

## **Stressor Gradients and Spatial Narratives of the St. Louis River Estuary**

### **Open Archives for Accessing the Science of the Estuary**

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This short paper provides information about providing access to the science of the St. Louis River Estuary. An important objective of the Stressor Gradient/Spatial Narratives project was development of an open archive to exchange, share and integrate scientific publications and data relevant to the St. Louis River Estuary and contributing watershed. This was the foundation for building spatial narratives and consists of annotated bibliographies and archives for scientific and geospatial data.

### **Science Bibliographies**

A St. Louis River Estuary bibliography was translated from RefWorks into the Mendeley reference manager and academic social network (<http://www.mendeley.com/>) in June 2013. The “SLRE Library” group (<http://www.mendeley.com/groups/3337111/slre-library/>) contains 167 bibliographic entries for scientific research covering the St. Louis River Estuary/Watershed.

The Wisconsin Department of Natural Resources completed a bibliography of Lake Superior estuaries in Spring 2012 with funding from the Wisconsin Coastal Management Program (<http://dnr.wi.gov/topic/wetlands/documents/cwLakeSuperior/LakeSuperiorEstuariesBibliography.pdf>). The “Lake Superior Estuaries” group in Mendeley (<http://www.mendeley.com/groups/1969071/lake-superior-estuaries/>) contains 337 bibliographic entries.

The Lake Superior National Estuarine Research Reserve (<http://lsnerr.uwex.edu/>) maintains its own research library and has developed a bibliography with approximately 1,000 entries using EndNote.

[Info about NRRRI RefWorks bibliography]

<http://www.mendeley.com/groups/3337111/slre-library/>

167 papers


**Feedback**

## Science Bibliography - Lake Superior Estuaries - Mendelay

<http://www.mendeley.com/groups/1969071/lake-superior-estuaries/>

Maintained by the Wisconsin Department of Natural Resources

337 papers

The screenshot shows the Mendeley website interface. At the top, there's a navigation bar with the Mendeley logo, a search bar, and links for 'Sign up & Download' and 'Sign in'. Below this, there's a section for the 'Lake Superior Estuaries' group, which includes a profile picture, the group name, and a 'Follow this group' button. The main content area is divided into two columns. The left column has a sidebar with 'Overview', 'Papers', and 'Members' tabs. The right column displays a list of papers under the heading 'Papers in this group'. The papers listed are:

- Pokegama, Little Pokegama and Red Rivers 303d Assessment Project Summary**  
Wisconsin Department of Natural Resources [WDNR] (2013)  
Added 3 weeks ago
- Erosion and sedimentation in the Nemadji River Basin: Nemadji River Basin final report**  
Natural Resource Conservation Service (1988)  
Added 3 weeks ago
- An Assessment of the Physical Factors That Trigger Landslides and the Relative Impact of a 500-Year Flood Within the Red River Breaks (Wisconsin/Minnesota)**  
Ashley Kotz, Crystal Lambert, Andy Breckenridge, Rachel Breckenridge (2014)  
The 7.2 mile long Red River is a tributary of the St. Louis estuary in far southwestern Lake Superior. The river downcuts a clay plain from a former glacial lake making the area highly susceptible to landslides when the clay becomes saturated....  
Added 3 weeks ago 1 reader
- Managing woodlands on Lake Superior's red clay plain**  
Wisconsin Department of Natural Resources [WDNR] (2007)  
Added 3 weeks ago 2 readers
- Wisconsin forest management guidelines**  
Wisconsin Department of Natural Resources [WDNR] (2003)  
Added 3 weeks ago 1 reader
- Wisconsin's forestry best management practices for water quality**  
Wisconsin Department of Natural Resources [WDNR] (1995)

On the right side of the paper list, there's a 'Top tags in this group' section with various tags like 'Great Lakes - Coastal Wet...', 'estuaries', 'hydrology', 'plants', 'water quality', 'invasive species', 'Great Lakes - not Superior', 'birds', 'Great Lakes - General', 'Nutrient Cycling & Chemistry', 'restoration', 'geomorphology', 'monitoring', 'land-use planning', 'ecology', 'aquatic macroinvertebrates', 'Lake Superior', 'biological indicators', and 'invertebrates'.

A RefWorks bibliography was prepared at the beginning of the project with entries for scientific research covering the St. Louis River Estuary/Watershed. This bibliography was accessible through RefWorks accounts at the University of Wisconsin-Madison and the University of Minnesota-Duluth. [Please note that the UW subscription to RefWorks ended on June 30, 2013, necessitating the transition to Mendelay.]

The screenshot displays the RefWorks web interface for a user named Anne Moser at the University of Wisconsin, Madison. The interface includes a top navigation bar with tabs for References, View, Search, Bibliography, Tools, and Help. Below this is a search bar and buttons for New Folder, Create Bibliography, and New Reference. The main content area shows a list of references under the heading "All References". The references are sorted by "Authors, Primary" and displayed in "One line/Cite View". The right sidebar contains sections for Announcements, Resources (Support Center, Webinars), Folders (My List, Not In Folder, Last Imported, Mining, Newspaper Articles, Non peer-reviewed material, Peer-Reviewed Journal Article, Reports, Sturgeon), Quick Access (Advanced Search, Import, Export, Create Bibliography, Delete References, Print References, Output Style Manager, Customize), and Statistics (155 Reference(s), 7 Folder(s), 0 Shared Item(s), 1 Attachment(s), 2599804 / 5368709120 bytes used).

References	Organize & Share Folders	1 2 3 4 5 ... Next Last
<input type="checkbox"/> (1999) Invasive crayfish discovered in St. Louis Bay	Selected <input type="radio"/> Page <input type="radio"/> All in List <input type="radio"/>	Sort by: Authors, Primary Change View: One line/Cite View
<input type="checkbox"/> (1989) Health assessment for St. Louis River/U.S. Steel, St. Louis River/Interlake/Duluth Tar, Duluth, Minnesota, Region 5. CERCLIS No. MND039045430		
<input type="checkbox"/> (1980) Duluth Sanitary District First in U.S. to Take Charge of Both Sewage and Refuse		
<input type="checkbox"/> Lake Superior Mining News		
<input type="checkbox"/> <a href="#">Anderson, J.</a> (2000) Duluth Metropolitan Area Streams Snowmelt Runoff Study		
<input type="checkbox"/> <a href="#">ASC Staff Writer</a> (1998) Ruffe Report		
<input type="checkbox"/> <a href="#">ASC Staff Writer</a> (1992) Tough Transplant		
<input type="checkbox"/> <a href="#">ASC Staff Writer</a> (1991) Ruffe customer		
<input type="checkbox"/> <a href="#">Auer, N.A.</a> (2003) A lake sturgeon rehabilitation plan for Lake Superior		
<input type="checkbox"/> <a href="#">Auer, N.A.</a> (1999) Population Characteristics and Movements of Lake Sturgeon in the Sturgeon River and Lake Superior		
<input type="checkbox"/> <a href="#">Axler, R.</a> (2004) DuluthStreams.org: Community partnerships for understanding urban stormwater and water quality issues at the head of the Great Lakes		
<input type="checkbox"/> <a href="#">Bahnick, D.A.</a> (1985) Occurrence and Transport of Organic Macrocontaminants in the Duluth-Superior Harbor		
<input type="checkbox"/> <a href="#">Bahnick, D.A.</a> (1985) Occurrence and transport of organic microcontaminants in the Duluth-Superior Harbor		

**Science Data Archives**

Digital archives accessible at the University of Wisconsin-Madison were reviewed as a means to provide distributed access to the publications, data and maps relevant to the St. Louis River Estuary and Watershed. These include UW Digital Collections (<http://uwdc.library.wisc.edu/>), Minds@UW (<http://minds.wisconsin.edu>) and the Hathi Trust (<http://www.hathitrust.org/>). The Hathi Trust is a digital repository being developed to support many of the large research libraries in the nation. Several searches were conducted in April 2014 to discover materials relevant to the St. Louis River.

## Science Data Archive - UW Digital Collections

A search for "St Louis River" through UW Digital Collections (<http://uwdc.library.wisc.edu/>) yielded 5,774 entries.

