

# Special Research Grants Program Aquaculture Research

Modification: Page 20 to correct Indirect Cost Language

## **Fiscal Years (FY) 2019 and 2020 Request for Applications (RFA)**

**LETTER OF INTENT RECEIPT DATE: April 29, 2019**

**APPLICATION DEADLINE: May 28, 2019**

**ELIGIBILITY: See Part III, A of RFA**

This RFA solicits applications for two funding cycles (FY 2019 and FY 2020). Applicants considering applying to the second year should check the [Special Research Grants Program Aquaculture Research RFA webpage](#) and [www.grants.gov](http://www.grants.gov) after September 30, 2019 for the FY 2020 Funding Opportunity Number and Application Kit, as well as for any programmatic changes.

ANTICIPATED FUNDING AVAILABLE for FY2019: \$2 million



United States  
Department of  
Agriculture

National Institute  
of Food and  
Agriculture

**NATIONAL INSTITUTE OF FOOD AND AGRICULTURE; U.S. DEPARTMENT OF AGRICULTURE**

**SPECIAL RESEARCH GRANTS PROGRAM: AQUACULTURE RESEARCH (AQUA)**

**INITIAL ANNOUNCEMENT**

**CATALOG OF FEDERAL DOMESTIC ASSISTANCE:** This program is listed in the Assistance listings under the Catalog of Federal Domestic Assistance number 10.200.

**DATES:** This Request for Application (RFA) solicits application for two funding cycles (FY 2019 and FY 2020).

**2019:** A Letter of Intent (LOI) for the FY 2019 funding cycle is highly encouraged and should be received by 5:00 p.m., Eastern Time on April 29<sup>th</sup>, 2019. Applications for the FY 2019 funding cycle must be received by 5 p.m. Eastern Time on May 28, 2019.

**FY 2020:** A Letter of Intent (LOI) for the FY 2020 funding cycle is highly encouraged and should be received by 5:00 p.m., Eastern Time on February 19, 2020. Applications for FY 2020 funding cycle must be received by 5 p.m. Eastern Time on April 22, 2020. Any updates will be posted to NIFA website.

Applications received after these deadlines will normally not be considered for funding (see Part IV, C of this RFA). Comments regarding this RFA are requested within six (6) months from the issuance of this notice. Comments received after that date will be considered to the extent practicable.

**STAKEHOLDER INPUT:** We at the National Institute of Food and Agriculture (NIFA) seek your comments about this RFA. We will consider your comments when we develop the next RFA for the program, if applicable, and we'll use them to meet the requirements of section 103(c)(2) of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7613(c)(2)). Submit your written stakeholder comments by the deadline set forth in the DATES portion of this notice via email to [Policy@nifa.usda.gov](mailto:Policy@nifa.usda.gov). (This email address is only for receiving comments regarding this RFA and *not* for requesting information or forms.) In your comments, please state that you are responding to the Aquaculture Research RFA.

Visit the [NIFA website](#) to access a factsheet on the Center of Excellence (COE) designation process, including COE criteria, and a list of programs that are offering COE opportunities. You may also review a recording of COE outreach and COE implementation webinars on the site. We will update COE webpages as appropriate.

**EXECUTIVE SUMMARY:** NIFA requests applications for the Special Research Grants Program - Aquaculture Research competitive grants program (henceforth, Aquaculture Research program) for two funding cycles, fiscal years (FY) 2019 or 2020. Applicants considering applying to the second year should check the [Special Research Grants Program Aquaculture Research RFA webpage](#) and [www.grants.gov](http://www.grants.gov).

The anticipated amounts available for grants in FY 2019 or FY 2020 are approximately \$1.2 million in each year.

This RFA is being released prior to the passage of an appropriations act for FY 2020. Enactment of additional continuing resolutions or an appropriations act may affect the availability or level of funding for this program in FY 2020.

This program funds applied aquaculture research projects to address issues related to: 1) Genetics of commercial aquaculture species; 2) Critical disease issues impacting commercial aquaculture species; 3) Design of environmentally and economically sustainable commercial aquaculture production systems; or 4) Economic research for increasing commercial aquaculture profitability.

Significant changes described in this RFA include:

- The inclusion of two fiscal years with separate sets of deadlines for each year;
- A new category for smaller, seed projects, with an intent to generate preliminary data for future submissions to the NIFA aquaculture program;
- Letters of intent are highly encouraged for this program in FY 2019 and FY 2020;
- A Data Management Plan (DMP) is required; and
- Matching support is no longer required for the Aquaculture Research program.

## Table of Contents

PART I—FUNDING OPPORTUNITY DESCRIPTION .....	5
A. Legislative Authority .....	5
B. Purpose and Priorities .....	5
PART II—AWARD INFORMATION.....	8
A. Available Funding .....	8
B. Types of Applications .....	8
C. Project Types: .....	9
D. Responsible and Ethical Conduct of Research .....	9
PART III—ELIGIBILITY INFORMATION.....	10
A. Eligible Applicants .....	10
B. Cost Sharing or Matching .....	10
C. Centers of Excellence .....	10
PART IV—APPLICATION AND SUBMISSION INFORMATION .....	11
A. Letter of Intent Instructions .....	12
B. Electronic Application Package .....	13
C. Content and Form of Application Submission.....	14
D. Submission Dates and Times.....	19
E. Funding Restrictions .....	20
F. Other Submission Requirements .....	21
PART V—APPLICATION REVIEW REQUIREMENTS.....	22
A. General.....	22
B. Evaluation Criteria .....	22
D. Conflicts of Interest and Confidentiality .....	24
E. Organizational Management Information .....	24
F. Application Disposition.....	24
PART VI—AWARD ADMINISTRATION .....	25
A. General.....	25
B. Award Notice .....	25
C. Administrative and National Policy Requirements.....	25
D. Expected Program Outputs and Reporting Requirements .....	25
PART VII—AGENCY CONTACT .....	27
PART VIII—OTHER INFORMATION .....	27
A. Use of Funds; Changes .....	28
B. Confidential Aspects of Applications and Awards.....	28
C. Regulatory Information.....	29
D. Definitions .....	29
E. Materials Available on the Internet.....	29

## **PART I—FUNDING OPPORTUNITY DESCRIPTION**

### **A. Legislative Authority**

The authority for the Special Research Grants Program - Aquaculture Research competitive grants program (henceforth, Aquaculture Research program) is contained in the Competitive, Special, and Facilities Research Grant Act, Pub. L. No. 89-106, as amended (7 USC 3157 (c)(1)(A)).

