PROPOSED COOPERATIVE INSTITUTE FOR SEVERE AND HIGH-IMPACT WEATHER RESEARCH AND OPERATIONS

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NOTICE OF FUNDING OPPORTUNITY

EXECUTIVE SUMMARY

Federal Agency Name(s): Oceanic and Atmospheric Research (OAR), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce

Funding Opportunity Title: PROPOSED COOPERATIVE INSTITUTE FOR SEVERE AND HIGH-IMPACT WEATHER RESEARCH AND OPERATIONS

Announcement Type: Initial

Funding Opportunity Number: NOAA-OAR-CIPO-2021-2006682

Catalog of Federal Domestic Assistance (CFDA) Number: 11.432, NOAA Cooperative Institutes

Dates: Applications must be received by OAR no later than February 15, 2021, 5:00 p.m. EDT. For applications submitted via Grants.gov, a date and time receipt indication will form the basis for determining timeliness. For those applicants not having access to the Internet, one signed original and two hard copy applications must be received by OAR at the following address: NOAA/OAR, Attn: Competition Manager Sandra Byers, 1315 East-West Highway, Silver Spring, Maryland 20910. Use of U.S. mail or another delivery service must be documented with a receipt. (Note that late-arriving hardcopy applications provided to a delivery service on or before 5:00 p.m. EDT on the closing date for applications will be accepted for review if the applicant is able to document that the application was provided to the guaranteed delivery service by the specified closing date and time and if the application is received by OAR no later than 5:00 p.m., EDT, two business days following the closing date.) No facsimile or electronic mail applications will be accepted. Applications submitted after 5:00 p.m. EDT, on February 15, 2021, will not be reviewed or considered for funding.

Funding Opportunity Description: The NOAA Office of Oceanic and Atmospheric Research (OAR) invites applications for the establishment of a Cooperative Institute (CI) for Severe and High-Impact Weather Research and Operations. The proposed CI will conduct severe and high-impact weather research by improving NOAA's understanding of severe storms. This research will include, mesoscale and stormscale dynamics, atmospheric electricity, microphysics, and planetary boundary layer processes; development and application of observational tools (weather radar, profilers, mobile mesonet, lidars, (etc); development and application of high-resolution numerical prediction models, including associated physical parameterizations, data assimilation systems, and ensemble systems and that provide estimates of uncertainty associated with various outcomes; improved understanding of societal impacts of different strategies for informing the public about imminent severe weather; and the effects of climate change on frequency, intensity,

and location of extreme weather.

The research activities described herein have been carefully defined to complement, rather than duplicate, research at other CIs, except in cases where there are advantages for such overlap. The CI may consist of one or more (e.g., a consortium) academic or non-profit, degree-granting institutions that possess an outstanding research program in one or more areas related to NOAA's mission. The CI is strongly encouraged to work in conjunction with a range of supporting research affiliates, including, but not limited to other governmental agencies; private industry; non-traditional partners; and NOAA laboratories, and science and data centers; other CIs and Cooperative Science Centers (CSCs); and Sea Grant Colleges.

FULL ANNOUNCEMENT TEXT

I. Funding Opportunity Description

A. Program Objective

CI Concept/Program Background

A Cooperative Institute (CI) is a NOAA-supported, non-Federal organization that has established an outstanding research program in one or more areas that are relevant to the NOAA
mission "to understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources." CIs are established at research institutions with outstanding graduate degree programs in NOAA-related sciences. CIs provide significant coordination of resources among all non-government partners and promote the involvement of students and post-doctoral scientists in NOAA-funded research. NOAA establishes a new CI competitively when it identifies a need to sponsor a long-term (5-10 years) collaborative partnership with one or more outstanding non-Federal, non-profit research institutions. For NOAA, the purpose of this long-term collaborative partnership is to promote research, education, training, and outreach aligned with NOAA's mission; to obtain research capabilities that do not exist internally; and/or to expand research capacity in NOAA-related sciences to:
* conduct collaborative, long-term research that involves NOAA scientists and those at the research institution(s) from one or more scientific disciplines of interest to NOAA;
* utilize the scientific, education, and outreach expertise at the research institution(s) that, depending on NOAA's research needs, may or may not be located near a NOAA facility;
* support student participation in NOAA-related research studies; and
* strengthen or expand NOAA-related research capabilities and capacity at the research institution(s) that complements and contributes to NOAA's ability to reach its mission goals.

A CI may be comprised of a single academic institution or a consortium of academic institutions, working in conjunction with supporting research affiliates, each of which demonstrates outstanding performance within one or more established research programs in NOAA-related sciences. CIs conduct research under approved administrative tasks, as described below. These tasks may not be redefined or abbreviated:

* Task I activities are related to the management of the CI, as well as general education and outreach activities. This task also includes support of postdoctoral and visiting scientists conducting activities within the research themes of the CI that are approved by the CI

Director,
in consultation with NOAA, and are relevant to NOAA and the CI's mission goals.
* Task II research activities usually involve on-going direct collaboration with NOAA scientists. This collaboration typically is fostered by the collocation of Federal and CI employees.
* Task III research activities require minimal collaboration with NOAA scientists and may include research funded by other NOAA competitive grant programs.

B. Program Priorities

9.1 Weather Radar and Observations Research and Development

Weather radar is the primary tool for studying severe thunderstorms and NOAA's Weather Surveillance Radar - 1988 Doppler (WSR-88D) is arguably the best operational weather radar in use today. Weather radar provides the highest temporal and spatial resolution data for use in the study of severe weather and the production of operational warnings (for severe thunderstorms and their attendant high-impact phenomena).

Research conducted under this theme is associated with accelerating the transfer of knowledge between the meteorological and engineering communities (in academia, and government and private laboratories) to improve the design, usability, and supportability of the NEXRAD WSR-88D Doppler weather radar. Continual enhancements to the system are needed for improving the quality, format, accuracy, resolution, and update frequency of the base data, and to keep pace with evolving hardware and software technologies. Furthermore, this research theme will examine the nascent application of Phased Array Radar (PAR) technology in the weather radar field. Research conducted under this theme would examine the various PAR technologies, determine their suitability for use in weather radar, and examine the cost/benefit of these new technologies for operational use within NOAA.

