DIGITAL MAPPING TECHNIQUES 2023

The following was presented at DMT’23
May 21 - 24, 2023

The contents of this document are provisional

See Presentations and Proceedings from the DMT Meetings (1997-2023)

http://ngmdb.usgs.gov/info/dmt/
Geological Data Flow: from field to publication

Étienne Girard May 22, 2023
Plan

- Context: challenge with maintenance
- Geological Map Flow
  - Acquisition
  - Mapping / interpretation
  - Publishing
- Challenges
# Level of development and maintenance

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New development</td>
<td>25%</td>
<td>Not integrate well in the flow</td>
</tr>
<tr>
<td>Obsolited</td>
<td></td>
<td>Obsolited</td>
</tr>
<tr>
<td>To be revised</td>
<td></td>
<td>To be revised</td>
</tr>
<tr>
<td>Not integrate well</td>
<td>50%</td>
<td>Current</td>
</tr>
<tr>
<td>In the flow</td>
<td></td>
<td>Current</td>
</tr>
<tr>
<td>Under development</td>
<td>75%</td>
<td>Current</td>
</tr>
<tr>
<td>Small fix</td>
<td></td>
<td>Current</td>
</tr>
<tr>
<td>100% mature</td>
<td></td>
<td>Current</td>
</tr>
</tbody>
</table>
Geological Data Flow
Geological Map Flow

Acquisition | Mapping | Publishing

DMT
Data Management Tool

PMT
Publishing Management Tool

75%
100% mature
Another way to look at: Geological Data Flow
Collect new data
GSC Field App

Windows 10 application
Develop in C#
GeoPackage
TilePackage

Multiple project
Spatial information
Geologic information
Dictionary

100% mature

GitHub - NRCan/GSC-Field-Application-3: Geological Survey Canada on site data collection for geologists.
Collect new data
**GSC Field App – To be rebuild**

<table>
<thead>
<tr>
<th>Now</th>
<th>Problem</th>
<th>Next step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 10 OS</td>
<td>Windows 11 is not support screen smaller than 9 inch</td>
<td>Android OS</td>
</tr>
<tr>
<td>Windows Hardware</td>
<td>Ruggedized is very expensive and it will not be available anymore at smaller than 9 inch</td>
<td>Android ruggerized tablet or Android phone…</td>
</tr>
<tr>
<td>GeoPackage 1.3</td>
<td>Not editable in ArcMap</td>
<td>No change will move to ArcPro</td>
</tr>
<tr>
<td>Tile Package</td>
<td></td>
<td>MBTiles</td>
</tr>
<tr>
<td>Esri development (free version)</td>
<td></td>
<td>Not anymore</td>
</tr>
</tbody>
</table>
Collect new data
GSC Field App

Why we develop our application
Control of schema and dictionaries
Data will be transfer to other corporate database
Collect new data

Desktop tools

Python script
No interface
Few parameters

Tools for Exif Header
Metadata to include in photos
Geotag photos

1. Setup.py
2. Add_Spatialite_Extension.py
3. Create_Spatial_Tables.py
4. Backup_Photos.py
5. Merge_Field_Data.py
6. Rename_Photos.py
7. Create_Field_Reports.py
8. Plan_Traverse.py
9. Sample_Reports.py
10. Create_GoogleEarth_Report.py
11. Geotag_Photos.py
Environment.ini
Tools to manage data in the field.docx

100% mature
Collect new data
UAV

Collect data at another scale
Very high resolution
Derived data
Other sensor (thermal)
Collect water

525 m
200 m
Interpretation

Surficial

Esri Geodatabase
ArcMap… easy to transfer to ArcPro
Provide with an MXD with template
Scientific Language
Manage by subtype and domain

Very complex to update
Scientific language is managed in Access database
No tools

100% mature
Interpretation

Bedrock

Esri Geodatabase
Good structure

But need tools develop in ArcMap
Very efficient
Interpretation

Bedrock

Esri Geodatabase
Good structure

But need tools develop in ArcMap

Very efficient

Nice interface

Few QA QC to be done

Scientific language manage with the tools

Not compatible with ArcPro

100% mature
Synthesis

Legend renderer

Easy to make a legend

Not well integrate in the workflow
Surround CGM tools

CGM Tools
Create and populate surround information
Integrate in ArcMap

Only in ArcMap…
Publishing Dissimination tools

Prepare data to disseminate

Only in ArcMap…
Synthesis

GSC Metadata Editor

Postgres database

HNAP Harmonized North American Profile (HNAP) - ISO 19115

Interface with PHP Runner

Send info to FGP

Send info to Geoscan

Including link to the publish geodatabase and shapefile
Following publication
Publication Management Tool (PMT)

Purpose
• To track the Canadian Geoscience Map (CGM) through the publication process
• Allows easy access and sharing of publication information
• Expedites approval process for managers
• Facilitates flagging any sensitive information to upper management, Intellectual Property Advisors, as well as Communications and Portfolio Sector Advisors

Functionalities
• Easy to use, web-based, native support of English (French coming)
• Enter, upload, and update publication information
• Searches based on various filters, export a CSV file with results
• Workflow tracking through dashboard
• Access to the publications full workflow history
• Website support through an integrated ticketing system
• Automatic email notifications and reminder

Not well implemented in the workflow
External development - $$$
Develop with Drupal 7 – update to Drupal 9 is hard… and now 10 (easier from 9)
Manage at all step: Data Management Plan

Postgres database

Interface with PHP Runner

Read from Geoscan for publication

Under integration at the beginning of the process of a project proposal
Other databases

- Sample Management System / SAMS
  - Oracle database

- Image Database
  - Oracle Database -> Postgres database
  - No interface

- Field Observation Data Repository
  - Postgres database / PHP runner

- CDoGS - Geochem Database
  - Access database

- Geochron Database
  - FoxPro database

- Link to database for external
Challenges with old projects

- Tools development
  - Software reliance
- OS change
  - Windows 11 and 9 inch screen to collect field data
- Go to Open software
  - Willingness to use open software
  - Real problem is more the data format
- Go to Open data
  - Real challenge is the schema and metadata
- Go to Cloud
  - New approach to manage and deliver data
    - Not a big hard drive
    - How to integrate those new tools available through the cloud
Challenges with old projects

- Tools development
  - Software reliance
- OS change
  - Windows 11 and 9 inch screen to collect field data
- Go to Open software
  - Willingness to use open software
- Go to Open data
  - Real challenge is the format, schema and metadata
- Go to Cloud
  - New approach to manage and deliver data maybe
    - Not a big hard drive
    - How to integrate those new tools available through the cloud
Challenges in a new environment

- New Political Relationship
  - Provinces and Territories (Partner and Sample already collected)
  - Indigenous group (Partner, Field and Sample already collected)

- New Security Policy
  - “Software” Development must follow strict rules (paper more)

- FAIR
  - Findable, Accessible, Interoperable and Reusable
© His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2023