← → ↻ uwdc.library.wisc.edu

# UWDC

## University of Wisconsin Digital Collections

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### Explore

Thousands of images, texts, and sound recordings from across Wisconsin and the world



### ABOUT US

The University of Wisconsin Digital Collections Center works to create and provide free access to digital resources that support the teaching and research needs of the UW community, uniquely document the university and State of Wisconsin, and possess broad research value. [Read More](#)

### SEARCH THE COLLECTIONS

"St. Louis River" 


### FEATURED COLLECTIONS



**The University of Wisconsin Collection**  
Images, manuscripts, papers, and books documenting the University's history and mission, including selections from the UW archives, Badger yearbooks, and much more.



**The University of Wisconsin Collection**



**The State of Wisconsin Collection**



**The Aldo Leopold Collection**



**The Ecology and Natural Resources Collection**

### LATEST NEWS

**Dec 18 Holiday Music**  
In celebration of the end of the semester and the rapidly approaching holidays, we are highlighting the holiday themed sheet music found in the [Americana Collection](#). Housed in the [Mills Music Library Special Collections](#), the Americana Collection contains sheet music published as... [FULL STORY](#)

**More News**

- [Spotlight: Mount Horeb History collections](#)
- [Marie Curie in the UW Digital Collections](#)

### VISIT A COLLECTION

- [Africa Focus](#)
- [African Studies Collection](#)
- [The Aldo Leopold Archives](#)
- [American Languages: Our Nation's Many Voices](#)
- [The Anthropology Collection](#)
- [The Antiquities of Wisconsin](#)
- [Archival Resources in Wisconsin: Descriptive Finding Aids](#)
- [Artists' Book Collection](#)
- [The Arts Collection](#)
- [Brecht's Works in English: A Bibliography](#)

University of Wisconsin Digital Collections Center • UW-Madison Libraries  
Technical Assistance • Content/Navigation Questions • Privacy Policy • Usage Statistics • Staff Access  
Copyright © 2011 Board of Regents of the University of Wisconsin System

Databases • Search • Guided Search • Saved Records • History • Help • Exit

## University of Wisconsin Digital Collections

Query: an: "St. Louis River" Records: 1 - 12 of 5774

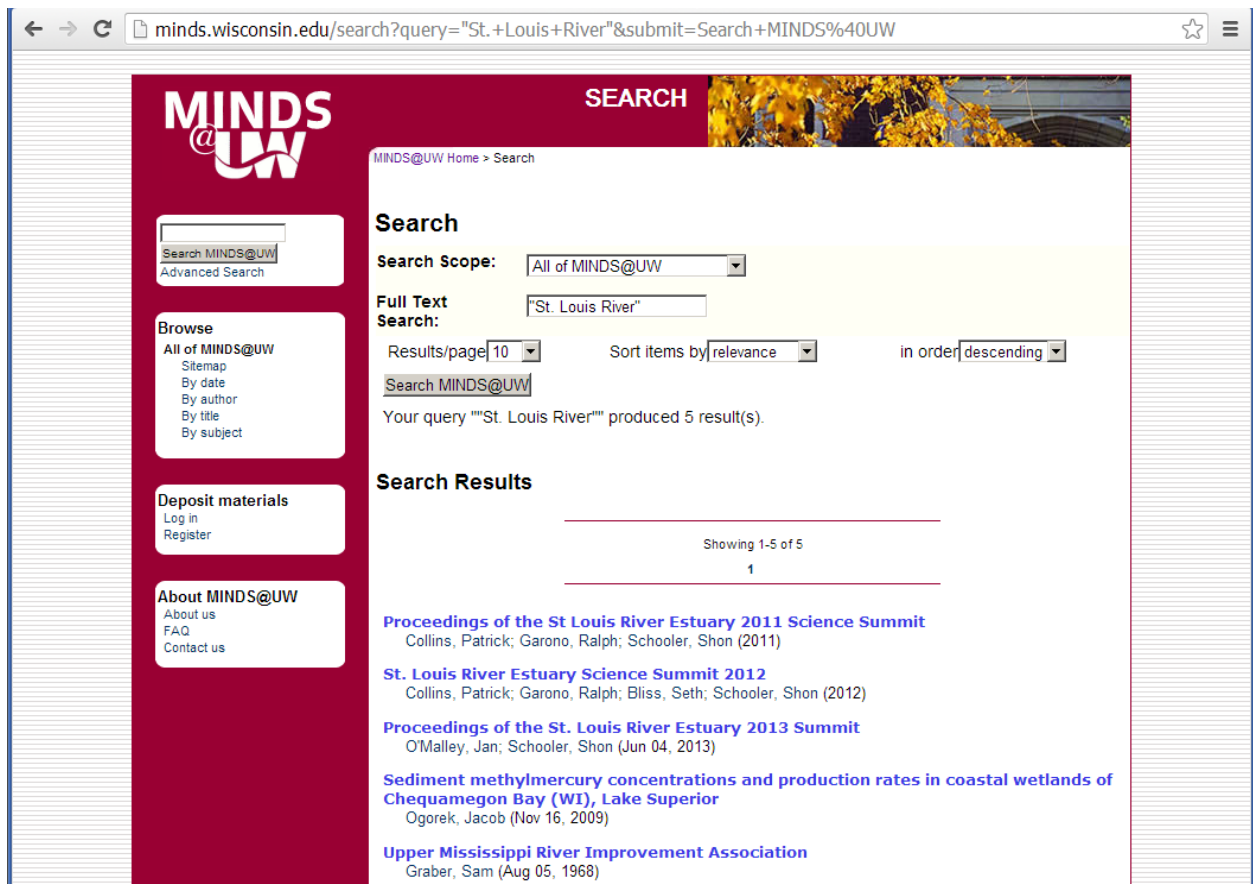
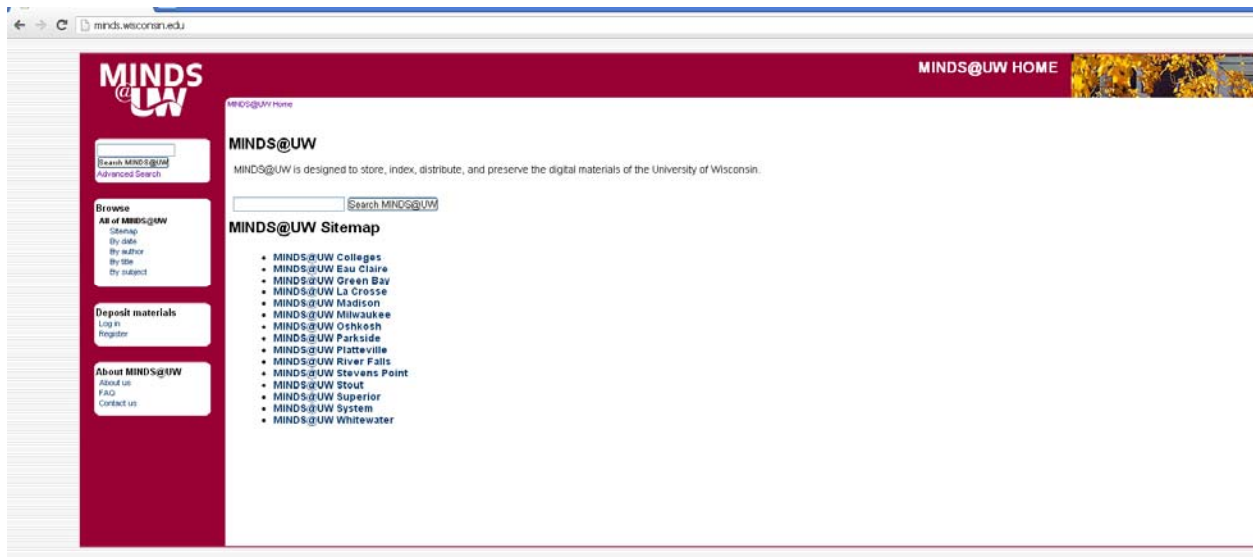
Select view: Gallery • Brief • Full Jump to: 1 13 25 37 49 61 ... 5773

[Save All](#)

<input type="checkbox"/>	<b>Title:</b> Neckens polska Wermland Lag ser uppa dina ogon
	<b>Lyricist:</b> Shipley, Marie A. (Marie Adelaide), 1843-1900
	<b>Rights:</b> Based on date of publication, this material is presumed to be in the public domain.
<input type="checkbox"/>	<b>Title:</b> Charming Waltz
	<b>Composer:</b> Kinkel, Charles
	<b>Date:</b> 1864
	<b>Subjects:</b> Piano music / Waltzes
	<b>Rights:</b> Based on date of publication, this material is presumed to be in the public domain.

