The following was presented at DMT'13
(June 2-5, 2013, Golden, CO).

The contents are provisional and will be
superseded by a paper in the
DMT'13 Proceedings.

See also earlier Proceedings (1997-2012)
http://ngmdb.usgs.gov/info/dmt/

GEM

GMF Data Workflow from Field to Maps: A Normalized Project BedrockGDB

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Outline

- Context
- Challenges
- Requirements
- Approach
  - Normalized database
  - Tools
- Conclusion
  - What we have learned
  - What we have learned with tools
  - Where are we going with all this…

Context

Recently, through the GEM Program, the GSC has undertaken the **Geological Map Flow** project (GMF) to develop protocols for:

- field data collection,
- compilation,
- interpretation,
- management, and
- dissemination of **bedrock and surficial maps.**

Context (2)

Success of the Geological Map Flow (GMF) project depends largely on its ability to **rapidly disseminate quality geological information**. To achieve this **goal**, it is critical to establish

- a **consistent data flow** that allows effective management of field data throughout the processes required by the GMF.

The presentation will therefore address the core of this GMF workflow that is the normalized Project Bedrock Geodatabase (PBGDB).

Challenges

- Overcome the paradigm of **human adaptation to new technologies** and the need to control it quickly and effectively,
- Users with **various levels of skill**,
- **Developed a robust, streamlined and integrated geological data flow from the field data collection up to the dissemination process** using the GSC corporate ESRI environment platform.

Requirements

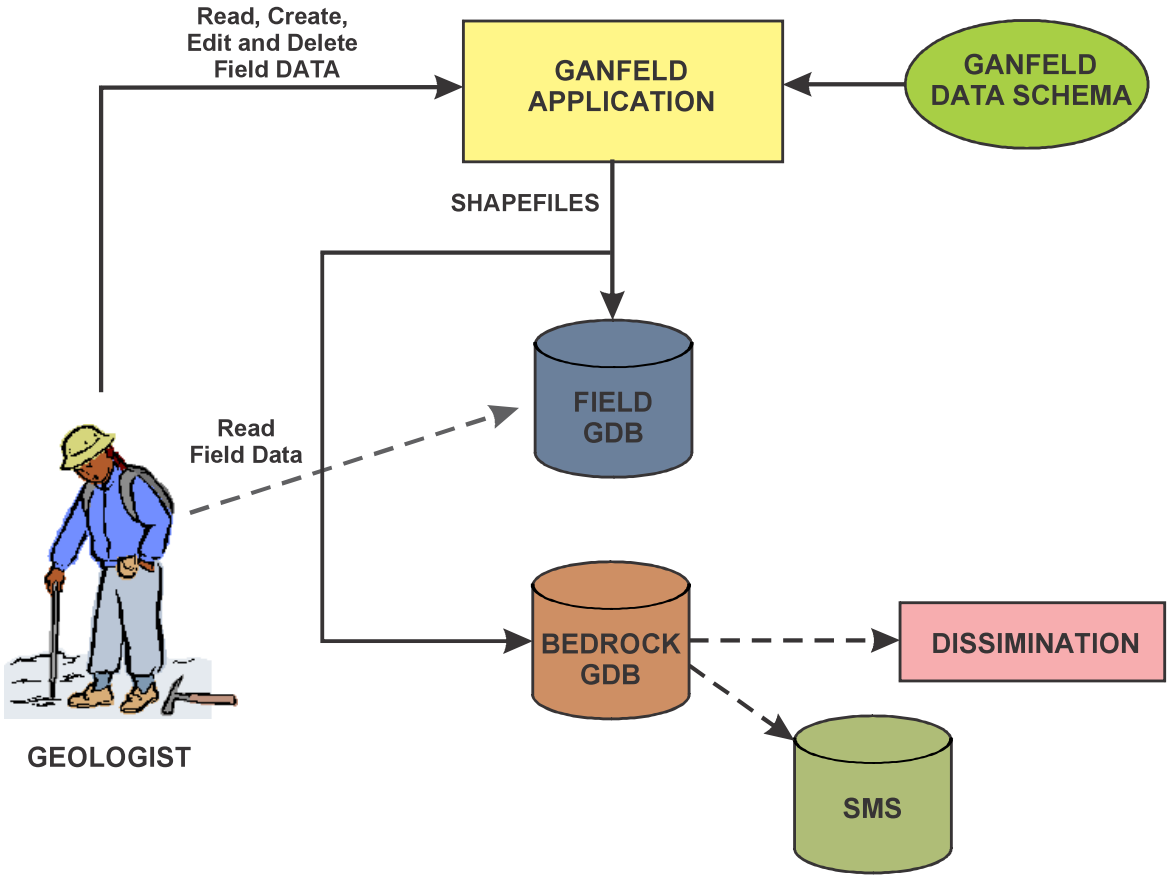
- GMF's operational requirements (**integrated workflow** from field data collection up to data ready for dissemination processes),
  - **Field work specific requirements** (use of GanFeld system, traverse planification, backup processes, etc…),
  - **Post- field work requirements** (geological interpretation, data integration to corporate databases, etc…),
  - **Metadata requirements** (ensure the input of proper metadata at all stages of the workflow).
  - Ensure **data interoperability** by using common scientific language and standards.

Approach

- Centralize all development around a **normalized database**,
- Develop **tools** that allow seamless data flow,
- Provide an **effective and easy to use** working environment.

