(1) Geo Data Portal:

Climate Data Delivery for Ecological Model

Nate Booth, Lauren Hay (USGS); Adam Terando (NCSU),
Katherine Hayhoe (TTU)

(2) Data Exchange & Virtual Observatory Experiences

DOI LCC / CSC National Network Meeting, Shephardstown, WV
March 29 - April 1, 2010

USGS

CIDA
Center for Integrated Data Analytics

Part 1

USGS

Project Scope

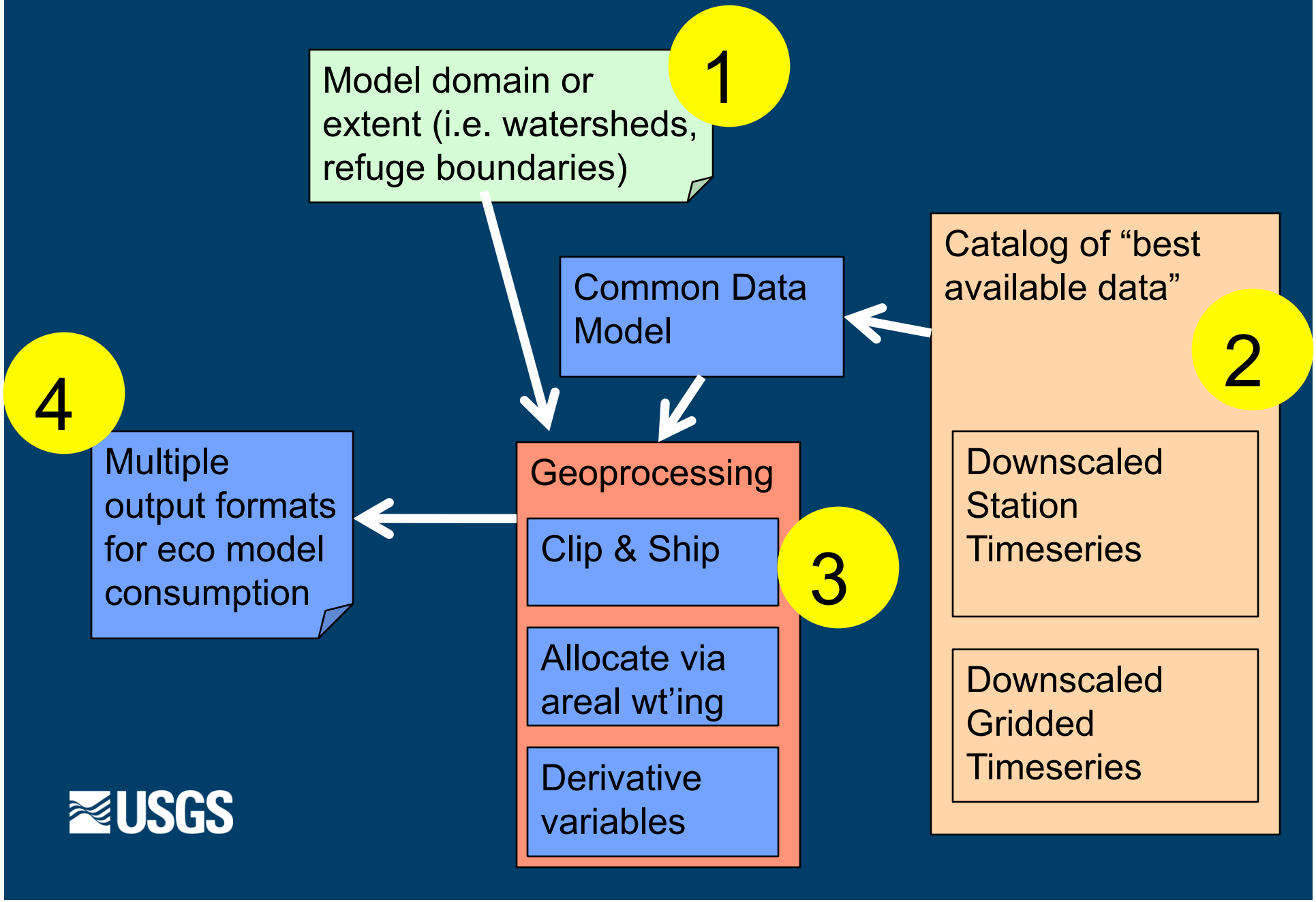
- Formalize common patterns of processing downscaled climate data products for ecological models in a modest web-based tool
- Provide "best available data" catalog that describes which downscaled products are most appropriate for different geographies, scales and applications
- Serve derivative products and variables as they become available (i.e. hydrologic model, number of days above some threshold)

Geo Data Portal Workflow Wizard

1. Define area of interest: extent or model domain
2. Select a downscaled dataset*
3. Choose geo-processing option
4. Choose output format

