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# External Evaluation of U.S. Department of Agriculture National Institute of Food and Agriculture Collaborative Projects

Meta-Evaluation Report  
of Second-Year Program Implementation  
2012-13 Program Year



**INTERCULTURAL DEVELOPMENT RESEARCH ASSOCIATION**  
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Submitted to:

U.S. Department of Agriculture  
National Institute of Food and Agriculture

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# Intercultural Development Research Association

**Mission:** assuring educational opportunity for every child

**Vision:** At IDRA, we develop innovative research- and experience-based solutions and policies to assure that (1) all students have access to and succeed in high quality schools, (2) families and communities have a voice in transforming the educational institutions that serve their children, and (3) educators have access to integrated professional development that helps to solve problems, create solutions, and use best practices to educate all students to high standards.

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Our assistance values the needs and cultures of our participants and acknowledges their experiences. We carefully craft training designs that include reflection and application. IDRA professional development causes participants to take a new look at persistent problems and equips them to take action that produces positive outcomes for all children.

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IDRA pro-actively disseminates cutting-edge information to educators, administrators, decision- and policymakers, parents and community leaders.

External Evaluation of U.S. Department of Agriculture National Institute of Food and Agriculture: Collaborative Projects – Final Meta-Evaluation Report of Second-Year Implementation, 2012-13 Program Year

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## Executive Summary

This evaluation report presents findings from the second-year of the meta-evaluation of the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA) collaborative projects funded through the Hispanic-Serving Institutions (HSIs) Grants Program. In October 2011, the USDA NIFA, awarded competitive grants to seven HSIs in four states and Puerto Rico to enhance the ability of these universities to support underserved students and develop a skilled American workforce. These grants support collaborations between HSIs and USDA agencies, such as the Natural Resources Conservation Service (NRCS), Forest Service (FS), Food and Nutrition Service (FNS), Agricultural Research Service (ARS), Animal and Plant Health Inspection Service (APHIS), and Food Safety Inspection Service (FSIS).

### Program Goals and Objectives of HSI Grant Program

Funding requirements for the collaborative projects stipulated that the primary focus of their activities was to improve teaching, enrollment, and graduation rates within a degree-granting program. The specific program goals of the HSI Grant Program include:

- Increase the number of underrepresented groups to reflect the nation's population demographics and to attain post-secondary and post graduate degrees in the food, agricultural, and natural resource sciences;
- Enhance the quality of postsecondary instruction within these disciplines;
- Facilitate the skill and competency development of Hispanic students in order to be competitive for jobs in the food and agriculture sector and at the U.S. Department of Agriculture (USDA) and other federal agencies;
- Provide opportunities and access to food and agricultural careers in the civil service; and
- Align the efforts of HSIs and other non-profit organizations in support of the academic development and career attainment of underrepresented groups.

The specific enabling objectives aligned with the program goals include:

- Strengthen institutional educational capacities to develop and enhance curriculum, faculty, instruction delivery systems, and infrastructure including libraries and scientific instrumentation, in order to respond and serve the needs of Hispanics/Latinos in identified state, regional, national, or international educational needs in the food and agricultural sciences;
- Recruit, retain, and support underrepresented undergraduate and graduate students from HSIs, especially Hispanics, who are severely underrepresented in professional jobs related to food and agricultural sciences, in order to prepare them for careers related to the food, agricultural, and natural resource systems of the United States. Recruitment may start with mentoring high school students and continue by providing financial support for students from undergraduate through graduate level toward completion of doctoral degrees;
- Facilitate cooperative initiatives between two or more HSIs or between HSIs and units of state government or the private sector, such as non-profit organizations serving Hispanics, in order to maximize the development and use of resources and to improve the food and agricultural sciences teaching programs; and
- Support the activities at institutions of higher education that strengthen the ability to serve as a role model on supporting Hispanic attainment by addressing the needs of this group and allowing the HSIs to enhance educational equity for underrepresented groups.

Projects had the flexibility to address an array of disciplines and subject matter areas. The list of possible disciplines and subject areas to be addressed included:

- General Food and Agricultural Sciences; Agribusiness Management and Marketing (includes Agricultural Economics);
- Agricultural/Biological Engineering;
- Agricultural Social Sciences (includes Agricultural Education, Agricultural Communications, and Rural Sociology);
- Animal Sciences; Aquaculture; Conservation and Renewable Energy and Natural Resources (includes Forestry and Ecology/Wetlands);
- Entomology - Animal;
- Entomology - Plant;
- Environmental Sciences/Management;
- Food Science/Technology and Manufacturing (including Food Safety);
- Human Nutrition;
- Human Sciences/Family and Consumer Sciences (excludes Human Nutrition);
- International Education/Research (enhancement of U.S. programs);
- Plant Sciences and Horticulture (including Turf Sciences);
- Related Biological Sciences (includes General/Basic Biotechnology, Biochemistry, and Microbiology);
- Soil Sciences;
- Veterinary Medicine/Science;
- Water Science/Water Resources (including Water Quality and Watershed Management); and
- Other relevant and subject matter areas including science, technology, engineering, and mathematics (STEM) disciplines.

For more information about the HSI Grant Program and USDA/NIFA, please visit the USDA websites.

## **Program Evaluation**

The Intercultural Development Research Association (IDRA) was contracted to conduct an external meta-evaluation and analysis. Based on the specifications listed in the request for an external evaluator, IDRA would:

- Prepare a work plan that outlines IDRA's approach and methodology for conducting the meta-analysis including the integration of baseline data generated by participating institutions into a comprehensive report delineating programmatic issues and challenges.
- Conduct a meeting of project directors to discuss scope of work, expectations of tasks, requirements for timely delivery, and identification of mitigating strategies to resolve challenges.
- Conduct focus group meeting with all grantees at their annual meeting and conduct a survey of project participants using SurveyMonkey to assess the ongoing status of each project relative to the goals of USDA to recruit, retain and graduate Hispanic students in agriculture, nutrition, and natural resources.
- Review all annual reports of participating projects to assess if institutions have adhered to their reporting requirements, and consolidate results of each project.
- Review all project reports and complete meta-analysis to determine the central tendencies of the projects, the variability of the results, and the best practices.

Second-year evaluation activities for the meta-evaluation spanned the period of October 2012 to March 2014. The meta-evaluator met with the USDA NIFA program officer and project directors in August 2013 in Mayagüez, Puerto Rico to discuss findings from the first-year evaluation and to discuss the work plan and timelines for the second-year evaluation. Major activities for the second-year evaluation include the development of surveys including the student survey, the conduct of site visits to each project, the meta-analysis of data collected by each project, and the development of the meta-evaluation report.

## **Collaborative Project Grantees**

The seven collaborative projects include:

- California State University-San Bernardino (CSU-SB), San Bernardino, California – Watershed Management Experiential Learning for USDA Careers;
- Florida International University (FIU), Miami, Florida – Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCAgE);
- New Mexico State University (NMSU), Las Cruces, New Mexico – Preparing Students for Career Paths with the USDA Forest Service by Linking Student Success with Experiential Learning Opportunities, Natural Resource Career Track (NRCT) Program;
- Texas A&M University-Kingsville (TAMUK), Kingsville, Texas – Step Up to USDA Career Success: Science, Technology and Environmental Programs for Undergraduate Preparation to USDA Career Success (STEP UP);
- Texas State University-San Marcos (TSU), San Marcos, Texas – Food Safety and Agroterrorism Training: Educating Our Future Workforce;

- University of Puerto Rico-Mayagüez (UPR-M), Mayagüez, Puerto Rico – UPR-Mayagüez Center for Education and training in Agricultural and Related Sciences (CETARS); and
- University of Texas-El Paso (UTEP), El Paso, Texas – Building a Regional Energy and Educational Network (BGREEN).

## Findings from the Archival Review and Meta-Analysis

The second year meta-evaluation relied upon archival and extant data made available by the collaborative projects, site visits to each of the seven projects, surveys administered to stakeholder groups, and an online survey administered to student participants.. Some key findings include:

- *Project Implementation:* Available data suggests that projects are being implemented as expected, and findings indicate that the participating colleges and universities are making strides to improve the opportunities for underrepresented students in the food and agricultural sciences, natural resources, and nutrition sectors.
- *College and University Collaboration:* The average number of collaborating colleges and universities was seven per project. Several projects also collaborated with each other.
- *USDA Agency Partnerships:* The projects collaborated with a wide array of USDA agencies in addition to USDA NIFA. Six of the seven projects (85.7 percent) partnered with USDA ARS and USDA NCRS; four of seven (57.1 percent) were partners with USDA FS and USDA APHIS; two of seven (28.6 percent) were partners with USDA FSIS and USDA RD.
- *Student Participation and Demographics:* The collaborative projects collectively served 487 college and university students, up from 385 in Year 1. Of the 487 students served, 271 (55.6 percent) were female and 216 (44.4 percent) were male, and 415 (85.2 percent) were of Hispanic origin.
- *Number of USDA agency and other internships.* Participating students were involved in 375 internships including 147 with USDA agencies and programs, and 228 with other partners. Some participating students are on target to receive employment in USDA jobs.
- *Measurable Impact.* The collaborative projects are achieving measurable impact as each project is achieving and/or making good progress in attaining the specific goals and objectives in their project plans.

## Findings from the Student Survey

As part of the meta-evaluation, a survey to participating students was conducted. The survey collected pertinent information organized in seven areas: (1) Background, Degree Plans and Goals, (2) Academic Interests and Career Plans, (3) College/University, Programs and Course of Study, (4) Recruitment of Under-Represented Students, (5) Supports and Opportunities for Experiential Learning, (6) USDA related Internships, Jobs, and Communications, and (7) Preparation for your field of interest and overall goals. Survey administration spanned the period of October 2013 through January 2014.

## Survey Highlights

### Background, Degree Plans and Goals

- Thirty-four institutions from the seven projects participated in the survey this year, compared to 24 last year.
- Most students were Hispanic (83.2 percent) with a higher proportion of female (61.6 percent).
- Nearly half of the students (46.9 percent) were first generation college students.
- More than half of the students (53.9 percent) were new to the project.
- Most students were enrolled in a program of study connected with agriculture, such as biology (11.9 percent), environmental science (8.7 percent), animal science (7.7 percent), and agricultural science (6.1 percent).
- More than a third of the students (36.5 percent) indicated a GPA between 3.50 and 3.99 in the spring of 2013, the latest time-period reported. A similar proportion (31.9 percent) reported a GPA between 3.00 and 3.49. More than 10 percent (11.6 percent) reported a perfect 4.0.
- A substantial majority of the students (69.7 percent) had an officially sanctioned degree plan, an improvement from the 62.7 percent reported last year.

### Academic Interests and Career Plans

- Overall, students (74.1 percent) had a strong interest in agriculture-related fields.
- The students (93.5 percent) were also satisfied with the program in which they are enrolled.

### College/University, Programs and Course of Study

- With more than 80 percent agreement (80.6 percent), students had a strong positive perspective on their colleges or universities.
- Most students (73.2 percent) indicated that their current college was their first choice.
- The students (91.2 percent) were satisfied with the program of study offered by the college or university in which they were enrolled.
- They (91.6 percent) also indicated that the courses they were taking were academically challenging and that the degree they would receive would prepare them for graduate or post-graduate school.

### Recruitment of Under-Represented Students

- With an overall agreement of 81.5 percent, students thought that their college or university was taking proactive steps to recruit more students in the agriculture field and in particular under represented students, including Hispanics.
- In this area, the highest agreement was with the statement, "The College/University I attend is taking pro-active steps to include diversity/multicultural perspectives in classes, presentations, assignments and discussions." The level of agreement was 84.1 percent.

### Supports and Opportunities for Experiential Learning

- Areas with high support (more than 80 percent agreement) include: Academic support with course requirements, partnering with faculty in research activities, faculty mentoring, professional meeting and conferences, and opportunities to conduct independent research, analyze and interpret my data and present my work.
- Areas with the least support (less than 65 percent agreement) include: Social and emotional counseling, out-of-state internships, visits to non-USDA agencies, job shadowing, and publishing opportunities. These are the areas the institutions should consider to improve on their offers for opportunities for experiential learning.
- Students felt comfortable getting what they need to succeed academically (92.9 percent), understanding what they need to do to meet graduation requirements (92.6 percent), and

getting their questions answered when they have doubts (92.6 percent).

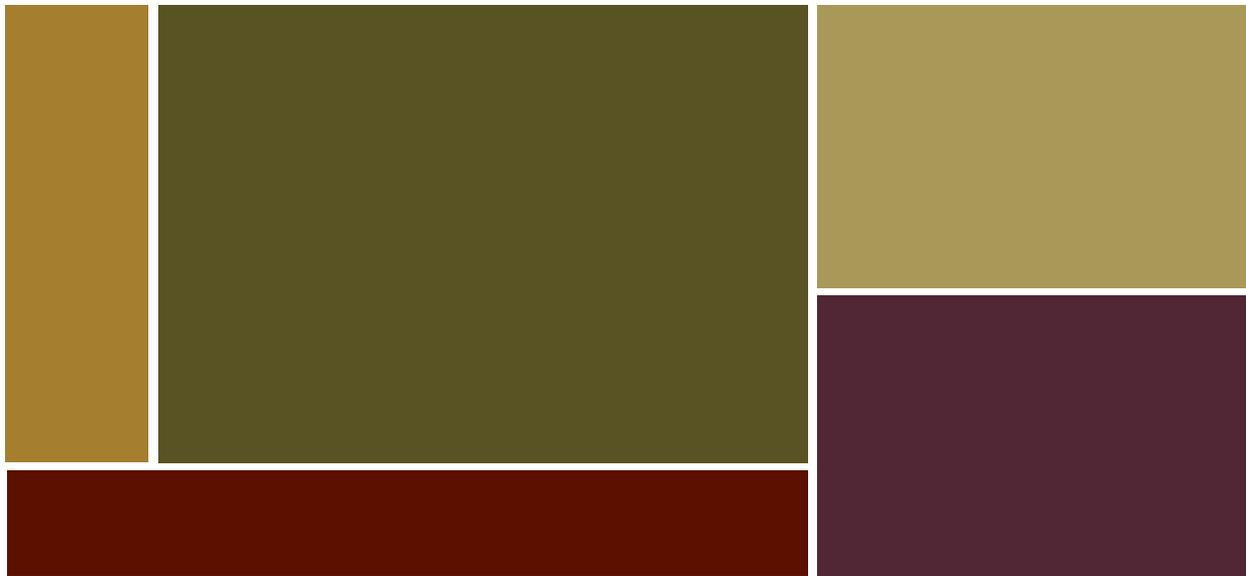
- More than a fourth of the students (29 percent) indicated that they developed and presented papers, and 11.9 percent of them were peer-reviewed.
- Close to half of the students (48. percent) indicated that they developed and displayed a poster as part of the project.
- The students' four most frequent challenges were: Financial issues/problems (18.3 percent), classes (13.9 percent), accessing information about internships (11.5 percent), and accessing information about jobs (9.5 percent).

### **USDA-related Internships, Jobs, and Communications**

- With more than 80 percent (81.8 percent) in the affirmative, students indicated that the college or university they attend offered the courses they needed for the job they sought.
- More than 75 percent (75.2 percent) of students were aware of internships and experiential learning opportunities within their USDA agency.
- However, 63.8 percent applied for them and 49.5 percent were successful in acquiring an internship, job shadowing or experiential learning opportunity within their USDA agency.
- On the other hand, 49.5 percent applied for an internship, job shadowing or experiential learning opportunity in a non-USDA agency and 38 percent were successful in acquiring an internship, job shadowing or experiential learning opportunity in a non-USDA agency.
- Regarding the student reactions to their experiential learning, nearly 40 percent (39.3 percent) of them suggested that the experience enabled them to acquire knowledge and practices from the real world, both in the field and in the lab, including equipment use, and a similar proportion (21.4 percent) emphasized the opportunity they received to practice conducting research, data collection and analysis.

### **Preparation for Your Field of Interest and Overall Goals**

- Nearly 70 percent of the students (69.4 percent) felt that they were well prepared in high school.
- More than 80 percent (84.2 percent) indicated that their high school encouraged them to enroll in college.
- And virtually all of them pointed out that their dream has always been to have a professional career (91.9 percent) and getting a college degree (93.8 percent).
- Comparatively, fewer (69.8 percent) indicated that their immediate goal was a career in a USDA related area. However, few (7.8 percent) disagreed with this goal; mostly they (22.4 percent) were neutral or uncommitted.



## Introduction

This evaluation report presents findings from the second-year of the meta-evaluation and analysis of information from the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA) collaborative projects funded through the Hispanic-Serving Institutions (HSIs) Grants Program. In October 2011, the U.S. Department of Agriculture, National Institute of Food and Agriculture, awarded competitive grants to seven HSIs in four states and Puerto Rico to enhance the ability of these universities to support underserved students and develop a skilled American workforce. These grants support collaborations between HSIs and USDA agencies, such as the Natural Resources Conservation Service, Forest Service, Food and Nutrition Service, Agricultural Research Service, Animal and Plant Health Inspection Service, and Food Safety Inspection Service.

### Overview of the USDA/NIFA HSI Grant Program

The U.S. Department of Agriculture (USDA) is the federal agency given the charge of supporting education in the food and agricultural sciences through USDA's Research, Education and Economics (REE) 2012 Strategic Goal #6: *Education and Science Literacy to recruit, cultivate, and develop the next generation of scientists and leaders, and to produce a highly-skilled workforce for food, agriculture, natural resources, forestry, and environmental systems.* Through the National Institute of Food and Agriculture (NIFA), Hispanic-Serving Institutions (HSIs) Grant Program, USDA funds higher education teaching programs in institutions that serve Hispanics at the regional and/or national level. These education awards focus on improving teaching, enrollment, and graduation rates of underrepresented students, particularly Hispanics, in the food and agricultural sciences.

Title V of the *Higher Education Act* defines HSIs as degree-granting public and private institutions of higher education with a full-time equivalent Hispanic student enrollment of at least 25 percent. Additionally, the *Food, Conservation and Energy Act of 2008* (FCEA) authorized establishment of new group HSIs referred to as Hispanic-serving agricultural colleges and universities (HSACUs). The NIFA annually certifies HSACUs under three criteria: (1) At least 25 percent of the institution's full-time student enrollment is Hispanic; (2) the institution offers accredited agriculture-related programs; and

(3) Hispanic students receive at least 15 percent of the degrees awarded in agriculture-related programs over the two most recent completed academic years.

The specific program goals of the HSI Grant Program include:

- Increase the number of underrepresented groups to reflect the nation's population demographics and to attain post-secondary and post graduate degrees in the food, agricultural, and natural resource sciences;
- Enhance the quality of postsecondary instruction within these disciplines;
- Facilitate the skill and competency development of Hispanic students in order to be competitive for jobs in the food and agriculture sector and at the U.S. Department of Agriculture (USDA) and other federal agencies;
- Provide opportunities and access to food and agricultural careers in the civil service; and
- Align the efforts of HSIs and other non-profit organizations in support of the academic development and career attainment of underrepresented groups.

The specific enabling objectives aligned with the program goals include:

- Strengthen institutional educational capacities to develop and enhance curriculum, faculty, instruction delivery systems, and infrastructure including libraries and scientific instrumentation, in order to respond and serve the needs of Hispanics/Latinos in identified state, regional, national, or international educational needs in the food and agricultural sciences;
- Recruit, retain, and support underrepresented undergraduate and graduate students from HSIs, especially Hispanics, who are severely underrepresented in professional jobs related to food and agricultural sciences, in order to prepare them for careers related to the food, agricultural, and natural resource systems of the United States. Recruitment may start with mentoring high school students and continue by providing financial support for students from undergraduate through graduate level toward completion of doctoral degrees;
- Facilitate cooperative initiatives between two or more HSIs or between HSIs and units of state government or the private sector, such as non-profit organizations serving Hispanics, in order to maximize the development and use of resources and to improve the food and agricultural sciences teaching programs; and
- Support the activities at institutions of higher education that strengthen the ability to serve as a role model on supporting Hispanic attainment by addressing the needs of this group and allowing the HSIs to enhance educational equity for underrepresented groups.

In order to address the future workforce needs in the food and agriculture sector, USDA/NIFA has refocused its mission by addressing its agricultural sciences research, education, and extension programs in five priority areas:

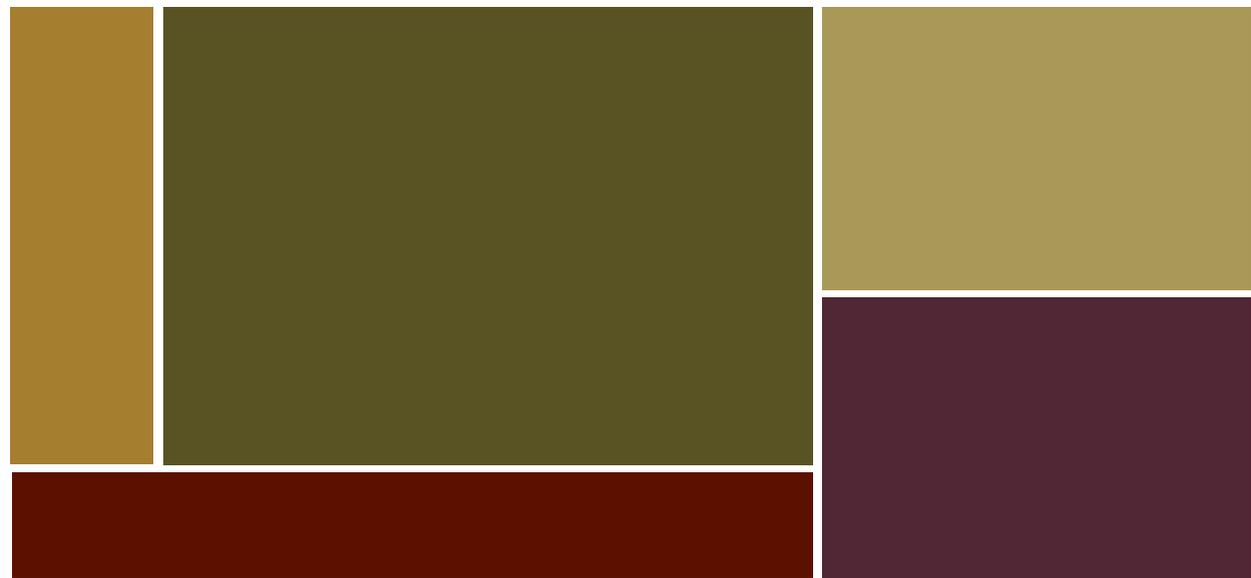
1. Global Food Security and Hunger;
2. Climate Change;
3. Sustainable Energy;
4. Childhood Obesity; and
5. Food Safety.

Funded projects have the flexibility to address an array of disciplines and subject matter areas. The list of possible disciplines and subject areas to be addressed included:

- General Food and Agricultural Sciences;
- Agribusiness Management and Marketing (includes Agricultural Economics);
- Agricultural/Biological Engineering;
- Agricultural Social Sciences (includes Agricultural Education, Agricultural Communications, and Rural Sociology);
- Animal Sciences;
- Aquaculture;
- Conservation and Renewable Energy and Natural Resources (includes Forestry and Ecology/Wetlands);
- Entomology – Animal;
- Entomology – Plant;
- Environmental Sciences/Management;
- Food Science/Technology and Manufacturing (including Food Safety);
- Human Nutrition;
- Human Sciences/Family and Consumer Sciences (excludes Human Nutrition);
- International Education/Research (enhancement of U.S. programs);
- Plant Sciences and Horticulture (including Turf Sciences);
- Related Biological Sciences (includes General/Basic Biotechnology, Biochemistry, and Microbiology);
- Soil Sciences;
- Veterinary Medicine/Science;
- Water Science/Water Resources; (including Water Quality and Watershed Management); and
- Other relevant and subject matter areas including science, technology, engineering, and mathematics (STEM) disciplines.

## **Overview of Report**

This evaluation report provides a summary of evaluation findings to date including those from the archival review of baseline and outcome data indicators, site visits conducted to each site, surveys conducted with key stakeholders, and findings from the online student survey. The next chapter of the report provides an overview of the collaborative projects. Following the overview of the projects, the next chapter will present the evaluation approach and methods. Next, the results of the archival review and meta-analysis will be presented, followed by the findings from the online survey. Lastly, the report will present conclusions and discussions of findings, and next steps in the evaluation.



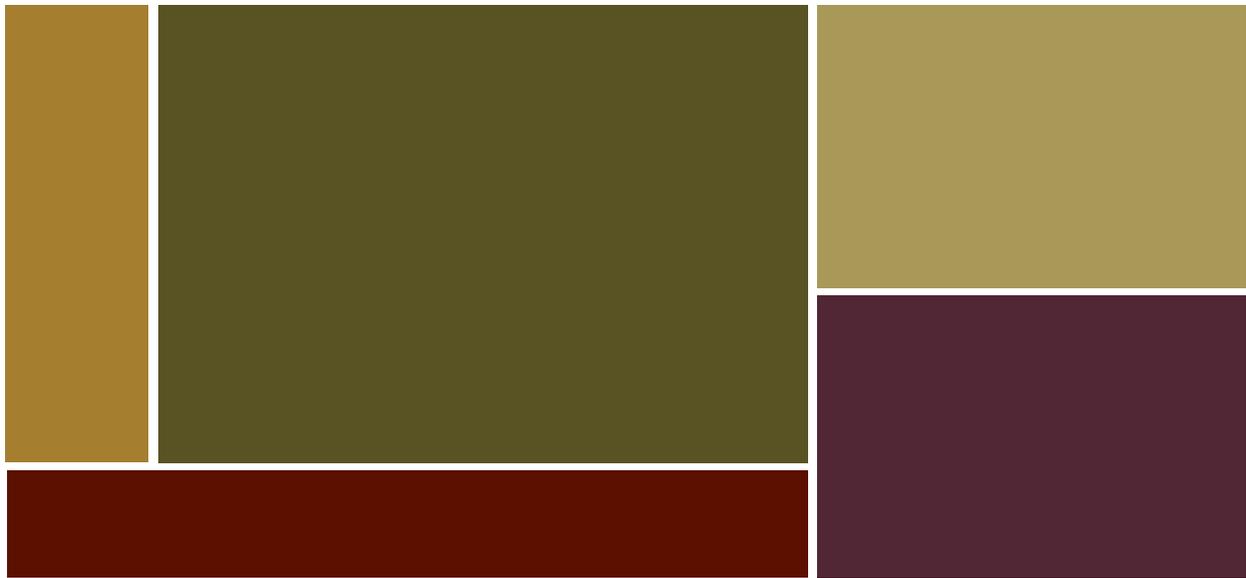
## Overview of the Collaborative Projects

There were 370 HSIs in the United States and Puerto Rico in 2012-13. This number continues to grow every year as the number of Hispanic/Latino students attending college continues to increase. In 2011-2, there were 356 HSIs. As defined in federal law, HSIs are degree-granting public and private institutions of higher education with a full-time equivalent Hispanic student enrollment of at least 25 percent. In October 2011, NIFA funded seven groups of HSIs in four states and Puerto Rico to enhance the ability of these universities to support underserved students and to develop a skilled workforce in the food and agriculture sciences, natural resources and nutrition. The seven collaborative projects are listed in the table below (see Exhibit 1). All of the project grantees were HSIs. One of the grantees (NMSU) is a land grant university based on federal law in 1862, 1890, and 1994. For the 2011-12 academic school year, four of the seven grantees were certified as HSACUs including CSU-SB, FIU, TAMUK, and UTEP. See Appendix A for a more detailed overview of each project.

<b>Exhibit 1: List of USDA/NIFA Collaborative Projects</b>		
<b>Grantees/Projects</b>	<b>Project Title</b>	<b>Brief Project Description</b>
California State University-San Bernardino, San Bernardino, California (CSU-SB)	Watershed Management Experiential Learning for USDA Careers	This project will increase the retention and graduation of underrepresented students for careers in the USDA's workforce through an innovative paid experiential-learning Watershed Management Internship program.
Florida International University, Miami, Florida (FIU)	Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCAge)	This project will train Hispanic students in biological and natural sciences for career placement in USDA and other federal agencies.

**Exhibit 1: List of USDA/NIFA Collaborative Projects**

Grantees/Projects	Project Title	Brief Project Description
New Mexico State University, Las Cruces, New Mexico (NMSU)	Preparing Students for Career Paths with the USDA Forest Service by Linking Student Success with Experiential Learning Opportunities  Natural Resource Career Track (NRCT) Program	This project will mentor cohorts of under-represented students through innovative academic and experiential learning opportunities to prepare them for careers in natural resource management.
Texas A&M-Kingsville, Kingsville, Texas (TAMUK)	Step Up to USDA Career Success: Science, Technology and Environmental Programs for Undergraduate Preparation to USDA Career Success (STEP UP)	This project will assist in the training and education of under-represented South Texas Hispanic students for careers in USDA agencies.
Texas State University-San Marcos, San Marcos, Texas (TSU)	Food Safety and Agroterrorism Training: Educating Our Future Workforce (FATE)	This project will fund 50 undergraduate students and employ six graduate students, who will become certified by the U.S. Department of Homeland Security and be introduced to food safety vulnerabilities through field trips to dairies, food processing factories, and the United States/Mexico livestock border crossing.
University of Puerto Rico, Mayagüez, Puerto Rico (UPR-M)	UPR-Mayagüez Center for Education and training In Agricultural and Related Sciences (CETARS)	This project will provide students from agriculture and related disciplines with graduate research assistantships, undergraduate research stipends and educational and training experiences.
University of Texas-El Paso, El Paso, Texas (UTEP)	Building a Regional Energy and Educational Network (BGREEN)	This project will create a collaborative network of researchers, educators, USDA agencies, and non-profit organizations to coordinate efforts, share resources, and increase educational, training and post-graduation opportunities for Hispanic students pursuing careers in sustainable energy.



## Evaluation Methodology

The Intercultural Development Research Association (IDRA) was contracted to conduct an external meta-evaluation and analysis. Based on the specifications listed in the request for an external evaluator, IDRA would:

- Prepare a work plan that outlines IDRA's approach and methodology for conducting the meta-analysis including the integration of baseline data generated by participating institutions into a comprehensive report delineating programmatic issues and challenges.
- Conduct a meeting of project directors to discuss scope of work, expectations of tasks, requirements for timely delivery, and identification of mitigating strategies to resolve challenges.
- Conduct focus group meeting with all grantees at their annual meeting and conduct a SurveyMonkey survey of project participants to assess the ongoing status of each project relative to the goals of USDA to recruit, retain and graduate Hispanic students in agriculture, nutrition, and natural resources.
- Review all annual reports of participating projects to assess if institutions have adhered to their reporting requirements, and consolidate results of each project.
- Review all project reports and complete meta-analysis to determine the central tendencies of the projects, the variability of the results, and the best practices.

The term meta-evaluation, introduced by Dr. Michael Scriven (1969), describes a plan to evaluate educational products. In its simplest term, meta-evaluation is the evaluation of the quality of evaluations. The HSIs Collaboration Grants meta-evaluation will aggregate information from seven individual project evaluations to identify lessons learned and improve organizational learning. The meta-evaluation will be conducted concurrently with the project evaluations and will provide the meta-evaluators opportunities to give formative feedback and summative judgments about the findings of the evaluations. It also will enable the projects to document some of the outcomes and impacts they are accomplishing as a group.

Second-year evaluation activities for the meta-evaluation spanned the period of October 2012 through February 2014 with concurrent activities being undertaken for the first and second years. The meta-evaluator met with the USDA NIFA program officer and project directors in August 2013 to discuss findings from the first-year evaluation and to discuss the work plan and timelines for the second-year evaluation. Major deliverables of the second-year evaluation include the development of surveys including the student survey, the conduct of site visits to each project, the meta-analysis of data collected by each project, and the development of the meta-evaluation report.

## Evaluation Questions

The overarching evaluation research questions for the meta-evaluation include the following:

1. **Institutional Efficacy:** How was institutional efficacy and capacity strengthened in terms of attracting and supporting undergraduate and graduate students from under-represented groups in food and agricultural sciences programs in terms of: (a) practices/policies; (b) numbers of students attracted; (c) student support systems; (d) numbers of students graduated; (e) facilities (libraries, etc.); and (f) faculty and faculty development?
2. **Collaborative Action:** How did the project achieve collaboration among the consortia of HSLs in terms of: (a) improved opportunities for collaboration; (b) sharing of resources (faculty, resources, etc.); (c) collaborative planning and problem-solving; and (d) sharing lessons learned?
3. **Collective Impact:** How did the initiative enhance the capacity and collective impact of agricultural departments in graduating (undergraduate and graduate) students from under-represented groups in terms of: (a) creating and disseminating models of effective practice; (b) increasing numbers of underrepresented students in food and agricultural sciences; and (c) increased state or private sector involvement in food and agricultural sciences programs?

## Schedule of Evaluation Activities

The schedule of major evaluation activities is presented in Exhibit 2 below.

Exhibit 2: Schedule of Evaluation Activities	
Evaluation Activities	Timelines
Review/revise work plan	November – December 2012
Develop/revise evaluation instruments	January – June 2013
Survey and interview guides including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator Survey; External Evaluator Survey; Faculty and Program Staff Survey; Collaborators and Partners Survey; Student Survey	January – June 2013
Site visit protocols and interview guides	April – July 2013

## Exhibit 2: Schedule of Evaluation Activities

Evaluation Activities	Timelines
<b>Collect evaluation data</b>	April 2013 – January 2014
Interim Progress Reports	April – July 2013
Final Annual Performance Reports	November 2013 – January 2014
Online Student Survey	October 2013 – January 2014
<b>Conduct site visits</b>	June – September 2013
TAMUK (Kingsville, TX)	June 5-7, 2013
UPR-M (Mayaguez, PR)	August 12-15, 2013
CSUSB (San Bernardino, CA)	August 27-29, 2013
FIU (Miami, FL)	September 16-17, 2013
UTEP(El Paso, TX)	September 24-25, 2013
NMSU (Albuquerque, NM and Valle Calderas National Preserve, Jemez Springs, NM)	September 27-28, 2013
TSU (San Marcos, TX)	October 2-3, 2013
<b>Conduct data analysis</b>	June 2013 – March 2014
<b>Develop report of evaluation findings</b>	December 2013 --- March 2014

As part of its activities, IDRA conducted site visits and interacted with participants and stakeholders at each site to learn about: progress and success achieved; descriptions of successful and innovative strategies associated with project implementation; quality of partnerships, collaboration and networks; lessons learned; information dissemination, etc. In order to facilitate discussions with project personnel and other stakeholders, IDRA developed several online surveys targeting several audiences.

## Baseline and Outcome Data Collection

The USDA NIFA program leader and the project directors from the seven collaborative projects selected 20 outcome indicators to measure outputs and impact of project implementation. These indicators are listed in the box below. Project directors provided information on these indicators in interim progress reports and annual performance reports which were submitted to USDA NIFA.

### Twenty Outcome Indicators for USDA/NIFA Collaborative Projects

1. Total number of USDA agencies and partners
2. Total number of internships (USDA vs. other)
3. Total number of students served including gender and ethnicity
4. Total percent of retention (undergraduate/graduate/Ph.Ds.)
5. Total number of students in experiential learning (research) mentoring
6. Total number of participants presenting
7. Total number of students enrolled in disciplines applicable to USDA jobs
8. Total number of degrees awarded with USDA qualifications
9. Total number of students publishing
10. Comparison of GPA's before and after
11. Developing curriculum and faculty for required USDA courses
12. Comparison of female success (before and after): gender and ethnicity
13. Total number of students hours advising and tutoring
14. Tracking students placement into jobs or Ph.D.s/ student mobility
15. Track research activities/English skills
16. K-12 activities (and freshmen)
17. Community engagement activities
18. Budget implementation
19. Program activities/implementation
20. Agency/participant survey

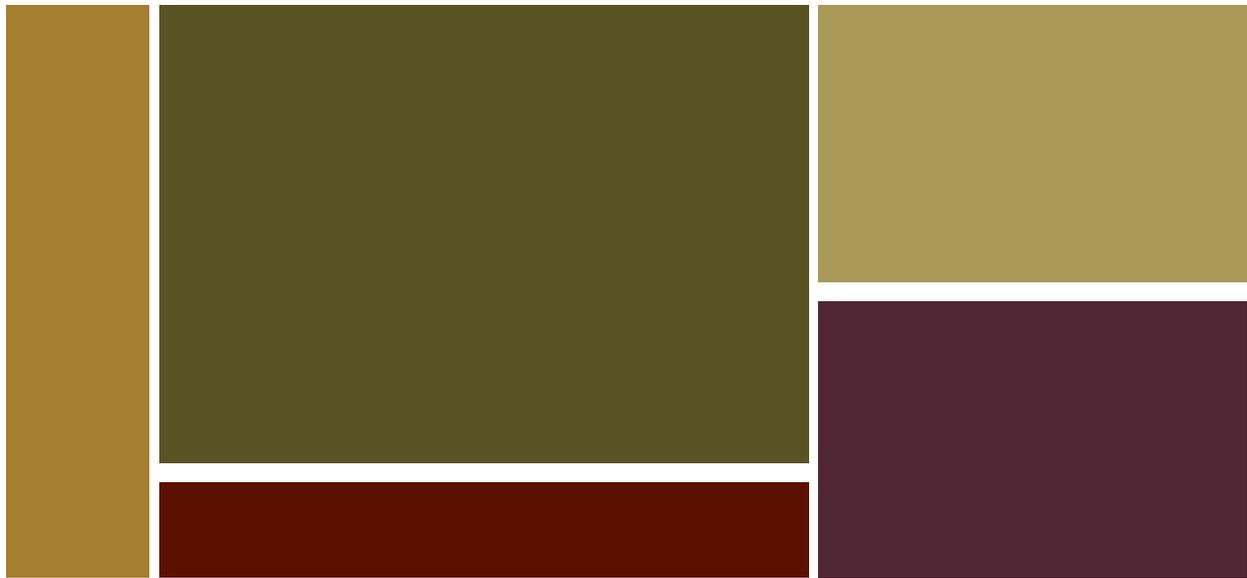
## Project Logic Model

The logic model in the figure below presents the evaluation methodology and approach (see Exhibit 3). The meta-evaluation brought together information provided by the individual projects and resulted in the meta-analysis of baseline and outcome data. While the meta-evaluation sought to assess the collective effects and outcomes of project implementation, the focus was not to determine the statistical significant or power of the sample size or the statistical significance of the resulting outcomes.

### Exhibit 3: Logic Model for USDA/NIFA Meta-Analysis Evaluation

**Objective:** Conduct a meta-analysis evaluation of seven projects funded by the Department of Agriculture to (1) support the activities of consortia of HSIs to enhance educational equity for underrepresented students; (2) strengthen institutional educational capacities including libraries, curriculum, faculty, scientific instrumentation, instruction delivery systems; and student recruitment and retention; (3) attract and support undergraduate and graduate students from underrepresented groups to prepare them for careers related to the food, agricultural, and natural resource systems of the United States; and (4) facilitate cooperative initiatives between two or more HSIs or between HSIs and units of state government or the private sector.

Inputs	Activities	Outputs	Outcomes – Impact		
			Institutional Efficacy	Collaborative Actions	Collective Impact
<p>Each project allocated funding for this meta-analysis evaluation</p> <p>Projects’ external evaluators</p> <p>Project Directors</p> <p>Students from underrepresented groups</p>	<p>I. Attend a meeting of all projects to meet with project directors to discuss scope of work and expectations of the tasks.</p> <p>II. The contractor shall prepare a work plan that outlines the contractor’s approach and methodology for accomplishing the tasks outlined in the deliverables.</p> <p>III. The contractor will conduct focus group meeting with all grantees at their annual meeting and conduct a SurveyMonkey of project participants.</p> <p>IV. At the end of the project year the contractor will review all annual reports to assess if institutions have adhered to their reporting requirements and consolidate the results of each project.</p> <p>V. The contractor will review all institutional reports and complete meta-analysis to determine the central tendencies of the projects, the variability of the results, and the best practices.</p>	<ol style="list-style-type: none"> <li>1. Interact with project directors and evaluators</li> <li>2. Provide guidance on metrics for local project and group evaluation</li> <li>3. Conduct site visits to each project</li> <li>4. Data review and analysis</li> <li>5. Meta-analysis of seven projects</li> <li>6. Rating of performance of each project</li> <li>7. Present findings at conference designated by USDA NIFA program officer</li> <li>8. Share deliverables projects and USDA NIFA</li> </ol>	<p>Institutional efficacy and capacity to attract and support students from underrepresented groups in food and agricultural sciences programs are strengthened as evidenced by:</p> <ol style="list-style-type: none"> <li>a) effective enrollment and retention practices and policies,</li> <li>b) increased numbers enrolled and graduated,</li> <li>c) culturally responsive student support systems,</li> <li>d) facilities (libraries, etc.),</li> <li>e) program and faculty development.</li> </ol>	<p>Collaboration and networking among the consortia of Hispanic-Serving Institutions in have increased as evidenced by:</p> <ol style="list-style-type: none"> <li>a) greater and improved opportunities for collaboration,</li> <li>b) sharing of resources (faculty, resources, etc.),</li> <li>c) collaborative planning and problem-solving,</li> <li>d) sharing lessons learned.</li> </ol>	<p>Initiative enhanced the capacity and collective impact of agricultural departments to enroll serve 350 graduate and undergraduate students from underrepresented groups as evidenced by:</p> <ol style="list-style-type: none"> <li>a) creating and disseminating models of effective practice,</li> <li>b) increasing numbers of underrepresented students in food and agricultural sciences, and</li> <li>c) increased state or private sector involvement in food and agricultural sciences programs.</li> </ol>
<p>Assumptions: (1) All seven projects have integrated into their evaluation designs a uniform set of metrics to respond to the meta-analysis evaluation requirements. (2) Each project has a unique set of responses to the grant objectives. (3) Each project has responded to the three major grant objectives delineated in the RFP.</p>		<p>External Factors: (1) Fidelity of implementation, (2) Timeliness of data, (3) State and IHE policies, (4) Collaboration, and (5) Adequacy of data collection systems.</p>			



## Findings from the Archival Review

### Collaborating Colleges and Universities

Collectively, 40 colleges and universities enrolled students in the project in 2012-13, up from 36 in 2011-12. An unduplicated count of 40 colleges and universities including the seven lead institutions and 33 collaborating institutions enrolled students in the project in 2012-13 (see Exhibit 4). Several lead institutions also collaborated with each other in the enrollment of participating students. (See Exhibit 5 below and Exhibit A-8 in Appendix A for lists of collaborating site).

**Exhibit 4: Number of Collaborating Colleges and Universities By Project, 2012-13**

Project Sites	Universities		Colleges		Total	
	Proposed	Actual	Proposed	Actual	Proposed	Actual
California State University-San Bernardino (CSU-SB)	14	11	0	0	14	11
Florida International University (FIU)	3	3	1	1	4	4
New Mexico State University (NMSU)	8	9	4	5	12	14
Texas A&M University-Kingsville (TAMUK)	2	2	3	3	5	5
Texas State University-San Marcos (TSU)	1	1	3	3	4	4
University of Puerto Rico-Mayagüez (UPR-M)	5	5	0	0	5	5
University of Texas-El Paso (UTEP)	4	4	0	0	4	4
<b>Total (Duplicated)</b>	<b>37</b>	<b>35</b>	<b>11</b>	<b>12</b>	<b>48</b>	<b>47</b>
<b>Total (Unduplicated)</b>	<b>30</b>	<b>28</b>	<b>11</b>	<b>12</b>	<b>41</b>	<b>40</b>

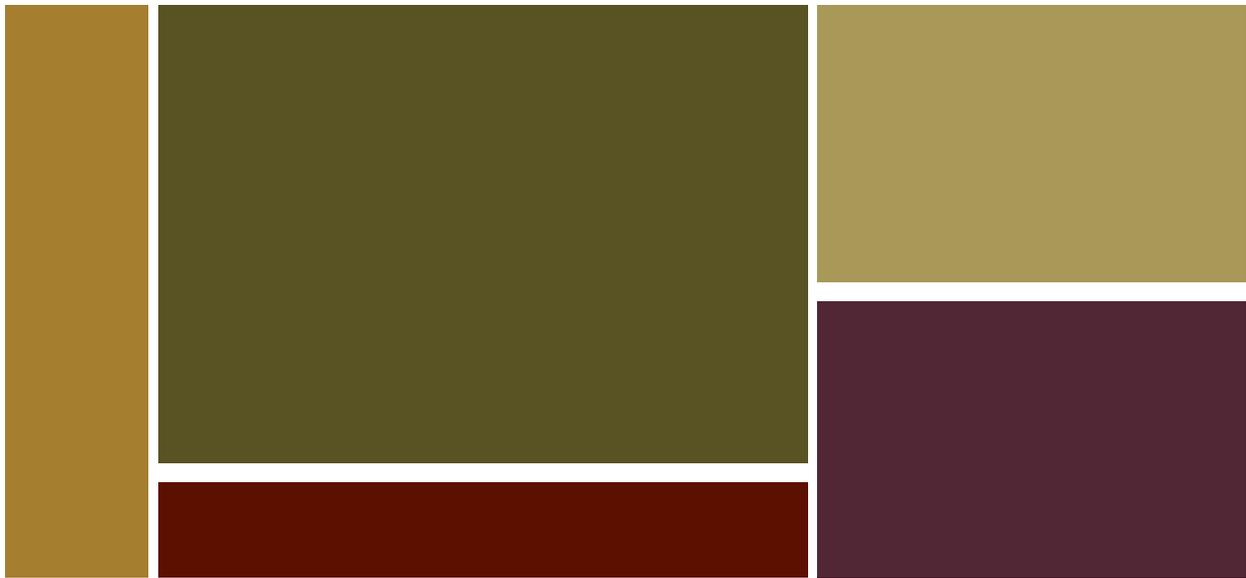
**Exhibit 5: List of Collaborating Colleges and Universities, 2012-13**

<b>Lead Universities</b>	<b>Proposed College and University Collaborators</b>	<b>Actual College and University Collaborators</b>
<p><b>California State University-San Bernardino (CSU-SB)</b></p>	<p>California State University-Bakersfield, California State University-Channel Islands, California State University-Dominguez Hills, California State University-Fresno, California State University-Fullerton, California State University-Long Beach, California State University-Los Angeles, California State University-Monterey Bay, California State University-Northridge, California State Polytechnic Institute – Pomona, California State University-San Bernardino, California State University-San Marcos, California State University-Stanislaus, San Diego State University (n = 14)</p>	<p>California State University-Bakersfield, California State University-Channel Islands, California State University-Fresno, California State University-Los Angeles, California State University-Monterey Bay, California State University-Northridge, California State Polytechnic Institute – Pomona, California State University-San Bernardino, California State University-San Marcos, California State University-Stanislaus, San Diego State University (n = 11)</p>
<p><b>Florida International University (FIU)</b></p>	<p>Florida International University, InterAmerican University of Puerto Rico – San Germán [Universidad Interamericana de Puerto Rico at San Germán], Miami Dade College, St. Thomas University (n = 4)</p>	<p>Florida International University, InterAmerican University of Puerto Rico – San Germán [Universidad Interamericana de Puerto Rico at San Germán], Miami Dade College, St. Thomas University (n = 4)</p>
<p><b>New Mexico State University (NMSU)</b></p>	<p>Luna Community College, InterAmerican University of Puerto- Bayamón, New Mexico Highlands University, New Mexico State University-Alamogordo, New Mexico State University-Carlsbad, New Mexico State University-Grants, New Mexico State University (Las Cruces), University of Puerto Rico-Bayamón, University of Puerto Rico-Cayey, University of Puerto Rico-Humacao,</p>	<p>Luna Community College, InterAmerican University of Puerto-Bayamón, New Mexico Highlands University, New Mexico State University-Alamogordo, New Mexico State University-Carlsbad, New Mexico State University-Grants, New Mexico State University (Las Cruces), University of Puerto Rico-Bayamón, University of Puerto Rico-Cayey, University of Puerto Rico-Humacao, University of Puerto Rico-Mayagüez, University of Puerto Rico-Rio Piedras, Eastern</p>

**Exhibit 5: List of Collaborating Colleges and Universities, 2012-13**

<b>Lead Universities</b>	<b>Proposed College and University Collaborators</b>	<b>Actual College and University Collaborators</b>
	University of Puerto Rico-Mayagüez, University of Puerto Rico-Rio Piedras (n = 12)	New Mexico University-Ruidosa, University of Puerto Rico-Utuado (n = 14)
<b>Texas A&amp;M University-Kingsville (TAMUK)</b>	Del Mar College, South Texas College, Texas A&M University-Kingsville, Texas State Technical College -Harlingen, University of Texas-Pan American (n = 5)	Del Mar College, South Texas College, Texas A&M University-Kingsville, Texas State Technical College -Harlingen, University of Texas-Pan American (n = 5)
<b>Texas State University-San Marcos (TSU)</b>	Laredo Community College, Northwest Vista College, Palo Alto College, Texas State University-San Marcos (n = 4)	Laredo Community College, Northwest Vista College, Palo Alto College, Texas State University-San Marcos (n = 4)
<b>University of Puerto Rico-Mayagüez (UPR-M)</b>	InterAmerican University of Puerto Rico – San Germán [Universidad Interamericana de Puerto Rico at San Germán], University of Puerto Rico-Aguadilla, University of Puerto Rico-Humacao, University of Puerto Rico-Mayagüez, University of Texas-El Paso (n = 5)	InterAmerican University of Puerto Rico – San Germán [Universidad Interamericana de Puerto Rico at San Germán], University of Puerto Rico-Aguadilla, University of Puerto Rico-Humacao, University of Puerto Rico-Mayagüez, University of Texas-El Paso (n = 5)
<b>University of Texas-El Paso (UTEP)</b>	New Mexico State University, Texas A&M University-Kingsville, Texas State University-San Marcos, University of Texas-El Paso (n = 4)	New Mexico State University, Texas A&M University-Kingsville, Texas State University-San Marcos, University of Texas-El Paso (n = 4)

**Source: Project Progress and Annual Reports, 2012-13**



## Findings from the Meta-Analysis

As mentioned earlier, 20 outcome indicators were selected by the USDA NIFA program leader and the project directors of the seven collaborative projects. The meta-analysis sought to aggregate the outputs of the individual projects in order to measure the collective outcomes and impact of the projects' implementation. Where possible, information was aggregated for the following indicators:

1. Total number of USDA Agencies and Partners
2. Total number of internships (USDA vs. other)
3. Total number of students served/including gender and ethnicity
4. Total percent of retention (undergraduate/graduate/Ph.Ds)
5. Total number of students in experiential learning (research) mentoring
6. Total number of participants presenting
7. Total number of students enrolled in disciplines applicable to USDA jobs
8. Total number of degrees awarded with USDA qualifications
9. Total number of students publishing
10. Comparison of GPA's before and after
11. Developing curriculum and faculty for required USDA courses
12. Comparison of female success (before and after): gender and ethnicity
13. Total number of students hours advising and tutoring
14. Tracking students placement into jobs or Ph.D.s/student mobility
15. Track research activities/English skills
16. K-12 activities (and freshmen)
17. Community engagement activities
18. Budget implementation
19. Program activities/implementation
20. Agency/participant survey

The interim progress and annual performance reports for each project are exhibited in Appendix B. These reports provide full detail on information presented regarding the outcome indicators.

## Number of USDA and Non-USDA Partners

The projects collectively formed 121 partnerships in 2012-13, up from about 77 in 2011-12. Exhibit 6 presents the number of partnerships established with USDA and non-USDA partners. The number of USDA partnerships increased from 37 in 2011-12 to 51 in 2012-13. Partnerships with non-USDA institutions also increased. There was a 75 percent increase in non-USDA partnerships from 40 in 2011-12 to 70 in 2012-13. Overall, the number of USDA and non-USDA partnerships increased by 57.1 percent from 77 in 2011-12 to 121 in 2012-13.

Exhibit 6: Number of USDA and Non-USDA Partnerships, 2012-13									
Partnership Types	Year	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
<b>USDA Partners</b>									
USDA Agencies	2011-12	3	4	3	5	5	5	3	28
	2012-13	4	3	3	5	5	3	3	26
USDA Programs and Offices	2011-12	0	2	2	2	0	1	2	9
	2012-13	1	10	1	2	0	9	2	25
Total USDA	2011-12	3	6	5	7	5	6	5	37
	2012-13	5	13	4	7	5	12	5	51
<b>Non-USDA Partners</b>									
National	2011-12	0	0	1	0	0	3	0	4
	2012-13	3	1	5	0	0	3	0	12
State and Territory	2011-12	6	0	0	2	1	1	1	11
	2012-13	3	6	0	4	2	3	1	19
Local and Regional	2011-12	11	3	0	4	0	0	1	19
	2012-13	17	4	0	3	0	0	0	24
Private and Other	2011-12	3	0	0	3	0	0	0	6
	2012-13	3	1	0	9	0	2	0	15
Total Non-USDA	2011-12	20	3	1	9	1	4	2	40
	2012-13	26	12	5	16	2	8	1	70
<b>Total (All Partners: USDA and Non-USDA)</b>	2011-12	<b>23</b>	<b>9</b>	<b>6</b>	<b>16</b>	<b>6</b>	<b>10</b>	<b>7</b>	<b>77</b>
	2012-13	<b>31</b>	<b>25</b>	<b>9</b>	<b>23</b>	<b>7</b>	<b>20</b>	<b>6</b>	<b>121</b>

Source: USDA NIFA Collaborative Projects, Annual Progress Reports, 2012-13

## USDA Agency Partners

The projects collaborated with a wide array of USDA agencies and program offices. Exhibit 7 presents the key partnerships with USDA agencies, programs and offices. In the second year, six of the seven projects (85.7 percent) partnered with USDA ARS and USDA NCRS; four of seven (57.1 percent) were partners with USDA FS and USDA APHIS; two of seven (28.6 percent) were partners with USDA FSIS and USDA RD; and one of seven (14.3 percent) were partners with USDA AMS and USDA FSA.

<b>Exhibit 7: Project Collaboration with USDA Agencies Partners, 2012-13</b>							
<b>USDA Agencies, Programs and Offices</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>
<b>USDA Agencies</b> (Excluding National Institute of Food and Agriculture (NIFA) who is the funding agency)							
Agricultural Marketing Service (AMS)				✓			
Agricultural Research Service (ARS)	✓	✓		✓	✓	✓	✓
Animal and Plant Health Inspection Service (APHIS)		✓	✓	✓		✓	
Farm Service Agency (FSA)	✓						
Food Safety and Inspection Service (FSIS)		✓			✓		
Forest Service (FS)	✓		✓	✓	✓		
Natural Resources Conservation Service (NRCS)	✓		✓	✓	✓	✓	✓
Rural Development (RD)					✓		✓
Total USDA Agency Partners	4	3	3	5	5	3	3
<b>USDA Programs and Offices</b>							
U.S. Forest Service, Southern California Consortium Roundtable of Education, Community and Employment (CRECE)	✓						
Agricultural Research Service (ARS), Ft. Lauderdale, FL		✓					
Agricultural Research Service (ARS), Miami, FL		✓					
Agricultural Research Service (ARS), Prosser, WA		✓					
Agricultural Research Service (ARS), Mayaguez, Puerto Rico		✓					
Animal and Plant Health Inspection Service (APHIS), Plant Protection Quarantine, Miami, FL		✓					
Animal and Plant Health Inspection Service (APHIS), Plant Protection Quarantine, Carolina, Puerto Rico		✓					
Animal and Plant Health Inspection Service (APHIS), Veterinary Services,		✓					

### Exhibit 7: Project Collaboration with USDA Agencies Partners, 2012-13

USDA Agencies, Programs and Offices	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP
Hato Rey, Puerto Rico							
Food Safety and Inspection Service (FSIS), Miami, FL		✓					
Hispanic-Serving Institutions National Program (HSINP)-Florida Regional Office		✓					
Hispanic-Serving Institutions National Program (HSINP)-Puerto Rico Regional Office		✓					
Forest Service, Office of Civil Rights, Albuquerque, NM			✓				
Animal and Plant Health Inspection Service (APHIS), Plant Protection Quarantine, Austin, TX				✓			
Natural Resources Conservation Service (NRCS), Plant Materials Center (PMC)				✓			
Agricultural Research Service (ARS), Beltsville, MD						✓	
Agricultural Research Service (ARS), Maryland						✓	
Agricultural Research Service (ARS), Mayaguez						✓	
Forest Service (FS), El Yunque PR						✓	
Forest Service (FS), Madison, WI						✓	
Agricultural Marketing Service (AMS), Dairy Programs, Washington DC						✓	
Agricultural Marketing Service (AMS), Dairy Programs, North Carolina						✓	
Natural Resources Conservation Service (NRCS), North Carolina						✓	
Natural Resources Conservation Service (NRCS), North Dakota						✓	
Agricultural Research Service (ARS) Southern Plains Area (Lubbock, TX)							✓
Natural Resources Conservation Service (NRCS), Resources Inventory and Assessment Division (RIAD)							✓
Total USDA Program/Office Partners	1	10	1	2	0	9	2
<b>Total USDA Partners</b>	<b>5</b>	<b>13</b>	<b>4</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>5</b>

Source: USDA NIFA Collaborative Projects, 2012-13

## National Agency/Organization Partners

Exhibit 8 presents the projects' collaboration with national agencies and organizations. Three of the projects collaborated with the U.S. Geological Survey. The list of other national partners included National Aeronautics and Space Administration (NASA); U.S. Department of Interior, Bureau of Land Management (BLM); U.S. Department of Interior, Bureau of Reclamation (BOR); U.S. Department of Interior, U.S. Fish and Wildlife Services (USFWS); U.S. Department of Interior, National Park Services (NPS); National Institute of Environmental Health Sciences (NIEHS); and U.S. Environmental Protection Agency (USEPA), Puerto Rico.

<b>Exhibit 8: Project Partnerships with National Agencies/Organizations</b>							
<b>National Agencies/Organizations</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>
National Aeronautics and Space Administration (NASA)	✓						
U.S. Geological Survey (USGS)	✓		✓			✓	
Inter-American Institute for Cooperation in Agriculture (IICA)		✓					
U.S. Department of Education, TRIO, Upward Bound Program	✓						
U.S. Department of Interior, Bureau of Land Management (BLM)			✓				
U.S. Department of Interior, Bureau of Reclamation (BOR)			✓				
U.S. Department of Interior, U.S. Fish and Wildlife Services (USFWS)			✓				
U.S. Department of Interior, National Park Services (NPS)			✓				
National Institute of Environmental Health Sciences (NIEHS)						✓	
U.S. Environmental Protection Agency (USEPA), Puerto Rico						✓	
<b>Total National Collaboration</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>

Source: USDA NIFA Collaborative Projects, 2011-12

## State, Territory, Region, Local and Private Partners

Exhibit 9 presents the projects' collaboration with local, state, region, and private entities, organizations, and companies.

Exhibit 9: Project Collaboration with State, Regional, Local and Private Partners							
State, Territory, Local, Regional, Private and Other Partners	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP
<b>State and Territory</b>							
California Department of Fish and Game	✓						
California Department of Forestry and Fire Protection (CAL FIRE)	✓						
Elkhorn Slough National Estuarine Research Reserve	✓						
International Research Associates		✓					
University of Tennessee, Center for Renewable Carton		✓					
University of Florida, Tropical Research and Education Center		✓					
University of Michigan, Plant and Soil Sciences (SROP – Summer Research Opportunities Program)		✓					
University of Miami, Diabetes Research Institute		✓					
University of Illinois at Urbana-Champaign Physics Laboratory (SROP – Summer Research Opportunities Program)		✓					
Texas AgriLife Research and Extension Service				✓			
Texas AgriLife Research, Integrated Pest Management (IPM)				✓			
Texas A&M Forest Service Nursery and Seed Industry				✓			
Texas Animal Health Commission				✓			
Southwest Border Food Safety and Defense Center at New Mexico State University, College of Agricultural, Consumer and Environmental Sciences					✓		
Texas Department of Agriculture					✓		
Ohio State University, Wooster Campus						✓	

**Exhibit 9: Project Collaboration with State, Regional, Local and Private Partners**

<b>State, Territory, Local, Regional, Private and Other Partners</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>
Puerto Rico Aqueduct and Sewer Authority (PRASA), Compost Plant						✓	
University of Wisconsin-Madison, Summer Undergraduate Research Experience (SURE)						✓	
Texas AgriLife Research Center at El Paso							✓
<b>Total State and Territory</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>1</b>
<b>Local and Regional</b>							
Central Coast Water Quality Protection	✓						
City of Monterey	✓						
City of Pacific Grove	✓						
City of Watsonville	✓						
County of Monterey	✓						
Marina Coast Water District	✓						
Monterey County Water Resources Agency	✓						
Monterey County Extension Office	✓						
Monterey County Health Department, Drinking Water Protection Services	✓						
Monterey Peninsula Water Management District	✓						
Poder Popular (Agricultural Workers Health Initiative)	✓						
Resource Conservation District of Santa Cruz County	✓						
Santa Lucia Conservancy	✓						
Santa Margarita Ecological Reserve	✓						
San Dieguito River Park	✓						
Tuolumne River Trust	✓						
Ventura Coastkeeper	✓						
Fairchild Tropical Botanical Garden		✓					
Earth Learning Foundation		✓					
Miami Dade Public School District		✓					
Jose Marti School		✓					
Texas A&M University Citrus Center				✓			

### Exhibit 9: Project Collaboration with State, Regional, Local and Private Partners

State, Territory, Local, Regional, Private and Other Partners	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP
TAMUK Farm				✓			
TAMUK Toxin Center				✓			
<b>Total Local and Regional Partners</b>	<b>17</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Private Industry and Other Partners</b>							
AgBiotech	✓						
Applied Marine Sciences (AMS)	✓						
Denise Duffy and Associates	✓						
Dumond Conservancy for Primates and Tropical Forests		✓					
Cargill (Food Distributor)				✓			
Golden Acres Genetics				✓			
Noble Foundation				✓			
Caesar Wildlife Research Institute at TAMUK				✓			
Purdue University				✓		✓	
King Ranch				✓			
Popular Hill Dairy Goat Farms (Scandia, MN)				✓			
Brownsville Zoo				✓			
Chattanooga Zoo				✓			
University of Maryland						✓	
<b>Total Private Industry Partners</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>2</b>	<b>0</b>
<b>Total State, Territory, Region, Local, Private and Other Partners</b>	<b>26</b>	<b>12</b>	<b>5</b>	<b>13</b>	<b>2</b>	<b>8</b>	<b>1</b>
<b>Total: All Partners</b>	<b>31</b>	<b>25</b>	<b>9</b>	<b>23</b>	<b>7</b>	<b>20</b>	<b>6</b>

Source: USDA NIFA Collaborative Projects, 2011-12

## Number of Career Experiences (Internships)

**Participating students participated in about 147 internships with USDA agencies, programs, and offices.** During the 2012-13 project year, participating students were involved in 375 internship experiences including 147 with USDA agencies and program and 228 with others collaborating partners (see Exhibit 10). In 2011-12 project year, participating students were involved in 234 internship experiences including 134 with USDA agencies and program and 100 with others collaborating partners.

<b>Exhibit 10: Number of Internships with USDA and Non-USDA Agencies</b>									
<b>Type of Internships</b>	<b>Year</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total</b>
<b>Internship with USDA Agencies, Programs and Offices</b>	2011-12	3	34	45	24	1	12	15	134
	2012-13	12	27	45	18	11	19	15	147
<b>Internship with Non-USDA Agencies</b>	2011-12	47	2	0	34	0	6	11	100
	2012-13	88	14	26	35	37	16	12	228
<b>Total Internships</b>	2011-12	50	36	45	58	1	18	26	234
	2012-13	100	41	71	53	48	35	27	375

Source: USDA Collaborative Projects, 2011-12

As Exhibit 11 shows most of the internships were paid by grant funds. Modifications made to the USDA career and work experience programs and the federal spending cuts from sequestration were reported to have negatively impacted the number of career experience opportunities for participating students.

<b>Exhibit 11: Number of Students Served and Demographics – Year 2</b>								
<b>Indicator</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total</b>
<b>Internship Pay Type</b>								
Unpaid			38			3		41
Paid	100	44	6	53	48	9	27	287
Volunteer						23		23
<b>Total</b>	100	44	44	53	48	35	27	351
<b>Internship Paid By</b>								
Employer	12	38	45			9		104
Grant	88	6	26	53	48	23	27	271
<b>Total</b>	100	44	71	53	48	32	27	375

Source: USDA/NIFA Collaborative Projects, 2012-13

Exhibit 12 presents some of the sites where students received their career and work experience.

<b>Exhibit 12: Internship Sites By Project, 2012-13</b>								
<b>Internship Sites</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total (Projects)</b>
<b>Internship with USDA Agencies</b>								
USDA AMS				✓		✓		2
USDA APHIS	✓	✓	✓	✓	✓	✓		6
USDA ARS	✓	✓		✓		✓	✓	5
USDA FS			✓		✓	✓		3
USDA FSA	✓							1
USDA FSIS		✓			✓			2
USDA NIFA							✓	1
USDA NRCS	✓		✓	✓	✓	✓	✓	6
USDA RD					✓		✓	2
<b>Internship with USDA Programs and Offices</b>								
USDA AMS, Dairy Programs, Washington, DC						✓		1
USDA AMS, North Carolina						✓		1
USDA APHIS, Plant Protection Quarantine, Base Muniz, PR						✓		1
USDA APHIS, Plant Protection Quarantine, Base Mayaguez, PR						✓		1
USDA ARS, Beltsville, Maryland						✓		1
USDA ARS, Southern Plains Area, Lubbock, TX							✓	1
USDA ARS, Blackland Research Center, Temple, TX							✓	1
USDA ARS, Mission, TX							✓	1
USDA ARS, Mayaguez, PR						✓		1
USDA FSIS, Puerto						✓		1
USDA FS, El Yunque National Forest, PR						✓		1
USDA FS, University of Wisconsin-Madison						✓		1
USDA NCRS, San Benito, TX							✓	1
USDA NRCS, North Carolina						✓		1
USDA NRCS, North Dakota						✓		1

**Exhibit 12: Internship Sites By Project, 2012-13**

<b>Internship Sites</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total (Projects)</b>
<b>Internships with Non-USDA agencies/Other Partners</b>								
AgBioTech	✓							1
Applied Marine Sciences	✓							1
California Department of Fish and Game	✓							1
California Department of Forestry and Fire Protection (CalFire)	✓							1
California State Polytechnic Institute-Pomona (Cal Poly Pomona)	✓							1
Central Coast Water Quality Protection	✓							1
City of Monterey	✓							1
City of Pacific Grove	✓							1
City of Watsonville	✓							1
County of Monterey	✓							1
CSU-Bakersfield	✓							1
CSU-Channel Islands	✓							1
CSU-Fresno	✓							1
CSU-Los Angeles	✓							1
CSU-Monterey Bay	✓							1
CSU-Northridge	✓							1
CSU-San Bernardino	✓							1
CSU-San Marcos	✓							1
CSU-Stanislaus	✓							1
Denise Duffy & Associates	✓							1
Elkhorn Slough National Estuarine Research Reserve	✓							1
Marina Coast Water District	✓							1
Monterey County Extension Office	✓							1
Monterey County Health Department	✓							1
Monterey County Water Resources Agency	✓							1
Monterey Peninsula Water Management District	✓							1

**Exhibit 12: Internship Sites By Project, 2012-13**

<b>Internship Sites</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total (Projects)</b>
National Aeronautics and Space Administration	✓							1
Poder Popular	✓							1
Resources Conservation District of Santa Cruz County	✓							1
San Diego State University	✓							1
Tuolumne River Trust	✓							1
Ventura Coastkeeper	✓							1
Aramark					✓			1
San Antonio Food Bank					✓			1
Ohio State University, Wooster Campus						✓		1
University of Puerto-Mayaguez						✓		1
University of Maryland						✓		1
Puerto Rico Aqueduct and Sewer Authority (PRASA), Compost Plant						✓		1
Purdue University						✓		1
University of Wisconsin-Madison, Summer Undergraduate Research Experience (SURE)						✓		1
La Semilla Food Center, Anthony, NM							✓	1
BGREEN Partner Institutions (UTEP, NMSU, TAMUK, TSU)							✓	1
Samsung Austin Semiconductor							✓	1
Philips, San Marcos, TX							✓	1

Source: USDA Collaborative Projects, 2011-12

## Number of Students Served and Demographics

**A total of approximately 487 students participated in the collaborative projects in the second year up from 385 served in the first year.** The collaborative projects reported that they collectively served about 487 students in the second year of the project up from 385 served in the first year (see Exhibit 13). Of this number, 271 (55.6 percent) were female and 215 (44.1 percent) were male, and 415 (85.2 percent) were of Hispanic origin. Eight out of 10 (77.4 percent) participating students were enrolled as undergraduates and 22.6 percent were graduates. With regards to degree programs in which the participating students were enrolled, 382 (78.4 percent) were enrolled in a bachelor's degree program, 83 (17.0 percent) were enrolled in a master's degree program, and 22 (4.6 percent) were enrolled in a doctoral degree program.

<b>Exhibit 13: Number of Students Served and Demographics – Year 2</b>								
<b>Indicator</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total</b>
Number of Students Served	101	73	83	67	48	65	50	487
<b>Gender</b>								
Female	56	35	44	38	31	48	19	271
Male	45	38	39	29	17	17	31	215
<b>Ethnicity</b>								
Asian	13	0	0	0	0	0	1	14
Black/African American	0	12	1	0	0	0	2	15
Hispanic	53	58	82	46	48	65	42	415
Native American	2	0	0	0	0	0	0	2
Pacific Islander	0	0	0	0	0	0	0	0
White	28	3	0	0	0	0	5	36
Other (Middle Eastern)	5	0	0	0	0	0	0	5
<b>Degree Program</b>								
Associates	0	0	0	0	0	0	0	0
Bachelors	62	71	64	60	45	51	29	382
Masters	38	2	17	6	3	7	10	83
Doctoral (Ph.D.)	1	0	2	1	0	7	11	22
<b>Classification Level</b>								
Undergraduate	62	71	64	58	45	48	29	377
Graduate	39	2	19	9	3	17	21	110
<b>First Generation</b>								
First Generation (Percent)	NR	50%	33%	NR	NR	NR	NR	NR
First Generation (Estimated Number)	NR	37	27	NR	NR	NR	NR	NR

NR = Not Reported

Source: USDA/NIFA Collaborative Projects, 2012-13

## Retention Rate

**The projects are maintaining the majority of their student participants.** Based on the reports of projects, they are retaining the majority of their student participants. The overall retention rate was 93 percent and ranged from a low of 85 percent for one project to 96 percent for two projects (see Exhibit 14).

Exhibit 14: Reported Retention Rates – Year 1 and Year 2								
Indicator	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
<b>Retention Rate (by Year)</b>								
Year 1 (2011-12)	98%	92%	100%	94%	96%	100%	100%	98%
Year 2 (2012-13)	96%	85%	96%	94%	92%	90%	92%	93%
<b>Reasons for Leaving Project</b>								
Dropped: Did not complete projects	3							3
Dropped		11						11
Graduated		11		4				15
Graduated and placed in USDA job			4					4
Dropped: Lack of interest			2					2
Academic failure/poor grades			1		3	NR		4
Lack of suitable performance						NR		NR
Change in major: Not applicable to USDA jobs					2	NR		2
Attending another university					2			2
Accepted a job					2			2
Moved to another state					1			1
Medical reasons					2			2
Loss of contact					1			1
Not Reported	4		3				3	10
<b>Total</b>	<b>7</b>	<b>22</b>	<b>10</b>	<b>4</b>	<b>13</b>	<b>5</b>	<b>3</b>	<b>64</b>

Source: USDA/NIFA Collaborative Projects, 2011-12 and 2012-13

## Number of Students in Experiential Learning

The number of students reported as participating in experiential learning increased from 358 in the first year to 388 in the second year. Exhibit 15 compares the number of students involved in experiential learning in the first and second years of implementation.

Exhibit 15: Number of Students in Experiential Learning – Year 1 and Year 2								
Indicator	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
<b>Experiential Learning (Research)</b>								
Year 1 (2011-12)	50	54	49	65	50	37	53	358
Year 2 (2012-13)	100	55	30	50	48	55	50	388
<b>Type of Experiential Learning: 2012-13</b>								
Number of students in experiential learning (research), mentoring, and job shadowing: 2011-12	50	54	49	65	50	37	53	358
Number of students in experiential learning (research), mentoring, and job shadowing: 2012-13	100	55	71	50	48	65	50	398
Number of students in career experience/job shadowing: 2012-13	50	41	71	53	48	35	50	298
Number of students in applied research: 2012-13			30			59		89
Number of students in graduate research		3	9	9				12
Source: USDA/NIFA Collaborative Projects, 2011-12 and 2012-13								

## Number of Students Presenting

The number of students presenting increased from 86 in the first year to 234 in the second year. Exhibit 16 presents the number of students who made presentations at professional meetings or other events.

Exhibit 16: Number of Students Presenting – Year 1 and Year 2								
Indicator	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
Year 1 (2011-12)	4	32	3	7	2	23	15	86
Year 2 (2012-13)	19	50	41	7	18	65	34	234
Source: USDA/NIFA Collaborative Projects, 2011-12 and 2012-13								

## Majors Applicable to USDA Jobs

The participating students were enrolled in a variety of disciplines which related to USDA jobs. The top seven disciplines included biology and biological sciences, environmental sciences, chemistry, agriculture, biotechnology, bio-chemistry, and civil engineering (see Exhibit 17).

Exhibit 17: Majors of Students Applicable to USDA Jobs								
Majors of Interest	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total (projects)
Biology/Biological Sciences	✓	✓		✓	✓	✓	✓	6
Environmental Science	✓	✓	✓	✓	✓		✓	6
Chemistry		✓			✓	✓	✓	4
Agriculture/Agricultural Sciences				✓	✓		✓	3
Biotechnology		✓		✓		✓		3
Bio-Chemistry				✓		✓	✓	3
Civil Engineering	✓					✓	✓	3
Agriculture Business				✓			✓	2
Animal Science (ANSC)				✓			✓	2
Chemical Engineering						✓	✓	2
Computer Science	✓						✓	2
Electrical Engineering	✓						✓	2
Engineering			✓		✓			2
Geology	✓		✓					2
Information Technology			✓			✓		2
Mechanical Engineering	✓					✓		2
Plant and Soil Sciences (PLSS)				✓			✓	2
Agriculture and Community Development			✓					1
Biological Writing				✓				1
Biopharmaceutical		✓						1
Coastal and Watershed Science and Policy	✓							1
Computer Engineering	✓							1
Computer Science							✓	1
Computer Technology				✓				1
Criminal Justice		✓						1
Crops and Agro-Environmental Sciences						✓		1
Ecology	✓							1
Entomology				✓				1
Environmental Engineering	✓							1

**Exhibit 17: Majors of Students Applicable to USDA Jobs**

<b>Majors of Interest</b>	<b>CSU-SB</b>	<b>FIU</b>	<b>NMSU</b>	<b>TAMUK</b>	<b>TSU</b>	<b>UPR-M</b>	<b>UTEP</b>	<b>Total (projects)</b>
Environmental Technology						✓		1
Fisheries			✓					1
Food Science and Technology						✓		1
Forestry			✓					1
French	✓							1
Geography	✓							1
German	✓							1
Horticulture				✓				1
Hydrogeology	✓							1
Industrial Chemistry						✓		1
Industrial Engineering							✓	1
Industrial Technology	✓							1
Landscape & Horticulture		✓						1
Landscape Architecture	✓							1
Mathematics	✓							1
Natural Resources Conservation				✓				1
Nutrition					✓			1
Optometry or Pre-Medicine		✓						1
Photography	✓							1
Plant Breeding and Physiology				✓				1
Political Science	✓							1
Psychology	✓							1
Public Administration	✓							1
Range and Wildlife Sciences				✓				1
Range Science			✓					1
Sociology	✓							1
Soil Conservation				✓				1
Veterinary Services				✓				1
Water Resources							✓	1
Wildlife and Wetland Management				✓				1
Wildlife Biology							✓	1
Wildlife Science			✓					1
Environmental Chemistry						✓		1

Source: USDA Collaborative Projects

## Number of Degrees Awarded with USDA Qualifications

The number of students awarded higher education degrees in disciplines applicable to USDA jobs increased from 17 in the first year to 87 in the second year. Exhibit 18 presents the number of degree awarded by type.

Exhibit 18: Number of Degrees Awarded with USDA Qualifications									
Type of Degrees Awarded	Year	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
Associate's Degrees	2011-12	0	0	0	0	0	0	0	0
	2012-13	0	4	0	0	0	0	0	4
Bachelor's Degrees	2011-12	0	0	0	5	0	3	6	14
	2012-13	16	7	10	9	1	9	19	71
Master's Degrees	2011-12	1	0	0	0	0	1	1	3
	2012-13	7	0	0	0	0	1	4	12
Doctorate (Ph.D.'s)	2011-12	0	0	0	0	0	0	0	0
	2012-13	0	0	0	0	0	0	0	0
Total (All Degrees)	2011-12	1	0	0	5	0	4	7	17
	2012-13	23	11	10	9	1	10	23	87

Source: USDA Collaborative Projects, 2011-12 and 2012-13

## Number of Students Publishing

The number of students publishing increased from 31 in the first year to 122 in the second year. Exhibit 19 presents the number of students who made presentations at professional meetings or other events.

Exhibit 19: Number of Students Publishing – Year 1 and Year 2								
Indicator	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
Year 1 (2011-12)	2	3	0	1	0	12	13	31
Year 2 (2012-13)	4	51	NR	25	18	17	7	122
Type and Number of Publications								
Peer-reviewed	1	1				13		15
Non-peer-reviewed	1	50						51
Total Publications	2	51		25	18	17	7	120

Source: USDA/NIFA Collaborative Projects, 2011-12 and 2012-13

## Comparison of GPA's: Before and After

Exhibit 20 presents the reported comparisons on GPAs.

Exhibit 20: Comparison of GPA's Before and After								
Outcome Indicators	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
GPA Comparisons: Before	3.38	3.313	3.271		2.93	3.35		
GPA Comparisons: After	3.53	3.296	3.468	3.2	3.09	3.40	3.61	
Undergraduate Students							3.25	
Graduate Students							3.65	
Ph.D. Students							3.93	
Male GPA Average: Before	3.93							
Male GPA Average: After	3.63							
Female GPA Average: Before	3.39							
Female GPA Average: After	3.43							

Source: USDA NIFA Collaborative Projects, 2012-13

## Hours in Student Advising and Tutoring

Exhibit 21 presents the reported con hours spent in student advising and tutoring.

Exhibit 21: Hours in Student Advising and Tutoring								
Outcome Indicators	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
Hours in student advising and tutoring	265 est.	3000 hours per year		960	Average 5 hours a week.	Eight students invested 80 hours per semester in mentoring/ tutoring activities for a total of 640 hours.		

Source: USDA NIFA Collaborative Projects, 2012-13

## Tracking and Job Placement

Exhibit 22 presents information on student tracking and job placement.

Exhibit 22: Student Tracking								
Outcome Indicators	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
<b>Job Placement</b>								
Self-reported Job Offers/Paid Internships	15							15
Graduated/Placed in Jobs		11	4					15
Placed in Indefinite Pathways Position			11					11
Indefinite Pathways Position: FS			8					8
Indefinite Pathways Position: APHIS			1					1
Indefinite Pathways Position: NRCS			2					2
<b>College to University Transfers</b>								
Community College Transfers to 4-Year Institutions	NA	1		9	26	NA	NA	36
NA = Not Applicable								
Source: USDA NIFA Collaborative Projects, 2012-13								

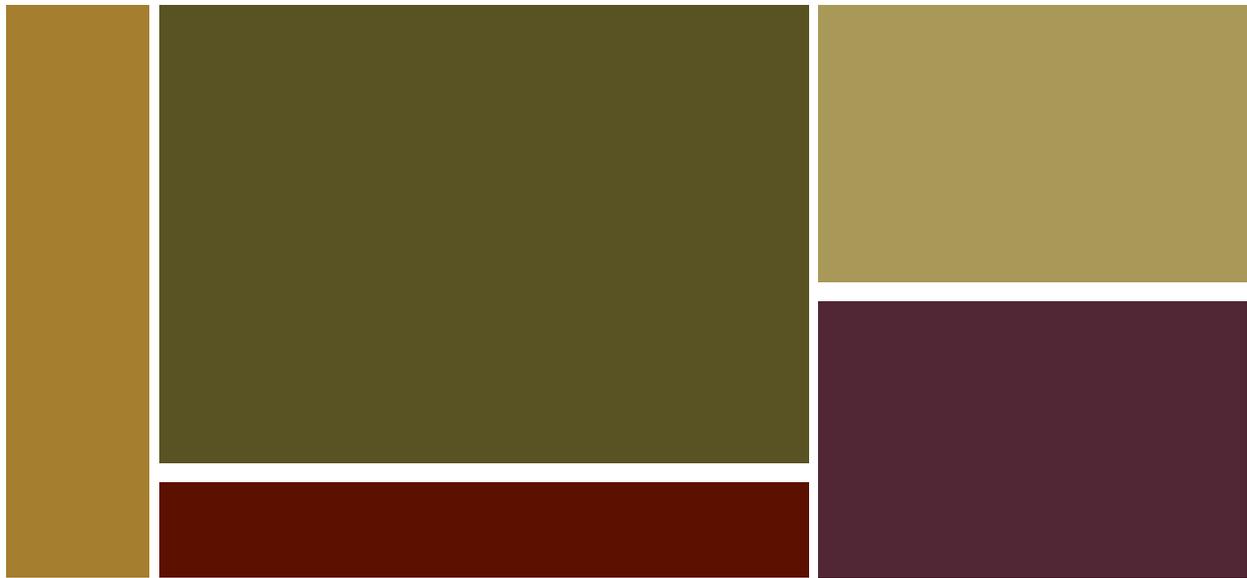
## Tracking and Job Placement

Exhibit 23 presents information on curriculum and course development.

Exhibit 23: Curriculum and Course Development								
Outcome Indicators	CSU-SB	FIU	NMSU	TAMUK	TSU	UPR-M	UTEP	Total
<b>Developing Curriculum</b>								
Colloquium	NA	2						2
Courses	NA	5		2		2	5	14
Workshops	NA	6						6
Online Course Modules	NA	4						4
Source: USDA NIFA Collaborative Projects, 2012-13								

## Other Indicators

See the progress and performance reports in Appendix B for information regarding the following indicators: K-12 activities, community engagement activities, program implementation, and budget implementation.



## Findings from the Online Student Survey

This section presents second-year results of the online student survey for school years 2011-12 and 2012-13, with emphasis on the most recent year (2012-13). Findings are organized in seven key areas in which the survey was divided: (1) Background, Degree Plans and Goals, (2) Academic Interests and Career Plans, (3) College/University, Programs and Course of Study, (4) Recruitment of Under-Represented Students, (5) Supports and Opportunities for Experiential Learning, (6) USDA-related Internships, Jobs, and Communications, and (7) Preparation for Your Field of Interest and Overall Goals. At the end of this section, key implications are presented.

### Survey Highlights

#### Background, Degree Plans and Goals

- Thirty-four institutions from the seven projects participated in the survey this year, compared to 24 last year.
- Most students were Hispanic (83.2 percent) with a higher proportion of female (61.6 percent).
- Nearly half of the students (46.9 percent) were first generation college students.
- More than half of the students (53.9 percent) were new to the project.
- Most students were enrolled in a program of study connected with agriculture, such as biology (11.9 percent), environmental science (8.7 percent), animal science (7.7 percent), and agricultural science (6.1 percent).
- More than a third of the students (36.5 percent) indicated a GPA between 3.50 and 3.99 in the spring of 2013, the latest time-period reported. A similar proportion (31.9 percent) reported a GPA between 3.00 and 3.49. More than 10 percent (11.6 percent) reported a perfect 4.0.
- A substantial majority of the students (69.7 percent) had an officially sanctioned degree plan, an improvement from the 62.7 percent reported last year.

#### Academic Interests and Career Plans

- Overall, students (74.1 percent) had a strong interest in agriculture-related fields.
- The students (93.5 percent) were also satisfied with the program in which they are enrolled.

### **College/University, Programs and Course of Study**

- With more than 80 percent agreement (80.6 percent), students had a strong positive perspective on their colleges or universities.
- Most students (73.2 percent) indicated that their current college was their first choice.
- The students (91.2 percent) were satisfied with the program of study offered by the college or university in which they were enrolled.
- They (91.6 percent) also indicated that the courses they were taking were academically challenging and that the degree they would receive would prepare them for graduate or post-graduate school.

### **Recruitment of Under-Represented Students**

- With an overall agreement of 81.5 percent, students thought that their college or university was taking proactive steps to recruit more students in the agriculture field and in particular under represented students, including Hispanics.
- In this area, the highest agreement was with the statement, "The College/University I attend is taking pro-active steps to include diversity/multicultural perspectives in classes, presentations, assignments and discussions." The level of agreement was 84.1 percent.

### **Supports and Opportunities for Experiential Learning**

- Areas with high support (more than 80 percent agreement) include: Academic support with course requirements, partnering with faculty in research activities, faculty mentoring, professional meeting and conferences, and opportunities to conduct independent research, analyze and interpret my data and present my work.
- Areas with the least support (less than 65 percent agreement) include: Social and emotional counseling, out-of-state internships, visits to non-USDA agencies, job shadowing, and publishing opportunities. These are the areas the institutions should consider to improve on their offers for opportunities for experiential learning.
- Students felt comfortable getting what they need to succeed academically (92.9 percent), understanding what they need to do to meet graduation requirements (92.6 percent), and getting their questions answered when they have doubts (92.6 percent).
- More than a fourth of the students (29 percent) indicated that they developed and presented papers, and 11.9 percent of them were peer-reviewed.
- Close to half of the students (48. percent) indicated that they developed and displayed a poster as part of the project.
- The students' four most frequent challenges were: Financial issues/problems (18.3 percent), classes (13.9 percent), accessing information about internships (11.5 percent), and accessing information about jobs (9.5 percent).

### **USDA-related Internships, Jobs, and Communications**

- With more than 80 percent (81.8 percent) in the affirmative, students indicated that the college or university they attend offered the courses they needed for the job they sought.
- More than 75 percent (75.2 percent) of students were aware of internships and experiential learning opportunities within their USDA agency.
- However, 63.8 percent applied for them and 49.5 percent were successful in acquiring an internship, job shadowing or experiential learning opportunity within their USDA agency.
- On the other hand, 49.5 percent applied for an internship, job shadowing or experiential learning opportunity in a non-USDA agency and 38 percent were successful in acquiring an internship, job shadowing or experiential learning opportunity in a non-USDA agency.

- Regarding the student reactions to their experiential learning, nearly 40 percent (39.3 percent) of them suggested that the experience enabled them to acquire knowledge and practices from the real world, both in the field and in the lab, including equipment use, and a similar proportion (21.4 percent) emphasized the opportunity they received to practice conducting research, data collection and analysis.

### **Preparation for Your Field of Interest and Overall Goals**

- Nearly 70 percent of the students (69.4 percent) felt that they were well prepared in high school.
- More than 80 percent (84.2 percent) indicated that their high school encouraged them to enroll in college.
- And virtually all of them pointed out that their dream has always been to have a professional career (91.9 percent) and getting a college degree (93.8 percent).
- Comparatively, fewer (69.8 percent) indicated that their immediate goal was a career in a USDA related area. However, few (7.8 percent) disagreed with this goal; mostly they (22.4 percent) were neutral or uncommitted.

As part of the evaluation, a survey to students served by the USDA National Institute of Food and Agriculture Collaborative Projects was conducted in school years 2011-12 and 2012-13. In total, 310 students participated in the survey in school year 2012-13, a 15.7 percent increase from the prior year, in which 268 students participated. The survey was available from early October 2013 to late January 2014, about 110 days, which was a shorter span compared to the 160 days the survey was opened last year. The survey was closed on January 29, 2014. The most recent response was entered on January 17, 2014, 12 days before the survey was closed. The earliest response was entered on October 10, 2013. This survey second implementation included important improvements based on feedback provided by the project leaders at the various institutions. This comprehensive survey collected information pertinent to the following seven key areas:

- Background, Degree Plans and Goals
- Academic Interests and Career Plans
- College/University, Programs and Course of Study
- Recruitment of Under-Represented Students
- Supports and Opportunities for Experiential Learning
- USDA-related Internships, Jobs, and Communications
- Preparation for Your Field of Interest and Overall Goals

This section of the document presents the results of that survey, organized by each of these areas. At the end of this section, key implications are presented.

## **Background, Degree Plans and Goals**

### **Student Demographics**

The exhibit below shows the student demographic compiled from the survey during school years 2011-12 and 2012-13. Most students were Hispanic (83.2 percent) with an increasing proportion of female (61.6 percent from 55.2 percent). They (88.3 percent) naturally spoke Spanish but also spoke English *Very Well* or *Well* (98.7 percent). Some also spoke other languages, including French, Portuguese, Hindi, Bengali and German. Nearly half of the students (46.9 percent) were first generation college students. More than half of the students (53.9 percent) were new to the project. Nearly 40 percent (37.1 percent) have been in the project for two years, and the remaining 9 percent for three years (see Exhibit 24).

