

Competition for a Cooperative Institute for Modeling the Earth System

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ANNOUNCEMENT OF FEDERAL 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: Competition for a Cooperative Institute for Modeling the Earth System

Announcement Type: Initial

Funding Opportunity Number: NOAA-OAR-CIPO-2018-2005422

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

Dates: Applications must be received by OAR no later than February 16, 2018, 5:00 p.m. EST. 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: Dr. Candice Jongsma, 1315 East-West Highway, Room 11350, 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. EST 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., EST, two business days following the closing date.) No facsimile or electronic mail applications will be accepted. Applications submitted after 5:00 p.m. EST, February 16, 2018 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 Modeling the Earth System. This new cooperative institute supports the Office of Oceanic and Atmospheric Research's Geophysical Fluid Dynamics Laboratory (GFDL) as it works toward advancing NOAA's ability to understand and predict variations and changes in weather, climate, oceans and coastal systems on a spectrum of timescales, through advanced numerical modeling of the Earth System's physical, dynamical, chemical, biogeochemical, and ecological processes. The scope of the new Cooperative Institute incorporates explicitly the consideration of the unforced variability of the Earth System, natural and anthropogenic forcings that include regional contributions and feedbacks, which together govern the response and temporal evolution of the Earth system (IPCC, 2001, 2013). Current state-of-the-art coupled climate models used to

forecast weather-to-climate conditions particularly from subseasonal to seasonal to interannual to decadal and longer timescales must be improved dramatically. Fundamental research is needed to improve the representation of many processes and interactions of importance if these models are to fulfill their promise of advancing the scientific understanding and prediction and addressing NOAA's goals. Consistent with the National Research Council, "A National Strategy for Advancing Climate Modeling" (2012) recommendation of a focus on advancing climate modeling across the continuum of time scales from weather-to-climate, this new Cooperative Institute is expected to conduct research and modeling across the continuum extending from the weather all the way to multidecadal timescales, covering processes, phenomena, variations, changes, and extremes. In the context of whole Earth System science and applications, it is imperative that this new Cooperative Institute address global-to-regional climate variations and changes affecting the world's terrestrial and oceanic ecosystems and biogeochemical cycles and, equally importantly, how ecosystems, in turn, can affect climate change. The Cooperative Institute must possess a vigorous Earth System modeling capability that is rooted in fundamental physics, dynamics, chemistry and biogeochemistry, and ecological principles, taking advantage of the various climate observing programs of NOAA and the nation, and leading to successfully addressing the NOAA mission objectives as identified in its "Next Generation Strategic Plan" (NGSP, December 2010, see: <http://www.performance.noaa.gov/ngsp/>).

FULL ANNOUNCEMENT TEXT

I. Funding Opportunity Description

A. Program Objective

The purpose of this announcement is to invite the submission of proposals to establish a Cooperative Institute for Modeling the Earth System and to provide details on the application, review, and selection process.

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 and supporting research affiliates, each of which demonstrate outstanding performance within one or more established research programs in NOAA-related sciences, including Minority Serving Institutions that can contribute to the proposed activities of the CI. CIs conduct research under approved scientific research themes and tasks. 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

Research Themes of Proposed Cooperative Institute for Modeling the Earth System:

1. Earth System Modeling - Research conducted under this theme will focus on the development of improved climate models that simulate and predict chemical, physical, dynamical, and ecosystem changes in the whole Earth system, including unforced variability, and under the influence of natural and anthropogenic forcings. The research will consist of:

a. Sustained advances in the numerical modeling of the physical climate system, including atmosphere, ocean, land surface and hydrology, and ice, with a special focus on those parts of the system, such as clouds and aerosols in the atmosphere, tropospheric chemistry, oceanic mixing, and ice-sheet ocean interactions, that are the sources of key climate forcing and feedback biases in current models and limit the utility of models for important applications ranging from simulations of sub-seasonal to seasonal weather, El Niño Southern Oscillation (ENSO), to estimates of radiative forcing for seasonal-to-decadal-to-centennial scale climate variations and change studies, to studies of the interactions of air quality and climate, to sea level rise projections.

b. Research on incorporating biogeochemical and ecological processes into GFDL's Earth System Models, to enable research on a broad range of topics involving climate impacts, including those due to natural and anthropogenic forcings, on the biosphere, both land and ocean, and feedbacks from the biosphere onto climate, including, for example, effects of climate variability on fisheries. This will lead to quantitative estimates of climate and biogeochemical feedbacks, and the global and regional climate sensitivity, leading to improved quantification of the Earth System responses to forcings.