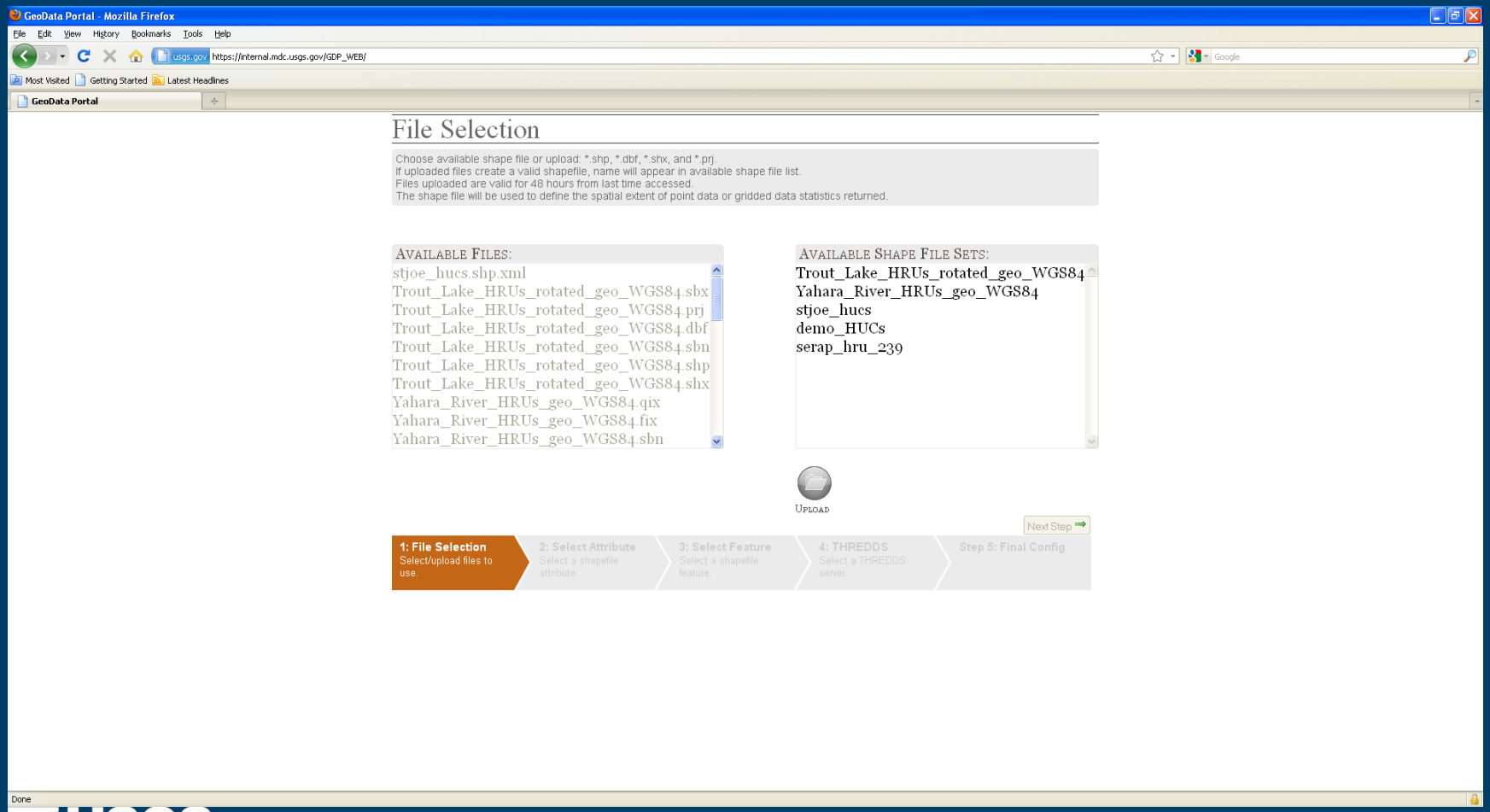
* Still TBD, but for now, three IPCC emission scenarios: A1b, A2, B1 (hopefully A1Fi too). All GCM output from IPCC AR4 (ranges from 5 GCMs for A1Fi to 21 GCMs for A1b). *But* can include any downscaled products that meet minimum criteria.

