NATIONAL OCEANOGRAPHIC PARTNERSHIP PROGRAM (NOPP) 2019 BROAD AGENCY ANNOUNCEMENT

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I. OVERVIEW OF THE RESEARCH OPPORTUNITY

On behalf of the National Oceanographic Partnership Program (NOPP), the Office of Naval Research (ONR) solicits research proposals under this Broad Agency Announcement (BAA #N00014-18-S-B007). Congress established NOPP via Title II, subtitle E, of Public Law 104-201 to promote the national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication by improving knowledge of the ocean. Over twenty agencies participate in the NOPP. They are identified on the NOPP website: www.nopp.org.

In this BAA, NOPP participants have identified seven ocean research and technology topics of mutual and emerging interest. Selected projects will be awarded and funded by individual agencies after the NOPP office, ONR and panels of experts conduct an evaluation of the full proposals under each topic. All successful offerors will be notified and the NOPP office will provide the 2019 NOPP project announcement on their website. Up to $27.3 million over three (3) years may be available for this solicitation, subject to appropriation, availability of funds and final approval by the participating NOPP agencies. NOPP funding will be dependent on proposal topic availability and individual agency policies, procedures, and regulations. There will be no classified work funded under this solicitation.

This document constitutes a Broad Agency Announcement (BAA) for awards on behalf of the NOPP, issued by the ONR Contact and Grants Awards Management Division, ONR Code 25 (or otherwise approved by Code 25) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016, the Department of Defense Grants and Agreements regulations (DoDGARS) 32 CFR 22.315(a) and DoD's Other Transaction Guide for Prototypes Projects, USD(AT&L), OT Guide, Jan 2017. A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued.

ONR will not issue paper copies of this announcement. ONR reserves the right to fund all, some, or none of the proposals received under this BAA. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals submitted under this BAA as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

A. Required Overview Content

1. Federal Awarding Agency Name

Office of Naval Research,
One Liberty Center
875 N. Randolph Street
Arlington, VA 22203-1995

2. Funding Opportunity Title

National Oceanographic Partnership Program (NOPP) FY2019 Broad Agency Announcement

#	BAA Topic Name	Letters of Intent Due Date	Full Proposal Due Date
1	CubeSat Sensors for Investigating Littoral Ocean & Atmosphere Dynamics	Not Applicable	December 21, 2018
2	Sustained observations of marine biodiversity for improved understanding of marine ecosystem responses to changing environmental conditions	Not Applicable	December 21, 2018
3	Advanced Sensor Technology	November 2, 2018	January 18, 2019
4	Autonomous Profiling Floats for Investigating Tropical Pacific Ocean Biogeochemistry	November 2, 2018	January 18, 2019
5	Improving Arctic Operational Forecasts Arctic Observing System Simulation Experiments using Year of Polar Prediction data (Arctic OSSE)	November 2, 2018	January 18, 2019
6	New Approaches for Data Assimilation to Improve Operational Ocean Prediction	November 2, 2018	January 18, 2019
7	Autonomous Mapping	November 2, 2018	January 18, 2019

3. Announcement Type

Initial Announcement

4. Funding Opportunity Number

N0014-18-S-B007

5. Catalog of Federal Domestic Assistance (CFDA) Numbers

12.300: Title: Department of Defense (DOD), Department of the Navy, Office of Chief of Naval Research, Basic and Applied Scientific Research

6. Key Dates (See also Section D.4)

Anticipated Schedule of Events		
Event	**Date (MM/DD/YEAR)**	**Time (Local Eastern Time)**
Letters of Intent Due Date **Topics 3, 4, 5, 6 7 only**	11/2/18	3 pm
Notification of Initial Navy Evaluations of LOIs **Topics 3, 4, 5 , 6 &7 only**	11/16/18	
Full Proposals Due Date, **Topics 1, 2**	12/21/18	
Full Proposals Due Date, **Topics 3, 4, 5, 6, 7**	1/18/19	
Notification of Selection for Award	4/30/19	
Awards	7/30/19	
Kickoff Meeting	8/30/19	

All dates are estimates as of the date of this announcement.

Submissions (Applicable to LOI s and Full Proposals) – For Topics 3, 4, 5, 6, and 7 LOI submission is **mandatory** to be considered for a full proposal. If an offeror does not submit an LOI before the specified due date and time, he/she is not eligible to submit a full proposal and is not eligible for funding. For any other documents, the Government reserves the right to not review documents submitted after the established due date (see key dates above).

7. North American Industry Classification System (NAICS) code

The NAICS code for ***contracts*** under this announcement is 541715 with a small business size standard of 1,000 employees.

II. DETAILED INFORMATION ABOUT THE FUNDING OPPORTUNITY

A. Program Description

NOPP agencies have identified seven ocean research and technology topics of mutual and emerging interest. Appendix 1 provides the research program descriptions for each topic.

B. Federal Award Information

1. Contracted Fundamental Research. With regard to any restrictions on the conduct or outcome of work funded under this BAA, ONR will follow the guidance on and definition of "contracted fundamental research" as provided in the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum of 24 May 2010 will be followed.

As defined therein the definition of "contracted fundamental research," in a DoD contractual context, includes research performed under grants and contracts that are (a) funded by Research, Development, Test and Evaluation Budget Activity 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Activity 2 (Applied Research) and performed on campus at a university. The research shall not be considered fundamental in those rare and exceptional circumstances where the applied research effort presents a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense, and where agreement on restrictions have been recorded in the contract or grant.

Pursuant to DoD policy, research performed under grants and contracts that are a) funded by Budget Activity 2 (Applied Research) and NOT performed on-campus at a university or b) funded by Budget Activity 3 (Advanced Technology Development) does not meet the definition of "contracted fundamental research." In conformance with the USD (AT&L) guidance and National Security Decision Directive 189, No restriction will be placed on the conduct or reporting of unclassified "contracted fundamental research," except as otherwise required by statute, regulation or executive order. For certain research projects, it may be possible that although the research being performed by the prime contractor is restricted research, a subcontractor may be conducting "contracted fundamental research." In those cases, it is the prime contractor's responsibility in the proposal to identify and describe the subcontracted unclassified research and include a statement confirming that the work has been scoped, negotiated, and determined to be fundamental research according to the prime contractor and research performer.

Normally, fundamental research is awarded under grants with universities and under contracts with industry. Non-fundamental research is normally awarded under contracts and may require restrictions during the conduct of the research and in the case of DoD. DoD pre-publication review of such research results due to subject matter sensitivity. Potential offerors should consult with the technical POC to determine whether the proposed effort would constitute basic research, applied research or advanced research.

FAR Part 35 restricts the use of Broad Agency Announcements (BAAs), such as this, to the acquisition of basic and applied research and that portion of advanced technology development not related to the development of a specific system or hardware procurement. Contracts and grants and other assistance agreements made under BAAs are for scientific study and experimentation directed towards advancing the state of the art and increasing knowledge or understanding.

2. Funded Amount and Period of Performance

Up to $27.3 million over three (3) years may be available for this solicitation, subject to appropriation, availability of funds and final approval by the participating NOPP agencies. Breakout of topic investments may not equal total amount listed here due to the uncertainty associated with receiving funding.

The amount and period of performance of each recommended or selected proposal will vary depending on the research area topic and the technical approach to be pursued by the selected or recommended offeror. The table below provides guidance by topic. Award funding levels will be dependent on both the cost of the proposed research and individual agency/topic funding levels. Each individual award may be fully funded for the entire performance period or incrementally funded with a base of one -year (subject to funding availability, government Program Officer recommendation based on award progress and funding agency award terms).

#	Topic Name	Anticipated # of Awards	Individual Award Amount Range per year	Performance Period (years
1	CubeSat Sensors for Investigating Littoral Ocean & Atmosphere Dynamics	Up to 6	Up to 250K	2
2	Sustained observations of marine biodiversity for improved	Up to 5	250K-350K	3

	understanding of marine ecosystem responses to changing environmental conditions		Note (40K team lead option per year)	
3	Advanced Sensor Technology	Up to 10	Up to 400K	3
4	Autonomous Profiling Floats for Investigating Tropical Pacific Ocean Biogeochemistry	1-2	200K-400K	2-3
5	Improving Arctic Operational Forecasts Arctic Observing System Simulation Experiments using Year of Polar Prediction data (Arctic OSSE)	Up to 2	$300K - 500K	3
6	New Approaches for Data Assimilation to Improve Operational Ocean Prediction	Up to 3	300-500K	3
7	Autonomous Mapping	1-3	Up to 350K	3

3. Instrument Type(s)

It is anticipated that awards will be in the form of grants. However, the NOPP participants reserve the right to award cooperative agreements, contracts, or other transaction agreements to appropriate parties, should the situation warrant use of an instrument other than a grant. When funding project participants that are Federal entities, agencies may fund these efforts separately based on policies and procedures, responses to the announcement and internal award administration. The following provides brief descriptions of potential ONR instrument types:

a. Assistance Instruments.

i. Grant: A legal instrument consistent with 31 U.S.C. 6304, is used to enter into a relationship:

- The principal purpose of which is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized

by a law or the United States, rather than to acquire property or services for the Federal Government's direct benefit or use.

- In which substantial involvement is not expected between the Federal Government and the recipient when carrying out the activity contemplated by the grant.

- No fee or profit is allowed

Any assistance instrument awarded under this announcement will be governed by the award terms and conditions that conform to DoD's implementation of OMB circulars applicable to financial assistance. Terms and conditions of new awards made after December 26, 2014, will include revisions to reflect DoD implementation of new OMB guidance in 2 CFR Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards." The DoD Terms and Conditions are located at http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions.aspx It should be noted that industry performers who waive fees or profit may submit through grants.gov.

ii. Cooperative Agreement: A legal instrument which, consistent with 31 U.S.C 6305, is used to enter into the same kind of relationship as a grant, except that substantial involvement is expected between the Federal Government and the recipient when carrying out the activity contemplated by the cooperative agreement. No fee or profit is allowed. (For information on the substantial involvement ONR expects to have in cooperative agreements, prospective offerors should contact the Technical Point of Contact identified in the research area of interest.)

iii. Technology Investment Agreement (TIA): Assistance Transaction other than a Grant or a Cooperative Agreement (see 32 CFR Part 37). A legal instrument, consistent with 10 U.S.C. 2371, which may be used when the use of a contract, grant, or cooperative agreement is not feasible or appropriate for basic, applied, and advanced research projects. The research covered under a TIA shall not be duplicative of research being conducted under an existing DoD program. To the maximum extent practicable, TIAs shall provide for a 50/50 cost share between the Government and the applicant. An applicant's cost share may take the form of cash, independent research and development (IR&D), foregone intellectual property rights, equipment, access to unique facilities, and/or other means. Due to the extent of cost share, and the fact that a TIA does not qualify as a "funding agreement" as defined at 37 CFR 401.2(a), the intellectual property provisions of a TIA can be negotiated to provide expanded protection to an applicant's intellectual property. No fee or profit is allowed on TIAs.

b. Procurement Contract: A legal instrument, consistent with 31 U.S.C. 6303, which reflects a relationship between the Federal Government and a state government, a local government, or other entity/contractor when the principal purpose of the instrument is to acquire property or services for the direct benefit or use of the Federal Government.

c. Other Transaction for Prototype (OTA): A legal instrument, consistent with 10 U.S.C. 2371b, which may be used when the use of a contract, grant, or cooperative agreement is not feasible or appropriate for prototype projects directly relevant to enhancing the mission effectiveness of military personnel and the supporting platforms, systems, components, or materials proposed to be acquired or developed by the Department of Defense, or for improvement of platforms, systems, components, or materials in use by the armed forces. The effort covered under an OTA shall not be duplicative of effort being conducted under an existing DoD program (please refer to the DoD "Other Transactions Guide for Prototype Projects" dated January 2017. This document along with other OTA resources may be accessed at the following link:
http://www.acq.osd.mil/dpap/cpic/cp/10USC2371bOTs.html

4. **Model Contracts and Grants**

Examples of ONR model contracts can be found on the ONR website at the following link: http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/contract-model-awards.aspx. Examples of ONR model grants can be found on the ONR website at the following link: http://www.onr.navy.mil/en/Contracts-Grants/submit-proposal/grants-proposal/model-grant.aspx..

The model contracts and grants at the links above are only provided as examples. In the event of any conflict between these examples and current FAR, DFARS, NMCARS, or ONR clauses, current FAR, DFARS, NMCARS, or ONR clauses will govern. Other participating NOPP agencies will follow their own policies and procedures for contracts and grants.

C. Eligibility Information

1. Eligible Applicants

a. **Team efforts are required**. However, offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR. The teams must be comprised of at least two of the following three sectors:

- Academia,
- Industry (including Non-Governmental Organizations - NGOs), and
- Government (including Tribal, State and Local)

All businesses both small and large are encouraged to submit proposals and compete for funding consideration. However, no portion of this BAA will be set aside for Small Business or other socio-economic participation.

Foreign institutions are eligible to apply for support as a partner under this BAA. However, the National Science Foundation (NSF) rarely provides support to foreign organizations. For proposals to be funded by NSF, NSF will consider proposals for cooperative projects involving U.S. and foreign organizations, provided support is requested only for the U.S. portion of the collaborative effort.

b. All responsible sources from academia, industry and the research community may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals.

c. Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal Offerors are allowed so long as such arrangements are permitted under the sponsoring agreement between the Government and the specific FFRDC.

d. Navy laboratories, military universities and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either LOI's or full proposals in response to this BAA. As with FFRDCs, these types of federal organizations may team with other eligible sources from academia and industry that are submitting proposals under this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact the Technical POC to discuss its area of interest.

e. University Affiliated Research Centers (UARCs) are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contract.

2. Cost Sharing or Matching

Cost sharing is not expected and will not be used as a factor during the merit review of any proposal hereunder. However, the Government may consider voluntary cost sharing if proposed.

3. Other

Offerors should be aware of recent changes in export control laws. Offerors are responsible for ensuring compliance with all U.S. export control laws and regulations, including the International Traffic in Arms Regulation (ITAR)(22 CFR Parts 120 - 130) and Export Administration Regulation (EAR) (15 CFR Parts 730 – 774), as

applicable. In some cases, developmental items funded by the Department of Defense are now included on the United States Munition List (USML) (22 CFR Part 121) and are therefore subject to ITAR jurisdiction. In other cases, items that were previously included on the USML have been moved to the EAR Commerce Control List (CCL). Offerors should address in their proposals whether ITAR or EAR restrictions apply to the work they are proposing to perform for ONR. The ITAR and EAR are available online at http://www.ecfr.gov/cgi-bin/ECFR?page=browse. Additional information regarding the President's Export Control Reform Initiative can be found at http://export.gov/ecr/index.asp.

Offerors must comply with all U.S. export control laws and regulations, including the ITAR and EAR, in the performance of any award or agreement resulting from this BAA. Offerors shall be responsible for obtaining any required licenses or other approvals, or license exemptions or exceptions if applicable, for exports of hardware, technical data, and software (including deemed exports), or for the provision of technical assistance.

D. Application and Submission Information

1. Address to Request (Access) Application Package

This BAA may be accessed from the sites below. Amendments, if any, to this BAA will be posted to these websites when they occur. Interested parties are encouraged to periodically check these websites for updates and amendments.

a. Grants.gov (www.grants.gov)
b. FedBizOpps (www.fbo.gov)
c. ONR website http://www.onr.mil

2. Content and Form of Application Submission

a. General Information: All proposal submissions will be protected from unauthorized disclosure in accordance with FAR Subpart 15.207, applicable law, and DoD/DoN regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information. IMPORTANT NOTE: Titles given to the Letters of Intent/Full Proposals should be descriptive of the work they cover and not be merely a copy of the title of this solicitation.

b. Submission of Unclassified and Classified Proposals

i. Letters of Intent and Full Proposals submitted under this BAA are expected to be unclassified; however, classified proposals are permitted. Unclassified proposals shall be submitted in accordance with this Section. If a classified proposal is submitted and selected for award, the resultant contract will be unclassified. An 'unclassified' Statement of Work (SOW) must accompany any classified proposal.

ii. Special Instructions for Classified LOI s and Proposal: Classified proposals shall be submitted directly to the attention of ONR's Document Control Unit at the following address and marked in the following manner:

OUTSIDE ENVELOPE - **(no classification marking)**:

"Office of Naval Research
Attn: Document Control Unit
ONR Code 43
875 North Randolph Street
Arlington, VA 22203-1995"

The inner wrapper of the classified LOI and/or Full Proposal should be addressed to the attention of the cognizant TPOC, ONR Code XX and marked in the following manner:

INNER ENVELOPE - **(stamped with the overall classification of the material)**

"Program Name:
Office of Naval Research
ATTN: ONR Program Officer Name
ONR Code: ONR Program Officer Code
875 North Randolph Street
Arlington, VA 22203-1995"

For both classified and unclassified proposals, a non-proprietary version of the Statement of Work must also be submitted. Do not put proprietary data or markings in or on the Statement of Work. For proposals containing data that the offeror does not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, the contractor shall mark the title page with the following legend:
"This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate the proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if is obtained from another source without restriction. The data subject to this restriction are contained in (insert numbers or other identification of sheets)."