2. Seamless Prediction Across Time and Space Scales

Research under this theme recognizes that weather- and climate-relevant phenomena operate across a wide range of time and space scales. Research and modeling that leads to predictions must develop theories and numerical tools based on fundamentals that are similarly applicable across these scales. In addition, this theme recognizes that smaller scale phenomena require the use of high-resolution models and advanced Earth System data assimilation techniques for realistic simulation and skillful prediction.

Predictions/projections under both the initial- and boundary-value problem will be recognized.

a. High-Resolution Modeling and Extremes - Research is needed to improve our

understanding of phenomena that can lead to extreme events, such as heat waves, tropical and extratropical storms, tornadoes, droughts, floods, atmospheric rivers and snowpack changes. Achieving this requires advancing both theoretical understanding of such phenomena as well as our ability to develop and use leading edge, high-resolution numerical models to simulate and predict these phenomena.

b. Predictability - Research is needed both to quantify the extent to which the ocean-atmosphere-land-ice system is predictable on time scales from hours to decades, and to translate such potential predictability into actual predictive skill. This encompasses theoretical and numerical modeling studies that quantify predictability across time scales and improve our understanding of the physical basis for such predictability. This also includes the development and use of systems that can translate potential predictability into actual predictive skill, including research into how best to use observations to initialize prediction models. Included in this is the sensitivity of global and regional climate to coupled atmosphere-ocean data assimilation, initialization, and reanalyses, building upon the atmospheric data initialization of the National Weather Service. Examples of phenomena that could contribute to such predictability include the Madden-Julian Oscillation, upper ocean thermal variations, ENSO, the North Atlantic Oscillation, stratospheric variations, Arctic Oscillation, and decadal variations in the Pacific and Atlantic oceans.

3. Earth System Science: Analysis and Applications – Research under this theme will focus on the use of Earth System models and analyses to study physical processes associated with climate change and its impacts, including abrupt change, coastal processes, carbon and nitrogen cycles, sea-level rise, the frequency of hurricanes and other geophysical phenomena as well as attributing climate change to natural and anthropogenic forces. Tools, methods, and observational synthesis will be developed and used in conjunction with Earth System Models to improve our understanding of past, present and future Earth System interactions including under the action of various forcings.

COOPERATIVE INSTITUTE CAPABILITIES

The proposed CI should provide the flexibility needed to work on multi-disciplinary research in collaboration primarily with NOAA's GFDL and other NOAA-related research laboratories or entities. The purpose of establishing this CI to Model the Earth System is to bring together in one location a critical mass of researchers who are focused on expanding the fundamental knowledge of the Earth's physical processes of the atmosphere, oceans, biosphere and cryosphere; numerically modeling those processes in an integrative manner utilizing high performance computing; and using that knowledge and numerical models to advance NOAA's mission to better understand and predict the behavior of the oceans and the atmosphere from short to long timescales. The wide range of in-depth scientific expertise that the CI should possess includes meteorology, oceanography, atmospheric physics, atmospheric chemistry, classical physics, biogeochemistry, cryosphere, mathematics, and computer science. The need exists to build, couple, and apply these

models and to transition them ultimately from research to operations. These are critical to the unified (“seamless”) modeling of the Earth System for understanding and prediction on diverse timescales. To have the CI collocated with GFDL is imperative.

NOAA requires substantial flexibility from the CI to provide both scientific depth to existing programs and to add new capabilities when NOAA is faced with new drivers such as the need to advance climate impacts science, including modeling and data assimilation, or regional climate information services.

The CI is expected to promote student and postdoctoral involvement in research projects in ways to train the next generation of scientists. The CI should provide substantial support for graduate and undergraduate students and post-doctoral scientists that will support 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). Applicants should clearly describe how they will recruit and train a more diverse and inclusive workforce.

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)].

COMPOSITION OF THE INSTITUTE

The proposed CI can be comprised of a single academic institution that offers accredited

graduate level degree-granting programs in NOAA-related sciences or a consortium of academic institutions with the aforementioned programs and their supporting research affiliates. Each proposing entity must have strong programs in support of at least one of the identified research areas. The CI would be expected to develop and implement mechanisms to facilitate collaborative research, education, and outreach with NOAA (e.g., post-doctoral appointments, graduate research assistantships and research appointments).

