



# The Arctic Observing Viewer (AOV): A Web-mapping Application for U.S. Arctic Observing Activities

## Abstract

Although a great deal of progress has been made with various arctic observing efforts, it can be difficult to assess such progress when so many agencies, organizations, research groups and others are making such rapid progress over such a large expanse of the Arctic. To help meet the strategic needs of the U.S. SEARCH-AON program and facilitate the development of SAON and other related initiatives, the Arctic Observing Viewer (AOV; <http://ArcticObservingViewer.org>) has been developed. This web mapping application compiles detailed information pertaining to U.S. Arctic Observing efforts. Contributing partners include the U.S. NSF, USGS, ACADIS, ADIwg, AOOs, a2dc, AON, ARMAP, BAID, IASOA, INTERACT, and others. Over 7700 observation sites are currently in the AOV database and the application allows users to visualize, navigate, select, advance search, draw, print, and more.

For 2015, the web mapping application has been enhanced by the addition of a query builder that allows users to create rich and complex queries. AOV is founded on principles of software and data interoperability and includes an emerging "Project" metadata standard, which uses ISO 19115-1 and compatible web services. Substantial efforts have focused on maintaining and centralizing all database information. In order to keep up with emerging technologies, the AOV data set has been structured and centralized within a relational database and the application front-end has been ported to HTML5 to enable mobile access. Other application enhancements include an embedded Apache Solr search platform which provides users with the capability to perform advance searches and an administration web based data management system that allows administrators to add, update, and delete information in real time.

We encourage all collaborators to use AOV tools and services for their own purposes and to help us extend the impact of our efforts and ensure AOV complements other cyber-resources. Reinforcing dispersed but interoperable resources in this way will help to ensure improved capacities for conducting activities such as assessing the status of arctic observing efforts, optimizing logistic operations, and for quickly accessing external and project-focused web resources for more detailed information and access to scientific data and derived products

## Collaborate

Would you like to showcase your sites? Increase visibility for your organization? Strategically assess your monitoring activities within the context of other observation networks to optimize opportunities? Consider joining a network of agencies and organizations that are sharing information for both individual and collective benefit.

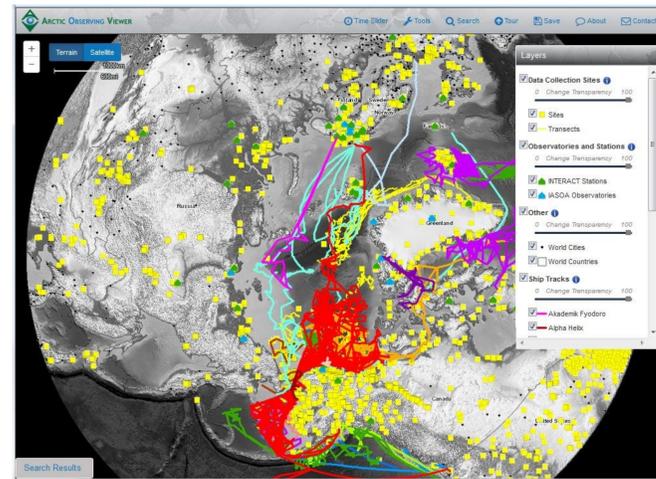


## In Pursuit of Interoperability

An ultimate goal is that information for multiple observing networks is discoverable, authoritative, and up to date. Due credit should be given to data sources. And the information should be made accessible for use by various groups in a variety of ways for their own purposes.

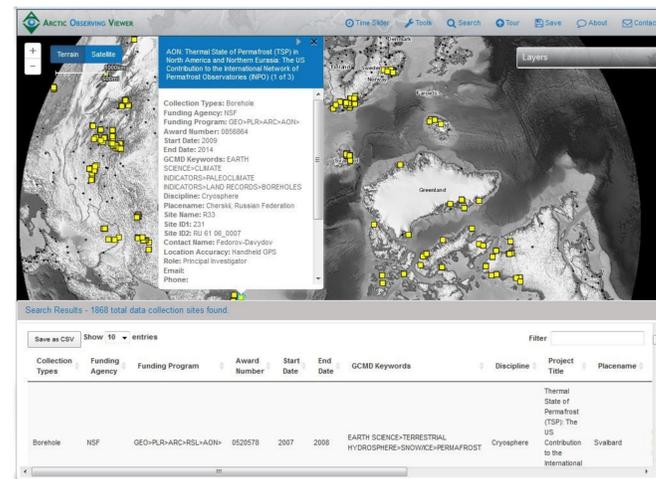
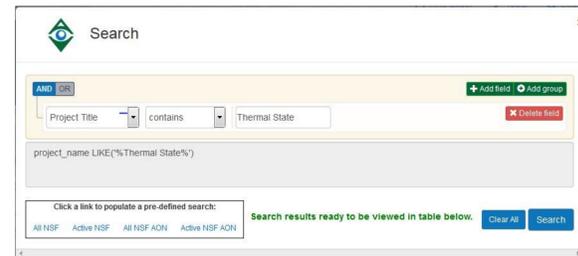
In essence, what is needed is a dynamic network of distributed nodes for information sharing. This in turn relies on establishment of web services -- live data feeds that conform to community-based metadata standards and compatible web service formats. Without interoperable web services, information becomes out of date, or requires repeated, substantial harmonizing and reprocessing. The Arctic data community is making progress on this front, notably through ADIwg, the SAON/IASC ADC, the IARPC ADCT, and other initiatives.