Each sheet of data that the offeror wishes to restrict must be marked with the following legend:
"Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal."

c. Letters of Intent (LOI)

i. LOI General Information

Letters of Intent (LOI): LOIs are required for Topics 3, 4, 5, 6 and 7 only. See the Key Dates section for deadlines (Section I.A.6.)

An LOI is to be submitted as a pdf file via electronic mail (email) only to the following email address:

noppbaa.fct@navy.mil.

Do not submit LOIs via grants.gov. There is an email size limit of 5MB per email. NOTE: Do not send:
a. Hardcopies of LOIs (including Facsimiles). Only electronic submissions will be accepted and reviewed;
b. ZIP files; and
c. Password protected files.

Offerors may submit more than one LOI to Topics 3, 4, 5, 6, and 7 research opportunity. Submit each LOI as a separate email. Please do not combine multiple LOIs into one email. Please use the following email subject line for LOI submission:

Subj: LOI_NOPP2019BAA_Topic# (Last, first name(s) of PI(s) in parentheses)

(If more than one LOI from the same team is being submitted, add LOI one of two, or as needed)

For Topics 3, 4, 5, 6, and 7 LOI submission is mandatory to be considered for a full proposal. If an offeror does not submit an LOI before the specified due date and time, he/she is not eligible to submit a full proposal and is not eligible for funding. Government representative notification of the LOI review results will be issued via email notification from the NOPP Program Office which is anticipated approximately 30 days after the LOI submission deadline. LOI submissions will be protected from unauthorized disclosure in accordance with FAR Subpart 15.207 and DOD/DoN regulations.

Letters of Intent (LOIs) and Ship time Instructions for Full Proposals requiring ship time will need to submit a ship time request (STR) form only at the full proposal stage. **Please do not submit a STR form as part of the LOI phase**.

ii. Letters of Intent (Format)

Please limit the submission to two (2) pages of text and the specified cover page using a font no less than 11 points in size. The letter of intent should be divided into the following sections:

a. Cover Page - The cover page must include:

1. title, preferably in a large, bold font; include the term “Letter of Intent”

2. name and address of the principal investigator’s organization and its “type” (e.g., for tribal, profit, nonprofit, educational, small business, minority owned, historically black college or university, minority institution, federal demonstration project participant etc.);

3. name of the Broad Agency Announcement (BAA), including the federal fiscal year, under which the letter of intent is submitted;

4. total requested funding for the duration of the project;

5. duration of the project and proposed start date;

6. Principal investigator’s name and contact information (address, telephone number, fax number, e-mail address, etc.);

7. co-investigators’ names, institutions and contact information;

8. date of submission;

9. Statement that the document contains proprietary information (optional).

b. Research Objectives – Please present a summary level statement of work and research objectives.

c. Technical Approach – Provide a description of the technical approach and challenges for the proposed effort.

d. Anticipated Outcome & Impact - Provide a supported description of the anticipated outcomes, impacts. If pre/post Technology Readiness Levels (TRLs) of the effort are required, please use the definitions supplied in http://www.acq.osd.mil/chieftechnologist/publications/docs/TRA2011.pdf

e. Management and partnership approach – Describe roles and responsibilities of partners and overall management of the effort.

f. Ship time needs information – year, desired location, number of days on station, special ship capabilities (e.g., DP, multibeam, APDC, deep submergence vehicles). If non-UNOLs vessels
are proposed, please indicate the ship information, number days on station and ensure that all institutional policies and procedures are followed for use of non-UNOLs vessels.

g. Milestone Schedule – Provide a brief list of the high level milestones and dates.

h. Budget (ship time costs are not included). The budget can have the form of a simple table indicating partners and costs.

iii. Letter of Intent Evaluation/Notification:

The ONR Program Officer will provide the NOPP Program Office with the results of the LOI reviews by the NOPP government agency representatives. The NOPP Program Office will provide email responses to all Topic 3, 4, 5, 6 and 7 offerors with LOI review results. The responses will indicate an encouragement to proceed to the full proposal submission stage or a statement of low likelihood of success of a full proposal.

d. Full Proposals:

i. Full Proposal General Information

See the 'Key Dates' section above (Section I.A.6) for due date for receipt of Full Proposals and date of notification of final selection.

ii. Full Proposal Format (See Appendices 2 and 3 for instructions.)

See Appendix 2 for instructions for Grants, Cooperative Agreements, and TIA's. See Appendix 3 for instructions for Contracts and Other Transaction Agreements. Please note the shiptime request submission information (if required).

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

Unique Entity Identifier and System for Award Management (SAM) - All offerors submitting proposals or applications must:

a. Be registered in the SAM prior to submission;
b. Maintain an active SAM registration with current information at all times during which it has an active Federal award or an application under consideration by any agency; and
c. Provide its DUNS number in each application or proposal it submits to the agency.

SAM may be accessed at https://www.sam.gov/portal/public/SAM

4. Submission Dates and Times

(See Section I, paragraph A.6, Key Dates, for information)

a. LOIs and full proposals submitted after an established deadline may be considered at the government's discretion.

5. Other Submission Requirements

a. NSF Guidelines for FASTLANE submission

i. After the full proposals are evaluated by the NOPP Panel, an authorized NOPP partner will contact the PI to submit their proposal via the FASTLANE system. The following are the FASTLANE submission criteria:

Data Management Plans

Proposals recommended for NSF funding will be required to submit a data management plan for review prior to entry into FASTLANE. The PI should coordinate submission of the data management plan with the assigned NSF Program Director.

Proposal Margin and Spacing Requirements

The proposal must conform to the following requirements:

a. Use one of the following typefaces identified below:

• Arial8, Courier New, or Palatino Linotype at a font size of 10 points or larger;

• Times New Roman at a font size of 11 points or larger; or

• Computer Modern family of fonts at a font size of 11 points or larger.

A font size of less than 10 points may be used for mathematical formulas or equations, figures, table or diagram captions and when using a Symbol font to insert Greek letters or special characters. PIs are cautioned, however, that the text must still be readable.

b. No more than six lines of text within a vertical space of one inch.

c. Margins, in all directions, must be at least an inch.

These requirements apply to all uploaded sections of a proposal, including supplementary documentation.

Page Formatting

Proposers are strongly encouraged to use only a standard, single-column format for the text.

The guidelines specified above establish the minimum type size requirements; however, PIs are advised that readability is of paramount importance and should take precedence in selection of an appropriate font for use in the proposal. Small type size makes it difficult for reviewers to read the proposal; consequently, the use of small type not in compliance with the above guidelines may be grounds for NSF to return the proposal without review. Adherence to type size and line spacing requirements also is necessary to ensure that no proposer will have an unfair advantage, by using smaller type or line spacing to provide more text in the proposal.

b. Grant, Cooperative Agreement, and TIA Proposals shall be submitted through Grants.gov. (See Appendix 2.)

c. Submission of Full Proposals for Contracts and Other Transaction Agreements (See Appendix 3)

Hard Copy:

Office of Naval Research
ATTN: Reginald Beach
ONR Code: 321 Beach
875 North Randolph Street
Arlington, VA 22203-1995

Electronic Submission:
Submit to the NOPP Office email:

noppbaa.fct@navy.mil

E. Application Review Information

1. Evaluation

a. Evaluation Criteria Proposals shall be evaluated under two principal selection criteria, of equal importance, as follows:

i. Overall scientific and technical merits of the proposal. [Note: Merit review criteria will follow National Science Foundation policies provided in Section II. E.1.c. for review and use in preparation of proposals under this BAA];

ii. Potential relationship of the proposed research and development to NOPP BAA topic objectives.

Other evaluation criteria used in the technical reviews, which are of lesser importance than the principal selection criteria and of equal importance are:

i. Experience and past performance of critical or key personnel;
ii. The technical and cost information which will be analyzed simultaneously during the evaluation process. This includes an assessment in accordance with the program's funding availability.
iii. Note: The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. Evaluation of options will not obligate the Government to exercise the options during contract or grant performance.

b. Evaluation Panels

i. Letters of Intent (relevant for Topics 3,4,5,6,7 only) – Participating NOPP government representatives will conduct an evaluation of the LOIs.

ii. Full Proposals - The cognizant ONR Program Officer, a NOPP panel of subject matter experts and other Government scientific staff will perform the evaluation of technical and cost proposals.

Technical and cost proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-4 and 15.207. Cost proposals may also be analyzed by Government business professionals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. Similarly, support contractors may be utilized to evaluate cost proposals. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to technical and cost proposals submitted in response to this BAA will be required to sign a non-disclosure statement prior to receipt of any proposal submissions.

c. National Science Foundation Merit Review Criteria

i. All NSF proposals are evaluated through use of two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities. The two merit review criteria are listed below. Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and

the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

1. Intellectual Merit (Criterion 1): The Intellectual Merit criterion encompasses the potential to advance knowledge; and

2. Broader Impacts: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to:

a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and

b. Benefit society or advance desired societal outcomes (Broader Impacts)?

2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

4. How well qualified is the individual, team, or organization to conduct the proposed activities?

5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Postdoctoral Mentoring Activities

Each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one- page supplementary document, will be evaluated under the Broader Impacts criterion.

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to the above-described merit review criteria.

Awards under this BAA will be made in accordance with FAR 35.016(e) or 2 C.F.R 200. The primary basis for selecting proposals for acceptance will be technical merit, importance to agency programs, and fund availability. To the extent appropriate,cost realism and reasonableness will also be considered

when selecting proposals. ONR reserves the right to request and require any additional information and documentation after it makes the type of award instrument determination. ONR reserves the right to remove Offerors from award consideration when the parties fail to reach agreement on award terms, conditions, and cost/price within a reasonable time, or when the Offeror fails to timely provide requested or required additional information.

2. Review and Selection Process

a. General Information Regarding the Review and Selection Process for Grants

1. Letters of Intent – The ONR Program Officer will provide the NOPP Program Office with the results of the LOI reviews by the NOPP government agency representatives. The NOPP Program Office will provide email responses to all Topic 3,4,5,6 &7 offerors with LOI review results. The responses will indicate an encouragement to proceed to the full proposal submission stage or a statement of low likelihood of success of a full proposal.

2. Full Proposals – Upon completion of the panel reviews, participating NOPP agencies will decide which proposals will be recommended for funding and the lead funding agency. The Program Officer from the lead agency or activity will notify the PI(s) for these proposals and provide any additional submission instructions to process the funding action. Investigators may be asked to modify objectives, work plans or budgets, and provide supplemental information. Awards will be issued and administered by the agency responsible for a specific project after receipt and processing of any required agency specific documents. Any proposals selected for funding by NSF will be required to be resubmitted to NSF's FastLane system. Section D7 provides submission NSF FastLane system instructions.

The ONR Program Officer will coordinate with the NOPP Program Office and send emails to all offerors for all topics with full proposal results. Anonymous panel summaries will be supplied as attachments to the emails. The NOPP Program Office will also coordinate with all agencies and issue a 2019 BAA Program Announcement on their website.

b. Commitment to Small Business- (For Contract Awards Only)

The Office of Naval Research is strongly committed to providing meaningful prime and subcontracting opportunities for small businesses, small disadvantaged businesses (SDBs), woman-owned small businesses (WOSBs), historically underutilized business zone (HUBZone) small businesses, veteran-owned small business (VOSBs), service disabled veteran-owned small businesses (SDVOSBs), historically black colleges and universities, and minority institutions, and other concerns subject to socioeconomic considerations through its awards.

Businesses unfamiliar with doing business with the government and that require

assistance may contact the state-specific Department of Defense (DoD) Procurement Technical Assistance Center (PTAC). DoD PTACs serve as a resource for businesses pursuing and performing under contracts with DoD, other federal agencies, state and local governments and with government prime contractors. Assistance provided by the PTACs is usually free of charge. PTAC support includes registration in systems such as SAM, identification of contract opportunities, understanding requirements and preparing and submitting proposals. The PTACs have a presence in each state, Puerto Rico and Guam.

To locate a local PTAC visit: http://www.dla.mil/SmallBusiness/Pages/ProcurementTechnicalAssistanceCenters.aspx or http://www.aptac-us.org/new/ .

1) Subcontracting Plan - For proposed contract awards exceeding $700,000, large businesses and non-profits (including educational institutions) shall provide a Subcontracting Plan (hereafter known as 'the Plan') that contains all elements required by FAR 19.704, FAR 52.219-9 (DEVIATION 2016-O0009 ALT III) and as supplemented by DFARS 252.219-7003 (DEVIATION 2016-O0009).

NOTE: Small businesses are exempt from this requirement to submit a subcontracting plan.

The Plan must be submitted as an attachment to the "Proposal Checklist" and will not be included in the page count. If a company has a Master Subcontracting Plan, as described in FAR 19.701 or a Comprehensive Subcontracting Plan, as described in DFARS 219.702, a copy of the Plan shall also be submitted as an attachment to the "Proposal Checklist".

Plans will be reviewed for adequacy, ensuring that the required information, goals, and assurances are included. FAR 19.702 requires an apparent successful offeror to submit an acceptable Plan. If the apparent successful offeror fails to negotiate a Plan acceptable to the contracting officer within the time limit prescribed by the contracting officer, the offeror will be ineligible for award.

Offerors shall propose a plan that ensures small businesses (inclusive of SDBs, WOSBs, HUBZone, VOSBs and SDVOSBs) will have the maximum practicable opportunity to participate in contract performance consistent with efficient performance.

As a baseline, Offerors shall, to the best extent possible, propose realistic goals to ensure small business participation in accordance with the current or most recent fiscal year subcontracting goals found on the DoD Office of Small Business Program website at: http://www.acq.osd.mil/osbp/. If proposed goals are below the statutory requirements, then the offeror shall include in the Plan a viable written explanation as to why small businesses are unable to be utilized and what attempts were taken to ensure that small business were given the opportunity to participate in the effort to the

maximum extent practicable.

2) Small Business Participation Statement –

If subcontracting opportunities exist, all prime Offerors shall submit a Small Business Participation Statement regardless of size in accordance with DFARS 215.304 when receiving a contract for more than the simplified acquisition threshold (i.e., $150,000). All offerors shall provide a statement of the extent of the offeror's commitment in providing meaningful subcontracting opportunities for small businesses and other concerns subject to socioeconomic considerations through its awards and must agree that small businesses, VOSBs, SDVOSBs, HUBZones, SDBs, and WOSBs concerns will have the maximum practicable opportunity to participate in contract performance consistent with efficient performance.

This assertion will be reviewed to ensure that it supports this policy by providing meaningful subcontracting opportunities. The statement should be submitted as an attachment to the "Proposal Checklist" and will not be included in the page count.

3) Subcontracting Resources -

Subcontracting to a prime contractor can be a good way to participate in the contracting process. The following is a list of potential resources that may assist in locating potential subcontracting partners/opportunities/resources:

*Companies Participating in DoD Subcontracting Program Report
*DAU Small Business Community of Practice (SB COP)
*DefenseLink ≥ $7.0 M Award Notices
*DoD OSBP Prime Contractors and Subcontractors with Subcontracting Plans
*Dynamic Small Business Search
*Electronic Subcontracting Reporting System (eSRS)
*Federal Business Opportunities (FEDBIZOPPS)
*Navy SBIR/STTR Search – Website or Brochure
*DoD Procurement Technical Assistance Centers (PTAC)
*Small Business Administration (SBA) Subcontracting Opportunities Directory
*SBA Subnet

For a description and associated websites visit the ONR Office of Small Business webpage at:
http://www.onr.navy.mil/Contracts-Grants/small-business.aspx.