### Exhibit 24: Student Demographics

Demographic Variables	2011-12		2012-13	
	Number	Percent	Number	Percent
Gender				
Male	120	44.8	119	38.4
Female	148	55.2	191	61.6
Race/Ethnicity: How do you describe yourself?				
American Indian or Alaska Native	3	1.1	4	1.3
Hawaiian or Other Pacific Islander	0	0.0	2	0.6
Asian or Asian American	8	3.0	6	1.9
Black or African American	7	2.6	11	3.5
Hispanic or Latino	224	83.6	258	83.2
Non-Hispanic White	27	10.1	30	9.7
Other	12	4.5	8	2.6
Do you speak a language other than English?				
Yes	198	73.9	225	72.6
No	70	26.1	85	27.4
Languages Spoken (Other than English)				
Spanish	175	91.1	204	88.3
French	2	1.0	9	3.9
Portuguese	3	1.6	4	1.7
Hindi	1	0.5	2	0.9
Bengali	0	0.0	2	0.9
German	0	0.0	2	0.9
Arabic	1	0.5	1	0.4
Haitian creole	1	0.5	1	0.4
Malayalam	1	0.5	1	0.4
Tagalog	1	0.5	1	0.4
Farsi	0	0.0	1	0.4
Japanese	0	0.0	1	0.4
Khmer	0	0.0	1	0.4
Navajo	0	0.0	1	0.4
Italian	2	1.0	0	0.0
Vietnamese	2	1.0	0	0.0
Bangla	1	0.5	0	0.0

Exhibit 24: Student Demographics					
Demographic Variables		2011-12		2012-13	
		Number	Percent	Number	Percent
	Chinese	1	0.5	0	0.0
	Luanda	1	0.5	0	0.0
How well do you speak English?					
	Very well	198	73.9	239	77.1
	Well	60	22.4	67	21.6
	Not well	9	3.4	4	1.3
	Not at all	1	0.4	0	0.0
Are you a first generation college student?*					
	Yes			144	46.9
	No			163	53.1
How long have you been a participant in the USDA NIFA project?*					
	One year			167	53.9
	Two years			115	37.1
	Three years			28	9.0
*Question was not asked in 2011-12.					

### College/University

**An overall survey response rate of 83 percent was achieved.** Exhibit 25 below shows the response rate for each USDA/NIFA project. Most of the institutions had participation rate above 60 percent, for an average overall response rate of 83 percent, substantially higher than the 71 percent rate achieved last year.

Exhibit 25: Response Rate for USDA/NIFA Student Participant Survey, 2012-13				
USDA/NIFA Project Site	Project Title	Expected Response	Actual Response	Response Rate
California State University-San Bernardino	CSU-SB: Watershed Management Experiential Learning for USDA Careers	50	31	0.62
Florida International University	FIU: Florida - Caribbean Consortium for Agriculture Education and Hispanic Workforce Development	50	41	0.82
New Mexico State University	NMSU: Preparing Students for Career Paths with the USDA Forest Service by Linking Student Success with Experiential Learning Opportunities	50	43	0.86
Texas A&M University-	TAMUK: Step Up to USDA Career Success: Science, Technology and	58	56	0.97

<b>Exhibit 25: Response Rate for USDA/NIFA Student Participant Survey, 2012-13</b>				
<b>USDA/NIFA Project Site</b>	<b>Project Title</b>	<b>Expected Response</b>	<b>Actual Response</b>	<b>Response Rate</b>
Kingsville	Environmental Programs for Undergraduate Preparation to USDA Career Success			
Texas State University-San Marcos	TSU: Food Safety and Agro- terrorism Training: Educating Our Future Workforce	50	42	0.84
University of Puerto Rico-Mayagüez	UPR-M: UPR-Mayagüez Center for Educational and Training In Agricultural and Related Sciences	65	57	0.88
University of Texas-El Paso	UTEP: BGREEN – Building a Regional Energy and Educational Network	50	40	0.80
<b>Total (All Sites)</b>		<b>373</b>	<b>310</b>	<b>0.83</b>

This year, 34 college or university campuses participated, compared to 27 last year. Nearly 50 percent (47.4 percent) of participants came from four campuses. With 17.4 percent, the Texas State University-San Marcos had the largest participation. The second largest group attended University of Puerto Rico-Mayagüez with 11.9 percent. The third was Texas A&M University-Kingsville, accounting for 9.4 percent of participation, and the fourth New Mexico State University with 8.7 percent (Exhibit 26).

<b>Exhibit 26: College/University Students Attend, 2012-13</b>		
<b>College/University</b>	<b>Number</b>	<b>Percent</b>
CSU-Bakersfield	4	1.3
CSU-Cal Poly Pomona	2	0.6
CSU-Channel Islands	1	0.3
CSU-Fresno	6	1.9
CSU-Los Angeles	1	0.3
CSU-Monterey Bay	6	1.9
CSU-Northridge	2	0.6
CSU-San Bernardino	1	0.3
CSU-San Diego State	4	1.3
CSU-San Marcos	1	0.3
CSU-Stanislaus	3	1.0
Del Mar College	3	1.0
Florida International University (FIU)	12	3.9
Inter-American University of Puerto Rico - San Germán	13	4.2
Inter-American University of Puerto Rico (IAU)	2	0.6
Laredo Community College (LCC)	2	0.6

<b>Exhibit 26: College/University Students Attend, 2012-13</b>		
<b>College/University</b>	<b>Number</b>	<b>Percent</b>
Luna Community College	1	0.3
Miami Dade College (MDC)	10	3.2
New Mexico Highlands University	9	2.9
New Mexico State University	27	8.7
South Texas College (STC)	5	1.6
St. Thomas University (STU)	12	3.9
Texas A&M University-Kingsville	29	9.4
Texas State Technical College (TSTC)	11	3.5
Texas State University-San Marcos	54	17.4
University of Puerto Rico-Aguadilla	3	1.0
Universidad Interamericana de Puerto Rico-Bayamón (UIPR Bayamón)	2	0.6
Universidad Politécnica de Puerto Rico	1	0.3
University of Puerto Rico-Humacao	10	3.2
University of Puerto Rico-Mayagüez	37	11.9
University of Puerto Rico-Medical Sciences Campus	1	0.3
University of Puerto Rico-Rio Piedras (UPR RP)	7	2.3
University of Texas-El Paso	12	3.9
University of Texas-Pan American (UTPA)	16	5.2
<b>Total</b>	<b>310</b>	<b>100.0</b>

### **Study Program**

**Participating students were enrolled in an array of disciplines related to agriculture.** As would be expected, most students were enrolled in a study program connected with agriculture, such as biology (11.9 percent), environmental science (8.7 percent), animal science (7.7 percent), and agricultural science (6.1 percent). Very few were enrolled in less-related programs, such as computer science (0.3 percent) and public administration (0.3 percent). However, there was a great diversity of study programs, totaling 101 different areas and sub-areas. Exhibit 27 lists the various study programs the students indicated in the survey.

<b>Exhibit 27: Study Programs Students are Enrolled, 2012-13</b>		
<b>Study Program</b>	<b>Number</b>	<b>Percent</b>
Biology	37	11.9
Environmental Science	27	8.7
Animal Science	24	7.7
Agricultural Science	19	6.1

**Exhibit 27: Study Programs Students are Enrolled, 2012-13**

<b>Study Program</b>	<b>Number</b>	<b>Percent</b>
Chemistry	17	5.5
Industrial Engineering	10	3.2
Industrial Chemistry	8	2.6
Wildlife Science	8	2.6
Civil Engineering	6	1.9
Agricultural Technology	5	1.6
Agronomy	4	1.3
Chemical Engineering	4	1.3
Electrical Engineering	4	1.3
Environmental Science and Engineering	4	1.3
General Agriculture	4	1.3
Geology	4	1.3
Agricultural Business	3	1.0
Agriculture	3	1.0
Agriculture - Animal Science	3	1.0
Agriculture Education	3	1.0
Biotechnology	3	1.0
Engineering	3	1.0
Forestry	3	1.0
General Biology	3	1.0
Geography	3	1.0
Mechanical Engineering	3	1.0
Nutrition and Food Science	3	1.0
Watershed Science	3	1.0
Agriculture Business	2	0.6
Agriculture Science Crop Protection	2	0.6
Animal Science Pre-Vet	2	0.6
Environmental Chemistry	2	0.6
Environmental Engineering	2	0.6
Food Science and Technology	2	0.6
Geological Sciences	2	0.6
Molecular Biology	2	0.6
Natural Resource Management	2	0.6

**Exhibit 27: Study Programs Students are Enrolled, 2012-13**

<b>Study Program</b>	<b>Number</b>	<b>Percent</b>
Nutrition Dietetics	2	0.6
Range and Wildlife Science	2	0.6
Range Science	2	0.6
Respiratory Therapist	2	0.6
Science	2	0.6
Soils Science	2	0.6
Wildlife Biology	2	0.6
Agricultural Economics	1	0.3
Agricultural Engineering and Bio systems	1	0.3
Agriculture - Extension	1	0.3
Agriculture Mechanics and Technology	1	0.3
Agriculture Science and Community Development	1	0.3
Agriculture Science and Environmental Science	1	0.3
Agriculture Science and Sustainability	1	0.3
Agroecology	1	0.3
Agroecology Environmental Studies	1	0.3
Applied Chemistry	1	0.3
Basics	1	0.3
Biochemistry	1	0.3
Biochemistry and Applied Mathematics	1	0.3
Biology - English	1	0.3
Biology Biomedical Sciences	1	0.3
Biomedical Sciences	1	0.3
Biopharmaceutical	1	0.3
Biopharmaceutical Sciences	1	0.3
Chemistry and Food Science	1	0.3
Civil Engineering Technology	1	0.3
Coastal and Watershed Science & Policy	1	0.3
Coastal Watershed Science and Policy	1	0.3
Computer science	1	0.3
Criminal Justice	1	0.3
Crop and Agro-Environmental Sciences	1	0.3

**Exhibit 27: Study Programs Students are Enrolled, 2012-13**

<b>Study Program</b>	<b>Number</b>	<b>Percent</b>
Crop Protection	1	0.3
Crop Sciences	1	0.3
Dietetics	1	0.3
Ecology and Sustainability	1	0.3
Economic Development	1	0.3
Environmental Health	1	0.3
Environmental Engineering Technology	1	0.3
Environmental geology	1	0.3
Environmental Science and Resource Management	1	0.3
Environmental Studies / Agro ecology	1	0.3
Genetics and bacterial	1	0.3
Geography - Environmental Studies	1	0.3
Geographic Information Science (GIS)	1	0.3
Geography - GIS	1	0.3
Green Energy	1	0.3
Horticulture	1	0.3
Horticulture and Environmental Science	1	0.3
Hydrogeology	1	0.3
Industrial Biotechnology	1	0.3
Interdisciplinary Studies	1	0.3
Life Sciences Environmental Management	1	0.3
Molecular Biology and Plant Pathology	1	0.3
Natural Resources	1	0.3
Natural Sciences	1	0.3
Optometry - Ophthalmology	1	0.3
Plant and Soil Sciences	1	0.3
Plant and Soil Sciences: Horticulture	1	0.3
Plant Science	1	0.3
Public Administration	1	0.3
Range Management	1	0.3
Remote Sensing and GIS Application	1	0.3
Wildlife and Fisheries Science	1	0.3
<b>Total</b>	<b>310</b>	<b>100.0</b>

## Self-reported GPA

**Most students reported a GPA above 3.00.** Last year, students were asked to enter their GPA into the survey. More than a third (36.2 percent) indicated a GPA between 3.50 and 3.99 in the previous year report. This time, students were asked to provide their GPAs for the most recent four semesters (see Exhibit 28, This Survey). The analysis shows a similar GPA distribution, with more than a third of the students (36.5 percent) reporting GPA's between 3.50 and 3.99, in the latest semester (spring 2013). A similar proportion (31.9 percent) reported a GPA between 3.00 and 3.49. More than 10 percent (11.6 percent) reported a perfect 4.0, which is better than 8.2 percent that reported perfect GPAs last year.

Exhibit 28: Student Self-Reported GPA										
GPA Range	Prior Survey		This Survey							
	2011-12		Fall 2011		Spring 2012		Fall 2012		Spring 2013	
	N	%	N	%	N	%	N	%	N	%
4.00	22	8.2	39	12.6	35	11.3	42	13.5	36	11.6
3.50 to 3.99	97	36.2	86	27.7	96	31.0	102	32.9	113	36.5
3.00 to 3.49	92	34.3	92	29.7	88	28.4	96	31.0	99	31.9
2.50 to 2.99	44	16.4	32	10.3	42	13.5	40	12.9	39	12.6
Below 2.50	10	3.7	19	6.1	12	3.9	16	5.2	16	5.2
I don't know-N/A	3	1.1	42	13.5	37	11.9	14	4.5	7	2.3
<b>Total</b>	<b>268</b>	<b>100</b>	<b>310</b>	<b>100.0</b>	<b>310</b>	<b>100.0</b>	<b>310</b>	<b>100.0</b>	<b>310</b>	<b>100.0</b>

## Credit Hours or Unites Completed in Degree Program and Cumulative

Nearly 90 percent of the students (87.4 percent) reported completing less than 121 credit hours or units in the program. The rest (12.6 percent) reported completing more than 120 credit hours or units (up to 300). The largest concentration was in the 21 to 40 credit hours or units' bracket, with 23.2 percent of students (Exhibit 29, Degree Program).

Regarding cumulative credit hours or units, about third-fourths of the students (74.5 percent) reported completing between 21 and 140, which was less than the 78.1 percent reported for the same range for the program. In general, as expected, there was a slight shift to higher numbers, when compared to credit hours or units completed in the degree program (Exhibit 19).

There was a significant improvement in student response rate for this question. This year, only seven students indicated that they did not know this information. Last year, more than a third of the students (36.2 percent) reported not knowing this information, not understanding the question, or simply skipped it. The improvement was probably due to rephrasing the question to include both credit hours and units completed. Last year, the survey used credit hours only.

**Exhibit 29: Credit Hours or Units Completed, 2012-13**

Credit Hours or Units Completed	Degree Program		Cumulative	
	Number	Percent	Number	Percent
None to 20	49	15.8	25	8.1
21 to 40	72	23.2	36	11.6
31 to 60	41	13.2	38	12.3
51 to 80	35	11.3	41	13.2
81 to 100	30	9.7	46	14.8
101 to 120	44	14.2	41	13.2
121 to 140	20	6.5	29	9.4
141 to 160	8	2.6	19	6.1
161 to 180	4	1.3	8	2.6
181 to 200	0	0.0	5	1.6
201 to 250	2	0.6	8	2.6
251 to 300	1	0.3	2	0.6
301 to 400	0	0.0	5	1.6
Don't know	4	1.3	7	2.3
<b>Total</b>	<b>310</b>	<b>100</b>	<b>310</b>	<b>100</b>

### **Degree Program Completed**

**About 16.1 percent of students completed a degree, more than double the 7.5 percent last year completion rate.** Most students (79.4 percent) had not completed a degree prior to the one they were pursuing in 2012-13 (see Exhibit 30). This year, 50 students indicated they had completed a degree (16.1 percent), which was more than twice the 20 students (7.5 percent) who indicated completing degrees last year (Exhibit 30). The following is a list of this year degrees (Major / Minor) reported by some students.

- A.A. Biotechnology and Forensic Technology Certificate
- A.A. in Biology
- Agriculture Education
- Agriculture Technology
- Agronomy
- Associate of Science / Culinary Arts
- Associate in Computer Science
- B.A. Biology
- B.A. Natural Sciences / Bio emphasis
- B.S. Geology
- B.S. in Chemistry
- B.S. in Geology
- Biology / Chemistry
- Biotechnology

- Biotechnology / Chemistry
- Chemistry / Biology
- Coastal and Watershed Science and Policy / Watershed Science emphasis
- Double Major Biology and English
- Environmental Science / Resource Management
- Environmental Science / Agroecology Program
- Environmental Technology / Biology
- Forestry / Spanish
- Geographic Information Systems
- Geology
- International Relations / Environmental Studies
- Industrial Engineering / Mathematics
- Mathematics / Physics
- Plant / Soil Science
- Wildlife Management

<b>Exhibit 30: Degree Program Completed</b>					
<b>Whether Have Degree Completed</b>		<b>2011-12</b>		<b>2012-13</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
	Yes	20	7.5	50	16.1
	No	234	87.3	246	79.4
	N/A	14	5.2	14	4.5
	<b>Total</b>	<b>268</b>	<b>100.0</b>	<b>310</b>	<b>100.0</b>

### Student Classification

**Students seemed to be progressing normally academically.** During the 2011-12 academic year, student academic classification was mainly concentrated across the first three levels (freshman, sophomore, and junior), at an average rate of about 24.3 percent, with 7.2 percent as senior. By the fall of 2013, the cohorts had moved upward. Now the majority were in the latter levels (sophomore, junior and senior), with an average of 25.1 percent and only 1 percent as freshman. The number of graduate students also increased from 18 to 45 and doctoral students from 13 to 17. Exhibit 31 shows details of the student academic classification for both years the survey was used.

<b>Exhibit 31: Student Academic Classification</b>							
<b>Academic Classification</b>	<b>Academic Years</b>				<b>This Fall</b>		
	<b>2011-12</b>		<b>2012-13</b>		<b>(2013)</b>		
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	
	Freshman	61	20.8	23	7.6	3	1.0
	Sophomore	92	31.4	66	21.9	30	10.0
	Junior	61	20.8	97	32.1	72	23.9
	Senior	21	7.2	63	20.9	125	41.5

<b>Exhibit 31: Student Academic Classification</b>						
<b>Academic Classification</b>	<b>Academic Years</b>				<b>This Fall</b>	
	<b>2011-12</b>		<b>2012-13</b>		<b>(2013)</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
Graduate	18	6.1	34	11.3	45	15.0
Doctoral	13	4.4	16	5.3	17	5.6
N/A	27	9.2	3	1.0	9	3.0

### Current Degree Plan

**About 70 percent of students are in a bachelor's degree program.** Most students (70.3 percent) plan to obtain a bachelor's degree, and 17.1 percent were working toward their master's degree (see Exhibit 32). An important different from last year was a significant decrease in the number of students pursuing associate's degree. It went down to 17 (5.5 percent) from 32 (11.8 percent).

<b>Exhibit 32: Current Degree Plan</b>				
<b>Degree Program</b>	<b>2011-12</b>		<b>2012-13</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
Associate's degree	32	11.8	17	5.5
Bachelor's degree	174	64.2	218	70.3
Master's degree	45	16.6	53	17.1
Doctorate	20	7.4	23	7.4

### Have an Official Degree Plan

**Nearly 70 percent of students have an official degree plan.** In 2012-13, a substantial majority of the students (69.7 percent) had an officially-sanctioned degree plan (see Exhibit 33). Of those who did not have an official degree plan, about a third reported a date by which they would have one. Out of those who reported a date, most think they will have it by the end of 2013 or 2014 (25 students). The rest indicated dates into 2015 (11 students) and 2016 (two students).

<b>Exhibit 33: Have an Official (Approved and Signed) Degree Plan</b>				
<b>Whether Have an Official Degree Program</b>	<b>2011-12</b>		<b>2012-13</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
Yes	168	62.7	216	69.7
No	66	24.6	68	21.9
N/A	34	12.7	26	8.4
<b>Total</b>	<b>268</b>	<b>100.0</b>	<b>310</b>	<b>100.0</b>

### Degrees Already Hold

**More than 45 percent (46.2 percent) of students held a bachelor's or associate's degree.** In 2012-13, most students (55.5 percent) did not have any degree (see Exhibit 34). More than 27 percent (27.7 percent) had bachelor's degrees and about 18 percent (18.4 percent) associate's degrees. Seventeen students (5.5 percent) had a master's degree and two had doctorate.

Exhibit 34: Degrees Students Already Hold					
Degree Hold		2011-12		2012-13	
		Number	Percent	Number	Percent
	Associate's degree	44	15.2	57	18.4
	Bachelor's degree	68	23.5	86	27.7
	Master's degree	14	4.8	17	5.5
	Doctorate	0	0.0	2	0.6
	None of the above	163	56.4	172	55.5

### Academic Interests and Career Plans

**Most students (74.1 Percent) expressed a strong interest in an agricultural-related career.** Overall, students (74.1 percent) had a strong interest in agriculture-related fields (see Exhibit 35). This represented a slight improvement over the 69.9 percent interest expressed in 2011-12 survey. They (93.5 percent) were also satisfied with the program in which they are enrolled. More than half (64.1 percent) of the students were considering other careers of interest. This probably indicates that they wanted to expand into other areas, not to substitute they current field for others. This year responses closely paralleled last year responses, whose totals are included in blue in Exhibit 25 for comparison.

Exhibit 35: Main Areas of Interests and Career or Academic Plans							
Statements		Agree		Neutral/NA		Disagree	
		Number	Percent	Number	Percent	Number	Percent
A.	My career interests are related to agriculture, nutrition and natural resources.	261	84.7	36.0	11.7	11.0	3.6
B.	I am satisfied with the program of study I am enrolled in.	289	93.5	18.0	5.8	2.0	0.6
C.	I have declared and/or plan to declare a major in an agriculture-related field of study.	222	71.8	65.0	21.0	22.0	7.1
D.	I plan to complete a degree in the agriculture-related field in which I am enrolled.	207	67.0	76.0	24.6	26.0	8.4
E.	Upon finishing my undergraduate studies, I	163	53.1	111.0	36.2	33.0	10.7

<b>Exhibit 35: Main Areas of Interests and Career or Academic Plans</b>							
<b>Statements</b>		<b>Agree</b>		<b>Neutral/NA</b>		<b>Disagree</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
	plan to enroll in graduate studies in an agriculture-related field.						
<b>A-E</b>	<b>Total interest in agriculture-related field.</b>	<b>1,142</b>	<b>74.1</b>	<b>306.0</b>	<b>19.8</b>	<b>94.0</b>	<b>6.1</b>
	<b>Total interest in agriculture-related field (2011-12).</b>	<b>931</b>	<b>69.9</b>	<b>286.0</b>	<b>21.5</b>	<b>114.0</b>	<b>8.6</b>
F.	I also am considering other careers of interest.	198	64.1	84.0	27.2	27.0	8.7
<b>Total (A-F)</b>		<b>1,340</b>	<b>72.4</b>	<b>390.0</b>	<b>21.1</b>	<b>121.0</b>	<b>6.5</b>
<b>Total (2011-12)</b>		<b>1,099</b>	<b>68.8</b>	<b>356.0</b>	<b>22.3</b>	<b>143.0</b>	<b>8.9</b>

### College/University, Programs and Course of Study

With more than 80 percent agreement (80.6 percent), students had a strong positive perspective on their colleges or universities (see Exhibit36). Most (73.2 percent) indicated that their current college was their first choice, but a substantial number (83 students or 26.7 percent) did not fully agree with this point. Students (91.2 percent) were satisfied with the program of study offered by the college or university in which they were enrolled. They (91.6 percent) also indicated that the courses they were taking were academically challenging and that the degree they (81.8) would receive would prepare them for graduate or post-graduate school. The main disagreements were in two areas. About a third (33.1 percent) did not think or were uncertain that their college or university was well known. More than a fourth of the students (29.4 percent) did not fully support the statement that their college or university was one of the best in the country. One the other hand, 70.6 percent did. This year responses closely paralleled last year responses, whose totals are included in blue in Exhibit 26 for comparison.

<b>Exhibit 36: Student Perspectives on their College or University</b>							
<b>Statements</b>		<b>Agree</b>		<b>Neutral/NA</b>		<b>Disagree</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
A.	The college/university I attend was my first choice of higher education institutions.	227	73.2	41	13.2	42	13.5
B.	The college/university I attend is well known for programs of study related to USDA jobs.	213	68.7	78	25.2	19	6.1
C.	I am satisfied with the program of study offered by	281	91.2	21	6.8	6	1.9

### Exhibit 36: Student Perspectives on their College or University

Statements		Agree		Neutral/NA		Disagree	
		Number	Percent	Number	Percent	Number	Percent
	the college/university I attend.						
D.	The courses I am taking are academically challenging.	284	91.6	24	7.7	2	0.6
E.	A degree from this college/university will help me get a job immediately after graduation.	251	81.8	51	16.6	5	1.6
F.	A degree from this program will prepare me for graduate school or a post-graduate degree.	268	87.0	39	12.7	1	0.3
G.	I consider the program in which I am enrolled at this college/university to be one of the best in the country.	218	70.6	67	21.7	24	7.8
<b>Total</b>		<b>1,742</b>	<b>80.6</b>	<b>321</b>	<b>14.8</b>	<b>99</b>	<b>4.6</b>
<b>Total (2011-12)</b>		<b>1,516</b>	<b>81.1</b>	<b>261</b>	<b>14.0</b>	<b>91</b>	<b>4.9</b>

#### Student Suggestions to Improve their Institutions

Students were asked to provide ideas to improve their college or university. Exhibit 27 shows a content analysis of their responses. About two-thirds of the students (65.8 percent) were perfectly happy with what their institutions were doing. They indicated this either explicitly, as one of them put it, "Nothing, I really enjoy attending this university," or implicitly by indicating that this question was inapplicable (N/A) or simply skipping the question altogether. Among the one-third (34.2 percent) who suggested some improvements, 8.1 percent indicated a need for more research projects, 7.1 percent wanted a greater variety of course offerings, and another 7.1 percent desired expanded degree programs. These findings are similar to last year's.

The next few suggestions are different from last year's. About 5 percent (5.2 percent) of the students suggested that the institution improve its community of learners. They wanted more "chances for peer community," "student involvement," "personal connections with the professors," and other similar manifestations of an activate community of learners. Another recommendation (3.5 percent) was to expand or improve the faculty, particularly in the way they teach their courses and how they relate to students. A few students (2.6 percent) were unhappy with the support they received in the financial aid department (or office). They implied that staff should receive better training and that the training should perhaps include more orientation on how to help students find jobs or plan their careers. Finally, two students suggested that the institution become a full university. Exhibit 37 lists all student responses with minimal editing.

### Exhibit 37: The college/university I attend could be strengthened by...

Main Themes	Student Statements
<p>1 Fully Satisfied or Nothing to Improve (with a frequency of 204 responses or 65.8 percent)</p>	<ul style="list-style-type: none"> <li>• Nothing to improve.</li> <li>• Nothing, I really enjoy attending this university.</li> <li>• N/A [6]</li> <li>• Blank [196]</li> </ul>
<p>2 Expand Research Projects (with a frequency of 25 responses or 8.1 percent)</p>	<ul style="list-style-type: none"> <li>• More funds for graduate students and research project.</li> <li>• Promoting more investigations.</li> <li>• Doing more field work, involving the student in different projects that has nothing to do with inside investigation or bats or manatees.</li> <li>• More field work or hands-on experiences due to the nature of the career in agriculture.</li> <li>• More research, better academic activity.</li> <li>• Offering more hands-on labs.</li> <li>• Collaborating with other departments to bring in useful projects.</li> <li>• Having a hands-on laboratory where to practice the theory learned in the classroom.</li> <li>• Improving research labs.</li> <li>• More on-site research, or study abroad opportunities.</li> <li>• Requiring additional work/research.</li> <li>• More outreach and research opportunities.</li> <li>• I think this college could be strengthened by more hands-on work and training. Less book work and more outside work.</li> <li>• More hands-on classes to get more knowledge and practice.</li> <li>• More professional experience opportunities.</li> <li>• Providing more field trips and field work for the environmental science students.</li> <li>• Could be strength by more research projects, more internship, and more fellowships for students so they can concentrate better on their studies. Giving more challenging project to strength the student's abilities.</li> <li>• It could be strengthened by more hands-on work and training.</li> <li>• More funds to do more research.</li> <li>• More college partners.</li> <li>• More outdoors programs.</li> <li>• New courses. More research grants.</li> <li>• Having better resources.</li> <li>• Additional resources.</li> <li>• Having live animals on campus.</li> </ul>
<p>3 Increase Course Offering (with a frequency of 22 responses or 7.1 percent)</p>	<ul style="list-style-type: none"> <li>• More variety in courses, more professors.</li> <li>• Giving more courses strongly related to my bachelor's degree, like machinery repairs, machinery operation, etc. Currently there is just one course for machinery in the whole bachelor's degree.</li> <li>• We need more classes! Especially those geared toward</li> </ul>

**Exhibit 37: The college/university I attend could be strengthened by...**

Main Themes	Student Statements
	<p>conservation, botany, field biology, and wildlife.</p> <ul style="list-style-type: none"> <li>• More agricultural classes.</li> <li>• The variety of courses.</li> <li>• Getting a broader choice of career plans in agriculture. For instance, I feel they could include a wildlife introductory class.</li> <li>• Workshops.</li> <li>• More class sections.</li> <li>• Offering more courses and more often.</li> <li>• Adding more lab information, and giving a larger selection of classes per semester.</li> <li>• Offering courses of interest, such as more equine science classes.</li> <li>• Larger number of professors and class schedules.</li> <li>• More math-based courses.</li> <li>• A wider variety of wildlife courses.</li> <li>• More classes and better professors.</li> <li>• More master courses and science-related programs.</li> <li>• Providing agricultural linked courses.</li> <li>• Adding a more diverse course load. The university is very limited as far as science majors goes. There is no distinction if a student studies biology. All students will graduate with a biology degree with no distinction for field of study.</li> <li>• Offering more elective credits.</li> <li>• Making it easier to graduate by offering classes every semester rather than just once a year.</li> <li>• Broader range of wildlife classes.</li> <li>• The university needs to uphold higher standards for all students.</li> </ul>
<p>4 Expand Degree Programs (with a frequency of 22 responses or 7.1 percent)</p>	<ul style="list-style-type: none"> <li>• More programs in agriculture.</li> <li>• More graduate degrees.</li> <li>• Broadening the type of bachelor's degrees. More degrees, more options.</li> <li>• More agriculture programs.</li> <li>• Having more science majors.</li> <li>• Engineering.</li> <li>• Having the wildlife and fisheries degree as one degree.</li> <li>• Revising the degrees, course, and professors.</li> <li>• More resources.</li> <li>• Having more options of degree plans for both my major and minor degree plans.</li> <li>• I feel the reason for me choosing the major I am currently in is directly correlated with the lack of choices for the undergraduate degree for agriculture. I wish there was a major in horticulture.</li> <li>• Inclusion of more diverse research opportunities.</li> <li>• Include more programs of study related to agriculture and USDA jobs. Make my program of study more diverse to include soils</li> </ul>

**Exhibit 37: The college/university I attend could be strengthened by...**

Main Themes	Student Statements
	<p>classes.</p> <ul style="list-style-type: none"> <li>• Offering more agricultural related curricula.</li> <li>• Creating an animal science doctoral program.</li> <li>• Offering more graduate programs.</li> <li>• A bachelor's degree program for biology.</li> <li>• Other fields of study.</li> <li>• More areas of study within the agriculture field.</li> <li>• More diversity/specifics in the field of biology. UTPA only offers a general biology degree; it would be nice to have more specific majors such as molecular and cell biology.</li> <li>• Having a wildlife program.</li> <li>• Better sports programs.</li> </ul>
<p>5 Improved Community of Learners (with a frequency of 16 responses or 5.2 percent)</p>	<ul style="list-style-type: none"> <li>• More grad students in ecology, more chances for peer community.</li> <li>• Student involvement.</li> <li>• A stronger means of communication between professor and student in terms of clearness of what is to be attained by the student.</li> <li>• One to one advisement.</li> <li>• Community building.</li> <li>• More personal connections with the professors.</li> <li>• More involvement between student and staff regarding the passing of information that is important to students. Many of the programs, grants, scholarships, etc. are not fully relayed to the students here resulting in students not participating.</li> <li>• More group gatherings with individuals with my related degree plan.</li> <li>• Getting information out to the students in a timely manner. So that they know what types of opportunities this university provides.</li> <li>• More graduate student networking and assistance in practical skills and forming a thesis project.</li> <li>• Having tutors that actually relate to agriculture courses.</li> <li>• Offering more tutoring in major specific classes.</li> <li>• Expanding the facilities dedicated to research, among these more focused for laboratories and research equipment.</li> <li>• Higher enrollment.</li> <li>• More tutors for my program of study.</li> <li>• Time bending abilities, more Starbucks.</li> </ul>
<p>6 Improved Faculty Pedagogy (with a frequency of 11 responses or 3.5 percent)</p>	<ul style="list-style-type: none"> <li>• Teachers that motivate students and are better facilitators of learning. Too many professors encourage a learning environment where memorization is the key to an A.</li> <li>• Employing professors who care more about students.</li> <li>• Providing a wider variety of courses in civil engineering.</li> <li>• New faculty members that can teach their students more</li> </ul>

### Exhibit 37: The college/university I attend could be strengthened by...

Main Themes		Student Statements
		<p>challenging concepts.</p> <ul style="list-style-type: none"> <li>• Good faculty and good research experience.</li> <li>• Educated teachers, knowledgeable advisors, and no hybrid classes.</li> <li>• More diversity of educators within the program.</li> <li>• Better instructors.</li> <li>• I think there are a lot of flaws with the faculty. I expected more from my professors, but most of them simply omit important material for the class. Of course there are excellent professors, but some are affecting the students' academic [performance].</li> <li>• Refreshing on professors.</li> <li>• Expanding faculty in certain departments.</li> </ul>
7	Better Financial Aid Support and Job/Career Orientation (with a frequency of 8 responses or 2.6 percent)	<ul style="list-style-type: none"> <li>• Having a better financial aid department. The personnel currently working there is obsolete and inefficient, and constantly creates federal aid related problems for the students.</li> <li>• It can be strengthened by having a more organized financial aid office that will actually help students with funds.</li> <li>• Helping the students who really need financial aid not those who get a big refund and blow it all in one weekend.</li> <li>• Being more pro-active in helping students secure internships.</li> <li>• Offering more internship opportunities.</li> <li>• Having someone telling us exactly what we could do with this degree once we graduate and actually help us to find jobs!</li> <li>• New courses and more scholarships for students that are community leaders and want to continue graduate school.</li> <li>• Lowering costs. Higher education should be cheaper as a whole.</li> </ul>
8	Increase Institution Standing (with a frequency of 2 responses or 0.6 percent)	<ul style="list-style-type: none"> <li>• Becoming a Tier I university.</li> <li>• Becoming a university.</li> </ul>

#### What Students Would Tell a Friend Interested in this Field

Students were asked the following question: If you had a friend who was interested in a similar career, what would you tell this friend about your experience with this program? Exhibit 28 shows a content analysis of the student responses. The analysis grouped responses by 10 main themes. The exhibit shows the themes in relative order of importance, based on the frequency of student responses.

The most frequent theme was: *Students would highly recommend and promote the program (with a few caveats)*. Most students were motivated to recommend the program and 79 of them (25.9 percent) openly indicated just that through this theme. Many indicated they had already talked to friends about the program and urged them to consider it, sharing their own experience with the program. One student said that being in the program is like winning a precious prize in which the odds are one in a million. The main caveat some students mentioned was that prospective participants have to like agriculture or being in the field with animals.

The second most frequent theme was: *The program created an accelerating, exciting, fulfilling, challenging, and insightful experience for participating students.* This was an emotional response 17 percent of the students shared. They felt that the program was a life-changing event. Although very demanding and challenging, the program delivered so much in return that it was more than rewarding and fulfilling. They emphasized the transformative nature of the experience, which changed them in a fundamental way. This theme is very revealing.

The third most frequent theme was: *The program expanded students' opportunities, networking, and job and career prospects.* This theme, gleaned from 16.7 percent of the student responses (51 cases), emphasizes the expanding opportunities the program offered beyond the traditional classroom setting and oriented toward the future lives of students, as professionals, entrepreneurs, and otherwise productive participants of society. They mentioned the important professional connections they made through the networking opportunities afforded by the program; the exposure they received to potential jobs and possible careers; the resources they received to help them get started in their pursuit of those possible jobs and careers; and the field trips and participation in events, such as conferences, that enabled them to experience already what their future profession would look like. In summary, after their participation in the program their horizons had expanded so that it was much clearer to them what their future could be.

The fourth theme (11.8 percent) was: *The program supported students' personal and professional growth.* While the previous theme emphasized a clarification of a vision toward the future, this theme underscores the students' preparation to achieve that vision. They mentioned the experience and skills the program enabled them to gain so that they felt they had grown both personally and professionally. This was achieved through hands-on experiences and through their interactions with more capable peers and guiding professors. They developed their social skills as well as their intellectual skills. After the program, they felt they were ready to be the professionals they had once dreamed of being.

The fifth theme was: *The program improved students' research skills and exposure.* One specific topic students were really excited to gain exposure, knowledge and skills was doing research. This theme covered this trend, which was present in 8.2 percent of the responses directly; it was present indirectly throughout many other statements classified under other categories. Students were aware of how conducting research might have a significant impact in their understanding of the subject matter. As one of them put it, "*As a student, there is no way to understand the trials of developing and carrying out an experiment in its entirety until one has experienced it firsthand.*" But they also understood the practical importance that conducting research will have in their future careers or job opportunities, as one indicated forcefully, "*This is an amazing experience that gives you research time in a top-notch lab and will prepare you for work immediately after obtaining your degree.*"

The sixth theme, representing 7.2 percent of the responses, was: *Students gained practical knowledge and academic preparation through the program.* This theme underscores students' view that the program offers an integral, holistic perspective, including both practical skills and academic knowledge. The practical skills were gained through the internships and lab experiences among other hands-on activities, and the academic skills through the focused, high-level courses.

The seventh theme, with 6.6 percent of responses, was: *The faculty, staff and mentor students were knowledgeable, accessible and caring.* Many students said that they felt like belonging to a large but very close family, or "a great support system." Professors, they said, were very knowledgeable but also

really cared for the students' success, as one of them put it, *"The professors want so badly for you to succeed and reach your goals."* They shared similar expressions about other people with whom they come in contact, as an example, *"The connection made between advisors and students are very close and productive,"* one student said. Another said, *"My mentors were great and helped me throughout the year with any questions I have."*

The eighth theme, with 3.3 percent of responses, was: *Students improved their leadership skills and connections to the community and the environment.* About 10 students felt that the program went well beyond the confines of academia and provided a forum for them to become leaders. One of them expressed this sentiment as follows, *"This program has helped me 'fine tune' my leadership skills and also my public speaking abilities."* This sense of leadership was manifested also in the way the students felt new connections with their communities and the environment, and the need to advocate for their protection through sustainable practices, as one student indicated, *"This program has helped me to learn but also to experience my role as scientist. For me this program has meant a constant learning path that has inspired me to develop a sustainable vision as a researcher."*

The ninth theme, with 2.3 percent of responses, was: *The program facilitated students' continuation of their higher education studies.* Although the program benefited materially hundreds of students, in this survey, seven students were particularly outspoken about this benefit because of the difference it made in their lives. The following quote is a good example: *"It is a great program. It has enabled me to attend conferences and continue my graduate studies. If it were not for the program's support I could have pursued neither a graduate nor a doctoral program."*

The final theme, with 1.0 percent of responses, was: *The program was sponsored through a prestigious, recognized institution.* Three students emphasized the prestigious nature of the specific department, the programs, or the whole institution, as reasons for students to enroll in it. Exhibit 38 shows all the student responses grouped by themes, in descending order of frequency.

### Exhibit 38: What Students Would Tell a Friend Interested in a Similar Career

Main Themes	Student Statements
<p>1 Students Would Highly Recommend and Promote the Program, with a few caveats (with a frequency of 79 responses or 25.9 percent)</p>	<ul style="list-style-type: none"> <li>• Yes, [I] highly recommended [it]. [2]</li> <li>• Yes, I most definitely would [recommend it]!</li> <li>• Overall a good environment and I like going to school here.</li> <li>• I would highly recommend the NRCT program; it has inspired me to engage into my studies to strive for the career I desire.</li> <li>• The program is excellent.</li> <li>• I will tell them that they have to be enrolled in something related to their studies because programs like this one will reinforce their areas.</li> <li>• [I would say] that [it] was the best program for my focus.</li> <li>• Overall, it is a satisfactory program.</li> <li>• Excellent!</li> <li>• Yes, I would [recommend it] and have told my friends about this program and my experience in it.</li> <li>• [I would share that] being part of my program would cause their college experience 10x better than what they imagined.</li> <li>• It's like winning when the odds are one in a million.</li> <li>• In my opinion, it's one of the best [programs] in the island, and I would</li> </ul>

### Exhibit 38: What Students Would Tell a Friend Interested in a Similar Career

Main Themes	Student Statements
	<p>definitely recommend it. Although, as I said before, the Financial Aid department can be a real problem, you should be all right if you hire the help of a person correctly prepared for filling a FAFSA [application].</p> <ul style="list-style-type: none"> <li>• I would recommend this program.</li> <li>• Yes, I would share my experiences.</li> <li>• It is a blooming program; however, GIS is not quite off the ground yet. It will take time to truly perfect it.</li> <li>• My program at CSUMB is challenging in a supportive environment of brilliant peers, but lacks some necessary support from professors and counselors.</li> <li>• Yes, this program has helped me. I would share my experience and offer to help join.</li> <li>• I would tell them to join.</li> <li>• This is an excellent program; I highly recommend it.</li> <li>• I would recommend the program. [2]</li> <li>• Yes, I would recommend the program with high value.</li> <li>• [It's an] amazing program; [I] strongly recommend it.</li> <li>• [I would say] that they should definitely sign up for it. It's a great program.</li> <li>• Of course I would; I would tell them everything I know, and what I've experienced. I actually did a presentation on the agriculture program for the incoming freshman on orientation day; so if anyone did have interest or questions, I made sure I helped them.</li> <li>• [I would tell them] that it is really fun and interesting and if they love animals to go for it.</li> <li>• It's a wonderful experience, and they should really consider this program.</li> <li>• Find something you like to do and want to do. And specifically ask what you are going to be doing before you accept an offer.</li> <li>• I would tell them it is a great program and he/she could benefit from it. Depending on what they want to do, this career choice could help.</li> <li>• They should enroll to acquire more experience to see if this is what they really desire.</li> <li>• Yes!! I have several friends with similar career interests and I am always talking about this program.</li> <li>• [I'll say] that [it] is a really good one.</li> <li>• I would tell them to definitely look into it. It has been a great experience with the program and you cannot go wrong with it.</li> <li>• If you love animals and being outside, I recommend this career.</li> <li>• I often promote the program to fellow students who are interested in Wildlife science or agriculture; and I share my experience so that they would consider it.</li> <li>• Yes [42]</li> </ul>

### Exhibit 38: What Students Would Tell a Friend Interested in a Similar Career

Main Themes	Student Statements
<p>2 The Program Created an Accelerating, Exciting, Fulfilling, Challenging, and Insightful Experience for Participating Students (with a frequency of 52 responses or 17.0 percent)</p>	<ul style="list-style-type: none"> <li>• This is the best experience I ever had and I will tell him to try it.</li> <li>• It is challenging but insightful.</li> <li>• How fulfilling it is.</li> <li>• I would tell them that this is a good program and that I have enjoyed it.</li> <li>• It is a very rewarding and challenging program at the same time. You gain a lot of experience and the possibilities of being prepared for graduate school are very high.</li> <li>• It has been a challenging experience but very rewarding. I have learned a lot and would highly recommend the program to anyone.</li> <li>• Very challenging but can be rewarding potentially.</li> <li>• It's been great but very challenging.</li> <li>• Extremely valuable! A wonderful way to get experience in related field of study!</li> <li>• It is the best experience that anyone can have as a student.</li> <li>• It is life changing.</li> <li>• I would tell them to enroll in this program so they can get experiences in science throughout this program.</li> <li>• It is a great experience. [4]</li> <li>• [It is] once in a lifetime experience!</li> <li>• It was a lot of work so it was very challenging.</li> <li>• A lot of work but a lot of knowledge gained!</li> <li>• I would tell them that it is a great program to get a great experience. I enjoyed this program and I learned so much from my internship. I have recommended this program to others.</li> <li>• I would tell them that this program is extremely beneficial, and to definitely look into it. It was a wonderful experience that I think anyone who is interested should have as well.</li> <li>• I have had an excellent experience with this program.</li> <li>• [I would say] that [it] has been good and I learned a lot.</li> <li>• [This was the] best multidisciplinary experience I could ever have.</li> <li>• It is a unique experience in which they will learn new skills in different areas.</li> <li>• It has been a great experience learning about sustainability and the different kinds of renewable and nonrenewable energies, and learning about the different processes on how to create them.</li> <li>• [The] program is great! You get to learn a lot; go to places you've never been before to make presentations; great people; great atmosphere among students.</li> <li>• It is a resourceful program and it will impact your life about agriculture.</li> <li>• It is the best decision they can make by trying to join the program.</li> <li>• The workload is tough and rigorous.</li> <li>• It is a challenging and rewarding program.</li> <li>• I talk to students about this program every chance that I have. My experience was amazing and I was able to learn a lot more than I could</li> </ul>

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Main Themes	Student Statements
	<p>in a classroom setting. These are the types of opportunities more students should have.</p> <ul style="list-style-type: none"> <li>• [It was a] great experience overall; you will learn, grow and benefit greatly.</li> <li>• [It was a] good experience, [but] a lot of surveys needed to be taken.</li> <li>• [I would tell them] that they should experience it by themselves.</li> <li>• [This was an] experience that they will never forget. [It] helps out in so many ways.</li> <li>• I would and do tell them it has been an awesome experience and I have had a lot of awesome opportunities that may not have been possible without the FATE grant.</li> <li>• [It was a] great experience and eye opening.</li> <li>• I would let them know how to sign up; it's a great learning experience.</li> <li>• It is challenging but equally satisfying and worthwhile.</li> <li>• It's an experience well appreciated; being able to see the real world opportunities is an eye opener to what we really are striving for.</li> <li>• It's a great experience and worth your time.</li> <li>• Do not sign up for this as a fall back plan; this school is hard work. The courses are challenging but they are the easy part; you have to be willing to dedicate yourself to a long-term project.</li> <li>• Yes, I would [recommend it] because it was a great experience.</li> <li>• This was the most encouraging and helping program I have ever heard of.</li> <li>• I love this program and have learned so much!</li> <li>• It is a thrilling experience; be prepared to learn a lot.</li> <li>• That it is a great experience that opened my eyes into the field. I would encourage my friends to join and see what the program has to offer them.</li> <li>• It is challenging, but very obtainable.</li> <li>• I really enjoyed it!</li> <li>• I would tell him that I have had a wonderful experience and advise him to take it into consideration.</li> <li>• [I would say,] "Follow your dreams!"</li> </ul>
<p>3 The Program Expanded Students' Opportunities, Networking, and Job and Career Prospects (with a frequency of 51 responses or 16.7 percent)</p>	<ul style="list-style-type: none"> <li>• I would tell them about all the opportunities it has offered me; how much I've learned; also give them contacts to learn more about the program.</li> <li>• It's very useful and a great reference.</li> <li>• [I would say] that a degree from this program can prepare him for graduate school and also to get a job after graduation.</li> <li>• It is a good choice because it is broad and an industrial engineer is needed everywhere.</li> <li>• I would tell them that it has allowed me to make importance professionals connections with people already working in this field.</li> <li>• I would tell them that this program has aided me in more ways that just</li> </ul>

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	<p>getting my feet on the ground academically. It has also helped me set other goals and accomplish [them] in ways I had never expected to. This program has given me many opportunities that I will forever be grateful for.</p> <ul style="list-style-type: none"> <li>• This program has given me the opportunity to get the experience and knowledge required for a future job in the natural resources area.</li> <li>• The geology program at CSUB is challenging, rewarding and can lead to great jobs in the future.</li> <li>• It is a good way to start a career in the federal government.</li> <li>• Yes, the watershed program has helped me in my field of study and has also allowed me to communicate with professionals within the field.</li> <li>• It is a great resource for learning about opportunities as well as exposure to other requirements that need to be fulfilled in order to be competitive for federal jobs.</li> <li>• [It is a way] to select agronomy or go outside Puerto Rico to enroll in an Ag-Engineering program.</li> <li>• [It's good] to attend any school that works more closely with the governmental agencies.</li> <li>• [I would tell them] that it is a good opportunity to see what else is out there.</li> <li>• Be sure to actively search for a position.</li> <li>• It is a great opportunity to explore the USDA agencies and other fields in science like agriculture and horticulture.</li> <li>• They should definitely enroll in this program or a program like this because it gives us the opportunity to meet new people from our same field; lets us travel and learn the importance of networking.</li> <li>• Great program! Offers lots of opportunities!</li> <li>• [It is] a positive experience with internship opportunities.</li> <li>• It's great and you start networking with people.</li> <li>• [I would tell them] to look into it; there is a growing need for USDA employees in the coming years.</li> <li>• It was a great opportunity for me to make connections, and that all the training that I've received was extremely important for my future.</li> <li>• The field of study and coursework is both challenging and engaging and with a degree in agriculture there are a wide range of possible career paths.</li> <li>• It is a great program that will help guide you through your graduate experience. It will not only provide funding, but will also allow students with networking possibilities.</li> <li>• This program has brought me great opportunities to network.</li> <li>• It's a great opportunity to meet people who are studying the same thing you are. Also, it helps you gain experience in the field you are pursuing.</li> <li>• This career has a lot of opportunities with the federal government and industries.</li> </ul>

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Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• It is a great opportunity to develop skills and abilities for future jobs and careers.</li> <li>• The program really opens up your eyes to all the job possibilities that can come from having a degree in agriculture.</li> <li>• The program is a great resource to help advance academically, network with professionals and other students, and shed a light on career paths with the federal government that might not be as accessible otherwise.</li> <li>• I would let them know of the amazing opportunities that the program offers both within the school and outside of it.</li> <li>• That is has provided me with some of the most valuable opportunities of my college education.</li> <li>• Without BGREEN I would have had a much tougher time pursuing my goal of working for the USDA (which was my plan even before BGREEN).</li> <li>• The program has showed me different career paths in agriculture, other than animal science (veterinary field). The program has also got me involved in school related activities and helped me gain positive relationships with other peers in the science field.</li> <li>• I tell [them this is] the best opportunity that they have and how much they can learn in the program.</li> <li>• It is an excellent opportunity to expand their knowledge in different fields of agriculture, ecology, etc.</li> <li>• It is very gratifying, formative and educational. It is probably the best opportunity you will ever have.</li> <li>• It was great for networking.</li> <li>• [I would tell them] to look for FATE scholarship program and make sure he knows it will open doors for him.</li> <li>• It has been an amazing experience! I would strongly recommend attempting to obtain an internship with the USDA; the connections and networking you experience is a great asset to have when looking for a job later on.</li> <li>• It is a great opportunity to build your resume and the work fits very well with school schedules.</li> <li>• This program provides you with opportunities that cannot be found easily in other universities. It allows you to network with future possible employers and/or work with agencies that are highly recognized in our field of study. If considering the option to enter this program, take advantage and go for it, and relish all opportunities it provides.</li> <li>• This is a great program that helps to keep you interested in school because it provides you with multiple job opportunities while attending college.</li> <li>• I would tell them this is one of the greatest opportunities I've ever been offered. I would also offer my assistance with program information.</li> <li>• [I would say] get into NRCT as soon as possible. The friendships and networking with people of a like mind within the same degree plan is priceless in helping the transition from lower to higher education.</li> </ul>

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	<ul style="list-style-type: none"> <li>• [I would suggest] to join and they would definitely learn about different opportunities in the natural resource field.</li> <li>• Yes, as students, we are exposed to different facets of the USDA. In fact, I just returned from the Latinos in Agriculture Conference where we met and heard people from across the United States speak about agriculture.</li> <li>• If you're interested, go for it! You are not going to regret this area of study from which I got so much, and it opens so many opportunities for the future.</li> <li>• CETARS lets you have hands-on experience in a lab and provides networking opportunities with professionals in the food/agriculture field.</li> <li>• This program has taught me a lot about different careers within the agricultural field.</li> <li>• You get hands-on experience in the lab and field and advice for mentors about future career options. Overall it is a wonderful program.</li> </ul>
<p>4 The Program Supported Students' Personal and Professional Growth (with a frequency of 36 responses or 11.8 percent)</p>	<ul style="list-style-type: none"> <li>• The program will challenge you and make you a well-rounded individual.</li> <li>• [I would tell them] that [it] is an opportunity to have a work experience at the same time that you can have practice about your interest area of study.</li> <li>• The program has been beneficial to my professional development and exposing me to various career fields and internship opportunities that contributed to the successful completion of my study program.</li> <li>• I will tell him that if he has the opportunity to participate from CETARS program, while studying a similar career, take all the advantage of it because it is a once-in-a-lifetime opportunity that will help him grow and develop as a professional and as a human being. It will open a lot of doors in his professional field.</li> <li>• It expands your point of view and gives you the experience needed for any other things you'll want to apply later.</li> <li>• It's a great opportunity to develop social, professional and academics skills that will help you achieve your goals in agricultural or related sciences.</li> <li>• The program has been a great experience in many ways and that the opportunities it has given me have helped develop me greatly as a professional.</li> <li>• This program is beneficial in getting better experience.</li> <li>• It really helped prepare me for a career in agriculture.</li> <li>• That helps you grow as a student.</li> <li>• My experience of being part of this program has been very good. It is a helpful program that benefits students and guides them to be better professionals in the future.</li> <li>• [The program offers] excellent opportunities, with state of the art instrumentation [and helps you] grow up professionally.</li> </ul>

### Exhibit 38: What Students Would Tell a Friend Interested in a Similar Career

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• It is a very good program, and that they will learn a lot of beneficial information that will help them in their careers.</li> <li>• This program allows people to get a firsthand look of what they can do possibly for the rest of their life.</li> <li>• It would help you to develop skills that are going to be used after your graduation.</li> <li>• I would tell them that my experience has been wonderful because it would help me be a better professional based on the skills I developed here.</li> <li>• That is an experience they should definitely try, and that will help them to build their skills through time.</li> <li>• This program helps grow as a professional in every aspect.</li> <li>• I would advise them to consider the fact that it has provided me with exceptional experiences such as internships and research opportunities that prove very useful when going into a professional setting.</li> <li>• The program is enriching; it makes you grow globally in experiences and helps you improve every aspect of your career.</li> <li>• This program is designated to help them become the most competitive candidate they can be, upon graduation. This program offers many opportunities that other students would not be able to attend.</li> <li>• This program is extremely beneficial in providing professional experiences, which include workshops, retreats, conferences, and internships.</li> <li>• That is a great opportunity; you can learn and develop a lot of skills for your future work.</li> <li>• [I would say] that this program could not only make him grow as a professional but also as an individual.</li> <li>• It prepared me for the real world.</li> <li>• This program has provided fundamental opportunities for both personal development and professional development. The amount of experience acquired would not have been possible without the program.</li> <li>• They were not only immediately rewarding, but helped define my future career.</li> <li>• Definitely! This program helped keep me focused and on track with high expectations and great support.</li> <li>• It is a great program that will help them to get started and advance them in their future aspirations.</li> <li>• It was amazing, and it helped me determine my future goals in academics/careers.</li> <li>• This program is an excellent opportunity to get knowledge about sciences, environment and resources; also this program will [teach] you to develop yourself, your mind and the heart of a farmer.</li> <li>• There is plenty of support and there are sufficient electives to make you a well-rounded individual. We could use more faculties to get more perspectives.</li> </ul>

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	Main Themes	Student Statements
		<ul style="list-style-type: none"> <li>• It is a really good experience for professional development.</li> <li>• It has given me the opportunity to explore different alternatives and learn different things – All involving the management of the environment. [It] made me realize that I love being outside. This program will give him/ her tools, orientation and support needed to find passion and focus on your goals.</li> <li>• This program helped me strengthen my knowledge, it helped me grow professionally and personally but it has its flaws. If you are not among the favorite students you will not travel to conferences (you will not be even considered nor invited).</li> <li>• The program has sparked a greater interest in my career and has helped me look at different jobs and opportunities with a different perspective.</li> </ul>
5	The Program Improved Students' Research Skills and Exposure (with a frequency of 25 responses or 8.2 percent)	<ul style="list-style-type: none"> <li>• [I would say] that I developed my scientific criteria [as the program has] been a good research opportunity with multidisciplinary focus.</li> <li>• [I would tell them] to join, because it gives you the opportunity to learn, enhance communication skills and research skills, and opens up a lot of opportunities.</li> <li>• [It is] very beneficial to building skills for the science industry.</li> <li>• I would recommend this program. As a student, there is no way to understand the trials of developing and carrying out an experiment in its entirety until you have experienced it firsthand.</li> <li>• This is an amazing experience that gives you research time in a top-notch lab and will prepare you for work immediately after obtaining your degree.</li> <li>• [I would say] that it affords a great way to pursue interesting and various research projects, and makes connections to FIU faculty.</li> <li>• This program offers you many opportunities to development skills in areas as research, scientific knowledge, critical thinking and others.</li> <li>• Crop sciences are one of the best options related to the agriculture because you can work in the field and/or in the laboratory at the same time. Also we can do research including other related sciences like biology and genetics.</li> <li>• Working with CETARS gave me the opportunity to know more about agriculture. Also this program has helped me to increase my research experience.</li> <li>• [It is a] very good program that builds your foundation in the natural sciences and will enhance your skills in research and networking.</li> <li>• It has been an excellent experience to enhance my knowledge and challenge my experiences in agriculture by doing research and outreach activities. The accomplishments and rewards after the effort of meeting the program requirements have been invaluable for my professional and academic development in an agriculture related career.</li> <li>• I would tell them that this program enhanced my knowledge in agriculture. It has given the opportunity to do research in plants.</li> </ul>

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	<ul style="list-style-type: none"> <li>• The FCCAgE Program gives you the opportunity to gain the experience in any field of agriculture from research to food science and more.</li> <li>• Good opportunities for research and internship, good access to funding.</li> <li>• This program is great! FCCAgE provided me the opportunity to do research and really awakened my interest in science. If you want to challenge yourself and thrive, join the program.</li> <li>• I would tell them to do as much research in the field as possible, job shadow, and intern as much as possible as well.</li> <li>• My experience was overall positive; the program provides an excellent opportunity to gain research experience.</li> <li>• [I would tell them] that they will learn a lot, and that they will have many opportunities, in research and or industry-related activities.</li> <li>• It is a good opportunity to improve research skills.</li> <li>• [It is a] great program with many research opportunities.</li> <li>• [It was] interesting and very helpful in gaining research experience.</li> <li>• This program offers the opportunity to develop a research study that may help you improve your career experience, and also through many workshops, which are offered throughout the year.</li> <li>• [It] provides great lab experiences.</li> <li>• If you are interested in agriculture related research, FCCAgE is for you.</li> <li>• [I would tell them] that we learn from hands-on with real world situations.</li> </ul>
<p>6 Students Gained Practical Knowledge and Academic Preparation Through the Program (with a frequency of 22 responses or 7.2 percent)</p>	<ul style="list-style-type: none"> <li>• Our courses in animal science prepare you with knowledge needed to apply to an agriculture-based job.</li> <li>• You take away so much knowledge and understanding of higher level animal science.</li> <li>• The program Food Science and Technology of UPR Mayaguez campus prepares you very well academically.</li> <li>• Internship gave a good industrial experience.</li> <li>• Excellent hands-on experience.</li> <li>• This internship allowed me to experience field work I would not otherwise have done.</li> <li>• It was a great experience for an undergraduate student to get familiar with the Forest Service. As well as gaining knowledge in the field of geology.</li> <li>• This program has had many benefits and it is worth the academic requirements.</li> <li>• It is a very good program; I have learned plenty in the one year I have been attending.</li> <li>• I would tell them that they would learn everything they needed to know about agriculture after going through this program.</li> <li>• It is a great program to learn about agriculture.</li> <li>• I would tell them that the program is a great opportunity and that it will greatly help with any academic situation.</li> </ul>

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	<ul style="list-style-type: none"> <li>• [It was] so good to educate myself in agriculture, animal sciences, and gain field work experience.</li> <li>• The program gives mostly field experience, but will cover a lot in the others. It does not waste time on extras and electives which will not benefit you.</li> <li>• This program is really hands-on and they provide you so many opportunities to become a better student.</li> <li>• That you gain a lot of knowledge and experience through this internship, and that it's a good program to participate in.</li> <li>• It is a great learning opportunity. [2]</li> <li>• [It was a] great opportunity to expand knowledge in an agriculture related area.</li> <li>• I would tell him that they should strongly consider this program as an opportunity to develop more knowledge and gain hands-on experience.</li> <li>• This program has helped me to succeed academically and has helped me to gain valuable knowledge by helping me gain internships. I would highly recommend it.</li> <li>• I would tell them to come to TSTC because the agriculture classes here are hands-on and very interesting and they get you ready for an agriculture related job.</li> </ul>
<p>7 The Faculty, Staff and Mentor Students were Knowledgeable, Accessible and Caring (with a frequency of 20 responses or 6.6 percent)</p>	<ul style="list-style-type: none"> <li>• Love it! Teachers are most caring and helpful! The program is awesome.</li> <li>• You won't be disappointed. Great teacher-to-student ratio!</li> <li>• This program is very challenging but in the future you will see the results of your efforts. There are very good and well prepared professors. Also, in my department we are like a family.</li> <li>• I would tell that joining the FCCAgE program would expose them to mostly all of the agricultural/environmental fields. They would have a great support system that would answer all questions and motivate them when needed. They would get the opportunity to take part of workshops, classes, and other activities that stimulate their mind and cause them to think beyond the closed box.</li> <li>• That it is a good program due to the small class sizes, ability to have working relationships with professors, and ability to have hands-on experience.</li> <li>• [It's an] amazing program! It's very close, like a family.</li> <li>• [I would tell them] that the professors and faculty in the area are very helpful and provide great professional advice.</li> <li>• It is a great program with lots of challenges, but you will learn from experienced faculty.</li> <li>• The experience has been amazing and the opportunities are endless if you work hard enough. The professors want so badly for you to succeed and reach your goals.</li> <li>• First and foremost, I would indicate that this program is excellent because at TAMUK you get to interact with your professors and students</li> </ul>

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	<p>and get to gain hands-on experience.</p> <ul style="list-style-type: none"> <li>• I would tell this friend that research is a very fulfilling experience. The connection made between advisors and students are very close and productive.</li> <li>• I have learned a lot from this program about agro-terrorism and we have developed a close family bond with each other. We all help each other out in classes that we are taking together or have already taken.</li> <li>• I would tell them to join because of the benefits of the communication experiences with knowledgeable people, the internships experiences, and the help given by the FATE director.</li> <li>• Great professors!</li> <li>• I would let them know that being part of this program was the best decision I made during my college career. I gained knowledge in new aspects of the USDA that I did not know of. My mentors were great and helped me throughout the year with any questions I have.</li> <li>• [You will have] excellent professors, always willing to help you understand the material being studied.</li> <li>• [It was a] great experience with professors and program.</li> <li>• I would tell them that this program is an extremely strong program; all professors are willing to help you at any time.</li> <li>• I would tell them about the many opportunities the university has available and the professors at the university are very helpful and supportive.</li> <li>• By participating in this program you will have the privilege of receiving help from others in the area of study and also, you can participate in meeting focused on improving your future academic plans.</li> </ul>
<p>8 Students Improved their Leadership Skills and Connections to the Community and the Environment (with a frequency of 10 responses or 3.3 percent)</p>	<ul style="list-style-type: none"> <li>• This program has helped me "fine tune" my leadership skills and also my public speaking abilities.</li> <li>• I would tell them about how diverse and important it is to our community.</li> <li>• This program has helped me to learn but also to experience my role of scientist. For me this program has meant a constant learning path that has inspired me to develop a sustainable vision as a researcher.</li> <li>• It's a great opportunity to learn about our environment and just how closely related we are. In addition, you will definitely see the impact that our actions have on our surroundings.</li> <li>• It's a refreshing experience where you can learn about the food industry and its regulations, food processing, sensory evaluation of food, quality control and many other fields related to the food you eat every day.</li> <li>• I would recommend it because I have grown educationally and professionally in the area of agricultural sciences, in the research area, and in leadership.</li> <li>• It helps the planet and the world; sustainability is everyone's concern.</li> <li>• My experience is very rewarding personally because you will make a</li> </ul>

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	Main Themes	Student Statements
		<p>difference in natural resources, performance of crops and improving people's life and health.</p> <ul style="list-style-type: none"> <li>• [I would say] that it is a great program that provides learning hands-on experiences and mentoring. These hands-on learning experiences are relevant not only for careers in natural resources but also for a variety of careers and academic settings. An example is the mentoring that graduate students provide undergraduate students in the program. Undergraduate students benefit from the experiences and the mentoring they receive from graduate students, but at the same time, graduate students gain hands-on experience in how to lead, mentor and teach undergraduate students. This cross fostering of mentoring and learning experiences benefits all members of the program.</li> <li>• This program aims to help develop any student who is interest and wants to empower the relationship between human and nature, into a professional through lifetime experiences.</li> </ul>
9	<p>The program Facilitated Students' Continuation of their Higher Education Studies (with a frequency of seven responses or 2.3 percent)</p>	<ul style="list-style-type: none"> <li>• It is a great program. It has enabled me to attend conferences and continue my graduate studies. If it were not for the program's support I could not have pursued neither a graduate nor a doctoral program.</li> <li>• I would tell them that it was a really beneficial program. I feel so lucky to be a part of it because I would not have been able to go to school without it.</li> <li>• It has given more opportunity than I could not have imagined. Because of it, I'm going to get a college degree and even move on to graduate school.</li> <li>• The opportunities and help (financial, support) are unique and will help you succeed.</li> <li>• It is truly a great hands-on experience that allows you to learn about careers directly related to what you are studying. The program provides you the tools to meet new people in your field of interest and helps you continue your education while gaining valuable experience.</li> <li>• The agricultural science has many branches and job opportunity exists both in government and in private enterprise. There are scholarships as the one I received from CETARS project that motivated me and helped me to continue my studies. In addition, such projects can lead you to be a complete professional with an educational experience beyond just the approved academic credits.</li> <li>• [I would tell them] that this program can pay for your tuition and books and it can also help you make connections, you get to travel and experience new things, get to go to conferences in and out of town to learn new things. And overall it is a fun experience.</li> </ul>
10	<p>The Program was Sponsored through a Prestigious, Recognized Institution (with a</p>	<ul style="list-style-type: none"> <li>• The geography department is highly recognized.</li> <li>• Del Mar College has the best biotech program in the state of Texas. It has prepared me to be a top student in a four year college and a top competitor for research positions available throughout the U.S.</li> <li>• I would encourage them to study at UPR Mayaguez, because this</li> </ul>

### Exhibit 38: What Students Would Tell a Friend Interested in a Similar Career

Main Themes	Student Statements
frequency of three responses or 1.0 percent)	university has the best programs in the area of agriculture and natural sciences in Puerto Rico and offers learning opportunities outside the university – opportunities like research, internships and volunteer work.

### Recruitment of Under Represented Students

**Students (81.5 percent) report their college or university is taking steps to recruit more students in agricultural-related fields.** With an overall agreement of 81.5 percent (an improvement over last year of 77.9 percent), students thought that their college or university was taking pro-active steps to recruit more students in the agriculture field, particularly under-represented students, including Hispanics. In this sub-section of the survey, the highest agreement was with the statement, “The college/university I attend is taking pro-active steps to include diversity/multicultural perspectives in classes, presentations, assignments and discussions.” Its level of agreement was 84.1 percent (see Exhibit 39).

Exhibit 39: The college/university I attend is taking pro-active steps to...							
Statements		Agree		Neutral/NA		Disagree	
		Number	Percent	Number	Percent	Number	Percent
A.	Recruit more students for agriculture related programs of study.	245	79.3	49	15.9	15	4.9
B.	Recruit more under-represented students for agriculture related programs.	249	80.6	53	17.2	7	2.3
C.	Enroll Hispanic students in agriculture related programs of study.	254	82.2	46	14.9	9	2.9
D.	Include diversity/multicultural perspectives in classes, presentations, assignments and discussions.	259	84.1	42	13.6	7	2.3
<b>Total</b>		<b>1,007</b>	<b>81.5</b>	<b>190</b>	<b>15.4</b>	<b>38</b>	<b>3.1</b>
<b>Total (2011-12)</b>		<b>831</b>	<b>77.9</b>	<b>192</b>	<b>18.0</b>	<b>44</b>	<b>4.1</b>

### Strengthening Outreach/Recruitment to Under-represented Students

Students were asked to provide ideas to strengthen their college or university outreach or recruitment of under-represented students. Exhibit 30 shows a content analysis of their recommendations. The large majority of the students (74.5 percent) felt their institutions were doing just fine in this area, and

therefore, no change was really needed. This was manifested by many students indicating, “No comments,” “N/A,” or simply skipping the question. A few students even explained what their university or college was doing in this area, as one of them put it, “As part of Agricultural Ambassadors, we go to high schools to recruit students. It has improved our agricultural population by 10 percent.”

However, about one-fourth (25.5 percent) of the students provided some suggestions. The most significant theme based on its frequency was to *increase direct contacts with prospective students*, with 10.0 percent of all responses. In this theme, students provided a variety of strategies, including more pro-actively interacting with high schools to enthuse them about the fields and the possibilities the program offers to minorities, creating activities (seminars, agriculture weeks, and symposiums) to attract attention to the program. The second most frequent theme (5.5 percent) was to *create or expand a media campaign*. They suggested promoting the program more through publicity, fliers and other means, such as the Internet, Facebook and even radio and television. These findings are similar to last year’s findings.

However, the next few suggestions are different. About 3.5 percent of the students suggested that the institution should *offer more incentives*. These incentives could be given to the new students and/or to students who helped bring the new students in. They can take the form of scholarships, payments for books, parking, and tuition waiver or reduction. Some students (3.2 percent) suggested *involving prospective high school students in university activities*. Perhaps they could be offered a class or some hands-on training so they could experience the program first hand. This did not have to be purely academic, some suggested. It could be something fun and informal that encourages prospective students to interact with university students and get a feel for university life. A final recommendation (3.2 percent) involved *reaching out to the community to understand its needs* and proceed from there. This required asking, “lots, lots of questions,” talking to parents, and reaching out beyond the traditional minority groups, in their opinion. Exhibit 40 lists all student suggestions organized by themes.

<b>Exhibit 40: Strengthening outreach/recruitment to under-represented students</b>	
<b>Main Themes</b>	<b>Student Statements</b>
1 Institution is Doing Just Fine, No Change is Necessary (with a frequency of 231 responses or 74.5 percent)	<ul style="list-style-type: none"> <li>• As part of Agricultural Ambassadors, we go to high schools to recruit students. It has improved our agricultural population by 10 percent.</li> <li>• Here in PR the majority of the population is considered minority when compared to mainland U.S. Also, the institution has an active component of international students, primarily from South America, actively participating in the fields of study.</li> <li>• I have no ideas at the moment.</li> <li>• I think my college does a fine job offering help to all students here.</li> <li>• N/A [3]</li> <li>• No actions are necessary.</li> <li>• No comments. [3]</li> <li>• The college I attend is already strong in these areas.</li> <li>• There are plenty of Hispanic students [in my college].</li> <li>• We invite students from high school to work in agricultural projects.</li> </ul>

## Exhibit 40: Strengthening outreach/recruitment to under-represented students

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Blank [217]</li> </ul>
<p>2 Increase Direct Contacts with Prospective Students (with a frequency of 30 responses or 10.0 percent)</p>	<ul style="list-style-type: none"> <li>• Advertise to future agriculture majors coming out of high school.</li> <li>• Attend events at livestock shows or high schools.</li> <li>• Attend job fairs.</li> <li>• By becoming more proactive recruiting students from high schools.</li> <li>• By having more recruitment activities to promote agriculture to Hispanic students.</li> <li>• By positive feedback from students.</li> <li>• CETARS, PREM.</li> <li>• During orientation, FIU should inform students about our program.</li> <li>• Go to high schools and career fairs at community colleges across TX not just nearby.</li> <li>• Have sponsorship or increase budget allocated to recruit in all high schools.</li> <li>• Have students go out the valley schools and represent our university.</li> <li>• Hold tables out by the student union building where there are more students around.</li> <li>• Increase funding for outreach activities.</li> <li>• Make more announcements of this subject in classes.</li> <li>• More active events on campus to expose the program.</li> <li>• More activities, field trips, and symposiums to involve more students.</li> <li>• More events.</li> <li>• Onsite visits.</li> <li>• Open house events.</li> <li>• Recruit at high schools.</li> <li>• Send representatives to high schools so that they can share their academic and career progress as well as their experiences.</li> <li>• Social events/culture related.</li> <li>• The university can have current students visiting the local high schools.</li> <li>• The university could reach out by attending areas with under-represented students and enlighten them about what the university has to offer.</li> <li>• Visit high schools and talk to students.</li> <li>• Visit more schools.</li> <li>• Visit smaller school districts whose students are fully aware of the concept of agriculture or what it has to offer.</li> <li>• Visiting more community colleges.</li> <li>• Visiting universities or schools to promote the program and its</li> </ul>

## Exhibit 40: Strengthening outreach/recruitment to under-represented students

Main Themes		Student Statements
		<p>benefits.</p> <ul style="list-style-type: none"> <li>• Workshops, university fairs, and outreach at high schools.</li> </ul>
3	Create or Expand a Media Campaign (with a frequency of 17 responses or 5.5 percent)	<ul style="list-style-type: none"> <li>• Advertise more.</li> <li>• Advertising more on and off campus.</li> <li>• Be more advertised, get the word out more.</li> <li>• Brochures, more outreach.</li> <li>• Continue with advertising in areas of need.</li> <li>• Develop a website.</li> <li>• Enroll more in nutrition.</li> <li>• Fliers, TV commercials, give seminars in schools about the opportunities.</li> <li>• Give promotion on television and newspaper.</li> <li>• Host a presentation at Del Mar, post on Facebook.</li> <li>• Internet.</li> <li>• More advertisement.</li> <li>• More publicity about the program! If you don't know someone in the program it is hard to know about it!</li> <li>• Nova U.</li> <li>• Public presentations.</li> <li>• Radio, school newspaper spread and conferences.</li> <li>• Spreading the word.</li> </ul>
4	Offer More Incentives (with a frequency of 12 responses or 3.5 percent)	<ul style="list-style-type: none"> <li>• Actively providing resources to the students.</li> <li>• Create incentive for students who bring others in; perhaps, money off tuition or off parking fees.</li> <li>• Bring more people of other countries by giving them scholarships.</li> <li>• I think they should advertise more their programs, and offer more scholarship/fellowships.</li> <li>• Information fair, support programs that improve the enrollment to under-represented students and give scholarship to those students.</li> <li>• Let students know about the program that's being offered and the opportunities that could be given to them.</li> <li>• Lowering costs. Higher education should be cheaper as a whole.</li> <li>• More scholarships.</li> <li>• Provide tuition waivers.</li> <li>• Provided more scholarship opportunities.</li> <li>• They should provide scholarships for Hispanics in <i>all</i> career fields.</li> <li>• Tuition waivers for graduate students.</li> </ul>
5	Involve High School Students in University Activities (with a frequency of 10 responses or 3.2 percent)	<ul style="list-style-type: none"> <li>• Get them involve, have teachers assign extra credit so students can participate, and maybe from that, by experiencing agriculture, will like it and change their degree plan.</li> <li>• Hands-on training.</li> <li>• Have more fun events that promote having fun rather than just</li> </ul>

## Exhibit 40: Strengthening outreach/recruitment to under-represented students

Main Themes	Student Statements
	<p>school.</p> <ul style="list-style-type: none"> <li>• Hold informational seminars about the program and what we do and hope to accomplish.</li> <li>• More career days perhaps.</li> <li>• More fraternization and interactive activities.</li> <li>• More representative activities should be done to attract interested students.</li> <li>• Seminars around different buildings.</li> <li>• Summer research opportunities for under-represented high school students.</li> <li>• Workshops.</li> </ul>
<p>6 Reach out to the Community to Understand its Needs (with a frequency of 10 responses 3.2 percent)</p>	<ul style="list-style-type: none"> <li>• Advertise these types of internships school-wide rather than only sharing with a small group of students; maybe coming out to different schools and talking about what the USDA does for people every day.</li> <li>• Allow more minorities.</li> <li>• Ask questions, lots and lots of questions.</li> <li>• Don't [concentrate] on just the Hispanic minorities. I am bi-racial and feel like I don't fit in.</li> <li>• Get specialized fields. We don't offer anything for agriculture, other than plant physiology, plant taxonomy or plant morphology. Additionally, we do not have much for the animal sciences, besides things as herpetology or ethology and such.</li> <li>• Inform parents.</li> <li>• Spend more time [planning] and create [meaningful] outreach programs.</li> <li>• Provide them with more opportunities for everyone, not just a select group.</li> <li>• Reach out to community needs.</li> <li>• Have more programs like this and promote them in high schools.</li> </ul>

### Supports and Opportunities for Experiential Learning

The survey listed several support areas that could reasonably contribute to student enrollment and success. Students were asked to indicate their degree of agreement with these assumptions. Exhibit 41 shows their responses.

Overall, students (70.6 percent) were supportive of the assertions (which was slightly higher than the 69.6 percent computed last year), but continued to present significant divergences. Areas with high convergence (more than 80 percent agreement) included: Academic support with course requirements; partnering with faculty in research activities; faculty mentoring; professional meeting and conferences; and opportunities to conduct independent research, analyze, interpret data and present work. Areas with the least convergence (less than 65 percent agreement) included: Social and emotional counseling; out-of-state internships; visits to non-USDA agencies; job shadowing; and publishing opportunities. These are the areas the institutions should consider to improve on their

offers for opportunities for experiential learning. This finding, with its corresponding groupings, is very similar to last year's findings.

<b>Exhibit 41: Support Areas contributing to Student Enrollment and Success</b>							
<b>Statements</b>		<b>Agree</b>		<b>Neutral/NA</b>		<b>Disagree</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
A.	Career counseling	221	71.8	69	22.4	18	5.8
B.	Social and emotional counseling	148	48.2	133	43.3	26	8.5
C.	Academic support with course requirements	266	85.8	40	12.9	4	1.3
D.	Out-of-state internships	154	50.5	127	41.6	24	7.9
E.	In-state internships	239	78.1	55	18.0	12	3.9
F.	Partnering with faculty in research activities	250	81.4	51	16.6	6	2.0
G.	Opportunities to conduct independent research, analyze and interpret my data and present my work	245	80.1	56	18.3	5	1.6
H.	Faculty mentoring	267	86.4	37	12.0	5	1.6
I.	Tutoring services	217	70.0	83	26.8	10	3.2
J.	Job shadowing	164	53.2	130	42.2	14	4.5
K.	Professional meeting and conferences	253	81.6	51	16.5	6	1.9
L.	USDA agency visits	211	68.1	85	27.4	14	4.5
M.	Visits to non-USDA agencies	196	63.6	100	32.5	12	3.9
N.	Opportunities to get involved in helping my community	246	79.6	56	18.1	7	2.3
O.	Publishing opportunities	183	59.6	110	35.8	14	4.6
<b>Total</b>		<b>3,260</b>	<b>70.6</b>	<b>1,183</b>	<b>25.6</b>	<b>177</b>	<b>3.8</b>
<b>Total (2011-12)</b>		<b>2,582</b>	<b>69.6</b>	<b>915</b>	<b>24.7</b>	<b>211</b>	<b>5.7</b>

### **Additional Support Students Found Helpful**

Students were asked for any further supports (besides those listed in Exhibit 31) that would be helpful to them. Exhibit 42 shows a content analysis of their recommendations. Most students (88.4 percent) were satisfied with what was been offered. In fact, one student responded, "Everything mentioned above is provided." Other students selected, "N/A," or entered, "No comments," or simply did not

respond and proceeded with the next question. This indicated they felt the list provided was exhaustive enough.

Out of the 11.6 percent of students who thought additional support was needed, about half (4.8 percent) suggested *more opportunities in areas such as jobs, internships, scholarships and independent research*. Some indicated that USDA should be more involved to support those additional opportunities. The second largest theme (2.6 percent) was *improved community of learners*. These students wanted, “A stronger peer community among grad students,” more communication with scholarship recipients, “More people coming and talking about their experiences,” and to work more closely with faculty on their research. The rest of the themes were *personalized orientation regarding jobs and other extra-academic activities* (1.6 percent), *additional resources, including equipment, technology, and information* (1.0 percent), *decrease cost of education* (1.0 percent), and *more mentoring/tutoring services* (0.6 percent). Exhibit 42 lists all student suggestions organized by themes.

<b>Exhibit 42: Additional Support Students Identified as Helpful</b>	
<b>Main Themes</b>	<b>Student Statements</b>
1 No Additional Support Needed Frequency: 274 responses (88.4 percent)	<ul style="list-style-type: none"> <li>• Everything mentioned above is provided.</li> <li>• N/A [13]</li> <li>• No comments. [3]</li> <li>• Blank [257]</li> </ul>
2 More Opportunities (Jobs, Internships, Scholarships, Independent Research) Frequency: 15 responses (4.8 percent)	<ul style="list-style-type: none"> <li>• A study abroad.</li> <li>• Actually provide these services.</li> <li>• Conducting independent wildlife related research.</li> <li>• Extra funding for conducting research.</li> <li>• Jobs (half time- hourly) (income + experience).</li> <li>• More field trips to gain experience outside of campus.</li> <li>• More internship opportunities.</li> <li>• More opportunities to be published and present posters.</li> <li>• More postings for post-graduate job opportunities.</li> <li>• Research opportunities.</li> <li>• The department would greatly benefit from stronger grant opportunities, allowing the students to have better investigative opportunities.</li> <li>• To visit more USDA agencies.</li> <li>• USDA is not very involved here.</li> <li>• USDA PPQ.</li> <li>• USDA scholarships similar to 1890 scholars.</li> </ul>
3 Improved Community of Learners Frequency: 8 responses (2.6 percent)	<ul style="list-style-type: none"> <li>• A stronger peer community among grad students.</li> <li>• Being able to work with some of the faculty on their research.</li> <li>• Courses.</li> <li>• Exercise programs and incentives within each department to promote healthy mind and body, and more un-biased thesis</li> </ul>

## Exhibit 42: Additional Support Students Identified as Helpful

Main Themes	Student Statements
	<p>mentoring (we have some workshops, but could use more).</p> <ul style="list-style-type: none"> <li>• I would like to see more facilities and get access to companies as well.</li> <li>• Meeting up more with scholarship recipients.</li> <li>• More important job tasks.</li> <li>• More visits to USDA and non USDA agencies, as well as more people coming and talking about their experiences.</li> </ul>
<p>4 Personalized Orientation Regarding Jobs and Other Extra-Academic Activities Frequency: 5 responses (1.6 percent)</p>	<ul style="list-style-type: none"> <li>• A program to get graduates into working positions.</li> <li>• Have the security that I will have a job related to my degree or at least related with my internship experience. Also be part of programs that improve my knowledge and leadership skill.</li> <li>• Mock interviews and resume builders.</li> <li>• My future welfare.</li> <li>• Orientation about USDA jobs in our program.</li> </ul>
<p>5 Additional Resources (Equipment, Technology, Information) Frequency: 3 responses (1.0 percent)</p>	<ul style="list-style-type: none"> <li>• It would be helpful to get a little more information on specific agencies located in and around my immediate area.</li> <li>• More analysis equipment.</li> <li>• More specific equipment available for students at labs.</li> </ul>
<p>6 Decrease Cost of Education Frequency: 3 responses (1.0 percent)</p>	<ul style="list-style-type: none"> <li>• Lowering costs. Higher education should be cheaper as a whole.</li> <li>• More financial support.</li> <li>• Tuition fee support.</li> </ul>
<p>7 More Mentoring/Tutoring Services Frequency: 2 responses (0.6 percent)</p>	<ul style="list-style-type: none"> <li>• More tutoring services.</li> <li>• My mentor and my own motivation!</li> </ul>

### Student Campus Experience

To measure whether students feel part of their campus and are comfortable there, they were asked a set of pertinent questions as part of the survey. Exhibit 43 shows their responses. It was clear from their responses that students (91.9 percent) do feel contented in their campuses. This was essentially the same as last year level (92.1 percent). They felt comfortable getting what they need to succeed academically (92.9 percent), understanding what they need to do to meet graduation requirements (92.6 percent), and getting their questions answered when they have doubts (92.6 percent). This is a solid indicator that students do feel part of the campus and their needs are generally being met. The comments they made supported this appreciation, as shown in the sample below.

- "This institution is my other home."
- "Here, there is a lot of school pride."

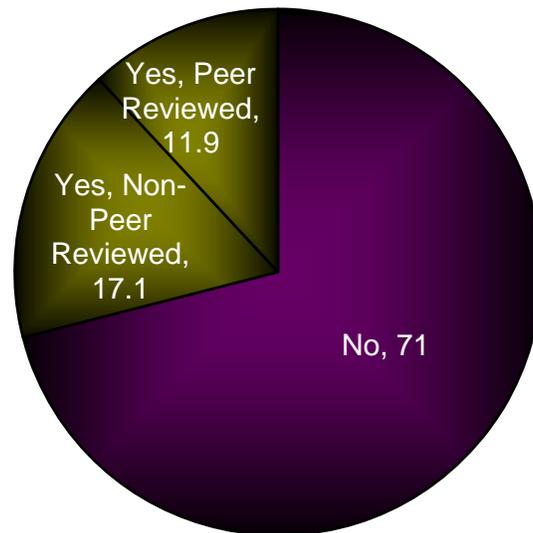
- “If it wasn't for the FCCAgE program it wouldn't have been as great as it has been until now.”
- “I chose this university because when I first stepped foot on campus, it felt like I was home.”
- “This college wasn't even on my list; I actually had a full ride scholarship for tennis, but I'm glad I was recommended TSTC. This is the best decision I made. Sure I gave up my dream as tennis player, but now I can achieve my biggest dream of all.”
- “UTPA is a good school, and I am obtaining a good education.”
- “Great atmosphere!”
- “I love NMSU!!”

<b>Exhibit 43: Student Characterization of Their Experience on Campus</b>							
<b>Statements</b>		<b>Agree</b>		<b>Neutral/NA</b>		<b>Disagree</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
A.	I feel comfortable getting what I need to succeed academically in this college/university.	287	92.9	17	5.5	5	1.6
B.	It is clear what I need to do to meet graduation requirements at this college/university.	287	92.6	21	6.8	2	0.6
C.	If I have a question about my degree plan, I know whom to ask.	286	92.6	14	4.5	9	2.9
D.	It is easy to find my way around campus.	293	95.1	13	4.2	2	0.6
E.	I have participated in classes or other opportunities designed to help me feel part of the college/university culture.	275	89.0	24	7.8	10	3.2
F.	I feel like I belong in this college/university.	275	89.0	29	9.4	5	1.6
<b>Total</b>		<b>1,703</b>	<b>91.9</b>	<b>118</b>	<b>6.4</b>	<b>33</b>	<b>1.8</b>
<b>Total (2011-12)</b>		<b>1,479</b>	<b>92.1</b>	<b>91</b>	<b>5.7</b>	<b>36</b>	<b>2.2</b>

### **Papers Developed and Presented by Students**

Part of experiential learning is to develop and present papers. Students were asked whether they have participated in these activities. Exhibit 44 shows their responses. More than a fourth of the students (29 percent) indicated that they developed and presented papers, and about half (11.9 percent) of them were peer-reviewed (Exhibit 44).

**Exhibit 44: Did you develop and present a research paper as part of the project?\***  
**[N = 310]**



\*First time question was asked.

Students were also asked to provide their paper topics or titles. Exhibit 55 shows what they provided. This is the first time these two questions were included in the survey.

**Exhibit 45: Topic or Title of Research Papers Developed and Presented by Students\***

- A Wireless Environmental Monitoring System for Reliable Photovoltaics
- Impact of Cerium Oxide Nanoparticles on Cilantro
- Contaminants in the Sweetwater Watershed
- Synchrotron Verification of TiO<sub>2</sub> Accumulation in Cucumber Fruit: A Possible Pathway of TiO<sub>2</sub> Nanoparticle Transfer From Soil Into the Food Chain
- The Effects of Cerium Oxide Nanoparticles on Cilantro
- Influence of Silver Nanoparticles on *N. europaea*
- Anaerobic Digestion of FOG for Methane Production
- I did a little study on blue bird nest boxes that were found to be inhabited by other things than birds around the conservancy I worked at
- Geochemical Analysis of Tulare Lake Sediments through the Late Pleistocene and Holocene
- Restoration and Reforestation of a Wetland
- TMF and Water Affordability
- Calibration of San Joaquin River Watershed from Friant Dam to Mendota
- Dinkey Land Restoration Project: Meadow Encroachment
- Characterization of Urban Runoff Treatment Ponds within San Dieguito River Park (SDRP).
- CSUCI Water TAP Program
- Using Paleo-Climate Proxies to Study Sierran River Discharge
- Catalytic Vapor Phase Upgrading of Pyrolysis Oil Vapors
- Effect of Surface Functionalization on the Adsorption of Arsenic by Magnetite Nanocrystals
- Water Remediation - Removal of Heavy Metals Using Magnetic Nanoparticles and Nanocomposites

#### Exhibit 45: Topic or Title of Research Papers Developed and Presented by Students\*

- Effects of Direct-fed Microbial Supplementation on Endotoxin Transport, Transipethelial Resistance and Performance in Broiler Chickens
- Evaluation of Phytophthora Infection in Citrus Groves in the Valley
- Determination of Point Zero Charge in Nanoparticles such as Magnetite Oleate within the Absorption of Hormones such as 17beta- Ethinyloestradiol
- Spatial Mapping to Estimate Pest Risk of Verde Plant Bug in Cotton Grown Along the Texas Gulf Coast
- Sorption of Triclosan onto Tyre Crumb Rubber. Adsorption Science & Technology, Vol. 30 No. 10 2012
- Entrapment of Tyre Crumb Rubber with Calcium Alginate
- In Wood Plastic Composites.
- Physico-Chemical Evaluation of Casturi Mango
- Effectiveness of Propiconazole Applications when Treating Laurel Wilt Disease in Avocado Trees
- Tropical Fruit Research - An Integral Key for Food Security in Developing Countries
- The effect of Plant Extracted Tannins on Porcine Adipocytes
- Cell Culture, Non-Invasive Surgery, and PCR (polymerase chain reaction)
- Stem Cutting Propagation of the Black Mangrove
- Internship at the King Ranch Feed Yard
- Wind as a Renewable Energy Option for Rural Southwest
- Energy Efficiency
- A Central VS Distributed Micro-Storage Management Using Game Theory and Evolutionary Techniques
- Effect of Precipitation and Temperature in the of Population Distribution of Anastrepha Suspensa and Anastrepha Obliqua during FY2007-2013 in Puerto Rico, Vieques, Culebra, St. Thomas and St. Croix
- The Mexican Fruit Fly
- Diffuse-Reflectance Mid-Infrared Spectroscopy
- Reveals Chemical Attributes/Differences In Soil Organic Matter Fractions Carried In Different Size Wind Eroded Sediments
- Biofuel Feedstock Optimization Considering Different Land Cover Scenarios
- The Correlation Of Residual Feed Intake On Carcass Characteristics Of Brahman And Brahman Influenced Steers
- Green Warehousing
- Analyzing the Utility of Previously Developed Microsatellite Markers
- Presence of Euglossa Viridissima, and its Effect on Clusia Lanceolata Fruit Set
- CSUB San Joaquin Valley Paleoriver Discharge Record: Grain-Size Proxy
- Mechanistic Investigation of DszB using Thiourea Dioxide
- School Gardening Workshops and Outreach to Elementary Schools.
- EMS Dosages
- Biodiveristy, Abundance, and Breeding Success of Amphibians at Scattered Urban, Suburban, and Rural Pond Sites in Stanislaus and San Joaquin County, CA, USA
- Water Management with the USDA
- Heavy Metal Removal (unpublished manuscript)
- Testing the Preservative Qualities of 10% Propylene Glycol Capture Fluid Over Time for

### Exhibit 45: Topic or Title of Research Papers Developed and Presented by Students\*

Mexican Fruit Fly DNA" It was peer reviewed by my mentors at the APHIS CPHST Lab in Mission, Texas.

