

Jun 20th, 2:15 PM - 2:30 PM

Landscape Approaches: A Multi-Scale Web-Based Fish Habitat Decision Support Tool

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A Multi-Scale Web-Based Fish Habitat Decision Support Tool

Jason Clingerman &
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Downstream Strategies
Dr. Todd Petty, WVU
Frank Orr, Critigen



www.FishHabitatTool.org

About us

Downstream Strategies

“Downstream Strategies offers environmental consulting services that combine sound interdisciplinary skills with a core belief in the importance of protecting the environment and linking economic development with natural resource stewardship”



- West Virginia–based company since 1997
- Offices in Morgantown and Alderson, West Virginia
- Program tools include monitoring and remediation, GIS, and stakeholder involvement
- Clients include Federal, state, and local governments, foundations and non-profits, universities, attorneys, individuals, and private businesses

Project Overview

Timeline

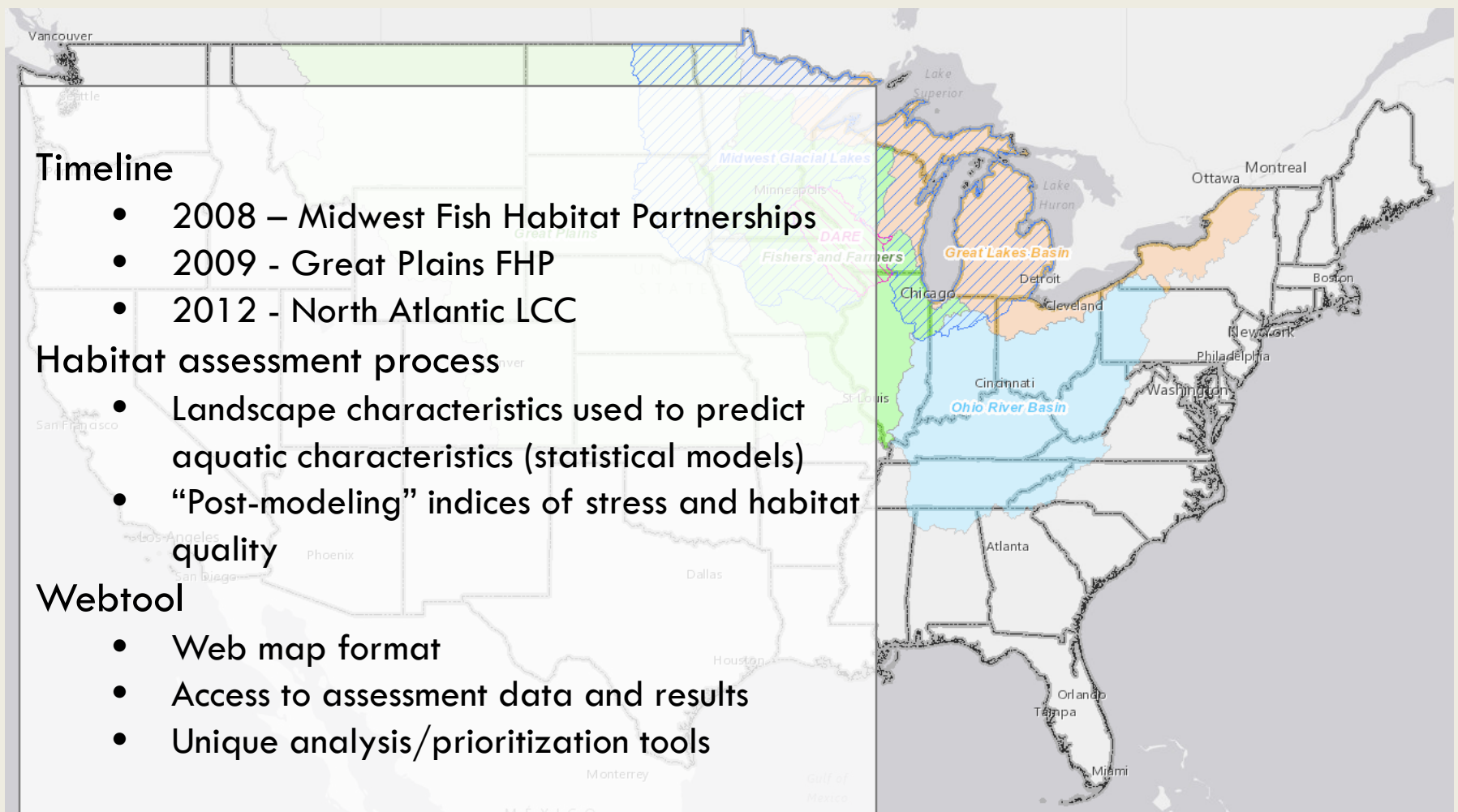
- 2008 – Midwest Fish Habitat Partnerships
- 2009 - Great Plains FHP
- 2012 - North Atlantic LCC

Habitat assessment process

- Landscape characteristics used to predict aquatic characteristics (statistical models)
- “Post-modeling” indices of stress and habitat quality