### **B. Purpose and Priorities**

The purpose of the Aquaculture Research program is to support the development of an environmentally and economically sustainable aquaculture industry in the U.S. by generating new, science-based information and technology to address industry constraints. Results of projects supported by this program are intended to help improve the profitability of the U.S. aquaculture industry, reduce the U.S. trade deficit, increase domestic food security, expand markets for U.S.-produced products, and provide more jobs for rural and coastal America.

Aquaculture produces more than half of the seafood consumed globally, and this contribution is expected to grow. Although U.S. aquaculture production has shown growth, the U.S. has a \$13 billion seafood trade deficit and imports more than 90% (by value) of seafood consumed. The factors that limit aquaculture in the U.S. are complex and multifaceted. Applied research in genetics, disease, production systems, and economics is needed to develop science-based, practical solutions that will facilitate growth of the U.S. aquaculture industry. This research will help reduce the U.S. trade deficit in seafood products and enhance the capacity of the U.S. aquaculture industry to contribute to domestic and global food security and economic growth.

For FYs 2019 and 2020 Aquaculture Research program, NIFA is soliciting applied aquaculture research applications. Applications must:

- 1) directly address major constraints to the U.S. aquaculture industry; and
- 2) focus on one or more of the following Program Area Priorities:
  - Genetics of commercial aquaculture species;
  - Critical disease issues impacting commercial aquaculture species;
  - Design of environmentally and economically sustainable commercial aquaculture production systems; or
  - Economic research for increasing commercial aquaculture profitability.

You must specify in the introductory part of the narrative which of the four Program Area Priorities (above) are addressed by your proposal. If multiple areas are covered, provide an estimate of the percentage of effort/funds dedicated to each, with the sum of percentages equaling 100 percent.

Priorities defined in this Aquaculture Research Program RFA are aligned with the following 2018-2022 USDA Strategic Goals (<https://www.usda.gov/our-agency/about-usda/strategic-goals>):

- Strategic Goal 2: Maximize the Ability of American Agricultural Producers to Prosper by Feeding and Clothing the World; and
- Strategic Goal 4: Facilitate Rural Prosperity and Economic Development

**Other key information:**

- This program is limited to **applied** research.
- Applications must include U.S. aquaculture industry involvement. This can include, but is not limited to, a U.S. aquaculture producer as a co-project director or partner or assembling an industry advisory committee for the project (e.g., a farmer’s advisory committee for the project that can also include producer-based organizations, feed manufacturers, animal health industry, etc.).
- Applications must clearly state how the research results or technology developed will be transferred to end-users outside of direct, scientific peers.
- Applicants must clearly describe how their specific research project will increase U.S. aquaculture production or profitability in the short or medium-term (1-5 years after the grant ends).
- For the critical disease Program Area Priority, proposals that focus on pathogens that pose a risk to humans or human food safety (vs. those that affect the health of an aquaculture species) are outside the scope of this program and will not be accepted or considered for review.
- Applicants must provide a plan to release research results to the public in a timely manner and provide a description and budgeted plan for the release of research results that is compliant with the terms and conditions that govern USDA NIFA-funded projects in aquaculture. Terms and conditions can be found at: <https://www.nifa.usda.gov/business/awards/awardterms.html>
- Applicants must include statistical power analyses, when appropriate, and describe the experimental design, experimental unit, replication and sample size for each experimental group.
- Applicants are strongly encouraged to review the American Fisheries Society (AFS) document, *Guidelines for the Use of Fishes in Research* (2014), when developing applications for submission to this RFA.
- The inclusion of students actively engaged in the scholarship of the research projects is strongly encouraged (particularly undergraduate student interns and trainees, graduate students, and post-doctoral research associates) to provide hands-on, experiential learning and training opportunities. Actively engaged students should be encouraged to contribute to presentations, articles, posters, and other expressions of scholarship that reflect their own work on the project.

NIFA encourages (but does not require) projects that develop content suitable for delivery through eXtension (<https://extension.org/>).

NIFA supports global engagement that advances U.S. agricultural goals. To attain the agency's goals for U.S. agriculture, promotion of global competence of our nation’s future agricultural workforce, and safe and nutritious food security in a growing world, NIFA recognizes that collaboration with international partners can contribute to advances for U.S. agriculture. Thus, applications in response to this program’s RFA may include collaborations with international

partners, but may only be submitted by eligible U.S. institutions. Such applications may include subcontracts to international partners or other institutions. Applications must clearly demonstrate benefits to the U.S. Additional guidance on including international activities is provided on the International Partnerships website (<https://nifa.usda.gov/resource/afri-international-partnerships>).

## **PART II—AWARD INFORMATION**

### **A. Available Funding**

The anticipated amounts available for NIFA support of this Aquaculture Research Program in FY 2019 and FY 2020 are approximately \$2 million in each year.

This RFA is being released prior to the passage of an appropriations act for FY 2020. Therefore, enactment of additional continuing resolutions or an appropriations act may affect the availability or level of funding for this program in FY 2020. There is no commitment by USDA to fund any particular application or to make a specific number of awards.

For FY 2019 and FY 2020, this program will accept applications for the following research awards:

- Standard Research Projects – Up to \$300,000 (total project, not per year). Project periods for this program are limited to a maximum duration of 2 years;
- For FY 2019 and FY 2020, an additional category is available for smaller, research seed projects that total between \$50,000 to \$100,000 (total project) and are limited to 1-year duration (except in rare circumstances). For details on this seed project category, please see section II.C of this RFA).
- The start date of a 2-year project funded with funds appropriated in FY 2019, in response to this RFA, must be before October 1, 2019; the start date of a 2-year project funded with FY 2020 appropriations, must be before October 1, 2020. (i.e., These projects must be initiated in the federal fiscal year in which the funds were appropriated). Recipients may be eligible for a no-cost extension for a third year, but no carryover or extension is permitted for any project beyond 3 years from the start date (any unexpended funds must be returned to the U.S. Treasury).

