GLTG: Great Lake To Gulf Virtual Observatory

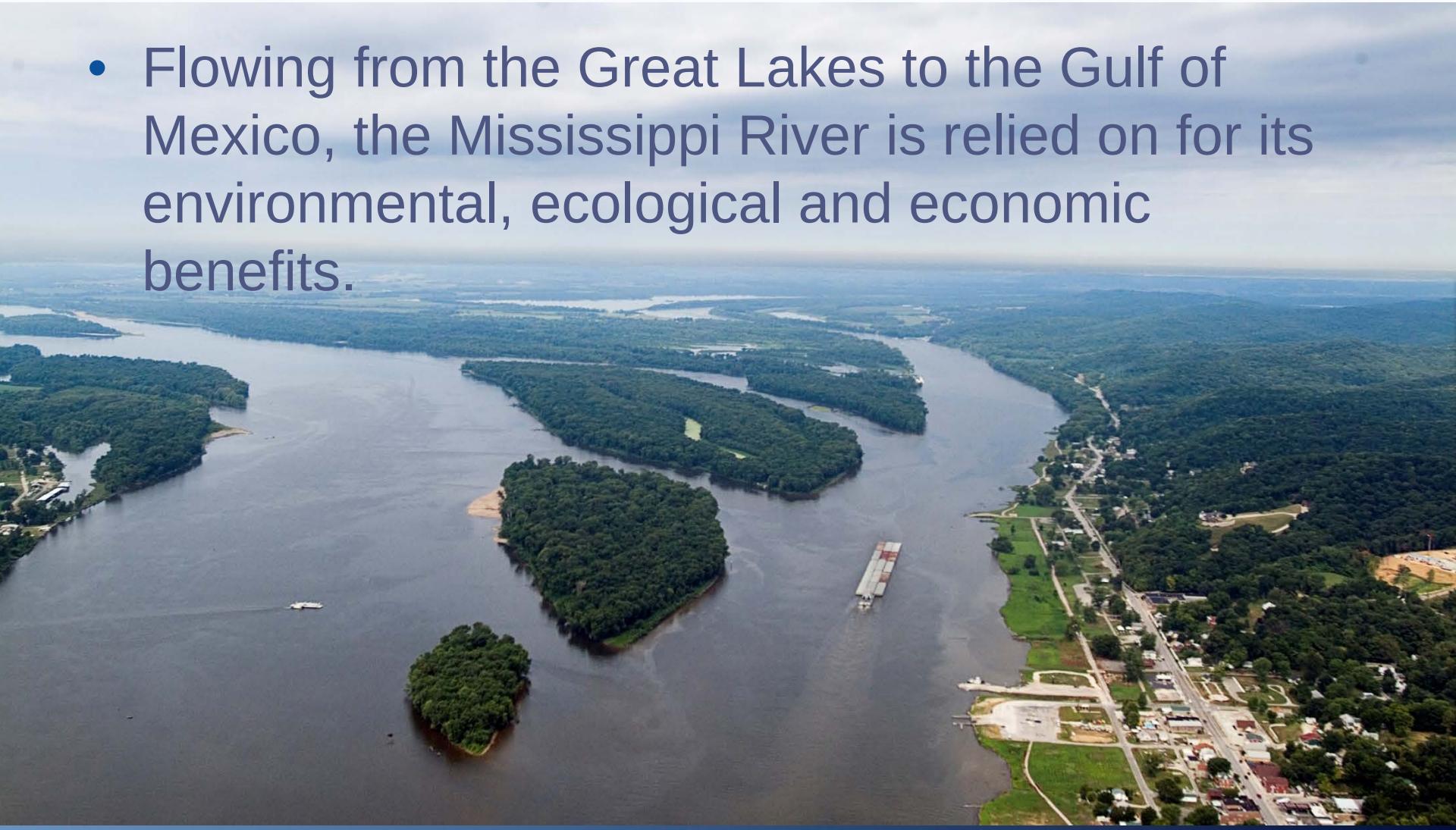
Jong Sung Lee (jonglee1@illinois.edu)
Senior Research Scientist, NCSA

