TO: Jennifer Rhodes, NOAA Program Office

FROM: NERACOOS, Northeastern Regional Association of Coastal Ocean Observing Systems

SUBJECT: Re: Request for Additional Information, NERACOOS Certification Application

DATE: June 16, 2017

Dear Ms. Rhodes,

The Northeastern Regional Association of Coastal Ocean Observing Systems has responded to

the U.S. Integrated Ocean Observing System Program Office in regard to NERACOOS's

Certification application. Within the document below the initial request information has been

included, as well as NERACOOS's response to this inquiry. If you have any additional questions

please don't hesitate to contact Ru Morrison, ru@neracoos.org.

Best,

Ru Morrison

NERACOOS, Executive Director

§997.21 Organizational Structure

(b)(3)(i):
A Conflict of Interest (COI) policy for the NERACOOS Board Members is provided and meets the requirement; however, sufficient documentation is not in place. The certification requirements state clearly that the By-Laws need to address liability issues; however, the By-Laws reference the creation of a future COI policy and should reference the existing policy and procedures.

Additionally, the response from NERACOOS does not address the Accountability and Liability controls requirement.

NERACOOS Response: A liability statement is included in Article V, section 8 of the By-laws, on page 10. Additionally, the NERACOOS By-laws are in the process of being amended to reference the organization's existing Conflict of Interest policy. The board will vote to amend the By-laws at the next board of directors meeting on August 23, 2017. Changes to the NERACOOS By-laws are as follows:

1.) **The Board of Directors amends Article IV, section 23, part f of the NERACOOS By-Laws to replace the existing text with the following:**

   EXISTING (to be deleted and replaced)
   f. Prior to the release of the first request for proposals, the Board shall adopt and make public a conflict of interest policy and make public procedures and criteria for proposal review that are based on merit and include independent and anonymous peer review. These procedures shall be followed for all RFPs released by NERACOOS.

   PROPOSED
   f. The corporation has a defined Request for Proposals process that includes procedures for dissemination, collection, review and selection. This process shall also ensure compliance with NERACOOS conflict of interest policies by all parties involved.

2.) **The Board of Directors amends Article IX, section 4 of the NERACOOS By-Laws to replace the existing text with the following:**

   EXISTING (to be deleted and replaced)
   Section 4. Conflict of Interest. The Board shall adopt and make public a conflict of interest policy by resolution. The policy shall address both actual and perceived conflicts of interest throughout the organization. The policy shall include, but not necessarily be limited, to a requirement for the Board of Directors, officers, employees, and committee and team members to at least annually disclose any situation involving actual or potential conflicts of interest; and a prohibition against any individual or institution submitting a proposal to NERACOOS also being involved in the review or decision-making regarding the proposal or other proposals associated with the same request for proposals.

   PROPOSED
   Section 4. Conflict of Interest. Directors, officers and employees of NERACOOS have an obligation to carry out their responsibilities within guidelines that minimize and make

transparent actual or potential conflicts of interest. The Board of Directors adopted a conflict of interest policy that establishes an ethical framework of transparency within which the Corporation wishes to conduct its affairs. The purpose of this conflict of interest policy is to provide specific direction so that directors, officers and employees will be aware of and comply with their obligations. Directors, officers and employees shall comply with the adopted conflict of interest policy.

§997.23 Strategic Operational Plan

(d)(3)(i):

The application identifies multiple individuals as being responsible for overall RICE Management, but IOOS will only accept one individual to fulfill this role for the purposes of certification. Please revise the application to reflect this requirement.

NERACOOS Response: The NERACOOS certification application has been revised so that only one individual is responsible for RICE Management: John R. Morrison, NERACOOS Executive Director.