Geo Data Portal



USGS

Define extent or model domain



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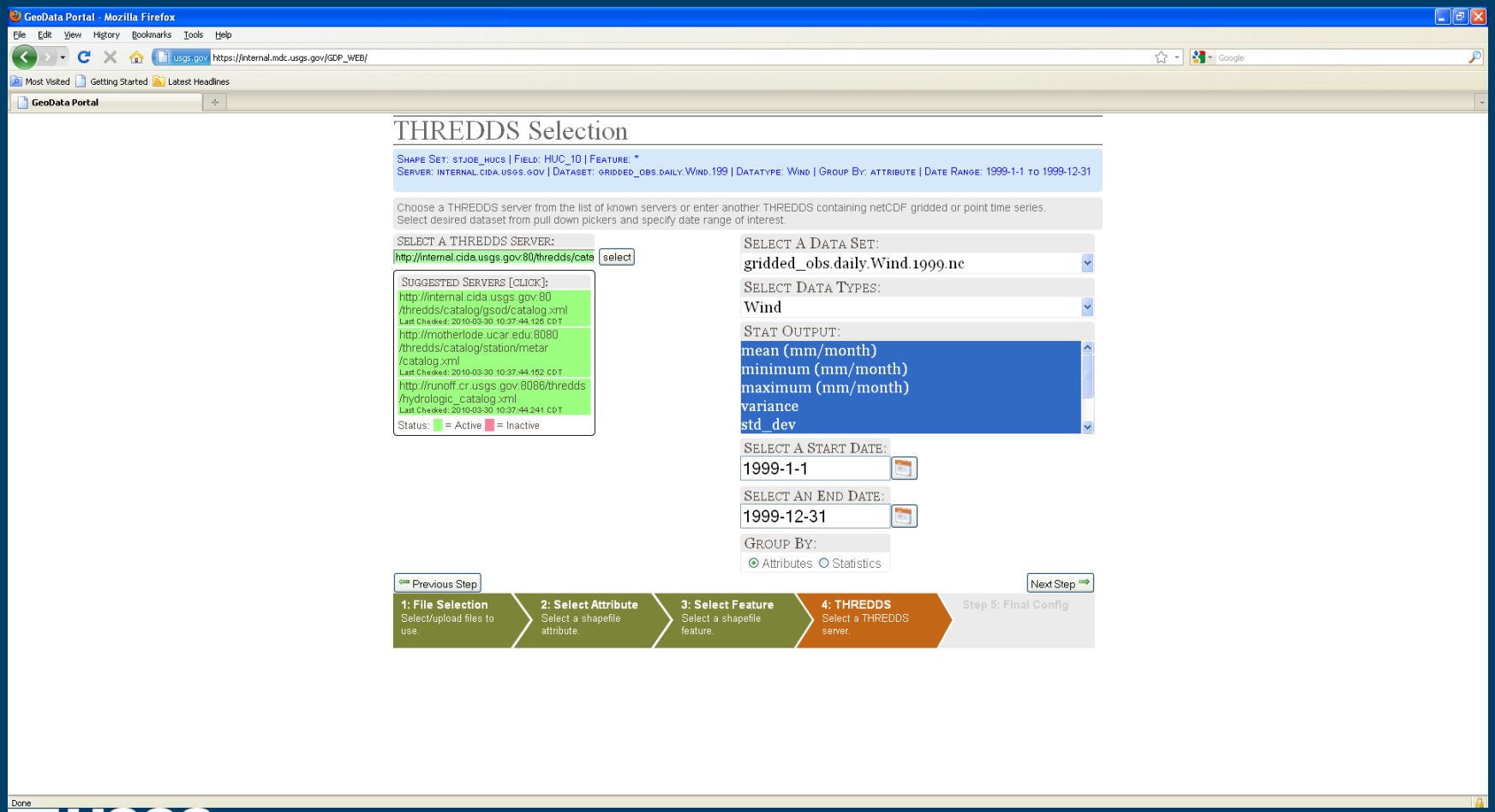
Select a dataset and query criteria



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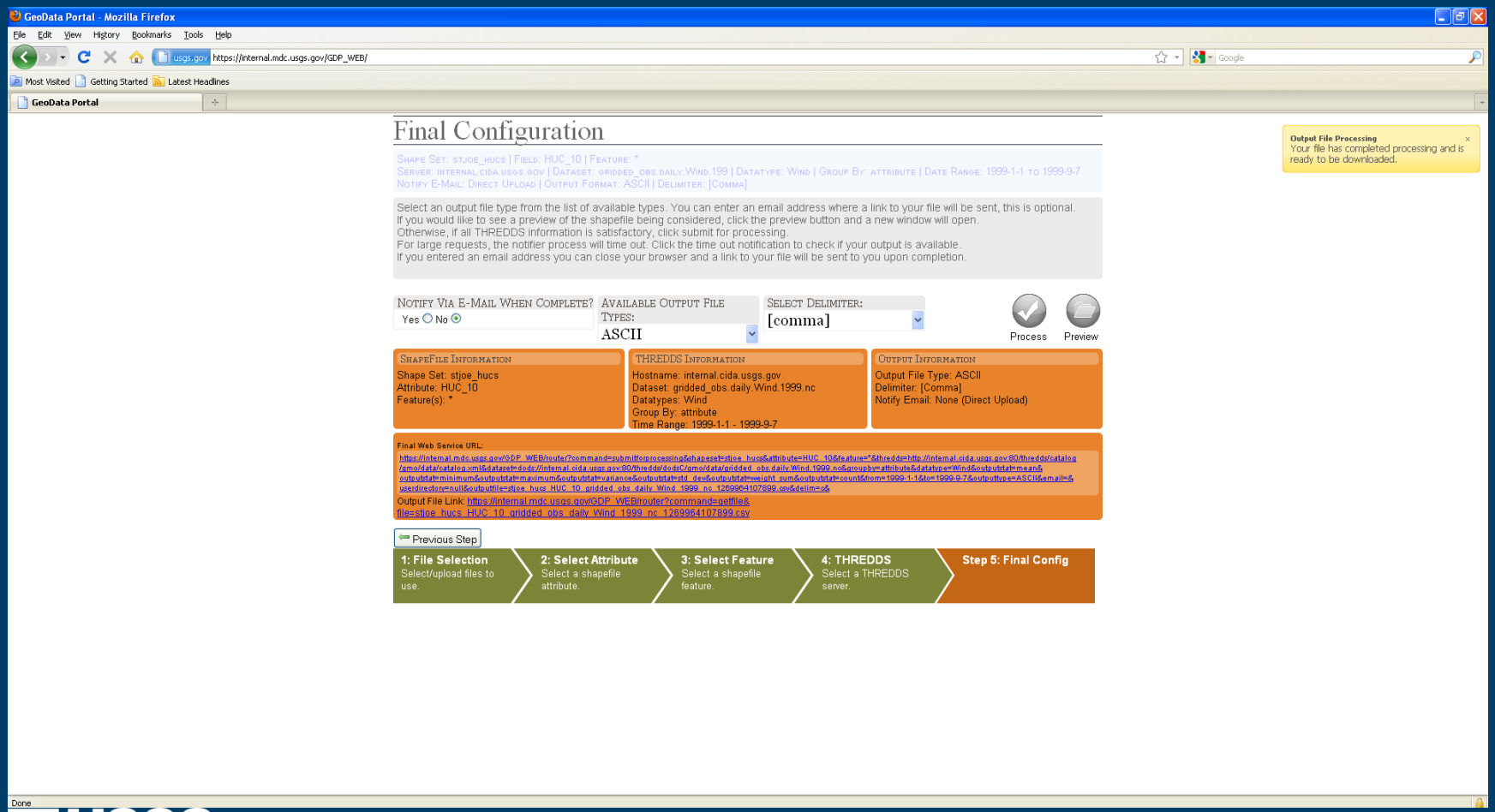
Final Selection & Processing



