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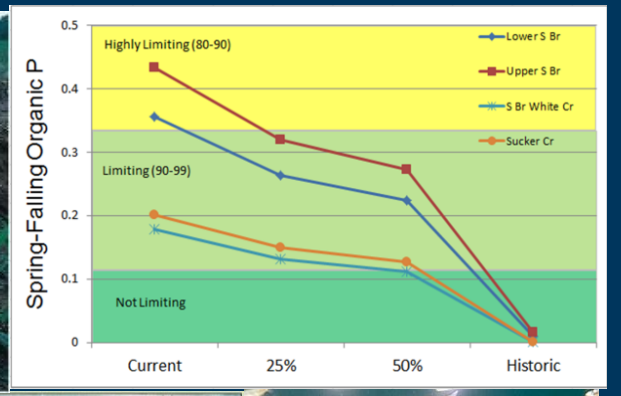
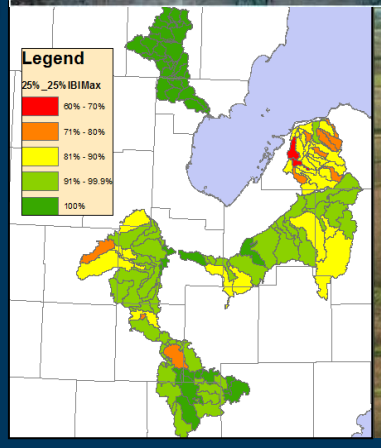
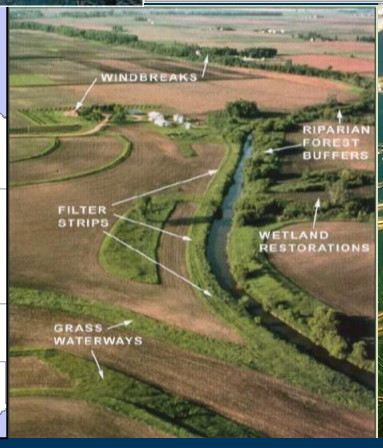
The Wildlife Component of CEAP–
Great Lakes and Western Lakes Erie Efforts

Scott P. Sowa

Matthew Herbert, Mary Fales, Kim Hall, Anthony Sasson, August Froelich, Carrie Vollmer-Sanders, Lizhu Wang, A. Pouyan Nejadhashemi, Stuart Ludsin, Jeffrey Reuter, Jeff Arnold, Mike White, Mari-Vaughn Johnson, & Charlie Rewa







