



# Use of USGS Hydrologic Data in Support of Lakes Management

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U.S. Geological Survey

# Discussion Topics

- **USGS Monitoring Networks**
- **Monitoring related to Illinois lakes**
- **Special lakes projects**
- **Management tools...**

# USGS Monitoring Networks



# Illinois Monitoring Networks

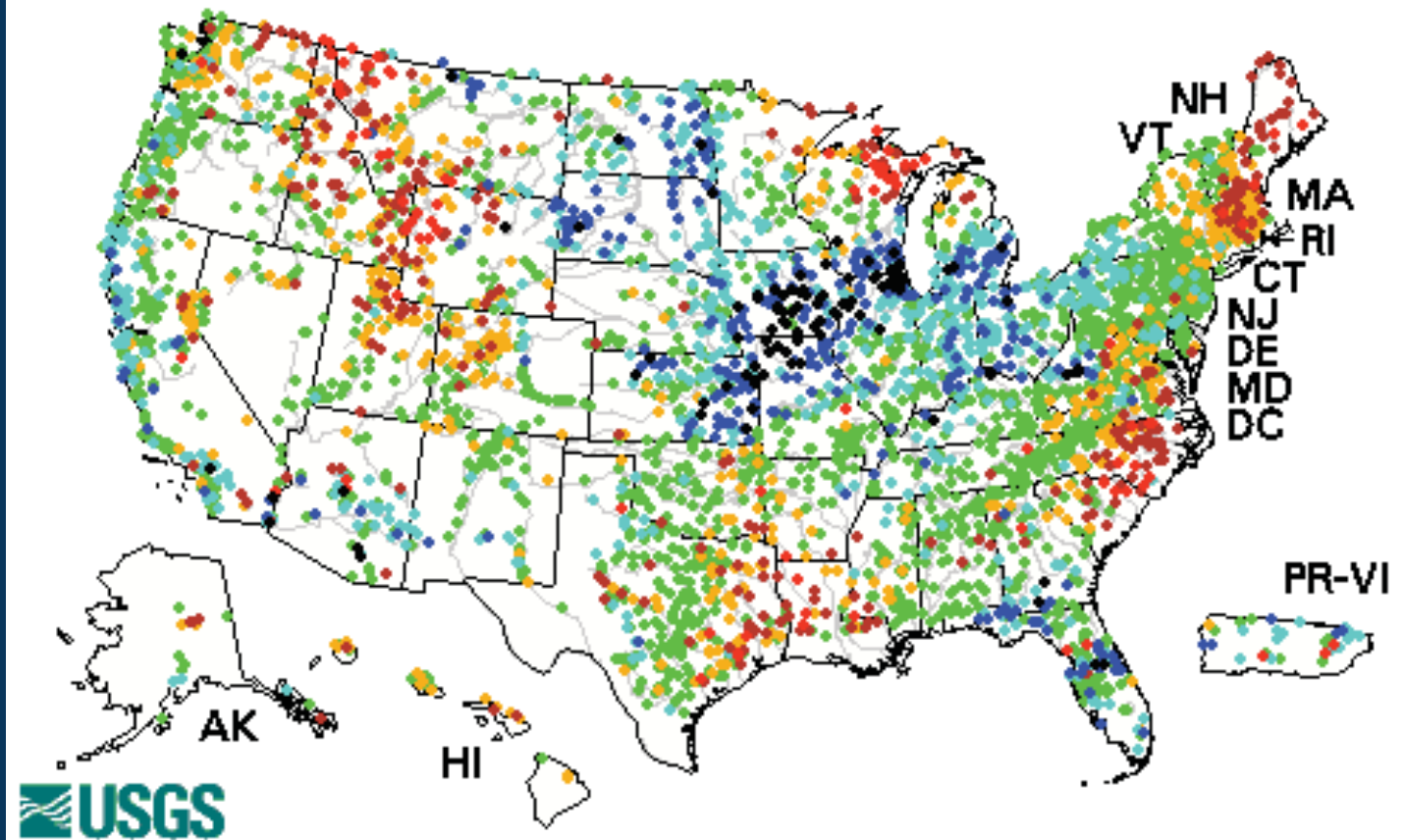
- Over 230 real-time surface water sites
- Over 50 real-time groundwater sites
  - ❖ Real-time water quality parameters at some locations (temp, SC, nitrates, pH, DO)
- In cooperation with:
  - Local municipalities / stormwater districts
  - Counties
  - Universities
  - State of Illinois (IDNR, IEPA, IDOT, ISWS, etc.)
  - Federal agencies (USACE, USEPA, NWS, etc.)