This theme also includes a growing research area for radar algorithms used for forecasting and warning. Research conducted under this theme supports radar data quality, improving precipitation estimation in complex terrain, and using dual-polarized radar to classify hydrometeors are important for cloud microphysics and how it is represented in numerical models, mitigating radar ambiguities, and improving ground clutter filters. To strengthen NOAA's understanding of severe weather, it is essential to research unconventional types of radars. These radars include imaging radars using the National Weather Radar Testbed (NWRT) and the Advanced Technology Demonstrator (ATD) phased array radar in Norman. This research provides NOAA the ability to improve the NWS NEXRAD radar and develop and deploy mobile radars.

In addition to radar, NOAA requires other observations that provide important information

to study the atmosphere and the severe weather phenomena. Additional observations include mobile and transportable surface observations, balloon-borne instruments, satellite, lightning mapping arrays, lower atmospheric profiling systems, Unmanned Aerial Systems (UAS) platforms, etc. These observations provide an understanding of the meteorological phenomena, but also play crucial roles via the integration of these observations into the modeling and forecast applications being developed to support weather research and operations.

9.2 Mesoscale and Stormscale Modeling Research and Development

Until recently, forecasters had to rely on numerical weather models that had a very coarse spatial resolution which was incapable of depicting the small-scale details of convective weather. As computing technology and the understanding of severe-storm processes have advanced, the numerical prediction models have become more sophisticated, running at finer resolutions, assimilating data sources to keep pace with evolving storms and improving the prediction of possible outcomes. Current convection-allowing models (CAMs) are better able to resolve convective features to provide forecasters with increasing specificity of potential severe weather threats, timing, evolution, and storm mode. NOAA has a need for rapidly updating storm-resolving numerical models. These models equip NOAA with the capability for explicit prediction of small-scale, rapidly evolving features like tornadoes.

Research conducted under this theme is associated with understanding cloud and mesoscale dynamics, microphysics and the precipitation process and their relationships to large and small scale forcing, as well as developing procedures for assimilation of meteorological data into simulation and prediction models of these processes. The work done here represents a fundamental building block for eventual applied techniques. Suggested work topics include, but are not limited to, examining mesoscale convective systems and other severe weather phenomena, field experiments, cloud microphysics, polarimetric radar, Doppler radar data quality control and analysis, and convection initiation studies.

9.3 Forecast Applications Improvement Research and Development

The forecast and warning decision-making process has largely remained the same for decades even though technologies and forecaster tools have improved. NOAA’s Hazardous Weather Testbed (HWT) has played a significant role in prototyping conceptual tools, evaluating them, and obtaining feedback from constituent stakeholders in the weather consortium.

Research conducted under this theme is associated with accelerating the transfer of research knowledge and skills between the academic and NOAA operational meteorological

communities to improve the design and utilization of weather observing systems and improve weather analysis, prediction and warning products.

Research topics include, but are not limited to, supporting and utilizing the Hazardous Weather Testbed (HWT): assimilation of radar and other remotely sensed observations into stormscale models and data fusion analysis products; ensemble modeling techniques, improved model output and hazardous weather information visualization techniques to better support NWS and core partners decision making process, investigating probabilistic based warnings and forecasts, improving flash flood forecasts, researching warn-on-forecast (vs. warn-on-detection) concepts to extend warning lead times, communicating weather uncertainties to operational forecasters, performing research associated with the Weather Research Forecast (WRF)and Finite Volume Cubed Sphere (FV3) dynamic cores, and assisting in the creation of training courses and material for the NWS and its partners. These topics will be folded into the concept of Forecasting a Continuum of Environmental Threats (FACETs), a proposed next-generation hazardous weather forecast and warning framework that is modern, flexible, and designed to communicate clear and simple hazardous weather information to serve the public.

9.4 Subseasonal-to-Seasonal (S2S) Predictions for Extreme Weather Events

It is evident that the climate is changing, but the impact of climate change on the occurrence, relative strength, location, and frequency of severe weather is not well understood. Moreover, as research of S2S predictions for severe weather is in its infancy, forecast products for severe convective storms are currently produced by NOAA.

Research conducted under this theme applies the understanding of mesoscale processes to climate maintenance and change to S2S predictability that can be impacted by extreme events. This theme also includes an investigation of the influence of the large-scale climatic environment and global forecast systems on the predictability of mesoscale and stormscale systems. Suggested research topics include, but are not limited to, extreme weather studies involving the sensitivities of models to convective parameterization; collaboration and participation in field programs; explaining severe weather seasonal variability associated moisture; intra-seasonal oscillations; and teleconnections that impact synoptic regimes favorable for severe weather; development of S2S forecast products using machine-learning technique; improving regional climate modeling associated with cumulus convection; and cloud variability.

9.5 Social and Socioeconomic Impacts of High Impact Weather Systems

Forecast and warning products have improved over the years but service assessments following deadly events have indicated that many in the public fail to take appropriate action

when their lives are threatened. The FACETs concept will include more impact-specific information including urgency, confidence, and variability, such that emergency managers, media, and the public will be better informed and well-positioned to respond to the developing threats.

Research conducted under this theme is associated with estimating the societal and socioeconomic impacts and values of stormscale and mesoscale high-impact weather systems and regional-scale climate variations of extreme events to provide needed data to mitigate adverse outcomes. A continuing component of this work is performed in collaboration with social scientists, meteorologists, emergency managers, and media practitioners. The proposed CI supports research on improving the communication of science to the public through outreach efforts and assessments of the value and utility of current and future hazardous weather products, including the watch/warning/advisory system. Other suggested topics involve working with NWS forecasters (both within the HWT and at NWS offices and centers) to improve the format and content of NWS forecast information for high impact events to help optimize societal response to NOAA warnings, and with core partners to evaluate use of current and future hazardous weather information as part of the Integrated Warning Team (IWT) concept. Efforts to improve communication forecast uncertainty and associated rare event risks to society will be pursued to enhance NOAA service delivery.