## Assess status. Fill gaps. Gauge progress. Coordinate. Collaborate. Optimize.



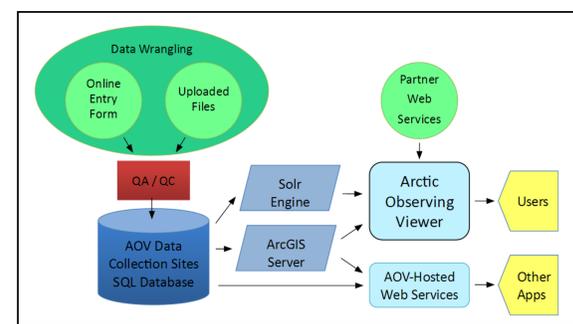
A new AOV app has just been released with a clean, fast and modern interface. An overview of the data provided is shown above. This prototype - based on HTML5, javascript, and hierarchical ISO metadata - is mobile friendly while being intuitive and more informative.

A new Search tool makes it easier to find sites of interest. Run complex searches based on Funding Agency, Funding Program, Year, Discipline, Type of Measurement, GCMD Science Keywords, and more.



Search results are shown in a table at bottom, with numerous details and links to more information as well as dataset catalog pages. Users can click on the points or lines to view details about each "data collection site": a borehole, flux tower, drifting buoy, etc.

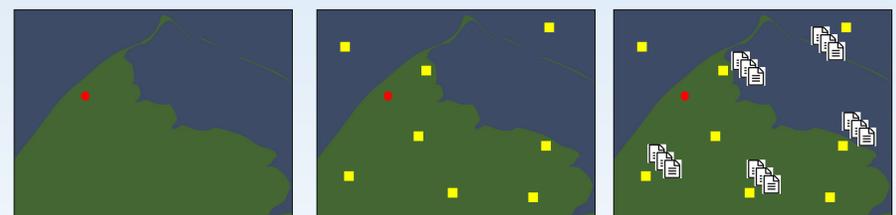
Detailed information on data collection sites, as ISO 19115-1 metadata, flows from the AOV database via web services to the AOV Viewer, and to applications or databases hosted by other organizations.



## AOV is Part of the Project & Data Life Cycle

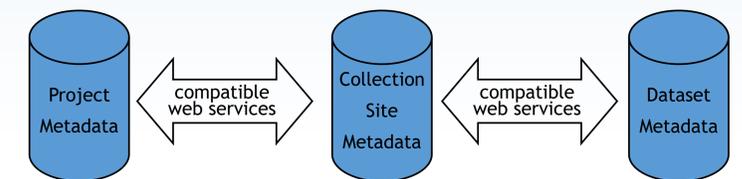


- Project Planning**
  - Who is doing what, when and where?
  - How do we plan for logistics?
  - Where are medical facilities, field research stations, airports, etc.?
- Collection Site Monitoring**
  - Where are existing data collection sites?
  - Where are more sites needed?
  - Who operates and manages existing sites?
  - Which sites can I use?
- Dataset Usage & Understanding**
  - Is this dataset suitable for my research?
  - Does it cover my area for the right time period?
  - How was it created? What are the errors? Who do I contact with questions?



Each **project location** is a logistical base of operation. Each **data collection site** is a sensor, observing platform, or repeat measurement. Each data collection site can have many **datasets**.

## Connecting Systems with ISO Metadata and RESTful Services



A few established metadata standards, or "dialects", for interoperability:

- ADIwg
- ARMAP
- AOV
- ADIwg
- ILTER
- CSW
- FGDC
- GCMD
- DataCite
- ADIwg

## Add Your Sites

- Use the online form
- Use a template spreadsheet
- Develop a compatible web service

At any time, please contact us at [info@ArcticObservingViewer.org](mailto:info@ArcticObservingViewer.org)

Become a Partner to showcase your network, identify co-location of resources, avoid duplication, and clarify directions.