December 3rd, 2015

National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

The River

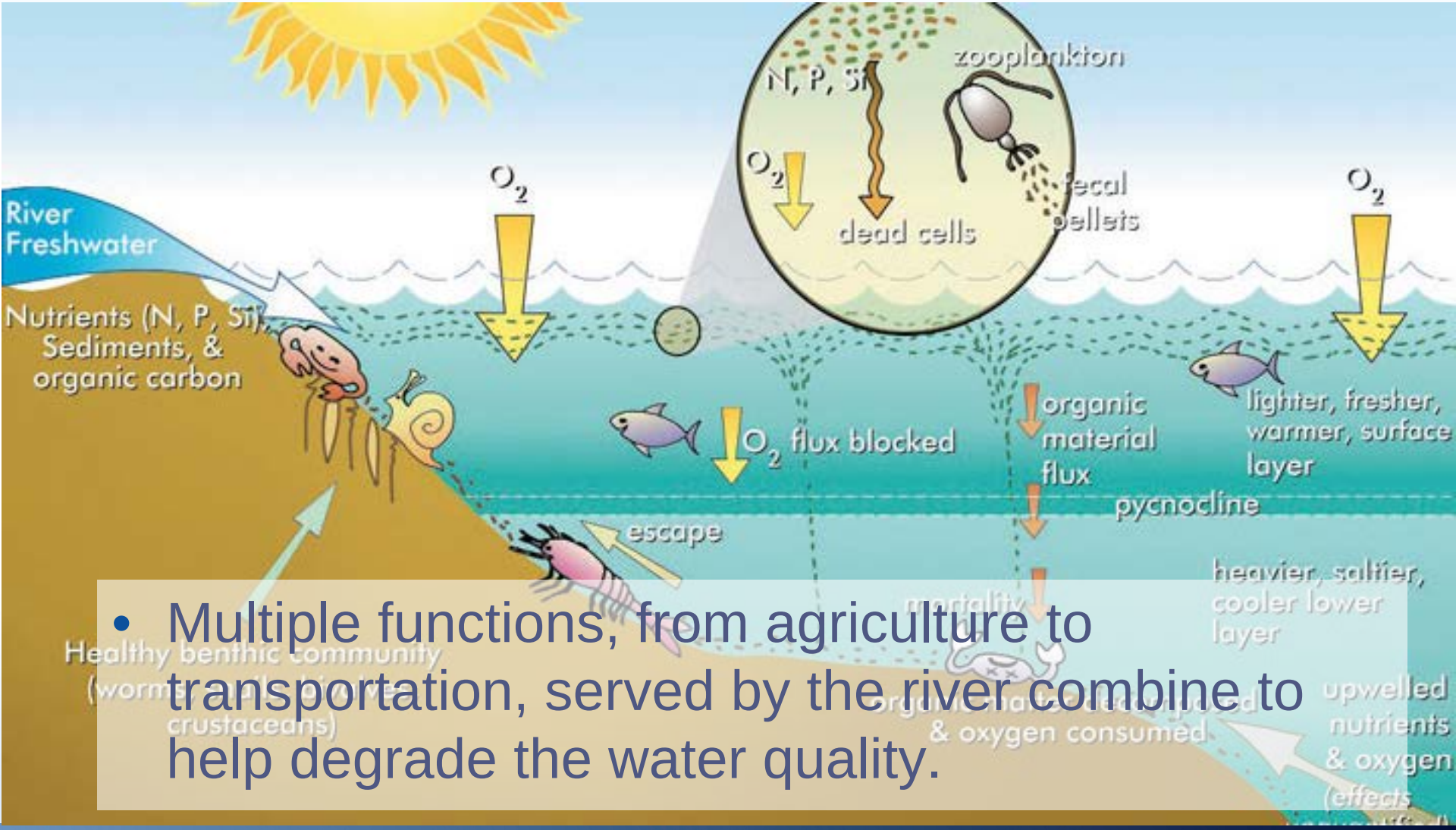
- Flowing from the Great Lakes to the Gulf of Mexico, the Mississippi River is relied on for its environmental, ecological and economic benefits.



The Watershed

- 92% of the nation's agricultural exports are produced in the basin and moved through the river’s 9 foot navigation channel.

The Challenges



- Multiple functions, from agriculture to transportation, served by the river combine to help degrade the water quality.

Water Quality Monitoring

- Multiple state and federal agencies conduct regular water quality monitoring and data collection. The data is made available to the public through multiple databases and websites.

The Response

- Identifying a need to consolidate the available data, the National Great Rivers Research and Education Center partnered with the University of Illinois' National Center for Supercomputing Applications and Illinois-Indiana Sea Grant to develop the Great Lakes to Gulf Virtual Observatory.

