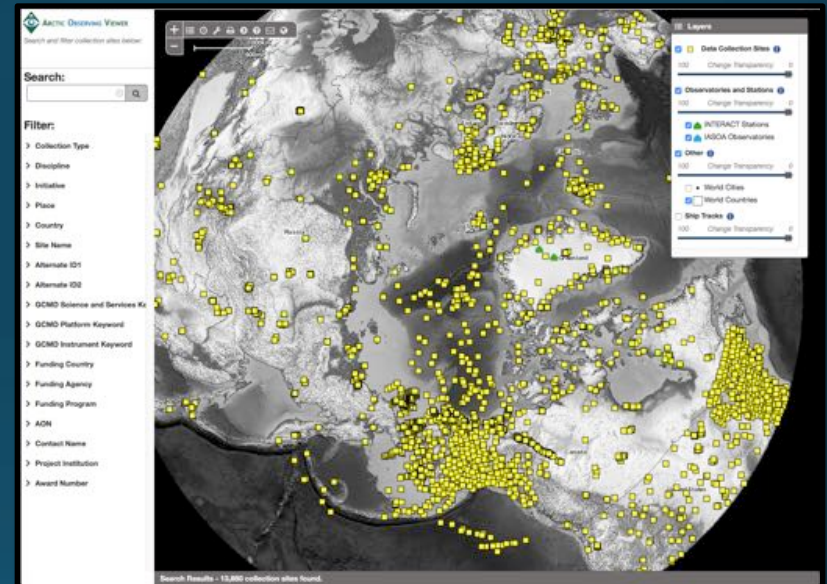
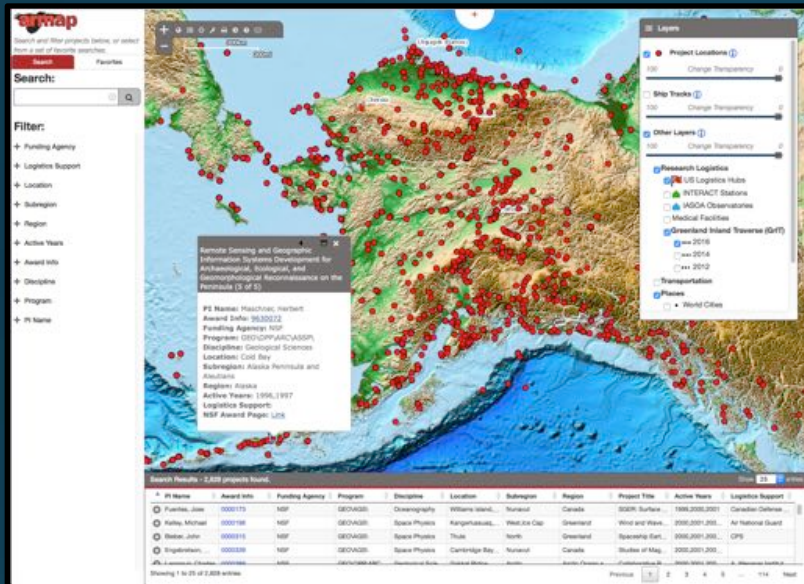


Apps for Arctic Science Planning: ARMAP & AOV



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William Manley, Allison Gaylord, Craig Tweedie, Naomi Whitty



armap.org



ARCTIC OBSERVING VIEWER

arcticobservingviewer.org

A Challenge ...

... is knowing who is doing what where.

What networks and assets already exist?

Where are the gaps?

Is there overlap?

How can we better plan, coordinate, and achieve scientific objectives?

Project - Data Life Cycle

Project Planning



Observations & Networks



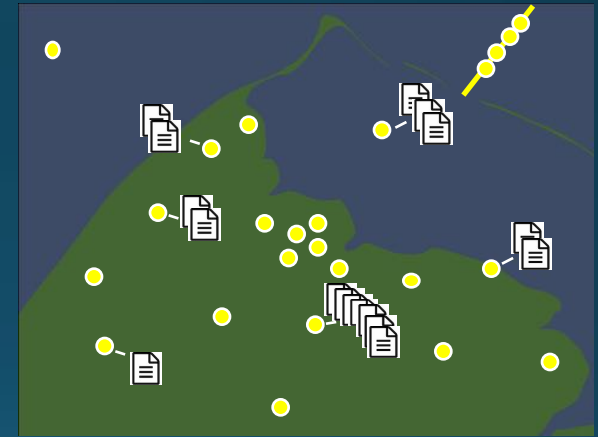
Dataset Usage & Understanding



Each **project location** is a logistical base of operation.



Each **data collection site** is an instrument, platform, or repeat measurement.



Each data collection site can have many **datasets**.

Meet User Needs

Project Planning



Who is doing what, when and where?

How do we plan for logistics?

Where are medical facilities, field research stations, ship tracks, airports, etc.?

How do we best achieve the science?

Observations & Networks



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?