NCER

Chicago, IL
August 1, 2013

USDA ARS NRCS

MICHIGAN STATE UNIVERSITY

Michigan DNRE Department of NATURAL RESOURCES and ENVIRONMENT

THE OHIO STATE UNIVERSITY

Sea Grant
Ohio Sea Grant College Program

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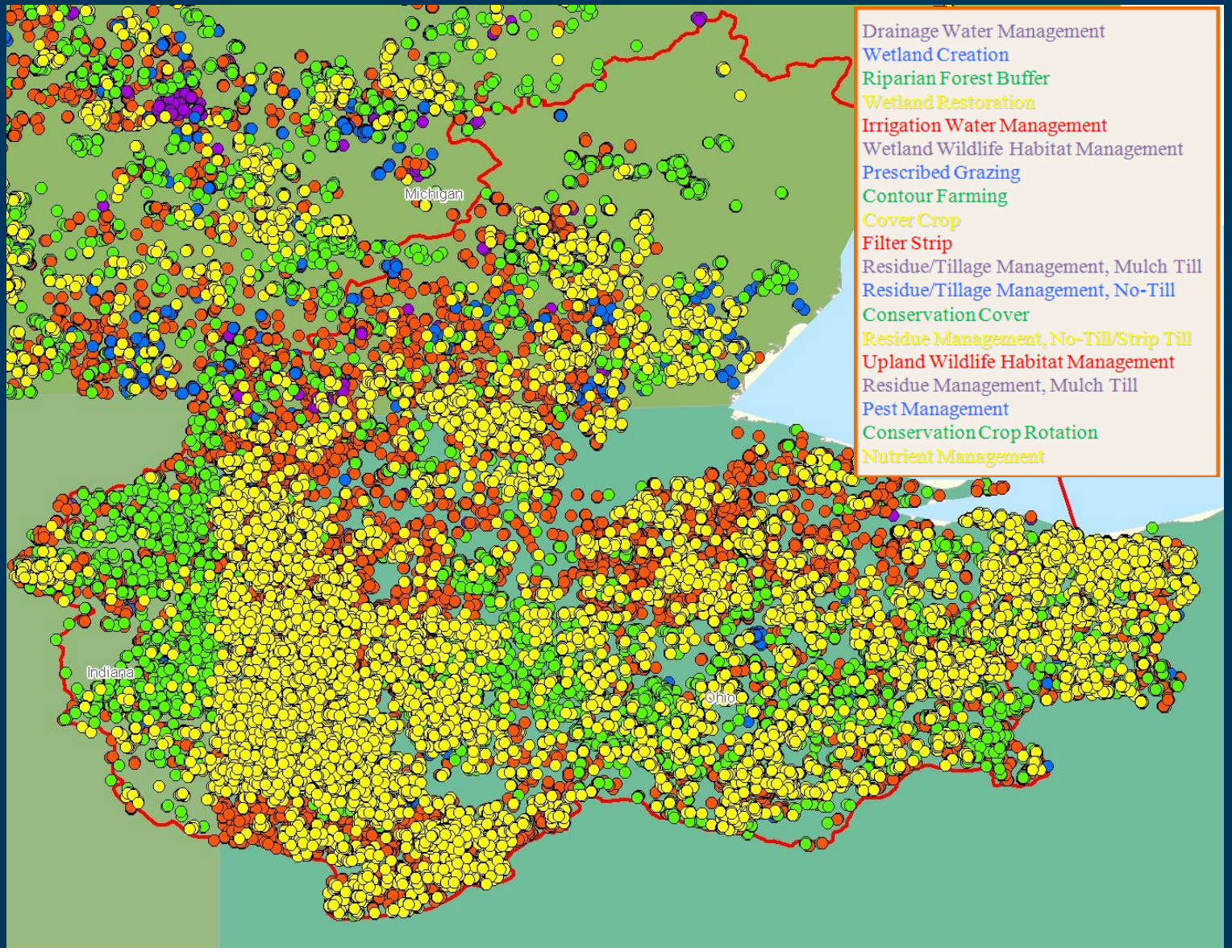
How Much Is Enough?