The Automated Standard Applications for Payment System (ASAP), operated by the Department of Treasury's Bureau of the Fiscal Service, is the designated payment system for awards resulting from this RFA. For more information, see:

[https://www.fiscal.treasury.gov/fsservices/gov/pmt/asap/asap\\_home.htm](https://www.fiscal.treasury.gov/fsservices/gov/pmt/asap/asap_home.htm).

### **B. Types of Applications**

In FY 2019 and FY 2020, you may only submit an application to the Aquaculture Research program as a **New** or as a **Resubmitted** application.

**New application.** This is a project application that has not been previously submitted to the NIFA Aquaculture Research program. We will review all new applications to ensure they meet administrative requirements and all applications will be competitively evaluated by a review panel using criteria and selection processes described in Part V—Application Review Requirements.

**Resubmitted application.** This is an application that had previously been submitted to the NIFA Aquaculture Research program, but not funded. Project Directors (PDs) must respond to the

previous review panel summary (see Response to Previous Review, Part IV of this RFA). Resubmitted applications must be received by the relevant due dates listed in this RFA. We will evaluate resubmitted applications in competition with other pending applications in the appropriate area to which they are assigned and review them according to the same evaluation criteria (Part V, B) as new and other resubmitted applications. If you are submitting a resubmission application, enter the NIFA-assigned proposal number of the previously-submitted application in the Federal field (Field 4 on the SF 424 form) and choose resubmission as the type of application (Field 8 on the SF 424 form).

### **C. Project Types:**

All projects must focus on applied aquaculture research. To accommodate projects differing in scope, two types of project proposal categories are offered. However, regardless of category, all proposed projects must directly address major constraints to the U.S. aquaculture industry and focus on one or more of the Program Area Priorities (listed above in section I.B.). Projects with similar content and the same investigators may not be submitted to more than one category.

**Standard project proposals:** The intent is to fund applied research that address program priority with a maximum award of \$300,000 and maximum duration of 2 years.

**Seed project proposals:** For FY 2019 and FY 2020, we added a category for smaller, research seed projects that total between \$50,000 to \$100,000 and are limited to 1-year duration (except in rare circumstances). The intent is to fund applied aquaculture research projects that are smaller in scope than standard proposals, but have potential for the same scale of impact as standard projects on U.S. aquaculture development. This category could be ideal for projects that are at an earlier stage of development, investigators who are new to the NIFA Aquaculture Program and intend to generate preliminary, pilot data for future submissions to the NIFA Aquaculture Research Special Research Grants or AFRI programs. This category is not intended to fund conferences or non-research planning efforts. These proposals will be evaluated by the same panel, using the same criteria as the standard proposals.

### **D. Responsible and Ethical Conduct of Research**

In accordance with sections 2, 3, and 8 of 2 CFR Part 422, institutions that conduct USDA-funded extramural research must foster an atmosphere conducive to research integrity, bear primary responsibility for prevention and detection of research misconduct, and maintain and effectively communicate and train their staff regarding policies and procedures. In the event an application to NIFA results in an award, the Authorized Representative (AR) assures, through acceptance of the award that the institution will comply with the above requirements. Award recipients shall, upon request, make available to NIFA the policies, procedures, and documentation to support the conduct of the training. See <https://nifa.usda.gov/responsible-and-ethical-conduct-research> for further information.

## **PART III—ELIGIBILITY INFORMATION**

### **A. Eligible Applicants**

Applications may be submitted by State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals for the purpose of conducting research, extension, or education activities to facilitate or expand promising breakthroughs in areas of the food and agricultural sciences of importance to the United States. Failure to meet an eligibility criterion by the application deadline may result in the application being excluded from consideration or, even though an application may be reviewed, will preclude NIFA from making an award.

For those new to Federal financial assistance, a [grants overview page](#) is available on the NIFA website. This page includes information about free Grants 101 Training and other resources that are highly recommended for those seeking an understanding of Federal awards.

### **B. Cost Sharing or Matching**

The Agriculture Improvement Act of 2018 (Pub. L. 115-334) removed the matching requirements for some NIFA competitive grants imposed by the Agricultural Act of 2014. Therefore, there are changes to the matching requirements for some funds awarded in 2019.

For FY 2019 and FY 2020, NIFA does not require matching support for the Aquaculture Research program and matching resources will not be factored into the review process as evaluation criteria.

### **C. Centers of Excellence (COE)**

Pursuant to Section 7214 of the Agricultural Act of 2014 (Pub. L. 113-79), beginning in Fiscal Year 2015, for applicable competitive research and extension programs, NIFA will recognize and provide priority in the receipt of funding to applications from “centers of excellence” that carry out research, extension, and education activities that relate to the food and agricultural sciences. NIFA held listening sessions in July 2014 and accepted written comments from stakeholders to inform NIFA’s implementation of the COE provision. Information from the webinars and a summary of the input are available on NIFA’s website at: <https://nifa.usda.gov/centers-excellence>.

A COE is composed of one or more of the following entities that provide financial or in-kind support to the COE.

- (A) State agricultural experiment stations;
- (B) Colleges and universities;
- (C) University research foundations;
- (D) Other research institutions and organizations;

- (E) Federal agencies;
- (F) National laboratories;
- (G) Private organizations, foundations, or corporations;
- (H) Individuals; or
- (I) any group consisting of two or more of the entities described in (A) through (H).

COE designation is available only to standard grant applicants. Part IV, C.3.b of this RFA contains additional requirements for COE consideration.

## PART IV—APPLICATION AND SUBMISSION INFORMATION

### A. Letter of Intent (LOI) Instructions

Applicants are **highly encouraged** to submit a “Letter of Intent to Submit an Application” by the LOI due date specified in this RFA. This does not obligate the applicant in any way, but provides useful information to NIFA in preparing for application review. Applicants who do not submit a LOI by the specified request date are still allowed to submit a complete application by the application due date specified in this RFA. We request a LOI for both Standard and Seed projects.