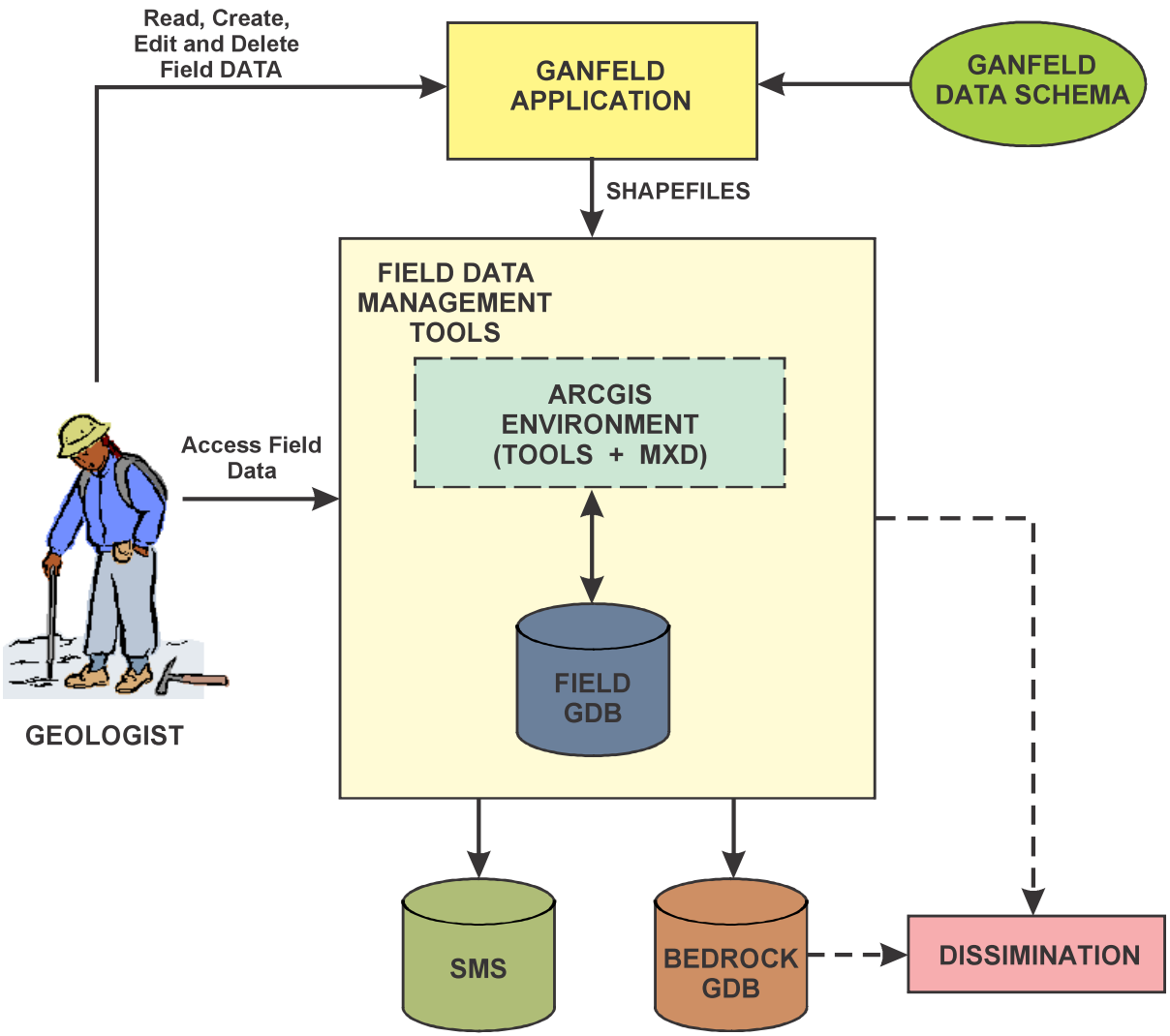
Approach

Flow change: Ganfeld centric / different databases



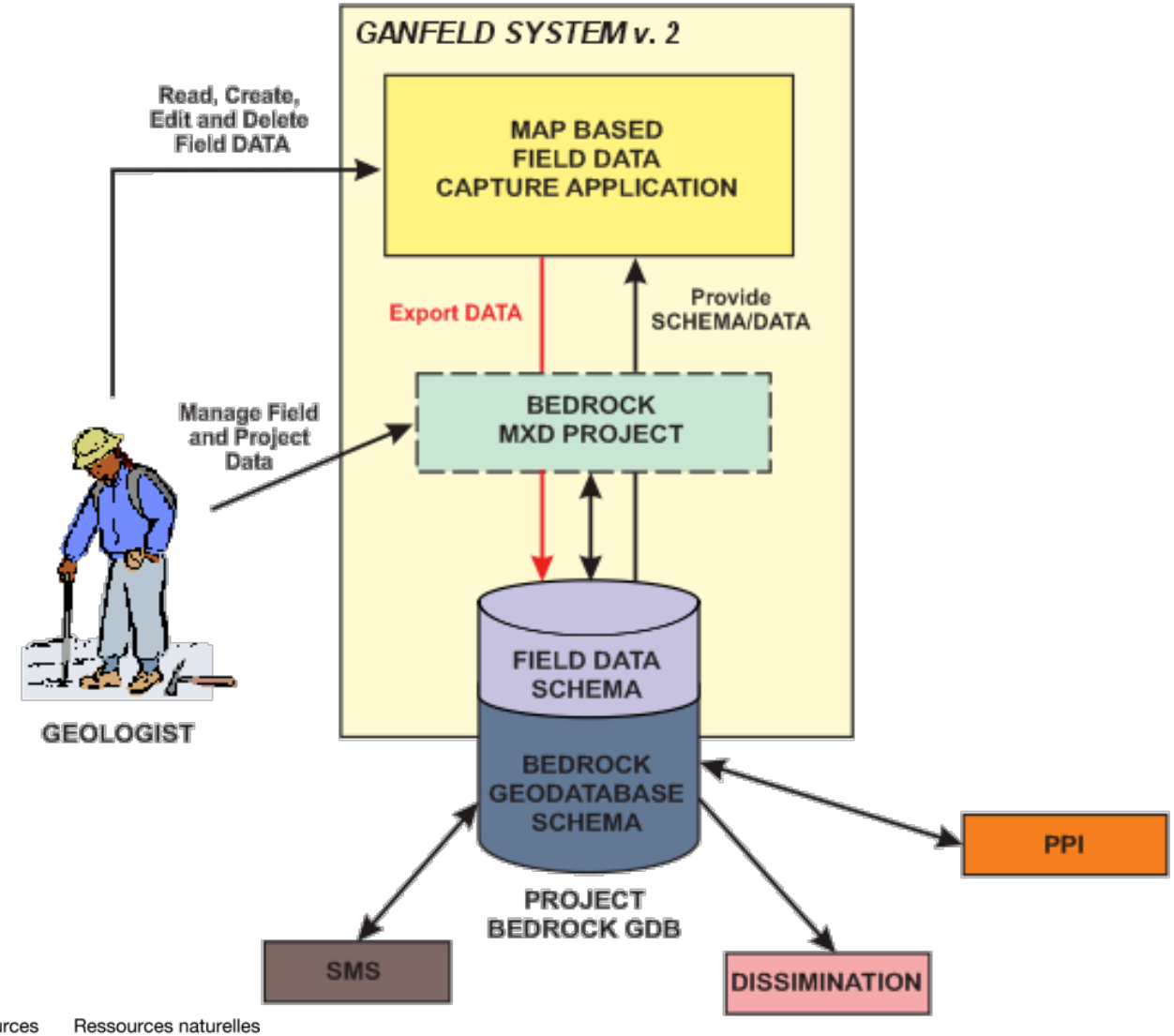
Approach

Flow change: adding tools to manage flow



Approach

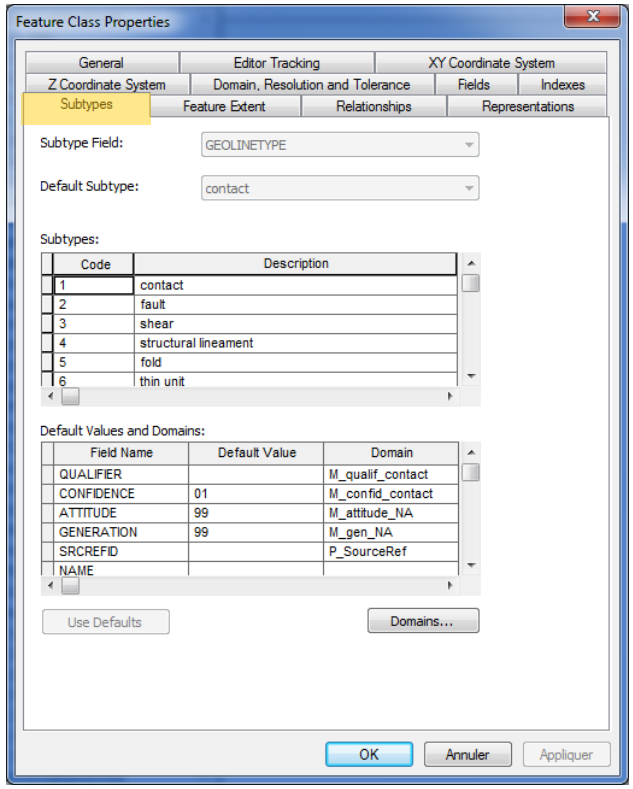
Flow change: A normalized database and its tools for flow management.

