ALASKA DATA INTEGRATION WORKING GROUP

Open Source Metadata Toolkit: Standards, Translator, Editor

ISO Metadata Tools Workshop

May 23, 2017
Dennis Walworth, USGS
Josh Bradley, Arctic LCC
Stan Smith, Arctic LCC

mdeitor-info@adiwg.org
Session Outline

1. Project Overview & History
2. Toolkit Overview
3. Tools in depth
   a. About mdJSON Standard & Schema
   b. About mdTranslator
   c. About mdEditor
4. Case Study
5. Timeline
6. Hands-on Q&A
About ADIwg* (established 2010)

Mission: “The Alaska Data Integration Working Group (ADIwg) was formed by the Alaska Climate Change Executive Roundtable (ACCER) to examine and address the technical barriers to efficiently integrate and share data within and among participating organizations.”

- **Federal**
  - DOI: BLM, BOEM, NPS, USFS, USFWS, USGS
- **State of Alaska**
  - University of Alaska (UAF, UAS)
  - Geographic Information Network of Alaska (GINA)
  - International Arctic Research Center (IARC)
- **Non-Governmental Organizations (NGOs)**
  - Arctic Ocean Observing System (AOOS)
  - Arctic Research Mapping Application (ARMAP) - Nunatech Consulting
  - North Pacific Research Board (NPRB)
  - North Slope Science Initiative (NSSI)
- **Cooperatives/Joint-Ventures**
  - Arctic LCC

*Pronounced add-ee-wig

mdeditor-info@adiwg.org

*Pronounced add-ee-wig
**ADlwg Goals**

- Share and integrate datasets
- Data Metadata
- Project Metadata
Project Purpose

The ADIwg* Metadata Toolkit is an open source suite of applications for authoring and editing metadata for both spatial and non-spatial projects and datasets. The main goal of the toolkit is to promote the creation and use of metadata by lowering the level of technical expertise required to produce archival quality metadata.

*Alaska Data Integration working group (add-ee-wig)
Introducing the... ADIwg ToolKit

- **mdJSON** Schemas
  - JSON Schemas describing the mdJSON standard; Used for structural validation of mdJSON documents.
  - [github.com/adiwg/mdjson-schemas](https://github.com/adiwg/mdjson-schemas)

- **mdJSON**
  - Extensible standard for encoding project and data metadata, based on JavaScript Object Notation (JSON).

- **mdEditor**
  - Web application for authoring and editing metadata, for both projects and datasets.
  - [github.com/adiwg/mdEditor](https://github.com/adiwg/mdEditor)

- **mdTranslator**
  - Open-source Ruby software application for translating between metadata standards. Metadata is input in one of the supported ‘reader’ formats and output in one of the supported ‘writer’ formats.
  - [adiwg.org/mdTranslator/](https://adiwg.org/mdTranslator/)
  - [http://mdtranslator.adiwg.org/api/v2/demo](http://mdtranslator.adiwg.org/api/v2/demo)

- **ADIwg ISO Profile**
  - The ADIwg ISO 19139/19115-3 metadata profile. The mdTranslator converts mdJSON into XML adhering to this profile (and other formats, too).
  - [github.com/adiwg/adiwg-metadata](https://github.com/adiwg/adiwg-metadata)
  - [github.com/adiwg/mdCodes](https://github.com/adiwg/mdCodes)

- **mdEditor-info@adiwg.org**
Metadata Standard: mdJSON

- Based on JSON (JavaScript Object Notation), a lightweight data-interchange format
- Fully defined and complete structural validation using json-schema (http://json-schema.org)
- Extendible, validator will ignore additional properties
- Uses standard GeoJSON for encoding extents
- Version 2.x is compatible with latest ISO metadata schema (19115-3)

mdJSON Schemas

JSON Schemas describing the mdJSON standard; Used for structural validation of mdJSON documents.
github.com/adiwg/mdJson-schemas

mdeditor-info@adiwg.org
mdJSON 1.x => 2.0 ISO 19115 Coverage

- 50% increase in coverage from 1.x to 2.0
- 52 ISO classes in 1.x
- 82 ISO classes in 2.0
- Most classes fully implemented in 2.0
- Data Quality moved out of 19115-1 standard
- Taxonomy not supported in 19115-1

mdeditor-info@adiwg.org
mdJSON vs ISO XML

```json
{
    "organizationName": "Arctic Landscape Conservation Cooperative",
    "address": {
        "city": "Anchorage",
        "country": "United States",
        "postalCode": "99503",
        "deliveryPoint": "[U.S. Fish & Wildlife Service", "1011 E. Tudor Rd]",
        "administrativeArea": "Alaska",
        "electronicMailAddress": "[staff@arcticlcc.org]"
    },
    "phoneBook": [
        {
            "service": "voice",
            "phoneNumber": "+1 907 4560325"
        }
    ],
    "onlineResource": [
        {
            "uri": "http://arcticlcc.org",
            "function": "information",
            "protocol": "http"
        }
    ]
}
```

```xml
<gmd:organisationName>
  <gco:CharacterString>Arctic Landscape Conservation Cooperative</gco:CharacterString>
</gmd:organisationName>

<gmd:contactInfo>
  <gmd:CI_Contact>
    <gmd:phone>
      <gmd:CI_Telephone>
        <gmd:voice><gco:CharacterString>+1 907 4560325</gco:CharacterString></gmd:voice>
      </gmd:CI_Telephone>
    </gmd:phone>
  </gmd:CI_Contact>
</gmd:contactInfo>
```

mdeditor-info@adiwg.org
Metadata Translation Support

- Provides translation to established metadata standards
- “Loosely coupled” architecture with “readers” and “writers”
- Any reader can output to any writer
- Built using Ruby (https://www.ruby-lang.org)
- CLI and Ruby on Rails webservice API available

mdiTranslator

mdeditor-info@adiwg.org

adiwg.org/mdTranslator/
http://mdtranslator.adiwg.org/api/v2/demo
mdTranslator Architecture
- Interactive documentation tool for the ADIwg mdJSON schemas
- mdJSON Validator tool to validate using the mdJSON schemas
- Translate using the mdTranslator web API
- View codelists in HTML table, JSON, or CSV formats.

mdTools
mdtools.adiwg.org

mdTools is an interface for ADIwg metadata tools. The purpose of these tools is to assist with the production of metadata, especially ISO-compliant metadata.