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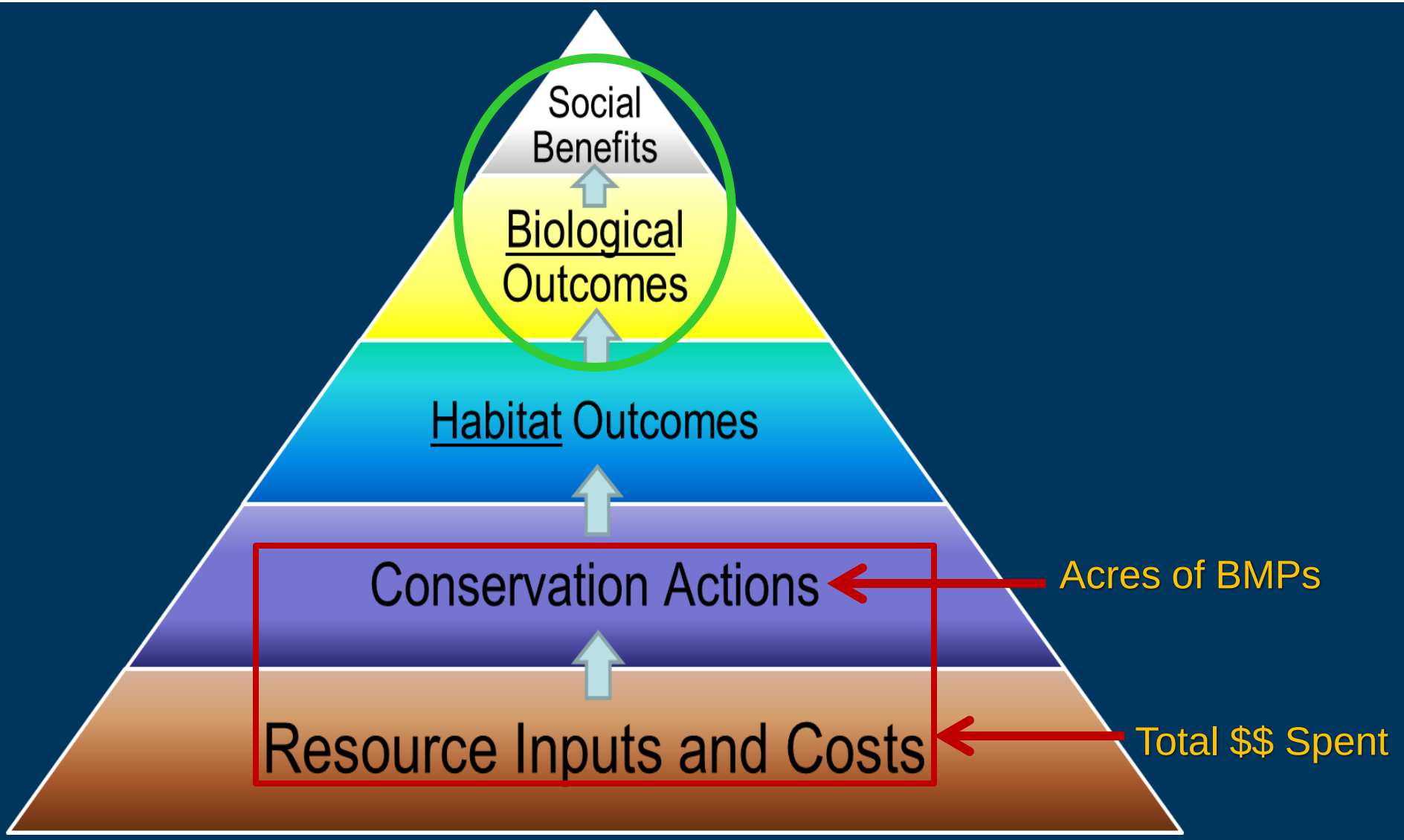
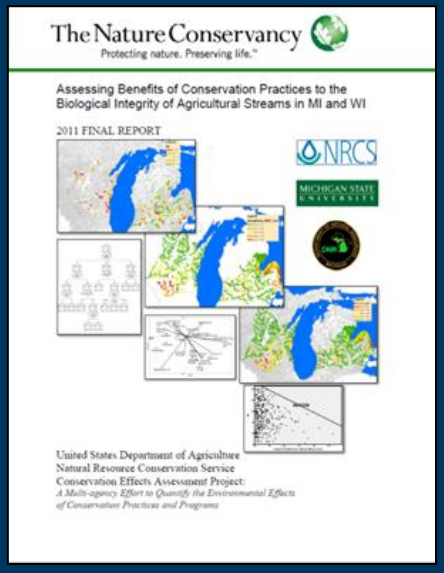
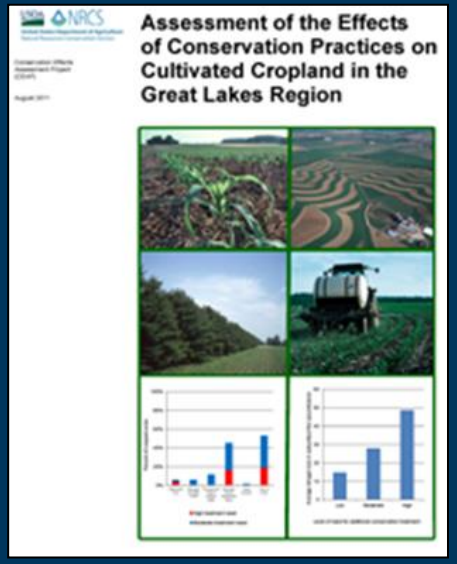
It Depends on Your Goal



Conservation Effects Assessment Project

- **Overall Goal:** improve efficacy of conservation practices and programs by providing the science and education needed to enrich conservation planning, implementation, management decisions, and policy
- Components
  - Wildlife
  - Cropland
  - Wetland
  - Grazing Lands
  - Watershed





- **Wildlife Goal:** Quantify the effects of USDA conservation practices and programs on fish and wildlife…

