



Approaches for Data Sharing

Lake Superior Environmental Monitoring Collaborative

November 19-20, 2014

Duluth, Minnesota

Outline

- Water Quality Portal
- EnDDaT
- SiGL Mapper
- Science Explorer



NATIONAL WATER QUALITY MONITORING COUNCIL

Water Quality Portal

www.waterqualitydata.us



Search over **150 million water-quality data records**
from States, Tribal Partners, USEPA, and USGS



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

Sensors are Everywhere



Environmental Data Discovery and Transformation

- Tool for assisting in the construction and operation of nearshore water-quality models
- Formalize common workflows for accessing and preparing environmental data
- Two primary modes:
 - Historical data for model creation (>2 years)
 - Real-time data for model operation
- Based on GLOS Enterprise Architecture

EnDDaT Data Streams

- USGS NWIS Sensor & Stream Discharge
- NWIS Water Quality Data
- STORET Water Quality Data
- NOAA Great Lakes Coastal Forecasting System (GLCFS), NOWCAST
- Radar indicated-rainfall (point or shapefile)
- National Data Buoy Center (NDBC)

Environmental Data Discovery and Transformation (EnDDaT)

Choose Data | Map Layers | Beach Information | Create Beach Marker

- USGS Time Series (NWIS)
- Great Lakes Coastal Forecasting System (GLCFS)
- USGS Water Quality (QW)
- National Data Buoy Center (NDBC)
- National Climate Data Center (NCDC)
- Surface Summary of Day Data (SOD)
- 6-hr Historic Quantitative Precipitation Archive
- 6-hr Real Time Quantitative Precipitation Archive
- 1-hr Historic Quantitative Precipitation Archive

Search within a 2 mile bounding box

Map | Satellite | Hybrid | Terrain

NWIS | GLCFS | **Precipitation** | QW | NDBC | NCDC | SOD

Shapefile | Individual Points

Choose shapefile: Redarrow **Upload shapefile**

Group results by: AREA

Choose one data set: National Mosaic Quantitative Precipitation Archive (QPE) - radar indicated-rain gage verified and corrected precipitation estimates

Property	Start Date	End Date
<input type="checkbox"/> Historical Precipitation National River Forecasting Center 6 hr accumulation Covers U.S.	2000-10-01	2011-07-01
<input type="checkbox"/> Real Time Precipitation National River Forecasting Center 6 hr accumulation Covers U.S.	2011-11-23	2011-11-30
<input checked="" type="checkbox"/> Historical Precipitation North Central River Forecasting Center	2000-06-15	2011-10-18

Manitowoc

Data Discovery

Data Discovery Transformation

- NWIS
- Water Quality
- GLCFS
- Weather
- Temporal
- Spatial
- Statistical

Output Options

- Tab delimited
- Web report
- Web Services
- Interactive plot

Available Data | Requested Data | Calculate Beach Orientation

Height above sea level: [138,17]
 E v_water - surface: [138,17]
 N v_water - surface: [138,17]
Air temp.: [138,17]
 Sea water temp.: [138,17,0]
 Precipitation over upload: Redarrow
 ||: v_water (surface), < 4.875°, [138,17]
 ⊥: v_water (surface), < 4.875°, [138,17]

Data Transformation

Data Processing*

Process	Over
<input checked="" type="checkbox"/> Mean (μ)	<input type="checkbox"/> 1 hour
<input type="checkbox"/> Minimum (Min)	<input type="checkbox"/> 2 hours
<input type="checkbox"/> Maximum (Max)	<input checked="" type="checkbox"/> 6 hours
<input type="checkbox"/> Summation (Σ)	<input type="checkbox"/> 12 hours
	<input type="checkbox"/> 24 hours

* Data processing is not supported for QW data.