In accordance with FAR 5.206, the following entities may transmit a notice to the Government-wide Point of Entry (GPE) at www.fedbizops.com to seek competition for subcontracts, to increase participation by qualified small businesses, VOSBs, SDVOSBs, HUBZones, SDBs, and WOSBs, and to meet established subcontracting plan goal as follows:

(a) A contractor awarded a contract exceeding $150,000 that is likely to

result in the award of any subcontracts;
(b) A subcontractor or supplier, at any tier, under a contract exceeding $150,000, which has a subcontracting opportunity exceeding $15,000.

The notices must describe:
(a) The business opportunity;
(b) Any prequalification requirements; and
(c) Where to obtain technical data needed to respond to the requirement.

An example of a place in which prime contractors may post solicitations or sources sought notices for small business is the SBA SUB-Net.. The SUB-Net database provides a listing of subcontracting solicitations and opportunities posted by large prime contractors and other non-federal organizations.

c. Options

The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. Evaluation of options will not obligate the Government to exercise the options during contract or grant performance.

d. Evaluation Panel

The cognizant Program Officer and other Government scientific experts will perform the evaluation of technical proposals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to technical and cost proposals submitted in response to this BAA will be required to sign the ONR Non-Disclosure Agreement (NDA) for Contractor Support prior to receipt of any proposal submissions. This NDA includes third-party beneficiary language giving the submitter of proprietary information a right of direct action against the contractor employee and/or his/her employer in the event that the NDA is violated.

3. Recipient Qualifications

a. Applicable to Grants, Cooperative Agreements and TIAs
(See Appendix 2.)
b. Applicable to Contracts and Other Transaction Agreements
(See Appendix 3.)

F. Federal Award Administration Information

1. Federal Award Notices

a. Applicants whose proposals are recommended for award may be contacted by a Contract or Grant specialist to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or pricing data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award.

The notification e-mail must not be regarded as an authorization to commit or expend funds. The Government is not obligated to provide any funding until a Government Contracting Officer or Grants Officer, as applicable, signs the award document.

The award document signed by the Contracting Officer or Grants Officer is the official and authorizing award instrument.

b. Office of Naval Research (ONR) award/modification documents are only available via the Department of Defense (DoD) Electronic Document Access System (EDA) within the Wide Area WorkFlow e-Business Suite (https://wawf.eb.mil/).

EDA is a Web-based system that provides secure online access, storage and retrieval of awards and modifications to DoD employees and vendors.

ONR creates an award notification profile for every award.

For grants, the notification profile will use the email addresses from the Application for Federal Assistance, SF424, to notify the recipient of an award. ***ONR recommends that organizations provide a global business address for their entity in Field 5 (Application Information) of the SF424.*** ONR is using the following three email addresses entered by the grantee on the SF424 application to create the EDA notification profile:

i. Applicant Information (Field 5 - Email)
ii. Project Director / Principal Investigator (Field 14 - Email)
iii. Authorized Representative (Field 19 - Email)

For all other awards, the notification profile will use the email address from the Business Point of Contact to notify the recipient of an award.

***IMPORTANT*:** In some cases, EDA notifications are appearing in recipients' Junk Email folder. If you are experiencing issues receiving EDA notifications, please check your junk email. If found, please mark EDA notifications as "not junk."

If you do not currently have access to EDA, you may complete a self-registration request as a "Vendor" via https://wawf.eb.mil/ following the steps below:

1. Click "Accept"
2. Click "Register" (top right)
3. Click "Agree"
4. In the "What type of user are you?" drop down, select "Vendor"
5. Select the systems you would like to access (iRAPT at a minimum)
6. Complete the User Profile and follow the site instructions

Allow five business days for your registration to be processed. EDA will notify you by email when your account is approved.

To access awards after your registration has been approved, log into https://wawf.eb.mil/, select "EDA", select either EDA location, Select "Contracts", select your search preference, enter the Contract Number (or, if applicable, enter the Grant Number in the Contract Number field), and select "View".

Registration questions may be directed to the EDA help desk toll free at 866-618-5988, commercial at 801-605-7095, or via email at disa.ogden.esd.mbx.cscassig@mail.mil (Subject: EDA Assistance).

2. Administrative and National Policy Requirements

a. Applicable to All

i. Offerors should be aware of recent changes in export control laws. Offerors are responsible for ensuring compliance with all U.S. export control laws and regulations, including the International Traffic in Arms Regulation (ITAR)(22 CFR Parts 120 - 130) and Export Administration Regulation (EAR) (15 CFR Parts 730 – 774), as applicable. In some cases, developmental items funded by the Department of Defense are now included on the United States Munition List (USML) (22 CFR Part 121) and are therefore subject to ITAR jurisdiction. In other cases, items that were previously included on the USML have been moved to the EAR Commerce Control List (CCL). Offerors should address in their proposals whether ITAR or EAR restrictions apply to the work they are proposing to perform for ONR. The ITAR and EAR are available online at http://www.ecfr.gov/cgi-bin/ECFR?page=browse. Additional information regarding the President's Export Control Reform Initiative can be found at http://export.gov/ecr/index.asp.

Offerors must comply with all U.S. export control laws and regulations, including the ITAR and EAR, in the performance of any award or agreement resulting from this BAA. Offerors shall be responsible for obtaining any required licenses or other approvals, or license exemptions or exceptions if applicable, for exports of hardware, technical data, and software (including deemed exports), or for the provision of technical assistance.

ii. *Security Classification*:

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the Offeror must clearly identify such need in Section II, Block 11 of the Proposal Checklist . The Proposal Checklist can be found at https://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/cost-proposal.

If it is determined that access to classified information will be required during the performance of an award, a Department of Defense (DD) Form 254 will be attached to the contract, and FAR 52.204-2 - Security Requirements will be incorporated into the contract.

ONR does not provide access to classified material under grants.

iii. *Requirements Concerning Live Organisms*:

(1) Use of Animals: If animals are to be utilized in the research effort proposed, the Offeror must submit a Full Appendix or Abbreviated Appendix with supporting documentation (copies of Institutional Animal Care and Use Committee (IACUC) Approval, IACUC Approved Protocol, and most recent United States Department of Agriculture (USDA) Inspection Report) prior to award. For assistance with submission of animal research related documentation, contact the ONR Animal Use Administrator at (703) 696-4046. Guidance: https://www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/animal-use

(2) Use of Human Subjects in Research:

(a) You must protect the rights and welfare of individuals who participate as human subjects in research under this award and comply with the requirements of the Common Rule at 32 CFR part 219 and applicable provisions of DoD Instruction 3216.02, Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research (2011), the DON implementation of the human research protection program contained in SECNAVINST 3900.39D (or its replacement), 10 USC 980 “Limitation on Use of Humans as Experimental Subjects,” and when applicable, Food and Drug Administration (FDA) and other federal and state law and regulations.

(b) For proposals containing activities that include or may include “research involving human subjects” as defined in DoDI 3216.02, prior to award, the Offeror must submit documentation of:

(i) Approval from an Institutional Review Board (IRB) (IRB-approved research protocol, IRB- approved informed consent document, and other material they considered); proof of completed human research training (e.g., training certificate or institutional verification of training for the principal investigator, co-

investigators); and the Offeror's Department of Health and Human Services (DHHS)-issued Federal wide Assurance (FWA#),

(ii) Any claimed exemption under 32 CFR 219 101(b), including the category of exemption, supporting documentation considered by your institution in making the determination (e.g., protocol, data collection tools, advertisements, etc.). The documentation shall include a short rationale supporting the exemption determination. This documentation should be signed by the IRB Chair or IRB vice Chair, designated IRB administrator or official of the human research protection program.

(iii) Any determinations that the proposal does not contain activities that constitute research involving human subjects, including supporting documentation considered by your institution in making the determination. This documentation should be issued by the IRB Chair or IRB vice Chair, designated IRB administrator or official of the human research protection program.

(c) Documentation must be submitted to the ONR Human Research Protection Official (HRPO), by way of the ONR Program Officer. If the research is determined by the IRB to be greater than minimal risk, you also must provide the name and contact information for the independent research monitor and a written summary of the monitors' duties, authorities, and responsibilities as approved by the IRB. For assistance with submission of human subject research related documentation, contact the ONR Human Research Protection Official (HRPO) at (703) 696-4046.

(d) Contracts, orders, or grant awards and any subawards or modifications will include a statement indicating successful completion of the HRPO review. Research involving human subjects must not be commenced under any contract award or modification or any subcontract or grant subaward or modification until awardee receives notification from the Contracting or Grants Officer that the HRPO has approved the assurance as appropriate for the research under the award or modification and that the HRPO has reviewed the protocol and accepted the IRB approval or determination for compliance with Federal, DoD and DON research protection requirements. See, DFARS 252.235-7004. Guidance: http://www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/Human-Subject-Research.aspx

iv. *Use of Recombinant DNA or Synthetic Nucleic Acid Molecules*: Proposals which call for experiments using recombinant or synthetic nucleic acid molecules must include documentation of compliance with NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines), approval of the Institutional Biosafety Committee (IBC), and copies of the DHHS Approval of the IBC letter. Guidance: https://www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/recombinant-or-synthetic-nucleic-acid-molecules

v. *Institutional Dual Use Research of Concern*: As of September 24, 2015, all institutions and United States Government (USG) funding agencies subject to the United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern must comply with all the requirements listed therein. If your research proposal directly involves certain biological agents or toxins, contact the cognizant Technical Point of Contact. U.S. Government Science, Safety, Security (S3) guidance may be found at http://www.phe.gov/s3/dualuse.

vi. *Department of Defense High Performance Computing Program*: The DoD High Performance Computing Program (HPCMP) furnishes the DoD S&T and RDT&E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and other assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at http://www.hpcmo.hpc.mil/.

vii. *Project Meetings and Reviews*: Individual program reviews between the ONR sponsor and the performer may be held as necessary. Program status reviews may also be held to provide a forum for reviews of the latest results from experiments and any other incremental progress towards the major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, offerors should assume that 40% of these meetings will be at or near ONR, Arlington VA and 60% at other locations such as the contractor/grantee's facility, other contractor' facility or government facilities. (This statement does not apply to international offerors submitting proposals to ONRG. International offerors should contact the cognizant ONRG Administrative Director (AD) for guidance prior to submitting a proposal.) Interim meetings are likely, but these will be accomplished via video telephone conferences, telephone conferences, or via web-based collaboration tools.

3. Reporting: If the Federal share of any Federal award may include more than $500,000 over the period of performance, the post award reporting requirements, Award Term and Condition for Recipient Integrity and Performance Matters (2 CFR Part 200 Appendix XII), is applicable as follows:

A. Reporting of Matters Related to Recipient Integrity and Performance

1. General Reporting Requirement. If the total value of your currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds $10,000,000 for any period of time during the period of performance of this Federal award, then you as the recipient during that period of time must maintain the currency of information reported to the System for Award Management (SAM) that is made available in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System (FAPIIS)) about civil, criminal, or administrative proceedings described in paragraph 2 of this award term and condition. This is a statutory requirement under section 41 U.S.C. 2313. All information posted in

the designated integrity and performance system on or after April 15, 2011, except past performance reviews required for Federal procurement contracts, will be publicly available.

2. Proceedings About Which You Must Report. Submit the information required about each proceeding that:

a. Is in connection with the award or performance of a grant, cooperative agreement, or procurement contract from the Federal Government;

b. Reached its final disposition during the most recent five year period; and

c. Is one of the following:

(i) A criminal proceeding that resulted in a conviction, as defined in paragraph 5 of this award term and condition;

(ii) A civil proceeding that resulted in a finding of fault and liability and payment of a monetary fine, penalty, reimbursement, restitution, or damages of $5,000 or more;

(iii)An administrative proceeding, as defined in paragraph 5. of this award term and condition, that resulted in a finding of fault and liability and your payment of either a monetary fine or penalty of $5,000 or more or reimbursement, restitution, or damages in excess of $100,000; or

(iv)Any other criminal, civil, or administrative proceeding if:

(a) It could have led to an outcome described in paragraph 2.c. (1), (2), or (3) of this award term and condition;

(b) It had a different disposition arrived at by consent or compromise with an acknowledgment of fault on your part; and

(c) The requirement in this award term and condition to disclose information about the proceeding does not conflict with applicable laws and regulations.

3. Reporting Procedures. Enter in the SAM Entity Management area the information that SAM requires about each proceeding described in paragraph 2 of this award term and condition. You do not need to submit the information a second time under assistance awards that you received if you already provided the information through SAM because you were required to do so under Federal procurement contracts that you were awarded.

4. Reporting Frequency. During any period of time when you are subject to the requirement in paragraph 1 of this award term and condition, you must report

proceedings information through SAM for the most recent five-year period, either to report new information about any proceeding(s) that you have not reported previously or affirm that there is no new information to report. Recipients that have Federal contract, grant, and cooperative agreement awards with a cumulative total value greater than $10,000,000 must disclose semiannually any information about the criminal, civil, and administrative proceedings.

5. Definitions. For purposes of this award term and condition:

a. Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative proceedings, Civilian Board of Contract Appeals proceedings, and Armed Services Board of Contract Appeals proceedings). This includes proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include audits, site visits, corrective plans, or inspection of deliverables.

b. Conviction, for purposes of this award term and condition, means a judgment or conviction of a criminal offense by any court of compete includes—

(i) Only the Federal share of the funding under any Federal award with a recipient cost share or match; and

(ii) The value of all expected funding increments under a Federal award and options, even if not yet exercised.

G. Federal Awarding Agency Contacts

1. Communications:

a. All UNCLASSIFIED communications shall be submitted via e-mail to (NOPP Program Office) at (noppbaa.fct@navy.mil) with a copy to (Darnell Griffin) at (darnell.griffin1@navy.mil).

b. CLASSIFIED questions shall be handled through the ONR Security POC. Specifically, any entity wanting to ask a CLASSIFIED question shall send an UNCLASSIFIED email to the ONR Security POC with a copy to both the Technical POC and the Business POC stating that the entity would like to ask a CLASSIFIED question. DO NOT EMAIL ANY CLASSIFIED QUESTIONS. The Security POC will contact the entity and arrange for the CLASSIFIED question to be asked through a secure method of communication.

Comments or questions submitted should be concise and to the point, eliminating any unnecessary verbiage. In addition, the relevant part and paragraph of the Broad Agency Announcement (BAA) should be referenced. Questions submitted within 2 weeks prior to a deadline may not be answered, and the due date for submission of the LOI and/or full proposal will not be extended.

Questions of a business nature, and suggestions for improvement, should be submitted to:

Point of Contact Name: Darnell Griffin
Point of Contact Occupation Title: Contract Specialist
Division Title: Contracts and Grants
Division Code: 25
Address: 875 N. Randolph St, Arlington, 22203
Email Address: darnell.griffin1@navy.mil

Questions of a technical nature should be submitted to:

Point of Contact Name: NOPP Program Office
Point of Contact Occupation Title: NOPP Program Office Team
Division Title: 32
Division Code: 322
Address: 875 N. Randolph St., Arlington 22203
Email Address: noppbaa.fct@navy.mil

Questions of a Security nature should be submitted to:

Torri Woodfolk
Industrial Security Specialist
Office of Naval Research
Security Department, Code 43
One Liberty Center
875 North Randolph St.
Arlington, VA 22203-1995
Email Address: torri.powell@navy.mil

H. Other Information

THIS ANNOUNCEMENT IS NOT FOR THE ACQUISITION OF TECHNICAL, ENGINEERING AND OTHER TYPES OF SUPPORT SERVICES

SECTION III

APPENDIX 1 – RESEARCH TOPIC DESCRIPTIONS

Topic 1. CubeSat Sensors for Investigating Littoral Ocean and Atmosphere Dynamics

Several of the U.S. Federal Agencies operate open ocean and coastal prediction models either in forecast, hindcast, simulation or analysis mode, for a variety of mission specific purposes ranging from protection of human life and safety, to design of engineered structures, to assessment of environmental conditions. In general, these prediction models consist of a series of science-based routines which contain the basic principles of air-sea interaction, wave generation and evolution, ocean circulation and interaction with terrestrial landforms and inputs and supporting infrastructure unique to the agency missions and prediction scenario.