Please follow the guidelines below for LOI submission

1. LOI formatting guidelines:
  - a) Font size must be at least 12 point;
  - b) Margins must be at least one (1) inch in all directions;
  - c) Line spacing must not exceed six (6) lines of text per vertical inch; and
  - d) Page size must be letter (i.e., 8.5 inches × 11 inches)
2. The LOI is limited to two (2) pages.:
  - a) On Page 1, provide only the following information:
    - the name, professional title, department, institution, and e-mail address of the lead project director (PD) and name, professional title, department, and institution of all collaborating investigators;
    - the **one**(1) Program Area that is most closely addressed in the application
  - b) On Page 2, include:
    - Project category (Standard or Seed Project);
    - A descriptive title;
    - Rationale and one (1) specific program area the project best aligns with;
    - Overall hypothesis or goal;
    - Specific objectives;
    - Approach; and
    - Potential impact and expected outcomes for U.S. Aquaculture.
3. NIFA will only accept a LOI in the portable document format (PDF). Attach the PDF LOI to an e-mail addressed to NIFA Aquaculture Program Staff (email to: SM.Aquaculture@usda.gov). In the e-mail subject line, write in the following format: Letter of Intent AQUA \_ [PDs Last Name].
4. We discourage the submission of more than one LOI to this program.
5. You must notify the main Program Contact of any changes to key project personnel, title, or objectives between the submission of the LOI and the full application

Scientific program staff will review LOIs to plan for appropriate expertise for the peer review panel and to ensure that proposed projects fit appropriately within the program areas. Applicants

can expect to receive notification of encouragement or discouragement from submitting a full proposal.

#### **LOI Deadlines:**

- **FY 2019:** a LOI is highly encouraged and the receipt date is April 29<sup>th</sup>, 2019 at 5:00 pm Eastern Time.
- **FY 2020:** a LOI is highly encouraged and the receipt date is February 19, 2020 at 5:00 pm Eastern Time. Any updates will be posted on the NIFA website.

#### **B. Electronic Application Package**

Only electronic applications may be submitted to NIFA via Grants.gov in response to this RFA. We urge you to submit early to the Grants.gov system. For information about the pre-award phase of the grant lifecycle see <https://www.grants.gov/web/grants/learn-grants/grants-101/pre-award-phase.html>.

#### **New Users of Grants.gov**

Prior to preparing an application, we recommend that the Project Director/Principal Investigator (PD/PI) first contact an Authorized Representative (AR, also referred to as Authorized Organizational Representative, or AOR) to determine if the organization is prepared to submit electronic applications through Grants.gov. If not (e.g., the institution/organization is new to the electronic grant application process through Grants.gov), then the one-time registration process must be completed PRIOR to submitting an application. It can take as long as two weeks to complete the registration process so it is critical to begin as soon as possible. In such situations, the AR should go to **“Register,” in the top right corner of the Grants.gov web page (or go to <https://www.grants.gov/web/grants/register.html>), for information on registering the institution/organization with Grants.gov.** Part II,1 of the NIFA Grants.gov Application Guide contains detailed information regarding the registration process. Refer to item 2, below, to locate the “NIFA Grants.gov Application Guide.”

#### **Steps to Obtain Application Package Materials**

To receive application materials:

1. You must download and install a version of [Adobe Reader](#) compatible with Grants.gov to access, complete, and submit applications. For basic system requirements and download instructions, see <http://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html>. Grants.gov has a test package that will help you determine whether your current version of Adobe Reader is compatible.
2. To obtain the application package from Grants.gov, go to <https://www.grants.gov/web/grants/applicants/search-opportunity-package.html> and enter the funding opportunity number where appropriate

**Funding Opportunity Number for FY 2019 USDA-NIFA-SRGP-006738.**  
**Applicants considering applying to the second year should check the Aquaculture Research Special Research Grants Program [RFA webpage](#) and [www.grants.gov](http://www.grants.gov)**

**after September 30, 2019 for the FY 2020 Funding Opportunity Number and Application Kit, as well as for any programmatic changes.**

Click “Search.” On the displayed page, click the corresponding link to continue. A Grant Application Package is tied to a particular funding opportunity. You may move forms amongst different grant Application Packages but you may ONLY submit an application to the particular funding opportunity to which the Grant Application Package is associated.

Contained within the application package is the “NIFA Grants.gov Application Guide.” This guide contains an introduction and general Grants.gov instructions, information about how to use a Grant Application Package in Grants.gov, and instructions on how to complete the application forms.

**If you require assistance to access the application package** (e.g., downloading or navigating Adobe forms) **or submitting the application**, refer to resources available on the Grants.gov website (<https://www.grants.gov/web/grants/support.html>). Grants.gov assistance is also available at:

Grants.gov customer support

800-518-4726 Toll-Free or 606-545-5035

Business Hours: 24 hours a day, 7 days a week. Closed on [federal holidays](#).

Email: [support@grants.gov](mailto:support@grants.gov)

Grants.gov iPortal (see <https://grants-portal.psc.gov/Welcome.aspx?pt=Grants>):

Top 10 requested help topics (FAQs), Searchable knowledge base, self-service ticketing and ticket status, and live web chat (available 7 a.m. - 9 p.m. ET).

Have the following information available when contacting Grants.gov:

- Funding Opportunity Number (FON);
- Name of agency you are applying to; and
- Specific area of concern

### **C. Content and Form of Application Submission**

Electronic applications are to be prepared following Parts V and VI of the NIFA Grants.gov Application Guide. This guide is part of the corresponding application package (see Section A of this part). The following is **additional information** you need to prepare an application in response to this RFA. **If there is discrepancy between the two documents, the information contained in this RFA is overriding.**

**Note the attachment requirements (e.g., PDF) in Part III, Section 3 of the guide. ANY PROPOSALS THAT ARE NON-COMPLIANT WITH THE REQUIREMENTS (e.g., content format, PDF file format, file name restrictions, and no password protected files) WILL BE AT RISK OF BEING EXCLUDED FROM NIFA REVIEW. Grants.gov does not check for NIFA-required attachments or whether attachments are in the required PDF format; see Part III, Section 6.1 of the guide for how to check the manifest of submitted files. Partial applications will be excluded from NIFA review. We will accept subsequent**

**submissions of an application until close of business on the closing date in the RFA (see Part V, 2.1 of the NIFA Grants.gov Application Guide for further information).**

**For any questions related to the preparation of an application,** review the NIFA Grants.gov Application Guide and the applicable RFA. If assistance is still needed for preparing application forms content, contact:

- Email: [electronic@nifa.usda.gov](mailto:electronic@nifa.usda.gov)
- Phone: 202-401-5048
- Business hours: Monday through Friday, 7 a.m. – 5 p.m. ET, excluding [federal holidays](#).

