APPENDIX I: Minority University Research and Education Project/ Science Mission Directorate Research: Ocean Biology and Biogeochemistry (OCEAN)

I.1 SCOPE OF ACTIVITY

I.1.1 Overview of the Funding Opportunity

The Minority University Research and Education Project (MUREP) is administered through the National Aeronautics and Space Administration's (NASA) Office of STEM Engagement (OSTEM). Through MUREP, NASA provides financial assistance via competitive awards to Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities, Hispanic-Serving Institutions, Asian American and Native American Pacific Islander Serving Institutions, Alaska Native and Native Hawaiian-Serving Institutions, American Indian Tribal Colleges and Universities, Native American-Serving Nontribal Institutions and other MSIs, as required by the MSI-focused Executive Orders. These institutions recruit and retain underrepresented and underserved students, including women and girls, and persons with disabilities, into science, technology, engineering and mathematics (STEM) fields.

MUREP investments enhance the research, academic and technology capabilities of MSIs through multiyear cooperative agreements. Awards assist faculty and students in research and provide authentic STEM engagement related to NASA missions. Additionally, awards provide NASA-specific knowledge and skills to learners who have historically been underrepresented and underserved in STEM. MUREP investments assist NASA in meeting the goal of a diverse workforce through student participation in internships and fellowships at NASA Centers and the Agency's Jet Propulsion Laboratory (JPL).

NASA's vision includes new and improved understanding of our planet Earth using space-based observations to conduct scientific studies of the land, atmosphere and ocean. In particular, better understanding of the ocean's role in the Earth system, and predicting future causes and impacts of change driven by Earth's climate, the environment, and event-scale phenomena on ocean biology, biogeochemistry, and ecology are of key importance for sustaining life on our planet.

NASA's ocean research supports a number of Presidential mandates and associated Federal research objectives, such as the 2018 Executive Order Regarding the Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States, which calls for the need to provide economic, security, and environmental benefits for present and future generations of Americans. The Agency's ocean research is also responsive to and supports priorities identified in the Subcommittee on Ocean Science and Technology (SOST) 2018 report Science and Technology for America's Oceans: A Decadal Vision. This vision identifies five goals to advance U.S. ocean science and technology and the Nation in the coming decade. Research developed to improve our understanding of ocean biology and biogeochemistry is anticipated also to support the Global Ocean Observing System (GOOS) Essential Ocean Variables (EOV) defined by the GOOS Biogeochemistry and Biology and Ecosystems panels, all of which specify remote sensing as a critical tool in Earth system research.

In support of NASA's ocean-focused research, the MUREP Ocean Biology and Biogeochemistry (OCEAN) activity is established to strengthen and develop the research capacity and infrastructure of MSIs in areas of strategic importance and value to NASA's mission and national priorities.

Overall, OCEAN awards seek to improve understanding of the structure and function of global aquatic ecosystems, their interactions with the atmosphere, terrestrial and cryospheric systems, and the ocean's role in the cycling of the major biogeochemical elements. This is done by enhancing the capability of institutions to participate in funding opportunities, such as Research Opportunities in Space and Earth Sciences (ROSES), and to support the Agency's advancement of science to achieve a deep scientific understanding of our planet.

Proposals are sought from MSIs that will respond to one of two objectives that address the OCEAN goal. The goal and objectives of OCEAN awards are as follows:

Goal 1: Quantitative Analyses of Vulnerability and Shifts of Aquatic Biology and/or Ecosystems in Response to Climate Change.

Objective 1.1: Quantitative remote sensing analyses of impacts and/or vulnerability of aquatic ecosystems to climate variability and change.
Research responsive to this objective shall be focused on understanding changes in aquatic ecological patterns, habitat shifts, and effects of environmental change on biological or ecological community structure induced by changes in the environment. Biological and ecosystem variability and change in response to a changing climate are anticipated to be greater in the coastal ocean (including islands) than in the open ocean. But coastal regions are not isolated; they are impacted by, and exert an influence on, the open ocean. To understand future impacts on and vulnerability of aquatic ecosystems to changing conditions, it is necessary to measure aquatic ecosystem properties across biological, physical, and chemical boundaries and better integrate coastal observations within regional and global frameworks and models.