(d)(3)(iii):

Certification requirements state clearly that the application must document to NOAA's satisfaction that the individual(s) responsible for RICE operations has the necessary qualifications and possesses relevant professional education and work experience to deliver observations successfully. At a minimum, applicant shall provide the curriculum vitae (CV) for each person identified as the individual(s) responsible for the overall RICE management and responsible for observations system management across the region. Further, the CVs must document that the individual performs one of the two roles identified in §997.23(d)(3) and must successfully describe the role and responsibilities of the individual within the RICE organization. While, the CVs do include detailed education and work experience for each individual, they do not clearly describe the roles and responsibilities of the individuals in the RICE. Please revise the CVs to clearly describe the roles and responsibilities of the individuals responsible for the overall RICE management and responsible for observations system management across the region.

NERACOOS Response: The NERACOOS certification application has been revised to include the responsibilities of each individual responsible for overall RICE management and for observations system management. Additionally, in section 1.3.3 of the NERACOOS Strategic Operation Plan a table of key personnel and their respective responsibilities has been included.

(d)(3)(iv) :

The documentation is not sufficient to meet the requirement.

The requirement is met for employees of NERACOOS. However, the application does not provide sufficient information about the evaluation procedures for the Operations Managers other than to indicate they are subject to their employer's evaluation policies and procedures.

The individual(s) in the roles of the Operations Manager(s) must be evaluated by NERACOOS, and procedures for these evaluations must be documented and referenced.

NERACOOS Response: Section 1.3.3.4 of the NERACOOS Strategic Operation Plan has been revised to include a more thorough description of the evaluation process. This language reads:

NERACOOS regularly monitors and evaluates its partners, subawardees, and/or contractors (hereinafter referred to as "partners") who perform tasks as part of the operations of the observing system. In choosing partners to work on projects, NERACOOS reviews the partners' qualifications and evaluates past performance. From time to time, NERACOOS will establish review panels populated by both NERACOOS staff members and external experts.

During the course of a particular project, NERACOOS monitors partner performance against established milestones through semi-annual progress reports. NERACOOS provides written performance evaluations to partners on an annual basis.

For example: when preparing the main five year proposal for the NOAA U.S. IOOS Program Office, the NERACOOS Board formed an oversight committee of un-conflicted Directors. This committee reviewed all written past feedback provided to partners and ranked performance as either 'satisfactory' or 'unsatisfactory' as well as providing additional comments. Partners with 'unsatisfactory' performance are most unlikely to be included in future proposals.

(f) Data Management and Communication (DMAC) Plan

Comments:
(f)(1)(ii)

Reviewer 1	i Individuals are identified in the DMAC plan as well as in the SOP and it would appear that they have the needed technical skills to coordinate data aggregation and dissemination ii. CVs are supposed to be in appendix 2.3 of SOP, but this appendix is blank.
Reviewer 2	CVs do not really list roles in NERACOOS. Would be good to have summary table of names, titles and roles/activities. See Reviewer 3's comments for some of the information for such a table.
Reviewer 3	Summary: · Names of additional GMRI individuals/roles are not provided or further documentation. SOP/DMAC Lists following individuals/Roles: (Source document in parentheses)

	· NERACOOS Executive Director (Ru Morrison) (SOP, DMAC)
	· **Jacqueline Ball** is the Program Coordinator of NERACOOS. (SOP)
	· NERACOOS Communications and Outreach Specialist (Tom Shyka) (SOP, DMAC)
	· Data manager from all of the funded NERACOOS data providers.
	o **Neal R. Pettigrew** is a physical oceanographer and an ocean engineer, and is presently the Director of the University of Maine Ocean Observing System (UMOOS), the Director of the Maine Center for Autonomous Marine Surveys (MCAMS), and Professor of Oceanography at the University of Maine. (SOP)
	o **Jim O'Donnell – UCONN (SOP)**
	o **Joe Salisbury** is a Research Assistant Professor in Oceanography and Biogeochemistry at the University of New Hampshire.(SOP).
	o **Andrew Thomas** is a Professor of Oceanography in the School of Marine Sciences at the University of Maine. (SOP)
	o **Francesco Peri** is currently the Managing Director of the Center for Coastal Environmental Sensing Networks at the School for the Environment - University of Massachusetts in Boston, as well as serving as President and CEO of Charybdis Group LLC. (SOP)
	· GMRI DMAC Team is led by co-PI Riley Young Morse who manages all GMRI DMAC activities, (SOP, DMAC)
	· GMRI Data Manager (Eric Bridger) (SOP, DMAC)
	· The GMRI DMAC team, which includes the Team Lead, Data Manager and additional GMRI technical staff are responsible for all aspects of the NERACOOS Data Management System. (DMAC)