### **1. SF 424 R&R Cover Sheet**

Information related to the questions on this form is dealt with in detail in Part V, 2 of the NIFA Grants.gov Application Guide. See Part V, Section 2.17 of the NIFA Grants.gov Application Guide for the required certifications and assurances (e.g., Prohibition Against Entities Requiring Certain Internal Confidentiality Agreements).

### **2. SF 424 R&R Project/Performance Site Location(s)**

Detailed information related to the questions on this form is available in Part V, 3 of the NIFA Grants.gov Application Guide.

### **3. R&R Other Project Information Form**

Detailed information related to the questions on this form is available in Part V, 4 of the NIFA Grants.gov Application Guide.

#### **a. Field 7. Project Summary/Abstract.**

The 250-word (or less) summary/abstract should also include the relevance of the project to the goals the Aquaculture Research Program. The summary/abstract may be used for public databases and announcements, therefore, it should be written for a general audience. See Part V. 4.7 of NIFA Grants.gov Application Guide for further instructions and a link to a suggested template.

#### **b. Field 8. Project Narrative.**

NOTE: The Project Narrative shall not exceed a total of **15 pages**, including all tables and figures. (12-point font; line spacing not exceeding six lines per vertical inch; and 1-inch margins) regardless of whether it is single- or double-spaced. Please take note, as this differs from other NIFA grant programs. Applicants requesting consideration of COE status must include their justification within the 15-page limit of the project narrative. This maximum (15 pages) is established to ensure fair and equitable competition. Applications exceeding this page limit will be returned without review.

Appendices, such as support letters to the Project Narrative, References Cited, may be included in Field 12. Other Attachments (see Part V, 4.12 of the NIFA Grants.gov Application Guide) if they are directly germane to the proposed project and are not included in the 15-page limit.

**The Project Narrative attachment must include all of the following:**

### **1) Response to Previous Review (if applicable)**

This requirement only applies to Resubmitted Applications as described in Part II, B. The Project Narrative attachment is to include two components: 1) a one-page response to the previous review (containing the previous proposal number in the first line) and entitled “Response to Previous Review” as the first page of the attachment; and 2) the 15-page Project Narrative, as required (see Part IV, C. 3. b., above). The one-page “Response to Previous Review” does not count against the 15-page limit of the Project Narrative.

### **2) Project Narrative**

#### **a. Introduction**

- i. Include a clear statement of the long-term goal(s) and supporting objectives of the proposed project.
- ii. Summarize the body of knowledge that substantiates the need for the proposed project.
- iii. Include preliminary data/information pertinent to the proposed project. All works cited should be referenced.

#### **b. Rationale and Significance**

- i. Present the rationale behind the proposed project and reasons for performing the work at the proposing institution;
- ii. Describe the specific relationship of the proposed project to the Program Area Priorities, and state which of the four Program Area Priorities the proposal is primarily addressing. Applications that do not address at least one Program Area Priority will not be reviewed;
- iii. Clearly document the expected improvement in and sustainability of the U.S. aquaculture industry;
- iv. Estimate the magnitude of the issues and their relevance to stakeholders and to ongoing state-federal food and agricultural research, education, and extension programs; and
- v. Document the role of stakeholders in problem identification, planning, implementation, and evaluation as appropriate. State the degree of industry participation and involvement in the proposed project.

#### **c. Approach**

- i. The activities proposed or problems being addressed must be clearly stated and the approaches applied must be clearly described. Specifically, this section must include:
  - a. A description of the activities proposed and the sequence in which the activities are to be performed;
  - b. Methods to be used in carrying out the proposed project, including the feasibility of the methods and the role and qualification of project partner(s);
  - c. Expected outcomes;
  - d. Means by which results will be analyzed, assessed, or interpreted;
  - e. How results or products will be used;
  - f. Plans to communicate results to stakeholders and the public (e.g., extension, technology transfer, education activities, workshops) that articulate how the

- research results or technology will be transferred to end-users outside of direct scientific peers;
- g. How this specific research project will advance aquaculture production in the U.S. in the short or medium term (1-5 years after the grant ends).
- h. How the impacts will be evaluated and reported (a logic model is suggested to do this);
- i. If undergraduate, graduate students, and post-doctoral research fellows are included, how they will be actively engaged in the research;
- j. Pitfalls that may be encountered;
- k. Limitations to proposed procedures;
- l. A full explanation of any materials, procedures, situations, or activities related to the project that may be hazardous to personnel, along with an outline or precautions to be exercised to avoid or mitigate the effects of such hazards; and
- m. A timeline for attainment of objectives and for production of deliverables that includes annual milestones with specific, measurable outcomes.

d. Center of Excellence (COE) Justification:

For consideration as a COE, you must provide a brief justification statement, as part of your Project Narrative and within the page limits provided, which describes how you meet the standards of a COE, based on the following criteria:

- i. The ability of the COE to ensure coordination and cost effectiveness by reducing unnecessarily duplicative efforts in the research, teaching, and extension activities outlined in this application;
- ii. In addition to any applicable matching requirements, the ability of the COE to leverage available resources by using public-private partnerships among agricultural industry groups, institutions of higher education, and the federal government in the proposed research and/or extension activities outlined in this application. Resources leveraged be commensurate with the size of the award;
- iii. The planned scope and capability of the COE to implement teaching initiatives that increase awareness and effectively disseminate solutions to target audiences through extension activities of the proposed research and/or extension activity outlined in this application; and
- iv. The ability or capacity of the COE to increase the economic returns to rural communities by identifying, attracting, and directing funds to high-priority agricultural issues in support of and as a result of the implementation of the proposed research and/or extension activity outlined in this application.

Additionally, where practicable (not required), COE applicants should describe proposed efforts to improve teaching capacity and infrastructure at colleges and universities (including land-grant colleges and universities, cooperating forestry schools, certified Non-Land Grant Colleges of Agriculture (NLGCA) (list of certified NLGCA is available at:

<https://nifa.usda.gov/resource/nlgca-list>), and schools of veterinary medicine).

**c. Field 12. Add Other Attachments - PDF Attachment.**

See Part V. Section 4.12 of the NIFA Grants.gov Application Guide (Field 12 on the form) for this field.