Research proposed under this area shall be integrative, and utilize remote sensing and other observational data to identify significant ocean biology and ecology impacts and vulnerabilities in response to global climate and environmental variability and change, to understand the processes controlling them, and to assess and quantify the likely magnitude of change(s).
Proposals shall offer compelling rationales as to (1) why the impacts and/or vulnerabilities to be studied are expected to be highly significant, representing major perturbations to the Earth system, and (2) how the remote sensing data and data products to be utilized in the study provide unique and powerful information for addressing the research issues/questions posed. Development of seasonal/annual/sub-decadal models is particularly encouraged.

Objective 1.2: Improve understanding of carbon cycle processes and feedbacks in aquatic critical zones that are particularly vulnerable to environmental changes.
Proposals responsive to this objective shall address research that contributes to furthering the understanding of carbon cycling in aquatic critical zones (e.g. large reservoirs, river plumes, wetlands, coastal zone). Aquatic critical zones are regions where important biogeochemical and physical processes take place and together regulate the functionality of aquatic ecosystems. Anthropogenic activities, such as land use and change, impact inland aquatic and coastal ecosystems, and climate change has altered temperature and precipitation patterns, adding a layer of complexity to the understanding of how these regions have been altered and how their condition and functionality will continue to change over time. Wetlands, peatlands, and coastal ecosystems also sequester large

quantities of carbon through processes at risk of disturbance from changing climate, land use change, and rising sea levels. The high uncertainty and poor understanding of how carbon moves from land to the ocean has been identified as one of the critical knowledge gaps necessary to constraining the structure and functioning of the Earth system. However, quantifying these fluxes remains challenging, as it requires measurements covering a wide range of spatial and temporal scales. Research under this objective shall be focused on furthering the understanding of present and future carbon fluxes into and out of aquatic critical zones due to projected changes in climate, environmental change or disturbance, and/or human actions, including but not limited to: management/decision making, urbanization, before and after land use change, sea level rise, etc., and understanding the potential feedback(s) of naturally or anthropogenically-driven change in such zones. Development of seasonal/annual/sub-decadal models is particularly encouraged. Activities that support the key findings and recommendations of the Coastal CARbon Synthesis (CCARS) Science Plan and the Second State of the Carbon Cycle Report (SOCCR2) are welcome. Proposed investigations shall utilize remotely sensed (e.g., the Moderate Resolution Imaging Spectroradiometer MODIS, Landsat, etc.) observations as a primary research tool. Proposers are encouraged to use, in addition to NASA and non-NASA Earth observing satellite sensors currently in orbit, data acquired by the Commercial SmallSat Data Acquisition Program (CSDAP). Projects planning to propose any new data collection are strongly encouraged to speak with the cognizant program manager prior to submitting the proposal to ensure the scope of the planned proposed effort are appropriate to the solicitation.

All proposals that respond to Objective 1 shall explain how error and uncertainty will be considered, incorporated into results, and reported. This explanation shall include characterization of uncertainties and quantification of errors associated with data, analytical approaches, model results, and scientific interpretations. This discussion shall be described in the Scientific/Technical/Management Section of the proposal.

OCEAN awardees' proposals shall focus on the above goal and objectives in order to maximize potential impact and success. In addition, all proposed activities shall address the requirements outlined in this appendix and in the broader Engagement Opportunities in NASA STEM (EONS) 2021 Notice of Funding Opportunity (NOFO).

I.1.2 National and Agency-Wide Priorities

Relevance to NASA

OCEAN is designed to capitalize on the unique facilities, capabilities and staff of MSIs to contribute to NASA Strategic Goals for STEM Engagement and to the Agency's four (4) Mission Directorate Offices, nine (9) Field Centers and NASA's JPL as summarized below and further described in NASA Strategic Plan and Relevance to STEM Engagement and NASA Mission Directorates and Center Alignment of the EONS 2021 NOFO (Sections 1.3 and Appendix H, respectively). Proposals that demonstrate alignment to agency priorities and to the goals and objectives of the OCEAN Activity are, by definition, relevant to NASA.

Agency Strategic Goals for STEM Engagement

The NASA Strategic Goals and Objectives relevant to STEM Engagement are outlined in the 2018 NASA Strategic Plan.

Strategic Goal 3: Address national challenges and catalyze economic growth.

Strategic Objective 3.3: Inspire, engage, educate, and employ the next generation of explorers through NASA-unique Science, Technology, Engineering, and Mathematics learning opportunities.

