



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

Lake Superior Environmental Monitoring Collaborative

March 19-20, 2015

Houghton, Michigan

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

The screenshot displays the SiGL Science in the Great Lakes mapper 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 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

SEARCH SITES

Enter at least one search term.

Parameters:

Sampling dates: from: to:

Resource component:

Media:

Great Lake:

State/Province:

The map shows the Great Lakes region with various data layers overlaid. The Great Lakes Basins are color-coded: Lake Erie (light green), Lake Huron (pink), Lake Michigan (light blue), Lake Ontario (light purple), and Lake Superior (light green). SiGL Sites are represented by colored dots: Lake Erie (yellow), Lake Huron (red), Lake Michigan (orange), Lake Ontario (purple), and Lake Superior (green). The map also shows EPA Areas of Concern and USGS GLRI Nutrient Monitoring Basins. The interface includes a search bar, a map navigation panel, and a search filter panel.

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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:

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 (greate...

PROJECT DESCRIPTION: This project will assess the status and trends of coastal wetlands in the Great Lakes basin. The project will identify the highest quality, most degraded wetlands in the Great Lakes basin and produce information on the status and trends of these wetlands in the Great Lakes basin. This information will be used to identify the highest quality, most degraded wetlands in the Great Lakes basin and produce information on the status and trends of these wetlands in the Great Lakes basin. This information will be used to identify the highest quality, most degraded wetlands in the Great Lakes basin and produce information on the status and trends of these wetlands in the Great Lakes basin.

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

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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

Kevin O'Donnell
U.S. Environmental Protection Agency, Great Lakes National Program Office
ODonnell.Thomas@epa.gov
312-886-0813

Don Uzarski
Central Michigan University, Institute for Great Lakes Research
uzars1dg@cmich.edu
989-774-2504

Lists who to contact for more information

Information available in SiGL

SiGL pop-up: Site information

USGS science for a changing world

SiGL: Science in the Great Lakes

Basemaps

Find address or place

MAP LAYERS

EXPLANATION

US EPA GLNPO Water and Biology Monitoring Programs

PROJECT SUMMARY DATA/PUBLICATIONS CONTACT INFO PROJECT SITES

SU 06
SU 10
SU 13
SU 18

ER 61
ER 91M
HU 27
HU 48
HU 54M
HU 98B
HU 95B

SITE NAME: SU 10

SITE DETAILS PARAMETERS SAMPLED

LOCATION (Lat., Long): 47.51417, -87.54611
STATE: Michigan
COUNTRY: United States Of America
GREAT LAKE: Superior
WATERBODY: Central Lake Superior
WATERSHED (HUC8): N/A
SITE DESCRIPTION: N/A
START DATE: 4/1/1993
END DATE: N/A
STATUS: Active
RESOURCE COMPONENT: Lake or stream bottom (be Offshore)
MEDIA: Sediment/Soil, Water
SAMPLING FREQUENCY: Spring, Summer
SAMPLING PLATFORM: R/V Lake Guardian
ADDITIONAL SITE INFORMATION: Data available ann
SITE WEBSITE: <https://greatlakesmonitoring.org/geod/location/SU10/>

US EPA GLNPO Water and Biology

PROJECT SUMMARY DATA/P

ER 60
ER 92
ER 93B
ER 95B
HU 06
HU 12
HU 15M
HU 37
HU 38
MI 11
MI 17
MI 30B
MI 42B
MI 51B
SU 05

SITE NAME: SU 10

SITE DETAILS PARAMETERS SAMPLED

BIOLOGICAL

- Algae/phytoplankton
- Chlorophyll
- Zooplankton

CHEMICAL

- Dissolved oxygen
- Major ions
- Metals
- Nutrients - nitrogen - any form
- Nutrients - other
- Nutrients - phosphorus - any form
- pH