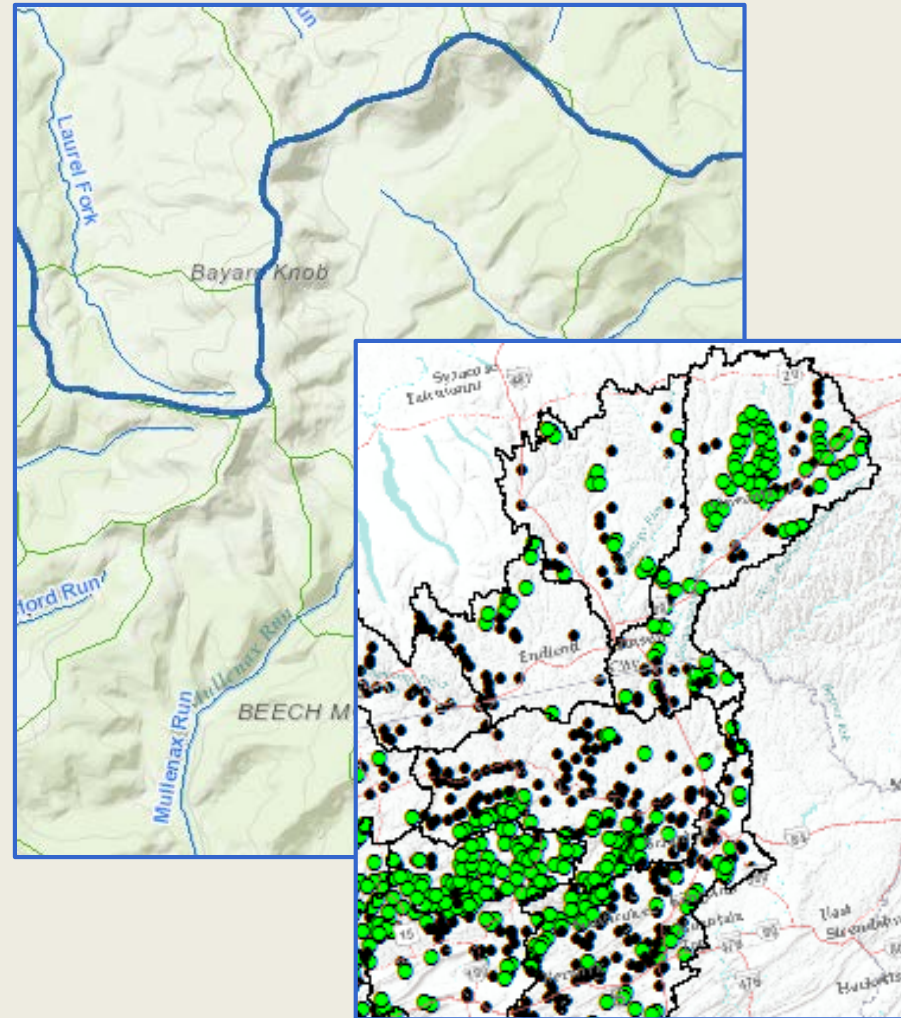
Webtool

- Web map format
- Access to assessment data and results
- Unique analysis/prioritization tools



Assessment Process

- NHD+ catchment - unit of analysis for all inland assessments
- Landscape data to predict various aquatic responses
 - Land cover/Land use
 - Geology/Soils
 - Landform (elevation, slope, etc)
 - Climate
- Sample data collected mostly from state and federal agencies