Annually, NASA OSTEM generates a body of evidence-based data it collects from awardees to assess progress of its investments in achieving the following Performance Goals (PGs):

- PG 3.3.3 Provide opportunities for students, especially those underrepresented in STEM fields to engage with NASA's aeronautics, space, and science people, content, and facilities in support of a diverse future NASA and aerospace industry workforce.
- PG 3.3.4 Enhance the effectiveness of education investments using performance assessment and evaluation-driven processes.
- PG 3.3.5 Provide opportunities for students to contribute to NASA's aeronautics, space, and science missions and work in exploration and discovery.

Proposals shall clearly and concisely describe the relevance of the proposed work to 1) NASA's Strategic Goals and Objectives for STEM Engagement; and 2) the research priorities of the Earth Science Division (ESD), and in particular the OCEAN activity.

I.1.3 Relevance to Lead Institution

The OCEAN goal and objectives include increasing "the ability of research leadership at the lead institution to leverage resources to enhance its research capacity at the project, program, department, college, and/or university levels." Proposals shall demonstrate how the proposed project plan will be a significant element of the lead institution's long and short-term STEM strategic research plans, interests, and capabilities, and how the project will provide base-level resources to support participation in future ESD opportunities such as in ROSES. Also, the proposal is encouraged to reference elements of department, college, and university strategic plan(s), research priorities, and/or other pertinent university documents.

I.2 AWARD INFORMATION

I.2.1 Award Value and Period of Performance

NASA's ability to make awards is contingent upon the availability of appropriated funds from which payment can be made. It is anticipated that approximately (4) awards of up to a maximum of $250,000 each, per year, for a period of performance not to exceed three years each may be made under this NOFO pursuant to the authority of Title 2 Code of Federal Regulations (CFR) Parts 200 and the *NASA Grant and Cooperative Agreement Manual* (GCAM).

This solicitation opens on November 16, 2020 and closes on April 15, 2021. Announcements of proposal status are projected to be available via NSPIRES in June 2021. The period of performance will begin when NASA issues funds to recipients, which is planned to be on or about July 1, 2021.

I.2.2 Budget Guidelines and Requirements

NASA OCEAN grants are intended to provide resources to MSIs to support a comprehensive research activity that will advance the understanding of Goal 1 (see Appendix I, Section I.1.1 above). Proposals may include but are not limited to support for personnel time, travel, meetings, research, specialized resources, technical expertise and support needed to develop

and implement proposed research. In particular, Principal Investigators (PIs) for each proposal shall budget for the following:

- Student support: Support for a MSI student (undergraduate/graduate level) shall be included for the duration of the project. This student shall be directly involved in developing and carrying out the research proposed.
- Conference/meeting attendance: PIs are required to attend one Ocean Color Research Team (OCRT) meeting or equivalent each year in the United States (e.g., PIs should budget a four-day trip to the farthest coast once per year). If the PI cannot attend, their designee shall participate. In addition, funds shall be included to allow the student to participate in scientific meetings/conferences where they can showcase the results of the ongoing research. Such meetings include, but are not limited to, SACNAS and other ocean sciences meetings (including AGU).

OCEAN budget proposals shall address costs that NASA Centers and JPL will incur for the use of their facilities and/or contracted technical support, should the proposer choose to utilize NASA Center or JPL support. The costs of such NASA services shall be included in the proposal as part of the funding amount. For additional budget guidelines, see the *2020 NASA Guidebook for Proposers (NASA Guidebook for Proposers).*

The following guidelines and restrictions apply to the use of OCEAN grant funds:

- The maximum allowable budget for grant activities is $250,000 per year. The proposed plan and all elements shall have a maximum performance period of three (3) years. Each proposer shall request only the amount of funding that they estimate will be used within the stated period of performance.
- All funds shall be awarded to the lead institution. Subcontracts, partnerships, and any other agreements within the proposing team are with the lead institution and not with the Agency.
- The budget shall clearly include information for the lead institution's overhead/general and administrative expenses.
- Cost sharing is not required.

I.2.3 Primary Roles

Principal Investigator

Every institution submitting a proposal shall identify a single individual, the Principal Investigator (PI), who will be responsible for the quality and direction of the entire proposed effort and for the use of all awarded funds. Please see EONS 2021 Section 3.3 (Principal Investigators and Proposal Team Members) for information regarding proposal team members in addition to the lead PI.