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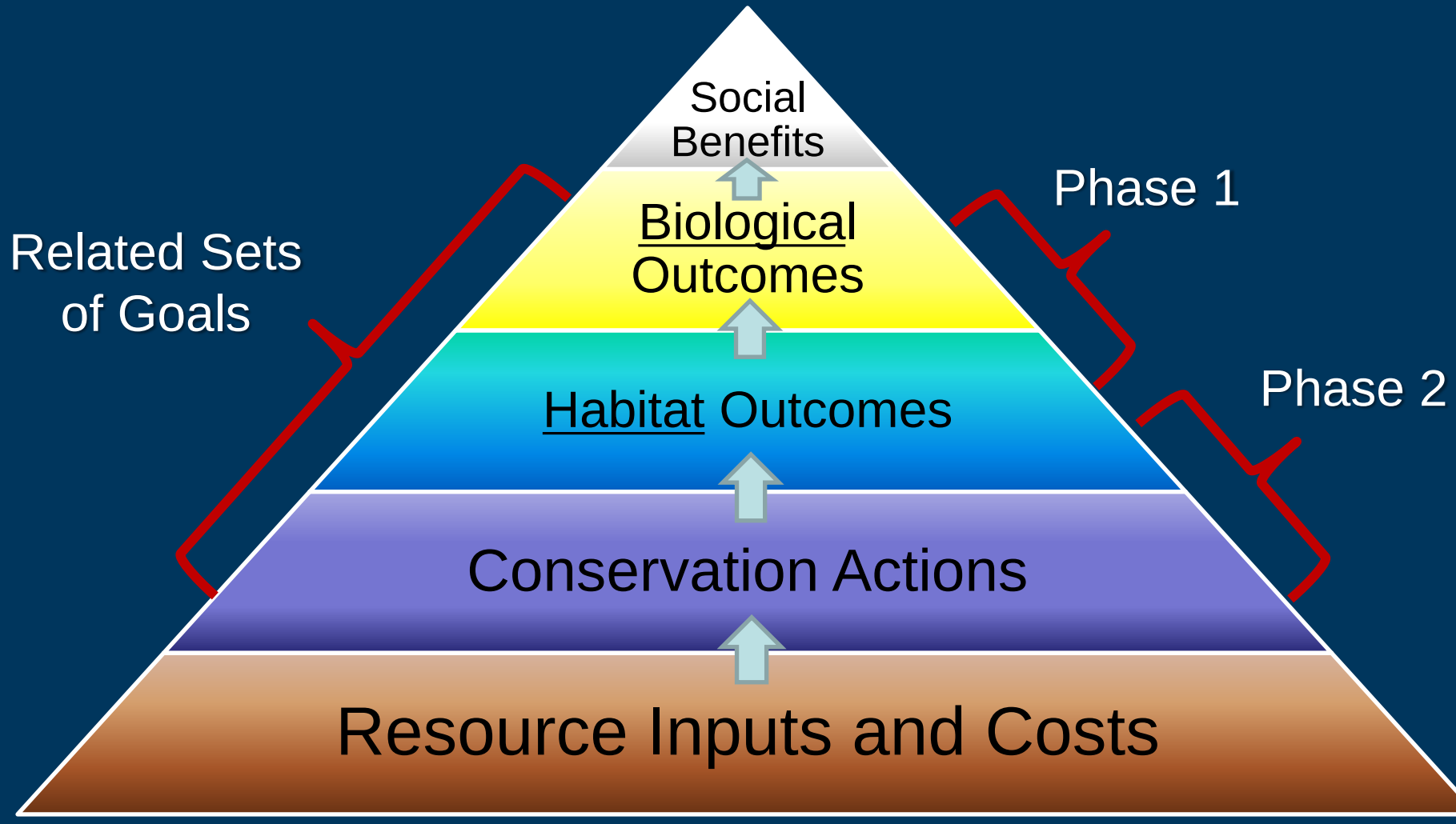
Linking Conservation Actions to Biological Outcomes



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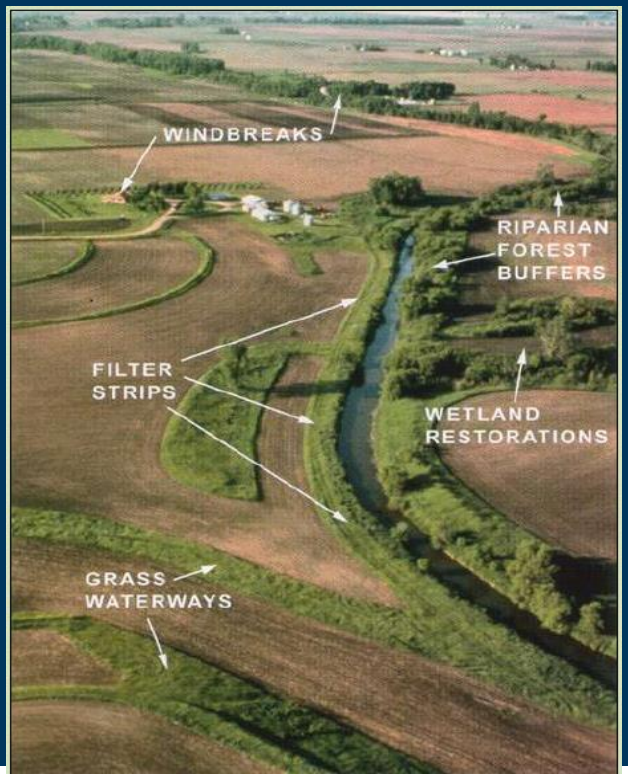
Strategic Conservation

Getting the right conservation practices to the right places, in the right amount, at the right time, as efficiently as possible to address the right problem and achieve realistic goals



