

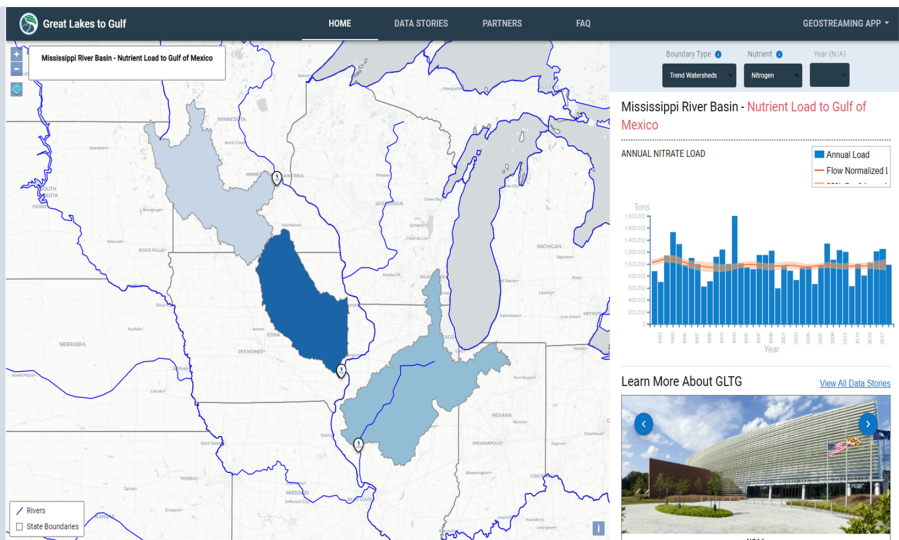
How the Great Lakes to Gulf Virtual Observatory Helps Track Nutrient Trends and Conservation Practices in the MARB

Hypoxia Task Force Public Meeting
14 December 2021

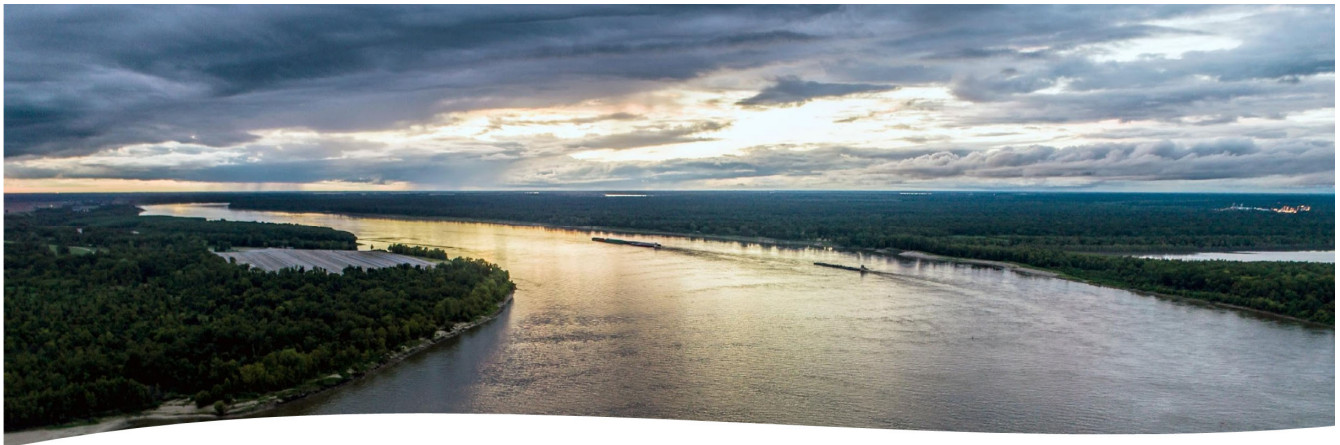
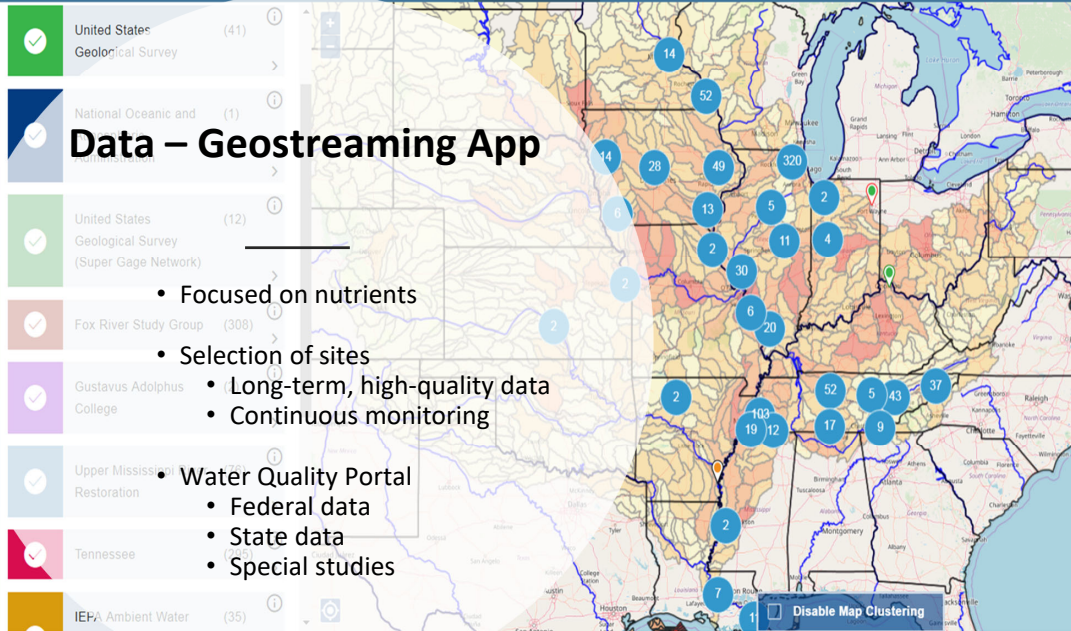