# Real-Time Streamgages

Thursday, May 13, 2010 11:30ET

## Explanation

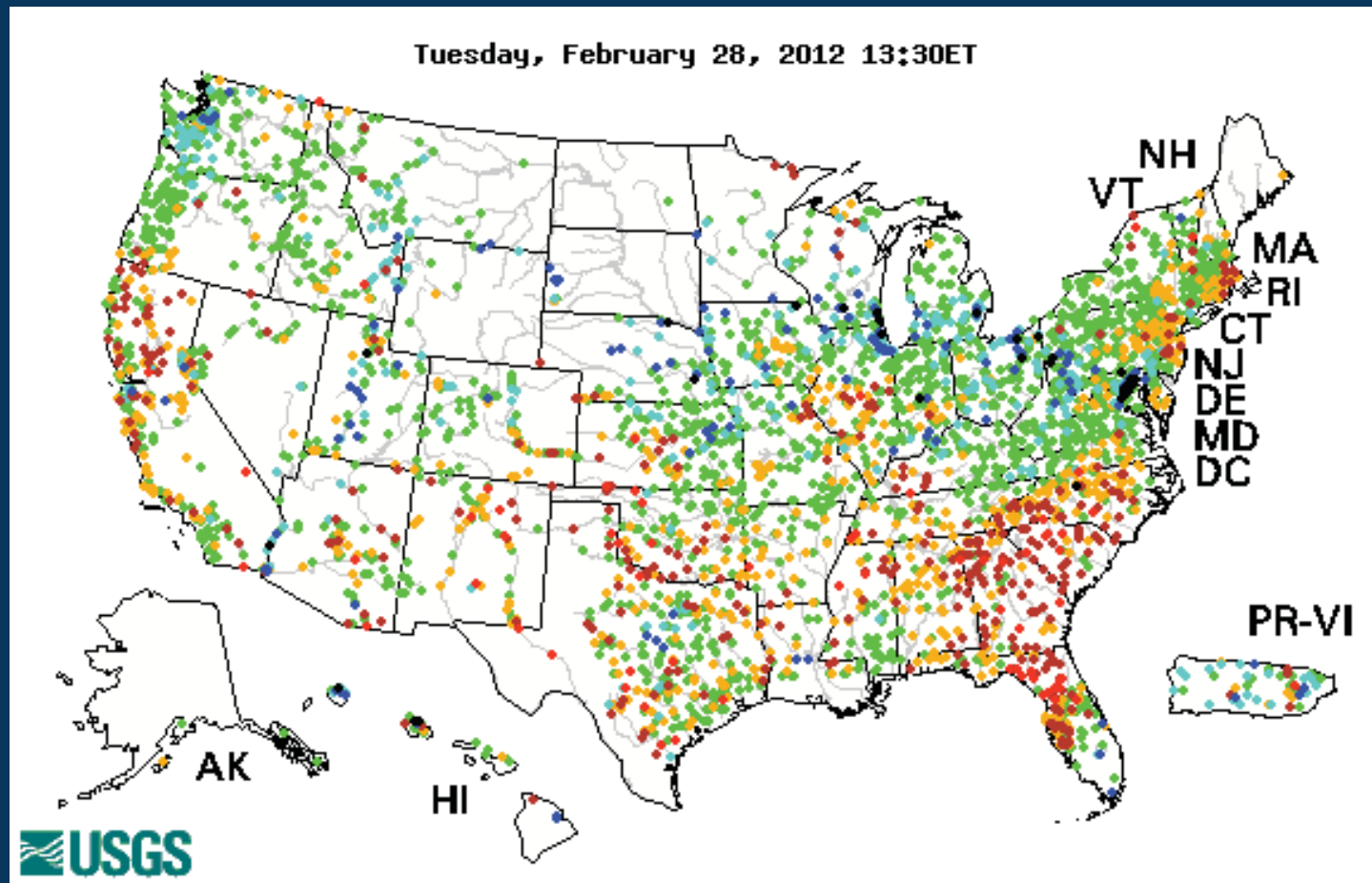
- High
- $\geq 90$ th percentile
- 75th - 89th percentile
- 25th - 74th percentile
- 10th - 24th percentile
- $< 10$ th percentile
- Low
- Not ranked



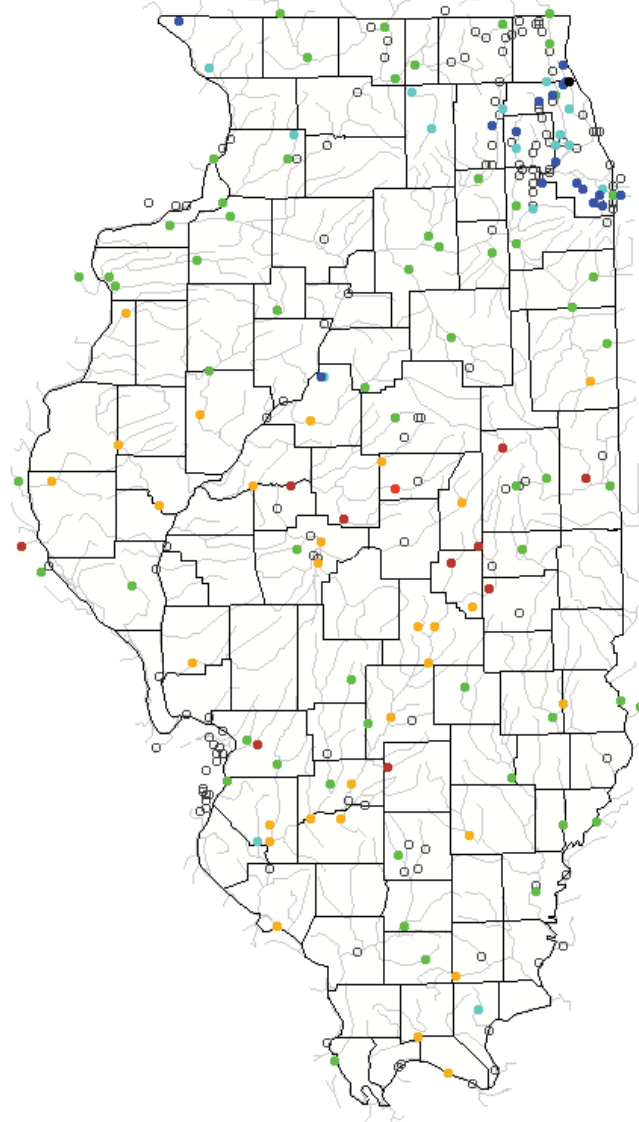
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Tuesday, February 28, 2012 13:30ET