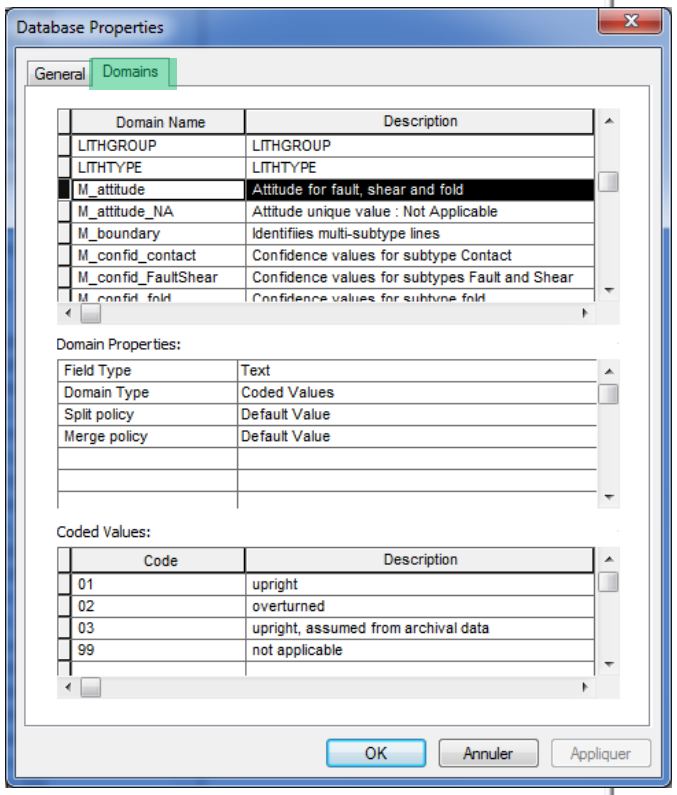


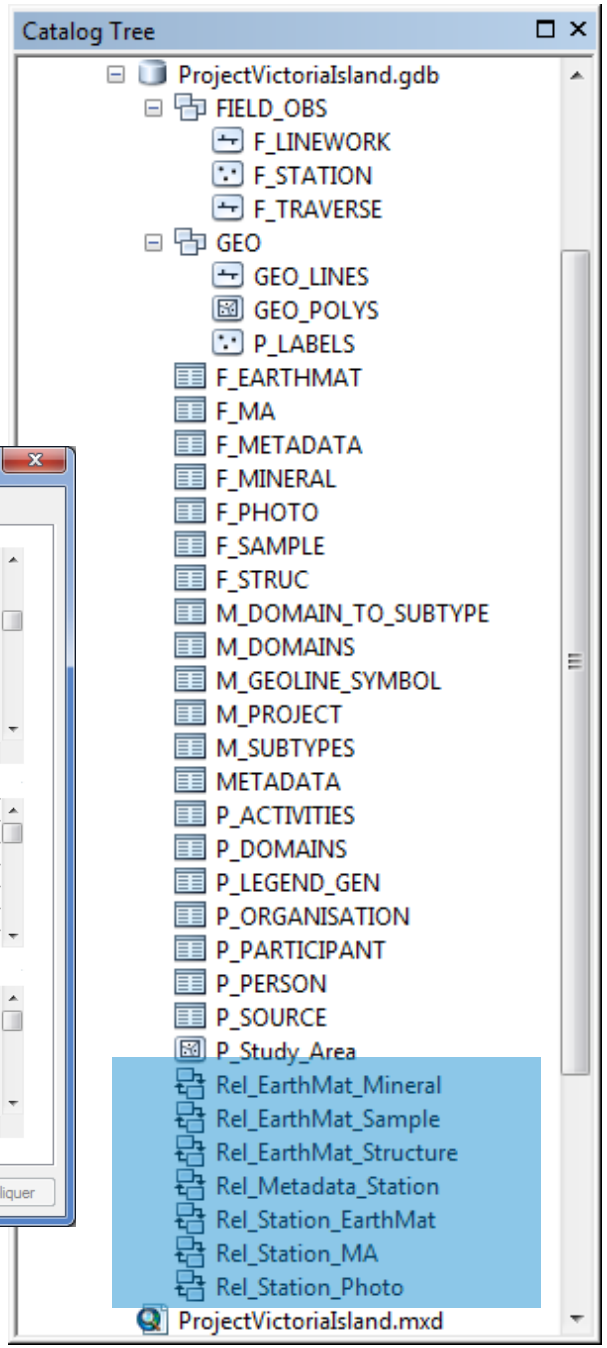
Approach: Normalized Database

Structured to:

- maintain integrity of data -> subtypes, domains and relations



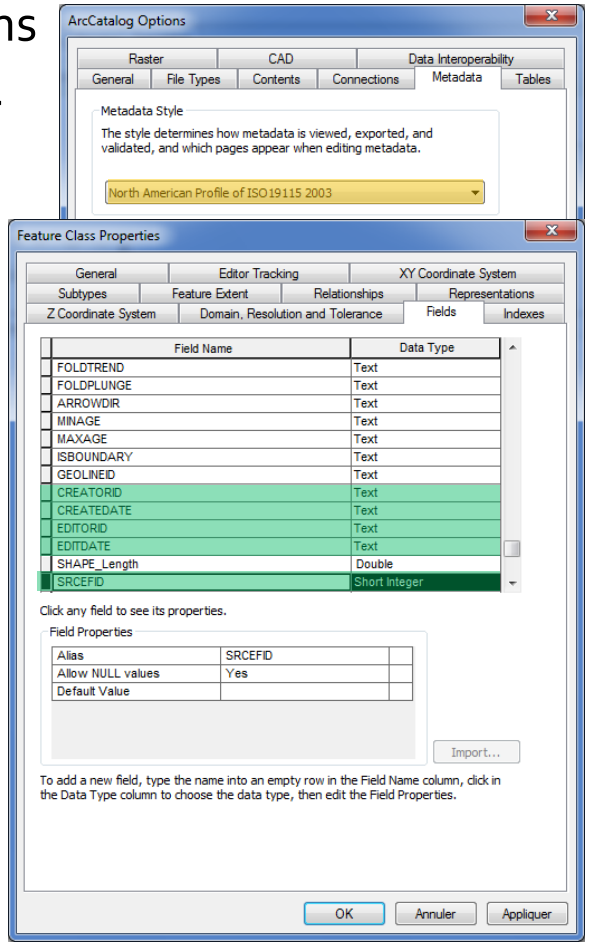


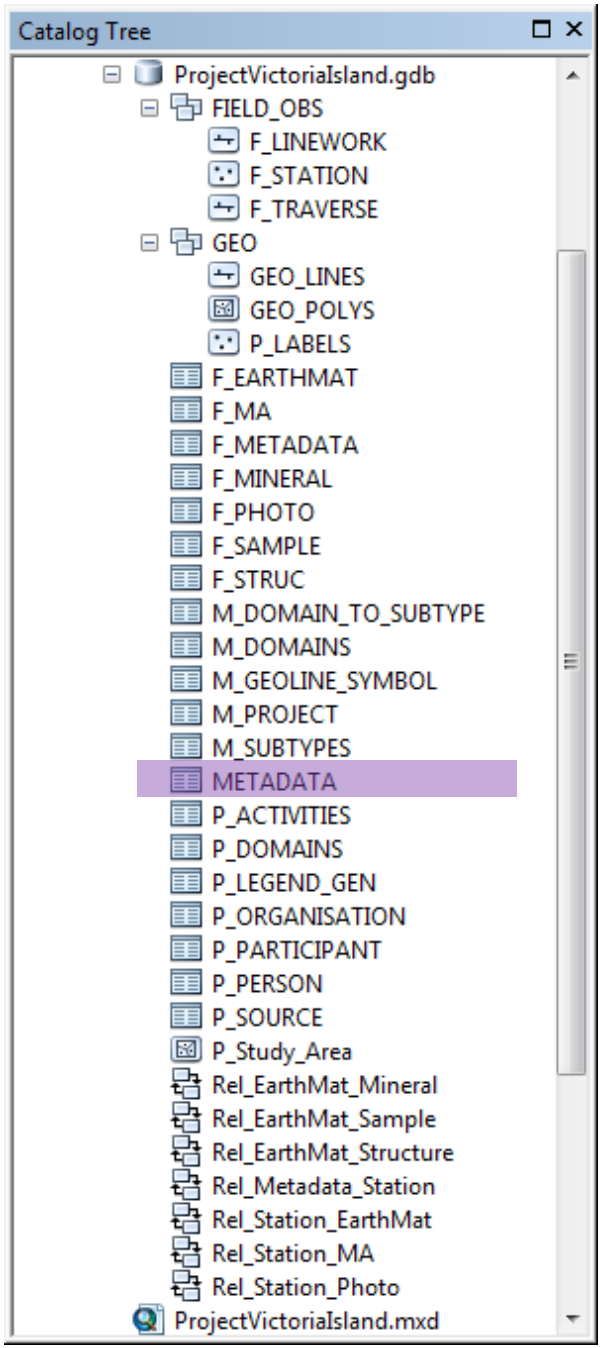


Approach: Normalized Database

Structured to:

- maintain integrity of data -> subtypes, domains and relations
- support metadata ->
  - at all level
    - Features
    - Project
    - Documents

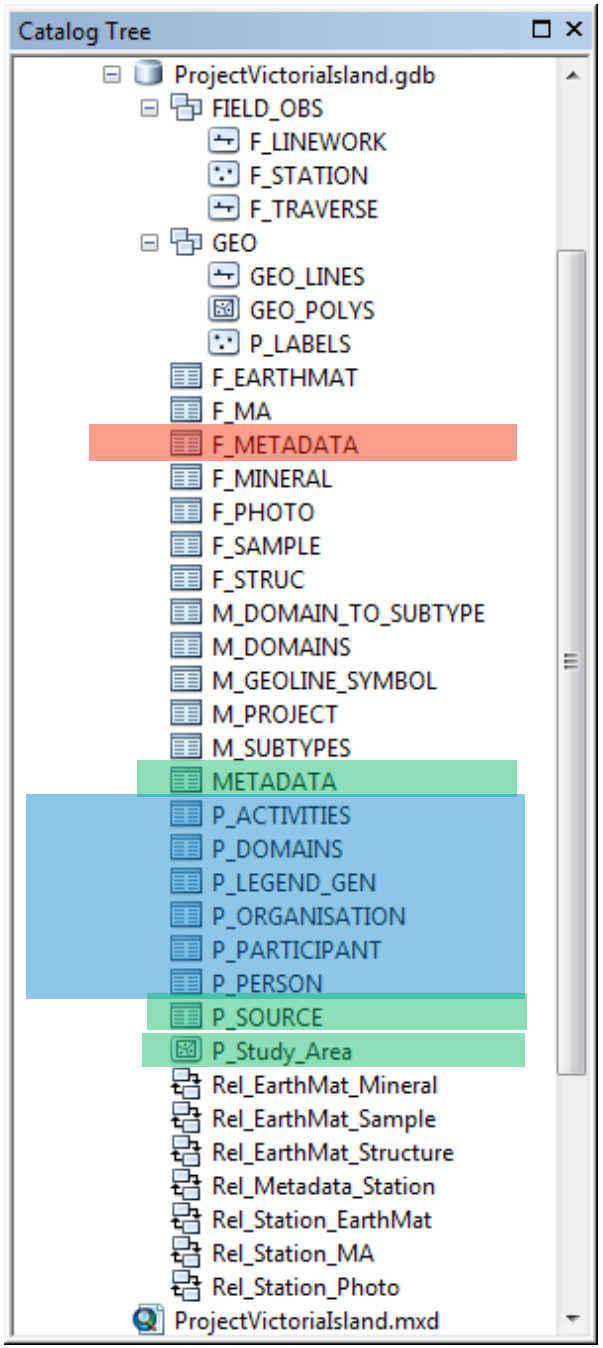




Approach: Normalized Database

Structured to:

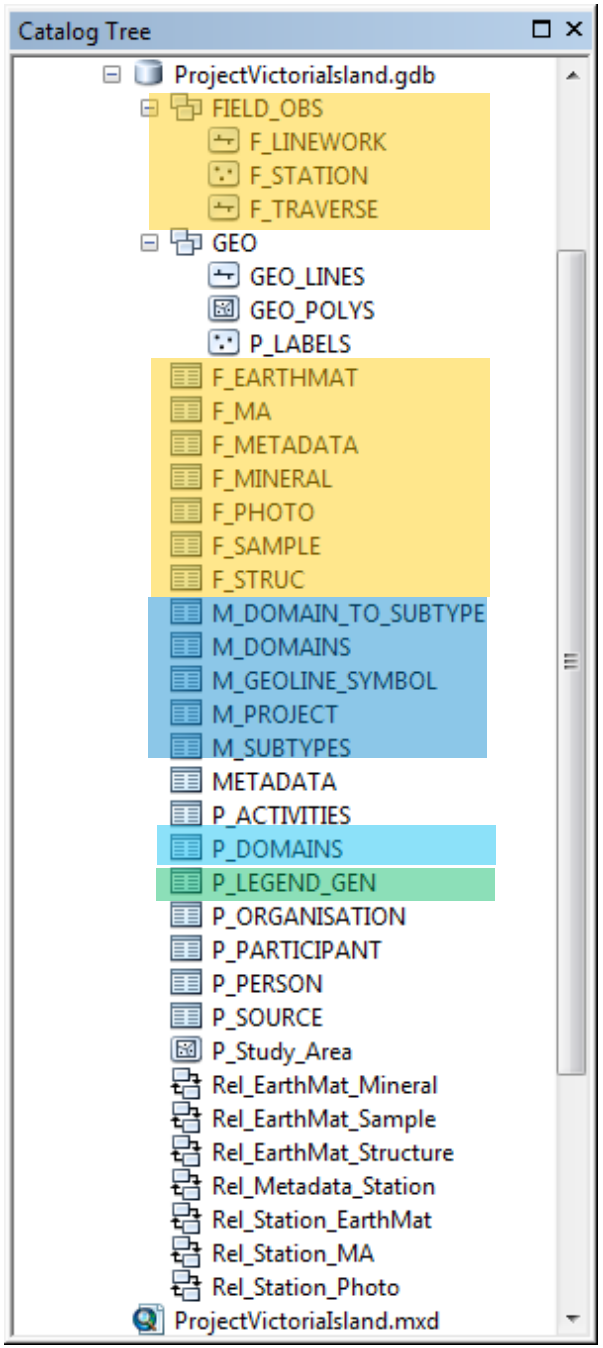
- maintain integrity of data -> subtypes, domains and relations
- support metadata ->
  - at all level
    - Feature
    - Project
    - Documents
  - in each step
    - Pre-field
    - Field
    - Publication