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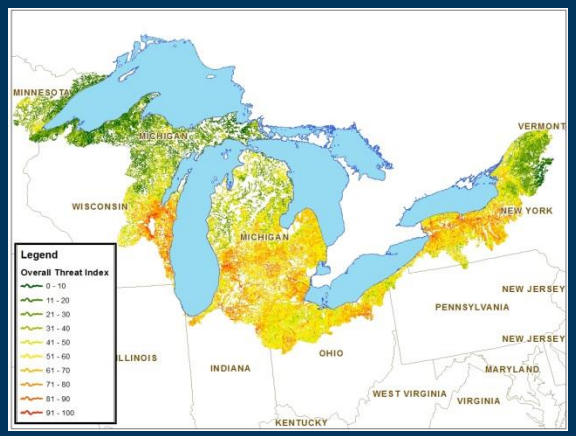
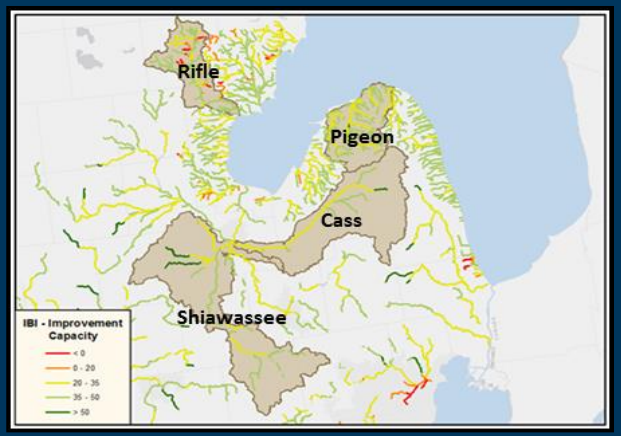
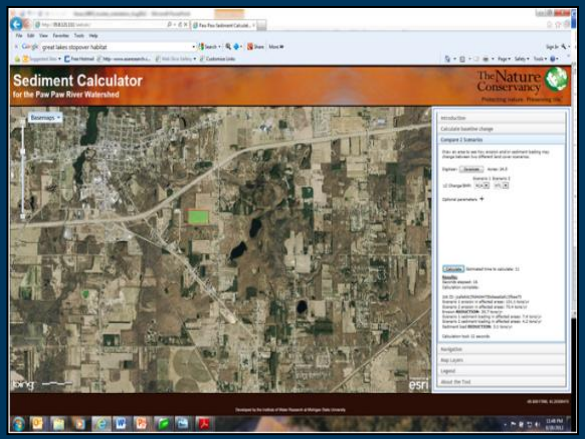
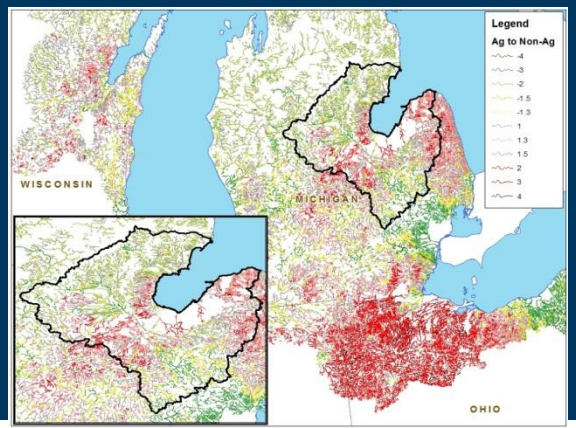
A Body of Work That Supports Logistics of Many Strategies

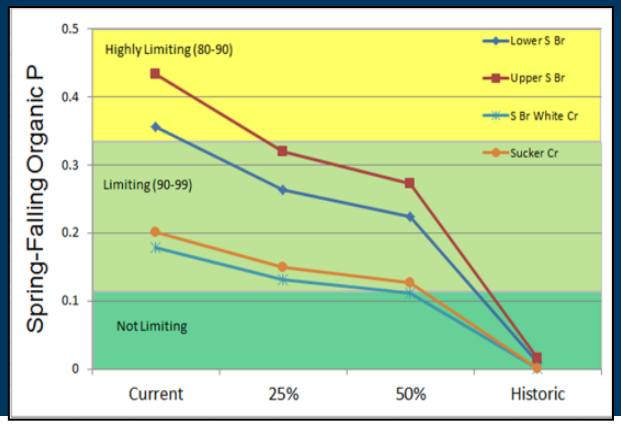
- Getting the right information to the right people in the right format to support setting realistic goals, strategically implement practices, & track progress