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

The proposed CI should support the long-term goals of NOAA identified in the NOAA Next Generation Strategic Plan and NOAA 5-year Research and Development Plan (see: <http://nrc.noaa.gov/CouncilProducts/ResearchPlans.aspx> - note that the referenced plan is the most current approved plan and the updated plan is not yet available) and should address the following program research gap(s):

Climate Adaptation and Mitigation ["Climate" R&D is taken to imply a continuum of timescales extending from weather onwards.]

- Subseasonal to multi-decadal (S2S2D) forecasts utilizing Earth System models
- Improved scientific understanding of the changing climate system and its impacts
- Assessments of current and future states of the climate system that identify potential impacts and inform science, service, and stewardship decisions
- Address the weather-to-climate continuum in the modeling of the coupled atmosphere-ocean-biosphere-cryosphere system for describing the complete Earth System, its variations, changes, and extremes
- Capture the realism of the Earth System through advances in fundamental theory, high-spatial-resolution modeling including integrating the ocean, atmosphere, land and ice, and computational techniques
- Account for the uncertainties present in the Earth system processes, and construct numerical simulations with state-of-the-art high resolution models to quantify the confidence intervals in the output variables of interest
- Water resources and drought forecasts including snowpack and nutrient runoff

Weather-Ready Nation

- Reduced loss of life, property, and disruption from high-impact events
- Characterize extremes of variability over all timescales of interest
- Weather and climate prediction anomalies and impacts
- Scenarios for future climate mitigation and adaptation studies, including land use changes
- Decision support informed by information and assessments of weather and climate variations and trends

Healthy Oceans

- Improved understanding of ecosystems to inform resource management decisions

- Resilient coastal communities and economies
- Resilient coastal communities that can adapt to the impacts of hazards and climate change
- Projection of sea level change and effects due to coastal storms on coastal inundation and surges

The following is a more complete description of the full depth and breadth of NOAA's need as it relates to the research to be conducted in partnership with the new CI:

NOAA is a mission-oriented agency, charged with the responsibility for understanding and predicting the behavior of the oceans and atmosphere and for managing coastal resources and ecosystems. NOAA Research operates in "Pasteur's Quadrant" which comprises performing fundamental, innovative science for practical applications. To respond to weather and climate variations and change, including extreme conditions on all timescales, decision makers must be informed by credible predictions powered by state-of-the-art numerical models that account for the myriad of critical factors and feedbacks governing the Earth System and their variations and changes, with high confidence. High-spatial-resolution numerical modeling of the global system, which accounts for the complexities in the system, is essential for regional weather and climate information, potentially down to county scales. The complexities are several e.g.,: processes involving atmospheric constituents such as greenhouse gases and aerosols, regional temperature, clouds, ocean circulation, sea ice, the terrestrial and marine hydrologic cycle, the carbon cycle, the nitrogen and phosphorus cycles, ecosystems, and human land use. In addition to the impacts of changing climate, coastal ecosystems are affected by human activities such as nutrient inputs from agricultural runoff and exchanges with the open ocean. Our growing awareness of the diversity of important interactions among elements of the Earth System provides unique challenges for the Agency.

There now exists an unprecedented opportunity to incorporate the increasingly advanced knowledge of the Earth System into physical climate models in order to provide the best possible information on a host of weather and climate elements: the threat of natural hazards (i.e., floods, storms, and droughts), air quality, nutrient inputs into coastal areas, decadal to centennial-scale climate change including extremes, and climate predictability. The impacts arising from weather and climate influences include the connections between air quality and climate, sea level rise and coastal inundation, climate variations/changes and fisheries, summertime warming and heat waves, Arctic climate change, climate change affecting agriculture and food production, precipitation changes and freshwater availability, water security, droughts and floods. These models should also have the capacity to assimilate the growing diversity of observations and focus on scales ranging from the planetary (fully coupled Earth System models) to the regional and local scales relevant to many stakeholders (feeding into offline limited area models as needed). The Agency's unique challenge is to work toward an integrated understanding of the system in the face of the combinatorial

increase in complexity that comes from coupling models of very different characteristic time and space scales and very diverse processes. This will require that NOAA makes fundamental advances in Earth System modeling in order to improve predictions of the system on all timescales.