While *in situ* observing systems provide essential data in the littoral regions to these coastal prediction models, they are by definition sparse relative to the length of coastline and Exclusive Economic Zone, and not easily re-locatable. Satellite remote sensing observations of coastal dynamics are typically limited to 1-2x per day or less per satellite. In addition, the spatial resolution of satellite sensors often cannot resolve the coastline (i.e., the data is a smearing of the land-water boundary), so the data at the coast is not usable (SAR is the exception). Airborne remote sensing can provide high spatial resolution, but is limited temporally and in extent of coverage. Land-based remote sensing (such as HF radar sites), provide long dwell coverage where they are deployed, but have relatively coarse spatial sampling, relative to littoral dynamical processes. As such, scientific investigations, modeling and data assimilation tend to cluster on those areas that already have *in situ* observing systems, and generally suffer from a lack of temporal and spatial coverage. Given that there are 356,000 km of coastline in the world, our ability to study, investigate and model them, even in a piecemeal fashion, is severely limited by our current methods.

The goal of this second NOPP solicitation on CubeSat's is to seek proposals from academia, private industry and government laboratories to work in partnership to develop a CubeSat-based resource of remotely sensed observations of littoral ocean and atmosphere dynamics that, preferably, can be directly assimilated into or provide boundary conditions for numerical models (results from the first CubeSat solicitation can be found at nopp.org). In this solicitation, only three (3) geophysical variables are sought: sea surface salinity, sea surface currents, and soil moisture of the coastal land topography to where it merges with the continentally influenced topography. A fourth area of interest, is the development of a CubeSat-sized synthetic aperture radar (SAR).

Program Description

Develop and/or demonstrate innovations in miniaturized sensors for future applications in CubeSat spacecraft missions dedicated to littoral science investigations. These novel technologies will enable CubeSats to expand from laboratory experiments to operational missions. Proposals should focus on designing and/or developing the sensor hardware to the highest level of technical maturity possible within the available funds and resources. Launch of the satellites will mainly be through the standardized CubeSat deployment system, the Poly Picosatellite Orbital Deployer (P-POD). Consideration for launch will

be determined as selected projects successfully progress through the milestone reviews described below. One unit (1U), three unit (3U), six unit (6U) and twelve unit (12U) Cubesat free flying mission designs will be considered, as will novel configurations of [trailing or parallel] CubeSats and/or CubeSat constellations. Passive and active methods are all viable candidates as are the adoption of new materials, sensor and antenna designs. Specific spacecraft bus models or designs have not been chosen, although it can be assumed, for example, that approximately half of a 3U spacecraft or one third of a 6U spacecraft size, weight and power will be used for power management, attitude control, communications and other basic spacecraft functions.

In general, proposed payloads should:

• Meet the CubeSat Design Specifications (http://www.cubesat.org/resources/

• Operate on throughput limited communications links

• Survive the Low Earth Orbit (LEO) space environment for at least six months

• Operate with significant power constraints, either very low duty cycle or very low instantaneous power

Measurement capabilities for sea surface salinity and sea surface currents should strive to measure at length scales which resolve littoral dynamics, gradients and fronts at resolutions comparable to littoral oceanographic models (less than or equal to 30m). Measurement capabilities for soil moisture should strive to measure at length scales of higher resolution coastal atmospheric models (less than or equal to 100m). As this is a sensor development program, to facilitate sensor inter-comparisons, calibration and validation, CubeSat test orbits will have high revisit times, nominally of order 90 minutes, and may be equatorial. Any single region of interest will be up to 200 km along-track, and up to 50km cross-track, with some portion of coastline being visible within that window. For power and data download considerations, littoral observations requirements would be for: one observation region per orbit (threshold); two or more regions per orbit (goal). If a sensor was proven to provide data of scientific quality, of course more ambitious, non-equatorial orbits, with constellations (to increase revisit times), could be pursued on subsequent launches. But, at this early stage, sensor development, evaluation and utility for science is the primary goal. The following is a list of the desired variables or sensor. The expectation is to fund at least one of each, assuming meritorious proposals are received.

Littoral Variable or Sensor	**Threshold Accuracy**	**Goal Accuracy**
Sea Surface Salinity	0.5 PSS	0.2 PSS

Sea Surface Currents	0.5 m/s	0.20 m/s
Soil Moisture	0.04 cm^3 cm^{-3} volumetric	0.02 cm^3 cm^{-3} volumetric
Synthetic Aperture Radar	5m grid-size	2m grid size

Annual solicitations are planned with the possibility of new topics based on an assessment of existing needs, capabilities, and priorities.

AWARD INFORMATION

The CubeSat Sensors for Investigating Littoral Ocean and Atmosphere Dynamics program is a cradle-to-grave program. It is divided into two distinct phases, Phase A and Phase B. Phase A starts once your proposed satellite program is granted acceptance. Over the course of the next two years, there will be six reviews that end with the Flight Selection Review (FSR). All of these reviews are schedule-based and will be organized by the sponsor. The purpose of Phase A is to finalize the satellite design, not only on paper but through extensive board level testing and to deliver a complete program plan, including cost, schedule, and approach to achieving the launch and operation of the satellite in Phase B as described below.

At FSR, performers will be selected to progress into Phase B based on their satellite maturity and program plan developed during Phase A. Phase B consists of completing the program through operations including fabricating the complete satellite and integrating the payload into a standard Cubesat vehicle, acquiring launch services for the satellite into its required orbit, integrating the spacecraft into the launch vehicle, operating the satellite while in orbit, and acquiring, processing and calibrating the sensor data that can be directly assimilated into or provide boundary conditions for numerical models.

NOPP is seeking unclassified, fundamental research proposals for this topic. It is expected that up to 6, two-year awards will be made at up to $250,000 per year for two years.

(Milestone schedule on next page)

Phase A. **Topic 1 Milestone Schedule Proposal Guidance**

Provide a milestone schedule over the 24-month period of performance that aligns with the following program goals. These meetings will be held at or near a major US city. The dates provided are notional and will be re-established at award.

• Award Announcement	See section I.A.6	(Month 0)
• Kickoff Meeting	See section I.A.6	(Month 1)
• System Concept Review - SCR	See section I.A.6	(Month 4)
• System Requirements Review - SRR	See section I.A.6	(Month 7)
• Mission Design Review - MDR	See section I.A.6	(Month 10)
• Preliminary Design Review - PDR	See section I.A.6	(Month 19)
• Flight Selection Review - FSR	See section I.A.6	(Month 24)

Topic 2: Sustained observations of marine biodiversity for improved understanding of marine ecosystem responses to changing environmental conditions

Overview

This funding opportunity invites proposals to: (1) build upon the foundation established by the existing US Marine Biodiversity Observation Network (MBON) demonstration projects as part of an evolving integrated and operational biological observing capability for the US oceans, coasts and the Great Lakes from bays to deep ocean; and (2) advance technologies for the efficient and/or automated collection of biological observations as part of the integrated and operational observing system. NOPP anticipates making five awards, subject to the availability of funds, in amounts ranging from $250,000 to $350,000 per year for up to three years. Proposals that include a team leader component can request up to an additional $40,000 per year for that role in a separate budget (further details provided below).

Biodiversity is defined as the variety of life, encompassing variation at all levels of complexity – genetic, species, ecosystems, and biomes – and including functional diversity and diversity across ecosystems. A growing body of research demonstrates that (1) the maintenance of marine biodiversity is critical to sustained ecosystem and human health and resilience in a globally changing environment, and (2) the condition of marine biodiversity is a very useful proxy for understanding the health of ecosystems and their ability to provide ecosystem services. Thus, managing marine resources in a way that conserves biodiversity directly supports the global Blue Economy and our collective ocean management objectives. A sustained, integrated and operational MBON would provide information to enhance biosecurity, protect ecosystem and public health, enable predictive modeling, better inform environmental impact assessments, and allow for adaptive monitoring and ecosystem-based management of living marine resources.

The US initiated three MBON projects in 2014 to demonstrate how an operational MBON could be developed for the nation. These projects paved the way in terms of biodiversity monitoring, and have made advances in the methods and best practices for operational observing applications. Among the successes emerging from this initial effort is a commitment by NOAA CoastWatch to produce MBON dynamic Seascapes classifications (Kavanaugh et al., ICES Journal of Marine Science, Volume 73, Issue 7, 1 July 2016, Pages 1839–1850, https://doi.org/10.1093/icesjms/fsw086) and map animations for national and global users. Additionally, US IOOS has committed to sustain the MBON Portal, which emerged from the demonstration effort as a platform where users can search and download real-time, delayed-mode, and historical data for *in situ* and remotely-sensed physical, chemical, and biological observations; compare datasets across regions and disciplines; generate and share custom data views; link to information about protocols, methods and best practices for biological observing; and access a full suite of interactive infographics and other tools for research and management applications.

Focus of Solicitation/Proposals Sought

We invite proposals from multi-sectoral, multi-disciplinary teams that contribute to and/or incrementally expand MBON toward an operational observing network providing needed biological observations of US oceans and coasts and the North American Great Lakes for users across the research to management continuum. We are soliciting proposals for projects conducted in US waters only. Proposed projects should also contemplate advancing technologies for the efficient and/or automated collection of biological observations that will contribute to an integrated and operational observing system.

Innovative observation approaches have significantly contributed to MBON efforts to date. Modeling approaches have also been important to contextualize and extend these organismal observations (e.g. remote sensing Seascapes classifications; soundscape characterizations, including ambient, anthropogenic and biological signals; and environmental condition information). This has enabled regional understanding of dynamic biogeographic patterns and underlying oceanographic processes, sustainable marine biological surveys, enhanced monitoring methodology, and real-time synoptic ecosystem assessments.

It is important to note that while this solicitation targets US waters, the US MBON is a US contribution to the international Group on Earth Observations (GEO) partnership, specifically through the Group on Earth Observations Biodiversity Observation Network (GEO BON). As part of GEO BON, the US MBON connects to a worldwide effort to understand marine biodiversity and its changes at a global level, e.g., GEO BON, and thus US MBON engages with the international activities of the Global Ocean Observing System (GOOS) and the Ocean Biogeographic Information System (OBIS). Thus, the US MBON is part of a developing global Community of Practice for the observation, understanding, and prediction of marine biodiversity.

Proposals must build on the pilot MBON project outcomes to date and must focus on the integration of the following:

(1) MBON-derived remote sensing Seascapes classifications (prototype expected at NOAA CoastWatch in Fall 2018);

(2) organismal observations (e.g., animal telemetry, traditional surveys, citizen science observers, passive acoustics, and other methods and technologies); and

(3) innovative approaches (e.g., eDNA, flow cytometry and other environmental imaging and analysis techniques, etc.).

Proposals must demonstrate how MBON activities/outcomes assist ecosystem-based management, which includes integrated ecosystem evaluations and improved management of protected areas, establishment of biodiversity baselines, and tracking changes against these baselines. Successful proposals will integrate observations and data across multiple scales of diversity (genetic to ecosystem, microbes to whales), time, and space (from fine-grain data collected *in situ* to coarser-grain in-water, airborne, and satellite remote sensing information) and integrate biological observations with

environmental condition information. Proposals that incorporate sound measures (ambient, anthropogenic and biological) are also of interest to the funding agencies; sound was included in the revised list of US IOOS core biological variables in 2016, and NOAA has expanded its capacity to collect and archive passive acoustic monitoring data so this is a growing area of interest.

Special and favorable consideration will be given to proposals that showcase the potential for establishing long-term, sustainable monitoring through partnerships with one or more of the following: BOEM's Environmental Studies Program, NOAA's Integrated Ecosystem Assessment program, the Smithsonian-led MarineGEO, the National Marine Sanctuary System, the National Estuarine Research Reserves, the IOOS Regional Associations, and other state and federal management and stewardship programs. Such efforts should provide baseline characterizations and inform understanding of shifts in baseline biological and environmental conditions, the status and trends of populations, and the condition of habitats and ecosystems. These include proposals that:

- Integrate biodiversity and environmental observations and address associated data collection and management needs at a regional to national scale;
- Integrate biodiversity observations from microbial and benthic communities with observations of higher trophic levels to inform system-level understanding of the impact of multiple stressors such as ocean acidification, climate and other environmental changes, or the introduction of invasive species;
- Integrate satellite remote sensing with *in situ* observations to address relationships and connections between *in situ* phenomena, observations and collections, and phenomena occurring at larger spatial scales;
- Integrate acoustic monitoring of vocalizing marine species by making *in situ* observations and/or employing archival data;
- Integrate observations of animal movements and behavior in relation to critical habitats in their aquatic environment to improve overall understanding of ecosystem function and dynamics;
- Combine existing federal agency monitoring programs with new sources of biological, oceanographic or satellite data to increase spatial and temporal resolution; and
- Employ innovative techniques for data discovery and methods that dynamically discover useful relationships among different data sets and add value to existing monitoring data.

As part of an integrated and operational observing system, funded US MBON projects must develop ties to other selected projects and support the ongoing development of the integrated network. Projects are welcome from areas not already represented across the MBON demonstration projects, and may focus on developing capacity for incrementally extending MBON's geographic scope. Projects are expected to emphasize integration with other US MBON projects and make sufficient resources available to do so, e.g., for travel, network building, knowledge sharing, joint developments and databases, etc. Funded projects cannot be isolated activities focusing solely on accomplishing their individual project's goals. Each project at least partially succeeds and fails as the entire network succeeds and fails.

Team Leader Option within a Proposal

This funding opportunity also invites proposals for a Team Leader. Proposals that include a team leader component can request up to an additional $40,000 per year for that role in a separate budget. The Team Leader will provide scientific leadership and coordination to the projects newly selected through this competition, and will coordinate and integrate new activities with the existing pilot MBON projects in consultation with the MBON manager in the US IOOS Program Office. He/She will foster efficient communications across all national MBON-related activities, will be responsible for calling and organizing team meetings and related activities, and will coordinate the derived scientific results and practical applications with identified end-users.

Proposals with a Team Leader option should have a separate section of up to two additional pages that describes only the activities to be undertaken by the designated Team Leader. They should specifically address the following:

- Qualifications and leadership skills of the proposing Team Leader, including knowledge of integrated, user-focused US MBON development approaches;
- A clear articulation of the proposed Team Leader's vision for an integrated US MBON and its contribution to other Federal sponsored missions and broader user needs; and
- A management plan that describes the approach to team leadership, how interactions with the US MBON teams and federal program management will be conducted, and how team business and meetings will be organized and conducted.

The budget section of Team Leader proposals must include an additional, detailed budget for the Team Leader activities and a narrative and justification for the Team Leader's work and this budget, narrative, and justification must be separate from those for their project activities.

The funding agencies reserve the option to select a Team Leader from among the funded teams should proposals of adequate merit and suitability not be received for the Team Leader role.

Additional Requirements

Data Management Plan

US MBON is the US contribution to the global MBON thematic node of GEO BON and supports the Global Earth Observing System of Systems (GEOSS) data sharing principles that have been endorsed by all GEO members and which postulate full and open exchange of data and metadata with minimum possible cost, delay and restriction. Data accessibility and strong data management are the foundation for success of any observing system, including MBON.

Projects will contribute integrated and interoperable data products and visualization tools that leverage existing interagency investments in advanced technologies and observing methods and lead efforts to assimilate biological observations into US IOOS. Data management efforts will assure that data follow the FAIR Guiding Principles of being findable, accessible, interoperable, and reusable.

Applicants are expected to provide the widest practical access to data collected and should include a data management plan in the proposal. The data management plan should be submitted as a separate section of up to two pages describing the types of data and information to be generated during the course of the project (environmental and biological); the target date by which data will be shared; the standards to be used for data/metadata formatting and content; policies addressing data stewardship and preservation; procedures for providing data access and security; and prior experience in publishing such data.

Projects must ensure alignment of biological data to the Darwin Core standard (http://rs.tdwg.org/dwc/terms/index.htm and http://rs.tdwg.org/dwc/) and adherence of metadata to the ISO 19115 family of geospatial metadata standards that have been endorsed by the Federal Geographic Data Committee. All data collected must be submitted by the project to an ERDDAP or comparable server that enables ingest to the MBON Portal. The costs for data management, archiving, and access should be included in the budget and reflected in the total project cost. Applicants are encouraged to address how historical or legacy data will be integrated into the project.

NOAA Data Sharing Policy: Environmental (including biological) data and information collected or created under NOAA grants or cooperative agreements should adhere to the 2016 revision of the NOAA Data Sharing Procedural Directive.