PHYSICAL

- Conductivity, specific
- Fluorescence

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

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

Links out to site-specific online data

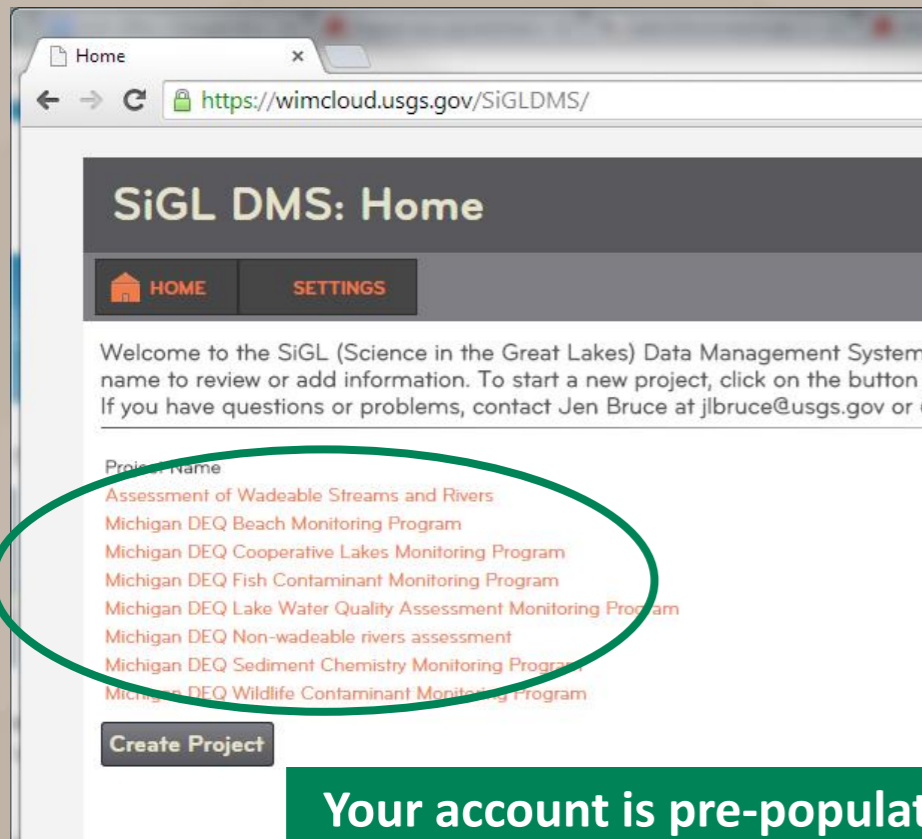
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How to submit data to SiGL

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



Your account is pre-populated with your projects

The screenshot displays the 'SiGL DMS: Project Details' page for the 'Great Lakes Sediment Surveillance Program'. The page includes navigation links for 'HOME' and 'RESOURCES', and buttons for 'Edit Project Details' and 'Delete Project'. The project information is as follows:

- Data Manager:** Todd Nettesheim
- Project Name:** Great Lakes Sediment Surveillance Program
- Organization:** U.S. Environmental Protection Agency, Great Lakes National Program Office; University of Illinois at Chicago, School of Public Health
- Project Duration:** Long term (greater than 5 years)
- Project Status:** Active - completion date undetermined
- Project Start Date:** 9/1/2010
- Project Completion Date:** (blank)
- Project Objectives:** Deposition, Trend analysis, Assessment, Ecosystem health, CSMI, Contaminants of emerging concern (CECs)
- Project Description:** This project will investigate the presence of persistent, bioaccumulative and toxic substances (PBTs), and determining the spatial distribution and temporal trend of PBTs in the Great Lakes through sedimentary records.
- Project Keywords:** sediment, chemicals of emerging concern
- Project Website:** (blank)
- Additional Project Information:** Sediment samples collected in one lake per year, starting in 2010, using the CSMI schedule. Dr. An Li with the University of Illinois at Chicago, is the PI for this EPA funded project.

On the right side, there are four sections for adding new items:

- DATA:** Includes 'Excel spreadsheets' and an 'Add New Data' button.
- CONTACTS:** Lists 'Todd Nettesheim' (U.S. Environmental Protection Agency) and 'An Li' (University of Illinois at Chicago), with an 'Add New Contact' button.
- PUBLICATIONS:** Lists 'Historical trends of inorganic and organic fluorine in sediments of Lake Michigan' and 'Polychlorinated Carbazoles in Sediments of Lake Michigan - A New Discovery', with an 'Add New Publication' button.
- SITES:** Shows 'Number of Sites: 208' and lists 'M010', 'M020', and 'M030'.

A note at the top right of the page states: 'Click on an existing data, contact, publication, or site to modify or delete. Click on the relevant button to add new items.'