NERACOOS Response: Appendix 2.3 of the SOP has been updated to include the CVs. The NERACOOS certification application has been revised to include the responsibilities of each individual responsible for overall RICE management and for observations system management. Additionally, in section 1.3.3 of the NERACOOS Strategic Operation Plan a table of key personnel and their respective responsibilities has been included. The responsibilities of DMAC personnel are described in Section 2 of the NERACOOS DMAC Plan (http://neracoos.org/sites/neracoos.org/files/documents/NERACOOS_DMAC_Plan_V2.5_June_2017.pdf).

The NERACOOS DMAC Plan has been revised to indicate that the GMRI DMAC Lead and Data Manager are responsible for NERACOOS DMAC implementation and management.

Comments:

(f)(1)(iii):

Reviewer	The proper documents are available - GMRI hiring and employee review documents

1	(GMRI, Gulf of Maine Research Institute) One thing that should be added here is how NERACOOS reviews their contracts.
Reviewer 2	Agree with other comments.
Reviewer 3	For section 1.iii, review of qualifications, statements are very broad (SOP page 12, 13) but not sure how to improve on.

NERACOOS Response: Section 1.3.3.4 of the NERACOOS Strategic Operation Plan has been revised to include a more thorough description of the awardee evaluation process. This language reads:

NERACOOS regularly monitors and evaluates its partners, subawardees, and/or contractors (hereinafter referred to as "partners") who perform tasks as part of the operations of the observing system. In choosing partners to work on projects, NERACOOS reviews the partners' qualifications and evaluates past performance. From time to time, NERACOOS will establish review panels populated by both NERACOOS staff members and external experts.

During the course of a particular project, NERACOOS monitors partner performance against established milestones through semi-annual progress reports. NERACOOS provides written performance evaluations to partners on an annual basis.

Comments:
(f)(2):

Reviewer 1	The DMAC plan splits observational data into real-time, near-real time, historical, and model data, with provider types of NERACOOS funded, federal and state, and private research. There is a dearth of information on what assets fall into which categories and the actual path taken by each data type. The most important assets in terms of NERACOOS would be those directly funded by NERACOOS. Which assets are those and how do the data get to NERACOOS? Telemetered to responsible institute is a good start, but then how and at what frequency are they sent to GMRI for inclusion in the NERACOOS data stream? Are the data telemetered directly to GMRI as well as the assets responsible party? Is GMRI the responsible party? The DMAC plan concentrates almost exclusively on buoys. In the SOP there is an excellent list of all assets included under NERACOOS. There should be mention in the DMAC plan how each data type makes its way through the NERACOOS data system. In addition, the handling (data flow, quality control, and archiving) of complicated assets such as the AZMP, HF radar, and gliders need to be addressed. For real-time data, are there more highly quality-controlled versions, which replace the real-time data at some point? For what assets is NERACOOS primarily responsible? I expect it would be those assets directly funded by NERACOOS. How are these data handled differently than assets for which NERACOOS is not the primary source - for instance buoys handled by NDBC or

