

# Sharing and Accessing Remote Sensing Data for Wetland Analysis

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**SharedGeo**





- 2 countries
- 8 states
- 1 province
- Several regional organizations
- Lots of counties, watershed districts, cities ....







# Orthos





# Obliques

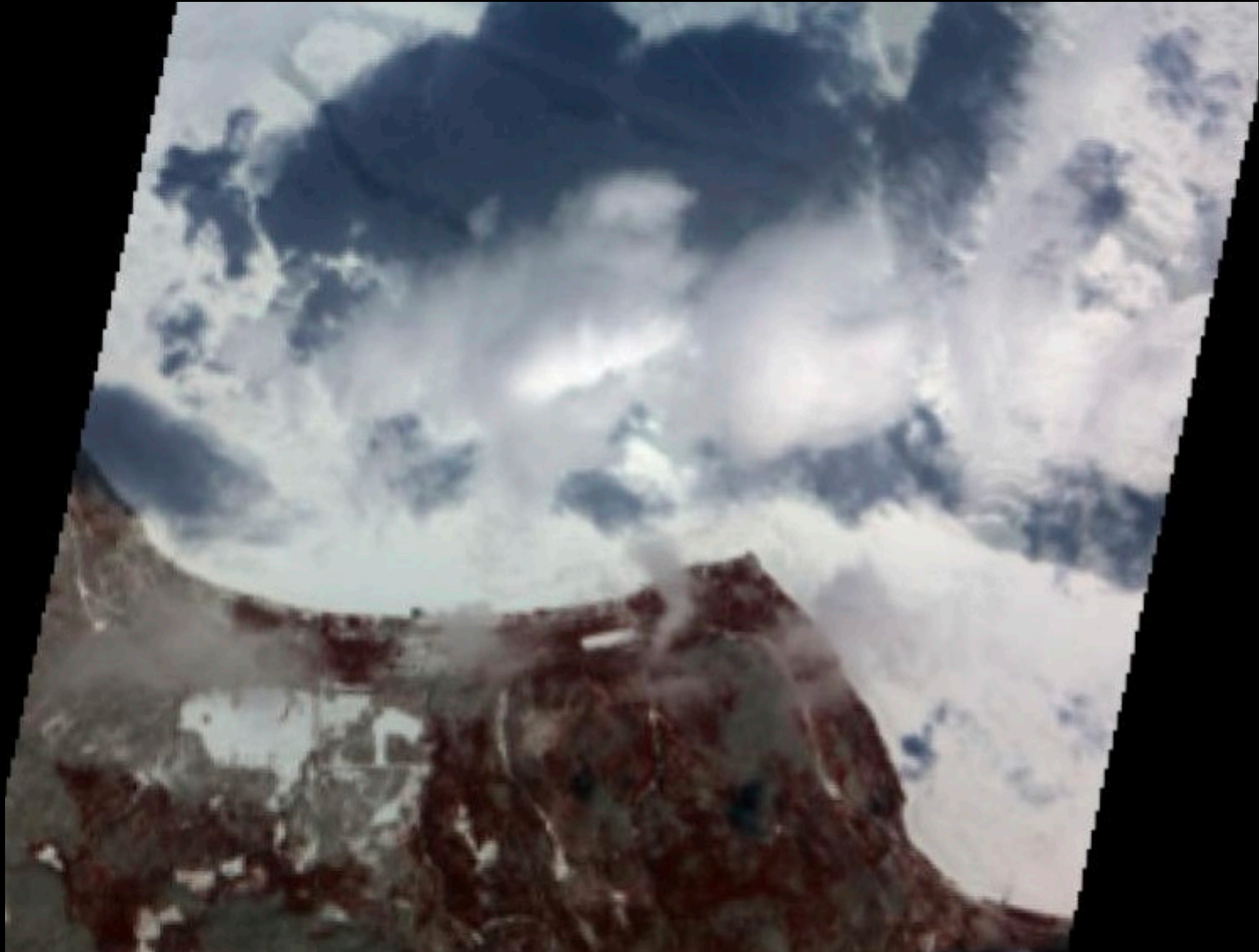




# Radar

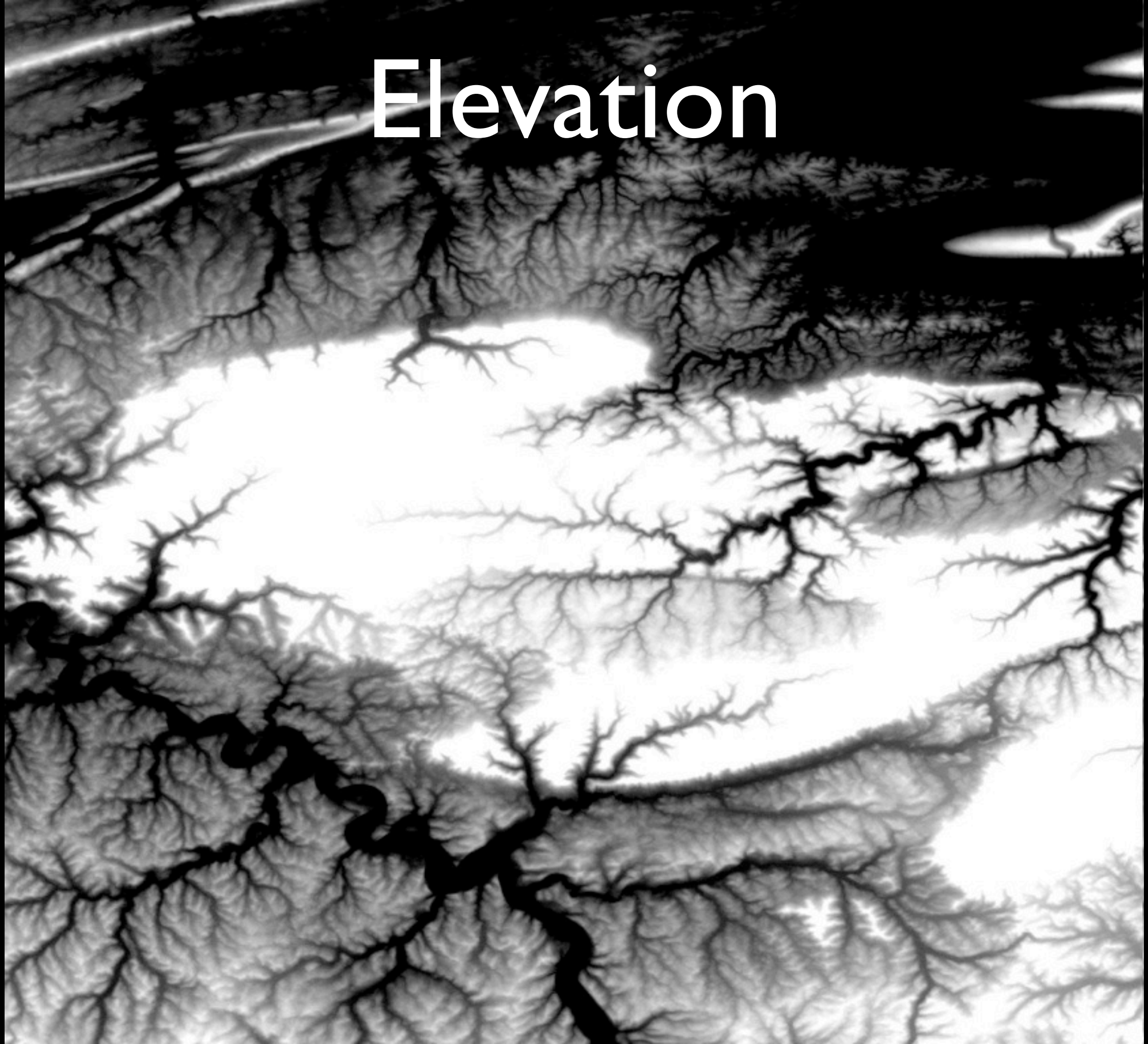


# Hyperspectral (EO-1)





# Elevation





# Stereo





# 3D Models







2

3

4

5

JESCO

2/3



# Standardized Metadata

## ▼ IDENTIFICATION INFORMATION

### ▼ Citation Information

Originator	Natural Resources Research Institute
Publication Date	Unknown
Title	GLEI Complex-specific Watersheds
Geospatial Data Presentation Form	vector digital data
Online Linkage	<a href="http://gisdata.nrri.umn.edu/nrgisl/proj/GLEI2/shapefiles/glei_watersheds.shp">http://gisdata.nrri.umn.edu/nrgisl/proj/GLEI2/shapefiles/glei_watersheds.shp</a>

Abstract	<p>GLEI complex-specific watersheds</p> <p>Complexes represent the "ecological unit" evaluated by a sampling event (locale). Where possible these have been drawn to include as many subprojects as possible. This may mean stretching a subproject's normal definition of "ecological unit", but is a trade-off to allow subproject overlap.</p> <p>Complexes are identified by arbitrary unique numbers in the complex_num field of the a_locale table. Locales that share the same complex_num value are in the same complex.</p> <p>Watersheds have a one-to-one relationship with complexes and share their arbitrary unique id numbers. In some cases where complexes exist up stream from each other, their corresponding watersheds overlap.</p>