Dry

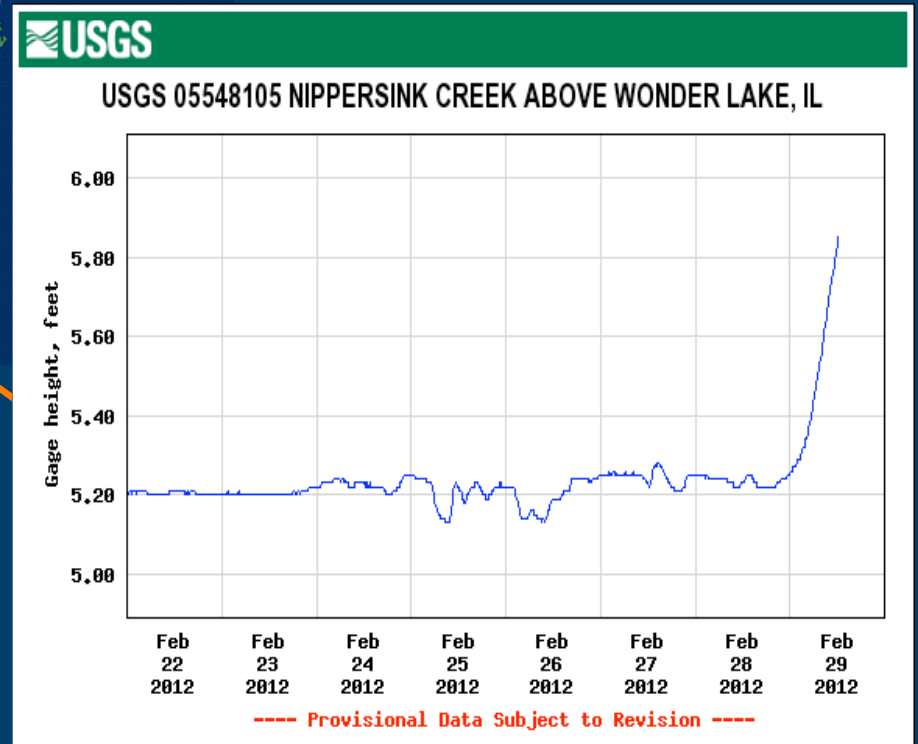
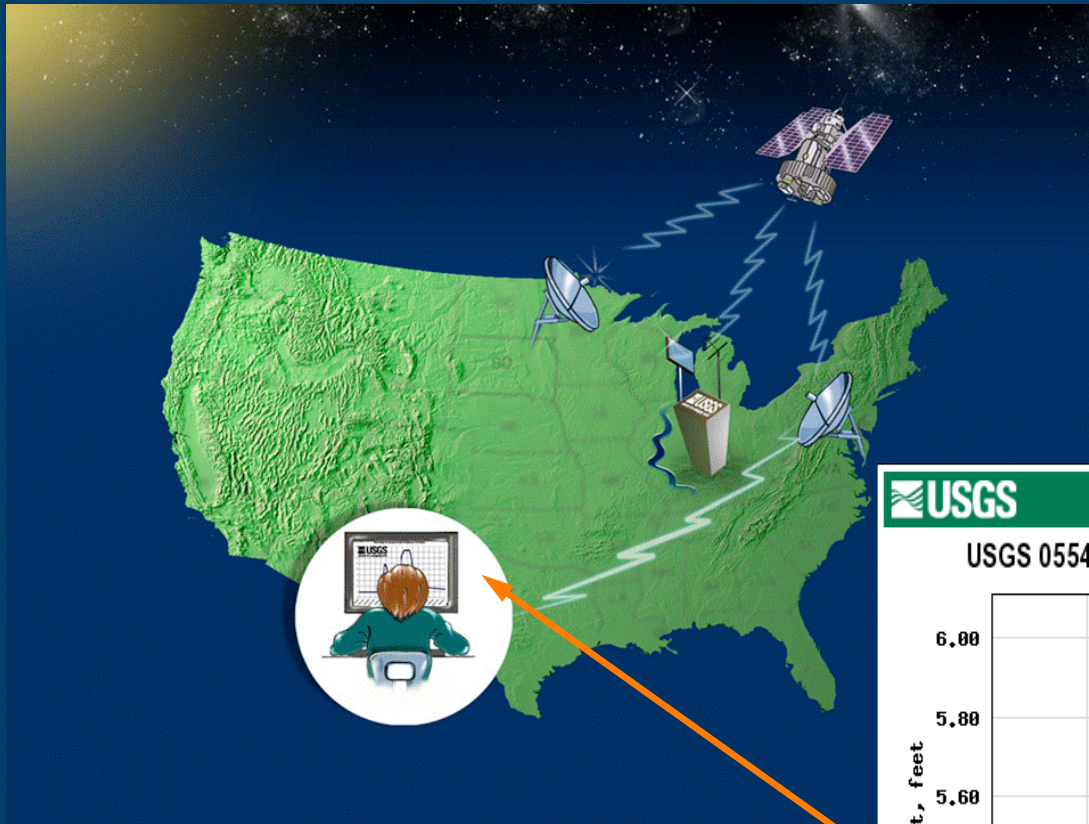
Normal

Wet





# Example of Flow of Satellite Data





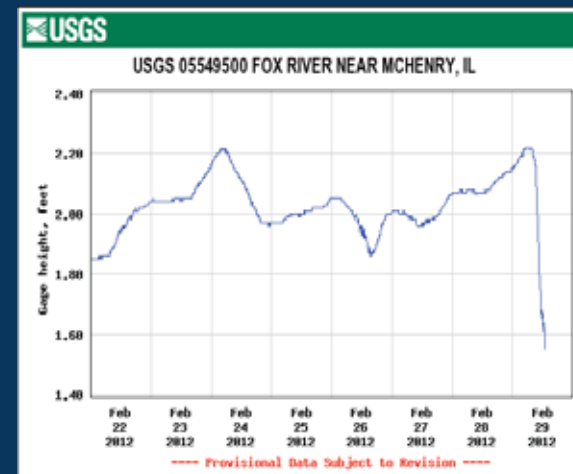
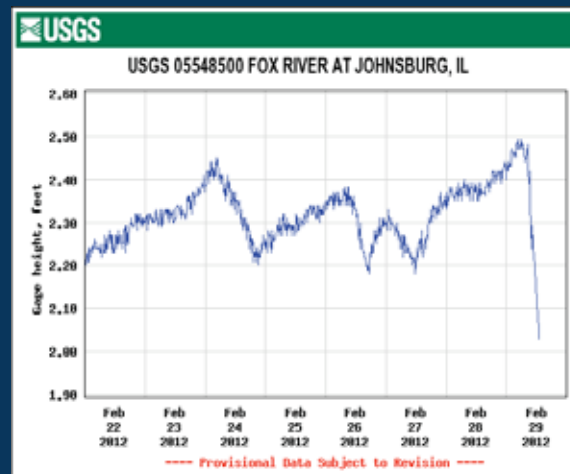
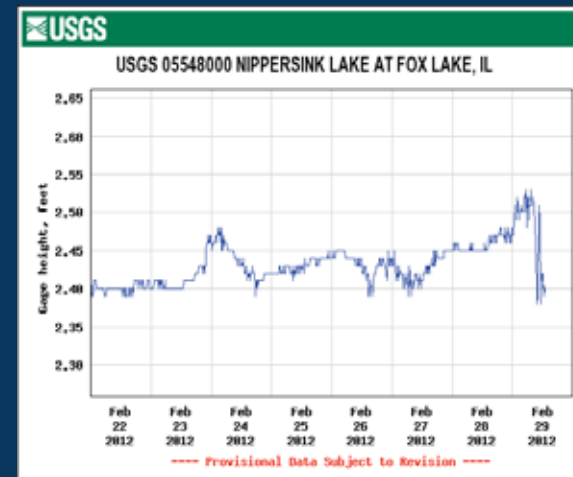
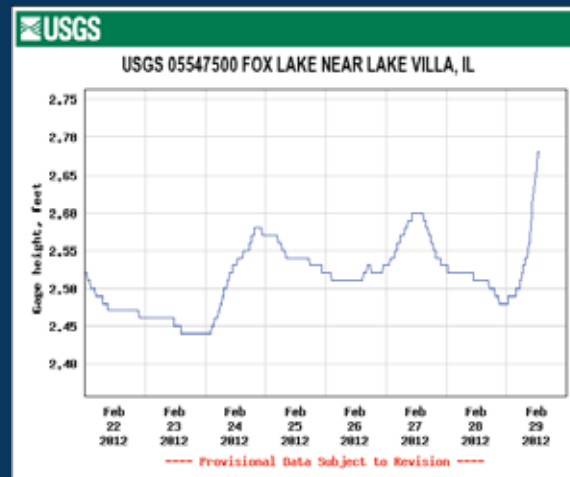
# Database