	CO-OPS? NERACOOS needs to pay special attention to data for which it is the primary source as opposed to those, which it aggregates from elsewhere to present a complete view of their region. The documents note that data since 2009 are part of NERACOOS. An inventory of NERACOOS data already part of their data system would be helpful.
Reviewer 2	Is there and agreement between NERACOOS and GMRI that describes the terms of data and code ownership, sharing etc.? If so, please include. Specific locations for access to all source code for loading and analyzing data. Saying it is on github is too generic.
Reviewer 3	Search of IOOS catalog for 'NERACOOS' returns 167 entries, all of which that reference a geographical location reference Gulf of Maine. NERACOOS funds UCONN and has providers such as URI that are south of what I know of as the Gulf of Maine (ending at Cape Cod/Nantucket). Should the Catalog entries be changed to better reflect these geographical locations? · Check of http://www.neracoos.org/thredds/catalog.html lists URI, UCONN, UNH but there is no link to actual data/metadata that I see. · This statement from DMAC page 27 "The collection of software code that includes data processing scripts, web services and web-delivered applications and products is managed through Git using GitHub (https://github.com/) and Bitbucket (https://bitbucket.org/) online repositories" is inadequate to insure everything is available with NERACOOS holding the license. · Google search for 'NERACOOS SOURCE CODE' returned this account, https://github.com/neracoos-open/NFWF, that had minimal contents and no license. Adding bitbucket to search criteria returned no useful links. All source code/scripts should be archived in one location (GitHub, BitBucket or other) under one account NERACOOS with a clear license file. Absent this, the Certification documentation should provide specific links to github sites. · General concerns that NERACOOS has rights/ownership of all processes and want to insure that GMRI has nothing that could be deemed proprietary. · General concern that data/processing emphasizes Gulf of Maine and that processes for other areas within the NERACOOS footprint may not be adequately described.

NERACOOS Response:

Reviewer 1: The NERACOOS DMAC Plan has been revised to include a new section (Section 6) titled "NERACOOS Data Streams." This section provides details about the data flow, QA/QC, backup and archival processes of the assets that are primarily funded by NERACOOS, which includes buoys, sensors, HF Radar, and satellite imagery.

NERACOOS does not currently support any glider operations. NERACOOS provides minimal support for Fisheries and Oceans Canada's Atlantic Zonal Monitoring Program (AZMP). All of the data management for AZMP is handled by Fisheries and Oceans Canada (see http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/azmp-pmza/index-eng.html). NERACOOS does not currently integrate any AZMP data into the NERACOOS DMAC system.

Reviewer 2: There is a NERACOOS sub award agreement with GMRI that includes the following language related to data and code ownership and sharing:

Subrecipient grants to NERACOOS an irrevocable, royalty-free, non-transferable, non-exclusive right and license to use, reproduce, make derivative works, display, and perform publicly any copyrights or copyrighted material (including any computer software and its documentation and/or databases) first developed and delivered under this agreement solely for the purpose of and only to the extent required to meet NERACOOS' obligations to the Federal Government under its Prime Award. All publications that cite the sources they express therein are those of the author and not necessarily those of NERACOOS or of the State or Federal Awarding Agencies.

Subrecipient grants to NERACOOS the right to use data created in the performance of this subaward agreement solely for the purpose of and only to the extent required to meet NERACOOS' obligations to the Federal Government under its Prime Award.

Regarding the management of source code. The DMAC plan has been updated (see section 8.2), to include the following language that describes source code management:

The collection of software code that includes data processing scripts, web services and web-delivered applications and products is managed internally through version control systems. GMRI uses Git, which is managed through an online private repository on Bitbucket (https://bitbucket.org/).GMRI maintains a library of technical documentation on Google Docs. These documents include detailed descriptions of the Amazon Web Services configuration, protocols for disaster recovery, data framework configuration and product development. These documentation resources are accessible by the NERACOOS staff but are not publicly available.

Reviewer 3: Not all data from NERACOOS has been accessible through the IOOS Catalog. NERACOOS has had an ongoing issue with the IOOS catalog harvester overloading the NERACOOS THREDDS server due to frequency of crawling activity and size and number of real-time and historic netCDF files being scanned. To resolve this issue, NERACOOS developed a WAF (Web Accessible Folder) that can be crawled by the catalog harvester to access metadata for data providers with available THREDDS servers (currently UMaine, UNH and URI). UConn data will be available through the WAF once they get their THREDDS server online later this year. NERACOOS DMAC is currently working with the IOOS program office to ensure that all NERACOOS data streams are represented accurately in the IOOS catalog.