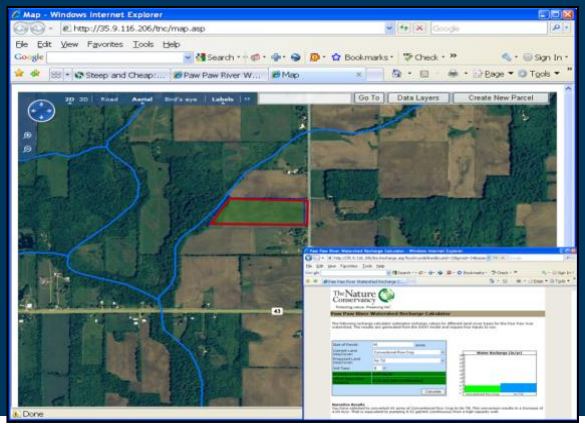












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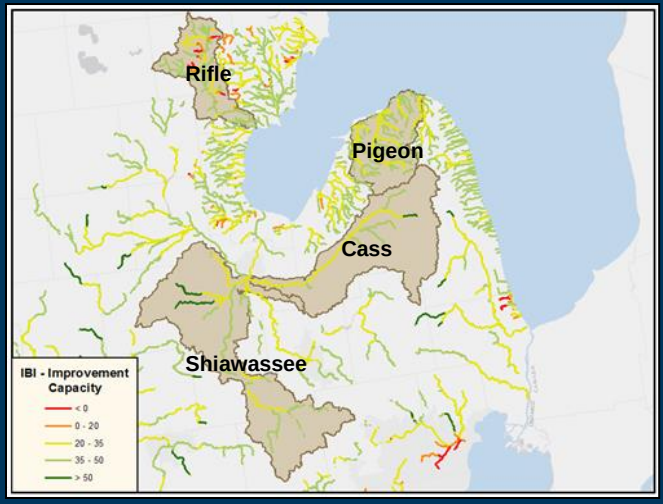
Project Areas

Phase 1

Phase 2

Great Lakes



Western Lake Erie Basin

?

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Phases of Work

Phase 1 – linking biological communities to water quality

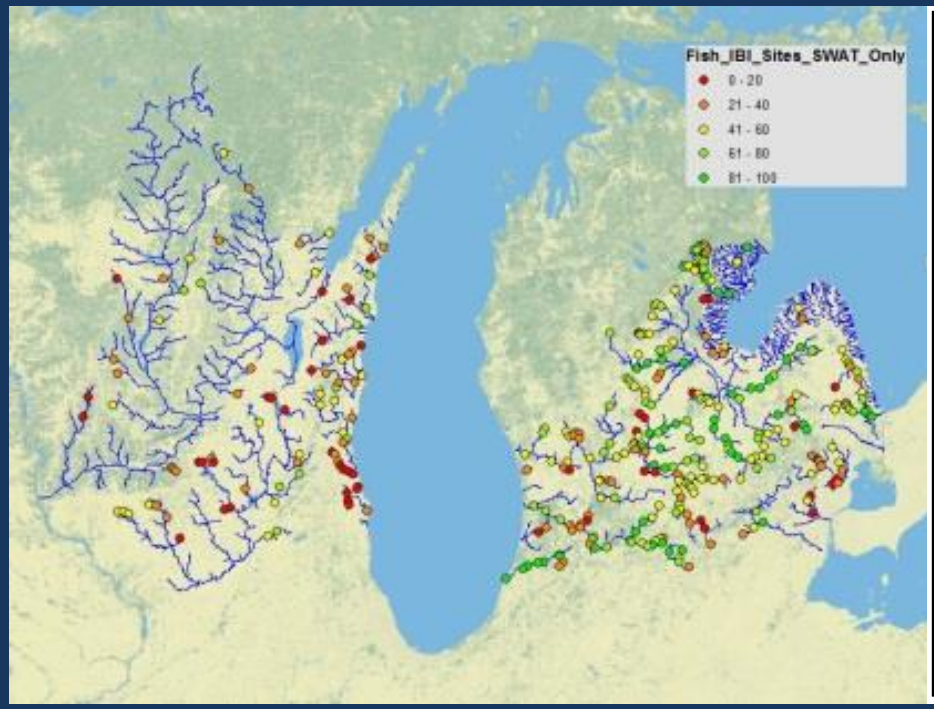
Phase 2 – linking conservation actions to water quality and biological endpoints