Purpose	Complex-specific Watersheds are watersheds defined as land area draining into a GLEI Complex. They provide a logical unit for summarizing the results of multiple GLEI investigators

### ▼ Time Period of Content

Calendar Date	unknown
Currentness Reference	publication date

### ▼ Status

Progress	Complete
Maintenance and Update Frequency	As needed



# Catalog Standards

- Catalog Web Service (CS-W)
- CSW is a standards-compliant way to serve metadata about data, services
- Metadata can be harvested from other data catalog and/or service
  - CSW, Z39.50, WAF, WMS, GeoNetwork nodes



# Spatial Data Catalog

Harvests and catalogs metadata and services

A catalog web service (CSW) is published. This can be queried from the web map and more

Metadata and services

JavaScript CSW Connector

GeoNetwork  
OpenSource

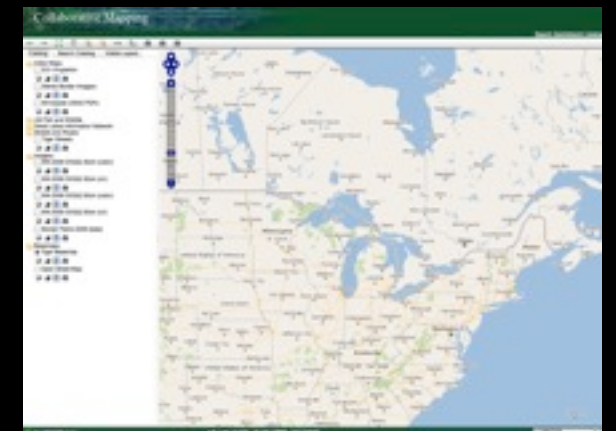
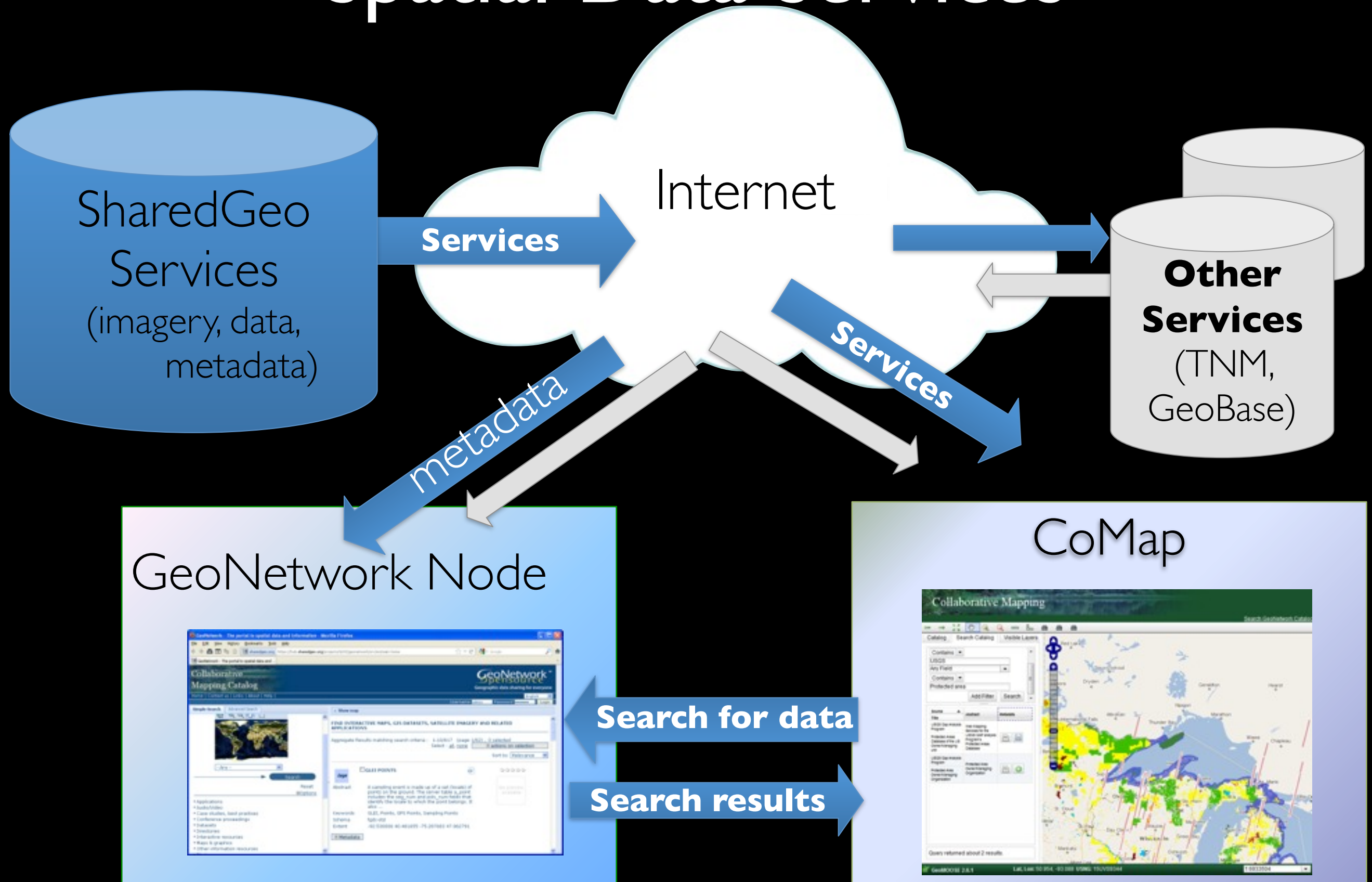
A screenshot of the Great Lakes Restoration Initiative Collaborative Mapping web interface. The page displays a table of data layers, including their names, formats, and availability. The table is organized into columns for layer name, format, and availability. The interface is designed for users to explore and access spatial data and services related to the Great Lakes Restoration Initiative.