**Data Management Plan.** A Data Management Plan (DMP) is required and is to clearly articulate how the project director (PD) and co-PDs plan to manage and disseminate the data generated by the project. The DMP will be considered during the merit review process (see Part V, B.). **See Part III Section 3.1 of the NIFA Grants.gov Application Guide for NIFA attachment specifications.**

The requirements for preparation and inclusion of a DMP in your application is included on the following web page, <https://nifa.usda.gov/resource/data-management-plan-nifa-funded-research-projects>. Also included on the web page are FAQs and information about accessing examples of DMPs.

**4. R&R Senior/Key Person Profile (Expanded)**

Detailed information related to the questions on this form is available in Part V, 5 of the NIFA Grants.gov Application Guide. This section of the guide includes instructions about senior/key person profile requirements, and details about the biographical sketch and the current and pending support, including a link to a suggested template for the current and pending support.

Biographical sketches (for example, a CV or resume) must adhere to a 2-page maximum for each senior/key person.

**Biographical Sketch** - The following are additional instructions of information to include:

- 1) Author identifier (ORCID, <https://orcid.org>) of the researcher if available.
- 2) Digital Object Identifier (DOI) of all publications where possible.

You may also include a list of data publications or published data products relevant to the proposed project, following recommended data citation format.

**5. R&R Personal Data** – As noted in Part V, 6 of the NIFA Grants.gov Application Guide, the submission of this information is voluntary and is not a precondition of award. Part V.6 also notes the importance and use of the information.

**6. R&R Budget**

Detailed information related to the questions on this form is available in Part V, 7 of the NIFA Grants.gov Application Guide.

**7. Supplemental Information Form**

Detailed information related to the questions on this form is available in Part VI, 1 of the NIFA Grants.gov Application Guide.

**a. Field 2. Program to which you are applying.** Enter the program code name (i.e., enter “AQUACULTURE RESEARCH”) and the program code (i.e., enter “AQUA”). Note that

accurate entry of the program code is very important for proper and timely processing of an application.

- b. Field 8. Conflict of Interest List.** See Part VI, 1.8 of the NIFA Grants.gov Application Guide for further instructions and a link to a suggested template.

### **8. Representations Regarding Felony Conviction and Tax Delinquent Status for Corporate Applicants**

This is a required form for corporate applicants. See Part VI, 2 of the NIFA Grants.gov Application Guide for a description of the term, “corporation,” and detailed information related to the questions on this form.

### **D. Submission Dates and Times**

We recommend that you conduct an administrative review of the application before submission via Grants.gov to ensure that it complies with all preparation instructions. An application checklist is included in Part VII of the NIFA Grants.gov Application Guide to assist with this review.

1. **Letter of Intent** is highly encouraged prior to submission of an application (see Part IV, A) for further information.  
FY 2019: LOI receipt date: April 29, 2019 at 5:00 pm Eastern Time.  
FY 2020: LOI receipt date: February 19, 2020 at 5:00 pm Eastern Time.
2. **Full Application**  
FY 2019 application deadline: May 28, 2019 at 5:00 p.m. Eastern Time.  
FY 2020 application deadline: April 22, 2020 at 5:00 p.m. Eastern Time. Any updates will be posted to the NIFA website.

Applications received after these deadlines will normally not be considered for funding.

While you may use the checklist to check the application for completeness, the application should be checked for the following required item(s). The list includes:

- Project summary/Abstract;
- Project Narrative;
- Bibliography & References Cited;
- Facilities & Other Resources;
- Curriculum Vitae (2-page maximum for each senior/key person);
- Conflict of Interest Lists;
- Current and Pending support;
- Budget;
- Budget Justification;
- Felony and Tax Certification Form; and
- Data Management Plan

This is not an exhaustive list of required items; it only serves to highlight items that may be

overlooked. **Failure to include any of the three critical documents of Project summary/Abstract, Project Narrative, or Bibliography & References Cited sections as PDF attachments will result in the application not being reviewed or considered for funding by NIFA.**

**Instructions for submitting an application are included in Part IV, Section 1.5 of the NIFA Grants.gov Application Guide.**

**If you have trouble submitting an application to Grants.gov, you should FIRST contact the Grants.gov Help Desk to resolve any problems. Keep a record of any such correspondence. See Part IV. A for Grants.gov contact information.**

NIFA will send email correspondence to the AR regarding the status of submitted applications. We strongly encourage you to provide accurate email addresses, where designated, on the SF-424 R&R Application for Federal Assistance.

If the AR has not received correspondence **from NIFA** regarding a submitted application within 30 days of the established deadline, contact the Agency Contact identified in Part VII of the RFA and request the proposal number assigned to the application. **Failure to do so may result in the application not being considered for funding by the peer review panel. Once the application has been assigned a proposal number, you should cite this number on all future correspondence.**

## **E. Funding Restrictions**

Section 1462(a) and (c) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA) limits indirect costs for the overall award to 30 percent of Total Federal Funds Awarded (TFFA) under a research, education, or extension grant. The maximum indirect cost rate allowed under the award is determined by calculating the amount of indirect costs using:

- 1) the sum of an institution's negotiated indirect cost rate and the indirect cost rate charged by sub-awardees, if any; or
- 2) 30 percent of TFFA.

The maximum allowable indirect cost rate under the award, including the indirect costs charged by the sub-awardee(s), if any, is the lesser of the two rates.

If the results of number one, is the lesser of the two rates, the grant recipient is allowed to charge the negotiated indirect cost rate on the prime award and the sub-award(s), if any. Any sub-awards would be subject to the sub-awardee's negotiated indirect cost rate. The sub-awardee may charge its negotiated indirect cost rate on its portion of the award, provided the sum of the indirect cost rate charged under the award by the prime awardee and the sub-awardee(s) does not exceed 30 percent of the TFFA.

If the result of number two, is the lesser of the two rates, then the maximum indirect cost rate allowed for the overall award, including any sub-award(s), is limited to 30 percent of the TFFA.

That is, the indirect costs of the prime awardee plus the sum of the indirect costs charged by the sub-awardee(s), if any, may not exceed 30 percent of the TFFA.

In the event of an award, the prime awardee is responsible for ensuring the maximum indirect cost allowed for the award is not exceeded when combining indirect costs for the Federal portion (i.e., prime and sub-awardee(s)) and any applicable cost-sharing (see 7 CFR 3430.52(b)). Amounts exceeding the maximum allowable indirect cost is considered unallowable. See sections 408 and 410 of 2 CFR 200.