Societal and socioeconomic impact research extends beyond the commercial weather enterprise and must engage the public at all levels. Individuals, small groups, business managers, large venue operators, and city/State governments each have distinct decision-making criteria and NOAA’s future weather products must provide the needed information for all. The threats and risks presented by severe weather may be felt disproportionately by lower income or other potentially vulnerable and underserved populations. On the other end of the spectrum, there is great potential for economic impact on businesses for improved efficiency in decision-making with regards to severe weather threats.

COOPERATIVE INSTITUTE CAPABILITIES

The CI will need to provide support for NOAA to maximize the potential of existing NWS operational weather radars; to successfully develop new next-generation weather radar systems; to significantly extend the lead time and accuracy of watches and warnings for severe weather and flash floods; to continually improve forecasts of high impact mesoscale and stormscale weather events; to accomplish the research needed to achieve future severe weather and flash flood warning capability that is significantly enhanced by high resolution, frequently updated numerical prediction models; and to ensure this new capability is

transferred into the operational workforce through training and education. The CI will need to support NOAA in performing mesoscale and stormscale research and modeling, in advancing research involving remote and in situ observations on these scales, and in developing technologies and techniques that combine observations and modeling leading toward significantly longer warning lead times.

Another essential requirement is to initialize and validate models using in situ and remotely sensed observations, particularly weather radar, and to improve forecasts and warnings. Multi-sensor products from radar, satellite, lightning, and other observing systems need to be developed for stormscale meteorology applications, with particular emphasis on high impact hazardous weather detection, prediction, nowcasting, and warning. Since some of this research will need to be transitioned to NOAA operations, these activities will require the CI to develop prototype systems and test them in areas such as the NOAA Hazardous Weather Testbed (HWT) and the National Weather Radar Testbed (NWRT), testbeds collocated with the NSSL, SPC, WDTD, and Norman WFO.

CI also should be involved in research and activities supporting computer application and algorithm development, artificial intelligence, data mining, data analytics, unstaffed observation on platforms, education, training, and outreach activities.

COMPOSITION OF THE INSTITUTE

The CI will promote undergraduate, graduate student, and postdoctoral support in research projects in ways to train the next generation of scientists and NOAA employees. The CI should provide support for graduate and undergraduate students and post-doctoral scientists that will provide a “hands-on” opportunity for the development of a wide range of expertise. NOAA can capitalize on this expertise, as CI employees and students will work with NOAA to conduct research that complements NOAA’s mission needs. The Nation’s underrepresented minority students enrolled in undergraduate science, technology, engineering or mathematics (STEM) degree programs and gaining degrees, are an untapped talent pool. NOAA is committed to developing a future workforce that reflects the diversity of the Nation and encourages the CI to work with Minority Serving Institutions (MSIs) and NOAA Cooperative Science Centers (CSCs).

The MSI designation is determined by statute, with the U.S. Department of Education

serving as the cognizant Federal education agency. The U.S. Department of Education provides the following MSI definitions:

(1) a part B institution (a historically Black college or university) [§322 of the HEA, 20 U.S.C. §1061(2)];
(2) a Hispanic-serving institution [§502 of the HEA, 20 U.S.C. §1101a(a)(5)];
(3) a Tribal College or University {§316 of the HEA, 20 U.S.C. §1059c(b)(3)];
(4) an Alaska Native-serving institution [§317(b) of the HEA, 20 USC 1509d(b)(2)] or a Native Hawaiian-serving institution [§317(b) of the HEA, 20 U.S.C. §1059d(b)(4)];
(5) a Predominantly Black Institution [§§318(b) and 371(c)(9) of the HEA; 20 U.S.C. §§ 1059e(b)(6) and 1067q(c)(9)];
(6) an Asian American and Native American Pacific Islander-serving institution [§§ 320(b) and 371(c)(2) of the HEA, 20 U.S.C. §§1059g(b)(2) and 1067q(c)(2)]; or
(7) a Native American-serving nontribal institution [§§319(b) and 371(c)(8) of the HEA; 20 U.S.C. §§ 1059f(b)(2) and 1067q(c)(8)].

DEMONSTRATED ABILITY TO SUPPORT NOAA'S LONG-TERM GOALS AND RESEARCH FOCI

The CI will also help NOAA meet a number of critical research objectives identified in the Agency's 20-year research vision, and the Weather Research and Forecasting Innovation Act,
Pub. L. 115-25 (April 18, 2017).

C. Program Authority

15 U.S.C. 1540; 118 Stat. 71 (January 23, 2004)

II. Award Information

A. Funding Availability

All funding is contingent upon the availability of Federal appropriations. NOAA anticipates that up to $41,600,000.00 will be available annually for this CI. The actual annual funding that the CI receives may be less than the anticipated amount and will depend on the

actual projects that are approved by NOAA after the main CI award begins, the availability of funding, the quality of the research, the satisfactory progress in achieving the stated goals described in project proposals, and continued relevance to program objectives.

B. Project/Award Period

The award period will be 5 years and may be renewed for up to an additional 5 years based on the outcome of a review of scientific and administrative performance conducted in the fourth year of the award period, as described in the NOAA CI Interim Handbook.

C. Type of Funding Instrument

The funding instrument for this institutional award will be a cooperative agreement since several NOAA organizations will be substantially involved in working with the CI. Examples of substantial involvement may include, but are not limited to, proposals for collaboration between NOAA scientists and a CI scientist and/or assistance by NOAA personnel in developing curricula. NOAA will issue only one award to the successful institution or to the lead academic institution of a consortium of universities, with supporting research affiliates if applicable, where the Institute will be established and resident.

III. Eligibility Information

A. Eligible Applicants

Eligibility is limited to non-Federal public and private non-profit universities, colleges and research institutions that offer accredited graduate-level degree-granting programs in NOAA-related sciences.

