A Governance Framework for Geographic Data, Services, and Applications

Colin MacDonald

Esri UC 2017
Some Context

Nova Scotia, Canada

Population ~1,000,000

Photos copyright Province of Nova Scotia
Geomatics Context

- Spatial Data Infrastructures in Province of Nova Scotia, Canada

- SDI “1.0”, ~ 2004
  - Website + Geo Viewer + metadata = Portal
  - Focus on distributed map services and centralised metadata

- SDI “2.0” ~ 2013
  - Nova Scotia Geospatial Infrastructure, aka NSGI
  - Focus on governance and process
The Problem

- Lack of local standards and processes
- No long term commitments from data providers
- Ability to publish data at source in pre AGOL days
- No integration across business areas / departments at the ‘data’ level
- Real accountability at senior management level
A Different Focus this Time

- Primary issue was for users to be able to access up to date, quality geospatial data from a single source
- Began implementing Stewardship, Custodianship, Single Source of Truth, etc.
- Develop ‘services’ to be consumed by non-geospatial systems from the SSoT
  - Civic address, place names, property, monument
- Realized what we were doing was **Master Data Management** for Geospatial
What is Master Data Management?

• A discipline that ensures the uniformity, accuracy, stewardship, consistency and accountability of the enterprise's official shared data assets.
  - ~ Gartner

• For geospatial, we have expanded the scope to include all relevant assets:
  - Datasets
  - Services (for e.g. map services, geoprocessing services, etc.)
  - Applications
Stewardship

• We need a framework for roles, responsibilities, and expectations re: geographic assets
• The framework includes those who
  - Have a mandate to collect the data
  - Maintain the data
  - Provide access to the dataset
  - Support the dataset
• Framework considers all aspects of the geographic data lifecycle
Stewardship – Key Concepts

- **Steward**: A steward is an agency accountable for a dataset on behalf of the Government of Nova Scotia. Accountability may be through legislation / regulations or policy.

- **Custodian**: an agency that performs any number of agreed upon responsibilities for a dataset as per an agreement with the Steward.
Stewardship Concepts (cont’d)

- Authoritative Data
- Authoritative Source
- Trusted Source
- Certified Data
<table>
<thead>
<tr>
<th>Lifecycle Step</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Authority to collect the data? This may be obtained whether through legislation, regulation, or policy.</td>
</tr>
<tr>
<td>Define</td>
<td>Define data requirements that support the business within their mandate.</td>
</tr>
<tr>
<td>Define</td>
<td>Define how the data will be collected.</td>
</tr>
<tr>
<td>Define</td>
<td>Define data standards and / or specifications required to support the dataset.</td>
</tr>
<tr>
<td>Create</td>
<td>Implement data collection processes.</td>
</tr>
<tr>
<td>Create</td>
<td>Implement metadata collection processes.</td>
</tr>
<tr>
<td>Maintain</td>
<td>Apply processes for quality control of the dataset.</td>
</tr>
<tr>
<td>Maintain</td>
<td>Create, update, and delete data records as appropriate to keep the dataset up to date.</td>
</tr>
<tr>
<td>Access and Use</td>
<td>Provide storage for the dataset.</td>
</tr>
<tr>
<td>Access and Use</td>
<td>Provide user access to the dataset by applying data security according to applicable policies and standards.</td>
</tr>
<tr>
<td>Access and Use</td>
<td>Provide reports on the access to the dataset.</td>
</tr>
<tr>
<td>Assess</td>
<td>Assess the value and continued relevance of the data for its intended use.</td>
</tr>
<tr>
<td>Assess</td>
<td>Assess all aspects of the data lifecycle in order to implement continuous improvement for the dataset.</td>
</tr>
</tbody>
</table>
Stewardship & the Geographic Data Lifecycle. Example
Formalizing Stewardship

• Senior Management sign off on awareness & accountability

• Defined roles for specific responsibilities
Capturing Custodian Level Details

**GEOGRAPHIC TECHNICAL REGISTRATION FORM**

**Purpose & Audience**
This tab of the Geographic Technical Registration Form is intended to outline information specific for publishing datasets within the NSGI. This information guides *Geographic Information Services* to make the geographic dataset(s) accessible to the public or to a targeted audience in government. Use one tab per dataset.

<table>
<thead>
<tr>
<th>DATA SUBMISSION &amp; PUBLICATION DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date Submitted:</strong></td>
</tr>
<tr>
<td>Dataset Title</td>
</tr>
<tr>
<td>Suggest a Filename:</td>
</tr>
</tbody>
</table>

**Data Types**
- Vector
- Raster
- Raster and Vector

**Dataset Description**

<table>
<thead>
<tr>
<th>GIS Formats</th>
<th>Vector Data Type</th>
<th>Raster Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What Data Format(s) are you Submitting?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File Geodatabase</td>
<td>Keyhole Markup Language</td>
<td>GPS Exchange</td>
</tr>
<tr>
<td>Shapefile</td>
<td>Geography Markup Language</td>
<td>DXF</td>
</tr>
<tr>
<td>LAS File</td>
<td>Multiuser Geodatabase</td>
<td></td>
</tr>
<tr>
<td><strong>What Data Formats do you want to be Published?</strong> (Optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* File Geodatabase</td>
<td>* Keyhole Markup Language</td>
<td>* GPS Exchange</td>
</tr>
<tr>
<td>* Shapefile</td>
<td>Geography Markup Language</td>
<td>DXF</td>
</tr>
<tr>
<td>LAS File</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* mandatory for external publishing *
# Capturing Custodian Level Details