DATA



MODEL



APPLICATION

Assessment Process

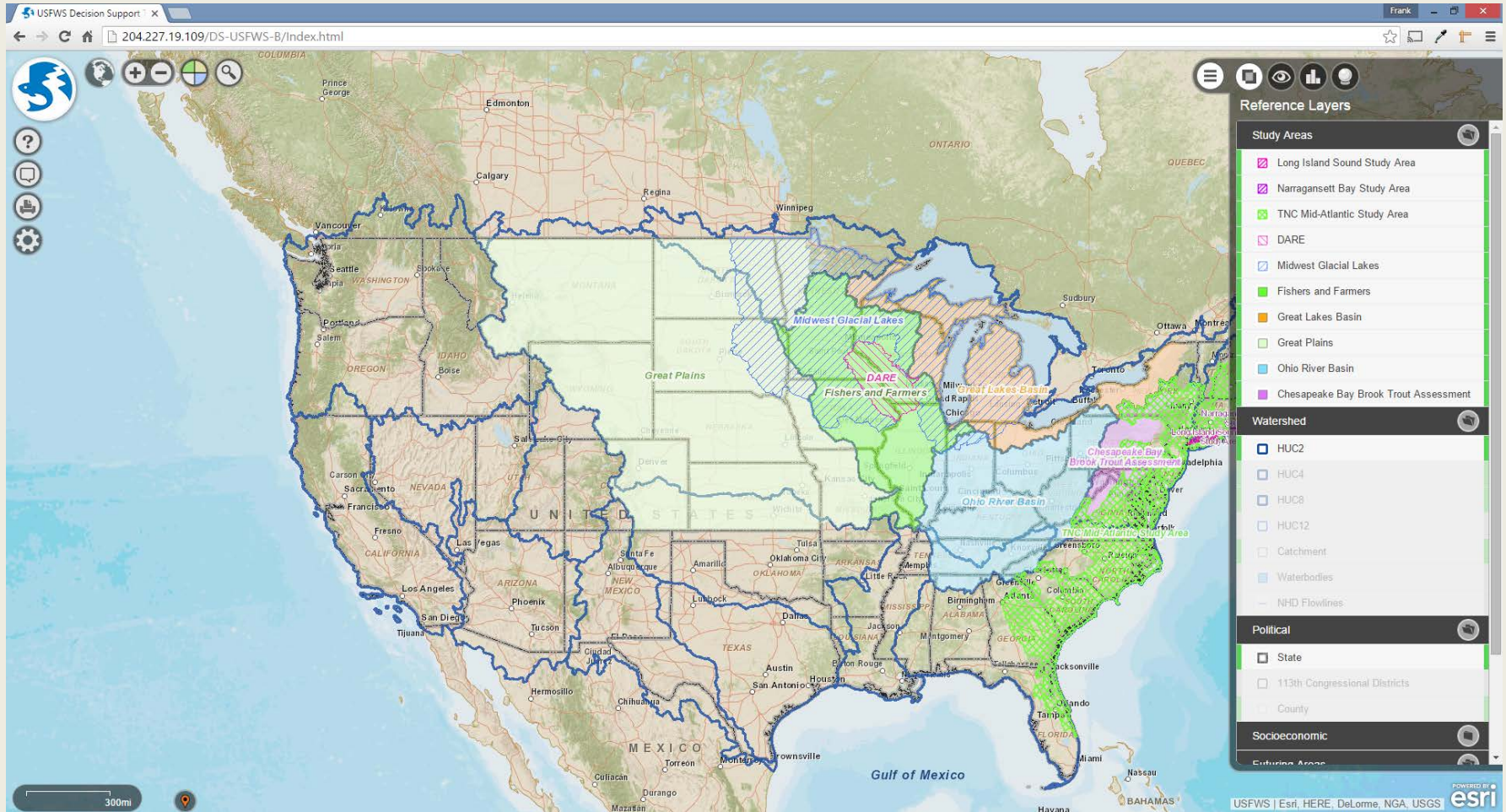
- Boosted regression trees
- Grounded in the research done at WVU for “Watershed Planning”
- 37 distinct predictive models

DATA

MODEL

APPLICATION

Web-based Mapping Application Design



DATA → MODEL → APPLICATION

www.FishHabitatTool.org

- Tutorial
- Case Studies
- Metadata
- Contact
- Tool
- Press

The screenshot shows the homepage of the Fish Habitat Decision Support Tool. At the top left is a logo of a fish. The main header reads "FISH HABITAT DECISION SUPPORT TOOL" with sub-headers "VISUALIZATION", "FUTURING", and "RANKING". A navigation bar includes "HOME", "TUTORIALS", "CASE STUDIES", "METADATA", "CONTACT", and "PRESS". The main content area is divided into a blue text box on the left and a map area on the right. The text box is titled "ABOUT THE TOOL" and contains three paragraphs of text. The map area features three map panels: a large map of the Great Lakes region, a detailed map of a river network, and a map with purple and brown shaded areas. An orange call-to-action box on the right says "CLICK THE MAPS TO USE THE TOOL".

FISH HABITAT DECISION SUPPORT TOOL
VISUALIZATION FUTURING RANKING

HOME • TUTORIALS • CASE STUDIES • METADATA • CONTACT • PRESS

ABOUT THE TOOL

This tool was created with funding from the United States Fish and Wildlife Service to provide resource managers and the general public with access to the extensive spatial data and results produced from multiple fish habitat assessments.

Additional assessments performed under funding and guidance from the North Atlantic Landscape Conservation Cooperative and the Atlantic Coastal Fish Habitat Partnership are also included within the same web mapping application.

Three main analytical tools (visualization, ranking, and futuring) are combined with intuitive basemaps and mapping features to allow users to explore the details of

CLICK THE MAPS TO USE THE TOOL

Custom Web-based Mapping Application

Analytical Tools

Visualization Tool

Setup Results About Help

Visualization Name
Viz1

Scale and Geography of Visualization
Watershed (data by catchment)

Watershed Selector
Hocking - 05030204

Model or Data Category
Landscape Variables

Data of Interest
Catchment Percent Agriculture

Visualize Reset

Visualization

Ranking Tool

Setup Results About Help

Ranking Name
Rank1

Scale and Geography of Ranking
Watershed

Watershed Selector
Driftwood - 05120204

Model or Data Category
Landscape Variables

Data of Interest
Network Active Mine Density

Variable(s)