- Hydrological Impacts of the Las Conchas Fire
- Nitrate Dynamics in Post Burn Areas of Las Conchas
- Burrowing Owls
- Relationship between Phytoplankton and Chromophoric Dissolved Organic Matter
- Relationship between Gene Expression and Behavior in Insects. The final aim is to publish it in a peer review journal after the project is completed.
- The Application of Nested PCR Technique for the Detection of Phytoplasma in Royal Palms of Puerto Rico
- Kapoho Papaya
- Carbohydrates Polymers
- Atrazine Removal from Water by Chitosan-Cellulose and Chitosan-GLA Beads
- Life Cycle Assessment of Short Span Secondary Steel and Wood Bridges
- Phytoplankton Survey in Six Reservoir of Puerto Rico: A Comparative Study of Algae Abundance and Diversity

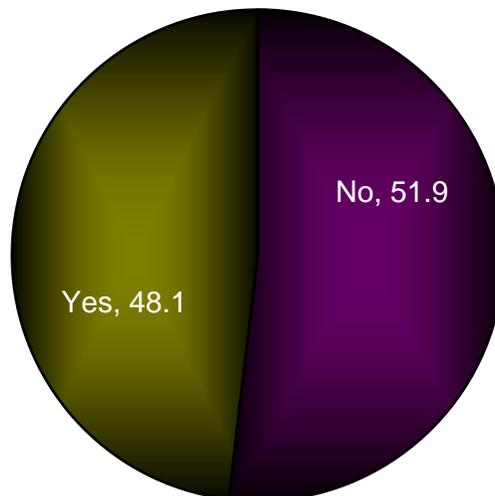
\*First time question was asked.

### Displays Developed and Presented by Students

Students were also asked whether they have developed and displayed a poster as part of the project. Exhibit 46 shows their responses. Close to half of the students (48. percent) indicated that they developed and displayed a poster as part of the project.

### Exhibit 46: Did you develop and display a poster presentation as part of the project?\*

[N = 310]



\*First time question was asked.

Exhibit 77 shows the topics or titles of the posters students developed and displayed as part of their projects. This is also the first time this two questions about posters were included in the survey.

### **Exhibit 47: Topic or Title of Posters Developed and Displayed by Students\***

- Microwave Assisted Synthesis of Metal-Based Nanoparticles in Presence of Glutathione
- Tension Fatigue of Polymer Matrix Composites with Nano Modified Silica-Nano Particles for Wind Turbine Blades
- Water Resources, Pollution and Biotics
- The Effect of Cerium Oxide Nanoparticles on Tomato
- Powering High-Tech Manufacturing Facilities Using Renewable Electricity
- An Evaluation of the Effects of the Eradication of the Invasive Bullfrog in the Mora River
- Searching the Green Invaders: Finding the Source Population of Iguana in Puerto Rico
- Adsorption of Methylene Blue and Congo Red by Chitosan/Cellulose Beads for Wastewaters Treatment
- Ion Ratio From Headwater to Bay
- Synchrotron Micro-Xrf and Micro-Xanes Confirmation of the Uptake and Translocation of Tio<sub>2</sub> Nanoparticles in Cucumber Fruit (*Cucumis Sativus* L)
- Effects of Cerium Oxide Nanoparticles on Cilantro and Tomato
- Influence of Silver Nanoparticles on *N. europaea*
- Water Quality of the Thompson's Creek Watershed, Claremont, California
- Geochemical Analysis of Tulare Lake Sediments Through the Late Pleistocene and Holocene
- Chemical Comparison and Characterization of Six Ripe Mango (*Mangifera Indica* L) Cultivars in Puerto Rico
- Zn Uptake by Alfalfa Plant
- Broad-Spectrum Detection for Bioactive Agents Using SERS
- Removal of Arsenic
- Structural and Compression Characteristics of Sintered Recycled Glass Designed for the Remediation of Polluted Soils
- Characterization of Urban Runoff Treatment Ponds Within San Dieguito River Park (SDRP)
- The Impacts of Invasive Bullfrogs on the Demographics of Leopard Frogs
- CSUCI Water Tap Program
- Researched the Impact of Cofe<sub>2</sub>o<sub>4</sub> Nanoparticles (NPS) on the Growth and Development of the Edible Plant *Solanum Lycopersicum* (Tomato Plant)
- Completed a Compost Characterization Project by Studying the Presence of Nutritive Content, Hard Metals Presence, Volatile Organic Compound (VOC), Conductivity, Ph Conditions and Soluble Salts
- School Gardening with CETARS
- Compression and Thermo-mechanical Analysis of Sintered Recycled Glass Designed for the Remediation of Polluted Soils
- Phylogenetic of the *Zamia Pumila* Complex
- Ploidy Induction in *Hippeastrum*
- Determination of Tulare Lake, California Late Pleistocene and Holocene Lake Level History Through Carbon/Nitrogen (C/N) Ratios
- Sierra Stream Discharge Forecasting Based on Tulare Lake-Level Reconstructions
- Comparative Survival of *Escherichia Coli* O157:H7 and *Salmonella Typhimurium* on Spinach Plants
- Chemical Analysis of Avocado Leaves
- Catalytic Vapor Phase Upgrading of Pyrolysis Oil Vapors
- The Brazilian Pepper an Invasive Weed in Florida

#### **Exhibit 47: Topic or Title of Posters Developed and Displayed by Students\***

- Porosity and Percolation in Sintered Recycled Glass for Polluted Soil Filtering
- Interaction Between Meloidogynes Incognita and Sweet Potato
- Novel Magnetic Nano-composite Adsorbent for the Removal of Inorganic Carcinogens (Metal Ions and Oxyanions) in Aqueous Matrix
- Enhancement of Lipid Production with Nanochloris Algae
- It Was a Power Point Presentation Over What my Summer Internship Entailed
- Removal of as and Cr Oxyanions From Water Using Magnetite Based Nano-composites
- Agricultural Tour - CETARS2012 2the Salt Tolerance on Mutant Plant of Arabidopsis Thaliana
- Horticultural Behavior of a Line of Pumpkin Selected for the Resistance of the Papaya Ringspot Virus
- Effects of Direct-Fed Microbial Supplementation on Endotoxin Transport, Transipethilial Resistance and Performance in Broiler Chickens
- Spatial Mapping to Estimate Pest Risk of Verde Plant Bug in Cotton Grown Along the Texas Gulf Coast
- Essential Oils of Cananga Odorata Exhibited Insecticide Activity Against the Coffee Berry Borer Hypothenemus Hampei (Curculionidae)
- Porosity and Percolation in Sintered Recycled Glass for Soil Filtering Presenter: Wesley Cuadrado Date: October 21, 2012
- Evaluation of the Sorption Behavior of Triclosan, Perchloroethylene and Trichloroethylene Onto Tyre Crumb Rubber
- Nitrate Removal, Flow Paths, and N<sub>2</sub>o Emissions in Two Denitrifying Woodchip Bioreactors: Mitigating Agricultural Nutrient Loads in the Salinas Valley, California
- Best Tomato Growth Medium
- PowerPoint Showering Pictures of Life of the Farm
- Physio-Chemical Evaluation of Casturi Mango
- Effectiveness of Propiconazole Applications when Treating Laurel Wilt Disease in Avocado Trees
- Tropical Fruit Research - An Integral Key for Food Security in Developing Countries
- Nematodes
- PowerPoint Presentation about Non-Invasive Surgery, Pig in Heat, and Cell Culture
- Ergonomics of a Portable Access Mobility Device
- Photocatalysis and Photovoltaics Solar Cells
- Chemical Recycling of Plastic Solid Waste for the Production of Transportation Fuels
- Internship at the Midewin National Tallgrass Prairie
- Interfacial Binding of Arsenic Antimicrobials Onto Bimetallic Iron/Silver Nano-composites
- Metal/Polymer Nano-composites as Vibrational
- Probes for the Sensitive Identification of E Coli and Lactobacillus spp
- Wind as a Renewable Energy Option for Rural Southwest
- Environmental Chemistry and Food Chemistry
- USDA Agencies, Professions Related with the USDA, and Describing the Mission and Vision of the Program
- Removal Efficiency of Endocrine Disrupting Compounds in Wastewater Treatment Plants in El Paso, Texas
- Ergonomic Analysis of Sustainable Vehicle
- Relation Between Swallow Colony Size and Land Use at Bridges From Central Texas

### Exhibit 47: Topic or Title of Posters Developed and Displayed by Students\*

- Energy Efficiency
- USDA Careers
- Wind Farm Design Optimization Using a Viral Systems Algorithm
- Valentin V, Tang W, and Maul P, Career Training at the USDA - Animal and Plant Health Inspection Service (Aphis), Plant Protection and Quarantine (PPQ): Insect Mounting and Professional Scientific Photography Poster Presented at the 5th Annual Undergraduate Summer Research Symposium September 20, 2013, Miami, Florida
- Designing, Building, and Testing a Solar Food Dehydrator
- RNA Extractions
- Water Quality Analysis and Remediation of Urban Ponds in El Paso, Texas
- It Was a PowerPoint Expressing my Trip and the Work I Did It Was Not Professional, Only at the College It Was Titles Purdue University
- Effect of Precipitation and Temperature in the of Population Distribution of *Anastrepha Suspensa* and *Anastrepha Obliqua* During FY2007-2013 in Puerto Rico, Vieques, Culebra, St Thomas and St Croix
- Developing Wood Plastic Composites as Sustainable Commodities Using Recycled Materials
- Mineral Plant Nutrition
- Different Growing Medium
- Method of Cultivation
- Simulation Transportation
- The Topic of the Project Presentation Was a Chemical and Nutritional Comparison of Organic Tomatoes Vs Non-Organic Tomatoes
- Diffuse-Reflectance Mid-Infrared Spectroscopy
- Reveals Chemical Attributes/Differences in Soil Organic Matter Fractions Carried in Different Size Wind Eroded Sediments
- Swallow Feces Accumulation Pattern During Nesting Phenology Phases at Central Texas
- The Correlation of Residual Feed Intake on Carcass Characteristics of Brahman and Brahman Influenced Steers
- Presence of *Euglossa Viridissima*, and Its Effect on *Clusia Lanceolata* Fruit Set
- Vermiculture in Urban Agriculture Setting
- Applied Electrochemistry for the Analysis of Heavy Metals in Vieques Soils
- Visiting Facilities Around Las Cruces, New Mexico
- Poster about Agro-terrorism presented at the HACU Conference
- Effect of Student Farm on Agricultural Science Curriculum and Research
- Evaluation of Water and Ethanol Extracts of *Ardesia Crenata* on the Growth and Invasion of Hs578t, Hs578ts(l)8, Mcf, and Panc-1 Cell
- Mechanistic Investigation of Dszb using Thiourea Dioxide
- A Comparison of Beetle Populations in Riparian Habitats Infested and Free of the Invasive Weed *Arundo Donax*
- Preparing Young Future Farmers
- Arsenic Sequestration From Surface Water Via Zvi and Copper Nanoparticle Filters
- Nanotechnology
- Outreach for Schools of K-12 Summer Internship at USDA Forest Service El Yunque National Forest
- Wildlife Ecology: Juvenile Burrowing Owl Movement Patterns and Survival in an Urban

### Exhibit 47: Topic or Title of Posters Developed and Displayed by Students\*

- Landscape
- Effect of Combining Nitidulid Pheromones and Cocontractants on Atemoya (*Annona Squamosa* Linn and *Annona Cherimola* Miller: Annonaceae) Pollinating Beetles
  - Investigating Protein Levels in the Valproic Acid Model of Autism
  - Water Management in Corn and Sunflower
  - Drought Tolerance in Sugarcane
  - Thermodynamics of Cu(Ii) and Pb(Ii) Adsorption Onto Iron Oxide and Manganese Oxide Nano-materials
  - Remediation of Cu(Ii) and Pb(Ii) From Aqueous Solution Using Engineered Iron Oxide Nano-materials
  - Texas Stock Tanks, as a Water Resource
  - Synthesis of Zn<sub>x</sub>Mg<sub>1-x</sub>O Solid Solution and the Assessment of Its Antimicrobial Activity Against *Escherichia Coli*
  - Human Wildlife Conflicts: New Mexico Wildlife Services Program Through Aphis
  - Outreach in K-12 Students of House Gardening
  - Connecting Diverse Youth to the Environment Through an Urban Setting
  - Developing Uhsc Using Local Materials
  - Santa Elena Maya Mopan Community Perception about the Forest in Belize
  - Critical Issues in Fracking Regulations: Comparative Case Studies and Best Management Practices
  - Hydrological Impacts of the Las Conchas Fire
  - Enhancing Rooting Success of Blank Mangrove Proragules of Texas Coastal Islands
  - Burrowing Owls
  - Water Quality Relationships Among CDOM, Physiochemical Parameters, and Nutrients in an Irrigation Canal System, Hidalgo County, Texas
  - Relationship Between Gene Expression and Behavior in Social Insects
  - Switchgrass Research on Ethanol Yield
  - Outreach Project: Elementary School Mariano Riera Palmer in Mayaguez, Puerto Rico
  - The Application of Nested PCR Technique for the Detection of *Phytoplasma* in Royal Palms (*Roystonea* spp) of Puerto Rico
  - Characterization of Protein-Protein Interaction of Apiap2 DNA-Binding Proteins from *Plasmodium Vivax*
  - Adsorption, Dyes, Wastes Waters Treatment
  - Atrazine Removal From Water by Chitosan-Cellulose and Chitosan- GLA Beads
  - Metals Based Nanoparticles for Food Packaging Applications
  - Phytoplankton Survey in Six Reservoir of Puerto Rico: a Comparative Study of Algae Abundance and Diversity

\*First time question was asked.

### Challenges Students Faced

When asked about challenges they faced from a list of choices, the students provided a variety of responses, as detailed in Exhibit 48. Notice that the largest response, with 20.8 percent, was: “None of the above, I have not experienced any challenges.” This represented an improvement from last year, when it was 19.5 percent. Outside of this, the four most frequently selected challenges were: financial issues/problems (18.3 percent), classes (13.9 percent), accessing information about internships (11.5 percent), and accessing information about jobs (9.5 percent). These were the same most frequent challenges listed last year, in about the same proportions.

<b>Exhibit 48: Challenges Students Experienced in Program</b>					
<b>Variables</b>		<b>2011-12</b>		<b>2012-13</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
	Financial Issues/Problems	101	20.5	100	18.3
	Classes	72	14.6	76	13.9
	Accessing information about internships	53	10.8	63	11.5
	Accessing information about jobs	46	9.3	52	9.5
	Problems with Internship	31	6.3	43	7.9
	Housing	35	7.1	41	7.5
	Getting Coaching and Mentoring	25	5.1	25	4.6
	Knowing how to navigate the university	10	2.0	12	2.2
	Getting counseling	11	2.2	11	2.0
	Other	13	2.6	10	1.8
	None of the above, I have not experienced any challenges	96	19.5	114	20.8

Students were given the opportunity to share any additional challenges they faced in an open-ended format. Exhibit 49 shows the full list compiled from their answers. From this, we can conclude that as in any situation, students have some personal issues and misunderstanding, but none of them represented a systemic situation other than the ones listed above. One recurrent theme was time management, which is typical of the students’ busy life.

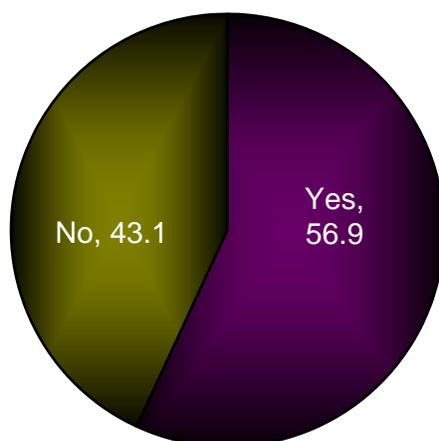
<b>Exhibit 49: Additional Challenges Students Experienced in Program</b>
<ul style="list-style-type: none"> <li>• Time consuming, but I think I am handling well.</li> <li>• Took an extremely LONG time to get the paperwork through. That I enrolled in an extra semester to prolong my graduation date and the semester was over before the paperwork went through.</li> <li>• Scheduling conflicts with group activities/meetings and my job.</li> <li>• Being that Miami Dade College is a commuter school, it has been a challenge to many of the students participating in the program to keep up with the workload that is required by FCCAgE. Many of the students hold jobs outside of school, and are usually juggling a full load of classes, which makes it difficult to keep up with all the requirements, otherwise it is a great privilege to be part of FCCAgE.</li> </ul>

### Exhibit 49: Additional Challenges Students Experienced in Program

- Travel for presentations.
- Knowing the path I should take for my future.
- The professors do not do much to help in terms of finding an internship but rather what they get you into at the time to make them look better.
- The schedule of classes is limited.
- Money is not ready when I need to pay tuition (I still needed a loan from school).
- Not many USDA internships are available for economists.
- Housing during internship (DC Metro).
- My issues were not because of the university or the program. They were personal financial issues.
- Managing a large work load with year-round independent research.
- Completing the amount of hours needed each semester due to mental disorder.
- Transportation.
- Some classes are only offered once every two years so that is a setback for many. As for coaching and mentoring, my thesis chair has been wonderful, but I think it would be nice to have outside mentoring and guidance when in the initial thesis steps. Problems with the internship were minor and just dealt with all of the strict stipulations of the time sheets.
- Meeting times; there are a lot of students that work and meeting at some times is difficult. But other than that there are no challenges.

Students were also asked if any of their challenges listed above had been resolved. As the pie chart below shows, more than half (56.9 percent) had already been resolved by the time students were asked the question (see Exhibit 50).

### Exhibit 50: If you noted any challenges, above, have they been resolved? [N = 174]



Finally, students were asked how they solved the challenges. Exhibit 51 shows the list compiled from their answers. Students obtained some type of financial help (often scholarships) to solve their challenges or some other support that involved mentoring or other specialized guidance. The following statement expressed by one student provides a good example: "With effort and the professors' help, I have passed all my classes with good grades, and also thanks to the BGREEN funding I have managed to pay for my education."

### Exhibit 51: How Students Resolved the Challenges

- Made the most out of my time.
- Searching on Google.
- Studying hard and getting economic help from the university.
- By counseling with the FCCAgE advisor.
- By mentorship from the FCCAgE Advisor.
- I moved!
- Looked to people other than my advisor for help.
- They have been improved through CETARS.
- Got appropriate tutoring and met with financial aid staff to resolve my situations.
- With mentoring and tutorials.
- With effort and the professors' help, I have passed all my classes with good grades, and also thanks to the BGREEN funding I have managed to pay for my education.
- The teachers helped to make sure I was able to take the classes needed to graduate.
- I was able to find housing but finances are still [challenging].
- Partially only, only one option for housing and high rates.
- Further options were given.
- Additional scholarship.
- Some, just the financial aid one is still there. It is difficult being by myself and had to pay rent, books and expenses.
- Talking to professors.
- The challenges were resolved by communicating, studying, and tutoring.
- Only the time sheet issues...these were explained in greater detail once I ran into issues.
- I went to someone for help.
- The grant eased my financial situation.
- Sitting with the coordinator and reevaluating funding and curriculum.
- Studying more.
- Talking to the professor about any available opportunities.

#### How Can the Project be Improved?

To get a sense of what else the project can do to help students, they were asked: How could the USDA/NIFA project at your college/university be improved? A content analysis of their answers was performed and presented in Exhibit 52. A substantial majority of the responses (63.5 percent) expressed satisfaction with the program as is and did not see the need to change anything, except to continue to support them by perhaps extending their participation in the project beyond the year (or period) they had been awarded. This represented the first theme derived from the content analysis. One representative student statement in this theme was this: "No need for improvements at this time. It is already promoting and creating great opportunities for students and professors."

However, 36.5 percent of the responses offered some suggestions to improve the project. These suggestions were grouped in six distinct themes (Main Themes 2 to 7 in exhibit). The most frequent suggestion, with 9 percent of the responses, was *provide more job/career/internship opportunities*. Students wanted more opportunities to gain experience and start their professional careers within this field, and perhaps as part of the USDA. Some of them even wanted to meet directly with USDA representatives to share this suggestion.

The second most frequent suggestion, with 8.4 percent response, was *improve community of learners*. Students wanted to improve their experience in the project by increasing their interactions with other students, professors and program staff, by organizing activities in a more flexible way, by sharing more knowledge and experiences through conferences and workshops, and by improving their interactions with the USDA. They wanted this sense of community to be pervasive throughout the project.

The third theme, with 6.5 percent of the responses, was *increase the number of students in the project*. They provided a range of strategies to entice students into the project, including having an open house, increasing marketing efforts, and disseminating information about how to apply for the program.

The next theme, with 6.1 percent, was: *improve communication and provide more information*, is closely related. However, it is a different theme because they wanted more information and communication with both new students and with students who are already in the project. They wanted the expectations to be more clearly stated and improve guidance so everyone can perform at their best.

The last two themes are also related. In the theme, *increase funds or use them more effectively to support student activities*, students wanted the project to maximize its resources so all students had an optimal experience in the project by experiencing all the activities contemplated in it, including traveling for presentations, using the needed equipment for research, and perhaps even supporting them with tuition expenses. Some of this could be achieved by *improving or expanding the project partnerships*, which is the last theme, with 2.9 percent of responses. In addition, this theme includes student suggestion to, "Increase collaboration and communication between projects involved in NIFA," and, "Provide more opportunities for community engagement."

Exhibit 52: How Can the Project Be Improved?	
Main Themes	Student Statements
1 Project is Doing Just Fine, Continue to Support Students (with a frequency of 197 responses or 63.5 percent)	<ul style="list-style-type: none"> <li>• An extension. I joined late and only have a year to get the most I can out of it.</li> <li>• [Based on] my experience in this project, I feel that this project should keep going the way it is.</li> <li>• Continue to provide opportunities for students.</li> <li>• Everything involving the project is fine.</li> <li>• Everything is perfect, except for the fact that my internship is coming to an end and I haven't graduated nor have I been here for a year.</li> <li>• I am currently satisfied with the program and do not feel that there is need for any improvements.</li> <li>• I believe the program is fine.</li> <li>• I don't see anything wrong with project.</li> <li>• I really don't know, so far it has had a great impact on my life.</li> <li>• I think it is an excellent project.</li> <li>• I think it is good the way it is going but there is always room for improvement.</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• I think it is working great at the present time.</li> <li>• I think it is a great start for Texas State University to give our students a chance to be outstanding in the Ag department.</li> <li>• I think the program is doing well.</li> <li>• I'm not sure because I have just started to work with this program. [2]</li> <li>• It can't; it's already as great as it can be; they're always doing everything they can to provide us with more opportunities and to improve the program.</li> <li>• It worked out well for me.</li> <li>• It's great how it is.</li> <li>• Keep helping students.</li> <li>• Keep it the way it is.</li> <li>• Everything is smooth, well understood, straight forward, and is a working progress.</li> <li>• N/A [18]</li> <li>• No comments.</li> <li>• No improvements.</li> <li>• No need for improvements at this time. It is already promoting and creating great opportunities for students and professors.</li> <li>• No suggestions for improvements.</li> <li>• None it is a great program so far.</li> <li>• None.</li> <li>• Nothing comes to mind.</li> <li>• Nothing to improve at this time I had great support.</li> <li>• Staying forever in the universities.</li> <li>• The program in general is great!!</li> <li>• The program is very good; I don't believe it needs improvement.</li> <li>• The program work efficiently and is a great experience.</li> <li>• The university does not need to improve; it is good the way it is.</li> <li>• The USDA is doing a great job in helping me reach higher education.</li> <li>• They are doing an excellent job.</li> <li>• It is nice as is.</li> <li>• Thus far, I have no complaints.</li> <li>• [Based on] my experience, I feel the program is already well organized. If ever I needed help or had any questions, someone was always willing to help.</li> </ul>
2 Provide More Job, Career, and	<ul style="list-style-type: none"> <li>• Doing more related work to USDA, in order to know more about the institution.</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
Internship Opportunities (with a frequency of 28 responses or 9.0 percent)	<ul style="list-style-type: none"> <li>• Getting more involved into agriculture carriers.</li> <li>• Giving me more internship opportunities in-of-state and out-of-state.</li> <li>• Help the students find internships with exotic animals.</li> <li>• I saw it mentioned earlier in the survey, but agency visits could prove very interesting. As of now, other than my own research lab, I have no idea what other places of work look like.</li> <li>• I would like it to get more involved and offer more and different internships.</li> <li>• I would like more opportunities/internships to work on USDA bases, especially out of state. I hope to have a career someday on a USDA base. I would also like to have more availability to go to national conferences to present my work.</li> <li>• I would think the students should be encouraged to start looking for their internships in the fall semester instead of waiting until the spring; I think it would make it easier to get an internship.</li> <li>• If there could be more internship opportunities.</li> <li>• It could be improved by offering more internships and long- term jobs for current graduate students.</li> <li>• Maybe provide a wider range of internships.</li> <li>• Meeting the USDA people responsible for the program. Also I feel they don't really know what we are doing as students, and we don't have hope of getting jobs at the USDA even when we would love to work for the USDA.</li> <li>• More engineering related USDA internships.</li> <li>• More in-depth discussions in career opportunities and qualifications needed for said careers.</li> <li>• More in depth information about job opportunities. [2]</li> <li>• More internship opportunities. [2]</li> <li>• More options and opportunities.</li> <li>• Organize more career focused projects throughout the year for students.</li> <li>• Perhaps more opportunities to meet employees of federal agencies.</li> <li>• Promote student internship programs directly with students in the program sending information via email.</li> <li>• Provide secure internships or jobs to the students in the program.</li> <li>• Provide workshops to students about what USDA wants from prospective employees.</li> <li>• Real jobs.</li> <li>• Showing them how to write better resumes, and helping them get more opportunities.</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• They could post up internships more often.</li> <li>• We don't talk to any USDA people. Perhaps it would be helpful if USDA would interact with us.</li> </ul>
<p>3 Improve Community of Learners (with a frequency of 26 responses or 8.4 percent)</p>	<ul style="list-style-type: none"> <li>• 1. Changing the way of how to select students to be in the program. 2. Changing the requirements to students keep up in the program. 3. The program should focus on making and keeping (maintenance) the orchard of each school for at least three years consecutively.</li> <li>• More encouraging and helpful supervisors and project managers. Please have a different USDA liaison at our college. The one we have did not help us at all getting internships and never even helped us with our resume. Nor is he interested in our challenges.</li> <li>• Better organization and more participation of the people in charge.</li> <li>• By incorporating students whose degree is not in agriculture better into the program. I noticed that students in the program who do not have this degree feel somewhat left out or excluded from meetings and events including myself.</li> <li>• Community style.</li> <li>• Consider every student in the program, not just the favorites.</li> <li>• Establishing an action plan for each semester with clear tasks to be completed by the participant students.</li> <li>• I feel like more retreats could be offered allowing professionals to interact with students more.</li> <li>• If students are supervised by a USDA personnel with the campus professors.</li> <li>• Initially my advisor had planned on those involved in the project meet weekly to discuss certain items. However, everyone's schedule was conflicting and meetings were difficult to put together.</li> <li>• Maintaining the workshops aimed at improving academic / professional to all members of the program.</li> <li>• Making trips related to agriculture, visits to USDA agencies and using the ideas recollected from those activities to improve the project.</li> <li>• More Ag classes.</li> <li>• More conferences and workshops. [2]</li> <li>• More interdisciplinary between departments.</li> <li>• More meetings, collaboration with other programs, more accountability.</li> <li>• More student interaction.</li> <li>• More time flexibility with conferences and classes. Help with landing internships/shadowing.</li> <li>• More time with other students to be able to build communication with one</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
	<p>another.</p> <ul style="list-style-type: none"> <li>• Not so many mandatory meetings.</li> <li>• Opportunities throughout the program could be more equally allocated to the students that are in the program.</li> <li>• The USDA could be more active with the students and student organizations, or open a lab area near the college where students could learn to do research.</li> <li>• The USDA project at my university could be improved if there were more guidance from professors.</li> <li>• We can meet more times a year to get better acquainted with all of the participants and professors.</li> <li>• With meetings to present the progress of every project and encourage peers to contribute.</li> </ul>
<p>4 Increase Number of Students in Project (with a frequency of 20 responses or 6.5 percent)</p>	<ul style="list-style-type: none"> <li>• Attracting more students into the program, and providing more opportunities for internship location.</li> <li>• Be more broadcasted among majors.</li> <li>• By actually being at my university.</li> <li>• By allowing more students to take part. This would most likely require more funding since the project director does his best to get as many students as possible into the program.</li> <li>• By an open house.</li> <li>• By doing more presentations at different departments and faculty, not only in the college of agriculture sciences.</li> <li>• By getting more students involved.</li> <li>• By getting the word out to more students about the project.</li> <li>• By involving the student and making more events for them.</li> <li>• Get more people involved. Procure more outreach activities to bring awareness to the community.</li> <li>• Give more money to the university to allow more students to join the program.</li> <li>• Increased marketing about project.</li> <li>• More advertisement.</li> <li>• More information on how to apply.</li> <li>• More resources so that more students can be provided with the opportunity to be a part of this program.</li> <li>• More resources to be able to invite more people into the program.</li> <li>• More students at my school need to be involved.</li> <li>• Recruitment would benefit it a lot. Maybe selecting ambassadors to</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
	<p>promote and recruit participants.</p> <ul style="list-style-type: none"> <li>• The project could be expanded to more students. There are currently only 10 students in the program and I believe more students could greatly benefit from the program if it was expanded.</li> <li>• The project should allow for more students to participate.</li> <li>• Trying expanding to accommodate students that are enrolled in a more molecular biology major, but are interested in agricultural applications.</li> <li>• Use more students of the agriculture major.</li> </ul>
<p>5 Improve Communication and Provide More Information (with a frequency of 19 responses or 6.1 percent)</p>	<ul style="list-style-type: none"> <li>• A better communication with everyone.</li> <li>• Advertise the program to future agriculture students coming out of high school.</li> <li>• Be more proactive on campus. Schedule public meetings or presentations on campus.</li> <li>• By orienting students more often about opportunities in agriculture related to science fields.</li> <li>• By simply educating students about the different agencies within USDA.</li> <li>• Do more presentations on what the program offers.</li> <li>• Have a rep on campus that we can go directly to in order to ask questions and deal with paperwork.</li> <li>• Have more interactions and advertisements around the campus.</li> <li>• I think more interaction or information.</li> <li>• If it was more exposed to students coming from high school with the mindset of working in the agricultural field.</li> <li>• Let other students know more about it.</li> <li>• More communication and clearness of what is needed.</li> <li>• More conferences of the program for students to give guidance.</li> <li>• More contribution, better understanding and communication. Overall, generating interesting and influential research topics.</li> <li>• More information needs to be provided.</li> <li>• More promotion, better outreach techniques.</li> <li>• More promotion.</li> <li>• The project can be improved by giving more information to students about the internship process and all it entails. Things such as paperwork, the fact that we have to find a place to live.</li> </ul>
<p>6 Increase Funds or Use them more Effectively to Support</p>	<ul style="list-style-type: none"> <li>• Facilitating more funds for equipment.</li> <li>• Getting more funds for graduate studies to facilitate our research presentations in conferences outside Puerto Rico.</li> <li>• Giving the opportunity to students to travel and present their posters in</li> </ul>

## Exhibit 52: How Can the Project Be Improved?

Main Themes	Student Statements
Student Activities (with a frequency of 11 responses or 3.5 percent)	<p>other parts of the United States.</p> <ul style="list-style-type: none"> <li>• Increase the number of presentation opportunities for students.</li> <li>• It could have a better promotion at my university. Also it can fund better equipment, so more researches could be made.</li> <li>• Lowering tuition costs. Higher education should be cheaper as a whole.</li> <li>• More strict expectations and effort from funded students.</li> <li>• Provide more funding to encourage more students to be involved.</li> <li>• Streamline the use of the equipment stipend by integrating with websites.</li> <li>• The project would greatly benefit from paying the student stipends on time, so they can continue to cover travel and living expenses during the investigative phase of the projects.</li> <li>• Tuition fee assistance for graduate students.</li> </ul>
7 Improve or Expand Project Partnerships (with a frequency of 9 responses or 2.9 percent)	<ul style="list-style-type: none"> <li>• Increase collaboration and communication between projects involved in NIFA.</li> <li>• Internship housing could benefit a little from having the help of HR representatives to find adequate housing. It's stressful to be in a new city and not knowing where to go for housing.</li> <li>• It will be good to receive workers from the different agencies that can give the students information and councils about their respective agencies.</li> <li>• More visits to USDA facilities to meet with staff and scientists.</li> <li>• Provide more opportunities for community engagement.</li> <li>• Since Bakersfield is in a major farming location, it would make sense for CSUB to have an agricultural department in collaboration with the USDA.</li> <li>• The USDA, when they visit our campus, is very agriculturally driven. I know there is opportunity for natural resources (wildlife, restoration, botany). Why don't we ever see this part of the USDA on campus?</li> <li>• There could be better cohesion between program coordinators at NMSU and here at NMHU.</li> </ul>

### Student Job Preferences

Students were asked about the jobs in which they were most interested. Some students (23.2 percent) did not know or simply did not answer this question, but more than three-fourths (76.8 percent) did. A content analysis of their responses was performed and is presented in Exhibit 53. The analysis grouped job preferences in nine distinct areas, presented in the exhibit in descending order of frequency. At the top of the list was a preference for a position in *natural resource, wildlife and environmental conservation and renewal*, with 17.1 percent of the responses. These students wanted to work preserving and protecting wildlife and the natural resources.

The second preference was to do *laboratory work in the field*, with 12.3 percent. These students wanted hands-on interaction with plants and animals as part of their research job. The third most popular job

preference was *working with governmental, community or international agencies or institutions*, with 11.0 percent of the responses. Many of these students wanted an official job, regulating or overseeing agricultural activities or helping best practices at the local, state, national or even international level. These three groups represented about 40.4 percent of the responses.

The most important of the least frequent preferences expressed an interest in *research and educational oriented occupations*, with 9.4 percent of responses. In this group, students wanted to combine their research activities with teaching, like university professors.

In the next preference, *veterinary, medical and health related position* (8.7 percent), students wanted to be veterinarians or work in some area to advance animal medicine and health. The next preference was in *agricultural and food related occupations* (7.4 percent). Here students wanted to use their knowledge to help improve crop growth, thereby increasing the quantity and quality of food production and distribution.

The next preference – *engineering, geology, GIS and other supplemental or infrastructure related job* (5.2 percent) – involved various professions that would provide logistic and technological support to the agricultural field. The penultimate preference was *quality control, operation or managerial occupation* (4.2 percent). These students wanted to manage various aspects associated with agriculture, such as feed lot, supply chain and coastal resources.

The final preference was for *entrepreneurship or advocate-oriented occupation* (1.6 percent). Some of these students wanted to do their own thing or advocate for their communities or those of some groups, such as indigenous populations. The content analysis revealed a wide range of job preferences and the rich diversity of interest among students, even though they were all related to agriculture in some way. Exhibit 53 shows the students' responses under each group, listed alphabetically.

Exhibit 53: Jobs of Interest to Students		
	Main Themes	Student Statements
1	Did not Know or Did not Answer (with a frequency of 72 responses or 23.2 percent)	<ul style="list-style-type: none"> <li>Jobs where I can utilize my degree.</li> <li>N/A.</li> <li>Did not answer. [70]</li> </ul>
2	Natural Resource, Wildlife and Environmental Conservation and Renewal Position (with a frequency of 53 responses or 17.1 percent)	<ul style="list-style-type: none"> <li>Agricultural or forest services.</li> <li>Agriculture and water resources.</li> <li>Agriculture, forestry, fire and IT.</li> <li>Agriculture/environmental related jobs.</li> <li>Any area related to environmental sciences.</li> <li>Conservation or environmental jobs.</li> <li>Dealing with wildlife conflicts with agriculture. Also with the forest department.</li> <li>Energy and renewable fuel production.</li> <li>Environmental area.</li> <li>Environmental engineering jobs.</li> <li>Environmental engineering related.</li> <li>Environmental Interpretation.</li> <li>Environmental, agriculture.</li> </ul>

## Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Environmental, caring for natural sources, endangered species.</li> <li>• Environmental. [2]</li> <li>• Field biology, in particular wildlife biology. I also would like to remain focused on habitat restoration.</li> <li>• Field work involving entomology, forestry, or conservation.</li> <li>• Forest related hydro jobs.</li> <li>• Forest research assistant.</li> <li>• Forest service and fish and wildlife service.</li> <li>• Game warden.</li> <li>• Green, sustainability engineering.</li> <li>• Hands on wildlife internships.</li> <li>• Jobs handling wildlife.</li> <li>• Jobs in advocating sustainability and natural resource conservation.</li> <li>• Jobs in forestry interest me.</li> <li>• Jobs related to sustainable energy production such as solar and wind energy.</li> <li>• Jobs that relate to the conservation of the earth's resources.</li> <li>• Mainly anything dealing with agriculture. Wildlife, horticulture, soil science, or anything with APHIS.</li> <li>• Mineral plant nutrition, hydroponics, conservation of natural resources, biosecurity.</li> <li>• Natural resource and conservation.</li> <li>• Natural resources and environmental jobs.</li> <li>• Natural resources, fire.</li> <li>• Ones where educating on sustainability/recycling are a component of the job.</li> <li>• Park ranger natural resource interpreter.</li> <li>• Park ranger, range specialist, recreation specialist, range technician.</li> <li>• Renewable energy.</li> <li>• Research positions, natural resources conservation.</li> <li>• The ones related to natural resources.</li> <li>• Wildlife and ecological research.</li> <li>• Wildlife biologist, zoologist, basically anything that involves the study of animals in research as well as in conservation.</li> <li>• Wildlife ecology.</li> <li>• Wildlife jobs, hands on work with small-medium animals.</li> <li>• Wildlife jobs.</li> <li>• Wildlife management and conservation.</li> <li>• Wildlife related jobs interest me the most.</li> <li>• Wildlife related. Large mammals (Ungulates).</li> <li>• Wildlife.</li> <li>• Work in the area of natural resource management, working</li> </ul>

## Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
	<p>with communities and research in the area of agriculture.</p> <ul style="list-style-type: none"> <li>• Working with APHIS and FS as a research technician. Anything that deals with conservation and restoration would be great. I would ideally want to work in the same field of study I have done my schooling in. However, I am not opposed to learning new things...</li> <li>• Working with exotic animals.</li> <li>• Zoos, being a vet, protecting endangered animals.</li> </ul>
<p>3 Laboratory Work in the Field (with a frequency of 38 responses or 12.3 percent)</p>	<ul style="list-style-type: none"> <li>• A career in research on the field of soil chemistry.</li> <li>• Agriculture, Forestry, Plant Pathogens Research.</li> <li>• Agroecology, Horticulture, Plant conservation, Tropical Fruit Research, Plant inspection, etc.</li> <li>• Biology research related jobs.</li> <li>• Equine science and actually hands-on related work.</li> <li>• Field research jobs.</li> <li>• Field research, post-doc interdisciplinary team research, (ARS).</li> <li>• Fish biology and aquatic ecology.</li> <li>• Hands on lab work and field work on.</li> <li>• Hands on research jobs where we are part of the end result.</li> <li>• Hands on.</li> <li>• Hydrology and marine sciences.</li> <li>• Hydrology, sedimentology, and other geology related jobs.</li> <li>• I am interest in an agricultural/animal science position.</li> <li>• I am interest on jobs that I have to work into the laboratory while i have to collect data in the field. Also I prefer work related to the success of any community.</li> <li>• I am interested in doing research in laboratories and field. I would also like to work in a food processing plant.</li> <li>• I like the more hands on jobs because I feel that is where I learn best.</li> <li>• I would like a job that is hands on and where the setting is outdoors.</li> <li>• I'm interested in working on farms or in laboratories.</li> <li>• Jobs that require interacting with animals.</li> <li>• Lab work; I want to do genetic research on plants to develop disease and pest resistance so chemicals can one day be eliminated.</li> <li>• Laboratory jobs.</li> <li>• Laboratory research interests me the most. I am very interested in cloning and doing research on adipocyte cells.</li> <li>• Laboratory work.</li> <li>• Marine sciences and hydrology.</li> <li>• Molecular plant scientist.</li> <li>• Outdoor hands-on jobs.</li> </ul>

### Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Outside work with animals.</li> <li>• Plant scientist.</li> <li>• Research and development.</li> <li>• Research based positions/opportunities to be in the field.</li> <li>• Research entomologist. Jobs pertaining to agricultural entomology, IPM and ecology studies pertaining to entomology.</li> <li>• Research projects in the field.</li> <li>• Research with animal studies.</li> <li>• Science field.</li> <li>• Teaching careers and careers that are outdoors or hands on are my top interests.</li> <li>• Using chemistry to analyze alkaloids in ethno-botanical plants used by shamans.</li> <li>• Zoologist.</li> </ul>
4 Working with Governmental, Community or International Agencies or Institutions (with a frequency of 34 responses or 11.0 percent)	<ul style="list-style-type: none"> <li>• Animal inspection - foreign agricultural service.</li> <li>• Community development.</li> <li>• Extension county agent.</li> <li>• Federal jobs with USFS and NRCS.</li> <li>• Game warden, USDA NRCS.</li> <li>• Government agency.</li> <li>• Government jobs or even veterinarian.</li> <li>• Government jobs within APHIS PPQ.</li> <li>• Government.</li> <li>• I am interested in natural resources jobs with federal agencies.</li> <li>• I am mostly interested in wildlife and fisheries positions in government or state agencies.</li> <li>• I would like to obtain a PhD in plant molecular genetics. I would then like to take my degree/studies back to a USDA position to aid in research.</li> <li>• In a USDA agency by doing research, working with chemical and/or food analyses.</li> <li>• International development.</li> <li>• Jobs with federal agencies where I can share my knowledge.</li> <li>• NRCS, Texas parks and wildlife.</li> <li>• NRCS.</li> <li>• Plant Pathologist at ARS- USDA.</li> <li>• Policy analysis, civil right, outreach and statistical data analysis.</li> <li>• Structural engineering.</li> <li>• Those dealing with biological research either in the federal or private sector.</li> <li>• Those dealing with natural world research either in the federal or private sector.</li> <li>• Those in the federal or private sector.</li> </ul>

### Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• USDA APHIS PPQ.</li> <li>• USDA compliance officer, food inspector, law enforcement.</li> <li>• USDA entomology.</li> <li>• USDA forest service.</li> <li>• USDA headquarters in D.C. and agricultural centers around D.C.</li> <li>• USDA, TDA, CBP or any Ag related field.</li> <li>• USGS.</li> <li>• Wildlife, agriculture, anything involving USDA.</li> <li>• Work in a regulating agency. A place to provide information and counselling about various topics related to the environment. To do research and on-field experimentation.</li> <li>• Working in environmental agencies. Work in the United Nations and help more communities.</li> <li>• Working with the TCEQ, EPA, and NRCS.</li> </ul>
5	<p>Research and Educational Oriented Occupation (with a frequency of 29 responses or 9.4 percent)</p> <ul style="list-style-type: none"> <li>• Academic work, research.</li> <li>• Agricultural and horticultural research.</li> <li>• Agriculture teaching jobs.</li> <li>• Anything within the NRCS and agriculture teacher.</li> <li>• Chemistry related.</li> <li>• Ecology and education.</li> <li>• Educational positions.</li> <li>• Environmental education.</li> <li>• I am very interested in a job in research, where I can apply the skills learned so far in the lab and acquire more skills to become a competent scientist.</li> <li>• I'm interest most for research jobs or any other.</li> <li>• Job as researcher.</li> <li>• Jobs involving livestock an agriculture education.</li> <li>• Jobs where I can do outreach, community engagement, and work with diverse youth.</li> <li>• Medical field related, instructor, research.</li> <li>• My main interest as of now is wildlife education, if not ornithology.</li> <li>• Peer mentoring other students.</li> <li>• Research / give class at the academy.</li> <li>• Research and development and individual problem solving.</li> <li>• Research area.</li> <li>• Research based jobs in government labs or academia.</li> <li>• Research jobs. [2]</li> <li>• Research or academia.</li> <li>• Research related to agriculture, field work, and university professor.</li> <li>• Research. [2]</li> <li>• Research/teaching.</li> </ul>

### Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
6	<p>Veterinary, Medical and Health Related Position (with a frequency of 27 responses or 8.7 percent)</p> <ul style="list-style-type: none"> <li>• Scientist or professor/scientist.</li> <li>• Scientist, educator in agriculture and natural sciences.</li> <li>• Animal inspector, veterinarian, food safety.</li> <li>• Animal science related.</li> <li>• Animal science. [2]</li> <li>• Becoming a veterinarian, or job shadowing a veterinarian to gain experience.</li> <li>• Biochemical science research, biomedical research.</li> <li>• Extension county agent or a pre-veterinary technology</li> <li>• Genetics, molecular biology, biotechnology.</li> <li>• Health related professions.</li> <li>• I am currently interested in pursuing a career in medicine.</li> <li>• Jobs that interest me most are the jobs that are health and environment related.</li> <li>• Medical or environmental research.</li> <li>• Medical.</li> <li>• Medicine research is what I would really like to try out.</li> <li>• Molecular biology and microbiology.</li> <li>• Physical therapy, medical, agricultural.</li> <li>• Research and veterinary.</li> <li>• Science, medical, and research related jobs.</li> <li>• Veterinarian, animal scientist.</li> <li>• Veterinarian.</li> <li>• Veterinary jobs, jobs that help improve animal welfare.</li> <li>• Veterinary Medicine or other field related wit animal sciences.</li> <li>• Veterinary medicine, animal health, agriculture engineering.</li> <li>• Veterinary medicine. [2]</li> <li>• Veterinary technology.</li> <li>• Working with animals. Microbiology.</li> </ul>
7	<p>Agricultural and Food Related Position (with a frequency of 23 responses or 7.4 percent)</p> <ul style="list-style-type: none"> <li>• Agriculture related jobs where I enjoy what I do.</li> <li>• Agroforestry and organic farming.</li> <li>• Anything regarding agriculture, like livestock, ranching, farming.</li> <li>• Anything that involves agriculture. I haven't discovered everything that has to do with agriculture.</li> <li>• APHIS related jobs. Animal and livestock production, nutrition, the process of feed commodity planting to consumption of the animal.</li> <li>• Entomologist or herbology.</li> <li>• Entomologist, herbalist.</li> <li>• Farm jobs.</li> <li>• Fate and transport of endocrine disrupting compounds related to agricultural activities.</li> </ul>

### Exhibit 53: Jobs of Interest to Students

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Food safety inspection and research.</li> <li>• Industrial and agricultural jobs.</li> <li>• Jobs in the agricultural field interest me most.</li> <li>• Jobs involving agriculture.</li> <li>• Neurobiological research, food research, and research in the medical field/pathogens.</li> <li>• Nutrition and food service.</li> <li>• Nutrition sector.</li> <li>• On field jobs; projects for the production of different agricultural products.</li> <li>• Plant and soil science jobs.</li> <li>• Plant related internships.</li> <li>• Research and development (food industry), food inspection involving regulatory basis (USDA, FDA), quality control (food industry).</li> <li>• Seed and chemical sales; extension.</li> <li>• Soil science.</li> <li>• Those that involve working closely with growers and their needs, i.e., pest control adviser, UC extension Ag adviser, and perhaps working for a chemical company that develops and does research on unregistered compounds.</li> </ul>
8	<p>Engineering, Geology, GIS and Other Supplemental or Infrastructure Related Job (with a frequency of 16 responses or 5.2 percent)</p> <ul style="list-style-type: none"> <li>• Analytical scientist.</li> <li>• Anything related to GIS, geospatial technologies, cartography or geography.</li> <li>• Chemical.</li> <li>• Circuit and electronics design.</li> <li>• Economist.</li> <li>• Engineering.</li> <li>• Environmental engineering, agricultural engineering, materials science.</li> <li>• Environmental science, transportation, forensics.</li> <li>• GIS related jobs.</li> <li>• Jobs dealing with environmental and resource type issues interest me the most, specifically those involving maps and the use of geospatial techniques to output data.</li> <li>• Material Science related.</li> <li>• Mechanical engineering, material sciences.</li> <li>• Mechanical engineering.</li> <li>• Petroleum geology, forest service geologist.</li> <li>• Research in climate change, ecology, geology, etc.</li> <li>• Specialized jobs, more specifically in data management and mapping.</li> </ul>

### Exhibit 53: Jobs of Interest to Students

Main Themes		Student Statements
9	Quality Control, Operation or Managerial Position (with a frequency of 13 responses or 4.2 percent)	<ul style="list-style-type: none"> <li>• Agriculture specialist and humane officer.</li> <li>• Any jobs related to civil engineering.</li> <li>• Coastal natural resource management.</li> <li>• Feed lot management.</li> <li>• Forest service jobs, including fuels, fuel management officer and assistant.</li> <li>• Monitoring and analyzing water quality.</li> <li>• Not sure yet. Wildlife management interests me so far.</li> <li>• Operations research.</li> <li>• Quality inspector in the FDA or manager of food development in research and development.</li> <li>• Research and developed; quality.</li> <li>• Supply chain management.</li> <li>• The jobs that interest me the most involve utilizing my skill set to help solve or mitigate management issues and having the opportunity to speak with students or interested public members about the projects or management programs.</li> <li>• Water management.</li> </ul>
10	Entrepreneurship or Advocate Oriented Occupation (with a frequency of five responses or 1.6 percent)	<ul style="list-style-type: none"> <li>• Animal trainers.</li> <li>• Cultural conservation of indigenous people.</li> <li>• Entrepreneurship.</li> <li>• Foreign international trade.</li> <li>• Sincerely, being a pilot or any work related to airplanes and their system interest me the most. But also, the area of economics and agriculture are on my top interest job too.</li> </ul>

### USDA related Internships, Jobs and Communications

The survey listed several assertions regarding USDA-related internships and jobs. Students were asked to indicate whether they applied to them or not. Exhibit 54 shows their responses, in order of most positive agreement to least positive agreement.

### Exhibit 54: Regarding USDA-related Internships and Jobs...

Statements	Yes		No		N/A	
	Number	Percent	Number	Percent	Number	Percent
A. The college/university I attend offers the courses I need for the job I seek.	251	81.8	29	9.4	27	8.8
B. I am familiar with the requirements of the various USDA-related jobs.	233	75.2	62	20.0	15	4.8

**Exhibit 54: Regarding USDA-related Internships and Jobs...**

Statements		Yes		No		N/A	
		Number	Percent	Number	Percent	Number	Percent
C.	I am aware of internships, job shadowing and experiential learning opportunities within a USDA agency.	229	74.1	62	20.1	18	5.8
D.	I know what courses are necessary for USDA-related jobs that interest me.	216	70.1	67	21.8	25	8.1
E.	I receive information about USDA job and internship opportunities regularly.	212	68.4	81	26.1	17	5.5
F.	I applied for an internship, job shadowing or experiential learning opportunity within an USDA agency.	197	63.8	96	31.1	16	5.2
G.	I have selected a USDA-related job of interest.	192	62.3	89	28.9	27	8.8
H.	I was successful in acquiring an internship, job shadowing or experiential learning opportunity within a USDA agency.	154	49.7	110	35.5	46	14.8
I.	I applied for an internship, job shadowing or experiential learning opportunity in a non-USDA agency.	152	49.5	129	42.0	26	8.5
J.	I was successful in acquiring an internship, job shadowing or experiential learning opportunity in a non-USDA agency.	117	38.0	129	41.9	62	20.1
K.	I was offered a job by a non-USDA agency.	57	18.8	195	64.1	52	17.1

### Exhibit 54: Regarding USDA-related Internships and Jobs...

Statements		Yes		No		N/A	
		Number	Percent	Number	Percent	Number	Percent
L.	I was offered a job by an USDA agency.	48	15.5	217	70.2	44	14.2
M.	I accepted a job from a non-USDA agency.	42	13.8	175	57.4	88	28.9
N.	I accepted a job from an USDA agency.	33	10.7	190	61.7	85	27.6
<b>Total</b>		<b>1,280</b>	<b>41.6</b>	<b>1,332</b>	<b>43.3</b>	<b>464</b>	<b>15.1</b>
<b>Total (2011-12)</b>		<b>1,655</b>	<b>61.9</b>	<b>766</b>	<b>28.7</b>	<b>251</b>	<b>9.4</b>

**With more than 80 percent (81.8 percent) in the affirmative, students indicated that the college or university they attend offered the courses they needed for the job they sought.**

Overall, students (41.6 percent) were less supportive of the assertions this year than last year (61.9 percent). However, there were significant differences in their opinions. With more than 80 percent (81.8 percent) in the affirmative, students indicated that the college or university they attend offered the courses they needed for the job they sought. In their second highest agreement (75.2 percent), students were aware of internships and experiential learning opportunities within their USDA agency. In this regard, 63.8 percent applied for them and 49.5 percent were successful in acquiring an internship, job shadowing or experiential learning opportunity within their USDA agency. On the other hand, 49.5 percent had applied for an internship, job shadowing or experiential learning opportunity in a non-USDA agency, and nearly 40 percent (38.0 percent) were successful in acquiring an internship, job shadowing or experiential learning opportunity in a non-USDA agency.

Students were given an opportunity to indicate what aspects of USDA-related jobs they would like to learn more about. Exhibit 55 lists their responses in their entirety.

### Exhibit 55: Aspects of USDA-related Students Would Like to Learn More

- Salary, benefits, relocation, community.
- Water resources. [2]
- Foreign agricultural research.
- Taking care of the crops, making the analysis of the products before being distributed, and anything related with agriculture.
- Jobs in forestry and natural resources.
- Inspection and lab research opportunities, new regulations.
- Recruitment and jobs opportunities in Fresno, Calif.
- Biotech area.
- Courses needed to actually acquire a USDA Job at my university.
- What do they offer to engineers?
- I would like to learn more about the jobs that pertain to my degree and what I need to do in school and outside of school in order to make myself more marketable to these jobs.
- Nutrition, toxicology.

### Exhibit 55: Aspects of USDA-related Students Would Like to Learn More

- Energy and renewable fuel production.
- The variety of jobs in the USDA.
- None at the moment.
- How you can still in contact with the USDA-internship while students are on graduate school.
- The duty of a scientist.
- Environmental science and forensics.
- Will I have to sell my soul to work for the USDA?
- Animal science.
- Plant health inspection.
- Every position has different requirements so it is hard to keep up with them. Also, I always apply to jobs and internships within the USDA but I have never seen anyone in my whole school that has been offered a job.
- How often do you get transferred?
- Public education
- Preparation requirements/ job descriptions.
- Nutrition.
- Specific fields of study with their locations, also, what are the best requirements to meet each program.
- Jobs more related to biology or animal welfare.
- GIS jobs that could lead to working in an international setting.
- Direct/Indirect conversion from an intern to an employee for Hispanics/Latinos.
- Forest Service.
- I would like to know about the specific requirements, and also about the current open positions.
- The abilities to get them, more openings and where we can apply.
- Naturalization assistance.
- Operations research/management.
- Positions for economists.
- The different agencies and what they consist of.
- Animal health.
- APHIS – PPQ.
- Veterinarian job shadowing.
- Sustainable development initiatives in country or abroad.
- Fields, opportunities, descriptions.
- Research entomology.
- Crop protection.
- Higher positions job offers rather than other interns working with me.
- Career opportunities.
- I would like to know more about what type of jobs are being offered related to geography.
- APHIS, USFS (wildlife biology, fieldwork with animals).
- Horticulture.
- I would like to learn more about the hydrological aspects of USDA-related jobs.
- Career opportunities for recent bachelor graduates.
- Dietetics.

### Exhibit 55: Aspects of USDA-related Students Would Like to Learn More

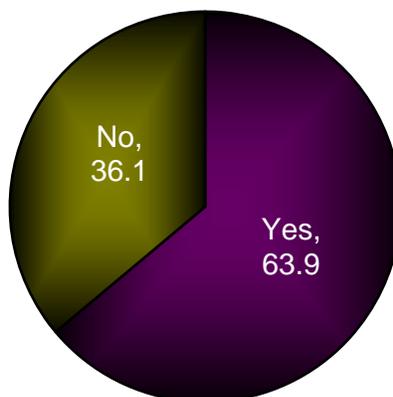
- The specific projects entailing plant molecular genetics at the various USDA bases.
- Information technology, anything dealing with technology.
- Research.
- Forest service, agricultural extension youth programs.
- Soil and water conservation, forestry and education.
- About the ARS. What research is being conducted in the U.S.?
- Wildlife programs. [2]
- Research, citizen science and human dimensions.
- Extension county agent.
- Economics.
- Seminars / internship opportunities.
- Pesticides control.
- Opportunities in research within the USDA related to food packaging.

### Characteristics of the Student Internship, Job Shadowing or Career Experience

The most significant survey improvement this year attempted to better understand the student experience in their internship, job shadowing or career experience. The following set of exhibits summarized what was learned.

First, students were asked whether they participated (or were currently involved) in an internship, job shadowing or career experience? About two-thirds were, as shown in Exhibit 56. The following analysis is based on this 63.9 percent of students who reported participation in any of these experiences.

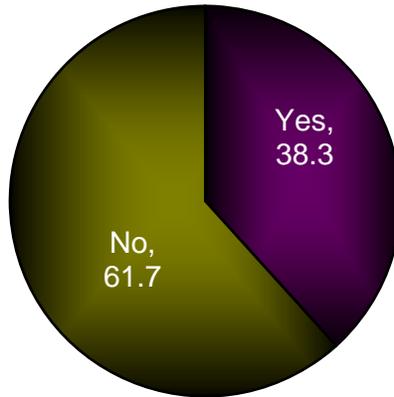
### Exhibit 56: Did you participate (or are you currently involved) in an internship, job shadowing, or career experience?\* [N = 310]



\*First time question was asked.

Students who had participated were asked whether they had multiple internship, job shadowing or career experience opportunities. More than a third (38.3 percent) responded in the affirmative (Exhibit 57).

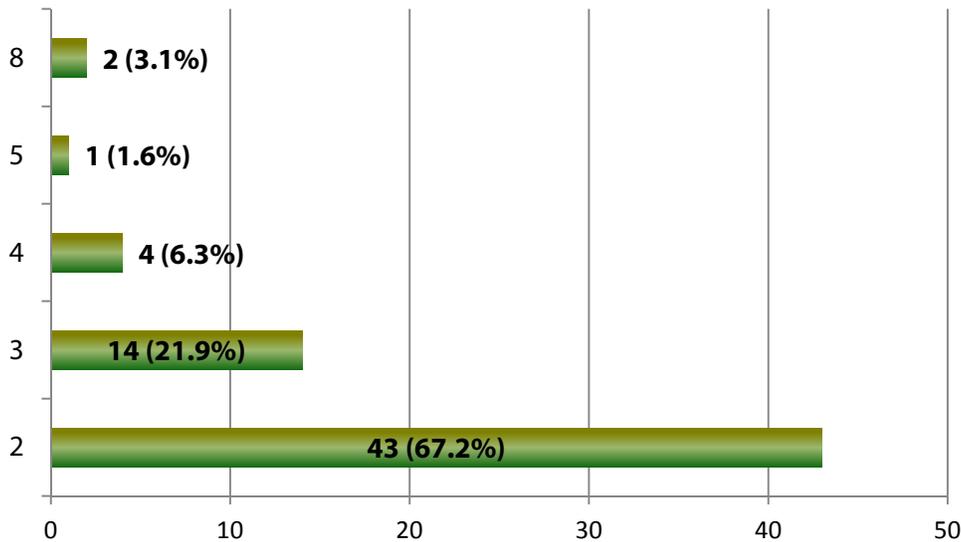
**Exhibit 57: Did you have multiple internship, job shadowing or career experience opportunities?\*** [N = 209]



\*First time question was asked.

Most of those who had multiple opportunities listed two (67.2 percent) as the number of opportunities; although some had more than two opportunities (see Exhibit 58). The largest number, eight, was reported by two students (3.1 percent).

**Exhibit 58: If you had multiple opportunities, please indicate how many\*** [N = 64]  
**Number of Opportunities**



\*First time question was asked.

Students were provided a list of all USDA agencies for them to choose the one where they had their internship, job shadowing or career experience. Exhibit 59 shows their selections. About half of the USDA agencies listed had some participation, with Agricultural Research Service (ARS) at the top, representing 20 percent of all participation. However, about a third (33.3 percent) of the students indicated their internship, job shadowing or career experience was in a different institution.

**Exhibit 59: In which USDA agency was (or is) your internship, job shadowing, or career experience?\* [N = 180]**

USDA Agencies		Number	Percent
1.	Agricultural Research Service (ARS)	36	20.0
2.	Animal and Plant Health Inspection Service (APHIS)	26	14.4
3.	Forest Service (FS)	24	13.3
4.	Natural Resources Conservation Service (NRCS)	17	9.4
5.	Food Safety and Inspection Service (FSIS)	7	3.9
6.	National Institute of Food and Agriculture (NIFA)	4	2.2
7.	Agricultural Marketing Service (AMS)	3	1.7
8.	Food and Nutrition Service (FNS)	2	1.1
9.	Economic Research Service (ERS)	1	0.6
10.	Center for Nutrition Policy and Promotion (CNPP)	0	0.0
11.	Farm Service Agency (FSA)	0	0.0
12.	Foreign Agricultural Service (FAS)	0	0.0
13.	Grain Inspection, Packers and Stockyards Administration (GIPSA)	0	0.0
14.	National Agricultural Library (NAL)	0	0.0
15.	National Agricultural Statistics Service (NASS)	0	0.0
16.	Risk Management Agency (RMA)	0	0.0
17.	Rural Development (RD)	0	0.0
<b>TOTAL USDA Agencies</b>		<b>120</b>	<b>66.7</b>
Other Institutions or Companies		60	33.3
<b>Total Participation</b>		<b>180</b>	<b>100.0</b>

\*First time question was asked.

The other institutions or companies where students had their internship, job shadowing, or career experiences are listed in Exhibit 60. They listed 40 organizations, some of which were listed more than once. The list is ordered alphabetically.

**Exhibit 60: Other Institutions or Companies where Students Had their Internship, Job Shadowing, or Career Experience\***

- A Veterinary Clinic
- Association of Zoos and Aquariums [2]
- Bureau of Reclamation
- Cargill, Inc.
- Central Coast Water Quality Preservation, Inc.
- CETARS [4]
- City of San Marcos

## Exhibit 60: Other Institutions or Companies where Students Had their Internship, Job Shadowing, or Career Experience\*

- Comanche-Faith Project
- Diabetes Research Institute
- Elkhorn Slough National Estuarine Research Reserve
- Elkhorn Slough Tidal Wetland Project
- Fish and Wildlife Service
- Hermit's Peak Watershed Alliance
- Inland Empire Utilities Agency
- Iowa State University and Mayaguez's Zoo
- King Ranch Feed Yard
- Laredo Medical Center
- Meals on Wheels
- Molecular Biology Laboratory at Texas A&M Kingsville
- National Park Service [2]
- New Mexico State University
- NMSU Graduate Professor
- Omni-Means, Engineers and Planners
- Pfizer, Inc.
- Project ACCESO
- Purdue University [2]
- Resource Conservation District
- Samsung Semiconductors
- Stubner Airline and Champions Vet Hospital
- Texas A&M Agrilife [3]
- Texas A&M University-Kingsville Citrus Center
- Texas Department of Agriculture
- Texas State University, San Marcos Chemistry Department
- Tuolumne River Trust [2]
- University of Tennessee, Center for Renewable Carbon
- US Fish and Wildlife
- Water Quality
- Water Research Institute [3]
- Wildlife Research at Texas State University
- Wimberley Vet Clinic

\*First time question was asked.

When asked about the type of internship, job shadowing or career experience listed in Exhibit 61, about half of the responses (49.0 percent), indicated a non-USDA experience. The most frequent USDA experience was a short-term employment position, with 29.0 percent of the selections. USDA long-term employment position obtained 8.7 percent of the responses. It is important to notice that this question was designed to be optional, so only students who had actually participated in an internship, job shadowing or career experience would answer it. But due to an error in the survey, it was actually required, so all students had to answer it. Therefore, this number might be inflated. We should get a more accurate reading on this indicator next year.

**Exhibit 61: In what type of internship, job shadowing, or career experience were you involved in the 2012-13 academic year?\***

Statements	Number	Percent
USDA short-term employment position (Pathways Internship for Students, formerly STEP – Student Temporary Employment Program)	90	29.0
USDA long-term employment position (Pathways Internship for Students, formerly SCEP – Student Career Experience Program)	27	8.7
USDA Recent Graduates Program	6	1.9
USDA Presidential Management Fellows (PMF) Program	0	0.0
USDA volunteer position (VSP – Volunteer Student Program)	35	11.3
Non-USDA internship/career experience	152	49.0

\*First time question was asked.

Students were asked about the number of hours they spent in their internship, job shadowing, or career experience. Exhibit 62 shows various descriptive statistics summarizing their responses. Nearly 60 percent (58.3 percent) of the students who had an internship, job shadowing, or career experience spent between 200 and 400 hours in this activity. The average number of hours was 357; the median (value in the center of the distribution) was 337, and the most frequent value reported was 400 hours, mentioned by 21 students.

**Exhibit 62: If you were involved in a USDA internship, job shadowing, or career experience, please indicate the number of hours completed\***

Descriptive Statistics	Number of Hours	Total	Percent
<b>Frequency</b>	20 to 200	22	20.4
<b>Distribution</b>	201 to 400	63	58.3
	401 to 600	14	13.0
	601 to 800	7	6.5
	801 to 1000	1	0.9
	1001 to 1300	1	0.9
	<b>Total</b>	<b>108</b>	<b>100</b>
<b>Other Statistics</b>	Mean	357	
	Median	337	
	Mode	400	

\*First time question was asked.

May (30.3 percent) and June (43.2 percent) were the most frequent months when students engaged in internship, job shadowing, or career experiences. January was the third most frequent month mentioned with 8.1 percent of responses. About three-fourths (73.0 percent) of the students

participated in internship, job shadowing, or career experiences in 2013; the other 27 percent did so in 2012 (Exhibit 63).

<b>Exhibit 63: Months and Years Students Participated in Internship, Job Shadowing, or Career Experience*</b>			
<b>Descriptive Statistics</b>		<b>Total</b>	<b>Percent</b>
<b>Months</b>	January	15	8.1
	February	6	3.2
	March	5	2.7
	April	4	2.2
	May	56	30.3
	June	80	43.2
	July	5	2.7
	August	6	3.2
	September	1	0.5
	October	3	1.6
	November	3	1.6
	December	1	0.5
	<b>Total</b>	<b>185</b>	<b>100.0</b>
<b>Years</b>	2012	50	27.0
	2013	135	73.0
	<b>Total</b>	<b>185</b>	<b>100.0</b>

\*First time question was asked.

The amount of time students spent in their internship, job shadowing, or career experience varied widely as demonstrated by Exhibit 64, but the large majority spent less than 17 weeks (82.1 percent). About 40 percent (40.4 percent) spent between 8.1 and 12 weeks in those activities. The average number of weeks was 16; this value was highly skewed by a few large numbers. The median and the mode were both 10 weeks, representing a more reliable indicator of central tendency.

<b>Exhibit 64: Number of Weeks Students Spent in Internship, Job Shadowing, or Career Experience*</b>			
<b>Descriptive Statistics</b>	<b>Number of Weeks</b>	<b>Total</b>	<b>Percent</b>
<b>Frequency</b>	2 to 8	46	29.5
<b>Distribution</b>	8.1 to 12	63	40.4
	12.1 to 16	19	12.2
	16.1 to 20	2	1.3

<b>Exhibit 64: Number of Weeks Students Spent in Internship, Job Shadowing, or Career Experience*</b>			
<b>Descriptive Statistics</b>	<b>Number of Weeks</b>	<b>Total</b>	<b>Percent</b>
	20.1 to 24	2	1.3
	24.1 to 28	4	2.6
	28.1 to 32	1	0.6
	32.1 to 36	1	0.6
	36.1 to 40	1	0.6
	40.1 to 44	0	0.0
	44.1 to 48	3	1.9
	48.1 to 52	10	6.4
	52.1 to 56	0	0.0
	56.1 to 99	4	2.6
	<b>Total</b>	<b>156</b>	<b>100</b>
<b>Other</b>	Mean	16	
<b>Statistics</b>	Median	10	
	Mode	10	

\*First time question was asked.

Students were also asked whether their internship, job shadowing or career experiences were paid and by whom. Exhibit 65 shows and analysis of their responses. The large majority (87.1 percent) of the internship, job shadowing or career experiences was paid. They were paid by the university grant (43.8 percent) or USDA agency (28.9) mainly. Very few students (6.7 percent) did not know the origin of their payments.

<b>Exhibit 65: Was your internship, job shadowing, or career experience unpaid or paid?*</b>			
<b>Statements</b>		<b>Number</b>	<b>Percent</b>
	Unpaid	25	12.9
	Paid by your university grant	85	43.8
	Paid by the USDA agency	56	28.9
	Paid by the non-USDA agency	15	7.7
	Paid but I don't know who paid for it	13	6.7
	<b>Total</b>	<b>194</b>	<b>100.0</b>

\*First time question was asked.

Nearly 90 percent (89.6 percent) of the students who reported payments received less than \$6,001 for their internship, job shadowing or career experiences. Within this group, the frequency distribution was even (Exhibit 66). The average payment was \$3,923. The mode and median were both \$4,000.

<b>Exhibit 66: Payments Students Received for their Internship, Job Shadowing, or Career Experience *</b>			
<b>Descriptive Statistics</b>	<b>Payment</b>	<b>Total</b>	<b>Percent</b>
<b>Frequency</b>	\$500 to \$2,000	11	22.9
<b>Distribution</b>	\$2,001 to \$3,000	10	20.8
	\$3,001 to \$4,000	9	18.8
	\$4,001 to \$5,000	8	16.7
	\$5,001 to \$6,000	5	10.4
	\$6,001 to \$7,000	2	4.2
	\$7,001 to \$8,000	3	6.3
	\$8,001 to \$9,000	0	0.0
	\$9,001 to \$9,500	1	2.1
	<b>Total</b>	<b>48</b>	<b>100</b>
<b>Other</b>	Mean	\$ 3,923	
<b>Statistics</b>	Median	\$ 4,000	
	Mode	\$ 4,000	

\*First time question was asked.

### **Student Reactions to their Experiential Learning**

Students were asked to share what they learned from their internship, job shadowing, or career experiences. Many of them provided important details about what their experiences were like and that information was processed through a content analysis, presented in Exhibit 67. This analysis classified their answers in five general groups, which are not mutually exclusive. In fact, many student answers could be placed in several of these groups, but, for simplicity, we placed answers under the group we felt best represented them.

As could be expected, the most popular responses indicated that *students acquired knowledge and practices from the real world, both in the field and in the lab, including equipment use* (with a frequency of 68 responses or 39.3 percent). Many students emphasized the importance of their exposure to the field, the work that takes place there, and the many things that people have to do there. Sometimes, they just listed all the activities they were exposed, as in, “field and greenhouse work, lab work, inoculating with the rust pathogen, information.” In other cases, they stated the skills they learned, such as, “How to screen Mexican fruit flies set up traps, read GPS and maps, conduct compliance checks.”

The second most popular theme emphasized the opportunity *students had to practice conducting research, data collection and analysis* (with a frequency of 37 responses or 21.4 percent). Many students

appreciated how this experience really helped them understand the process of conducting research. For example, one student said, "I have learned that although field work is an important aspect for any job, it's the data collected and analyzed that makes the project."

The next most popular theme was *students learned about themselves, their passion in life, and the personally transformative nature of the experience* (with a frequency of 24 responses or 13.9 percent). Many students were introspective in their comments and reflected about how this experience changed them and enabled them to discover what they really wanted to do with their lives, professionally. The following is a good example: "First of all, I have learned a great deal about myself and my growing interests in research. Specifically, I have learned much about grain-size analysis regarding lake sediments and how the data gathered will eventually lead to projecting water runoff from the Sierras. I have also been introduced to inorganic and organic carbon analysis via carbon coulometer."

For some students this experience presented an opportunity to *learn how to behave in a professional environment and what is needed to develop a career* (with a frequency of 24 responses or 13.9 percent). As one student put it, "I have learned to work in a professional environment along with applying skills that are applicable to my major."

Finally, some students *improved their leadership, communication and English skills* (with a frequency of 20 responses or 11.6 percent). One typical answer was: "From this internship, I learned valuable field experience using equipment such as a clinometer and densitometer. I also improved professionally and personally on my writing, communication, and leadership."

<b>Exhibit 67: What have you learned from this internship, job shadowing, or career experience?* [N = 173]</b>	
<b>Main Themes</b>	<b>Student Statements</b>
1 Students Acquired Knowledge and Practices from the Real World, both in the Field and in the Lab, including Equipment Use (with a frequency of 68 responses or 39.3 percent)	<ul style="list-style-type: none"> <li>• Ecosystem management and conservation (Parrot Habitat I improvement, fisheries, surveys, proposals, 4-H voluntary leader).</li> <li>• Ecosystem management (Parrot Habitat improvement, surveys, fisheries, reforestation plans, proposals).</li> <li>• Everything that FSIS does in compliance investigations in regards to the meat, poultry, and eggs act.</li> <li>• Experiential learning of wildlife and natural resource management.</li> <li>• Facility, roads, and engineering responsibilities within the Forest Service.</li> <li>• Feeding procedures.</li> <li>• Field and greenhouse work, lab work, inoculating with the rust pathogen, information.</li> <li>• Food service safety and management.</li> <li>• Habitat improvement of parrot and bats, reforestation plans, fisheries, AD700 documents and proposal and planning of construction and fixing of compost box and water supplier box.</li> <li>• How in-depth NRCS really is. I never expected to gain so much.</li> <li>• How the plant materials center is involved in the propagation of plants to help solve erosion problems. Also how research is</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<p>conducted in the pursuit of biofuels and not only that if the resulting plant mass could be used as animal feed and since the plants that were used were legumes did they help enrich the soil nutrients.</p> <ul style="list-style-type: none"> <li>• How to complete the objectives of the agency.</li> <li>• How to screen Mexican fruit flies, set up traps, read GPS and maps, conduct compliance checks.</li> <li>• How to use global position systems, do compliance checks with vendors, screen flies, setup fly traps and collect them.</li> <li>• How to use special lab equipment, gather data and make sense of the data.</li> <li>• How to work in a lab.</li> <li>• How to write contracts, design roads, review contract proposals.</li> <li>• I enhanced my skills set with various power tools used for construction as well as putting together another research poster.</li> <li>• I gained knowledge on animal husbandry, the rules and regulations on how to care for exotic animals from administering medicine to feeding them.</li> <li>• I have learned a great deal about the Sierra National Forest during my internship. I gained experience working with programs such as ArcGIS, Erdas I, Excel, and working with aerial photos. I also was able to create a scientific report on meadow encroachment and provide preventable options.</li> <li>• I have learned a lot about running a preserved land and many different things about taking care of a preserve.</li> <li>• I have learned a lot of information that is valuable in my reproduction class I am currently taking. I also learned how to do certain procedures listed in my paper and do a non-invasive surgery.</li> <li>• I learned a lot of skills as a laboratory assistant. Also I learned how to use all lab equipment and how to resolve lab problems.</li> <li>• I learned a number of analytical chemistry techniques such as the use of a GC-MS.</li> <li>• I learned and practiced some techniques as HPLC at lab, also learned about nanotechnology and agriculture among other things.</li> <li>• I learned different slaughtering techniques, parasites and diseases farm animals can have.</li> <li>• I learned how to read a hand drawn map without GPS.</li> <li>• I learned how to screen Mexican fruit flies.</li> <li>• I learned how to screen the flies.</li> <li>• I learned mostly about cover crops, no till, contracts to preserve land, soil classification and different methods of soil conservation. Also it was a challenge to share with people with a different</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<p>language than mine.</p> <ul style="list-style-type: none"> <li>• I learned new techniques used in soil microbiology as well as what a USDA job is all about.</li> <li>• I learned numerous things that were very interesting. We learned about Mexican fruit fly and how to collect and examine them.</li> <li>• I learned what the Mexican fruit fly is and what exactly the APHIS agency does.</li> <li>• I was given the opportunity to work with great individuals who helped me gain experience and knowledge about different sectors in agriculture.</li> <li>• I went out and check and set Mexican fruit fly traps.</li> <li>• I went out to the routes, check, clean, and set the traps. I checked out nurseries. I also cleaned the laboratory, and I cleaned out the back.</li> <li>• I worked for a non-profit organization that allowed me to learn a lot about watershed maintenance and restoration.</li> <li>• Identification of swine farms and management, swine bleeding and how to give new born piglet medical care.</li> <li>• Lab procedures and equipment used.</li> <li>• Laboratory and field testing strategies.</li> <li>• Laboratory equipment.</li> <li>• Landscaping engineering.</li> <li>• Life cycle assessment techniques and manipulation of environmental data such as emissions and how they affect the environment.</li> <li>• Lots about harvesting techniques.</li> <li>• Many useful skills (laboratory- field- inspection- quarantine, import, export, food safety).</li> <li>• Methods for biological control in south Texas.</li> <li>• Molecular technique.</li> <li>• Multiple skills working with a variety of wildlife.</li> <li>• Overall, I learned about various species of wildlife in the northern Rocky Mountain area. I learned the environmental needs that are vital to support that wildlife and what the Forest Service does to maintain the health of each species habitat all while cooperating with the public to meet their needs as well. Some of the skills that I acquired from this internship included observing and recording data, data entering, data interpretation, GPS usage, GPS coordinate entering, various types of wildlife surveying, etc.</li> <li>• Parrot and bat habitat improvement, fisheries, reforestation plan, 4-H voluntary leader, agroforestry.</li> <li>• Precautions with exotic animals.</li> <li>• Quality Assurance Review.</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Requirements for being approved as a pesticide applicator and continuing education for applying pesticides.</li> <li>• The availability of more jobs within APHIS PPQ than I originally thought. I also learned about different agriculture related research that my university here does not have, such as aquaponics. I hope to be able to change that.</li> <li>• The available opportunities USDA has and how it functions, from grant management to agricultural centers, and state of the art research.</li> <li>• The importance of sustainability.</li> <li>• Too much to state here! To summarize, however, I learned about the importance of taking time in the process of developing public outreach materials and tools through a process of inclusion and revision, instead of just rushing to produce a product.</li> <li>• Trapping.</li> <li>• University.</li> <li>• Water for mud for cities.</li> <li>• Water requirements of corn and sunflower.</li> <li>• Working with farmers, GIS systems, conservation practices, contracts, etc.</li> </ul>
<p>2 Students Practiced Conducting Research, Data Collection and Analysis (with a frequency of 37 responses or 21.4 percent)</p>	<ul style="list-style-type: none"> <li>• Analyzing water reservoirs in Puerto Rico.</li> <li>• Analysis Data; analytical process with Raman Micro-spectroscopy and electro-vaporization.</li> <li>• Aspects of conducting proper experiments, paper writing and data presenting.</li> <li>• That when collecting field data, it is most important to be accurate.</li> <li>• GIS and laboratory work.</li> <li>• How to biologically monitor species of interest.</li> <li>• How to collect and manage GPS data point.</li> <li>• How to conduct research, obtain samples and do water quality testing in a laboratory setting.</li> <li>• How to do data entry and interpretation according to USDA FS security requirements.</li> <li>• How to do water sampling and testing.</li> <li>• How to interpret data from a scientific paper.</li> <li>• How to process small mammals.</li> <li>• How to research efficiently and in a more organized fashion.</li> <li>• How to secure data for data management.</li> <li>• How to work in an agency, sampling groundwater wells, working with contractors, data analysis.</li> <li>• I have learned how to carry on a research project by conducting field work (collection, tracking, mapping and locations) and lab</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<p>work (collecting phenotypic traits of tropical edibles in a curatorial lab).</p> <ul style="list-style-type: none"> <li>• I have learned how to conduct a trial from start to finish and all the work that is needed to manage the crops grown for the trial. I have also learned about new agriculture technologies, such as phytoremediation and bio-fortification that allow for remediation of soil and production of marketable agriculture products at the same time.</li> <li>• I have learned that although field work is an important aspect for any job, it's the data collected, and analyzed that makes the project.</li> <li>• I have learned to analyze data from survey, work with GIS and AUTOCAD.</li> <li>• I learned all about watershed health and how to do field surveys and collect data. I also learned how to ID plants and take geomorphology measurements and much more.</li> <li>• I learned how to properly create and edit a research notebook, basic molecular techniques used for analyses, I performed my own analyses on my own data, I learned how convert various qualitative data sets into quantificational data sets, created my own proper scientific report and presentation.</li> <li>• I learned much about lab work, safety and procedures. I learned how to gather, record and store field data and samples, and water quality testing techniques. I also learned how to conduct research for publishing papers.</li> <li>• I learned various important analytical techniques, including the use of an ICP-MS and an HPLC, and the proper sample prep for such instruments.</li> <li>• I was able to sharpen my analytical skills and gain more knowledge in the area of atomic absorption.</li> <li>• Land management and analysis.</li> <li>• Leadership, soils investigation and survey.</li> <li>• Learned critical concepts when maintaining fields that are used for research projects. Learned different mango cultivars and the differences between them. Learned how to analyze and input data collected into a database.</li> <li>• Learned how to analyze data as well as presenting.</li> <li>• Research and molecular techniques in plant tissue culture.</li> <li>• Research opportunities are readily available to those who seek it.</li> <li>• Several scientific techniques.</li> <li>• So far, I have learned proper methods of collecting data, preparing Excel spreadsheets, and communicating with other professionals and non-employee citizens of San Marcos. I also plan to gain more experience in using GIS software over the next</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<p>several months.</p> <ul style="list-style-type: none"> <li>• Telemetry, forging behavior, and vegetation sampling.</li> <li>• The complexity and dedication involved in conducting a research project from start to finish is quiet challenging.</li> <li>• Tick sampling.</li> <li>• To love research, and learned different techniques never done in class.</li> <li>• What it takes to put on research and prepare for writing a proposal.</li> </ul>
<p>3 Learned about Themselves, their Passion in Life, Personally Transformative (with a frequency of 24 responses or 13.9 percent)</p>	<ul style="list-style-type: none"> <li>• A lot but it was thanks to the guidance that my mentor gave me, and thanks to my intentions of getting the most out it.</li> <li>• A small role goes a long way.</li> <li>• Definitely, that cultural difference can affect the evaluation of your job in a foreign location. Also I learned about the USDA-partners and many programs that support the natural resources and agriculture.</li> <li>• Education does really pay off because you get paid better for having education higher than high school.</li> <li>• First of all, I have learned a great deal about myself and my growing interests in research. Specifically, I have learned much about grain-size analysis regarding lake sediments and how the data gathered will eventually lead to projecting water runoff from the sierras. I have also been introduced to inorganic and organic carbon analysis via carbon coulometer.</li> <li>• I do not want to sit behind a desk all day. I would prefer to do more hands-on stuff.</li> <li>• I have learned the importance of producing non-edible renewable fuels. In addition, I learned about the UT goal to one day help switch petroleum for renewable fuels. I have also learned that I love to do research and that it could be a possible career choice for me.</li> <li>• I learned a lot about the NRCS, and that it is now a career I am definitely looking into after graduation.</li> <li>• I learned about the aspects that I need to improve in order to be a better candidate for graduate school. Also, I learned about real graduate careers, the importance of learning from undergraduate courses, how to work on a real and professional laboratory and on the relationship that must be maintained between graduate student and a faculty member.</li> <li>• I learned I want to focus on medical research.</li> <li>• I learned that I am in the right field of study.</li> <li>• I learned that I do not want to become a veterinarian. But I really do enjoy lab work.</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• I learned that I was a quick learner, and I got the job done.</li> <li>• I want to pursue a job in agriculture.</li> <li>• It helped me see another road that I could follow besides working in a company.</li> <li>• It helps the planet and the world; sustainability is everyone’s concern.</li> <li>• Job shadowing with pathologists and clinical area at the pathology department really helped me to decide my interests on my career. Also, I learned aspects of [those tasks.]</li> <li>• My true passion.</li> <li>• One of the main things I have learned was that I realized I am not someone to be in a laboratory.</li> <li>• Self-worth, team work, the importance of insects and plant life, computer skills, remote sensing.</li> <li>• That I really need a career with hands-on work along with technical computer work and research as well.</li> <li>• That lab research is a possibility for me.</li> <li>• The different careers a person could go in and how they can impact lives.</li> <li>• With this experience I have learned to work in a laboratory, and that I could apply my skills to the workplace and has inspired me to continue my studies in the natural sciences.</li> </ul>
<p>4 Students Learned How to Behave in a Professional Environment and What's Needed to Develop a Career (with a frequency of 24 responses or 13.9 percent)</p>	<ul style="list-style-type: none"> <li>• A lot of new concepts related to animal and botanical sciences, how to use some fieldwork tools, and ways to relate to others in a work environment.</li> <li>• Essential skills and trainings needed for my position.</li> <li>• Everything you need to perform this work.</li> <li>• How to fill out paper work.</li> <li>• How to operate and perform in a professional environment.</li> <li>• How to run equipment and process samples. I was able to develop my own theories and ideas during the project and the boss helped me to figure out solutions.</li> <li>• I had learned several processes on how to study the nutrients in the different kinds of soil. Also how to operate the equipment needed for these processes. Also during the internship we had several doctors who mentored me and the other students. It was a great experience, full of learning in the social, educational and environment aspects.</li> <li>• I have learned many valuable skills that will be helpful in successfully obtaining a career with the USDA.</li> <li>• I have learned to work in a professional environment along with applying skills that are applicable to my major.</li> <li>• I have learned what it takes to be an employee for the USDA</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<p>Forest Service.</p> <ul style="list-style-type: none"> <li>• I learned a variety of wildlife techniques and I also made excellent contacts with natural resource professionals that will make me competitive in the job market and possibly lead to future employment.</li> <li>• I learned that there are a lot of different career opportunities with the USDA.</li> <li>• I learned that you have to be very professional at a job that has to do with the government and respectful and I really liked that.</li> <li>• I received an overview of working for an actual USDA agency. I learned how to apply and perform many of the duties in lab and got to network with people that were well experienced in the field.</li> <li>• I was able to observe how the USDA does experiments, talk with engineers and scientists, observe the way everybody worked together and learn more about job opportunities within the USDA.</li> <li>• Job skills.</li> <li>• Punctuality, record keeping, methodology, conducting research, working in a lab.</li> <li>• Skills involved in veterinary careers and day to day challenges.</li> <li>• The entire grant funding process and daily duties of staff at all levels (within IBCE).</li> <li>• The type of jobs that are out there and the work environment. I also learned how to trap and screen the Mexican fruit fly.</li> <li>• Transition from student to professional. Learned about the wide variety of services within the USDA and about the different departments.</li> <li>• Useful what you need to know exactly for that job.</li> <li>• What is required to be prepared for a job with the USDA.</li> <li>• What NRCS does.</li> </ul>
<p>5 Improved Leadership, Communication and English Skills (with a frequency of 20 responses or 11.6 percent)</p>	<ul style="list-style-type: none"> <li>• Everything, from GMPs to SOPs, teamwork, EHS standards (regulated by OSHA). Monitoring noise doses levels for employee safety, leadership and professional behavior.</li> <li>• From this internship, I learned valuable field experience using equipment such as a clinometer and densitometer. I also improved professionally and personally on my writing, communication, and leadership.</li> <li>• Great networking.</li> <li>• How to assist landowners in developing and implementing conservation of natural resources on their private land.</li> <li>• How to work in a lab environment and work with others.</li> <li>• How to write a poster or a scientific poster.</li> </ul>

**Exhibit 67: What have you learned from this internship, job shadowing, or career experience?\* [N = 173]**

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• I have learned about community outreach, youth engagement, project planning/management, volunteer coordination, how to plant trees, and conduct archaeological inventories.</li> <li>• I learned how to lead and supervise a crew of three. Also, how to write yearly reports.</li> <li>• I learned how to organize and host non-profit events related to community improvement and environmental stewardship. Also learned how to test river water and water mounter.</li> <li>• I learned how to think and work better as a scientist. Also, those experiences helped me improve my language skills in English.</li> <li>• I was able to get hands-on experience in the field of wildlife biology, ecology, and hydrology. By being able to do this project I gained invaluable professional skills on how to deal with local community and stakeholders to gain permission to land and also to spread awareness about conservation issues.</li> <li>• Independent project initiation and implementing.</li> <li>• Leadership and working in groups.</li> <li>• Leadership skills, professional training, life experience, and many countless other experiences.</li> <li>• Multitudes of skills.</li> <li>• Network and to communicate well with others, meet new cultures and new ways of thinking respect of what I want to be in a future.</li> <li>• Project management, marine mammal monitoring.</li> <li>• Recreation management in the forest.</li> <li>• This internship has allowed me to gain many ties to agencies around my general area. I have learned a lot about the mechanics of non-profit organizations and what it takes to create excitement within a low-mean community that lives next to a beautiful river. From collecting water monitoring data to treading through dense water hyacinth in a raft this experience has been unforgettable.</li> <li>• Working in a team to get daily task done.</li> </ul>

\*First time question was asked.