Scope

Project Planning



- The big picture of Arctic science
- 2700+ research projects
- For science planning, logistics, and more

Observations & Networks



- A high-resolution view of observing
- 13,000+ observing sites
- For network planning, data discovery, and more

Dataset Usage & Understanding



- By geographic area, discipline, or initiative
- A million+ scientific datasets
- For data discovery, access, reuse, and synthesis

Web Services

The screenshot shows the ARMAP website with a navigation bar including 'HOME', 'LAUNCH VIEWER', 'TEXT SEARCH', 'MAP GALLERY', 'WEB SERVICES', 'ABOUT', and 'RESOURCES'. The 'Web Services' section is highlighted in red. Below the navigation bar, the 'Web Services' heading is followed by a sub-heading 'Connect to web services for live, updated data & information.' A paragraph explains that ARMAP's suite of web services provides direct data streams from its servers, accessible via various data management systems, GIS applications, and software packages. A 'Field Research Projects REST' section is also visible, featuring a blue button labeled 'ARMAP REST PAGE'. At the bottom, there is a section for 'Field Research Project Locations' with a map showing project locations and a list of service options: 'ARCGIS DESKTOP', 'ARCGIS ONLINE', 'WMS', 'WFS', 'ADWIG REST', and 'TXT'.

The screenshot shows the Arctic Observing Viewer website with a navigation bar including 'Home', 'Partners', 'About', 'Interoperability', and 'Collaborate'. The 'Arctic Observing Viewer' logo is prominently displayed, along with the tagline 'collaborative mapping of data collection sites'. The main content area features a paragraph explaining that users can connect to AOV's suite of web services for live, updated data. A 'Data Collection Sites' section is highlighted, featuring a map of the Arctic region. Below the map, a paragraph describes the service's focus on long-term observing activities and data wrangling efforts. A list of service options is provided: '+ ArcGIS Desktop', '+ ArcGIS Online', '+ WMS', and '+ WFS'.

Field Research Project Locations, Data Collection Sites, Location Placenames, Arctic Base Map, Arctic Countries, Arctic World Cities

ISO 19115-1, ISO 19115-2, FGDC, TXT, WMS, WFS, KMZ, ArcGIS

Guide to Interoperability

Home Partners About **Interoperability** Collaborate



ARCTIC OBSERVING VIEWER
collaborative mapping of data collection sites

Guide to Interoperability

Many Arctic science organizations realize that it's important to share data center or monitoring network can increase its visibility by having a catalog of some sort, making it possible for end users to browse for information that makes data more discoverable and accessible.

The problem is that there is a growing multitude of data catalogs, within the Arctic data landscape is fragmented, frustrating the end user that wants to find data. In this context, organizations or initiatives can be more successful by releasing metadata in such a way that it is broadly compatible for use by portals. In so doing, the information is highly visible for more users.

Once an organization makes a decision to release metadata, the next hurdle is deciding on the implementation that maximizes compatibility with other information systems. Ideally, metadata is released through web services – live data feeds between databases and applications – that are date and comprehensive. In this light, this brief guide is an attempt to facilitate the use of metadata specifically for sets of metadata that span from projects to collection sites and datasets and for existing or potential Partners collaborating with AOV, and may be helpful as an example of implementation.

Why Create Web Services?

The ultimate goal is that information from multiple observing networks is discoverable, accessible, and usable. Due credit should be given to data sources. And the information should be made accessible in a variety of ways for their own purposes.

In essence, what is needed is a dynamic network of distributed nodes for information exchange and the establishment of web services – live data feeds that conform to community-based metadata standards and web service formats. Without interoperable web services, information becomes out-of-synch and requires substantial harmonizing and reprocessing. The Arctic data community is making progress through ADIwg, the IARPC ADCT, the IASC/SAON ADC, and other efforts or initiatives.

links to a list of collection sites, which includes links to individual site-level metadata records. This is easier to follow by digging into the XML as provided in the next section.

Implementation Examples

The metadata web services inherent to AOV and ARMAP are illustrated with ISO XML links in the table below. The template XML's are embedded with explanatory text, whereas the use case XML's are from live services for an NSF-funded AON project. Together they can assist with generating a workflow.

Project-Level Metadata:	template XML	use case XML
List of Collection Sites:	template XML	use case XML
Site-Level Metadata:	template XML	use case XML
Dataset-Level Metadata:	-	use case XML

Additional templates will be made available when possible. The templates and use cases above were last updated on May 3rd, 2017.

Which Fields to Use?

Metadata records for projects, data collection sites, and scientific datasets have the potential for each to include a multitude of descriptive fields, or tags. It can be helpful to identify a minimum set of core fields while designing or maintaining databases and services. Indeed, most important for interoperability in general is the ability to "crosswalk" fields with compatible definitions. Existing and potential Partners are advised to peruse:

- the ISO XML templates above
- our contributors' template spreadsheet
- the AOV Database Data Dictionary

Annotated template ISO XML's, use case ISO XML's, contributors' template spreadsheet, data dictionaries, picklists ...

Interoperability

Goal: to easily find, assess, access, reuse, and integrate data and metadata

Challenges: a fragmented data landscape & incompatible conceptual models, metadata structures, and vocabularies

Solutions?

- **Share** schemas, templates, data dictionaries, code lists, use cases, crosswalks, transforms, web services, ...
- Groups starting out: proceed with **eyes wide open** to avoid later effort
- Enable **federated search**
- **Avoid silos**: Arctic, Antarctic, disciplinary, organizational, etc.
- **Communicate and coordinate**: ADC, IARPC, SCADM, SOOS, RDA, etc.

Specific Suggestions

- Focus on interoperability of **one essential variable**
- Standardize vocabularies for **observation/measurement type** (code list of essential variables)
- **Include project-level and site-level metadata** inside dataset-level metadata records
- Who else is interested in interoperability of project-level and site-level metadata?

Thank you

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