**Data Management Plan**

**EcoFOCI Observing System (NOAA/PMEL & Univ.of Washington JISAO)**

**CTD Profile Data**

**June 13, 2016**

**1. General Description of Data to be Managed**

 **1.1 Dataset Name:** EcoFOCI Observing System:Water-column profile observations in Alaskan waters.

 **1.2 Keywords (NASA:GCMD v.8.1:** [**http://gcmd.nasa.gov/learn/keyword\_list.html**](http://gcmd.nasa.gov/learn/keyword_list.html)**):**

Science: Salinity, Ocean Salinity, Pressure, Water Pressure, Density, Water Depth, Temperature, Potential Temperature, Thermocline, Water Temperature, Fluorescence, Chlorophyll, Ocean Mixed Layer, Nitrate, Nitrite, Nutrients, Silicate, Phosphate, Organic Carbon, Oxygen, PH, scattering, turbidity, Fresh Water Flux, Fronts, Ocean Currents, Sea Ice, Thermohaline Circulation, Advection, Wind-Driven Circulation, Heat Flux, Shortwave Radiation, Ice Edges, Ecosystems, Pelagic Habitat, Marine Habitat, Halocline, Pycnocline, Salt Transport

Instruments: CTD, Fluorometer, PAR Sensors, Conductivity Sensors, Thermistors, Oxygen Meters, Pressure Sensors,

Locations: Eastern Pacific Ocean, Alaska, Bering Sea, Gulf of Alaska, Chukchi Sea,

Projects: FOCI

Data Centers (Providers): DOC/NOAA/OAR/PMEL, DOC/NOAA/OAR/PMEL/EPIC, DOC/NOAA/NESDIS/NCEI, UCAR/NCAR/EOL, UAK-F/SFOS/AOOS, GLOBEC/US\_GLOBEC

Platforms: Moorings, Buoys, ROV, Ships, R/V WECOMA, R/V RONALD H. BROWN, R/V OSHORO-MARU, R/V MILLER FREEMAN, R/V ALPHA HELIX, F/V GREAT PACIFIC

 **1.3 Data Summary (abstract):** Oceanographic data have been collected since the 1984 start of EcoFOCI, a multi-disciplinary ecosystems research program between NOAA Pacific Marine Environmental Laboratory (PMEL) and NOAA Alaska Fisheries Science Center (AFSC). EcoFOCI advances understanding of ecosystem dynamics by looking at the influence of the physical and biological environment on marine populations, and the subsequent impact on fisheries. The research contributes to fisheries management and longer-term observation of climate patterns.

Profile data from CTD casts are regularly collected by EcoFOCI scientists. CTD casts generate surface-to-bottom water-column data traces and discrete samples at various depths via deployment of a CTD rosette with attached instrumentation and a series of Niskin water-collection bottles. CTD casts are often taken along a defined CTD line or series of cast sites, to show cross-section water characteristics. They are also taken to provide data points for calibration of time-series and other data types.

 **1.4 Temporal coverage:** 1984 to present (2015).

 **1.5 Geographic coverage:** Latitude/longitude range: 51°N to 73°N, and 179°E to134°W.  All data originate in Alaskan Waters including the Gulf of Alaska, Southeast Alaska, Kodiak Island area, Aleutian Islands, Bering Sea, Bering Strait, Chukchi Sea, and Beaufort Sea.

 **1.6 Data types:** water temperature, conductivity, water-column pressure, salinity, chlorophyll fluorescence, chlorophyll a concentration, dissolved oxygen, oxygen concentration, PAR (shortwave radiation), transmittance, attenuation and nutrients.

 **1.7 Method of Data Capture/Collection:** CTD profile data are collected via deployment of a CTD rosette with attached instruments and Niskin bottles. Data traces are captured using manufacturer’s software and written to a ship or field computer, then transferred to in-office computers at the end of a cruise. Separate instruments on the rosette may also store data that are dumped to a field computer. Discrete water samples are taken from Niskins following CTD recovery, and processed either at sea or in the lab. Values are recorded onto field or in-office computers and combined, as appropriate, with other profile traces, or used to calibrate profile data.