Approach: Normalized Database

Structured to:

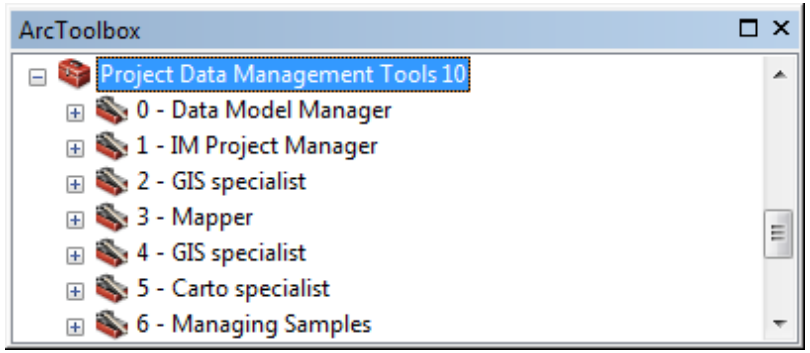
- maintain integrity of data -> subtypes, domains and relations
- support metadata ->
  - at all level
  - in each step
- collect field data -> axf structure or…
- use common scientific language -> standard dictionary
- Use specific project language -> will have to be standardized
- Facilitate thematic mapping and legend -> specific table used for mapping but also for descriptive notes