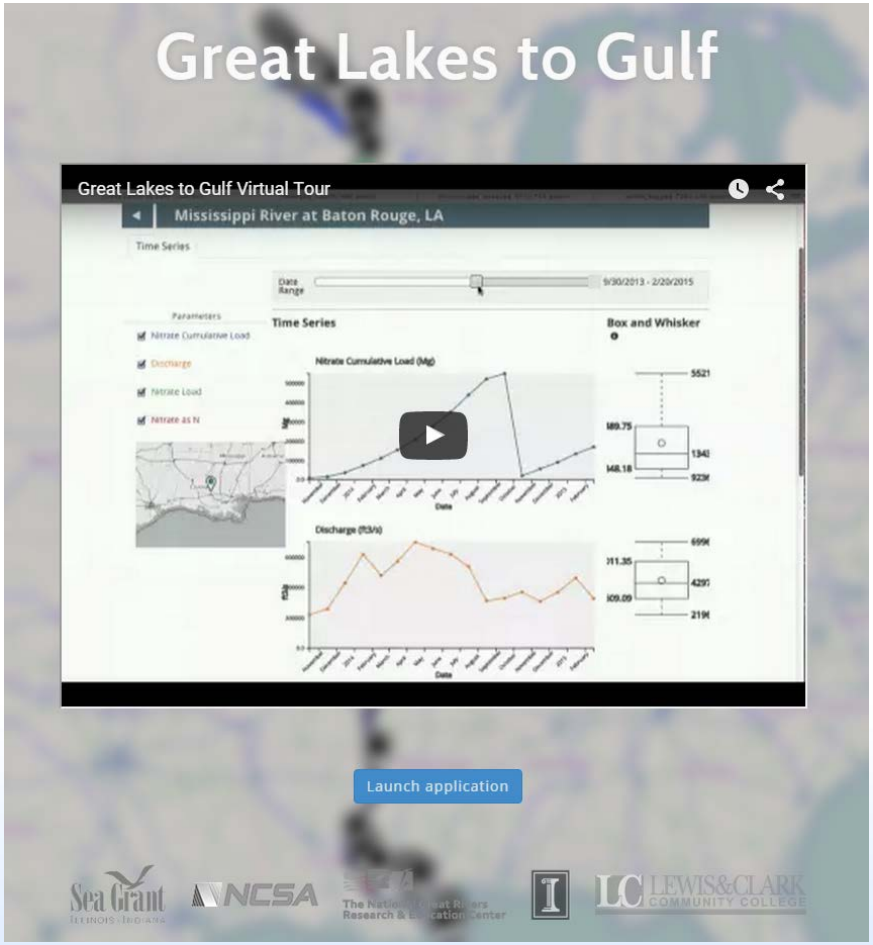
The Mission

- To assist our understanding of large river ecology and facilitate decision making through an interactive geospatial application that integrates and visualize relevant data from respected sources.

GLTG Virtual Observatory

- Powered by the NCSA's GeoDashboard, the Observatory provides access to environmental monitoring data collected throughout the Mississippi River Watershed.
- It provides a new resource for stakeholders to inform their research and decisions on how the functions of the river are managed and sustained.