The PI shall be a tenured or tenure-track faculty member of the lead institution if a tenure system is established. Postdocs and eligible institutions without a tenure-track system may also apply but shall submit a letter of commitment to comply with guidance provided under Section I.6.2 (Summary of OCEAN Grantee Responsibilities) below. Please note that all proposed changes to a PI shall be submitted to the Technical Officer, per the process described in the *NASA Grants and Cooperative Agreements Manual* (GCAM), Section 7.9 and are subject to NASA's prior written approval.

PI responsibilities include, but are not limited to:

- Delivering a final, actionable implementation plan for responding to NASA Earth Science Division (ESD) (within NASA's Science Mission Directorate (SMD)) opportunities in the institution's selected emphasis area;
- Providing visionary and contemporary leadership for the planning and delivery of high-impact research and educational programs;
- Providing overall leadership, administration, and evaluation of the project and its activities;
- Engaging with the institution's departmental, college, and university leadership to promote institutional advancement and enhanced research capacity;
- Carrying out supervisory responsibilities for project staff in accordance with the organization's policies and applicable state and federal laws;
- Providing day-to-day management of project budgets and ensuring that all applicable institutional and NASA rules, as well as state and federal guidelines, are followed in the utilization of such funding;
- Participating in OCRT meetings; and
- Ensuring that all progress reports are delivered, annual/closeout performance report and responses to data calls are completed in compliance with NASA guidance and delivered to OCEAN management in a timely manner.

NASA will facilitate communication among awardees, NASA's OSTEM and subject matter experts (SMEs) in the Agency in order to promote synergy, prevent duplication of effort, and build upon ongoing work during the period of performance. NASA will schedule periodic teleconferences and/or web conferences with recipients and appropriate members of NASA's OSTEM and other STEM communities to share information.

I.2.4 Partnerships and Collaboration

Carefully constructed partnerships between OCEAN recipients and other entities may lead to substantial benefits for all parties involved. Specifically, OCEAN recipients can benefit from access to special purpose facilities, exposure to new work areas; leveraged support for their research efforts, and/or potential sources of future funding from partners. Industry and other universities and colleges may benefit from the capabilities OCEAN recipients bring in specialized work areas, and from the OCEAN students who may be recruited as future employees or graduate students. NASA also benefits from the increased innovation that these partnerships bring to the Agency's missions and projects.

Proposers are encouraged to demonstrate partnerships or collaborations among a broad range of entities, including academic institutions, government agencies, business and industry, private research foundations, and non-profit agencies. Proposals shall describe how the proposed teams/collaborations will increase student access to the OCEAN research opportunities, achieve OCEAN's goals and objectives, leverage significant sources of additional funding, obtain essential services that are not available at the proposer's home institution, and/or contribute to sustainability.

Institutions receiving OCEAN awards may choose to build collaborations with NASA Centers and JPL when such collaborations will mutually benefit the OCEAN recipients' and NASA Centers' and JPL's abilities to accomplish the ESD's goals. Proposers are strongly encouraged to identify professional learning opportunities for faculty, postdocs and

researchers. Letters of support from partners are encouraged when collaborations are planned.

I.2.5 Data Management Plan

All proposals shall contain a Data Management Plan (DMP). The DMP shall be included in a special section of the proposal, entitled "Data Management Plan." The DMP may not exceed two pages in length and shall immediately follow the references and citations for the Scientific/Technical/Management Section of the proposal. The two-page DMP section does not count against the 15-page limit of the Scientific/Technical/ Management Section of the proposal. Formatting requirements for DMPs are the same as for the Scientific/Technical/Management Section. The DMP section shall include, as relevant to the type of study being proposed, the types of data and data products or other materials to be produced in the course of the project, the standards to be used for data and metadata formats, and plans for providing access to and/or archiving the data and other research products in compliance with NASA Earth Science Data and Information Policy. A valid DMP may include only the statement that no detailed plan is needed, as long as a clear justification is provided. The DMP shall describe how errors and uncertainties will be reported, including the data and products to be shared and archived. Additional information about data management is available at the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) Web site. For any new data sets proposed, the DMP shall include plans for quality assessment, timely public release, and long-term archive of the data set(s). Consistent with the DMP, costs needed to support all data management activities, including quality assessment, documentation, data and product sharing, and preparation for long-term archive, shall be included in the budget presented in the proposal. In addition, the person(s) within the proposing team responsible for data management shall be identified, along with the time to be devoted to data management detailed in the table of personnel effort. NASA strongly encourages allocating resources within the proposal budget to adequately address data management needs.

