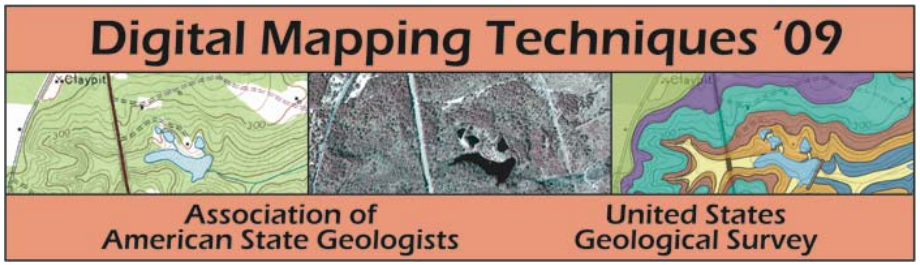

The following was presented at DMT'09 (May 10-13, 2009).

The contents are provisional and will be superseded by a paper in the DMT'09 Proceedings.

See also earlier Proceedings (1997-2008)
http://ngmdb.usgs.gov/info/dmt/

Web services to assemble pieces of a geoscience information network

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Arizona Geological Survey

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Motivation

- Access to geologic maps via the web
- Make it simple to find and utilize geologic maps in georeferenced views.
- WMS service is relatively mature
- Setup is not difficult
- Many clients

How

- Catalog service—discovery
  - Access from wthin application
  - Access from separate application that facilitates opening in user GIS
- WMS
  - Get map image with symbolization already done
  - Provides legend and simple get feature info

Components

- Catalog—metadata registry
- Catalog service
- Catalog application
- GIS geologic map
- Web map server
- WMS client

Catalog

- Database
  - Contains necessary content in separate fields that can be mapped to metadata interchange format
- Content model
  - Author, title, abstract, extent, date modified, identifier, publisher, language, type, format
  - Dublin core, FGDC, ISO 19115, CSW common

Catalog service

- Filter syntax– CQL, OGC Filter.
  - Encoding of first order logic to express search criteria
- Operations
  - getCapabilities, getRecord, getRecordByID, describeRecord, Transaction (insert, delete, update) or Harvest
- Schema to encode metadata (xml--e.g. ISO 19139)
- Common querable and returnable properties
  - Shortcuts to express common search criteria

Search application (the client)

- Interface (e.g. web page) to assist users to compose and submit queries
  - Might provide pick lists from standard vocabularies
  - Mapping to query schema
- Formats results for easy interpretation
- Provides links to related resources, other features to add value for users
- **If communication with catalog is via service, don’t have to build separate client for each catalog server**

Geologic map content

- Georeferenced digital data
- Symbolized
  - Have to use symbolization tools available in map server
- Polygons and undecorated lines for faults and contacts are simplest

Web map service

- Produces raster images for maps
- Different environments have different symbolization schemes
  - Free open source servers have limited symbolization capability
- Simple get feature info (single point), commonly servers allow use of templates to provide html formatting for results