- All USGS data are public domain
- Accessible via Internet or from local office
  - <http://il.water.usgs.gov/>
- Methods/Standards for collecting, analyzing, verifying, storing, and serving data are consistent across the country
  - Confidence in data
  - Able to make comparisons

# Monitoring related to Illinois Lakes

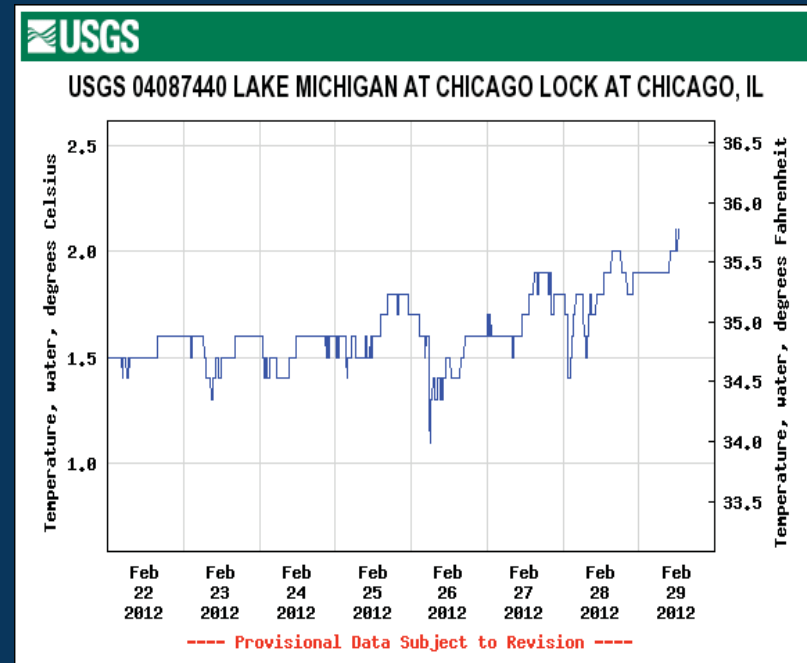
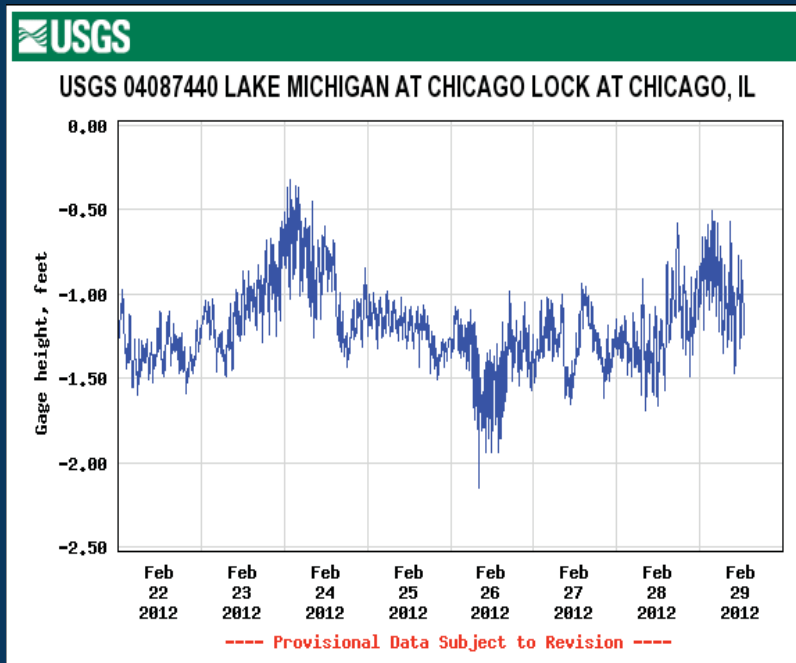
# Lake Levels in Chain O' Lakes

- Provides information to Illinois DNR for making operating decisions on Fox River



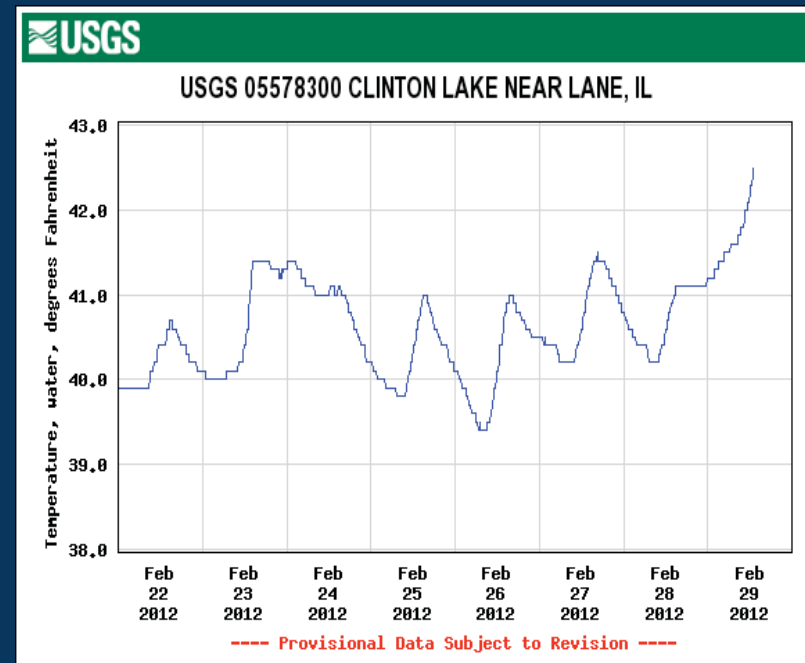
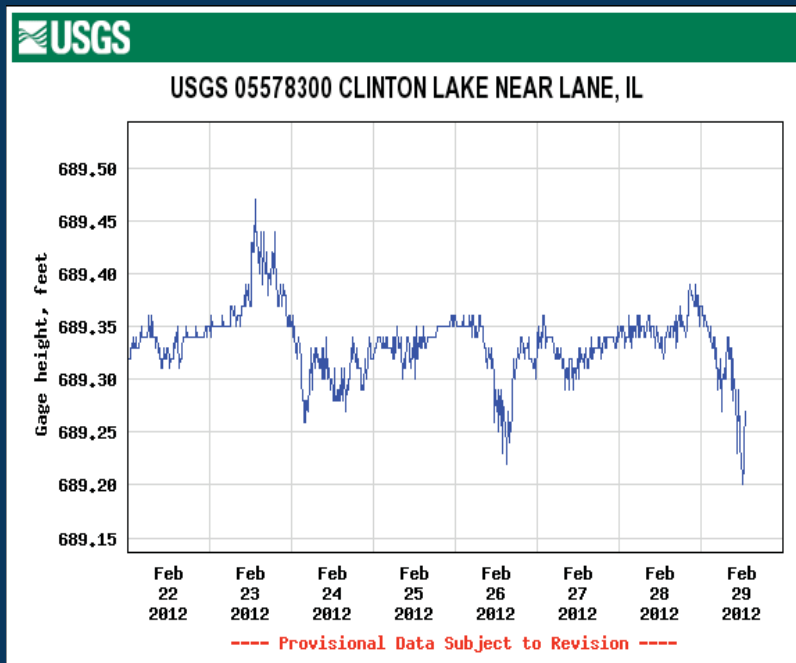
# Lake Levels and Water Temperature in Lake Michigan