Landscape Variables: Catchment Percent Forest
Weight: 50
 Inverse Remove

Landscape Variables: Network Active Mine Density
Weight: 25
 Inverse Remove

Add Variable Remove All Variables

Rank Reset

Ranking

Futuring Tool

Setup Results About Help

Futuring Name
Future1

Model of Interest
Brook Trout

Catchment Selector
Thunder Bay - 04070006 - 12962899

Model Data of Interest
Catchment Percent Agriculture

Catchment Variable(s)

Brook Trout: Catchment Percent Agriculture
Catchment ID: 12962957
Value: 70
Flash Remove

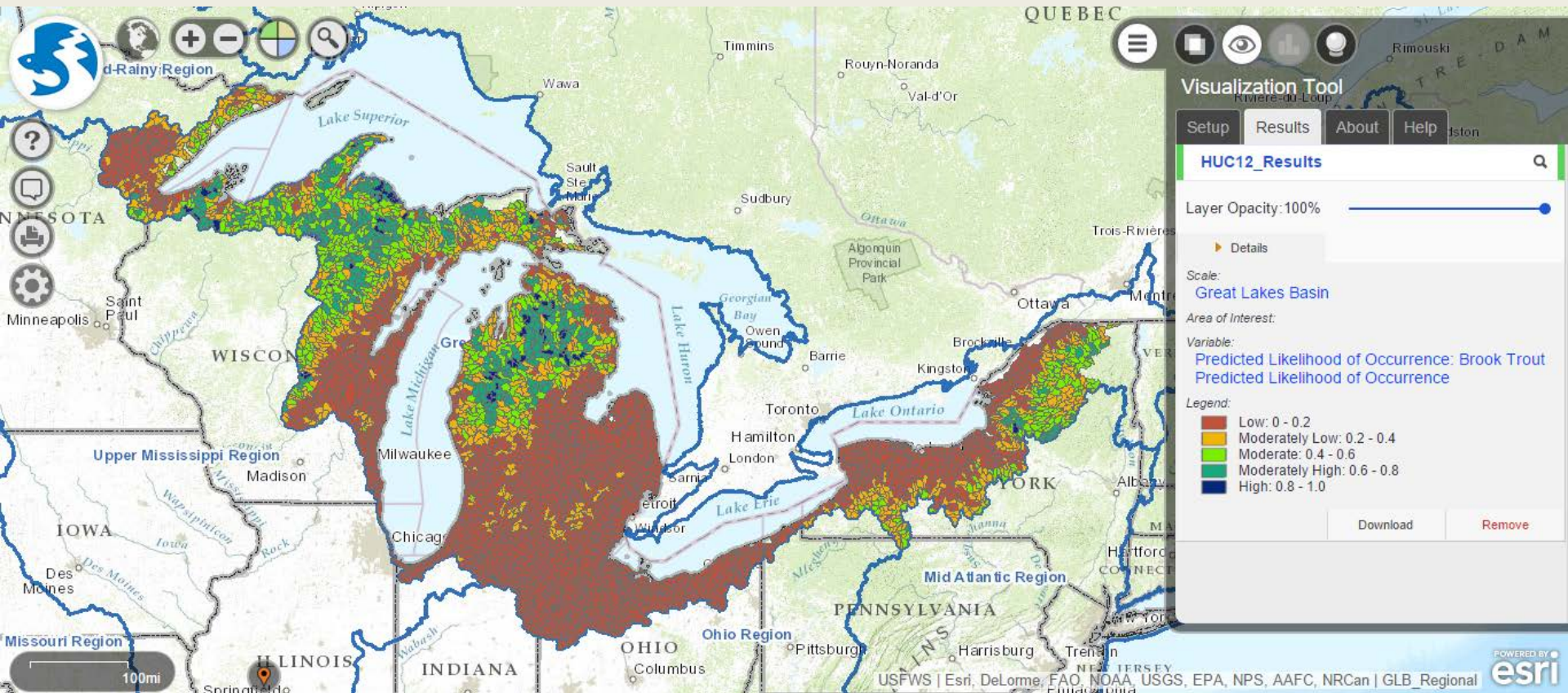
Brook Trout: Catchment Percent Developed
Catchment ID: 12962953
Value: 80
Flash Remove