Data produced under resulting grants shall be archived in the SeaWiFS Bio-optical Archive and Storage System (SeaBASS), within the Ocean Biology Distributed Active Archive System (OB.DAAC). Data collection and analysis methods shall follow community-vetted protocols, and datasets shall be accompanied by complete documentation and calibration information (see "Contribute Data" sections of the SeaBASS website). Datasets will be reviewed for compliance after awardees submit them.

I.3 ELIGIBILITY INFORMATION

I.3.1 Proposing Institutions

All proposals shall originate from a minority-serving U.S. community college, college or university, designated and listed by the U.S. Department of Education as an MSI. **A current list of MSIs can be found on the MUREP website**. Institutions not meeting this requirement are encouraged to partner with colleges or universities that are eligible. See the EONS 2021 NOFO, Section 3 (Eligibility Information) for additional information.

I.4 PROPOSAL AND SUBMISSION INFORMATION

I.4.1 Proposal Submission

To ensure proposals are responsive to the goal and objectives outlined in this solicitation, this program element will use a **two-step proposal submission** process in which the Notice of Intent (NOI) is replaced by a mandatory Step-1 proposal which shall be submitted electronically by the Authorized Organizational Representative (AOR) from the proposing institution, and not the PI. The body of the Step-1 proposal is a summary briefly describing the proposed work (see below).

Budgets shall not be submitted for Step-1 proposals. The Step-1 proposal shall identify the PI and all funded Co-Investigators (Co-Is). These team members are added to the Step-1 proposal through the NASA Solicitation Proposal Integrated Review and Evaluation System (NSPIRES). The Step-1 proposals will be checked for compliance and undergo peer-review. Submission of the Step-1 proposal does not obligate the offerors to submit a Step-2 full proposal. **Only proposers that receive an invitation via NSPIRES will be permitted to submit a Step-2 proposal. Step-2 proposals that are submitted without an invitation from NSPIRES will not be accepted or reviewed.** Step-1 proposal titles, science goals and objectives are required to be the same in Step-2 proposals. NASA expects that team members from Step 1 proposals will be continue to be the same in Step-2 proposals. However, any changes to team members between Step-1 and Step-2 proposals are permitted only with previous written consent by the NASA points of contact (POCs) listed in Section I.6.3, Summary of Key Information, at least 4 weeks in advance of the Step-2 proposal due date. The expected format and evaluation criteria are described below.

Submission of a Step-1 proposal does not obligate a proposer to submit a Step-2 proposal if invited to do so.

Step-1 Proposal Content

The Science/Technical/Management section of each Step-1 proposal is restricted to three (3) pages (not including references). It shall include the following information:

- A description of the science goals and objectives to be addressed by the proposal.
- A description of the methodology to achieve the goals and objectives
- A description of how the proposed project aligns and/or supports CoSTEM, NASA STEM Engagement and MUREP pathways, priorities, goals and objectives
- In the Step-1 proposal, proposers are strongly encouraged to communicate the scientific impact and context of their proposal at a basic level that does not require detailed domain knowledge.

Each Step-1 proposal shall also include a Biographical sketch/CV of up to two (2) pages for the PI. Step-1 proposals shall not include biographical sketches/CVs for any other team members.

Step-1 proposals shall not include a table of work effort, current and pending support, or other additional components of Step-2 proposals. In addition to the Step-1 proposal uploaded as a PDF, the NSPIRES system for proposal submission requires that all proposals include a summary (i.e., abstract) in the 4000-character "Proposal Summary" text box on the NSPIRES web cover pages.

Step 2 Proposal Content

The process for preparation and submission of the Step-2 (full) proposal shall follow EONS 2021, Section 5 (Proposal Instructions), with the following exceptions:

- Team members who were included in the Step-1 proposal may be omitted from the Step-2 proposal.
- Collaborators who were **not** listed in the Step-1 proposal may be added to the Step-2 proposal.
- However, the addition of Co-Is or any other collaborators to the Step-2 proposal is only permitted if proposers notify the NASA POCs listed below in Section I.6.3,

Summary of Key Information, via E-mail at least four weeks in advance of the Step-2 proposal due date.

