



# UPRM-CETARS: Consolidating the pipeline in Agriculture and Natural Resources

## From K-12 to The Field

Award #: USDA/NIFA: 2011-38422-30835.

Amount: 850K for second year for a total of 1.65M

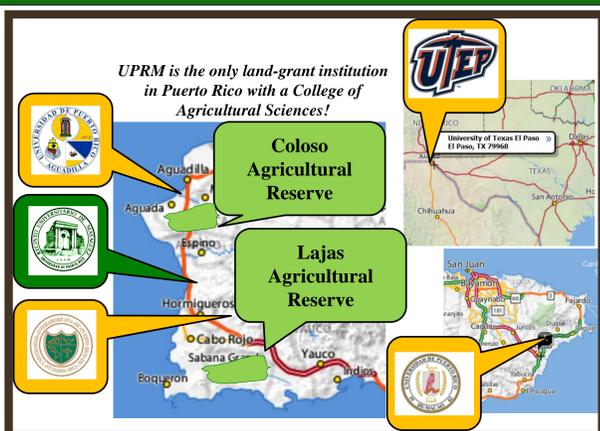


### Abstract

The CETARS program provide students from agriculture and related disciplines, graduate research assistantships, undergraduate research stipends, outreach activities, training and hands-on research experiences from K-12 to PhD. The proposal is synergistic collaboration between UPRM, UTEP, UPRAg, UPRH, and IAUSG. CETARS education training activities are aimed at providing innovative, high impact research training and education to students and faculty from underrepresented groups. CETARS will establish and consolidate a pipeline attracting by retaining and graduating talented individuals while supporting their actual placement in Agriculture-related positions. The CETARS program during its second year benefited over 1,000 K-12, 50 B.S., 9 M.S. and 6 Ph.D. students and over 2,000 individuals through its research and outreach activities.

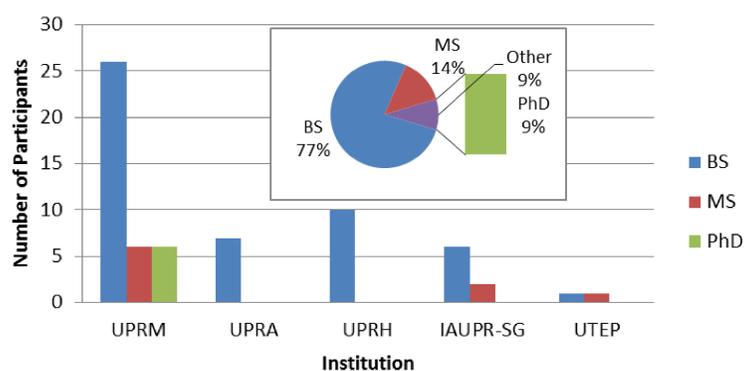
Projected Outcomes: Strengthen the Food Science, Applied Chemistry, and Crops and Agro-Environmental Sciences by creating new interdisciplinary courses in the latest food and agribusiness technologies, establish a suitable interagency network to facilitate the placement of program graduates in USDA-Mission Critical Occupations (MCO's) and promote faculty development and competitiveness, retain, graduate and place at least 80% of program graduates in USDA positions. The project will follow the performance of students and faculty involved by monitoring of their retention, time for graduation and hiring, number of peer-reviewed publications, and received grants. Student's success will be based on research and agribusiness results.