## Science Data Archive - Minds@UW

A search for "St Louis River" through Minds@UW (<http://minds.wisconsin.edu>) yielded 5 entries, including proceedings of the 2011, 2012 and 2013 St Louis River Estuary Science Summits.





## Science Data Archive - Hahti Trust

A catalog search for "St Louis River" using Hathi Trust (<http://www.hathitrust.org/>) yielded 48 entries. A full-text search for "St Louis River" using Hathi Trust yielded 17,554 entries.

The screenshot shows the HathiTrust Digital Library homepage. At the top is a navigation bar with links: Home, About, Collections, Help, and Feedback. Below this is the HathiTrust logo, which consists of a stylized orange icon and the text "HATHI TRUST Digital Library". To the right of the logo is a yellow "LOG IN" button. The main content area features a search bar with the placeholder text "Search words about or within the items". Above the search bar are two tabs: "FULL-TEXT" and "CATALOG". To the right of the search bar is a "Search" button with a magnifying glass icon. Below the search bar are two links: "Advanced full-text search" and "Search tips". To the right of these links is a checkbox labeled "Full view only" which is checked. Below the search bar is a link: "? Should I search catalog or full-text?". To the right of the search bar is a yellow box with the text "Want to get the most out of HathiTrust?" and "Log in with your partner institution account to access the largest number of volumes and features." Below this text is a link: "Not with a partner institution? »". Below the search bar is a section titled "WHAT CAN YOU DO WITH HATHITRUST?". This section contains four columns. The first column is titled "BROWSE COLLECTIONS" and contains the text "Explore user-created featured collections." The second column is titled "READ BOOKS ONLINE" and contains the text "Read millions of titles online — like this one!". The third column is titled "READ BOOKS ON THE GO" and contains the text "Take the library's books anywhere with our mobile website." The fourth column is titled "DOWNLOAD BOOKS\* & CREATE COLLECTIONS" and contains the text "\*requires institutional login".

www.hathitrust.org

Home About Collections Help Feedback

**HATHI TRUST**  
Digital Library

**LOG IN**

**Search HathiTrust's digital library**

FULL-TEXT CATALOG

Search words about or within the items

Search

[Advanced full-text search](#) | [Search tips](#)

☒ Full view only

? [Should I search catalog or full-text?](#)

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[Not with a partner institution? »](#)

HathiTrust is a [partnership](#) of academic & research institutions, offering a collection of millions of titles digitized from libraries around the world.

**WHAT CAN YOU DO WITH HATHITRUST?**

**BROWSE COLLECTIONS**  
Explore user-created [featured collections](#).

**READ BOOKS ONLINE**  
Read millions of titles online — [like this one!](#)


**READ BOOKS ON THE GO**  
Take the library's books anywhere with our [mobile website](#).

**DOWNLOAD BOOKS\* & CREATE COLLECTIONS**  
*\*requires institutional login*



← → C catalog.hathitrust.org/Search/Home?type%5B%5D=all&lookfor%5B%5D="St.%20Louis%20River"&page=1&ft=☆

Home About Collections Help Feedback Hi DAVID A HART! My Collections Logout

 FULL-TEXT CATALOG

"St. Louis River" All Fields 🔍

[Advanced catalog search](#) | [Search tips](#) ☒ Full view only

**Refine Results**

**Subject**

- [Business and industry](#) (11)
- [Business and Industry](#) (8)
- [business and industry](#) (8)
- [Transportation](#) (5)
- [Politics and government](#) (3)
- [more...](#)


**Author**


- [Brown, Baxter L. 1864-](#) (1)
- [Brown, Baxter Lamon, b. 1864](#) (1)
- [Lanman, Charles, 1819-1895](#) (1)
- [Saint Louis \(Mo.\) City Plan Commission](#) (1)

**Showing 1 - 20 of 48 Results for all fields:"St. Louis River"**

All items (48) Only full view (47)


Sort Relevance 1 2 3 Next »

 Excursion boat on St. Louis River  
Published 1915  
[Catalog Record](#) [Full view](#)

 Bridges across St. Louis River. Hearings ... on H.R. 15727 and H.R. 17762. September 26, 1914.  
by United States. Congress. House. Committee on Interstate and Foreign Commerce.  
Published 1915  
[Catalog Record](#) [Full view](#)

← → C babel.hathitrust.org/cgi/lis?field1=ocr;q1="St.%20Louis%20River";a=srchls;lm=ft ☆

Home About Collections Help Feedback

 FULL-TEXT CATALOG

"St. Louis River" 🔍 LOG IN

[Advanced full-text search](#) | [Search tips](#) ☒ Full view only

**Refine Results**

**Subject**

- [United States](#) (1,277)
- [Engineering](#) (677)
- [Railroads](#) (546)
- [Canada](#) (503)
- [United States.](#) (435)
- [more...](#)

**Author**

- [United States. Congress.](#) (478)
- [United States. Army. Corps of Engineers.](#) (413)
- [Geological Survey \(U.S.\)](#) (355)
- [United States. Mississippi River Commission.](#) (177)
- [Canada Parliament.](#) (173)
- [more...](#)

**Language**


- [English](#) (11,269)


**Search Results: 11,953 items found for "St. Louis River" in Full-Text + All Fields**

All Items (17,554) Full View (11,953)

25 per page Prev 1 2 3 4 5 6 7 8 9 10 ... 479 Next >>

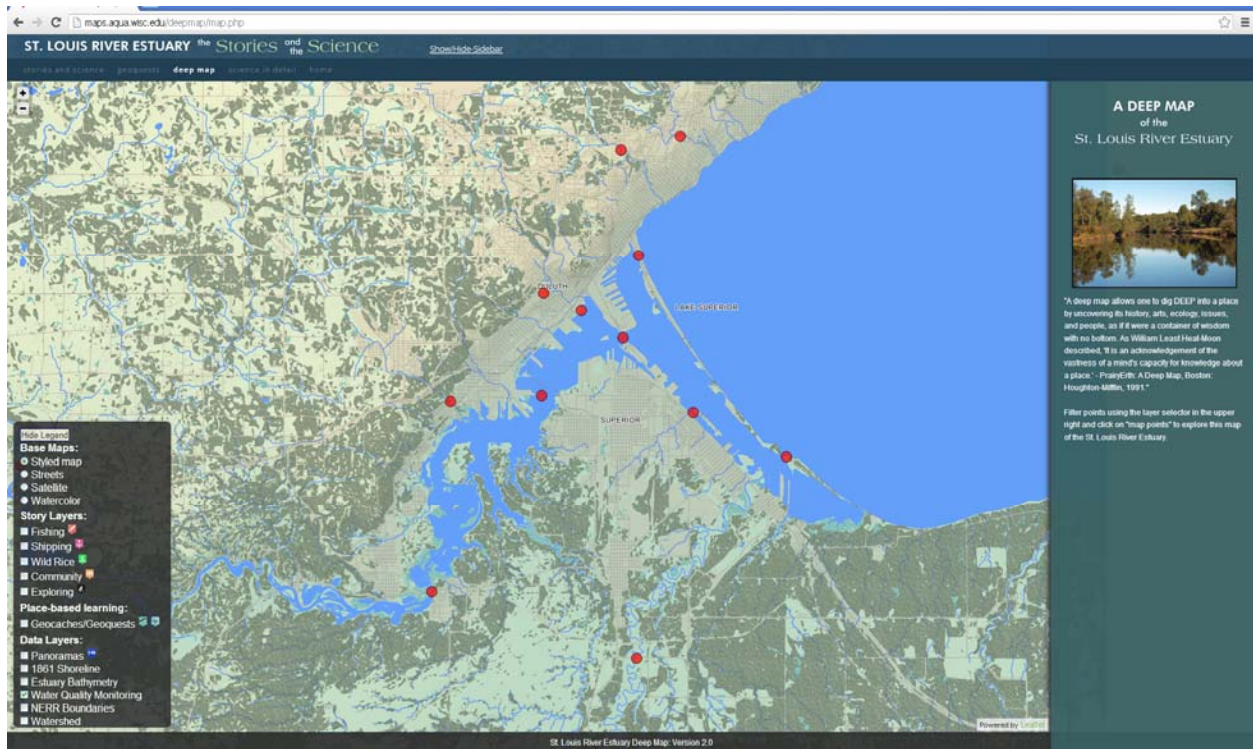
Select all on page ☐ Select Collection

☐  Bridge over St. Louis River at Grassy Point, Minnesota. Mr. Fletcher, from the Committee on Interstate and Foreign Commerce, submitted the following report.  
Published 1894  
[Catalog Record](#) [Full view](#)

