

1. DATA AND INFORMATION TYPES

A. Provide a contextual description of the data stream.

The Historical Sea Ice Atlas was a joint project funded by the Alaska Ocean Observing System (AOOS), the Alaska Center for Climate Assessment and Policy (ACCAP), and the Scenarios Network for Alaska and Arctic Planning (SNAP). It aggregates a wide variety of sea ice observations and measurements, from whaling ship logbooks from 1850 to near real-time passive microwave satellite data in the present, to generate a sea ice time series over 150 years long for the seas surrounding the state of Alaska, USA. This resource can be used to explore the trends in sea ice extent and concentration at multiple scales through time.

Website URL:

<http://portal.aos.org/#module-metadata/8e007272-4b5b-11e4-b73e-00219bfe5678/24bbffd-a-d2d5-40f9-b22d-f0c968f0eacc>

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

N/A

C. What are the specific parameters of the data.

The parameters of this data stream include: sea ice concentration, time, latitude, longitude

D. Provide information about the sampling platform or instrumentation.

N/A

2. DATA PATHWAY

A. Is a data sharing agreement required?

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

Data were received as NetCDF files from the originator.

C. How can the information be accessed?

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

- Web Mapping Service (WMS)
- File Downloads (CSV)

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

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

E. Describe how the data is 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 as NetCDF files from source to servers within the AOOS data management system. Data are made available in the AOOS portals through the access points and via graphic display. Graphical map displays are generated through internal data requests from the sensor service in JSON format. Program code handles the connection of data from the server to graphic display in the portal. A time series extraction tool uses a JSON request to pull values out of the netCDF files for multiple times at a specific location. Extracted data are provided as CSV. Gridded data files may be downloaded by the user from the AOOS data portal. A user request for a WMS file will provide a georeferenced image tile for use with common web mapping services. The source data parameters and units are converted to comply with CF standard units, if those same units are not already utilized in the source data. Refer to Appendix I for CF standards.

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

SNAP provides overview information and XML metadata record in ISO19139 format:

<http://ckan.snap.uaf.edu/dataset/historical-sea-ice-atlas-observed-estimates-of-sea-ice-concentration-in-alaska-waters/resource/636bfb1-1ce5-4dd9-a835-1959bd08029f>

Data are shared in the AOOS portals with descriptive narratives describing the data and linking back to the originator's site.

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?

Tom Kurkowski, Scenarios Network for Alaska and Arctic Planning (SNAP)

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).

Historical

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

Not required

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

N/A

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

QC by originator

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

QC methods are fully described in the SNAP metadata records. In brief: "Gaps in temporal or spatial resolutions were filled in with spatial and temporal analog month approaches. Note the monthly values from January 1954 - December 2013 are the week 2 values from the weekly time series. They are provided in the monthly time series for ease of use in monthly midpoint analyses. The January 2014 - December 2015 monthly time series data have been regridded and processed to match the January 1954 - December 2013 series from the NSIDC 0051 Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS Passive Microwave Data, Version 1, which were accessed from the NSIDC website (http://nsidc.org/data/docs/daac/nsidc0051_gsfc_seaice.gd.html).

The further post-processing and regridding of the NSIDC product was a non-standard process. It involved initially warping the polar stereographic data to a pacific centered WGS84 crs, converting the sea ice concentration values to points and performing a spline interpolation across the entire domain. This interpolated raster was then filled further around the land-sea divide where there was a mismatch between the NSIDC mask and the Sea Ice Atlas mask. The filling was performed by taking the average of the surrounding sea ice concentration pixels and filling the missing locations. These locations have been flagged in the source band (band 2) to keep track of what was modified from the NSIDC 0051 for this purpose. These data are a compilation of data from many sources integrated into a single gridded product. The sources of data for each grid cell have changed over the years from infrequent land/sea observations, to observationally derived charts, to satellite data for the most recent decades. Temporal and spatial gaps within observed data are filled with analog month approaches. Please note that large portions of the pre-1953, and almost all of the pre-1900 data, are either analog or interpolated data and the user is cautioned to use these data with care. The temporal and spatial inhomogeneities in the data sources that went into the construction of this dataset require that any historical analysis of the data are done with caution and an understanding of the limitations of the data. Methods of data compilation varied by data source, but included visual interpretation of hard copy map notation and legends, scanning, digitization, geo-rectification into digital geospatial products, reprojection, and also resampling into a common resolution. To standardize the data onto a common spatial grid, the resampling methodology utilized the centroid of the target 1/4 x 1/4 grid cell as the location to extract the value from the underlying data source."

a. Provide a link to any documented procedures.

<http://ckan.snap.uaf.edu/dataset/historical-sea-ice-atlas-observed-estimates-of-sea-ice-concentration-in-alaska-waters>

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

No applied AOOS QC. This is a synthesis product made from existing data sources.

a. Provide a link to any documented procedures.

N/A

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 were aggregated for visualization and exploration with other layers in the AOOS data portal. AOOS stores these data on the AOOS data servers.

AOOS will facilitate data archival with NCEI. NCEI may have interest in this Atlas data stream, and will reach out to a few other NCEI people to see if this is something they want to archive.

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

NCEI if they they will accept data.

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.

N/A