NOAA/GFDL has well-known core competencies in the study of the physical climate and fundamental research that advances weather and climate modeling, including on decadal and longer timescales. Through this new Cooperative Institute, these competencies are expected to be leveraged to accelerate the pace of discovery relevant to NOAA's mission, specifically:

- Research leading to weather, climate, and Earth System Models for transitioning to applications and/or operations
- Improved understanding and forecasting of ecosystem conditions
- New analytical insights into processes and predictive capabilities for water resources, hydrology, climate and oceans
- Understanding the links between weather circulation and climate and regional impacts, including drought, hurricanes, fires, and weather extremes

These activities also directly support Assessment Reports such as those issued by the Intergovernmental Panel on Climate Change (IPCC), the Climate Change Science Program (CCSP), and the North American Regional Climate Change Assessment Program.

While NOAA's mission requires delivery of high-quality earth system modeling and application products at weather and climate timescales (e.g., subseasonal-to-seasonal-to-decadal and even longer), permanent federal resources to accomplish this mission are limited both in number of federal personnel and the breadth and depth of disciplines available to address these areas. Therefore, it is necessary to utilize the Nation's research and development infrastructure/capabilities more broadly to help achieve NOAA's mission goals. We seek a partner that possesses demonstrated capabilities to address the need to make Earth system models increasingly realistic; to make these models operate successfully at high spatial resolutions and for those phenomena of special interest to society; and to characterize and narrow uncertainties based on understanding that in turn allows the delivery of credible information to society. A Cooperative Institute with access to all the necessary capabilities and expertise is essential in order to conduct the envisioned research, particularly long-term research activities that focus on a 5-10 year time frame.

The proposed Cooperative Institute for Modeling the Earth System would work in partnership with NOAA as it strives to meet a number of critical research objectives identified in the Agency's 5-year research plan and 20-year research vision, see:

<http://nrc.noaa.gov/CouncilProducts/ResearchPlans.aspx> and

http://nrc.noaa.gov/sites/nrc/Documents/Reduced%20file%20size_20%20yr%20Research%200Vision.pdf, respectively. These include the following research milestones in the 5-year research plan:

- Report on climate model improvements resulting from Climate Process Teams and

recent major field studies

- Report on state of knowledge of decadal variability, the monitoring ability for this, and potential decadal predictability
- Routine reports on detection/attribution studies linking observing capabilities with model projections
- Develop dynamic understanding of decadal variability and predictability studies
- Report on limits of predictability on decadal timescales
- Track and improve the ability to forecast the relationships among climate and variations in coral cover, bleaching, and anthropogenic impacts on coral reefs
- Develop new experimental tools (including methods, models, and educational and outreach resources) that communicate climate information and deliver techniques for incorporating that information/analysis into specific decision scenarios
- Implement prototype decision support tool for water management linking historical, current, next season, and decadal outlooks
- Identify key climate-sensitive issues at regional scales
- Develop prototype methods for the application of climate information to practical challenges associated with natural resource management and hazard mitigation

The Cooperative Institute would also work collaboratively with NOAA federal scientists to develop these long-term products and services identified in the 20-year research vision:

- Subseasonal-to-multi-Decadal (S2S2D) forecasts utilizing Earth System models
- Water resource & drought forecasts including snowpack and nutrient runoff
- Projections of sea level change, and effects due to coastal storms on coastal inundation and surges
- Weather and climate-predicted anomalies, and impacts
- Scenarios for future climate mitigation and adaptation studies – including land use changes
- Decision support informed by climate information and assessments of weather and climate variations and trends

It is expected that the research, numerical models, and applications developed under this Cooperative Institute would be transitioned into NOAA's operations, applications, and information for as-needed decision-making, according to the processes adopted by NOAA and that the Cooperative Institute will collaborate and share results with other institutes that would benefit from such an exchange. Some of the applications, such as decadal and centennial projections of climate change using physical coupled climate models, are relatively mature and are applied operationally to support, for example, periodic assessment reports on long-term climate from the IPCC and some of the synthesis and assessment products from the National Climate Assessment (NCA). Other applications, such as decadal forecasting, are very immature and it may be years before they are developed sufficiently for operational deployment.

Comprehensiveness

NOAA's need as it relates to the development of Earth System Models, the capacity to explore key applications of those models, and improved models that may be used for prediction on time scales from weeks to decades, are articulated by portions of many federal statutes and requirements, as well as international agreements for coordination of research on climate variability and change. The expertise necessary to develop improved global climate models is very diverse, ranging from glaciology to mesoscale meteorology, and from interaction between ocean biology across trophic levels to modeling of clouds in the atmosphere. To be effective, this expertise must be focused within a coherent global modeling framework towards key applications rather than dispersed and weakly coordinated. The NOAA Federal workforce focused on Earth System Modeling cannot provide this diversity of expertise in isolation. It is expected that this Cooperative Institute will play a central role in increasing the comprehensiveness of NOAA's Earth System Modeling effort, working in close coordination with the existing global modeling projects, including their transition to operations/applications. It is also expected to provide expertise in particular observational datasets essential to the development process. The totality of the efforts in modeling and use of observational data will enable the understanding of forcings and feedbacks in the coupled Earth System.