 **1.8 Data Management Plan Location (non NOAA DMP):** PMEL/EcoFOCI web area

http://www.ecofoci.noaa.gov/dataInfo/efoci\_dataInfo.shtml

 **1.9 Volume of stored data:** 40 GB

 **1.10 Occurrence of PII (Personally identifiable Info) within data:** None

**2. Points of Contact**

Project and Data point-of-contact:  Dr. Phyllis J. Stabeno
Overall Point-of-contact for data:  Peggy Sullivan
Data Quality:  Peggy Sullivan and Shaun Bell
Data questions (collection, documentation, storage, metadata):  Peggy Sullivan

**3. Data Stewardship**

**3.1** **QC Procedures**: Data are processed and carefully quality checked via plotting and statistics. They are scrutinized by the data processor who often has participated in the data collection and has knowledge of content, conditions and any anomalies. They are further check by a Principal Investigator, with filtering, de-spiking, and interpolation/extrapolation performed as required.

**3.2** **Overall Lifecycle:** Data are collected in the field and are transferred to field computers then to desktop systems and servers at PMEL. They are processed on the ship and in-office according to SeaBird and other instrument manufacturer specifications. Final processed, calibrated and edited files are stored as NetCDF data files, in either PMEL-EPIC-standard, or more recently, as COARDS standard using CF-conventions.  Both raw and final versions of data are stored on an internal linux server RAID array. As needed, an ASCII, CSV version of data files is created and retained. All data files and supporting information and files are available upon request from this internal archive. Data through 2009 were sent to and are currently available on the PMEL-EPIC web server. A subset of data files is available on a PMEL ERDDAP server. Parts of the long-term data are available at NCEI and parts are available through UCAR/EOL, NSF Arctic Data Portal, BOEM, and NPRB.

**4. Data Documentation**

NetCDF files have selected metadata (attributes) bundled within the files. In addition, we are developing a protocol for creating an external metadata document (MS Word) for each set of data files within a cruise. The format of the metadata document is in line with ISO-19115 standards, and is modeled after the UCAR/EOL format. These metadata documents exist for more recent profile data sets.

Metadata files created for NPRB projects are in XML and HTML format, created using Metavist software tool and NBII (National Biological Information Infrastructure) standard (FGDC-STD-001-1998).

**5. Data Sharing**

Data are available to the public via the NOAA/PMEL/EPIC web server and the NOAA/PMEL ERDDAP server (http://ferret.pmel.noaa.gov/pmel/erddap/info/index.html). These data will also be accessible via Live Access Server (LAS) at PMEL.  Profile data are sent to NCEI within one year following the end of the field season when it was collected.  Portions of the data are available through data sites related to project funding (GLOBEC, NPRB/NSF Bering Sea Project, AOOS, EOL/UCAR). All data reside on EcoFOCI archive, and are available upon request.

Users of data are requested to credit NOAA/PMEL/EcoFOCI project and Principal Investigators in their publications and presentations, to give credit to funding agencies, and to provide a copy of published materials to EcoFOCI and/or the principal investigator. If data are extensively used for journal publications, we request that EcoFOCI be involved with possible joint authorship.

**6. Initial Data Storage and Protection**

Field data are returned to the office on field computers, optical media or portable hard drives. Data that originate on ship-board computers are downloaded to similar media. Once downloaded, physical media are placed in a file drawer along with cruise-related paper logs and reports. Raw data files are dumped to a secure, password protected data repository on a Linux server RAID array. Permissions are set so that files cannot be overwritten. Work and access within this archive is given to a limited number of data-related personnel. A horizontal directory structure is created, housing logical phases of data processing, support data and documentation. An area is created to hold final, processed data, includes NetCDF and ascii format, which are available internally to all project personnel for research use. The RAID array has redundancy. Additionally, TAR files are created weekly for each data set and copied to a separate server and to a desktop system.

The data archive and most processing areas reside on internal Linux computers that are password- protected and not accessible outside of the PMEL EcoFOCI. Some processing occurs on Windows-based PCs or Macs which are not accessible to anyone outside of PMEL and EcoFOCI. Data contain no personally-identifiable information and present no security or theft implications.

**7. Long-Term Archiving and Preservation**

**7.1 NOAA Data Center**: Data will be sent to NCEI for long-term archive and preservation.

**7.2 Long-term strategy if no NOAA Data Center**: See 7.1 and 6.

**7.3 Long-term costs of archiving:** Unknown

**7.4 Data transformation for preservation/sharing and what related information:**

The final data format is appropriate for preservation and sharing. Data are bundled with a set of metadata within the NetCDF format. An additional, external metadata document will accompany each per-cruise data set. The metadata document is aligned with the ISO-19115 standard and modeled after the UCAR/EOL format. It includes an abstract, and provides information for variables, instruments, calibration, the data-collection setting, project information and pertinent publications if any exist.

**Created and submitted by**

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From NOAA DMP directive V.1

EcoFOCI DMP for profile data: version 1