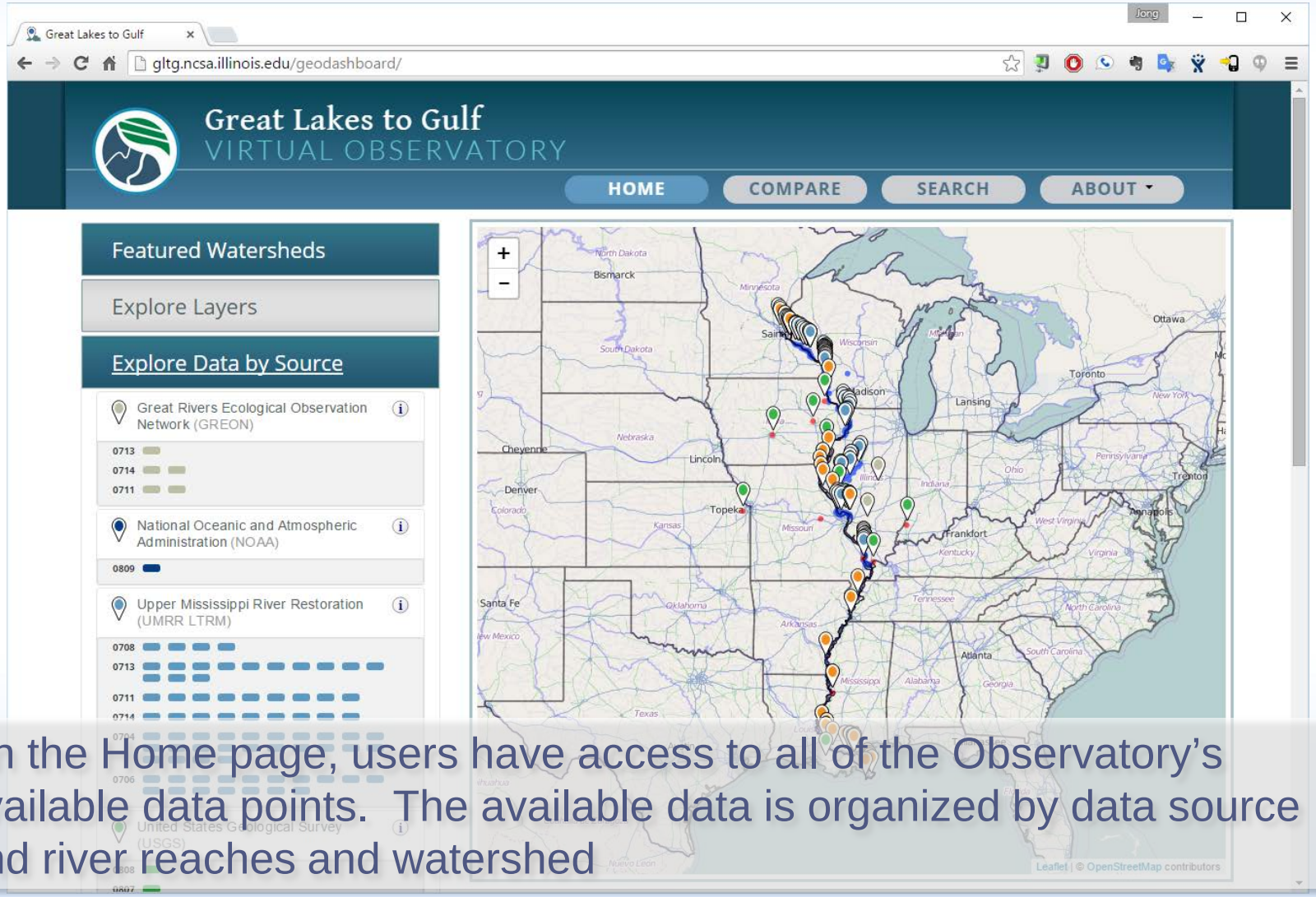
http://gltg.ncsa.illinois.edu/



Geodashboard

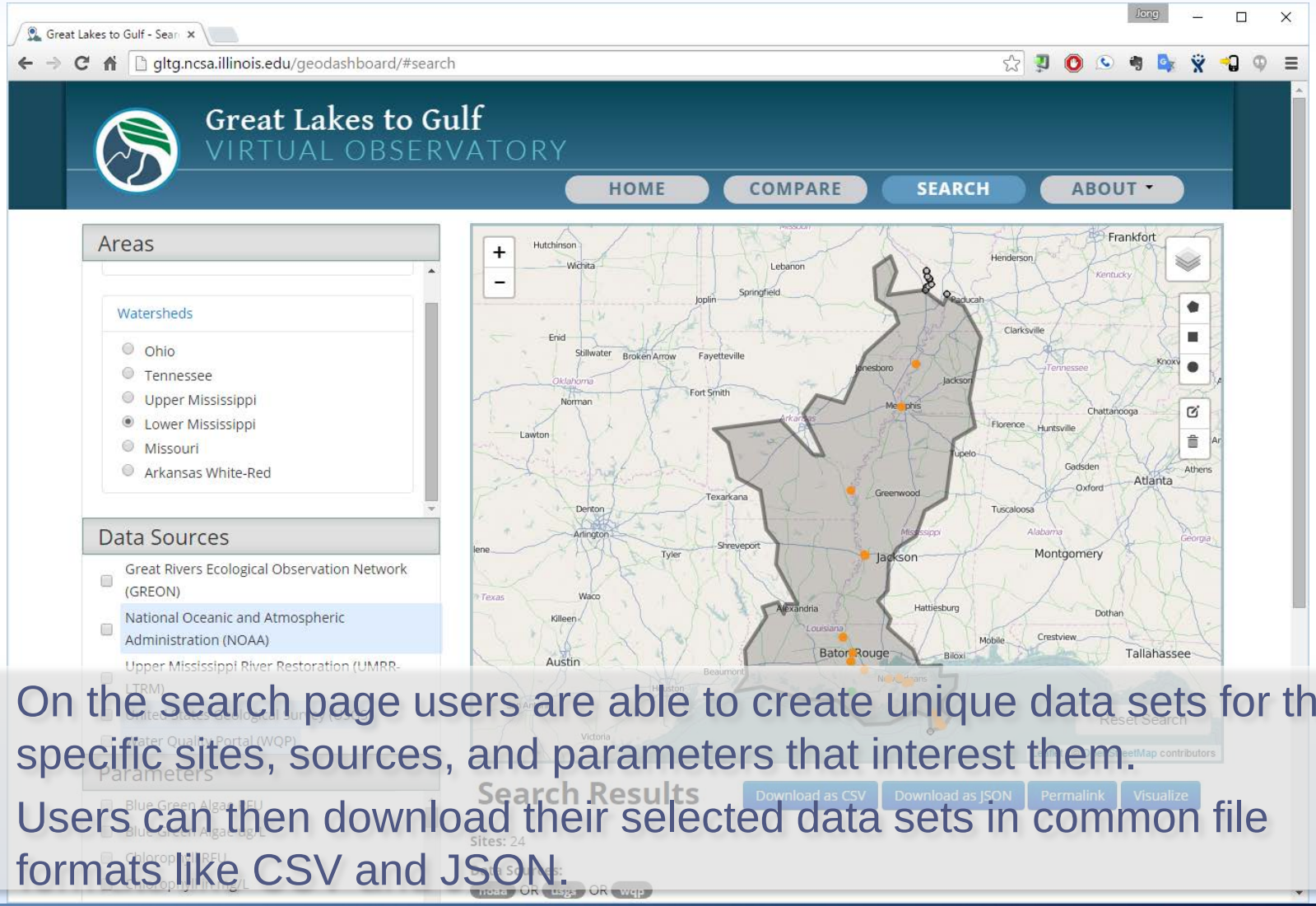
- Platform to provide collect, organize and visualize the sensor data (temporal and spatial)
- Built on RESTful web service of GeoAPI and Clowder
- Other projects
  - Great Lake Monitoring https://greatlakesmonitoring.org/
  - IML-CZO (Intensively Managed Landscapes Critical Zone Observatory) http://data.imlczo.org/geodashboard/

HOME



On the Home page, users have access to all of the Observatory's available data points. The available data is organized by data source and river reaches and watershed