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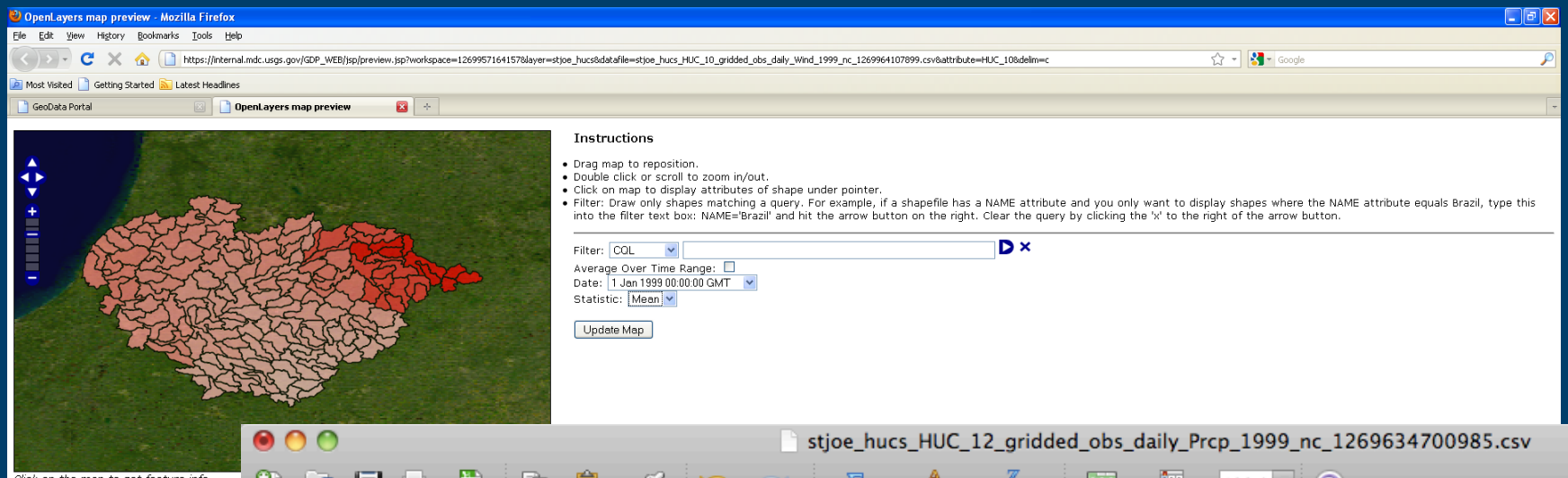
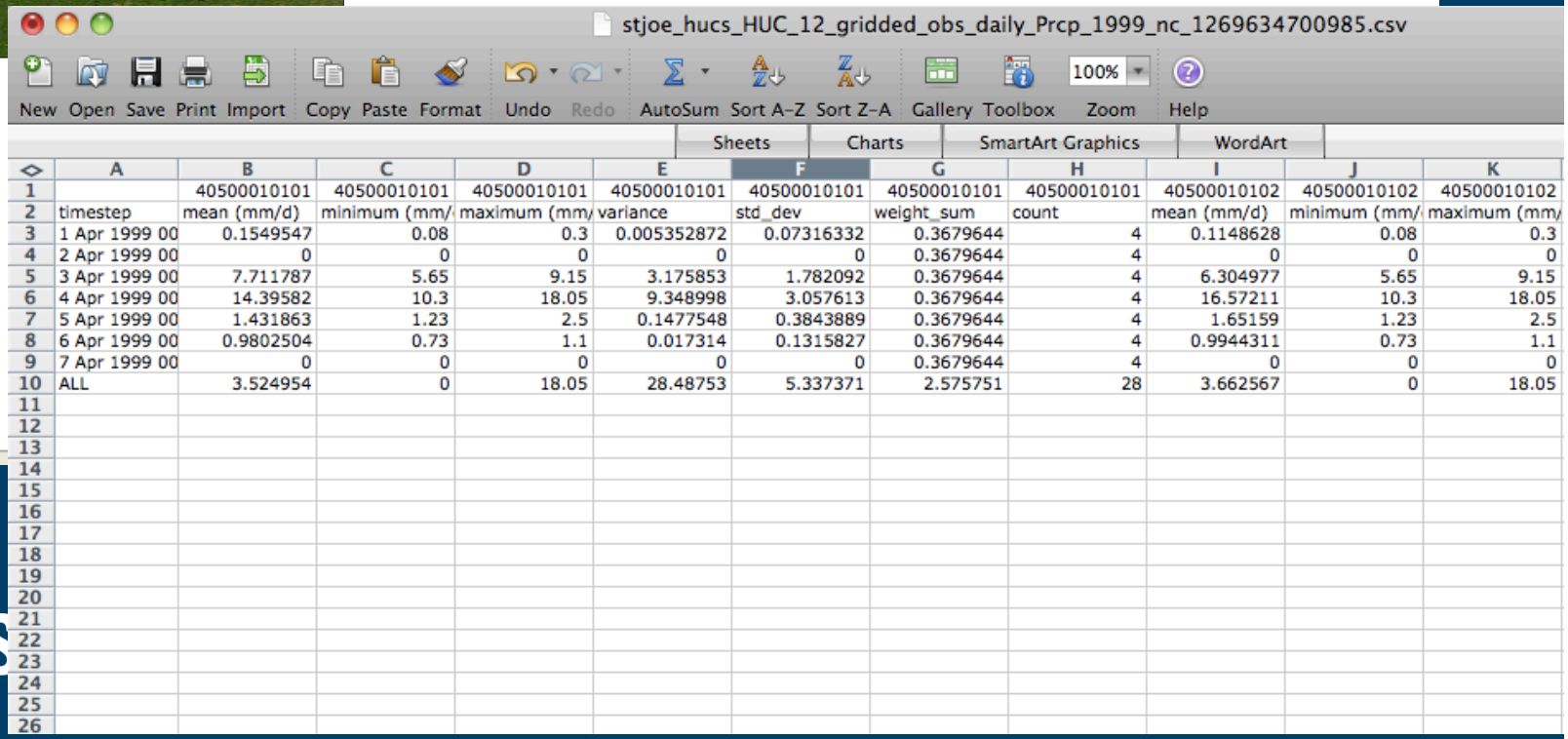
Output: Map preview and file download