#### **F. Other Submission Requirements**

**You should follow the submission requirements noted in Part IV, Section 1.5 in the document entitled “NIFA Grants.gov Application Guide.”**

For information about the **status of a submitted application**, see Part III, Section 6 of the NIFA Grants.gov Application Guide.

## **PART V—APPLICATION REVIEW REQUIREMENTS**

### **A. General**

NIFA will evaluate each application in a two-part process. First, NIFA will screen each application to ensure that it meets the administrative requirements as set forth in this RFA. Second, a technical review panel will evaluate applications that meet the administrative requirements.

We select reviewers based upon their training and experience in relevant scientific, extension, or education fields, taking into account the following factors:

- The level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, or extension activities;
- The need to include experts from various areas of specialization within relevant scientific, education, or extension fields;
- The need to include other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess relevance of the applications to targeted audiences and to program needs;
- The need to include experts from a variety of organizational types (e.g., colleges, universities, industry, state and federal agencies, and private profit and non-profit organizations) and geographic locations;
- The need to maintain a balanced composition with regard to minority and female representation and an equitable age distribution; and
- The need to include reviewers who can judge the effective usefulness of each application to producers and the general public.

After each peer review panel has completed its deliberations, the responsible program staff of the Aquaculture Research program will recommend that your project be approved for support from currently available funds or be declined due to insufficient funds or unfavorable review.

The Aquaculture Research program reserves the right to negotiate with the PD/PI and/or with the submitting organization or institution regarding project revisions (e.g., reductions in the scope of work, funding level, period, or method of support) prior to recommending any project for funding.

NIFA will send copies of reviews, *not* including the identity of reviewers, and a summary of the panel comments to the PD after the review process has been completed.

### **B. Evaluation Criteria**

A reviewer's written evaluation entails two levels of assessment. First, the reviewer summarizes how well the application addressed each evaluation criterion. After the application has been assessed for strengths and weaknesses of each criterion, the reviewer then evaluates the overall likelihood that the project will have significant outcome and impact. These written reviews are used to begin panel discussions with other reviewers serving on the peer review panel. Through

these discussions, peer review panelists come to consensus on the final rating and ranking of proposals. A complete description of NIFA’s peer review process can be found at the NIFA website: <https://nifa.usda.gov/resource/nifa-peer-review-process-competitive-grant-applications>.

The three evaluation criteria given below will be weighted equally. For the proposals selected for funding, the budget justification documents are analyzed in detail by the program as well as grants management for appropriateness of the costs proposed.

1. **Proposal Relevance and Effectiveness**— This ascertains if the proposed work: is applied research directed toward one of the four Program Area Priorities identified in this RFA; directly addresses major constraints that currently limit development and progress of domestic aquaculture; clearly states how the research results or technology will be transferred to end-users outside of direct scientific peers; and how it will accelerate U.S. aquaculture industry development, by increasing production or profitability, in the short- or medium-term (1-5 years after the grant ends).
2. **Technical/Scientific Merit**— This assesses: whether the approach is technically sound and innovative; whether there are clear project goals and objectives; if preliminary data support the demonstration of feasibility; if the methods are appropriate and the proposal includes all components necessary to achieve goals and objectives; if the proposal includes a concrete, unambiguous, specific desired outcome for domestic aquaculture and has a high probability of achieving that outcome; and if the proposal includes a way to objectively determine its success at achieving its outcomes.
3. **Overall Qualifications of Applicants**— This ascertains whether the applicant and others on the team possess: the necessary education, experience, and training; a demonstrated record of successful technology transfer to end-users outside of direct scientific peers; and the facilities and resources to accomplish the project. This includes applicant’s record of achievement with previous funding, as well as the qualifications of project partners. If the proposal includes the use of outside consultants not yet identified, this criterion includes how clearly the selection factors for the outside consultants are set out, and the expected qualifications of the consultants based on those selection factors.

### C. Center of Excellence Status

All eligible applicants will be competitively peer reviewed (as described in Part V, A and B of this RFA), and ranked in accordance with the evaluation criteria. Those that rank highly meritorious and requested to be considered as a COE, will be further evaluated by the peer panel to determine whether they have met the standards to be a COE (Part III, C. and Part IV, C). In instances where they are found to be equally meritorious with the application of a non-COE, based on peer review, selection for funding will be weighed in favor of applicants meeting the COE criteria. NIFA will effectively use the COE prioritization as a “tie breaker.” Applicants that rank highly meritorious but who did not request consideration as a COE or who are not deemed to have met the COE standards may still receive funding.

In addition, the applicant’s Notice of Award will reflect that, for the particular grant program, the applicant meets all of the requirements of a COE. Entities recognized as COE will

maintain that distinction for the duration of their period of performance or as identified in the terms and conditions of that award.

#### **D. Conflicts of Interest and Confidentiality**

During the peer evaluation process, NIFA will take extreme care to prevent any actual or perceived conflicts of interest that may impact review or evaluation. See <https://nifa.usda.gov/resource/nifa-peer-review-process-competitive-grant-applications> for further information about conflicts of interest and confidentiality as related to the peer review process.

#### **E. Organizational Management Information**

Specific management information relating to an applicant shall be submitted one-time, with updates on an as-needed basis. This requirement is part of the responsibility determined prior to the award of a grant identified under this RFA, if such information has not been provided previously under this or another NIFA program. We will provide you copies of forms recommended for use in fulfilling these requirements as part of the pre-award process. Although an applicant may be eligible based on its status as one of these entities, there are factors that may exclude an applicant from receiving federal financial and nonfinancial assistance and benefits under this program (e.g., debarment or suspension of an individual involved or a determination that an applicant is not responsible based on submitted organizational management information).

#### **F. Application Disposition**

An application may be withdrawn at any time before a final funding decision is made regarding the application. Each application that is not selected for funding, including those that are withdrawn, will be retained by the NIFA Aquaculture Research Program for a period of three years.