Image Type	Metadata Link	Public / Private	Public / Private	When to Map / Download	Service Link
PAULS_PALMSP_121				PAULS_PALMSP_121	
PAULS_PALMSP_122				PAULS_PALMSP_122	
PAULS_PALMSP_123				PAULS_PALMSP_123	
PAULS_PALMSP_124				PAULS_PALMSP_124	
PAULS_PALMSP_125				PAULS_PALMSP_125	
PAULS_PALMSP_126				PAULS_PALMSP_126	
PAULS_PALMSP_127				PAULS_PALMSP_127	
PAULS_PALMSP_128				PAULS_PALMSP_128	
PAULS_PALMSP_129				PAULS_PALMSP_129	
PAULS_PALMSP_130				PAULS_PALMSP_130	

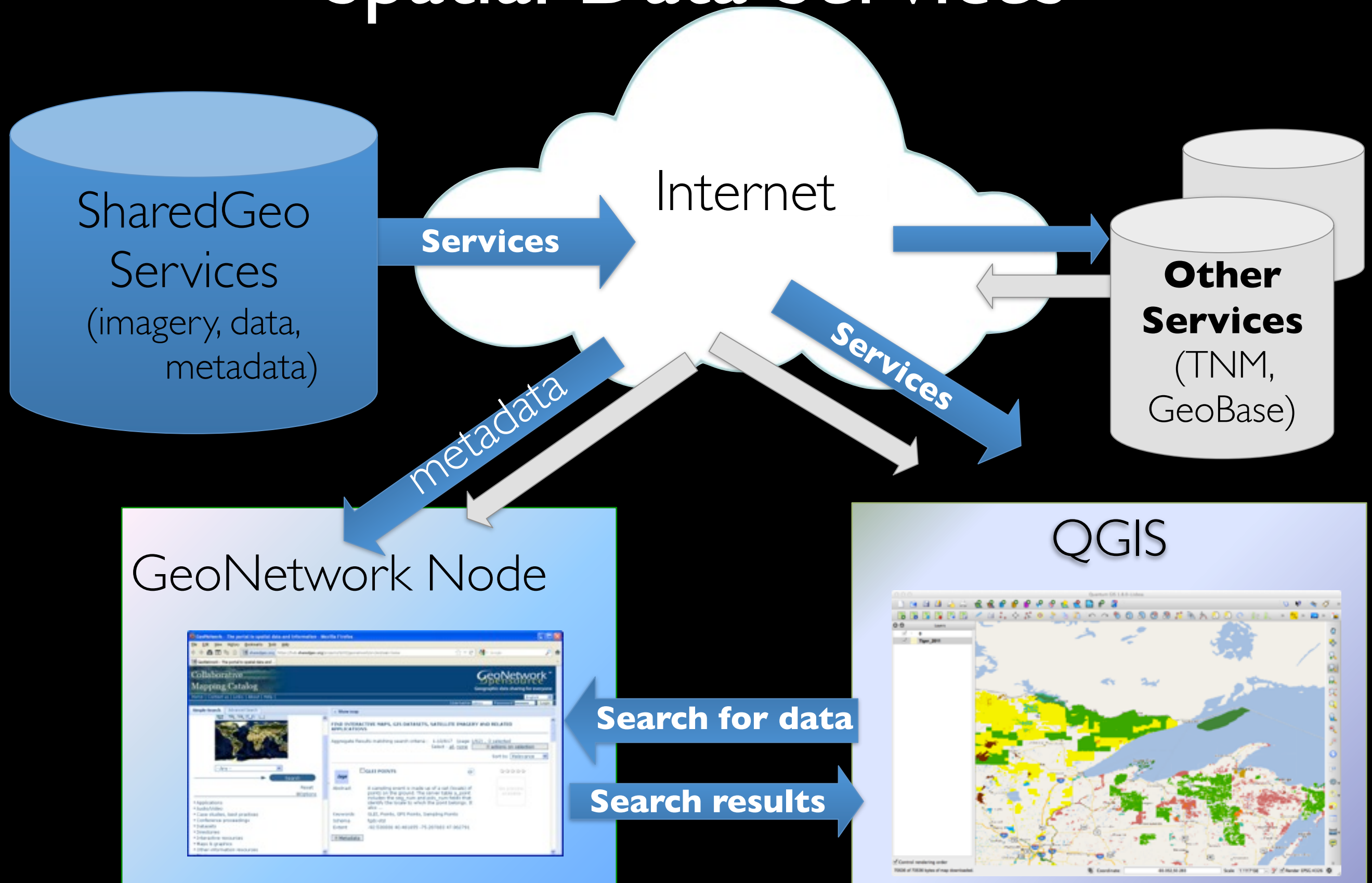


# Spatial Data Services



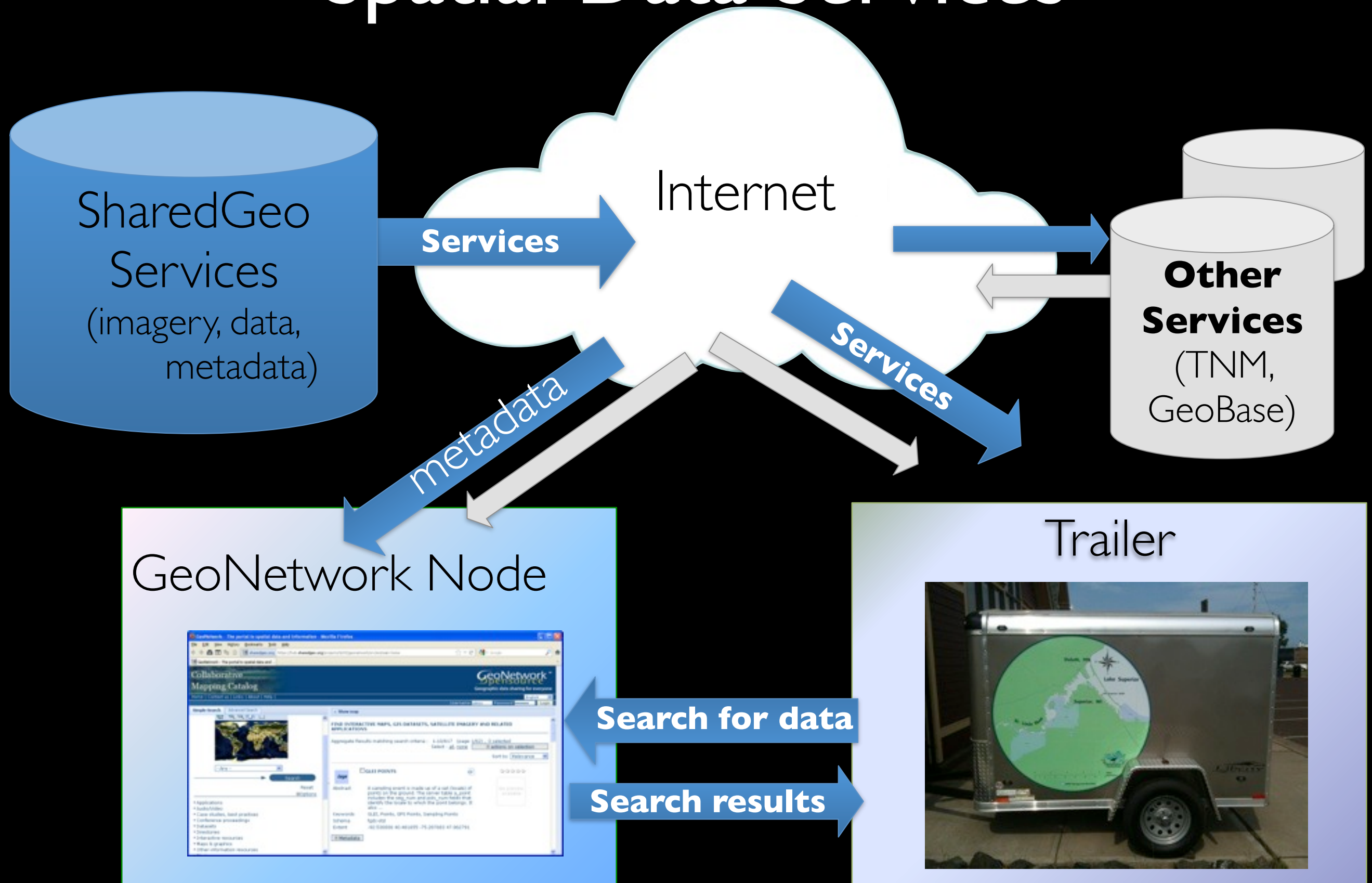


# Spatial Data Services





# Spatial Data Services







Catalog Search Catalog

- Index Maps
  - ☐ EO-1/Hyperion
  - ☐ Stereo Border Imagery
  - ☐ Minnesota USNG PDFs
- US Fish and Wildlife
- Great Lakes Information Network
- Streets and Roads
- Imagery
- Basemaps
  - ☐ Tiger Basemap
  - ☒ Open Street Map



Data, imagery and map information provided by MapQuest, Open Street Map <http://www.openstreetmap.org/> and contributors, CC-BY-SA <http://creativecommons.org/licenses/by-sa/2.0/>



# Collaborative Mapping

Search GeoNetwork Catalog

Catalog Search Catalog Visible La

- Index Maps
- US Fish and Wildlife
- Great Lakes Information Network
- Streets and Roads
- Imagery
  - MN 2009 DOQQ 30cm (color)
  - MN 2009 DOQQ 30cm (cir)
  - MN 2009 DOQQ 50cm (color)
  - MN 2009 DOQQ 50cm (cir)
  - Border Patrol 2009 (beta)
- Basemaps
  - Tiger Basemap
  - Open Street Map

