Great Lakes to Gulf Virtual Observatory
- A Place to Deposit, Organize, and Integrate NLRS Data and Information

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What is the Great Lakes to Gulf Virtual Observatory?

• The GLTG Virtual Observatory is a web-based geospatial application that integrates water quality data and analytical tools from multiple sources allowing a user to visualize and understand nutrient pollution and water quality conditions in the Mississippi River watershed.

• The online interactive application provides users with tools to explore, analyze and compare water quality data from the Mississippi River and its tributaries.
Data in GLTG

• GLTG Main Site
  • 1427 sites
    • 30,536,674 individual measurements (on current and growing)
    • 27,650,502 individual measurements (on 2/11/2019)
    • 26,418,123 individual measurements (on 9/10/2018)
  • 13 Data sources
  • 13 States
    • Illinois, Wisconsin, Minnesota, Arkansas, Kentucky, Nebraska, Kansas, Missouri, Louisiana, Mississippi, Iowa, Tennessee, Indiana

• IL NRLS Site
  • 393 sites from 9 sources and 12,228,339 datapoints (on current)
Selected Data Sources

• US Geological Survey – NWIS
  • ‘Supergages’, ambient monitoring
• US Environmental Protection Agency –
  • STORET/WQX
• UMRR LTRM – Upper Mississippi River Restoration Long Term Resource Monitoring Program
• NGRREC – GREON (Great Rivers Ecological Observatory Network)
• Metropolitan Council, Minneapolis/St. Paul, MN
• Fox River (Illinois) Study Group
  • Latest data 3/28/2019
• Iowa Water Quality Information System / University of Iowa
Geospatial Contextual Layers

- SPARROW 2002 Model
- Hypoxia Extent from 2005 to 2017
- USDA CropScape Frequency layer
- NOAA Precipitation layer
- State EPA impaired waters layer
- Layers related to nutrient analysis for Illinois
  - Catchment
  - Point sources
  - Unmonitored area
  - Nutrient loading by HUC 8
Illinois NLRS Data Portal
Development of IL NLRS Data Portal

• Base on GLTG application and data, IL NLRS data portal has been developed working with IL EPA
• Initial data is from GLTG
• New version of IL NLRS has been deployed
What’s New?

• Geostreaming Data Framework V3
  • Developed through combining efforts of 4 projects
    • GLTG, Seagrant Great Lakes Monitoring, IML-CZO, TERRA-REF
• New Frontend (User Interface)
  • Complete rewrite using latest technologies
  • Improvements to user interface/interaction
• New Backend (Performance)
  • New binning methodology and database improvement
• Signup/Login for users
  • Track downloads
• Dashboard for IL NLRS data
• Story board
Dashboard

Boundary Type
- IL Drainage

Nutrient
- Nitrogen

Year
- 2017

ILLINOIS > Illinois R, at Valley City

YEARLY AVERAGE - 2017

13.8

ANNUAL NITROGEN YIELD 1980-2017
Narrative / Storyboard

• Work with users / stakeholders to develop relevant stories
• Easy to digest graphs, charts, summaries
Explore Page

- New User Interface design
  - Separate panes for data sources and Geospatial layers
- Map clustering option
- Turn on/off data sources
Detail Page

- New and improved User Interface design
- Performance improvement for smart binning
- Categories for parameters
- Charts
  - Box plots shows on the charts; highlight outliers
- Graph options
  - Start data at Zero
  - Use same time scale
    - It will sync all charts with same time range/scale
- Date Range
  - Select all dates: option to show all dates quickly
• Easy search and on-the-fly update on search

• Main search criteria
  • Data Source
  • Parameter
  • Location
  • Time
  • Online
V3 - User Login / Track Downloads (In Progress)
Collaboration with IL - NLRS

• Collaborating with Illinois Nutrient Loss Reduction Strategy (by IEPA)
• Geospatial data support for analyses on N/P changes over time with Prof. Greg McIsaac
  • Catchment analysis of monitoring stations (# stations)
  • Identifying point sources related to certain monitoring stations
  • Identifying unmonitored area in Illinois (with point sources)
  • Generating/visualizing the N/P loads by HUC 8
  • Those geospatial layers will be GLTG contextual layers
Question & Comments?

• https://illinois.greatlakestogulf.org/