## Projection & Datum

### What Projection & Datum are you submitting?

- [ ] * NAD83(CSRS), Universal Transverse Mercator Zone 20
- [ ] ATS77, Geographic Coordinates
- [ ] ATS77, Modified Transverse Mercator
- [ ] WGS84, Geographic Coordinates
- [ ] NAD83(CSRS), Geographic Coordinates
- [ ] NAD83(CSRS), Modified Transverse Mercator
- [ ] WGS84, Geographic Coordinates

### What Projection & Datum do you want to be Published?

- [ ] * NAD83(CSRS), Universal Transverse Mercator Zone 20
- [ ] ATS77, Geographic Coordinates
- [ ] ATS77, Modified Transverse Mercator
- [ ] WGS84, Geographic Coordinates
- [ ] NAD83(CSRS), Geographic Coordinates
- [ ] NAD83(CSRS), Modified Transverse Mercator
- [ ] WGS84, Geographic Coordinates

## Update Cycle

### Frequency

- [ ] Daily
- [ ] Weekly
- [ ] Monthly
- [ ] Bi-annually
- [ ] Annually
- [ ] Irregular

## Access

### License Type

- [ ] Open Data Program
- [ ] Restricted

### Restricted Audience

- [ ] Steward Agency Only
- [ ] Public Sector Only (provincial)
- [ ] External with Data Agreement Only
- [ ] Other. Please describe below:

## Classification

## Metadata Theme

## Communication

### For a new dataset?

- [ ] Notify GIS Support
- [ ] 'Latest News' on GeoNOVA.ca
- [ ] Twitter (@NSGeoNOVA)
- [ ] GeoPulse News
Capturing Custodian Level Details

Data for publication is data to be shared with others, and therefore needs to be in a schema that is friendly to that public or targeted government audience. Data at Authoritative Source typically has a schema that allows for efficient maintenance. With a much broader audience accessing the data in NSGI, the schema may need modification to help enable users to have a clearer understanding of the data.

The form below documents the schema that is submitted (the authoritative source or maintenance view) to GIS and illustrates how the data will be structured for publication in NSGI. The Custodian will work with Geographic Information Services to fill out the "Schema Conversion Request" below. Use one table for each feature class submitted.

<table>
<thead>
<tr>
<th>Feature Class Details</th>
<th>Suggest a Filename:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Structure at Authoritative Source (for maintenance purposes)</td>
<td>Data Structure for Publication</td>
</tr>
<tr>
<td>Column Name</td>
<td>Data Type</td>
</tr>
</tbody>
</table>

| | | |
| | | |
Geospatial Data Publishing

1. Client Engagement
   - Learn how publishing works & what services are available

2. Establish Data Governance
   - Discover accountability, roles & responsibilities

3. Registration
   - Register information about data & stewardship

4. Submit Data
   - Submit data for publishing

5. Support Initiation
   - Initiate geographic data support model

6. Publish Data
   - Share data with the world or a government audience
Geo-Change Coordination

- Provides technical reviews of geo applications that are proposed to be deployed to the Nova Scotia Geospatial Infrastructure (NSGI)
- Approves all production changes to the NSGI (datasets, map services, apps, etc.)
- Ensures the stability of a common, shared environment for geographic
- Handshakes with a broader government change process

Accountable to: Approvals Committee
Consists of: GIS Subject Matter Experts
Primary Role: Providing technical advice: overseeing change in corporate geospatial environments, recommendations for geospatial standards and processes.
Scope of Change Coordination

1. A new GIS dataset to be published.
2. A schema change to a previously published GIS dataset.
3. A new service (Map, geoprocessing, XML, etc.) to be published.
4. A functional change to a previously published service.
5. A new mapping application to be promoted to production.
6. A change or an enhancement to a mapping application previously promoted to production.
7. A change to hardware in the SDI (that GIS is responsible for).
8. A change to server software in the SDI (that GIS is responsible for).
Geo-Change Coordination

Geospatial Change Co-ordination Process

1. Implementation Request
   - Implementation Plan
   - Back-out Plan
   - Risk Matrix
2. Filter/Accept
3. Authorize
4. Schedule
5. Communicate
6. Authorized Implementation Request
7. Implement
8. Updated Geospatial Change Calendar
Process Improvement

• Continuous Process Improvement is a critical factor for realizing efficiencies in Geographic Information Services
• No individual process will ever be a one-off
• It is natural for processes to evolve
  • Efficiencies realized
  • Technology changes
  • Services / Programs change
Process Improvement (cont’d)

• Geographic Process Improvement Task Group
• Adopted in the fall of 2015
• Responsible for defining geomatics-related processes and procedures used by the geomatics community within the Government of Nova Scotia.
• Membership is fluid resulting in unique membership for each geographic process to be defined or improved.
Next – some Governance Improvements

- Updating Governance structure for Geomatics in Province of Nova Scotia
- *Geographic Information Council* - an oversight committee for all geospatial assets
- Escalation to existing Geomatics Governance Committee
- *Geographic Stewards User group*
  - A user group for Stewards to share and learn from one another
Questions?