Data, imagery and map information provided by MapQuest, Open Street Map <http://www.openstreetmap.org/> and contributors, CC-BY-SA <http://creativecommons.org/licenses/by-sa/2.0/>



# Collaborative Mapping

[Search GeoNetwork Catalog](#)



Catalog Search Catalog Visible La

- Index Maps
- US Fish and Wildlife
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  - ☐ MN 2009 DOQQ 30cm (color)
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  - ☐ Tiger Basemap
  - ☒ Open Street Map



Data, imagery and map information provided by MapQuest, Open Street Map <http://www.openstreetmap.org/> and contributors, CC-BY-SA <http://creativecommons.org/licenses/by-sa/2.0/>



# Collaborative Mapping

Search GeoNetwork Catalog

The screenshot displays the GeoMOOSE 2.6.1 web application. The interface is divided into several sections:


- Top Toolbar:** Contains navigation icons for back, forward, home, search, and other map functions.
- Left Sidebar:**
  - Catalog:** A list of map layers including Index Maps, US Fish and Wildlife, Great Lakes Information Network, Streets and Roads, Imagery, and Basemaps.
  - Search Catalog:** A search input field.
  - Visible Layers:** A list of currently visible layers with checkboxes and icons for each.
- Main Map Area:** A satellite map showing a region with roads, water bodies, and urban areas. A vertical scale bar and navigation controls are visible on the left side of the map.
- Bottom Status Bar:** Displays the application name (GeoMOOSE 2.6.1), coordinates (Lat, Lon: 46.706, -92.247 USNG: 15TWM57587279), and a scale indicator (1:108336).