- Only proposers who have been "invited" to submit a Step-2 proposal via NSPIRES will be able to do so.

All information needed to respond to this announcement is contained in this Appendix, the EONS 2021 NOFO, the *NASA Grant and Cooperative Agreement Manual (GCAM)* and the *NASA Guidebook for Proposers*.

I.4.2 Pre-proposal Teleconference and Questions and Answers

A pre-proposal teleconference will be held on **Tuesday, December 1, 2020** at **4:00 PM Eastern Time**. Prospective proposers shall refer to the OCEAN web page on NSPIRES for connection details. During this time, prospective proposers may verbally ask questions about this opportunity. Proposers may also receive technical assistance from project staff at this time, which may include useful tips and guidance for submitting proposals.

Prospective proposers are requested to submit any written questions as instructed on the NSPIRES announcement for this opportunity. Responses to questions submitted will be provided in a list to be posted on NSPIRES. The list will be updated periodically during the open solicitation period.

Prospective proposers are strongly encouraged to register in NSPIRES as soon as possible and sign up for notification emails to receive notice of this teleconference. Refer to the OCEAN web page on NSPIRES for questions regarding submission and schedule information.

A list of additional resources on proposal preparation and writing is as follows:

- New PI Resources
- Library and useful links includes videos and slides, as well as other resources related to proposal development
- Electronic Code of Federal Regulations
- Federal Funding Accountability and Transparency Act Subaward Reporting System (FSRS)
- Tips for Preparing Grant Applications
- Grants Life Cycle Overview

1.5 Proposal Evaluation and Selection

I.5.1 Proposal Evaluation Criteria

Proposals will be assessed against the following evaluation factors for award: Relevance to NASA Objectives, Intrinsic Merit, and Budget/Cost. Proposals will be evaluated according to the criteria defined in Appendix D of the *NASA Guidebook for Proposers.*

I.5.1.1 Relevance to NASA

Evaluation of **Relevance to NASA** will consider the following sub-elements: *Technical Relevance and Educational Relevance*. Proposers shall adequately and clearly define how the proposed activity addresses the following criteria:

a. Technical Relevance

- Identifies the primary alignment to NASA's ESD and the goal as described in Appendix I, Section I.1.1.
- Demonstrates how research findings, results, and products will align with one or more of the research priorities of NASA's ESD. See *NASA Earth Science Decadal Survey;*
- Describes the state of the art in the literature for proposed research and how the project will enhance, extend, or challenge the status quo;
- Demonstrates how designed research infrastructure will align with NASA Research and Analysis Program;
- Describes the proposed use of NASA content, people, and/or facilities in the execution of the research activities (as needed);
- Develops mechanisms for increased participation by students, faculty, and researchers to engage in OCEAN research activities; and
- Clearly identifies all members of the team and how they will contribute towards the research efforts of the proposed activity.

b. Educational Relevance

- Demonstrates how the project aligns to and/or supports relevant CoSTEM, NASA STEM Engagement and MUREP pathways, priorities, goals and objectives (see EONS 2021 sections 1.2, 1.3, 1.4, and 1.6 for more information);
- Demonstrates how project align with the *NASA Science 2020-2024 A Vision for Science Excellence*;
- Demonstrates innovative methods, approaches, and concepts to deliver the project by meeting OCEAN objectives;
- Demonstrates how proposed program activities will support efforts to build a more diverse STEM workforce that reflects the diversity of the nation;
- Demonstrates how proposed program activities will encourage continued student affiliation with NASA throughout their academic careers;
- Demonstrates plans for easily accessible application materials for and coordination of research and mentoring experiences; and
- Identifies mechanisms for the institution that facilitate the disbursement of scholarships and other funds, and the coordination of research and mentoring experiences.

