



Approaches for Data Sharing: Science in the Great Lakes (SiGL) Mapper

Lake Superior Environmental Monitoring Collaborative

June 9, 2015

Ashland, Wisconsin

GLRI Data Delivery Overarching Goal

To create a publicly accessible data network that:

- Seamlessly provides efficient **discovery** of and **access** to multi-disciplinary monitoring data sets to advance Great Lake science
- Enables policy makers to plan and evaluate restoration activities
- Provides flexible products that can accommodate the community's changing needs and integrate with other Great Lakes data applications

Purpose of the SiGL Mapper

- **Supports strategic Great Lakes data collection and analysis**
 - Increases access and visibility of existing efforts
 - Identifies areas and topics that need more study
 - Allows future projects to build on existing data
- **Captures and displays spatial data component**
 - Those without GIS capabilities can display monitoring locations
- **Built for both large and small datasets**
 - Connects with large, enterprise data repositories
 - Captures smaller datasets that aren't documented using current metadata standards or may not have access to online data hosting

Data vs. Metadata

Your science produces **data**: measurements, values, statistics, results, analysis, etc.

SiGL collects **metadata**: information about your data

- *Project information*
 - Who, what, where, when, why?
 - Contact/PI details
 - Publications
- *Data information*
 - Sources (what data exists and where it's stored)
 - Site information (what, where, when, and how data was collected)

Science in the Great Lakes (SiGL) mapper

wim.usgs.gov/SiGL

BETA VERSION RELEASED
IN NOV. 2014

Science in the Great Lakes Ma... x +

wim.usgs.gov/SiGL

USGS science for a changing world

SiGL: Science in the Great Lakes

Basemaps

SEARCH SITES SEARCH

Enter at least one search term.

Parameters:
Choose parameters...

Sampling dates:
from: to:

Resource component:
Choose resource...

Media:
Choose media...

Great Lake:
Choose lake...

State/Province:
Choose state...

CLEAR ALL SEARCH

MAP LAYERS

- SiGL Sites
- Great Lakes Basins
- EPA Areas of Concern
- USGS GLRI Nutrient Monitoring Basins

EXPLANATION

SiGL Sites

- Lake Erie Sites
- Lake Huron Sites
- Lake Michigan Sites
- Lake Ontario Sites
- Lake Superior Sites

Great Lakes Basins

- Lake Erie
- Lake Huron
- Lake Michigan
- Lake Ontario
- Lake Superior

WISCONSIN MICHIGAN ONTARIO

ILLINOIS INDIANA OHIO PENNSYLVANIA NEW YORK

USGS science for a changing world

FAO, USGS, NOAA, EPA, NPS, NRC, AAFC

Searchable data

Search SITES

SEARCH SITES | SEARCH PROJECTS

Enter at least one search term.

Parameter type:
Choose parameters... ▲

Parameters:
Choose parameters... ▲

Sampling dates:
from: to:

Resource component:
Choose resource... ▲

Media:
Choose media... ▲

Great Lake:
Choose lake... ▲

State/Province:
Choose state... ▲

CLEAR ALL **SEARCH**

Search PROJECTS

SEARCH SITES | **SEARCH PROJECTS**

Search by project name:
Select Individual Project... ▲

SEARCH

Search for projects
Enter at least one search term.

Organization:
Choose a project... ▲

Project objective:
Choose objective... ▲

Project dates:
from: to:

Great Lake:
Choose lake... ▲

State/Province:
Choose state/Province... ▲

CLEAR ALL **SEARCH**

Information available in SiGL

SiGL pop-up: Project information

Great Lakes Coastal Wetland Monitoring

PROJECT SUMMARY DATA/PUBLICATIONS CONTACT INFO PROJECT SITES

Project Name: Great Lakes Coastal Wetland Monitoring

ORGANIZATIONS: U.S. Environmental Protection Agency, Great Lakes National Program Office; Central Michigan University, Institute for Great Lakes Research

PROJECT WEBSITE: <http://greatlakeswetlands.org>

PROJECT STATUS: Active - completion date undetermined

START DATE: 10/01/2010

END DATE: N/A

PROJECT OBJECTIVE: Assessment, Ecos

PROJECT DURATION: Long term (greater than 5 years)

PROJECT DESCRIPTION: This project will assess the health of coastal wetlands in the Great Lakes basin. The project will produce information on the status and trends of wetlands, and identify the highest quality, most degraded wetlands. This information will be used to guide the development of wetland protection and restoration programs in the States and Canada. This information will be used to guide the development of wetland protection and restoration programs in the States and Canada.

PROJECT KEYWORDS: monitoring, Coastal Wetlands, Great Lakes

ADDITIONAL PROJECT INFORMATION: Don Uzarski of Central Michigan University is the project manager.