Resolve Velocity Vectors

Direction	Beach Orientation
<input checked="" type="checkbox"/> Parallel ()	<input type="radio"/> 90 deg
<input checked="" type="checkbox"/> Perpendicular (⊥)	<input checked="" type="radio"/> 4.875 deg

Get Data

Calculate Beach Orientation

Francis Creek | Point Beach State Forest

Two Rivers

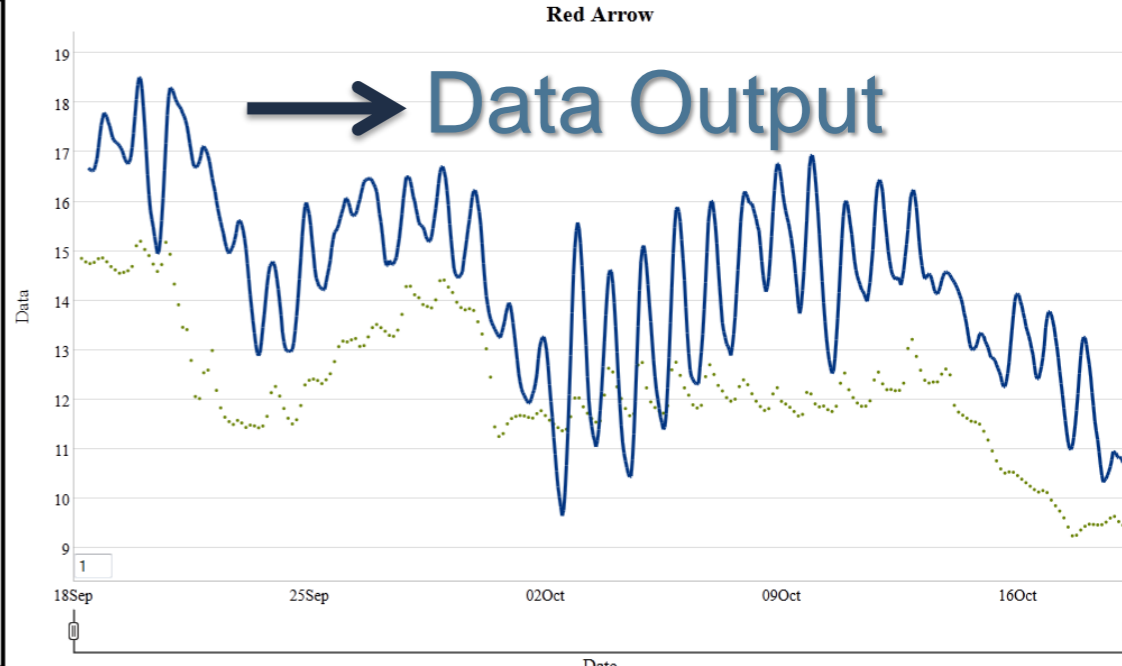
Manitowoc

Step 1: Drag 'L' marker to left-most beach edge
 Step 2: Drag 'R' marker right-most beach edge
 Step 3: Perpendicular line should be pointed towards the water. If it is not, hit the 'Flip Orientation' button

Marker	Latitude	Longitude
Left	44.1073	-87.6544
Right	44.0264	-87.6613

Flip Orientation

Beach orientation: **4.87** degrees from north



What is the SiGL Mapper?

SiGL = Science in the Great Lakes
wim.usgs.gov/SiGL

BETA VERSION NOW ONLINE

The screenshot displays the SiGL Mapper web application interface. The browser address bar shows wim.usgs.gov/SiGL/. The page header includes the USGS logo and the title "SIGL: Science in the Great Lakes".

MAP LAYERS:

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

EXPLANATION:

SIGL Sites

- Lake Erie (Yellow dot)
- Lake Huron (Red dot)
- Lake Michigan (Green dot)
- Lake Ontario (Purple dot)
- Lake Superior (Dark Green dot)

Great Lakes Basins

- Lake Erie (Light Green)
- Lake Huron (Red)
- Lake Michigan (Brown)
- Lake Ontario (Purple)
- Lake Superior (Dark Green)

SEARCH SITES:

Enter at least one search term.

Parameter type: Choose parameters... (dropdown)

Parameters: Choose parameters... (dropdown)

Sampling dates: from: [] to: []

Resource component: Choose resource... (dropdown)

Media: Choose media... (dropdown)

Great Lake: Choose lake... (dropdown)

State/Province: Choose state... (dropdown)

CLEAR ALL **SEARCH**

The map shows the Great Lakes region with various data points and basins overlaid. A search bar is located in the top left of the map area. The footer includes the USGS logo and the text "science for a changing world".