B. Cost Sharing or Matching Requirement

Cost sharing is not required. However, given the collaborative nature and investment of a CI by both NOAA and the research institution, the amount of voluntary committed cost sharing will not be considered when determining the level of the CI’s commitment. Acceptable cost-sharing proposals include, but are not limited to, offering a reduced indirect cost rate against activities in one or more Tasks, waiver of any indirect costs assessed by the awardee on subawards, waiver of indirect costs assessed against base funds and/or Task I activities, waiver or reduction of any costs associated with the use of facilities at the CI, and full or partial salary funding for the CI director, administrative staff, graduate students, visiting scientists, or postdoctoral scientists.

C. Other Criteria that Affect Eligibility

Not applicable

IV. Application and Submission Information

A. Address to Request Application Package

The standard application package, consisting of the standard forms, i.e., SF-424, SF-424A, SF-424B, SF-LLL, and the CD-511, is available at http://www.grants.gov. Users of Grants.gov will be able to download a copy of the application package, complete it offline, and then upload and submit the application via the Grants.gov site. If an applicant has problems downloading the application forms from Grants.gov, contact Grants.gov Customer support at 1-800-518-4726 or support@Grants.gov. For applicants without Internet access, an application package may be secured by contacting:

NAME: Sandra Byers
OAR Cooperative Institutes
1315 East West Highway, Room 11324
Silver Spring, MD 20910
Telephone: (301) 734-1125
Sandra.Byers@noaa.gov

B. Content and Form of Application

Proposals submitted in response to this Announcement must include a Data Management Plan (up to 2 pages). See Section VI.B., Administrative and National Policy Requirements, below for additional information on what the plan should contain.

• As required by the National Environmental Policy Act (NEPA), NOAA must analyze the potential environmental impacts of applications that request Federal funding. In order for NOAA to complete its analysis, NOAA must address the following questionnaires:

1. The U.S. Department of Commerce National Environmental Policy Act (NEPA) Environmental Questionnaire & Checklist, which may be found at: http://hr.commerce.gov/s/groups/public/@doc/@os/@ocio/@oitpp/documents/web_assets/prod01_008655.pdf, and

2. NOAA’s Environmental Compliance Questionnaire for Federal Financial Assistance Applicants, which may be found at: http://www.nepa.noaa.gov/questionnaire.pdf Applicants are required to submit answers to the following abbreviated set of questions and, depending on the specifics of the project as indicated in response to those questions, may be required to provide additional detail, prior to a funding decision, as NOAA deems necessary in order for NOAA to fulfill its NEPA responsibilities:

Project Title
Name and contact information for the principal investigator
Describe the proposed activity, including, as applicable:
- its purpose, objectives, and goals;
- graphics (i.e. figures, photographs), site plans, plan diagrams, models, etc.;
- sampling, collection, or observation protocols and operational procedures;
- any proposed mitigation or monitoring measures and protocols;
- a description and plan diagram of the proposed impact area, if the proposed activity involves construction, restoration, dredging, excavation, and/or fill;
- a description (i.e. specifications) of the equipment or structures (e.g. scientific monitoring equipment, deployment platforms, etc.) that would need to be temporarily or permanently placed in the environment.
Proposals must adhere to the provisions under “Proposals” and the requirements under “Required Elements” in this section.

1. PROPOSALS
a. Proposals must include elements requested on the Grants.gov portal. If a hard copy application is submitted, NOAA requests that the original and two unbound copies of the proposal be included.

b. Proposals, electronic or paper, should be no more than 75 pages (numbered) in length, excluding budget, investigators vitae, and all appendices. Federally mandated forms are not included within the page count. Facsimile transmissions and electronic mail submission of full proposals will not be accepted.

2. REQUIRED ELEMENTS
a. Title page. The title page should clearly indicate the proposed name of the CI, principal investigators, total amount of Federal funds being requested, and award period. In the event that the application is submitted by a consortium, the lead academic institution for the consortium should submit the application on behalf of its supporting research affiliates. Applications submitted by a CI consortium should include the name of each academic institution and supporting research affiliate, along with each associated principal investigator.

b. Abstract. An abstract must be included and should contain a brief description of the CI, research themes, and proposed activities. The abstract should appear on a separate page, headed with the proposal title, institution’s investigators, total proposed cost, and budget period.

c. Results from prior research. The results of related projects supported by NOAA and other agencies should be described, including their relation to the currently proposed work. Reference to each prior research award should include the title, agency, award number, Principal Investigators, period of award, and total award. The section should be a brief summary and should not exceed two pages.

d. Project Description. The information provided in this section will be used to evaluate the proposal according to NOAA's standard evaluation criteria described in Section V of this document. The project description includes the following sections:
The Goals Section should clearly describe the mission and vision of the CI, and what the CI expects to accomplish during the award.

The Research Theme Section includes information that will help NOAA determine the quality of the CI's capabilities and the expertise at the CI needed to conduct outstanding research in each of the research themes described in Section I.B. This Section also includes project descriptions of research projects that could be conducted by the CI under each theme (or combination of themes), if sufficient funding during the five-year award is provided. The selection of this proposal neither precludes the CI from proposing additional research projects after the award has been made as long as they fit under one of the research themes, nor obligates NOAA to fund the projects proposed in this application. Following the selection of the award, the CI will be required to provide a complete proposal and budget for each research project funded under the CI award after consulting with the OAR CI Program Director and the NOAA program(s) that provide funding for the project. The Education Section includes information on NOAA-related education programs offered at the CI's institution(s), including a complete list of terminal degrees in these programs. This Section should also describe how the CI will integrate students and post-docs into the research projects at the CI, as well conduct outreach and education activities in support of the research themes.

The Business Plan should be well-developed and include details regarding CI governance structure, fiscal and human resource management, as well as strategic planning and accountability. It must describe the organizational structure of the CI, how it will operate, the responsibilities of the participants from multiple institutions, and the composition of the Executive Board and the Council of Fellows (as well as each governing entity's roles and responsibilities, consistent with the terms of the Cooperative Institute Interim Handbook (found at https://ci.noaa.gov/Contact-Us/Policies-and-Guidance)). The Business Plan must describe how the CI chooses projects and reviews its progress, as well as how the CI will support enhanced communication and collaborations with NOAA. If any CI personnel will work in NOAA-operated facilities, the Business Plan must describe the administrative

support structure for such personnel.