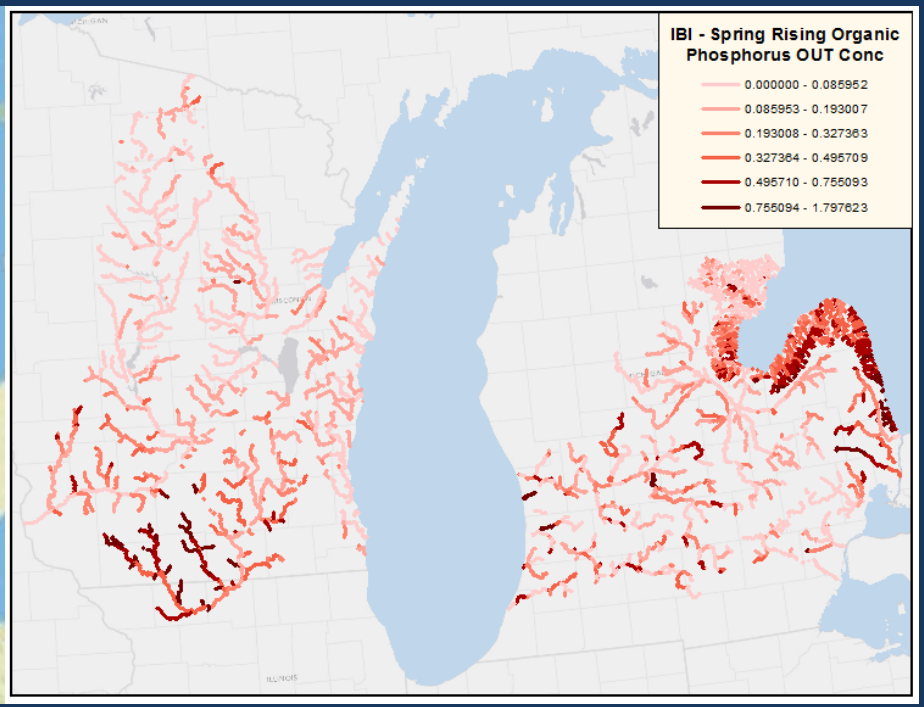
Phase 3 – decision tools to target and track

Phase 4 – partnering to set goals and test innovative strategies to achieve them

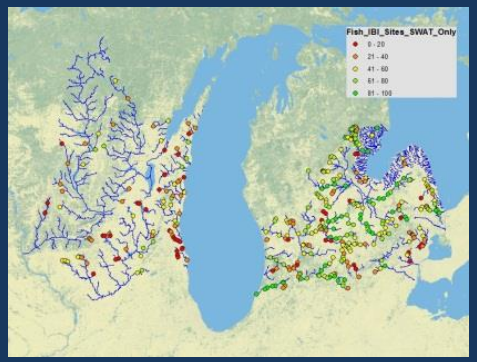
Phase 1 – Models Linking Fish Communities to Water Quality

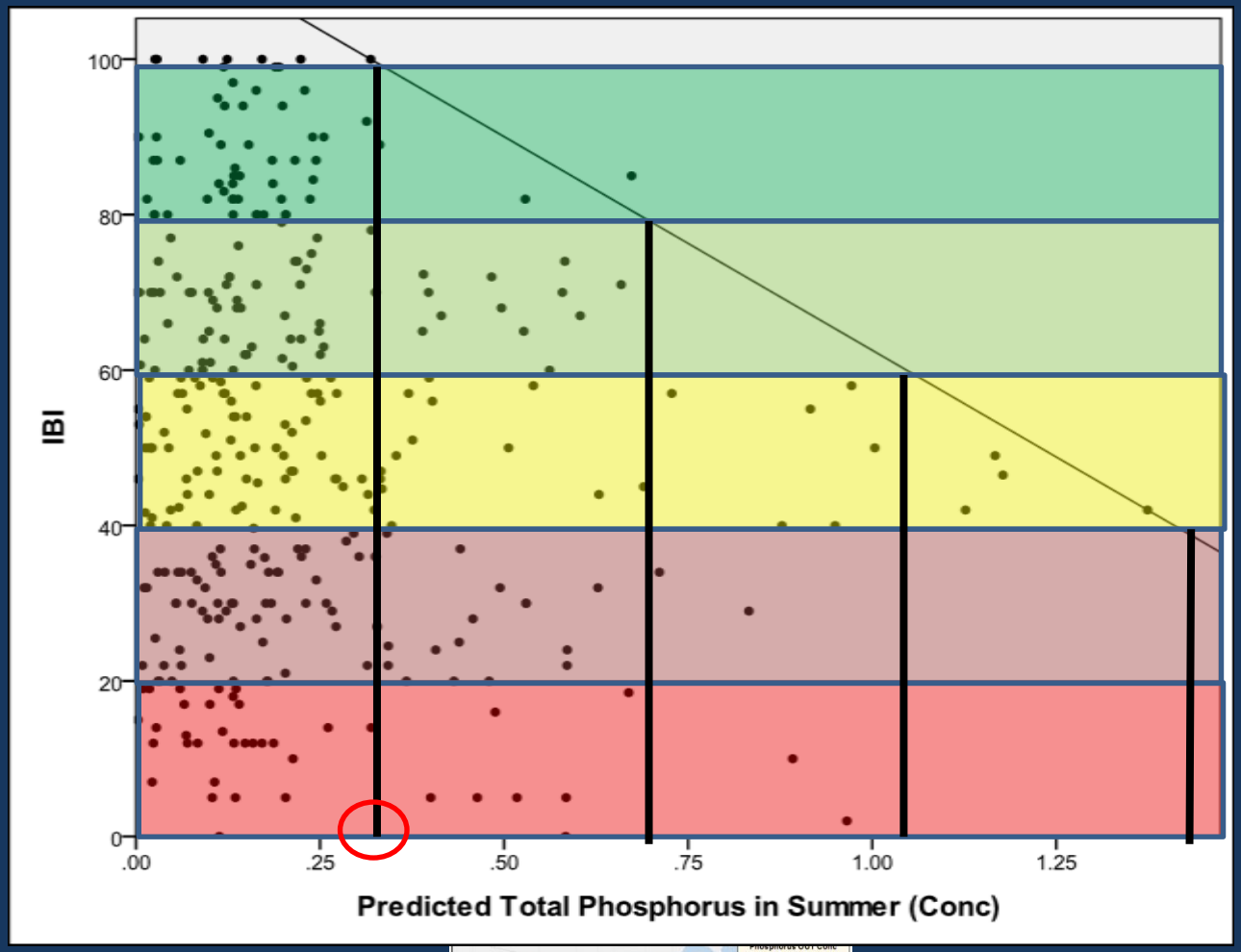
- Actual Fish community health data vs. Predicted water quality (SWAT modeling)