☐  Bulletin. no. 3  
by Minnesota Geological Survey.  
Published 1887  
[Catalog Record](#) [Full view](#)

## Deep Map – St. Louis River Estuary, the Stories and the Science

The “Deep Map” developed by the project team (<http://maps.aqua.wisc.edu/deepmap/map.php>) includes a “Water Quality Monitoring” layer that provides access to monitoring observation data for the St. Louis River Estuary. It includes access to USGS stream gages, buoys maintained by the Large Lakes Observatory at UMD, monitoring stations in Duluth trout streams maintained by NRRI, and monitoring sites in the estuary maintained by NRRI and partners.



## NOAA National Estuarine Research Reserve System, Centralized Data Management Office

The LSNERR monitoring program includes 5 stations along the estuary at the Oliver Bridge, Bong Bridge, Blatnik Bridge, Barker's Island and Pokegama Bay. Data access is provided through the NOAA National Estuarine Research Reserve, Centralized Data Management Office (<http://cdmo.baruch.sc.edu/>).



# NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

Centralized Data Management Office

[Home](#) [About CDMO](#) [About Data](#) [Get Data](#) [Web Services](#) [Contact CDMO](#)



### View / Download Data



### Real Time Monitoring Data

Choose Reserve...  
ELKCMWET 11/20/13 12:45 PM  
ELKSMWQ 11/20/13 01:15 PM



Air Temperature: 15.2 °C (59 °F)  
Wind Speed: 3.4 m/Sec (08 mph)  
Water Temperature: 13.8 °C (57 °F)  
Salinity: 33.2 PPT  
Dissolved Oxygen: 7.1 mg/L

### CDMO News

The CDMO is excited to announce the launch of our new **SWMP Mobile application**. Near real-time SWMP data is now available on your smartphone or tablet at: [www.nerrsdata.org/mobile](http://www.nerrsdata.org/mobile)

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Our **Data Export System** has been updated and now has enhanced graphing capabilities! Want to easily export or graph data? If so, check out our [Data Export System!](#)

[Department of Commerce](#) | [NOAA](#) | [National Ocean Service](#) | [Ocean and Coastal Resource Management](#) | [NERRS](#) | [Webmaster](#)

Site hosted by NOAA National Estuarine Research Reserve, Centralized Data Management Office.




## Data Export System

<http://cdmo.baruch.sc.edu/get/export.cfm>

Developed to provide users with quick and easy access to monitoring data. It includes a map-based interface and offers single station exports, yearly authenticated file downloads, charting, and a current conditions display for real-time stations.

cdmo.baruch.sc.edu/get/export.cfm

 NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM  
Centralized Data Management Office

Home About CDMO About Data Get Data Web Services Contact CDMO

**Data Export System** Powered By The Centralized Data Management Office

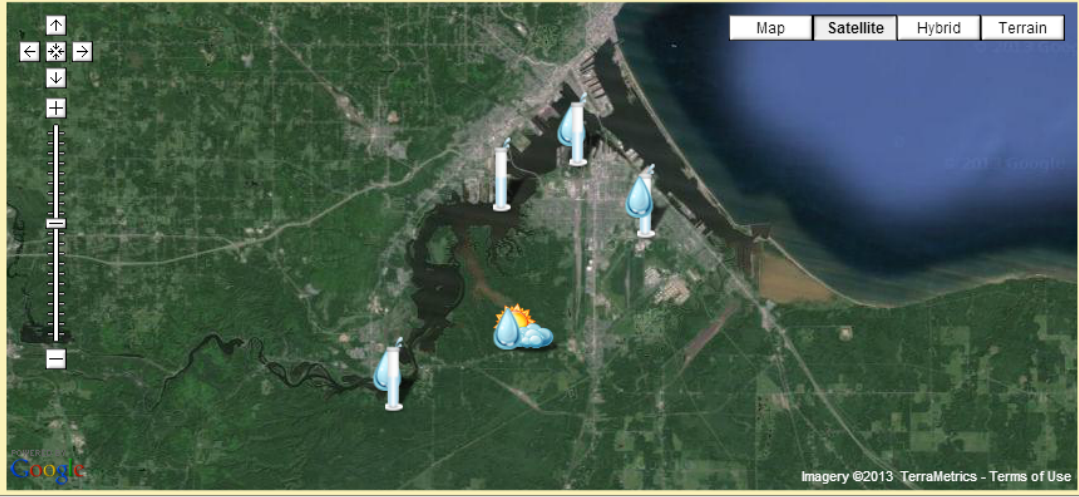
Choose Reserve Choose Sampling Station View or Download Data Submit Info Complete!

**Please select a sampling station from Lake Superior, WI:**

Filter sampling stations by data type: All Stations

Station Name	SWMP	Real Time	Status	Data Type	Station Code
Barker's Island	P	Yes	Active	water quality	BA
Pokegama Bay	P	Yes	Active	meteorological	PO
Oliver Bridge	P	Yes	Active	water quality	OL
Blatnick Bridge	P	No	Active	water quality	BL
Barker's Island	P	No	Active	nutrient	BA


Your Station Selection: Choose above



Map Satellite Hybrid Terrain

Imagery ©2013 TerraMetrics - Terms of Use

Department of Commerce | NOAA | National Ocean Service | Ocean and Coastal Resource Management | NERRS | Webmaster  
Site hosted by NOAA National Estuarine Research Reserve, Centralized Data Management Office.






## Advanced Query System

<http://cdmo.baruch.sc.edu/aqs>

Developed to specifically address the data delivery needs of those end-users looking for large amounts of data exported in a format that can be easily imported and manipulated for data analysis. It offers three different query options allowing for mass downloads of annual files, customized queries for specific parameters and multiple stations in the same file, and an option to merge water quality, meteorological and nutrient datasets.

cdmo.baruch.sc.edu/aqs/chooseParamsCustomWaterMet.cfm



NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM  
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[<< Back To Choose Download Type](#)

**Custom Water/Met Query Choose Parameters:**

### Weather Stations

☐ ATemp ☐ RH ☐ BP ☐ WSpd ☐ MaxWSpd ☐ Wdir ☐ SDWDir ☐ TotPAR ☐ TotPrcp ☐ CumPrcp ☐ TotSoRad

[Select all weather parameters](#) | [Remove all weather parameters](#)

### Water Stations

☐ Temp ☐ SpCond ☐ Sal ☐ DO\_pct ☐ DO\_mgl ☐ Depth ☐ cDepth ☐ pH ☐ Turb ☐ ChlFluor

