**Data Management Plan**

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

**Mooring and Underway time-series, CTD profiles, and Drifter Data**

**April 7, 2015**

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

 **Dataset Name:** EcoFOCI Observing System:oceanographic observations in Alaskan waters.

 **Keywords (NASA:GCMD v.8.1 keywords:** [**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, ADCP, Fluorometer, PAR Sensors, Turbidity Meter, 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/NODC, 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

 **Data Summary:** Oceanographic data have been collected since the 1984 start of EcoFOCI, a joint research program between NOAA Pacific Marine Environmental Laboratory (PMEL) and NOAA Alaska Fisheries Science Center (AFSC). 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. The PMEL-EcoFOCI research effort looks at water-column properties, annual sea ice and biota in the context of climate change. EcoFOCI comprises physical and biological oceanographers, atmospheric scientists, fisheries biologists and other scientists from federal and academic institutions, and promotes cooperation among scientific disciplines.

Three major categories of data are regularly collected by EcoFOCI scientists: time-series data via moored arrays and underway shipboard measurements, profile data from CTD casts, and lagrangian drifter data. Time-series data come from moored arrays of instruments placed at the sea surface and at various depths in the water column and left for two to 12 months. Additional time-series data are acquired from underway shipboard measurements of near-surface atmospheric and oceanic variables. CTD casts produce 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 bottles. Drifter data come from free-floating, drogued drifters deployed from ships, and consist of a series of latitude, longitude points that comprise the path of the drifter.

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

 **Geographic coverage:** Latitude/longitude range: 51°N to 73°N, and 178°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 and Chukchi Sea.

 **Data types:** air temperature, barometric pressure, PAR (shortwave radiation), wind speed and direction, relative humidity, water temperature, conductivity, pressure, salinity, chlorophyll fluorescence, current speed and direction, oxygen, turbidity, nutrients and sea ice draft.

 **Method of Data Capture/Collection:** Time-series data are collected by a variety of instruments that are mounted at various depths in the water column along the mooring array. Moorings remain in place 2-12 months. Data are dumped to sea-going computers upon recovery, and transferred to in-office processing computers. Underway shipboard observation time series are collected automatically by various instruments using centralized shipboard computers along with occasional discrete water samples. These are transferred to in-office computers, calibrated against laboratory-analyzed discrete samples, and quality controlled. CTD profile data are collected using manufacturers’ software and written to a ship or field computer, then transferred to in-office computers post-cruise. Separate instruments on the rosette may also store data that are dumped to a field computer. Discrete water samples are collected at sea and processed either at sea or in the lab. Values are recorded onto field or in-office computers and combined, as appropriate, with other CTD data. Drifters are released from ships, often during research cruises. Locations are tracked via satellite. Drifters are drogued to travel at either 25 or 40 meters depth, which minimizes wind influence. Drifter data are relayed via satellite communication, and are retrieved via web access or by daily email messages delivered by ARGOS. Drifters travel until batteries fail or they are otherwise stopped by inadvertent grounding or fishing.

 **Data storage:** Time series and CTD data are stored in NetCDF files (PMEL:EPIC or COARDS conventions) with metadata attributes, per instrument or cast.  Occasional funding rules have required conversion of subsets of NetCDF files to tab-delimited text files. Drifter data are in text/ascii format with metadata header. All data files are stored on a local, internal RAID data archive that is backed up. CTD data through 2009 and time series data through 2002 and all drifter data are stored on PMEL:EPIC servers for public access. Additionally, subsets of the data are also at NODC, NPRB, GLOBEC, and EOL/UCAR.

 **Volume of stored data:** 40 GB

 **Occurrence of PIN (Pers.ident 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**

Data are processed according to known scientific protocols and instrument manufacturer specifications.  Data from CTD casts and from mooring instruments are converted to NetCDF using PMEL-EPIC or COARDS conventions.  Calibrations are performed and applied as required. Data are carefully quality checked.  Calculated variables are added to data sets.

**4. Data Documentation**

NetCDF files have selected metadata (attributes) within the files.

Metadata files have been created for NPRB projects in the form of XML and HTML documents created using Metavist software tool and NBII (National Biological Information Infrastructure) standard (FGDC-STD-001-1998).

Drifter data are in ascii format and have a metadata header in each data file.

**5. Data Sharing**

Data have been available to the public via the NOAA/PMEL/EPIC web server.  Time series and profile data are sent to NODC as time allows.  Portions of the data are available through data sites related to various project funding (GLOBEC, NPRB/NSF Bering Sea Project, AOOS, EOL/UCAR). Drifter data are available on the NOAA/PMEL EcoFOCI web site. 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.

**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. Physical media are placed in a file drawer along with cruise-related paper logs and reports. Raw data files are dumped to a long-term data archive located on a Linux server and marked as read-only. Data are also placed in the work area of an internal server for various stages of processing and quality control. 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 PC’s or Macs’ which are authenticated and/or password-protected and also not accessible to anyone outside of PMEL and EcoFOCI.

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

Raw, intermediate and final data are reside in a data archive on a Linux RAID belonging to the PMEL/EcoFOCI project. The system is password-protected, has limited access, and is backed up to another internal server and periodically sent to an off-site data-storage facility that is part of PMEL computer division services. Project-driven subsets of the data are stored for access in the GLOBEC (WHOI) data repository, and with NPRB, AOOS and EOL/UCAR. Portions of the data are archived in the NOAA-NODC data archive. CTD data through 2009 and time series data through 2002 are stored and accessible on the PMEL:EPIC metadatabase and web service.

**Created and submitted by**

Peggy Sullivan, Research Scientist

Univ.of Washington, JISAO

NOAA/PMEL, Seattle WA

Peggy.Sullivan@noaa.gov