

1. DATA AND INFORMATION TYPES

A. Provide a contextual description of the data stream.

Researchers at the University of Alaska Fairbanks School of Fisheries and Ocean Sciences (UAF-SFOS) developed and deployed a moored sensor package attached to a detachable surface buoy to provide real-time data on vertical temperature and salinity water column structure prior to and during freeze-up. The mooring was deployed on September 6, 2015 approximately 76 miles NNW of Wainwright in the Chukchi Sea.

Prior to ice inundation over the mooring, which would put the mooring at risk of loss, a signal to release the surface buoy was sent at 10 pm on November 6, 2015. The surface float equipped with a sea-surface temperature sensor were then drifting free, and sensors at depth were disconnected. The remaining instruments on the mooring, which were reporting data real-time, continue to report their last measured value, and these sensors continue to record data internally below the ice cover until the mooring is recovered the following year.

Website URL: Historical Sensors: Source: UAF School of Fisheries and Ocean Sciences
<http://portal.aos.org/#map?page=1&tagId=&q=Ice%2520detection%2520buoy&tags=&lg=467dd946-87aa-11e3-9eb2-00219bfe5678>

Project Page: <http://www.aos.org/ice-detection-buoy/>

Data Plot: <http://www.aos.org/ice-detection-buoy/#data-access>

B. How many station locations are there for this data stream?

1 (2015-16)

C. What are the specific parameters of the data.

The parameters include a date/time stamp, a GPS position (Latitude and Longitude), surface water temperature, and subsurface water temperature, conductivity (both used to compute salinity) at 8, 20, 30 and 40 m depths.

D. Provide information about the sampling platform or instrumentation.

The platform is a mooring with a remotely detachable surface buoy containing Iridium satellite communications and a burn wire. The mooring consists of an inductive cable, four SBE 37 IM microCAT CTDs deployed on the line at 8, 20, 30, 40 m depths, a subsurface floatation, and a bottom weight with acoustic release assembly. A webcam was deployed on the buoy, but images were not transmitted to AOOS.

2. DATA PATHWAY

A. Is a data sharing agreement required?

Data are available publically.

B. In which format(s) are data received by AOOS?

This station data are in the format of CSV.

C. How can the information be accessed?

AOOS accesses the data from <http://api.pacificgyre.com/api2/getData.aspx>, which requires a username and password.

The data are made available through the AOOS data portal, where it can be downloaded or explored through interactive visualizations. Specifically, data are available from two unique access points:

- File Downloads (CSV)
- ERDDAP

D. What file formats will be used for sharing data, if different from original?

Data are shared as CSV and through ERDDAP. Data are also available for exploration in the AOOS portals via interactive, graphical visualizations.

E. Describe how the data are ingested(e.g. the flow of data from source to AOOS data portals) and any transformations or modifications made to share data in the AOOS data portal.

Data are downloaded from the source to the AOOS storage. Custom Java, Scala, and Python scripts are used to convert data formats suitable for internal and external interoperability services. Data are made available in the AOOS portals through the access points and via graphic displays generated through internal JSON-format data requests from these services.

Graphic displays include a mapping service, customized interactive visualizations, and time-series plots of the unit values wherein each parameter is graphed independently. Back-end scripts handle the conversion of visualized data from CF standards to other, non-CF units that may be requested by the user. Data files may be downloaded by the user from the AOOS data portal. A user request for a CSV file request pulls the data from the server cache. A user request for ERDDAP pulls data from the ERDDAP service using the same cache. For this data, no CF-standard names or units exist, therefore custom names of abundance_of_{scientific_name} were used. Refer to Appendix I for CF standards.

Summary statistics generated within the interactive graphical displays may be requested by the user. Summary statistics may include minimum, maximum and mean values. Seasonal statistics, available on time series longer than 3 years, include mean, and 10th and 90th percentiles. Note: the number of points visually available to interactive users from the source data are limited when necessary using temporal binning, such as daily, weekly, monthly, seasonally and yearly.

F. What metadata or contextual information is provided with the data?

Data are shared in the AOOS portals with descriptive narratives describing the data and linking back to the AOOS-UAF Project Page: <http://www.aos.org/ice-detection-buoy/>

G. Are there ethical restrictions to data sharing?

No

a. If so, how will these be resolved?

N/A

H. Who holds intellectual property rights (IPR) to the data?

University of Alaska Fairbanks

I. Describe any effect of IPR on data access.

None

3. DATA SOURCE AND QUALITY CONTROL

A. Indicate the data source type (i.e. Federal, Non-Federal, University, State Agency, Local Municipality, Military Establishment (branch), private industry, NGO, non-Profit, Citizen Science, Private individual)

University

a. If Federal data source, were changes applied to the data?