	A	B	C	D	E	F	G	H	I	J	K
1		40500010101	40500010101	40500010101	40500010101	40500010101	40500010101	40500010101	40500010102	40500010102	40500010102
2	timestep	mean (mm/d)	minimum (mm/	maximum (mm/	variance	std_dev	weight_sum	count	mean (mm/d)	minimum (mm/	maximum (mm/
3	1 Apr 1999 00	0.1549547	0.08	0.3	0.005352872	0.07316332	0.3679644	4	0.1148628	0.08	0.3
4	2 Apr 1999 00	0	0	0	0	0	0.3679644	4	0	0	0
5	3 Apr 1999 00	7.711787	5.65	9.15	3.175853	1.782092	0.3679644	4	6.304977	5.65	9.15
6	4 Apr 1999 00	14.39582	10.3	18.05	9.348998	3.057613	0.3679644	4	16.57211	10.3	18.05
7	5 Apr 1999 00	1.431863	1.23	2.5	0.1477548	0.3843889	0.3679644	4	1.65159	1.23	2.5
8	6 Apr 1999 00	0.9802504	0.73	1.1	0.017314	0.1315827	0.3679644	4	0.9944311	0.73	1.1
9	7 Apr 1999 00	0	0	0	0	0	0.3679644	4	0	0	0
10	ALL	3.524954	0	18.05	28.48753	5.337371	2.575751	28	3.662567	0	18.05

Part 2

USGS

Data Exchange & Virtual Observatories

- Objective: Efficient and timely data exchange to promote LCC / CSC / National collaboration in support of science-based adaptive management
- Analogy: first responders getting on the same shared frequencies

Data Sharing and Exchange

- Registries of projects & project datasets has provided value but we're a ways from integrating OBSERVATIONS
  - Need common spatial frameworks, phenomena vocabularies, taxa crosswalk, ways of describing protocols, etc.