Data, imagery and map information provided by MapQuest, Open Street Map <http://www.openstreetmap.org/> and contributors, CC-BY-SA <http://creativecommons.org/licenses/by-sa/2.0/>



# Collaborative Mapping

Search GeoNetwork Catalog



Visible LayersFind Image Files

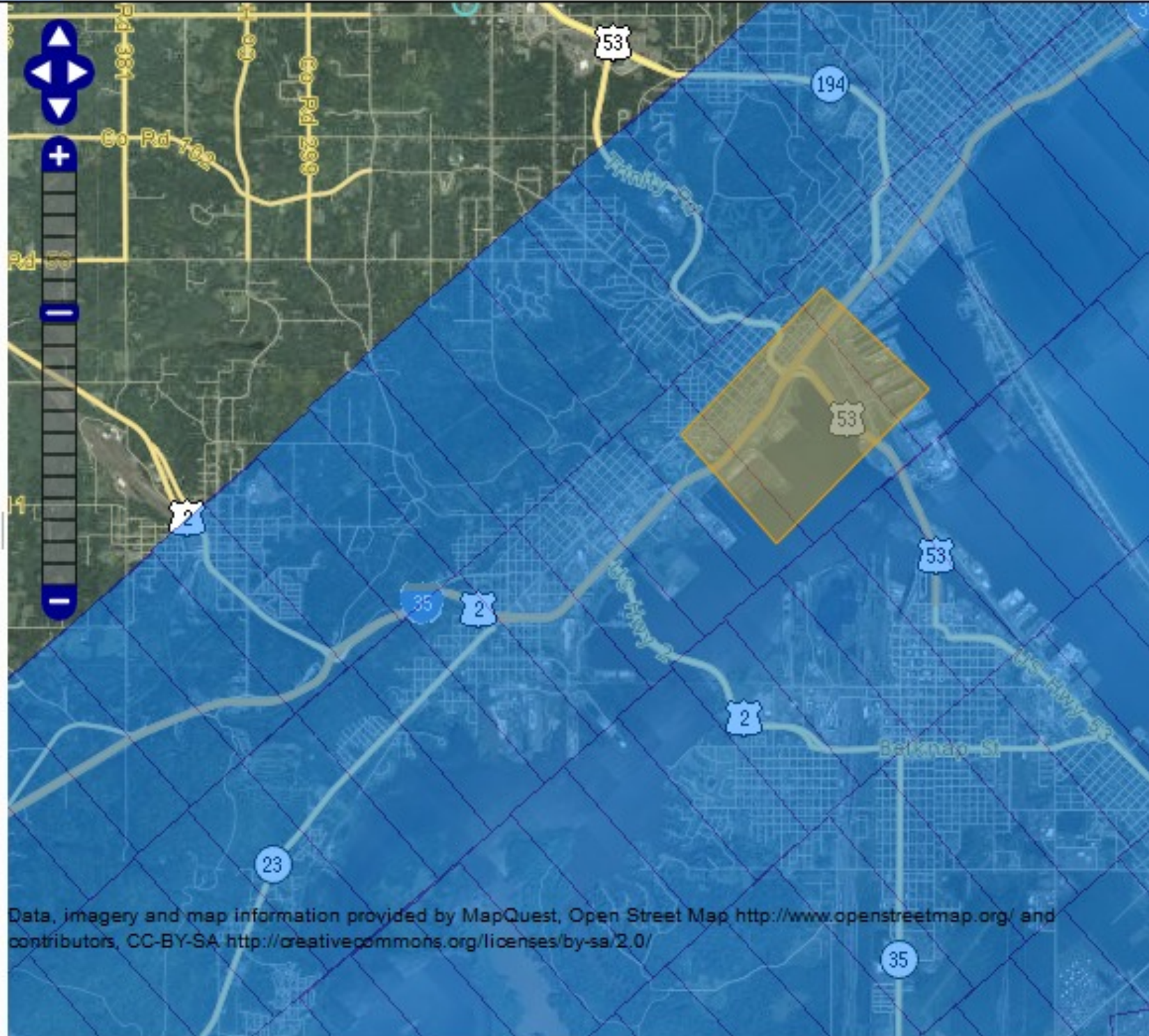
[Back to Settings](#)

Images available for the selection area:

**Border Patrol**

☐ [Border Stereo/MI0904/MI0904/58005\\_23.tif](#)  
☐ [Border Stereo/MI0904/MI0904/58005\\_24.tif](#)  
☒ [Border Stereo/MI0904/MI0904/58005\\_25.tif](#)  
☒ [Border Stereo/MI0904/MI0904/58005\\_26.tif](#)  
☐ [Border Stereo/MI0904/MI0904/58005\\_27.tif](#)  
☐ [Border Stereo/MI0904/MI0904/58006\\_25.tif](#)  
☒ [Border Stereo/MI0904/MI0904/58006\\_26.tif](#)  
☐ [Border Stereo/MI0904/MI0904/58006\\_27.tif](#)  
☐ [Border Stereo/MI0904/MI0904/58006\\_29.tif](#)

Download Checked Images



Data, imagery and map information provided by MapQuest, Open Street Map <http://www.openstreetmap.org/> and contributors, CC-BY-SA <http://creativecommons.org/licenses/by-sa/2.0/>







# Collaborative Mapping

Search GeoNetwork Catalog

The screenshot displays the GeoMOOSE 2.6.1 web application interface. The main map area shows a view of Lake Superior, including islands such as Ely, Bear, Superior, South Twin, Eagle, Hermit, Ashland, Paines, Chequamegon, Big Timber, and Strawberry. The map is overlaid with a grid of blue and red rectangular areas, likely representing different data layers or footprints. The interface includes a top toolbar with navigation and map controls, a left sidebar with a layer catalog, and a bottom status bar with coordinates and scale.

**Catalog** | **Search Catalog** | **Visible Layers**

- Index Maps**
  - ☒ EO-1/Hyperion
    -
  - ☒ Stereo Border Imagery
    -
  - Footprints**
    - ☐ Minnesota USNG PDFs
      -
- US Fish and Wildlife**
- Great Lakes Information Network**
- Streets and Roads**
  - ☐ Tiger Streets
    -
- Imagery**
  - ☐ MN 2009 DOQQ 30cm (color)
    -
  - ☐ MN 2009 DOQQ 30cm (cir)
    -
  - ☐ MN 2009 DOQQ 50cm (color)
    -
  - ☐ MN 2009 DOQQ 50cm (cir)
    -
  - ☐ Border Patrol 2009 (beta)
    -
- Basemaps**
  - ☒ Tiger Basemap
    -

**GeoMOOSE 2.6.1** | **Lat, Lon: 46.874, -92.242 USNG: 15TWM577914** | **1:1733376**



# Collaborative Mapping

[Search GeoNetwork Catalog](#)

The screenshot displays the GeoMOOSE 2.6.1 web application. The main map shows a portion of Wisconsin, with labels for cities like St. Paul, Eau Claire, and Oshkosh, and features like Red Lake and Sioux Lookout. A search overlay is visible, which is a duplicate of the left-hand sidebar. This overlay is highlighted with a red rectangular border. A red arrow points from the 'Any Field' dropdown in the sidebar to the corresponding dropdown in the search overlay. The search overlay contains the following elements:

- Buttons: Catalog, Search Catalog, Visible Layers
- Dropdown: Contains
- Text input: USGS
- Dropdown: Any Field
- Dropdown: Contains
- Text input: Protected area
- Buttons: Add Filter, Search

At the bottom of the sidebar, a status bar indicates: "Query returned about 2 results."

The bottom of the application shows the version "GeoMOOSE 2.6.1", the coordinates "Lat, Lon: 51.490, -94.208 USNG: 15UVT1605", and a scale indicator "1:6933504".