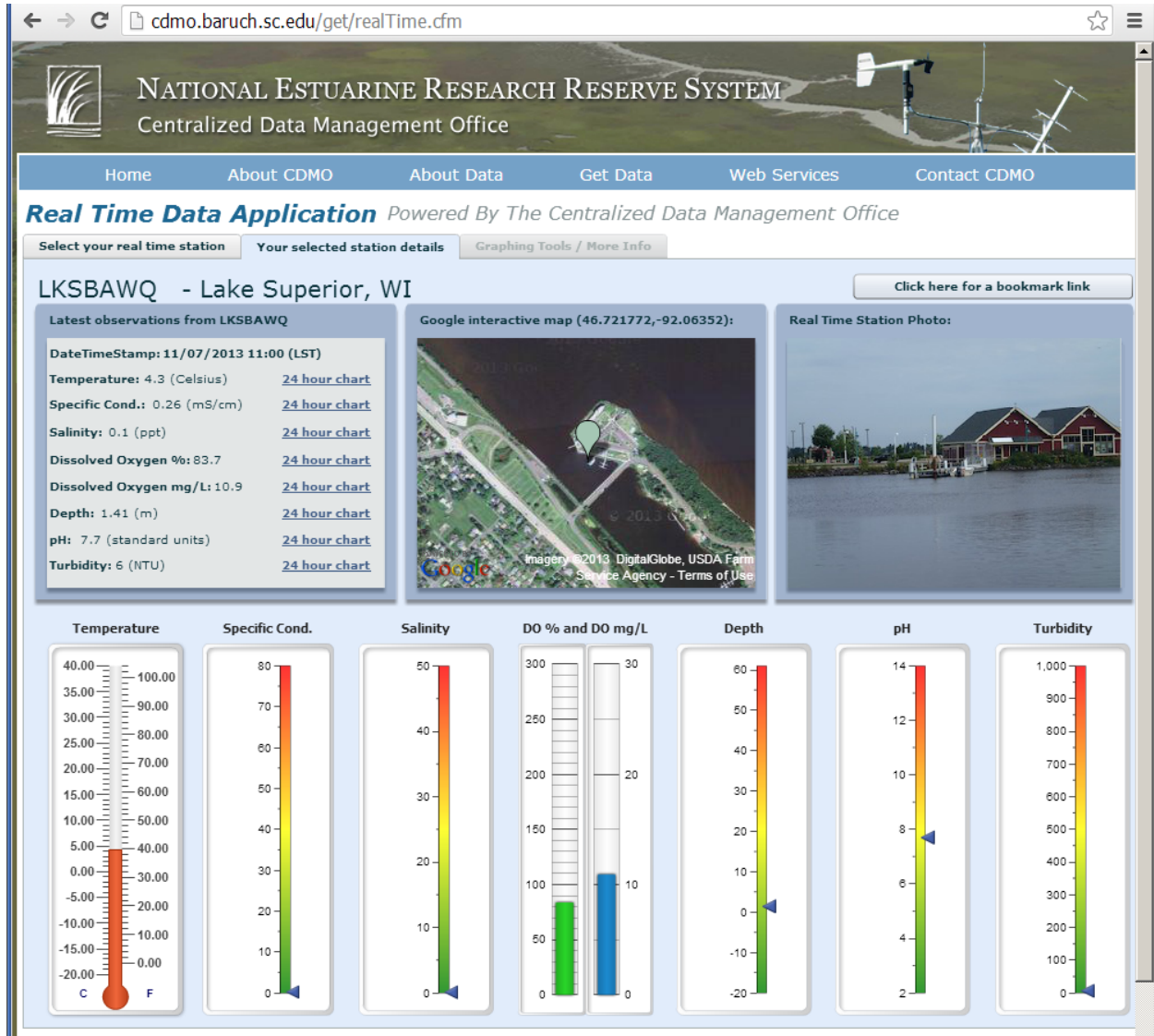
[Select all water quality parameters](#) | [Remove all water quality parameters](#)

[Proceed To Choose Dates](#)

## Real Time Data Application

<http://cdmo.baruch.sc.edu/get/realTime.cfm>

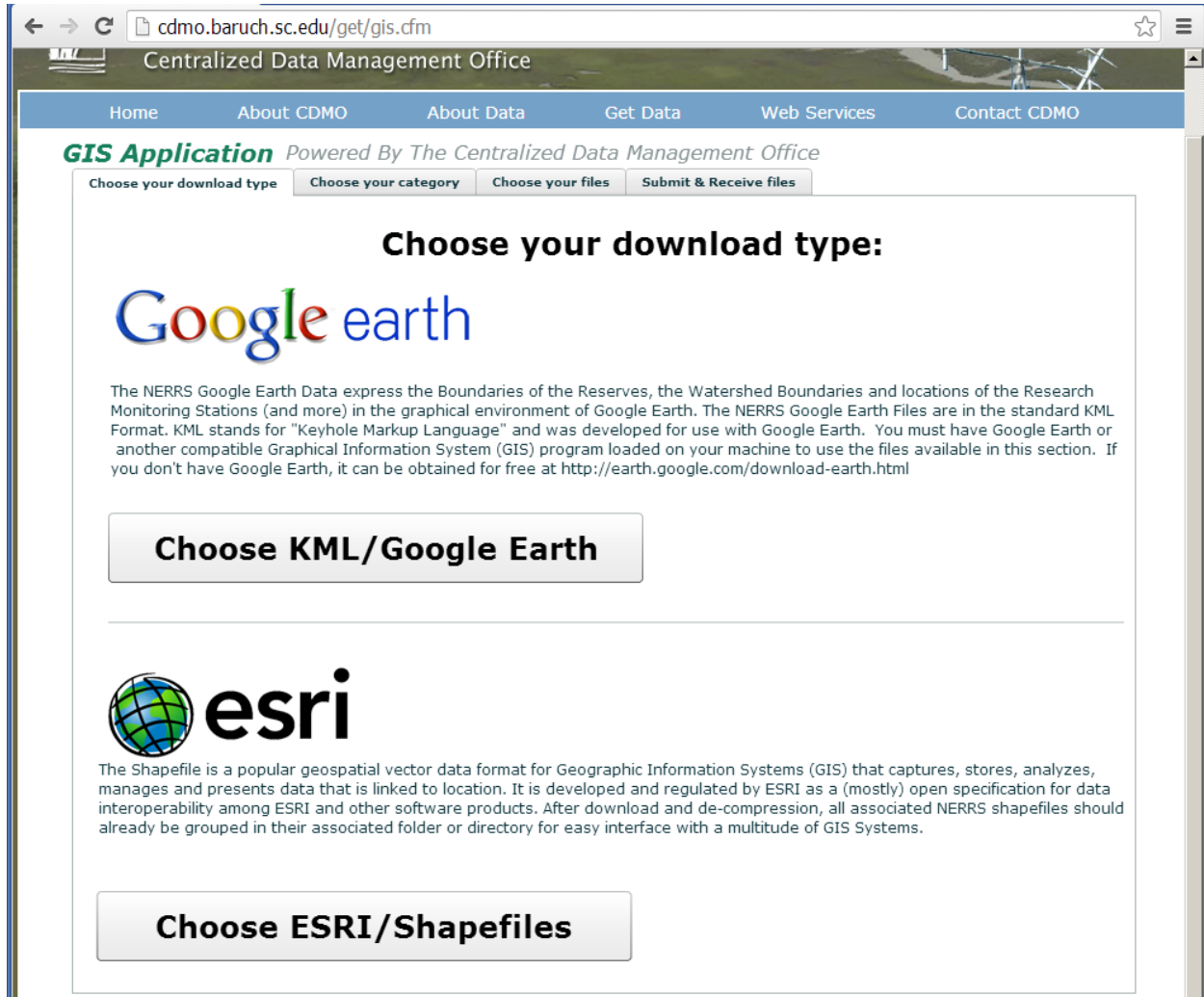
Developed to allow users to view near real time data, real time gauges, and 24 hour graphs with multiple parameters.



## GIS Application

<http://cdmo.baruch.sc.edu/get/gis.cfm>

Developed to give users access to Reserve boundary, watershed boundary, moderate resolution habitat/land cover maps, and and monitoring station locations.





<http://cdmo.baruch.sc.edu/webservices.cfm>

[←](#)
[→](#)
[C](#)

[cdmo.baruch.sc.edu/webservices.cfm](#)

# NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

## Centralized Data Management Office

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## Web Services

### Web Services

In an effort to increase distribution and use of the data collected by the NERRS, the Centralized Data Management Office has created several web service products for this purpose. These services can be used to pull real-time data from our databases for use by other individuals and organizations.

**You must contact [cdmowebmaster@belle.baruch.sc.edu](mailto:cdmowebmaster@belle.baruch.sc.edu) for authorization before pulling data from the CDMO.**

#### Transmission Time Schedule

- Realtime satellite transmissions are received hourly based upon the diagram shown below. Decoding occurs at 11 minutes past the hour and 41 minutes past the hour. This data becomes available on the CDMO website at 15 and 45 minutes past the hour. Each transmission will have 4 15-minute records in it.
- What does all this mean? Let's take Block #5 as an example. Three stations are transmitted in that block from 47:00 - 47:30 past the hour. The data from those stations will be decoded at 11 minutes past the hour and will be available on this website at 15 minutes past the hour.
- What would be the best time to pull data from the website for Block #5?  
Answer: We recommend 16 or 17 minutes after the hour.