I.5.1.2 Intrinsic Merit

Evaluation of **Intrinsic Merit** will consider, in addition to the factors given in the EONS NOFO, the *NASA Guidebook for Proposers*, the quality and completeness of the *Management Plan* and, if included, the *Collaboration Plan*. Proposers shall address these criteria to demonstrate the capability of its institution, staff, faculty, collaborators, and targeted students to achieve successful outcomes for the proposed activity. Proposals shall also clearly identify all members of the team and how they will contribute towards the research efforts of the proposed activity.

a. ***Management Plan***

- Demonstrates a management plan that aligns with (1) OCEAN goals and objectives, (2) the NASA 2018 Strategic Plan; and (3) awardee institution mission and goals;

- Provides a project Logic Model that illustrates the relationship among OCEAN goals and objectives, and project objectives, activities, benchmarks, and results;
- Demonstrates a clearly organized and feasible management plan for developing achievable research and educational goals and objectives, and includes clear lines of communication with NASA and other members of the collaborative team;
- Provides specific details of the organizational structure including the PI, administrative support, Co-Is, key partners and collaborators, and the appropriate management oversight office at the lead institution. Provides an organization chart for proposed management structure;
- Describes how the PI is qualified to serve as the PI for the project and includes biographical sketches for the PI and each proposed Co-I (if applicable);
- Demonstrates an achievable timeline for project activities over the four-month period of performance, including benchmarks for success; and
- Provides a work breakdown structure for the proposed planning grant that includes a timeline for the proposed project's short and long-term outcomes.

b. Collaboration Plan (optional)

- Delineates mechanisms for building partnerships to enhance the ability of the lead institutions to achieve its objectives, to obtain and leverage sources of additional funding, and/or to obtain essential services not otherwise available;
- Includes a list of partners and collaborators, the organization to which they belong, their roles and responsibilities, the percentage of time allocated to support the proposed research, and capabilities that the partnership contributes. Collaborators may include, but are not limited to, individuals from NASA Centers and JPL, NASA EPSCoR jurisdictions, NASA Space Grant Consortia, and other federal government agencies; non-profits; community colleges, MSIs, and other universities; industry and other organizations;
- Presents a plan that outlines each collaborator's responsibilities to the proposed activities;
- Details specific contributions (such as financial, personnel, assets, and facilities) that each collaborator will provide and how these contributions will contribute to the goals and objectives of the proposed planning grant; and
- Provides a letter of support from each collaborator that specifies the unique responsibilities and contributions as outlined above.

I.5.1.3 Budget/Cost

Proposals shall include a detailed implementation/costing plan that clearly demonstrates how awarded funds will be utilized for the duration of the award. This section of the proposal will be evaluated for reasonableness and allowability of the proposed costs, as well as how proposed costs are allocated throughout the period of performance of the award.

In addition to the above, the budget shall:

- Align with budget guidelines and requirements outlined in Appendix I.2.2 (Budget Guidelines and Requirements);
- Indicate how the proposed budget is clearly aligned with the proposal narrative and budget narrative;
- Describe how the proposed budget is allocable, allowable, and reasonable;
- Demonstrate effective use of funds in which outcomes justify total costs; and
- Provide a budget justification detailing how funds will be allocated to support project personnel, travel, student scholarships or support, and subcontracts.

I.5.2 Review and Selection Process

Reviewers and panelists with appropriate expertise shall be identified to evaluate each proposal that is compliant and meets the requirements stated within the OCEAN solicitation. Proposers shall provide sufficient detail to enable an effective evaluation by persons who are knowledgeable of, but not necessarily specialists, in the proposed research area. The reviewers may include personnel from NASA, other federal government agencies, industry, and universities.

Evaluation of OCEAN proposals will be done in a two-step process (see Appendix I, Section I.4.1, Proposal and Submission Information). Proposals will be evaluated through a virtual panel process. The panelists will present final recommendations to the NASA program scientist, and they will in turn provide that information to the Selection Official, Mr. Torry Johnson, MUREP Manager at NASA Headquarters, or his designee.

In evaluating the proposals, NASA will assign one of the following overall ratings for each of the evaluation factors:

- **Excellent** - A comprehensive and thorough proposal of exceptional merit with one or more significant strengths. No deficiency or significant weakness exists.
- **Very Good** - A proposal having no deficiencies, and which demonstrates overall competence. One or more significant strengths have been found, and strengths outbalance any weaknesses that exist.
- **Good** - A proposal having no deficiencies, and which shows a reasonably sound response. There may be strengths or weaknesses, or both. On a whole, weaknesses not offset by strengths do not significantly detract from the Proposer's response.
- **Fair** - A proposal having no deficiencies, and which has one or more weaknesses. Weaknesses outbalance strengths.
- **Poor** - A proposal that has one or more deficiencies or significant weaknesses that demonstrate a lack of overall competence or that would require a major proposal revision to correct.