Nearly every student (99 percent) would recommend the organization that hosted their internship, job shadowing or career experiences to other students. The two students (1 percent) who did not, had some issues with the project leaders or the payment schedule. Most students indicated that it was an extraordinary learning experience that significantly helped them prepare for their future jobs and to initiate a career in their chosen field. The analysis along with the student responses is shown in Exhibit 68.

**Exhibit 68: Would you recommend this organization to other students?\* [N = 195]**

Main Themes	Student Statements
<p>1 Yes (with a frequency of 193 responses or 99.0 percent)</p>	<ul style="list-style-type: none"> <li>• A lot of knowledge gained!</li> <li>• Awesome opportunities.</li> <li>• Because of the opportunities provided for research, internship and agricultural learning experiences.</li> <li>• Because you get job experiences and during the year you learn a lot from workshops they offer.</li> <li>• Can help you to improve the knowledge by making with your hands.</li> <li>• Challenging experience and it shows on the real face of the Pharmaceutical Industry these days, including the regulatory standards they have to meet.</li> <li>• Excellent preparing the students to learn all about the function and work that agency realize.</li> <li>• Excellent.</li> <li>• For the experience.</li> <li>• Great experience- good networking.</li> <li>• Great experience with professionals in the workforce.</li> <li>• Great experience.</li> <li>• Great opportunities!</li> <li>• Great opportunity to get funded to learn skills and essentially get trained for a potential future career. You are also continually notified of opportunities for advancement and/or future potential careers.</li> <li>• Great opportunity.</li> <li>• Has been a great learning experience.</li> <li>• Highest recommendation to any student interested in agriculture or GIS. Incredible experience!!!!</li> <li>• I have been able to meet and work with professionals in my field of study and the pay is great!</li> <li>• It is important for our future.</li> <li>• I learned a lot and enjoyed my summer very much.</li> <li>• I would recommend this organization to other students because it is an opportunity to gain experience, and to get a job in the future with an agency that has a well-focused mission to save the lands of our country.</li> <li>• If they are interested in research on ornamentals this is the place to go.</li> <li>• If you have any doubts then you can really learn what you like and do not like.</li> <li>• If a community-based internship where you are involved with people a lot is what you like, I would recommend it.</li> <li>• In my opinion, this organization provides a great experience to network and gain as much knowledge and experience that a student can ask for.</li> </ul>

**Exhibit 68: Would you recommend this organization to other students?\* [N = 195]**

Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• It brought me a lot of intellectual, as well as personal, benefits.</li> <li>• It is an excellent program to obtain employment with a government agency.</li> <li>• It is a good way to explore.</li> <li>• It prepares you as a professional.</li> <li>• It was a great learning experience!</li> <li>• It was an amazing opportunity and they are very flexible with students.</li> <li>• It was very interesting.</li> <li>• It's a great experience and opens doors.</li> <li>• It's a great experience.</li> <li>• It's a great learning experience. [2]</li> <li>• It's a great way to become aware of just how important it is to help maintain the environment.</li> <li>• It's great and there is a lot of potential to move up.</li> <li>• It's very hands-on.</li> <li>• Most of the time people think of soil conservation as a physical aspect but it takes a concerted effort of mechanical and plants to achieve effective soil erosion control.</li> <li>• My boss was a great person who was passionate about what she did and loved teaching me everything she knew.</li> <li>• Rewarding experience.</li> <li>• The agency is so willing to help students who have an interest in natural resources.</li> <li>• The agency is top notch.</li> <li>• The mentors are great people who are willing to share their knowledge.</li> <li>• The people are great and very helpful.</li> <li>• They are active with the students and interns. It was a lot of fun and a unique experience.</li> <li>• They were great mentors and kept me on my toes at all times.</li> <li>• Useful what you need to know exactly for that job.</li> <li>• You will get more knowledge in your area of study.</li> <li>• No additional comments. [143]</li> </ul>
<p>2 No (with a frequency of 2 responses or 1.0 percent)</p>	<ul style="list-style-type: none"> <li>• I would if changes were made to the people who manage this grant.</li> <li>• I would recommend it, only if they have the means to survive without pay for two months, as the stipend is paid approximately 1.5 months after the internship is completed.</li> </ul>

\*First time question was asked.

Another way of gauging students' experience with the organization that hosted their internship, job shadowing or career experience was their willingness to work there if the opportunity presented itself. When asked this question, most students (91.2 percent) indicated that would gladly consider a job offer from this organization, after their graduation. Many of them explained that it would be a great opportunity. One telling statement is from a student who would consider the opportunity because: "Before I did my second internship, I had no idea APHIS even existed. My internship with APHIS opened my eyes and helped me realize that I enjoyed everything I did during my internship and would love the opportunity to one day work with the agency and put the knowledge and experience I gained back into the agency."

Most of the students who would decline the offer explained that they would like to pursue more advanced studies after they graduate, or they would like to work in another geographic area, or that they found that the type of job offered by the organization would not be a good fit with what they wanted to do. They still were grateful for the experience. Exhibit 69 shows the analysis and the student responses in both cases.

<b>Exhibit 69: If offered, would you accept employment in this organization after graduation?* [N = 193]</b>	
<b>Main Themes</b>	<b>Student Statements</b>
1 Yes (with a frequency of 176 responses or 91.2 percent)	<ul style="list-style-type: none"> <li>• Awesome opportunity. I would definitely take a position if offered.</li> <li>• Because I love research.</li> <li>• Before I did my second internship, I had no idea APHIS even existed. My internship with APHIS opened my eyes and helped me realize that I enjoyed everything I did during my internship and would love the opportunity to one day work with the agency and put the knowledge and experience I gained back into the agency.</li> <li>• Excellent.</li> <li>• Great benefits and competitive pay.</li> <li>• I did not accept employment after I graduated with my BS in order to pursue an MA. But I would accept a job after my MA is complete.</li> <li>• I enjoyed being there because of all I learned; it helps me apply that knowledge somewhere else.</li> <li>• I like it.</li> <li>• I like the wildlife related research being conducted on the Preserve.</li> <li>• I love what I do.</li> <li>• I think I could help at least one land owner keep his land from eroding away then my education and my job would have been worth all the work I did at the university.</li> <li>• I want to work on an organic farm.</li> <li>• I would accept employment in this agency because thanks to the summer internship I know the kind of work I have to do in this agency.</li> <li>• I would accept employment in this organization in a</li> </ul>

**Exhibit 69: If offered, would you accept employment in this organization after graduation?\* [N = 193]**

Main Themes	Student Statements
	<p>heartbeat. I have had such a positive experience with my internship.</p> <ul style="list-style-type: none"> <li>• I would be able to play a role in an agency that helps maintain the environment.</li> <li>• I would but hopefully it would not be long term.</li> <li>• I would like to work there, or nearby. Perhaps not at the college.</li> <li>• If reasonable and best situation.</li> <li>• It brings me the opportunity to work in my area of study and brings me a lot of challenges that will improve my contingency skills.</li> <li>• It has great benefits, the supervisor was very helpful and understanding and I loved the environment.</li> <li>• It is a goal for me to get a job in a USDA agency to offer my services, knowledge and professional preparation.</li> <li>• It is an amazing agency, and I can see myself working there.</li> <li>• It will be my first experience working after graduation. Plus, working at a university will be a great experience.</li> <li>• My goal is to obtain a job in one of these organizations.</li> <li>• Of course because I am focused on getting the best education and continue to study to get in the graduate school to be trained to work with the USDA. Also I am improving my English because probably I must know good English to get the USDA job.</li> <li>• Rewarding experience, great people.</li> <li>• This has been my favorite agency to complete an internship.</li> <li>• USDA was the reason I wanted to pursue a college degree.</li> <li>• Worked with a great staff.</li> <li>• No additional comments. [147]</li> </ul>
<p>2 No (with a frequency of 17 responses or 8.8 percent)</p>	<ul style="list-style-type: none"> <li>• After I finish my master's degree.</li> <li>• Changed major emphasis.</li> <li>• Depends on if the job is fitting.</li> <li>• I plan to attend graduate school before accepting a job offer.</li> <li>• I plan to move to a different city after graduation.</li> <li>• I would not accept an employment offer in this organization, due to the current fiscal situation inside said institution.</li> <li>• I would prefer to work in Southern California after grad school.</li> <li>• It depends on the workplace.</li> <li>• It is a good job; it is just not what I want to do.</li> <li>• It is not exactly what I want to do. I am hoping to work with wildlife when I graduate.</li> </ul>

**Exhibit 69: If offered, would you accept employment in this organization after graduation?\* [N = 193]**

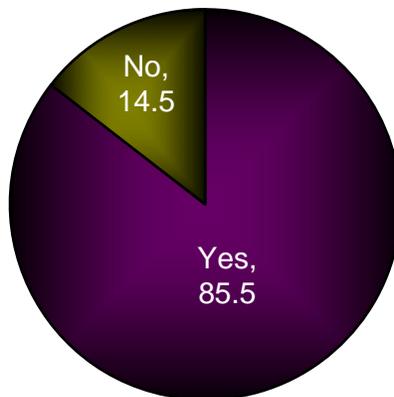
Main Themes	Student Statements
	<ul style="list-style-type: none"> <li>• Just maybe, not yes, because it is not really my field of master's degree.</li> <li>• No career advancement opportunities.</li> <li>• Only good for volunteering.</li> <li>• No additional comments. [4]</li> </ul>

\*First time question was asked.

**Student Proclivity to Participate in Experiential Learning**

Students who had not participated in an internship, job shadowing or career experience, were asked whether they had plans to do so. More than 85 percent (85.5 percent) responded in the affirmative (Exhibit 70).

**Exhibit 70: If you have not participated in an internship, job shadowing or career experience, are you planning to do so in the future?\* [N = 165]**



\*First time question was asked.

The few who responded negatively indicated for the most part that they were busy trying to finish their current studies and graduate or they already had a job (see Exhibit 71).

**Exhibit 71: Reasons for Not Participating in an Internship, Job Shadowing or Career Experience\***

- My research keeps me busy and at the moment will suffice for graduating and possibly getting a masters'.
- Graduating with a masters and will seek employment.
- I'll find an internship with a petroleum-related company.
- As an MS student, my research program should be adequate to prepare me for jobs, and I have no time.
- I'm next to graduate.
- I participated in an internship in a non-USDA agency.
- I said no, but I can barely think a week ahead of time.
- I already have a job.

### Exhibit 71: Reasons for Not Participating in an Internship, Job Shadowing or Career Experience\*

- I have not found any positions that as a chemical engineer I would be particularly interested in.
- Seems like very few opportunities available to economists.
- Focusing on thesis; no time for it, although I would be interested.
- I am ready to get an actual career soon.
- I will pursue a PhD after completing my MS.
- I'm a graduate student.

\*First time question was asked.

Most students who plan to participate in an internship, job shadowing or career experience (70.3 percent) estimate that they will start in May or June of 2014 (Exhibit 72).

### Exhibit 72: If you are planning to participate in an internship, job shadowing, or career experience, when (month and year) will this happen (in your estimation)?\*

Year	Month	Number	Percent
2013	May	1	0.9
2013	June	2	1.9
2013	August	1	0.9
2013	November	1	0.9
2013	December	2	1.9
2014	January	7	6.5
2014	February	1	0.9
2014	March	2	1.9
2014	April	2	1.9
2014	May	21	19.4
2014	June	55	50.9
2014	July	4	3.7
2014	August	2	1.9
2014	September	2	1.9
2015	January	1	0.9
2015	May	1	0.9
2015	June	3	2.8
<b>Total</b>		<b>108</b>	<b>100</b>

\*First time question was asked.

Students were provided a list of all USDA agencies for them to choose the one where they plan to have their internship, job shadowing or career experience. Exhibit 73 shows their selections. Students showed a preference for Agricultural Research Service (ARS) with 27.6 percent of their selection, followed by Natural Resources Conservation Service (18.9 percent), Animal and Plant Health Inspection Service (16.5 percent) and Forest Service (12.6 percent). Nearly 10 percent (9.4 percent) planned to engage in other companies. Exhibit 63 shows the analysis and the other companies or institutions students mentioned.

**Exhibit 73: If you are planning to participate in an internship, job shadowing, or career experience, where (organization or company) will this happen (in your estimation)?\***

Agencies		Number	Percent
1.	Agricultural Research Service (ARS)	35	27.6
2.	Natural Resources Conservation Service (NRCS)	24	18.9
3.	Animal and Plant Health Inspection Service (APHIS)	21	16.5
4.	Forest Service (FS)	16	12.6
5.	Food Safety and Inspection Service (FSIS)	9	7.1
6.	Food and Nutrition Service (FNS)	7	5.5
7.	Agricultural Marketing Service (AMS)	2	1.6
8.	Rural Development (RD)	1	0.8
	Other	12	9.4
<b>Total</b>		<b>127</b>	<b>100.0</b>
<b>Other Organizations Mentioned:</b>			
	Bayer Crop Science		
	FDA, FAO		
	La Semilla Food Center		
	National Park Service		
	Texas A&M Agrilife		
	UT Dallas Natural Science and Engineering Research Lab		

\*First time question was asked.

**Student Participation in Conferences**

Students were asked about the kind of benefits they received from the conference they attended. Several choices were provided. Exhibit 74 lists their selections in order of frequency in the most recent survey. Most students found the conferences useful for professional growth (72.6 percent), networking opportunities (69.0 percent), learning about jobs (67.1 percent), and presentation experience (65.5 percent), and learning about internships (62.3 percent), among others. These percentages were somewhat lower than last years'. Also there were more students (from 2.2 percent to 4.8 percent) who did not find any utility attending conferences compared to last year survey results. The number of students that appeared not to have attended any conferences also increased from 9.7 percent to 21.0 percent.

### Exhibit 74: Conferences are Providing Me Opportunities for....

Statements		2011-12		2012-13	
		Number	Percent	Number	Percent
A.	Professional growth	219	81.7	225	72.6
B.	Networking opportunities	184	68.7	214	69.0
C.	Learning about jobs	193	72.0	208	67.1
D.	Presentation experience	194	72.4	203	65.5
E.	Learning about internships.	193	72.0	193	62.3
F.	Knowing other cities	142	53.0	179	57.7
G.	N/A	26	9.7	65	21.0
H.	None of the above, attending conferences has not been valuable to me	6	2.2	15	4.8

Students were asked to provide the names of the conferences they attended. Exhibit 75 provides their responses in alphabetic order. Repeated names were deleted and their frequency placed in squared brackets ([ ]). Four conferences were prominent: Hispanic Association of Colleges and Universities (HACU) Annual Conference, with a frequency of 30, the Center for Education and Training in Agriculture and Related Sciences (CETARS), with 29 references, Latinos in Agricultural Leaders Conference, with 27, and Minorities in Agriculture, Natural Resources Related and Sciences (MANRRS) with 21 references.

### Exhibit 75: What conference did you attend?\*

- AAAS [3]
- ABRCMS
- ACS National Meeting in New Orleans, April 2013 [4]
- AFA Leadership Conference
- Agricultural Outlook Forum
- Agricultural Symposium in Texas
- Agriculture: Science of the Future
- Agro-Ecology Symposium [6]
- Agro-Safety Training Conference in New Mexico [6]
- American Chemical Society National Meeting & Exposition, Philadelphia, PA, Aug. 19–23, 2012 [2]
- American Society for Plant Biology [3]
- AMP conference [2]
- ASGA
- ASM Texas Branch
- Cancer Conference
- CATIE Training
- Center for Education and Training in Agriculture and Related Sciences (CETARS) [29]
- Congressional Hispanic Leadership Institute

### Exhibit 75: What conference did you attend?\*

- COS Research Conference - UTSA
- Ecological Society of America: Race, Ethnicity, and Places
- Emerging Researchers National Conference
- Entomological Society of America
- EPCOR 2013
- ESRI
- FATE Conference
- FIU Agro-ecology Symposium, Inter-American University of Puerto Rico FCCAgE symposium
- FNCE [2]
- Food Safety and Handling.
- GRAS
- GSA Denver, CO
- Hispanic Association of Colleges and University (HACU) Annual Conference [30]
- Hispanic in Agriculture Leadership Conference
- Horticulture conferences
- HSI Symposium
- IFAMA in Atlanta [2]
- IIE Annual Conference in Puerto Rico [3]
- Industrial and Systems Engineering Conference
- INFORMS Conference [3]
- International Trail Symposium
- ISERC 2013
- ISG Iguana specialist Group Meeting
- Joint Annual Meetings [4]
- Latinos in Agricultural Leaders Conference [27]
- MAES symposium 2013-2013
- MANNRS
- MGE@MSA/WAESO 2013
- Minorities in Agriculture and Natural Related Resources Sciences (MANRRS) [21]
- Nanotechnology and agriculture [3]
- National 4H Conference
- National Advancement for Science
- National Conservation Career Symposium, West Virginia
- National FFA Convention
- National MANRRS Conference - Sacramento
- Natural Resources
- NCSL
- NEA Science
- New Chemistries Symposium 2003, Delft, The Netherlands
- Nitrate Treatment Technology CA EPA, Sacramento
- NMSU Bio-symposium [2]
- NRCS Zone 3 conferences
- NRCT retreats in 2012 and 2013
- NSF
- PACE conference in Pasadena, California

### Exhibit 75: What conference did you attend?\*

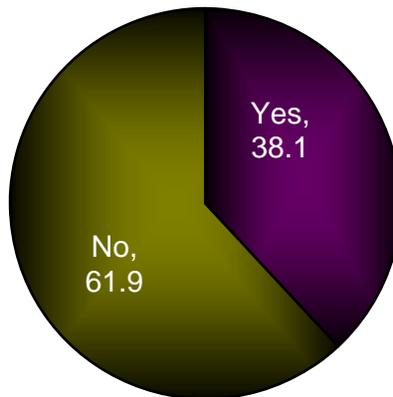
- PRASA
- Reciprocal Meat Conference
- Re-Energize the Americas
- Riparian Conferences
- SACNAS conference in 2002 in Anaheim, California [5]
- SAF 2013
- SAGE
- Salmon Restoration Federation Conference
- SAMPE tech 2013
- SCCUR
- Science Symposium
- Scientific Literature Search- February 21, 2013 [2]
- SITC budget conference
- SNO Conference in Santa Barbara, CA. November 2013 [2]
- Society for Range Management National Meeting 2013
- Society of American Foresters Conference
- Southwest Energy Science and Engineering Symposium
- SSSA conference in Tampa, Nov 2013
- St. Thomas University Undergraduate Research Symposium
- Step Up Program in TAMUK
- Sustainable Nanotechnology Organization Conference, Arlington, VA, Nov. 4–6, 2012 [2]
- SWFE Conference [2]
- TAMUK Workshop [2]
- Texas Academy of Science [3]
- Texas State Student Diversity and Inclusion Conference—Equality
- TMS 2013
- TOP Conferences
- UPRM
- USAJOBS
- USCID
- USDA Conference/Webinar/Symposium [18]
- UTEP Chemistry Seminar, El Paso, Texas
- UTEP Geological Science Colloquium, El Paso, Texas
- Valley Plant Society meeting
- Water Conference in San Bernardino
- Wildlife Society Conference
- Wildlife Society Joint Annual Meeting
- WISE
- WRI 2013 in Long Beach [2]
- WRPI 2012 in Sacramento
- WSSA conference in California

\*First time question was asked.

### Student Participation in Community Activities

Community activities present another opportunity for students to realize some experiential learning. When asked about this, 38.1 percent of students indicated that they participated in community activities (Exhibit 76).

**Exhibit 76: Were you involved in any community activities through the program?\***  
[N = 310]



\*First time question was asked.

To gain a sense of the student involvement in these activities, they were asked to enter the number of hours they spent in their community activities. More than 60 percent (61.1 percent) of the students spent fewer than 41 hours in community activities (Exhibit 77). A few students spent many more hours, increasing the average to about 50 hours for all students. The median and mode were both 40 hours, reflecting a more representative central measurement for all students.

<b>Exhibit 77: If you were involved in community activities, please indicate the approximate number of hours spent*</b>			
<b>Descriptive Statistics</b>	<b>Number of Hours</b>	<b>Total</b>	<b>Percent</b>
<b>Frequency</b>	4 to 20	25	34.7
<b>Distribution</b>	21 to 40	19	26.4
	41 to 60	13	18.1
	61 to 80	3	4.2
	81 to 100	7	9.7
	101 to 200	4	5.6
	201 to 250	1	1.4
	<b>Total</b>	<b>72</b>	<b>100</b>
<b>Other</b>	Mean	50	
<b>Statistics</b>	Median	40	
	Mode	40	

\*First time question was asked.

### Factor Affecting Students Relocation

Finally, students were asked about the factors that would keep them from relocating to take a USDA-related job. Exhibit 78 lists their selections in order of frequency. More than half of the students (55.5 percent) did not have any problem relocating. The other half selected the following issues: Potential costs (37.1 percent), distance (17.1 percent), unfamiliarity with area (11.0 percent), family would not want them to move (9.7 percent), and not knowing anyone there (9.0 percent). The order this year was identical to the previous year and the percentages were very similar, indicating an important trend.

<b>Exhibit 78: Factors that Keep Students from Relocating to Take a USDA Related Job</b>					
<b>Statements</b>		<b>2011-12</b>		<b>2012-13</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
A.	None of the above, I am willing to relocate wherever the job is (to another state, Washington, D.C., etc.)	142	53.0	172	55.5
B.	Potential costs	102	38.1	115	37.1
C.	Distance - the job requires relocation to a new town/city	52	19.4	53	17.1
D.	Unfamiliar with the area/city where job is located	42	15.7	34	11.0
E.	My family would not want me to move	34	12.7	30	9.7
F.	Not knowing anyone there	25	9.3	28	9.0

Other factors that would keep student from relocating to take a USDA-related job include the following (see Exhibit 79). This list echoed similar themes as the previous year, although its length is about half of what it was last year.

<b>Exhibit 79: Other Factors that Would Affect Decision to Relocation for Job or Internship</b>	
<ul style="list-style-type: none"> <li>• I would prefer to stay in southern California near my family.</li> <li>• My girlfriend.</li> <li>• Personal farming project development.</li> <li>• I don't want to work for the USDA.</li> <li>• Besides costs, I would need to bring my husband and kids with me!</li> <li>• Already have a job.</li> <li>• Pets or school.</li> <li>• High cost of living in D.C. Terrible commutes.</li> <li>• Availability of funds restricting how far I would like to go and whether or not it can sustain me during the length of my internship.</li> <li>• Amount of long distance travel and overnights required away from home.</li> <li>• Where my husband is employed.</li> <li>• Child care support.</li> </ul>	

## Preparation for Field of Interest and Overall Goals

To assess how well-prepared student felt upon entering the program and their overall goals, the online survey asked them several pertinent questions in a Likert scale. The survey listed several assertions in this regard and asked students to select the degree to which they agreed with the statements. Exhibit 80 shows their responses, summarized by *Agree* and *Disagree* for simplicity.

Nearly 70 percent of the students (69.4 percent) felt that they were well prepared in high school. More than 80 percent (84.2 percent) indicated that their high school encouraged them to enroll in college. Virtually all of them (91.9 percent) pointed out that their dream has always been to have a professional career and getting a college degree (93.8 percent). Many (69.8 percent) indicated that their immediate goal was a career in a USDA related area; few (7.8 percent) disagreed with this goal. These percentages were almost identical to the previous year's results, as suggested by the totals for school year 2011-12.

Exhibit 80: Preparation for Student's Field of Interest and Overall Goals							
Statements		Agree		Neutral/NA		Disagree	
		Number	Percent	Number	Percent	Number	Percent
A.	I feel I was well prepared in high school to enroll in college.	215	69.4	45.0	14.5	50.0	16.1
B.	My high school encouraged me to enroll in college.	261	84.2	29.0	9.4	20.0	6.5
C.	My dream has always been to have a professional career.	284	91.9	22.0	7.1	3.0	1.0
D.	A career in a USDA related area is my immediate goal.	215	69.8	69.0	22.4	24.0	7.8
E.	Getting a college degree has always been my goal.	289	93.8	14.0	4.5	5.0	1.6
<b>Total</b>		<b>1,264</b>	<b>81.8</b>	<b>179</b>	<b>11.6</b>	<b>102</b>	<b>6.6</b>
<b>Total (2011-12)</b>		<b>1,120</b>	<b>83.8</b>	<b>128</b>	<b>9.6</b>	<b>88</b>	<b>6.6</b>

### Students Additional Comments

Finally, students were given an opportunity to express any other comments they desired to share. Exhibit 71 lists them. An analysis of their responses shows that most students (83.2 percent) did not take the opportunity to express additional comments. This might be a reflection of the length of the survey, or perhaps, more positively, of its thoroughness.

One the other hand, students who expressed some additional comments were very positive about the project and its effect on their future profession or economic prospects. In the most relevant theme in this group, students (5.8 percent) *expressed gratitude and appreciation for the opportunities provided by project*. As an example, one student said, "I would like to take the time to thank the USDA for allowing me the opportunity to work with such great individuals and expand my knowledge about the different aspects that agriculture has to offer, especially within USDA APHIS."

The second most relevant theme among students who provided some comments underscored that the *project provided a great opportunity to gain experience in the real world and jobs that will help in*

*students' future success.* About 4.2 percent of the entire group was classified under this theme. One representative comment was this: "Great program! Entering college not knowing anything, I did not know what to expect; this program was of great help mentoring and letting me know of all these doors that are open that I had no idea existed."

Some students did take the opportunity to *provide feedback to improve the project or the survey* (4.2 percent). A few students indicated that they had not been given as many opportunities as others had, and complained about a degree of inequity or some shortcoming in the administration of the project. Other students wanted the project to be expanded so they could stay a little longer in it. And others wanted to learn more about the project various possibilities, including how to get internships or to get to go to conferences, or participate in actual research.

In the last theme that resulted from the content analysis, students *expressed admiration for the project.* They said the project was awesome, a great experience, or "I love this program." Exhibit 81 list of students comments under the various themes.

Exhibit 81: Student Additional Comments	
Main Themes	Student Statements
1 No Comments or Skipped Question (with a frequency of 258 responses or 83.2 percent)	<ul style="list-style-type: none"> <li>• N/A. [7]</li> <li>• No. [16]</li> <li>• None. [2]</li> <li>• Skipped question. [233]</li> </ul>
2 Expressed Gratitude and Appreciation for the Opportunities Provided by the Project (with a frequency of 18 responses or 5.8 percent)	<ul style="list-style-type: none"> <li>• I am appreciative and thankful of the opportunity that has been given to me by WRI in conjunction with the USDA. It has helped me enhance my knowledge in my field of study.</li> <li>• I appreciate my teachers/mentors for their effort in wanting us to succeed in school and with the USDA.</li> <li>• I really enjoyed participating in the STEP UP program as well as presenting a poster for one of my professors. This was all new to me and I am thankful for having the opportunity to have been able to do this. Thank you all for everything!</li> <li>• I would like to express my thankfulness to this agency and to San Bernardino for giving me the opportunity to grow professionally and network with amazing people.</li> <li>• I would like to take the time to thank the USDA for allowing me the opportunity to work with such great individuals and expand my knowledge about the different aspects that agriculture has to offer, especially within USDA APHIS.</li> <li>• It was an honor to be in FCCAgE.</li> <li>• Thank you for this program! It has changed my life for the better and for that I will always be grateful.</li> <li>• Thanks for everything!</li> <li>• Thanks for giving me this wonderful opportunity!</li> <li>• The experience gained from this internship was more than what I expected and I thoroughly enjoyed having the opportunity to experience this type of work. I am very grateful to have been</li> </ul>

## Exhibit 81: Student Additional Comments

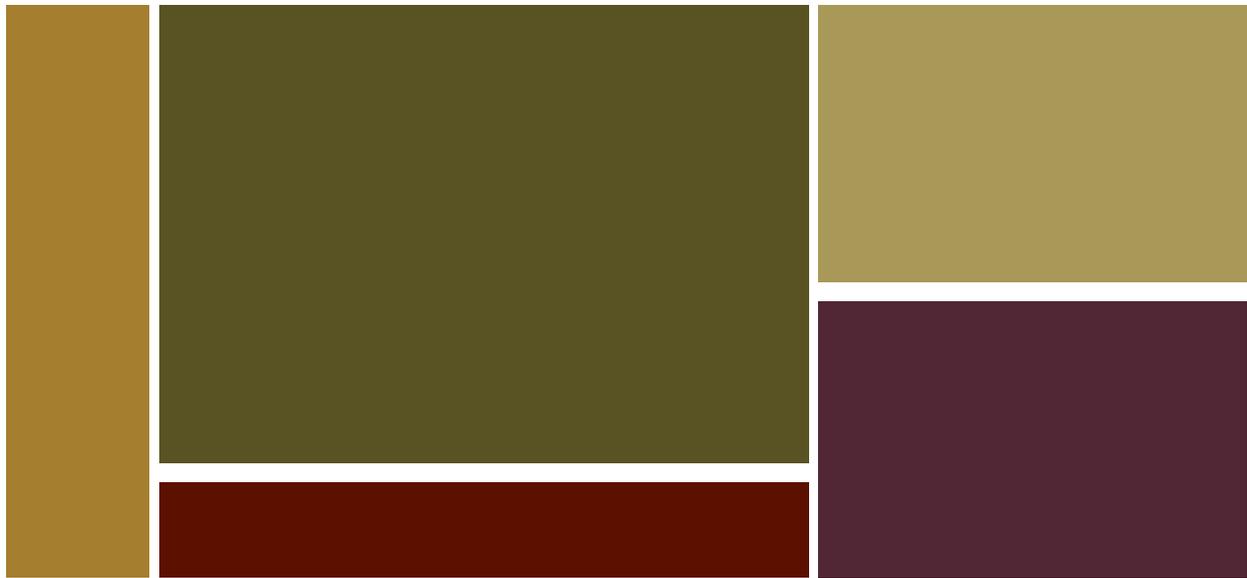
Main Themes	Student Statements
	<p>offered and given such a wonderful opportunity.</p> <ul style="list-style-type: none"> <li>• The FCCAgE program has been one of the best and most valuable experiences that I have had since I started attending college in 2009. I am a strong believer in the program and I strongly think it should be expanded to more students.</li> <li>• The internship has been great, but the only thing that it has done is to give me more job related experience. The internship has nothing to do with my career aspirations but it has been a wonderful experience.</li> <li>• The NRCT is a great program that has helped me so much, providing me with services and opportunities for future jobs.</li> <li>• The NRCT Program is the best thing that could have happened to me in my college career. It has provided me with so many great opportunities and I am extremely thankful that I am a part of such a great program!</li> <li>• This opportunity is amazing. Thank you very much for allowing me to participate!</li> <li>• This program has exposed me to other minority students in the natural resource field which inspired me to keep going and showed me that more Hispanics are getting involved with this field. It also supported me and made me feel like others care for the success of us students. Thank you for your contribution to my future!</li> <li>• This program is life changing and I am glad I was chosen to be part of this program. Within the program, I have a great support system. Most importantly, I get to partake in the bio-fuels research projects. Thank you very much!</li> <li>• This scholarship is wonderful I am thankful for it.</li> </ul>
<p>3 Project Provided Great Opportunity to Gain Experience in Real World and Jobs that Will Help in My Future Success (with a frequency of 13 responses or 4.2 percent)</p>	<ul style="list-style-type: none"> <li>• Being professional and determined goes a long way in the workplace.</li> <li>• Great program! Entering college not knowing anything, I did not know what to expect; this program was of great help mentoring and letting me know of all these doors that are open that I had no idea existed.</li> <li>• Having this opportunity was an honor and a chance to grow as a person; it's well appreciated.</li> <li>• I am excited to keep on working on the BGEEN project because the experience will be my best key to success.</li> <li>• I am sure that being enrolled in the CETARS program will open doors for me related to what I love: chemistry and the environment.</li> <li>• I think the NRCT program is a great program for students. It provides them with skills and trainings that will make them more competitive in the job market.</li> <li>• I would like to know if there are opportunities to have references</li> </ul>

## Exhibit 81: Student Additional Comments

Main Themes	Student Statements
	<p>through this project. I think it would be nice, since this project allows students from all over California and surrounding states, to have local USDA workers involved with student projects.</p> <ul style="list-style-type: none"> <li>• I would like to say that this was a great experience and that this opportunity has prepared me for the job I am currently in.</li> <li>• My USDA internship was a wonderful experience!</li> <li>• TAMUK has an excellent program with excellent faculty. The Golden Meadow PMC was an excellent internship place with excellent staff.</li> <li>• The FCCAgE is my most important key to have a future full of successful and knowledge. I am proud!</li> <li>• This was a great learning experience; however, more information on where job opportunities lie would be beneficial.</li> <li>• This was a helpful learning experience for working in a laboratory setting.</li> </ul>
<p>4 Provided Feedback to Improve Project or Survey (with a frequency of 13 responses or 4.2 percent)</p>	<ul style="list-style-type: none"> <li>• Higher education should be cheaper for all.</li> <li>• I applied for USA jobs internships last summer but I was not accepted. Instead I was accepted to an REU program at Rutgers. I want to participate greatly in this program, do internships, get a job and go to the conferences but just as I was about to get more involved the funding was cut. I hope, if the funds are returned, to become incredibly involved.</li> <li>• I did not start college until fall 2012, though the survey would not let me submit unless I entered a number for fall 2011 and spring 2012. I entered any number to be able to submit. [This will be corrected in next survey.]</li> <li>• I enrolled in the program three months before my bachelor's graduation. I really enjoyed the first year but the second one needed more organization. On the other hand, there are some students that in repeated occasions travelled to conferences outside PR with the program. I think they should give opportunities to other students and not to the same ones. Conferences help students learn about agencies and job opportunities, networking opportunities, meet new cities, etc.</li> <li>• I know my internship with the PMC here in Kingsville did not go well for me, as I was dealing with health issues. With my doctors helped people that know me from my first semester at this university and my professor whom I saw during this summer noted a dramatic difference in me; I am more capable now of doing any work that is required of me. All I need is just a chance to prove it.</li> <li>• I wish I could get more information about USDA summer internships.</li> <li>• I would like more internships and information.</li> <li>• I would love for this program to be extended. I just joined and</li> </ul>

### Exhibit 81: Student Additional Comments

Main Themes	Student Statements
	<p>feel like I have not had all of the experiences like everyone else has had.</p> <ul style="list-style-type: none"> <li>• New to this program.</li> <li>• Now that I am graduating, I feel like I know a lot but still hopeless to get a job within the USDA.</li> <li>• The only concern that I have about the program is the management of the USDA-FCCAgE link, or the USDA liaison personnel. I feel that I was not attended to as I was told I would, despite emailing resumes for help and development.</li> <li>• USDA link should arrange his priorities in order to better help our FCCAgE scholars reach their goals.</li> <li>• I would like to learn more about internship opportunities available to people with expertise other than agricultural.</li> </ul>
<p>5 Expressed Admiration for Project (with a frequency of 8 responses or 2.6 percent)</p>	<ul style="list-style-type: none"> <li>• Awesome Program!</li> <li>• Great Experience!</li> <li>• Great program! [2]</li> <li>• I feel really honored to be in this program.</li> <li>• I love this program.</li> <li>• Overall the FATE program is excellent. The only thing I wish I would have had was a chance at better instructors or more options offered when picking classes. Some of my classes are not only hard, but unorganized. I have had trouble up till this point and it has actually kind of disappointed me when choosing Texas State.</li> <li>• This was and is a great experience.</li> </ul>



## Conclusions, Discussions and Next Steps

### Implications from Archival Review and Meta-Analysis

- **Institutional Efficacy.** Based on a review of the information provided on the outcome indicators and observations from site visits, the collaborative projects are recruiting and enrolling students at and above the targets set to increase the number of underrepresented students, particularly Hispanics, in agricultural-related careers. The participating sites have partnered with USDA agencies and other institutions to provide internships and experiential learning opportunities for students. Additionally, the project sites have created research projects and designed courses to strengthen the academic preparation and research capabilities of students. Student support systems are emerging including the provision of mentors, membership in agriculture-relation groups, websites, curriculum development, and outreach to K-12 institutions. Despite this early success, challenges still persist in creating internships for students in some USDA agencies due in part to changes in the USDA work and career experience programs and federal funding costs caused by sequestration.
- **Collaborative Action.** During the second year of project implementation, the collaborative projects have established partnerships with an array of USDA agencies and program offices. The project sites have participated and made presentations in a number of national conferences, often providing participating students and faculty members to provide multi-media presentations on their project and research publications. The project directors/principal investigators have participated in frequent teleconferences and meetings with the USDA NIFA program manager. In these settings, project staff have had opportunities to problem-solve and share lessons learned from project implementation.
- **Collective Impact.** Each project has provided information on the required outcome measures though reporting formats and level of detail varies from site to site. Information contained in progress and annual reports show that the grantees are implementing program activities which show great promise for increasing the number of underrepresented students in food, agricultural sciences, natural resources, and nutrition.

## Implications from Online Student Survey

- **Participation Rate.** With an average response rate of 83 percent, most colleges and universities had a healthy participation. This rate represented an important improvement from the 71 percent last year participation rate. However, there was a wide range in participation rates across institutions, ranging from 62 percent to 97 percent. Perhaps, it would be important to contact low-rate participation institutions to find out the reasons behind their lagging participation.
- **Study Program Satisfaction.** Virtually all students (93.5 percent) were satisfied with the program in which they are enrolled. This figure represented a slight decrease from last year's 97.4 percent, which was due most likely to the larger sample obtained this year. Therefore, we can consider this finding a reaffirmation of this trend. It is important to continue to support the students as each institution looks into the project sustainability. It is important to realize when an initiative is working to continue it and expand on its success.
- **Improving the Colleges or Universities.** When students were pressed for improvements, about two-thirds (65.8 percent) were perfectly happy with what their institutions were doing. This is important because it supports the general trend of student high satisfaction with their institutions. Among the one-third (34.2 percent) who suggested some improvements, (a) 8.1 percent indicated a need for more research projects, (b) 7.1 percent wanted a greater variety of course offerings, and (c) 7.1 percent desired expanded degree programs. These findings are similar to last year's. The main difference is that this time we were able to quantify them through an in-depth content analysis of student responses. This analysis also yielded some new findings: (d) 5.2 percent suggested that the institution improve its community of learners. They wanted more student involvement, personal connections with the professors, and other similar manifestations of an activate community of learners; (e) 3.5 percent wanted to expand or improve the faculty, particularly in the way they teach their courses and how they relate to students; (f) 2.6 percent were unhappy with the support they received in the financial aid department; they implied that staff should receive better training and that the training should include more orientation on how to help students find jobs or plan their careers; and (g) 0.6 percent suggested that the institution become a full university. These findings might provide elements for a road map to improve the institutions.
- **Recruitment of Underrepresented Students.** The large majority of the students (74.5 percent) felt their institutions were doing a good job recruiting underrepresented students, and therefore, no change was really needed. However, one-fourth (25.5 percent) provided these suggestions that might help the institutions become even better: (a) 10.0 percent suggested increasing direct contacts with prospective students, through a variety of strategies, including more proactively interacting with high schools to enthuse them about the fields and the possibilities the program offers to minorities, and increase the number of activities (seminars, agriculture weeks, and symposiums) to attract attention to the program; (b) 5.5 percent recommended to create or expand a media campaign, perhaps through more publicity, fliers and other means, such as the internet, Facebook and radio and television. These findings are similar to last year's findings. This time, a more sophisticated content analysis quantified them. In addition, the analysis found new suggestions as follows: (c) 3.5 percent suggested the institution should offer incentives, to be given to the new students and/or to students who helped bring the new students in. These incentives can take the form of scholarships, payments for books, parking, and tuition waiver or reduction; (d) 3.2 percent

recommended involving prospective high school students in university activities, perhaps through a class or some hands-on training so they could experience the program first hand, or through fun and informal activities that encourage prospective students to interact with university students so they get a feel for university life; and (e) 3.2 percent suggested reaching out to the community to understand its needs and proceed from there, by asking their leaders many questions, talking to parents, and reaching out beyond the traditional minority groups.

- **Improving Experiential Learning.** Most students (88.4 percent) were satisfied with what was been offered in this area. Out of the 11.6 percent of students who thought additional support was needed, (a) half (4.8 percent) suggested more opportunities in areas such as jobs, internships, scholarships and independent research, perhaps through more direct USDA involvement; (b) 2.6 percent indicated a desired for an improved community of learners. They wanted a stronger peer community among students, more communication with scholarship recipients, more people coming and talking about their experiences, and working more closely with faculty on their research; (c) 1.6 percent wanted more personalized orientation regarding jobs and other extra-academic activities; (d) 1.0 percent requested additional resources, including equipment, technology, and information; (e) decrease cost of education (1.0 percent), and (f) more mentoring/tutoring services (0.6 percent).
- **Improving the USDA/NIFA Project.** A substantial majority of the students (63.5 percent) expressed satisfaction with the program as is and did not see the need to change anything, except to continue to support them by perhaps extending their participation in the project beyond the year (or period) they had been awarded. However, 36.5 percent of the responses offered these suggestions to improve the project: (a) 9 percent suggested providing more job/career/internship opportunities to students so they could gain experience and/or start their professional careers within this field; (b) 8.4 percent wanted an improved community of learners, by increasing their interactions with other students, professors and program staff, by organizing activities in a more flexible way, by sharing more knowledge and experiences through conferences and workshops, and by improving their interactions with the USDA; (c) 6.5 percent suggested increasing the number of students in the project. They provided a range of strategies to entice students into the project, including having an open house, increasing marketing efforts and disseminating information about how to apply for the program; (e) 6.1 percent recommended providing more information and improving communication, with both new students and with students who are already in the project. They wanted the expectations to be more clearly stated and improve guidance so everyone can perform at their best; (f) 3.5 percent suggested to increase funds or use them more effectively to support student activities. Students wanted the project to maximize its resources so all students had an optimal experience in the project by experiencing all the activities contemplated in it, including traveling for presentations, using the needed equipment for research, and perhaps even supporting them with tuition expenses; (g) some of this could be achieved by improving or expanding the project partnerships, which is the last suggestion, with 2.9 percent of responses.

# **Appendix A: Project Profiles**

### Exhibit A-1: Project Overview for California State University-San Bernardino (CSU-SB)

Item/Element	Brief Description
<b>Project Title</b>	Watershed Management Experiential Learning for USDA Careers
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Julie Lappin, J.D., Program Manager Water Resources Institute (WRI), California State University-San Bernardino (CSU-SB)
<b>Co-Project Director/Co-Principal Investigators</b>	Dr. David Zoldoske, California Water Institute, California State University-Fresno
<b>External Evaluator(s)</b>	Dr. Rachel Weiss, Office of Research & Sponsored Programs, California State University-San Bernardino
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	<p>California State University-Bakersfield; California State University-Channel Islands; California State University-Dominguez Hills; California State University-Fresno; California State University-Fullerton; California State University-Long Beach; California State University-Los Angeles; California State University-Monterey Bay; California State University-Northridge; California State Polytechnic Institute - Pomona; California State University-San Bernardino; California State University-San Marcos; California State University-Stanislaus; San Diego State University [n=14]</p> <p>California State University-San Bernardino is the lead academic institution collaborating with 13 other 4-year universities.</p>
<b>USDA Agency Partners</b>	<p>Agricultural Research Service (ARS); Forest Service (FS); Natural Resources Conservation Service (NRCS) [n = 3]</p> <p>The project served 50 interns, three of whom are working in USDA agencies, with an additional seventeen in other governmental entities and municipalities. As the project progresses, the project plans to maintain those relationships and continue to cultivate additional agency partnerships for internships and future employment opportunities for our students. Other partners include: California State Fish and Game, Elkhorn Slough National Estuarine Reserve, Santa Margarita Ecological Reserve, San Dieguito River Park, Resource Conservation District, various city and county departments, multiple water districts, and industry.</p>
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• Measurably increase the encouragement, retention,</li> </ul>

**Exhibit A-1: Project Overview for California State University-San Bernardino (CSU-SB)**

Item/Element	Brief Description
	<p>graduation and USDA career attainment of underrepresented CSU students who are enrolled in undergraduate and graduate disciplines related to national resource protection.</p> <ul style="list-style-type: none"> <li>• Measurably increase student research skills that ensure that national forests and private working lands are conserved, restored, and made more resilient to climate change, while enhancing water resources.</li> </ul>
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>• The primary objective of this 4-year collaborative project is to measurably increase the encouragement, retention, graduation and USDA career attainment of underrepresented California State University (CSU) students who are enrolled in undergraduate and graduate disciplines related to natural resource protection.</li> </ul>
<b>Project Outcome Objectives</b>	<ul style="list-style-type: none"> <li>• Provide 200 experiential learning internships (50 a year for four years) in water related and natural resource disciplines.</li> <li>• Support/encourage underrepresented students to complete their degree and possibly continue their education in disciplines related to natural resource protection through a master’s degree (or possibly higher).</li> <li>• Increase/improve student research skills, including collaboration and knowledge-sharing across a broad spectrum of domains.</li> <li>• Enhance the nation’s water resources and make watersheds more resilient to climate change.</li> <li>• Utilize paid watershed management internships to help prepare up to 80 percent of participants for USDA natural resource careers.</li> <li>• Develop new student skills, abilities, and knowledge that will favorably impact USDA employability of underrepresented graduates.</li> </ul>
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>• Provide paid internships for 50 California State University (CSU) students enrolled in undergraduate and graduate disciplines annually, for a total of 200 students over four years. Underrepresented students will be recruited from 14 CSU campuses identified as Hispanic Serving Institutions (HSIs) listed in Section IV as Regional Collaboration Partners.</li> <li>• Every student will be individually mentored by an identified water-related faculty member, researcher or person from a participating USDA or local agency.</li> <li>• Each intern will be required to identify specific careers at USDA agencies that are best suited to their career aspirations.</li> <li>• Students will be required to identify any mandatory</li> </ul>

**Exhibit A-1: Project Overview for California State University-San Bernardino (CSU-SB)**

Item/Element	Brief Description
	<p>courses required as a prerequisite to submitting a USDA application and whether the CSU campus they attend offers the necessary courses. Students attending a CSU campus that does not offer the courses needed on their home campus will be required to identify where those classes are available, whether that is another CSU or a nearby institution.</p> <ul style="list-style-type: none"> <li>• Five students per year will be funded to travel to attend national NIFA meetings, annual WRPI Conferences, or other watershed management activities.</li> <li>• The program will make available a resume list of graduating students (optional for the students), updated twice each year (summer and winter).</li> <li>• Water-related faculty, researchers, and advisors will assist each chosen student in developing an individual scope of work for their paid, mentored watershed management.</li> <li>• Virtual and in-person meetings during Project Years 1-4 for mentors and students to discuss current internships underway and identify synergies.</li> <li>• Provide K-12 outreach and community engagement activities.</li> </ul>
<b>Project Evaluation</b>	<ul style="list-style-type: none"> <li>• Individual success will be tracked utilizing a scorecard for each student intern.</li> <li>• Exit Interview Questionnaire to be completed by students detailing the areas of the project that were most and least helpful to them, and how they could be better served by such an internship program.</li> </ul> <p>A questionnaire to be completed by the internship advisor providing feedback about the interns they oversaw and the perceived affect of the internship on the student's future employability.</p>
<b>Number of Students Served</b>	The project served a total of 50 students.
<b>Students' Majors of Interest</b>	<p>Biology/Biological Sciences; Civil Engineering; Coastal and Watershed Science and Policy; Computer Science/Computer Engineering ; Environmental Engineering; Environmental Science; Geography; Geology ; German; Health Sciences; Industrial Technology; Mathematics; Photography (1); Plant Science (1); Psychology (1)</p> <p><b>*Note: Some Interns are dual majors</b></p>

<b>Exhibit A-2: Project Overview for Florida International University (FIU)</b>	
<b>Item/Element</b>	<b>Brief Description</b>
<b>Project Title</b>	Florida – Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCAgE)
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Mahadev Bhat, (Lead Director) Professor and Co-Director, Agro ecology Program, Earth & Environment Dept. (E&E), bhatm@fiu.edu
<b>Co-Project Director/Co-Principal Investigators</b>	Dr. Krish Jayachandran, Associate Professor, E&E Dept., jayachan@fiu.edu Dr. Adriana Campa, Associate Professor, Dietetics and Nutrition, campaa@fiu.edu Dr. Suzanne Koptur, Professor, Biol. Sciences, kopturs@fiu.edu Dr. Eric von Wettberg, Assistant Professor, Biol. Sc. Dept., ebishopv@fiu.edu (FTBG liaison)
<b>FIU Collaborators</b>	Dr. Kateel G. Shetty, Research Scientist, E&E Dept., shettyk@fiu.edu Dr. Assefa Melesse, Associate Professor, E&E Dept., melessea@fiu.edu Dr. Jeff Onsted, Assistant Professor, Earth & Environment, jonsted@fiu.edu
<b>Current Co-Project Director [Collaborating Universities/Colleges]</b>	Prof. Loretta Adoghe, Miami Dade College Dr. Pilar Maul, St. Thomas University Dr. Arlin Toro, InterAmerican University
<b>Miami Dade College-North Campus Collaborators</b>	Prof. Loretta Adoghe, Professor and Chair, Department of Biological Sciences, ladoghe@mdc.edu; Dr. Steve Ritter, Associate Professor, sritter@mdc.edu; Dr. Clemente Fernandez, Assistant Professor, cfernan3@mdc.edu; Department of Biology, Health and Wellness
<b>St. Thomas University Collaborators</b>	Dr. Pilar Maul, Assistant Professor (Biology), pmaul@stu.edu; Dr. Scott Malinconico, Associate Professor (Biology), smalinconio@stu.edu Wim Steelant, Dean of the School of Science, teelant@stu.edu School of Science Technology and Engineering Sciences
<b>Universidad Interamericana de Puerto Rico, San Germán Collaborators</b>	Dr. Arlin Toro, Associate Professor (Microbiology), arlin@sg.inter.edu
<b>External Evaluator(s)</b>	Dr. C. Lee Burras, Iowa State University
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	Miami Dade College-North; St. Thomas University; Universidad Interamericana de Puerto Rico at San <i>Germán</i> (UIPR-SG)  FIU is the lead academic institution collaborating with two other 4-year universities and one community college.

### Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
<b>USDA Agency Partners</b>	Mr. Vladimir Diaz, Regional Director, USDA/HSI National Program, vladimir.diaz@mdc.edu; Dr. Stewart Reed, Research Agronomist, USDA ARS Subtropical Horticultural Research Station, Miami, Stewart.Reed@ARS.USDA.GOV; USDA APHIS Office, Santurce, Puerto Rico; Tropical Agriculture Research Station at Mayagüez, Puerto Rico.
<b>Other Partners</b>	Earth Learning: Mr. Mario Yanez, Founding Director, Earth Learning, mario@earth-learning.org Dr. Carl Lewis, Director, Fairchild Tropical Botanical Garden, Miami, clewis@fairchildgarden.org Ms. Diana Collingwood, Science Coordinator, Miami-Dade Schools, DCollingwood@dadeschools.net
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• Aims at preparing 49 undergraduates, four masters, one doctoral, 20 High School students and more than 200 unintended students in multiple levels for preparation in USDA careers and degrees in areas of environmental, biological sciences, and food science programs.</li> </ul>
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>• Recruit and graduate 54 students, (49 Hispanic undergraduate students, four masters students, and one doctoral student) into biological, environmental, and food science degree programs</li> <li>• Train students in plant, natural resources, and food sciences through curricular enrichment and expansion, and scientifically rigorous, technologically appealing, socially interactive instructional delivery systems.</li> <li>• Establish a number of experiential, experimental and community outreach programs to provide students with USDA mission critical occupation skills, and</li> <li>• Help place Hispanic and other minority graduates of the FCCAgE in USDA and other federal agencies or advanced agricultural science education through rigorous professional advancement and career development programs</li> <li>• Support 20 high school interns and conducts annual high school teacher workshop benefiting more than 50 of them.</li> </ul>
<b>Project Outcome Objectives</b>	In the long term, the project will directly contribute to the USDA educational and agriculture, food and natural resource protection goals by (a) increasing the number of Hispanic college graduates by more than 50, (b) building a strong consortium for a cost-effective alternative to the traditional land-grant agriculture education model at four Florida and Puerto Rico universities and colleges, and (c) unique educational programs and technical job-training ability in high national priority areas like biological and environmental

## Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
	sciences [also meeting STEM education goal].
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>• Through a variety of undergraduate research experience projects, community engagement projects and professional development activities (field trips, national conferences, and professional workshops), students stand to gain scientific and professional skills necessary to gain entry into USDA mission critical jobs.</li> <li>• Students in the program will have an opportunity to increase their analytical skill and hands-on field experience through participating in the campus organic garden program, school yard gardens and area farms. Students will also engage in a variety of student club activities and thus form a learning community on each of the four HSI campuses.</li> <li>• The FIU students will continue to maintain the local chapter of the Minority in Agriculture, Natural Resources and Related Sciences (MANRRS) and engage in agri-science educational, mentoring, professional, and social activities.</li> <li>• Each student in the program will also attend one or two national conferences during the four year program.</li> <li>• They will also present the internship experience at the annual Agroecology Symposium to be conducted in Miami. The symposium will also provide an opportunity for students to interact with USDA and other agricultural career professionals.</li> <li>• Each year, a number of career development activities will be conducted through the university career service offices, in order to help students develop job interview skills and the understanding of the various USDA careers.</li> <li>• An annual summer workshop in agroecology will be conducted for high school teachers. This program will include lectures, seminars, and field visits on issues related to agroecosystem principles. In the workshop, they will identify opportunities to connect high school students and teachers with USDA and other research institutions.</li> <li>• Throughout the grant program, project activities and results will be disseminated through promotional material, newsletters, articles, student presentations, and a website.</li> </ul>
<b>Project Evaluation</b>	<ul style="list-style-type: none"> <li>• The Project Director will be in charge of the evaluation process. The evaluation plan will adopt both formative and summative techniques and be based on both qualitative and quantitative indicators and targets.</li> <li>•</li> </ul>

## Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
<b>Students' Majors of Interest</b>	Agriculture (0); Biology/Biological Sciences (25); Biotechnology (7); Chemistry (6); Environmental Biology (1); Environmental Science (2); Environmental Studies (9); Environmental studies and International relations (1); Landscape & Horticulture (1); Microbiology (0); Nursing (0); and Nutrition and Dietetics (1). Criminal justice (1).
<b>Products</b>	<ul style="list-style-type: none"> <li>• Infusing agri-science education with biological, agriculture, environmental, food and natural resource sciences</li> <li>• New courses in Integrated Pest Management, Plant Pathology, Agriculture Communication, Bioinformatics and Biosciences (1 time each)</li> <li>• FCCAgE Website Development and Updates</li> <li>• Students trained in Agri-Science Education</li> <li>• FCCAgE scholarships/internships</li> <li>• FCCAgE student graduate research assistantship</li> <li>• FCCAgE student USDA internships and Community Outreach Activities</li> <li>• USDA Job Placement</li> <li>• Students maintained Online FCCAgE Blog</li> <li>• FCCAgE students conference trips</li> <li>• Annual Agriculture Symposium</li> <li>• Field trips</li> <li>• Publications: papers, posters and presentations</li> </ul>
<b>Long Term Impact</b>	The continuous focus on training students with the necessary skills to obtain a career that contributes to USDA's educational and agriculture, food and natural resource protection goals.
<b>Four-pronged approach</b>	<p>(1) An infusion of emerging agriculture issues into existing and new biological, environmental, and food sciences curricula [Educational Need Area (a)];</p> <p>(2) Integration of advanced instructional technology into curriculum [Educational Need Area (c)];</p> <p>(3) Experimental and experiential learning for the students via hands-on undergraduate research experience, community engagement, and USDA internships [Need Area (e)]; and</p> <p>(4) An aggressive science career development and placement program to funnel Hispanic graduates into USDA's mission critical occupations.</p>
<b>Project Scope</b>	<p>(1) The need for enhancing the nation's manpower capacity in new biology approaches to agricultural problem solving;</p> <p>(2) The need for maximizing the effectiveness of instructional delivery systems; and</p> <p>(3) The need for increasing workforce diversity within USDA and related employment sectors nation-wide.</p>

### Exhibit A-3: Project Overview for New Mexico State University (NMSU)

Item/Element	Brief Description
<b>Project Title:</b>	Preparing Students for Career Paths with the USDA Forest Service by Linking Student Success with Experiential Learning Opportunities
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Martha Desmond Dr. Jess K. Zimmerman Berlinda Baca Sanchez Dr. Skip VanBloem
<b>Co-Project Director/Co-Principal Investigators</b>	Amy Padilla Rick Tafoya
<b>External Evaluator(s)</b>	Dr. H. Prentice Baptiste, Department of Curriculum and Instruction, New Mexico State University Dr. William Leftingwell, Puerto Rico
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	<p>New Mexico and Puerto Rico (New Mexico State University campuses in Las Cruces, Grants, Carlsbad and Alamogordo), New Mexico Highlands University and Luna Community College, University of Puerto Rico campuses in Rio Piedras, Cayey, Humacao, Bayamón, and Mayagüez and InterAmerican University in Bayamón).</p> <p>NMSU is the lead academic institution collaborating with seven other 4-year universities and four community colleges. NMSU also collaborated with UPR-M, a fellow collaborative project grantee.</p>
<b>USDA Agency Partners</b>	<p>Animal and Plant Health Inspection Service (APHIS); Forest Service (FS); Natural Resources Conservation Service (NRCS)</p> <p>The project placed 45 of 53 students on the summer Student Temporary Employment Program (STEP) and Student Career Experience Program (SCEP). The number of students placed in USDA agencies included 42 in the USDA Forest Service, one in USDA NRCS, and one in USDA APHIS. Two students graduated during the summer.</p>
<b>National Partners</b>	U.S. Geological Survey (USGS)
<b>Target Audiences</b>	The primary target audience is Latino students.
<b>Project Goal(s)</b>	<p>Mentor cohorts of students in New Mexico and Puerto Rico for careers in Natural Resource fields with the Forest Service</p> <ul style="list-style-type: none"> <li>• Provide NM and PR student's 2 local field courses annually (Cohort 1) to introduce them to natural resource management and career opportunities with 90 percent of students successfully completing course requirements (12 students/course yr. 1 and 10 for yr. 2-4).</li> <li>• Conduct field trips for entry level natural resource classes</li> </ul>

## Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
	<p>and high school students to promote program and career opportunities in natural resources. We anticipate 90 percent of students will have an improved understanding of natural resource disciplines and careers, and will understand available opportunities through this program.</p> <ul style="list-style-type: none"> <li>• Provide student experiential learning in their chosen natural resource field through summer internships with the USDA Forest Service with 90 percent of students successfully completing the internship (minimum of 20 students annually, Cohort 2)</li> <li>• Retain 90 percent of students completing internship program (Cohort 2) to enroll in a SCEP or second internship in Cohort 3.</li> <li>• Establish a faculty and Forest Service mentorship program to provide students with academic and career advice. This program will increase overall GPAs, graduation rates and job placement by minimum of 10 percent. This program will impact 50 students annually.</li> <li>• Establish a faculty research mentorship program to guide students in research in natural resource fields (28 students annually). Students in the semester program will maintain 3.0 GPA and conduct independent research. 90 percent of students will successfully complete program. This program will identify students for a research track.</li> <li>• Provide NM and PR students with one shared international field courses to broaden student perspectives of natural resource management to an international scale. We target an enrollment of 12 students /yr., with 90 percent successfully completing course requirements.</li> <li>• Provide NM and PR students with an educational and cultural exchange that will include a summer internship, a fall semester exchange or both (4+ students annually). We anticipate that 90 percent of students will successfully complete this program.</li> <li>• Develop a Forest Service/graduate student mentorship program to recruit underrepresented students into graduate programs and USDA agency positions (up to 10 students annually yrs. 2-4). We anticipate a 90 percent completion rate for this program.</li> <li>• Develop an advising and tutoring center to improve the academic performance, retention rate and graduation rate of our students. This will impact &gt;50 students annually. We anticipate this program will help us retain 90 percent of students each year in NRCT program and will increase GPA's by 10 percent and increase 4 &amp; 6 year graduation</li> </ul>

## Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
	<p>rates by 10 percent.</p> <ul style="list-style-type: none"> <li>• Each semester there will be a one-day meeting for all NRCT students that will include educational, informational and networking components (anticipate 90 percent participation).</li> <li>• Establish USDA Seminar Series, telecast to all institutions. Anticipate 90 percent participation.</li> <li>• Move 70 percent of students from SCEP (or pathways program; Cohort 3 &amp; 4) into Forest Service (or other USDA Natural Resource) positions post-graduation.</li> </ul>
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>• Our main objectives are centered on identifying and mentoring cohorts of students (Cohort Program) according to academic level to prepare them for careers in Natural Resource Management with the FS.</li> </ul>
<b>Project Outcome Objectives</b>	<ul style="list-style-type: none"> <li>• Increase student knowledge and skills in natural resource fields by placing students on Forest Service internships and SCEPS (40 students/year), research experiences (16 students), and in introductory field courses (24 students).</li> <li>• Increase the academic performance and four-year graduation rates of students enrolled in the cohort program by 10 percent through our tutoring and advising programs.</li> <li>• Provide students with global experiences to broaden their perspectives of natural resource management fields and decision processes through an international field course and an exchange program between New Mexico State University and the University of Puerto Rico (16 students)</li> <li>• Develop critical thinking and communication skills through independent research projects (16 per year), faculty and professional mentoring (all cohort students), attendance to professional meetings (6/year) and research presentations (minimum of 2 per year).</li> <li>• Provide outreach to high school and entry level college students through classroom visits and field trips to excite students about careers and opportunities in natural resource management.</li> <li>• Develop a Forest Service/graduate student mentorship program to recruit students into graduate programs and USDA agency positions (4 students annually). We anticipate a 90 percent completion rate for this program.</li> <li>• NMSU, UPR and Forest Service have been meeting regularly to develop a long-term plan for this program, this has included meetings in Washington DC and Albuquerque with Forest Service Civil Rights personnel and Human Resources; this activity is ongoing.</li> </ul>

## Exhibit A-2: Project Overview for Florida International University (FIU)

Item/Element	Brief Description
<b>Measureable Outcomes</b>	<ol style="list-style-type: none"> <li>1) Total number of students (&amp; percent Hispanic) impacted by various project programs,</li> <li>2) retention of students ( percent Hispanic) in cohorts (anticipated 90 percent annually),</li> <li>3) number of students (&amp; percent Hispanic) that participate in USDA Forest Service (FS) internships and SCEPS (minimum of 24 students annually),</li> <li>4) improved academic standing and graduation rates (minimum of 10 percent),</li> <li>5) number of students (&amp; percent Hispanic) attending and presenting at professional meetings (14 annually,) and</li> <li>6) number of students (&amp; percent Hispanic) recruited into careers with the USDA (70 percent of Cohort 3 &amp; 4 annually), especially the FS.</li> </ol>
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>• Initial Project Planning Session</li> <li>• Annual Key Personnel Meeting</li> <li>• Project Advertisement &amp; Student Recruitment</li> <li>• Monthly Telecast Meeting (Key Personnel)</li> <li>• Cohort Identification</li> <li>• Graduate Student Recruitment</li> <li>• Advising &amp; Tutoring Center</li> <li>• Monthly Cohort Meetings</li> <li>• Faculty Research Mentorship Program</li> <li>• Forest Service Internship &amp; SCEP Program</li> <li>• Agency and Research Internships</li> <li>• Field Class-Cohort 1</li> <li>• Field Class-Cohorts 2 &amp; 3</li> <li>• Semester Exchange Program</li> <li>• Field Trips – entry level classes &amp; high schools</li> <li>• Mid-Year Evaluation (end of Fall Semester)</li> <li>• Annual Project Evaluation (end Spring Semester)</li> <li>• Field trips to local National Forests will be conducted for entry level natural resource classes at collaborating institutions and area high school students.</li> </ul>
<b>Project Evaluation</b>	<ul style="list-style-type: none"> <li>• This program will be evaluated annually. The evaluation will place an emphasis on our goals of: (1) reaching a minimum of 50 students/year, (2) achieving the USDA goal of 90 percent retention annually, (3) having 100 percent of students being underrepresented minorities in the NRCT Program, and (4) 70 percent of students moving into Forest Service (or other USDA) careers post-graduation.</li> <li>• These 4 goals will account 15 percent each of weighted criteria for evaluation (60 percent). Additional evaluation criteria for students in core programs will include: (1) a 10 percent increase in GPA, (2) 10 percent increase in</li> </ul>

**Exhibit A-2: Project Overview for Florida International University (FIU)**

Item/Element	Brief Description
	<p>graduation rates, (3) 14 students annually attending professional meetings (5 percent ea.), and ranking of evaluations (1-5) by key personnel involved in the project (a) student evaluations, (b) faculty mentor evaluations, (c) Forest Service evaluations, (d) key project personnel evaluations, and (e) student tutor evaluations (5 percent ea.).</p> <ul style="list-style-type: none"> <li>• Baseline data will consist of 4 &amp; 6 yr. graduation rates and mean GPA's prior to project implementation for students in related departments. Baseline data will be compared with these departments post project implementation, and for program students. Exit interviews will be conducted with all program students completing a degree and an equal number of randomly chosen non-program students starting in year 2 to compare GPA, time to completion, program impression, and career plans.</li> </ul>
<b>Program Participants</b>	Undergraduate Candidates (4-yr. institutions); Graduate Candidates; and Doctoral Candidates.
<b>Students' Majors of Interest</b>	Engineering; Environmental Science; Environmental Studies; Environmental studies and International relations; Environmental Technology; Fisheries; Forestry; Geology; Range Science; and Wildlife.
<b>Use of Technology</b>	<ul style="list-style-type: none"> <li>• Website</li> <li>• SKYPE</li> <li>• Distance communication tools</li> <li>• Webinars</li> <li>• Facebook</li> <li>• Conference calls</li> </ul>

<b>Exhibit A-4: Project Overview for Texas A&amp;M University-Kingsville (TAMUK)</b>	
<b>Item/Element</b>	<b>Brief Description</b>
<b>Project Title:</b>	Step Up to USDA Career Success: Science, Technology and Environmental Programs for Undergraduate Preparation to USDA Career Success
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Shad David Nelson, Texas A&M University-Kingsville (TAMUK)
<b>Co-Project Director/Co-Principal Investigators</b>	<ul style="list-style-type: none"> <li>• Randy L. Stanko, Texas A&amp;M University-Kingsville (TAMUK);</li> <li>• Michael Persans, University of Texas-Pan American (UTPA), Edinburg, TX;</li> <li>• Debora Villalon, South Texas College (STC), Weslaco, TX;</li> <li>• Armando Duarte; Texas State Technical College (TSTC), Harlingen, TX;</li> <li>• Jonda Halcomb, Del Mar College (Del Mar), Corpus Christi, TX</li> </ul>
<b>External Evaluator(s)</b>	<p>Dr. Stacey Clettenberg</p> <p>The evaluation of this project will be performed externally by Dr. Stacey Clettenberg, Independent Grant Program Evaluator and Director Research and Grants Management at DePelchin Children's Center in Houston.</p>
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	<p>Texas A&amp;M University-Kingsville; University of Texas –Pan American; Del Mar College; South Texas College; and Texas State Technical College [n = 5].</p> <p>TAMUK is the lead academic institution collaborating with another 4-year university, UTPA, and three community colleges including Del Mar, STC and TSTC.</p>
<b>USDA Agency Partners</b>	<p>Agricultural marketing Service (AMS); Animal and Plant Health Inspection Service (APHIS); Agricultural Research Service (ARS); Forest Service (FS); Natural Resources Conservation Service (NRCS); and Natural Resources Conservation Service, Plant Material Center NRCS PMC).</p> <p>This is a 'Regional Collaboration' [ROCN] project involving five educational, primarily Hispanic Serving Institutions, and multiple USDA research or service centers and agencies (primarily USDA-NRCS (NRNR Track), but also preparing employees for the USDA AMS, USDA ARS, USDA APHIS, and USDA FS).</p>
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• This project will produce 50 undergraduates with baccalaureate degrees in the sciences that meet minimum qualification requirements to be hired by the USDA agencies (NRCS, AMS, ARS, APHIS) upon graduation.</li> </ul>

### Exhibit A-4: Project Overview for Texas A&M University-Kingsville (TAMUK)

Item/Element	Brief Description
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>The primary objective of this project is focused on undergraduate training and education for career preparation and employment with USDA agencies upon graduation with B.S. degrees.</li> </ul>
<b>Project Outcome Objectives</b>	<ul style="list-style-type: none"> <li>To form a collaborative effort to provide undergraduate education and hands-on training to a minimum of 50 underrepresented Hispanic south Texas students.</li> <li>To provide undergraduate students with intensive short-courses based in soils, biotechnology, livestock and meat grading, and environmental sciences that prepare them for soils, biological, animal agriculture, and natural resource science-related careers to a minimum of 50 underrepresented Hispanic students.</li> <li>To provide a minimum of 50 summer undergraduate internship experiences with agricultural-related USDA agencies as fast track preparation for USDA careers.</li> <li>The overall outcomes of the proposed project will increase Hispanic Americans prepared for USDA agricultural- and natural resource-related careers.</li> <li>The completion of this project will lead to the following: (1) a progressive internship program with a USDA agency and collaborative experiential learning work experience between 5 HSI institutions; (2) increase the recruitment and retention of students in the agricultural and natural resource sciences; (3) provide new skills to students through the implementation of practical summer training courses and in the use of up-to-date field and laboratory instrumentation and equipment; (4) develop student and faculty enrichment through collaborative efforts and beneficial partnerships with agricultural professionals; and (5) enhance student opportunities for public speaking, technical writing, and professional growth and development through attendance and participation at research symposiums and/or regional/national professional conferences.</li> </ul>
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>USDA Tours</li> <li>Plan Camps</li> <li>Summer Camps</li> <li>Summer USDA Internship</li> </ul>
<b>Project Evaluation</b>	<ul style="list-style-type: none"> <li>The evaluation process will include advisement to the institutional PDs and Co-PDs regarding research and evaluative dimensions of the grant, examination and analysis of evaluation assessment measures, modification</li> </ul>

<b>Exhibit A-4: Project Overview for Texas A&amp;M University-Kingsville (TAMUK)</b>	
<b>Item/Element</b>	<b>Brief Description</b>
	of evaluation processes as appropriate, and assist in timely AD-421 progress and termination reporting.
<b>Number of Students Served</b>	70
<b>Students' Majors of Interest</b>	Environmental Engineering (1); Ag Science –Certified (2); AgriBusiness-Ranch Man (1); Agriculture Business (2); Agriculture Science (2); AGSC-Soils minor (1); AGSC-WREN (1); Animal Science (6); Animal Science- Pre vet (3); and ANSC (2).
<b>Disciplines Addressed</b>	<ul style="list-style-type: none"> <li>• TAMUK disciplines addressed: Plant and Soil Sciences; Agricultural Science; Animal Sciences; Animal Sciences: Pre Vet; AgriBusiness</li> <li>• UTPA disciplines addressed: Biology</li> <li>• STC disciplines addressed: Biology; Criminal Justice; Chemistry (n = 2); Computer Science (n = 1)</li> <li>• TSTC disciplines addressed: Agriculture Technology</li> <li>• Del Mar College disciplines addressed: Biotechnology; Biology; and Chemistry</li> </ul>

<b>Exhibit A-5: Project Overview for Texas State University-San Marcos (TSU)</b>	
<b>Item/Element</b>	<b>Brief Description</b>
<b>Project Title:</b>	Food Safety and Agroterrorism Training: Educating Our Future Workforce
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Douglas G. Morrish, Texas State University-San Marcos (TSU)
<b>Co-Project Director/Co-Principal Investigators</b>	Dr. Ryan Saucier, Texas State University-San Marcos (TSU) Dr. Nora Garza, Laredo Community College (LCC)
<b>External Evaluator(s)</b>	Dr. Manuel Pina, Views Unlimited, Inc.
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	Laredo Community College (LCC); Northwest Vista College (NWVC) Palo Alto College (PAC); Texas State University-San Marcos (TSU)  TSU is the lead academic institution collaborating with three community colleges including LCC, NWVC, and PAC.
<b>USDA Agency Partners</b>	Food Safety and Inspection Service (FSIS); Animal and Plant Health Inspection Service (APHIS); Forest Service (FS); Food and Nutrition Service (FNS); and Natural Resources Conservation Service (NRCS).
<b>Other Partners</b>	Southwest Border Food Safety and Defense Center
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• Students funded through this innovative program will gain a valuable certification and an immense amount of experience with food safety and agroterrorism, thus increasing their chances of employment with USDA and helping narrow the gap of underrepresented Hispanic students in food and agricultural sciences and USDA agencies.</li> <li>• The goals of the project include creating a seamless transition for community college students from Laredo Community College, Palo Alto College, and Northwest Vista College to transfer to Texas State University, complete degrees in agriculture, nutrition, or related life sciences and be trained to accept jobs with the USDA , particularly in the food safety and inspection arena.</li> </ul>
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>• Objective # 1 – Encourage Hispanic community college students to develop early linkages with Texas State University through the newly established University Transfer Centers, mentorship websites, summer camps, faculty networking, and experiential learning fieldtrips and have a retention rate at or higher than that of the University.</li> <li>• Objective # 2 – Develop early linkages and a strong pipeline for K-12 students by visiting 10 schools a year</li> </ul>

**Exhibit A-5: Project Overview for Texas State University-San Marcos (TSU)**

Item/Element	Brief Description
	<p>with a high representation of Hispanic students. Discussion and activities regarding USDA employment will be performed.</p> <ul style="list-style-type: none"> <li>• Objective # 3 – Train 50 scholar Hispanic students in the course “Preparing Communities for Agroterrorism.”</li> <li>• Objective # 4 – Retain and place 90 percent of the student participants in job shadowing and internship opportunities within USDA agencies.</li> <li>• Objective # 5 – Graduate 50 Hispanic students who are well trained and ready to enter employment in the food safety / inspection areas with APHIS, FSIS, or another USDA agency.</li> <li>• Objective # 6 – Provide funding for 12 graduate students to complete a thesis and a degree within the Department of Agriculture, thus allowing them to be competitive for USDA employment.</li> <li>• Objective #7 – Form “Academic Research Clusters” (directed by faculty and graduate students) to create a mentoring component and allow Hispanic students to collect data and present their findings at one research conference.</li> </ul>
<p><b>Project Outcome Objectives</b></p>	<ul style="list-style-type: none"> <li>• Create and implement a Joint Admissions Agreement with Texas State University and Laredo Community College / Palo Alto College / Northwest Vista College to increase the transfer rate of Hispanic students to a 4 year university.</li> <li>• Encourage Hispanic community college students to develop early linkages with Texas State University through the newly established University Transfer Centers, mentorship websites, summer camps, faculty networking, and experiential learning fieldtrips and have a retention rate at or higher than that of the University.</li> <li>• Develop early linkages and a strong pipeline for K-12 students by visiting 10 schools a year with a high representation of Hispanic students. Discussion and activities regarding USDA employment will be performed.</li> <li>• Train 50 scholar Hispanic students in the course "Preparing Communities for Agroterrorism."</li> <li>• Retain and place 90 percent of the student participants in job shadowing and internship opportunities within USDA agencies.</li> <li>• Graduate 50 Hispanic students who are well trained and ready to enter employment in the food safety / inspection areas with APHIS, FSIS, or another USDA agency.</li> <li>• Provide funding for 6 graduate students to complete a thesis and a degree within the Department of Agriculture,</li> </ul>

**Exhibit A-5: Project Overview for Texas State University-San Marcos (TSU)**

Item/Element	Brief Description
	<p>thus allowing them to be competitive for USDA employment.</p> <ul style="list-style-type: none"> <li>• Form "Academic Research Clusters" (directed by faculty and graduate students) to create a mentoring component and allow Hispanic students to collect data and present their findings at one research conference.</li> </ul>
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>• Participate in a 7 day summer workshop at Texas State University during summer 2012.</li> <li>• During Summer 2 of the project, students will attend a 7 day "travelling classroom" component of the project.</li> <li>• Students will attend summer workshops at Texas State University and participate in activities such as being trained and certified by the Department of Homeland Security and the National Center for Biomedical Research and Training Academy of Counter-Terrorist.</li> <li>• A one week "travelling classroom" will be taken to Las Cruces, NM to visit the Southwest Border Food Safety and Defense Center.</li> <li>• Training of the project director and Co-PI to become trainers in Preparedness and Response to Food and Agriculture Incidents.</li> <li>• Develop marketing materials and application for program.</li> <li>• Create the two University Transfer Centers at LCC and Palo Alto College.</li> <li>• Create MANRRS program for recruitment.</li> <li>• Proposed MANRRS and graduate student recruiting trips to community colleges and high schools.</li> <li>• Select students to participate in the program and fill vacant spots.</li> <li>• Issue selected students an IPAD for journal keeping and reflection.</li> <li>• Create mentoring website to monitor students and display contact information of each participant.</li> <li>• One Week Summer Workshop for participants.</li> <li>• One week travelling classroom to Southwest Border Food Safety and Defense Center.</li> <li>• Place students in an Academic Research Cluster. Conduct undergraduate research.</li> <li>• Immerse students into internships and job shadowing with USDA agencies, particularly APHIS and FSIS.</li> <li>• External Evaluations</li> </ul>
<b>Project Evaluation</b>	<p>The performance of the FATE Program will be evaluated based on a plan of management by objectives (MBO). This plan includes an indicator, a proposed goal, the actual number obtained, and the percentage accomplished for each key</p>

**Exhibit A-5: Project Overview for Texas State University-San Marcos (TSU)**

Item/Element	Brief Description
	<p>activity area.</p> <p>The Project Director and Co-Directors will be conducting an ongoing evaluation by including the following three evaluation criteria in the overall evaluation design: (1) formative assessment whereby project activities and management procedures may be analyzed and 18 compared to the design intent expressed in this proposal; (2) summative assessment which provides an examination of project goals and objectives; and (3) a longitudinal study of participants to assess the possible extent of the impact that the project had on the participants.</p> <ul style="list-style-type: none"> <li>• Track retention rate, transfer rate, GPA, student organizations, internships, and conference presentations.</li> <li>• Track participant enrollment and progress by semester.</li> <li>• Track the number of schools visited and compile evaluation results of the presentation.</li> <li>• Track the number of high school students transferring to Texas State</li> <li>• University and majoring in agriculture, nutrition, or related area.</li> <li>• Track student certified by the Department of Homeland Security.</li> <li>• Track students entering the USDA in food safety or nutrition.</li> <li>• Track participant employment with USDA.</li> <li>• Track conference presentations and publications.</li> </ul>
<b>Students' Majors of Interest</b>	Agriculture; Biology/Biological Sciences; Chemistry; Environmental Science; Information Technology; and Nutrition Science.

<b>Exhibit A-6: Project Overview for the University of Puerto Rico-Mayagüez (UPR-M)</b>	
<b>Item/Element</b>	<b>Brief Description</b>
<b>Project Title:</b>	UPR-Mayagüez Center for Educational and Training In Agricultural and Related Sciences (CETARS)
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Felix R. Roman
<b>Co-Project Director/Co-Principal Investigators</b>	Dr. Angela Gonzalez Dr. Oscar Perales Dr. Jorge Gardea Dr. Roland Tremont
<b>External Evaluator(s)</b>	Dr. Danny Reible, University of Texas-Austin
<b>Internal Evaluator(s)</b>	Dr. Catherine Mazak, University of Puerto Rico-Mayagüez
<b>Collaborating Universities/Colleges</b>	University of Puerto Rico at Aguadilla (UPRAG); University of Puerto Rico at Humacao (UPRH); Inter-American University of Puerto Rico at San Germán (IAUSG); and University of Texas El Paso (UTEP).  UPR-M is the lead academic institution collaborating with four universities including one collaborative project grantee (UTEP).
<b>USDA Agency Partners</b>	Forest Service (FS); Agricultural Research Service (ARS); Animal and Plants Health Inspection Service (APHIS); and Natural Resources Conservation Service (NRCS).
<b>Other Partners</b>	US Geological Service (USGS) and National Institute of Environmental Health Sciences (NIEHS).
<b>Project Collaborators</b>	
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• CETARS will establish and consolidate a pipeline attracting, retaining and graduating talented individuals while supporting their actual placement in USDA 20 Mission Critical Occupations.</li> </ul>
<b>Approach</b>	<ul style="list-style-type: none"> <li>• Two undergraduate students will be selected to improve their research skills by getting involved in summer research projects at UPRM. Workshops for undergraduates and visits to high schools to bring seminars on environmental protection-related issues will be coordinated. CETARS activities at UPRH include outreach with K-12 students and science teachers. Students will be recruited from private and public schools in Eastern Puerto Rico to participate in summer workshops related to agriculture and environment with UPRH-STEM faculty and assistance of USDA agencies such as Forest Service and NRCS. Ten undergraduate students will also be recruited to perform research in environmental projects with UPRH faculty. Six undergraduate students from UPRH will be involved in</li> </ul>

**Exhibit A-6: Project Overview for the University of Puerto Rico-Mayagüez (UPR-M)**

Item/Element	Brief Description
	<p>summer research projects at UPRM. Workshops for K-12 school, teachers and undergraduates and visits to high schools to bring seminars on agriculture and the environment will also be organized.</p> <ul style="list-style-type: none"> <li>• IUAPR-SG proposed activities include the recruitment of four undergraduate students and one graduate student per year to do research in environmental projects.</li> </ul>
<b>Project Objectives</b>	<ul style="list-style-type: none"> <li>• The Center for Education and Training in Agricultural and Natural Resources, (CETARS), activities are focused on attracting talented and highly motivated high school, undergraduate and graduate students to pursue academic and professional careers in agricultural key areas.</li> <li>• CETARS will seek to: (1) strengthen the Food Science, Applied Chemistry and Crops and Environmental Sciences and Engineering Science and Materials curriculum through the involvement of students and faculty in meaningful research projects related to agriculture and by the sharing of educational and research resources; (2) develop outreach activities at participating institutions from K-12 to recruit talented students into agriculture or related sciences careers; (3) increase the participation of minority students in programs related to agricultural sciences and the protection of natural resources; (4) enhance the research skills of undergraduate and graduate students enrolled in food, soils and applied chemistry programs by exposing them to experiential learning, research experiences and community service; (5) fostering student-centered research projects that integrate specialists from diverse disciplines to solve real-life problems faced by communities, small developing agro-industries and government agencies; (6) develop a technical critical mass capable of supporting multi-institutional and multi-disciplinary collaborations and to provide support to solve technical problems in Puerto Rico; (7) promote faculty development and competitiveness in agriculture and related sciences.</li> </ul>
<b>Project Outcome Objectives</b>	<ul style="list-style-type: none"> <li>• Strengthen the Food Science, Applied Chemistry and Crops and Environmental Sciences and Engineering Science and Materials curriculum through the involvement of students and faculty in meaningful research projects related to agriculture and by the sharing of educational and research resource.</li> <li>• Develop outreach activities at participating institutions</li> </ul>

**Exhibit A-6: Project Overview for the University of Puerto Rico-Mayagüez (UPR-M)**

Item/Element	Brief Description
	<p>from K-12 to recruit talented students into agriculture or related sciences careers.</p> <ul style="list-style-type: none"> <li>• Increase the participation of minority students in programs related to agricultural sciences and the protection of natural resources.</li> <li>• Enhance the research skills of undergraduate and graduate students enrolled in food, soils and applied chemistry programs by exposing them to experiential learning, research experiences and community service.</li> <li>• Fostering student-centered research projects that integrate specialists from diverse disciplines to solve real-life problems faced by communities, small developing agro-industries and government agencies.</li> <li>• Develop a technical critical mass capable of supporting multi-institutional and multi-disciplinary collaborations and to provide support to solve technical problems in Puerto Rico.</li> <li>• Promote faculty development and competitiveness in agriculture and related sciences.</li> </ul>
<p><b>Project Activities</b></p>	<ul style="list-style-type: none"> <li>• Students will be transported to the UPRM Laboratory Farm to participate in a Crop Sciences Tour and workshops in seed preparation, seedling transplant, soil and nutrient management, among others.</li> </ul> <p>CETARS proposed a series of K-12 and undergraduate activities:</p> <ul style="list-style-type: none"> <li>• Constructions of home gardens at 10 participating public schools and weekly follow-up visits to provide educative lectures and workshops to students.</li> <li>• Globe program outreach activity for K-12 students and teachers to measure soil and water properties and quality.</li> <li>• Mentoring; Undergraduate and graduate students are actively participating of research and outreach activities under faculty mentorship.</li> <li>• Food Safety workshops: 1) Food safety from farm to the table; 2) Food defense, traceability and transportation; 3) Serve safe food for food handlers; 4) Prevention on Salmonella Enteritidis in shell eggs during production, storage and transportation.</li> <li>• Other activities that were not originally proposed but have been incorporated were:</li> <li>• Resume writing workshops; this activity aimed to improve CETARS students’ resumes in order for them to become more competitive in the internships</li> </ul>

**Exhibit A-6: Project Overview for the University of Puerto Rico-Mayagüez (UPR-M)**

Item/Element	Brief Description
	<p>applications.</p> <ul style="list-style-type: none"> <li>• Internships webinars/workshops; this activity was introduced in order to introduce CETARS students to internships opportunities at USDA and to teach them how to apply.</li> <li>• CETARS lecture series: Five scientific lectures were offered to CETARS participants, including one from a CETARS invited speaker from the UPR-Rio Piedras Campus. Over</li> <li>• 100 students participated of these CETARS lectures series.</li> <li>• Moodle workshop. This an open source platform to offer courses online which is available to all institutions.</li> <li>• Science on wheels chemistry show. Over 500 students were impacted in two visits to schools and one to an ACS sponsored meeting.</li> <li>• Agricultural tour. Five CETARS students for the Crops and Agro-environmental Department constructed a home garden on the Alzamora Farm on Campus and organized a field trip. Around 100 students from the ten CETARS-schools participated.</li> <li>• Community outreach seminars at the Aguada Credit Union Facility (TBA).</li> </ul>
<b>Project Evaluation</b>	A survey conducted by the internal evaluator was sent to 55 students.
<b>Students' Majors of Interest</b>	Biotechnology; Chemical Engineering; Chemistry; Civil Engineering; Crops and agro-environmental sciences; Environmental Technology; Industrial Chemistry; and Mechanical Engineering.