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										

Future development plans

SiGL functionality:

- Search results will display in list form, allowing projects without sites to be searchable
- Improve selection ability for overlaying sites
- Expand database to allow line and polygon spatial features
- 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

Form SiGL user group:

- Representatives from a variety of organizations and disciplines
- Will help guide SiGL development, identify priorities, and keep system content relevant and consistent
- Once assembled, the user group will undertake a rigorous review of SiGL fields and parameters (ex. PCBs)

Contact SiGL

John Walker, USGS Wisconsin Water Science Center

Center Director

jfwalker@usgs.gov

608-821-3810

Jen Bruce, USGS Wisconsin Water Science Center

SiGL mapper project lead

jlbruce@usgs.gov

608-821-3906

[SiGL Mapper demo]

greatlakesmonitoring.org team

- EPA-GLNPO
 - Paul Horvatin, MIRB Branch Chief
 - Program leads – Eric Osantowski and Glenn Warren, Limnology; Beth Murphy Fish Monitoring; Todd Nettesheim, IADN
- NCSA
 - Developers: Luigi Marini, Barbara Minsker, Nick Tenczar, Rob Kooper, Brock Angelo, Eugene Roeder
 - Designer – Lisa Gatzke
- IL – IN Sea Grant
 - Brian Miller, Kristin Tepas



Corpus Christi Bay (CCBay)

Dimensions

N to S ~ 12 mi

E to W ~ 18 mi

Average depth ~ 9 ft

Adjacent bays:

Oso Bay, Laguna

Madre, Nueces Bay,

Redfish Bay



Hypoxia

Dissolved oxygen < 30 % saturation (~2mg/L)

Occurs episodically in CCBay during summer months

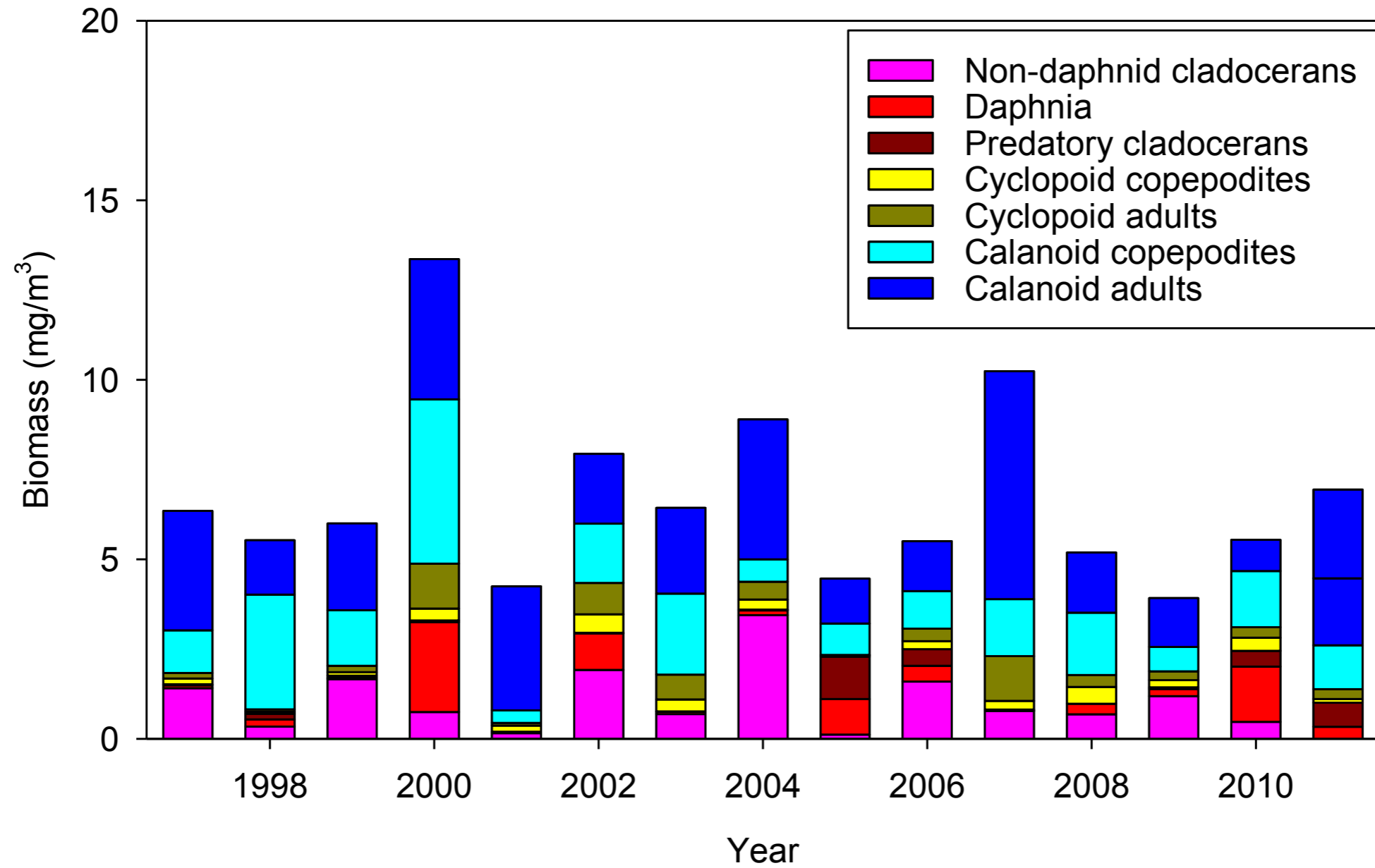
Results in ten-fold reduction in stock and diversity of benthic organisms.