- Provides information to U.S. Army Corps of Engineers for making operating decisions on the Chicago Sanitary and Ship Canal



# Lake Levels and Water Temperature in Clinton Lake

- Provides information to Exelon Corporation for power plant cooling operations



# Upstream or Downstream of Major Reservoirs

- Several streamgages are operated to provide information to U.S. Army Corps of Engineers or others for operation of reservoirs

## Examples:

- BIG MUDDY SUBIMPOUNDMENT NEAR WALTONVILLE --- Rend Lake
- KASKASKIA RIVER AT CARLYLE --- Carlyle Reservoir
- KASKASKIA RIVER AT SHELBYVILLE --- Shelbyville Reservoir

# **Suspended Sediment Monitoring --- Rasmussen Lake**

- **Automatic samplers at three locations**
  - **Provide Lake County Forest Preserve District with sediment loading information at Rasmussen Lake**
- **Inflow sites:**
  - **NORTH MILL CREEK AT HICKORY CORNERS**
  - **HASTINGS CREEK NEAR LINDENHURST**
- **Outflow site:**
  - **NORTH MILL CREEK NEAR MILBURN**



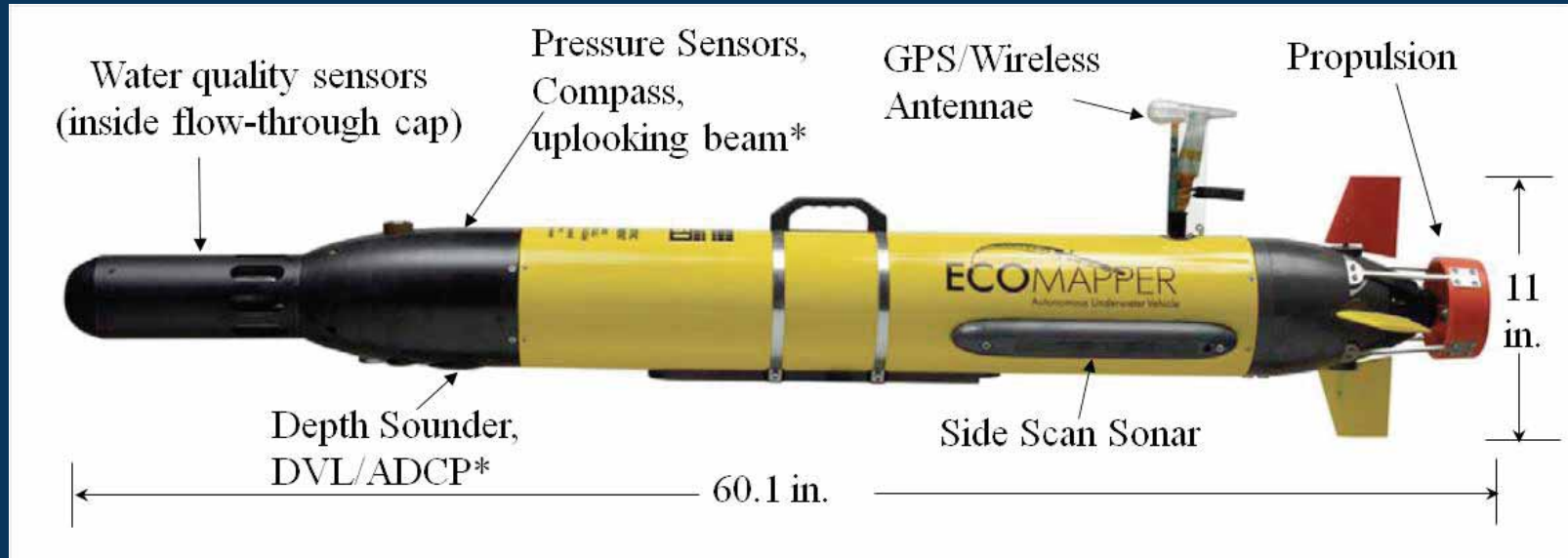
# Suspended Sediment Monitoring --- Wonder Lake

- Automatic sampler at inflow location
  - Provide Wonder Lake managers with sediment loading information
  - NIPPERSINK CREEK ABOVE WONDER LAKE



# Special lakes projects

# Bathymetric and Water Quality Lake Surveys --- YSI EcoMapper

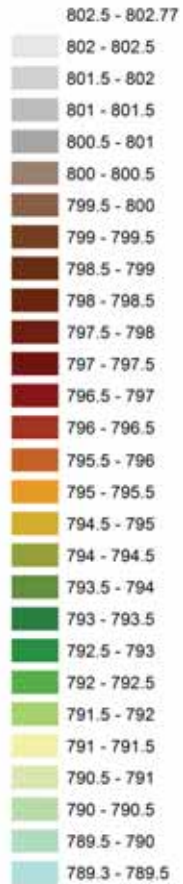




# Wonder Lake Surveys

Wonder Lake (Illinois)  
August 2010

Bed Elevation (ft; NGVD29)