### Exhibit A-7: Project Overview for the University of Texas-El Paso (UTEP)

Item/Element	Brief Description
<b>Project Title:</b>	BGREEN – Building a Regional Energy and Educational Network
<b>Project Start Date</b>	September 1, 2011
<b>Project Director/Principal Investigator</b>	Dr. Heidi Taboada Jimenez
<b>Co-Project Director/Co-Principal Investigators</b>	Shad Nelson (TAMUK) Tongdan Jin (TSU) Delia Valles (NMSU)
<b>External Evaluator(s)</b>	Dr. Manuel Pina, Texas A&M University-College Station
<b>Internal Evaluator(s)</b>	
<b>Collaborating Universities/Colleges</b>	Texas A&M University- Kingsville (TAMUK); Texas State University San Marcos (TSU); and New Mexico State University (NMSU).  UTEP is the lead academic institution collaborating with three other collaborative project grantees including NMSU, TAMUK, and TSU.
<b>USDA Agency Partners</b>	<ul style="list-style-type: none"> <li>• Dan R. Upchurch, ARS Southern Plains Area Director</li> <li>• Jeffrey Steiner, National Program Leader for Biomass Production Systems</li> <li>• M. Lee Norfleet, Natural Resources Conservation Service (NRCS) – USDA Resources Inventory and Assessment Division (RIAD)</li> <li>• Francisco Valentin Jr., Texas State Director for Rural Development (RD)</li> </ul>
<b>Other Partners</b>	Ari M. Michelsen, Texas AgriLife Research Center at El Paso Director
<b>Project Collaborators</b>	
<b>Project Goal(s)</b>	<ul style="list-style-type: none"> <li>• To create a collaborative network of researchers, educators, USDA agencies, and non-profit organizations to coordinate efforts, share resources, and increase educational, training and post-graduation opportunities for Hispanic students pursuing careers in the Sustainable Energy area.</li> </ul>
<b>Project Summary</b>	<ul style="list-style-type: none"> <li>• A consortium comprised of the University of Texas at El Paso (UTEP), Texas A&amp;M University-Kingsville (TAMUK), Texas State University-San Marcos (TSU), New Mexico State University (NMSU), and USDA-ARS proposes to establish an educational network to increase the number of Hispanic students enrolled in studies related to Sustainable Energy and facilitate the employment of Hispanics in critical occupations to USDA's mission in renewable energy and rural development.</li> </ul>

**Exhibit A-7: Project Overview for the University of Texas-EI Paso (UTEP)**

Item/Element	Brief Description
<p><b>Project Objectives</b></p>	<ul style="list-style-type: none"> <li>The objective is to provide our students with the required skills to satisfy current and future USDA workforce needs related to sustainable energy. Therefore, one of the main goals of BGREEN will focus on reshaping curricula to respond to current demands in the sustainable energy sector. BGREEN is composed of four key components: 1) Outreach &amp; Recruitment, 2) Education, 3) Experiences, and 4) Dissemination.</li> </ul>
<p><b>Project Outcome Objectives</b></p>	<ul style="list-style-type: none"> <li>Twelve new courses in the Sustainable Energy area will be developed. Examples of new courses/modules include Feedstock Logistics, Sustainable Agriculture, Water-Energy Nexus, Green Chemistry, Renewable Energy Policy and Economics, and Biofuels and Sustainable Energy, among others.</li> <li>Curricula to better satisfy current and future NIFA needs will be developed and implemented.</li> <li>Existing courses/modules related to sustainable energy will be shared among partner institutions such as sustainability engineering and renewable energy systems.</li> <li>One PhD track in Sustainable Science and Engineering under the Environmental Science and Engineering PhD program at UTEP will be developed.</li> <li>The BGREEN project's webpage will be developed to serve as a virtual resource library to showcase all of the materials developed.</li> <li>Videoconferencing capabilities will be utilized to broadcast USDA's seminar presentations from College Station to all consortium universities.</li> <li>At least 8 student internships per year will be conducted at USDA research centers.</li> <li>At least 16 students per year will participate in research experiences conducted at the partner institutions.</li> <li>At least 10 presentations per year will be presented at regional/national conferences.</li> <li>Twelve lesson plans and case studies in Sustainable Energy (bio-energy) will be developed for use in K-12 outreach programs to attract students to careers in sustainable energy</li> <li>Two times at each partner institution, the "Imagine the 2050: Green City Design Exposition," will be organized and hosted for local middle and high school students and teachers to discover sustainable energy solutions.</li> <li>On average 42 undergraduate and graduate students will be supported per year, and their progress towards achievement of their Bachelor of Science, Master of</li> </ul>

**Exhibit A-7: Project Overview for the University of Texas-EI Paso (UTEP)**

Item/Element	Brief Description
	Science, or PhD degrees will be tracked using a database created for this purpose.
<b>Project Activities</b>	<ul style="list-style-type: none"> <li>• Speaker seminar series.</li> <li>• Scientific method workshop.</li> <li>• Career activities.</li> <li>• Field trips, picnic day at end of semester.</li> </ul>
<b>Project Evaluation</b>	<ul style="list-style-type: none"> <li>• The primary intent of the evaluation is to contribute to the achievements and success of the project as it unfolds and evolves. To do this, the plan is composed of two strands of work. The first strand is qualitative, formative, and continual. It is intended to gain insight into the successes and concerns about the project as perceived by all stakeholders and to allow making informed necessary mid-course adjustments. The second strand is quantitative and summative.</li> </ul>
<b>Students' Majors of Interest</b>	Environmental Science & Engineering (Energy Track), Industrial & Systems Engineering, Civil Engineering, Wildlife Biology, Biochemistry, Animal Science, Chemistry, AgriBusiness-Ranch Management, Agriculture Science , Agribusiness, Animal Science-Pre Vet, Agricultural Economics and Agricultural Business
<b>USDA Strategic Goals</b>	Goal 1 (Assist rural communities to create prosperity so they are self-sustaining, re-populating, and economically thriving) and Goal 2 (Ensure Our National Forests and Private Working Lands Are Conserved, Restored, and Made More Resilient to Climate Change, While Enhancing Our Water Resources)

**Exhibit A-8: Collaborating Colleges and Universities, 2011-12**

Collaborating Colleges/ Universities	Type of Institution	USDA Land Grant University (1862, 1890, and 1994) <sup>1</sup>	Hispanic- Serving Institution (HSI) in 2012-13	Hispanic- Serving Agricultural College and University (HSACU) in 2012-13	Participant Status (Yes or No)	
					2011-12	2011-12
<b>California State University-San Bernardino (CSU-SB)</b>						
California State University-Bakersfield	University	No	Yes	Yes	Yes	Yes
California State University-Channel Islands	University	No	Yes	No	No	Yes
California State University-Dominguez Hills	University	No	Yes	No	No	No
California State University-Fresno	University	No	Yes	Yes	Yes	Yes
California State University-Fullerton	University	No	Yes	Yes	No	No
California State University-Long Beach	University	No	Yes	Yes	No	No
California State University-Los Angeles	University	No	Yes	No	Yes	Yes
California State University-Monterey Bay	University	No	Yes	Yes	Yes	Yes
California State University-Northridge	University	No	Yes	No	Yes	Yes
California State Polytechnic Institute – Pomona	University	No	Yes	Yes	No	Yes
California State University-San Bernardino	University	No	Yes	Yes	Yes	Yes
California State University-San Marcos	University	No	Yes	No	Yes	Yes
California State University-Stanislaus	University	No	Yes	No	Yes	Yes
San Diego State University	University	No	Yes	No	Yes	Yes

**Exhibit A-8: Collaborating Colleges and Universities, 2011-12**

Collaborating Colleges/ Universities	Type of Institution	USDA Land Grant University (1862, 1890, and 1994) <sup>1</sup>	Hispanic- Serving Institution (HSI) in 2012-13	Hispanic- Serving Agricultural College and University (HSACU) in 2012-13	Participant Status (Yes or No)	
					2011-12	2011-12
<b>Florida International University (FIU)</b>						
Florida International University (FIU)	University	Yes	Yes	Yes	Yes	Yes
InterAmerican University of Puerto Rico – San Germán (IAU-SG) [Universidad Interamericana de Puerto Rico at San Germán]	University	No	Yes	Yes	Yes	Yes
Miami Dade College	College	No	Yes	Yes	Yes	Yes
St. Thomas University (STU)	University	No	Yes	Yes	Yes	Yes
<b>New Mexico State University (NMSU) [Las Cruces]</b>						
Luna Community College	College	No	Yes	No	Yes	Yes
InterAmerican University of Puerto-Bayamón	University	No	Yes	No	Yes	Yes
New Mexico Highlands University	University	No	Yes	Yes	Yes	Yes
New Mexico State University-Alamogordo	College	No	Yes	No	Yes	Yes
New Mexico State University-Carlsbad	College	No	Yes	No	Yes	Yes
New Mexico State University-Grants	College	No	Yes	No	Yes	Yes
New Mexico State University (Las Cruces)	University	Yes	Yes	No	Yes	Yes
University of Puerto Rico-Bayamón (UPR-B)	University	No	Yes	No	Yes	Yes
University of Puerto Rico-Cayey (UPR-C)	University	No	Yes	No	Yes	Yes
University of Puerto Rico-Humacao (UPR-H)	University	No		No	Yes	Yes

**Exhibit A-8: Collaborating Colleges and Universities, 2011-12**

Collaborating Colleges/ Universities	Type of Institution	USDA Land Grant University (1862, 1890, and 1994) <sup>1</sup>	Hispanic- Serving Institution (HSI) in 2012-13	Hispanic- Serving Agricultural College and University (HSACU) in 2012-13	Participant Status (Yes or No)	
					2011-12	2011-12
University of Puerto Rico-Mayagüez (UPR-M)	University	No	Yes	No	Yes	Yes
University of Puerto Rico-Rio Piedras (UPR-RP)	University	No	Yes	No	Yes	Yes
Eastern New Mexico University-Ruidoso	College	No	No	No	No	Yes
University of Puerto Rico-Utuado	University	No	Yes	No	No	Yes
<b>Texas A&amp;M University-Kingsville</b>						
Del Mar College	College	No	Yes	No	Yes	Yes
South Texas College (STC)	College	No	Yes	No	Yes	Yes
Texas A&M University-Kingsville (TAMUK)	University	No	Yes	Yes	Yes	Yes
Texas State Technical College -Harlingen (TSTC)	College	No	Yes	Yes	Yes	Yes
University of Texas-Pan American (UTPA)	University	No	Yes	Yes	Yes	Yes
<b>Texas State University-San Marcos (TSU)</b>						
Laredo Community College (LCC)	College	No	Yes	No	Yes	Yes
Northwest Vista College (NWVC)	College	No	Yes	No	Yes	Yes
Palo Alto College (PAC)	College	No	Yes	Yes	Yes	Yes
Texas State University-San Marcos (TSU)	University	No	Yes	No	Yes	Yes

**Exhibit A-8: Collaborating Colleges and Universities, 2011-12**

Collaborating Colleges/ Universities	Type of Institution	USDA Land Grant University (1862, 1890, and 1994) <sup>1</sup>	Hispanic- Serving Institution (HSI) in 2012-13	Hispanic- Serving Agricultural College and University (HSACU) in 2012-13	Participant Status (Yes or No)	
					2011-12	2011-12
<b>University of Puerto Rico-Mayagüez</b>						
InterAmerican University of Puerto Rico – San Germán (IAU-SM) [Universidad Interamericana de Puerto Rico at San Germán	University	No	Yes	No	Yes	Yes
University of Puerto Rico-Aguadilla (UPR-A)	University	No	Yes	Yes	Yes	Yes
University of Puerto Rico-Humacao (UPR-H)	University	No	Yes	No	Yes	Yes
University of Puerto Rico-Mayagüez (UPR- M)	University	No	Yes	No	Yes	Yes
University of Texas-El Paso (UTEP)	University	No	Yes	Yes	Yes	Yes
<b>University of Texas-El Paso (UTEP)</b>						
New Mexico State University (NMSU)	University	Yes	Yes	No	Yes	Yes
Texas A&M University- Kingsville (TAMUK)	University	No	Yes	Yes	Yes	Yes
Texas State University- San Marcos (TSU)	University	No	Yes	No	Yes	Yes
University of Texas-El Paso (UTEP)	University	No	Yes	Yes	Yes	Yes

# **Appendix B: Project Progress and Performance Reports (including Outcome Data)**

# **California State University – San Bernardino**

# CSUSB Watershed Management Experiential Learning for USDA Careers

## Progress Report

### September 2012 - April 2013

#### Outputs

##### **Student Recruitment:**

During the first half of Year 2, 50 students were recruited, hired, and placed in paid, mentored experiential learning internships with advisors from the USDA and other agency partners, municipal departments, non-profit organizations, and their institutions. This brings the total number of students placed in internships to 100 for the first two years of this Project. Applications for Year 2 were received from 12 different HSI California State University (CSU) campuses. The students selected for Year 2 represented 11 CSU campuses (4 interns from Bakersfield; 1 from Channel Islands; 7 from Fresno; 3 from Los Angeles; 9 from Monterey Bay; 4 from Northridge; 5 from Pomona; 3 from San Bernardino; 5 from San Diego State; 4 from San Marcos; and 5 from Stanislaus). More internship applications were received than the Program had openings and a wait list was created. This wait list will be utilized to fill any vacant internship opportunities.

The students selected for internships for Year 2 were primarily undergraduates (n=35) compared to graduate students (n=15) and came from a variety of racial backgrounds: Hispanic n=29; Asian n=7; Middle Eastern n=3; and White n=11. The gender of the students was mostly female (n=28) compared to male (n=22). 1 student is disabled. The selected students are pursuing diverse USDA-relevant degrees.

##### **Completed Internships:**

Of the 50 interns from Year 1, 23 students completed their internships and turned in final reports. The remaining 27 interns are still working on their internships - the students were given 1 full year to complete their internships and some are still in progress. In Year 1, 1 intern began the internship, but quit the program prior to completion due to discontinuing school. This student was replaced with another intern. Examples of some titles of the completed projects included: *Resource Conservation District of Santa Cruz County: Conservation Incentives and Managed Aquifer Recharge in the Pajaro Watershed*; *Determination of Tulare Lake, CA Late Pleistocene and Holocene Lake Level History through Total Inorganic Carbon Analysis*; *Sierra River Discharge*; *Characterization of Urban Runoff Treatment Ponds within San Dieguito River Park*; and *Applied Science to Inform Conservation and Restoration of a Threatened Habitat Type; the Salt Marsh - Upland Ecotone*.

##### **Collaborations:**

Collaborations between the project and the USDA, other agencies, and organizations for placement and advising of interns continue to be ongoing. We continued to place students with the USDA Natural Resources Conservation Service and Agricultural Research Service, as well as other entities, as in Year 1, but in addition we formed new collaborations with the USDA U.S. Forest Service and U.S. Farm Service Agency and placed interns with them. Additionally, we

expanded our partner list and placed students with the following new entities: CalFire, Ventura Coastkeeper/Wishtoyo Foundation; Central Coast Water Quality Protection, Inc.; Santa Lucia Conservancy; NASA; Poder Popular; and Tuolumne River Trust.

During the reporting period of this Progress Report, we entered into a formalized Master Participant Agreement with the Pacific Southwest Region of the U.S. Forest Service to facilitate diverse student placement with the Forest Service. This Agreement cultivates adequate participation by Hispanic students in the Project and encourages participation of the Forest Service in hosting and mentoring student interns, and providing housing and background checks, as needed.

Additionally, as part of the K-12 Outreach, the Project collaborated with Upward Bound, a U.S. Department of Education TRIO program, and provided a High School Internship Program to underrepresented, STEM-focused high school students in the local area. This High School Internship Program teaches students advanced Geographic Information Systems (GIS), Global Positioning Systems (GPS), and mobile technologies (tablets, pads and mobile applications) skill sets in settings that are tailored to USDA-relevant topics. Two cohorts of interns, for a total of 19 underrepresented students, participated during this reporting period (Hispanic n= 17; African American n=2). The gender of the students was predominately female (n=13) compared to male (n=6). They came from 5 different local high schools.

#### **Scholarships:**

The scholarship component to this grant funds outstanding students capable of enhancing the agricultural and natural resource professional work force. One \$40,000 scholarship will be awarded to a CSU Hispanic student towards the completion of a Ph.D. degree in a USDA-relevant discipline. The Scholarship Committee has been created and will be involved in the applications review and awarding of the funds. The Scholarship application period will be open April 15 - June 7, 2013.

#### **Miscellaneous:**

The Project continues to utilize social media to connect with the interns. Facebook and Twitter accounts continue to provide the students a forum to collaborate with each other and the WRI, post updates and pictures on their internship projects, share results, and pose questions, among other things. CSUSB utilizes the social media to communicate broadly with the interns, post relevant USDA career information and job postings, internship opportunities, scholarship information, and related conferences and meetings of interest. The respective sites are: <http://www.facebook.com/WRI.csusb> and <https://twitter.com/WRIcsusb>.

Travel funds were allocated to allow interns to attend professional and student conferences and annual meetings to enrich their internship experiences. 5 interns were sent to the 2012 HACU Annual Conference and 1 intern attended MANRRS 2013. Additionally, 2 interns presented their work at the Water Resources and Policy Initiatives Board Meeting.

## **Outcomes/Impacts**

Corresponds to USDA Indicators and is combined for Years 1 and 2. 1) Our Program partnered with the following entities for intern placement: USDA ARS, NRCS, FS, and FSA; CA Fish and Game; CalFire; Central Coast Water Quality Protection; Elkhorn Slough National Estuarine Reserve; NASA; Poder Popular; Santa Lucia Conservancy; Santa Margarita Ecological Reserve; San Dieguito River Park; Tuolumne River Trust; Resource Conservation District; Ventura Coastkeeper; various City and County departments; multiple Water Districts; industry; and CSU campuses. 2) 100 students were awarded paid internships. 11 were placed with USDA agencies. 3) 55 percent are females and 45 percent are males, while ethnically 52 percent Hispanic; 2 percent Native American; 13 percent Asian; 5 percent Middle Eastern; and 28 percent Caucasian. 4) 99 students have been retained, but many internships are still in progress so rates will continue to be assessed. 5) 100 interns (38 percent graduate, 62 percent undergraduates) are placed in experiential learning mentored internships. 6) 6 students presented at local and regional meetings. 7) The interns' majors include (some dual): Biological Sciences (17 percent); Civil Engineering (7 percent); Coastal Watershed Science Policy (22 percent); Computer Science (1 percent); Computer Engineering (1 percent); Ecology (1 percent); Electrical Engineering (1 percent); Environ. Engineering (3 percent); Environ. Science (6 percent); French (1 percent); Geography (16 percent); Geology (11 percent); German (2 percent); Health Science (2 percent); Hydrogeology (1 percent); Industrial Technology (4 percent); Landscape Architecture (1 percent); Math (3 percent); Mechanical Engineering (1 percent); Photography (1 percent); Plant Science (3 percent); Political Science (1 percent); Psychology (2 percent); and Sociology (2 percent). All projects are watershed and natural resource relevant. 8) 4 Masters and 2 Bachelors degrees awarded, however graduation rates will continue to be assessed. 9) 4 students produced 2 publications to date. 10) The average GPA pre-internship is 3.37. Since many internships are still ongoing, the post-internship average will continue to be assessed. 11) Curriculum development and faculty hire was not an objective of our proposal, as funded. 12) 55 percent of the interns are females with an average pre-internship GPA of 3.39 (Hispanic-3.2; Asian-3.23; Native American-2.74; and Caucasian-3.71). 13) Academic indicators such as quality of advising and access to tutorial services will continue to be collected as internships end. 14) To date, 6 students have been offered jobs or additional paid internships. 15) Since many internships are in progress, we continue to assess the effectiveness of research activity and skill development, but the presentation opportunities are giving them the ability to improve their communication skills. 16) CSUSB offers unpaid High School Internships to underrepresented students on advanced GIS, GPS, and mobile technologies skill sets that are tailored to USDA-relevant topics. Two cohorts have been established, comprised of 19 students from 5 local schools. Ethnically, they are primarily Hispanic (17) and female (13), compared to African American (2) and male (6). Additionally, CSU Fresno is working with the Mathematics, Engineering, Science Achievement (MESA) Program to discuss water related topics to high school students. 17) CSUF participated in the National Professional Science Master's Association Regional Workshop, discussing water related careers, promotion of degrees, and internships. CSUSB exhibited at Stemapalooza 2012 with over 750 middle school students in attendance. 18) 16 interns attended the Informational Sessions on USDA Careers Webinar. 18) Budget obligations and expenditures are on track. 19) All 100 interns have been hired and most activities are on

schedule. 20) Initial IDRA surveys were completed and data was received from 32 CSU interns. Exit interviews are ongoing.

### **Publications**

Blunt, A., Negrini, R., Randall, K., Garcia, E., Wilson, James, Wilson, John, Chauhan, J., Chehal, R., Shurbaji, H., and Shugart, J. (2012). Supplementing a Tulare Lake, CA Late Pleistocene to Holocene Lake-Level Record Using Geochemical and Geophysical Proxies from Core Sediments. Geological Society of America Abstracts with Programs, Vol. 44, No. 7, p. 84.

Lawrence, S. and Bryant, E. (2012). Riverscape. Monthly. Provides information on the San Dieguito River Park to establish a continuous open space corridor throughout the length of the Park that preserves natural habitats, protects linkages for wildlife movement, and provides compatible areas for recreational opportunities.

### **Participants**

Key Personnel:

1) Julie Lappin, JD, the PI of the project, is responsible for the administration of the program and provides oversight on the program and reporting requirements. She also coordinates collaboration efforts with the 14 HSI CSU campuses, community partners, and the faculty teams. Ms. Lappin tracks interns' efforts and is responsible for reporting project results. She also reviews and approves all internship applications, ensuring the scope of work meets the requirements of the USDA guidelines and is consistent with university-level research. She provides guidance to interns as needed.

2) Dr. David Zoldoske, Ed.D., serves as co-PI of the project. His duties include working with CSUSB to successfully promote and implement the program at the participating campuses. This includes selecting mentors and student participants for the program. Dr. Zoldoske also assists with contacting USDA agencies and informing them about the program requirements and intended outcomes, and requesting their participation when appropriate to promote USDA career opportunities among current and potential students attending the 14 HSI campuses. This includes promoting campus visits by Federal agencies and other activities designed to raise student awareness of USDA career opportunities. Dr. Zoldoske works with the program Bilingual Coordinator to provide Spanish language support to students.

### **Target Audience**

During the first two years of the project, 100 paid experiential learning internship opportunities were awarded to students from Hispanic Serving Institution Cal State University campuses. Females made up the largest composition of interns, 55 percent, compared to males, 45 percent. Ethnically, the interns were comprised of 52 percent Hispanic; 2 percent Native American; 13 percent Asian; 5 percent Middle Eastern; and 28 percent Caucasian. Of the 100 interns, 38 percent are graduate students, while 62 percent are undergraduate students.

### **Project Modifications**

The Project requested a budget modification to allow the funds originally allotted for the K-12 Outreach Consultant to be reallocated into different budget categories. This was due to when the original K-12 outreach scope was defined, the funds as originally allocated did not represent what was needed for the outreach component. No additional funds were requested in this modification and additionally, the total amount allocated for the K-12 piece remains unchanged.

**Watershed Management Experiential Learning for USDA Careers**  
**Award Number 2011-38422-31204**  
**Sept. 1, 2012 - Aug. 31, 2013 Annual Report (Year 2)**

**Project Director:**

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**Co-Project Director:**

David Zoldoske  
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**Accomplishments**

**A. What was accomplished under these goals?**

**1. Major Activities Completed**

During the second year, the Watershed Management Experiential Learning for USDA Careers Project has recruited, hired, and placed 50 students from multiple CSU campuses in paid, mentored experiential learning career experiences with advisors from the USDA and other agency partners, municipal departments, non-profit organizations, and their institutions. This brings the total number of students placed in experiences to 100 for the first two years of this Project. Applications for Year 2 were received from 12 different HSI California State University (CSU) campuses. The students selected for Year 2 represented 11 CSU campuses (4 students from Bakersfield; 1 from Channel Islands; 7 from Fresno; 3 from Los Angeles; 9 from Monterey Bay; 3 from Northridge; 5 from Pomona; 3 from San Bernardino; 6 from San Diego State; 4 from San Marcos; and 5 from Stanislaus). The selected students are pursuing diverse USDA-relevant degrees. More student applications were received than the Program had openings and a wait list was created. This wait list was utilized to fill any vacant career experience opportunities.

Also during this reporting period, the Project entered into a formalized Master Participant Agreement with the Pacific Southwest Region of the U.S. Forest Service to facilitate diverse student placement in the Watershed Management Project with the Forest Service. This Agreement cultivates adequate participation by Hispanic students in the Project and encourages participation of the Forest Service in hosting and mentoring student interns, and providing housing and background checks, as needed.

One \$40,000 WRPI/USDA Watershed Management Doctoral Scholarship was awarded during this reporting period to address the underrepresentation of Hispanics/Latinos in professional careers in the food, agriculture, and natural resource system as well as the government, and to attain post-graduate degrees in the food, agricultural, and natural resources sciences. The scholarship awardee is an outstanding Hispanic CSU Fresno graduate that is entering his Ph.D. program in Environmental Systems at UC Merced. The recipient began volunteering with ARS as a junior in high school with a K-12 outreach program. He eventually worked his way up to Student Assistant and then Biological Science Technician, while earning both his B.S. and M.S. degrees in Chemistry at CSU Fresno. He is eager to continue working for ARS upon graduation. A Scholarship Committee composed of faculty and staff from 3 CSU campuses participated in the review process of the scholarship funds.

As part of the K-12 Outreach, the Project collaborated with Upward Bound, a U.S. Department of Education TRIO program, and provided a High School Internship Program to underrepresented, STEM-focused high school students in the local area. This High School Internship Program teaches students advanced Geographic Information Systems (GIS), Global Positioning Systems (GPS), and mobile technologies (tablets, pads and mobile applications) skill sets in settings that are tailored to USDA-relevant topics. Two cohorts of interns, for a total of 19 underrepresented students, participated during this reporting period.

## **2. Specific Objectives Met**

The primary objective of this Project is to measurably increase the encouragement, retention, graduation, and USDA career attainment of underrepresented California State University (CSU) students by placing 50 students a year for 4 years (200 total students) into paid experiential learning opportunities in the field of watershed management which helps students gain real-world experience in natural resource protection while developing new knowledge, skills, and abilities in problem-solving from a watershed perspective. The training provided is aimed at preparing 80% of these total 200 participants for USDA careers.

Both of these objectives are being met. The Project has recruited and hired 50 CSU students a year from the Hispanic Serving CSU campuses and placed them in paid experiential learning career experiences with the USDA, other agency partners, municipal departments, non-profit organizations, and their institutions. The Project has a retention rate in the program of 96% and 6 Masters and 16 Bachelors degrees have been awarded to student participants to date. 15 students have self-reported that they've been offered jobs or additional paid internships. 1 scholarship was awarded to a Hispanic male pursuing his PhD in Environmental Systems at UC Merced.

Additionally, all students participating in the Project are required to complete a USDA Career Identification Worksheet, in which the students identify a USDA career or careers that they are most interested in pursuing, and research that career. This includes researching the requirements and mandatory courses that are prerequisites to submitting a USDA application and whether the CSU campus they attend offers the necessary courses. Students attending a CSU campus that does not offer the courses needed are required to identify where those classes are available, whether that is at another CSU or a nearby institution, and the date by which the student will complete those classes. This career identification process exposes the students to USDA careers and starts their mindset of thinking towards attaining that career. The Project's Student Reporter posts USDA job descriptions for entry-level positions and internship opportunities on the Project Facebook page so the students are aware of available jobs and opportunities and can determine which agencies are hiring and the locations. Placing the students with USDA agencies and other organizations directly exposes the student to the agency, providing the students an opportunity to participate in agency projects, network within the agency, and learn about and understand agency opportunities, careers, and requirements. The agency is able to see firsthand the quality of the student and their work product which can

lead to the agency offering the student additional opportunities or even a job offer. Students not placed directly with the USDA are still gaining the valuable and desired skill sets and networking needed for future USDA careers.

### **3. Significant Results Achieved, Including Major Findings, Developments, or Conclusions**

50 students per year from 14 different campuses are recruited, hired and placed in paid, mentored experiential learning career experiences with the USDA and other partners. 100% of the students are enrolled in a discipline that is USDA career-relevant. There is a 96% retention rate in the Project, with 6 master and 16 bachelor degrees awarded in disciplines relevant to the USDA to date. 15 students have self-reported that they've been offered jobs or additional paid internships. 9 students have begun a master's program and 1 student is in the process of applying for a master's program.

The Project entered into a formalized Master Participant Agreement with the Pacific Southwest Region of the U.S. Forest Service. This Agreement facilitates diverse student placement in the Watershed Management Project with the Forest Service. It cultivates adequate participation by Hispanic students in the Project and encourages participation of the Forest Service in hosting and mentoring student interns, and providing housing and background checks, as needed.

### **4. Key Outcomes or Other Accomplishments Realized**

The Project utilizes and incorporates lessons learned from previous internship programs into this Project. For example, the Project is a collaborative with 14 CSU campuses, but it is designed to reduce administrative costs because of the centralization of the project management and fiscal management functions on one partner campus, CSUSB. This allows the Project to keep the cost of the program down and ensures that the majority of the funds go directly to student support. In comparison, for traditional multi-campus initiatives, all of the fiscal and much of the project management functions are duplicated at each site. Next, the Project utilizes the employment process as the means for paying the students. This allows the students to focus on a project that is relevant to their discipline and ultimately, their career, and in some instances allows the student to stop working at non-relevant jobs such as retail and fast food. The students appear to take pride and ownership in their work, knowing they are being paid for it.

Post-career experience surveys received from the advisors indicated that the students consistently exceeded expectations or exceeded expectations in regards to performing assigned functions with the desired results and performing the amount of work expected. The advisors stated the students were committed and loyal, willing to accept responsibility for decisions and actions, flexible and cooperative in working with supervisors and coworkers, and adjusted to changes and managed stress. The surveys completed indicated the students understood his/her specific duties or assignments and had a thorough grasp of conceptual and technical aspects of work, and they have potential for work of a scientific nature within the USDA or one of its affiliate organizations. All advisors who responded were willing to supervise future students from this Project again.

Post-career experience surveys received from the students indicated that they were originally interested in the Project for the experience. Most students responded there were no issues with their advisor and there was adequate communication with the Project. The students mostly indicated that their career experiences broadened the awareness of what is available to them, with students commenting they now consider agriculture as a career choice, realized their career goals were in line with what they want to do, and garnered excitement to see their profession in action during field visits as part of the projects. Regarding academic goals, students indicated that their academic goals weren't changed because their project supported their goals already, the project affected what classes were taken to be more applicable to the projects, one master's student indicated he was inspired to continue his education because there are so many things that need to be solved, and the experience got one student more serious in general about his career path. Most students stated they feel prepared academically for a career, but would enjoy learning more. Comments from the students indicated the most beneficial part of the project was the experience they gained, including experience with training others, practicing and applying the skills the student received during their project, gaining lab skills, working with others and cooperating with critical thinking skills in a group, and securing a job.

**B. What opportunities for training and professional development has the project provided?**

By placing all of the students directly in mentored, experiential learning opportunities, the students see the day-to-day operations of the agencies and organizations they are placed with. This allows them to gain first-hand knowledge of the tasks, and experience with the skill sets needed, for careers within those agencies and organizations. The opportunities that are provided to the student also allow them to network within the agency and organization. The Project also sends students to various professional conferences and meetings and encourages the students to present their work. To date 19 students have presented posters of their projects at various events (see Section 1 under Products for additional details). In addition to giving the students experience with public speaking and preparing academic posters, the students are able to network not only with their peers, but with potential employers and stakeholders as well.

**C. How have the results been disseminated to communities of interest?**

The Project continues to utilize the Project website and social media to disseminate the Project information and results. The students' final reports documenting their projects are posted on the website and the students present their project results at various professional meetings and conferences. A collaborative yearbook has been compiled, showcasing the student participants for our Project, but also the students of the other 6 collaborative projects as well. The Project participates in the meta-data analysis of all 7 collaborative projects, done by IDRA. Posters and flyers on the project have been created, presented, and disseminated at various events including the PD meetings in DC and Mayaguez, Puerto Rico, the CETARS Symposium, the Water Resources and Policy Initiatives Annual Conferences and Board meetings, the Agriculture Day in Sacramento, various CSU meetings, and multiple K-12 events.

**D. What do you plan to do during the next reporting period to accomplish the goals?**

The Project will continue to recruit and hire another 50 students to participate in career experiences, bringing the total amount to 150 students served. Grades, graduation rates, and job placements will continue to be tracked and reported on. Another scholarship will be awarded to a student pursuing their PhD degree. Additional dissemination of the Project results will be done.

**Actual FTEs for the Reporting Period**

Role	Faculty and Non-Students	Students within Staffing Roles			Total by Roles
		Undergraduate	Graduate	Post-Doctorate	
Scientist					
Professional	0.48				0.48
Technical					
Administrative	0.65	0.19			0.84
Other					
Total	1.13	0.19			1.32

**Target Audience**

The goal of this project is to measurably increase the encouragement, retention, graduation, and USDA career attainment of underrepresented California State University (CSU) students. During Year 2 of the project, 50 paid experiential learning career experience opportunities were awarded to students from Hispanic Serving Institution Cal State University campuses. The students selected for Year 2 were primarily undergraduates (n=35 or 70%) compared to graduate students (n=15 or 30%) and came from a variety of racial backgrounds: Hispanic n=29 (58%); Asian n=7 (14%); Middle Eastern n=3 (6%); and White n=11 (22%). The gender of the students was mostly female (n=28 or 56%) compared to male (n=22 or 44%). 1 student (2%) is disabled. The selected students are pursuing diverse USDA-relevant degrees. Additionally 1 \$40,000 scholarship was awarded to a Hispanic male pursuing his PhD in Environmental Systems at UC Merced.

The K-12 outreach component of this grant targets underrepresented, STEM-focused high school students and offers a High School Internship Program to teach them advanced Geographic Information Systems (GIS), Global Positioning Systems (GPS), and mobile technologies (tablets, pads and mobile applications) skill sets in settings that are tailored to USDA-relevant topics. By offering access, training, and hands-on learning experience with these technologies to the students, the students may increase both their performance and persistence in high school and it may also result in a more direct pathway for the students to enter higher education, particularly a STEM discipline that is relevant to a career with the USDA. During this reporting period, two cohorts of high school students, for a total of 19 underrepresented students, participated (comprised of 89 percent Hispanic and 11 percent African American). The gender of the students was predominately female (68 percent) compared to male (32 percent). They came from 5 different local high schools.

## Products

### 1. Publications

- Alcalá, R., and Shah-Fairbank, S., RVR Meander to Assess Snowslide Canyon Creek. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Blanco, S., Sreenivasan, A., and Los Huertos, M., Monitoring a Toxic Cyanobacterial Bloom in a Shallow, Hypereutrophic Lake on California's Central Coast. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Dang, M., Adhikari, D., and Barnes, P. Automation of Surface Renewal Based Micro-met Systems to Evaluate Crop Evaporation (ET). Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- David, C. Nitrate Removal, Flow Paths, and N<sub>2</sub>O Emissions in Two Denitrifying Woodchip Bioreactors: Mitigating Agricultural Nutrient Loads in the Salinas Valley, CA. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Diaz, C., Developing Landscape Profiles for Urban Watersheds. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012. (poster)
- El Haddad, I., Csupak, K., and Radniecki, T., Investigating the Toxicity of Silver Ions to Chronically Exposed Nitrifying Bacteria. Water Resources and Policy Initiatives Advisory Board Meeting, Los Angeles, CA, Feb. 27, 2013. (poster)
- El Haddad, I., Csupak, K., and Radniecki, T., Investigating the Toxicity of Silver Ions to Chronically Exposed Nitrifying Bacteria. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Garcia, A., Piecuch, O., Machado, M., Buchanan, J., Avwundiogoba, A., and Hauselt, P. Hydro-Geomorphic Characteristics of the Stanislaus, Tuolumne, and Merced Watersheds. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Lawrence, S. and Flanders, E. Characterization of Urban Runoff Water Treatment Ponds in San Dieguito River Park. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Lee, R. and Biggs, T. Thermal and Oxygen Dynamics in Four Drinking Water Reservoirs. Water Resources and Policy Initiatives Advisory Board Meeting, Los Angeles, CA, Feb. 27, 2013. (poster)
- Lee, R. and Biggs, T. Thermal and Oxygen Dynamics in Four Drinking Water Reservoirs. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Padilla, K., Blunt, A., Prosser, L., Negrini, R., Medina, L., Randall, K., Garcia, E., Wilson, James, Wilson, John, Reyes, C., Jimenez, M., Wigand, P., Adams, K., and Zimmerman, S. Sierran Stream Discharge Forecasting Based on Tulare Lake-level Reconstructions. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).

- Padilla, K., Blunt, A., Prosser, L., Padilla, K., Garcia, E., Wilson, James, Randall, K., Rivas, C., Jimenez, M., Wilson, John, Medina, L., and Negrini, R., Determination of Tulare Lake, CA Late Pleistocene and Holocene Lake Level History through Carbon/Nitrogen (C/N) Ratios. Center for Education and Training in Agriculture and Related Sciences Symposium, University of Mayaguez, Puerto Rico, Aug. 12, 2013 (poster)
- Prosser, L., Blunt, A., Padilla, K., Garcia, E., Wilson, James, Randall, K., Rivas, C., Jimenez, M., Wilson, John, Medina, L., and Negrini, R. Determination of Tulare Lake, CA Late Pleistocene and Holocene Lake Level History Through Sediment Grain-Size Analysis ... Center for Education and Training in Agriculture and Related Sciences Symposium, University of Mayaguez, Puerto Rico, Aug. 12, 2013 (poster)
- Rhodes, J., Evaluation of Suitable Juvenile Steelhead Trout Habitat in the Carmel River Lagoon. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).
- Saltis, M., and Phalen, R., Removal of Arsenic from Contaminated Ground Water Using a Nicaraguan Ceramic Filter. Water Resources and Policy Initiatives Annual Conference, Long Beach, CA, June 20, 2013. (poster).

## **2. Patent(s) and Plant Variety Protection(s)**

None

### **Other Products**

#### Collaborations:

Collaborations between the project and the USDA, other agencies, and organizations for placement and advising of students continue to be ongoing. We continued to place students with the USDA Natural Resources Conservation Service and Agricultural Research Service, as well as other entities, as in Year 1, but in addition we formed new collaborations with the U.S. Forest Service and Farm Service Agency and placed students with them. Additionally, we expanded our partner list and placed students with the following new entities: CalFire, Ventura Coastkeeper/Wishtoyo Foundation; Central Coast Water Quality Protection, Inc.; Santa Lucia Conservancy; NASA; Poder Popular; and Tuolumne River Trust. Collaborations between the CSU campuses increased as well. The Project has received additional faculty support (14 new advisors) from the participating CSU campuses with many inquiries received from non-HSI campuses about getting involved and offering the Project opportunities to their students.

During the reporting period of this Report, we entered into a formalized Master Participant Agreement with the Pacific Southwest Region of the U.S. Forest Service to facilitate diverse student placement with the Forest Service. This Agreement cultivates adequate participation by Hispanic students in the Project and encourages participation of the Forest Service in hosting and mentoring student interns, and providing housing and background checks, as needed.

The Project staff also worked with the Forest Service Southern California Consortium's Consortium Roundtable: Education, Community and Employment (CRECE). CRECE facilitates partnerships, pools resources and assesses community needs related to environmental education, outreach and employment recruitment in the San Bernardino Valley. It also provides

funds for a Student Liaison to be located on the CSUSB campus working in conjunction with the Forest Service, CSUSB, and the community, promoting CSUSB students' interest in FS internships and career opportunities and connecting the Southern California Consortium to local community efforts that relate to environment awareness and education.

Additionally, as part of the K-12 Outreach, the Project collaborated with Upward Bound, a U.S. Department of Education TRIO program, and provided a High School Internship Program to underrepresented, STEM-focused high school students in the local area. This High School Internship Program teaches students advanced Geographic Information Systems (GIS), Global Positioning Systems (GPS), and mobile technologies (tablets, pads and mobile applications) skill sets in settings that are tailored to USDA-relevant topics. Two cohorts of interns, for a total of 19 underrepresented students, participated during this reporting period (Hispanic n= 17; African American n=2). The gender of the students was predominately female (n=13) compared to male (n=6). They came from 5 different local high schools.

#### Scholarships:

During the second year of this Project, one \$40,000 WRPI/USDA Watershed Management Doctoral Scholarship was available to address the underrepresentation of Hispanics/Latinos in professional careers in the food, agriculture, and natural resource system as well as the government, and to attain post-graduate degrees in the food, agricultural, and natural resources sciences. The scholarship was awarded to an outstanding Hispanic CSU Fresno graduate that is entering his Ph.D. program in Environmental Systems at UC Merced. The recipient began volunteering with ARS as a junior in high school with a K-12 outreach program. He eventually worked his way up to Student Assistant and then Biological Science Technician, while earning both his B.S. and M.S. degrees in Chemistry at CSU Fresno. He is eager to continue working for ARS upon graduation. A Scholarship Committee composed of faculty and staff from 3 CSU campuses participated in the review process of the scholarship funds.

#### Miscellaneous:

The Project continues to utilize social media to connect with the students. Facebook and Twitter accounts continue to provide the students a forum to collaborate with each other and the WRPI, post updates and pictures on their projects, share results, and pose questions, among other things. WRPI utilizes the social media to communicate broadly with the students, post relevant USDA career information and job postings, internship opportunities, scholarship information, and related conferences and meetings of interest. The respective sites are: <https://www.facebook.com/WRI.WRPI> and [https://twitter.com/WRI\\_WRPI](https://twitter.com/WRI_WRPI).

The Project posts the students' final reports on the Project website. These can be located at: <http://wri.csusb.edu/InternfinalReportsforwebsite.htm>.

A total of 71 students (27 graduate and 44 undergraduate) completed their biographies and submitted images for inclusion in the Spring 2013 USDA HSI Collaboration Yearbook.

The Project participated or exhibited at the following events:

- September 2012: STEMapalooza, San Bernardino (over 750 middle school students in attendance)
- November 2012: GIS training, CSUSB's Palm Desert campus (18 underrepresented high school students in attendance)
- 16 students attended the Informational Sessions on USDA Careers Webinar in early 2013
- May 10, 2013: Keynote speaker at Fourth Annual Environmental and Sustainability Expo, CSUSB's Palm Desert Campus (140 6th grade students in attendance)
- May 10, 2013: Presentation on Internships and Water Careers (35 community college students from San Bernardino Valley College in attendance)
- April 23, 2013: Agriculture Day, Sacramento
- July 2013: Water Resources Institute's water conservation garden tour was given to local elementary school children, addressing the importance of water and its conservation.

Travel funds were leveraged and allocated to allow students to attend professional and student conferences and annual meetings to enrich their career experiences. 5 students were sent to the 2012 HACU Annual Conference in October in Washington, DC; 1 student presented a poster at the NIFA Project Directors Meeting in Washington, DC in October; 2 students presented their work at the Water Resources and Policy Initiatives Board Meeting at Metropolitan Water District in February; 1 student attended the 2013 MANRRS Conference in Sacramento in March; 1 student attended the 2013 Annual Salmonid Restoration Foundation Conference in Fortuna, CA in March; 14 students presented posters at the 2013 Water Resources and Policy Initiatives Annual Conference in Long Beach in June; and 2 students and the one scholarship recipient presented posters at the 2013 CETARS Symposium in Mayaguez, Puerto Rico in August.

### **Changes/Problems**

During this reporting period, the Project requested a budget modification to allow the funds originally allotted for the K-12 Outreach Consultant to be reallocated into different budget categories. This was due to when the original K-12 outreach scope was defined, the funds as originally allocated did not represent what was needed for the outreach component. No additional funds were requested in this modification and additionally, the total amount allocated for the K-12 piece remains unchanged. The request was approved.

**Watershed Management Experiential Learning for USDA Careers**  
**Award Number 2011-38422-31204**  
**20 Indicators Report**  
**Sept. 1, 2012 - Aug. 31, 2013 (Year 2)**

The following Indicators are combined for Years 1 and 2:

**1) Total Number of USDA Agencies and Partners**

The Watershed Management Experiential Learning for USDA Careers has two paid collaborators on the Project, CSU Fresno and San Bernardino. Additionally, the Project has 12 other unpaid CSU partners (all have received the HSI designation and include CSU Bakersfield, CSU Channel Islands, CSU Dominguez Hills, CSU Fullerton, CSU Long Beach, CSU Los Angeles, CSU Monterey Bay, CSU Northridge, Cal Poly Pomona, CSU San Marcos, CSU Stanislaus, and San Diego State University); 4 unpaid USDA partners (Agricultural Research Service, Natural Resource Conservation Service, Forest Service, and Farm Service Agency); and 24 unpaid other partners (AgBio Tech, Applied Marine Sciences, CA Fish and Game, CalFire, Central Coast Water Quality Protection, Cities of Monterey, Pacific Grove, and Watsonville, County of Monterey, Denise Duffy and Associates, Elkhorn Slough National Estuarine Reserve, Marina Coast Water District, Monterey County Extension Office, Monterey County Health Department, Monterey County Water Resources Agency, Monterey Peninsula Water Management District, NASA, Poder Popular, Resource Conservation District of Santa Cruz County, San Dieguito River Park, Santa Lucia Conservancy, Santa Margarita Ecological Reserve, Tuolumne River Trust, and Ventura Coastkeeper) for student placement in career experiences.

**2) Total Number of Career Experiences (USDA vs Others)**

100 students were awarded paid career experiences during the first two years. Of these, 12 were placed with USDA agencies (ARS, NRCS, FS, and FSA), while 88 were placed with other agencies, organizations, and campuses (AgBio Tech, Applied Marine Sciences, CA Fish and Game, CalFire, Cal Poly Pomona, Central Coast Water Quality Protection, Cities of Monterey, Pacific Grove, and Watsonville, County of Monterey, CSU Bakersfield, CSU Channel Islands, CSU Fresno, CSU Los Angeles, CSU Monterey Bay, CSU Northridge, CSU San Bernardino, CSU San Marcos, CSU Stanislaus, Denise Duffy and Associates, Elkhorn Slough National Estuarine Reserve, Marina Coast Water District, Monterey County Extension Office, Monterey County Health Department, Monterey County Water Resources Agency, Monterey Peninsula Water Management District, NASA, Poder Popular, Resource Conservation District of Santa Cruz County, San Diego State University, San Dieguito River Park, Santa Lucia Conservancy, Santa Margarita Ecological Reserve, Tuolumne River Trust, and Ventura Coastkeeper).

**3) Total Number of Students Served Including Gender and Ethnicity**

Of the 100 students placed, 56 % (n=56) are females and 44 % (n=44) are males, while ethnically 52 % (n=52) Hispanic; 2 % (n=2) Native American; 13 % (n=13) Asian; 5 % (n=5)

Middle Eastern; and 28 % (n=28) Caucasian. 38 % (n=38) are graduate students, while 62 % (n=62) are undergraduate students. Additionally, 1 Hispanic male was awarded a \$40,000 scholarship to pursue his PhD degree in Environmental Systems at UC Merced.

#### **4) Total % of Retention**

Of the 100 students, the Project had 3 students accept the career experience opportunities, but were not hired, did not start their projects, and support wasn't disbursed to them. These students have been replaced from the wait list. Taking into consideration these three, 96 students (96%) have been retained in the Project to date, but many career experiences are still in progress so rates will continue to be assessed. Of the total 4 students that haven't been retained, 1 (25%) was a graduate student while 3 (75%) were undergraduates.

#### **5) Total Number of Students in Experiential Learning (Research) Mentoring**

100 students (100%) are placed in experiential learning mentored career experiences.

#### **6) Total Number of Participants Presenting**

19 students have presented posters at various professional meetings and conferences.

#### **7) Total Number of Students Enrolled in Disciplines Applicable to USDA Jobs**

The students' majors include (some dual): Biological Sciences (17% or n=17); Civil Engineering (7% or n=7); Coastal Watershed Science Policy (22% or n=22); Computer Science (1% or n=1); Computer Engineering (1% or n=1); Ecology (1% or n=1); Electrical Engineering (1% or n=1); Environmental Engineering (3% or n=3); Environmental Science (6% or n=6); French (1% or n=1); Geography (15% or n=15); Geology (11% or n=11); German (2% or n=2); Health Science (2% or n=2); Hydrogeology (1% or n=1); Industrial Technology (4% or n=4); Landscape Architecture (1% or n=1); Math (3% or n=3); Mechanical Engineering (1% or n=1); Photography (1% or n=1); Plant Science (3% or n=3); Political Science (1% or n=1); Psychology (2% or n=2); Public Administration (1% or n=1) and Sociology (2% or n=2). Each student's discipline, with the exception of some students' dual majors, is relevant to USDA careers.

#### **8) Total Number of Degrees Awarded with USDA Qualifications**

6 Masters and 16 Bachelors degrees were awarded to date, however graduation rates will continue to be assessed.

#### **9) Total Number of Students Publishing**

4 students produced 2 publications to date, broken down by the following:

a. Peer Reviewed:

Blunt, A., Negrini, R., Randall, K., Garcia, E., Wilson, James, Wilson, John, Chauhan, J., Chehal, R., Shurbaji, H., and Shugart, J. (2012). Supplementing a Tulare Lake, CA Late Pleistocene to Holocene Lake-Level Record Using Geochemical and Geophysical Proxies from Core Sediments. Geological Society of America Abstracts with Programs, Vol. 44, No. 7, p. 84.

b. Other:

Lawrence, S. and Bryant, E. (2012). Riverscape. Monthly. Provides information on the San Dieguito River Park to establish a continuous open space corridor throughout the length of the Park that preserves natural habitats, protects linkages for wildlife movement, and provides compatible areas for recreational opportunities.

#### **10) Comparison of GPA's Before and After**

The average GPA pre-career experience is 3.38, while the average GPA post-experience is 3.53. Since many career experiences are still ongoing, the post-internship average will continue to be assessed.

#### **11) Developing Curriculum and Faculty For Required USDA Courses**

Curriculum development and faculty hire were not objectives of our proposal, as funded.

#### **12) Comparison of Female Success (Before and After); Gender and Ethnicity**

56% (n=56) of the students are females. Of this 56%, the ethnic breakdown is as follows: Hispanic - 29% or n=29; Native American -1% or n=1; Asian - 5% or n=5; and Caucasian - 21% or n=21. For the female participants, the average GPA pre-career experience is 3.39; post-experience is 3.63. For males, the average GPA pre-career experience is 3.36; post-experience is 3.43. Since many career experiences are still in process, these numbers will continue to be tracked.

#### **13) Total Number of Student Hours Advising and Tutoring**

The approximate number of hours spent advising and tutoring student participants is 265, however these numbers are estimations and the Project continues to gather data as the career experiences are completed.

#### **14) Tracking Students' Placement Into Jobs or PhDs/Student Mobility**

To date, 15 students have been offered jobs or additional paid internships. Of the 16 students that have graduated with their bachelor's degree, 9 (56%) have begun a master's program, 1 (6%) is applying for master's program, and 1 (6%) has started a post-baccalaureate program.

#### **15) Track English Skills**

All students (n=100; 100%) are proficient in the English language.

#### **16) K-12 Activities (and Freshman)**

CSUSB offers unpaid High School Internships to underrepresented students on advanced GIS, GPS, and mobile technologies skill sets that are tailored to USDA-relevant topics. The high school students also used a mobile application that was developed to monitor tree health and plot healthy/infected trees on a map using GIS. The students attend Saturday classes once a month for 6 months, giving them repetitive access. Two cohorts have completed their internships, comprised of 19 students from 5 local schools, with 1 student dropping out of the program for a retention rate of 95%. Ethnically, the students are primarily Hispanic (n=17; 89%) and female (n=13; 68%), compared to African American (n=2; 11%) and male (n=6; 32%).

### **17) Community Engagement Activities**

In 2012, CSU Fresno participated in the National Professional Science Master's Association Regional Workshop, discussing water related careers, promotion of degrees, and internships. CSUSB exhibited at Stemapalooza 2012 with over 750 middle school students in attendance. 16 students attended the Informational Sessions on USDA Careers Webinar in early 2013. A keynote presentation was given at the May 2013 Fourth Annual Environmental and Sustainability Expo on the CSUSB Palm Desert campus with 140 6th grade students in attendance. In May 2013, a presentation on internships and water careers was given to 35 San Bernardino Valley College community college students majoring in STEM degrees or water certificate programs. In April 2013, the Project presented their poster at the Agriculture Day in Sacramento. In July, a tour of the WRI water conservation garden was given to local elementary students, addressing the importance of water and its conservation. Lastly, many USDA careers require GIS skill sets and the Project staff has introduced GIS to students in multiple capacities; in addition to our K-12 High School Internship component discussed above, during both Project years CSUSB has provided GIS training and mentoring to 22 Hispanic female college STEM majors and in November 2012 the Project staff held a GIS training for 18 underrepresented high school students at the CSUSB Palm Desert campus.

### **18) Budget Implementation**

Budget obligations and expenditures are within budget and mostly on track. The amount set aside for the external evaluator hasn't been completely expended since many career experiences are still ongoing. Additionally, the amount budgeted for student supplies and mileage reimbursement hasn't been expended at the anticipated rate due to not all students requiring supplies or mileage reimbursement for their career experiences. These excess funds will be allocated to support additional students. The budget for the second year of this Project places the highest priority on student support, allocating 70% percent of direct costs for career experiences salaries, doctoral student support, and the supplies, materials, and travel necessary to carry out the individual projects. Direct costs for the four professional staff (Principal Investigator/Project Director; Project Manager/Co-Investigator; Administrative Support Coordinator; and Bilingual Coordinator) represent less than 20% of direct costs.

### **19) Program Activities/Implementation**

All 100 interns have been hired and most activities are on schedule. Recruitment for Year 3 has begun. The \$40,000 doctoral scholarship has been awarded.

### **20) Agency/Participant Survey**

Initial IDRA surveys are being completed and data was received from 40 CSU interns. Exit interviews by the external evaluator with the students and advisors are ongoing.

# **Florida International University**

**Interim Performance Report for Period from September 2012 to March 2013  
Florida International University, Miami**

**ACCESSION NO:** 0226605 **SUBFILE:** CRIS  
**PROJ NO:** FLAE-2011-02725 **AGENCY:** NIFA FLAW  
**PROJ TYPE:** OTHER GRANTS **PROJ STATUS:** NEW  
**CONTRACT/GRANT/AGREEMENT NO:** 2011-38422-30804 **PROPOSAL NO:**  
2011-02725  
**START:** 01 SEP 2012 **TERM:** 31 MARCH 2013 **GRANT YR:** 2012  
**GRANT AMT:** \$800,000

**INVESTIGATOR:** Bhat, M.; Jayachandran, K.; Campa, A.; Koptur, S.; Adoghe, L.;  
Maul, P.; Toro, A.

**PERFORMING INSTITUTION:**  
Earth and Environment  
FLORIDA INTERNATIONAL UNIVERSITY  
MIAMI, FLORIDA 33199

***FLORIDA-CARIBBEAN CONSORTIUM FOR AGRICULTURE EDUCATION AND  
HISPANIC WORKFORCE DEVELOPMENT*** (FCCA<sub>gE</sub>)

**Outputs:** 2012/09 TO 2013/03

The grant established the Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCA<sub>gE</sub>) between Florida Intl Univ (FIU), St Thomas Univ (STU), Miami Dade College North (MDC), and Inter-American Univ (IAU). The consortium produced the following measurable outputs. OBJ. 1 (Recruit Hispanic undergraduate and graduate students--As a consortium, we have retained 51 undergraduate students and two master students (83 percent of whom are Hispanic), meeting 93 percent of our recruitment goal (the balance is not due until the third year, particularly with masters students). OBJ. 2 (Train students in plant, natural resources, and food sciences)--FIU's Organic Garden and MDC garden engages students in experiential learning, with students dedicating a minimum of 3 hours per week of hands-on activities. STU also established a garden on campus for research purposes and curriculum development, with each student dedicating 3-5 hours per week on its design and implementation. In addition, students have attended professional hands-on workshop in aquaponics which included the design of a prototype. Agri-Science infusion was also implemented at STU by adding a Plant Bioinformatics section to the Plant Physiology course and by implementing Biochemistry II laboratories activities focused on the preparation of plant extracts for anticancer drug discovery. FIU has continued its colloquium courses in Agri-science related topics, addressing Integrated Pest Management, and Food Security during year two of the grant. Both MDC and IAU have their students completing module training in various Agri-science topics, with each student completing a minimum of 70 hours. Students at FIU learned first-hand the

process of sugar production during a field tour of Florida Crystal's facilities, and gained experiential learning of agroecological research between cattle ranching and wildlife management at the MacArthur Agroecology Research Station in Central Florida. FIU conducted a Vermiculture workshop for its students, with 50 other interested students attending as well. IAU is training their students through a Crop Biosecurity course and has also taken their students field training workshops, addressing topics such as Lymnology in Waters, and sustainable forest management with the Forest Service in Puerto Rico. FCCAgE students continue to use advance, socially interactive instructional technologies such as facebook, learning wiki programs, and other such mediums of information transfers. OBJ. 3 (Establish experiential, experimental, and community outreach programs)--Each of the 53 students admitted has a faculty mentor to guide his or her research project, with less experience students having graduate mentors or being group mentored. Consortium-wide, students have spent over 2000 hours in community engagement activities during the second year period of the grant. Students from FIU, MDC and STU participated in various community related activities at Fairchild Tropical Botanical Gardens, as well as the USDA ARS open house events. Moreover, FIU conducted a day log agri-science immersion for 160 kindergarten children as well as multiple workshops and tours for over 100 high school students during year two. OBJ. 4 (Place Hispanic and other minority graduates of the FCCAgE in USDA)--23 students attended the MANRRS conference in March and 18 students attended other conferences. The Agroecology Symposium held at FIU in March held a panel on Food Security and gave students opportunity to learn about research ideas and network with others. This year, Mr. Vladimir Diaz, USDA HSI regional director, was instrumental in conducting Moc Interviews for 70% of FCCAgE students. Collectively, FCCAgE has conducted 20 professional development workshops during year two. All students have created a profile on the usajobs Pathways system, and the consortium has allocated funding for students to participate in volunteer internship training with USDA agencies over the summer.

### **Outcomes:**

This grant program has enabled each institution to engage under-represented students in biological, environmental, and food sciences at the university and in the community. About half of the supported students are first generation students and 96% are of minority background. More than 1000 students (both grant-funded and unfunded and K-12 students), with at least 70 percent of which are Hispanic, took advantage of the agroecology courses, internships, workshops, and travel opportunities offered by the FCCAgE. At least 100 more, including four different minority serving high school students and teachers, attended the annual agroecology symposium. These scholarly activities, along with teaching resources such as the campus food gardens, student Garden Clubs, and collaborations with area government and non-governmental agricultural institutions, have expanded each university's faculty expertise in offering training and advice to college and high students and teachers on issues related to local and national agriculture and environmental management.

The following are the program' **TWENTY outcome indicators**--(1) number of USDA Agencies--7; (2) number of internships—too early to report; (3) number of students

served, including gender and ethnicity--51 (56% Female, 83% Hispanic, , 13% Black, and 4% White); (4) percent of retention (undergraduate/grad/Ph.Ds)--89%; (5) number of students in experiential learning--51; (6) number of participants presenting--students (19), faculty (3); (7) number of students enrolled in disciplines applicable to USDA jobs--51; (8) number of degrees awarded with USDA qualifications--3; (9) number of student publication-- 21; (10) Comparison of GPAs before and after-- Current average GPA-- 3.34; (11) developing curriculum and faculty for required USDA courses--8 (2 colloquium at FIU, 2 courses at IAU, 2 course with Agri-science infusion at STU, 4 seminar classes at MDC); (12) comparison of female success (before and after) (gender and ethnicity)--too early to measure; (13) number of student hours advising and tutoring--1260 hours year to date; (14) Tracking student placement into jobs or Ph.Ds/student mobility—1 graduate now coordinator of STU program, 1 graduate at MDC moved to FIU for higher education, 1 graduating student at FIU will become ari-science teacher, many have indicated they now consider Ph.D; (15) Track research activities/English skills--87% fully proficient in English; (16) K-12 activities (and freshmen)--17; (17) Community engagement activities--26 activities, total hours (collectively) 2000; (18) Budget implementation—roughly 70% \$850000 of the second year budget spent or committed; (19) Program activities/implementation--100 percent recruitment, 70% curriculum innovation and instructional delivery, 100% experiential and experimental training, and 100% internship and career development activities; and (20) Agency/participant survey--complete.

### **Impact:**

The FCCAgE Program is becoming increasingly popular among students, area high schools and community colleges, farmers and community organizations. Scholars in the program have spent over 4000 hours in professional development training and Agroecology Workshops. Additionally, non-funded student participation in these activities accounted for an additional 3000 hours collectively. The continuous focus on training students with necessary skills to obtain a career with USDA is proving a valuable impact on student professional growth. Students organized the club MANRRS at three of the four institutions and regularly participate in various community engagement activities. Three of the four institutions have created an on-site garden, with the fourth institution with plans to have research at a nearby forest. In addition, FIU's Agroecology class is also providing experiential learning through field activities at a high biologically diverse farm called Possum Trot. All of students created a profile for applying to USDA internships through Pathways; yet given any possible limitations of internship availability, the consortium has determined to use part of the remaining funds from the first year to fund USDA related internships to students this summer.

### **Publications (not previously reported):**

Amedee, G.; Maul P.; Kuennen C.; Fiorelli J. 2013. Timer Management at the National Forest in Fairplay, Colorado Poster presentation at the FIU Agroecology Symposium. March 2013.

Bhat, M. G. Global Food Security. New York Times Round Table Discussion, Florida International University, February 2013.

Bruceta, Melanio A.; Salas, Dayana; Maul, Pilar, and Meerow, Alan W . 2013. Phylogenetics of the *Zamia pumila* complex Poster presentation at the FIU Agroecology Symposium. March 2013.

Castellon, Arturo and Ruiz, Hernan. 2013. Identification of nematodes and fungi, USDA-APHIS-PPQ plant inspection station Poster presentation at the FIU Agroecology Symposium. March 2013.

Herdocia, Karenyn and Valentin, Vanessa. 2013. Testing *Carea varipes* and *Neostauropus alternus* as biological control agents for the Florida invasive plant species *Rhodomyrtus tomentosa*. Oral presentation at the FIU Agroecology Symposium. March 2013.

Herdocia, Karenyn; Valentin ,Vanessa; Maul, Pilar; Pratt, Paul. 2013. Testing *Carea varipes* and *Neostauropus alternus* as biological control agents for the Florida invasive plant species *Rhodomyrtus tomentosa*. Poster presentation at the FIU Agroecology Symposium. March 2013.

Jean-Mary, Rose and Mercado, Philip. 2013. The natural examination of chelating agents in the removal of metal contaminants. Oral presentation at the FIU Agroecology Symposium. March 2013.

Juste , Randy and Soti, Pushpa . 2013. Understanding the Old World: A Study on Plant and Soil Relationship Poster presentation at the FIU Agroecology Symposium. March 2013.

Lehrman, Jonathan and Arevalo, Jason. 2013. Plant-Growth-Promoting Bacteria Isolated from *Rhizophora mangle* Roots. Poster presentation at the FIU Agroecology Symposium. March 2013.

Misdraji, J., D.P. Maul; Pilar; P.E. Loulis, P. E. 2013. Summer Training at the USDA Food Safety Inspection Services: Providing the Consumer with Safe Meat, Poultry, and Egg Products Everyday Poster presentation at the FIU Agroecology Symposium. March 2013.

Ramos, Siffredi; Hunter, Wayne B.; Maul, Pilar. 2013. C002 Gene Detection in two Hemipteran Species: Brown Citrus Aphid (*Toxoptera citricidus*) and Whitefly (*Bemisia argentifolii*) Poster presentation at the FIU Agroecology Symposium. March 2013.

Thema, Luke. 2013. Producing biodiesel from waste vegetable oil. Oral presentation at the FIU Agroecology Symposium. March 2013.

Thema, Luke; De la Rosa, Nina; Shetty, Kateel G.; and Jayachandran, Krish. 2013. Examining the effects of methanol on free fatty acid content during an acid esterification. Poster presentation at the FIU Agroecology Symposium. March 2013.

Valentina Rivadeneira, Diana; Gonzalez, Patricia; Parajon, Fernando and De la Pena, Amaya. 2013. Characterization of Bacterial Cultures Isolated from the Rhizosphere of *Rhizophora mangle*. Poster presentation at the FIU Agroecology Symposium. March 2013.

Vasquez, Melanie. Closing the Loop on Urban Agriculture: Utilizing Vermicompost on *Spinacia oleracea*. Poster presentation at the FIU Agroecology Symposium. March 2013.

Vergara, Karen and Maul, P. 2013. Smithsonian National Zoo, Washington D.C. A Work Experience Internship USDA, APHIS, Animal Care Poster presentation at the FIU Agroecology Symposium. March 2013.

Vidales, Rosario. 2013. Presence of *Euglossa viridissima*, and its effect on *Clusia lanceolata* fruit set. Poster presentation at the FIU Agroecology Symposium. March 2013.

Urbina, Cristina. 2013. Tropical Fruit Research: An Integral Key for Food Security in Developing Countries". Oral presentation at the FIU Agroecology Symposium. March 2013.

Urbina, Cristina . 2013. Application of Propiconazole in Avocado Trees as Preventive Method when treating Laurel Wilt Disease. Poster presentation at the FIU Agroecology Symposium. March 2013.

## **Participants**

Select one of the following options:

- a) Not relevant to this project
- b) Nothing significant to report during this reporting period
- c) Report narrative entered in the box below

*Provide information about individuals who worked on the project. If applicable, provide information about partner organizations, collaborators, and contacts. Also describe opportunities for training or professional development that were provided by the project. more ...*

The Program involves four Hispanic Serving Institutions, namely, Florida International University (as lead institution), Miami Dade College North, St. Thomas University and Inter-American University. Other collaborators include seven USDA Agencies, including National Hispanic Program Regional Office of Florida and Puerto Rico and

Agricultural Research Service in Miami, and Fairchild Tropical Botanical Garden, Earth Learning Foundation, Miami Dade Public School District and area farmers. During the second year, the FCCAgE program funded 53 students, one full-time program coordinator, three part-time program coordinators at partner HSI institutions, and seven faculty members. At the annual Agroecology Symposium, twenty-one FCCAgE students made oral and/or poster presentations. More than 200 high school and college students, staff, faculty members, farmers and agency representatives participated at the symposium. Through high school outreach, we have communicated with over 500 high school students and are in the process of recruiting 5 students for high school internships for this summer. We have conducted over 20 professional development and Agri-science related workshops, and infused Agri-science into eight courses. Twenty FCCAgE students have had the opportunity to attend a national conference during year two. Various social media mechanisms have created the opportunity for scholars at each institution to maintain communication and learn of each other's work.

### **Target Audiences**

Select one of the following options:

- a) Not relevant to this project
- b) Nothing significant to report during this reporting period
- c) Report narrative entered in the box below

*Provide information on target audiences for efforts designed to cause a change in knowledge, actions, or conditions. more ...*

Undergraduate and graduate students primarily belonging to Hispanic origin in Florida and Puerto Rico.

### **Project Modifications**

Select one of the following options:

- a) Not relevant to this project
- b) Nothing significant to report during this reporting period
- c) Report narrative entered in the box below

**Annual Performance Report for Period from September 2012 to August 2013  
Florida International University, Miami**

Please use the following citation for reporting purpose:

Alvarez-Ventura, S., M. G. Bhat, K. Jayachandran, P. Maul, A. Toro, and Adoghe, L. Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCAgE): Annual Progress Report, Period ending August 2013. Submitted to the US Department of Agriculture, National Institute of Food and Agriculture, under the Cooperative Agreement 2011-38422-30804, Department of Earth and Environment, Florida International University, Miami, October 2013.

**ACCESSION NO:** 0226605 **SUBFILE:** CRIS  
**PROJ NO:** FLAE-2011-02725 **AGENCY:** NIFA FLAW  
**PROJ TYPE:** OTHER GRANTS **PROJ STATUS:** NEW  
**CONTRACT/GRANT/AGREEMENT NO:** 2011-38422-30804 **PROPOSAL NO:**  
2011-02725  
**START:** 01 SEP 2012 **TERM:** 31 AUG 2013 **GRANT YR:** 2012  
**GRANT AMT:** \$800,000

**INVESTIGATOR:** Bhat, M.; Jayachandran, K.; Campa, A.; Koptur, S.; Adoghe, L.; Maul, P.; Toro, A.

**PERFORMING INSTITUTION:**  
Earth and Environment  
FLORIDA INTERNATIONAL UNIVERSITY  
MIAMI, FLORIDA 33199

***FLORIDA-CARIBBEAN CONSORTIUM FOR AGRICULTURE EDUCATION AND  
HISPANIC WORKFORCE DEVELOPMENT*** (FCCAgE)

**Outputs:** 2012/09 TO 2013/08

The grant established the Florida-Caribbean Consortium for Agriculture Education and Hispanic Workforce Development (FCCAgE) between Florida Intl Univ (FIU), St Thomas Univ (STU), Miami Dade College North (MDC), and Inter-American Univ (IAU). The consortium produced the following measurable outputs.

**Participants:**

The Program involves four Hispanic Serving Institutions, namely, Florida International University (as lead institution), Miami Dade College North, St. Thomas University and Inter-American University. Other collaborators include three USDA Agencies, including National Hispanic Program Regional Office of Florida and Puerto Rico and Agricultural

Research Service in Miami, and Fairchild Tropical Botanical Garden, Miami Dade Public School District and area farmers. We have also partnered with 11 non-agency institutions, including the Interamerican Institute for Cooperation in Agriculture (IICA), and University of Florida's Tropical Research and Education Center among other universities. During the second year, the FCCAgE program served 71 students, one full-time program coordinator, three part-time program coordinators at partner HSI institutions, and seven faculty members. More than 400 high school and college students, staff, faculty members, farmers and agency representatives participated at both the FIU and IAU Agroecology Symposiums, with over 1000 K-12 students being impacted during other activities as part of year two of the project.

**Targeted Audience:** Undergraduate and graduate students primarily belonging to Hispanic origin in Florida and Puerto Rico.

**Products:**

a. Peer reviewed (1):

Ayala-Silva<sup>1</sup>, Thomas; Hamide Gubbuk, Hamide; and Urbina, Cristina. Physico-chemical Evaluation of 'Casturi' Mango. Proc. Fla. State Hort. Soc. 126: 2013.

b. Other (50):

Acado, Sarah. 2013. Catalytic Vapor-Phase Upgrading of Pyrolysis Oil Vapors. Oral presentation at the Center for Renewable Carbon Seminar. July 2013.

Alvarez, Beverly. 2013. USDA Jobs Career: Veterinary. Poster Presentation at the Agroecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

Amedee, G.; Maul P.; Kuennen C.; Fiorelli J. 2013. Timber Management at the National Forest in Fairplay, Colorado Poster presentation at the FIU Agroecology Symposium. March 2013.

Amedee, G.; Maul, D.; Kuennen, C.; Fiorelli, J. Timber Management at the National Forests in Fairplay, Colorado: My experience as a forestry technician. Poster Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.

Bhat, M. G. Global Food Security. New York Times Round Table Discussion, Florida International University, February 2013.

Bhat, M.G. 2013. Graduate Research Experiences. Sowing the Seeds for Success. Agroecology Symposium at Inter-American University. May 2013.

- Bruceta, Melanio A.; Salas, Dayana; Maul, Pilar, and Meerow, Alan W . 2013. Phylogenetics of the *Zamia pumila* complex Poster presentation at the FIU Agroecology Symposium. March 2013.
- Castellon, Arturo and Ruiz, Hernan. 2013. Identification of nematodes and fungi, USDA-APHIS-PPQ plant inspection station Poster presentation at the FIU Agroecology Symposium. March 2013.
- Cicilio, Edy. 2013. Implications of the Genetic Modification of Switchgrass to reduce cell wall recalcitrant on Plant Stem Toughness. Oral presentation at the Center for Renewable Carbon Seminar. July 2013.
- Herdocia, Karenyn and Valentin, Vanessa. 2013. Testing *Carea varipes* and *Neostauropus alternus* as biological control agents for the Florida invasive plant species *Rhodomyrtus tomentosa*. Oral presentation at the FIU Agroecology Symposium. March 2013.
- Herdocia, Karenyn; Valentin ,Vanessa; Maul, Pilar; Pratt, Paul. 2013. Testing *Carea varipes* and *Neostauropus alternus* as biological control agents for the Florida invasive plant species *Rhodomyrtus tomentosa*. Poster presentation at the FIU Agroecology Symposium. March 2013.
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- Herdocia, K.; Valentin, V.; Maul, D.; Pratt, P. 2013. Testing *Carea varipes* and *Neostauropus alternus* as biological control agents for the Florida invasive plant species *Rhodomyrtus tomentosa*. Poster Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.
- Jean-Mary, Rose and Mercado, Philip. 2013. The natural examination of chelating agents in the removal of metal contaminants. Oral presentation at the FIU Agroecology Symposium. March 2013.
- Juste , Randy and Soti, Pushpa . 2013. Understanding the Old World: A Study on Plant and Soil Relationship Poster presentation at the FIU Agroecology Symposium. March 2013.
- Juste, Randy and Soti, Pushpa . 2013. Understanding the Old World: A Study on Plant and Soil Relationship Poster presentation at the Sowing the Seeds for Success. Agroecology Symposium at Inter-American University. May 2013.
- Lehrman, Jonathan and Arevalo, Jason. 2013. Plant-Growth-Promoting Bacteria Isolated from *Rhizophora mangle* Roots. Poster presentation at the FIU Agroecology Symposium. March 2013.

Millan-Hernandez, Christian. 2013. USDA Jobs Career: Wildlife Conservationist. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

Millan-Hernandez, Christian, Jenkins, David, Mc-Phail, Robert. 2013. Effect of combining nitidulid pheromones and co attractants on atemoya (*Annona squamosal* Linn and *Annona cherimola* Miller:Annonaceae) pollinating beetles. Oral Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

Millan-Hernandez, Christian, Jenkins, David, Mc-Phail, Robert. 2013. Effect of combining nitidulid pheromones and co attractants on atemoya (*Annona squamosal* Linn and *Annona cherimola* Miller:Annonaceae) pollinating beetles. Oral Presentation at the 2nd Annual Undergraduate Research Symposium in Biology at the University of Puerto Rico, Mayagüez. May 4, 2013.

Millan-Hernandez, Christian, Jenkins, David, Mc-Phail, Robert. 2013. Effect of combining nitidulid pheromones and co attractants on atemoya (*Annona squamosal* Linn and *Annona cherimola* Miller:Annonaceae) pollinating beetles. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013

Misdraji, J., D.P. Maul; Pilar; P.E. Loulis, P. E. 2013. Summer Training at the USDA Food Safety Inspection Services: Providing the Consumer with Safe Meat, Poultry, and Egg Products Everyday Poster presentation at the FIU Agroecology Symposium. March 2013.

Misdraji, Jeny. 2013. Summer Training at the USDA Food Safety Inspection Services: Providing the Consumer with Safe Meat, Poultry, and Egg Products Every Day. Oral Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013

Misdraji, J.; Maul, D.; Loulis P. 2013. Summer Training at the USDA Food Safety Inspection Services: Providing the Consumer with Safe Meat, Poultry, and Egg Products Every Day. Poster Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.

Moreno, R.; Vazquez, C.; Peterson, C.; Maul, D. 2013. Micropropagation and the development of an in vitro method for long term storage of *Justicia cooleyi*. Poster Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.

Otero-Ramos, Jonathan. 2013. USDA Jobs Career: Environmental Science. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

Otero-Ramos, Jonathan. 2013. USDA Jobs Career: Microbiology. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

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Ramos, S.; Hunter, W.; Maul, D. 2013. C002 Gene Detection in two Hemipteran Species: Brown Citrus Aphid (*Toxoptera citricidus*) and Whitefly (*Bemisia argentifolii*). Poster Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.

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Santiago, Leishnaly. 2013. USDA Jobs Career: Nutritionist. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

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Thema, Luke; De la Rosa, Nina; Shetty, Kateel G.; and Jayachandran, Krish. 2013. Examining the effects of methanol on free fatty acid content during an acid esterification Poster presentation at the FIU Agroecology Symposium. March 2013.

Toro, Isamar. 2013. USDA Jobs Career: Marine Biologist. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

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Rhizophora mangle. Poster presentation at the FIU Agroecology Symposium. March 2013.

Vazquez, Carlos. 2013. Micropropagation and the development of an in vitro method for long term storage of Justicia cooleyi. Oral Presentation at the Agro-Ecology Symposium, Inter-American University of Puerto Rico. May 7, 2013.

Vazquez, Jannybeth. 2013. USDA Jobs Career: Soil Scientist. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

Vazquez, Jorge. 2013. USDA Jobs Career: Biochemistry. Poster Presentation at the Agro-ecology Symposium, InterAmerican University San Germán Campus. May 7, 2013.

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Vidales, Rosario. 2013. Presence of Euglossa viridissima, and its effect on Clusia lanceolata fruit set. Poster presentation at the FIU Agroecology Symposium. March 2013.

Vidales, Rosario. 2013. Presence of Euglossa viridissima, and its effect on Clusia lanceolata fruit set. Poster presentation at the Sowing the Seeds for Success. Agroecology Symposium at Inter-American University. May 2013.

Urbina, Cristina. 2013. Tropical Fruit Research: An Integral Key for Food Security in Developing Countries”. Oral presentation at the FIU Agroecology Symposium. March 2013.

Urbina, Cristina . 2013. Application of Propiconazole in Avocado Trees as Preventive Method when treating Laurel Wilt Disease Poster presentation at the FIU Agroecology Symposium. March 2013.

Urbina, Cristina. 2013. Tropical Fruit Research: An Integral Key for Food Security in Developing Countries”. Oral presentation at the Sowing the Seeds for Success. Agroecology Symposium at Inter-American University. May 2013.

### **Other Products/Outcomes:**

This grant program has enabled each institution to engage under-represented students in biological, environmental, and food sciences at the university and in the community. About half of the supported students are first generation students and 96% are of minority background. More than 1000 students (both grant-funded and unfunded and K-12 students), with at least 70 percent of which are Hispanic, took advantage of the agroecology courses, internships, workshops, visits, and travel opportunities offered by the FCCAgE. At least 100 more, including four different minority serving high school students and teachers, attended the annual agroecology symposium. These scholarly activities, along with teaching resources such as the campus food gardens, student Garden Clubs, and collaborations with area government and non-governmental agricultural institutions, have expanded each university's faculty expertise in offering training and advice to college and high students and teachers on issues related to local and national agriculture and environmental management.

### **Accomplishments:**

#### *Datafield 1: What was accomplished under these goals?*

The overall goal of this project is to enable underrepresented students at four South Florida and Puerto Rican universities/colleges to develop scientific skills in biological, food and natural resource sciences and to find a career in USDA or related agencies, or to advance to higher education. Specifically our goal is to recruit 49 Hispanic undergraduate and five graduate students into programs focused in biological and natural resources sciences related to food and agriculture. As a consortium, we currently have 49 undergraduate students and two master students (78 percent of whom are Hispanic). Two graduate students are not due until the 3<sup>rd</sup> year. Eleven students have graduated so far from the consortium. Eleven students have dropped but we have replaced them with new students at appropriate year of college. Thus, we have met 100% percent of our recruitment goal for the first two years of the project.

Our second objective is to train students in plant, natural resources, and food sciences. Efforts include the following: FIU's Organic Garden and MDC garden engages students in experiential learning, with students dedicating a minimum of 3 hours per week of hands-on activities. STU also established a garden on campus for research purposes and curriculum development, with each student dedicating 3-5 hours per week on its design and implementation. In addition, students have attended professional hands-on workshop in aquaponics which included the design of a prototype. Agri-Science infusion was also implemented at STU by adding a Plant Bioinformatics section to the Plant Physiology course and by implementing Biochemistry II laboratories activities focused on the

preparation of plant extracts for anticancer drug discovery. FIU has continued its colloquium courses in Agri-science related topics, addressing Integrated Pest Management, and Food Security during year two of the grant. Both MDC and IAU have their students completing module training in various Agri-science topics, with each student completing a minimum of 70 hours. Students at FIU learned first-hand the process of sugar production during a field tour of Florida Crystal's facilities, and gained experiential learning of agroecological research between cattle ranching and wildlife management at the MacArthur Agroecology Research Station in Central Florida. FIU conducted a Vermiculture workshop for its students, with 50 other interested students attending as well. IAU is training their students through a Crop Biosecurity course and has also taken their students field training workshops, addressing topics such as Lymnology in Waters, and sustainable forest management with the Forest Service in Puerto Rico. FCCAgE students continue to use advance, socially interactive instructional technologies such as facebook, learning wiki programs, and other such mediums of information transfers. In all, 17 (2 colloquium, 5 course with Agri-science infusion, 6 Agroecology training workshops, and 4 online course modules) have been created.

Our third objective is to establish experiential, experimental, and community outreach programs. Each of the 51 students currently in the program and those who have graduated has or had a faculty mentor to guide his or her research project, with less experience students having graduate mentors or being group mentored. Consortium-wide, students have participated in at least 40 different community engagement activities during the second year period of the grant. Students from FIU, MDC and STU participated in various community related activities at Fairchild Tropical Botanical Gardens, as well as the USDA ARS open house events. Moreover, FIU conducted a day log agri-science immersion for 160 kindergarten children as well as multiple workshops and tours for over 100 high school students during year two. FIU and MDC students got a chance to attend a two-week long agro-ecological training at the Center for Agriculture Training, Research and Education (CATIE) in Costa Rica. Other activities worth noting are collaborative garden tours and building days where students from the collaborating universities joined and created gardens at various K-12 institutions.

Our final objective is to place Hispanic and other minority graduates of the FCCAgE in USDA. In order to expand network and training opportunities, 23 students attended the MANRRS conference in March and 18 students attended other conferences relevant to USDA mission areas. The Agroecology Symposium held at FIU in March held a panel on Food Security and gave students opportunity to learn about research ideas and network with others. Then in April, IAU organized and hosted a weeklong workshop attended by students from all collaborating institutions. Workshops included: How to write presentation letters, USDA Veterinary Services Farms and APHIS workshops, visit to USDA Forest Services and "El Yunque" tropical rain forest. This year, Mr. Vladimir Diaz, USDA HSI regional director, was instrumental in conducting Mock Interviews for 70% of FCCAgE students. Collectively, FCCAgE has conducted 20 professional development workshops during year two. All students have created a profile on the usajobs Pathways system, and the consortium allocated funding for students to participate in volunteer career experience training with USDA agencies over the summer. Overall,

41 students received internship opportunities, with 27 of these internships at USDA agencies. Internal surveys regarding summer career experiences have demonstrated change in knowledge since all students felt they learned more about lab or field protocols and equipment use. Moreover, 87% of respondents felt that participating in summer career experience has encouraged them to apply for a position at USDA or other federal agencies in the future. In addition, about 97% reported that participating in the career experience has encouraged them to continue their educational studies. Finally, all of the respondents would consider going back to the same USDA or other agency if given the opportunity. These results highly demonstrate the positive effect these career experiences have on students' training and perception of working in a USDA (or related) field. In fact, there is a notable change in action upon return of summer experiences as students are more eager to engage and community outreach projects and demonstrate improved skills to actively participate in research. One student has received a position within the USDA ARS station as a result of program efforts.

***Datafield 2: What opportunities for training and personal development has the project created?***

Scholars in the program have spent over 4000 hours collectively in professional development training and Agroecology Workshops. Additionally, non-funded student participation in these activities accounted for an additional 3000 hours collectively. Students also obtained agri-science training through summer career experiences at various USDA agencies and other universities. The continuous focus on training students with necessary skills to obtain a career with USDA is proving a valuable impact on student professional growth. Students organized the club MANRRS at three of the four institutions and regularly participate in various community engagement activities. Three of the four institutions have created an on-site garden, with the fourth institution with plans to have research at a nearby forest. In addition, FIU's Agroecology class is also providing experiential learning through field activities at a high biologically diverse farm called Possum Trot, while STU students participated in a professional hands-on workshop on aquaponics. MDC hosted a day-long business and table etiquette workshop for MDC and FIU students, and IAU included a professional development component for all scholars in the program during the Agroecology Symposium in Puerto Rico. Mr. Vladimir Diaz was instrumental in providing mock interview to 70% of students in the program and helping place students in various USDA summer career experiences.

***Datafield 3: How have the results been disseminated to the community?***

The FCCAgE Program is becoming increasingly popular among students, area high schools and community colleges, farmers and community organizations. The program has

conducted over 40 community engagement activities during year two. These included both individual activities organized by each institution separately, as well as collaborative activities between the institutions in the grant and the local community. Students from FIU, STU, and MDC collaborated with the Farchild Tropical Botanical Gardens by participating in events such as the Ramble, Science Fair, and the Green Cuisine Event. The program also collaborated with USDA partner, the Agriculture Research Service, by participating the USDA ARS Community Day. Other activities worth noting are collaborative garden (and lab) tours and building days where students from the collaborating universities joined and created gardens. FIU, MDC, STU and IAU each conducted annual research symposium on their campuses at which students presented their undergraduate research and summer internship experiences. The program has also targeted K-12 schools, through class visits and presentations, tours, activities, and the summer internship program for high school students. Visits to local farmers have created opportunities for students to learn about local food production and network for future opportunities. The programs have also participated in multiple community events, whereby they have dedicated time to educating and learning from local community members. The students have also presented in regional and national conferences, thereby sharing the results of their research and experiences with multiple audiences.

#### ***Datafield 4: What do you plan to do to accomplish goals?***

During year two, we successfully accomplished our goals through targeted measures. For year three, we plan to continue recruiting Hispanic students as other students graduate, particularly focusing on recruiting additional graduate students to meet our targeted goal of graduating 5 masters students. We also plan to continue the momentum of extensive research and engagement activities as they have proven to be successful and beneficial to students' growth. For students that participated in summer career experiences we encourage, where possible, for students to continue assisting in various research projects at local ARS stations. We plan to continue to incorporate agri-science course infusion and develop various workshops for consortium-wide student interactions. We also plan to continue to expand professional development and agri-science training through use of modules that were developed during year two, while also improving website and other technological tools. Students will continue to participate in local community events and offering tours and other peer mentoring opportunities to K-12 schools.

#### **Changes/Problems:**

The differences in cost of attendance at each institution, along with administrative hurdles, have made consortium-wide courses difficult to implement. To overcome this challenge, each institution has created various agri-science course infusion and various training opportunities. We will focus on offering additional workshops and engagement opportunities for further information sharing between the participants.

#### **20 Indictors**

Each collaborative includes 20 indicators in the reporting of their respective projects, however upon review of the reports, each indicator can be interpreted in multiple ways. In order to achieve uniformity across all collaboratives and help to ensure the projects' statistics are reported accurately and projected in the best light, below is a discussion on each indicator and what it should include for our reporting.

## **1. Total number of USDA agencies and partners**

USDA Partners: TOTAL = 3

- Agricultural Research Service, Miami, FL
- Agricultural Research Service, Ft. Lauderdale FL
- Agriculture Research Service, Prosser, WA
- Agricultural Research Service, Mayaguez, Puerto Rico
- Food Safety and Inspection Service, Miami, FL
- Animal and Plant Health Inspection Services- Plant Protection Quarantine, Miami, FL
- Animal and Plant Health Inspection Services- Plant Protection Quarantine, Carolina, Puerto Rico
- Animal and Plant Health Inspection Services- Veterinary Services, Hato Rey, Puerto Rico

Non-USDA Partners: TOTAL = 11

- Interamerican Institute for Cooperation in Agriculture (IICA)
- Earth Learning
- Jose Marti School
- Fairchild Tropical Gardens
- University of Tennessee, Center for Renewable Carbon
- University of Florida's Tropical Research and Education Center
- University of Michigan, Plant and Soil Sciences (SROP)
- University of Miami –Diabetes Research Institute
- International Research Associates
- Dumond Conservancy for Primates and Tropical Forests
- University of Illinois at Urbana-Champaign, Physics Laboratory (SROP)

Non-USDA Collaborators: TOTAL = 4

- Florida International University
- Miami-Dade College-North
- St. Thomas University
- Interamerican University of Puerto Rico, Mayaguez

## **2. Total number of career experiences (USDA vs others)**

(41) Total, including, (15) ARS, (10) APHIS, (1) FSIS, and (14) Non-USDA

### 3. Total number of students served including gender and ethnicity

The grant served 73 students:

- 35 Males Students: 48%
- 38 Female Student: 52%
- 71 undergraduate student: 97%
  - 33 Males Students: 46.5%
  - 38 Females Students: 53.5 %
- 2 graduate student: 3 %
  - 2 Male Student: 100%
- 79.4 % (58 students) Hispanic, 16% (12) Black, and 4.1% (3) White.

### 4. Total percent of retention (undergraduate/graduate/PhDs)

85% Retention. [73 = 51 currently in the program + 11 graduated + 11 dropped]

- 60 Undergraduate Students: 85% Retained
- 2 Graduate Students: 100% Retained

### 5. Total number of students in experiential learning (research) mentoring

55 of 73 students (75%) participated in experiential learning mentoring.

FIU- 18, IAU- 7 , STU- 13, MDC- 17

### 6. Total number of participants presenting

50 presentations

### 7. Total number of students enrolled in disciplines applicable to USDA jobs

DISCIPLINE	NUMBER STUDENTS ENROLLED (graduated)	PERCENTAGE ENROLLED (including graduated)	USDA APPLICABLE (Y/N)
Biology	28 (5)	54.9% (53%)	Y
Environmental Science	12 (2)	23.5% (23)	Y
Chemistry	4	7.8% (6.5%)	Y
Biotechnology	3 (3)	5.9% (9.7%)	Y
Criminal Justice	1	2% (1.6%)	N
Landscape and Horticulture	1	2% (1.6%)	Y
Biopharmaceutical	1	2% (1.6%)	Y
Optometry or premed	1 (1)	2% (3%)	N

TOTAL	51 (+11)	100%	
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**8. Total number of degrees awarded with USDA qualifications**

Total number of degrees awarded with USDA qualifications: 11  
 Associates Degrees Awarded: 4  
 Bachelor's Degrees Awarded: 7  
 Master's Degrees Awarded: 0

**9. Total number of students publishing**

- a. 1 peer reviewed
- b. 50 other publications

**10. Comparison of GPA's before and after**

Before experience: 3.313  
 After: 3.296

**11. Developing curriculum and faculty for required USDA courses**

17 (2 colloquium, 5 course with Agri-science infusion, 6 Agroecology training workshops , and 4 online course modules created 2012-2013 – awaiting implementation January 2014.

**12. Comparison of female success (before and after): gender and ethnicity**

- Grant serves 38 Female Students: 52%
- 81.6% (31) Hispanic, 15.8% (6) Black, and 2.6 % (1) White.
- 63.6% of those Graduated are females (7 )
- 45.5% of those Dropped are females (5)
- Transfer rate: 1 student transferred to FIU, 3 students that graduated applied to graduate programs or will soon apply

**13. Total number of student hours advising and tutoring**

Clarification: Approximate if necessary, the total number of hours spent advising and tutoring student participants.

About 3000 hours have been spent advising and tutoring student participants per year.

**14. Tracking students placement into jobs or PhDs/student mobility**

1 graduate now coordinator of STU program, 1 graduate at MDC moved to FIU for higher education, 1 graduating student at FIU became ari-science teacher, 1 student graduated at FIU is working for Agriculture Industry, 2 students at STU have already applied for graduate school, and many have indicated they now consider masters or Ph.D upon graduation.

### **15. Track English skills**

63 of 73 Students served (90%) are proficient in English.