glm demo

Future steps

- Increase flexibility of data views
- Identify data sets for ingestion:
 - USGS stream gauges
 - NOAA buoy data
 - STORET
- Additional data views:
 - GLNPO Biology program

August crustacean zooplankton biomass
Station SU 10, 1997-2011
153 um mesh, 100 m tows

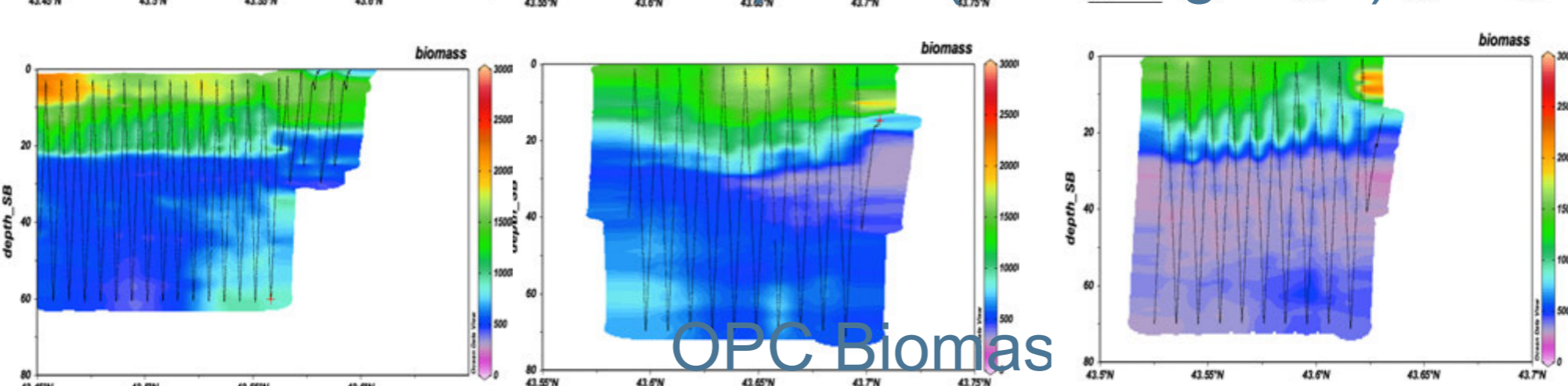
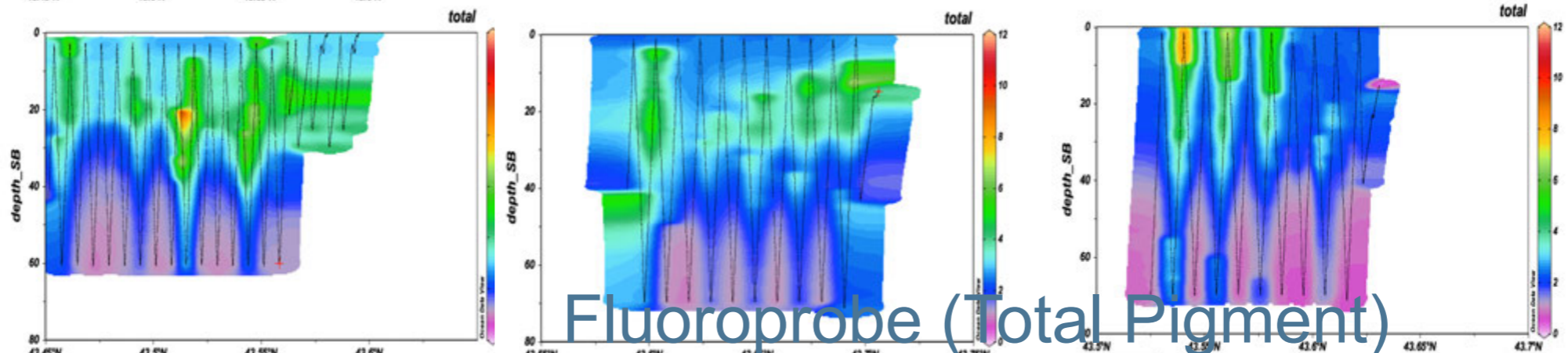
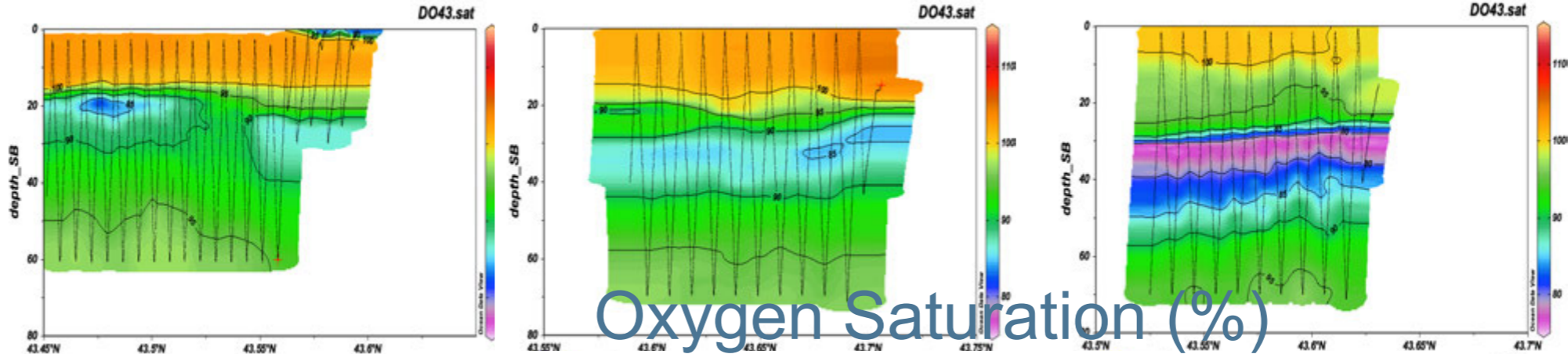
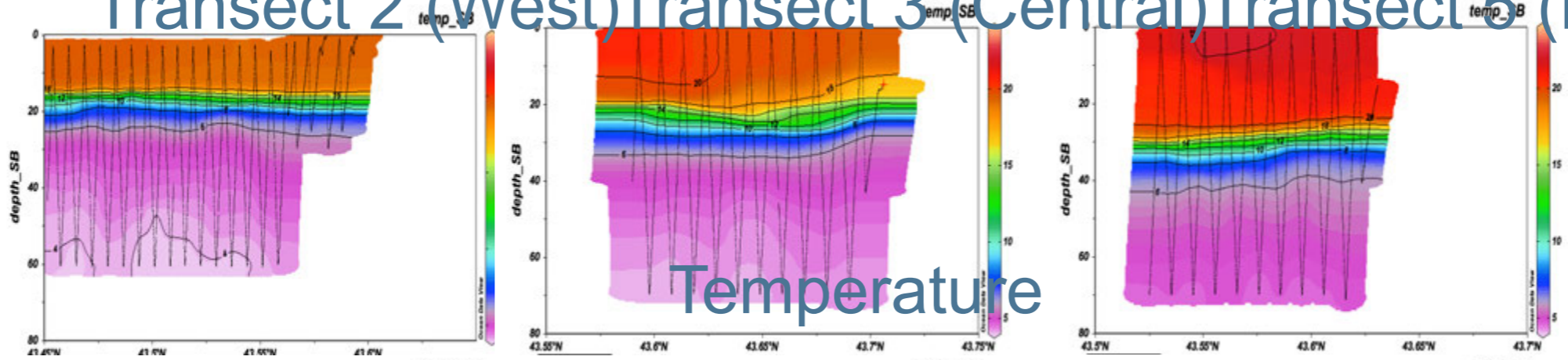