N/A

b. If Yes, describe any changes to the data that require documentation?

N/A

B. Indicate the data reporting type (e.g. real-time, historical).

Although this mooring reported Real-time through November 2015, this Data Stream Plan is currently only relevant for the Historical Record. If a new Ice Detection Buoy is deployed in the future, this plan will be modified or a new plan developed to document QC for Real-Time temperature and salinity data reported.

C. If real-time, list the QARTOD procedures that are currently applied.

Three of the five required tests were applied by AOOS to the original real-time temperature and salinity data: Syntax, Gross Range, and Time-Gap Tests (see 3G).

D. If real-time, list the QARTOD procedures that are planned for implementation.

There are five required tests for in-situ temperature and salinity identified by QARTOD, of which three are currently implemented by the AOOS Data System -- the syntax, gross range and time gap tests (see 3G). A version of the Timing Gap Test, which with QARTOD, is intended to ensure ingestion of minimum hourly time series, is performed by AOOS. The AOOS version of the timing gap test changes the station color to a grey shade ("shade-flags") on the real-time sensors map display after 4 hours of missed data reports, and removes the station from the map (though not the archive) after a week of missed

reports. Once the station is removed from the Real-time Sensor map, all prior data are made available through the Historical sensor catalogue.

QARTOD requires two additional tests to real-time temperature and salinity, including a location test and climatology test. The Location Test will be implemented on future real-time data using the GPS (latitude and longitude) location provided in the station data stream.

The Climatology Test is more rigorous, and currently, the AOOS Data System does not have the historical data in place to perform meaningful climatology tests on non-federal sourced weather assets. It is a test that may be considered after there are 7+ years of data in the AOOS archive.

E. What is the status of the reported data? (e.g. raw, some QC, incomplete, delayed mode processed but not QC'd)

Some QC by originator and AOOS.

F. Describe the data control procedures that were applied by the originator.

Data were reported real-time directly from the instrument platform via inductive modem. Data were recorded by the CTD in hexadecimal format, and converted to temperature, conductivity engineering units, both of which are used to compute salinity. Onboard conversions and salinity computations use the most recent calibration coefficients for each sensor, which are programmed into instrument's computer to allow real-time reporting of accurate engineering outputs directly from the instrument. Then data are received in CSV format from the project website (see 2.) No additional processing is performed on the real-time data stream at this point, other than the standard QC checks performed by AOOS. See 3G.

a. Provide a link to any documented procedures.

AOOS Data Assembly Center and Data Management Subsystem Plan

G. Describe the data control procedures that were applied by AOOS.

AOOS applied 3 standard QC tests to the temperature and salinity data from this mooring:

1. Syntax Test: checks for parity errors by testing if data can be extracted from the downloaded or scraped data. If no data can be extracted, the test fails, and no data are accessed, served or stored for that record.
2. Gross Range Test: This test checks data values against minimum and maximum values defined for each parameter. Water temperature range: 20-135 deg F; practical salinity 0-50; Values outside of the prescribed parameter ranges are rejected and replaced with missing value flags in data storage connected to access points and the graphic displays.
3. Time-Gap Check: AOOS implements a "time-gap check" that informs observational assets (e.g., weather stations) displayed on its "Real-Time Sensor Map". If no data are received from an existing observational station for four hours, the icon on the map changes from a scaled color to a small grey-shade dot. If no data are received from an existing

observational station for one week, the asset is automatically removed from the map, although assets are still made available on a historical sensor map.

a. Provide a link to any documented procedures.

AOOS Data Assembly Center and Data Management Subsystem Plan, Section 4.4.4.

H. List the procedures taken for data that could not be QC'd as directed.

N/A

4. STEWARDSHIP AND PRESERVATION POLICIES

A. Who is responsible for long-term data archiving?

Data are aggregated for visualization and exploration with other layers in the AOOS data portal. AOOS stores the real-time and historical data internally using the AOOS data servers.

AOOS will facilitate data archival with NCEI.

Future installations will likely feed data directly through the National Weather Service GTS, and therefore, will likely be archived by NOAA. AOOS will work with the NWS to determine other appropriate archival locations.

B. Which long-term data storage facility will be used for preservation?

NCEI, and AOOS will work with the NWS to determine other appropriate archival locations.

C. Describe any transformation necessary for data preservation.

To be determined.

D. List the metadata or other documentation that will be archived with the data.

To be determined.