Purpose of the SiGL Mapper

- **Supports strategic Great Lakes data collection and analysis**
 - 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 share data
- **Built for both large and small datasets**
 - Captures smaller datasets that aren't created using current data standards or may not have access to online data hosting
- **Provides metadata and contact info, links to data repositories**

The SiGL interface

Contains a variety of additional data layers to enhance data exploration – more layers to come in FY15

Choose from a variety of basemaps

The screenshot displays the SiGL web interface. At the top, the browser address bar shows `wim.usgs.gov/SiGL/`. The main header reads "SIGL: Science in the Great Lakes". The central map shows the Great Lakes basin with colored overlays for SIGL sites and basins. On the left, a "MAP LAYERS" panel is open, showing checked boxes for "SIGL Sites" and "Great Lakes Basins". Below it is an "EXPLANATION" legend. On the right, a "Basemaps" panel is open, displaying a grid of map styles including Imagery, Imagery with Labels, Streets, Topographic, Terrain with Labels, Light Gray Canvas, National Geographic, Oceans, and OpenStreetMap. A "SEARCH SITES" panel is also visible, with fields for "Parameter type:", "Parameters:", "Sampling dates:", "Resource component:", "Media:", "Great Lake:", and "State/Province:", along with "CLEAR ALL" and "SEARCH" buttons.

Searchable data

Search SITES

SEARCH SITES | SEARCH PROJECTS

Enter at least one search term.

Parameter type:

Parameters:

Sampling dates:
from: to:

Resource component:

Media:

Great Lake:

State/Province:

Search PROJECTS

SEARCH SITES | **SEARCH PROJECTS**

Search by project name:

Search for projects
Enter at least one search term.

Organization:

Project objective:

Project dates:
from: to:

Great Lake:

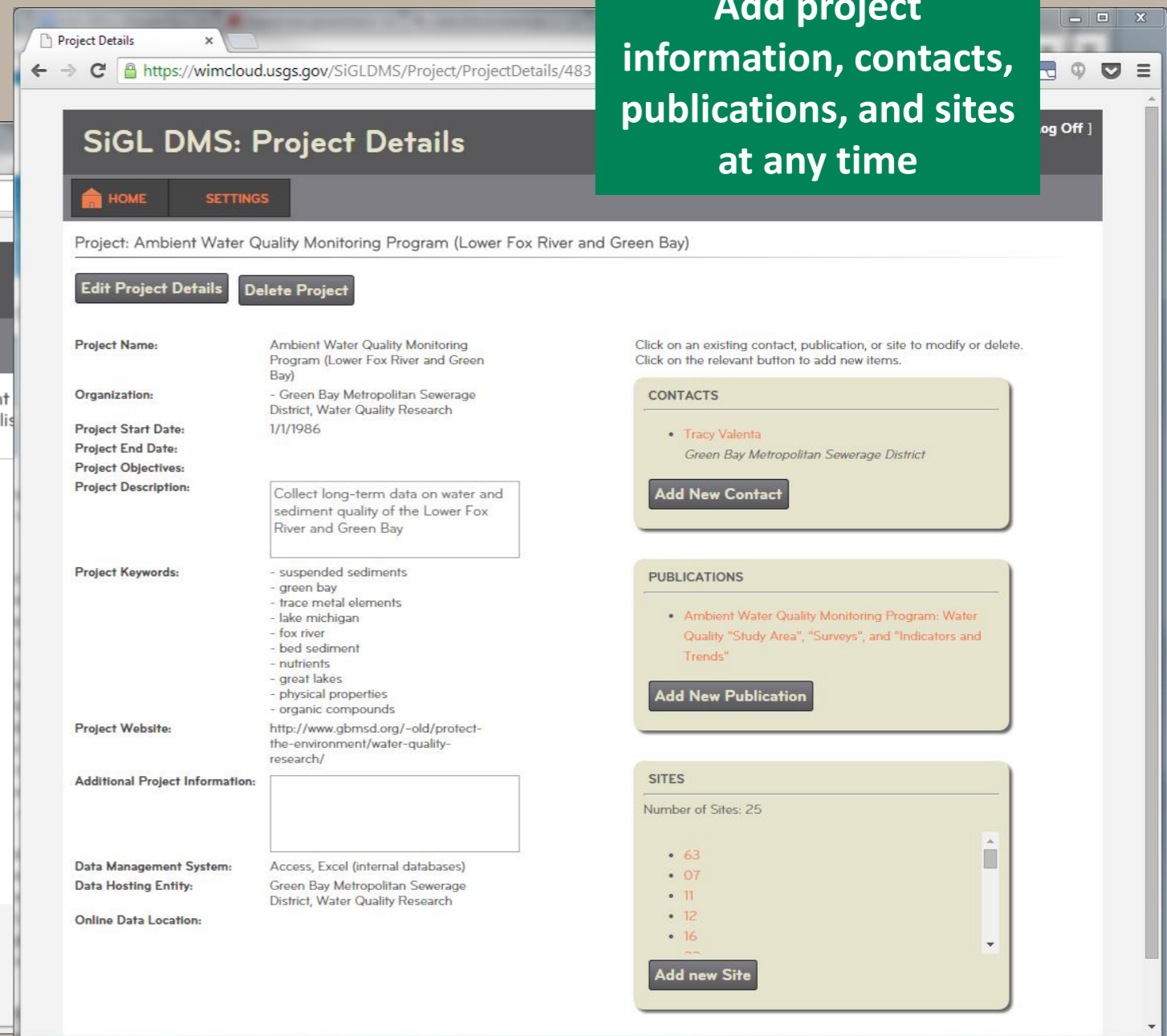
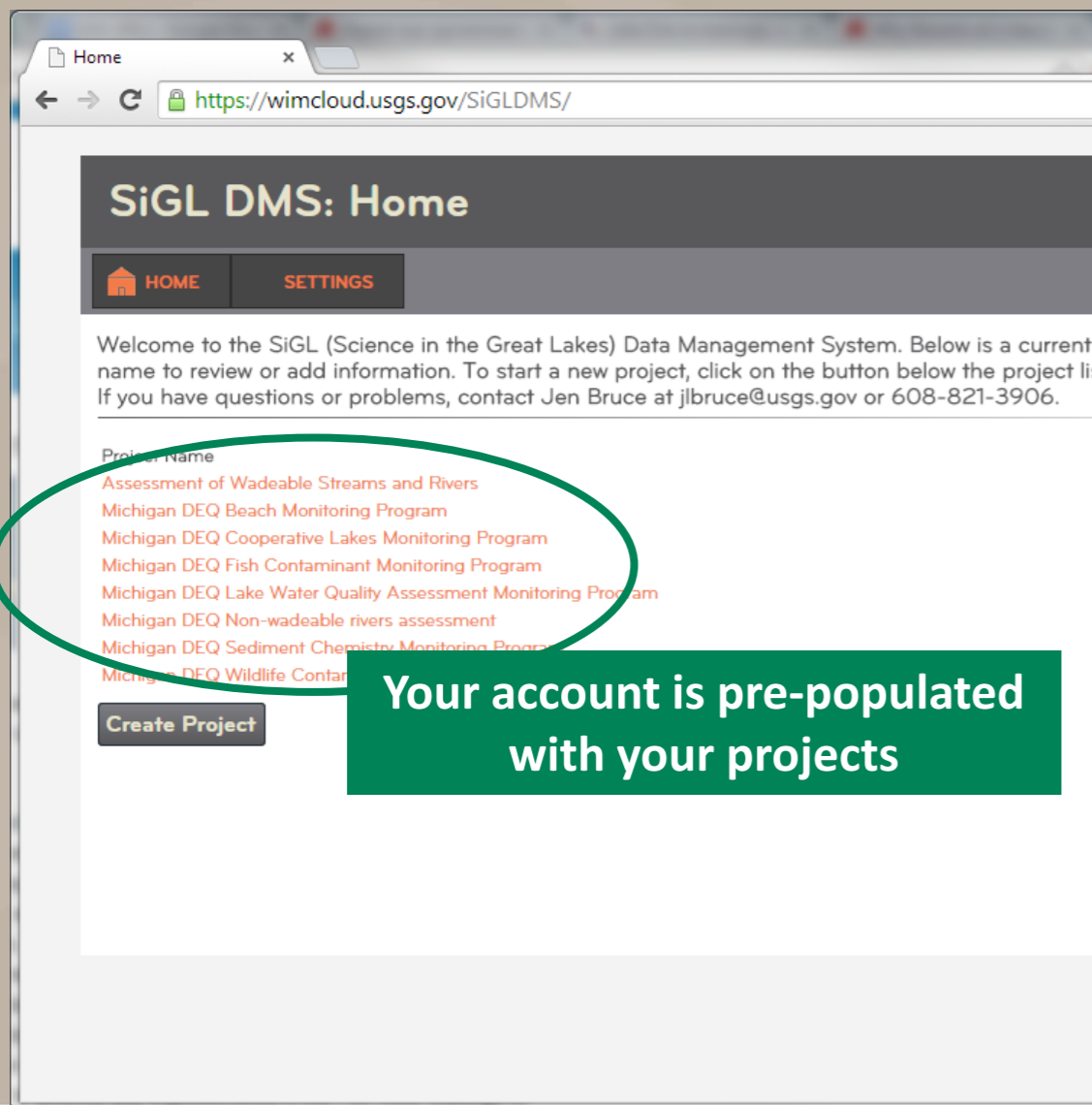
State/Province:

How to submit data to SiGL

OPTION 1 – submit excel spreadsheet

OPTION 2 – SiGL Data Management System (DMS)

- New online tool
- Edit, update, and submit projects



GLRI Science Explorer

- Tool to allow researchers, managers and the public to explore and find information about USGS GLRI science projects
- Presents project metadata, publications and datasets
- Project information is stored and managed in ScienceBase (USGS Product)

GLRI Science Explorer

USGS Home
Contact USGS
Search USGS

Great Lakes RESTORATION Initiative Science Explorer

Discover USGS Science in the Great Lakes



[Drag Map](#) [Draw Bounds](#)

Text Search

Water Feature

Focus Area

Template

Resource Type

<input type="checkbox"/>	Any	
<input checked="" type="checkbox"/>	Data	6
<input type="checkbox"/>	Publication	0
<input checked="" type="checkbox"/>	Project	2

[Clear Form](#) [Search](#)

Powered by ScienceBase

2 results, showing 1 - 2

< Previous **1** Next >

Sort by:

Show **5** 10 15 results per page

Forecasting Potential Phragmites Coastal Invasion Corridors

Kurt P Kowalski (Principal Investigator), Russell M Strach (Associate Project Chief), USGS Great Lakes Science Center (Cooperator/Partner), and others.

U.S. Geological Survey (USGS) will use remote sensing data to establish a baseline understanding of current distributions of invasive wetland plants and then forecast potential invasion corridors. Alterations to the Great Lakes shoreline or water-level patterns associated with global climate change could have significant impacts on the extent and composition of coastal habitat. Low lake levels can expose fertile wetland bottomlands to invasive species such as common reed (Phragmites).

[Project Home Page](#)
[Publications and Datasets](#)

8 Child record(s) (projects and datasets) [Close child list](#)

Assessment of suitable habitat for Phragmites australis (common reed) in the Great Lakes coastal zone

Carlson Mazur, Martha L. (Author), Kowalski, Kurt P. (Author), Galbraith, David (Author), and others.

In the Laurentian Great Lakes, the invasive form of Phragmites australis (common reed) poses a threat to highly productive coastal wetlands and shorelines by forming impenetrable stands that outcompete native plants. Large, dominant stands can derail efforts to restore wetland ecosystems degraded by other stressors. To be proactive, landscape-level management of Phragmites requires information on the current spatial distribution of the species and a characterization of areas suitable for future colonization. Using a recent basin-scale map of this invasive plant's distribution in the U.S. coastal zone of the Great Lakes, environmental data (e.g., soils, nutrients, disturbance, climate, topography), and climate predictions, we performed [...]

[index page](#)

Coastal Corridors Vulnerable Under Reduced Lake Level Scenarios

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