Future steps

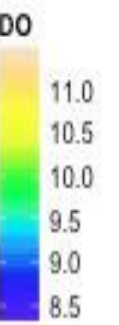
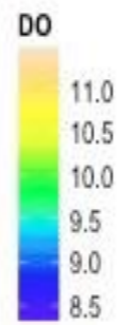
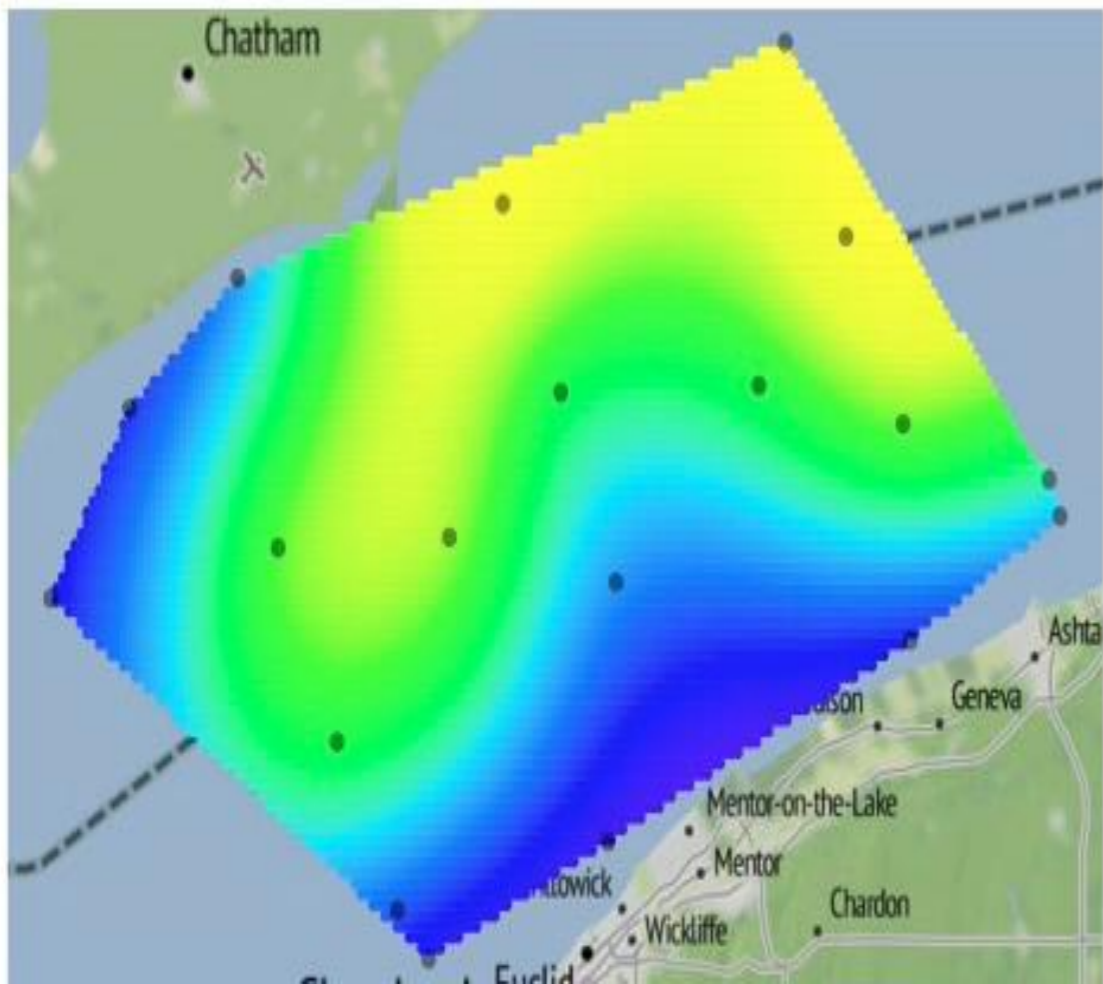
- Identify data sets for ingestion:
 - USGS stream gauges
 - NOAA buoy data
 - STORET
- Additional data views:
 - GLNPO Biology program
 - Triaxus and D.O. program

Night Transects

Transect 2 (West) Transect 3 (Central) Transect 5 (East)



2014-06-25 12:00:00



gltg demo



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

[SiGL DMS demo]