1. **General Description of Data to be Managed**
   1. Name of the Data, data collection Project, or data-producing Program:

NOAA 2019 Arctic program, EcoFOCI Chukchi Sea time-series data collection.

* 1. Summary description of the data:

For the PMEL-EcoFOCI contribution to the 2019 NOAA Arctic program, time-series data will be collected via moored buoys. These instrument arrays will record continuous data for three to 12 months at various depths in the water column, and at defined stations. Four stations in the Chukchi Sea include C1, C2 and C3 along the Icy Cape line and C4 northeast of Icy Cape. These data will add to longer-term observations, some of which date back to 2010. The Ecosystems & Fisheries-Oceanography Coordinated Investigations (EcoFOCI) program, a joint research program between NOAA Pacific Marine Environmental Laboratory (PMEL) and NOAA Alaska Fisheries Science Center (AFSC) has collected oceanographic data since it’s 1984 inception. EcoFOCI is advancing understanding of ecosystem dynamics by looking at the influence of the physical and biological environment on marine populations, and the subsequent impact on fisheries.

* 1. Is this a one-time data collection, or an ongoing series of measurements?

On-going series of measurements.

* 1. Actual or planned temporal coverage of the data:

August 2 – 23, 2019 (USCGC Healy research cruise)

* 1. Actual or planned geographic coverage of the data:

Latitude/longitude range: 70.8°N to 71.83°N, and 160.5°W to 166.1°W. All data originate in Alaskan Arctic Waters in the Chukchi Sea.

* 1. Type(s) of data:  
     digital numeric data - water temperature, salinity, conductivity, pressure, PAR (shortwave radiation), oxygen, chlorophyll fluorescence, current speed and direction, turbidity, nutrients, sea ice draft, and sea ice keels.
  2. Data collection method(s):  
     Time-series data are collected from a variety of automated instruments on moored buoys that are deployed from research vessels. The vertical mooring line places instruments at various depths in the water column. Moorings remain in place 3-12 months. Upon recovery of a mooring and instruments, data are uploaded to sea-going computers, then transferred to in-office computers for processing.
  3. If data are from a NOAA Observing System of Record, indicate name of system:

Ecosystems and Fisheries-Oceanography Coordinated Investigations (EcoFOCI)

1. **Point of Contact for this Data Management Plan (author or maintainer)**
   1. Name: Peggy Sullivan
   2. Title: Research Scientist
   3. Affiliation or facility: University of Washington, JISAO
   4. E-mail address: [peggy.sullivan@noaa.gov](mailto:peggy.sullivan@noaa.gov)
   5. Phone number: 206.526.6185
2. **Responsible Party for Data Management***Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.*
   1. Name: Peggy Sullivan
   2. Position Title: Research Scientist
   3. Name of current Position holder: same as above
3. **Resources***Programs must identify resources within their own budget for managing the data they produce.*
   1. Have resources for management of these data been identified?

Yes. Data will be processed, distributed and stored following standard protocols within the PMEL-EcoFOCI program.

* 1. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown.

1. **Data Lineage and Quality***NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.*
   1. Processing workflow of the data from collection or acquisition to making it publicly accessible:

Data are uploaded from instruments and processed using recommended software from the manufacturer along with most-recent calibrations. Data are inspected and plotted using in-house software and tools including python and perl scripts, PMEL ferret software and/or open-source or commercial software such as R and Matlab. Instruments are setup so that the midpoint of the sampling interval falls on an even hour. If the sampling start time could not be set to an even hour, or if the clock drifted, data are later interpolated to begin on an even hour and to be evenly spaced, with initial even delta-t in time. Final data sets are written to NetCDF-4 format files. Missing data value for all variables is 1.0e+35. Files include salinity which is derived from conductivity and temperature, and sigma-T which is calculated from water density based on temperature and salinity.

* 1. Quality control procedures employed:

CTD casts are taken at both deployment and recovery for each mooring, and are used to correct time-series variables. If velocity data are at all questionable, tidal analysis is used to find the amplitudes of major tidal components, and these are compared to known components in the near proximity as a quality check. Time series values are visually inspected for singleton spikes which are removed when appropriate. Missing data value for all variables is 1.0e+35. If the sampling start time could not be set to an even hour, or if the clock drifted, data are interpolated to begin on an even hour and to be evenly spaced, with initial even delta-t in time.