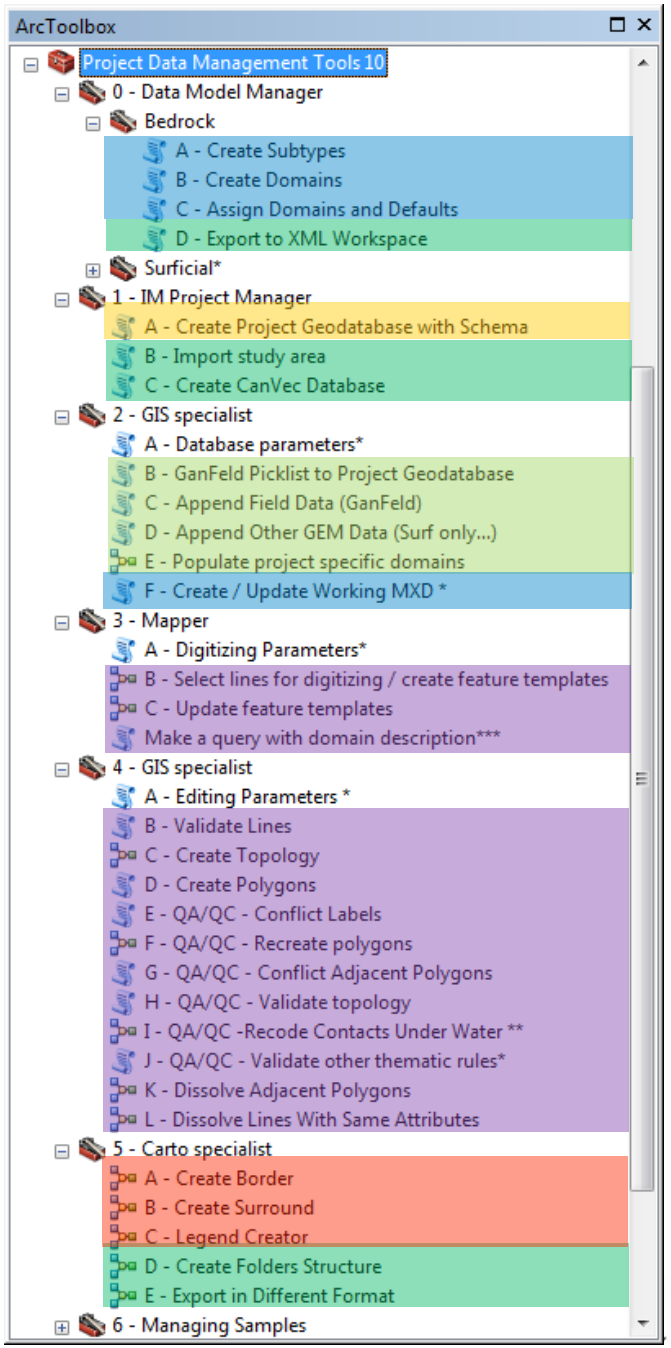


Approach: Tools

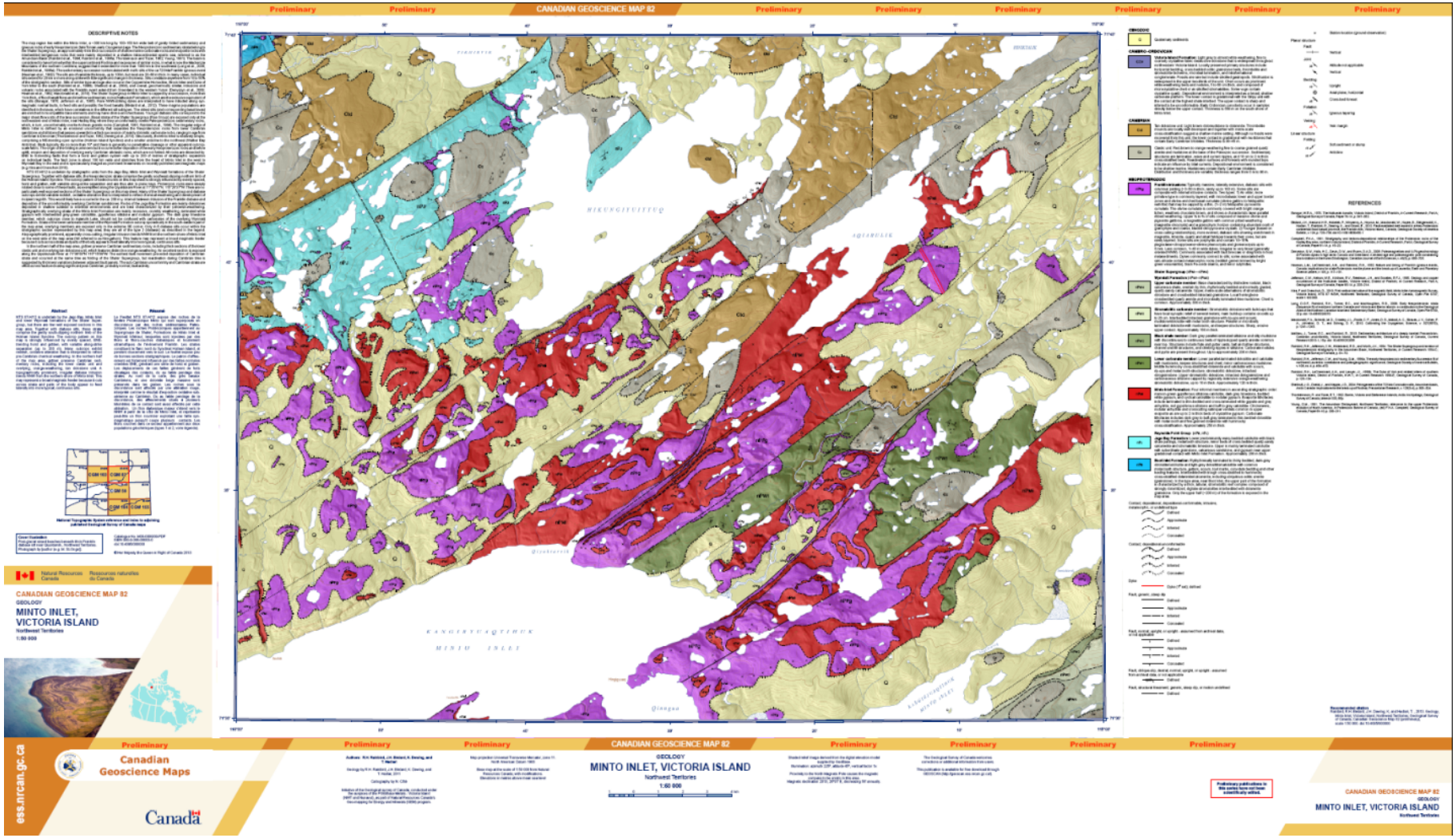
Development of tools are:

- Proposed with a flow based on actors and time
- File management
- Data management
- Simplify interaction with ER database
- Simplify digital maps management
- Maintain easy interopability