### **16. K-12 activities (and freshman)**

The program has conducted multiple events that have benefited high school students. FIU conducted a day long agri-science immersion for 160 kindergarten children as well as multiple workshops and tours for over 100 high school students during year two. In addition, over 80 high school students attended the Agroecology Symposium at FIU and 14 high school students participated in the summer Agroecolog Internship Program. Through various activities, MDC has impacted 200 K-12 students and about 50 Teachers. Similarly in Puerto Rico, IAU also conducted workshops where around 200 students were impacted. St. Thomas also conducted presentations at local education centers, where many students attended and benefitted from STEM education and engagement.

### **17. Community engagement activities**

The program has conducted over 40 community engagement activities during year two. These included both individual activities organized by each institution separately, as well as collaborative activities between the institutions in the grant and the local community. Students from FIU, STU, and MDC collaborated with partner, Farchild Tropical Botanical Gardens by participating in events such as the Ramble, Science Fair, and the Green Cuisine Event. The program also collaborated with USDA partner, the Agriculture Research Service, by participating the USDA ARS Community Day. Other activities worth noting are collaborative garden tours and building days where students from the collaborating universities joined and created gardens.

### **18. Budget implementation**

Roughly 90% \$850000 of the second year budget spent or committed; overage has received no cost extension

### **19. Program activities/implementation**

For year two, we met 100% recruitment, 70% curriculum innovation and instructional delivery, 100% experiential and experimental training, and 100% internship and career development activities. One undergraduate student has published her first peer reviewed paper on collaborative research with the USDA ARS agency. Another student has already started working for USDA and plans to transition to full time position upon graduation. For year three, we plan to continue recruiting students as current students graduate and maintain or increase our Hispanic representation. We also plan to continue to have more collaborative opportunities for students to engage and network and improve website and other technological tools. We also plan to continue to expand professional development and agri-science training through use of modules that were developed during year two as well as workshops and seminars.

## **20. Agency/participant survey**

We have sent IDRA students to students and partners. We also sent internal surveys to students regarding their internship experience. Internal surveys regarding summer career experiences have demonstrated that 100 percent of students responding to the survey (n. 30) agreed or strongly agreed that the USDA scientists and staff were friendly and approachable. 100 percent also felt that participating in this career experience helped them to feel more comfortable following laboratory and/or field protocols as well as handling the laboratory and/or field equipment used during the experience. About 87% of respondents felt that participating in summer career experience has encouraged them to apply for a position at USDA or other federal agencies in the future. In addition, about 97% felt that participating in the career experience has encouraged them to continue their educational studies. Finally, all of the respondents would consider going back to the same USDA or other agency if given the opportunity. These results highly demonstrate the positive effect these career experiences have on students' training and perception of working in a USDA (or related) field.

# **New Mexico State University**

## **Accomplishments Report – AD-421**

*Annual Report: September 1, 2012 – August 31 2013*

### *Outputs:*

The New Mexico/Puerto Rico Natural Resource Career Track (NRCT) Program is collaboration among 14 Hispanic Serving Institutions in New Mexico and Puerto Rico focusing on Climate Change and Forest Service (FS) Labor Force Track. Our main objectives center on identifying and mentoring cohorts of students to prepare them for careers in Natural Resource Management. These students are provided a series of experiential learning opportunities appropriate for their academic level that engage them in resource management. In the second year of our program, September 2012- August 2013 we focused on working collaboratively with the USDA Forest Service to fully implement our program. Lead project personnel meet bi weekly and in addition to program workshops and seminars, program students meet monthly. Project PIs and Education Coordinators worked with program students to provide a diversity of experiences that include research and internship opportunities, networking with agency personnel through direct contacts and through professional meetings, research presentations, spring visitor's day for 2-yr institutions, workshops and trainings, cultural exchanges, high school outreach, academic advising, and tutoring. In January-March we worked with project personnel and USDA FS recruiters to advertise, interview and recruit a new cohort of students into our program. Through faculty leads at each institution, we identified students best suited for this program. We also advertised through appropriate classes. Students provided transcripts and resumes as part of their application material. Ten visits were made to groups of program institutions to recruit and interview students. Through this recruitment effort 50 additional students were interviewed for placement in the program. By far, the largest challenge we have encountered this year is placing our students in summer internship positions due to sequestration impacts on availability of federal summer jobs for students and implementation of the new PATHWAYS program. To secure placement of as many students as possible, we canceled our three May field classes and put those funds toward student internships. This is a triage approach to ensure that as many of our students obtain meaningful summer positions as possible as these summer experiences are the cornerstone of the NRCT Program. We are working collaboratively with recruiters from the USDA Forest Service to identify positions for program students on national forests where we will offer students 8-10 week internships for \$4,000. These positions will be on national forests where cheap government housing is available. The program will fund as many of these internships as possible for students that are not able to secure a paid summer position. If we have sufficient funds remaining at the end of the summer, we will attempt to offer one class in August (Back Country Travel and Wilderness Emergency Management) and some additional training experiences for students. It is our goal to try and ensure all students obtain meaningful summer experiences.

### *Outcomes/Impacts*

All program partners have been working closely to make this program a success. PIs from NMSU, UPR and Forest Service have been meeting regularly to implement a long-term plan for the NRCT program, this has included meetings in Washington DC and Albuquerque with Forest Service Civil Rights personnel and Human Resources; this activity is ongoing. The USDA Forest Service is our main partner, but we are also working with the USDA Natural Resources Conservation Service (NRCS), USDA Animal, Plant and Health Inspection Service (APHIS), Bureau of Land Management (BLM) and US Geological Service (USGS). In year two we enrolled two additional institutions in our program, Eastern New Mexico University-Ruidoso (2-year institution) and UPR-Utuado (4-year institution). In year 2, we retained the majority of students in our program (92%), graduated and placed 4 students (December 2012) in permanent positions with the USDA Forest Service, have an additional nine students in long-term PATHWAYS positions with the USDA, and recruited 31 new students into our program bringing the total number of program students to 83. The large number of new recruits was in anticipation of 10-12 students graduating in May 2013 and the high quality of the applicants. We anticipate that an additional 6 students will be permanently placed with the USDA in May or June 2013 (4 with USDA FS, 1 with USDA NRCS, and 1 with USDA APHIS). Our current 83 students consist of 2 PhD, 12 MS and 69 undergraduate students. Fifty-two percent of students are female and 48% male. Eighty five of our 87 students are Hispanic, one is Native American and one is African American. Of the 87 students approximately 53% are first generation college students. Student disciplines include forestry, environmental science, wildlife science, fisheries science, range science, conservation ecology, natural resources, geology, Information technology, agriculture and community development, and civil engineering. Orientations were held for all new program students in New Mexico and Puerto Rico for a total of 3 introductory workshops. This is in addition to 12 workshops and field days (6 each in NM and PR) ranging from resume building, an event day for student pathways position applications, spring visitors day for 2 year institutions at NMSU, and mock interviews to separate field days at various research stations. Four students (2 NM and 2 PR) participated in the student exchange program between New Mexico and Puerto Rico in 2012-2013. Graduate students supported financially serve as Teaching Assistants (TA's) for the field courses, coordinate and conduct high school outreach and implement other program activities. This fall graduate students developed a high school outreach program. They are now implementing this program and have visited 22 classrooms in New Mexico in spring 2013. Outreach by Puerto Rico students began in 2012 working in the classrooms of 4 highschool teachers. We have conducted 4 spring field trips. In 2012-2013, 33 students participated in the faculty/research mentorship program, 40 students attended professional meetings and have given 18 presentations. Fourteen tutors were hired across our 14 institutions during this second year; these tutors are available to our program students as well as other students that seek assistance. As of now, we estimate 25 of our NRCT students have secured summer internships. Offers are still being made and we expect the majority of our students will be placed officially through the Forest Service or other agencies. The program will fund as many internships as possible to place our students in relevant summer experiences. If we have sufficient funds remaining, we will attempt to offer one class in August and some additional training experiences for students. We have developed a program website <http://nrct.nmsu.edu/> (English and Spanish), Facebook pages for our New Mexico and Puerto Rico programs, a program brochure (English and Spanish), a PATHWAYS brochure, and are using

distance communication technology (skype) to communicate with students at remote locations and connecting via webinars via real time video conferencing.

*Publications*

New Mexico- Puerto Rico Career Tracks (NRCT) - Brochure

PATHWAYS - Brochure

*Project Participants*

Martha Desmond, PI, New Mexico State University

Jess Zimmerman, PI, University of Puerto Rico-Rio Piedras

Berlinda Baca Sanchez, PI, USDA Forest Service, Office of Civil Rights

Skip Van Bloem, PI, University of Puerto Rico, Mayaguez/USDA Forest Service

Erika Concepcion, Education Coordinator, University of Puerto Rico

Jennifer Frey, Education Coordinator, New Mexico State University

*Target Audiences*

Our primary target audience is Latino students at our 14 collaborating institutions in New Mexico and Puerto Rico (New Mexico State University campuses in Las Cruces, Grants, Carlsbad and Alamogordo, New Mexico Highlands University, Luna Community College and Eastern New Mexico University-Ruidoso, University of Puerto Rico campuses in Rio Piedras, Cayey, Humaco, Bayamon, Utuado, and Mayaguez and InterAmerican University in Bayamon). We also provide outreach to high school students.

*Project Modifications:* Not relevant to this project.

**Baseline Data for Recruitment – Year II September 1 2012- August 31, 2013**

**NM\_PR Natural Resource Career Tracks Program**

**Preparing Students For Career Paths With The USDA Forest Service By Linking Student Success With Experiential Learning Opportunities**

**Martha Desmond (New Mexico State University), Jess Zimmerman (University of Puerto Rico),**

**Berlinda Baca-Sanchez (USDA Forest Service)**

1. Number of students served:
  - a. 83 students are currently enrolled in our NM\_PR Career Tracks Program
    - i. 53 New Mexico (1 PhD, 10 MS, 42 BS)
    - ii. 30 Puerto Rico (1 PhD, 7 MS, 22 BS – 2 BS students converted to MS in August 2013)
  - b. 2 Ph.D/17 MS/64 BS
2. Gender:
  - a. UPR: 18 f: 12 m
  - b. NMSU: 26 f: 27 m
3. Number of courses/credits
  - a. Field courses were canceled to use savings to support students in need of paid internship positions through NRCT.
4. GPA at end of year
  - a. NM: 3.271
  - b. PR: 3.468
5. Major interest
  - a. Environmental Science
  - b. Forestry
  - c. Wildlife
  - d. Fisheries
  - e. Range Science
  - f. Geology
  - g. Engineering
  - h. Agriculture and Community Development
  - i. Information Technology
6. First Generation – 33%
  - a. NM 45% (24/53)
  - b. PR 10% (3/30)
7. Institutional Retention rate (We do not have this information for 2012 yet)
  - a. New Mexico Institutions: In 2011 student retention was 45% for NMSU-Las Cruces, 19% for NMHU, 9% for NMSU-Alamogordo, 6% for NMSU-Carlsbad, 16% for NMSU-Grants, and 15% for Luna CC.
  - b. Puerto Rico Institutions: 2011 student retention was 45% for UPR-Rio Piedras, UPR-Cayey 42%, UPR-Humaco 41%, UPR Bayamon 42%, and InterAmerican Bayamon 18%.

**Grant Activities and Tracking Students' Progress-Interventions**

1. Agency visits

- a. Six visits were made to participating institutions by the USDA Forest Service and project personnel to recruit new students.
- 2. Workshops
  - a. We have held 3 introductory workshops to introduce this program to our new student recruits and an additional 14 workshops and field days (8 in New Mexico and 6 in Puerto Rico).
- 3. Student Ambassadors
  - a. 2 student ambassadors – one each in NM and PR
  - b. 1 Information technology student working on the website and brochures.
- 4. Professional Meetings
  - a. Overall
    - i. 68 professional meetings were attended by 41 students
    - ii. 41 presentations were given.
  - b. New Mexico
    - i. 38 professional meetings were attended by 24 students.
    - ii. 29 presentations were given.
  - c. Puerto Rico
    - i. 30 professional meetings were attended by 17 students.
    - ii. 12 presentations were given.
- 5. Applied Research Opportunities
  - a. 30 Students participated in applied research opportunities in year II.
    - i. New Mexico – 17 students participated in semester lab mentorship positions.
    - ii. Puerto Rico – 13 students participated in semester lab mentorship positions.
  - b. Summer Internships (2013)
    - i. New Mexico
      - 1. 44 students had internships,
        - a. 38 students on internships paid by employer.
        - b. 6 students on internships paid by NRCT (ie this grant).
      - 2. 6 students working on their graduate research.
      - 3. 2 students left the program before su 2013 (and one left after su 2013).
    - ii. Puerto Rico
      - 1. 27 students had internships
        - a. 7 students on internships paid by employer.
        - b. 20 students on internships supported by NRCT (this grant).
      - 2. 3 students working on their graduate research.
  - c. Eleven students currently have long-term pathways positions with USDA FS (8), USDA APHIS (1) and USDA NRCS (2). Additionally, in the previous year, we have placed 6 program students in permanent positions with the USDA Forest Service (n=6).

### **Working with USDA and other Federal Agencies to Meet Job Placements**

- 1. Potential Partnerships
  - a. USDA Forest Service

- b. USDA NRCS
  - c. USDA APHIS
  - d. BOR (Bureau of Reclamation)
  - e. USFWS (US Fish and Wildlife Service)
  - f. NPS (National Park Service)
  - g. BLM (Bureau of Land Management)
  - h. USGS
2. Point of contact at Human Resources
- a. Amy L Padilla  
MWSI Program Specialist/Liaison  
US Forest Service-Civil Rights  
4000 Masthead NE  
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Phone 505-944-8383  
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Cell 505-670-0533  
Email [apadilla@fs.fed.us](mailto:apadilla@fs.fed.us)
  - b. Berlinda Baca-Sanchez  
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  - c. Rick Tafoya  
Outreach Coordinator  
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333 Broadway Blvd. SE, 3rd Floor  
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Ph (505) 842-3188  
Cell (505) 263-9417  
Fax (505) 842-3807
3. Jobs Targeted
- a. Primarily Natural Resource Related positions with the USDA Forest Service

- b. New Mexico: 38 students on internships paid by agency or NGO/7 students on internships supported by NRCT/ 6 graduate students focused on graduate research/2 students unknown
  - c. Puerto Rico: 8 students have internships paid by agency or NGO/19 students are supported by NRCT/5 students are focused on graduate research/one student is volunteering.
  - d. Seven students have moved on to permanent placement with the USDA Forest Service or NRCS (6 with USDA FS/1 USDA APHIS) and nine students currently have long-term PATHWAYS positions (8 with USDA FS and 1 with USDA NRCS)
4. Use of Technology
    - a. Program website
    - b. Distance education tools to communicate with program students at distant campuses
    - c. Webinars
    - d. skype
  5. Identifying Requirements
    - a. Field of interest and academic major
    - b. GPA
    - c. Credit Hours completed
    - d. Past experience
    - e. Communication skills

### **Student Placement and Tracking**

1. Survey job/agency or preference
  - a. We have established a direct collaboration with USDA FS on student recruitment and placement
2. Determine Requirements
  - a. GPA
  - b. Major field
  - c. Credit hours completed
  - d. Communication Skills
3. Orientation to ensure student understands expectations
  - a. 3 workshops have been held to introduce students to program
  - b. All students will sign a contract annually.
4. Understanding public service Institution retention rates
  - a. New Mexico Institutions: In 2011 student retention was 45% for NMSU-Las Cruces, 19% for NMHU, 9% for NMSU-Alamogordo, 6% for NMSU-Carlsbad, 16% for NMSU-Grants, and 15% for Luna CC.
  - b. Puerto Rico Institutions: 2011 student retention was 45% for UPR-Rio Piedras, UPR-Cayey 42%, UPR-Humaco 41%, UPR Bayamon 42%, and InterAmerican Bayamon 18%.
5. Exceed Institutional Retention Rate
  - a. We retained 96% of students from September 2012-August 2013, by far exceeding institutional retention rates.

- i. Two students dropped out of program due to lack of interest.
- ii. One student failed out of school.

**Budget Adjustments (Percentage per Category)**

- 1. Staff – no changes
- 2. Scholarships - NA

## **Accomplishments Report – AD-421**

*Annual Report: September 1, 2012 – August 31 2013*

### *Outputs:*

The New Mexico/Puerto Rico Natural Resource Career Track (NRCT) Program is collaboration among 14 Hispanic Serving Institutions in New Mexico and Puerto Rico focusing on Climate Change and Forest Service (FS) Labor Force Track. Our main objectives center on identifying and mentoring cohorts of students to prepare them for careers in Natural Resource Management. These students are provided a series of experiential learning opportunities appropriate for their academic level that engage them in resource management. In the second year of our program, September 2012- August 2013 we focused on working collaboratively with the USDA Forest Service to fully implement our program. Lead project personnel meet bi weekly and in addition to program workshops and seminars, program students meet monthly. Project PIs and Education Coordinators worked with program students to provide a diversity of experiences that include research and internship opportunities, networking with agency personnel through direct contacts and through professional meetings, research presentations, spring visitor's day for 2-yr institutions, workshops and trainings, cultural exchanges, high school outreach, academic advising, and tutoring. In January-March we worked with project personnel and USDA FS recruiters to advertise, interview and recruit a new cohort of students into our program. Through faculty leads at each institution, we identified students best suited for this program. We also advertised through appropriate classes. Students provided transcripts and resumes as part of their application material. Ten visits were made to groups of program institutions to recruit and interview students. Through this recruitment effort 50 additional students were interviewed for placement in the program. By far, the largest challenge we have encountered this year is placing our students in summer internship positions due to sequestration impacts on availability of federal summer jobs for students and implementation of the new PATHWAYS program. To secure placement of as many students as possible, we canceled our three May field classes and put those funds toward student internships. This was a triage approach to ensure that as many of our students obtain meaningful summer positions as possible as these summer experiences are the cornerstone of the NRCT Program. We worked collaboratively with recruiters from the USDA Forest Service to identify positions for program students on national forests where we offered students who did not receive competitive internship positions 8-10 week internships for \$4,000. These positions were on national forests where cheap government housing is available. It is our goal to try and ensure all students obtain meaningful summer experiences.

### *Outcomes/Impacts*

All program partners have been working closely to make this program a success. PIs from NMSU, UPR and Forest Service have been meeting regularly to implement a long-term plan for the NRCT program, this has included meetings in Washington DC and Albuquerque with Forest Service Civil Rights personnel and Human Resources; this activity is ongoing. The USDA Forest

Service is our main partner, but we are also working with the USDA Natural Resources Conservation Service (NRCS), USDA Animal, Plant and Health Inspection Service (APHIS), Bureau of Land Management (BLM) and US Geological Service (USGS). In year two we enrolled two additional institutions in our program, Eastern New Mexico University-Ruidoso (2-year institution) and UPR-Utuado (4-year institution). In year 2, we retained the majority of students in our program (96%), graduated and placed 4 students (December 2012 (n=3) & May 2013 (n=1)) in permanent positions with the USDA Forest Service, have an additional 11 students in Indefinite PATHWAYS positions with the USDA (8 with USDA FS, 2 with USDA NRCS & 1 with USDA APHIS), and recruited 31 new students into our program bringing the total number of program students to 83. The large number of new recruits was in anticipation of 10-12 students graduating in May 2013 and the high quality of the applicants. Six visits were made to participating institutions by the USDA FS to recruit new students in spring 2013. Our current 83 students consist of 2 PhD, 17 MS and 64 undergraduate students (2 program students from UPR moved from undergraduate to graduate status in year II). Fifty-three percent of students are female and 47% male. Eighty-one of our 85 students are Hispanic, one is Native American and one is African American. Of the 83 students approximately 33% are first generation college students (45% in NM and 10% in PR). Student disciplines include forestry, environmental science, wildlife science, fisheries science, range science, conservation ecology, natural resources, geology, biology, Information technology, agriculture and community development, and civil engineering. Orientations were held for all new program students in New Mexico and Puerto Rico for a total of 3 introductory workshops. This is in addition to 14 workshops and field days (8 in NM and 6 in PR) ranging from resume building, an event day for student pathways position applications, spring visitors day for 2 year institutions at NMSU, and mock interviews to separate field days at various research stations. Four students (2 NM and 2 PR) participated in the student exchange program between New Mexico and Puerto Rico in 2012-2013. Graduate students supported financially serve as Teaching Assistants (TA's) for the field courses, coordinate and conduct high school outreach and implement other program activities. This fall graduate students developed a high school outreach program. In the spring of 2013 they visited 22 classrooms in New Mexico. Outreach by Puerto Rico students began in 2012 working in the classrooms of 4 highschool teachers. We have conducted 4 spring field trips. In 2012-2013, 30 students participated in the faculty/research mentorship program, 41 students attended a total of 68 professional meetings and made 41 presentations. Fourteen tutors were hired across our 14 institutions during this second year; these tutors are available to our program students as well as other students that seek assistance. Seventy-one students had summer internships (44 in NM and 27 in PR). Forty-five of these internships (38 NM & 7 PR) were paid by employers and 26 (6 NM & 20 PR) were paid by the NRCT program. Nine students were supported by the program to work on their graduate research during summer 2013. We have developed a program website <http://nrct.nmsu.edu/> (English and Spanish), Facebook pages for our New Mexico and Puerto Rico programs, a program brochure (English and Spanish), a PATHWAYS brochure, and are using distance communication technology (skype) to communicate with students at remote locations and connecting via webinars via real time video conferencing.

### *Publications*

New Mexico- Puerto Rico Career Tracks (NRCT) - Brochure

## PATHWAYS - Brochure

### *Project Participants*

Martha Desmond, PI, New Mexico State University

Jess Zimmerman, PI, University of Puerto Rico-Rio Piedras

Berlinda Baca Sanchez, PI, USDA Forest Service, Office of Civil Rights

Erika Concepcion, Education Coordinator, University of Puerto Rico

Jennifer Frey, Education Coordinator, New Mexico State University

### *Target Audiences*

Our primary target audience is Latino students at our 14 collaborating institutions in New Mexico and Puerto Rico (New Mexico State University campuses in Las Cruces, Grants, Carlsbad and Alamogordo, New Mexico Highlands University, Luna Community College and Eastern New Mexico University-Ruidoso, University of Puerto Rico campuses in Rio Piedras, Cayey, Humaco, Bayamon, Utuado, and Mayaguez and InterAmerican University in Bayamon). We also provide outreach to high school students.

*Project Modifications:* Not relevant to this project.

## **Baseline Data for Recruitment**

### **NM\_PR Career Tracks Program**

#### **Preparing Students For Career Paths With The USDA Forest Service By Linking Student Success With Experiential Learning Opportunities**

**Martha Desmond (New Mexico State University), Jess Zimmerman (University of Puerto Rico),  
Berlinda Baca-Sanchez (USDA Forest Service), Skip Van Bloem (USDA Forest Service)**

1. Number of students served:
  - a. 87 students are currently enrolled in our NM\_PR Career Tracks Program
    - i. 53 New Mexico
    - ii. 34 Puerto Rico
  - b. 2 Ph.D/11 MS/72 BS
2. Gender:
  - a. UPR: 18 f: 16 m
  - b. NMSU: 26 f: 27 m
3. Number of courses/credits
  - a. Field courses were canceled to use savings to support students in need of paid internship positions through NRCT.
4. GPA at end of year
  - a. We are currently gathering this information for 2013 – should have it by end of summer.
5. Major interest
  - a. Environmental Science
  - b. Forestry
  - c. Wildlife
  - d. Fisheries
  - e. Range Science
  - f. Geology
  - g. Engineering
  - h. Agriculture and Community Development
  - i. Information Technology
6. First Generation
  - a. Approximately 53% but we do not have this for all new students
7. Institutional Retention rate
  - a. New Mexico Institutions: In 2011 it was 45% for NMSU-Las Cruces, 19% for NMHU, 9% for NMSU-Alamogordo, 6% for NMSU-Carlsbad, 16% for NMSU-Grants, and 15% for Luna CC.
  - b. Puerto Rico Institutions:
  - c. Have not yet gathered this information yet for the past academic year.

## **Grant Activities and Tracking Students' Progress-Interventions**

1. Agency visits
  - a. 10 visits were made to participating institutions by the USDA Forest Service and project personnel to recruit new students.

2. Workshops
  - a. We have held 3 introductory workshops to introduce this program to our new student recruits and an additional 12 workshops and field days (6 each in New Mexico and Puerto Rico).
3. Student Ambassadors
  - a. 2 student ambassador
4. Professional Meetings
  - a. 40 students attended professional meetings
5. Applied Research Opportunities
  - a. 33 students have participated in applied research opportunities
  - b. 18 presentations were given at professional meetings
  - c. Summer Internships (2013)
    - i. New Mexico
      1. 38 students on internships paid by employer.
      2. 7 students on internships paid by NRCT (ie this grant).
      3. 6 students working on their graduate research.
      4. 2 students unaccounted for.
    - ii. Puerto Rico
      1. 8 students on internships paid by employer.
      2. 18 students on internships supported by NRCT (this grant).
      3. 5 students working on their graduate research.
      4. 1 student volunteering
      5. 2 students unaccounted for
  - d. Nine students are currently have long-term pathways positions with USDA FS and NRCS. Additionally we have placed 7 program students in permanent positions with the USDA Forest Service (n=6) and APHIS (n = 1).

### **Working with USDA and other Federal Agencies to Meet Job Placements**

1. Potential Partnerships
  - a. USDA Forest Service
  - b. USDA NRCS
  - c. USDA APHIS
  - d. BOR (Bureau of Reclamation)
  - e. USFWS (US Fish and Wildlife Service)
  - f. NPS (National Park Service)
  - g. BLM (Bureau of Land Management)
  - h. USGS
2. Point of contact at Human Resources
  - a. Amy L Padilla  
MWSI Program Specialist/Liaison  
US Forest Service-Civil Rights

4000 Masthead NE  
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Albuquerque, NM 87102  
Ph (505) 842-3188  
Cell (505) 263-9417  
Fax (505) 842-3807

### 3. Jobs Targeted

- a. Primarily Natural Resource Related positions with the USDA Forest Service
- b. New Mexico: 38 students on internships paid by agency or NGO/7 students on internships supported by NRCT/ 6 graduate students focused on graduate research/2 students unknown
- c. Puerto Rico: 8 students have internships paid by agency or NGO/19 students are supported by NRCT/5 students are focused on graduate research/one student is volunteering.
- d. Seven students have moved on to permanent placement with the USDA Forest Service or NRCS (6 with USDA FS/1 USDA APHIS) and nine students currently have long-term PATHWAYS positions (8 with USDA FS and 1 with USDA NRCS)

### 4. Use of Technology

- a. Program website
- b. Distance education tools to communicate with program students at distant campuses
- c. Webinars
- d. skype

5. Identifying Requirements
  - a. Field of interest and academic major
  - b. GPA
  - c. Credit Hours completed
  - d. Past experience
  - e. Communication skills

#### **Student Placement and Tracking**

1. Survey job/agency or preference
  - a. We have established a direct collaboration with USDA FS on student recruitment and placement
2. Determine Requirements
  - a. GPA
  - b. Major field
  - c. Credit hours completed
  - d. Communication Skills
3. Orientation to ensure student understands expectations
  - a. 3 workshops have been held to introduce students to program
  - b. All students will sign a contract annually.
4. Understanding public service Institution retention rates
  - a. New Mexico Institutions: In 2011 student retention was 45% for NMSU-Las Cruces, 19% for NMHU, 9% for NMSU-Alamogordo, 6% for NMSU-Carlsbad, 16% for NMSU-Grants, and 15% for Luna CC.
  - b. Puerto Rico Institutions: 2011 student retention was 45% for UPR-Rio Piedras, UPR-Cayey 42%, UPR-Humaco 41%, UPR Bayamon 42%, and InterAmerican Bayamon 18%.
5. Exceed Institutional Retention Rate
  - a. We retained 93% of students from year one, by far exceeding institutional retention rates.

#### **Budget Adjustments (Percentage per Category)**

1. Staff – no changes
2. Scholarships - NA

# **Texas A&M University – Kingsville**

## Mid-Year Progress Report: Year 2

**USDA-NIFA Award Number:** 2011-38422-30826 (2012-02298)

**Title:** **STEP UP to USDA Career Success;** Science, Technology and Environmental Programs for Undergraduate Preparation to USDA Career Success

**Lead Institution Project Director:** Shad D. Nelson, Texas A&M University-Kingsville

**Co-PDs:** Randy L. Stanko, Texas A&M University-Kingsville (TAMUK);

Michael Persans, University of Texas-Pan American (UTPA), Edinburg, TX;

Debora Villalon, South Texas College (STC), Weslaco, TX;

Armando Duarte; Texas State Technical College (TSTC), Harlingen, TX;

Jonda Halcomb, Del Mar College (DelMar), Corpus Christi, TX.

**State Involved:** Texas

This is a '**Regional Collaboration**' [ROCN] project [TRACK CODE (NRNR)] located in South Texas involving **five** educational, primarily Hispanic Serving Institutions, and multiple USDA research or service centers and agencies (primarily USDA-NRCS (NRNR Track), but also preparing employees for the USDA-AMS, -ARS, and-APHIS) aimed at providing student experiential learning and student recruitment and retention through agricultural- and natural resources-oriented research or career training. The lead institution, Texas A&M University-Kingsville (TAMUK) in collaboration with an additional 4-year institution, University of Texas-Pan American (UTPA), and three 2-year community colleges (DelMar College, South Texas College (STC), and Texas State Technical College (TSTC) will be the academic institutions involved in this project. The purpose is to build a bridge between regional community colleges and continue students after obtaining a 2-year Associates degree to continue onto a four-year degree to obtain the necessary skills and academic training to qualify for hire in the USDA upon graduation with a Bachelor of Science degree.

The STEPUP objectives are: 1) To form a collaborative effort to provide undergraduate education and hands-on training to a minimum of 50 underrepresented Hispanic south Texas students. 2) To better prepare students for opportunities in agricultural- or natural resource sciences-related internships within USDA (STEP UP), targeted summer camps and short-courses for skills training in the soil-, animal-, or natural resource- sciences. Objective 3) To provide an underserved student population with the opportunity to experience firsthand exposure to research in agricultural or natural resource sciences through faculty-mentored projects, **or** the opportunity to have a USDA career training experience during a 10-wk summer internship.

The STEP UP grant proposed to serve a minimum of 50 undergraduate and 5 graduate Hispanic students annually and surpassed that in Year 1 by serving 60 students who participated in and received stipends from the STEP UP grant. The participants were 57 percent male and 43 percent female and 70 percent Hispanic.

## Year 2 Mid-Year Accomplishments Report

### Outputs:

Dissemination of this multi-institutional project has been promoted through various means during the spring of 2013. Websites highlighting the program have been established at TAMUK to document program direction, purpose, and student progress and achievements, located at: <http://www.tamuk.edu/anschsi3/index.html>. Whereas, UTPA website is located at: [http://portal.utpa.edu/utpa\\_main/daa\\_home/cosm\\_home/usda\\_home](http://portal.utpa.edu/utpa_main/daa_home/cosm_home/usda_home). Some of the students funded in part and through this grant have presented their work at professional meetings, such as the Subtropical Plant Science Society Meeting held February 15, 2013 at the Texas A&M AgriLife Research and Extension Center in Weslaco, TX . Students from STC, TSTC, UTPA and DelMar College will participate in a 3-day summer camp to be held in June 2013 to be taught and instructed by TAMUK graduate students and faculty regarding the agricultural and natural resources sciences. (<http://www.tamuk.edu/anschsi3/events/CampPics.html> ). The summer camps are a recruiting and retention tool for student from community colleges to learn about the advantages to agriculture-related careers. We estimate to have over 25 undergraduate students attend the summer camps at Kingsville this summer 2013.

### Outcomes/Impacts:

The majority of time and effort this second project year was placed upon obtaining reports and promoting project results from undergraduate interns and graduate students funded during Year 1 (2011-12), continue promotion of the STEP UP program to students within the five institutions, followed by recruitment and selection of new students into the program for Year 2 (2013), and establish locations for students to perform summer 2013 internships with scientists at various USDA agencies or other research-related institutions and industry partners.

### **20 INDICATORS OF SUCCESS:**

- 1. Total Number of USDA Agencies and Partners:** 4 USDA agencies:-NRCS,-AMS,-ARS,-APHIS; and 16 other partner institutions: Texas A&M AgriLife Research, Various University Research Centers, Ag-Related Industry Companies, Veteranary Services and Zoos.
- 2. Total Number of Internships (USDA vs. Others):** 18 USDA and 35 others.
- 3. Total Number of students served/including gender and ethnicity:** 59 total students, 44 hispanic and 15 other ethnicity; 32 females and 27 males.
- 4. Total Percent of retention (undergraduate/grad/Ph. Ds):** 100% retained in school and progressing to graduation so far for all newly participating or returning students for 2012-13 as this is the second year in program, Planned for 80%.
- 5. Total Number of students in experiential learning (research) mentoring:** 42 out of 53 students in summer research related mentoring, and 8 in graduate research projects.
- 6. Total Number of participants presenting:** 7 students so far.
- 7. Total Number of students enrolled in disciplines applicable to USDA jobs:** 59 out of 59 students.
- 8. Total Number of degrees awarded with USDA qualifications:** 4 graduating by Aug

2012, 3 of which are working for or doing internships with USDA now.

**9. Total Number of students publishing:** 1 publication, and 24 abstracts published and/or presented since start of program in 2011.

**10. Comparison of GPAs before and after:** Average GPA for student participants is near 3.2; with 63% (37 out of 59) of the students enrolled into STEP UP internship program are new to program as of Spring 2013. Need to continue to monitor GPA after summer internship is over to properly evaluate impact on GPA.

**11. Developing curriculum and faculty for required USDA courses:** New environmental science courses developed and taught Spring 2013 and soils courses reorganized and curriculum revamped at TAMUK. New soils faculty at TAMUK created new 'soil judging team' at TAMUK with several of last year's summer interns participating in team events and placing 4<sup>th</sup> at Regional Meeting held in Oklahoma in Fall 2012 semester.

**12. Comparison of female success (before and after); gender and ethnicity:** Success is measured more so by academic retention and graduate rates, and this will take time to assess for current 2013 cohort. Year 1 was highly successful with 100% of student participants at TAMUK graduating or on track to graduate by Summer 2013, whereas, collaborating institutions having over 95% retention of students progressing towards and obtaining degrees.

**13. Total Number of students honors advising and tutoring:** Students advised by program leaders at each institution and is implied by program enrollment criteria. Effort to retain students is done by faculty within each institution working with students in research and via internships as an incentive to retain original student cohort from community colleges to transfer to 4-year institution to obtain minimum academic qualifications for careers in USDA and agriculture.

**14. Tracking students placement into jobs or PhD/student mobility:** Students are tracked at each institution by participating project directors and co-PDs. Metric tables that include information on career choice and job placement will be provided and maintained through the PD, Dr. Shad Nelson.

**15. Track research activities/English skills:** internship and research experiences require students to present work in an oral English format to faculty, students and others at professional meetings, venues and/or seminars. Each summer intern at TAMUK must provide evidence of both written and oral communication skills for academic credit towards a B.S. degree in the agricultural sciences.

**16. K-12 activities (and freshman?):** Summer camps in June 2012 incorporated high school sophomore-senior students intermixed with community college students participating in this program. Graduate students from TAMUK participating in the STEP UP program assist in setting up, running and serving as student ambassadors TAMUK and promote the program to community college freshman and high school students; TAMUK College of Agriculture hosts over 1400 high school students in ag-related recruitment activities during the month of April 2013.

**17. Community engagement activities:** University student clubs are used as a venue for

community services, and students within the program present results and experiences at local and regional meetings and recruiting activities.

**18. Budget implementation:** Most of the first year budget is spent by all institutions and second year budget allocated towards student summer internship and research programs. Each subcontracting institution implements and is responsible to adhere to the budgets set forth in original proposal and approved through main institution, TAMUK.

**19. Program activities/implementation:** Implemented a website to document STEP UP program (<http://www.tamuk.edu/anschsi3/index.html>), secured locations for over 95% of student participant for summer 2013 internships, 2013 summer camp in June is being planned for Kingsville, and students will provide written and oral reports on internship and research experiences in Fall 2013 semester.

**20. Agency/Participant Survey:** Each student has agreed to participate in a student pre- and post-surveys. Student interns at TAMUK are required to rate their internship experience and the agency submits a summary report on the students effectiveness in the internship program. Similar surveys are distributed to all subcontracting institutions.

The impacts of this project are focused on the student's individual achievements and movement of students after graduation into careers with the USDA. Special emphasis will be made to track students who obtain employment in USDA agencies after graduation, and those who transition into graduate school.

### **Participants**

Participating Academic Institutions: TAMUK, UTPA, STC, TSTC, Del Mar College  
Participating USDA Agencies: USDA-NRCS (-PMC), -ARS, -APHIS (-PPQ), -AMS  
Participating Texas State Agencies: Texas A&M University; Texas A&M AgriLife Research and Extension; Texas Animal Health Commission  
Participating Partner Organizations: Cargill, Ceaser Kleberg Wildlife Research Institute, Purdue University, King Ranch, Bureau of Reclamation; Poplar Hill Dairy Goat Farms; Brownsville Zoo, Chattanooga TN Zoo

### **Target Audiences**

The target audience is primarily for undergraduate students at the Community College level to increase the number of students to obtain a four-year degree in the agricultural and biological sciences that will qualify students for careers within USDA agencies, especially the USDA-NRCS.

### **Project Modifications**

Nothing significant changes to project objectives to report during this reporting period

### **Publications: (students in bold)**

**Trevino, J.**, G. Schuster, S.D. Nelson, A.P. Ochoa, and J. Munyaneza. 2011. Effects of potato planting dates on psyllid populations and zebra chip incidence in Texas. Pp: 62-68. In: (Eds: F. Workneh, A. Rashed, and C.M. Rush) Proceedings of the 11<sup>th</sup> Annual 2011 Zebra Chip Reporting Session. San Antonio, TX. Nov. 6-9, 2011.

### **Abstracts & Presentations at Professional Meetings 2011-2013**

1. 61st Annual Meeting of the Southwestern Branch of the Entomological Society of America and the Annual Meeting of the Society of Southwestern Entomologists. 25-28 February 2013, Las Cruces, NM.
  - a. **Velez, Aida**, K. Summy, J. Goolsby, W. Osbrink and D. Thomas. Evaluation of Ant Diversity and Phenology at Field Sites for the Biological Control Program for *Arundo donax* on the Rio Grande. (UTPA, 1<sup>st</sup> place winner, poster)
2. 67<sup>th</sup> Annual Meeting of the Subtropical Plant Science Society. Feb 15, 2013. Weslaco, TX. *Subtrop. Plant Sci.* Vol. 65 (published poster abstracts)
  - a. **Melgoza, Franciso**, A. Kusakabe, J.C. Melgar and S. Nelson. Understanding and Improving Cold Tolerance in Citrus. (2<sup>nd</sup> place winner)
  - b. **Young, Blake**, S. Biles, G. Schuster and S. Nelson. Economic Thresholds for Boll Feeding Bugs in Cotton.
  - c. **Mays, Tyler**, G. Schuster and S. Nelson. Evaluation of *Bacillus thuringiensis* against Helioverpa populations in cotton varieties grown in the upper coastal bend of Texas.
  - d. **Dupnik, Megan**, G. Schuster, S. Nelson and J. Halcomb. Incidence and prevalence of bacterial boll rot in Coastal Bend and Rio Grande Valley cotton production.
  - e. **Ortiz, Stephanie**, M. Chapa, K. Rod Summy, and F.W. Judd. Enhancing Rooting Success of Black Mangrove Propagules (UTPA)
  - f. **Velez, Aida**, K. Summy, J. Goolsby, W. Osbrink and D. Thomas. Evaluation of Ant Diversity and Phenology at Field Sites for the Biological Control Program for *Arundo donax* on the Rio Grande. (UTPA)
3. 2012 SCRI Zebra Chip Annual Reporting Session, San Antonio, TX. Oct. 30-Nov 2, 2012.
  - a. **J. Trevino**, G. Schuster, S. Nelson, and B. Bextine. Evaluating the impact of planting dates on psyllid populations and ZC disease incidence in Pearsall, TX.
4. American Institute of Chemical Engineers (AIChE) Annual Meeting. Pittsburg, PA. Oct 28-Nov 2, 2012.
  - a. **R.C. Rivas**, P.L. Mills, K.D. Jones, and S. Nelson. Adsorption of Galacturonic Acid onto Anion-Exchange Resins to Enhance the Enzymatic Hydrolysis in a Proposed Citrus Processing Waste Biorefinery. (oral)
  - b. **R.C. Rivas**, K.D. Jones, P.L. Mills, and S. Nelson. Utilization of Citrus Processing Waste as a Renewable Feedstock for Biorefinery Applications: Technical Advances, and Analysis of Engineering Challenges for the Pretreatment and Enzymatic Hydrolysis Steps. (oral)
5. Texas Section Society of Range Management. Fredericksburg, TX. Oct. 10-12, 2012.

- a. **R. Silguero**, E. Biediger, M. Clayton, R. Lyons, E. Montemayor, H. Martinez, R. Stanko, and S. Nelson. Invasive tanglehead management using broadcast herbicide applications. (poster).
  - b. **E. Biediger**, R. Silguero, M. Clayton, B. Yarta, G. Gonzales, R. Stanko, and S. Nelson. Supplemental requirements for beef cattle fed native and improved forage using fecal analysis. (poster).
6. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012.
  - a. **R. Silguero**, E. Biediger, M. Clayton, R. Lyons, E. Montemayor, H. Martinez, R. Stanko, and S. Nelson. Invasive tanglehead management using broadcast herbicide applications. (poster).
  - b. **E. Biediger**, R. Silguero, M. Clayton, B. Yarta, G. Gonzales, R. Stanko, and S. Nelson. Supplemental requirements for beef cattle fed native and improved forage using fecal analysis. (poster).
  - c. **C. Teran**, F. Mendoza, C. Adames, J. Goolsby, D. Thomas, S. Nelson, R. Davey, A. Perez de Leon, D. Strickman, and R. Stanko. Development of field sampling methods for cattle fever ticks for use in the permanent quarantine zone. (poster).
  - d. **S. Godfrey**, R. Stanko, S. Nelson, and K. Gladney. USDA livestock and grain market news. (poster).
7. American Society of Horticultural Science Annual Conference. Miami, FL. July 31-Aug 3, 2012
  - a. S.D. Nelson, **M. Esparza**, **D.E. Garza**, M. Setamou, and M. Young. Potential Benefits of Supplemental Calcium Additions for Sustaining Citrus Production and Quality.
  - b. **C.R. Simpson**, S.D. Nelson, A. Volder, G. Schuster, S. King, J. Jifon, and J.C. Melgar. Water Quality Effects on Grafted and Non-Grafted Citrus (oral).
  - c. **F. Melgoza**, A. Kusakabe, S.D. Nelson, and J.C. Melgar. Foliar and Ground Application of Abscisic Acid to Increase Cold Tolerance in Citrus. (poster)
  - d. **D.E. Garza**, S.D. Nelson, and M. Setamou. Foliar Applications of Micro and Macro Nutrients to Control ACP in Citrus. (poster)
8. 2012 Project Directors' Conference. USDA/NIFA HSI Grants Program. May30-June 1, Edinburg, TX.
  - a. S.D. Nelson, R. Stanko, T. Machado, G. Schuster, M. Persans, D. Villalon, A. Duarte, and J. Halcomb. STEP UP to USDA Career Success. (oral)
  - b. **F. Melgoza**, A. Kusakabe, S.D. Nelson, and J.C. Melgar. Foliar and Ground Application of Abscisic Acid to Increase Cold Tolerance in Citrus. (poster)
9. 2012 Southeastern/Southwestern Joint Annual Branch Meeting of the Entomological Society of America. Sharing Insect Science Globally. Little Rock, Arkansas Mar. 4-7, 2012
  - a. **Esparza, M.**, Raygoza, J., Nelson, S.D. and Setamou, M. Effect of Soil and Foliar Calcium Sources on the Survivorship and Population Dynamics of Asian Citrus Psyllid. (poster).
  - b. **Garza, D.**, Nelson, S. and Setamou, M. Effects of Micro and Macro Nutrients on Major Citrus Pests in Texas. (oral).

<b>Title:</b>	<b>STEP UP to USDA Career Success: Science, Technology and Environmental Programs for Undergraduate Preparation to USDA Career Success</b>		
<b>Sponsoring Agency</b>	NIFA	<b>Project Status</b>	CHANGED
<b>Funding Source</b>	Non Formula	<b>Reporting Frequency</b>	Annual
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<b>Project No.</b>	TEXE-2011-02665	<b>Proposal No.</b>	2011-02665
<b>Project Start Date</b>	09/01/2011	<b>Project End Date</b>	08/31/2014
<b>Reporting Period Start Date</b>	09/01/2012	<b>Reporting Period End Date</b>	08/31/2013
<b>Submitted By</b>		<b>Date Submitted to NIFA</b>	

**Program Code:** NJ

**Program Name:** Hispanic Serving Institutions Education

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**Recipient Organization**

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Agricultural technology  
Biology  
Animal, Range and Wildlife Sci

**Non-Technical Summary**

Low enrollment of students in agricultural sciences has resulted in few students prepared with the skills to replace a retiring USDA workforce. This multi-institutional project addresses USDA NIFA priorities by student experiential learning and recruitment and retention of 58 underrepresented students of South Texas for careers in USDA agencies. Students from five degree granting HSI institutions will receive training in the agricultural and natural resource sciences from Texas A and M University Kingsville (TAMUK) faculty through a series of targeted summer short courses in the soil, animal, and natural resource sciences. This project creates a seamless transition of moving students receiving Associates degrees from three regional south Texas community colleges (South Texas College, Texas State Technical College, and Del Mar College) to obtaining baccalaureate degrees in the agricultural and biological sciences at a four year degree granting institution (TAMUK or University of Texas Pan American). This program addresses USDA NIFA priorities (e) student experiential learning and (f) recruitment and retention of underrepresented students for careers in the USDA. Undergraduate students will have experiential

learning and career track development in agricultural sciences through summer internships with USDA agency partners and research projects under the direction of faculty mentors. Graduate student at the masters and doctoral level will serve as research mentors and advisors to undergraduates performing research in lab. This project will produce 50 undergraduates with baccalaureate degrees in the sciences that meet minimum qualification requirements to be hired by the USDA agencies (NRCS, AMS, ARS, APHIS) upon graduation. Furthermore, the grant will fund a minimum of eight masters and one doctoral level Hispanic graduate students for advanced career path development in the agricultural sciences. The NRCS is the main USDA collaborator targeted in this project, but some students will be prepared for employment with other USDA agencies such as AMS, ARS, and APHIS upon graduation. Undergraduate students will have had a minimum of two summer internships with emphasis placed on working with USDA agencies. At least 58 students that are underrepresented in science careers will benefit from this collaborative project with B.S., M.S., and Ph.D. degrees in the agricultural and biological sciences.

## Accomplishments

### Major goals of the project

The primary objective of this project is focused on undergraduate training and education for career preparation and employment with USDA agencies upon graduation with B.S. degrees. To obtain this, the primary objective has been separated into 3 objectives listed below. Objective 1) to form a collaborative effort to provide undergraduate education and hands-on training to a minimum of 50 underrepresented Hispanic south Texas students. Objective 2) to provide undergraduate students with intensive short-courses based in soils, biotechnology, livestock and meat grading, and environmental sciences that prepare them for soils, biological, animal agriculture, and natural resource science-related careers to a minimum of 50 underrepresented Hispanic students. Objective 3) to provide a minimum of 50 summer undergraduate internship experiences with agricultural-related USDA agencies as fast track preparation for USDA careers. The graduation of one underrepresented doctoral and eight masters level Hispanic students is also a performance measure for program success. The major benefits of this project will be a large number of students prepared with the minimum academic credentials and coursework needed to obtain employment with USDA agencies upon graduation. USDA agencies will have a pool of well qualified candidates to select from for employment that represent persons that are underrepresented in the agricultural and biological science based careers. Within two years of this project agencies will have qualified soil scientist, soil conservationist, meat graders, animal scientists, plant inspection specialists, biological scientist and other agricultural and natural resource specialist ready for hire. Furthermore, this project will provide necessary skills and training to students through internship opportunities with USDA agencies or other partners and industry leaders. Summer internships with the USDA, coupled with research experience under the direction of faculty mentors, will provide students with a firm foundation and understanding of what their career opportunities are in the agricultural and biological sciences. Students enrolled in the program will receive support in the means of stipends to help alleviate the financial burdens associated with higher education. The resultant outcome of this program will be strengthened cooperation and collaboration between educators, scientists and federal agency representatives, such that it will provide a framework for continued collaboration between academic institutions and USDA agency partners for promoting the career development of underserved students of south Texas.

### What was accomplished under these goals?

#### 1) Major Activities Completed

The STEP UP grant proposed to serve a minimum of 50 undergraduate and 5 graduate Hispanic students annually and surpassed that again in Year 2 by serving 58 undergraduate and 9 graduate students who participated in and received stipends from the STEP UP grant. The participants were 43% male and 57% female, and 66% of these undergraduates and 89% of these graduate students identified as Hispanic.

Project Director Shad D. Nelson and Co-Project Directors Randy L. Stanko, TAMUK; Michael Persans, UTPA, Edinburg, TX; Debora Villalon, STC, Weslaco, TX; and Judith Ybarra (Armando Duarte left TSTC in early 2013), TSTC, Harlingen, TX; and Jonda Halcomb, DMC, Corpus Christi, TX, **spent a minimum of 960 hours in Year 2** to positively increase the competitiveness of South Texas undergraduate and graduate students for the job market within USDA agencies and the agricultural sciences. Additionally, six USDA research or service centers and agencies, primarily Natural Resources Conservation Services (NRCS); Agricultural Marketing Service (AMS); Plant Materials Centers (PMC); Agricultural Research Service (ARS), Animal and Plant Health Inspection Service (APHIS); and Forest Service (FS), **provided 19 internship opportunities**, while additional partner institutions, including Texas AgriLife Research, Cargill, TAMU Citrus Center, Texas A&M Forest Service Nursery and Seed Industry, plus researchers at STC, Del Mar and UTPA, and the TAMUK Farm, **provided 34 undergraduate and graduate students with research, field trip, and internship opportunities**, for a total of 53 internship opportunities in Year 2.

In Year 2, there was a 94% student retention rate with STC, TSTC, and DMC retaining 30 of 31 students, UTPA 10 of 12 students, and TAMUK retaining all 30 students in Year 2 (23 B.S., 6 M.S., 1 PhD). STEP UP students completed surveys regarding the various activities of the grant and reported an increase in their scientific understanding, knowledge of educational opportunities, and the realization that they are good candidates for science and research classes and careers.

#### 2) Specific Objectives Met

The collaboration among the 5 academic institutions, 3 research stations, and 6 USDA agencies is serving as a model by which highly qualified underrepresented college graduates who have the training and experience to become successful USDA

specialists and scientists are produced. In Year 2, we once again surpassed STEPUP Objective 1: To form a collaborative effort to provide undergraduate education and hands-on training to a minimum of 50 underrepresented Hispanic south Texas students. During Year 2 of the project, to address the USDA/NIFA educational need areas e and f, which are aimed at providing student experiential learning and student recruitment and retention, **67 students, 68 percent self-identified as Hispanic**, were a part of this project, which allowed them to attend scientific meetings, complete internships, and participate in research projects.

Objective 2, to provide undergraduate students with intensive short-courses based in soils, biotechnology, livestock and meat grading, agribusiness and environmental sciences that prepare them for soils, biological, animal agriculture, and natural resource science-related careers, was met in Year 2 during the June 6-8th, 2013, summer short-course session conducted **for 35 STEP UP undergraduate participants**. Ten (10) master's level STEP UP participants from TAMUK, as well as 15 collaborating researchers, professors, and instructors, provided hands-on experiences in environmental soil science, integrated pest management, plant science, grading and reporting of market livestock and agribusiness principles, meat grading, research opportunities in livestock nutrition, reproduction, and genetics, tools and techniques of range and wildlife management, financial aid opportunities, and USDA agency information session on qualifying requirements. Students completed a pre and post knowledge survey regarding the activities of the summer camp. Results of the survey indicated that students increased their knowledge from pretest low-moderate levels to posttest high-very high levels in the areas of understanding how scientists work on real problems; knowledge and appreciation of field applications in agricultural sciences – specifically soil, plant, animal, and wildlife sciences; food safety laboratory procedures, ability to analyze data; awareness of the USDA and knowledge of education requirements for jobs within USDA. Most of the students who attended the summer camp came in with a high level and left with a very high level of confidence in their ability to learn science and their readiness for more demanding research. When asked which part of the summer camp made the biggest impression on them, students reported that the dirt pit activity made them realize how important dirt is to the agricultural process; that the enthusiasm and passion of all of the faculty and graduate students was amazing, and that they really enjoyed being on a 4-year university campus. Students were also asked how the summer camp impacted the way they view college. Many stated that the camp opened their minds to different possibilities and opportunities in agricultural sciences, reinforced the idea that college is an important part of success, and made them aware of the many possible jobs in USDA. The summer camp was a great success, as two students realized that nothing in life is impossible because the camp made them feel more confident in their knowledge and abilities.

### **3) Significant Results Achieved (major findings, developments, conclusions)**

In Year 2, 94% of STEP UP participants were retained in school and continued their progress towards graduation (target of 80% of undergraduate/grad/Ph.Ds). The number of students in experiential learning (research) mentoring totaled 50 out of 53 students in summer research related mentoring, and 9 in graduate research projects. Additionally, 100% of Year 2 STEP UP participants were enrolled in disciplines applicable to USDA jobs. Since the start of this program, 9 community college students have transferred to TAMUK after receiving Associate degrees. At TAMUK, 5 graduate students had received M.S. degrees by the end of Year 2, with qualifications to be employed by the USDA.

### **4) Key Outcomes or Other Accomplishments Realized (changes in knowledge, action, or condition)**

**Objective 3** of this project is to provide an underserved student population with the opportunity to experience firsthand exposure to research in agricultural or natural resource sciences through faculty-mentored projects, **or** the opportunity to have a USDA career training experience during a 10-wk summer internship. **The STEP UP faculty worked unceasingly to place 53 STEP UP participants in either USDA internship opportunities or in the mentored scientist and/or faculty research directed projects.**

Students graduated while in the STEP UP program, including two Master's students who graduated in Year 2 from TAMUK in Plant and Soil Sciences and have degree credentials sufficient to work for USDA. Two students from UTPA graduated with BS degrees in Biology and have applied or are accepted to graduate school for academic year 2013-14.

### **What opportunities for training and professional development has the project provided?**

**The STEP UP project gave 23 TAMUK, 10 UTPA, 3 TSTC, 8 STC, and 9 Del Mar** students the opportunity to intern with scientists/mentors who specialize in a wide variety of disciplines, including environmental science, agricultural science, biology, genetics, entomology, plant breeding/physiology, soil conservation, natural resources conservation, veterinary services, wildlife/wetland management, and horticulture, among others. Involvement with these research scientists helped the students develop their research skills in agricultural- or natural resource sciences-related research, illustrating that, through this project, underrepresented students can become confident and knowledgeable research partners with important research findings to share.

Internship supervisors were surveyed and rated the majority of interns as effective to highly effective regarding self-discipline, reliability/responsibility, preparedness for internship, communication (listening, speaking, writing), laboratory skills, research skills, analysis/problem solving, initiative, ability to work independently, and teamwork. The supervisors relayed that the interns' work was important, productive, interesting, and useful. All of the internship supervisors were satisfied with the intern's work and most would readily take another intern from the STEP UP program. All surveyed internship supervisors agreed that they would provide a letter of recommendation for their intern for jobs in the future and all but one supervisor would hire their intern for a job in the future if a position was available to do so. The only supervisor who responded no to this

query explained that he thought the intern needed more research experience and that, as the intern developed those skills, he would become immediately employable.

Internship supervisors were impressed with many characteristics and skills of their interns, including the initiative of the students to learn the methods to solve research problems, their dependability and responsibility to the job, their adaptability in working independently as well as in a team, the knowledge they brought to the table and their willingness to learn more, and their respectful and positive demeanors. Areas in which the students could improve included reporting and presentation skills, self confidence, experience in agricultural research, and communication – including asking more questions about lab work and experiments.

Each STEP UP student completed an internship pre and post survey and agreed and strongly agreed that their internship assignments were a positive experience and relevant to their coursework and educational/career plans, that they learned new skills and knowledge, that they would recommend the internship to other students, and that they would consider applying for and taking a job with the internship agency/company after graduation. After the internship, the majority of students believed they were effective or very effective regarding their initiative, self-discipline, reliability/responsibility, communications skills, analysis/problem solving skills, and their abilities to work independently or as part of a team. Students rated their laboratory and research skills slightly lower, but still within the effective range. Pre internship to post internship, students' ratings improved regarding their understanding of the research process, skill in interpreting research results, and readiness for more demanding research. They also improved, pre to post internship, in their ability to connect theory and practice, to understand how scientists work on real problems, in lab skills and working independently. Finally, their perceptions pre to post showed growth in their confidence and ability to learn science and to appreciate agricultural science.

Students reported that specific college classes helped them prepare for their internships, including biology, biotechnology, biochemistry, and biological writing; plant and soil sciences; computer technology; environmental science and environmental regulations and impact analysis; agriculture business; and entomology. These classes and many others too numerous to list, gave students an appreciation for how organisms work and gave them the needed background in dealing with scientific facts. Comments that students wrote about the internships related how much they had learned, the high caliber of scientists that they were privileged to work with, and the sense of direction for the future that the internship experience gave them.

During their summer internships, at least 80% of the students had the opportunity to assist a scientist, participate in training events, gather samples and perform samples research, and work hands-on with plants. At least one-third of the internship students experienced hands-on research with animals, extension laboratory work, and visiting other work sites.

The summer camp short courses also provided important training opportunities, as well as the multiple experiential college courses that prepared STEP UP students for work in the field of agricultural sciences.

#### **How have the results been disseminated to communities of interest?**

Dissemination of this multi-institutional project has been promoted through various means during Year 2 of the project, including the Project Directors' meeting in Puerto Rico in summer 2013 with Project Officer Irma Lawrence. Websites highlighting the program have been established at TAMUK and UTPA to document the program direction, purpose, and student progress and achievements. The research results of the students' independent research projects are primarily disseminated at professional meetings and conferences and in various publications (see Products section).

The following participating institutions and agencies multiply the avenues for dissemination:

**Academic Institutions:** TAMUK, UTPA, STC, TSTC, Del Mar College

**USDA Agencies:** USDA-NRCS (-PMC), -ARS, -APHIS (-PPQ), -AMS, -FS

**Texas State Agencies:** Texas A&M University; Texas A&M AgriLife Research and Extension; Texas Animal Health Commission

**Partner Organizations:** Cargill; Caesar Wildlife Research Institute at Texas AM University-Kingsville; Purdue University; King Ranch; US Bureau of Reclamation; Poplar Hill Dairy Goat Farms, Scandia, MN; Brownsville TX Zoo; Chattanooga TN Zoo.

Collaborative efforts among the 5 institutions has increased the number of transfer students from Del Mar College in Corpus Christi and South Texas State College in Harlingen Texas transferring to TAMUK to obtain 4 year degrees in the agricultural sciences. South Texas College also has students transferring to the University of Texas-Pan American to finish a 4-year degree in the biological sciences after they finish an Associates degree.

#### **What do you plan to do during the next reporting period to accomplish the goals?**

The STEP UP program has been meeting its stated goals. However, during Year 3, we plan to increase advertisement efforts for the STEP UP program during hosted FFA competitions with high school students during fall and spring semesters at TAMUK.

#### **Participants**

**Actual FTEs for this Reporting Period**

Role	Faculty and Non-Students	Students within Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	2	0	0	0	2
Professional	0.3	0	0	0	0.3
Technical	0	0	0	0	0
Administrative	1	0	0.5	0	1.5
Other	0	0	0	0	0
Computed Total	3.3	0	0.5	0	3.8

**Target Audience**

The STEP UP project is designed to engage undergraduate students traditionally underrepresented in the sciences in activities intended to enhance experiential learning and to expose these students to careers and research in the agricultural sciences. Starting at the community college level, the intent of this project is to increase the number of students who obtain a four-year degree in the agricultural and biological sciences, ultimately qualifying students for careers within USDA agencies, especially the USDA-NRCS. The distribution of the 58 undergraduate students participating in the grant in Year 2 included 43% male, 57% female and 66 percent Hispanic.

During Year 2, the STEP UP project acted as a catalyst for building important relationships with professors, researchers, and peers that helped underrepresented students integrate into the social and academic fabric of the college and of the research community. The project served as a useful strategy in helping underrepresented college students persist and earn degrees. The summer camp short courses, the research exposure, and internships of the project provided educational and career opportunities for a diverse and economically disadvantaged student population, without jeopardizing the affordability of that education. Through the summer internship and mentoring process, this project offered students an optimized learning experience, along with a stipend, which is important in the world of budget decreases and a student population that has to work throughout the summer to afford school in the winter. Paying a stipend to the students during their summer research elevated them to the status of being real researchers, which shifted the way they think about themselves. The project raised awareness and appreciation of research in general and agriscience in particular for students who otherwise may not have had these rich research opportunities.

**Products**

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2012	YES

**Citation**

Biediger, E., Silguero, R., Clayton, M., Yarta, B., Gonzales, G., Stanko, R., and Nelson, S. Supplemental Requirements for Beef Cattle Fed Native and Improved Forage Using Fecal Analysis. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Biediger, E., Silguero, R., Clayton, M., Yarta, B., Gonzales, G., Stanko, R., and Nelson, S. Supplemental Requirements for Beef Cattle Fed Native and Improved Forage using Fecal Analysis. Texas Section Society of Range Management. Fredericksburg, TX. Oct. 10-12, 2012. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Dupnik, M., Schuster, G., Nelson, S., and Halcomb, J. Incidence and Prevalence of Bacterial Boll Rot in Coastal Bend and Rio Grande Valley Cotton Production. 67th Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Godfrey, S., Stanko, R., Nelson, S., and Gladney, K. USDA Livestock and Grain Market News. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	YES

**Citation**

Mays, T., Schuster, G., and Nelson, S. Evaluation of Bacillus thuringiensis Against Helioverpa Populations in Cotton Varieties Grown in the Upper Coastal Bend of Texas. 67th Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	YES

**Citation**

Melgoza, F., Kusakabe, A., Melgar, J., and Nelson, S. Understanding and Improving Cold Tolerance in Citrus. 67 Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts) (2nd place winner)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	YES

**Citation**

Ortiz, S., Chapa, M., Summy, K., and Judd, F. Enhancing Rooting Success of Black Mangrove Propagules (UTPA) 67th Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Rivas, R., Mills, P., Jones, K., and Nelson, S. Adsorption of Galacturonic Acid onto Anion-Exchange Resins to Enhance the Enzymatic Hydrolysis in a Proposed Citrus Processing Waste Biorefinery. (oral) American Institute of Chemical Engineers (AIChE) Annual Meeting. Pittsburg, PA. Oct 28- Nov 2, 2012.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Rivas, R., Jones, K., Mills, P., and Nelson, S. Utilization of Citrus Processing Waste as a Renewable Feedstock for Biorefinery Applications: Technical Advances, and Analysis of Engineering Challenges for the Pretreatment and Enzymatic Hydrolysis Steps. American Institute of Chemical Engineers (AIChE) Annual Meeting. Pittsburg, PA. Oct 28- Nov 2, 2012. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Silguero, R., Biediger, E., Clayton, M., Lyons, R., Montemayor, E., Martinez, H., Stanko, R., and Nelson, S. Invasive Tanglehead Management Using Broadcast Herbicide Applications. Texas Section Society of Range Management. Fredericksburg, TX. Oct. 10-12, 2012. (poster).

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**Citation**

Silguero, R., Biediger, E., Clayton, M., Lyons, R., Montemayor, E., Martinez, H., Stanko, R., and Nelson, S. Invasive Tanglehead Management Using Broadcast Herbicide Applications. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Teran, C., Mendoza, F., Adames, C., Goolsby, J., Thomas, D., Nelson, S., Davey, R., Perez de Leon, A., Strickman, D., and Stanko, R. Development of Field Sampling Methods for Cattle Fever Ticks for Use in the Permanent Quarantine Zone. USDA/NIFA HSI Project Directors Conference, Washington, D.C. Oct. 19, 2012. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Trevino, J., Schuster, G., Nelson, S., and Bextine, B. Evaluating the Impact of Planting Dates on Pysllid Populations and ZC Disease Incidence in Pearsall, TX, 2012 SCRI Zebra Chip Annual Reporting Session, San Antonio, TX. Oct. 30-Nov 2, 2012.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Velez, A., Summy, K., Goolsby, J., Osbrink, W., and D. Thomas. Evaluation of Ant Diversity and Phrenology at Field Sites for the Biological Control Program for *Arundo donax* on the Rio Grande. 61st Annual Meeting of the Southwestern Branch of the Entomological Society of America and the Annual Meeting of the Society of Southwestern Entomologists. Las Cruces, NM. February 25-28, 2013, (UTPA, first place winner, poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	YES

**Citation**

Velez, A., Summy, K., Goolsby, J., Osbrink, W., and Thomas, D. Evaluation of Ant Diversity and Phrenology at Field Sites for the Biological Control Program for *Arundo donax* on the Rio Grande. (UTPA) 67th Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	YES

**Citation**

Young, B., Biles, S., Schuster, G., and S. Nelson. Economic Thresholds for Boll Feeding Bugs in Cotton. 67th Annual Meeting of the Subtropical Plant Science Society. Weslaco, TX. Feb 15, 2013. Subtrop. Plant Sci. Vol. 65 (published poster abstracts)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Alaniz, A., Castro, R., Allen, W., Lucena, S. and Sanchez, E. 2013. Anti Proliferative Activity of Recombinant Disintegrins r-Mojastin and r- Vridistatin on Human Pancreatic Carcinoma Cells (BXPC-3). Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression and Purification of Crotamine in Escherichia coli BL21Cells, and its Effects on Murine Myoblasts and Melanoma Cells using Microcell Culture. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept. 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression and Purification of Crotamine in Escherichia coli BL21Cells, and its Effects on Murine Myoblasts and Melanoma Cells using Microcell Culture. American Society of Microbiology Poster Presentation Baylor College Waco, TX. Oct 18-20th 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression, and Purification of Recombinant Crotamine in Comparison with Native Crotamine. American Association for the Advancement of Science Meeting Poster Presentation Boston, MA. Feb. 14-18 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression, and Purification of Recombinant Crotamine in Comparison with Native Crotamine. 12th Annual Undergraduate Research Symposium. Texas A&M University Corpus Christi, TX. Mar. 2, 2013 (2nd place) (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression, and Purification of Recombinant Crotamine in Comparison with Native Crotamine. Texas American Society of Microbiology Regional Meeting Poster Presentation. New Braunfels, TX. April 4-6, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Beach, A., Halcomb, J., McLarty, M., Balderas, L., and Sanchez, E. 2012. Isolation, Expression, and Purification of Recombinant Crotamine in Comparison with Native Crotamine. Del Mar College Student Research Day Poster Presentation. Corpus Christi, TX. April 26, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Beach, A., Halcomb, J., Trejo, C., Vaidya, J. and D'Mello S. 2013. Investigating Protein Levels in the Valproic Acid Model of Autism. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept. 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Buentello, M., Horn, P., James, C., Zhang, D., Halcomb, J. and Chapman, K. 2012. Characterization of Avocado Lipids and Proteins Involved in Lipid Droplet Formation. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Calles, B., Seay, D., Yildirim, Y., Halcomb, J. and Zhang, D. 2013. The Isolation and Characterization of Mycobacteriophage "CGFrank". Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Cartwright, A., Anderson, D., Halcomb, J. and Brewer, M. 2013. Landscaping and Cropping patterns as Indicators of Insect Intensity in Cotton along the Texas Gulf Coast. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Cochran, K., John, R., Hunt, D., Halcomb, J. and Moyer, M.P. 2013. Durability and Quality Testing of M3:10 Media using a variety of Mammalian Cell Lines. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Dupnik, M., Field, K., Schuster, G., Nelson, S. and Halcomb, J. 2012. Isolation of Bacteria from Cotton Bolls in the Costal Bend and Rio Grande Valley. (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Ganceres, A., Yurchenko, O., Park, S., Mason, C., Shockey, J., Halcomb, J. and Dyer, J. 2013. Metabolic Engineering of Plant Leaves for Production of Biofuels. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Garcia, A., Zhang, D., Halcomb, J., Dearing, M., Horn, P., Auld, D. and Chapman, K. 2012. Characterization of Low-Palmitic EMS Mutants in *Gossypium hirsutum*. /D. Auld. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Gonzalez, R., Fernandez, C., Correa, C., Landivar, J., Mirkov, E., Dickman, M. and Halcomb, J. 2013. Drought Tolerance of Sugarcane: A preliminary study for assessing the water economy of transgenic varieties. Del Mar College Student Research Day Poster Presentation. Corpus Christi, TX. April 26, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Gonzalez, R., Fernandez, C., Correa, C., Landivar, J., Mirkov, E., Dickman, M. and Halcomb, J. 2013. Drought Tolerance of Sugarcane: A preliminary study for assessing the water economy of transgenic varieties. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Hall, P., Jia, Y., Halcomb, J. and Sanchez, E. 2013. Bacterial Expression, Affinity Purification and Functional Analysis of Recombinant Distintegrin. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Kellogg, B., Cantu, E., Scott, A., Pinion, T., Torres, F., Chintalapati, S., Zhang, D. and Sanchez, E. 2012. The Cloning, Expression, and Purification of a Functional Snake Venom C-Type Lectin from the Southern Prairie Rattlesnake with Potential Antimetastatic Activity. 12th Annual Undergraduate Research Symposium Texas A&M University Corpus Christi, TX. March 2, 2013 (Honorable Mention) (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Kellogg, B., Cantu, E., Scott, A., Pinion, T., Torres, F., Chintalapati, S., Zhang, D. and Sanchez, E. 2012. The Cloning, Expression, and Purification of a Functional Snake Venom C-Type Lectin from the Southern Prairie Rattlesnake with Potential Antimetastatic Activity. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Lardner, K., Halcomb, J., Hatherill, R., Fedynich, A., Nelson, S. and Henke, S. 2012. Assessment of the Feasibility of Exposure of Song Birds to Potentially Aflatoxin Contaminated Grain by Observation of Ground and Perch Feeders. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Lardner, K., Halcomb, J., Hatherill, R., Fedynich, A., Nelson, S. and Henke, S. 2012. Assessment of the Feasibility of Exposure of Song Birds to Potentially Aflatoxin Contaminated Grain by Observation of Ground and Perch Feeders. American Society of Microbiology Poster Presentation Baylor College Waco, TX. Oct 18-20th 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Lentz, T., Wang, H. and Jenks, Matt. 2012. Characterization of Arabidopsis Mutant Defective in Cuticle Formation. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Lentz, T., Wang, H. and Jenks, Matt. 2012. Characterization of Arabidopsis Mutant Defective in Cuticle Formation. 2013 Beltwide Cotton Conference Poster presentation San Antonio, TX. Jan. 7-10, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Perez, M., Zhang, D., Dovalina, S., Halcomb, J. and Hatherill, R. 2012. Mycobacterium smegmatis Bacteriophage Gene Annotation and Study of Host Specificity Using Agrobacterium tumefaciens, Escherichia coli and Saccharomyces cerevisiae as alternative hosts. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept. 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Perez, M., Zhang, D., Dovalina, S., Halcomb, J. and Hatherill, R. 2012. Mycobacterium smegmatis Bacteriophage Gene Annotation and Study of Host Specificity Using Agrobacterium tumefaciens, Escherichia coli and Saccharomyces cerevisiae as alternative hosts. American Society of Microbiology Poster Presentation Baylor College Waco, TX. Oct 18-20th 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Pruter, L., Halcomb, J., Brewer, M., Anderson, D. and Nelson, J. 2012. Regional Cropping and Landscape Analysis Applied to Cotton Pest Management: Risk Assessment of a sucking bug. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept. 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Pruter, L., Halcomb, J., Brewer, M., Anderson, D. and Nelson, J. 2012. Regional Cropping and Landscape Analysis Applied to Cotton Pest Management: Risk Assessment of a Sucking Bug. 2013 Beltwide Cotton Conference Poster presentation San Antonio, TX. Jan. 7-10, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Rahman, T., Yildirim, Y., Seay, D., Halcomb, J. and Zhang, D. 2013. Transformation of OMRI and RidA Genes to *Arabidopsis thaliana* via *Agrobacterium tumefaciens*. Del Mar College 8th Annual Natural Science Poster Session. Corpus Christi, TX. Sept 5, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Seay, D., Bollam, S., Park, S., Zhang, D., Halcomb, J. and Dyer, J. 2012. Characterizing the Role of Comparative Gene Identification-58 in *Arabidopsis thaliana* Under Stress conditions. Del Mar College 7th Annual Natural Sciences Student Poster Session Corpus Christi, TX. Sept. 7, 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Seay, D., Bollam, S., Park, S., Zhang, D., Halcomb, J., Hatherill, R. and Dyer, J. 2012. Using the *Saccharomyces cerevisiae* strain Y2H-Gold to characterize the Role of *Arabidopsis thaliana* Comparative gene Identification – 58. American Society of Microbiology Poster Presentation Baylor College Waco, TX. Oct 18-20th 2012 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Seay, D., Bollam, S., Park, S., Zhang, D., Halcomb, J., Hatherill, R. and Dyer, J. 2012. Characterizing the role of the Alpha/Beta Hydrolase Comparative Gene Identification -58 in *Arabidopsis thaliana*. American Association for the Advancement of Science Meeting Poster Presentation Boston, MA. Feb. 14-18 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Seay, D., Bollam, S., Park, S., Zhang, D., Halcomb, J., Hatherill, R. and Dyer, J. 2012. Characterizing the role of the Alpha/Beta Hydrolase Comparative Gene Identification -58 in *Arabidopsis thaliana*. Del Mar College Student Research Day Poster Presentation. Corpus Christi, TX. April 26, 2013 (poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Hernandez, H., Navarro, A., Persans, M., and DeYoe, H. "Enhancement of Lipid Production of the Marine Green Microalgae *Nannochloris* sp." 116th Annual Meeting of the Texas Academy of Science, Kerrville, TX March, 2013. (Poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Thomas, T., Torrez, I., and Dirrigl Jr., F. "Water Quality Gradients of Nutrients, CDOM, and Phytoplankton along an Irrigation Canal". 116th Annual Meeting of the Texas Academy of Science Kerrville, TX March, 2013. (Oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Dirrigl, F. Jr., Thomas, T., and Torres, I., 2013. Water Quality Relationships among CDOM, Physicochemical Parameters, and Nutrients in an Irrigation Canal System, Hidalgo County, Texas. in The Agriculture/Urban Water Interface-Conflicts and Opportunities. United States Committee on Irrigation and Drainage, Denver, Colorado.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Ortiz, S. , Chapa, M., Summy, K., Judd, F., and A. Kuang, A., 2012. Survivorship and growth of black mangrove under laboratory conditions. 2012 Undergraduate Research Conference, The University of Texas – Pan American, November, 2012.(poster)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Ortiz, S. , Chapa, M., Summy, K., Judd, F., and A. Kuang, A., 2013. Enhancing Rooting Success of Black Mangrove Propagules on Texas Coastal Islands.” 2013 Annual Meeting of the Subtropical Plant Science Society, Weslaco, TX, February, 2013. (poster).

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Barbosa, A. 2013. EMS dosage test for drought tolerance grass. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Bordan, J. 2012. Flower Development and Sex Chromosome Evolution in Papaya. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Guerra, D. 2012. Identification of Host Genes Interacting with a Viro Protein. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Guerra, T. 2012. In Vitro Propagation and Molecular Sex Determination in Papaya. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Gutierrez, A. 2013. Creation of a transgenic hermaphrodite variety in Papaya. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Martinez, E. 2012. Importation and Processing of Arundo Scale for Biological Control of Arundo Donax; An Invasive Weed of the Rio Grande Basin. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Ortega, O. 2012. Genetic Engineering of Sugarcane, an Emerging Bioenergy Crop for Biomass Production. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Ortega, S. 2012. Genetic Engineering of Sugarcane to Enhance Cold Tolerance. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Ortega, S. 2013. "Engineering Sugarcane to Enhance its Tolerance to Abiotic Stress". (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2012	YES

**Citation**

Ruiz, A. 2012. Use of Molecular Techniques to Effectively Diagnose Citrus Tristeza Virus and Citrus Tatter Leaf Virus. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Ruiz, A. 2013. Lime Antrachnose in the Rio Grande Valley. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Tanguma, J. 2013. Developing Sugarcane as a Biofactory for Pharmaceutical Proteins. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Trevino, J. 2013. "Following the population of Asian Citrus Psyllid". (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Rich, B. 2013. A Survey of Native Ground Beetles in Arundo donax. (oral)

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Other	2013	YES

**Citation**

Rodriguez, V. 2013. "Biocontrol of Arundo donax using R. donacis". (oral)

**Other Products****Product Type**

Other

**Description**

A TAMUK STEP UP project website, <http://www.tamuk.edu/anschsi3/index.html>, was established early in the program, making all project information freely available, including information regarding research collaborators, and a detailed description of the STEP UP project. A UTPA website, [http://portal.utpa.edu/utpa\\_main/daa\\_home/cosm\\_home/usda\\_home](http://portal.utpa.edu/utpa_main/daa_home/cosm_home/usda_home), directs students to a UTPA-USDA Student-Faculty Research Program application for various USDA experiences.

**Product Type**

Educational Aids or Curricula

**Description**

New environmental science courses were developed and taught beginning in Spring 2013 and soils courses were reorganized and curriculum revamped at TAMUK. New soils faculty at TAMUK created a new 'soil judging team' at TAMUK, with several of last year's summer interns participating in team events, placing 4th at the Annual Southern Regional Soil Judging Competition held in Oklahoma during the fall 2012 semester.

**Product Type**

Other

**Description**

All students who participated in Year 1 summer internships at TAMUK presented their work in a symposium during the fall 2012 semester. Their reports helped in the recruitment and advertisement of the STEP UP program for new participants for Year 2. The Year 2 summer interns have designed a presentation of their experiences and are scheduled to discuss their internships in early fall of Year 3 of the project. Other students are invited to the presentations, in part, so that they can learn about STEP UP and how to apply for the 2014 STEP UP summer internship program.

**Product Type**

Educational Aids or Curricula

**Description**

The STEP UP summer camps serve as a recruiting and retention tool for students from community colleges to learn about agriculture-related careers and are designed to incorporate experiential learning and career track development in agricultural sciences for participants. Students from STC, TSTC, UTPA and Del Mar College participated in a 3-day summer camp in June 2013, taught by TAMUK graduate students and research faculty regarding the agricultural and natural resources sciences. (<http://www.tamuk.edu/anschsi3/events/CampPics.html>). The 3 day agenda included plant, soil, meat, and animal science events, as well as food safety and meal preparation. Collaborating institutions brought a total of 23 students to work with professors and graduate

students.

**Product Type**

Survey Instruments

**Description**

STEP UP students - 9 graduate and 58 undergraduate - completed information sheets in preparation for their inclusion in the Spring 2013 USDA Scholarship Student Yearbook.

**Changes/Problems**

{Nothing to report}

# **Texas State University**

<b>Title:</b>	<b>Food Safety and Agroterrorism Training: Educating Our Future Workforce</b>		
<b>Sponsoring Agency</b>	NIFA	<b>Project Status</b>	CHANGED
<b>Funding Source</b>	Non Formula	<b>Reporting Frequency</b>	Annual
<b>Accession No.</b>	226639	<b>Grants.gov No.</b>	GRANT11081536
<b>Project No.</b>	TEXE-2011-02723	<b>Proposal No.</b>	2011-02723
<b>Project Start Date</b>	09/01/2011	<b>Project End Date</b>	08/31/2013
<b>Reporting Period Start Date</b>	09/01/2012	<b>Reporting Period End Date</b>	08/31/2013
<b>Submitted By</b>	Douglas Morrish	<b>Date Submitted to NIFA</b>	08/05/2013

**Program Code:** NJ

**Program Name:** Hispanic Serving Institutions Education

**Project Director**

Douglas Morrish  
512-245-3321  
dm43@txstate.edu

**Recipient Organization**

TEXAS STATE UNIVERSITY-SAN MARCOS  
601 UNIVERSITY DR  
San Marcos, TEXAS 786664684  
DUNS No. 074602368

**Performing Department**

Agriculture

**Co-Project Directors**

Garza, Nora  
Saucier, P. Ryan

**Departments**

VPRD  
Agriculture

**Non-Technical Summary**

Following the September 11, 2001 terrorist attacks on the World Trade Center and the Pentagon, much attention by the United States Department of Agriculture (USDA) and Texas Department of Agriculture (TDA) has been put on agroterrorism and the safety of our food supply (House Research Organization, 2001). These alerts are still present today. Many jobs are available for students who are trained in this specific area, but the Hispanic population is often underrepresented in the food safety and inspection area. The proposed project will fund 50 undergraduate college students' education from Texas State University, Laredo Community College, Palo Alto College, and Northwest Vista College and 6 graduate students to help administer the program. The community college students will then transfer to Texas State University Department of Agriculture. During this funding period, 50 scholar Hispanic students will be involved in training to become certified in agroterrorism by completing the course entitled Preparedness and Response to Food and Agriculture Incidents: Management and Planning Level. The 50 scholar students will participate in a one week "travelling classroom" to the Southwest Border Food Safety and Defense Center where they will be introduced to food safety vulnerabilities through field trips to dairies, food processing factories, the United States/Mexico Livestock Border Crossing, and others. During the course of the project, students at all of the participating community colleges will be required to attend mandatory teleconference seminars until they physically transfer to Texas State University. These seminars will be used for mentoring, tracking, and presenting materials completed. "Academic Research Clusters" will be formed and students will work with a faculty member on a research project. This research will be presented at the local institution and at regional and national conferences. Additionally, all participating students will participate in job shadowing and internship opportunities with the Animal and Plant Health Inspection Service, the Food Safety and Inspection Service, or other USDA agencies. Students funded through this innovative program will gain a valuable certification and an immense amount of experience with food safety and agroterrorism, thus increasing their chances of employment with USDA and helping narrow the gap of underrepresented Hispanic students in food and agricultural sciences and USDA agencies.

**Accomplishments**

**Major goals of the project**

Objective 1. Create and implement a Joint Admissions Agreement with Texas State University and Laredo Community College / Palo Alto College / Northwest Vista College to increase the transfer rate of Hispanic students to a 4 year university. Objective 2. Encourage Hispanic community college students to develop early linkages with Texas State University through the newly established University Transfer Centers, mentorship websites, summer camps, faculty networking, and experiential learning fieldtrips and have a retention rate at or higher than that of the University. Objective 3. Develop early linkages and a strong pipeline for K-12 students by visiting 10 schools a year with a high representation of Hispanic students. Discussion and

activities regarding USDA employment will be performed. Objective 4. Train 50 scholar Hispanic students in the course "Preparing Communities for Agroterrorism". Objective 5. Retain and place 90 percent of the student participants in job shadowing and internship opportunities within USDA agencies. Objective 6. Graduate 50 Hispanic students who are well trained and ready to enter employment in the food safety / inspection areas with APHIS, FSIS, or another USDA agency. Objective 7. Provide funding for 6 graduate students to complete a thesis and a degree within the Department of Agriculture, thus allowing them to be competitive for USDA employment. Objective 8. Form "Academic Research Clusters" (directed by faculty and graduate students) to create a mentoring component and allow Hispanic students to collect data and present their findings at one research conference. Participants will increase their credentials by being trained in an agroterrorism course entitled Preparedness and Response to Food and Agriculture Incidents thus increasing their chances of being employed by FSIS, APHIS, or other USDA agencies. The newly created Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) organization will travel to secondary schools with a high representation of Hispanic students and discuss the many employment opportunities available within USDA. The project creates many safety nets to increase retention of Hispanic students. University Transfer Centers will be created at Laredo Community College and Palo Alto College, thus making a "one-stop shop" for students to get information about transferring, admission requirements, and USDA job shadowing or internship opportunities. "Academic Research Clusters" of 4 or 5 students will be paired with a faculty member creating a "research team". A "travelling classroom" component to the Southwest Border Food Safety and Defense Center in Las Cruces, NM gives students hands on experience with the day to day operations of inspection, safety, and agroterrorism threats in dairies, Mexico livestock border crossing, food processing facilities, etc. All 50 participants will be provided and required to participate in and complete job shadowing and/or USDA internships during the life of the project, thus increasing possible employment with USDA and alleviating underrepresentation of Hispanic workers in the agency.

### **What was accomplished under these goals?**

- **Fund and conduct recruitment activities to select students interested in agriculture**

Fifty students from the 4 different institutions have been funded from the grant. Students from Palo Alto College, Northwest Vista College, Laredo Community College all received a \$2,500 scholarship during the Spring 2012, Summer 2012, Fall 2013, and Spring 2013 semesters to defray tuition, books, fess, and other educational expenses.

The FATE program has created the MANRRS student organization, which currently has 30 members. Students have been trained for recruitment presentations at K-12 schools. The MANRRS students have recruited at 6 different K-12 schools, the State FFA Convention in Corpus Christi, Texas, the Fort Worth Stock Show, the San Antonio Livestock Show.

Two University Transfer Centers (one at LCC and one at Palo Alto) are still in the process of being developed. The project director has already conducted information sessions on each campus about transferring to Texas State University and majoring in agriculture, nutrition, or related sciences. A website and TRACS has been established to post relevant material and upcoming dates to. The project directors have seen a natural tutoring phenomena happen. We have built on big family even though the students are spread out at different institutions. Texas State University students have taken the community college students under their wing and walked them through the application process, financial aid, parking issues, class suggestions, and other academic guidance issues. One Texas State University student who is from Laredo was hired as a mentor at the Undergraduate Mentor Center.

Overall GPA, semester GPA, number of hours completed and enrolled in, etc. are all data collected. Retention strategies include creating Academic Research Clusters that the students will belong to according to their major. This will create a small family (5-7 students) within a large one (50 students). One of the objectives of the grant was to create a seamless transition from community college to four-year university (Texas State). At the onset of the project, we had 10 students from Palo Alto Community College, 13 from Northwest Vista Community College, 13 from Laredo Community College, and 14 from Texas State University. Since the inception of the project, we have had 16 of those community college students transfer to Texas State University (for a total of 30 at Texas State Spring 2013) who otherwise would probably not have transferred.

A "travelling classroom" component was conducted January 6-11. All students travelled to Las Cruces, NM to receive Agriculture Security Training from the Southwest Border Food Safety and Defense Center. All students completed the course and received another certificate. The agenda included visiting a dairy, cheese factory, salsa plant, fertilizer manufacturer, and dairy transportation company to examine food vulnerabilities. USDA inspection was discussed in great detail.

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50 students were selected for the program with GPAs ranging from 2.28 to 4.0, all of which are in good standing with the institution they are attending. The average GPA Fall 2011 was 2.93 and has increased to an average of 3.10 for Spring 2013. The GPA of students has consistently increased from semester to semester..

All 50 funded students have entered all contact information in to the USDA internship application database. All of the participants were required to attend at least one USDA webinar discussing internship application procedures. Strong

collaborations have been made with FSIS and APHIS. A MOU is currently being developed to be used for securing future internship sites. In Summer 2012, one student had an internship with the Forest Service in Illinois at the Midewin National Tallgrass Prairie. An additional student has been selected for a paid internship at NRCS – San Marcos office. Since many of the students are community college students and early on in the college career, it is anticipated that many will land internships Summer 2014. FSIS has committed to unpaid summer internships in the State of Texas. The agency has committed to five locations throughout the State of Texas including: Sanderson Farms (Bryan, TX) – Food Inspector; Sanderson Farms (Waco, TX) – Food Inspector; L&H Packing Company (San Antonio, TX) – Food Inspector; Holmes Foods (Nixon, TX) – Food Inspector; FSIS Dallas District Office (Dallas, TX) – Enforcement Investigations Analysis Officer.

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All students have been funded Spring 2012, Summer 2012, Fall 2012, and Spring 2013. The students at Texas State University have been given a \$4,000 scholarship per semester and the community college students have been given a scholarship in the amount of \$2,500 per semester. To date we have 29 Texas State University students, 6 Palo Alto students, 7 Northwest Vista students, and 5 Laredo Community College students. All but one student will be transferred to Texas State Fall 2013.

The project currently has 4 undergraduate students and 2 graduate students funded. The project directors have recruited 4 additional graduate students (2 starting in Summer 2013 and 2 starting Spring 2014). Additional funds in year 3 will allow the project to help fund students' expenses during summer internships. This will impact 25 additional students for a total of 75. A website has been developed and published at <http://ag.txstate.edu/usda-fate/>. All accomplishments, activities, and a student gallery appear on the site.

All 50 participants have attended the webinar discussing USDA internship application procedures. All of the students have entered their information in to the USDA portal for internships. Students have been encouraged and mentored on applying for non-profit internships and volunteer work. We have created an informal MOU with FSIS and ARS. Strong ties have been made with Ms. Laura Sepulveda in Washington, D.C. to help place our students within FSIS. Five of our students were placed Summer 2013 in non paid internships. Additionally, Mr. Beto Perez (Director for the Knipling-Bushland U.S. Livestock Insects Research Laboratory in Kerrville, TX) has verbally committed to placing our students with ARS in Edinburg, Kerrville, and Panama Summer 2014.