# Collaborative Mapping

[Search GeoNetwork Catalog](#)

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Catalog Search Catalog Visible Layers

Contains ▾

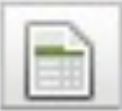

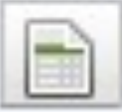

USGS

Any Field ▾

Contains ▾

Protected area

Add Filter Search

Source	Abstract	Metadata
USGS Gap Analysis Program	Web Mapping Services for the USGS GAP analysis Program's Protected Areas Database	 
USGS Gap Analysis Program	Protected Area Owner/Managing Organization	 

Query returned about 2 results.

Red Lake

Kenora

Inter

Beridji

Chippew

Brainer

St. Cloud

Fillmar

St. Paul

Eau Claire

Mankato

Albert Lea

La Crosse

Nicolet

Wausau

Manistee

Greer Bay

Oshkosh

Manistee

Petoskey

Traverse City

Cadillac

Huron

Marquette

Little Cu



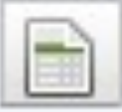
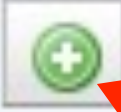
Chapleau

Marie

Wisconsin

Lat, Lon: 43.845, -95.241 USNG: 15TJ1957

1:6933504

Source	Abstract	Metadata
USGS Gap Analysis Program	Web Mapping Services for the USGS GAP analysis Program's Protected Areas Database	 
USGS Gap Analysis Program	Protected Area Owner/Managing Organization	 



# Collaborative Mapping

[Search GeoNetwork Catalog](#)

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Catalog

Search Catalog

Visible Layers

Contains ▾

USGS





Any Field ▾

Contains ▾

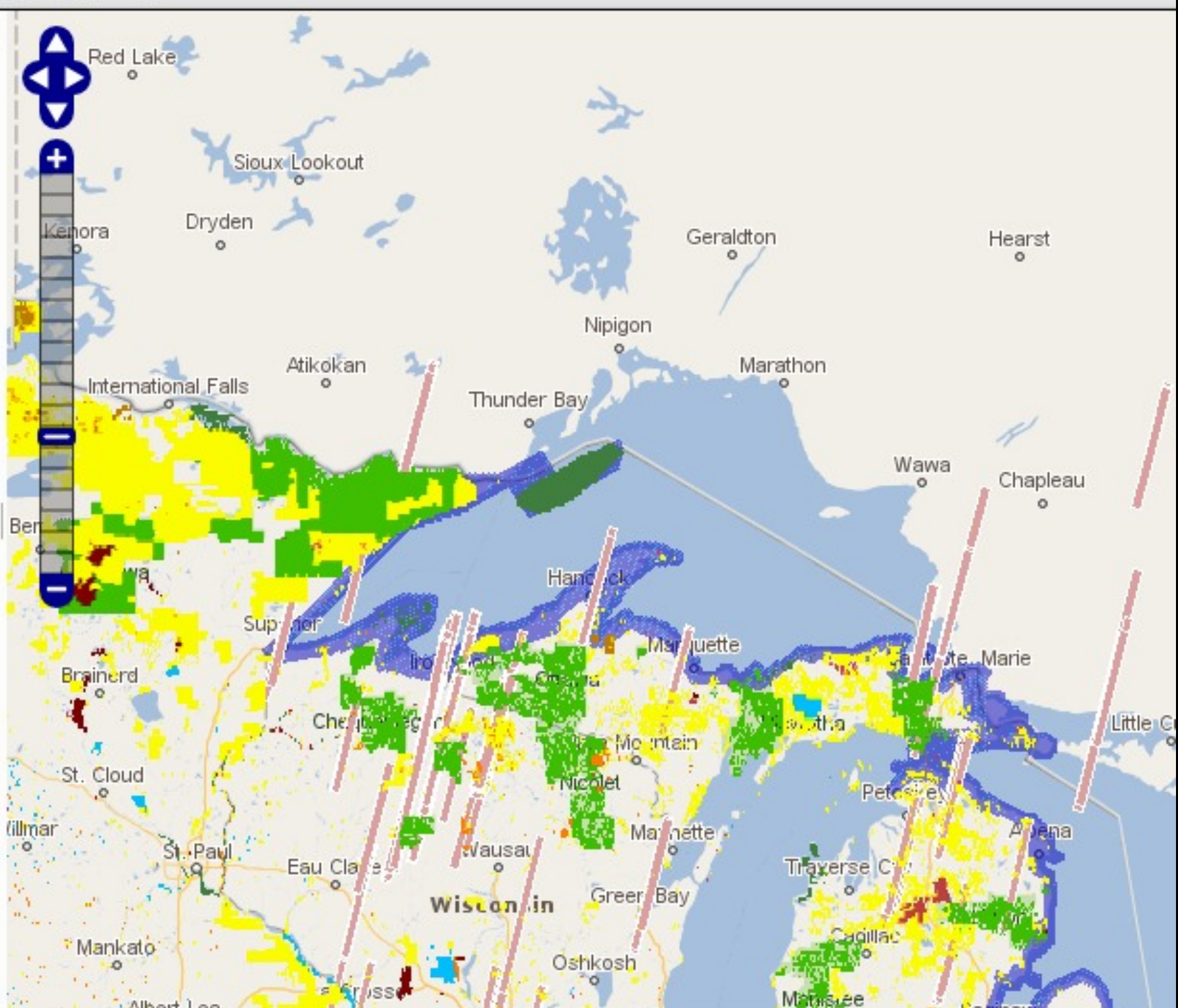
Protected area

Add Filter

Search

Source	Abstract	Metadata
USGS Gap Analysis Program	Web Mapping Services for the USGS GAP analysis Program's Protected Areas Database	 
USGS Gap Analysis Program	Protected Area Owner/Managing Organization	 

Query returned about 2 results.