- Pragmatics: mix and match as appropriate including formal and de facto standards, data warehousing and GIS geo-databases

Service Oriented Architecture (SOA) for environmental observations

- While very successful for pushing around small data messages, SOA is much less mature for large data needs to support science
- Data edits and value-adds are often not accommodated – solutions so far have been primarily one-way

Examples

USGS

Exchange Network - Home

http://www.exchangenetwork.net/

environmental

Environmental Information exchange Network

the exchange network

1

Search

sharing information for a cleaner environment

archives | contacts | calendar

- home
- network basics
- management
- network policies
- partner benefits
- build a node
- data exchanges
- build an exchange
- data standards
- progress
- grants
- press room
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sign up for network email alerts today!

welcome to the National Environmental Information Exchange Network website. The Exchange Network is a partnership among states, tribes, and the U.S. Environmental Protection Agency that is revolutionizing the exchange of environmental information. Partners on the Exchange Network share data efficiently and securely over the Internet. This new approach is providing real-time access to higher quality data while saving time, resources, and money for partner states, tribes, and territories.

network news

Exchange Network Open Call Scheduled for April 15th
more details...

Job Opportunity: ECOS Seeks Exchange Network Project Manager
more details...

The Exchange Network is Now on Facebook!
more details...

Register for the 2010 Exchange Network National Meeting

REGISTER NOW >

recent message board threads

Thread Title	Author	Start Date
Making Handler Ver5 Insta...	Darryl	12/21/09 at 04:07 PM
Node 2 Installation Quest...	Caltexan	08/18/09 at 01:54 PM
EPA Asbestos Schema 1	mahern	07/23/09 at 01:22 PM
Web Based Node 2 Client	ian	06/26/09 at 02:05 PM
OpenNode2 Web Client	ian	06/26/09 at 01:59 PM

stay connected!

Use these tools to keep up on the latest news and share your own thoughts and ideas on the Exchange Network.

network connection

Visit the new Exchange Network blog for Exchange Network news, musings, and an opportunity to join the conversation.

network wiki

Check out the Exchange Network Wiki to find information for Network partners by Network partners.

network email alerts

Receive email updates on new data exchanges, guidance documents, and other news. You can also view an archive of previous email alerts.

progress and profiles

Click the map to find contact information for fellow exchange network partners. You can also view partners' progress toward implementing data exchanges.

Environmental Exchange Network

- Primarily focused around pushing data from states and tribes to an EPA database; less in terms of query
- Broad adoption by states and tribes through carrot and stick approach
- Free and well supported “node” software
- Includes a security model
- Rigid: Nodes are expected to serve data in prescribed format and semantics

Water-Quality Data Exchange (WQDeX)

2

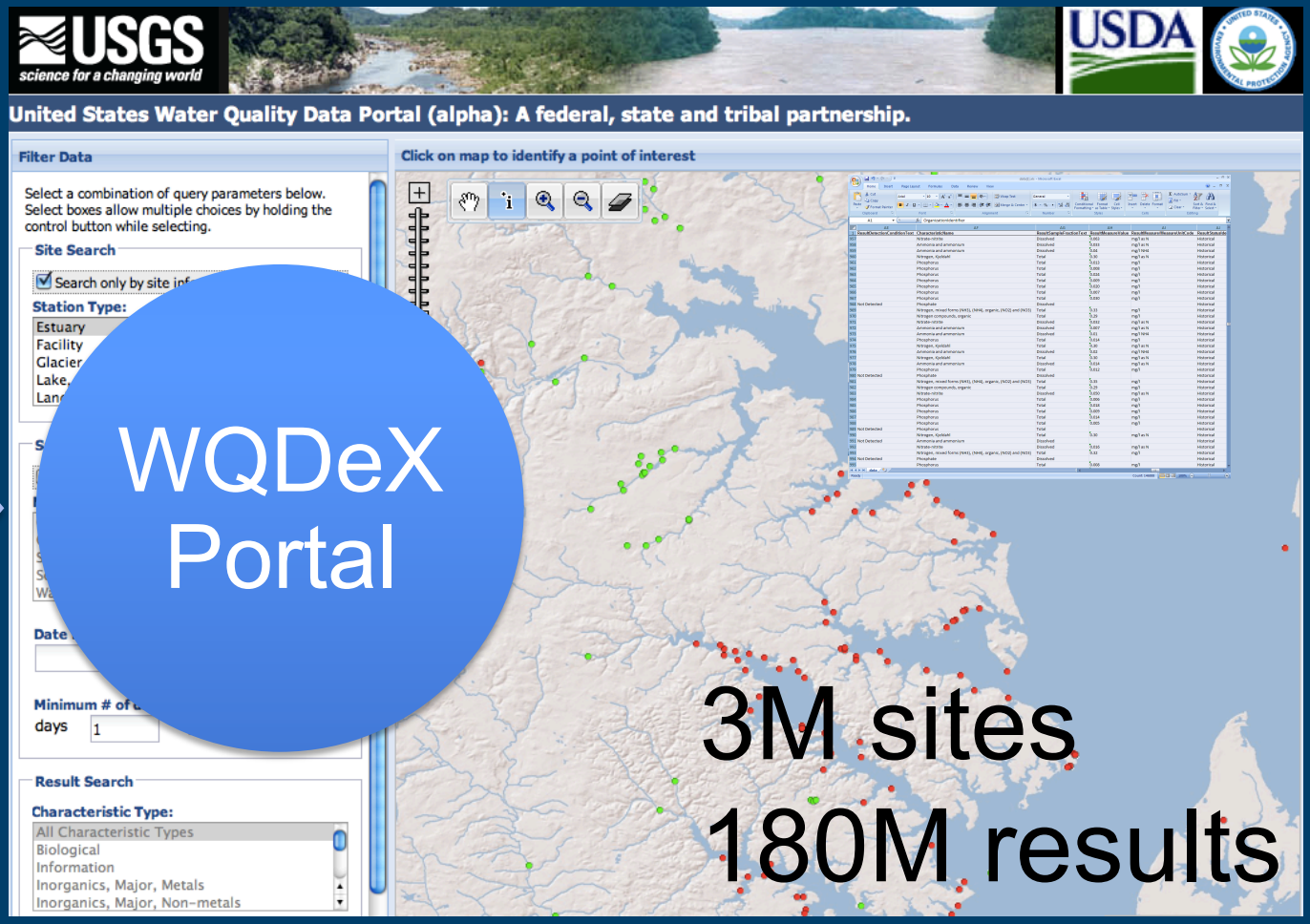
Data Standards (WQX, SRS, NEMI)