- mdJSON Schema Viewer
  Interactive documentation tool for the ADIwg mdJSON schemas.
- mdJSON Validator
  A tool to validate a metadata file using the mdJSON schemas.
- mdTranslator
  A tool that converts between metadata standards. For example, from mdJSON to ISO 19139. The tool is powered by the mdTranslator webservice.
- mdCodes Viewer
  View mdCodes in HTML table, JSON, or CSV formats.

Check us out on GitHub!
Metadata Editor for Projects and Datasets

- Creates mdJSON compatible with mdTranslator
- Manage multiple records at once
- Re-use metadata records (citations), contacts (person or group), dictionaries
- Import/Export supports managing record “sets”
- Built-in help

mdeditor-info@adiwg.org
mdEditor Architecture

- Extendable via “plugins”
- Interacts with external webservice or APIs to enhance functionality
- Possibility of future desktop application
Technology and Standards

- JSON (http://www.json.org/) and GeoJSON (http://geojson.org/)
- EmberJS (http://emberjs.com/)
- Bootstrap 3 (http://getbootstrap.com)
- NodeJS (https://nodejs.org)
- Leaflet (http://leafletjs.com/)
- NASA GCMD (http://gcmd.arcticlcc.org/)
- ITIS (https://www.itis.gov/)
Keep it clean and simpl(ish)

- Consistent, Responsive Two-panel Layout
- Plain navigation, breadcrumbs
- Font Awesome Icons help with context
- Trying to minimize scrolling
- Should work on larger mobile devices

mdeditor-info@adiwg.org
Usability Features

- Optional AutoSave
- Inline error reporting
- Scroll-spy for long forms
- Colors indicate status visually
  - OK, Success
  - Info, Take Action
  - Danger, Alert
  - Warning, Error

mdeditor-info@adiwg.org
Manage files using the browser

- You’ll need a **modern** web browser
- Supports loading and saving from the local filesystem
- Uses localstorage to save in the browser cache
- Treat it like a desktop application
- Can easily share files: contacts, metadata, or dictionaries
Configure or build as needed

- Built-in support for “profiles”
  - Determines what appears in the interface
  - Configured using JSON
- Can be extended by creating Ember addons
  - Publish to a catalog
  - Grab contacts from a webservice
- Fork on Github and automagically host your own instance using GitHub pages
- No server-side code required!!*

mdeeditor-info@adiwg.org
Open source Rocks!

- Taking advantage of some great open source libraries to build large components
- Spatial support uses:
  - Leaflet (mapping)
  - Ember addons
  - Some Mapbox libraries help with spatial imports
  - Etc.
- Benefits:
  - Can import many formats to define extents
  - GeoJSON, KML, Delimited TXT, ShapeFile, GPX
Toolkit in Action: Landscape Conservation Cooperatives

Purpose: Develop a framework for supporting the LCC Network Science Catalog, which will contain metadata for all LCC projects and products.

The architecture must:

- **Aggregate** metadata into a central searchable database
- **Support** multi-level reporting (data calls, funding, partnerships)
- **Integrate** with existing LCC information systems
- **Distribute** metadata to established discovery portals (e.g., Sciencebase, Data.gov) in accordance with Federal Open Data policies.

mdeditor-info@adiwg.org
So....

- ScienceBase will support import of mdJSON records
- Using the mdTranslator ScienceBase will be able to convert mdJSON to ISO 19115
- The mdEditor will be able to edit records from (in) ScienceBase
- Capabilities should be available to all ScienceBase users
## Timeline

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release version 2.0 of the ADIwg mdJSON standard</td>
<td>Done!!!</td>
</tr>
<tr>
<td>Release version 2.0 of the ADIwg mdTranslator</td>
<td>Release Candidate</td>
</tr>
<tr>
<td>Release mdEditor version 1.0</td>
<td>6/15/2017</td>
</tr>
<tr>
<td>Complete User Documentation for mdEditor</td>
<td>6/30/2017</td>
</tr>
<tr>
<td>Release ISO19115-1 writer</td>
<td>8/15/2017</td>
</tr>
</tbody>
</table>

mdeditor-info@adiwg.org
Who’s to blame for this stuff?

Alaska Data Integration working group:

- Josh Bradley (Arctic LCC), joshua_brady@fws.gov
- Stan Smith (Arctic LCC!!!), ssmith@arcticlcc.org

We have lots of issues:

- https://github.com/adiwg/mdEditor/issues
- https://github.com/adiwg/mdJson-schemas/issues
- https://github.com/adiwg/mdTranslator/issues

mdeditor-info@adiwg.org
Resources

- Github (https://github.com/adiwg/mdEditor)
- Wiki (https://github.com/adiwg/mdEditor/wiki)
- Issues (https://github.com/adiwg/mdEditor/issues)
- mdTools (http://mdtools.adiwg.org/)
- EmberJS (http://emberjs.com/)

Live Development Application: http://www.adiwg.org/mdEditor/

Awesome financial support from:

mdeeditor-info@adiwg.org
Hands-on Q&A

http://www.adiwg.org/mdEditor/

http://mdtools.adiwg.org/

mdeditor-info@adiwg.org