GeoMOOSE 2.6.1

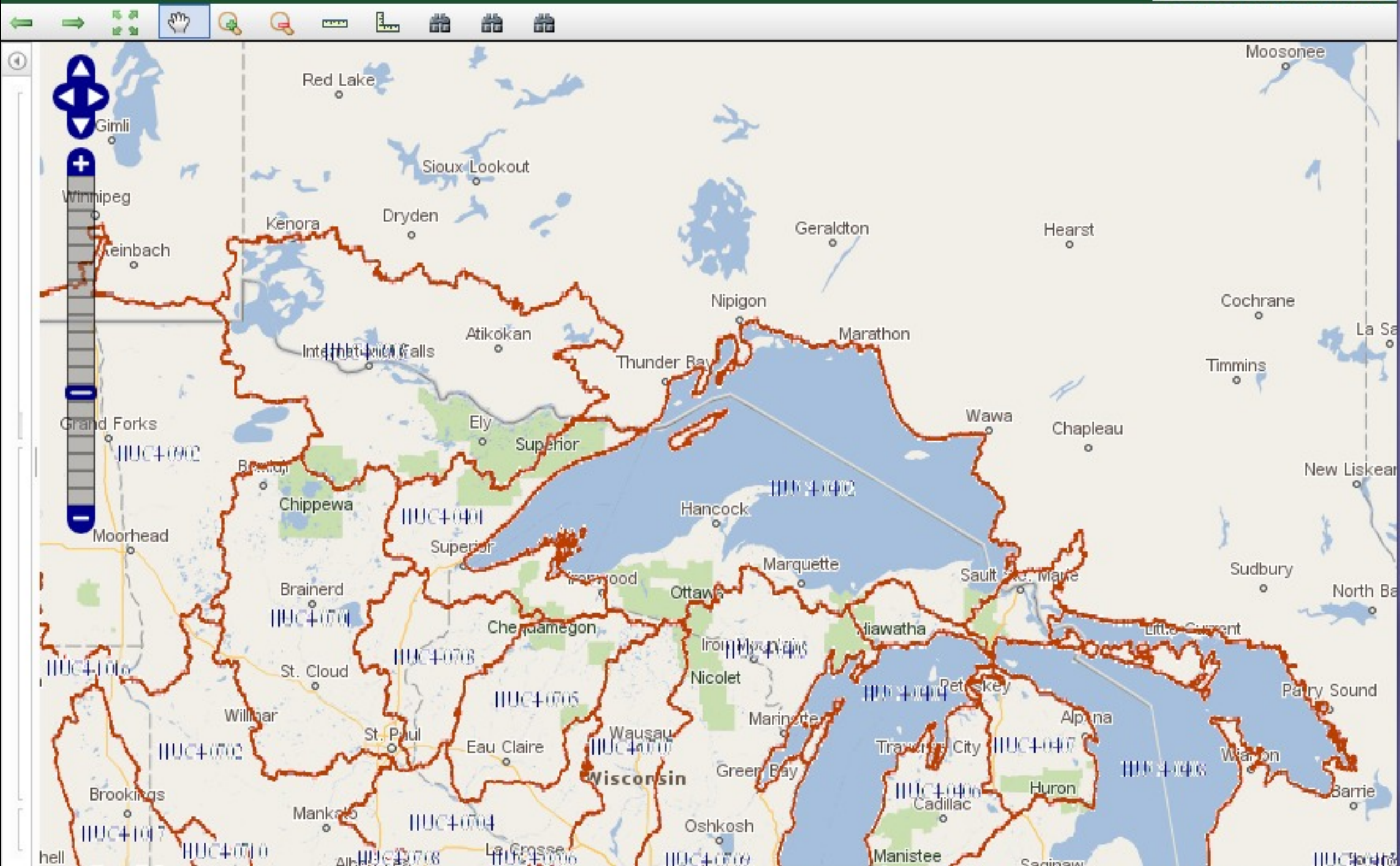
Lat, Lon: 50.954, -93.088 USNG: 15UVS9344

1:6933504





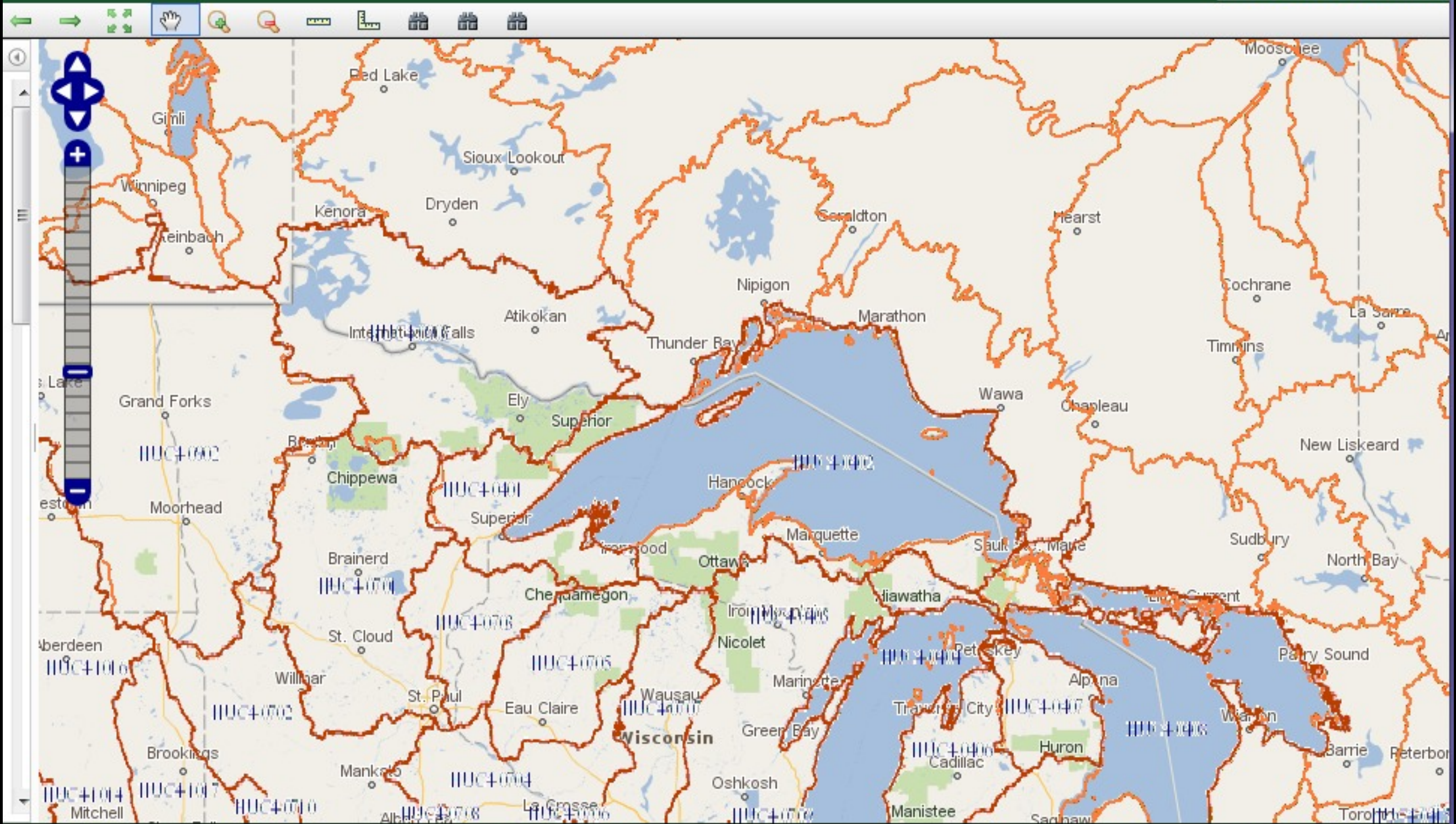
# Collaborative Mapping

[Search GeoNetwork Catalog](#)



# Collaborative Mapping

[Search GeoNetwork Catalog](#)