SEARCH



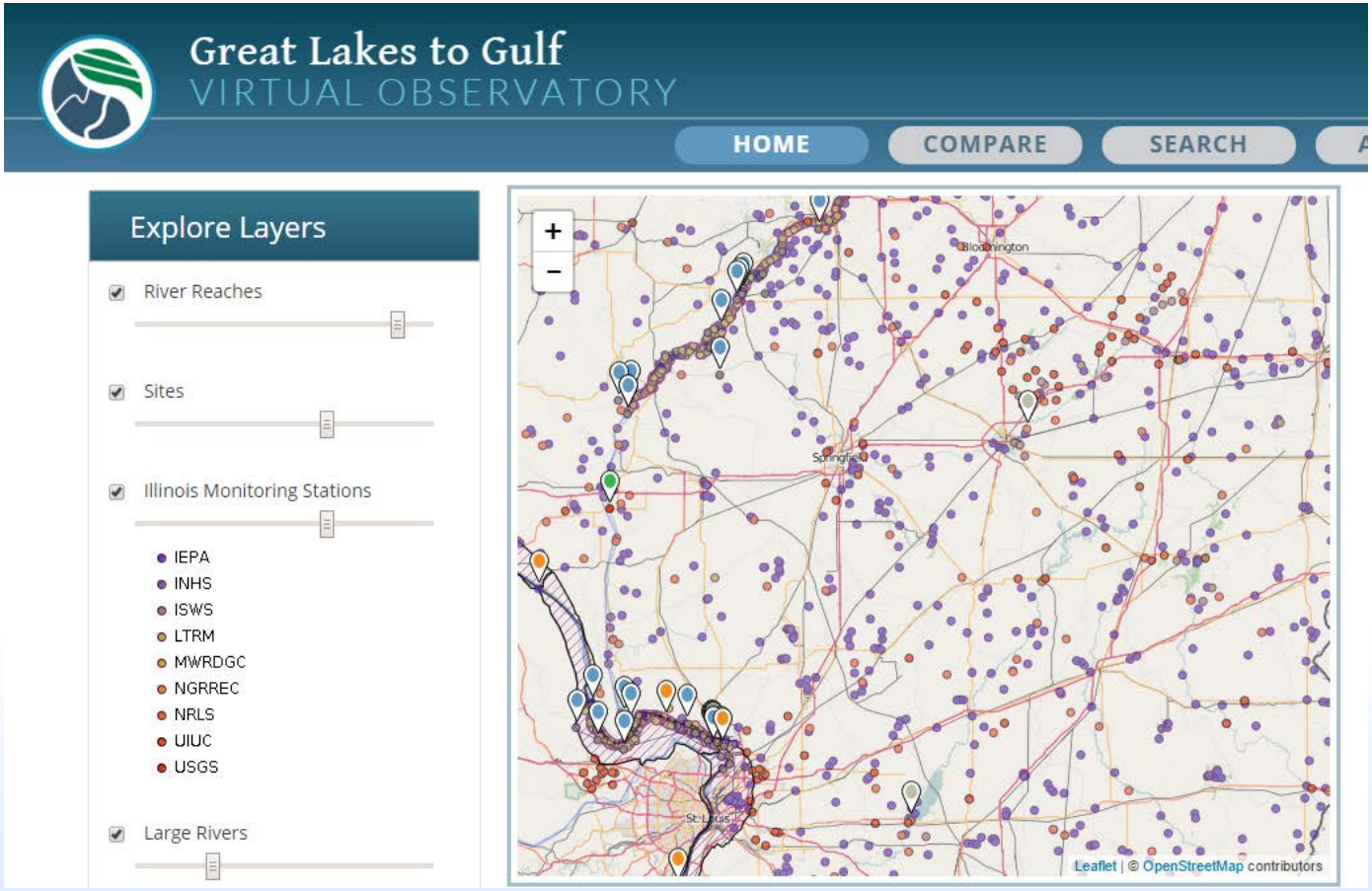
- On the search page users are able to create unique data sets for the specific sites, sources, and parameters that interest them.
- Users can then download their selected data sets in common file formats like CSV and JSON.

The Current & Future

- After launching with a focus on nutrients and water quality, the Observatory will expand to include additional types of environmental monitoring data in the future.