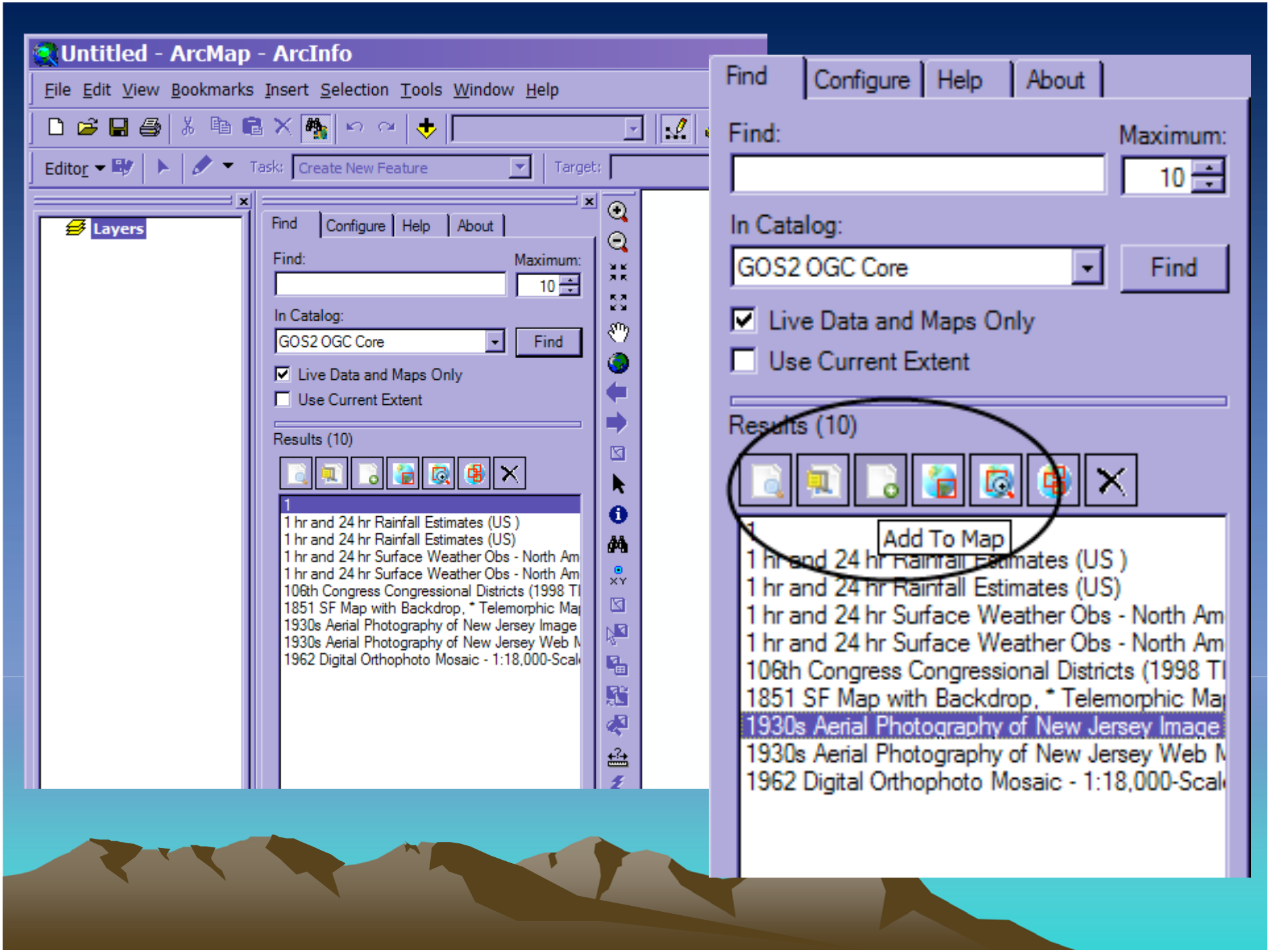
WMS client

- Requests a particular map portrayal for the current view frame
- Does mapping from view coordinates to geographic coordinates for requests
- Provides uses with tools to turn ‘layers’ on and off, request legend, and get feature info (info click).