Add Catchment Remove All Catchments

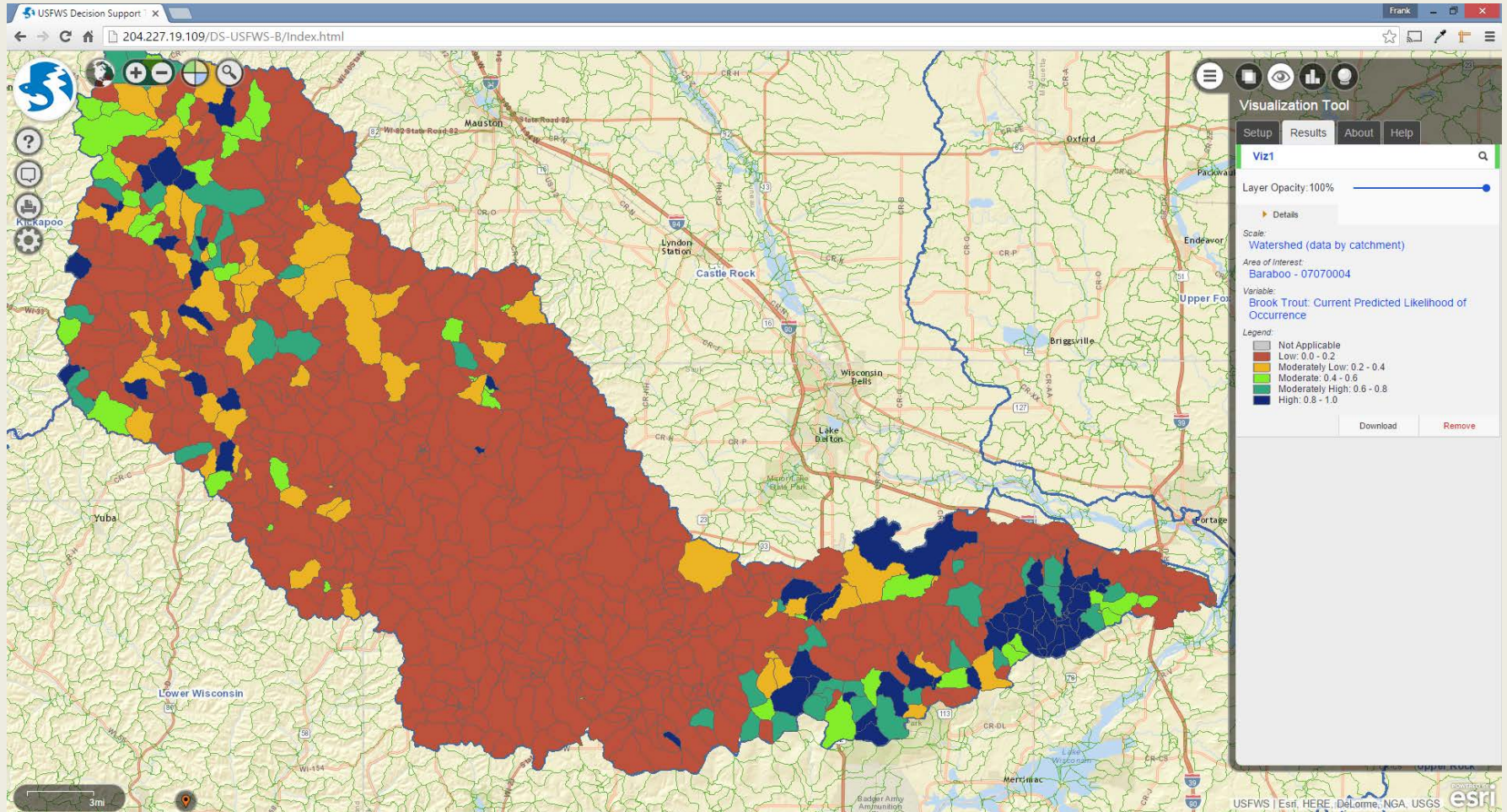
Future Reset

Futuring

Custom Web-based Mapping Application Visualization Tool

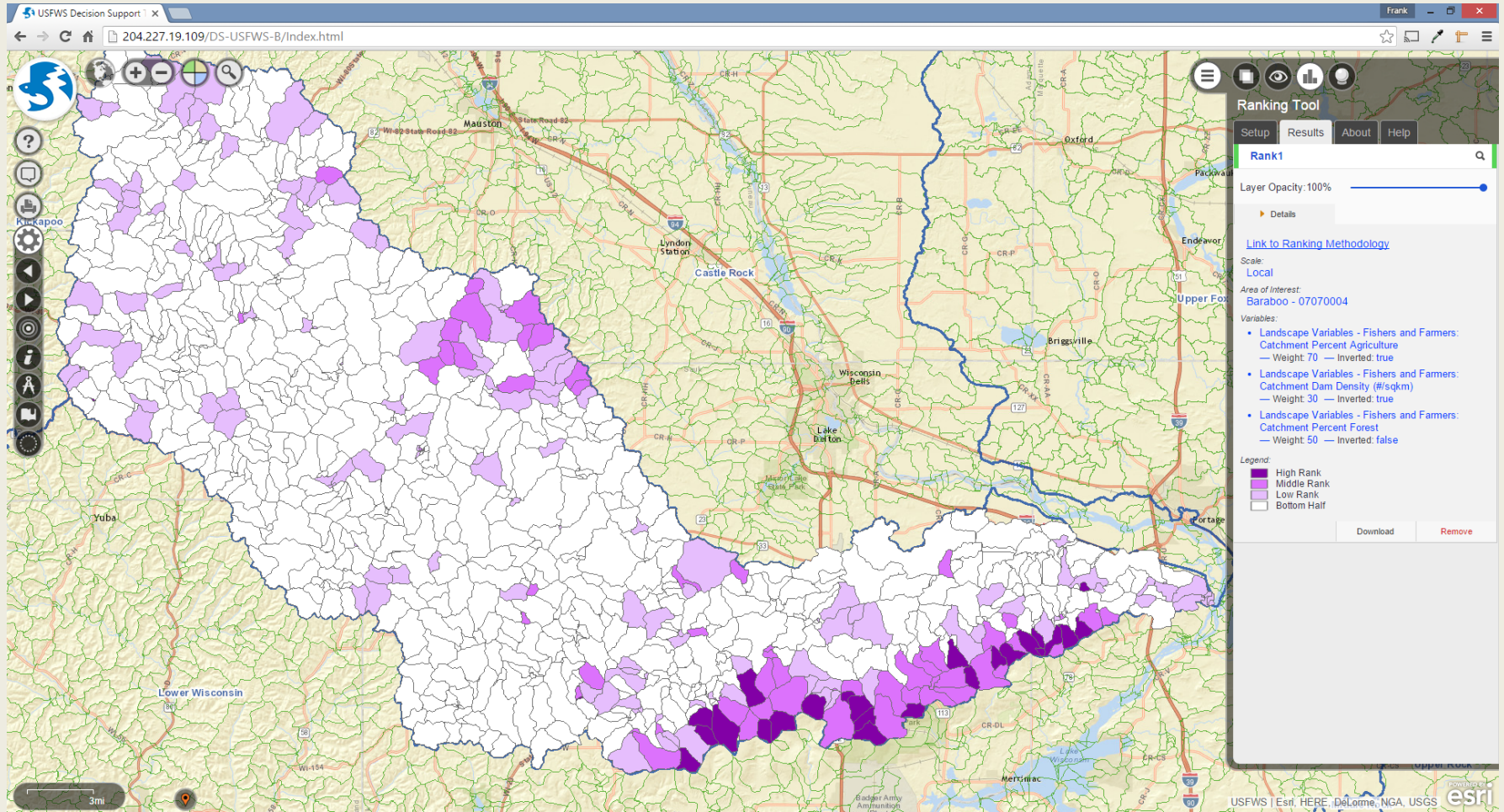