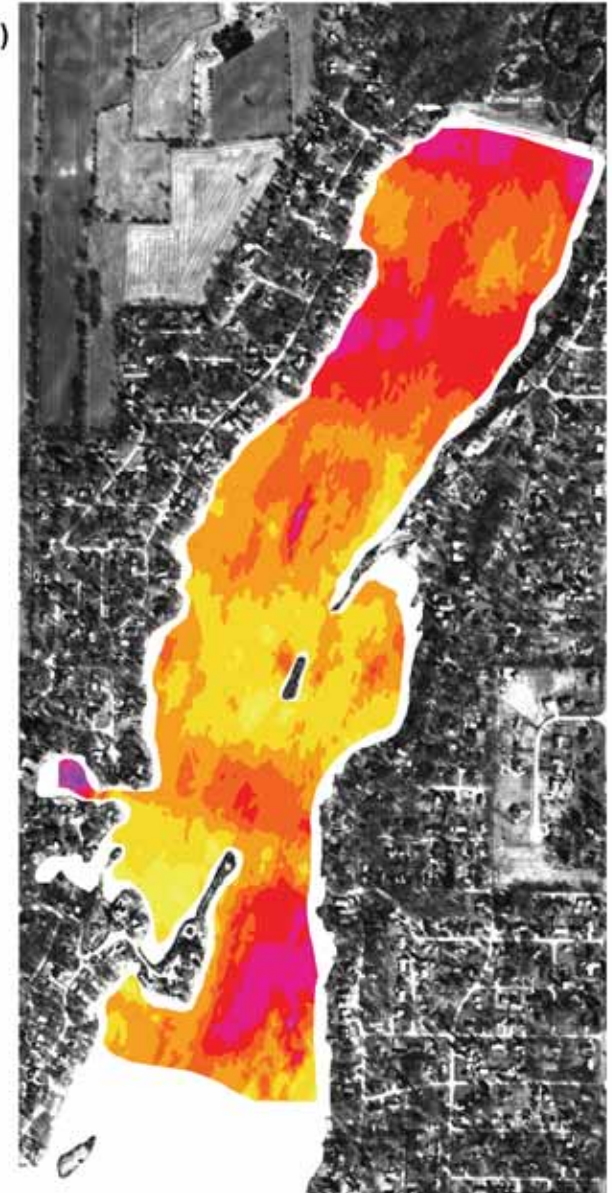


Mean Water Surface Elevation During Survey: 802.77 ± NGVD29

\*Provisional data subject to revision

Wonder Lake (Illinois)  
August 2010

Chlorophyll A\*  
(ug/L)

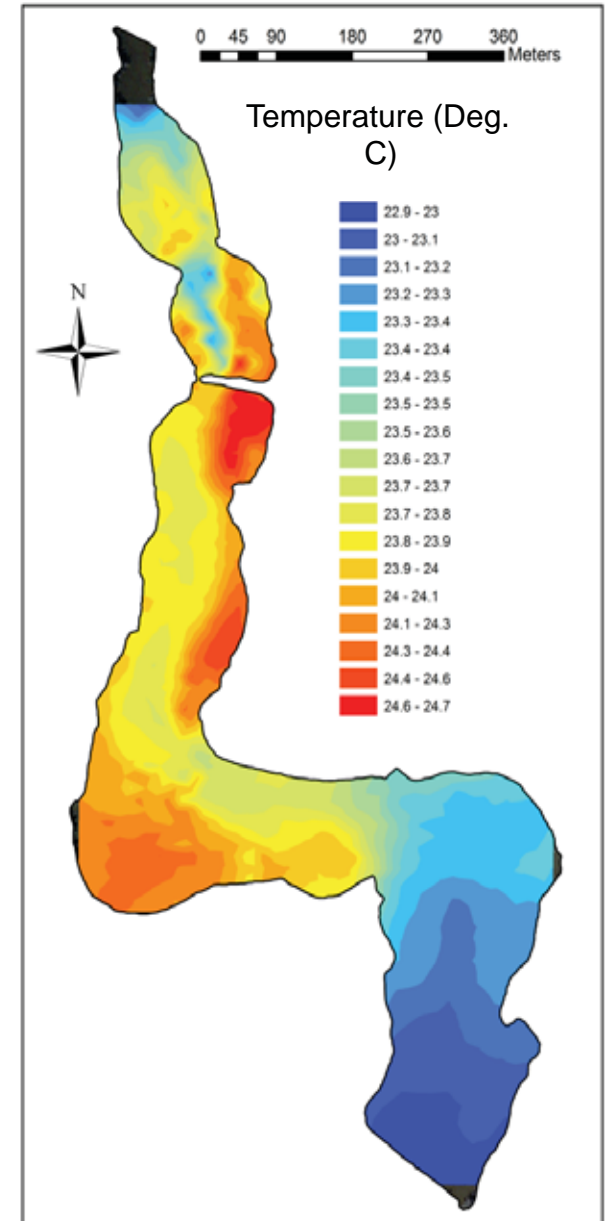
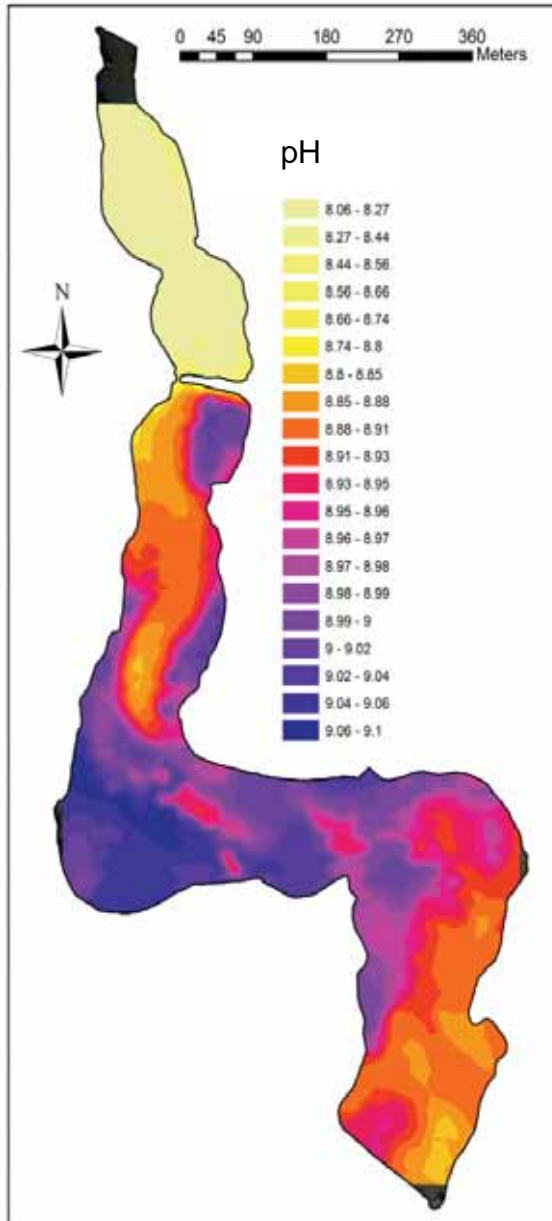
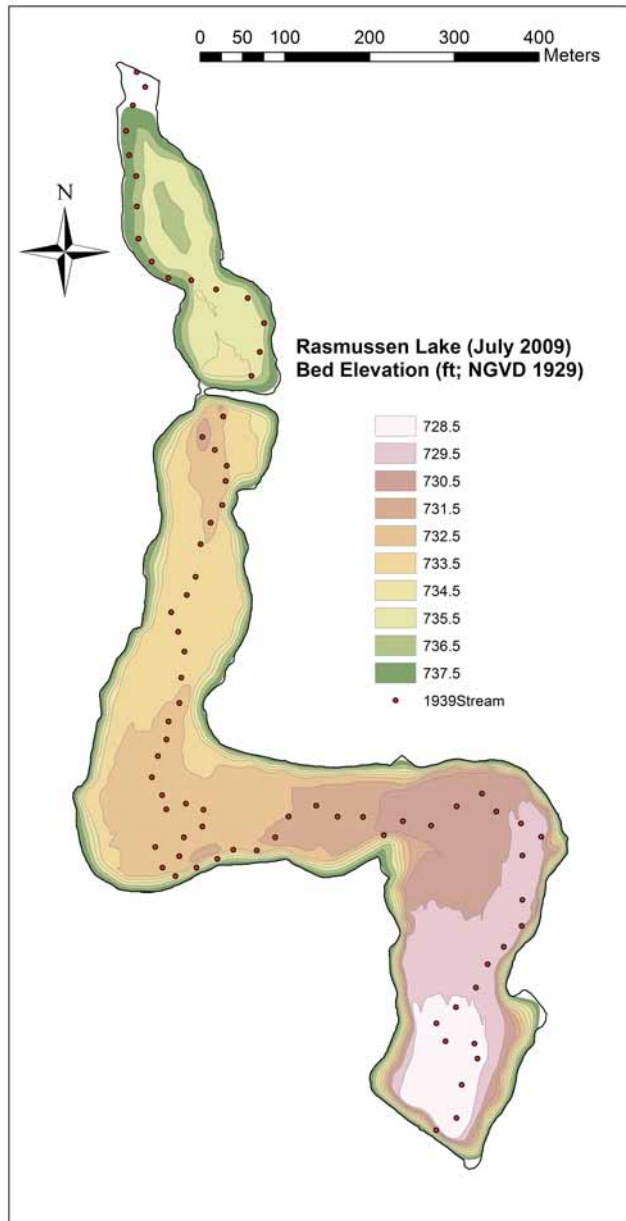