### **What opportunities for training and professional development has the project provided?**

All 50 students participating in the NIFA funded grant have gained a certificate from the Department of Homeland Security in "Agroterrorism" and a certification of completion from the Southwest Border Food Safety and Defense Center in Las Cruces, NM. The students went through "Agriculture Security Training", the same training as FBI agents. The classes were both one week in duration.

### **How have the results been disseminated to communities of interest?**

Six students attended and presented a poster at the HACU Conference and USDA-HSI annual meeting on October 16-18, 2012. Additionally, 5 students attended the annual MANRRS conference in Sacramento, CA on March 21-23, 2013. Research posters will also be submitted to the NACTA conference in Blacksburg, VA. Texas State University held an HSI day on March 20, 2013. Eight students presented posters in the poster session:

Aguilera, M., Garcia, P., Gonzales, J., Martinez, A., Garcia, A., Morrish, D., & Saucier, P. R. (2013) Texas State University San Marcos agriculture security training – Las Cruces, NM. Presented at the HSI Poster Day at Texas State- San Marcos.

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Two graduate students were also selected to participate in the 2nd Annual USDA Graduate Fellows Career Preparation Institute at the 8th Annual American Association of Hispanics of Higher Education (AAHHE) National Conference March 26-30, 2013.

#### What do you plan to do during the next reporting period to accomplish the goals?

We will increase the participation in paid internships. All students will have transferred to Texas State University and will be ready (hour wise) to complete the required internship. We have created an informal MOU with FSIS and ARS. Strong ties have been made with Ms. Laura Sepulveda in Washington, D.C. to help place our students within FSIS. Five of our students were placed Summer 2013 in non paid internships. Additionally, Mr. Beto Perez (Director for the Knipling-Bushland U.S. Livestock Insects Research Laboratory in Kerrville, TX) has verbally committed to placing our students with ARS in Edinburg, Kerrville, and Panama Summer 2014.

#### Participants

##### Actual FTEs for this Reporting Period

Role	Faculty and Non-Students	Students within Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	0	0	0	0	0
Professional	3	0	0	0	3
Technical	0	0	2	0	2
Administrative	2	0	0	0	2
Other	0	0	0	0	0
Computed Total	5	0	2	0	7

#### Target Audience

Fifty Hispanic students from the 4 different institutions have been funded from the grant. Students from Palo Alto College, Northwest Vista College, Laredo Community College all received a \$2,500 scholarship during the Spring 2012, Summer 2012, Fall 2013, and Spring 2013 semesters to defray tuition, books, fess, and other educational expenses. Students at Texas State University received a \$4,000 scholarship. Two graduate students received an assistantship to help with the grant, collect data and start a thesis. At the end of Summer 2013 each of the graduate students will be defending their thesis. One additional graduate student will be starting in the Summer 2013 and two others have been recruited for Fall 2013.

The FATE program has created the MANRRS student organization, which currently has 30 members. Students have been trained for recruitment presentations at K-12 schools. The MANRRS students have recruited at 6 different K-12 schools, the State FFA Convention in Corpus Christi, Texas, the Fort Worth Stock Show, the San Antonio Livestock Show. These visits included information about opportunities at Texas State University in the discipline of agriculture, nutrition, and life sciences and working for the USDA. Internship opportunities were also presented as a topic. Approximately 2500 K-12 students were reached during these activities.

#### Products

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Accepted	2013	YES

#### Citation

Aguilera, M., Garcia, P., Gonzales, J., Martinez, A., Garcia, A., Morrish, D., & Saucier, P. R. (2013) Texas State University San Marcos agriculture security training – Las Cruces, NM. Presented at the HSI Poster Day at Texas State-San Marcos.

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Vela, D., Morrish, D., & Saucier, P. R. (2013) USDA internship at Midewin National Tallgrass Prairie. Presented at the HSI Poster Day at Texas State- San Marcos.

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Garcia, J., Saucier, P.R., Morrish, D., & Bond, N. (2013) Perceived barriers and supporting factors influencing Hispanic/Latino students at Texas State – San Marcos to achieve higher education. Presented at the HSI Poster Day at Texas State- San Marcos.

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Morales, D., Morrish, D., & Saucier, P.R. (2013) Hispanic/ Latino student perceptions of agriculture and their knowledge levels of the different agencies within the USDA. Presented at the HSI Poster Day at Texas State- San Marcos.

**Other Products**

{Nothing to report}

**Changes/Problems**

{Nothing to report}

## NIFA's Expectations for Continuation Collaboration Grantees

Documentation of Progress FY 2012

### FATE: Food Safety and Agroterrorism Training: Educating Our Future Workforce

- **Fund and conduct recruitment activities to select students interested in agriculture**

Fifty students from the 4 different institutions have been funded from the grant. Students from Palo Alto College, Northwest Vista College, Laredo Community College all received a \$2,500 scholarship during the Spring 2012, Summer 2012, Fall 2013, and Spring 2013 semesters to defray tuition, books, fess, and other educational expenses. Students at Texas State University received a \$4,000 scholarship. Two graduate students received an assistantship to help with the grant, collect data and start a thesis. At the end of Summer 2013 each of the graduate students will be defending their thesis. One additional graduate student will be starting in the Summer 2013 and two others have been recruited for Fall 2013.

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- **Provide academic guidance and tutoring as required**

Administrative assistants have been hired for tracking and technical assistance for students. Two University Transfer Centers (one at LCC and one at Palo Alto) are still in the process of being developed. The project director has already conducted information sessions on each campus about transferring to Texas State University and majoring in agriculture, nutrition, or related sciences. A website and TRACS has been established to post relevant material and upcoming dates to. The project directors have seen a natural tutoring phenomena happen. We have built on big family even though the students are spread out at different institutions. Texas State University students have taken the community college students under their wing and walked them through the application process, financial aid, parking issues, class suggestions, and other academic guidance issues. One Texas State University student who is from Laredo was hired as a mentor at the Undergraduate Mentor Center.

- **Track students and document student progress to show 90 percent retention until graduation**

All students are tracked by the administrative assistants and the graduate students. Overall GPA, semester GPA, number of hours completed and enrolled in, etc. are all data collected. Retention strategies include creating *Academic Research Clusters* that the students will belong to according to their major. This will create a small family (5-7 students) within a large one (50 students). One of the objectives of the grant was to create a seamless transition from community college to four-year university (Texas State). At the onset of the project, we had 10 students from Palo Alto Community College, 13 from Northwest Vista Community College, 13 from Laredo Community College, and 14 from Texas State University. Since the inception of the project, we have had 16 of those community college students transfer to Texas State University (for a total of 30 at Texas State Spring 2013) who otherwise would probably not have transferred. The project has had a couple of students drop out

due to things other than academic reasons. For instance, one student moved out of state, another one was accepted in to Physical Therapy school, etc. Any student who drops is immediately replaced with another student. We currently have retained 90 percent of the students who have started the program.

Pipeline K-12: We have targeted roughly 3500 high school students. The MANRRS/Agriculture Ambassadors program visits high schools to recruit students to the agricultural and life sciences area. Opportunities with USDA are discussed. Additionally we attend the State FFA Convention every summer. Roughly 10000 FFA students attend the event. We have a Texas State University Department of Agriculture booth used for recruiting.

Community College: 36

Undergraduate: 50 (all but one of the above 36 community college students have transferred to Texas State University)

Fall 2013 49 undergraduates will be at Texas State University.

Graduate: Starting in Fall 2013, a total of 5 graduate students will have been supported through the project.

Doctorates: None to date (funds will be set aside to support a Ph.D. student at another University since we do not offer a Ph.D. within the Agriculture Department).

○ **Develop a set of activities that will enhance student academic experience**

On June 8-10 a Summer workshop for students was conducted by the project director, co-project director, and Mr. Billy Dictson, Director for the Southwest Border Food Safety and Defense Center. All students were trained in the course entitled "Preparedness and Response to Food and Agriculture Incidents: Management and Planning Level." Forty-eight students received a certificate from the Department of Homeland Security. Additional activities while on campus included staying in the dorms, getting an orientation to Texas State University, eating in the dining halls, and leadership building team activities. Lastly, a "travelling classroom" component was conducted January 6-11. All students travelled to Las Cruces, NM to receive Agriculture Security Training from the Southwest Border Food Safety and Defense Center. All students completed the course and received another certificate. The agenda included visiting a dairy, cheese factory, salsa plant, fertilizer manufacturer, and dairy transportation company to examine food vulnerabilities. USDA inspection was discussed in great detail.

○ **Provide students the opportunity to engage in research with faculty**

*Academic Research Clusters* are in the process of being formed and will be completed by the end of the Summer 2012 camp for students. Faculty members from across disciplines (agriculture, nutrition, soils, biology, related sciences) have been invited to participate (with compensation). Two faculty members in nutrition have agreed to host a number of students to work in their labs. Both researchers are examining nutrition mechanisms, particularly the mechanism used by vitamin A to prevent colon cancer metastasis. Student will be involved in tissue culture and western blots. An Assistant Professor in the Biology Department has also committed to mentoring students interested in the discipline. Student interns will be looking at the tick-rodent associations primary to identify the ecological correlates of the prevalence of *Borrelia* (Lyme disease agent). They will be involved in trapping wild small mammals at Wildlife Management Areas in several areas of Texas. The main point of the study will be to

compare the prevalence of ticks and *Borrelia* in peridomestic and sylvan environments and connect this to ecology and epidemiology of this disease. Additionally, the project directors are working with the Chemistry department in encouraging the grant students to apply for a Chemistry research community with a focus on Molecular Innovation and Entrepreneurship.

○ **Provide students the opportunity to attend a professional meeting**

Six students attended and presented a poster at the HACU Conference and USDA-HSI annual meeting on October 16-18, 2012. Additionally, 5 students attended the annual MANRRS conference in Sacramento, CA on March 21-23, 2013. Research posters will also be submitted to the NACTA conference in Blacksburg, VA. Texas State University held an HSI day on March 20, 2013. Eight students presented posters in the poster session:

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Two graduate students were also selected to participate in the 2nd Annual USDA Graduate Fellows Career Preparation Institute at the 8th Annual American Association of Hispanics of Higher Education (AAHHE) National Conference March 26-30, 2013.

○ **Assist students to maintain academic good standing of a 3.0 GPA or higher with a minimum of 15 credit hours a semester**

50 students were selected for the program with GPAs ranging from 2.28 to 4.0, all of which are in good standing with the institution they are attending. The average GPA Fall 2011 was 2.93 and has increased to an average of 3.10 for Fall 2012. The GPA of students has consistently increased from semester to semester.

○ **Provide assigned Faculty (compensated) mentoring**

*Academic Research Clusters* are in the process of being formed. Two faculty members in Nutrition and one in Chemistry have agreed to help mentor through work in their research labs. Agriculture research is in the process of being established.

○ **Engage students in community, Federal government, or non-profit volunteer or paid service**

Students have become trained in recognizing agroterrorism incidents so the community and our food are safer. Funded students have become student members of the MANRRS student organization. Students volunteer their services by making recruiting trips to local high schools and community colleges and discuss opportunities in the discipline of agriculture and

employment within USDA agencies. In Year 3, the students will be making visits back to their community college to recruit future students.

- **Collect student letter of commitment stating expectation for reimbursement if they do not fulfill the requirements of their program participation**

All students receiving scholarships were required to attend an informational session conducted by the project director. A formal contract was developed and distributed to each student requiring signatures.

- **Include in the application travel support for underrepresented students to attend conferences and make presentations**

Six students were funded to attend the HACU conference and present a poster on the project objectives and results. Five different students will be funded to attend the MANRRS conference in Sacramento, CA and 5 students will be funded to attend the NACTA conference in Blacksburg, VA. Additionally, undergraduate and graduate students will be required to develop a poster to be presented on March 20<sup>th</sup> for Texas State University's HSI Day.

- **Negotiate summer paid internship off campus with USDA/affiliate agency each summer and document efforts and results**

All 50 funded students have entered all contact information in to the USDA internship application database. All of the participants were required to attend at least one USDA webinar discussing internship application procedures. Strong collaborations have been made with FSIS and APHIS. A MOU is currently being developed to be used for securing future internship sites. In Summer 2012, one student had an internship with the Forest Service in Illinois at the Midewin National Tallgrass Prairie. An additional student has been selected for a paid internship at NRCS – San Marcos office. Since many of the students are community college students and early on in the college career, it is anticipated that many will land internships Summer 2014. FSIS has committed to unpaid summer internships in the State of Texas. The agency has committed to five locations throughout the State of Texas including: Sanderson Farms (Bryan, TX) – Food Inspector; Sanderson Farms (Waco, TX) – Food Inspector; L&H Packing Company (San Antonio, TX) – Food Inspector; Holmes Foods (Nixon, TX) – Food Inspector; FSIS Dallas District Office (Dallas, TX) – Enforcement Investigations Analysis Officer.

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- **Encourage more effective partnerships and reduce duplication of efforts among participating academic institutions**

Partnerships with the three institutions remain strong. The project and co-project directors have been forming additional partnerships with 4 year universities to try to recruit underrepresented graduate students. Assistantship application guidelines have been sent to the American Association of Agricultural Education who has ties with every major university producing undergraduate agriculture students.

- **Train qualified underrepresented students who are capable of entering the agricultural sciences workforce with occupational competencies expected by USDA**  
All 50 funded students are pursuing a degree that is to be used with employment in the multiple USDA agencies. Students received a certificate in Summer 2012 in recognizing agroterrorism incidents and another in January 2013 in Agriculture Security Training. These documents make students more marketable to the USDA. Students are enrolled in courses that will fulfill the expectations of the USDA.
- **Fund at least fifty students per year, document student progress, and retain at least 90 percent of students until graduation**  
All students have been funded Spring 2012, Summer 2012, Fall 2012, and Spring 2013. The students at Texas State University have been given a \$4,000 scholarship per semester and the community college students have been given a scholarship in the amount of \$2,500 per semester. To date we have 29 Texas State University students, 6 Palo Alto students, 7 Northwest Vista students, and 5 Laredo Community College students. All but one student will be transferred to Texas State Fall 2013.
- **Leverage funding to maximize the number of students participating in the project**  
The project currently has 4 undergraduate students and 2 graduate students funded. The project directors have recruited 4 additional graduate students (2 starting in Summer 2013 and 2 starting Spring 2014). Additional funds in year 3 will allow the project to help fund students' expenses during summer internships. This will impact 25 additional students for a total of 75.
- **Develop a project website with information on the students funded**  
A website has been developed and published at <http://ag.txstate.edu/usda-fate/>. All accomplishments, activities, and a student gallery appear on the site.
- **Coordinate student screening and recruitment activities with USDA collaborator**  
A second summer camp was held on July 26 and 27th highlighting resume building, interviewing, and the guest speakers from multiple agencies within the USDA. A representative was present on campus to speak with the students about the USDA agency they were employed with. Internship opportunities were also discussed. Representatives present included: Ms. Leslie Lankster, FNS Regional Public Affairs director, Mr. Stephen Svacina, FSA County Executive director, Mr. Francisco Valentine, Rural Development State director, Mr. Doug Rundle, AG Statistics Service Texas Field Office director, Ms. Laurie Morales, APHIS Operations Support officer, Mr. Jeff Goodwin, NRCS Grazingland Specialist, Ms. Judith Canales, Acting Deputy Under Secretary Rural Development, Bertha Venegas, NRCS State Outreach, Mr. Alfred Almanza, FSIS administrator, and Dr. Elisabeth Hagen, Food Safety Under Secretary.
- **Work with USDA to develop a plan for Summer Internship placement**  
All 50 participants have attended the webinar discussing USDA internship application procedures. All of the students have entered their information in to the USDA portal for

internships. Students have been encouraged and mentored on applying for non-profit internships and volunteer work. We have created an informal MOU with FSIS and ARS. Strong ties have been made with Ms. Laura Sepulveda in Washington, D.C. to help place our students within FSIS. Five of our students were placed Summer 2013 in non paid internships. Additionally, Mr. Beto Perez (Director for the Knipling-Bushland U.S. Livestock Insects Research Laboratory in Kerrville, TX) has verbally committed to placing our students with ARS in Edinburg, Kerrville, and Panama Summer 2014.

- **Assist participating students to develop a resume**

All students developed and submitted a resume to the project director as a result of the second summer camp. The project director corrected, revised, and returned the resume to the student for revisions.

- **Hold USDA internship application workshops for students twice a year**

All students attended at least one of the two USDA internship webinars offered on campus. Rooms were reserved with teleconference capability.

- **Place at least 80 percent of the students in mission critical occupations at USDA or relevant agency**

Students have begun to make decisions about the USDA agency they are interested in. Funded students are aware that one of the requirements of the grant is to participate in an internship with a USDA agency. This participation will increase the odds of employment with USDA agencies. Many networking opportunities have been provided to students by the grant (Summer camps, guest speakers from USDA agencies, “travelling classroom”, attendance at the HACU conference in Washington, D.C. The more in college training students receive, the better their odds.

- **Design qualifications and/or placements of students’ projects that lead to measurable, documented changes in learning, actions, or conditions in an identified audience or stakeholder group**

Baseline data has been collected on the knowledge levels and perceptions of USDA and each agency. A pre and post test was given to participants of the summer camp to see if a change in knowledge level occurred. Results indicated a statistically significant difference in the level of knowledge of all agencies pre and post. The implications indicate that students were not well informed about USDA agencies before the Summer Camp activities.

- **Participate on a meta-analysis for collaboration proposals**

The project’s local evaluator has provided a report to the project director and that report has been shared with the meta-analysis evaluators. All students participating in the project completed the required survey administered by the meta-analysis evaluation team.

## 2012-2013 Indicators

**1) Total number of USDA agencies and partners**

USDA – Food Safety and Inspection Service (FSIS), Agriculture Research Service (ARS), Rural Development (RD), Natural Resource Conservation Service (NRCS), Forest Service (FS).

Other agencies – Southwest Border Food Safety and Defense Center, Texas Department of Agriculture.

**2) Total number of career experiences**

Eleven students completed an internship with a USDA agency (Forest Service, NRCS, ARS, and FSIS). One student completed an internship with Aramark, made possible through HACU, 2 students with the San Antonio Food Bank nutritionists. The remaining students completed an undergraduate research experience with a faculty member, job shadowing, or attended a Summer Research Institute abroad.

**3) Total number of students served including gender and ethnicity**

45 undergraduate students – 15 male and 30 female

3 Graduate students – 2 male and 1 female

\*\* All students are Hispanic

**4) Total percent retention**

- The grant started with 52 students in 2011. We lost 13 students due to numerous reasons. (75% retention). These reason included:

Change of major that is non-applicable to USDA	2 students
Attending another University	2 students
Accepted a job	2 graduate students
Moved from Texas	1 student
Medical reasons	2 students
Loss of contact	1 student
Poor grades	3 students

If we just take a look at losing students from grades and no contact, we have a retention rate of 92%. Those lost students have been replaced and to date we have 46 students (45 undergraduate students and 3 graduate students).

**5) Total number of students in experiential learning (research) mentoring**

*Academic Research Clusters* are in the process of being formed. Faculty members from across disciplines (agriculture, nutrition, soils, biology, related sciences) have been

invited to participate (with compensation). Two faculty members in nutrition have agreed to host a number of students to work in their labs. Both researchers are examining nutrition mechanisms, particularly the mechanism used by vitamin A to prevent colon cancer metastasis. Student will be involved in tissue culture and western blots. An Assistant Professor in the Biology Department has also committed to mentoring students interested in the discipline. Student interns will be looking at the tick-rodent associations primary to identify the ecological correlates of the prevalence of Borrelia (Lyme disease agent). They will be involved in trapping wild small mammals at Wildlife Management Areas in several areas of Texas. The main point of the study will be to compare the prevalence of ticks and Borrelia in peridomestic and sylvan environments and connect this to ecology and epidemiology of this disease. Additionally, the project directors are working with the Chemistry department in encouraging the grant students to apply for a Chemistry research community with a focus on Molecular Innovation and Entrepreneurship. All 48 students have been involved in some kind of undergraduate research or job shadowing activity.

#### **6) Total number of students presenting**

Six students attended and presented a poster at the HACU Conference and USDA-HSI annual meeting on October 16-18, 2012. Additionally, 5 students attended the annual MANRRS conference in Sacramento, CA on March 21-23, 2013. Research posters will also be submitted to the NACTA conference in Blacksburg, VA. Texas State University held an HSI day on March 20, 2013. Eight students presented posters in the poster session:

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**TOTAL: Undergraduate students presenting: 16**

Graduate students presenting: 2

**7) Total number of students enrolled in disciplines applicable to USDA jobs**

Majors

Agriculture	29	
Chemistry	1	
Biology	8	
Nutrition	5	
Environmental Science		4
Engineering	1	

**8) Total number of degrees awarded with USDA qualifications**

1 undergraduate student has graduated. All community college students have transferred.

Transfer Dates

1/11	1 student
5/12	1 student
8/12	7 students
1/13	4 students
8/13	11 students
1/14	2 students

**9) Total number of students publishing**

16 undergraduates presenting posters  
2 graduate students presenting at conferences (peer reviewed)

**10) Comparison of GPA before and after**

Mean GPA per Institution

Texas State	$M = 2.91$
LCC	$M = 3.22$
NWVC	$M = 3.23$
Palo Alto	$M = 2.98$

Mean GPA Gender

Males	$M = 3.14$
Females	$M = 3.05$

The average GPA Fall 2011 was 2.93 and has increased to an average of 3.09 for Spring 2013. The GPA of students has consistently increased from semester to semester.

**11) Developing curriculum and faculty required USDA Courses**

No curriculum has been developed. Students have been trained in 2 Agriculture

Security courses.

**12) Comparison of Female success before and after**

The mean GPA of female students in Fall 2011 was 2.89 and the mean GPA Spring 2013 was  $M = 3.05$ .

**13) Total number of student hours advising and tutoring**

We have open door policy for the students and we meet on a monthly basis with all of the funded students. We average roughly 5 hours a week of advising and mentoring.

**14) Tracking students placement into jobs**

One undergraduate student has graduated and started his Master's degree in Agricultural Education. All students starting at the community college level have transferred.

Transfer Dates

1/11	1 student
5/12	1 student
8/12	7 students
1/13	4 students
8/13	11 students

**15) English Skills**

All 48 students are proficient in English.

**16) K-12 activities**

We have targeted roughly 3500 high school students. The MANRRS/Agriculture Ambassadors program visits high schools to recruit students to the agricultural and life sciences area. Opportunities with USDA are discussed. Additionally we attend the State FFA Convention every summer. Roughly 10000 FFA students attend the event. We have a Texas State University Department of Agriculture booth used for recruiting.

**17) Community engagement activities**

Same as above.

**18) Budget implementation**

All budget expenditures are on track with the majority of the money being spent on participant support (scholarships- roughly \$400,000 per year)

**19) Program activities**

On June 8-10 a Summer workshop for students was conducted by the project director, co-project director, and Mr. Billy Dictson, Director for the Southwest Border Food Safety

and Defense Center. All students were trained in the course entitled “Preparedness and Response to Food and Agriculture Incidents: Management and Planning Level.” Forty-eight students received a certificate from the Department of Homeland Security. Additional activities while on campus included staying in the dorms, getting an orientation to Texas State University, eating in the dining halls, and leadership building team activities. Lastly, a “travelling classroom” component was conducted January 6-11. All students travelled to Las Cruces, NM to receive Agriculture Security Training from the Southwest Border Food Safety and Defense Center. All students completed the course and received another certificate. The agenda included visiting a dairy, cheese factory, salsa plant, fertilizer manufacturer, and dairy transportation company to examine food vulnerabilities. USDA inspection was discussed in great detail. All objectives and activities are on track.

## **20) Participant survey**

Baseline data has been collected on the knowledge levels and perceptions of USDA and each agency. A pre and post test was given to participants of the summer camp to see if a change in knowledge level occurred. Results indicated a statistically significant difference in the level of knowledge of all agencies pre and post. The implications indicate that students were not well informed about USDA agencies before the Summer Camp activities.

# **University of Puerto Rico – Mayagüez**

## **Internal Mid-semester Evaluation Report April 2013**

**Proposal Number:** 2012-02177

**Project Director:** Dr. Félix Román

**Proposal Title:** UPR-Mayagüez Canter for Education and Training in Agriculture and Related Sciences (CETARS): Consolidating the Pipeline in Agriculture and Related Sciences  
**Cooperating Institutions:** The University of Puerto Rico at Mayaguez (UPRM); the University of Puerto Rico at Aguadilla (UPRA); the University of Puerto Rico at Humacao (UPRH); the Inter-American University of Puerto Rico at San German (IAUPR-SG) and the University of Texas El Paso (UTEP)

### **Introduction:**

CETARS continues to excel during its second year. The number of students participating of the CETARS activities and programs has increased from fifty-five to sixty-five, which represents an 18% percent increase with respect to last year, while keeping a retention rate as high as 90%. Most of CETARS students have also attended online courses offered by the University of Minnesota and at UPRM that aimed at enhancing their communication skills in order to better compete for future USDA opportunities. All CETARS participants are from underrepresented Hispanic groups. CETARS have directly sponsored the research-training activities of 65 students from all the participating institutions, 73.8% of which were females. Out of the 51 undergraduate students, 78% are involved in research and rendered outreach contributions to the program. Undergraduate and graduate students are actively participating of research and outreach activities under faculty mentorship. Regarding the research activities, CETARS students were involved in diversous subjects including: experimental design associated to nanotoxicology studies in plants; development of nanosize bactericidal and fungicidal materials; fabrication and evaluation of plasmonic sensors and nano-sequestering agents for water and soil remediation; use of spectroscopic methods for the early detection of food pathogens; use of heat shock and protein genetic polymorphysim as environmental stress biomarkers; analysis of heavy metal content in food and soil and development of novel remediation technologies for the pre-treatment of food processing and irrigation water. The research efforts have resulted in 8 peer-reviewed manuscripts and 19 presentations (posters and oral) in regional and national conferences. These include the 2012 PR Senior Technical Meeting of the American Chemical Society (November 30, 2012, Ponce, PR), the ACS National Meeting (April 8-11, 2013, New Orleans, LA); The Hispanic Association of Colleges and Universities Meeting (October 16-24, 2012, Washington DC) and a presentation to the PR Water and Sewer Authority of a CETARS research initiative to sustainably incorporate composted waste water solids for farming applications (December 20, 2012, Mayagüez, PR). CETARS Program Director also participated in a Conference sponsored by The UPRM-NSF CREST program (April 4, 2013, Washington DC).

**Outcome Indicators:**

**1. Total Number of USDA Agencies and Partners:** USDA-NRCS, USDA-ARS and USDA-APHIS

CETARS has successfully educated and trained students whom were accepted, as internship trainees, by NRCS, USDA-ARS and USDA-APHIS Programs. We are working to continue strengthening these collaborations and continue placing CETARS students in internships at these and others related agencies.

**2. Total Number of Internships (USDA versus Others):**

At present Nitza Guzman, graduate student of Chemistry at UPRM, is working in a paid internship at Pall Life Sciences in Bayamon PR. There she is being trained in the fabrication of water filtration and purification systems. She will be joining CETARS this summer 2013.

We are making all the necessary arrangements to place CETARS students at USDA or related agencies for summer paid internships during this summer. Most undergraduate students have applied to summer internships using the USJOBS webpage. We also have kept in contact with Vladimir Diaz and Daisy Lugo (Student liaison Officer for USDA) to place students in ARS Mayaguez or other USDA-related agencies. Mr. Diaz made arrangements to place five CETARS students at ARS-Mayaguez.. Some students have already received internship offers, but a significant number are still waiting to be placed.

Last year, twenty-three students (18 from UPRM and 5 from the Inter-American University at San German) participated in internships with the following organizations: ,USDA-ARS, Beltsville, Maryland, NRCS Utuado, PR; General Electric, Vega Alta, Coop Student Program, NRCS North Dakota, SCEP program, U.S. Engineering Corps, Champaign, IL; USDA-FSIS, Green Bay, Wisconsin; NRCS Mayaguez, PR; U.S. Engineering Corps, Champaign, IL; NSF-funded programs; University of Tennessee at Knoxville Center for Nanophase Material Sciences at Oak Ridge National Lab; Iowa State University, Kimberly Clark Wisconsin.

**3. Total Number of students served/including gender and ethnicity:**

**Sixty Five (65) Hispanic students** from the five-CETARS institutions were served as presented in table 3.1.

Table 3.1: CETARS students served at each participating institution.

<b>Institution</b>	<b>Total Students</b>	<b>Number of students in Research &amp; Development</b>	<b>Number of students in Outreach</b>	<b>Number of students in Experiential Learning</b>
UPRM	41	25	16	41
UPRAg	33	0	8	25
UPRH	9	9	9	9
IAUSG	5	5	5	5
UTEP	2	2	2	2

In average, 73.8% of the CETARS participants are females. The male-female distribution at each participating CETARS institution is presented in table 3.2.

Table 3.2: Gender distribution of CETARS participants by institution.

	Female		Male	
	Undergraduate	Graduate	Undergraduate	Graduate
<b>UPRM</b>	19 (46%)	8 (20%)	10 (24%)	4 (10%)
<b>UPRH</b>	9 (100%)	0 (0%)	0 (0%)	0 (0%)
<b>UPRAg</b>	7 (88%)	0 (0%)	1 (13%)	0 (0%)
<b>IAUSG</b>	3 (60%)	0 (0%)	1 (20%)	1 (20%)
<b>UTEP</b>	1 (50%)	1 (50%)	0 (0%)	0 (0%)

From an academic perspective, 11% of our students are in an academic track toward a Ph. D. degree, 12% are in the M.S. program, while the 77% are on a B.S. track. The corresponding percent distribution is summarized on table 3.3

Table 3.3: Student distribution (N=65) by academic program and participating institution.

Institution	Total/institution	Ph. D	M.S.	B.S.
<b>UPRM</b>	41 (63%)	7 (11%)	5 (8%)	29 (45%)
<b>UPRAg</b>	8 (12%)	0 (0%)	0 (0%)	8 (12%)
<b>UPRH</b>	9 (14%)	0 (0%)	0 (0%)	9 (14%)
<b>IAUSG</b>	5 (8%)	0 (0%)	1 (2%)	4 (6%)
<b>UTEP</b>	2 (3%)	0 (0%)	1 (2%)	1 (2%)

#### 4. Total Percent of retention (undergraduate/grad/PhDs):

At present, we have maintained 90% retention of the students involved in year-1. We lost five the starting students, due to lack of suitable performance, inefficient academic progress or student changes in career priorities. We made the best effort to retain them by their placement in probation and providing the proper orientation and tutoring; however, upon discussion with the students and their mentors, it was decided that it will be best for the progress of the program to terminate their participation. It should be emphasized that our CETARS student population has been increased from 55 (year-1) to 65 (year-2), thus showing an 18% increase.

#### 5. Total Number of students in experiential learning (research and outreach) mentoring:

In academic year 2012-2013, fifty five (55) out of a total of sixty five (65) CETARS students were involved in research, thus representing a 85% of the CETARS student population involved in research activities. Only the ten freshman students from the Department of Crops and Agro-Environmental Sciences are not currently involved in research; however, they are actively involved in outreach activities including the construction of vegetable gardens in ten public schools, thus representing a 100% percent of their involvement in experiential learning activities. This year they are also working in the construction of a showcase garden at the UPRM-Alzamora Farm to host an open house activity during next May and bring all CETARS schools to illustrate

them about agriculture. In this specific activity, CETARS students will teach K-12 students how to prepare the field, plant the seeds, construct irrigation, control weeds and insects, harvest among others. In turn, CETARS students are also actively involved in research, which includes the experimental design and preliminary work associated to nanotoxicology studies in plants; development of nanosize bactericidal materials; synthesis of polymer-based Nano-composites for controlled release of fungicidal species; development of novel remediation technologies for water cleaning, among others.

## **6. Total Number of participants presenting:**

Nineteen (19) students have presented the results of their research work at different local and national meetings as presented below:

Presentations at the 245<sup>th</sup> ACS National Meeting; April 7-11, 2013; New Orleans; LA

1. Metal/polymer nanocomposites as vibrational probes for the sensitive identification of *Escherichia coli* and *Lactobacillus* spp; Authors: Elena M. Flores-Velez, Francisco Negrón, Edna P. Vargas, Rafael Hiciano, Marco A. De Jesus ; Division: AGFD: Division of Agricultural and Food Chemistry
2. Removal of pharmaceutical and personal care products from water using transition metal modified and partially calcined inorganic-organic pillared clays ; Authors: Professor Arturo J. Hernández-Maldonado, Wilman A. Cabrera-Lafaurie, Professor Félix R. Román; Division: ENVR: Division of Environmental Chemistry
3. Removal of arsenic and chromium in groundwater using a magnetite based nanocomposite; Authors: Manuel García, Tatiana Luna-Pineda, Oscar Perales-Pérez, Félix Román-Velázquez; Division: CHED: Division of Chemical Education
4. CETARS research training initiative in agriculture and related sciences; Authors: Marco A. De Jesus, Félix R. Román, Oscar J. Perales-Perez, Edna Negrón, Winston de la Torre, Jesús L. Borges, Rolando Tremont, Angela González, Jorge Gardea-Torresdey; Division: AGFD: Division of Agricultural and Food Chemistry
5. Hybrid morphology nanoarrays as plasmonic Raman probes for the detection of arsenic antimicrobials; Authors: Jenifier Olavarria-Fullerton, Sabrina Wells, Michael J. Sepaniak, Marco A. De Jesús; Division: AGFD: Division of Agricultural and Food Chemistry
6. Arsenic sequestration from surface water via ZVI and copper nanoparticle filters; Authors: Angelica A Campos, Edgardo O Ortiz, Jenifier Olavarria, Marco A De Jesús ; Division: CHED: Division of Chemical Education
7. Effect of phytohormones in nutrient uptake by coriander plants in soil-compost system; Authors: Taina Rodríguez-Curet, Martha López-Moreno; Division: CHED: Division of Chemical Education

8. *Ocimum basilicum* (basil) growth and nutrient uptake in soil-compost systems amended with phytohormones monitored by ICP-MS; Authors: Laura V. Ramírez, Martha L. López-Moreno ; Division: AGFD: Division of Agricultural and Food Chemistry.
9. Simultaneous sorption of cationic and anionic dyes by chitosan/cellulose beads for water purification; Authors: Angel L. Vega-Negrón, Luis A. Alamo-Nole, Oscar Perales-Pérez, Félix R. Román, Angela Gonzalez; Division: ENVR: Division of Environmental Chemistry.

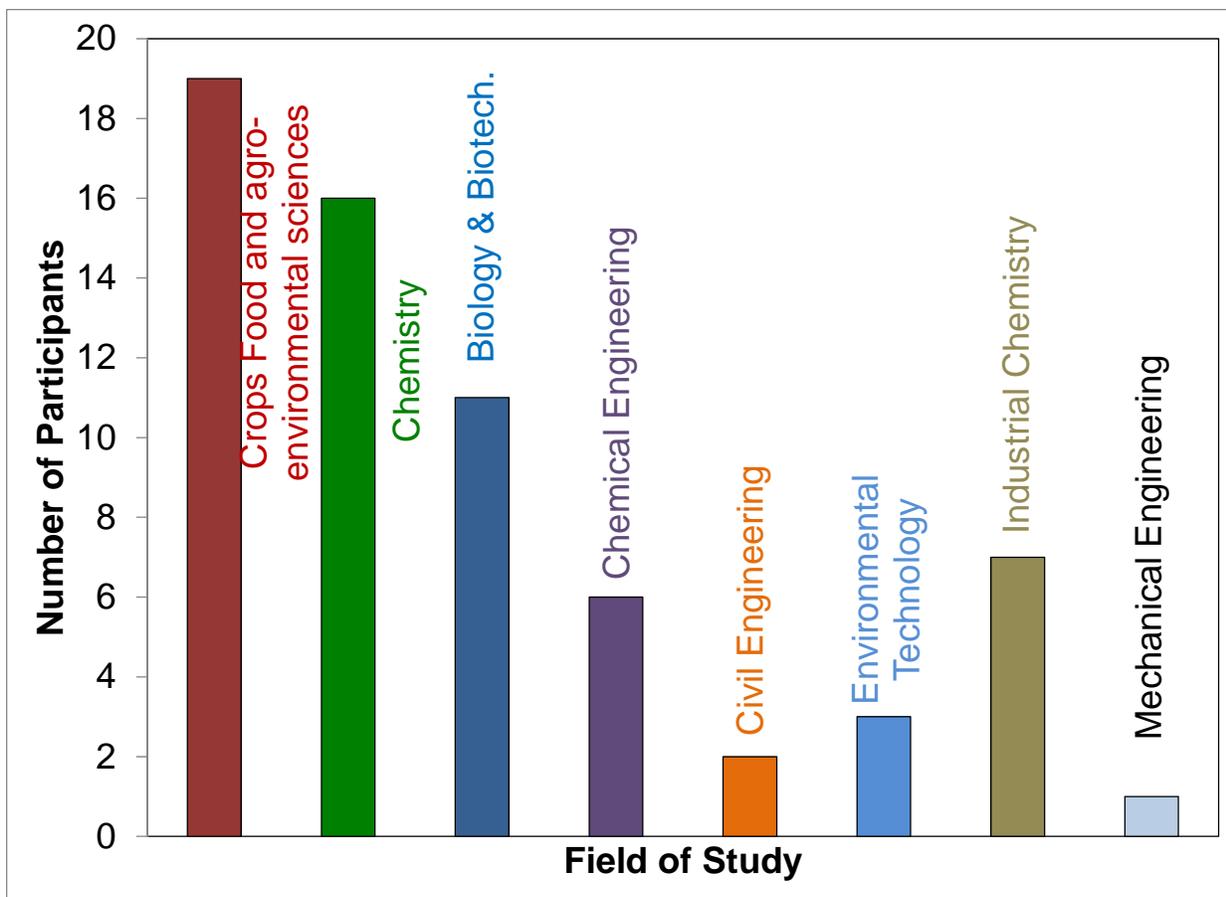
Other Conferences or Scientific Meeting where CETARS present their works were:

1. Second annual UTEP Campus Office Undergraduate Research Initiative Symposium, April 21, 2012. El Paso, Texas.
2. ACS Senior Technical Meeting at Ponce Puerto Rico on November 30, 2012.
3. HACU 26<sup>th</sup> Annual Conference October 26-28 on Washington DC
4. Practice Experience in Environmental Technology; UPR-Aguadilla, December, 2012
5. Rural Aqueduct Jácanas Piedra Blanca, Inc. in Yabucoa, Puerto Rico; UPR-Aguadilla, December, 2012
6. Carrier Assembly, Arecibo Plant Lean Challenge; General Electric, Arecibo, December, 2012
7. External LCG Lean Event; General Electric, Vega Alta, October, 2012
8. Sigma Xi Poster Presentation (March, 2012)
9. CETARS Poster Presentation (August, 2012)
10. SETAC North America 33rd Annual Meeting. November 11- 15, 2012, Long Beach, CA.

## **7. Total Number of students enrolled in disciplines applicable to USDA jobs:**

All sixty-five CETARS students (65) are enrolled in disciplines related to USDA interests. The UPRM-CETARS population consists of twenty-seven (29) undergraduates, 5 MS and 7 PhD students and are distributed as follows: Crops and Agro-Environmental Sciences (17; all undergraduates), Food Science and Technology program (2; MS); Chemistry Department (2; undergraduate; 2 MS and 7 PhD); Biotechnology (3 undergraduates); Chemical Engineering (6; undergraduates); Civil Engineering (2; undergraduates), Mechanical Engineering (1; MS). Students at UPRA-CETARS came from the departments of Biology (6; undergraduates) and Environmental Technology (2; undergraduates). UPRH-CETARS students came from Industrial Chemistry (7) and Biology (2), all undergraduates. IAUPR-SG CETARS are from the Department of Chemistry Biology (4; undergraduates) and Environmental Science (1; MS). The UTEP Environmental Chemistry Department has one undergraduate and one master student as part of CETARS.

The overall distribution is summarized on figure 7.1 below.



**Figure 7.1: CETARS Student distribution based on academic field of study.**

### **8. Total Number of degrees awarded with USDA qualifications:**

During the CETARS cycle that corresponds from September 2012 to present, four students obtained USDA related degrees. José Torres Tellado and Nicole Bonilla Hernández from UPRM obtained BS degrees in Chemical Engineering and both applied to graduate schools in Continental USA. Two chemistry students from the Inter-American University at San Germán also obtained BS degrees. Ms. Wildelys Colón obtained a BS in Chemistry with minor in microbiology and Nathalie González also obtained a BS in chemistry.

### **9. Total Number of students publishing:**

CETARS Students collaborated in the following publications:

1. Sorption of triclosan onto tyre crumb rubber By López-Morales, J.; Perales-Perez, O.; Román-Velázquez, F.; Adsorption Science & Technology (2012), 30(10), 831-845.
2. Structural and thermo-mechanical characterization of calcium and barium alginate films; By Vidal-Urquiza, Turner K.; Blagg, Amanda; Perales-Pérez, O.; Cleantech Conference & Showcase, Santa Clara, CA, United States, June 18-21, 2012 (2012), 357-360.
3. Use of recycled tires crumb rubber to remove organic contaminants from aqueous and gaseous phases; Alamo-Nole, Luis; Perales-Perez, Oscar; Román, Felix R.;

- Desalination and Water Treatment (2012), 49(1-3), 296-306.
4. Effect of carbon black and silver nanoparticle loading on the structural and thermo-mechanical properties of chitosan- based films; Blagg, Amanda; Perez, O. Perales; Valentin, R. Edited By:Laudon, Matthew; Romanowicz, Bart; Nanotech Conference & Expo 2012: An Interdisciplinary Integrative Forum on Nanotechnology, Microtechnology, Biotechnology and Cleantechnology, Santa Clara, CA, United States, June 18-21, 2012 (2012), 1, 628-631.
  5. Structural and thermo-mechanical characterization of calcium and barium alginate film; Vidal-Urquiza, Turner K.; Blagg, Amanda; Perales-Perez, O. Edited By:Laudon, Matthew; Romanowicz, Bart; Nanotech Conference & Expo 2012: An Interdisciplinary Integrative Forum on Nanotechnology, Microtechnology, Biotechnology and Cleantechnology, Santa Clara, CA, United States, June 18-21, 2012 (2012), 3, 672-675.
  6. Transition metal modified and partially calcined inorganic-organic pillared clays for the adsorption of salicylic acid, clofibrilic acid, carbamazepine, and caffeine from water; Cabrera-Lafaurie, Wilman A.; Román, Félix R.; Hernandez-Maldonado, Arturo J.; Journal of Colloid and Interface Science (2012), 386(1), 381-391.
  7. Diana Sanchez-Rivera, Oscar Perales-Perez and Félix R. Román. LC-ICPMS speciation of arsenite and arsenate oxyanion mixtures during their adsorption with dried sludge Analytical Methods . 2013.DOI 10.1039/c3ay26352e.(F)
  8. M. Reyna and I. Ramos “Characterization of Antimony-doped Tin Oxide Nanofibers”, Proc. Nat. Conf. On Underg. Res. (NCUR) 2010, Univ. Of Montana, Missoula, MT, Apr 15-17, 2010.(F)

In addition to the publications above, the following publications are in progress:

1. María Isabel Morales, Ana C. Barrios, Cyren M. Rico, José R. Peralta-Videa, Jorge L. Gardea-Torresdey. 2012. Toxicity assessment of cerium oxide nanoparticles on cilantro (*Coriandrum sativum*) grown in organic soil (*to be submitted to the Journal of Agricultural and Food Chemistry*).
2. Cyren M. Rico, María Isabel Morales, Jie Hong, Ana C. Barrios, Ricardo McCreary, Wen Yee Lee, Armando Varela-Ramírez, Jose R. Peralta-Videa, Jorge L. Gardea-Torresdey. 2012. The impact of cerium oxide nanoparticles on rice: the relationship between oxidative stress, enzyme activity and macromolecular composition. (*to be submitted to Environmental Science & Technology*).
3. Design and development of hybrid morphology nanoarrays as plasmonic Raman probes. Jenifler Olavarría-Fullerton<sup>1</sup>, Raymond A. Velez<sup>1</sup>, Sabrina Wells<sup>2</sup>, Michael J. Sepaniak<sup>2</sup>, Samuel P. Hernández-Rivera <sup>1</sup> and Marco A. De Jesús<sup>1\*</sup> (1) University of Puerto Rico at Mayagüez, Department of Chemistry, Call Box 5000, Mayaguez, P.R. 00681; (2) University of Tennessee at Knoxville, Department of Chemistry, 552 Buehler Hall, Knoxville TN 37996, U.S.A.
4. Photocatalytic activity of bare and amine-treated TiO<sub>2</sub> nanoparticles; Fahim Hossain, Oscar J. Perales Pérez, Sangchul Hwang; Under review.

## **10. Comparison of GPAs before and after:**

CETARS students are receiving assistance from CETARS faculty and UPR academic counseling orientation office about different approaches to maintain and improve their GPA. Average GPA from CETARS students is 3.40/4.00 and has increased by 0.05 (from 3.40 to 3.45). As part of their commitment, every CETARS student requires a minimum of 15 credit hours/ semester and a GPA of 3.0 or above. Students whom GPA falls below the required are placed in probation and are given special mentoring; however, if they fail to improve their GPA after one year, they are terminated.

## **11. Developing curriculum and faculty for required courses:**

Two courses were developed in CETARS program during the semester January-May 2012 at UPRM: (1) QUIM 6007 (03 credits) 'Food and Agriculture Application of Nanotechnology', and (2) AGRO 4035 (03 credits) 'Introduction to Natural Resources Management'. QUIM 6007 will be offered in class to UPRM students and online to students from other CETARS partners; AGRO 4035 course will be offered in fall 2013. QUIM-6007 is scheduled to be offered for its second time during the Fall 2013.

## **12. Comparison of female success (before and after); gender and ethnicity:**

All students in the CETARS project are Hispanic, and so all data collected throughout this document reports on Hispanic students.

Out of the 27 students who presented, 18 (67%) were female and 9 were male (33%). Of the 23 students who got internships, 14 (61%) were female and 9 were male (39%).

Of the 32 students who reported their GPA as of May 2012, 20 were female (63%) and 12 were male (37%). Of the 20 female students, 6 students (30%) increased their GPA, 8 students (40%) remained the same, whereas 6 students (30%) decreased their GPA. For the male population, 2 students (17%) increased their GPA, 8 (66%) stayed the same, and 2 (17%) decreased their GPA.

Of the 35 students who reported their GPA as of April 2013, 25 (71%) were female and 10 (29%) were male. Of the 25 female students, 9 students (36%) increased their GPA, 11 students (44%) remained the same, and 5 students (20%) decreased their GPA. Regarding the male students, 8 (80%) increased their GPA, and 2 (20%) decreased their GPA. Because this is self-reported data, it does not necessarily represent the CETARS population. In the future we will try to collect institutional statistics from the UPRM's office to get solid GPA data.

Females and males evaluated their experiences in CETARS equally positively in a survey carried out in May 2012. In a April 2013 survey, females were asked to comment on their experience in CETARS. All females surveyed spoke positively about the program, remarking their development in the areas of research, organization, presentation skills, confidence, and professionalism.

### **13. Total Number of students honors advising and tutoring:**

Academic year 2011-2013: As part of UPRM-CETARS activities eight (8) students from the UPRAg were involved in peer-mentoring activities every semester. Student mentors invested 80 hours per semester in mentoring/tutoring activities for a total of 640 hours.

### **14. Tracking students placement into jobs or Ph. Ds/student mobility:**

Wildelys Colón obtained a BS in Chemistry with minor in microbiology from the Inter-American University at San German and is currently working at OSHA. Nathalie Gonzalez also obtained a BS in chemistry from Inter-American University at San German and was hired by CDC in Atlanta. None of the graduates are currently working for USDA. They applied but received no offers.

### **15. Track research activities/English skills:**

In May 2013, fifty-five (55) out of a total of sixty-five (65) CETARS students were involved in research (85%). In a survey given in March 2013, 25 of the 35 respondents (71%) reported involvement in research activities. CETARS students are involved in the experimental design and preliminary work associated to nanotoxicology studies in plants; development of nanosize bactericidal materials; synthesis of polymer-based nanocomposites for controlled release of fungicidal species; development of novel remediation technologies for water cleaning, among others. CETARS students are also receiving customized workshops in different subjects such as HPLC techniques, vapor deposition protocols, effective writing and presentation strategies, to cite some examples. For a summary of research projects for each student, please enter the CETARS webpage at <http://cetars.uprm.edu/> in the participating students section.

### **16. K-12 activities:**

Academic year 2012-2013, CETARS developed 9 activities impacting 2186 K-12 students and teachers. The activities spanned geographic regions and covered a wide range of scientific topics. In October 2011, 500 public schools students participated in a Chemistry demonstration of a water purification process as part of National Chemistry Week at the Inter-American University in Caguas, PR. Five-hundred and fifty (550) public school students participated in a Science on Wheels Chemistry show in the UPR-Aguadilla, also as part of National Chemistry Week. In November 2011, 200 high school students received a conference about Nanotechnology in El Paso, Texas. CETARS sponsored a regional math competition and a Science on Wheels Program for 125 elementary school students in Moca and Isabel, PR, in February and March 2012.

In January through March 2012, CETARS began visiting ten elementary schools in the Mayaguez district to develop and implement activities in the agricultural sciences. A school garden will be established in each school to serve as a field laboratory. A total of five visits per school took place within the reporting period, impacting 150 elementary school students. Eight (8) elementary schools were invited to the Alzamora Laboratory Farm on the UPR-Mayaguez campus to participate in a four-hour showcase activity that impacted 90 elementary students and 12 teachers. Students participated in hands-on activities such as seeds identification and

plantation development, as well as receiving instruction on seed development, plant growth and management, and food nutrition.

Four hundred and eighteen (418) K-12 students representing (20) schools in western Puerto Rico were impacted in September 2012-April 2013 by CETARS lectures, project orientation seminars, and support to science fairs.

CETARS students participated in outreach activities including:

- Chemistry Festival during ACS National Chemistry Week
- Workshops delivered at schools about: The Scientific Method, Establishing a Home Garden, Basic Chemistry, Photosynthesis, Recycling, Plant Reproduction, Vegetable Gardening, Orchard Construction, Plant Reproduction, Germination, Pollination, Plant Pathogens, Composting, Fertilization, Food Nutrition, Hydrology and Soils, and Plant Life Cycle.
- Soil and water quality workshops.
- Tours for students of the university farm

Also, last Fall 2012, the GLOBE program visited 6 schools (1 elementary, 1 middle school, and 3 high schools) to deliver workshops in Hydrology and Soils. A total of 175 students and 6 teachers were impacted.

### **17. Community engagement activities:**

Faculty of UPRM offered their services to the Mayaguez community by doing chemical analyses of water, soils and foods samples. The project provided assistance to farmers in Añasco. Also students participated in the International Coastal Cleaning in Cabo Rojo, Puerto Rico on September 2012. Students analyzed water quality to investigate its safety for recreational use. In addition, CETARS students participated in church outreach activities such as the collection of clothes and food for low income families. One CETARS student also served as a volunteer for the American Red Cross.

### **18. Budget implementation:**

The budget has been implemented as described in the project proposal, however due to slow procedure at participating institutions and our institution, the signing the sub-awards contracts takes usually months causing a delay in the submission of request for payments by the sub-awardees. We are working with the legal section of the External Funding Office located at the Center for Research and Development at UPRM to expedite the process.

### **19. Program activities/implementation:**

CETARS activities for the academic year 2012-2013 can be arranged into the following categories:

*Program awareness and development* (4 activities impacting 92 people):

CETARS Faculty met with students to orient them other the internships opportunities and how to apply using the USJOBS webpage (September-October, 2012). CETRAS programmed three

workshops activities to inform and prepare CETARS students for summer internships applications and interviews. These workshops took place in September 2012 (Wendy Carrasco, USDA Career Opportunities for Students and Recent Graduates), November 2012 (Daisy Lugo, Career Opportunities within USDA and how to apply online using USJOBS), January 2013 (Krystal Navarro, Workshop on the use of USJOBS to submit resume for summer applications).

*Professional development:*

Several students including student leaders have participated of sever courses aimed at increasing their development to prepare them to better compete in the internships and USDA job opportunities. At present, a group of CETARS students are registered and participating of Integrated Pest Management "**IMP3-Spanish Core Concepts Module**" offered by the University of Minnesota. These students are Fabian Carmona, Krystal Navarro, Darsy Smith, Rosiel M. Grajales, Mario Garcia and Josua Otero. Susee Maldonado is also enrolled in Pest Biology in course series offered by the University of Minnesota. Another course that was offered by Food Science and Technology Program on the UPRM campus the in which to CETARS students participated was "Hazard Analysis was Critical Control Points". This is a food safety course which aims at preventing food transmitted diseases Krystal Navarro and Darsy Smith participated and obtained a certification of this training.

*K-12 Outreach Activities* (22 activities impacting 1,000 K-12 students and teachers):  
These are summarized below.

- Agricultural Tour 2012, University of Puerto Rico at Mayaguez (under development) the open house exhibition will be held on May 2012.
- Agriculture: the science of the future. A teacher workshop and activity based in the importance of the agriculture, the agricultural crisis in Puerto Rico and other related themes. It was presented in Pinero's Amphitheater in November 17, 2012.
- Principles and Techniques of Recycling November 15, 2012
- Natural Resources November 30, 2012
- Soil Workshop December 6, 2012
- Workshops on Bios and Resume- Various times (January/February 2013)
- GLOBE Program workshop of data entry for the program's software (January 2013)
- Nanotechnology Workshop: 15 January 2013
- Informational Webinar Sessions on USDA Careers: September 2012, University of Puerto Rico at Mayaguez, Puerto Rico - HACCP Certification: February 2013, University of Puerto Rico at Mayaguez
- Plant Reproduction February 6, 2013
- Attendance at orientation webinar for summer internships with USDA: 7 February 2012
- Establishment Vegetable Garden (Garden 2) February 20, 2013
- Germination and plant structures Garden 1 February 27, 2013

- Agro Fair: 28 February 2013. A painting book about agriculture was distributed to children that visited the Fair. This activity in a campus wide supported by CETARS but is not part of the CETARS program.
- Plant diseases and insects March 13, 2013
- Two important processes in plants: Photosynthesis and nutrient uptake March 6, 2013
- Workshop on Science Fair for Elementary Students with Agro. Jaime Curbelo- March 7, 2013
- Crop Garden Workshop; Krystal Navarro & Fabián Carmona, March 16, 2013.
- Science on Wheels Shows that impacted over 500 students at Math competition and in Science Fair held on March 2013 at the Aymat Coliseum in San Sebastian and at the S Antonio S. Pedreira School in Moca, PR

To date, CETARS has also implemented various outreach activities that impacted 808 K-12 students throughout this cycle (Table 10.1). Students participated in the USDA Webinar about internships and various other workshops including Life Skills, Time Management, Ethics in Investigation, and How to Plan Your Academic and Professional Future. Students participated in the ES-EPA Chemistry and Microbiology Wastewater Workshop in July 2012 and a Nanotechnology workshop in January 2013.

Table 19.1 K-12 Students served by participating institution.

<b>Institution</b>	<b>Served K-12 students</b>
<b>UPRM</b>	418
<b>UPRAg</b>	0
<b>UPRH</b>	11
<b>IAUSG</b>	271
<b>UTEP</b>	100
<b>Total Participants</b>	661

The crop garden and GLOBE programs have played a very active role impacting 175 and 100 students, respectively. The program has also served over 6 teachers through the delivery of 10 Hydrology and Soil workshops.

**Table 19.2: Highlights of GLOBE K-12 Outreach Activities**

<b>School</b>	<b>Level</b>	<b>Town</b>	<b>Teacher</b>	<b>Date</b>	<b>Description</b>	<b>Number of students (F/M)</b>
Vocacional, Salvador Fuentes	High School	Aguadilla	Maria Mendiza & Olga Alvarez	November 30, 2012	Soil Protocol	12/3
Vocacional, Salvador Fuentes	High School	Aguadilla	Maria Mendiza & Olga Alvarez	December 10, 2012	Hydrology Protocol	19/12
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	September 28, 2012	Hydrology Protocol (Temperature, pH & Transparency)	18/14
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	November 2, 2012	Hydrology Protocol (Salinity & Dissolved Oxygen)	9/6
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	November 16, 2012	Soil Protocol (Theory)	7/6
Bernardino Cordero Bernard	High School	Ponce	Joel Martínez	October 9, 2012	Soil Protocol	9/2
Bernardino Cordero Bernard	High School	Ponce	Joel Martínez	October 16, 2012	Hydrology Protocol	8/2
Eugenio LeComte	Middle School	Ponce	Marisol Medina	October 16, 2012	Hydrology Protocol	14/8
Vocacional Pedro Perea Fajardo	High School	Mayagüez	Esther Echevarría	November 8, 2012	Hydrology Protocol	10/7
Vocacional Pedro Perea Fajardo	High School	Mayagüez	Awilda Esquerdo	November 29, 2012	Soil Protocol	8/5

**Figure 19.3: CETARS – Schools Gardens Program 2012-2013**

<b>School</b>	<b>Level</b>	<b>Town</b>	<b>Teacher</b>	<b>Number of students</b>	<b>CETARS Student</b>
Olga Más (Malezas)	Elementary	Mayaguez	Jackeline Capella	29	Jonathan Gómez Viernes 12:00-2:00
Consuelo Pérez (Rio Hondo)	Elementary	Mayaguez	Sonia Torres	13	Susej Maldonado 1:00-3:00
Juan de Dios Quiñones	Elementary	Moca	Sra. Glorynel Arocho Ramírez	10	Krystel Navarro Viernes 1:00-2:00
Federico Asenjo	Elementary	Mayaguez	Sra. Adeline Torres	35	María González Viernes 1:00-3:00
Rio Cañas Abajo	Elementary	Mayaguez	Sra. Bethzaida Feliciano	23	Rosiel Grajales Viernes 12:30-2:30
Miradero	Elementary	Mayaguez	Doris Ramasatt	19	Ana Vega Viernes 1:00-3:00
Mariano Riera Palmer	Elementary	Mayaguez	Sra. Milka Troche Sra. Sheila Ramos (Trabajadora Social)	32	Rubén Morales 8:00-9:00
Francisco Vincenty	Elementary	Mayaguez	Sra. Mayra Rosado	10	Arleen Rodríguez Jueves 9:00-11:00
Barrio Castillo	Elementary	Mayaguez	Daisy del Valle	23	Mario García Viernes PM
George Washington	Elementary	Moca	Minerva Marquez, Jacqeline Hernández Iris Torres	20	Gudianne Romero Viernes 2:00-3:00

## **20. Agency/Participant Survey:**

As part of the meta-evaluation process, Dr. Roy Johnson of IDRA developed and administered a survey, which is in the process of revision prior to its release.

**INTERNAL FINAL EVALUATION REPORT SEPTEMBER 1<sup>RST</sup> 2012 TO AUGUST 31  
2013 USING THE 20 OUTCOME INDICATORS OF SUCCESS**

**Proposal Number:** 2012-02177  
**Project Director:** Dr. Félix Román

**Title: UPR-Mayagüez Center for Education and Training in Agriculture and Related Sciences (CETARS): Consolidating the Pipeline in Agriculture and Related Sciences**

**Collaborating Institutions:** The University of Puerto Rico at Mayaguez (UPRM); the University of Puerto Rico at Aguadilla (UPRA); the University of Puerto Rico at Humacao (UPRH); the Inter-American University of Puerto Rico at San German (IAUPR-SG) and the University of Texas at El Paso (UTEP)

**Introduction:**

CETARS continues to excel during its second year. The number of students participating of the CETARS activities and programs has increased from fifty-five to sixty-five, which represents 18% percent of increase with respect to last year, while keeping a retention rate as high as 90%. A group of CETARS students have also attended online courses offered by the University of Minnesota and UPRM which aimed to enhance their communication skills in order to better compete for future USDA opportunities. All CETARS participants are from underrepresented Hispanic groups. CETARS have directly sponsored the research-training activities of 65 students from all the participating institutions, 72% of which were females. Out of the 50 undergraduate students, 91% are involved in research and 100 are participating of outreach contributions to the program. Undergraduate and graduate students are actively participating of research and outreach activities under faculty mentorship. Regarding the research activities, CETARS students were involved in diverse subjects including: experimental design associated to nanotoxicology studies in plants; development of nanosize bactericidal and fungicidal materials; fabrication and evaluation of plasmonic sensors and nano-sequestering agents for water and soil remediation; use of spectroscopic methods for the early detection of food pathogens; use of heat shock and protein genetic polymorphysim as environmental stress biomarkers; analysis of heavy metal content in food and soil and development of novel remediation technologies for the pre-treatment of food processing and irrigation water. The research efforts have resulted in 13 peer-reviewed manuscripts and 81 presentations (posters and oral) in regional and national conferences. These include the 2012 PR Senior Technical Meeting of the American Chemical Society (November 30, 2012, Ponce, PR), the ACS National Meeting (April 8-11, 2013, New Orleans, LA); The Hispanic Association of Colleges and Universities Meeting (October 16-24, 2012, Washington DC) and a presentation to the PR Water and Sewer Authority of a CETARS research initiative to sustainably incorporate composted waste water solids for farming applications (December 20, 2012, Mayagüez, PR) and the Second CETARS Symposium during August 2013 at UPRM.

Thirty-five CETARS students (54%) participated of paid and voluntary career experiences at USDA or research laboratories at universities in Puerto Rico and mainland USA.

**Outcome Indicators:**

**1. Total Number of USDA Agencies and Partners:** USDA-NRCS, USDA-ARS and USDA-APHIS

CETARS has successfully educated and trained students whom were accepted for career experiences trainees, by NRCS, USDA-ARS and USDA-APHIS Programs. We are working to continue strengthening these collaborations and continue placing CETARS students in career experiences at these and others related agencies and universities.

**2. Total Number of career experiences (USDA versus Others):**

Twenty (20) UPRM undergraduate students and four (4) UPRM graduate (3 Ph.D./1 MS) students participated in summer career experiences with USDA agencies and other institutions.

UPRM CETARS Agricultural Sciences  
Career experiences summer 2013

Table 2.1 UPRM CETARS Agricultural Sciences that participated of summer career experiences in 2013

<b>Name</b>	<b>USDA/ Others</b>	<b>Institution</b>	<b>Country</b>	<b>With pay/ Volunteer</b>
Krystel Navarro	other	Ohio St. Univ Wooster Campus	USA	W
Mario García	USDA	APHIS-PPQ Base Muñiz PR	PR	V*
Jonathan Gómez	USDA	APHIS-Mayaguez	PR	V*
María González	USDA	US National Forest PR	El Yunque PR	V*
Rosiel Grajales	USDA	NRCS- NC	USA	W
Susej Maldonado	USDA	AMS Dairy Programs - DC	USA	V*
Rubén Morales	USDA	AMS Dairy Programs – DC	USA	V*
Arleen Rodríguez	USDA	ARS-Maryland	USA	W
Gudianne Romero	USDA	APHIS-Mayaguez	PR	V*
Ana M. Vega	USDA	FSIS	PR	V*

<b>Name</b>	<b>USDA/ Others</b>	<b>Institution</b>	<b>Country</b>	<b>With pay/ Volunteer</b>
Fabian Carmona	USDA	NRCS-ND	USA	W
Nathalia Cancel	USDA	ARS-Maryland	USA	V
Jorge de Jesús	other	Univ. PR Mayaguez	PR	V
Joshua Otero	USDA	ARS-Mayaguez	PR	V*
Darsy Smith	Other	University of Maryland	USA	V

\* Monthly stipend paid by CETARS Program

Table 2.2 UPRM CETARS Sciences and Engineering students that participated of summer career experiences in 2013

<b>Name</b>	<b>Institution</b>	<b>Major</b>	<b>With pay/ Volunteer</b>
Liliana Hernandez	SURE Program Univ of Wisconsin-Madison	Civil Engineering	W
Grecia Gratacos	USDA-ARS, Beltsville	Chemistry, Ph.D. Program	W
Jennifer Olavarria	USDA-AMS, NC	Chemistry, Ph.D. Program	V*
Andrea López	USDA-AMS, NC	Agricultural Sciences	V*
Wesley Cuadrado	USDA- AMS , Washington, DC	Mechanical Engineering, MS Program	V*
Francisco Negrón	USDA-FS, Madison, Wisconsin	Chemical Engineering	V*
Maricelis Ramirez	USDA-FS, Madison, Wisconsin	Chemical Engineering	V*
Nitza Guzmán	PRASA, Compost Plant	Industrial Engineering	V*
Elena Flores	USDA-AMS, NC	Chemistry, Ph.D. Program	V*

\* Monthly stipend paid by CETARS Program

Table 2.3 Inter-American University – San German students that participated of summer career experiences at the University of Puerto Rico at Mayaguez in 2013

Name	Institution	Major	With pay/ Volunteer
Angel Vega	UPR-Mayaguez	M.S. Environmental Sciences	V*
Naqueira González	UPR-Mayaguez	M.S. Environmental Sciences	V*
Manuel García	UPR-Mayaguez	B.S. Biology	V*
Taina Rodríguez	UPR-Mayaguez	B.S. Biology	V*
Frank Cruz	UPR-Mayaguez	B.S. Biology	V*
Karina López	UPR-Mayaguez	B.S. Biology	V*

\* monthly stipend paid by CETARS Program

Table 2.4 UPR- Aguadilla students that participated of summer career experiences in 2013

Name	Institution	Major	With pay/ Volunteer
Reynat Jiménez Hernandez	Purdue University	Biomedical	W
Abner Mercado	Purdue University	Biology-Biomedical	W
Adriana Osoria	Purdue University	Biology-Biomedical	W
Diego Zamot	UPR-Mayaguez	Biology-Biomedical	V*
Gabriel Borges	UPR-Mayaguez	Biology-Biomedical	V*

\* Monthly stipend paid by CETARS Programby

### 3. Total Number of students served/including gender and ethnicity:

**Sixty five (65) Hispanic students** from the five-CETARS institutions were served as presented in table 3.1.

Table 3.1: CETARS students served at each participating institution.

Institution	Total Students	Number of students in Research and Development	Number of students in Outreach	Number of students in Experiential Learning
UPRM	38	32	38	38
UPRAg	7	7	7	7
UPRH	10	10	10	10
IAUSG	8	8	8	8
UTEP	2	2	2	2

In average, 72.3% of the CETARS participants are females which are divided into 55.4% undergraduates and 16.9% graduates. The CETARS male's distribution is 21.5% undergraduates 6.2% graduates. Females are dominant at the undergraduate and graduate levels. The male-female distribution at each participating CETARS institution is presented in table 3.2 and figures 3.2 and 3.3.

Table 3.2: Gender distribution of CETARS participants by institution.

Institutions, total students and %	Female		Male	
	Undergraduate	Graduate	Undergraduate	Graduate
<b>UPRM- 38 (58%)</b>	17 (26%)	9 (14%)	9 (14%)	3 (5%)
<b>UPRH-10 (15%)</b>	9 (14%)	0 (0%)	1 (1.5%)	0 (0%)
<b>UPRAg-7 (11%)</b>	5 (8%)	0 (0%)	2 (3%)	0 (0%)
<b>IAUSG-8 (12%)</b>	4 (6%)	1 (1.5%)	2 (3%)	1 (1.5%)
<b>UTEP-2 (3%)</b>	1 (1.5%)	1 (1.5%)	0 (0%)	0 (0%)
<b>Total-65 (100%)</b>	38 (58%)	10 (15%)	15 (23%)	5(8%)

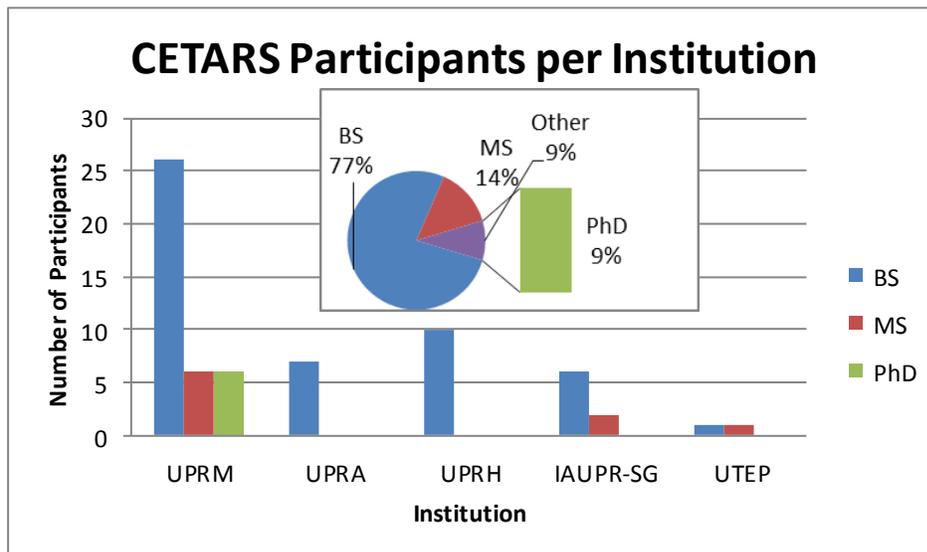
From an academic perspective, 9% of our students are in an academic track toward a Ph. D. degree, 9% are in the M.S. program, while the 77% are on a B.S. track. The corresponding percent distribution is summarized on table 3.3 and figure 3.1

As the CETARS PD's we are very proud to sponsor a dominant majority of females Hispanic students, which traditionally are very underrepresented in agriculture, science and engineering fields at most institutions in the mainland.

Table 3.3: Student distribution (N=65) by academic program and participating institution.

Institution	Total/institution	Ph. D	M.S.	B.S.
<b>UPRM</b>	38 (58.5%)	6 (9.2%)	6 (9.2%)	26 (40%)
<b>UPRAg</b>	7 (10.7%)	0 (0%)	0 (0%)	7 (10.7%)
<b>UPRH</b>	10 (15.4%)	0 (0%)	0 (0%)	10 (15.3%)
<b>IAUSG</b>	8 (12.3%)	0 (0%)	2 (3.1%)	6 (9.2%)
<b>UTEP</b>	2 (3.1%)	0 (0%)	1 (1.5%)	1 (1.5%)
<b>total</b>	<b>65 (100%)</b>	<b>6 ( 9.2%)</b>	<b>9 (14%)</b>	<b>49 (76.7%)</b>

Figure 3.1 CETARS Participants per institution



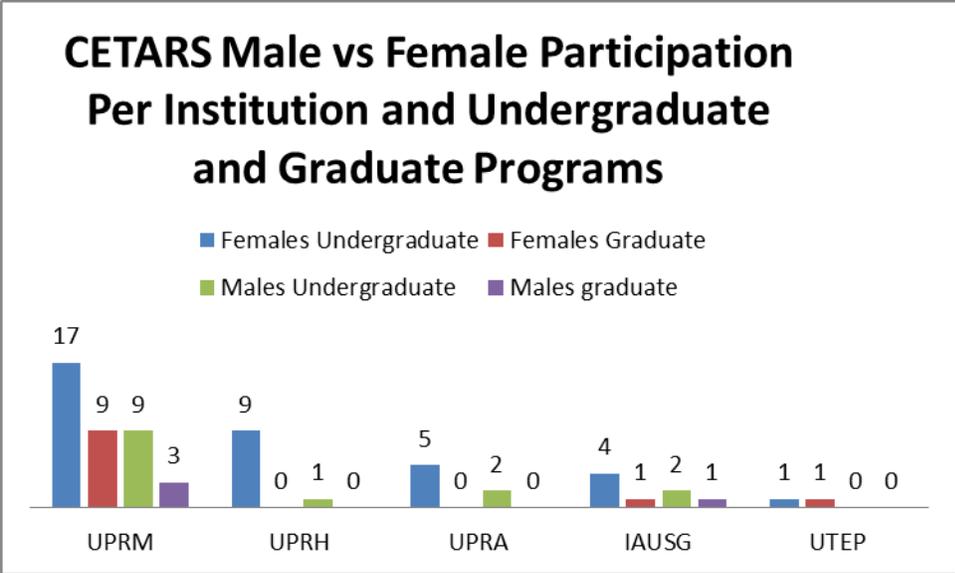


Figure 3.2 CETARS Male vs Female Participation per Institution and Degree.

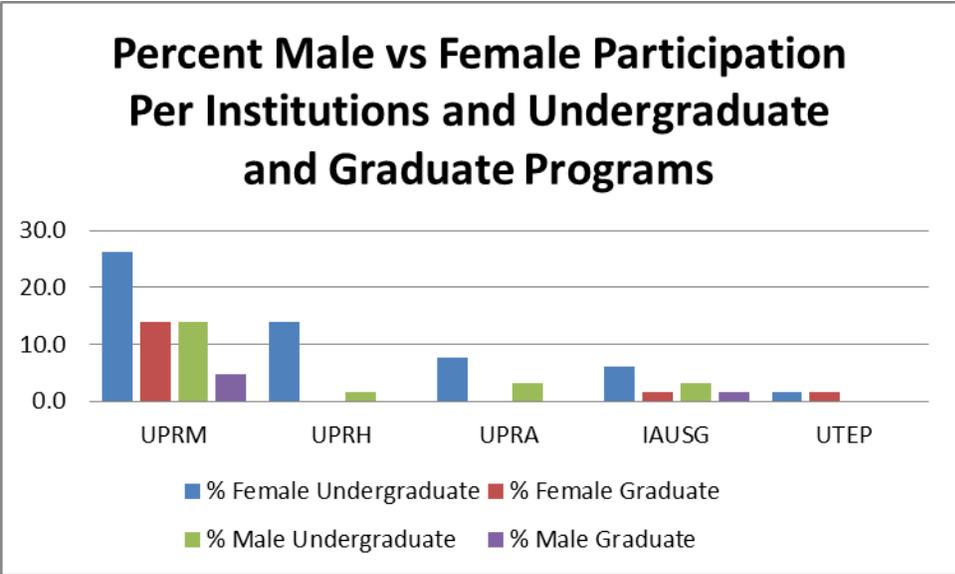


Figure 3.3 CETARS Percent Female vs Male Participation Per Institution and Undergraduate and Graduate Programs.

**4. Total Percent of retention (undergraduate/grad/PhDs):**

At present, we have maintained 90% retention of the students involved in first year. We did not retain five of the starting students, due to lack of suitable performance, inefficient academic progress, or student changes in their career priorities. CETARS participants made the best effort to retain them by providing proper orientation and tutoring; however, upon discussion with the students and their mentors it was found that priorities and goals from those students were not aligned with the mission and objectives of the CETARS Program. It should be emphasized that

our CETARS student population has been increased from 55 (first year) to 65 (second year), thus showing an 18% increase.

#### **5. Total Number of students in experiential learning (research and outreach) mentoring:**

In academic year 2012-2013, 59 out of a total of 65 CETARS students were involved in research, thus representing a 91% of the CETARS student population involved in research activities. Only six students from the Department of Crops and Agro-Environmental Sciences are not currently involved in research; however, they are actively participating in outreach activities including the construction of vegetable gardens in ten public schools, thus representing a 100% percent of their involvement in experiential learning activities. This year they were also involved in the construction of a showcase garden at the UPRM-Alzamora Farm and an open house activity in May where students from middle schools were illustrated about agriculture and related sciences. In this specific activity, CETARS student's tough K-6 students about how to prepare the field, planting of the seeds, construction of irrigation systems, weeds and insects control, and harvesting among others. In addition, CETARS students are now actively involved in research projects which includes the experimental design and preliminary work associated to nanotoxicology studies in plants, development of nanosize bactericidal materials, synthesis of polymer-based Nano-composites for controlled release of fungicidal species, and development of novel remediation technologies for water cleaning among others.

#### **6. Total Number of participants presenting:**

From September 1, 2012 to August 31, 2013 CETARS students have presented the results of their research work or outreach activities at different local and national meetings including the Second CETARS Symposium 2013 for a total of 81 posters as shown below. The PD's also presented the CETARS project at the NACTA 2013 meeting during June 24-29 at Virginia Tech.

Posters presentations at the 245<sup>th</sup> ACS National Meeting; April 7-11, 2013; New Orleans; LA

- 1. Metal/polymer nanocomposites as vibrational probes for the sensitive identification of *Escherichia coli* and *Lactobacillus* spp;** Authors: Elena M. Flores-Velez, Francisco Negrón, Edna P. Vargas, Rafael Hiciano, Marco A. De Jesus ; Division: AGFD: Division of Agricultural and Food Chemistry
- 2. Removal of pharmaceutical and personal care products from water using transition metal modified and partially calcined inorganic-organic pillared clays ;** Authors: Professor Arturo J. Hernández-Maldonado, Wilman A. Cabrera-Lafaurie, Professor Félix R. Román; Division: ENVR: Division of Environmental Chemistry
- 3. Removal of arsenic and chromium in groundwater using a magnetite based nanocomposite;** Authors: Manuel García, Tatiana Luna-Pineda, Oscar Perales-Pérez, Félix Román-Velázquez; Division: CHED: Division of Chemical Education
- 4. CETARS research training initiative in agriculture and related sciences;** Authors: Marco A. De Jesus, Félix R. Román, Oscar J. Perales-Perez, Edna Negrón, Winston de la Torre, Jesús L. Borges, Rolando Tremont, Angela González, Jorge Gardea-Torresdey; Division: AGFD: Division of Agricultural and Food Chemistry
- 5. Hybrid morphology nanoarrays as plasmonic Raman probes for the detection of arsenic antimicrobials;** Authors: Jenifier Olavarria-Fullerton, Sabrina Wells, Michael J.

Sepaniak, Marco A. De Jesús; Division: AGFD: Division of Agricultural and Food Chemistry

6. **Arsenic sequestration from surface water via ZVI and copper nanoparticle filters;** **Authors:** Angelica A Campos, Edgardo O Ortiz, Jenifier Olavarria, Marco A De Jesús ; Division: CHED: Division of Chemical Education
7. **Effect of phytohormones in nutrient uptake by coriander plants in soil-compost system;** **Authors:** Taina Rodríguez-Curet, Martha López-Moreno; Division: CHED: Division of Chemical Education
8. **Ocimum basilicum (basil) growth and nutrient uptake in soil-compost systems amended with phytohormones monitored by ICP-MS;** **Authors:** Laura V. Ramírez, Martha L. López-Moreno ; Division: AGFD: Division of Agricultural and Food Chemistry.
9. **Simultaneous sorption of cationic and anionic dyes by chitosan/cellulose beads for water purification;** **Authors:** Angel L. Vega-Negrón, Luis A. Alamo-Nole, Oscar Perales-Pérez, Félix R. Román, Angela Gonzalez; Division: ENVR: Division of Environmental Chemistry.

Posters presented at 2<sup>nd</sup> CETARS SYMPOSIUM, August 2013 and others.

1. **COMPOST AND SLUDGE CHARACTERIZATION, COMPOST-SOILS SYSTEMS INTERACTION AND EFFECT ON BASIL (*Ocimum basilicum*).** Álamo Irizarry, Bianca<sup>1</sup>, Guzmán Pérez, Nitza, M. <sup>2</sup>, López-Moreno Martha Laura, PhD<sup>3</sup>. <sup>1</sup>Department of Industrial Biotechnology, <sup>2</sup>Department of Chemical Engineering, <sup>3</sup>Department of Chemistry, University of Puerto Rico, Mayaguez, PR
2. **EFFECT OF TiO<sub>2</sub> NANOPARTICLES IN SINTERED RECYCLED GLASS FILTERS DESIGNED FOR POLLUTED SOILS REMEDIATION.** Arroyo Anel<sup>1</sup>, Wesley Cuadrado<sup>2</sup>, Liliana M. Hernández<sup>3</sup>, Gerardo Nazario<sup>3</sup>, O.M Suarez<sup>4</sup>. <sup>1</sup>Department of Mechanical Engineering, <sup>2</sup>Department of Mechanical Engineering, <sup>3</sup>Department of Mechanical Engineering, <sup>4</sup>Department of General Engineering, University of Puerto Rico-Mayagüez, P.O. Box 9000, Mayagüez, PR.
3. **THE EFFECT OF AGE ON THE EXPRESSION OF ESTROGEN RECEPTORS ALPHA AND BETA IN THE CHOROID PLEXUS.** Ayala Luis<sup>1</sup>, A. Calderon<sup>1</sup>, A.A. Arrellano<sup>1</sup>, E. Taylor<sup>1</sup>, R. Taylor<sup>1</sup>, R. Flores<sup>1</sup>, Randy L. Stanko<sup>1,2</sup>, and Michelle R. Garcia<sup>1</sup>. <sup>1</sup>Department of Animal, Rangeland, and Wildlife Sciences, Texas A&M University-Kingsville, Kingsville, TX. <sup>2</sup>Animal Reproduction Laboratory, Texas A&M AgriLife Research, Beeville, TX.
4. **ALGINIC ACID SODIUM SALT BEADS INFUSE WITH METAL IONS AS BACTERICIDAL AGENT.** Borges Gabriel, Diego Samot, Jomarys González, Felix R. Roman and Carlos Ruíz; University of Puerto Rico, Mayagüez; Department of Chemistry; P.O. Box 9000, Mayagüez PR, 00681-9000
5. **COMPARATIVE SURVIVAL OF ESCHERICHIA COLI O157:H7 AND SALMONELLA TYPHIMURIUM ON SPINACH PLANTS.** Cancel Villamil Nathalia C. <sup>1</sup>, Cheryl L. Roberts<sup>2</sup>, Eric Handy<sup>2</sup>, Manan Sharma<sup>2</sup>. <sup>1</sup>Department of Crop

- Science, University of Puerto Rico, Mayaguez, PR.<sup>2</sup>United States Department of Agriculture, Agricultural Research Service, Environmental Microbial and Food Safety Laboratory, 10300 Baltimore Ave, Beltsville MD 20705
6. **SUMMER INTERNSHIP WITH NATURAL RESOURCES CONSERVATION SERVICE AT MANDAN, NORTH DAKOTA. PATHWAYS PROGRAM.** Carmona Fabian. Department of Agricultural Engineering, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR
  7. **CETARS AGRICULTURAL TOUR 2013.** Carmona Fabian<sup>1</sup>, Darsy K. Smith<sup>2</sup>, Nathalia C. Cancel<sup>3</sup> Joshua Otero<sup>4</sup>, Jorge De Jesus Silva<sup>5</sup>.<sup>1</sup>Department of Agricultural Engineering,<sup>2</sup>Department of Agronomy,<sup>3</sup>Department of Agri-Ambiental and Crop Sciences,<sup>4</sup>Department of General Agriculture, University of Puerto Rico, Mayagüez PR.
  8. **DETERMINATION OF HEAVY METALS IN FRESH MILK.** Carrasquillo Lizbeth. Department of Chemistry, University of Puerto Rico, Humacao, Humacao, PR
  9. **EVALUATION OF THE 17 $\alpha$ -ETHYNYLESTRADIOL (ORAL CONTRACEPTIVE) HORMONE IN AQUEOUS SOLUTIONS: REMOVED BY THE NANOPARTICLES MAGNETITE-SODIUM OLEATE;** Casiano-Santiago Marcos A<sup>1</sup>., Victor Fernandez-Alos<sup>1</sup>, Tatiana Luna-Pineda<sup>1</sup>, Oscar Perales-Perez<sup>1,2</sup>, and Felix Roman<sup>1</sup>.<sup>1</sup>Department of Chemistry, University of Puerto Rico Mayagüez, PR 00680. <sup>2</sup>Department of Engineering Science and Materials, University of Puerto Rico Mayagüez, PR 00680
  10. **SIZE-CONTROLLED SYNTESIS OF MgO NANOPARTICLES AND THE ASSESSMENT OF ITS ANTIMICROBIAL ACTIVITY AGAINST *ESCHERICHIA COLI*.** Cedeño-Mattei Yarilyn<sup>1,2</sup>, Oscar Perales-Pérez<sup>1,2</sup>, and Félix R. Román<sup>1</sup>.<sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR. <sup>2</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.
  11. **ZINC REMOVAL FROM WASTE TIRE CRUMB RUBBER IN AQUEOUS PHASE.** Cedeño-Mattei Yarilyn<sup>1,2</sup>, Oscar Perales-Pérez<sup>1,2</sup>, and Félix R. Román<sup>1</sup>.<sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR. <sup>2</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR
  12. **SYNTHESIS OF Zn<sub>x</sub>Mg<sub>1-x</sub>O SOLID SOLUTION ANT THE ASSESSMENT OF ITS ANTIMICROBIAL ACTIVITY AGAINST *ESCHERICHIA COLI*.** Concepción-Abreu Rosa<sup>1</sup>, Yarilyn Cedeño-Mattei<sup>2,3</sup>, Oscar Perales-Pérez<sup>2,3</sup>, and Félix R. Román<sup>2</sup>.<sup>1</sup>Department of Biology, Chemistry, and Environmental Sciences, Interamerican University of Puerto Rico, San Germán, P.O. Box 5100, San Germán, PR. <sup>2</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR. <sup>3</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.