End User Engagement

Proposals must identify at least one specific management need and describe the role of MBON methods, tools, or products in addressing this(-ese) challenge(s). Selected projects must conduct their work in conjunction with end users throughout the life of the project to develop, demonstrate and enable sustained uses of MBON to meet user needs. Proposals should provide statements from the end user(s) describing the problem to be

addressed by the method, tool, or product to be developed by the project and how MBON supports the end-user's decision-making activity. The end-user organization(s) implementing the method, tool, or product must be included as a team member on the proposal. The project team should consider having the Principal Investigator (PI) be someone who is very familiar with the needs of the end-user(s) (i.e., decision-making) organization(s). Furthermore, proposals must outline plans and a schedule for transition of developed tools or products to the end-user organization(s) for deployment and long-term sustained use. For the final project year, proposals must include transition activities and an end-of-project event to announce results.

Team Members

- The project team must include at least two of the following entities: academia, industry, and government.
- The project team must include participation by one or more IOOS Regional Association(s) as an operational observing and/or data management partner.

–Award Information

- Up to $1.5M may be available over a three-year period to support efforts under this topic. Agencies participating in this NOPP topic anticipate supporting up to five three-year projects, in amounts ranging from $250,000 to $350,000. There is an option of 40K per year for proposals with a team leader.

Topic 3: Sensor Technology Development
Topic 3A: Advancing Sensors for Physical Oceanographic Measurements
Topic 3B: Ocean Sensors Embedded in Soft Materials

This FY19 NOPP topic will focus on advancing sensors for physical oceanographic measurements and developing new ocean sensors that are embedded in soft materials also known as soft matter electronic sensors.

Background

Over the last two decades, ocean science workshops have identified the need to: (1) reduce the power requirements and size of autonomous in-situ ocean sensors, (2) research and develop advanced technology in-situ ocean sensors, and (3) increase technology readiness levels (TRLs) of existing and emerging in-situ ocean sensors. Success in research and development of advanced sensor platforms has changed the paradigm of how the ocean is sampled and observed. These advanced platforms include but are not limited to Lagrangian vehicles, unique animal tags, surface vehicles and drifters, high powered buoys, floats, and cabled systems. Modern ocean observations consist of nested arrays of advanced platforms and ocean sensors which drive the need for additional research and technology maturation.

Recent advances in material science and embedded computing systems have closed many in-situ sensor technology gaps and provide an opportunity for participating NOPP partners to fund high impact in-situ ocean sensor research and technology development. Following the Ocean Observations 2009 conference (www.oceanobs09.net), an international, community-driven, prioritized list of the Essential Ocean Variables was developed and can be used as a guideline for sensor selection for topic 3A (physical oceanographic sensors) and topic 3B (soft matter ocean sensors). The variables and informative specification sheets can be found at: http://goosocean.org/index.php?option=com_content&view=article&id=14&Itemid=114 Technology Readiness Levels (TRLs) have to be described in this topic following the US Department of Defense (USDOD) definitions on pages 2-13 to 2-14 found at: http://www.acq.osd.mil/chieftechnologist/publications/docs/TRA2011.pdf

Topic 3A: Advancing Sensors for Physical Oceanographic Measurements (PO Sensors)

The goal of this topic is to provide opportunities to advance sensors that provide *physical oceanographic* measurements for all environments and depths. The advancements could include:

1) Increased on board sensor processing capacity. This topic could incorporate on board algorithms to process in-situ ocean sensor data and enable the communication of higher level science data products to shore. These efforts could also include improvements in adaptive sampling, communications and other automated techniques.
2) Lowering of SWaP-C (lower **S**ize, **W**eight **a**nd **P**ower along with lower **C**ost) for PO Sensors including improved sensor controls, diagnostics, in-situ calibration, communications/energy management.
3) Improved TRLs

4) Sensor Stability, Calibration & Analysis technique enhancements

Topic 3B: Ocean Sensors Embedded in Soft Materials

Participating NOPP partners are interested in soft matter electronics and/or soft robotics as a new technology application for oceanographic sensor development. As opposed to conventional machines and electronics, soft matter technologies are made of soft and elastically deformable polymers. The technology permits application of stretchable electronics embedded in soft material usually by patterning ultrathin films of metal in the elastomer or dispersing conductive particles within an elastomeric matrix. Soft matter electronics are a candidate for underwater research sensing environments because they're made of incompressible material that can withstand large hydrostatic pressures. There are many ocean science techniques and technologies which may be ripe for soft matter electronics, including: animal tags; conductivity, temperature and depth sensors (CTD); profiling floats; diver equipment, , physiological monitoring; and application to the deep sea investigations, where pressure is no longer an issue.

Soft matter sensors could potentially be applied to multi-modal ocean measurements (physical, chemical, biological, optical) and these devices could eliminate the need for pressure chambers and seals. If the sensor required an actuation or movement, then the application would be considered soft robotics. For instance, animal tags might be more easily attached if they incorporated soft robotics to achieve reversible adhesion. Or analysis of sediment characteristics/chemistry might be achieved with soft robotics capable of digging, burrowing, or clinging; or including sensors embedded in moveable probes, appendages, antennae or tentacles. At this time, participating NOPP partners place a higher priority on soft matter electronic sensors, but are open to soft robotics proposals if the sensor platform requires actuation and it advances ocean science sensing.

While soft matter electronics has many advantages, there are recognized hardware research and development challenges due to the low technology readiness levels in the areas of:

- system integration,
- data transmission,
- data management.

Reliable electrical interfaces between sensors and conventional computing hardware are emerging and require research and development for success in oceanographic environments. Soft electronics interface well with Bluetooth and optics, however, data communications must be extended to underwater applications and maintain a reasonable range and transmission rates. Data heavy nodes are being designed (cameras and electronic skins with embedded sensors) and they require innovation to address oceanographic data management practices. It is recognized that many challenges exist for this emerging field and the application to ocean sensing. This topic area is focused on research, development and testing soft matter electronic and/or soft robotic applications to sensing underwater environments. The goal is to develop and prove a soft matter electronics and/or soft robotics concept for underwater research and mature the technology.

Technical Proposal Guidance

Responses to BAA should include:
• a description of the science questions that the sensor will help answer
• a description of the current state of the art including a discussion of the current TRL
• a description and quantification of the sensor development instrument and environmental parameters including power requirements, size, weight, hardware/software/computing features, pressure and temperature limits, precision, accuracy, temporal, and spatial resolution anticipated.
• an integration plan or description of the platform that the proposed sensor will be integrated onto as well as the forecasted system level power reductions (where applicable), a description of the design, build, calibrate, and test processes along with any software or configuration control processes (where applicable),
• an assessment of the technical, cost and schedule risk areas (subsystem or concepts) for the proposal
• a discussion of the projected cost or cost reduction (where applicable) for the sensor as compared to the conventional measurement.
• a discussion of post development TRL

Awards

Up to 4 awards at 200-400K per year for three years are planned. (Budget ceiling per proposal is $1.2M)

Topic 4: Autonomous Profiling Floats for Investigating Tropical Pacific Ocean Biogeochemistry

Background & Research Opportunity Description

Ocean biogeochemical observations are critical for understanding the impacts of a changing climate on living marine resources, fisheries habitats, and primary production and to inform resource management, climate policy and mitigation strategies. The tropical Pacific Ocean plays an important role in the global carbon cycle and is home to diverse ecosystems and food chains upon which entire economies rely. Further understanding of tropical Pacific biogeochemistry, such as the global significance of biological productivity and the oxygen minimum zone (OMZ) in this region, coupled with the emergence of new technologies, necessitates further consideration of biogeochemical observations in an integrated ocean observing system for the Tropical Pacific (Cravatte et al., 2016). The overarching goal of the Tropical Pacific Observing System 2020 (TPOS 2020 - http://tpos2020.org/) Project is to advance the current observing system to meet observational, experimental and operational needs of today and the future. "*The First Report of TPOS 2020"* identifies recommendations and proposed actions that form the scientific drivers for this solicitation, including the need for observations of

1. Subsurface biogeochemical properties, including chlorophyll concentration, particulate backscatter, oxygen and nutrients to determine the seasonal- to decadal-scale variability in biological productivity, ocean uptake of CO_2, ocean acidification and hypoxia;
2. Magnitude and spatial extent of the oxygen minimum zone (OMZ) and the large-scale and long-term changes in ocean oxygen levels as an indicator of ventilation/stratification and denitrification, and for mapping fish habitats; and
3. In situ measurements of chlorophyll-a and optical properties for validating and improving algorithms for satellite ocean color.

Development of a regional network of autonomous biogeochemical profiling floats (e.g. BGC-Argo – http://biogeochemical-argo.org/) in the tropical Pacific Ocean, in support of the TPOS 2020 Project, will advance our ability to monitor and forecast changes in ocean warming, ocean acidification, deoxygenation, and ecosystem function, and contribute towards a global BGC-Argo Observing Network.

In this solicitation we encourage teams to assess the efficacy of instrumented autonomous profiling floats for observing tropical Pacific Ocean biogeochemistry. This activity will complement current ocean observing strategies utilizing research and commercial ships, autonomous platforms, and aircraft and satellite instruments. Specifically, we are interested in the development and calibration of profiling floats equipped with core Argo temperature and salinity and biogeochemical sensors for pH, oxygen, nitrate, and optical observations, including but not limited to, chlorophyll *a* fluorescence and particle backscattering to observe biogeochemical properties in the upper 2000 meters of the ocean with sufficient accuracy for climate studies. Additional acoustic sensors for wind speed and rainfall may be included. NOAA will be responsible for securing ship time for float deployment.

This solicitation is relevant to NOAA's Long-Term Goals of Healthy Oceans and Climate Mitigation and Adaptation (NOAA's Next Generations Science Plan (NGSP), 2010, http://www.performance.noaa.gov/ngsp/), the mission of NOAA's Ocean Observing and Monitoring Division (OOMD) to provide high-quality long-tern global observations, climate information, and products to researchers, forecasters, and other users to inform and prepare society for environmental challenges (NOAA Climate Program Office Climate Observation Division 2015-2020 Strategic Plan (2015), https://cpo.noaa.gov/Portals/0/Docs/OOM/COD%20Strategic%20Plan_June2015_publicdraft.pdf), and NOAA's commitment to the TPOS 2020 project.

Optical observations are of particular interest to NASA's Ocean Biology and Biogeochemistry program (OBB). NASA's OBB program utilizes a range of suborbital (including *in situ*) and remotely sensed observations from land, ocean, and atmosphere, as well as field studies and campaigns, and interdisciplinary data assimilation and modeling efforts to better understand the ocean's role in the Earth System and to predict future causes of change and feedbacks on ocean biology and biogeochemistry within the Earth System. Critical to this is the development of new technology and sensors.

Technical Proposal Guidance

1. Letters of Intent (LOIs) are required for this topic submission
2. Data Management Plan: All proposals must include a data management plan. Data generated by the deployed floats must be submitted to the NOAA National Centers for Environmental Information (NCEI) (https://www.nodc.noaa.gov/argo/index.htm). Guidance for data submission can be found at Argo Data Management (http://www.argodatamgt.org/).

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Award Information

We anticipate funding 1-2 proposals for 2-3 years at $200-400K/year

It is strongly suggested that proposals should address scalability of their proposed activities in the event of changes (increase/decreases) in funding amounts.

References

Biogeochemical-Argo Task Team, 2016. The scientific rationale, design and Implementation Plan for a Biogeochemical-Argo float array. Edited by K. S. Johnson and H. Claustre. doi:10.13155/46601.

Cravatte, S., W. S. Kessler, N. Smith, S. E. Wijffels, and Contributing Authors, 2016: Executive Summary. First Report of TPOS 2020. GOOS-215, pp. i-xii.

NOAA's Next Generations Science Plan (NGSP) (2010)
(http://www.performance.noaa.gov/ngsp/)

NOAA CLIMATE PROGRAM OFFICE CLIMATE OBSERVATION DIVISION 2015-2020 STRATEGIC PLAN (2015)
https://cpo.noaa.gov/Portals/0/Docs/OOM/COD%20Strategic%20Plan_June2015_publicdraft.pdf).

Topic 5: Improving Arctic Forecasts: Arctic Observing System Simulation Experiments (Arctic OSSE)

This NOPP opportunity addresses the need for research aimed at improving operational predictions in the maritime Arctic. Specifically, the call requests proposals for Observing System Simulation Experiments (OSSE) that may take advantage of many recent and ongoing observational campaigns, including but not limited to those organized under the Year of Polar Prediction (YOPP).

Background

YOPP is the flagship activity of the Polar Prediction Project (PPP), a 10-year (2013–2022) endeavor of the World Meteorological Organization (WMO) World Weather Research Program (WWRP). The aim of YOPP is to enable a significant improvement in environmental prediction capabilities for the polar regions and beyond, by coordinating a period of intensive observing, modelling, verification, user-engagement and education activities. The PPP promotes cooperative international research to enable the development of improved weather and environmental prediction services for the polar regions, on time scales from hours to seasonal. [1]

OSSEs use numerical models to: 1) quantitatively assess the potential impact of new or different observing system designs on earth system science, data assimilation and numerical weather prediction; 2) evaluate new methods for data processing and assimilation; 3) evaluate tradeoffs in the design, cost and configuration of proposed observing systems, such as coverage, resolution, accuracy and data redundancy; 4) assess the ability of observing systems for a variety of earth science applications. [2]

In an OSSE, simulated observations with simulated errors are drawn from a free run of a numerical model (termed a "nature run" or "NR") and provided to a data assimilation system which will produce state estimates of the NR using the simulated observations. Since the OSSE deals entirely with simulations, it is not restricted to using only observations that actually exist. Also, the underlying "true" model state from the NR is known precisely. These two properties of the OSSE facilitate many types of informative experiments. [3]

For the OSSEs to produce accurate quantitative results, all of the components of the OSSE system must be sufficiently realistic. This means that:

1. the NR, which is used to represent the atmosphere, ocean, cryosphere, and/or earth system components under analysis, should be generated by a state-of-the-art numerical model;
2. there should be realistic differences between the NR model and the model used for assimilation and forecasting;
3. the assimilation methodology must conform to current or future practices;
4. observations should be simulated with realistic coverage and accurately calibrated errors; and
5. the entire OSSE system must be validated to ensure that the accuracy of analyses and forecasts and that the impact of existing observing systems in the OSSE are comparable to the accuracies and impacts of the same observing systems in the real world. [3]

Program Description

This NOPP topic requests proposals that develop, design and conduct innovative Arctic Observing System Simulation Experiments that can help to assess the relative importance of and sensitivity to various observation types, locations, and frequencies of sampling, with the metric of improving predictive skill in the Arctic. Examples of operational parameters for which improved forecasts would be useful include sea ice thickness and concentration, ice edge and marginal ice zone locations, ocean currents and stratification, sea ice motion, surface winds, and ocean wave characteristics. To the extent that real world reanalyses or hindcasting experiments may play a role in the proposed research, the period from 2017 – 2019 is of particular interest due to enhanced observational campaigns during this period. The specific goals for this Arctic OSSE topic are:

1. To explore the impact of assimilating new types of data as well as to optimize the assimilation of existing observational data in order to demonstrate and quantify potential improvements relevant to Arctic operational forecasts.
2. To conduct quantitative evaluation of alternate deployments of existing systems and optimize observing strategies in order to demonstrate and quantify improvement relevant to operational Arctic forecasts.

This NOPP topic will not fund the development of new observing platforms, sensors, or systems, but looks to develop a useful OSSE framework for Arctic System Modeling that could address the potential need, impact, and design for Arctic observing.

Technical Proposal Guidance

Please provide a clear, detailed description of the following in your proposal:

1. OSSE technical goals, objectives and hypothesis.
2. YOPP and other data that will be used for the experiment.
3. Detailed description of OSSE elements including: Nature Run, Forecast Model, Data Assimilation, Observation/Simulation, and the Evaluation Strategy. There are no constraints on which models can be used for the OSSEs, but they must be fit for purpose, and the proposal must justify the appropriateness of use for this purpose (through references to previous testing or use).
4. Project team members, tasks and time allocations.
5. Technical risks associated with project budget & schedule.

Award Information

Up to $3M may be available for efforts under this topic. The participating NOPP agencies anticipate up to two awards of $300-$500K/year for three years may be awarded.

[1] Atlas, R. (2011). *Observing System Simulation Experiments: Methodology Early Results and plans for the future*. [presentation] Available at: http://aosc.umd.edu/~seminar/data/y11spring/umd_aosc_110623_atlas.pdf [Accessed 2 Aug. 2018].

[2] Pawson, S. (Responsible Nasa Official - 2012). *Global Modeling and Assimilation Office: GMAO Observing System Simulation Experiments (OSSE)*. Available at: https://gmao.gsfc.nasa.gov/projects/osse/ [Accessed 2 Aug. 2018]

[3] Hoffman, R. N. & Atlas, R. Future Observing System Simulation Experiments. *Bulletin of the American Meteorological Society* 97, 1601–1616 (2016).