- Global Biogeochemical Cycles

The incorporation of more accurate representation of global biogeochemical cycles is essential to improve our models of the Earth System as it evolves both naturally and in response to external forcings, and is one area where the broadening of expertise through the Cooperative Institute is essential. Of special importance is improving our understanding of land and ocean carbon sinks as they operate today and as they are anticipated to operate in the future. The evolution of these carbon sinks remains one of the key uncertainties in climate science.

- Ecological modeling

A number of other biological and ecological model components, on land and ocean, are required to address key application of the next generation of Earth System Models, two illustrative examples being ocean fisheries and forest fires. In both of these cases, it is not only the implications of climate change but also natural variability on time scales of seasons to decades, including the quantification of predictability on these timescales and the value of experimental forecasts, that need to be integrated with a coherent Earth System modeling framework.

- Air Quality

It is also anticipated that the next generation of Earth System models will address problems of air quality more directly, including understanding variability and predictability on various time scales. This requires a substantial increase in fidelity of the atmospheric chemistry component of our global models. Additional Cooperative Institute-based expertise is needed

that is closely coordinated with other Earth System Model development.

- High-resolution atmospheric and land models

The increasing emphasis on high-resolution atmospheric modeling associated with Next Generation Global Prediction System (NGGPS) models opens up important research and development efforts in what might be referred to as “global mesoscale meteorology”.

Phenomena of societal relevance, often associated with extreme weather, can be studied in the coherent framework of global climate models in which climate change, internal variability, and predictability can be studied coherently. Phenomena range from tropical cyclones, to extreme warm-season convection in the United States, to extreme extratropical cyclones, to floods and droughts.

These high-resolution atmospheric models are also the setting where model development aimed at improving the simulations of convection and clouds will be focused in the future. Diverse meteorological expertise will be needed to ensure that model development takes into account the simulation of weather phenomena of societal importance in global models, as well as the more familiar biases in climatology that have driven development of new treatments of clouds and convection in the past.

A new generation of high-resolution land models with improved hydrology, and natural and managed vegetation, needs to be fully integrated into these high-resolution atmospheric models to facilitate improvements in models of global, regional, and watershed level hydrologic modeling.

- Atmospheric Aerosols

The aerosol component of the atmosphere is another source of complexity that requires diverse expertise. Besides the continuing uncertainty in the consequences for climate change of the interactions between aerosols and clouds, different components of the atmospheric aerosol, such as dust or black carbon, can play important roles in climate variability -- for example, the potential for Saharan dust to affect both interannual and interdecadal tropical storm activity over the Atlantic, and for dust to exert control over the fertilization of biology in the Southern Ocean, with potential consequences for the carbon cycle.

- Ocean modeling

A critical component in providing the next generation of Earth System Models is developing new generations of ocean models. Over the last several years a new ocean modeling system (MOM6) has been developed at GFDL. This new system provides important new capabilities for Earth System simulation by incorporating leading edge numerical techniques and physical parameterizations. Much research remains, however, to further develop this system and have it reach its full potential. Crucial to this will be development of alternate coordinate systems in the models, improving the parameterization of small-scale processes, explicit simulation in high resolution ocean models of small mesoscale eddies that have a significant impact on the ocean climate of localized upwelling systems in coastal zones, and developing this new modeling system into prediction systems on seasonal to decadal scales.

- Predictability

To improve the ability to make predictions across a wide range of timescales, from hourly to weekly to seasonal to decadal to centennial is an important research objective. Newly developed modeling systems at GFDL offer the potential for significant advances in studying predictability across time scales, laying the foundation for improved predictions. However, the limited number of federal personnel presents a significant hurdle to fully exploiting these new modeling systems for improved understanding of predictability and prediction across time and space scales, and thus advancing this important objective. Ways in which Cooperative Institute partners could substantially supplement, complement, and leverage NOAA's financial, technical and human capabilities in order to accelerate the advancement of this important objective include research on coupled atmosphere-ocean model initialization for predictions, assimilation techniques, as well as advancing our understanding of fundamental aspects of predictability and variability across scales, including extremes. Both the initial-value (i.e., with initializations) and boundary-value (i.e., with natural and anthropogenic climate forcings) problems will need accounting for in the investigation of predictability. Examples include predictability of seasonal to decadal hydroclimate extremes, such as the 1930s Dust Bowl or the recent California drought, as well as predictability of decadal-scale ocean variability and its impact on the climate system.