The THREDDS catalog that was viewed (http://www.neracoos.org/thredds/catalog.html) is an older THREDDS catalog that was established by NERACOOS. The more recent NERACOOS THREDDS is located at http://www.neracoos.org/thredds/sos_catalog.html and contains records

from UMaine, UNH and URI. As indicated above, UConn is working on establishing a THREDDS and when that is completed, the UConn records will be available through the NERACOOS THREDDS catalog.

Regarding source code management and code rights/ownership please see response to reviewer 2 above.

Comments:

(f)(3):

Reviewer 1	Explanation for buoy data is adequate, though specialized buoy data such as CO_2 and chlorophyll could use some more specific attention. There is very little information on other assets. For each asset listed in the SOP there should be some information on the quality control of the data. In addition, some information on real-time quality control vs. more in depth quality control performed later (including post deployment calibration of sensors).
Reviewer 2	Agree with other comments
Reviewer 3	Additional Data Request: · Need to include WHOI QC procedures.

NERACOOS Response: The NERACOOS DMAC Plan has been updated to include additional details about QC of specialized buoy data including CO_2 and Chlorophyll. These updates can be found in the QA/QC sections of the funded data providers in Section 6. Additionally, details about QC of other funded data streams including HF Radar and satellite imagery can also be found in Sections 6.

Comments:

(f)(4):

Reviewer 1	As stated above, except for buoy data, it is not clear what NERACOOS assets should be or are part of the data stream. An inventory of assets and whether they are available in real-time, near real-time, in a delayed time frame with additional quality control, or not at all.
Reviewer 2	Concerns will be met in answers to questions in other sections.
Reviewer 3	In my opinion the RICE is striving to provide as much data as possible and is in compliance with the directive except as noted or asking for supporting documentation in other parts of this review.

NERACOOS Response: As described in our response to (f)(2) Reviewer 1, the NERACOOS DMAC Plan has been updated to include a section that describes funded assets including buoys, HF radar and satellite imagery (Section 6).

Comments:
(f)(5):

Reviewer 1	It is noted in the DMAC plan that Eric Bridger is responsible for implementing and adhering to IOOS and IOOC standards. It looks like this is being done for IOOS standards, or will be in some cases by 2018, for instance in implementation of the QARTOD quality control standards. But there is no mention of IOOC standards What IOOC is and what their standards are should be discussed in this document. Are the standards simply IOOS standards, or is there something more?
Reviewer 2	Need more information on how new protocols or requirements will be implemented. Timing for implementation also needs to be described.
Reviewer 3	Reading the DMAC supports what was done to meet current protocols and standards. Regarding future protocols I see "The NERACOOS DMAC team continues to work closely with the IOOS Program Office and DMAC community to implement new requirements and protocols developed to further enhance access to data" on Page 7 of the DMAC. This seems vague and not adequately addressing how future protocols will be implemented and in a reasonable and timely manner. Enhancing the SOP and/or DMAC to specifically address how the team will become aware of new protocols (via meetings, directives, etcetera) and a clear policy that new protocols will be implemented in a given (6 months, 1 year, etc.) timeframe with any anticipated or actual delays reported to the NERACOOS Board of Directors in writing on a quarterly (or other timeframe) basis should be considered.

NERACOOS Response: We have removed the reference to IOOC standards from the DMAC Plan. Eric Bridger works directly with the DMAC staff from the IOOS Program Office and is responsible for leading implementation of standards required by the IOOS program.

We have added the following language to Section 2 of the DMAC Plan to describe the process of communicating with the IOOS Program Office and implementing new DMAC protocols.