Topic 6: New Approaches for Data Assimilation to Improve Operational Ocean Prediction

Background

The assimilation of observations into numerical ocean models enables environmental forecasts with predictive skill on lead times of days to weeks depending on the metric. Over the past two decades, significant enhancements of the Global Ocean Observing System, incorporating both *in situ* and remote sensing, has provided an impressive array of ocean-related variables that are available in near-real time for operational use. Many of the observational data sets that are either currently available, or that will be available in the near future, provide high-resolution observations at the ocean surface, including surface temperature, sea surface height, and optical properties. However, while systematic improvements in approaches such as 4DVAR and ensemble Kalman filter techniques have improved operational forecasts, the full value of these observations for ocean prediction have not been realized and further advancements in ocean state estimation methodology are still needed.

Despite increases in computational capabilities, many approaches to ocean state estimation are limited by their computational cost, and many data assimilation algorithms are unable to incorporate all of the ocean observations, leading to sub-sampling and discarding much of the data that is available in near-real time. Under this topic, the development of new, computationally-efficient procedures for initializing ocean models, or the ocean component of earth system models, that may result in improvements in forecast skill at multiple lead times are desired. Novel approaches, such as the development and application of machine learning techniques, assimilation of ocean features or non-standard observations, or algorithms that are designed to exploit new computational architectures are strongly encouraged.

This topic encourages proposals to investigate the development and application of new approaches in the assimilation of ocean or atmospheric observations (remote sensing, *in situ*, and/or new/non-traditional) to improve operational ocean prediction. Methodologies suitable for global, basin-scale, or regional ocean domains will be considered. Partnerships between academic, industry, and federal entities, particularly those federal agencies with missions that require operational ocean forecasts, are strongly encouraged, and successful proposals must have substantive partnerships involving both research and operational entities.

Technical Proposal Guidance

Please provide a clear, detailed description of the following in your proposal:

Data assimilation technical goals, objectives and hypothesis.
Data that will be used for the experiment.
Detailed description of data assimilation elements including: There are no constraints on which models can be used, but they must be fit for purpose, and the proposal must justify the appropriateness of use for this purpose (through references to previous testing or use).
Project team members, tasks and time allocations.
Technical risks associated with project budget & schedule.

Award Information

Up to $4.5M may be available over a three-year period to support efforts under this topic. Agencies participating in this NOPP topic anticipate supporting up to three, three-year projects, each at a level of approximately $300-$500K per year.

Topic 7: Autonomous Mapping

Topic: Integration and demonstration of a cost-effective autonomous system and methodology for deep ocean mapping and environmental characterization.

Overview: The capability for autonomous ocean mapping exists, but is not fully developed and integrated for deep ocean exploration which includes discovery-based research and environmental characterization. This topic focuses on advancing the depth and endurance of deep water (>200 m) autonomous mapping capabilities and applying existing sensing suites for routine mapping and environmental characterization at low cost.

Proposed solutions will demonstrate a systematic mapping capability in the US EEZ, that could include multiple platforms both surface and subsurface, and provides data to improve understanding and knowledge of the deep ocean environment over large areas in a cost-effective way. Results will enable site specific targeting for more intensive field studies using either the same system or additional follow-on tools for more detailed site characterization and/or process studies.

System Requirements

Mapping: The autonomous system should be capable of generating high-resolution bathymetric data with appropriate positioning control. The system could include multiple platforms either surface or subsurface or a combination.

Sensors: The autonomous system is envisioned to support physical, chemical, and biological sensors (e.g.,'omics sensors such as those for acquiring eDNA data) of high technical readiness level (TRL 7 or greater) along with acoustic and optical mapping capabilities. The system should be designed to maximize the number of sensors capable of acquiring Essential Ocean Variables (EOVs) relevant to the deep ocean such as those described in the draft Deep Ocean Observing Strategy - Science and Implementation Guide (http://deepoceanobserving.org/reports/doos-science-and-implementation-guide/). For high-resolution imagery data, the system should support photogrammetry tools and some level of automated image classification using artificial intelligence.

Operational Parameters: The system must be capable of providing quality data in water depths greater than 200m and preference will be given to solutions that can provide quality data at depths greater that 2000m. Mapping demonstrations should occur within the US EEZ. Ideally, the system will be shore-launch capable in addition to being deployable from a surface support vessel.

Letter of Intent responses to the BAA, must include:

- a description of the operational approach and location of demonstration mapping area.

- a description of the sensors that can be integrated in the system including precision, accuracy, temporal, and spatial resolution anticipated.

- a description of the current state of the platform and sensor capabilities including a discussion of the current Technical Readiness Level (TRL)

- a description of the design, build, calibration, and test processes along with any software or configuration control processes (where applicable),

- an assessment of the risk (subsystem or concepts) for the proposed application

- a schedule and cost estimate for the proposal,

- a high level business case/cost analysis for system acquisition and operation

One to three, 3 year awards are expected. There is a $1M budget per year, or overall $3M budget

APPENDIX 2 – REQUIREMENTS APPLICABLE TO GRANTS, TIA's AND COOPERATIVE AGREEMENTS

A. Application and Submission Information

1. Content and Form of Application Submission

(a) Full Proposals:

i. Instructions for Grants, Cooperative Agreements, and TIAs

Content and Form of Application:

Applicants must complete the mandatory forms in accordance with the instructions provided on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (.PDF).

Full Proposal Format

• Spacing – single spaced
• Font – Times New Roman, not smaller than12 point
• Discuss the limit on the number of pages for the Technical Proposal with the cognizant Program Officer. There are no page limitations to the Budget.

NOTE: The electronic file name for all documents submitted under this BAA must not exceed 68 characters in length, including the file name extension.

Required Forms

(1) SF-424 (RESEARCH & RELATED) (Mandatory)

The SF-424 (R&R) form must be used as the cover page for all proposals. Complete all required fields in accordance with the "pop-up" instructions on the form and the following instructions for specific fields. Please complete the SF-424 first, as some fields on the SF-424 are used to auto-populate fields on other forms.

The completion of most fields is self-explanatory with the exception of the following special instructions:

- Field 3 - Date Received by State: The Date Received by State and the State Application Identifier are not applicable to research.

- Field 4a - Federal Identifier: For new proposals, enter N00014-18-S-B007. If the application is a renewal or expansion of an existing award, enter the ONR award number.
- Field 4b - Agency Routing Number: Enter the three (3) digit Program Office Code and the Program Officer's name, last name first, in brackets (e.g., 331 [Smith, John]).
    - Where the Program Office Code only has two digits, add a "0" directly after

the Code (e.g., Code 30 would be entered as 300)

- Use Code 600 for ONRG).

Applicants who fail to provide a Program Officer Code identifier may receive a notice that their proposal is rejected.

- Field 4c - Previous Grants.gov Tracking ID: If this submission is for a Changed/Corrected Application, enter the Grants.gov tracking number of the previous proposal submission; otherwise, leave blank.
- Field 7 - Type of Applicant. Complete as indicated: If the organization is a Minority Institution, select "Other" and under "Other (Specify)" note that the institution is a Minority Institution (MI).

- Field 9 - Name of Federal Agency: List the Office of Naval Research as the reviewing agency. This field is pre-populated in Grants.gov.

- Field 16 - Is Application Subject to Review by State Executive Order 12372 Process? Choose "No". Check "Program is Not Covered by Executive Order 12372."

- Field 17 – Certification: All awards require some form of certifications of compliance with national policy requirements. By checking the "I agree" box in field 17, and attaching the representation to Field 18 of the SF424 (R&R) as part of the electronic proposal submitted via Grants.gov, the Grant Applicant is providing the certification on lobbying required by 32 CFR Part 28 and representation regarding an unpaid delinquent tax liability or a felony conviction under any federal law – DoD appropriations.

(2) R&R Form: Project/Abstract Form (Mandatory)

The project summary/abstract must identify the research problem and objectives, technical approaches, anticipated outcome of the research, if successful, and impact on DoD capabilities. Use only characters available on a standard QWERTY keyboard. Spell out all Greek letters, other non-English letters, and symbols. Graphics are not allowed and there is a 4,000 character limit including spaces.

Do not include proprietary or confidential information. The project summary/ abstract must be marked by the applicant as "Approved for Public Release". Abstracts of all funded research projects will be posted on the public DTIC website: https://dodgrantawards.dtic.mil/grants

(3) R&R Form: Research and Related Other Project Information (Mandatory)

- Fields 1 and 1a - Human Subject Use: Each proposal must address human subject involvement in the research by completing Fields 1 and 1a of the R&R Other Project Information form. For proposals containing activities that include or may include "research involving human subjects" as defined in DoDI 3216.02, prior to award, the Applicant must submit the documentation under "Use of Human Subjects in Research" (Section F).

- Fields 2 and 2a – Vertebrae Animal Use: Each proposal must address animal use protocols by addressing Fields 2 and 2a of the R&R Other Project Information form. If animals are to be utilized in the research effort proposed, the Applicant must submit the

documents described under “Use of Animals” (Section F).

- Fields 4a through 4d - Environmental Compliance: Address these fields and briefly indicate whether the intended research will result in environmental impacts outside the laboratory, and how the applicant will ensure compliance with environmental statutes and regulations.

Federal agencies making grant or cooperative agreement awards and recipients of such awards must comply with various environmental requirements. The National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. Sections 4321-4370 (a), requires that agencies consider the environmental impact of “major Federal actions” prior to any final agency decision. With respect to those awards which constitute “major Federal actions,” as defined in 40 CFR 1508.18, federal agencies may be required to comply with NEPA and prepare an environmental impact statement (EIS), even if the agency does no more than provide grant funds to the recipient. Questions regarding NEPA compliance should be referred to the technical point of contact. Most research efforts funded by ONR will, however, qualify for a categorical exclusion from the need to prepare an EIS. Navy instructions/regulations provide for a categorical exclusion for basic and applied scientific research usually confined to the laboratory, if the research complies with all other applicable safety, environmental and natural resource conservation laws.

- Field 7 – Project Summary/Abstract: Leave Field 7 blank; complete Form SF424, Project Abstract.

- Field 8 – Project Narrative: Describe clearly the research, including the objective and approach to be performed, keeping in mind the evaluation criteria. Attach the entire proposal narrative to R&R Other Project Information form in Field 8. To attach a Project Narrative in Field 8 click on “Add Attachment” and attach the technical proposal as a single PDF file. (Save the file as “Technical Proposal,” as typing in the box is prohibited).

The technical proposal must describe the research in sections as described below:

- **Cover Page**: This must include the words “Technical Proposal” and the following:
  (a) BAA Number: N00014-18-S-B007;

  (b) Title of Proposal;

  (c) Identity of prime applicant and complete list of subawards, if applicable;
  (d) Technical contact (name, address, phone/fax, electronic mail address)

  (e) Administrative/business contact (name, address, phone/fax, electronic mail address) and;

  (f) Proposed period of performance (identify both the base period and any options, if included).
- **Table of Contents**: An alphabetical/numerical listing of the sections within the proposal, including corresponding page numbers.

- **Technical Approach**. Describe the basic scientific or technical concepts that will be investigated, giving the complete research plan. Describe what is innovative about the

proposed approach. Provide the proposed approach compared to alternate approaches other researchers in this field have taken. Given the successful completion, describe the results, new knowledge, or insights.

- Future Naval Relevance (where applicable): A description of potential Naval relevance and contributions of the effort to the agency's specific mission.

- Operational Naval Concept (where applicable): A description of the project objectives, the concept of operation for the new capabilities to be delivered, and the expected operational performance improvements.

- Operational Utility Assessment Plan (where applicable): A plan for demonstrating and evaluating the operational effectiveness of the applicant's proposed products or processes in field experiments and/or tests in a simulated environment.

- Project Schedule and Milestones: A summary of the schedule of events and milestones:

- Reports: The following are sample reports that are typically required under a research effort:
  - Technical and Financial Progress Reports
  - Final Report

Grants do not include the delivery of software, prototypes, and other hardware deliverables.

- Management Approach. Describe the overall management approach and provide rationale for participation of key team members. Describe the planned relationships with any subawardees or collaborators. This is a single PI award; if there are subawardees or collaborators, explain how the proposed team fits the single PI structure. If appropriate, briefly describe anticipated schedule.

- Current and Pending Project and Proposal Submissions: Applicants are required to provide information on all current and pending support for ongoing projects and proposals, including subsequent funding in the case of continuing contracts, grants, and other assistance agreements. Applicants shall provide the following information of any related or complementary proposal submissions from whatever sources (e.g., ONR, Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations). Concurrent submission of a proposal to other organizations will not prejudice its review by ONR.

  - Title of Proposal and Summary;
  - Source and amount of funding (annual direct costs; provide contract and/or grant numbers for current contracts/grants);
  - Percentage effort devoted to each project;
  - Identity of prime applicant and complete list of subwards, if applicable;
  - Technical contact (name, address, phone/fax, electronic mail address)
  - Administrative/business contact (name, address, phone/fax, electronic mail address);

- Period of performance (differentiate basic effort);
- The proposed project and all other projects or activities requiring a portion of time of the Principal Investigator and other senior personnel must be included, even if they receive no salary support from the project(s);
- The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months or labor hours per year to be devoted to the project, regardless of source of support; and
- State how projects are related to the proposed effort and indicate degree of overlap.

- Principal Investigator Qualifications: A discussion of the qualifications of the proposed Principal Investigator and any other key personnel. Include resumes or curricula vitae for the Principal Investigator, other key personnel and consultants. The resumes/curricula vitae shall be attached to the proposal.

- Responsibility: Applicants must provide the following information to ONR in order to assist in ONR's evaluation of the applicants's responsibility:

  - Describe how you have adequate resources or the ability to obtain such resources as required to complete the activities proposed.

  - Describe how you have the ability to comply with the grant conditions, taking into account all existing and currently prospective commitments of the applicant, nongovernmental and governmental.

  - Describe your performance history; specifically, your record in managing Federal awards and the extent to which any previously awarded amounts will be expended prior to future awards.

  - Describe your record of integrity and business ethics.

  - Describe qualifications and eligibility to receive an award under applicable laws and regulations.

  - Describe your organization, experience, accounting, and operational controls and technical skills, or the ability to obtain them (including as appropriate such elements as property control systems, quality assurance measures, and safety programs applicable to the efforts to be performed).

- Facilities & Equipment. Describe facilities available for performing the proposed research and any additional facilities or equipment the organization proposes to acquire at its own expense. Indicate government-owned facilities or equipment already possessed that will be used. Justify the need for each equipment item. (Additional facilities and equipment will not be provided unless the research cannot be completed by any other practical means.)

(4) R&R Form: Research & Related Budget

The applicant must use the Grants.gov forms (including the Standard Form (SF) Research and Related (R&R) Budget Form) from the application package template associated with the BAA

on the Grants.gov web site located at http://www.grants.gov/. If options are proposed, the cost proposal must provide the pricing information for the option periods; failure to include the proposed costs for the option periods will result in the options not being included in the award.

Notional Schedule. The following provides a notional schedule to determine proposed period of performance and associated budget for Grant submissions.

Grant proposals submitted	**Use this start date**
See Key Dates (I.A.6)	See Key Dates (I.A.6)
See Key Dates (I.A.6)	See Key Dates (I.A.6)
See Key Dates (I.A.6)	See Key Dates (I.A.6)
See Key Dates (I.A.6)	See Key Dates (I.A.6)

A separate Adobe .pdf document should be included in the application that provides appropriate justification and/or supporting documentation for each element of cost proposed. This document shall be attached under Section K. "Budget Justification" of the Research and Related Budget form. Click "Add Attachment" to attach.

(a) Part 1**:** The itemized budget should include the following

- Direct Labor – Individual labor categories or persons, with associated labor hours and unburdened direct labor rates. Provide escalation rates for out years.

- Administrative and Clerical Labor – Salaries of administrative and clerical staff are normally indirect costs (and included in an indirect cost rate). Direct charging of these costs may be appropriate when a major project requires an extensive amount of administrative or clerical support significantly greater than normal and routine levels of support. Budgets proposing direct charging of administrative or clerical salaries must be supported with a budget justification which adequately describes the major project and the administrative and/or clerical work to be performed.