Custom Web-based Mapping Application Visualization Tool



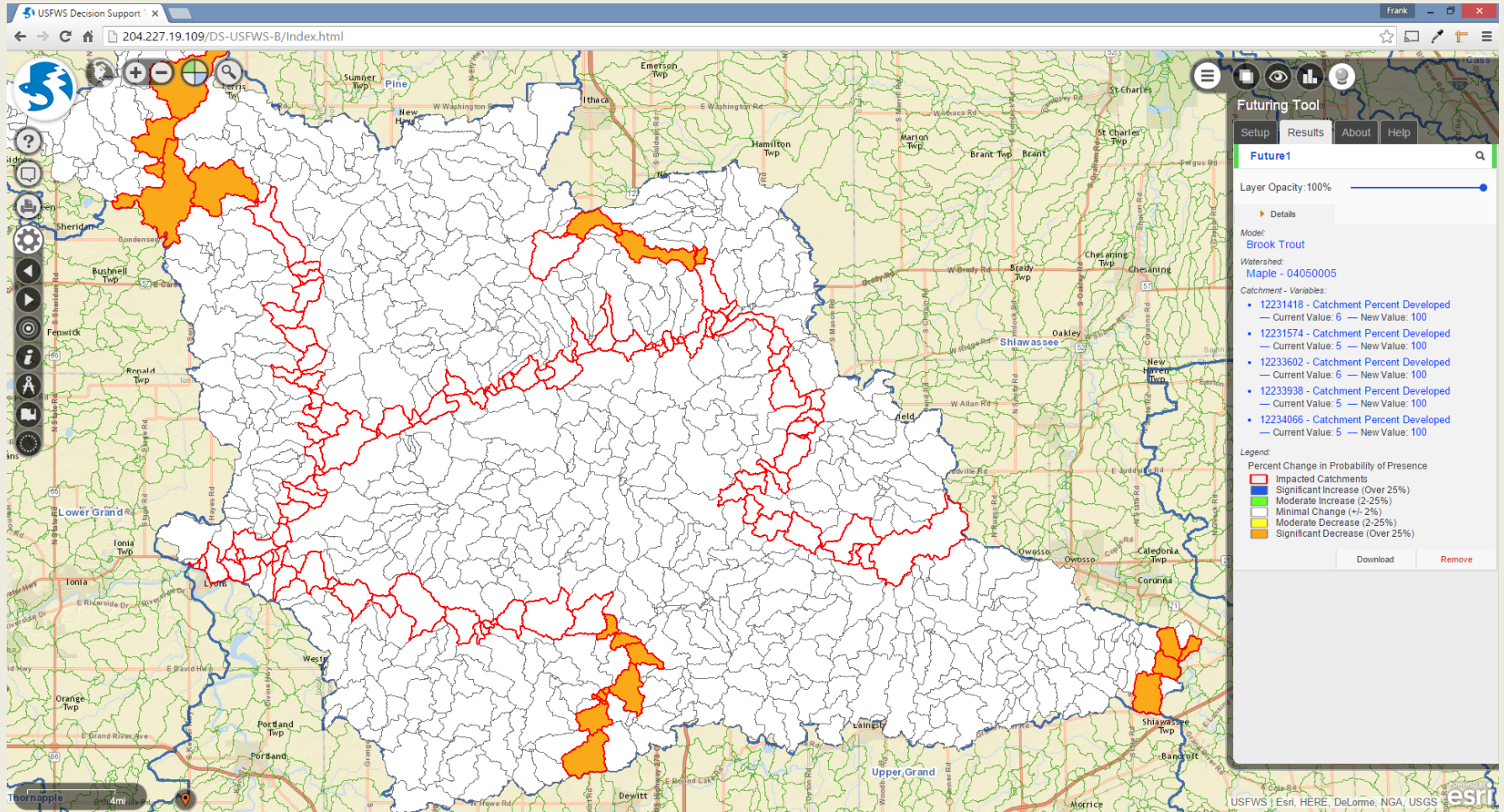
Custom Web-based Mapping Application

Ranking



Custom Web-based Mapping Application

Futuring



Summary

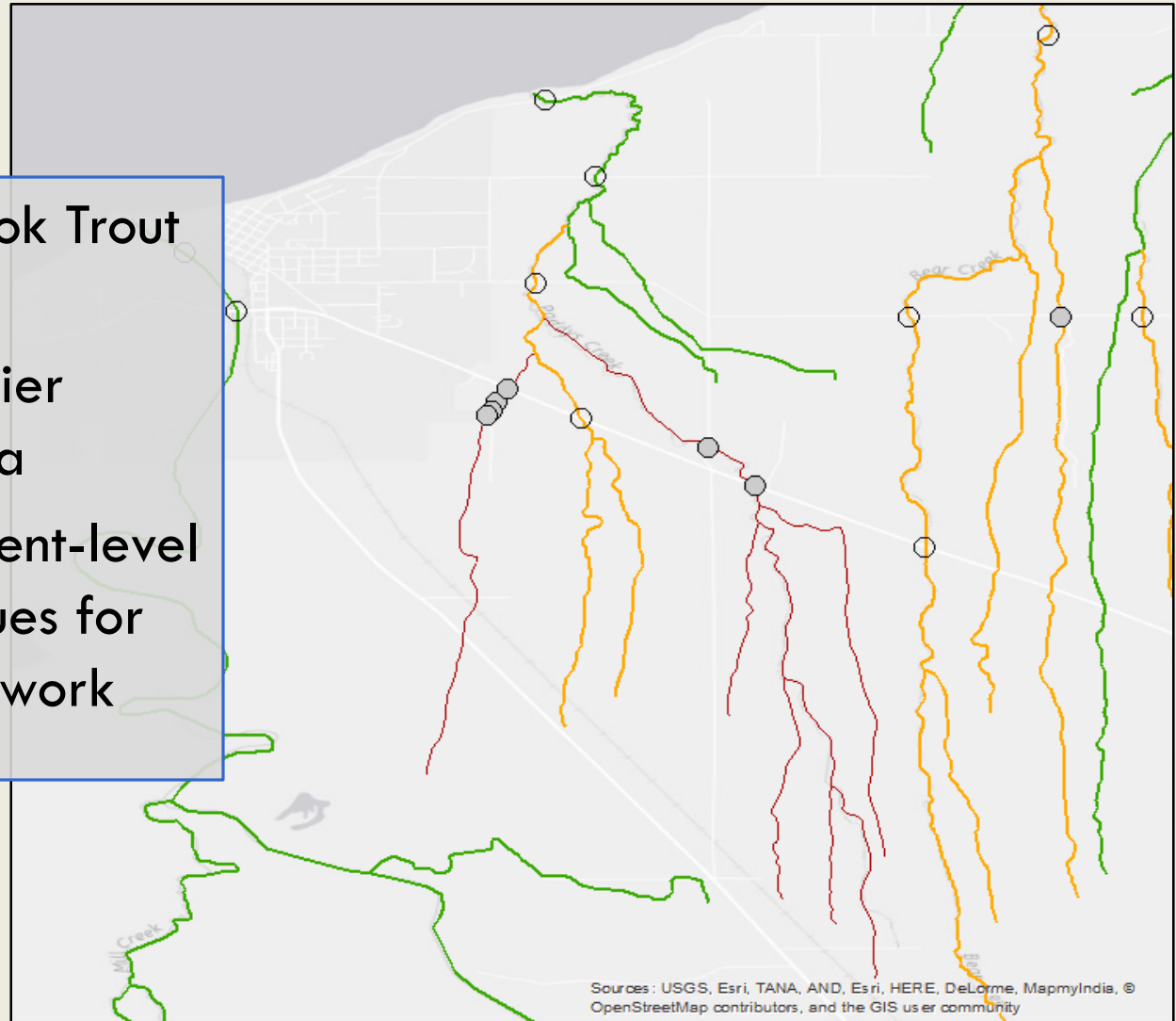
- Accessible, flexible tool for aquatic prioritization
- Utilizes unique combination of factors
 - Habitat quality
 - Stress
 - Current conditions
 - Climate
 - Others (socioeconomic, landcover, soils, etc)