- Ice Sheet Modeling

Land-based ice sheets contain a vast amount of water, and melting of land-based ice sheets could contribute substantially to sea level rise. An important component of the Cooperative Institute will be collaborative efforts to improve our understanding of the dynamics of land-based ice sheets and translate that understanding into improved numerical models of ice sheets, including their response to changing external forcing. Such ice sheet models will ultimately be incorporated into full Earth System Models to provide NOAA and the Nation with the best possible projections of the future contribution of changes in ice sheets to sea level rise.

- Coastal Marine Modeling

Coastal marine environments are very important, in part because of their critical role in fisheries and ecosystems. The Cooperative Institute will work towards developing improved understanding of coastal marine processes and improving the representation of those processes in Earth System Models. This includes improved understanding and modeling of intense boundary currents and shelf processes and their impacts on fisheries and ecosystems in a changing environment.

Reducing uncertainties through expanding the number of ensemble simulations:

High-Performance Computing (HPC) research and developments: This activity will be required for capturing the realism of the Earth's systems; for obtaining increasingly better weather and climate information in regional space scales; for high-resolution initialization and data assimilation to advance predictability; and for increased ensembles.

Flexibility

A key expectation for the Cooperative Institute is to provide flexibility to move resources as the science evolves. In the future, for example, if forest fire prediction, or air quality, or fisheries modeling prove to be especially promising, the expectation is that this Cooperative Institute will allow rapid concentration of resources in a way that would not be feasible with the government workforce in isolation.

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 approximately \$8M-\$10M 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 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, in the event that a consortium of academic institutions and supporting research affiliates submits the successful application, to the lead academic institution of the proposed consortium that applied for the award and where the CI 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

To stress the collaborative nature and investment of a CI by both NOAA and the research institution, cost sharing is required. There is no minimum cost sharing requirement; however, the amount of cost sharing will be considered when determining the level of the CI's commitment under NOAA's standard evaluation criteria for overall qualifications of applicants. 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:

Dr. Candice Jongsma

OAR Cooperative Institutes

1315 East West Highway, Room 11350

Silver Spring, MD 20910

Telephone: (301) 734-1177

candice.jongsma@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/pr od01_008655.pdf

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. Applications submitted by a CI consortium should include the name of each research participant and associated principal investigator. In the event that the application is submitted by a consortium of academic institutions, the lead academic institution for the consortium should submit the application on behalf of its supporting research affiliates.
- 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 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 how the CI will use the Executive Council and Council of Fellows described in the CI Interim Handbook. 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.

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 \$8M in the first year, with reasonable inflationary escalation in subsequent years. NOAA uses the proposed annual budgets to establish a 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 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: <http://www.ecfr.gov/cgi-bin/text-idx?SID=2dae4a7dcd5848a6364bb94d2d7786dd&mc=true&tpl=/ecfrbrowse/Title02/2subtitl eA.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., EST, February 16, 2018. 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: Dr. Candice Jongsma 1315 East-West Highway, Room 11350, Silver Spring, Maryland 20910; telephone (301) 734-1177. 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 16, 2018, 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, “Intergovernmental Review of Federal Programs.”

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 11350, Silver Spring, Maryland 20910, Attn: Dr. Candice Jongsma.

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 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. All 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

July 1, 2018, should be used as the proposed start date on proposals. The announcement of

the award is expected at the end of May 2018.

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 <http://go.usa.gov/SBYh> and <http://go.usa.gov/SBg4>.

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 <http://www.ago.noaa.gov> and at <http://go.usa.gov/hKbj>. **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. Certifications Regarding Federal Felony and Federal Criminal Tax Convictions, Unpaid Federal Tax Assessments and Delinquent Federal Tax Returns. In accordance with Federal appropriations law, an authorized representative of the selected applicant(s) may be required to provide certain pre-award certifications regarding federal felony and federal criminal tax convictions, unpaid federal tax assessments, and delinquent federal tax returns.

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.

FREEDOM OF INFORMATION ACT (FOIA) - 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.

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

Contact: Dr. Candice Jongsma
OAR Cooperative Institutes
1315 East-West Highway, Room 11350
Silver Spring, MD 20910
301-734-1177
Candice.Jongsma@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.