\*Surface Water (Approx. 0.5 ft depth)  
Estimated using YSI 6025 Chlorophyll  
sensor post-calibrated using  
Chlorophyll A lab sample

Mean Water Surface Elevation During Survey: 802.77 ± NGVD29

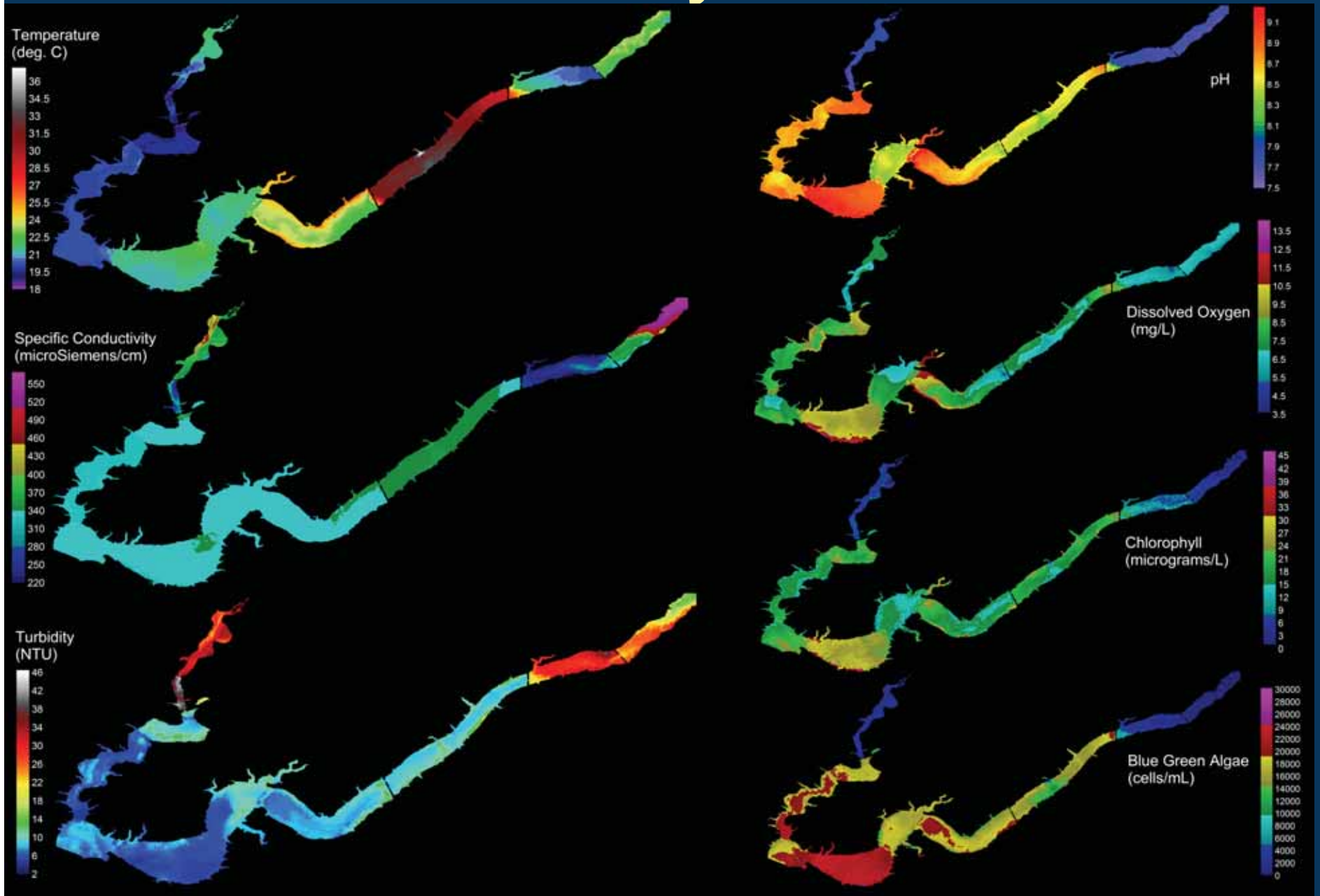
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# Rasmussen Lake Surveys