CHALLENGE: There is a need to be able to more fully visualize and understand historic and current water quality conditions in the Mississippi River watershed.

SOLUTION: A single platform that combines multiple data sources from the HTF states into a user-friendly tool that can be used by managers and stakeholders to model actions that will improve water quality in the Mississippi River watershed and in the Gulf of Mexico.



RESOURCE: The GLTG Virtual Observatory is a web-based, interactive geospatial application that integrates water quality data and analytics from multiple sources.
<https://gltg.ncsa.illinois.edu/>



With GLTG as the platform for analyzing and visualizing nutrient data –

Where to Next?

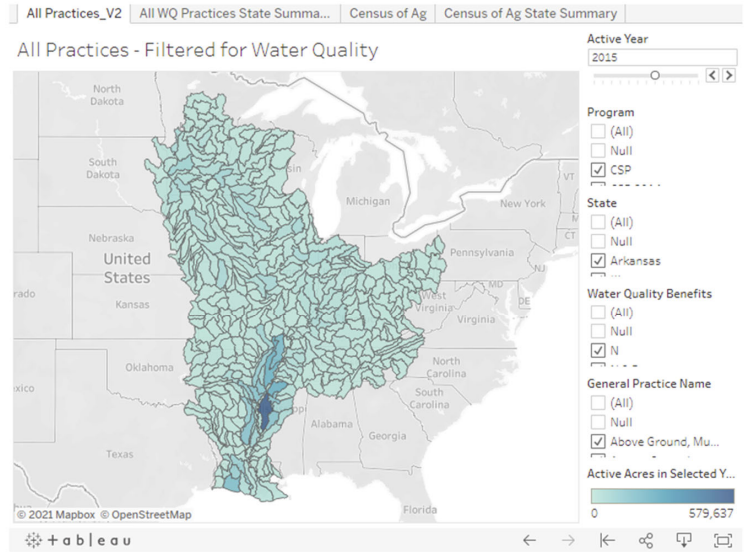
Conservation Practices

DATA TO BE ADDED in 2022-23

Nutrient Trends: GLTG will provide visualizations of flow-normalized nutrient trends (trends watershed, trend graph and statement of trend output) for at least 5 sites per HTF state on the dashboard.