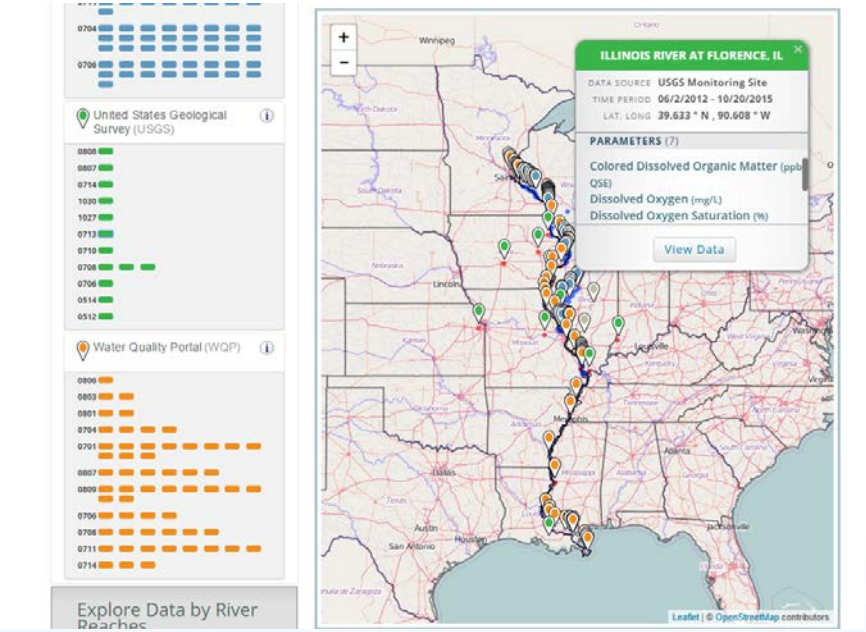
DEMO

- Sensor locations as a static layer



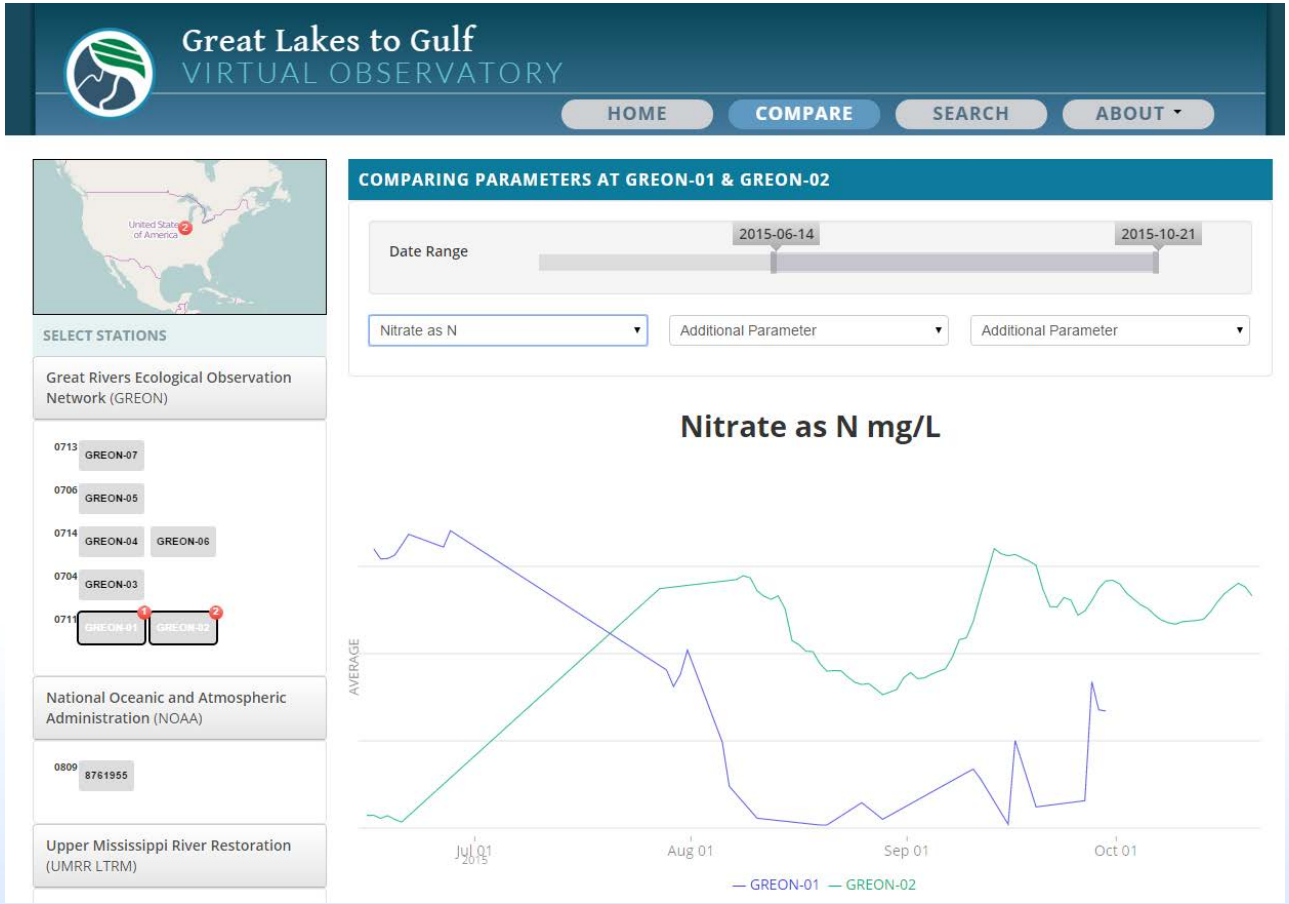
DEMO

- USGS SuperStation



DEMO

- Comparison



GLTG Virtual Observatory

- Production Site (Stable site)
  - http://gltg.ncsa.Illinois.edu
- Development site (new capability but unstable)
  - http://gltg-dev.ncsa.illinois.edu/