Innovative Technology for the Exploration of the Arctic Ocean: Ecosystem and Carbon Wave Glider Surveys
Data Management Plan

OER Data Management Objectives

1. **General Description of Data to be Managed**
   - **1.1. Name and Purpose of the Data Collection Project**

     Name: Innovative Technology for the Exploration of the Arctic Ocean: Ecosystem and Carbon Wave Glider Surveys

     Purpose: To deploy a radiation buoy (with heat content mooring) and conduct Ecosystem Wave Glider (EWG) and Carbon Wave Glider (CWG) surveys in support of NOAA Goals Climate Adaptation and Mitigation and Healthy Oceans, and to fulfill the Vision and Mission of the NOAA's Office of Ocean Exploration and Research.

   - 1.2. **Summary description of the data to be collected**

     Data collected will be from three research platforms. This includes the Carbon and Ecosystem Wave Gliders and the Radiation Buoy (with Heat Content Mooring).

     CWG & EWG:

     The CWG collects hourly data from sensors measuring CO2 (air and surface seawater), temperature, salinity, pH, and O2. The CO2 data is corrected for humidity, and daily files are
     transmitted to PMEL. On the EWG, sensors will be placed on the float to collect meteorological data as well as ocean temperature and salinity. In addition there will be a thermistor chain spanning the upper 6 m of the water column. Sensors will record 10 min data. All data will be internally recorded and downloaded once the glider is recovered.

     Radiation Buoy: Radiometer measurements will include total shortwave radiation (diffuse and direct), fraction of diffuse light, and longwave radiation. Radiation and meteorological data will be logged every second or every 10 minutes. From the mooring, salinity will be measured at two depths, and temperatures will be measured through the water column. These data will be logged every minute or every 10 minutes depending on the instrument. A fluorometer will be placed in the bridle of the buoy, and sample every 10 minutes. All meteorological and oceanographic data will be stored internally. In addition, a subset of this data will be transmitted to PMEL daily.

   - **1.3. Keywords or phrases that could be used (NASA:GCMD v.8.1 keywords)**

     Science: Carbon, Winds, Surface Winds, Salinity, Ocean Salinity, Temperature, Potential Temperature, Thermocline, Water Temperature, Fluorescence, Chlorophyll, Ocean Mixed Layer, Organic Carbon, Oxygen, PH, Ocean Currents,Shortwave Radiation, Ice Edges, Ecosystems, Halocline, Pycnocline, Salt Transport

     Instruments: CTD, PAR Sensors, Conductivity Sensors, Thermistors, Oxygen Meters, Pressure Sensors, nitrate sensors, fluorometers

     Locations: Chukchi Sea, Alaska, Arctic

     Projects: FOCI

DataCenters (Providers): DOC/NOAA/OAR/PMEL, DOC/NOAA/OAR/PMEL/EPIC, DOC/NOAA/NESDIS/NODC, UCAR/NCAR/EOL, UAK-F/SFOS/AOOS
Platforms: Buoys, Ships
(Other keywords)
Carbon Wave Glider, Ecosystem Wave Glider, Radiation Buoy, NOAA Buoy, NOAA Wave Glider, Unmanned Maritime Vehicle, USV, satellite, NOAA, ocean exploration, ocean research, OER, sea, USCCG Healy, ocean acidification, ocean chemistry

1.4. If this mission is part of a series of missions, what is the series?
Part II of the Innovative Technology for Arctic Exploration (ITAE) 2015 missions.

1.5. Planned or actual temporal coverage of the data
Planned Dates: July 09 – September 15, 2015

1.6. Planned or actual geographic coverage of the data
The Chukchi Sea, approximately 30-60nm North of Icy Cape, AK near 164°N, 71°W, dependent on ice conditions.

1.7. Data types created or captured
radiometer buoy: meteorological variables include air temperature and humidity, shortwave radiation (diffuse and direct), fraction of diffuse light, and longwave radiation. Radiation and meteorological data will be logged every second or every 10 minutes depending on data type. Oceanographic variables include near-surface and bottom salinity, water-column temperatures, and chlorophyll fluorescence. These data will be logged every minute or every 10 minutes depending on the instrument provided. A subset will be transmitted to PMEL
Carbon Wave Glider: air and sea-surface CO2 (corrected for humidity), temperature, salinity, pH and O2. Data are hourly and will be transmitted daily to PMEL.
Ecosystem Wave Glider: Meteorological variables, surface ocean temperature and salinity, temperature in the upper 6 meters of water. Data are 10-minute frequency and will be downloaded at end of data collection.