- Fringe Benefits and Indirect Costs (F&A, Overhead, G&A, etc.) – The application should show the rates and calculation of the costs for each rate category. If the rates have been approved/negotiated by a Government agency, provide a copy of the memorandum/agreement. If the rates have not been approved/negotiated, provide sufficient detail to enable a determination of allowability, allocability and reasonableness of the allocation bases, and how the rates are calculated. Additional information may be requested, if needed. If composite rates are used, provide the calculations used in deriving the composite rates.

- Travel – The proposed travel cost must include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip must be justified based on the organizations historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant

costs claimed must conform to the applicable Federal cost principals. Applicants may include travel costs for the Principal Investigator to attend the peer reviews described in Section II of this BAA.

- Subawards/Subcontracts – Provide a description of the work to be performed by the subrecipient/subcontractor. For each subaward, a detailed cost proposal is required to be submitted by the subrecipient(s). A proposal and any supporting documentation must be received and reviewed before the Government can complete its cost analysis of the proposal and enter negotiations. ONR's preferred method of receiving subcontract information is for this information to be included with the Prime's proposal. However, a subcontractor's cost proposal can be provided in a sealed envelope with the recipient's cost proposal or via e-mail directly to the Program Officer at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Applicant and that the attached proposal is a subcontract.

- Consultants – Provide a breakdown of the consultant's hours, the hourly rate proposed, any other proposed consultant costs, a copy of the signed Consulting Agreement or other documentation supporting the proposed consultant rate/cost, and a copy of the consultant's proposed statement of work if it is not already separately identified in the prime contractor's proposal.

- Materials & Supplies – Provide an itemized list of all proposed materials and supplies including quantities, unit prices, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).

- Recipient Acquired Equipment or Facilities – Equipment and/or facilities are normally furnished by the Recipient. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items must be provided. Provide an itemized list of all equipment and/or facilities costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). Allowable items normally are limited to research equipment not already available for the project. General purpose equipment (i.e., equipment not used exclusively for research, scientific or other technical activities, such as personal computers, laptops, office equipment) should not be requested unless they will be used primarily or exclusively for the project. For computer/laptop purchases and other general purpose equipment, if proposed, include a statement indicating how each item of equipment will be integrated into the program or used as an integral part of the research effort.

- Other Direct Costs – Provide an itemized list of all other proposed other direct costs such as Graduate Assistant tuition, laboratory fees, report and publication costs, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).

NOTE: *If the grant proposal requests funds for a conference, workshop or symposium:*

1. ONR (including ONRG) will not sponsor an ONR, Navy, or DoD event. Provide a list of other sponsors and the requested amounts to be funded by all sponsors.

2. The funds provided by ONR (including ONRG) may be used to pay for food or beverages as a direct cost only in exceptional circumstances. The funds shall not be used for food or beverages unless:

a. The grant proposal contains a request for such funding that is fully supported factually in accordance with the cost principles of the relevant OMB Circular, and

b. The Grants Officer determines that the funding is a reasonable, allocable, allowable expense under the relevant cost principles.

3. Specify in your proposal how the event and related outcomes will directly and programmatically relate to the US Naval or Marine Corps Science & Technology Plan and identify specific focus areas that will be addressed. The proposal must provide the technical and scientific objectives of the program or event and clearly state the desired outcomes (e.g. conference proceedings, journal articles, algorithms, tools, additional research, etc.).

- Fee/Profit – Fee/profit is unallowable under assistance agreements at either the prime or subaward level but may be permitted on subcontracts issued by the prime awardee.

NOTE: To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A§ 1681 Et. Seq.), the Department of Defense is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering, or mathematics disciplines. To enable this assessment, each application must include the following forms completed as indicated.

(5) Research and Related Senior/Key Person Profile (Expanded) (Mandatory)

The Degree Type and Degree Year fields on the Research and Related Senior/Key Person Profile (Expanded) form will be used by DoD as the source for career information. In addition to the required fields on the form, applicants must complete these two fields for all individuals that are identified as having the project role of PD/PI or Co-PD/PI on the form. Additional senior/key persons can be added by selecting the "Next Person" button.

(6) Research and Related Personal Data (Mandatory):

This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator and any Co-Project Director(s)/Co-Principal Investigator(s) completed; however, provision of the demographic information in the form is voluntary. If completing the form for multiple individuals, each Co-Project Director/Co-Principal Investigator can be added by selecting the "Next Person" button. The demographic information, if provided, will be used for statistical purposes only and will not be made available to merit reviewers. Applicants who do not wish to provide some or all of the information should check or select the "Do not wish to provide" option.

7. Other Submission Requirements

a. Submission of Grant, Cooperative Agreement, and TIA Proposals through Grants.gov

Grants.gov Application Submission and Receipt Procedures

This section provides the application submission and receipt instructions for the Office of Naval Research (ONR) program applications. Please read the following instructions carefully and completely.

1. Electronic Delivery

ONR is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. ONR encourages applicants to submit their applications online through Grants.gov.

2. How to Register to Apply through Grants.gov

a. *Instructions:* Read the instructions below about registering to apply for ONR funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

The registration process can take up to four weeks to complete. Therefore, registration should be done in sufficient time to ensure it does not impact your ability to meet required application submission deadlines.

If individual applicants are eligible to apply for this grant funding opportunity, refer to: https://www.grants.gov/web/grants/applicants/individual-registration.html

Organization applicants can find complete instructions here: https://www.grants.gov/web/grants/applicants/organization-registration.html

1) *Obtain a DUNS Number*: All entities applying for funding, including renewal funding, must have a Data Universal Numbering System (DUNS) number from Dun & Bradstreet (D&B). Applicants must enter the DUNS number in the data entry field labeled "Organizational DUNS" on the SF-424 form.

For more detailed instructions for obtaining a DUNS number, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-1-obtain-duns-number.html

2) *Register with SAM*: In addition to having a DUNS number, organizations applying online through Grants.gov must register with the System for Award Management (SAM). All organizations must register with SAM in order to apply online. Failure to register with SAM will prevent your organization from applying through Grants.gov.

For more detailed instructions for registering with SAM, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-2-register-with-sam.html

3) *Create a Grants.gov Account*: The next step in the registration process is to create an account with Grants.gov. Applicants must know their organization's DUNS number to complete this process. Completing this process automatically triggers an email request for applicant roles to the organization's E-Business Point of Contact (EBiz POC) for review. The EBiz POC is a representative from your organization who is the contact listed for SAM. To apply for grants on behalf of your organization, you will need the Authorized Organizational Representative (AOR) role.

For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-3-username-password.html

4) *Authorize Grants.gov Roles*: After creating an account on Grants.gov, the EBiz POC receives an email notifying them of your registration and request for roles. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online anytime after you have been approved as an AOR.

For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-4-aor-authorization.html

5) *Track Role Status*: To track your role request, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-5-track-aor-status.html

b. *Electronic Signature*: When applications are submitted through Grants.gov, the name of the organization's AOR that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC **must** authorize individuals who are able to make legally binding commitments on behalf of the organization as an AOR; **this step is often missed and it is crucial for valid and timely submissions.**

3. How to Submit an Application to the Office of Naval Research via Grants.gov

White Papers must not be submitted through the Grants.gov application process. White paper submissions must be e-mailed directly to the appropriate ONR Program Officer/Program Manager.

All attachments to grant applications submitted through Grants.Gov must be in Adobe Portable Document Format. Proposals with attachments submitted in word processing, spreadsheet, or any format other than Adobe Portable Document Format will not be considered for award.

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each funding opportunity announcement (FOA), you can create individual instances of a workspace.

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to:
https://www.grants.gov/web/grants/applicants/apply-for-grants.html

1) *Create a Workspace*: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

2) *Complete a Workspace*: Add participants to the workspace, complete all the required forms, and check for errors before submission.

a. *Adobe Reader*: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace so that they will appear similar to other Standard or [INSERT AGENCY NAME] forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at:
https://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html

b. *Mandatory Fields in Forms:* In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.

c. *Complete SF-424 Fields First*: The forms are designed to fill in common required fields across other forms, such as the applicant name, address, and DUNS number. To trigger this feature, an applicant must complete the SF-424 information first. Once it is completed, the information will transfer to the other forms.

3) *Submit a Workspace*: An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package at least 24-48 hours prior to the close date to provide you with time to correct any potential technical issues that may disrupt the application submission.

4) *Track a Workspace*: After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

For additional training resources, including video tutorials, refer to:
https://www.grants.gov/web/grants/applicants/applicant-training.html

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@grants.gov. (Foreign applicants should contact 1-606-545-5035.) For questions related to the specific grant opportunity, contact the number listed in the application package of the grant you are applying for.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist ONR with tracking your issue and understanding background information on the issue.

4. Timely Receipt Requirements and Proof of Timely Submission

a. *Online Submission.* All applications must be received by **[See Key Dates (I.A.6)]** Eastern time on the due date established for each program. Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant AOR will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. Applicant AORs will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission.

When the Office of Naval Research successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the applicant with the AOR role. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. Applications received by Grants.gov after the established due date for the program will be considered late and will not be considered for funding the Office of Naval Research

Applicants using slow internet, such as dial-up connections, should be aware that transmission can take some time before Grants.gov receives your application. Again, Grants.gov will provide either an error or a successfully received transmission in the form of an email sent to the applicant with the AOR role. The Grants.gov Support Center reports that some applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

B. Application Review Information

1. Recipient Qualifications

a. Grant, Cooperative Agreement, and TIA Proposals

i. The Grants Officer is responsible for determining a recipient's qualification prior to award. In general, a Grants Officer will award grants or cooperative agreements only to qualified recipients that meet the standards at 32 CFR 22.415. To be qualified, a potential recipient must:

(1) Have the management capability and adequate financial and technical resources, given those that would be made available through the grant or cooperative

agreement, to executed the program of activities envisioned under the grant or cooperative agreement;

(2) Have a satisfactory record of executing such programs or activities (if a prior recipient of an award);

(3) Have a satisfactory record of integrity and business ethics; and

(4) Be otherwise qualified and eligible to receive a grant or cooperative agreement under applicable laws and regulations.

Applicants are requested to provide information with proposal submissions to assist the Grants Officer's evaluation of recipient qualification.

ii. In accordance with Office of Management and Budget (OMB) guidance in parts 180 and 200 of Title 2, CFR, in its DoD policy that DoD Components must report and use integrity and performance information in the Federal Awardee Performance and Integrity Information System (FAPIIS), or any successor system designated by OMB, concerning grants, cooperative agreements, and TIA's as follows:

If the total Federal share will be greater than the simplified acquisition threshold on and Federal award under a notice of funding opportunity (see 2 CFR 200.88 Simplified Acquisition Threshold):

(1) The Federal awarding agency, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, will review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS)(see 41 U.S.C. 2313);

(2) An applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM;

(3) The Federal awarding agency will consider any comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 2 CFR 200.205 Federal awarding agency review of risk posed by applicants.

C. Federal Award Administration Information

1. Administrative and National Policy Requirements

a. Applicable to Grants, Cooperative Agreements, and TIA's (See Appendix 2).

i. Federal Funding Accountability and Transparency Act of 2006:

The Federal Funding Accountability and Transparency Act of 2006 (Public Law 109-282), as

amended by Section 6202 of Public Law 110-252 and expanded by the Digital Accountability and Transparancy Act of 2014 (Public Law 113-101), requires that all agencies establish requirements for recipients reporting information on subawards and executive total compensation as codified in 2 CFR Part 170. Any company, non-profit agency or university that applies for financial assistance (either grants, cooperative agreements or TIAs) as either a prime or sub-recipient under this BAA must provide information in its proposal that describes the necessary processes and systems in place to comply with the reporting requirements identified in 2 CFR Part 170 Appendix A. Entities are required to meet reporting requirements unless an exception or exemption applies. Please refer to 2 CFR Part 170, including Appendix A, for a detailed explanation of the requirements, exceptions, and exemptions.

ii. Certification regarding Restrictions on Lobbying:

Grant and Cooperative Agreement awards greater than $100,000, as well as OTAs not under 10 U.S.C. 2371b, require a certification of compliance with a national policy mandate concerning lobbying. Grant applicants shall provide this certification by electronic submission of SF424 (R&R) as a part of the electronic proposal submitted via Grants.gov (complete Block 17). The following certification applies likewise to each Cooperative Agreement and normal OTA applicant seeking federal assistance funds exceeding $100,000:

(1) No Federal appropriated funds have been paid or will be paid by or on behalf of the applicant, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the applicant shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The applicant shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

iii. Representation Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction Under any Federal Law - DOD Appropriations:

All grant applicants are required to complete the "Representation on Tax Delinquency and Felony Conviction" found at http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal.aspx by checking the "I agree" box in block 17 and attaching the representation to block 18. of the SF424 (R&R) as part of the electronic proposal submitted via Grants.gov. The representation reads as follows:

(1) The applicant represents that it is___ is not___ a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in timely manner pursuant to an agreement with the authority responsible for collecting the tax liability

(2) The applicant represents that it is___is not_ __a corporation that was convicted of a felony criminal violation under any Federal law within the preceding 24 months.

NOTE: If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the agency suspension and debarment official (SDO) has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore should provide information about its tax liability or conviction to the agency's SDO as soon as it can do so, to facilitate completion of the required consideration before award decisions are made.

iv. Representation Regarding the Prohibition on Using Funds with Entities that Require Certain Internal Confidentiality Agreements

Agreement with the representation below will be affirmed by checking the "I agree" box in block 17 of the SF424 (R&R) as part of the electronic proposal submitted via Grants.gov. The representation reads as follows:

By submission of its proposal or application, the applicant represents that it does not require any of its employees, contractors, or subrecipients seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting those employees, contractors, subrecipients from lawfully reporting that waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

Note that, as applicable, the bases for this representation are the prohibition(s) as follow:

a. Section 743 of the Financial Services and General Government Appropriation Act, 2015 (Division E of the Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. 113-235)

b. Section 101(a) of the Continuing Appropriation Act, 2016 (Pub. L. 114-53) and any subsequent FY2016 appropriations act that extends to FY2016 the same restrictions as are contained in section 743 of Division E, title VII of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub L. 113-235)

c. Pub. L. 114-223, Continuing Appropriations Act, 2017, or any other Act that extends to fiscal year 2017 funds the same prohibitions as contained in section 743, Division E, title VII, of the Consolidated Appropriations Act, 2016 (Pub. L. 114-113).

d. Any successor provision of law on making funds available through grants and cooperative agreements to entities with certain internal confidentiality agreements or statements.

The prohibitions stated above do not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

v. Code of Conduct:

Applicants for assistance are required to comply with 2 CFR 200.318(c), Codes of Conduct, to prevent real or apparent conflicts of interest in the award and administration of any contracts supported by federal funds. This provision will be incorporated into all assistance instruments awarded under this BAA.

v. Peer Review

In the case of proposals funded as basic research, ONR may utilize peer reviewers from academia, industry, and Government agencies to assist in the periodic appraisal of performance under the awards, as outlined in ONR Instruction 3966.1. Such periodic program reviews monitor the cost, schedule and technical performance of funded basic research efforts. The reviews are used in part to determine which basic research projects will receive continued ONR funding. Peer reviewers who are not U.S. Government employees must sign nondisclosure agreements before receiving full or partial copies of proposals and reports submitted by the basic research performers. Applicants may include travel costs for the Principal Investigator (PI) to attend the peer review.

APPENDIX 3 - REQUIREMENTS APPLICABLE TO CONTRACTS AND OTHER TRANSACTION AGREEMENTS

A. Application and Submission Information

1. Content and Form of Application Submission

(a) Full Proposals:

i. Instructions for Contracts and Other Transaction Agreements

Proposal Package:

The following six documents with attachments comprise a complete proposal package:

(1) Proposal Checklist (.pdf)
(2) Technical Proposal Template (.pdf)
(3) Cost Proposal Spreadsheet (Excel)
(4) Adequacy Checklist for Pre Award Audit (SF 1408) (as applicable)
(5) Stand-alone non-proprietary Statement of Work (SOW) in Word
(6) Representations and Certifications

NOTE: The electronic file name for all documents submitted under this BAA must not exceed 68 characters in length, including the file name extension.

Items 1 – 5 above are located at: http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/. All have instructions imbedded into them that will assist in completing the documents. Also, both the Proposal Checklist and the Cost Proposal Spreadsheet require completion of cost-related information. Please note that attachments can be incorporated into the Proposal Checklist.