### Agencies/Organizations/ collaborators

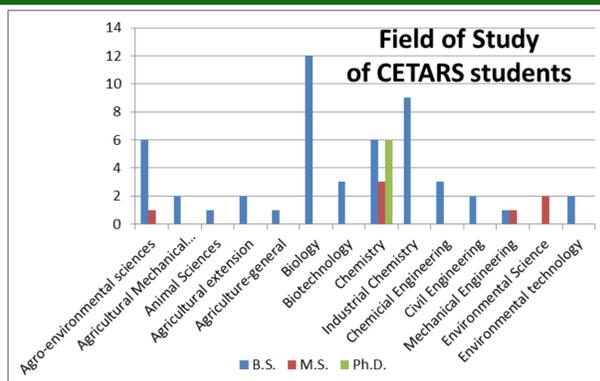


### Participants by Institutions

#### CETARS Participants per Institution



### CETARS Participants by fields of study



### Objectives

- Strengthen** collaborative research-education between Food Science, Applied Chemistry, Crops and Environmental Sciences and Engineering Science and Materials
- Develop** outreach activities at participating institutions from K-12 to recruit talented students into agriculture or related sciences
- Increase** the participation of minority students in programs related to agricultural sciences and the protection of natural resources
- Enhance** the research skills of students by exposing them to experiential research-learning and community service
- Foster** student-centered research to solve real-life problems faced by communities, small developing agro-industries and government agencies
- Develop** a technical "critical mass" supporting multi-institution collaborations to solve technical problems in Puerto Rico
- Promote** faculty development and competitiveness in agriculture and related sciences.

### Current Project outcomes

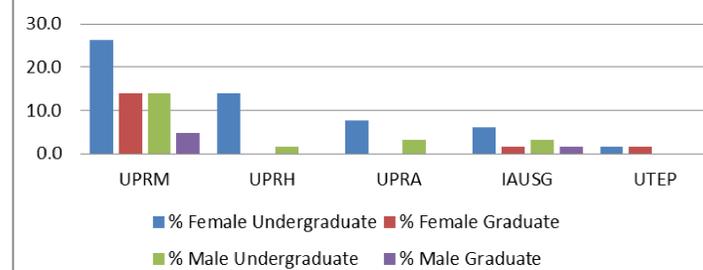
- The CETARS project serves a student population 65 Hispanic students (50 are undergraduates, 9 MS and 6 PhD in five campuses) which represents an increase of 18% from the previous year and are divided into the following fields: Agro-environmental Sciences 6 BS and 1 MS, Agriculture Mechanical Technology 2 BS, Animal Sciences 1BS, General Agriculture 1BS, Food Science and Technology 2 MS, Chemistry: 6 BS, 3 MS and 6 PhD, Industrial Chemistry 9 BS, Biotechnology 4 BS, Biology 12 BS, Chemical Engineering 3BS, Civil Engineering 2 BS, Mechanical Engineering 1 MS. Environmental Technology 2 BS, Environmental Sciences 2 MS; 90% retention.
- Forty seven (47) of the 65 are females, representing 72% of the served population ( 55.45 undergraduates).
- Female's success before and after CETARS experiences was evaluated in a survey carried out to females in November 2013. They 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.
- The CETARS project has 50 undergraduate students of which 100 are actively involved in experiential learning activities and 46 are involved in research thus representing a 92% participation.
- During the second year we had 13 publications in peer review journals and 81 presentations at local and national meetings.
- 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.
- Over 20 K-12 schools distributed throughout Puerto Rico were visited for a total of 1291 students impacted directly into the classrooms. Ten schools were visited by CETARS agriculture students to establish a school vegetable garden and present at least 10 training sessions related to crop and sustainable development impacting 437 students. Fifteen lectures/workshops were presented per elementary school, for a total of 150 lectures. Another ten K-12 schools were visited every month by the CETARS' science and engineering students using the Globe program to work with students in hydrology and soils assays impacting 477 k-12 students directly in the classrooms. The Interamerican University of Puerto Rico at San German (IAUPRSG) also impacted 296 K-12 students and UPR-Humacao impacted 82 high school students for a total of 1292 K-12 students by the CETARS program. Also chemical demonstrations by IAUPR SG students and UPRM Science-On-Wheels shows impacted over 1000 K-12 students from public schools in Puerto Rico.

### Photos of K-12 Activities



### Female Participation

#### Percent Male vs Female Participation Per Institutions in Undergraduate and Graduate Programs



### Acknowledgements

We greatly appreciate the support of USDA-NIFA-HSI Program under the grant 2011-38422-30835. It has allow us to help CETARS students towards the achievement of their goals. We also thank all the UPRM personnel that assisted in this project.