- Simplify standard map creation…



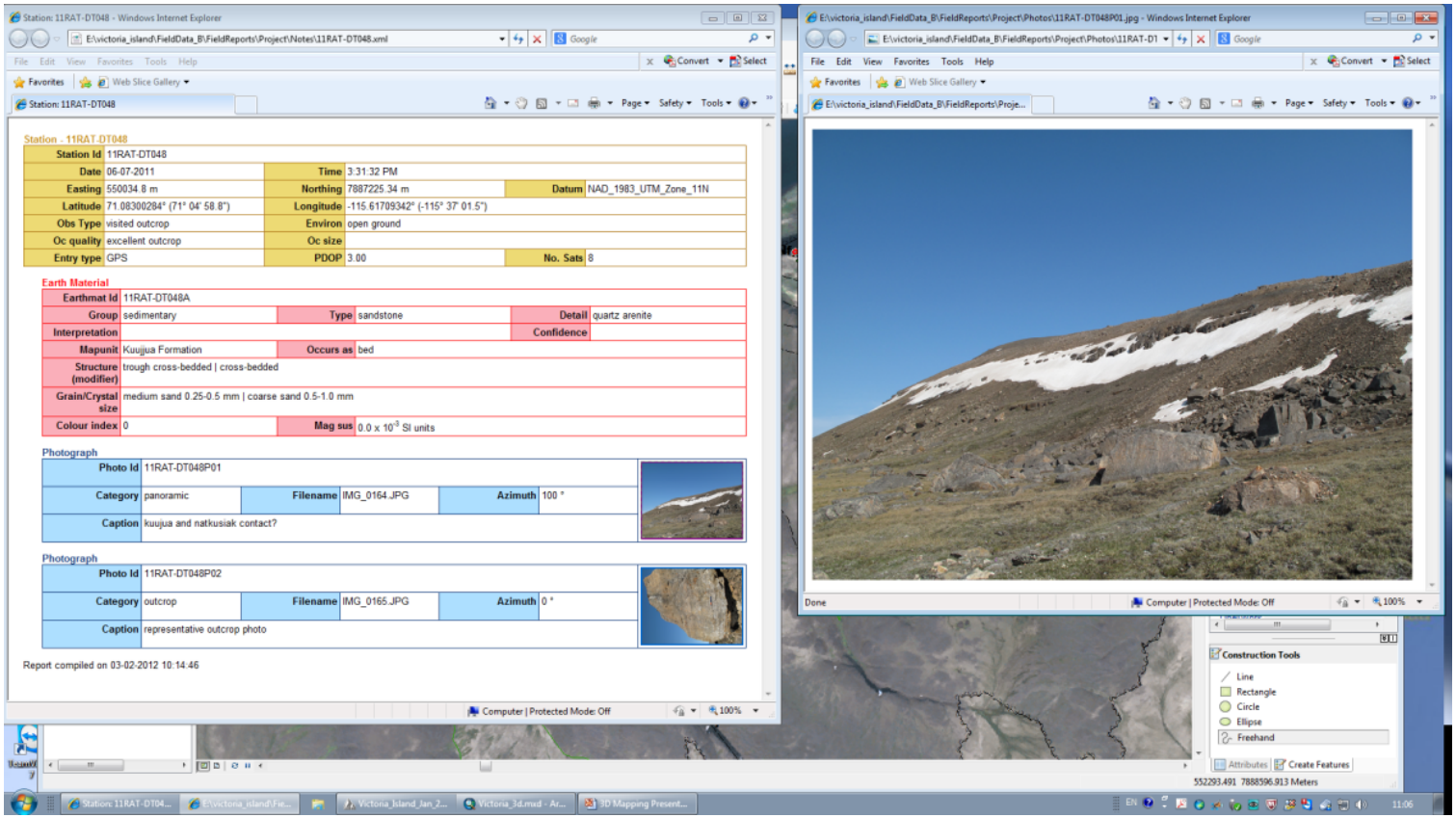


Conclusion


Preliminary
CANADIAN GEOSCIENCE MAP 82
DESCRIPTIVE NOTES
CANADIAN GEOSCIENCE MAP 82
GEOLOGY
MINTO INLET, VICTORIA ISLAND
Northwest Territories
1:60 000
Canadian Geoscience Maps
ess.nrcan.gc.ca
Canada
REFERENCES