### National Estuarine Research Reserve Hourly Satellite Transmission Decode & Export Details

East Coast Sites

West Coast Sites

Recommended Collection Interval  
30 Mins w/ a 20 min offset  
(20 mins & 50 mins)

## Lake Superior Streams

Scientific data for the St. Louis River Estuary is accessible through the LakeSuperiorStreams website (<http://www.lakesuperiorstreams.org/>), which currently serves educational information and data visualizations about water quality along the North Shore of Lake Superior.

The screenshot shows the homepage of the Lake Superior Streams website. The browser address bar displays [www.lakesuperiorstreams.org](http://www.lakesuperiorstreams.org). The website has a dark green background with white text.

**Header:**

- Logo: A stylized illustration of a river flowing through a forest.
- Text: **lake superior** (large), **duluth streams.org** (smaller, below lake superior).
- Link: [about the project...](#)
- Yellow starburst graphic: **On-Line Website Questionnaire** - help improve our website.

**Main Content Area:**

- lake superior communities**
  - Regional Information
  - Duluth
  - Cloquet
  - Hermantown
  - Proctor
  - Superior, WI
  - UMD and more....
- stormwater**
  - Stormwater Plan
  - Inflow & Infiltration
  - RSPT
  - Site Design Toolkit
  - Lakeside Project
- citizens and schools**
  - Volunteer Activities
  - School Resources
  - Home and Garden
  - FAQs
  - Resources
  - Spot a problem?
- the streams**
  - The Streams
  - About Data
  - Current Data
  - Stream Restoration
  - QA/QC and more....
- understanding**
  - Stream Primer
  - Water Quality Primer
  - Water Quality Impacts
  - Organisms
  - The Landscape
  - Water and Wastewater


**Footer:**

- Real Time Data:** Animated **graphing tools** bring the stream data to life.
- The leaves are falling!** It is autumn once again. Learn stream friendly yard care tips [here](#).
- Visit the MN Beaches website** to find out the water quality status of your favorite North Shore beach. Worried about bacteria in the water? [Click here](#).
- Logos:** Great Lakes Information Network Partner, Data Launch Pad, Superior Buoy, Duluth Inlet, NOAA, EPA, Minnesota's Lake Superior Coastal Program.
- Navigation Links:** HOME ABOUT US CONTACT US DATA VIEWER SEARCH GLOSSARY SITE MAP DATA INDEX WHAT'S NEW
- Updated:** 11/18/2013

## Real Time Data

<http://www.lakesuperiorstreams.org/streams/data/Java/index.html>

The Real Time Data viewer allows exploration of data from sensors in Duluth streams, observation stations in the estuary and buoys in Lake Superior.



lake superior  
duluth streams.org

lake superior communities  
understanding  
citizens and schools  
stormwater

the streams

Select a Stream

Trout Streams

Current Data

About Data

QA/QC

Reports

Stream Restoration

DataViewer

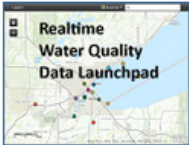
Examples


Data Vignettes

This Week in Water

Saving Plots

Troubleshooting





examples

Launch Java applets to plot the data from these sites

☐ In development

☒ on-line

☐ off-line

Trout Streams - Duluth Area

Plot data from multiple streams, by year:

Chester/Kingsbury/Tischer (2002+)

Amity Creek (2005+)

Miller Creek (2008+)

☒ 2013

'12| '11| '10| '09| '08| '07

'06| '05| '04| '03| '02

(or multiple years: [2002-05](#) | [2006-09](#) | [2010-13](#))

or by individual streams/ rivers:

active stream sites:

☐ Amity

☐ Chester

☒ Kingsbury

☐ Miller (LSC)

☒ Tischer

historical stream sites:

[Poplar](#) 2006-8 | [Knife](#) (4 sites) 2004-6 | [Miller](#) (TMDL sites) 1999, 2007-9

St. Louis River Estuary, AOC, WLSSD discharge, and Harbor inlets

active sites:

☒ [Duluth Lift Bridge inlet](#)(2002-5, 2010-present)

☐ [Superior Inlet](#) (2013)

☐ [Barker's Island, Blatnik Bridge, & Oliver Bridge](#) **NEW** : [2013](#) | [2012](#)

☐ [Barker's Island](#) **NEW** (2012 - 2013)

☐ [Blatnik Bridge](#) **NEW** (2012 - 2013)

☐ [BNRR Oliver Bridge](#) **NEW** (2012 - 2013)

☐ Bong Bridge

☒ [St Louis River at Scanlon](#) (2011 - present)

☐ [Duluth-Superior Harbor & Lake Superior Beach Bacteria](#) (2003-2013)

☒ [WLSSD Plant Discharge & Duluth city-wide precipitation](#) (2002-present)

historical sites:

[St. Louis River Estuary sites](#) (WLSSD data) 1973-1996

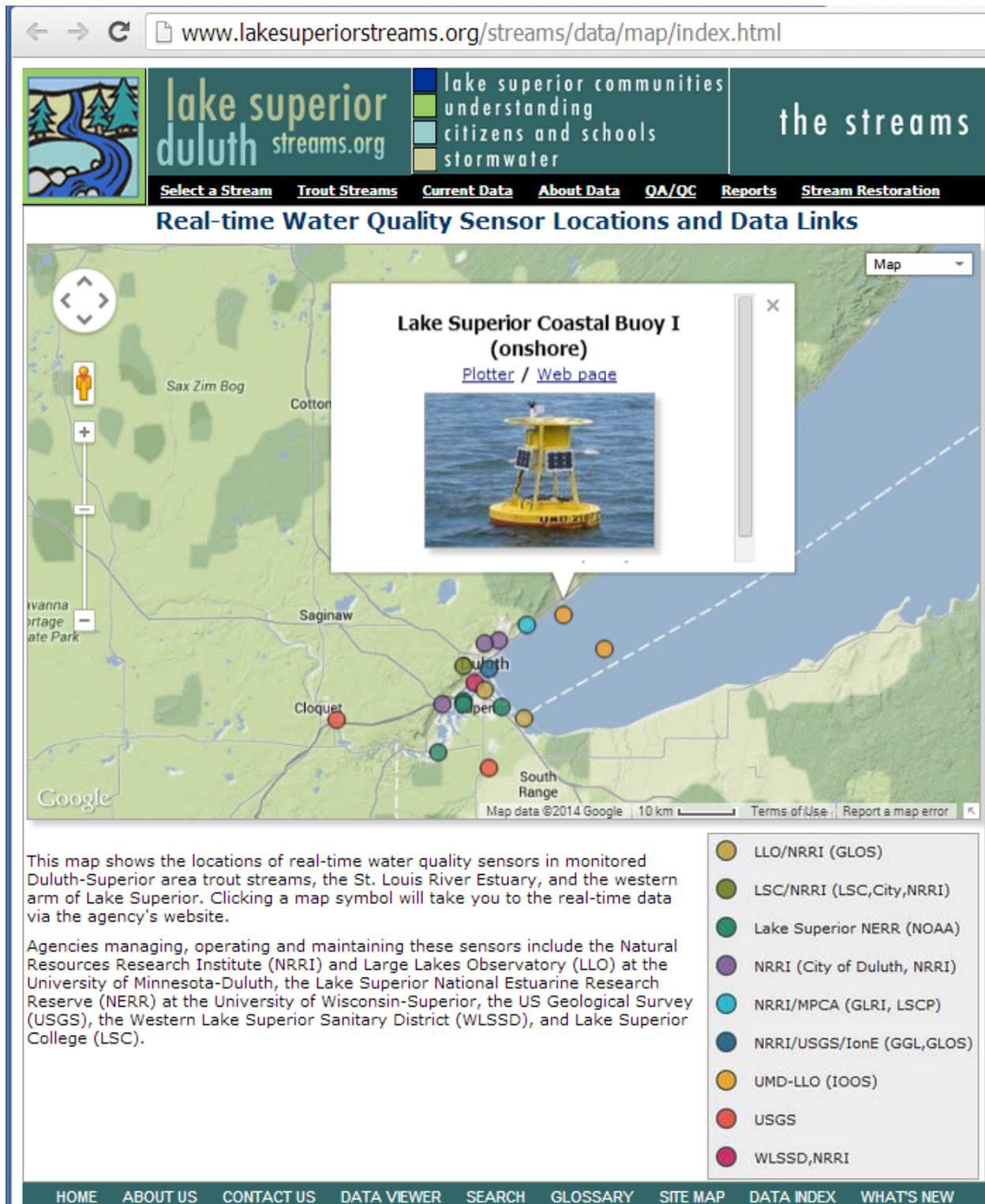
Lake Superior

active sites:

## Data Launch Pad

<http://www.lakesuperiorstreams.org/streams/data/map/index.html>

A new Data Launch Pad provides a map-based interface to real-time data from water quality sensors.