Agricultural BMPs (location and densities): Working with Dr. Reid Christianson, University of Illinois, to Track Nonpoint Source Agricultural Conservation Practices:

- Inventory of ag best management practices for each of the 12 MRB mainstem states in the Mississippi River Basin
- EQUIP, CSP, EPA 319
- Pilot states (AR, IN, MN, IL, KY)
- Conservation “Heat” Maps



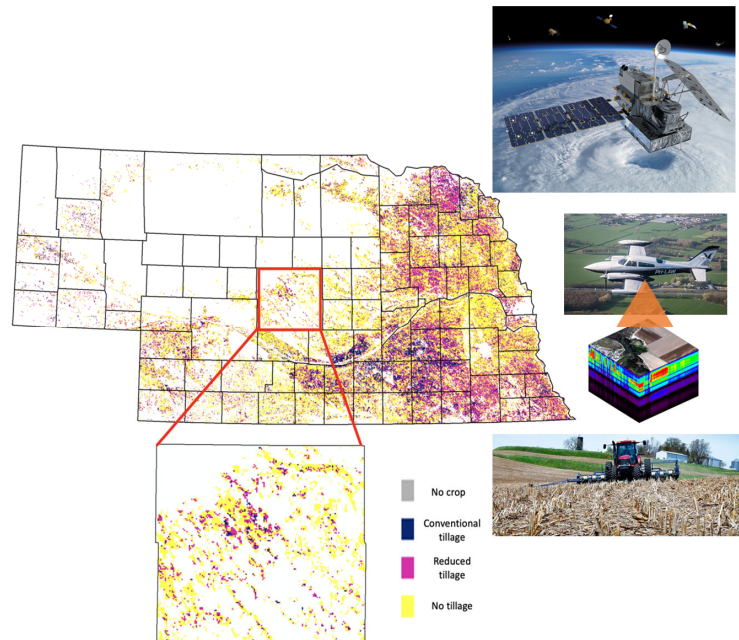
To cite these data, please use:
 Christianson, R. 2021. Common Data for Hypoxia Task Force Member States through 2020 [spatial data – unpublished]. Retrieved from https://public.tableau.com/app/profile/reid.christianson/viz/HTF_NRCS_Conservation/AllPractices_V2?publish=yes.

Conservation Practices

Remote Sensing of Cover Crops and Tillage Practices and the Relationship to Water Quality (location and densities):

Working with Dr. Kaiyu Guan, University of Illinois, on the Impact of Corn Fractions and Tile Drainage on Nitrogen Concentrations

- Long-term high resolution remotely sensed data for cover crops and tillage practices
- Agriculture at the field scale in real time
 - Tillage
 - Planting/Harvesting
 - Cover crop
 - Tracking Cover Crop Adoption for Each Field
- Includes “What If” scenarios
- Hindcasting



Conservation Practices

Hydrology: Working with Dr. Jason Knouft, Saint Louis University and NGRREC, on incorporating data from high-resolution streamflow and water temperature models to provide estimates of past, current, and future water conditions.

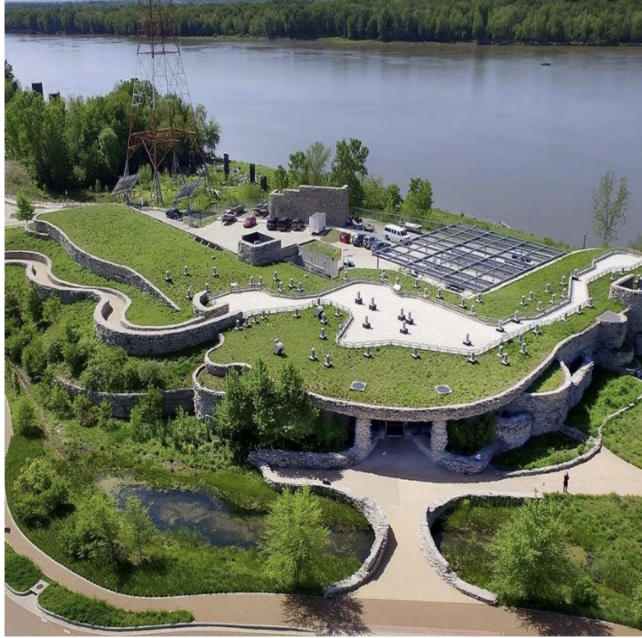
- HydroClim: Collaborative effort between Saint Louis University, Tulane University, and Indiana University
- Streamflow and water temperature estimates across the U.S. and Canada to enhance management of freshwater systems in a changing climate
- Monthly discharge and water temperature data from 1950 to 2099, with future estimates based on an array of climate change projections.
- SWAT hydrologic model
- Based on 39 Global Climate Model projections

<https://www.hydroclim.org/index.html>



Next Steps – Making Data Accessible

- Increasing awareness of nutrient conditions in the Mississippi River and its tributaries
- Visualizing BMP effectiveness as part of each state's nutrient reduction plans
- Guiding adaptive management of nutrient management practices in the field



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