NERACOOS DMAC personnel maintain regular communication with the U.S. IOOS Program Office through in-person meetings, phone calls, webinars, and emails. Additionally, NERACOOS often consults outside DMAC expertise from our sister RAs (or RICEs) and other federal partners with DMAC expertise. This frequent communication ensures that NERACOOS is aware of all new practices and protocols, as promulgated by the IOOS Program Office, and understands how to implement them. The GMRI data manager, DMAC lead, NERACOOS staff

and the funded data providers participate in monthly DMAC calls to discuss new protocols and/or and evaluate implementation of protocols recommended by the U.S. IOOS office.

Whenever guidance is provided by the U.S. IOOS Program Office on data management protocols, NERACOOS will respond within 1 month with an assessment of the relevance of such guidance to our DMAC procedures and if appropriate, an estimate of the time it will take us, given resources and capacity, to reach compliance. Once the data management lead receives the recommended protocol, they will take the necessary steps towards its implementation in a reasonable and timely manner. Implementation of new services is only limited by personnel time and expertise. If feasible, NERACOOS will implement new protocols in one year. Any delays in implementation will be reported to the NERACOOS Board of Directors during the quarterly board meetings.

Comments:
(f)(6):

Reviewer 1	It is noted in the DMAC plan that the University of Maine is working with NCEI to archive their data by 2018. Does this mean the GMRI is working with NCEI to archive all NERACOOS assets for which NERACOOS is the primary source? Or is this endeavor simply for the assets controlled by the University of Maine? It should be made clear. It would make sense that GMRI would work with NCEI to archive all NERACOOS assets since they are managing the data for all of NERACOOS. It would not make sense for each institution within NERACOOS to set up a plan separately with NCEI.
Reviewer 2	It's not enough to state they will archive by a date - they also need to describe their plans/proposed process. The Certification Guidance doc gives a good description of what we expect on this. There are 6 steps they need to describe though the first 3 are typically covered in other questions. How do they plan to send data to NCEI - are they posting NetCDF files? Are they FTP'ing, or is NCEI harvesting from NERACOOS? There needs to be detail about the proposed process, as discussed with NCEI.
Reviewer 3	Page 27 of the DMAC indicates that "All NERACOOS funded data will be archived at NCEI by 2018" and goes on to talk about UMAINE efforts. No mention is made of UNH or UCONN efforts, which are also NERACOOS funded. I would prefer to see a more detailed implementation plan, possibly with staggered dates for the different institutions if that is what is being planned. UMAINE by 1/2018, UNH by 6/2018, UCONN by 9/2018 (or other plan or schedule of their choice) would be more measurable and appropriate than a generic sentence of '…. by 2018'.

NERACOOS Response: Section 8.3 of the DMAC plan has been updated to better describe the implementation of archival with NCEI. NERACOOS.org has established a Web Accessible Folder (WAF) to allow NCEI to pull the data as needed. Each NERACOOS funded data provider

will submit to NCEI via the single NERACOOS WAF. We will implement the NCEI archival in a phased approach, first with UMaine followed by UNH and then UConn. The anticipated completion dates are UMaine 12/2017, UNH 5/2018, and UConn 8/2018.

§997.24 Gaps Identification

(b)(3):

The documentation is not sufficient to meet this requirement. Required documentation to meet this requirement includes: a priority regional gaps analysis that compares information from the asset inventory in §997.24(b)(1) and the build out plan in §997.24(b)(2) and describes the gaps between the two. A statement or description of how the gaps will be revised and updated at least once every 5 years is also required.

The documentation is not sufficient to meet the requirement.

NERACOOS provided documentation within their SOP, Section 1.5.4 called the Gaps Identification. This section does indicate a comparison of the asset inventory in §997.24(b)(1) and the build-out plan in §997.24(b)(2) and describes the gaps between the two, but it does not define the priority order for closing these gaps.

A statement or description of how the gaps analysis will be reviewed and updated at least once every 5 years was not included in the referenced plan.

NERACOOS Response: Section 1.5.4 of the NERACOOS Strategic Operating Plan (table 3.1; table 3.2; 3.3) has been updated to better describe the gaps identification process and to identify the priority order in which these gaps will be closed; these changes can be seen on pages 15-19.