For item 6, above, ONR contract specific representations and certifications are located at http://www.onr.navy.mil/en/Contracts-Grants/submit-proposal/contracts-proposal.aspx

The format requirements for attachments are as follows:

- Paper Size- 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing- single or double spaced
- Font- Times New Roman, 12 point

Offerors responding to this BAA must submit a separate list of all technical data or computer software that will be furnished to the Government with other than unlimited rights. The Government will assume unlimited rights if offerors fail to identify any intellectual property restrictions in their proposals. Include all proprietary claims to results, prototypes, and/or deliverables. If no restrictions are intended, then the offeror should state "NONE."

For proposals below the simplified acquisition threshold (less than or equal to $150K), the Technical Proposal Template and Proposal Checklist documents, and the Cost Proposal

Spreadsheet are required. Purchase orders can also contain options, as long as the total amount of the base and all options does not exceed $250K.

For proposed subcontracts or inter-organizational transfers over $150,000, Offerors must provide a separate fully completed Cost Proposal Spreadsheet in support of the proposed costs. This spreadsheet, along with supporting documentation, must be provided either in a sealed envelope with the prime's proposal or via e-mail directly to both the Program Officer and the Business Point of Contact at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract, and should include a description of the effort to be performed by the subcontractor.

Offerors should submit an appropriate number of hard copies as discussed with the cognizant Program Officer of their proposal package.

The electronic copy must be submitted in a secure, pdf-compatible format, except for the electronic file of the Cost Proposal Spreadsheet which must be submitted in a Microsoft Excel 2010 compatible format and the Statement of Work Template which must be submitted in Microsoft Word format. All attachments to any required proposal documents must be submitted in a secure, pdf-compatible format.

The secure pdf-compatible format is intended to prevent unauthorized editing of the proposal prior to any award. A password should not be required for opening the proposal document, but the Government must have the ability to print and copy text, images, and other content. Should an Offeror amend its proposal, the amended proposal should be submitted following the same hard and electronic copy guidance applicable to the original proposal.

Any proposed options that are identified in the Technical Proposal Template or Proposal Checklist documents, but are not fully priced out in the Cost Proposal Spreadsheet, will not be included in any resulting contract, cooperative agreement, or other transaction. If proposing options, they **must** be separately priced and separate spreadsheets should be provided for the base period and each option. In addition to providing summary by period of performance (base and any options), the Contractor is also responsible for providing a breakdown of cost for each task identified in the Statement of Work. The sum of all costs by task worksheets MUST equal the total cost summary.

The electronic submission of the Excel spreadsheet should be in a "useable condition" to aid the Government with its evaluation. The term "useable condition" indicates that the spreadsheet should visibly include and separately identify within each appropriate cell any and all inputs, formulas, calculations, etc. The Offeror should not provide "value only spreadsheets" similar to a hard copy.

When multiple IDIQ contracts will be awarded as a result of the BAA, include the following:

> In addition to completing the ONR Technical and Cost Proposal Template for the IDIQ contract, the offeror must also submit a Task Order 0001 proposal that will address Program Phase I only. The following sections in Section III, Technical Content, of th ONR Technical and Cost Proposal Template shall be addressed: Phase I Statement of Work, Phase I Technical Approach and Justification, Phase I Schedule and Milestones, and Phase I Deliverables/Reports. The proposal is limited to 25 pages with no more

than 15 pages for the Technical Approach.

Fixed Fees on ONR Contracts: The Government Objective is set in accordance with the DFARS 215.404-71. See the below table for range and normal values:

Contract Risk Factor	**Contract Type**	**Assigned Value (Normal range)**	**Normal Value**
Technical (1)		3% - 7% (2)	5%
Management/Cost Control (1)		3% - 7% (2)	5%
Contract Type Risk	Firm Fixed Price	2% - 6% (3)	3% - 5% (4)
Contract Type Risk	Cost Plus Fixed Fee	0% - 1% (2)	0.5%

(1) Assign a weight (percentage) to each element according to its input to the total performance risk. The total of the two weights equal 100%
(2) Assign a weighting score relative to the Risk Factor.
(3) Depends on the specific Contract Type (With/without financing, performance-based payments, and/or progress payments).
(4) Depends on the specific Contract Type.

Technology Incentive (TI) is rarely utilized at ONR, because the contracts issued by ONR typically are not eligible for TI (See DFARS 215.404-71-2(c) (2)). Any consideration of TI requires strong and convincing justification in the proposal, which are then subject to negotiation and determination of a fair and reasonable fee, within the context of the specific award.

Typically the range of fee is 5% to7.5% on an ONR awarded contract.

B. Application Review Information

1. Recipient Qualifications

a. Contract Proposals:

i. Contracts shall be awarded to responsible prospective contractors only. See FAR 9.104-1 for a listing of the general standards against which an applicant will be assessed to determine responsibility.

Applicants are requested to provide information with proposal submission to assist the Contracting Officer's evaluation of responsibility

ii. FAPIIS (Federal Awardee Performance and Integrity Information System) will be checked prior to making an award. The web address is:

httsp://www.fapiis.gov/fapiis/index.action

The applicant representing the entity may comment in this system on any information about the entity that a federal government official entered. The information in

FAPIIS will be used in making a judgment about the entity' integrity, business ethics, and record of performance under Federal awards that may affect the official's determination that the applicant is qualified to receive an award.

C. Federal Award Administration Information

1. Administrative and National Policy Requirements

b. Applicable to Contracts and Other Transaction Agreements (See Appendix 3).

i. Applies to Contracts (and may be applicable, as revised, to Other Transactions):

(1) Government Property/Government Furnished Equipment (GFE) and Facilities: Government research facilities and operational military units are available and should be considered as potential government-furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for any one specific program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should indicate in the Proposal Checklist, Section II, Blocks 8 and 9, which of these facilities are critical for the project's success.

(2) Use of Arms, Ammunition and Explosives:

Safety

The Offeror is required to be in compliance with DoD manual 4145.26-M, *DoD Contractor's Safety Manual for Ammunition and Explosives* if ammunitions and/or explosives are to be utilized under the proposed research effort. (See DFARS 223.370-5 and DFARS 252.223-7002) If ammunitions and/or explosives (A&E) are to be utilized under the proposed research effort, the Government requires a preaward safety survey in accordance with DFARS PGI 223.370-4(C)(iv) entitled *Preaward survey*.

If the Offeror proposes that the Government provide Government-furnished A&E containing any nitrocellulose-based propellants and/or nitrate ester-based materials (such as nitroglycerin) or other similar A&E with a tendency to become chemically unstable over time, then NMCARS 5252.223-9000 will also apply to a resulting contract award. (See NMCARS 5223.370-5)

Security

If arms, ammunition or explosives (AA&E) are to be utilized under the proposed research effort, the Government requires a preaward security survey. (See DoD manual 5100.76-M, dated April 17, 2012, *Physical Security of Sensitive Conventional Arms, Ammunition and Explosives*, Enclosure 2, paragraph 2.a.)

If AA&E are to be utilized under the proposed research effort, the Government may require the Contractor to have perimeter fencing around the place of performance in accordance with DoD 5100.76-M dated April 17, 2012, Enclosure 5, paragraph 2.a.

If AA&E are to be utilized under the proposed research effort, the Offeror is required to provide a written copy of the Offeror's AA&E accountability procedures in accordance with DoD 5100.76-M. If the Offeror is required to provide written AA&E accountability procedures, the Offeror should provide the respective procedures with its proposal submission. See DoD 5100.76-M dated April 17, 2012, Enclosure 9, paragraph 9.

(3) System for Award Management (SAM):

FAR 52.204-7 System for Award Management and FAR 52.204-13 System for Award Management Maintenance are incorporated into this BAA, and FAR 52.204-13 will be incorporated in all awards.

(4) Employment Eligibility Verification (E-verify):

As per FAR 22.1802, recipients of FAR-based procurement contracts must enroll as Federal Contractors in E-verify and use E-verify to verify employment eligibility of all employees assigned to the award. All resultant contracts from this solicitation will include FAR 52.222-54, "Employment Eligibility Verification."

(5) Conflicts of Interest:

(a) Disclosure. An offeror shall state in its proposal whether it is aware of any information bearing on the existence of any actual or potential organizational conflict of interest (OCI) as defined in FAR 2.101 and as further discussed in FAR Subpart 9.5 as to itself and any proposed subcontractors, partners, consultants or other affiliates. Offerors performing systems engineering and technical assistance (SETA) for ONR are considered to have an OCI that may not be susceptible to mitigation. See ONR's Statement of Policy on OCIs, which can be found at the following address: http://www.onr.navy.mil/en/About-ONR/compliance-protections/Organizational-Conflicts-Interest.aspx

The nondisclosure or misrepresentation of an interest creating an OCI may result in the disqualification of an offeror for award, or if such nondisclosure or misrepresentation is discovered after award, the Government may terminate the contract for default, recommend that the contractor be disqualified from subsequent related contracts, or be subject to such other remedial actions as may be permitted or provided by law (see 18 U.S.C. § 1001 and 31 U.S.C. § 3802(a)(2)). Therefore, offerors should interpret the requirements of this section broadly.

An offeror who does not provide support services to ONR or concludes no actual or potential OCI exists shall include the following statement in its proposal: "I [NAME] as an authorized negotiator on behalf of [NAME OF OFFEROR] certify that **NO** actual or potential organizational conflict of interest (OCI) exists under [BAA NUMBER]. I understand that the failure to disclose the existence of actual or potential OCI shall result in the offeror not being considered for award."

An offeror who does provide support services to ONR or is aware circumstances exist that may result in the appearance that it may have an unfair competitive advantage shall submit the following with its proposal:

(i) The name of the entity the offeror, its subcontractors, partners, consultants or affiliates supports.

(ii) The number of the contract, subcontract, or agreement that creates the actual or potential OCI. If ONR did not award the contract or agreement, provide a copy of the document. If ONR awarded the contract, provide the name of the technical point of contact.

(iii) A description of the actual or potential OCI. The statement must describe in a concise manner all relevant facts concerning any past, present or currently planned interest (financial, contractual, organizational, or otherwise) relating to the work to be performed hereunder and bearing on whether the offeror has a possible organizational conflict of interest with respect to (1) impartial, technically sound, and unbiased assessments, recommendations, or evaluations, or (2) being given an unfair competitive advantage. If relevant, offerors shall address the personal conflicts of their employees.

(iv) A Mitigation Plan. Offerors should refer to FAR Subpart 9.5 for policies and procedures for avoiding, neutralizing, or mitigating organizational conflicts of interest.

(v) A concluding statement as follows: "I [NAME] as an authorized negotiator on behalf of [NAME OF OFFEROR] certify that I have, to the best of my knowledge and belief, disclosed all actual or potential organizational conflicts of interest (OCI) under [BAA NUMBER]. I understand that the failure to disclose the existence of an actual or potential OCI shall result in the offeror not being considered for award."

(b) OCI Mitigation Plan Contents. At a minimum, a Mitigation Plan shall:

(i) Provide organizational charts showing the offeror's (and, as appropriate, those of its subcontractors, partners, consultants, and affiliates) structure as it relates to performance under the contract awarded under this BAA and all contracts and agreements relevant to the OCI, highlighting those elements that create the actual or apparent OCI.

(ii) Demonstrate how the elements that create the actual or apparent OCI will be isolated from the resources that will perform work under the contract awarded under this BAA.

(iii) Provide information showing whether the organizational elements that will perform work under the contract awarded under this BAA will be geographically or physically separated from the elements that create the actual or apparent OCI.

(iv) For each contract or agreement relevant to the OCI, describe the process for reassigning personnel, including those belonging to subcontractors, partners, consultants, and affiliates, from one organization to another. Include restrictions that apply.

(v) For each contract or agreement relevant to the OCI, describe the any controls, including nondisclosure agreements, that are exercised over the future employment of departing employees as it relates to the OCI.

(vi) For each contract or agreement relevant to the OCI, describe any OCI training the employees are offered or required to attend, along with the timing (before or after starting work on a government contract), frequency, length, and content of such training.

(vii) Provide evidence of facts and circumstances that the offeror asserts mitigate or address the concerns related to the actual or potential OCI.

(c) Review. The Contracting Officer will review an offeror's certifications, statements, and OCI Mitigation Plan (if applicable) submitted and may require additional relevant information from an offeror. All such information and any other relevant information will be used by the Contracting Officer to determine whether an award to the offeror may create an OCI. If found to exist, the Government may: (1) impose appropriate conditions which avoid such conflict, (2) disqualify the offeror, (3) determine that it is otherwise in the best interest of the Government to award a contract to the offeror and include appropriate conditions mitigating such conflict in the award, or (4) seek a waiver. If the Contracting Officer determines that an actual or significant potential conflict of interest exists that cannot reasonably be avoided, neutralized or mitigated, the offeror will be ineligible for award. If accepted, the Mitigation Plan shall become part of the contract.

An offeror who has refused to disclose the information or make the certification required by this BAA concerning an actual or potential OCI shall be disqualified from consideration for award.

6. FAR / DFARS Provisions/Clauses: For purposes of illustration and not of limitation, the following provisions and clauses may be applicable to ONR contracts:

#	**Provision/Clause**
52.204-7	System for Award Management
52.204-13 System	System for Award Management Maintenance
52.215-16	Facilities Capital Cost of Money
52.215-22	Limitations on Pass Through Charges - Identification of Subcontract Effort
52.216-1	Type of Contract
52.216-27	Single or Multiple
52.217-4	Evaluation of Options Exercised at time of Contract Award
52.217-5	Evaluation of Options
52.217-9	Option to Extend the term of the Contract
52.222-24	Preaward On-Site Equal Opportunity Compliance Evaluation (Applies if exceeds $10M)
52.226-2	Historically Black College or University and Minority Institution Representation
52.230-7	Proposal Disclosure - Cost Accounting Practice Changes
52.232-15	Progress Payments not included
52.233-2	Service of Protest
52.252-1	Solicitation Provisions Incorporated by Reference
52.252-3	Alterations in
52.252-5	Authorized Deviations in Provisions

252.203-7005	Representation Relating to Compensation of Former DoD Officials
252.204-7004	Alternate A, System for Award Management
252.204-7008	Compliance with Safeguarding Covered Defense Information Controls (DEC 2015)
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting (DEC 2015)
252.215-7003	Requirements for Submission of Data Other than Certified Cost or Pricing Data - Canadian Commercial Corporation
252.219-7000	Advancing Small Business Growth
252.219-7003 (DEVIATION 216-O0009) ALT II	Small Business Subcontracting Plan (DOD CONTRACTS) - BASIC

(a) Combating Trafficking in Persons: FAR Clause 52.222-50 will be incorporated in all awards.

(b) Certification Regarding Trafficking in Persons Compliance Plan:
Prior to award of a contract, for the portion of the contract that is for supplies, other than commercially available off-the-shelf items, to be acquired outside the United States, or services to be performed outside the United States, and which has an estimated value that exceeds $500,000, the contractor shall submit the certificate as specified in paragraph (c) of 52.222-56, Certification Regarding Trafficking in Persons Compliance Plan

(c) Updates of Information regarding Responsibility Matters: FAR clause 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matter, will be included in all contracts valued at $550,000 where the contractor has current active Federal contracts and grants with total value greater than $10,000,000.

(7) Production and Testing of Prototypes

ONR may modify a contract awarded under this BAA to add a contract line item or contract option for the provision of advanced component development or for the delivery of initial or additional prototype units. However, such a contract addition shall be subject to the limitations contained in Section 819 of the National Defense Authorization Act (NDAA) for Fiscal Year 2010, as modified in Section 811 of the NDAA for Fiscal Year 2015.

i. <u>Applies to Other Transaction Agreements only</u>:

(1) Federal Funding Accountability and Transparency Act of 2006:

The Federal Funding Accountability and Transparency Act of 2006 (Public Law 109-282), as amended by Section 6202 of Public Law 110-252 and expanded by the Digital Accountability

and Transparency Act of 2014 (Public Law 113-101), requires that all agencies establish requirements for recipients reporting information on subawards and executive total compensation as codified in 2 CFR Part 170. Any company, non-profit agency or university that applies for financial assistance (either grants, cooperative agreements or TIA's other transaction agreements) as either a prime or sub-recipient under this BAA must provide information in its proposal that describes the necessary processes and systems in place to comply with the reporting requirements identified in 2 CFR Part 170 Appendix A. Entities are required to meet reporting requirements unless an exception or exemption applies. Please refer to 2 CFR Part 170, including Appendix A, for a detailed explanation of the requirements, exceptions, and exemptions.