I.6 AWARD ADMINISTRATION INFORMATION

I.6.1 Grant Agreement Awards

The reporting requirements for award recipients under the OCEAN will be consistent with the NASA Grant and Cooperative Agreement Manual (GCAM). Unless otherwise noted, the OCEAN PI shall submit reports via secure transfer and following Personally Identifiable Information (PII) requirements to the NASA OCEAN Activity Manager. For additional information on PII, see NASA Privacy and NASA Privacy of Information. The OCEAN PI is required to respond to data calls as requested by NASA OCEAN Activity Manager and utilize the NASA approved data management system (NASA STEM Gateway) for performance data reporting. Additional communications and guidance regarding data calls, standardized template(s), and the NASA STEM Gateway will be provided by the NASA OCEAN Activity Manager. The PI shall ensure they have the appropriate staff and resources to facilitate data collection activities and complete tasks required for reporting.

Recipients shall also complete all required reports as requested by the NASA OSTEM, and the NASA Shared Services Center (NSSC), as listed on the grant agreement required reports and publications document.

I.6.2 Summary of OCEAN Grantee Responsibilities

Awards from this funding announcement that are issued under 2 CFR §1800 are subject to the Federal Research Terms and Conditions (RTC). In addition to the RTC and NASA-specific guidance, three companion resources can also be found on the website: Appendix A— Prior Approval Matrix, Appendix B—Subaward Requirements Matrix, and Appendix C—National Policy Requirements Matrix.

Within one month (30 days) after award, using required report formats, award recipients shall:

- submit a Projected Implementation Plan that outlines when major activities and expenditures will take place during the period of performance.

Within two months (60 days) prior to award anniversary date, award recipients shall:

- submit an Annual Report in accordance with NASA guidance, providing a review of project progress, accomplishments and outcomes including but not limited to number of paper presentations, peer review research presentations and student proposed solutions and products.

NOTE: At the end of the performance period (3 years), the Annual Report will be considered a Final Report.

At the expiration of the project using required report formats, award recipients shall submit an actionable plan for responding to future NASA ESD opportunities including, at a minimum:

- Identification of faculty/staff member to actively monitor for opportunities;
- Structure of an opportunity response team which includes faculty, staff and student participants;
- Identification of research areas to be expanded upon for broader ability to respond to opportunities; and
- Statement of support from the institution for continued efforts to expand collaboration with NASA and ESD.

I.6.3 Summary of Key Information

Total ESTIMATED annual budget for OCEAN activity	~ $1,000,000 per year Individual awards will be up to a maximum of $250,000
Number of new awards pending adequate proposals of merit	~3-4
Start date (estimated)	July 1, 2021
Duration of awards	3 years
Award Type	Grant
Release Date	November 16, 2020, 11:59 pm Eastern Time
OCEAN Pre-proposal Conference (Optional)	December 1,2020, 4:00 pm Eastern Time
DUE DATE for OCEAN STEP-1 PROPOSALS	December 18, 2020, 11:59pm Eastern Time
Notification of status to Step-1 proposers/Invitations issued for Step-2	February 1, 2021
DUE DATE for OCEAN STEP-2 PROPOSALS	April 15, 2021, 11:59 pm Eastern Time
Page limit for the central Scientific-Educational-Management section of proposal	15pp (includes all illustrations, tables, and figures, where each "n-page" foldout counts as n-pages and each side of a sheet containing text or an illustration counts as a page.); See *NASA Guidebook for Proposers.*
Detailed instructions for the preparation and submission of proposals	*NASA Guidebook for Proposers*
Submission medium	Electronic proposal submission is required via NSPIRES only; no hard copy will be accepted. *NASA Guidebook for Proposers.*
Site for submission of proposal via NSPIRES	http://nspires.nasaprs.com/ (Help Desk available at nspires-help@nasaprs.com or (202) 479-9376 from 8 am to 6 pm Eastern Time) Monday through Friday, excluding federal holidays.
Selection Official	Mr. Torry Johnson MUREP Manager NASA Headquarters Washington, DC 20546
NASA Point of Contact for this activity	Dr. Evelina Félicité-Maurice OSTEM Activity Manager NASA Goddard Space Flight Center Telephone: (301) 286-6949 Email: NASAOCEAN@nasaprs.com