What we have learned

- Need special features to get the seal of approval :
  - Feature templates
  - XML Report with hyperlink



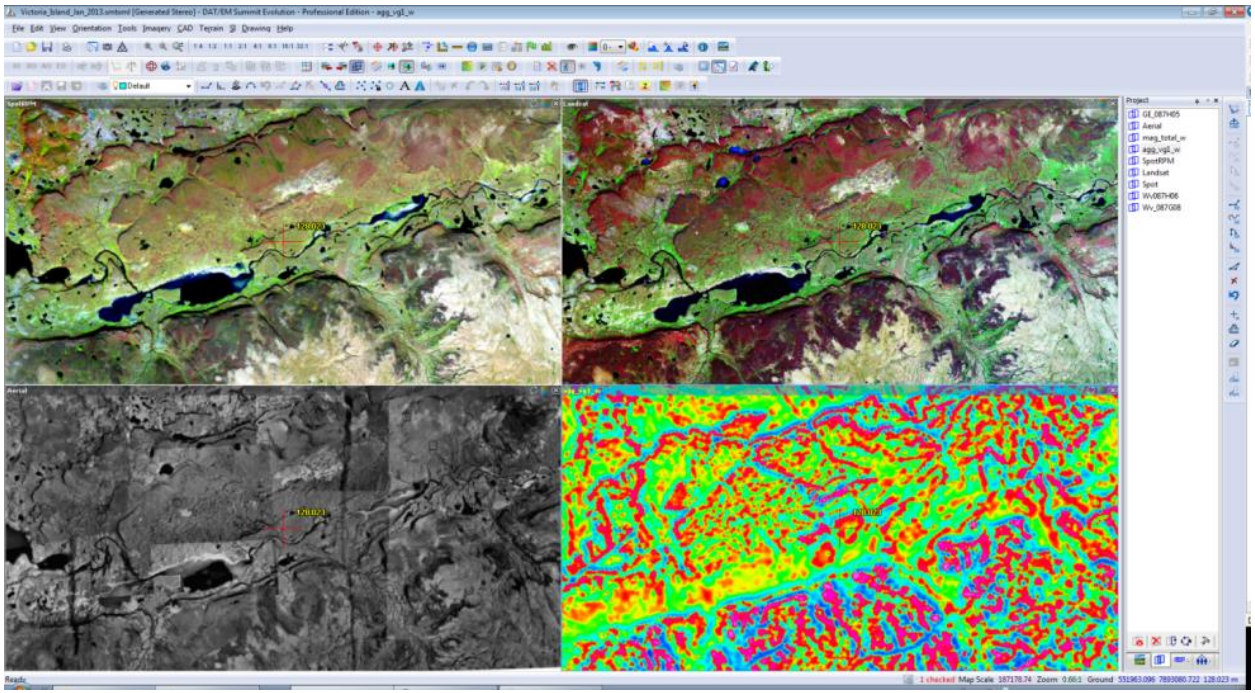
What we have learned

- Need special features to get the seal of approval :
  - Feature templates
  - XML Report with hyperlink
  - Digitize in 2.5 D

What we have learned

Need special features to get the seal of approval :

- Feature templates
- XML Report with hyperlink
- Digitize in 2.5 D
- Multi-source data



What we have learned

- Need special features to get the seal of approval :
  - Feature templates
  - XML Report with hyperlink
  - Digitize in 2.5 D
  - Multi-source data
- Facilitate data migration to corporate databases
  - Sample Management System (SMS)
  - Photo library (metadata)
- Need interface for non GIS person for query and entering data
- Will have to find new hardware to collect data
- **People and knowledge are the most important…**

What we have learned with tools

- Pros
  - Easy to recommend a flow
  - Less manipulation of files
  - Easier to maintain integrity of data
  - Use a configuration file, declare general variables and process in one script,
  - Use model builder to plan our development and python to implement tools
- Cons
  - Black box
  - Export from model builder to python is not working

Where are we going with all this…

- Tools development
  - For entering metadata at each step
  - Domain/Sutbypes --> Being able to query with description instead of code
  - For geologist… user requirement first…
- Incorporate carto representation
- Make Maps…

Thanks to

- Christine Deblonde for the model… the bedrock database is based on the Christine's development on surficial geodatabase
- Andy Moore for pushing GMF
- GanFeld Group for development and ideas
- and future collaborators…

Probably more of a "Geo Data Flow"

- As we start from the very first step, the field,
- As we maintain more data than the map can show -> scale representation limitation
- As we maintain more metadata than a paper map can show -> feature level metadata
- As we use dictionary, topology, process.

Good times in field give us a lot of idea

Other Link…

- Field data capture
  - http://pubs.usgs.gov/of/2004/1451/buller/
- Ganfeld supporting TOOLS for Field Data Management
  - http://ngmdb.usgs.gov/Info/dmt/docs/DMT12_Brouillette.pdf
- Other Field data capture
  - BGS SIGMA 2012 - Open Source - v1.0
- Digitize in 2.5D
  - http://www.datem.com/summit-evolution
  - http://www.datem.com/capture-for-arcgis
- IkeGps Esri Partner
  - http://www.ikegps.com/download-case-studies
- Why not - Ballon kit…
  - http://publiclaboratory.org/wiki/balloon-mapping-kit