## **PART VI—AWARD ADMINISTRATION**

### **A. General**

Within the limit of funds available for such purpose, the NIFA awarding official shall make grants to those responsible, eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. The date specified by the NIFA awarding official as the effective date of the grant shall be no later than September 30 of the federal fiscal year in which the project is approved for support and funds are appropriated for such purpose, unless otherwise permitted by law. The project need not be initiated on the grant effective date, but as soon thereafter as practical so that project goals may be attained within the funded project period. All funds granted by NIFA under this RFA may be used only for the purpose for which they are granted in accordance with the approved application and budget, regulations, terms and conditions of the award, applicable federal cost principles, USDA assistance regulations, and NIFA General Awards Administration Provisions at 7 CFR part 3430, subparts A through E.

### **B. Award Notice**

The award document will provide pertinent instructions and information including, at a minimum, the information described in [2 CFR 200.210](#).

See <https://nifa.usda.gov/terms-and-conditions> to view current NIFA award terms and conditions.

### **C. Administrative and National Policy Requirements**

Several federal statutes and regulations apply to grant applications considered for review and to project grants awarded under this program. These may include, but are not limited to, the ones listed on the NIFA web page – <https://nifa.usda.gov/federal-regulations>.

NIFA Federal Assistance Policy Guide—a compendium of basic NIFA policies and procedures that apply to all NIFA awards, unless there are statutory, regulatory, or award-specific requirements to the contrary—is available at <https://nifa.usda.gov/policy-guide>.

### **Responsible and Ethical Conduct of Research**

Refer to Part II, D for more information.

### **D. Expected Program Outputs and Reporting Requirements**

The output and reporting requirements are included in the award terms and conditions (see <https://nifa.usda.gov/terms-and-conditions> for information about NIFA award terms). If there are any program- or award-specific award terms, they will be identified in the award.

### **Project Meetings**

In addition to reviewing (and monitoring the status of) progress and final technical reports and financial reports, NIFA Program Officers may use regular and periodic conference calls to

monitor the awardee's performance as well as PD conferences, workshops, meetings, and symposia to not only monitor the awards, but to facilitate communication and the sharing of project results and impacts. These opportunities also serve to eliminate or minimize NIFA funding of unneeded duplicative project activities. Applicants are required to attend the annual PD meeting and have to budget the costs for attending the PD meeting in their proposal.

## **PART VII—AGENCY CONTACT**

Applicants and other interested parties are encouraged to contact:

### **Programmatic Contact –**

Dr. Gene W. Kim  
National Program Leader, Aquaculture  
Institute of Food Production and Sustainability  
National Institute of Food and Agriculture, USDA; STOP 2240 1400 Independence Avenue, SW  
Washington, DC 20250-224  
Telephone: (202) 531-0636  
E-mail: [Gene.W.Kim@nifa.usda.gov](mailto:Gene.W.Kim@nifa.usda.gov)

### **Administrative/Business Contact –**

Garland Robertson  
Awards Management Division  
National Institute of Food and Agriculture, USDA; STOP 2240 1400 Independence Avenue, SW  
Washington, DC 20250-224  
Telephone: 202-401-2160  
Email: [garland.robertson@nifa.usda.gov](mailto:garland.robertson@nifa.usda.gov)

Rochelle McCrea  
Awards Management Division  
National Institute of Food and Agriculture, USDA; STOP 2240 1400 Independence Avenue, SW  
Washington, DC 20250-224  
Telephone: 202-401-2880  
Email: [rmccrea@nifa.usda.gov](mailto:rmccrea@nifa.usda.gov)

## **PART VIII—OTHER INFORMATION**

### **A. Use of Funds; Changes**

#### **1. Delegation of Fiscal Responsibility**

Unless the terms and conditions of the award state otherwise, awardees may not in whole or in part delegate or transfer to another person, institution, or organization the responsibility for use or expenditure of award funds.

#### **2. Changes in Budget or Project Plans**

In accordance with [2 CFR 200.308](#), awardees must request prior approval from NIFA for the following program or budget-related reasons:

- (i) Change in the scope or the objective of the project or program (even if there is no associated budget revision requiring prior written approval);
- (ii) Change in a key person(s) specified in the application or the federal award;
- (iii) The disengagement from the project for more than three months, or a 25 percent reduction in time devoted to the project, by the approved project director or principal investigator;
- (iv) The inclusion, unless waived by the federal awarding agency, of costs that require prior approval in accordance with 2 CFR 200 Subpart E—Cost Principles of this part or 45 CFR Part 75 Appendix IX, “Principles for Determining Costs Applicable to Research and Development under Awards and Contracts with Hospitals,” or 48 CFR Part 31, “Contract Cost Principles and Procedures,” as applicable;
- (v) The transfer of funds budgeted for participant support costs as defined in §200.75 Participant support costs to other categories of expense;
- (vi) Unless described in the application and funded in the approved federal awards, the sub-awarding, transferring, or contracting out of any work under a federal award, including fixed-amount sub-awards as described in §200.332 Fixed amount sub-awards. This provision does not apply to the acquisition of supplies, materials, equipment, or general support services;
- (vii) Changes in the approved cost-sharing or matching provided by the non-federal entity;
- (viii) The need arises for additional federal funds to complete the project.

**The awardee will be subject to the terms and conditions identified in the award. See <https://nifa.usda.gov/terms-and-conditions> for information about NIFA award terms B. Confidential Aspects of Applications and Awards**

When an application results in an award, it becomes a part of the record of NIFA transactions, available to the public upon specific request. Information that the Secretary of Agriculture determines to be of a confidential, privileged, or proprietary nature will be held in confidence to the extent permitted by law. Therefore, any information that the applicant wishes to have considered as confidential, privileged, or proprietary should be clearly marked within the application. NIFA will retain for three years, a copy of an application that does not result in an award. Such an application will be released only with the consent of the applicant or to the extent required by law. An application may be withdrawn at any time prior to the final action thereon.

### **C. Regulatory Information**

This program is not subject to the provisions of Executive Order 12372, which requires intergovernmental consultation with state and local officials.

Under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35), the collection of information requirements contained in this notice have been approved under OMB Document No. 0524-0039.

### **D. Definitions**

Refer to [7 CFR 3430, Competitive and Noncompetitive Non-formula Financial Assistance Programs--General Award Administrative Provisions](#), for applicable definitions for this NIFA grant program.

### **E. Materials Available on the Internet**

NIFA Aquaculture Research Program material may be found at:

[www.nifa.usda.gov/funding-opportunity/special-research-grants-program-aquaculture-research](http://www.nifa.usda.gov/funding-opportunity/special-research-grants-program-aquaculture-research)