The Performance Measures Section must include proposed measures to be used by the CI to gauge, quantify, and/or evaluate progress on both individual projects and its overall performance. After the award is made, NOAA will work with the CI to finalize a set of performance measures that are acceptable to the CI and NOAA. Immediately after the CI award has been established, the CI must produce an annual research plan that provides specific information about the research projects described in the Research Themes Section that will be accomplished during the first year. The plan will be developed after consultations with the OAR CI Program Director and the NOAA programs that will provide project funding to the CI. This plan must state the goals and objectives of each project, along with a description of the research that the CI expects to accomplish and a detailed budget for these projects. CI funding for the projects described in this plan will be released upon NOAA's approval of the annual research plan. Funding for subsequent years of the award will require additional annual research plans.

e. Budget. Applicants must submit a Standard Form 424 "Application for Federal Assistance," including a detailed budget using the Standard Form 424A, "Budget Information--Non-Construction Programs," and a Standard Form 424B, "Assurances -- Non-Construction Programs." These and other forms, including Commerce Department Form CD-511 "Certification Regarding Lobbying," and, if applicable, Standard Form SF-LLL "Disclosure of Lobbying Activities," are provided in the Grants.gov application package. Additionally, the CD-512 "Certifications Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion-Lower Tier Covered Transactions and Lobbying" is required to be submitted with the application package. To do this, download the form from http://ci.noaa.gov/sites/lci/Documents/Forms/funding_forms_CD-512.pdf. Fill out, sign, scan, and attach the form to the application package. The proposal must include total and annual budgets corresponding to the descriptions provided in the project description not to exceed $[amount]M in the first year, with a reasonable inflationary escalation in subsequent years. NOAA uses the proposed annual budgets to establish funding for the entire award. After award selection, annual funding will be provided only after approval by the NOAA Grants Officer of an annual research plan or any other proposal submitted to NOAA that includes a detailed budget. While this level of funding is not guaranteed, this amount will allow for the possibility of funding for projects that were not originally planned for the CI award. Annual and total budgets should be stratified by Task and Institution, particularly if the CI award has proposed a reduced indirect cost rate for certain tasks. A budget justification should include the information described in the budget guidelines provided in the Grants.gov application package. NOAA AGO also provides guidance on preparing the budget narrative on its website at

http://www.ago.noaa.gov/grants/docs/gmd_budget_narrative_guidance_-_05-24-2017_final.pdf.

f. Vitae. Abbreviated 1-2 page curriculum vitae are sought with each proposal. Publication lists should be limited to all publications in the last 3 years with up to five other relevant papers.

g. Current and pending support. For each principal investigator, submit a list which includes project title, supporting agency with grant number, investigator months, dollar value, and duration. Requested values should be listed for pending support.

C. Unique Entity Identifier and System for Award Management (SAM)

To enable the use of a universal identifier and to enhance the quality of information available to the public as required by the Federal Funding Accountability and Transparency Act, 31 U.S.C. 6101 note, to the extent applicable, any proposal awarded in response to this announcement will be required to use the System for Award Management (SAM), which may be accessed online at: https://www.sam.gov/portal/public/SAM/. Applicants are also required to use the Dun and Bradstreet Universal Numbering System, as identified in OMB guidance published at 2 CFR Parts 25, which may be accessed at https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title02/2cfr25_main_02.tpl

D. Submission Dates and Times

The deadline for receipt of proposals in Grants.gov or at the NOAA/OAR office is 5:00 p.m., EDT, February 15, 2021,. Proposals received after the deadline will not be considered. NOAA uses information from Grants.gov to determine whether an application has been submitted before the deadline. If a hard copy proposal is submitted, the original and two unbound copies of the proposal should be included. Paper submissions should be sent to: Shannon Louie 1315 East-West Highway, Room 11324, Silver Spring, Maryland 20910; telephone (301) 734-1180. Hard copy applications will be date/time stamped as they are physically received in the NOAA/OAR office. (Note that late-arriving hard copy proposals provided to a delivery service on or before 5:00 p.m., E.T., February 15, 2021, will be accepted for review if the applicant can document that the proposal was provided to the guaranteed delivery service by the specified closing date and time and if the proposal is received by OAR no later than 5 p.m., two business days following the closing date.) No email or facsimile proposal submissions will be accepted.

E. Intergovernmental Review

Applications under this program are not subject to Executive Order 12372.

F. Funding Restrictions

NOAA will not consider expenses associated with fees, fund-raising activities, travel for activities not directly related to project implementation, travel or salaries for Federal employees, or profit as allowable costs in the proposed budget. The total costs of a project consist of all allowable costs incurred in accomplishing project activities during the project period. Project costs can only include support for activities conducted between the effective start date and end date of the award, and cannot include activities undertaken either before or after the agreed upon dates. Applicants will not be reimbursed for time expended or costs incurred in developing a project or in preparing an application, or in any discussions or negotiations with the agency prior to the award. Such expenditures may not be considered as part of the applicant's cost share or matching contribution.

G. Other Submission Requirements

Federal employees are not allowed to assist in the preparation of an application or proposal, except that these individuals may provide you with information on program goals, funding priorities, application procedures, and completion of application forms. Because this is a competitive program, Federal employees will not provide assistance in conceptualizing, developing, or structuring proposals, or write letters of support for an application or proposal.

All applicants are strongly encouraged to submit proposals through the Grants.gov portal. For applicants without Internet access, hard copy proposals will be accepted. The hard copies must be submitted by postal mail, commercial delivery service, or hand-delivery. Proposals must be submitted to: NOAA/OAR, 1315 East-West Highway, Room 11324, Silver Spring, Maryland 20910, Attn: Sandra Byers.

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the standard NOAA evaluation criteria. Various questions under each criterion are provided to ensure that the applicant includes information that NOAA will consider important during the evaluation, in addition to any other information provided by the applicant.