GeoMOOSE 2.6.1

Lat, Lon: 43.861, -95.900 USNG: 15TTJ6660

1:6933504



# But what does it all mean?

- Two watersheds
- Different methods





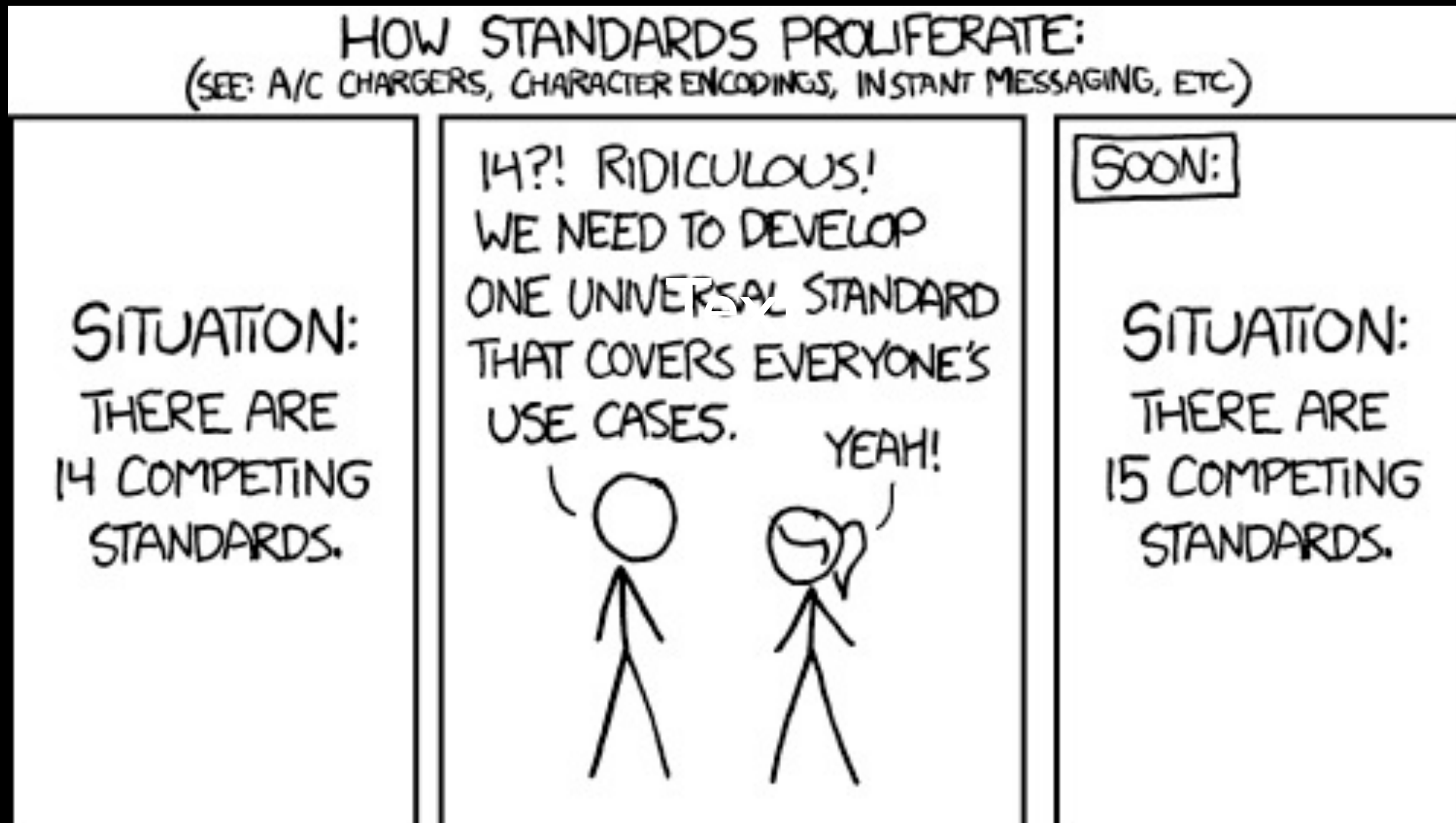


# Not all in the same language

- All the data matches if it all your own
- How combine across organizations?



# Standards





# Standardized Metadata

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<metadata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="http://www.fgdc.gov/schemas/metadata/fgdc-std-001-1998.xsd">
```

```
<idinfo>
```

```
<citation>
```

```
<citeinfo>
```

```
<origin>Natural Resources Research Institute</origin>
```

```
<pubdate>Unknown</pubdate>
```

```
<title>GLEI Complex-specific Watersheds</title>
```

```
<geoform>vector digital data</geoform>
```

```
<onlink>http://gisdata.nrri.umn.edu/nrgisl/proj/GLEI2/shapefiles/glei_watersheds.shp</onlink>
```

```
</citeinfo>
```

```
</citation>
```

```
<descript>
```

```
<abstract>GLEI complex-specific watersheds Complexes represent the "ecological unit" evaluated by a sampling event (locale). Where possible these have been drawn to include as many subprojects as possible. This may mean stretching a subproject's normal definition of "ecological unit", but is a trade-off to allow subproject overlap. Complexes are identified by arbitrary unique numbers in the complex_num field of the a_locale table. Locales that share the same complex_num value are in the same complex. Watersheds have a one-to-one relationship with complexes and share their arbitrary unique id numbers. In some cases where complexes exist up stream from each other, their corresponding watersheds overlap.</abstract>
```

```
<purpose>Complex-specific Watersheds are watersheds defined as land area draining into a GLEI Complex. They provide a logical unit for summarizing the results of multiple GLEI investigators</purpose>
```

```
</descript>
```



# http://gisdata.nrrri.umn.edu/nrgisl/proj/GLEI2/ shapefiles/glei\_watersheds.shp

```
<form method='get'
  action='/nrgisl/proj/GLEI2/shapefiles/glei_watersheds.shp'>
<div style='display:none'><input type='hidden' name='csrfmiddlewaretoken' value='ea3fb89533d536b1fa627cece80c3f71' /></div>

<p>Pick a format for</p>

<p>proj/GLEI2/shapefiles/glei_watersheds.shp</p>

<p>from GLEI Complex-specific Watersheds</p>

<select name='format'>
  <option value='Shapefile ZIP'>Shapefi
  <option value='KMZ'>KMZ</option>
  <option value='DBF only'>DBF only</option>
</select>

<input type='submit' value='Get data' />
</form>

<p>Note that large files, particularly line / polygon data,
may cause the server to time out if "KMZ" mode is selected, so
use "Shapefile ZIP" instead if that happens.</p>
```

# NOT DATA



# Need Standardized Semantics

- Standard formats
- Standard semantics



- Data users: There are tools to help you find data
- Data producers: Make your data available



# Thank you

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**SharedGeo**

[www.sharedgeo.org](http://www.sharedgeo.org)