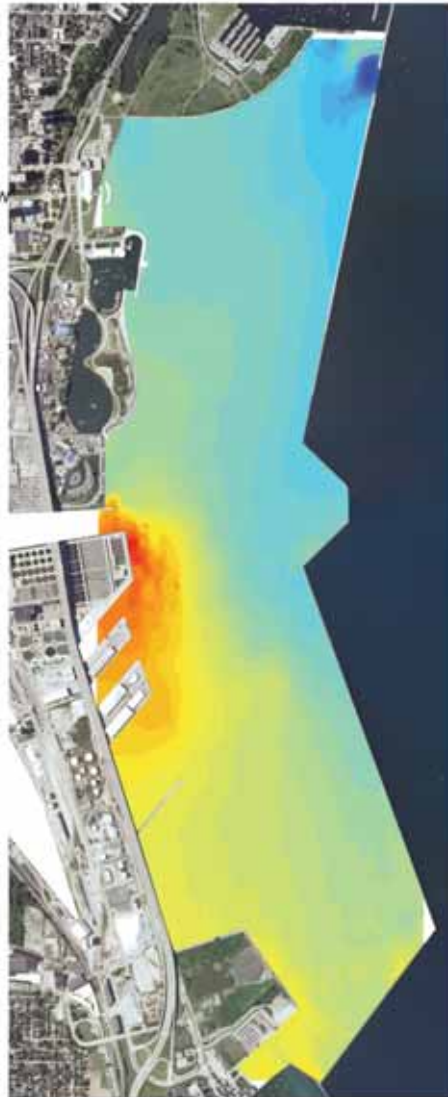
# Clinton Lake Surveys



# Lake Michigan – Milwaukee Harbor Surveys

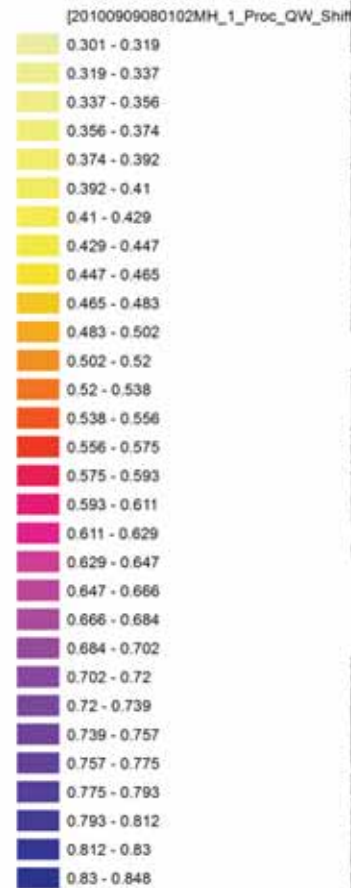
Milwaukee Harbor  
USGS Survey  
September 7-9, 2010

Temperature (deg.C)



Milwaukee Harbor  
USGS Survey  
September 7-9, 2010

Specific Conductance (mS/cm)





# Management tools...

# Water Alert System

- Sends e-mail or text messages when certain parameters measured by a USGS data-collection station exceed user-definable thresholds
  - Can be used for any parameter that is available at the specific site
    - Water level or precipitation are most common

<http://water.usgs.gov/wateralert/>

# USGS StreamMail

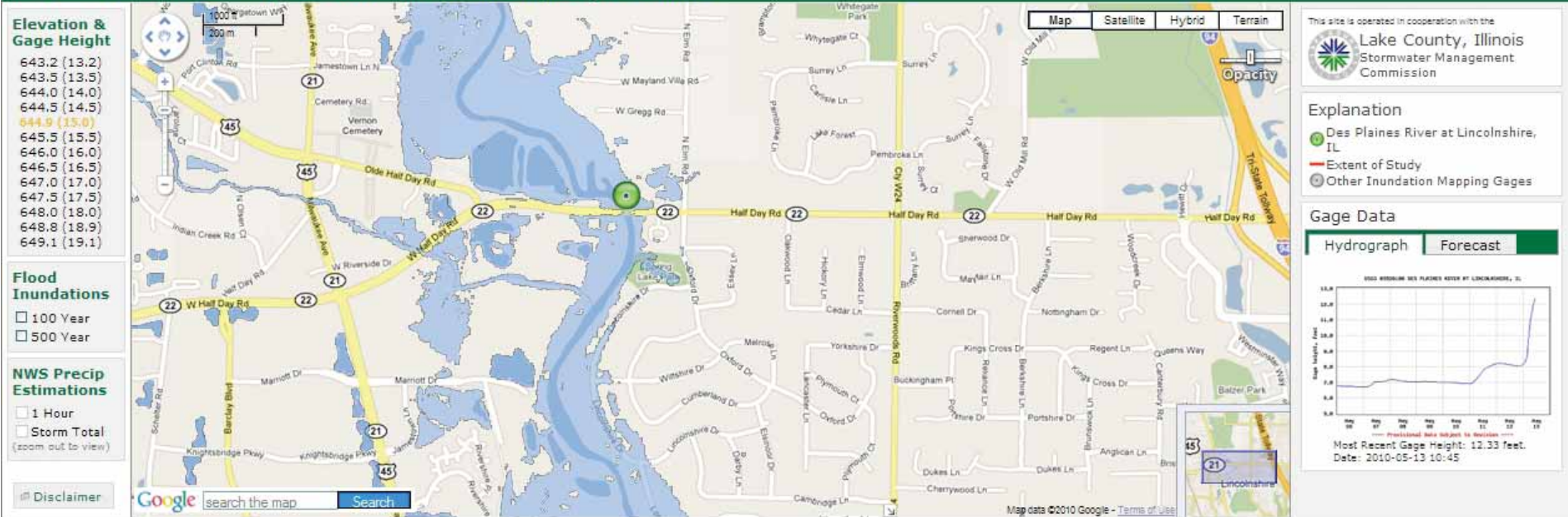
- Query a USGS streamgaging site via email, cell phone, handheld device (Blackberry), etc...
  - Send email or text message to “streamail@usgs.gov with the Station ID in the subject line
  - In a few minutes, you will receive an email or text message back with the most recent water level and discharge

# Flood Inundation Mapping



USGS Home  
Contact USGS  
Search USGS

## Des Plaines River at Lincolnshire, IL -- Provisional Inundation Map Subject to Revision





# Thank You

## Questions?

U.S. Department of the Interior  
U.S. Geological Survey