1. Importance and/or relevance and applicability of proposed project to the program goals (25 percent): This criterion ascertains whether there is intrinsic value in the proposed work and/or relevance to NOAA, Federal, regional, state, or local activities.
* Does the proposal include research goals and projects that address the critical issues

identified in NOAA's 5-year Research Plan, NOAA's Strategic Plan, and the priorities described in the program priorities (see Section I.B.)?
* Is there a demonstrated commitment (in terms of resources and facilities) to enhance existing NOAA and CI resources to foster a long-term collaborative research environment/culture?

2. Technical/scientific merit (30 percent): This criterion assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives.
* Does the project description include a summary of clearly stated goals to be achieved during the five-year period that reflect NOAA's strategic plan and goals?
* Does the CI involve partnerships with other universities or research institutions, including Minority Serving Institutions, and universities, such as NOAA Cooperative Science Centers, that can contribute to the proposed activities of the CI?
* Does the proposal include a Data Management Plans that is appropriate for work and that addresses the intent of NOAA's Data and Publication Sharing Directive for NOAA Grants, Cooperative Agreements, and Contracts?

3. Overall qualifications of applicants (30 percent): This criterion ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the project.
* If the institution(s) and/or Principal Investigators have received current or recent NOAA funding, is there a demonstrated record of outstanding performance working with NOAA and/or NOAA scientists on research projects?
* Is there nationally and/or internationally recognized expertise within the appropriate disciplines needed to conduct the collaborative/interdisciplinary research described in the proposal?
* Is there a well-developed business plan that includes fiscal and human resource management, as well as strategic planning and accountability?
* Are there any unique capabilities in a mission-critical area of research for NOAA?
* Has the applicant shown a substantial investment to the NOAA partnership, as demonstrated by the amount of the cost-sharing contribution?

4. Project costs (5 percent): The budget is evaluated to determine if it is realistic and commensurate with the project needs and time-frame

5. Outreach and education (10 percent): This criterion assesses whether the project provides a focused and effective education and outreach strategy regarding NOAA's mission to protect the Nation's natural resources.

* Is there a strong education program with established graduate degree programs in NOAA related sciences that also encourages student participation in NOAA-related research studies?

B. Review and Selection Process

An initial administrative review/screening is conducted to determine compliance with requirements/completeness. Thereafter, these proposals will be evaluated and individually ranked in accordance with the assigned weights of the above-listed evaluation criteria by an independent peer review panel. At least three experts, who may be Federal or non-Federal, will be used in this process. Each expert will submit an individual merit review and there will be no consensus opinion. The merit reviewers' ratings are used to produce a rank order of the proposals. The Selecting Official selects proposals after considering the peer reviews and selection factors listed below. In making the final selections, the Selecting Official will award in rank order unless the proposal is justified to be selected out of rank order based upon one or more of the selection factors. The Selecting Official makes the final award recommendation to the Grants Officer authorized to obligate funds.

C. Selection Factors

The merit review ratings shall provide a rank order to the Selecting Official for final funding recommendations. A program officer may first make recommendations to the Selecting Official applying the selection factors below. The Selecting Official shall award in the rank order unless the proposal is justified to be selected out of rank order based upon one or more of the following factors:
1. Availability of funding.

2. Balance/distribution of funds:
a. Geographically
b. By type of institutions
c. By type of partners
d. By research areas
e. By project types

3. Duplication of other projects funded or considered for funding by NOAA or other federal agencies.

4. Program priorities and policy factors.

5. Applicant's prior award performance.

6. Partnerships and/or Participation of targeted groups.

7. Adequacy of information necessary for NOAA staff to make a NEPA determination and draft necessary documentation before recommendations for funding are made to the NOAA Grants Officer.

Awards may not necessarily be made to the highest scored proposals.

D. Anticipated Announcement and Award Dates

10/01/21, should be used as the proposed start date on proposals. The announcement of the award is expected around July 1, 2021.

VI. Award Administration Information

A. Award Notices

1. Successful applicants will receive notification that the application has been recommended for funding to the NOAA Grants Management Division. This notification is not an authorization to begin performance of the project. Official notification of funding, signed by the NOAA Grants Officer, is the authorizing document that allows the project to begin. Notification will be issued to the Authorizing Official and the Principal Investigator of the project electronically via Grants Online or in hard copy. Unsuccessful applicants will be notified that their proposals were not selected for recommendation. Applications not selected for funding will be destroyed.

2. Modification of Applications. Successful applicants may be asked to modify objectives, work plans, or budgets prior to final approval of an award. The exact amount of funds to be awarded, the final scope of activities, the project duration, and specific NOAA substantial involvement (if any) with the activities of each project will be determined in pre-award negotiations among the applicant, the NOAA Grants Office, and NOAA program staff.

3. Award documents provided by the Grants Officer may contain special award conditions limiting the use of funds for activities that have outstanding environmental compliance requirements. These special award conditions may also include other compliance requirements for the award as applicable and will be applied on a case-by-case basis. Applicants are strongly encouraged to review award documents carefully before accepting a Federal award so they are fully aware of the relevant Standard Terms and Conditions as well as any Special Award Conditions that have been placed on the award.

B. Administrative and National Policy Requirements

DEPARTMENT OF COMMERCE PRE-AWARD NOTIFICATION REQUIREMENTS FOR GRANTS AND COOPERATIVE AGREEMENTS. The Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements contained in the Federal Register notice of December 30, 2014 (79 FR 78390) are applicable to this solicitation and may be accessed online at http://www.gpo.gov/fdsys/pkg/FR-2014-12-30/pdf/2014-30297.pdf.
UNIFORM ADMINISTRATIVE REQUIREMENTS, COST PRINCIPLES, AND AUDIT REQUIREMENTS. Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program. Refer to https://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1

DOC TERMS AND CONDITIONS. Successful applicants who accept a NOAA award under this solicitation will be bound by Department of Commerce Financial Assistance Standard Terms and Conditions. This document will be provided in the award package in NOAA's Grants Online system at https://www.commerce.gov/sites/default/files/2020-11/DOC%20Standard%20Terms%20and%20Conditions%20-%2012%20November%202020%20PDF_0.pdf.