Ongoing/Future Work

- As broad-scale connectivity data improves, these factors can be utilized within this process
 - Within model as predictor variables
 - Within application/prioritizations
- Opportunity:
 - Robust connectivity data = more comprehensive tool

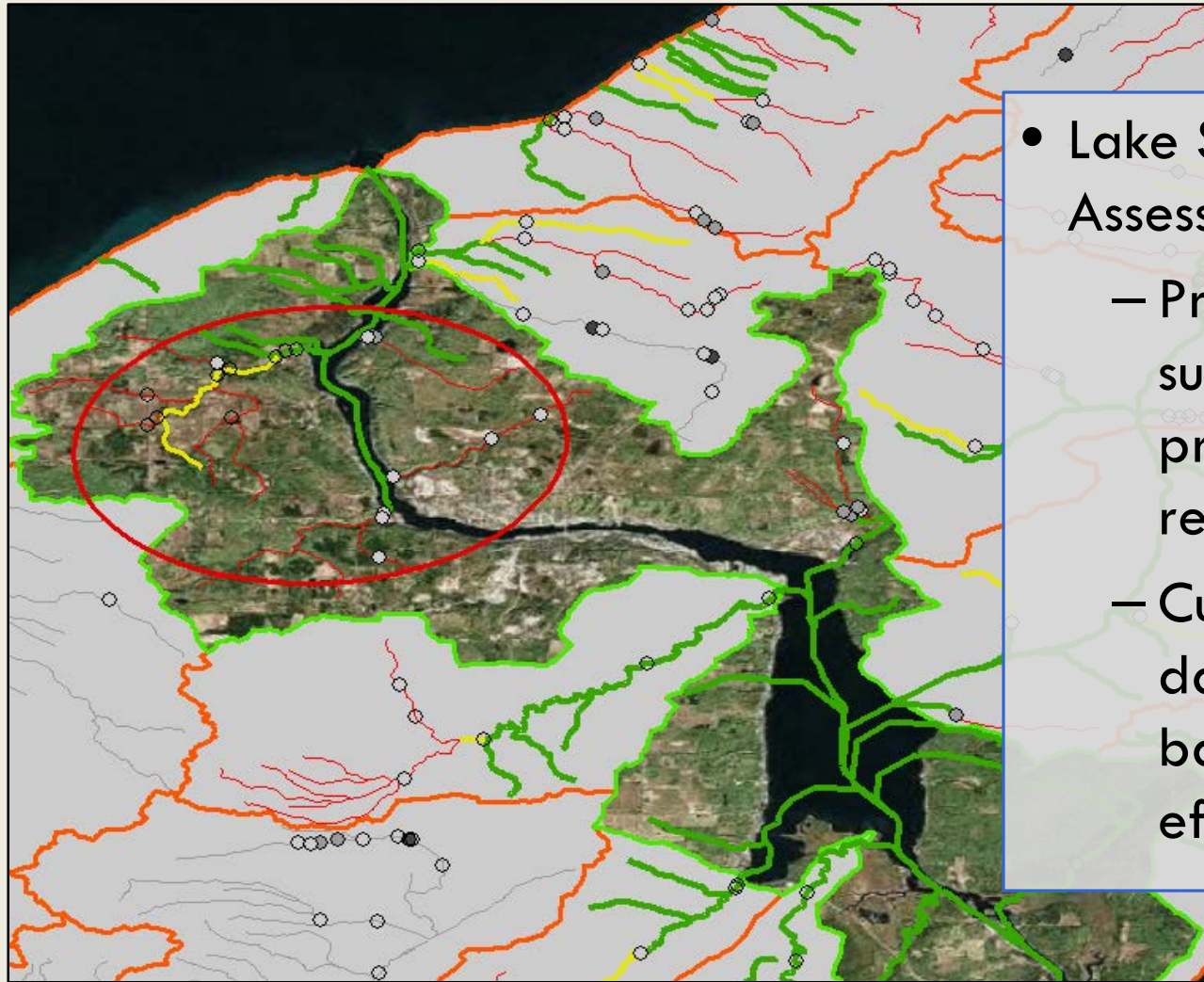
Ongoing: Lake Superior Brook Trout Assessment

- Lake Superior Brook Trout Assessment
 - Fishwerks barrier passibility data
 - Created segment-level passibility values for entire flow network



Ongoing:

Lake Superior Brook Trout Assessment



- Lake Superior Brook Trout Assessment
 - Prioritized this subwatershed as a priority for brook trout restoration.
 - Currently using this data to prioritize barrier replacement efforts

Ongoing/**Future** Work

Creating passibility values for
entire flow networks

Updating data

- Fisheries data
- Predictor data
- Barrier/passibility data



Questions?



CRITIGEN



Eastern Brook Trout
JOINT VENTURE
A Fish Habitat Partnership