Walk through

Catalog client integrated into WMS client

1. Search catalog
2. Pick service
3. Add to project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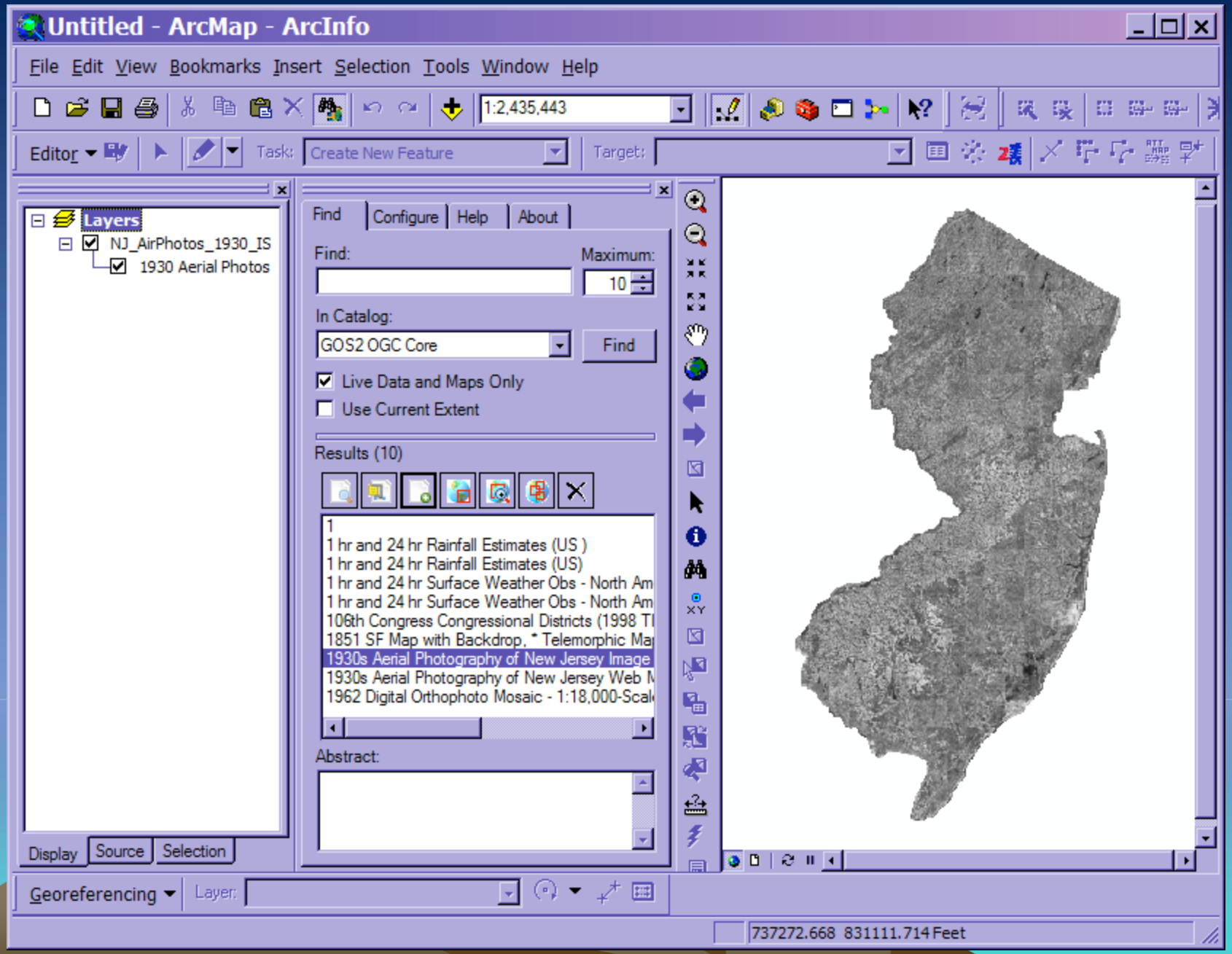
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1930s Aerial Photography of New Jersey Image
1930s Aerial Photography of New Jersey Web M
1962 Digital Orthophoto Mosaic - 1:18,000-Scal
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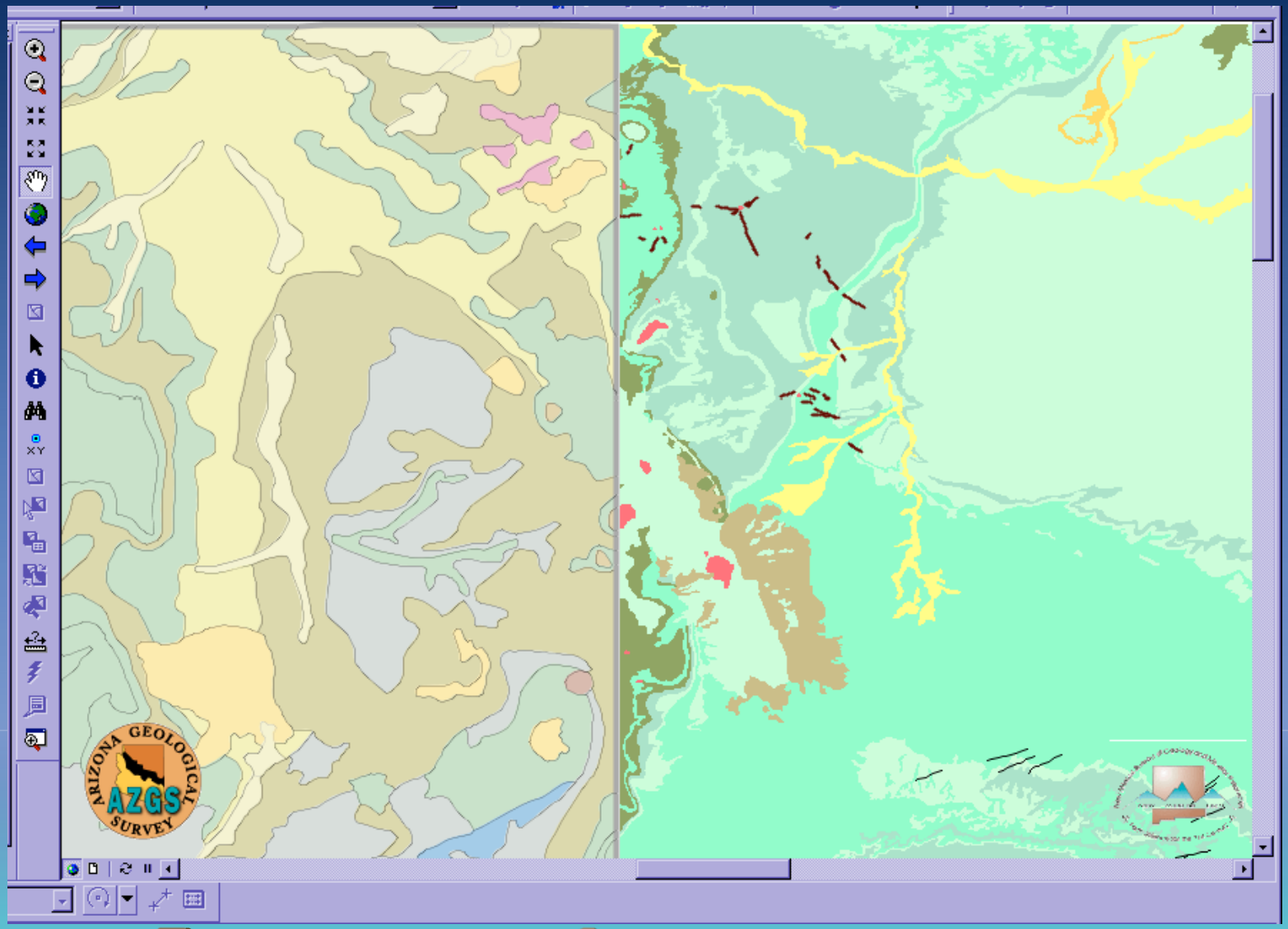
Social considerations in federated data network

- Services should provide branded maps, like google
- Catalogs need to carry information about original source of metadata and catalog that delivered
- Some kind of feed back essential to data providers

WMS images need to be ‘watermarked’



Catalogs need to identify sources

How do I get started...

- Set up a WMS
  - Use an existing server you've got
  - Find a 'buddy' agency that can host your service (NGMDB, other state survey...)
  - Run and Amazon Virtual Machine ($70/month)
- Register service with catalogs:
  - NGMDB map catalog
  - GEON
  - One Geology

Conclusion

- WMS technology is mature enough to roll out production delivery systems
- Implemention of standardized catalog service will enable integration of existing catalogs for more effective resource discovery

Thank You