LIMITATION OF LIABILITY. Funding for programs listed in this notice is contingent upon the availability of appropriations. Applicants are hereby given notice that funds may not have been appropriated yet for the programs listed in this notice. In no event will NOAA or the Department of Commerce be responsible for proposal preparation costs. Publication of this announcement does not oblige NOAA to award any specific project or to obligate any available funds.

UNPAID OR DELINQUENT TAX LIABILITY. When applicable under appropriations law, an authorized representative of the selected applicant(s) will be required to provide certain pre-award representations regarding federal felony and federal criminal tax convictions, unpaid federal tax assessments, and delinquent federal tax returns. The form must be completed and submitted with grant applications for: (a) all for-profit and non-profit organization applicants (Part I, and if required, Part II); and (b) all non-Federal entity applicants anticipating receipt of $5 million or more in the current Federal Fiscal Year appropriated funding (Part II only). The form can be found at https://www.osec.doc.gov/oam/grants_management/policy/documents/FAM%202015-01.pdf

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA). NOAA must analyze the potential environmental impacts, as required by the National Environmental Policy Act (NEPA), for applicant projects or proposals which are seeking NOAA federal funding

opportunities. Detailed information on NOAA compliance with NEPA can be found at the following NOAA NEPA website: http://www.nepa.noaa.gov/, including NOAA Administrative Order 216-6A for NEPA, http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/216-6A.html, and the Council on Environmental Quality implementation regulations, http://energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf. Consequently, as part of an applicant's package, and under its description of its program activities, applicants are required to provide detailed information on the activities to be conducted, locations, sites, species and habitat to be affected, possible construction activities, and any environmental concerns that may exist (e.g., the use and disposal of hazardous or toxic chemicals, introduction of non- indigenous species, impacts to endangered and threatened species, aquaculture projects, and impacts to coral reef systems). In addition to providing specific information that will serve as the basis for any required impact analyses, applicants may also be requested to assist NOAA in drafting an environmental assessment, if NOAA determines an assessment is required. Applicants will also be required to cooperate with NOAA in identifying feasible measures to reduce or avoid any identified adverse environmental impacts of their proposal. Failure to do so shall be grounds for not selecting an application. In some cases if additional information is required after an application is selected, funds can be withheld by the Grants Officer under a special award condition requiring the recipient to submit additional environmental compliance information sufficient to enable NOAA to make an assessment on any impacts that a project may have on the environment.

REVIEW OF RISK. After applications are proposed for funding by the Selecting Official, the Grants Office will perform administrative reviews, including an assessment of risk posed by the applicant under 2 C.F.R. 200.205. These may include assessments of the financial stability of an applicant and the quality of the applicant’s management systems, history of performance, and the applicant’s ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities. Special conditions that address any risks determined to exist may be applied. Applicants may submit comments to the Federal Awardee Performance and Integrity Information System (FAPIIS) about any information included in the system about their organization for consideration by the awarding agency.

DATA SHARING PLAN.
1. Environmental data and information collected or created under NOAA grants or cooperative agreements must be made discoverable by and accessible to the general public, in a timely fashion (typically within two years), free of charge or at no more than the cost of reproduction, unless an exemption is granted by the NOAA Program. Data should be available in at least one machine-readable format, preferably a widely-used or open-standard format, and should also be accompanied by machine-readable documentation (metadata),

preferably based on widely used or international standards.
2. Proposals submitted in response to this Announcement must include a Data Management Plan of up to two pages describing how these requirements will be satisfied. The Data Management Plan should be aligned with the Data Management Guidance provided by NOAA in the Announcement. The contents of the Data Management Plan (or absence thereof), and past performance regarding such plans, will be considered as part of proposal review. A typical plan should include descriptions of the types of environmental data and information expected to be created during the course of the project; the tentative date by which data will be shared; the standards to be used for data/metadata format and content; methods for providing data access; approximate total volume of data to be collected; and prior experience in making such data accessible. The costs of data preparation, accessibility, or archiving may be included in the proposal budget unless otherwise stated in the Guidance. Accepted submission of data to the NOAA National Centers for Environmental Information (NCEI) is one way to satisfy data sharing requirements; however, NCEI is not obligated to accept all submissions and may charge a fee, particularly for large or unusual datasets.
3. NOAA may, at its own discretion, make publicly visible the Data Management Plan from funded proposals, or use information from the Data Management Plan to produce a formal metadata record and include that metadata in a Catalog to indicate the pending availability of new data.
4. Proposal submitters are hereby advised that the final pre-publication manuscripts of scholarly articles produced entirely or primarily with NOAA funding will be required to be submitted to NOAA Institutional Repository after acceptance, and no later than upon publication. Such manuscripts shall be made publicly available by NOAA one year after publication by the journal.

INDIRECT COST RATE - If an applicant has not previously established an indirect cost rate with a Federal agency they may choose to negotiate a rate with the Department of Commerce or use the de minimis indirect cost rate of 10% of MTDC (as allowable under 2 C.F.R. §200.414). The negotiation and approval of a rate is subject to the procedures required by NOAA and the Department of Commerce Standard Terms and Conditions. The NOAA contact for indirect or facilities and administrative costs is: Lamar Revis, Grants Officer, NOAA Grants Management Division, 1325 East West Highway, 9th Floor, Silver Spring, MD 20910, or lamar.revis@noaa.gov.
MINORITY SERVING INSTITUTIONS - The Department of Commerce/National Oceanic and Atmospheric Administration (DOC/NOAA) is strongly committed to increasing the participation of Minority Serving Institutions (MSIs), i.e., Historically Black Colleges and Universities, Hispanic-serving institutions, Tribal colleges and universities, Alaskan Native and Native Hawaiian institutions, and institutions that work in underserved communities.