+

Web Services

+

Catalog / Register



USGS | EPA STORET

WQDeX Data Sharing Status

1) Format and nomenclature ✓
2) Web services to serve monitoring data ✓
3) Services for users to find sites and data
4) Portal to merge disparate web service feeds

✓ = Phase One complete

"An investigator will be able to explore the entire USGS and USEPA water-quality data holdings without needing to know which agency manages the desired data."

EOS: Scott et al, 2008

The U.S. Integrated Ocean Observing System(IOOS)

http://ioos.gov/

ioos

IOOS® INTEGRATED OCEAN OBSERVING SYSTEM

3

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Of Special Note

- Implementation Guidance of the IOOS DMAC
- MTS 2009 - Ocean Observing System Technical Track
- Secretary Gary Locke - Scarlet Knight Landing
- National Surface Current Mapping Plan
- Federal Funding Opportunities
- Waves Plan
- IOOS Timeline
- Business Case for Improving NOAA Management and Integration of Ocean and Coastal Data
- IWGOO IOOS Strategic Plan
- NOAA IOOS Program Strategic Plan
- FY 09 Regional Fact Sheets

U.S. IOOS®: Our Eyes on Our Oceans, Coasts, and Great Lakes.

Providing the data and information needed to improve safety, enhance our economy, and protect our environment.

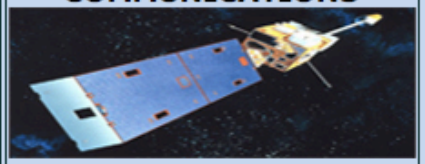
The Integrated Ocean Observing System (IOOS®) is a federal, regional, and private-sector partnership working to enhance our ability to collect, deliver, and use ocean information. IOOS delivers the data and information needed to increase understanding of our oceans and coasts, so decision makers can take action to improve safety, enhance the economy, and protect the environment.

OBSERVATIONS

DATA MANAGEMENT

Data Integration Framework (DIF)
Data Management and Communications (DMAC)
DMAC Steering Team

COMMUNICATIONS



Press Room
Calendar of Events
Messaging Materials
Brochures, Videos, Podcasts
Z-grams

REGIONAL PARTNERS

INTERAGENCY PROGRAMS

Ocean Observatories Initiative

GLOBAL OBSERVATIONS

Global Ocean Observing System

Integrated Oceans Observing System (IOOS)

- Central group defines a flexible data sharing architecture in collaboration with 12 regions
- Some expectations of monitoring core variables, but architecture general enough to transport varying domains
- Leverages other standards including ISO, OGC and NetCDF-CF – all of which are domain independent

Recommended Web Services and Data Encodings

Geo Data Portal

Data Type	Web Service	Encoding
In-situ data (buoys, piers, towed sensors)	OGC Sensor Observation Service (SOS)	XML based on OGC Observations and Measurements (O&M)
Gridded data (model outputs, satellite)	OpenDAP and/or OGC Web Coverage Service (WCS)	NetCDF using Climate and Forecast (CF) conventions
Images of data	OGC Web Map Service (WMS)	GeoTIFF, PNG etc. -possibly with standardized styles

*[*OGC = Open Geospatial Consortium]*

Groundwater Information Network (GIN-RIES)

http://www.gw-info.net/Home.aspx?locale=en-ca&c=1

Google

4

Groundwater Information Network
Réseau d'Information sur les Eaux Souterraines

GIN-RIES

GIN-RIES

Search

Collections
- Documents

Collaboration
- Announcements
- Contacts
- Discussions
- Events
- Links

News

Users Online
- Anonymous (1)

For basic access to water well and aquifer info.
Click here... Water Wells and Aquifers of Canada

For Google-like viewing and analysis of water well info.
Click here... Analysis of Water Wells of Canada

The **Groundwater Information Network** (GIN) aims to improve knowledge of groundwater systems and enhance groundwater management through increased access to groundwater information. GIN connects water well databases from British Columbia, Alberta, Manitoba, Ontario, Québec, Nova-Scotia, and Yukon, and provides some key aquifer information from Natural Resources Canada. The information can be accessed by **clicking** on a link above. It can then be viewed on a map of Canada or in 3D, queried one well or aquifer at a time, and multiple items can be downloaded in a common structure using a variety of convenient digital formats such as GWML (Groundwater Mark-up Language), Excel, ESRI and Google Earth. The information is accessed dynamically from its host location using open geospatial information standards, and then translated on-the-fly to the selected output format. The project is accomplished in collaboration with GeoConnections.