1. **Data Documentation***The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.*
   1. Does metadata comply with EDMC Data Documentation directive?

Yes.

* 1. Name of organization or facility providing metadata hosting:

Metadata are submitted with data to NCEI, and are rarely hosted separately.

* + 1. If service is needed for metadata hosting, please indicate:

Metadata-only hosting may be of interest.

* 1. URL of metadata folder or data catalog, if known:

Unknown.

* 1. Process for producing and maintaining metadata *(describe or provide URL of description)*:

Metadata are created as a separate (Word doc) file. Sections in the document provide all needed information as defined in the ISO—19115 metadata standard.

1. **Data Access***NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive*[[1]](#footnote-1) *contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.*
   1. Do these data comply with the Data Access directive?

These data will comply with the Data Access directive when they are completed then submitted to NCEI, and also loaded into the PMEL ERDDAP data server.

* 1. Name of organization or facility providing data access:

NOAA, NCEI (formerly NODC), and PMEL ERDDAP server. AOOS via AXIOM and NPRB will provide password protected hosting and access to preliminary data to all associated principal investigators before final data are distributed.

* + 1. If data hosting service is needed, please indicate: No
    2. URL of data access service, if known:

<https://www.nodc.noaa.gov/archivesearch/>

[https://ferret.pmel.noaa.gov/pmel/erddap/info/](https://ferret.pmel.noaa.gov/pmel/erddap/info/index.html?page=1&itemsPerPage=1000)

* 1. Data access methods or services offered:

NCEI data access is through the standard NCEI web interface and includes metadata access. ERDDAP data access is through a PMEL data server, includes CF-compliant metadata from NetCDF files, and allows sub-setting, mapping and plotting of data.

* 1. Approximate delay between data collection and dissemination:

Six to eight months. Data collection lasts for approximately a year, and data are returned to the lab 2-3 months after instruments are recovered due to research cruise timing and post-cruise shipping of instruments. Therefore, processing will begin around December 2020, and data will be submitted by July 2021.

1. **Data Preservation and Protection***The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.*
   1. Actual or planned long-term data archive location:

NODC (NCEI), and other.

* + 1. If World Data Center or Other, specify:

PMEL ERDDAP data server.

* + 1. If To Be Determined, Unable to Archive or No Archiving Intended, explain: n/a
  1. Data storage facility prior to being sent to an archive facility (if any):

All data will reside on an internal Linux RAID array at PMEL which includes raw data files, files from intermediate stages of processing, final data, and related documents. These files are internally available to EcoFOCI scientists, and are write protected. As data sets are completed, combined tar files are moved to an internal, shared lab server that is backed up offsite weekly. Additionally, intermediate (non-final) data files are copied to a large external hard drive on a monthly basis.

* 1. Approximate delay between data collection and submission to an archive facility:

Data will be available approximately 6 months after data arrive from the field for processing. Data collection lasts for approximately a year, and data are returned to the lab 2-3 months after instruments are recovered due to research cruise timing and shipping. Therefore, processing will begin around December 2020, and data will be submitted by July 2021.

* 1. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive? Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection:

All data will reside on an internal Linux RAID array at PMEL which includes raw data files, files from intermediate stages of processing, final data, and related documents. These files are available to EcoFOCI scientists via the PMEL intranet. Files and directories permissions are set for limited access and are write protected to protect from accidental changes. The computer division (CNSD) has strong NOAA-mandated security practices in place to protect against malicious external access to internal systems. As data sets are completed, combined tar files of final data are moved to an internal, shared lab server that has a schedule of weekly back-up to a commercial entity, and that follows a 1-, 3- and 6-month backup rotation. Additionally, intermediate (non-final) data files are copied to a large external hard drive on a monthly basis. Disaster recovery can be successfully achieved by accessing internal backup resources and by calling back media from off-site backup.

1. [↑](#footnote-ref-1)