ISO Metadata Developer’s Toolkit

ISO TC ‘Standards in Action’

June 10, 2015
Josh Bradley, Arctic LCC
Stan Smith, USGS
ISO Metadata
Developer’s Toolkit

A collection of open-source software tools designed to assist individuals and organizations create metadata for their research projects and data.

GitHub Repositories:  https://github.com/adiwg
Who is ADIwg?

- Federal
  - BLM, BOEM, NPS, USFWS, USFS, 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
Project Objectives

• Make it easier for organizations to achieve ISO compliance:
  o Integrate ISO support into local applications and services
  o Implement custom web services with ISO metadata capabilities

• Support both project and data metadata

• Offer as open-source, extensible software architecture

• Eliminate necessity of users needing to learn the ISO 19115 family of standards to produce metadata

• Support individual researchers and large organizations

• Host a public web service for generation of ISO metadata records

• Host a public web app for researchers to enter and edit metadata content
Prioritize ISO Content

Polled members for priority data types and usage

Major Categories Response Totals

- Frequent use, high priority
- Occasional use, low priority
- Not used

Number of Responses

- Tabular with media
- Tabular without data
- Geospatial data
- Digital image
- Digital audio
- Digital video
- Documents
- Application
- Web Services
- Gridded data

www.adiwg.org
Supported ISO Fields

- ADIwg supported fields
- ~80 classes
- ~350 attributes
- 70% of full standard
Why JSON and not XML?
- Wide support from programming languages
- Easy to read by both humans and machines
- Focus is on the data, less markup
- Native to JavaScript - browsers
- Validation against schema definition

Support multiple standards (primarily ISO)
Support custom fields
Support complete data dictionaries
Support complex geography in GeoJSON
Flexibility to extend profile
```json
{
    "version": {
        "name": "mdJson",
        "version": "1.0.0"
    },
    "contact": [
        {
            "contactId": "1",
            "organizationName": "US Geological Survey - Alaska Science Center"
        }
    ],
    "metadata": {
        "resourceInfo": {
            "resourceType": "min example",
            "citation": {
                "title": "Real-Time Permafrost and Climate Monitoring Network - Arctic",
                "date": [
                    {
                        "date": "2012-12-21",
                        "dateType": "revision"
                    }
                ]
            },
            "abstract": "DOI is developing a long-term permafrost monitoring network.
            "status": "onGoing",
            "pointOfContact": [
                {
                    "contactId": "2",
                    "role": "pointOfContact"
                }
            ],
            "language": [
                "eng; USA"
            ]
        }
    }
}
```
• Complete structural validation of JSON
• Latest IETF draft (version 4)
• Validation engines available in many languages
• http://json-schema.org/
The Core: mdTranslator

ADlwg mdTranslator

<table>
<thead>
<tr>
<th>Future readers:</th>
<th>Future writers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>sbJson, NetCDF</td>
<td>FGDC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ISO 19115-2 Writer</th>
</tr>
</thead>
<tbody>
<tr>
<td>19110</td>
</tr>
<tr>
<td>19115-1</td>
</tr>
</tbody>
</table>

mdJson Validator

mdJson Reader

ISO 19115-2

mdJson

Future writers:
- FGDC
- SQL
- HTML
- 19110
- 19115-1

Future readers:
- FGDC
- sbJson
- NetCDF

www.adiwg.org
• Developed for metadata content editors (mdEditor) to load codelist values
• Contains all ISO codelists needed by ADIwg Profile
• Codes current with 19115-2, 19115-1, including some ADIwg extensions
• Each codelist is a maintained as a YAML file
  o “Yet Another Markup Language” or “YAML Ain’t Markup Language”
  o Suited for text editing structured data
  o Supported in Ruby, Python, Perl, grep
• Will generate an ISO CT_CodelistCatalogue for codelists
ISO Toolkit Components

- **mdJson**
  - Standard for encoding project and data metadata

- **mdTranslator**
  - Provides translation to established metadata standards

- **mdTools**
  - Groups documentation, validation, and translator interface tools

- **mdEditor**
  - Online preparation and editing of mdJson files

- **mdBook**
  - Online documentation for all tools in the ISO Metadata Developer’s Toolkit

- **mdCodes**
  - Standard ISO codelists for populating metadata editors

- **mdJson-schemas**
  - Schema definition for mdJson for validating mdJson file structure and content

- **mdTranslator-rails**
  - Ruby on Rails website for public access to hosted mdTranslator

Code available on GitHub: [https://github.com/adiwg/](https://github.com/adiwg/)

www.adiwg.org
mdTranslator as code

Ruby install + program

GitHub

mdJSON

Method call or CLI

Ruby code
mdTranslator as a gem

Ruby install + program

Ruby code

Ruby Gem

Method call or CLI
mdTranslator as a web service

Web Application

mdJSON

POST

Public hosted web service

Ruby code

Ruby Gem

mdTranslator-rails

www.adiwg.org
mdTranslator from mdTools

Browser

{mdJSON}

Copy

Public hosted web service

Ruby code

Ruby Gem

mdTranslator-rails

mdTools

Document mdJson
Validate mdJson
Submit & Capture
mdJSON from mdEditor

Browser

mdEditor

Public hosted web service

POST

Ruby code

Ruby Gem

mdTranslator-rails
Demonstration
Questions?

- Hosted mdTranslator: [http://mdtranslator.adiwg.org](http://mdtranslator.adiwg.org)
- mdTools: [http://www.adiwg.org/mdTools](http://www.adiwg.org/mdTools)
- Documentation (mdBook): [http://mdbook.adiwg.org](http://mdbook.adiwg.org)
- RubyGems: [https://rubygems.org](https://rubygems.org)
- GitHub Repositories: [https://github.com/adiwg](https://github.com/adiwg)

- Stan Smith stansmith@usgs.gov
  (U.S. Geological Survey – Alaska Science Center)

- Josh Bradley joshuaBradley@fws.gov
  (U.S. Fish & Wildlife – Arctic Landscape Conservation Cooperative)