For **GIN user guides** and **GIN web services** information, see Documents.

Events

GeoEdmonton 2008
Location: Edmonton Westin Hotel
September 21, 2008 to September 24, 2008

System Administrator: sysadmin
Version: 2.91.3335.34004 Build Date: 24/10/2009 11:35:34 AM | Help Wiki

Canada Groundwater Info. Network (GIN)

- Providers push data in their own formats and semantics
- GIN dynamically crosswalks data via semantic mediation technologies and ontologies
- Queries are spawned across data sources

Open Geospatial Consortium

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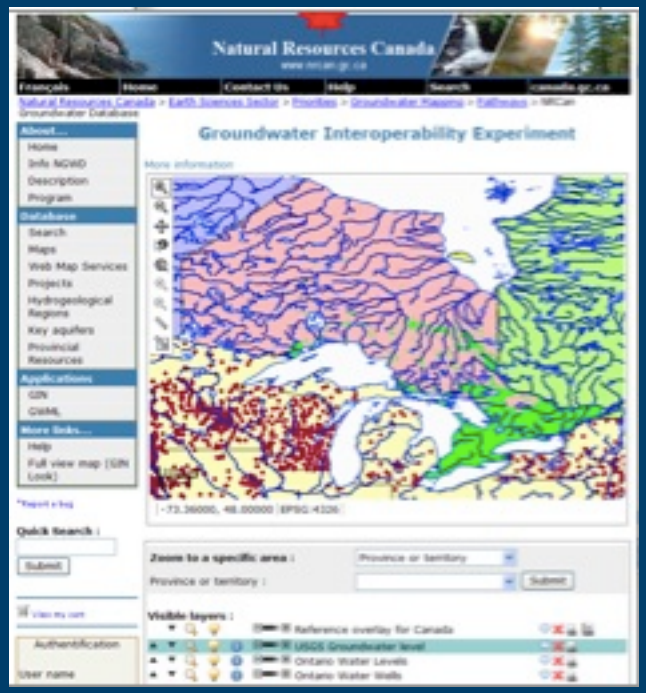
- Solution stack encompasses geospatial display and query; and links to observations
- Broad adoption internationally
- Many well supported open source servers and clients
- Fits into international data sharing of GEOSS

Groundwater Data Exchange – OGC/WMO HydroWG Interoperability Experiment

- Test and enhance OGC standards for water observations
- Exchange groundwater well characteristics and water levels with Canada



USGS science for a changing world

Natural Resources Canada

CSIRO

CUAHSI HIS Sharing hydrologic data

OGC® Open Geospatial Consortium, Inc.

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Great Lakes Restoration Initiative – DOI backbone to GLOS (IOOS)

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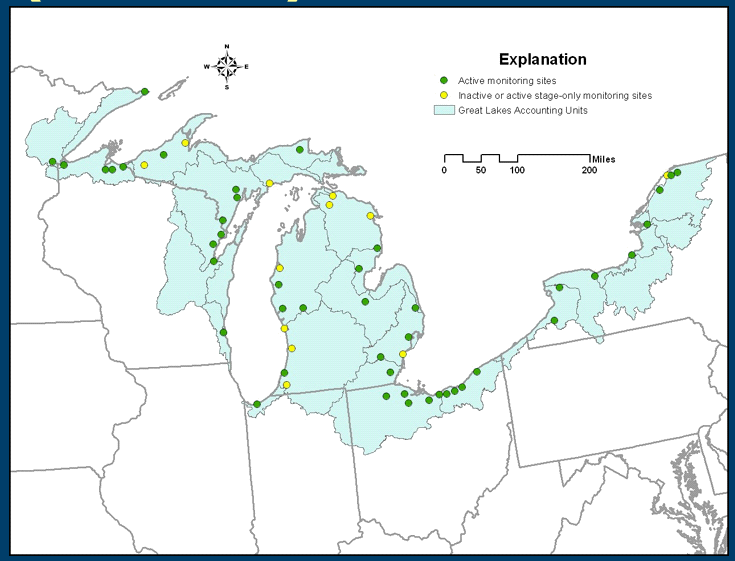
- Support cross-agency and cross-discipline data analysis (integrated science) through a broad standards-based virtual observatory



BioData Aquatic Biology System

- Stores fish, inverts, algae (occurrence and abundance) and habitat monitoring data collected according to USGS NAWQA and EPA National Rivers and Streams Assessment (NRSA) protocols
- Web based data entry client with linkages to labs via web services
- New and Legacy data joined in BioShare data warehouse for distribution
- Links to other systems via common monitoring locations