13. **PHYTOPLANKTON SURVEY IN SIX RESERVOIRS OF PUERTO RICO: A COMPARATIVE STUDY OF ALGAE ABUNDANCE AND DIVERSITY;** Cruz Vélez Frank O<sup>1</sup>, Karina M. López Mercado<sup>1</sup>, Carlos Santos Flores<sup>2</sup>, and Bárbara Sánchez Santana<sup>1</sup>.<sup>1</sup>Department of Biology, Chemistry and Environmental Sciences, Inter American University of Puerto Rico, San Germán, P. O. Box 5100 San Germán, PR 00683.<sup>2</sup>Department of Biology, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.
14. **FARMERS MARKET COMMUNITY KITCHEN: HEAT AND VENTILATION LOADS.** Cuadrado Wesley<sup>1</sup>, Fidel Delgado<sup>2</sup>. <sup>1</sup>Department of Mechanical Engineering, University of Puerto Rico-Mayagüez, P.O. Box 9000, Mayagüez, PR. <sup>2</sup>Agricultural Marketing Service (AMS), U.S. Department of Agriculture, 1400 Independence Ave., Room 4531 South Building, Washington, DC.
15. **ASSESSING THE EFFECTS OF COMPOST AND PHYTOHORMONE ADDITIVES ON THE CA, FE AND K UPTAKE OF ROQUETTE ARUGULA IN COLOSO AND VOLADORA SOIL;** De Jesus Kiara Z.; Queziel Rivera, Jomaris González; Martha L. López; University of Puerto Rico, Mayagüez; Department of Chemistry; P.O. Box 9000, Mayagüez PR, 00681-9000
16. **CHEMICAL COMPARISON AND CHARACTERIZATION OF SIX RIPE MANGO (*MANGIFERA INDICA* L.) CULTIVARS IN PUERTO RICO.** Eduardo J. Diaz, María L. Plaza, Edna Negron, Javier Huertas. Food Science and Technology Program, University of Puerto Rico at Mayaguez, College of Agricultural Science, Call Box 9000, Mayaguez, PR
17. **METAL/POLYMER NANOCOMPOSITES AS VIBRATIONAL PROBES FOR THE SENSITIVE IDENTIFICATION OF *E. COLI* AND *LACTOBACILLUS* SPP.** Flores-Vélez Elena M<sup>1</sup>, Francisco A. Negrón<sup>2</sup>, Wilniadys Sepúlveda<sup>1</sup>, Marco A. De Jesús<sup>1</sup>.<sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, PR. <sup>2</sup>Department of Chemical Engineering, University of Puerto Rico, Mayagüez, PR
18. **OUTREACH PROJECT IN BO.CASTILLO ELEMENTARY SCHOOL** Garcia Mario A. Crops and Agro-environmental Sciences Department, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR
19. **OUTREACH AT ELEMENTARY SCHOOLS.** Gomez Zamot Jonathan. Department of Agronomy and Soils. University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR
20. **CENTER OF EDUCATION AND TRAINING IN AGRICULTURE AND RELATED SCIENCES “CETARS” ESCUELA FEDERICO ASENJO SCHOOL GARDENING.** González M. Department of Agricultural Sciences, University of Puerto Rico, Mayaguez
21. **CETARS AGRICULTURAL EDUCATION IN THE RIO CANAS ABAJO ELEMENTARY SCHOOL** Grajales Rosiel M. Agronomy & Soils, University of Puerto Rico Mayagüez P.O. Box 9000
22. **INTERNSHIP WITH THE NATURAL RESOURCES CONSERVATION SERVICE AGENCY (NRCS);** Grajales Rosiel M. Agronomy & Soils Undergraduate Student, University of Puerto Rico; Mayagüez P.O. Box 9000

23. **METAL NANOCOMPOSITES AS RAMAN PROBES FOR FOODBORNE BACTERIAL IDENTIFICATION;** Gratacós Grecia V<sup>1</sup>., Jeysika Zayas<sup>2</sup>, Omayra C.Vargas<sup>3</sup> and Marco A. De Jesus<sup>1</sup>; <sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, PR<sup>2</sup>Department of Industrial Microbiology, University of Puerto Rico, Mayagüez, PR <sup>3</sup>Department of Industrial Biotechnology, University of Puerto Rico, Mayagüez, PR
24. **METAL POLYMER NANOCOMPOSITES AS RAMAN PROBES FOR THE IDENTIFICATION OF PROBIOTIC AGENTS IN DAIRY PRODUCTS.** Guzmán, Clarissa M. Sepúlveda, Wilniady; Viera, Ashley; Areizaga, Héctor; De Jesús, Marco A. University of Puerto Rico, Mayagüez; Department of Chemistry; P.O. Box 9000, Mayagüez PR, 00681-9000
25. **COMPRESSION AND THERMOMECHANICAL ANALYSIS OF SINTERED RECYCLED GLASS DESIGNED FOR THE REMEDIATION OF POLLUTED SOILS.** Hernández Liliana M.<sup>1</sup>, Wesley Cuadrado<sup>2</sup>, Gerardo Nazario<sup>1</sup>, Anel Arroyo<sup>3</sup>, O. Marcelo Suárez<sup>4</sup>. <sup>1</sup>Department of Civil Engineering, University of Puerto Rico, Mayaguez, P.O. Box 9000, Mayaguez, PR. <sup>2</sup>Department of Mechanical Engineering, University of Puerto Rico, Mayaguez, P.O. Box 9000, Mayaguez, PR. <sup>3</sup>Department of Chemical Engineering, University of Puerto Rico, Mayaguez, P.O. Box 9000, Mayaguez, PR. <sup>4</sup>Department of Materials Science, University of Puerto Rico, Mayaguez, P.O. Box 9000, Mayaguez, PR
26. **DYE PHOTODEGRADATION BY BARE AND AMINE- (WITH DIFFERENT CONCENTRATIONS) TREATED TIO<sub>2</sub>.** Hossain Fahim, Oscar J. Perales Perez, Engineering Science and Materials, Universidad de Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.
27. **SIMULTANEOUS ADSORPTION OF CATIONIC AND ANIONIC DYES BY CHITOSAN/CELLULOSE AND CHITOSAN/CELLULOSE-GLA BEADS FOR WASTEWATERS TREATMENT.** Jusino C<sup>1</sup>., Vega A. L.<sup>2</sup>, O. Perales<sup>1,3</sup>, L. Alamo<sup>4</sup>, F. R. Roman<sup>1</sup> and A. Gonzalez<sup>2</sup>; <sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, P.R. <sup>2</sup>Department of Biology, Chemistry and Environmental Sciences, Inter American University of Puerto Rico-San Germán Campus, P.O. Box 5100, San Germán P.R. <sup>3</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, P.R. <sup>4</sup>Department of Chemistry, Pontifical Catholic University of Puerto Rico, Ponce, P.O. Box 9997, Ponce, P.R.
28. **SRTD SUMMER INTERSHIP 2013.** López-Rodríguez Andrea. Department of Agricultural Science, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR
29. **UPTAKE OF ZnSO<sub>4</sub>, Zn(COOCH<sub>3</sub>)<sub>2</sub>, ZnNO<sub>3</sub> AND ZnG IN ALFALFA PLANT (*Medicago sativa*)** Lugo-Avilés Leany<sup>1</sup>, Millán-Barea Mayrim<sup>2</sup>, Rivera-Peña Meilyn<sup>3</sup>, Cedeño Yarilin PhD<sup>4</sup>, Perales-Pérez Oscar PhD<sup>4</sup>, Román Félix PhD<sup>5</sup>, López-Moreno

Martha Laura PhD<sup>5</sup>.<sup>1</sup>Department of Industrial Biotechnology, <sup>2</sup>Department of Biology, <sup>3</sup>Department of Chemical Engineering, <sup>4</sup>Department of General Engineering-Materials Science and Engineering, <sup>5</sup>Department of Chemistry, University of Puerto Rico, Mayaguez, PR

30. **ADSORPTION OF ARSENIC BY MAGNETITE NANOPARTICLES IN AQUEOUS PHASE.** Luna-Pineda Tatiana<sup>1</sup>, Oscar Perales-Pérez<sup>1,2</sup>, Félix Román-Velázquez<sup>1</sup>. <sup>1</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, PR. <sup>2</sup>Department of Engineering Science & Materials, University of Puerto, Mayagüez, PR
31. **EDUCATING THE FUTURE GENERATIONS IN AGRICULTURE.** Maldonado Susej M. Department of Agricultural Education, University of Puerto Rico at Mayaguez
32. **THE CORRELATION OF RESIDUAL FEED INTAKE ON CARCASS CHARACTERISTICS OF BRAHMAN AND BRAHMAN INFLUENCED STEERS.** Montemayor Krystal <sup>1</sup>, Tanner Machado<sup>1</sup>, Kimberly McCuiston<sup>1</sup>, Monte Rouquette<sup>2</sup>, and Joe Paschal<sup>3</sup>. <sup>1</sup>Department of Animal, Rangeland, and Wildlife Sciences, Texas A&M University Kingsville, TX. <sup>2</sup>Texas A&M AgriLife Research-Overton, TX. <sup>3</sup>Texas A&M AgriLife Extension- Corpus Christi, TX
33. **CETARS OUTREACH: ELEMENTARY SCHOOL MARIANO RIERA PALMER, MAYAGUEZ, PR;** Morales Rivera Ruben J. College of Agricultural Science, Department of Agricultural Engineering University of Puerto Rico at Mayaguez
34. **COMPOSITE PLANT SYSTEM TO INVESTIGATE THE INTERACTION BETWEEN SWEET POTATO (*Ipomea batatas*) ROOTS AND PLANT PARASITIC ROOT-KNOT NEMATODES (*Meloidogyne incognita*).** Navarro Acevedo Krystal<sup>1</sup>, Christopher Taylor, PhD<sup>2</sup>.<sup>1</sup> University of Puerto Rico at Mayaguez, P.O. Box 9000, Mayagüez, PR.<sup>2</sup> Ohio State University- OARDC.
35. **POROSITY AND PERCOLATION IN SINTERED RECYCLED GLASS FOR POLLUTED SOIL FILTERING.** Nazario Gerardo<sup>1</sup>, Wesley Cuadrado<sup>2</sup>, Liliana M. Hernández<sup>1</sup>, Anel Arroyo <sup>2</sup>, O.M Suarez<sup>3</sup>. <sup>1</sup>Department of Civil Engineering, University of Puerto Rico-Mayagüez, P.O. Box 9000, Mayagüez, PR.<sup>2</sup>Department of Mechanical Engineering, University of Puerto Rico-Mayagüez, P.O. Box 9000, Mayagüez, PR. <sup>3</sup>Department of General Engineering, University of Puerto Rico-Mayagüez, P.O. Box 9000, Mayagüez, PR
36. **SUMMER INTERNSHIP USDA-AMS, NATIONAL SCIENCE LABORATORY IN GASTONIA, NC.** Olavarría-Fullerton Jenifier and Elena M. Flores-Vélez. Department of Chemistry, University of Puerto Rico, Mayagüez, PR 00681.USDA-AMS S&T NSL, 801 Summit Crossing Place, Suite B, Gastonia, NC 28054
37. **DETERMINATION OF LEAD AND COPPER IN DIFFERENT CIGARETTE BRANDS.** Oliveras Cabrera Adriana, Lizbeth Carrasquillo, Rolando Tremont. Department of Chemistry, University of Puerto Rico-Humacao Call Box 860 Humacao, PR 00792

38. **ANALYSIS OF HEAVY METALS IN THE *LUTJANUS VIVANUS***. Olmeda Natalia and Rolando Tremont. Department of Chemistry, University of Puerto Rico At Humacao, Call Box 860, Humacao, PR 00792
39. **ATRAZINE REMOVAL FROM WATER BY CHITOSAN-CELLULOSE AND CHITOSAN-CELLULOSE -GLA BEADS**. Ortiz Mattei Maria. Department of Chemistry, University of Puerto Rico, Mayagüez, PR 00681.
40. **THE APPLICATION OF PCR TECHNIQUES FOR THE DETECTION OF PHYTOPLASMA IN THE ROYAL PALM (*ROYSTONEA SPP.*)** Otero Pichardo Joshua, Jorge D. Caicedo, Lydia I. Rivera Vargas y Alejandro Segarra, Departamento de Cultivos y Ciencias Agroambientales, Universidad de Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.
41. **ENVIRONMENTAL REMOTION OF HEAVY METALS: USE OF MIMOSA PELLITA AS A POTENTIAL LEAD HYPERACCUMULATOR**. Pacheco Angel<sup>1</sup>, Rivera-Nieves Queziel<sup>2</sup>, Román Félix PhD<sup>2</sup>, López-Moreno Martha Laura PhD<sup>2</sup>.  
<sup>1</sup>Department of Industrial Biotechnology, <sup>2</sup>Department of Chemistry, University of Puerto Rico, Mayaguez, PR.
42. **FABRICATION AND CHARACTERIZATION OF CHITOSAN/CELLULOSE/ZnO NANOPARTICLES BLEND FILMS FOR BACTERICIDES APPLICATIONS**. Pérez-Altamar Melina<sup>1</sup>, Oscar Perales-Pérez<sup>2</sup>.  
<sup>1</sup>Food Science and Technology, <sup>2</sup>Department of General Engineering, University of Puerto Rico, Mayagüez, PR
43. **LIFE CYCLE ASSESSMENT OF SHORT SPAN BRIDGES FOR SECONDARY ROADWAYS: COMPARING WOOD AND STEEL SUPERSTRUCTURES**. Ramirez Hernandez Maricely<sup>1</sup>, Negron Aviles Francisco<sup>1</sup>, Richard D. Bergman<sup>1</sup>, PhD<sup>2</sup>, James Wacker<sup>2</sup>.<sup>1</sup>Chemical Engineering Department, University of Puerto Rico-Mayaguez, <sup>2</sup>USDA Forest Products Laboratory, Madison, Wisconsin
44. **ANALYSIS OF LEAD AND CADMIUM IN WASHINGTON RED APPLES**. Rolando Tremont, Ramírez Verónica. Department of Chemistry, University of Puerto Rico at Humacao, Call box 860, Humacao, PR 00792
45. **ESSENTIAL OILS OF *CANANGA ODORATA* EXHIBITED INSECTICIDE ACTIVITY AGAINST THE COFFEE BERRY BORER *HYPOTHENEMUS HAMPEI* (CURCULIONIDAE)**. Ramos-Camacho Elisa<sup>1</sup>, Diana T. Medina-Laabes<sup>1</sup>, Ileana I. Rodriguez-Velez<sup>2</sup>. <sup>1</sup>Department of Biology, University of Puerto Rico at Humacao, Call Box 860, Humacao, P.R. <sup>2</sup>Department of Chemistry, University of Puerto Rico at Humacao, Call Box 860, Humacao, P.R.
46. **MICROWAVE ASSISTED SYNTHESIS OF METAL-BASED NANOPARTICLES USING GLUTATHIONE**. Reyes Blas Myrna<sup>1</sup>, Maricely Ramírez Hernandez<sup>2</sup>, Wilfredo Ortiz Ortiz<sup>2</sup>, Oscar Perales<sup>3</sup>, Felix R. Román<sup>1</sup>.  
<sup>1</sup>Department of Chemistry, University of Puerto Rico (UPRM), Mayaguez, USA,  
<sup>2</sup>Department of Chemical Engineering, University of Puerto Rico (UPRM), Mayaguez,

- USA, <sup>3</sup>Department of Engineering Science & Materials, UPRM, Mayaguez, USA.
47. **HYDROPHYLIC STABILITY AND DISPERSION FROM LIGAND EXCHANGE** Reyna Maritza<sup>1</sup>, Ryan Knutson<sup>2</sup>, Lee Penn<sup>2</sup>, Rolando Tremont<sup>1</sup>. <sup>1</sup>University of Puerto Rico at Humacao, <sup>2</sup>University of Minnesota.
  48. **PHYTOAVAILABILITY OF NUTRIENTS IN MUNICIPAL SOLID WASTE-SOIL MATRIXES;** Rivera, Q<sup>1</sup>.; Alamo, B<sup>2</sup>.; Parsons, J<sup>3</sup>., Lopez, M.L<sup>1</sup>. <sup>1</sup>Chemistry Department; University of Puerto Rico at Mayaguez Campus, P.R. <sup>2</sup>Biotechnology Department; University of Puerto Rico at Mayaguez Campus, P.R. <sup>3</sup>Chemistry Department; The University of Texas Pan-American, Edinburg, TX
  49. **SPECTROSCOPY FOR THE ANALYSIS OF THE LEAD LEVELS ON LIPSTICKS.** Rivera Linoshka, Jorge M. Marcano, Rolando J. Tremont. Department of Chemistry, University of Puerto Rico at Humacao, Call Box 860, Humacao, PR 00792.
  50. **UPTAKE AND TRANSPORT OF Fe<sub>3</sub>O<sub>4</sub> and Fe<sub>3</sub>O<sub>4</sub>/DMSA NANOPARTICLES IN *Prosopis juliflora* (MESQUITE) PLANTS.** Rivera Peña Meilyn E.<sup>1</sup>, Leany Lugo Aviles<sup>2</sup>, Reinaldo J. Agostini<sup>2</sup>, Martha L. López- Moreno, PhD<sup>3</sup>. <sup>1</sup>Department of Chemical Engineering, University of Puerto Rico, Mayagüez, PR. <sup>2</sup>Department of Industrial Biotechnology, University of Puerto Rico, Mayagüez, PR. <sup>3</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, PR
  51. **MICROBIAL PRESENCE, CHEMICAL STABILITY, AND NUTRIENT AVAILABILITY IN SOIL-COMPOST SYSTEMS.** Rodríguez Curet Taina A. <sup>1</sup>, Martha L. López Moreno PhD<sup>2</sup>. <sup>1</sup>Interamerican University of Puerto Rico, San German. <sup>2</sup>University of Puerto Rico, Mayagüez PR.
  52. **OUTREACH ACTIVITIES IN FRANCISCO VICENTY ELEMENTARY SCHOOL.** Rodriguez-Decllet Arleen, Department of Crops and Agro-environmental Sciences, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, PR.
  53. **AGRICULTURAL OUTREACH FOR ELEMENTARY STUDENTS.** Gudianne M. Romero, Winston De La Torre
  54. **VALIDATION OF OPTIMUM CULTURE CONDITIONS OF PRO-BIOTIC AGENTS FOR ITS RAPID IDENTIFICATION AND CHARACTERIZATION VIA SURFACE-ENHANCED RAMAN SPECTROSCOPY (SERS);** Sepulveda, Wilniady; Guzmán, Clarissa; Viera, Ashley; Areizaga, Hector; De Jesus, Marco A.; University of Puerto Rico, Mayagüez; Department of Chemistry; P.O. Box 9000, Mayagüez PR, 00681-9000
  55. **SUCCESSFUL DIRECT IMPACT ON STUDENTS AND TEACHERS FROM HIGH SCHOOL. RESEARCH LABORATORY AND WORKSHOPS IN SUMMER-2013.** Tremont Rolando J. Department of Chemistry, University of Puerto Rico at Humacao, Call Box 860, Humacao, PR 00792.
  56. **AGRICULTURAL OUTREACH ACTIVITIES AS PART AS CETARS PROJECT.** Vega Suarez Ana Maria. Crop and Agroenvironmental Science. University of Puerto Rico at Mayagüez, PR
  57. **ADSORPTION OF METHYLENE BLUE AND CONGO RED BY CHITOSAN/CELLULOSE BEADS FOR WASTEWATERS TREATMENT.** A. L. Vega<sup>1</sup>, Velázquez G. M. <sup>2</sup>, O. Perales<sup>2,3</sup>, L. Alamo<sup>4</sup>, F. R. Roman<sup>2</sup> and A. Gonzalez<sup>1</sup>. <sup>1</sup>Department of Biology, Chemistry and Environmental Sciences, Inter American University of Puerto Rico-San Germán Campus, P.O. Box 5100, San Germán P.R.

<sup>2</sup>Department of Chemistry, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, P.R. <sup>3</sup>Department of Engineering Science and Materials, University of Puerto Rico, Mayagüez, P.O. Box 9000, Mayagüez, P.R. <sup>4</sup>Department of Chemistry, Pontifical Catholic University of Puerto Rico, Ponce, P.O. Box 9997, Ponce, P.R. **CETARS: OUTREACH AGRICULTURAL ACTIVITIES AT PUBLIC PRIMARY SCHOOL 2012-2013.** Winston de la Torre and Vicente Nydia. Crops and Agro-environmental Sciences Department, University of Puerto Rico, Mayaguez, PO Box 9000, Mayaguez, Puerto Rico

58. **ANALYSIS OF HEAVY METALS IN PLANTING SOIL NEAR INDUSTRIAL AREA.** Velazquez Pérez Kiara and Tremont Rolando, PhD. Department of Chemistry, University of Puerto Rico at Humacao, Call Box 860 Humacao, PR 00792
59. **ADSORPTION OF ARSENIC BY MAGNETITE NANOPARTICLES IN AQUEOUS PHASE.** Manuel García-Cartagena<sup>1</sup>, Tatiana Luna-Pineda<sup>2</sup>, Oscar Perales-Pérez<sup>2,3</sup>, Félix Román-Velázquez<sup>2</sup>; <sup>1</sup>Department of Biology, Chemistry & Env. Sc. Interamerican University of Puerto Rico –San German Campus <sup>2</sup> Department of Chemistry, University of Puerto Rico, Mayagüez, PR; <sup>3</sup> Department of Engineering Science & Materials, University of Puerto, Mayagüez, PR
60. **POTENTIAL FOR URBAN AGRICULTURE IN THE RIO PIEDRAS WATERSHED;** Natalia B. Álvarez Negrón; New Mexico-Puerto Rico Program in Natural Resource Career Track.
61. **-TOXICITY ASSESSMENT OF CERIUM OXIDE NANOPARTICLES IN CILANTRO (*CORIANDRUM SATIVUM L.*) PLANTS GROWN IN ORGANIC SOIL.** María Isabel Morales,<sup>1,3</sup> Cyren M. Rico,<sup>1,4</sup> Jose Angel Hernandez-Viezcas,<sup>1,4</sup> Jose E. Nunez,<sup>1</sup> Ana Cecilia Barrios,<sup>1,3</sup> Alejandro Tafoya,<sup>5</sup> Juan Pedro Flores-Marges,<sup>6</sup> Jose R. Peralta-Videa<sup>1,3,4</sup>, Jorge L. Gardea-Torresdey<sup>1,2,3,4</sup> <sup>1</sup>Department of Chemistry, The University of Texas at El Paso, 500W. University Ave., El Paso, TX 79968. <sup>2</sup>Environmental Science and Engineering PhD Program, The University of Texas at El Paso, 500W. University Ave., El Paso, TX 79968. <sup>3</sup>USDA Center for Education and Training in Agricultural and Related Sciences (CETARS). <sup>4</sup>UC Center for Environmental Implications of Nanotechnology (UC CEIN) the University of Texas at El Paso. <sup>5</sup> Franklin High School, 900 N. Resler, El Paso, Texas 79912. <sup>6</sup>Autonomous University of Ciudad Juarez, 32320, Mexico.
62. **“SYNCHROTRON MICRO-XRF AND MICRO-XANES CONFIRMATION OF THE UPTAKE AND TRANSLOCATION OF TiO<sub>2</sub> NANOPARTICLES IN CUCUMBER FRUIT (*CUCUMIS SATIVUS L.*)”** Authors: Alia D. Servin<sup>†, ‡, §</sup>, Maria Isabel Morales<sup>†, ‡</sup>, Hiram Castillo-Michel<sup>‡</sup>, Berenice Muñoz<sup>‡</sup>, Jose Angel Hernandez-Viezcas<sup>†, §</sup>, Jose R. Peralta-Videa<sup>†, ‡, §</sup>, Jorge L. Gardea-Torresdey<sup>†, ¶, ‡, §</sup>  
<sup>†</sup>Department of Chemistry, The University of Texas at El Paso, 500 W. University Avenue, El Paso Texas 79968, United States <sup>¶</sup>Environmental Science and Engineering PhD Program, The University of Texas at El Paso, 500 W. University Avenue, El Paso Texas 79968, United States <sup>‡</sup>Environmental Science program, The University of Texas at El Paso, 500 W. University Avenue, El Paso Texas 79968, United States. <sup>‡</sup>Center for Education and Training in Agriculture and Related Sciences (CETARS), The University of Texas at El Paso, 79968 United States. <sup>§</sup>UC Center for Environmental Implications of Nanotechnology (UC CEIN), The University of Texas at El Paso, 79968 United States. <sup>‡</sup>European Synchrotron Radiation Facility, B.P.220 - 38043 Grenoble Cedex, France

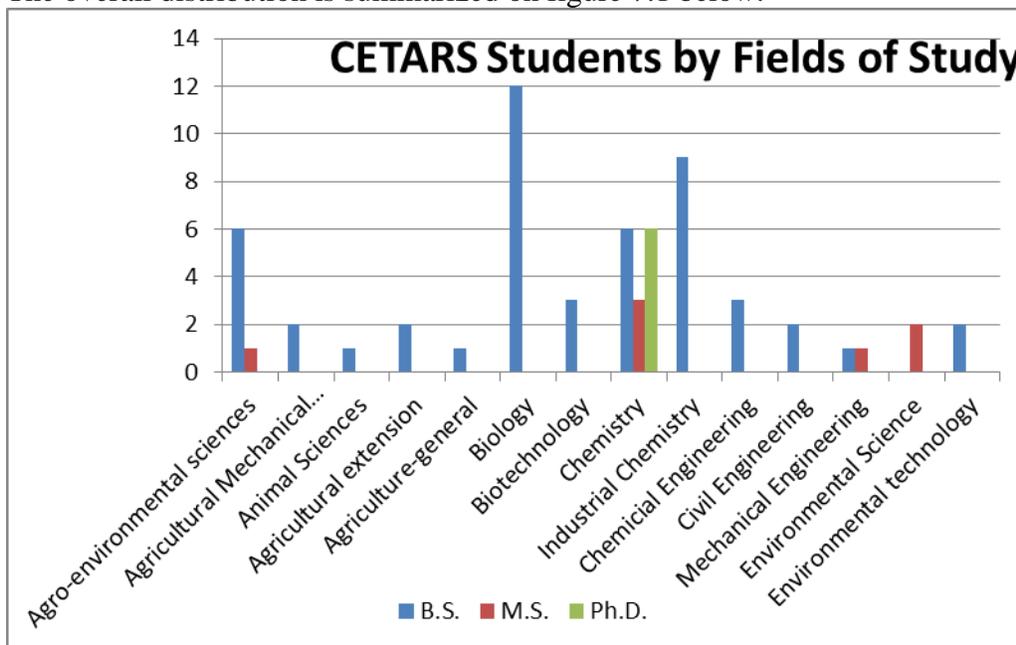
63. **THE SALT TOLERANCE ON MUTANT PLANT OF *ARABIDOPSIS THALIANA***  
 Authors: Darsy K. Smith<sup>1</sup>, Rongrong Wang<sup>2</sup>, Qingmei Guan<sup>2</sup>, Jianhua Zhu<sup>2</sup>  
 Undergraduate student<sup>1</sup>, Department of Crops and Environmental Sciences, University  
 of Puerto Rico, Mayagüez. Professor<sup>2</sup>, Department of Plant Science and Landscape  
 Architecture, University of Maryland, College Park, MD 20742.
64. **IMPACT OF CERIUM OXIDE NANOPARTICLES ON CILANTRO (*CORIANDRUM SATIVUM*).** Morales, M.I., Barrios, A.C., Rico, C.M., Hernandez-Viezcas, J.A., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2012. *SETAC North America 33rd Annual Meeting, November 11-15, 2012, Long Beach, CA.*
65. **SYNCHROTRON CONFIRMATION OF THE UPTAKE AND TRANSLOCATION OF TiO<sub>2</sub> NPS IN CUCUMBER (*CUCUMIS SATIVUS*) PLANTS,** Servin, A.D., Hernandez, J.A., Castillo-Michel, H., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2012.. *First Sustainable Nanotechnology Organization (SNO) Conference, November 4-6, 2012, Washington D.C.*
66. **THE IMPACT OF CeO<sub>2</sub> NPS ON RICE ROOTS: THE RELATIONSHIP BETWEEN ENZYME ACTIVITY, MEMBRANE DAMAGE, AND LIPID CONTENT,** Rico, C.M., Hong, J., Morales, M.I., Barrios, A.C., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2012.. *First Sustainable Nanotechnology Organization (SNO) Conference, November 4-6, 2012, Washington D.C.*
67. **CeO<sub>2</sub> NANOPARTICLES ENHANCE LIPID PEROXIDATION IN THE SHOOT OF GERMINATING RICE SEEDS** Rico, C.M., Morales, M.I., Hong, J., Barrios, A.C., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2012.. *SETAC North America 33<sup>rd</sup> Annual Meeting, November 11-16, Long Beach, CA.*
68. **THE IMPACT OF CeO<sub>2</sub> NPS ON RICE ROOTS: THE RELATIONSHIP BETWEEN ENZYME ACTIVITY, MEMBRANE DAMAGE, AND MACROMOLECULE CONTENTS.** Rico, C.M., Hong, J., Morales, M.I., Barrios, A.C., McCreary, R., Lee, W.Y., Varela-Ramirez, A., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2012. *UTEP Graduate Research Expo, November 9, 2012, UTEP.*
69. **CERIUM OXIDE NANOPARTICLES AND THEIR IMPACT ON TOMATO (*SOLANUM LYCOPERSICON*).** Barrios, A.C., Morales, M.I., Rico, C.M., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013. *Third annual UTEP Campus Office Undergraduate Research Initiative Symposium, April 20, 2013. El Paso, Texas.*
70. **THE IMPACT OF CeO<sub>2</sub> NANOPARTICLES IN RICE.**Rico, C.M., Morales, M.I., Barrios, A.C., Hong, J., McCreary, R., Lee, W.Y., Varela-Ramirez, A., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013. *UTEP Chemistry Research Day, May 3-4, El Paso, TX.*
71. **TOXICITY ASSESSMENT OF CeO<sub>2</sub> NANOPARTICLES ON CILANTRO (*CORIANDRUM SATIVUM*) GROWTH IN ORGANIC SOIL** Morales, M.I., Rico, C.M., Hernandez-Viezcas, J.A., Nunez, J.E., Barrios, A.C., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013.. *Chemistry Research Day at the University of Texas at El Paso. May 3-4.*
72. **PHYSIOLOGICAL IMPACTS OF CERIUM OXIDE NANOPARTICLES IN RICE PLANTS.**Rico, C.M., Morales, M.I., Barrios, A.C., McCreary, R., Hong, J., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013. *UC-CEIN EH&S Forum, May 8-9, Los Angeles, CA.*

Oral presentation by CETARS' PD Felix R. Roman at NACTA 2013 Conference during June 25-29 at Virginia Tech; **UPRM CENTER FOR EDUCATION AND TRAINING IN AGRICULTURE AND RELATED SCIENCES (CETARS): AN INTERDISCIPLINARY APPROACH FROM K-12 TO PHD TO WORK IN PROBLEM FACING AGRICULTURE.** Felix R. Román, Marco de Jesus and Martha L. Lopez, Chemistry Department, Oscar Perales Department of Engineering Science and Materials, Winston Dela Torre, Department of Crops and Agro-environmental Sciences, University of Puerto Rico at Mayaguez

**7. Total Number of students enrolled in disciplines applicable to USDA jobs:**

All sixty-five CETARS students (65) are enrolled in disciplines related to USDA interests. The UPRM-CETARS population consists of twenty-six (26) undergraduates (BS), 6 MS and 6 PhD students and are distributed as follows: Crops and Agro-Environmental Sciences (6 BS and 1MS), Agricultural Mechanical Technology (2 BS), Animal Sciences (1BS), General Agriculture (1BS), Agricultural Extension (2BS), Food Science and Technology program (2 MS); Chemistry Department (5 BS, 2 MS and 6 PhD); Biotechnology (3 BS); Chemical Engineering (3 BS); Civil Engineering (2 BS), Mechanical Engineering (1BS; 1MS). The Food Science and Technology Program has 2MS students. UPRA-CETARS' students came from the departments of Biology (5 BS) and Environmental Technology (2 BS). UPRH-CETARS' students came from Industrial Chemistry (9 BS) and Biology (1BS). IAUPR-SG CETARS participants are from the Department of Chemistry and Biology and are distributed as follows: Biology 6 BS and Environmental Science Program (2 MS). The UTEP Environmental Chemistry Department has one BS and one MS student as part of CETARS.

The overall distribution is summarized on figure 7.1 below.



**Figure 7.1: CETARS Student distribution based on academic field of study.**

### **8. Total Number of degrees awarded with USDA qualifications:**

During the CETARS cycle that corresponds from September 2012 to present, four students obtained USDA related degrees. José Torres Tellado and Nicole Bonilla Hernández from UPRM obtained BS degrees in Chemical Engineering and both applied to graduate schools in Continental USA. Two chemistry students from the Inter-American University at San Germán also obtained BS degrees. Ms. Wildelys Colón obtained a BS in Chemistry with minor in microbiology and Nathalie González also obtained a BS in chemistry. Krystal Navarro from UPRM obtained a B.S. degree in Plant Protection and was accepted into the PhD program at Ohio State University. At UTEP Ana C. Barrios obtained her BS within this program and continues her MS program within the program and Maria Isabel Morales finished her MS program and was admitted in a PhD program in Texas A & M University.

### **9. Total Number of students publishing:**

Research activities and collaborations of CETARS students and faculty resulted in 13 publications in peer review journals as shown below.

1. Sorption of triclosan onto tyre crumb rubber By López-Morales, J.; Perales-Perez, O.; Román-Velázquez, F.; Adsorption Science & Technology (2012), 30(10), 831-845.
2. Structural and thermo-mechanical characterization of calcium and barium alginate films; By Vidal-Urquiza, Turner K.; Blagg, Amanda; Perales-Pérez, O.; Cleantech Conference & Showcase, Santa Clara, CA, United States, June 18-21, 2012 (2012), 357-360.
3. Use of recycled tires crumb rubber to remove organic contaminants from aqueous and gaseous phases; Alamo-Nole, Luis; Perales-Perez, Oscar; Román, Felix R.; Desalination and Water Treatment (2012), 49(1-3), 296-306.
4. Diana Sanchez-Rivera, Oscar Perales-Perez and Félix R. Román. LC-ICPMS speciation of arsenite and arsenate oxyanion mixtures during their adsorption with dried sludge Analytical Methods Anal. Methods, 2013,5, 1583-1589
5. Morales MI, Rico CM, Hernandez-Viezcas JA, Nunez JE, Barrios AC, Tafoya A, Flores-Marges JP, Peralta-Videa JR, Gardea-Torresdey JL. Toxicity assessment of cerium oxide nanoparticles in cilantro (*Coriandrum sativum* L.) plants grown in organic soil. J. Agric. Food Chem. 2013 Jul 3;61(26):6224-30
6. Size-controlled synthesis of MgO nanoparticles and the assessment of their bactericidal capacity. Cedeno-Mattei, Yarilyn; Reyes, Myrna; Perales-Perez, Oscar; Roman, Felix R.; MRS Online Proceedings Library (2013), 1547(Solution Synthesis of Inorganic Functional Materials), opl.2013.638, 6 pp..
7. Effect of high-energy ball milling time on structural and magnetic properties of nanocrystalline cobalt ferrite powders. By Cedeno-Mattei, Yarilyn; Perales-Perez, Oscar; Uwakweh, Oswald N. C.; Journal of Magnetism and Magnetic Materials (2013), 341, 17-24.
8. One-step synthesis of water-dispersible ZnSe(S)-alloy quantum dots in the presence of thiol species. Bailon-Ruiz, Sonia; Perales-Perez, Oscar; Su, Yi-feng; Xin, Yan; Current Nanoscience (2013), 9(1), 117-121.
9. Removal of inorganic arsenic oxyanions using Ca-Fe(III) alginate beads. Sanchez-Rivera, Diana; Perales-Perez, Oscar; Roman, Felix R.; Desalination and Water

- Treatment (2013), 51(10-12), 2162-2169.
10. Preparative size-exclusion chromatography for separation and purification of water-stable Cd-based quantum dots. Alamo-Nole, Luis; Bailon-Ruiz, Sonia; Perales-Perez, Oscar; Roman, Felix R.; *Analytical Methods* (2012), 4(10), 3127-3132.
  11. Rico, C.M., Morales, M.I., McCreary, R., Castillo-Michel, H., Barrios, A.C., Hong, J., Tafoya, A., Lee, W.-Y., Varela-Ramirez, A., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013. Cerium oxide nanoparticles modify the antioxidative stress enzyme activities and macromolecule composition in rice seedlings. *Environmental Science and Technology* (submitted and in review).
  12. Servin, A.D., Morales, M.I., Castillo-Michel, H., Hernandez-Viezcas, J.A., Munoz, B., Zhao, L., Nunez, J.E., Peralta-Videa, J.R., Gardea-Torresdey, J.L. 2013. Synchrotron verification of TiO<sub>2</sub> accumulation in cucumber fruit: A possible pathway of TiO<sub>2</sub> nanoparticle transfer from soil into the food chain. *Environmental Science*
  13. Rico, C. M., Hong, J., Morales, M.I., Zhao, L., Barrios, A.C., Zhang, J., Peralta-Videa, J.R., Gardea-Torresdey, J.L. **2013**. Effect of cerium oxide nanoparticles on rice: A study involving the antioxidant defense system and in vivo fluorescence imaging. *Environmental Science and Technology* 47 (11), 5635–5642.

#### **10. Comparison of GPAs before and after:**

CETARS students are receiving assistance from CETARS faculty and UPR academic counseling orientation office about different approaches to maintain and improve their GPA. Average GPA from CETARS students is 3.40/4.00 and has increased by 1.21 %. GPA average before career experiences was 3.30 calculated from all CETARS students. GPA average upon completion of career experiences was 3.34. As part of their commitment, every CETARS student requires a minimum of 15 credit hours/ semester and a GPA of 3.0 or above.

#### **11. Developing curriculum and faculty for required courses:**

Two courses were developed in CETARS program during Period September 1 to August 31 2013 are: 1) UPRM: (1) QUIM 6007 (03 credits) ‘Food and Agriculture Application of Nanotechnology’ (three classes per week during 1 semester), 2) UTEP: workshop entitled “How to Get Published in Scientific Journals.” (Workshop offered in one day during CETARS Symposium in August 12 and 13 of 2013 with the participation of 400 individuals).

#### **12. Comparison of female success (before and after); gender and ethnicity.**

All students in the CETARS project are Hispanic, and so all data collected throughout this document reports on Hispanic students. In average, 73.8% of the CETARS participants are females and 26.25% are male.

Of the 51 students who reported their GPA as of August 31, 2013, 36 were female (71%) and 15 were male (29%). Of the 36 female students, 18 students (50%) increased their GPA, 12 students (33.3 %) remained the same, whereas 6 students (16.6 %) decreased their GPA. For the male population, 4 students (26.6%) increased their GPA, 4 (26.6%) stayed the same, and 7 (46.6%) decreased their GPA. Table 3.2 reports gender distribution of CETARS participants.

Female’s success before and after CETARS experiences was evaluated in a survey carried out to females in November 2013. Females surveyed stated that CETARS program has contributed in a very positive way on the networking with professionals from the agriculture field. They also obtained student leadership positions, expanded their scientific knowledge, increase their

participation in community activities. Females specified that after their involvement in CETARS they changed their perception about the participation of women in agricultural areas.

### **13. Total Number of students honors advising and tutoring:**

Academic year 2011-2013: As part of UPRM-CETARS activities seven (7) students from the UPRAg were involved in peer-mentoring activities every semester. Student mentors invested 80 hours per semester in mentoring/tutoring activities for a total of 640 hours.

### **14. Tracking students placement into jobs or Ph. Ds/student mobility:**

Wildelys Colón obtained a BS in Chemistry with minor in microbiology from the Inter-American University at San German and is currently working at OSHA. Nathalie Gonzalez also obtained a BS in chemistry from Inter-American University at San German and was hired by CDC in Atlanta.

### **15. Track research activities/English skills:**

In May 2013, fifty-five (55) out of a total of sixty-five (65) CETARS students were involved in research (85%). In a survey given in March 2013, 25 of the 35 respondents (71%) reported involvement in research activities. CETARS students are involved in the experimental design and preliminary work associated to nanotoxicology studies in plants; development of nanosize bactericidal materials; synthesis of polymer-based nanocomposites for controlled release of fungicidal species; development of novel remediation technologies for water cleaning, among others. CETARS students are also receiving customized workshops in different subjects such as HPLC techniques, vapor deposition protocols, effective writing and presentation strategies, to cite some examples. For a summary of research projects for each student, please enter the CETARS webpage at <http://cetars.uprm.edu/> in the participating students section.

### **16. K-12 activities:**

#### 16.1 UPRM campus crops garden and Globe programs

The UPRM K-12 activities are divided into two components. The first is the Crops Gardens program is administered by agriculture students and the second is the CETARS Globe program is administered by the science and engineering students. Each one of these programs visited 10 public schools per semester to involve K-12 students and teachers in outreach activities. CETARS-Agricultural Sciences Co-Director and Collaborator coordinate the crops garden program and began visiting ten elementary schools in the Mayaguez district to develop and implement activities in the agricultural sciences for the incoming 2012-2013 academic year. A school garden was established in each school to serve as a field laboratory. A total of 13 visits per school took place within the reporting period, impacting 231 elementary school students (K to 6<sup>th</sup>). Ten (10) elementary schools were invited to the Alzamora Laboratory Farm on the UPR-Mayaguez campus to participate in a four-hour showcase activity that impacted 120 elementary students and 12 teachers during this tour. K-12 students participated in hands-on activities such as seeds identification and plantation development, as well as receiving instruction on seed development, plant growth and management, and food nutrition. Also agriculture students with the help of a collaborator designed a coloring book aimed at introducing kindergarten and early grades students to agriculture. Students visited the classrooms and as they colored CETARS students explained the role of agriculture including the role of animals. A total of 223 kindergarten students participated in a short workshop using the coloring book and 214 students were impacted with the crops gardens for a total of 437 students impacted by the CETARS

agriculture students. Copies of book were distributed to students and teachers participating in the project. Table 16.1 presents a summary of activities.

**Table 16.1 UPRM-CETARS – K-6 Outreach Agricultural Activities 2012-2013**

School and location	Level	Municipality	dates	impacted students	CETARS Student
Olga Más (Malezas)	Elementary	Mayaguez	August 2012-May 2013,	29	Jonathan Gómez
Consuelo Pérez (Rio Hondo)	Elementary	Mayaguez	August 2012-May 2013,	13	Susej Maldonado
Juan de Dios Quiñones	Elementary	Moca	August 2012-May 2013, 1hr/wk	10	Krystel Navarro
Federico Asenjo	Elementary	Mayaguez	August 2012-May 2013, 1hr/wk	35	María González
Rio Cañas Abajo	Elementary	Mayaguez	August 2012-May 2013,	23	Rosiel Grajales
Miradero	Elementary	Mayaguez	August 2012-May 2013,	19	Ana Vega
Mariano Riera Palmer	Elementary	Mayaguez	August 2012-May 2013,	32	Rubén Morales
Francisco Vincenty	Elementary	Mayaguez	August 2012-May 2013,	10	Arleen Rodríguez
Barrio Castillo	Elementary	Mayaguez	August 2012,	23	Mario García
George Washington	Elementary	Moca	August 2012,	20	Gudianne Romero

The crop gardens program served a total of 10 schools and impacted 214 K-9 students in the crops garden program as shown above in table 16.1 above and 223 Kindergarten students.

The CETARS Globe program is part of the K-12 outreach activities and also had a great impact in the outreach activities. The Globe components is coordinated Felix R Roman with the help of Lisa Torres and is managed by Science and Engineering students at UPRM. This program also served 10 schools around Puerto Rico through the delivery of hydrology and soil workshops impacting 10 teachers and 477 students during the year. The combined K-12 activities of school gardens and Globe impacted 20 different K-12 schools for a total of and 914 students directly in the classroom with lectures, workshops, and coloring books (see tables 16.1-16.2).

**Table 16.2 UPRM-CETARS K-12 Outreach Agricultural Activities by UPRM-Globe Program Participants 2012-2013**

School	Level	Town	Teacher	Date	Description	Number of students (F/M)
Vocacional, Salvador Fuentes	High School	Aguadilla	Maria Mendiza & Olga Alvarez	November 30, 2012	Soil Protocol	12/3
Vocacional, Salvador Fuentes	High School	Aguadilla	Maria Mendiza & Olga Alvarez	December 10, 2012	Hydrology Protocol	19/12
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	September 28, 2012	Hydrology Protocol (Temperature, pH & Transparency)	18/14
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	November 2, 2012	Hydrology Protocol (Salinity & Dissolved Oxygen)	9/6
Juan de Dios Quiñones	Elementary	Moca	Glorinel Arocho	November 16, 2012	Soil Protocol (Theory)	7/6
Bernardino Cordero Bernard	High School	Ponce	Joel Martínez	October 9, 2012	Soil Protocol	9/2
Bernardino Cordero Bernard	High School	Ponce	Joel Martínez	October 16, 2012	Hydrology Protocol	8/2
Eugenio LeComte	Middle School	Ponce	Marisol Medina	October 16, 2012	Hydrology Protocol	14/8
Vocacional Pedro Perea Fajardo	High School	Mayagüez	Esther Echevarría	November 8, 2012	Hydrology Protocol	10/7
Vocacional Pedro Perea Fajardo	High School	Mayagüez	Awilda Esquerdo	November 29, 2012	Soil Protocol	8/5
Juan Alejo Arizmendi	High School	Quebradillas	Brenda Pérez	October 25, 2012	Hydrology Protocol	9/6
Dr. Pila	High School	Ponce	Mirna Cruz	Sept.27, 2012	Hydrology Protocol	16/10
Ponce High	High School	Ponce	Frances Nadal	March 21, 2013	Hydrology Protocol	12/8
Vocacional Dr. Pedro Perea	High School	Mayaguez	Ester Echevarría	March 21, 2013	Hydrology Protocol	7/7
Vocacional Dr. Pedro Perea	High School	Mayaguez	Ester Echevarría	March 21, 2013	Hydrology Protocol	10/25
Segunda Unidad Galo Rosario	Middle School	San Germán	Iris Cintron Irrizarry	April 18,2013	Hydrology Protocol	7/9
Juan Alejo Arizmendi	High School	Quebradillas	Brenda Pérez	April 30, 2013	Hydrology Protocol	9/6
Superior Jardines de Ponce	High School	Ponce	Samirah Mercado		Hydrology Protocol	62/38

### 16.2 K-12 Outreach at the Interamerican University of Puerto Rico at San Germán (IAUPRSG)

As part of their outreach activities, IAUPR-SG students visited three rural schools of the area in several occasions. IAUPRSG CETARS students promoted research and its relationship to agriculture and the environment (shown in Table 16.3 below). The total number of impacted students in these K-12 outreach activities was 296 from elementary, intermediate grades and high schools.

**Table 16.3. CETARS-IAUPR-SG – Visits to schools**

<b>Name School</b>	<b>Municipality</b>	<b>Level-Grade</b>	<b>Students Impacted</b>
Rosendo Matienzo Cintrón	Lajas	Elementary- 3 <sup>th</sup>	87
Luis Negrón López	Sabana Grande	High School -10 <sup>th</sup> , 11 <sup>th</sup> & 12 <sup>th</sup>	167
S.U. David Antongiorgi	Sabana Grande	High school -9 <sup>th</sup>	42

### 16.3 Outreach activities at UPR-Humacao

Dr Rolando Tremont and Dr. Ileana Rodriguez from UPR-Humacao worked in summer outreach activities in with 10 High School teachers (2 males and 8 females) and 82 students High Schools Petra Mercado Bougart-Humacao, Dra. Conchita Cuevas-Gurabo, Manuel Mediavilla-Humacao, High School PECES-Punta Santiago. These students from grades 10-12<sup>th</sup> of which 51 (62% were female) and 31(38%) were male were divided into four groups and participated of workshops about topics in agriculture and environmental sciences. Some were selected to participate of summer research under the mentorship of Dr. Rolando Tremont and Dr Ileana Rodriguez. A summary of the activities is shown in table 16.4 below.

The total number of students impacted by CETARS institutions was 1296 K-12 students without including the participation of other activities such as the lectures provided by Dr. Jorge Gardea-Torresday at UTEP, which also impacted 235 students. These lectures were presented to students from Mission Early College High School, Transmountain Early College, and Valle Verde Early College on to the impacts of nanotechnology in agriculture.

**Table 16.4 Summer outreach activities at UPR-Humacao.**

Activity	School and population impacted	Calendar, date and place
Workshop of Agricultural Sciences and Environmental Sciences	High School Students (10, 11 and 12 grades)  <b>82 Students</b>	Group 1: June 3-7, 2013 Group 2: June 10-14, 2013 Group 3: June 17-21, 2013 Group 4: June 24-28, 2013 Department of Chemistry, UPR-Humacao.
Workshop of Agricultural Sciences and Environmental Sciences	<b>10 High school Teachers</b>	July 1-5, 2013 Department of Chemistry, UPR-Humacao
Scientific Research of Several Researchers with Undergraduate Students	Dr. Ileana Rodríguez Dr. Rolando Tremont	June-August 2013 Department of Chemistry, UPR-Humacao

**17. Community engagement activities:**

Faculty of UPRM offered their services to the Mayaguez community by performing chemical analyses of water, soils and foods samples. The project provided assistance to farmers in Añasco. In addition, students participated in the International Coastal Cleaning in Cabo Rojo, Puerto Rico on September 2012. Students analyzed water quality to investigate its safety for recreational use. Also CETARS students from UPR-Humacao analyzed fish samples from local fisherman in an effort to access environmental contamination. A group of CETARS students participated in church activities aimed at the collection of clothes and food for low income families. One CETARS student also served as a volunteer for the American Red Cross.

**18. Budget implementation:**

The budget has been implemented as described in the project proposal, however due to slow procedure from all participating institutions, the signing the sub-awards contracts takes usually months causing a delay in the submission of request for payments by the sub-awardees. We are working with the legal section of the External Funding Office located at the Center for Research and Development at UPRM to expedite the process. We also transferred funds from non-faculty personnel to support voluntary USDA summer internships.

**19. Program activities/implementation:**

CETARS activities for the academic year 2012-2013 can be arranged into the following categories:

**Program awareness and development:**

CETARS Faculty met with students to orient them about internships opportunities and how to apply using the USJOBS webpage (September-October, 2012). Three workshops activities were programed to inform and prepare CETARS students for summer internships applications and interviews. These workshops took place in September 2012 (Wendy Carrasco, USDA Career

Opportunities for Students and Recent Graduates), November 2012 (Daisy Lugo, Career Opportunities within USDA and how to apply online using USJOBS), January 2013 (Krystal Navarro, Workshop on the use of USJOBS to submit resume for summer applications).

**Professional development:**

Several students including student leaders have participated of sever courses aimed at increasing their development to prepare them to better compete in the internships and USDA job opportunities. A group of CETARS students registered and participating of Integrated Pest Management "**IMP3-Spanish Core Concepts Module**" offered by the University of Minnesota. These students were Fabian Carmona, Krystal Navarro, Darsy Smith, Rosiel M. Grajales, Mario Garcia and Josua Otero. Susee Maldonado also enrolled in Pest Biology . Another course that was offered by Food Science and Technology Program on the UPRM campus the in which to was "Hazard Analysis was Critical Control Points". This is a food safety course which aims at preventing food transmitted diseases Krystal Navarro and Darsy Smith participated and obtained a certification of this training. A workshop on how to publish in peer-review journals was also offered during August 2013 as part of the CETARS symposium impacting about 25 faculty members and over 100 students at UPRM.

***K-12 Outreach Activities impacting K-12 students and teachers at UPRM:***

These are summarized below.

- Agricultural Tour 2012 held on May 2013 at the University of Puerto Rico at Mayaguez impacted 120 K-12 and 10 teachers.
- Agriculture: the science of the future. A teacher workshop and activity based in the importance of the agriculture, the agricultural crisis in Puerto Rico and other related themes. It was presented in Pinero's Amphitheater in November 17, 2012.
- Principles and Techniques of Recycling November 15, 2012
- Natural Resources November 30, 2012
- Soil Workshop December 6, 2012
- Workshops on Bios and Resume- Various times (January/February 2013)
- GLOBE Program workshop of data entry for the program's software (January 2013)
- Nanotechnology Workshop: 15 January 2013
- Informational Webinar Sessions on USDA Careers: September 2012, University of Puerto Rico at Mayaguez, Puerto Rico - HACCP Certification: February 2013, University of Puerto Rico at Mayaguez
- Plant Reproduction February 6, 2013
- Attendance at orientation webinar for summer internships with USDA: 7 February 2012
- Establishment Vegetable Garden (Garden 2) February 20, 2013
- Germination and plant structures Garden 1 February 27, 2013
- Agro Fair: 28 February 2013. A painting book about agriculture was distributed to children that visited the Fair. This activity in a campus wide supported by CETARS but is not part of the CETARS program.

- Plant diseases and insects March 13, 2013
- Two important processes in plants: Photosynthesis and nutrient uptake March 6, 2013
- Workshop on Science Fair for Elementary Students with Agro. Jaime Curbelo- March 7, 2013
- Crop Garden Workshop; Krystal Navarro & Fabián Carmona, March 16, 2013.
- Science on Wheels Shows that impacted over 500 students at Math competition and in Science Fair held on March 2013 at the Aymat Coliseum in San Sebastian and at the S Antonio S. Pedreira School in Moca, PR

The above described activities impacted over 1,000 K-12 students during September 1 to August 31 periods. Students participated in the USDA Webinar about internships and various other workshops including Life Skills, Time Management, Ethics in reseach, How to Plan Your Academic and Professional Future and a Nanotechnology workshop in January 2013.

### **Outreach and dissemination activities at Interamerican University of Puerto Rico San Germán**

IAUPR-SG conducted out scientific demonstrations to the public, as part of our dissemination activities. They presented demos during the Chemistry Week and Celebration of Earth Day. Both activities were carried out at San Juan, Puerto Rico. They also participated in an Institutional Family Day, where they also carried out demonstrations. They estimated the participation of about 1000 individuals/students from all ages (Table 19.1 )

**Table 19.1 CETARS-IAUPR-SG Outreach Activities**

<b>Activity</b>	<b>Place</b>	<b>Description of Activity</b>	<b>Date</b>	<b>Number of persons impacted</b>
International Coastal Cleaning	Cabo Rojo, PR	CETARS students participated in beach cleaning	September 21, 2012	>300
ACS Chemistry Festival / Paseo La Princesa	San Juan, P.R.	Erosion Effect on Water Quality Demonstration	October 21, 2012	>300
IAU Centenary - Agricultural Demonstrations/ IAU-PR,	San Germán, P.R.	Carried on Demonstrations about hydroponic systems and seeding.	March 2, 2013	>500
ACS Chemistry Festival / Paseo La Princesa -	San Juan, P.R.	Carried on Demonstrations about hydroponic systems and seeding.	April 28, 2013	>500

The University of Puerto Rico at Aguadilla (UPRA) also programed a series of activities aimed at student development and research tools. These included resume workshop, portfolio

workshop, summer internship orientation workshop, electronic database workshop, how to write a scientific article, how to write a good personal statement and a summer camp aimed at preparing student for research. These activities impacted 139 students. The summer camp impacted 19 high school students and 7 teachers. These activities are summarized in table 19.2 below.

**Table 19.3 UPR-Aguadilla Activities**

<b>Activity</b>	<b>Date</b>	<b>Students Impacted</b>
Resume Workshop	October 18, 2012	19
Portfolio Workshop	November 1, 2012	31
Summer Internship Workshop	November 27, 2012	20
Electronic Database Workshop	February 21, 2013	16
How to write a good scientific article	April 4, 2013	19
How to write a good “Personal Statement”	April 9, 2013	15
Summer Camp: Introduction to Scientific Research, Basic Concepts	June 1 – June 14	19 HS students (9 schools) 7 HS teachers

**20. Agency/Participant Survey:**

As part of the meta-evaluation process, Dr. Roy Johnson of IDRA developed and administered a survey to students and PD’s and collaborators, which is in the process of revision prior to its release. UPRM CETARS students administered survey to all impacted students from outreach activities. One hundred percent (100%) of the surveys students and teachers showed a great satisfaction with the program activities at their K-12 schools.

# **University of Texas – El Paso**

# INTERIM REPORT –YEAR 2

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This interim report has been completed with information  
collected on the current second year of funding (Sept 1/2012 – date)

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The University of Texas at El Paso (UTEP)

GRANT NO: 2011-38422-30803

USDA NIFA HSI PROPOSAL NO: 2011-02766

**BGREEN - Building a Regional Energy and Educational Network:  
A Partnership to Integrate Efforts and Collaboration to Shape Tomorrow's  
Hispanic Sustainable Energy Leaders**

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## OUTCOMES AND IMPACTS

### 1. Total number of USDA Agencies and Partners

(INDICATOR 1) BGREEN is a consortium integrated by four universities; The University of Texas at El Paso, Texas A&M-Kingsville, Texas State University-San Marcos, and New Mexico State University. Our consortium is partnering with the following agricultural research agencies; Agricultural Research Service-Southern Plains Area Director, Natural Resources Conservation Service–RIAD, Texas AgriLife Research Center at El Paso, and Rural Development.

### 2. Total number of internships (USDA vs. other)

(INDICATOR 2) In Year 1, a total of 18 students got an internship during the summer of 2012; 14 of those at USDA agencies and 4 of them at other agencies. The students were positioned in the following agencies/places: NRCS (4), NIFA (2), ARS (5), AMS (1), APHIS (1), Texas Agrilife (1), Citrus Center (1), INTEL, Albuquerque (2), Texas A&M (1). In order to increase the number of students obtaining an internship in Year 2, we are looking at more different agencies and making more contacts. We are positioning students to work as research interns with faculties as well. To date, we have secured 12 internships for BGREEN students. Additionally, we are contacting another pool of agencies to see if they can accept more students for this summer.

The agencies we are contacting are: USDA-ARS - Grassland Soil and Water Research Laboratory located in Temple, Texas; USDA ARS (Agricultural Research Service) Cotton Ginning Laboratory; USDA Farm Service Agency for Dona Ana County, the USDA NASS (National Agricultural Statistics Service) state office; USDA NRCS (Natural Resources Conservations Service) district office; the USDA AMS (Agricultural Marketing Service) livestock reporter; and USDA ARS Jornada Experimental Range. We are positive we can increase the number of student internships for Year 2.

### **3. Total number of Students served/ including gender and ethnicity**

(INDICATOR 3) On Year 2 cross the four institutions, 49 students are currently being supported; 18 of those are female students; 31 are male students; 38 are Hispanic.

### **4. Total percent of retention (undergraduate/grad/Ph.Ds)**

(INDICATOR 4) on Year 2, the level of study of the supported students is as follows; 10 PhD, 11 MS, and 28 UG. 100% retention in program until graduated in MS and Ph.D, 88% retention in UGs.

### **5. Total number of students in experiential learning (research) mentoring**

(INDICATOR 5) For Year 2, our goal is to at least position 20 students in USDA internships, and have at least 15 students work as research interns with faculties over the summer of 2013. All students working under BGREEN participate in research experiences/mentoring.

### **6. Total number of participants presenting**

(INDICATOR 6) On year 2, a total of 29 students have presented –or as scheduled to present– their research work at either regional or national conferences.

### **7. Total number of students enrolled in disciplines applicable to USDA jobs**

(INDICATOR 7) Out of the 49 students being supported under BGREEN in year 2, 45 are enrolled in disciplines applicable to USDA jobs.

### **8. Total number of degrees awarded with USDA qualifications**

(INDICATOR 8) – A total of 23; 19 BS and 4 MS - Of students hired on year 1, 6 students received BS in either May, summer or December of 2012; 1 received MS in May 2012; 13 will receive BS by May 2013, and 3 will receive MS by May 2013.

### **9. Total number of students publishing**

(INDICATOR 9) On Year 1, 42 peer reviewed publications were produced by BGREEN faculty and student co-authors in 8 of them. On Year 2, so far 35 peer reviewed publications have been produced by BGREEN faculty; BGREEN students are co-authors in 20 of them.

### **10. Comparison of GPA's before and after**

(INDICATOR 10) All students are performing well; on average the UG students have a GPA of 3.25, MS students have an average GPA of 3.65, Ph.D students have an average GPA of 3.93.

### **11. Developing curriculum and faculty for required USDA courses**

(INDICATOR 11) A total of 5 new 3-credit courses and 6 learning modules have been developed.

### **12. Comparison of female success (before and after): gender and ethnicity**

(INDICATOR 12) On year 2, 49 students are currently being supported; 18 of those are female students; 38 are Hispanic. Some examples of female success are shown below:

- Bridgette Quintero graduated in May 2012, she is currently working for a private company in Albuquerque, NM.
- Marisol, Burciaga-Montoya graduated in May 2012 and is currently pursuing an MS in industrial engineering at NMSU.
- Eliana Nuñez has been contacted by several universities to pursue an MS. She has also being contacted by Dr. Kim Kiniry (USDA-ARS) to join his research group. She has been nominated as the best senior of year 2013.
- Cristina Villa has been getting various awards due to her GPA. She is still working on sustainability but funded by NSF. She has also been contacted by several private companies to pursue a summer internship. She is one of the candidates for a BGREEN summer internship.
- Jody Elias has been contacted by numerous companies interested in her background and research experience.
- Clarissa Gonzalez and Amanda Herrera have been contacted by Intel, Rio Rancho NM.
- Ursula Erickson has plans to become an entrepreneur
- Felly Montelya graduated with a BS in Chemical Engineering and joined the MS in Chemical Engineering.

### **13. Total number of students honors advising and tutoring**

(INDICATOR 13) 8 students involved in advising other students.

### **14. Tracking students placement into jobs or Ph.Ds/ student mobility**

(INDICATOR 14) 6 students moved into MS program after graduating with BS degrees. 1 student has got a job in an energy related job in Washington State, the company is called EnergySolutions. Several other students are considering continuing with their MS studies after graduating from their BS.

### **15. Track research activities/ English skills**

- (INDICATOR 15) English proficiency is a mandatory competency component of all BGREEN funded students. All students are required to submit written reports of diverse

activities. Students performing research are also asked to submit periodical reports. All the research presentations given by students at different meetings offer them the opportunity to improve their presentation and communication skills. Across the different universities participating in the consortium, we all have different ways to track and enhance the research experiences of the BGREEN students. As an example, 12 poster presentations were given by BGREEN students mentored by BGREEN faculty at a local HSI conference at Texas State University held on 3/20/2013.

- Felipe Caldeira, **Tongdan Jin**. Carbon Footprint Mitigation via Wind Technology: a Lifecycle Analysis.
- Victor Santana-Viera, **Jesus Jimenez**, **Tongdan Jin**. Designing Distributed Generation Systems for Wafer Fabs considering Unexpected Downtime Cost.
- Ivan Zecena, **Zilang Zong**, **Tongdan Jin**. Energy Consumption Analysis of Different Algorithm Designs Running on Multicore Systems.
- Nhi Mai, Rana Dawud, Long Vo, **Tongdan Jin**. Electric Vehicles and the Impact on Power Quality of Distributed Generation Systems.
- Sergio Espinoza, Andres Alvarez, Adam Mokhtari, **Jitendra Tate**. NSF-NUE: NanoTRA Texas Regional Alliance to Foster Nanotechnology Environment, Health, and Safety Awareness in Tomorrow's Engineering and Technology Leaders.
- Jingfang Yu, Johnathan Simms, **Luyi Sun**. In-situ Synthesis of polyelectrolyte/LDH Intercalation Compounds.
- Davontae L. Habbit, Yan Li, **Luyi Sun**. Silver Nanoparticle Stabilized by Rice Husk Silica: Synthesis, Characterization and Catalytic Applications.
- Haoran Chen, Kaitlynn A. Lee, Adam J. Oliphant, Jarett C. Martin, **Luyi Sun**. Synthesis of Lithium Aluminum Silicate from Different Sources of Silica via Sol-gel Method.
- Adam J. Contreras, Stephen B. Riggs, **C. Reed Richardson**. The Value Of Natural Microflora In Food And Water Resources and Supplemental Probiotics In Sustaining "BGREEN" Ruminant Renewable Systems.
- Antonio S. Herrera, Stephen B. Riggs, **C. Reed Richardson**. Effects of Water Pollution In Hays, Caldwell, and Guadalupe Counties In Sustaining "BGREEN" Ruminant Renewable Systems.
- Erica M. Molina, Monique J. Manibusan, **C. Reed Richardson**. Evaluating The Effects of Tillage and Photoperiod on Reproductive Performance and Growth of Animals In Sustaining Small Ruminant Renewable Systems.
- Stephen B. Riggs, Hunberto Galvan, **C. Reed Richardson**. The Texas Stock Tank: Treatment Measuring For Sustainable BGREEN System Water For Livestock and Wildlife.

We also keep track of all the research activities our students are doing and we document work performed at internships as well. Some examples are shown below:

	<b>BGREEN STUDENT NAME</b>	<b>Brief Description</b>
1	Eliana, Nunez	Lab experiments; data collection. Algae Biofuels Project in spring 2012. Summer: Mason-Dixon project. this project is to use the data for ongoing biofuel research
2	Ursula, Erickson	Lab experiments; data collection. Algae Biofuels Project in spring 2012. For summer: Analysis of Algal Waste Using Energy Dispersive Spectrometry
3	Christina, Villa	Lab experiments; data collection. Algae Biofuels Project in spring 2012. In summer: ALMANAC simulation and collect data as well as hard physical labor to keep the plants free of weeds
4	Soltero, Jorge	Lab experiments and data collection: Biomass conversion to wood plastic composite project and Algae Biofuels Project
5	Basilio, Garcia	Lab experiments and data collection. Biomass conversion to wood plastic composite project
6	Marisol, Buruaga-Montoya	Lab experiments; data acollection. Algae Biofuels Project
7	Michael Carlock	Lab experiments and data collection. Biomass conversion to wood plastic composite project
8	Jose Del Rayo Corral	Lab experiments and data collection. Biomass conversion to wood plastic composite project
9	German Montes	He could not make it to work during summer time as it was scheduled
10	Fernando Perez	Lab experiments and data collection. Biomass conversion to wood plastic composite project
11	Montelya, Felly R.	Lab experiments; data collection. Algae Biofuels Project
12	Hector Hernandez	Literature review on renewable energy; solar energy potential in NM; wind and socio-economic data collection
13	Clarissa Gonzales	Creating a goal programming model to obtain a multi-objective optimization program for the mechanical properties of wood-plastic composites.
14	Bridgette Quintero	Lab experiments; data collection. Dark Fermentation and Anaerobic Digestion and Lipid Extracted Algal Biomass Project
15	Amanda Herrera	Creating a goal programming model to obtain a multi-objective optimization program for the mechanical properties of wood-plastic composites.
16	Jody Elias	Lab experiments and data collection. Biomass conversion to wood plastic composite project
17	Hill, Joshua	chemical analysis; experiments in spring 2012. For summer: Compositional Analysis of Algal Waste Project: Three different samples of the algal waste in the powder form were analyzed in triplicate using Energy Dispersive Spectrometry. For analysis using Gas Chromatography Mass Spectrometry, samples of the algal waste were dissolved in three different organic solvents. Blanks of each solvent were also prepared as a reference in using the gas chromatograph mass spectrometer.
18	German Reyes	Started Literature review. Started first draft of the research paper. Presented early stage of the project at the Southwest Energy Science and Engineering Symposium (2012). The project title was Challenges on Bio-Fuels Distribution Network in the United States. In summer: Obtain current data about: Plant location and capacity. Crop harvesting location and quantity. National fuel demand by location. Petro-fuel production and distribution.
19	Alex Bernald	Literature review on renewable energy; wind energy potential in NM; wind and socio-economic data collection
20	Arturo Del Valle	Literature Review on combinatorial methods for experimental optimization when converting biomass in to wood plastic composites. Lab experiments and data collection.
21	John Schutte	Literature Review on Chemical Recycling of Plastic Solid Waste for the Production of Transportation Fuels
22	Gabriela Rodriguez	Lab experiments; data collection. Algae Biofuels Project

## 16. K-12 activities

(INDICATOR 16) Different K-12 activities took place during the summer of Year 1 at the different institutions. Same activities are scheduled for Year 2. Some examples of the different K-12 activities that take place at our different institutions are:

### At UTEP:

UTEP organized the “Imagine the 2050 Green City Design Expo”. The Exposition took place on February 19-22. The main objective of the “Imagine the 2050 Green City Design Expo” is to raise awareness of the environment, and spark students' interest in a science and/or engineering career. The goal of the Imagine the 2050 Green City Design Expo is to engage students in the design of a model city set within the Southwestern United States that is as “green” as possible.

The Green City Expo had three categories to participate in:

**Category 1: Elementary School (Grades 3-5)** - Participants in this category were required to submit a drawing in which they created a graphic sketch or drawing to represent the 2050 Green City. All participants have their drawing posted on the Green City Expo website.

**Categories 2 and 3: Middle and High School (Grades 6-8 and 9-12)** - Participants under these 2 categories built a physical model "mock-up" and described the different components which made their city "green". Teams were encouraged to consider sustainability aspects related to water, energy, agriculture, waste management, green spaces and transportation systems. The top 20 teams and their associated schools were invited to tour the College of Engineering to learn more about green and sustainable initiatives.

This exciting event had a great impact in the local elementary, middle and high schools; we received 16 individual submissions from elementary school students. All of their drawings were accepted and displayed in the College of Engineering. On the categories 2 and 3, we received 36 submissions (each submission was sent by a team of 3-5 students), we accepted 25 of those submissions and invited to the College of Engineering to display their prototype and talk about their green city and the ideas they had to make be part of the development of future sustainable cities. The Expo directly impacted 16 elementary school students and 100 high school students. However, the Expo was set as an exhibition and served as a recruitment tool because we additionally brought 220 students from El Paso area high school to tour the expo and the College of Engineering. Drawings produced by the elementary school students and prototypes produced by high school students can be viewed at <http://engineering.utep.edu/greencity/index.htm>

### At NMSU:

- 1) BGREEN has also partnered with the NMSU Society of Women Engineers to participate in two events:
  - i. Expanding Your Horizons Conference for Girls. To be host in April 13 from 8:00am to 3:00pm. Target Audience: 6 - 12 grade girls. This event is funded by the NM Girls Collaborative Project in CSTEM  
<http://eyhnmsu.webs.com/>  
<http://ngcproject.org/collaborative/new-mexico-girls-collaborative-c-stem>
  - ii. Green City Design Competition to be hosted in second week of May. BGREEN faculty and students will organize and invite SWE students to collaborate with in this event.
  - iii. Many recruitment activities have been organized in the College of Engineering and BGREEN Faculty and students have actively participated in year 1 and 2 of the grant.

### At TXState:

Texas State have hosted more than 50 high school students visiting the engineering lab, and showcased the solar photovoltaic power production.

### At TAMUK:

Undergraduate and graduate students and faculty were involved in FFA Area recruiting activities. 10 activities took place with over 700 High School students coming to TAMUK. In month of April, over 1400 High School students are involved in recruiting by College of Agriculture with Dr. Nelson's Department overseeing the recruiting. 3 day Summer Camps in June 2012 were also used as recruiting opportunities.

## **17. Community engagement activities**

(INDICATOR 17) At TAMUK, student clubs are focus for community engagement with over 80% of all students within the College of Agriculture engaged in at least one club. Dr. Nelson oversees the TAMUK Horticulture Club and a new 'Soils Judging Team' was formed in 2012 with students placing 4<sup>th</sup> place in Regional competition. BGREEN Project at NMSU became a member of the NMSU Sustainability Council which reports to the Association for the Advancement of Sustainability in Higher Education in US. We are under the category of an Innovation Credit in the STARS report.

## **18. Budget implementation**

(INDICATOR 18) Budget expenditures are on track. Unspent funds from Year 1 are being used to support students traveling to conferences and pay student internships.

**19. Program activities/implementation**

(INDICATOR 19) Most of the planned activities are being carried out according to the anticipated schedule.

**20. Agency/ participant survey**

(INDICATOR 20) To ensure that more participants respond to the survey to be administered on year 2, BGREEN funded students have been asked to sign paperwork stating that they will take necessary survey as needed.

# ANNUAL REPORT –END OF YEAR 2

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This annual report has been completed with information  
collected from the second year of funding (Sept 1/2012 – Aug 31/2013)

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The University of Texas at El Paso (UTEP)

GRANT NO: 2011-38422-30803

USDA NIFA HSI PROPOSAL NO: 2011-02766

**BGREEN - Building a Regional Energy and Educational Network:  
A Partnership to Integrate Efforts and Collaboration to Shape Tomorrow's  
Hispanic Sustainable Energy Leaders**

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## OUTCOMES AND IMPACTS

### 1. Total number of USDA Agencies and Partners

(INDICATOR 1) BGREEN is a consortium integrated by four universities; The University of Texas at El Paso, Texas A&M-Kingsville, Texas State University-San Marcos, and New Mexico State University. Our consortium is partnering with the following agricultural research agencies; Agricultural Research Service-Southern Plains Area Director, Natural Resources Conservation Service–RIAD, Texas AgriLife Research Center at El Paso, and Rural Development.

### 2. Total number of internships (USDA vs. other)

(INDICATOR 2) In Year 1, a total of 18 students got an internship during the summer of 2012. In Year 2, 27 students got an internship during the summer of 2013. This represents a 50% increase in the placement of students at internships from Year 1 to Year 2. On Year 2, students were placed as follows: 16 at USDA or an agriculture related agency/facility, and 11 at other places. The students were positioned in the following places: NIFA (2); Soil Microbiology Lab/Cropping Systems Research Lab, and the Wind Erosion & Water Conservation Unit in USDA-ARS Lubbock, TX., (1); USDA-ARS Blackland Research Center, Temple, TX., (8); USDA-ARS, Mission, TX., (2); USDA-NRCS, San Benito, TX., (2); La Semilla Food Center, Anthony, NM., (1).

The other eleven (11) students that did not get a USDA internship, obtained the following positions during the Summer of 2013: summer research experience at any of the partner institutions (8), international experience (1), Samsung Austin Semiconductor (1), Philips, San Marcos, TX., (1).

### **3. Total number of Students served/ including gender and ethnicity**

(INDICATOR 3) On Year 2 cross the four institutions, 50 students were supported; 19 of those are female students; 31 are male students. Ethnicity is as follows: Hispanic (42), White (5), African American (2), Asian American (1).

### **4. Total percent of retention (undergraduate/grad/Ph.Ds)**

(INDICATOR 4) on Year 2, the level of study of the supported students is as follows; 11 PhD, 10 MS, and 29 UG. All Ph.D students are still part of the program, 90% retention at the MS and UG levels.

### **5. Total number of students in experiential learning (research) mentoring**

(INDICATOR 5) In Year 2, the 50 students supported under BGREEN worked at some type of research project with the different faculty members which are part of the consortium. All the 11 Ph.D students are writing Dissertations, 9 out of the 10 MS students are working toward their MS theses, and the UG students are involved in a research projects.

### **6. Total number of participants presenting**

(INDICATOR 6) In year 2, a total of 38 research presentations were given by BGREEN students/faculty at either regional or national conferences; 34 presentations were given by BGREEN students.

**\* BGREEN student name underlined and BGREEN Faculty Highlighted (in Bold)**

- [1] Moreno, O. and **Taboada, H.** (2013) Energy Efficiency and Conservation at The University of Texas at El Paso. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [2] Ibarra, J., Martinez, E., Trueba, I. and **Taboada, H.** (2013) An Evolutionary Optimization Algorithm for Logistics System Design Considering Multiple Types of Feedstock. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [3] Gutierrez, K., Trueba, I., Valles, C. and **Taboada, H.** (2013) Optimization of a Sustainable Biofuel Supply Chain using an Evolutionary Algorithm. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [4] Vance, R. and **Espiritu, J.** (2013). Second-Generation Biofuel Feedstock Optimization Considering Different Land Cover Scenarios and Watershed Impacts. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.

- [5] Padilla, J., Calderon, F., Acosta-Martinez, V., Van Pelt, S., Gardner, T., Baddock, M., **Noveron, J.** and Zobeck, T. (2013). Diffuse Reflectance Mid-Infrared Spectroscopy Reveals Chemical Differences in Soil Organic Matter Carried in Different Size Wind Eroded Sediments. CETARS Symposium, USDA/NIFA HSI Collaborative Grants Annual Meeting. Aug. 10-15, 2013. Mayaguez, Puerto Rico. (poster).
- [6] Bezares-Cruz, J., Walker, S., Lee, W-Y. and Espiritu, J. (2013). Removal Assessment of Endocrine Disrupting Chemicals in Wastewater Treatment Unit Processes in El Paso, TX. CETARS Symposium, USDA/NIFA HSI Collaborative Grants Annual Meeting. Aug. 10-15, 2013. Mayaguez, Puerto Rico. (poster)
- [7] Ituarte, C. and **Espiritu, J.** (2013) Considering Wind-Wake and Reliability as Multi-State System. Research Presentation at the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [8] Lopez, N. and **Espiritu, J.** (2013). Modular Energy-Storage System-Management by Adaptive Echolocation & Game Theory. Research Presentation at the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [9] **Espiritu, J.**, Lopez, N. and Lopez, R. (2013). Lopez, Renewable Energy System Optimization for a Rural Farm in the state of Morelos, Mexico. Research Presentation at the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [10] **Espiritu, J.**, Ituarte, C., Lopez, N. and **Taboada, H.** (2013) Wind Farm Layout Optimization Considering Multiple-Objectives. Research Presentation at the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
- [11] Carlos A. Escobar, German Reyes and **Hansuk Sohn**, "Modeling and Analysis of Sustainable Emergency Medical Services in Las Cruces, NM", SACNAS (Advancing Hispanics/Chicanos & Native Americans in Science) Conference, Poster Presentation, San Antonio, TX, October 3-6, 2013.
- [12] Bernal, A.E. and **Acharya, R.N.** 2013. "Wind as Renewable Energy Option for Rural Southwest." Presented at the *Graduate Research & Arts Symposium*, Las Cruces, New Mexico, March 11-13, 2013.
- [13] Bernal, A.E. and **Acharya, R.N.** 2013. "Small Wind in an Agricultural Setting." Presented at the annual meeting of *American Society of Agricultural and Biological Engineers*, New Mexico Section, Bio systems Group, Las Cruces, New Mexico, April 12, 2013.
- [14] Bernal, A.E. and **Acharya, R. N.** 2013. "The Economics and Demographics of Small Wind." Presented at the 23rd Annual World Forum and Symposium of the *International Food and Agribusiness Management Association*, Atlanta, Georgia, June 16-20, 2013.
- [15] Hernandez, H. and **Acharya, R. N.** 2013. "Pyrethrum Production and Marketing Challenges and Opportunities for Smallholder Farmers in Kenya." Poster presented at the *2013 Graduate Research and Arts Symposium*, NMSU, March 12, 2013.

- [16] Hernandez, H. and **R.N. Acharya**. 2013. "Pyrethrum Production in Kenya." Presented at the annual meeting of the *American Society of Agricultural and Biological Engineers*, NM Section, Las Cruces, April 12, 2013.
- [17] Hernandez, H. and **R.N. Acharya**. 2013. "Export Demand for Natural Insecticide (Pyrethrum) Produced in Kenya." Presented at the 23<sup>rd</sup> Annual World Forum and Symposium of the *International Food and Agribusiness Management Association*, Atlanta, Georgia, June 16-20, 2013.
- [18] Yu, J.; Xiang, L.; Martin, B. R.; Gummelt, C. A.; Clearfield, A.; Luo, Z.; **Sun, L.** Tailoring the Third Dimension in Layered Materials: Direct Synthesis of Layered Intercalation Compounds and Colloidal Single-Layer Nanosheets. 2013 TMS Annual Meeting & Exhibition. March 3-7, 2013, San Antonio, TX.
- [19] Wang, W.; Martin, J. C.; Huang, R.; Huang, W.; Li, A.; Han, A.; **Sun, L.** Synthesis of Organosilicon Complexes from Rice Husk Derived Silica Nanoparticles. Global Biofuels & Bioproducts Summit. November 19-21, 2012, San Antonio, TX.
- [20] Chen, H.; Wang, W.; Martin, J. C.; Oliphant, A.; DeBorn, K.; Fan, X.; Huang, W.; Wang, H.; **Sun, L.** Comprehensive Utilization of Rice Husks. Global Biofuels & Bioproducts Summit. November 19-21, 2012, San Antonio, TX.
- [21] Wang, W.; Martin, J. C.; Huang, R.; Huang, W.; Liu, A.; Han, A.; **Sun, L.** Synthesis of Organosilicon Complexes from Rice Husk Derived Silica Nanoparticles. 2012 AIChE Annual Meeting. October 28-November 2, 2012, Pittsburgh, PA.
- [22] Chen, H.; Wang, W.; Martin, J. C.; Oliphant, A.; DeBorn, K.; Fan, X.; Huang, W.; Wang, H.; **Sun, L.** Comprehensive Utilization of Rice Husks. 2012 AIChE Annual Meeting. October 28-November 2, 2012, Pittsburgh, PA.
- [23] Chen, H.; Wang, W.; Martin, C. J.; Oliphant, J. A.; Doerr, A. P.; DeBorn, M. K.; Xu, J.; Wang, H.; **Sun, L.** Extraction of Lignocellulose and Synthesis of Porous Silica Nanoparticles from Rice Husks - A Comprehensive Utilization of Rice Husk Biomass. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [24] Chen, H.; Lee, A. K.; Oliphant, J. A.; Martin, C. J.; **Sun, L.** Synthesis of Lithium Aluminum Silicate from Different Sources of Silica via Sol-gel Method. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [25] Yu, J.; Sims, J. E.; Martin, J. C.; **Sun, L.** In situ Synthesis of Layered Double Hydroxide (LDH)/Polyelectrolyte Intercalation Compounds. HSI Research Symposium, March 20, 2013, San Marcos, TX.

- [26] Yu, J.; Sims, J. E.; **Sun, L.** Silver Nanoparticles Stabilized by  $\alpha$ -Zirconium Phosphate Nanosheets. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [27] Li, Y.; Turner, R. R.; Habbit, D. L.; Chen, H.; **Sun L.** Monodisperse Gold Nanoparticles Supported by Rice Husk Silica for Heterogeneous Catalysis Applications. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [28] Habbit, D. L.; Li Y.; **Sun, L.** Silver nanoparticle stabilized by rice husk silica: synthesis, characterization and catalytic applications. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [29] Ding, F.; Sisco, A. Z.; Yarbrough, B. F.; Hu, H.; Zhou, Y.; Hurtado, G. H.; **Sun, L.** Sulfonated Poly(fluorenyl ether ketone)/Functionalized  $\alpha$ -Zirconium Phosphate Nanocomposites Membrane for Fuel Cell Applications. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [30] Ding, F.; Yarbrough, B. F.; Sisco, A. Z.; Hu, H.; Zhou, Y.; Hurtado, G. H.; **Sun L.** Sulfonated Poly(fluorene ether ketone) (SPFEK)/ $\alpha$ -Zirconium Phosphate ( $\alpha$ -ZrP) Nanocomposite Membrane for Fuel Cell Applications. HSI Research Symposium, March 20, 2013, San Marcos, TX.
- [31] Wang, W.; Martin, J. C.; Huang, R.; Huang, W.; Liu, A.; Han, A.; **Sun, L.**; Chen, H. Synthesis of Organosilicon Complexes from Rice Husk Derived Silica Nanoparticles. 2013 TMS Annual Meeting & Exhibition. March 3-7, 2013, San Antonio, TX.
- [32] Yu, J.; Sims, J. E.; Martin, J. C.; **Sun, L.** In Situ Synthesis of Layered Double Hydroxide (LDH)/Polyelectrolyte Intercalation Compounds. 2013 International Polyolefins Conference. February 24-February 27, 2013, Houston, TX.
- [33] Chen, H.; Wang, W.; Martin J. C.; Oliphant, A. J.; Doerr P. A.; DeBorn, K. M.; Xu, J. F.; Wang, H.; **Sun, L.** Extraction of Lignocellulose and Synthesis of Porous Silica Nanoparticles from Rice Husks-A Comprehensive Utilization of Rice Husk Biomass. 2012 OMICS: Global Biofuels & Bioproducts Summit. November 19-21, 2012, San Antonio, TX.
- [34] Chen, H.; Wang, W.; Martin J. C.; Oliphant, A. J.; Doerr P. A.; DeBorn, K. M.; Xu, J. F.; Wang, H.; **Sun, L.** Extraction of Lignocellulose and Synthesis of Porous Silica Nanoparticles from Rice Husks-A Comprehensive Utilization of Rice Husk Biomass. The Fourth International Research Conference for Graduate Students. November 7-8, 2012, San Marcos, TX.
- [35] Yu, J.; Li, Y.; Spiegel, M. T.; **Sun, L.** Silver Nanoparticle Stabilized by  $\alpha$ -Zirconium Phosphate Nanosheets. 2012 Chinese American Chemical Society-Southwest Chapter Fall Meeting. October 13, 2012, Huston, TX.

- [36] Chen, H.; Wang, W.; Martin J. C.; Oliphant, A. J.; Doerr P. A.; DeBorn, K. M.; Xu, J. F.; Wang, H.; **Sun, L.** Extraction of Lignocellulose and Synthesis of Porous Silica Nanoparticles from Rice Husks-A Comprehensive Utilization of Rice Husk Biomass. 2012 Chinese American Chemical Society-Southwest Chapter Fall Meeting. October 13, 2012, Huston, TX.
- [37]M. Romero, Gentry, and **S.D. Nelson**. Accelerated Solvent Extraction of the Herbicide Mesotrione from Soils. ASA-CSSA-SSSA International Annual Meeting. Nov. 3-6, 2013. Tampa, FL.
- [38]K. Montemayor, T. Machado, K. McCuiston, M. Rouquette, and J. Paschal. The Correlation of Residual Feed Intake on Carcass Characteristics of Brahman and Brahman Influenced Steers. CETARS Symposium, USDA/NIFA HSI Collaborative Grants Annual Meeting. Aug. 10-15, 2013. Mayaguez, Puerto Rico. (poster)

## 7. Total number of students enrolled in disciplines applicable to USDA jobs

(INDICATOR 7) Out of the 50 students supported under BGREEN in year 2, 45 are enrolled in disciplines applicable to USDA jobs.

## 8. Total number of degrees awarded with USDA qualifications

(INDICATOR 8) – A total of 23 students who were BGREEN participants have graduated by the end of Year 2; 19 received BS and 4 received MS degrees. On Year 1, 6 students received a BS degree in either May, summer or December of 2012; 1 received an MS degree in May 2012. On Year 2, 13 received BS degrees in May 2013, and 3 received MS degrees in May 2013.

## 9. Total number of students publishing

(INDICATOR 9) On Year 2, 8 peer reviewed publications were produced by BGREEN faculty, students are co-authors in 7 of them.

\* BGREEN student name underlined and **BGREEN Faculty Highlighted (in Bold)**

1. Moreno, O. and **Taboada, H.** (2013) Energy Efficiency and Conservation at The University of Texas at El Paso. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
2. Ibarra, J., Martinez, E., Trueba, I. and **Taboada, H.** (2013) An Evolutionary Optimization Algorithm for Logistics System Design Considering Multiple Types of Feedstock. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.
3. Vance, R. and **Espiritu, J.** (2013). Second-Generation Biofuel Feedstock Optimization Considering Different Land Cover Scenarios and Watershed Impacts. In Proceedings of the Industrial Engineering Research Conference (IERC 2013), San Juan, Puerto Rico, May 18-22, 2013.

4. Zecena, Z. Zong, R. Ge, **T. Jin**, "Energy consumption analysis of parallel sorting algorithms running on multicore systems," in Proceedings of Green Computing Conference (IGCC), 2012, pp. 1-6.
5. Saul Villarreal, **Jesus A. Jimenez**, **Tongdan Jin**, and Mauricio Cabrera-Rios, "Designing a sustainable and distributed generation system for semiconductor wafer fabs," IEEE Transactions on Automation Science and Engineering, vol. 10, no. 1, 2013, pp. 10-16.
6. Chen, H.; Wang, W.; Martin, J. C.; Oliphant, A. J.; Doerr, P. A.; Xu, J. F.; DeBorn, K. M.; Chen, C.; **Sun, L.** Extraction of Lignocellulose and Synthesis of Porous Silica Nanoparticles from Rice Husks - A Comprehensive Utilization of Rice Husk Biomass. *ACS Sustainable Chemistry & Engineering* **2013**, *1*, 254-259.
7. Wu, X.; Zeng, H.; Yu, Q.; Fan, C.; Ren, J.; Yuan, S.; **Sun, L.** Controlled growth and up-conversion luminescence of  $Y_2O_3 : Er^{3+}$  phosphor with the addition of  $Bi_2O_3$ . *RSC Advances* **2012**, *2*, 9660-9664.
8. Wang, W.; Martin, J. C.; Huang, R.; Huang, W.; Liu, A.; Han, A.; **Sun, L.** Synthesis of Silicon Complexes from Rice Husk Derived Silica Nanoparticles. *RSC Advances* **2012**, *2*, 9036-9041.

## **10. Comparison of GPA's before and after**

(INDICATOR 10) All students are performing well; on average the UG students have a GPA of 3.25, MS students have an average GPA of 3.65, Ph.D students have an average GPA of 3.93.

## **11. Developing curriculum and faculty for required USDA courses**

(INDICATOR 11) A total of 5 new 3-credit courses and 6 learning modules have been developed.

## **12. Comparison of female success (before and after): gender and ethnicity**

(INDICATOR 12) On year 2, 50 students are currently being supported; 19 of those are female students; 42 are Hispanic. 100% retention of females.

## **13. Total number of students honors advising and tutoring**

(INDICATOR 13) 13 students involved in advising other students.

## **14. Tracking students placement into jobs or Ph.Ds/ student mobility**

(INDICATOR 14) 6 students moved into MS program after graduating with BS degrees. 1 student got a job in an energy related job in Washington State, the company is called EnergySolutions. Several other students are considering continuing with their MS studies after graduating from their BS.

## **15. Track research activities/ English skills**

(INDICATOR 15) English proficiency is a mandatory competency component of all BGREEN funded students. All students are required to submit written reports of diverse activities.

Students performing research are also asked to submit periodical reports. All the research presentations given by students at different meetings offer them the opportunity to improve their presentation and communication skills. Across the different universities participating in the consortium, we all have different ways to track and enhance the research experiences of the BGREEN students.

## **16. K-12 activities**

(INDICATOR 16) Different K-12 activities took place on Year 2. Some examples of the different K-12 activities that took place at our different institutions are:

### **At UTEP:**

UTEP organized the “Imagine the 2050 Green City Design Expo”. The Exposition took place on February 19-22. The main objective of the “Imagine the 2050 Green City Design Expo” is to raise awareness of the environment, and spark students' interest in a science and/or engineering career. The goal of the Imagine the 2050 Green City Design Expo is to engage students in the design of a model city set within the Southwestern United States that is as “green” as possible.

The Green City Expo had three categories to participate in:

**Category 1: Elementary School (Grades 3-5)** - Participants in this category were required to submit a drawing in which they created a graphic sketch or drawing to represent the 2050 Green City. All participants have their drawing posted on the Green City Expo website.

**Categories 2 and 3: Middle and High School (Grades 6-8 and 9-12)** - Participants under these 2 categories built a physical model "mock-up" and described the different components which made their city "green". Teams were encouraged to consider sustainability aspects related to water, energy, agriculture, waste management, green spaces and transportation systems. The top 20 teams and their associated schools were invited to tour the College of Engineering to learn more about green and sustainable initiatives.

This exciting event had a great impact in the local elementary, middle and high schools; we received 16 individual submissions from elementary school students. All of their drawings were accepted and displayed in the College of Engineering. On the categories 2 and 3, we received 36 submissions (each submission was sent by a team of 3-5 students), we accepted 25 of those submissions and invited to the College of Engineering to display their prototype and talk about their green city and the ideas they had to make be part of the development of future sustainable cities. The Expo directly impacted 16 elementary school students and 100 high school students. However, the Expo was set as an exhibition and served as a recruitment tool because we additionally brought 220 students from El Paso area high school to tour the expo and the College of Engineering. Drawings produced by the elementary school students and

prototypes produced by high school students can be viewed at <http://engineering.utep.edu/greencity/index.htm>

#### At NMSU:

- 1) BGREEN has also partnered with the NMSU Society of Women Engineers to participate in two events:
  - i. Expanding Your Horizons Conference for Girls. To be host in April 13 from 8:00am to 3:00pm. Target Audience: 6 - 12 grade girls. This event is funded by the NM Girls Collaborative Project in CSTEM <http://eyhnmsu.webs.com/>  
<http://ngcproject.org/collaborative/new-mexico-girls-collaborative-c-stem>
  - ii. Green City Design Competition to be hosted in second week of May. BGREEN faculty and students will organize and invite SWE students to collaborate with in this event.
  - iii. Many recruitment activities have been organized in the College of Engineering and BGREEN Faculty and students have actively participated in year 1 and 2 of the grant.

#### At TXState:

Texas State have hosted more than 50 high school students visiting the engineering lab, and showcased the solar photovoltaic power production.

#### At TAMUK:

We had an outreach program that brought in High School age students and their teachers to a 3 day summer camp during 2 separate weeks in the month of June 2012 was put on at TAMUK campus. Discussions regarding sustainability of natural resources and biofuels were incorporated into these summer camp training events. Summer camps were repeated for Community College age students in June 2103 with sustainability focus in animal, plant and soil sciences programs.

### **17. Community engagement activities**

(INDICATOR 17) At TAMUK, student clubs are focus for community engagement with over 80% of all students within the College of Agriculture engaged in at least one club. Dr. Nelson oversees the TAMUK Horticulture Club and a new 'Soils Judging Team' was formed in 2012 with students placing 4<sup>th</sup> place in Regional competition. BGREEN Project at NMSU became a member of the NMSU Sustainability Council which reports to the Association for the Advancement of Sustainability in Higher Education in US. We are under the category of an Innovation Credit in the STARS report.

### **18. Budget implementation**

(INDICATOR 18) Budget expenditures are on track.

**19. Program activities/implementation**

(INDICATOR 19) Most of the planned activities are being carried out according to the anticipated schedule.

**20. Agency/ participant survey**

(INDICATOR 20) Project Director sent an email to all project co-directors requesting completion of student survey. 30 students completed survey on Year 2.