### **Geospatial Data Archives**

Both the University of Wisconsin Sea Grant Institute and the Natural Resources Research Institute at the University of Minnesota, Duluth maintain geocatalogs that promote discovery and access to geospatial data. They utilize GeoNetwork software (<http://geonetwork-opensource.org/>), where data custodians can author interoperable catalog services that adhere to standards adopted by the Open Geospatial Consortium (<http://www.opengeospatial.org/>). UW Sea Grant's geocatalog (<http://maps.aqua.wisc.edu/geonetwork>) is a component of the Wisconsin Coastal Atlas (<http://wicoastalatlas.net/>) and includes 57 datasets as of April 2, 2014, two of which are specific to the St. Louis River. NRRI's geocatalog (<http://gisdata.nrri.umn.edu/geonetwork/>) includes 21 data sets as of April 2, 2014, four of which are specific to the St. Louis River. Additional geospatial data sets that intersect with the St. Louis River watershed can be accessed through the Minnesota Coastal GIS (<http://www.nrri.umn.edu/CoastalGIS/>) and the catalog section of the Wisconsin Coastal Atlas (<http://wicoastalatlas.net/Default.aspx?tabid=63>).



## GeoNetwork - Wisconsin Coastal Atlas, University of Wisconsin Sea Grant

<http://maps.aqua.wisc.edu/geonetwork/>

### GetCapabilities Request

<http://maps.aqua.wisc.edu/geonetwork/srv/en/csw?request=GetCapabilities&service=CSW&Version=2.0.2>

### DescribeRecord Request

<http://maps.aqua.wisc.edu/geonetwork/srv/en/csw?request=DescribeRecord&service=CSW&version=2.0.2>

### GetRecords Request (searched for records containing "St. Louis River" returned two records)

[http://maps.aqua.wisc.edu/geonetwork/srv/en/csw?request=GetRecords&service=CSW&version=2.0.2&namespace=xmlns\(csw=http://www.opengis.net/cat/csw\)&resultType=results&outputSchema=http://www.opengis.net/cat/csw/2.0.2&outputFormat=application/xml&maxRecords=10&typeNames=csw:Record&elementSetName=summary&constraintLanguage=CQL\\_TEXT&constraint\\_language\\_version=1.1.0&constraint=AnyText+LIKE+%27%25st.%20louis%20river%25%27](http://maps.aqua.wisc.edu/geonetwork/srv/en/csw?request=GetRecords&service=CSW&version=2.0.2&namespace=xmlns(csw=http://www.opengis.net/cat/csw)&resultType=results&outputSchema=http://www.opengis.net/cat/csw/2.0.2&outputFormat=application/xml&maxRecords=10&typeNames=csw:Record&elementSetName=summary&constraintLanguage=CQL_TEXT&constraint_language_version=1.1.0&constraint=AnyText+LIKE+%27%25st.%20louis%20river%25%27)

The screenshot displays the Wisconsin Coastal Atlas (WCA) web application. The header includes the WCA logo and navigation links: Home, Contact us, Links, About, Help. The search bar shows 'Simple Search' and 'Advanced Search' tabs. The search criteria are 'St. Louis River'. The results page shows '1-2/2 (page 1/1), 0 selected'. Two records are listed, both titled 'LAND USE, ST. LOUIS RIVER ESTUARY, 2013'. The first record is for St. Louis County, and the second is for Douglas County. Both records include an abstract, keywords, schema, and extent. The interface also features a sidebar with navigation links, a search bar, and a map view.

**WCA Wisconsin Coastal Atlas**

Home | Contact us | Links | About | Help | English | Username | Password | Login

Simple Search | Advanced Search

WHAT? St. Louis River

WHERE?

Aggregated results matching search criteria : 1-2/2 (page 1/1), 0 selected

Select : all, none | actions on selection

Sort by Relevance

**LAND USE, ST. LOUIS RIVER ESTUARY, ST. LOUIS COUNTY, 2013**

**Abstract** This dataset represents a land-based classification standards (LBSCS) survey conducted for parcels within 100 feet of the St Louis River from the Fond du Lac dam to the mouth of the river. Dataset in...

**Keywords** land based classification standards (LBSCS), land use, Minnesota, St. Louis River Estuary, St. Louis County

**Schema** iso19139

**Extent** -92.304 46.638 -91.96 46.790000000000006 2012-08-20 2013-07-16

**LAND USE, ST. LOUIS RIVER ESTUARY, DOUGLAS COUNTY, 2013**

**Abstract** This dataset represents a land-based classification standards (LBSCS) survey conducted for parcels within 100 feet of the St Louis River from the Fond du Lac dam to the mouth of the river. Dataset in...

**Keywords** land based classification standards (LBSCS), land use, Wisconsin, St. Louis River Estuary, Douglas County

**Schema** iso19139

**Extent** -92.304 46.638 -91.96 46.790000000000006 2012-08-20 2013-07-16

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## GeoNetwork – Natural Resources Research Institute, University of Minnesota-Duluth

<http://gisdata.nrri.umn.edu/geonetwork/>

### GetCapabilities Request

<http://gisdata.nrri.umn.edu:80/geonetwork/srv/en/csw?request=GetCapabilities&service=CSW&version=2.0.2>

### DescribeRecord Request

<http://gisdata.nrri.umn.edu/geonetwork/srv/en/csw?request=DescribeRecord&service=CSW&version=2.0.2>

### GetRecords Request (searched for records containing “St. Louis River” returned four records)

[http://gisdata.nrri.umn.edu/geonetwork/srv/en/csw?request=GetRecords&service=CSW&version=2.0.2&namespace=xmlns\(csw=http://www.opengis.net/cat/csw\)&resultType=results&outputSchema=http://www.opengis.net/cat/csw/2.0.2&outputFormat=application/xml&maxRecords=10&typeNames=csw:Record&elementSetName=summary&constraintLanguage=CQL\\_TEXT&constraint\\_language\\_version=1.1.0&constraint=AnyText+LIKE+%27%25st.%20louis%20river%25%27](http://gisdata.nrri.umn.edu/geonetwork/srv/en/csw?request=GetRecords&service=CSW&version=2.0.2&namespace=xmlns(csw=http://www.opengis.net/cat/csw)&resultType=results&outputSchema=http://www.opengis.net/cat/csw/2.0.2&outputFormat=application/xml&maxRecords=10&typeNames=csw:Record&elementSetName=summary&constraintLanguage=CQL_TEXT&constraint_language_version=1.1.0&constraint=AnyText+LIKE+%27%25st.%20louis%20river%25%27)

The screenshot displays the GeoNetwork web interface. The top navigation bar includes links for Home, Contact us, Links, About, and Help. A search bar at the top right contains the text 'St. Louis River'. The main content area is divided into two columns. The left column, titled 'WHAT?' and 'WHERE?', shows a map of the world with a red dot indicating the location of the St. Louis River. Below the map is a search bar with the text 'St. Louis River' and a 'Search' button. The right column, titled 'FIND INTERACTIVE MAPS, GIS DATASETS, SATELLITE IMAGERY AND RELATED APPLICATIONS', displays a list of search results. The results are sorted by Relevance and show four records. Each record includes a thumbnail image, a title, an abstract, and keywords. The records are: 1. DNR\_NRRI\_SLR\_GIS\_LOCS\_856, 2. 2010 SLRE VEGETATION POINTS, 3. ST. LOUIS RIVER WATERSHED, and 4. 2010 SLRE WATER QUALITY THALWEG. Each record also has a 'Metadata' link.