USE OF APPLICANT INFORMATION AND THE FREEDOM OF INFORMATION ACT (FOIA) The applicant acknowledges and understands that information and data contained in applications for financial assistance, as well as information and data contained in financial, performance and other reports submitted by applicants, may be used by the Department of Commerce in conducting reviews and evaluations of its financial assistance programs. For this purpose, applicant information and data may be accessed, reviewed and evaluated by Department of Commerce employees, other Federal employees, and also by Federal agents and contractors, and/or by non-Federal personnel, all of whom enter into appropriate conflict of interest and confidentiality agreements covering the use of such information. As may be provided in the terms and conditions of a specific financial assistance award, applicants are expected to support program reviews and evaluations by submitting required financial and performance information and data in an accurate and timely manner, and by cooperating with Department of Commerce and external program evaluators. In accordance with 2 C.F.R. § 200.303(e), applicants are reminded that they must take reasonable measures to safeguard protected personally identifiable information and other confidential or sensitive personal or business information created or obtained in connection with a Department of Commerce financial assistance award.

In the event that an application contains information or data that you do not want disclosed prior to award for purposes other than the evaluation of the application, mark each page containing such information or data with the words “Privileged, Confidential, Commercial, or Financial Information - Limited Use” at the top of the page to assist NOAA in making disclosure determinations. DOC regulations implementing the Freedom of Information Act (FOIA), 5 U.S.C. 552, are found at 15 C.F.R. Part 4, which sets forth rules for DOC to make requested materials, information, and records publicly available under FOIA. The contents of funded applications may be subject to requests for release under the FOIA. Based on the information provided by the applicant, the confidentiality of the content of funded applications will be maintained to the maximum extent permitted by law.

NOAA ADMINISTRATIVE ORDER (NAO) 202-1106, SEXUAL ASSAULT AND SEXUAL HARASSMENT
a. If NOAA-operated, leased, or owned facilities are involved in any awards funded under this announcement, such awards are subject to the NOAA Sexual Assault and Sexual Harassment Prevention and Response Policy Applicable to Financial Assistance Awards Involving NOAA-Operated Facilities (May 2018) found at: https://www.noaa.gov/sites/default/files/atoms/files/NOAA%20Sexual%20Assault%20and%20Sexual%20Harassment%20Prevention%20and%20Response%20Policy%20Applicable%20to%20Financial%20Assistance%20Awards%20Involving%20NOAA-Operated%20Facilities%20%28May%202018%29%20%281%29.pdf

b. If the use of a vessel(s) under NOAA contract, order, grant, or cooperative agreement is involved in any awards funded under this announcement where the non-Federal entity employees are anticipated to be crew members aboard the vessel(s), such awards are subject to the NOAA Sexual Assault and Sexual Harassment Prevention and Response Policy Applicable to Financial Assistance Awards Involving the use of a Vessel(s) under NOAA Contract, Order, Grant, or Cooperative Agreement (May 2018) found at: http://www.ago.noaa.gov/grants/vessel_assault_policy.html.

C. Reporting

In accordance with the terms and conditions of the award, financial reports are to be submitted to the NOAA Grants Officer semiannually and Performance (technical) reports are to be submitted to the NOAA program officer annually. Near the end of each award year, NOAA will provide the CI with guidance on what information should be submitted as part of the annual performance report. This information will be used by NOAA to assess the quality of the research and provide NOAA with general information about the quality of activities at the CI, including how many students are participating, scientific output, and number of employees associated with the CI receiving NOAA support. Reports should be submitted electronically through NOAA's Grants Online system.
The Federal Funding Accountability and Transparency Act, 31 U.S.C. 6101 note, includes a requirement for awardees of applicable Federal grants to report information about first-tier subawards and executive compensation under Federal assistance awards. All awardees of applicable grants and cooperative agreements are required to report to the Federal Sub-award Reporting System (FSRS) available at https://www.fsrs.gov/ on all sub-awards over $25,000. Refer to 2 CFR Parts 170.

Publications, Videos and Acknowledgement of Sponsorship. Publication of the results or findings of the funded award activities in appropriate professional journals, outreach materials, or press releases, and production of video or other media is encouraged as an important method of recording and reporting scientific information. These are also constructive means to expand access to federally funded research. The recipient is required to submit a copy of any publication to the funding agency, and when releasing information related to a funded project, include a statement that the project or effort undertaken was or is sponsored by NOAA Cooperative Institute Program. The recipient is also responsible for assuring that every publication of material (including Internet sites and videos) based on or developed under an award, except scientific articles or papers appearing in scientific, technical or professional journals, contains the following acknowledgement and disclaimer: "This project received funding under award [number] from NOAA Cooperative Institute Program. The statements, findings, conclusions, and recommendations are those of the

author(s) and do not necessarily reflect the views of NOAA." The final report is a public document and may be posted, partially or in its entirety, on the NOAA Cooperative Institute Program's website.

VII. Agency Contacts

NAME: Shannon Louie
OAR Cooperative Institutes
1315 East West Highway, Room 11324
Silver Spring, MD 20910
Telephone: (301) 734-1180
shannon.louie@noaa.gov

VIII. Other Information

Permits and Approvals

It is the applicant's responsibility to ensure that all necessary Federal, state and local government permits and approvals for the proposed work to be conducted are obtained and effective before any research begins. Permits for proposed projects can be held by any formally and substantially involved collaborator, including a NOAA collaborator, provided the collaborator is receiving or providing resources associated with this announcement and related awards. Failure to apply for and/or obtain Federal, state, and local permits, approvals, letters of agreement, or failure to provide environmental analysis, when necessary, will eliminate any further consideration of a proposed project for funding.

Per 2 CFR § 200.315(b), the proposed Cooperative Institute for Severe and High-Impact Weather Research and Operations may copyright any work that is subject to copyright and was developed under this Federal award, and NOAA receives a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use the work for Federal purposes, and to authorize others to do so.

Federal purposes are derived from all authorities and mandates Congress has entrusted to federal agencies. By submitting a proposal to this competition, you acknowledge that if selected, you understand that work produced under this cooperative agreement could be publicly disseminated by NOAA for federal purposes in furtherance of its authorities and mandates. NOAA may define specific intended uses, pursuant to its Federal purpose(s) in individual awards.