1.8. What platforms will be employed during this mission?
All research platforms will be deployed from the USCGC Healy. These research platforms include:

- NOAA Carbon Wave Glider
- NOAA Ecosystem Wave Glider
- NOAA Radiation Buoy

2. Point of Contact for this Data Producing Project
Name: Phyllis Stabeno
Title: Principal Investigator, Physical Oceanographer
Affiliation/Department: NOAA/PMEL
E-mail:phyllis.stabeno@noaa.gov
Phone: (206) 526-6453

3. Point of Contact for Managing the Data

3.1. Name & Position Title

Carbon Wave Glider
Overall Point of Contact: Wiley Evans
Title: Research Associate
Affiliation/Department: NOAA/PMEL
E-mail: wiley.evans@noaa.gov
Phone: (206) 526-6438

Ecosystem Wave Glider & Radiation Buoy
Overall Point of Contact: Peggy Sullivan
Title: Research Scientist
Affiliation/Department: UW-JISAO/PMEL
E-mail: peggy.sullivan@noaa.gov
Phone: (206) 526-6185

4. Resources

4.1. Have resources for management of these data been provided? Yes.

4.2. Approximate percentage of the budget devoted to data management.

Unknown

5. Data Lineage and Quality

5.1. What is the processing workflow from collection to public release?

Instruments on these platforms will be processed according to accepted standard practices. Data will be downloaded from instruments following the cruise. These data will be converted from raw, calibrated as needed, plotted, and QC'd. Raw and final data are placed within an internal, secure archive. Final data will be distributed to NCEI (NODC) and elsewhere as required.

5.2. What quality control procedures will be employed?

Quality control procedures for the data from the research platforms is handled at NOAA/PMEL. Raw files are cleaned/edited into new data files and converted to a variety of products.

6. Data Documentation

6.1. Does the metadata comply with the Data Documentation Directive

6.2. If metadata are non-existent or non-compliant, please specify

Metadata will be created as data are processed and finalized.

6.3. Where will the metadata be hosted?

Organization: NOAA/PMEL, EcoFOCI
URL: http://www.ecofoci.noaa.gov/dataInfo/efoci_dataInfo.shtml
Mets Std:

6.4. Process for producing and maintaining metadata

7. Data Access

7.1. Do the data comply with the Data Access Directive?

Data will be processed, documented and distributed as per the EDMC Data Access Procedural Directive (March 1, 2015). Machine-to-machine readable data will be compliant in alignment with capabilities of NCEI.

7.2. **If the data are not to be made available to the public at all, or with limitations, provide a valid reason.** N/A

7.3. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure. N/A

7.4. Name and URL of organization or facility providing data access.

Org: Ecosystems & Fisheries-Oceanography Coordinated Investigations (NOAA, PMEL)
URL: http://www.ecofoci.noaa.gov/

Org: PMEL Carbon Program (NOAA, PMEL)
URL: http://www.pmel.noaa.gov/co2/

7.5. Approximate delay between data collection and dissemination. By what Authority?

Hold Time: ~6 months, NTE 1 year. Planned delivery is for early 2016, and not to exceed Summer 2016.

Authority: not applicable

7.6. Prepare a Data Access Statement

No data access constraints, unless data are protected under the National Historic Preservation Act of 1966

8. Data Preservation and Protection

8.1. Actual or planned long-term data archive location

Data from this mission will be preserved and stewarded at the NOAA Pacific Marine Environmental Lab through the Carbon and EcoFOCI Programs.

If no archive planned, why? N/A

8.2. If any delay between data collection and submission to an archive facility, please explain.

Standard delay post platform recovery of approximately 60-90 days.

8.3. How will data be protected from accidental or malicious modification or deletion.

To ensure Stewardship and Preservation, all data and metadata will be stored on the core PMEL network, and also submitted to NODC. The PMEL network is a government-owned system managed by the Computing and Network Services Division (CNSD) at PMEL. The network does not have publicly accessible servers, and is kept up-to-date with operating system patches and anti-virus software, and adheres to all DoC, NOAA, OAR, and PMEL IT policies.

8.4. Prepare a Data Use Statement

Data use shall be credited to NOAA Pacific Marine Environmental Lab and the Innovative Technology for Arctic Exploration Program.