Home | Contact us | Links | About | Help |

Username: Password: Login

WHAT?  
St. Louis River

WHERE?

Aggregate Results matching search criteria : 1-4/4 (page 1/1), 0 selected

Select : all none actions on selection

Sort by Relevance

**DNR\_NRRI\_SLR\_GIS\_LOCS\_856**

Abstract: This shapefile is a combination of John Lindgren's 687 sample points and NRRI's 169 sample points in the St. Louis River estuary.

Keywords: 40th, remediation, sample points, St. Louis River, estuary, SLRE

**2010 SLRE VEGETATION POINTS**

Abstract: St. Louis River Estuary

Keywords: 2010 SLRE Vegetation Samples

**ST. LOUIS RIVER WATERSHED**

Abstract: Outline of the St. Louis River Watershed based on the ArchHydro derived subcatchments.

Keywords: St. Louis River Watershed, ArchHydro, watershed, Lake Superior

**2010 SLRE WATER QUALITY THALWEG**

Abstract: Thalweg Sites sampled for water quality for the St. Louis River Project in the summer of 2010

Keywords: SLRE Aquatic Sample Points for Thalweg

1

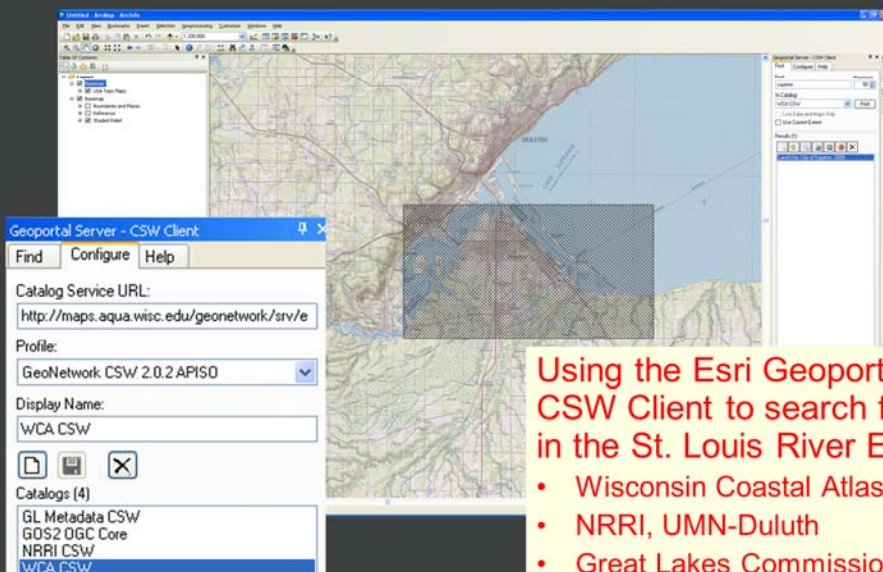


The Wisconsin Coastal Atlas project team tested linking the interoperable geocatalogs at UW Sea Grant and NRRI to demonstrate sharing geospatial data from distributed sources to address trans-boundary issues in the estuary. A presentation titled “Networking Coastal Web Atlases to Address Regional Scale Issues” was recorded on December 6, 2011 as part of the Ecosystem-Based Management Tools Network webinar series (<http://www.ebmtools.org/networking-coastal-web-atlases-address-regional-scale-issues.html>). The section on the Wisconsin Coastal Atlas as an interoperable resource runs from 31:08 to 57:15, with the description of linking interoperable catalogs for the St. Louis River Estuary starting at approximately 52:00.

**WCA**

Wisconsin Coastal Atlas

## Testing Coastal Atlas/GIS Interoperability



The screenshot displays the Esri Geoportal CSW Client interface. The main window shows a map of the St. Louis River Estuary. Overlaid on the map is a 'Geoportal Server - CSW Client' window. This window has tabs for 'Find', 'Configure', and 'Help'. The 'Find' tab is active, showing a 'Catalog Service URL' field with the value 'http://maps.aqua.wisc.edu/geonetwork/srv/e'. Below this is a 'Profile' dropdown menu set to 'GeoNetwork CSW 2.0.2 API SO'. The 'Display Name' field contains 'WCA CSW'. At the bottom, there is a 'Catalogs (4)' list with the following entries: 'GL Metadata CSW', 'GOS2 OGC Core', 'NRRI CSW', and 'WCA CSW'. The 'WCA CSW' entry is highlighted. To the right of the map, there is a 'Map Control' panel with various map navigation tools.

**Using the Esri Geoportal - CSW Client to search for data in the St. Louis River Estuary**

- Wisconsin Coastal Atlas
- NRRI, UMN-Duluth
- Great Lakes Commission

SharedGeo (<http://www.sharedgeo.org/>), an organization focused on promoting data sharing based in Minnesota, has accessed and utilized the catalog service for the web (CSW) accessed through WCA GeoNetwork. The SharedGeo Collaborative Mapping Catalog (<https://hub.sharedgeo.org/projects/GLRI/geonetwork/>) harvests metadata records from the WCA GeoNetwork, as well as other interoperable catalogs. Their catalog contains 5,142 records and a search on “St. Louis River” yields 16 records.

The screenshot displays the SharedGeo Collaborative Mapping Catalog interface. The browser address bar shows the URL: <https://hub.sharedgeo.org/projects/GLRI/geonetwork/srv/eng/main.home>. The page header includes the "Collaborative Mapping Catalog" title and the "GeoNetwork OpenSource" logo with the tagline "Geographic data sharing for everyone". Navigation links for Home, Contact us, Links, About, and Help are present. A search bar is located at the top left, with "Simple Search" and "Advanced Search" tabs. The search criteria are "WHAT? St. Louis River" and "WHERE? - Any -". A "Search" button is visible, along with "Reset" and "Options" links. A sidebar on the left lists various categories: Applications, Audio/Video, Case studies, best practices, Conference proceedings, Datasets, Directories, Interactive resources, Maps & graphics, Other information resources, Photo, Physical Samples, Registers, and Z3950 Servers. Below this is a "GeoRSS" section with a list of boundaries and toponyms. The main content area is titled "FIND INTERACTIVE MAPS, GIS DATASETS, SATELLITE IMAGERY AND RELATED APPLICATIONS". It shows aggregated results matching the search criteria: 1-10/16 (page 1/2), 0 selected. The results are sorted by Relevance. Three results are visible: 1. "DNR\_NRRIS\_SLR\_GIS\_LOCS\_856" with an abstract describing a shapefile of sample points, keywords including "40th, remediation, sample points, St. Louis River, estuary, SLRE", schema "fgdc-std", and extent "-92.290368 46.644733 -92.008387 46.776388". 2. "ST. LOUIS RIVER WATERSHED" with an abstract describing the watershed outline, keywords including "St. Louis River Watershed, ArchHydro, watershed, Lake Superior", schema "fgdc-std", and extent "-93.221306 46.594560 -91.448421 47.781816". 3. "VEGETATION\_POLYS" with an abstract describing vegetation polygons, keywords including "40th, remediation, boundary, St. Louis River, estuary, vegetation", schema "fgdc-std", and extent "-92.159185 46.728369 -92.134246 46.747151". Each result has a "Metadata" link and a "No preview available" message. A fourth result, "IWI RED RIVER BASIN MAPPING 2008-2010 - ORTHOIMAGERY", is partially visible at the bottom.

## Additional GeoNetwork instances with Great Lakes data

Great Lakes Metadata Catalog, Great Lakes Observing System

<http://data.glos.us/metadata/>

220 records

Search on Lake Superior: 78 records

Great Lakes Metadata Catalog, U.S. Geological Survey

<http://cida.usgs.gov/glri/geonetwork/>

21 records

Search on Lake Superior: 2 records

Weather and Water Information Gateway - Discovering Ontario DataProject

<https://www.appliometadata.lrc.gov.on.ca/geonetwork/>

10,602 records

Search on "Great Lakes": 402 records

USGS Coastal and Marine Geology Program

<http://cmgds.marine.usgs.gov/geonetwork/>

615 records

Search on "Great Lakes": 9 records

Data.gov

Search on St. Louis River Estuary. 20 datasets found.

Search on St. Louis River. 340 datasets found.

Search on Lake Superior. 60 datasets found.

Search on Great Lakes. 717 datasets found.