Displays vital information about the project, including the organizations involved and custom descriptions

Links out to project websites

Great Lakes Fish Monitoring and Surveillance Program

PROJECT SUMMARY DATA/PUBLICATIONS CONTACT INFO PROJECT SITES

PROJECT DATA

DATA MANAGEMENT SYSTEM: Oracle Database (GLENDA)

DATA HOSTING ENTITY: USEPA GLNPO

ONLINE DATA LOCATION (IF AVAILABLE): http://www.epa.gov/grtlakes/monitoring/data_proj/glenda/index.html

PUBLICATIONS

PUBLICATION TITLE: Xia, X., Hopke, P.K., Holsen, T.M., and Crimmins, B.S. 2011. Modeling Toxaphene trends in the Great Lakes. *Science of the Total Environment*. 409:792-799

PUBLICATION DESCRIPTION: Peer Reviewed Journal Article

PUBLICATION URL: <http://www.sciencedirect.com/science/article/pii/S0048969710011691>

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Shows if data and publications are available and where to get them

Links out data sources, online applications, and publications

Great Lakes Coastal Wetland Monitoring

PROJECT SUMMARY DATA/PUBLICATIONS CONTACT INFO PROJECT SITES

PROJECT CONTACTS

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Lists who to contact for more information

Information available in SiGL

SiGL pop-up: Site information

The screenshot shows the USGS SiGL interface. The top left features the USGS logo and the text "SiGL: Science in the Great Lakes". Below this is a search bar and navigation controls. A map of the Great Lakes region is visible, with a red diamond marker indicating a selected site. Two pop-up windows are overlaid on the map. The first pop-up, titled "US EPA GLNPO Water and Biology Monitoring Programs", has tabs for "PROJECT SUMMARY", "DATA/PUBLICATIONS", "CONTACT INFO", and "PROJECT SITES". The "PROJECT SITES" tab is active, showing a list of sites with "SU 10" circled in green. To the right of the list, the "SITE DETAILS" tab is active, displaying information for "SU 10", including location, state, country, lake, and sampling details. A green box highlights the "SITE WEBSITE" link: <https://greatlakesmonitoring.org/geod/location/SU10/>. The second pop-up window, also titled "US EPA GLNPO Water and Biology Monitoring Programs", has tabs for "PROJECT SUMMARY" and "DATA/P". The "PARAMETERS SAMPLED" tab is active, showing a list of parameters for "SU 10", including biological, chemical, and physical parameters. A green box highlights the "PARAMETERS SAMPLED" tab.

The "Parameters Sampled" button will show which constituents were sampled at that site

If you've clicked on a site, the pop-up highlights that site and shows you the site-specific details.

Links out to site-specific online data

How to submit data to SiGL

OPTION 1 – SiGL Data Management System (DMS)

- New online tool
- Add, edit, and update your projects
- You maintain control of your own data

Add project information, data sources, contacts, publications, and sites at any time

The screenshot shows the user's project list in the SiGL DMS. The user is identified as Jana Stewart with 9 projects. The list includes:

- NorEaST Stream Temperature Web Portal
- Great Lakes Coastal Wetland Monitoring
- Michigan Beach Monitoring
- Great Lakes Sediment Surveillance Program
- USEPA National Coastal Condition Assessment-Great Lakes
- Michigan Tributary Streamgages
- Wisconsin Beach Health
- US EPA GLNPO Water and Biology Monitoring Programs
- Great Lakes Surveillance Program

A "Create new project" button is visible at the bottom of the list.

Your account is pre-populated with your projects

The screenshot shows the "Add Site" form in the SiGL DMS. The project is "NorEaST Stream Temperature Web Portal". The site name is "Broad Street Beach". The form includes a "SAVE PROJECT" button and a "Publish project on SiGL Mapper?" button. A sidebar menu is circled in green, showing the following counts:

- Project Information
- Organizations: 7
- Contacts: 3
- Data Sources: 0
- Publications: 2
- Sites: 2,453

The form fields include:

- Site Name*: Broad Street Beach
- Additional Site Information: Water Quality Survey; start date is general date for all sampling for this project
- Site URL: http://nwis.usgs.gov/siteID0976543d2

The "Parameters" section is expanded, showing a grid of checkboxes for various parameters:

Physical	Chemical	Biological	Microbiology
<input type="checkbox"/> Acidity	<input type="checkbox"/> Carbon - any form	<input type="checkbox"/> Algae/phytoplankton	<input type="checkbox"/> Bacteria - other
<input checked="" type="checkbox"/> Alkalinity	<input type="checkbox"/> Cyanide	<input type="checkbox"/> Amphibians	<input type="checkbox"/> Fecal indicator bacteria (e.g. E. coli)
<input type="checkbox"/> Bed sediment	<input type="checkbox"/> Dissolved oxygen	<input checked="" type="checkbox"/> Birds	<input type="checkbox"/> Pathogens
<input type="checkbox"/> Conductivity, specific	<input type="checkbox"/> Major ions	<input type="checkbox"/> Carcasses	<input type="checkbox"/> Other microbiology parameter
<input type="checkbox"/> Discharge	<input type="checkbox"/> Mercury	<input type="checkbox"/> Chlorophyll	
<input type="checkbox"/> Fluorescence	<input type="checkbox"/> Metals	<input type="checkbox"/> Disease/deformities/tumors	
<input type="checkbox"/> Habitat	<input checked="" type="checkbox"/> Nutrients - nitrogen - any form	<input type="checkbox"/> Fish	
<input type="checkbox"/> Land use/land cover	<input type="checkbox"/> Nutrients - other	<input type="checkbox"/> Invasive species	
<input type="checkbox"/> Photosynthetically active radiation (PAR)	<input type="checkbox"/> Nutrients - phosphorus - any form	<input type="checkbox"/> Invertebrates	
<input type="checkbox"/> Precipitation	<input type="checkbox"/> Organic compounds - other	<input type="checkbox"/> Mammals	<input checked="" type="checkbox"/> Chronic toxicity parameter
<input type="checkbox"/> Sampling depth		<input type="checkbox"/> Mussels	<input type="checkbox"/> Other toxicology parameter
		<input type="checkbox"/> Parasites	

How to submit data to SiGL

OPTION 2 – submit site information via excel spreadsheet

- Best for large numbers of sites
- Links to existing project in SiGL DMS
- Optionally can be used to add sites to existing project information entered through SiGL DMS

	A	B	C	D	E	F	G	H	I	J
	Project Name*	Site Name*	Latitude*	Longitude*	Country*	State/Province*	Lake Name*	Waterbody	Watershed (8-digit HUC)	Site Description
1										
2	Example project 1 - Water Quality of Tributaries	UFOX-1	42.59444800	-87.60278100	United States	Wisconsin	Michigan	Upper Fox River	04030204	offshore of Wis. State line
3	Example project 1 - Water Quality of Tributaries	LFOX-1	42.49444800	-87.70278100	United States	Wisconsin	Michigan	Lower Fox River, Green Bay	04030204	half-mile upstream from Leo Frigo Mer
4	Michigan DEQ Cooperative Lakes Monitoring Program									
5	Michigan DEQ Wildlife Contaminant Monitoring Program									
6	Michigan DEQ Fish Contaminant Monitoring Program									
7	Michigan DEQ Non-wadeable rivers assessment									
8	Michigan DEQ Sediment Chemistry Monitoring Program									
9	Michigan DEQ Lake Water Quality Assessment Monitoring Program									
10	Assessment of Wadeable Streams and Rivers									
11	Michigan DEQ Beach Monitoring Program									
12										
13										

Progress since LSEMC Houghton meeting

1. Rebuilding SiGL DMS (online data management system) due to authentication system issues – will be faster and easier to use
 2. Added one new dataset from NPS
 3. Added ceded territories and tribal reservation boundaries layers
 4. Added citizen science as a project objective
 5. Started technical discussions about mining STORET/WQP for metadata using technology developed by GLM.org
-
1. Launched SiGL User Group...

SiGL Lake Superior User Group

- Formed after the March meeting in Houghton
 - Introductory call on April 16th
 - Follow up call on June 4th
- 22 members from a variety of federal, state, and tribal organizations, representing a variety of scientific disciplines
- Guide SiGL development, identify priorities, and keep system relevant and consistent
- *Current actions:*
 - Testing the mapper
 - Reviewing the information SiGL is collecting
 - Partner with one state or tribe for a pilot STORET import

Upcoming efforts in the next few months

1. Relaunch SiGL DMS
2. SiGL User Group
 - Will beta test new DMS
 - More datasets coming
 - Group discussions about parameters lists (issues identified during last User Group call)
 - Create metadata dictionary
3. Work with GLM.org on a pilot STORET import
4. Continued development efforts to improve user experience:
 - Polygon/line database expansion
 - Overlapping site issue in mapper
 - Results return screen to allow access to projects without spatial data

Contact SiGL

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[SiGL Mapper demo]

[unused slides]

Future development plans

- Expand database to allow line and polygon spatial features
- Improve selection ability for overlaying sites
- Search results will display in list form, allowing projects without sites to be searchable
- Download a project's information and export your search results
- Improved integration with other Great Lakes data products, especially *greatlakesmonitoring.org*
- Enhance and expand additional data layers

Integrating with *GreatLakesMonitoring.org*

Currently:

- Shared SiGL projects and sites individually link out to *GreatLakesMonitoring.org*

Potential integration options:

- Crosswalk sites dynamically with *GreatLakesMonitoring.org* (mappers will sync simultaneously using web services)
- Select multiple sites in SiGL, access data as a group at *GreatLakesMonitoring.org*
- Select sites using geographical area and program areas in *GreatLakesMonitoring.org* and display metadata from SiGL.
- Joint export function – select a site in either application, and have the option to download both the *GreatLakesMonitoring.org* data and SiGL metadata at once