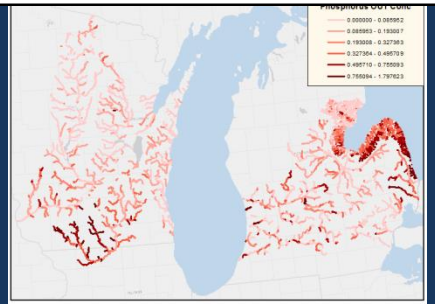




Phase 1 – Identify “ceilings” to set goals



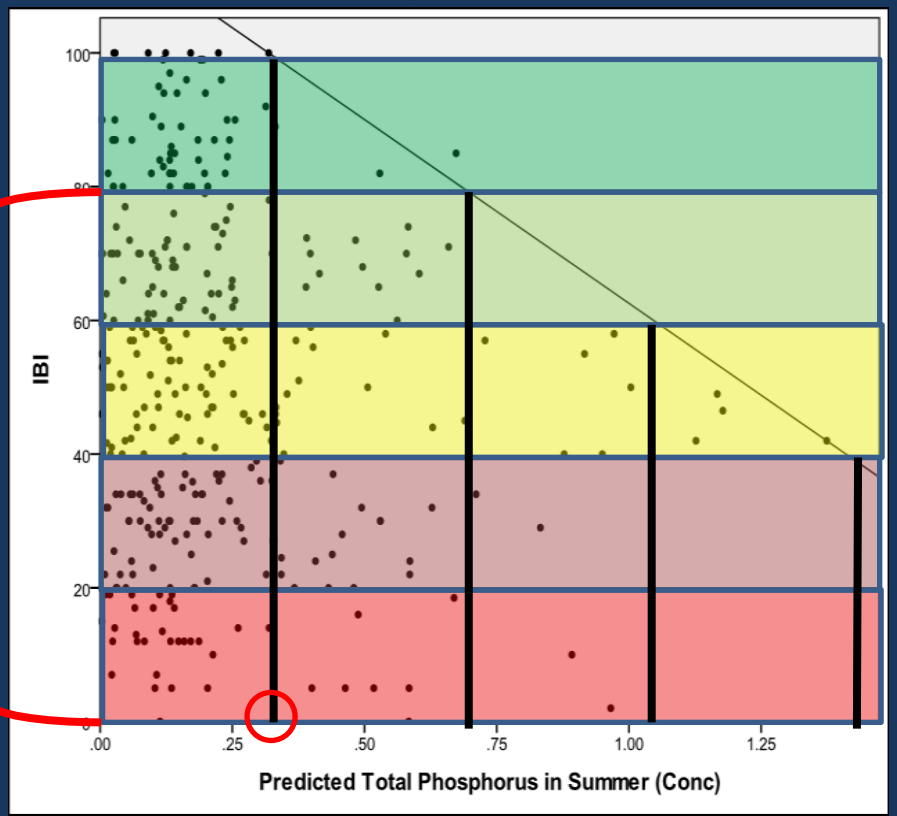




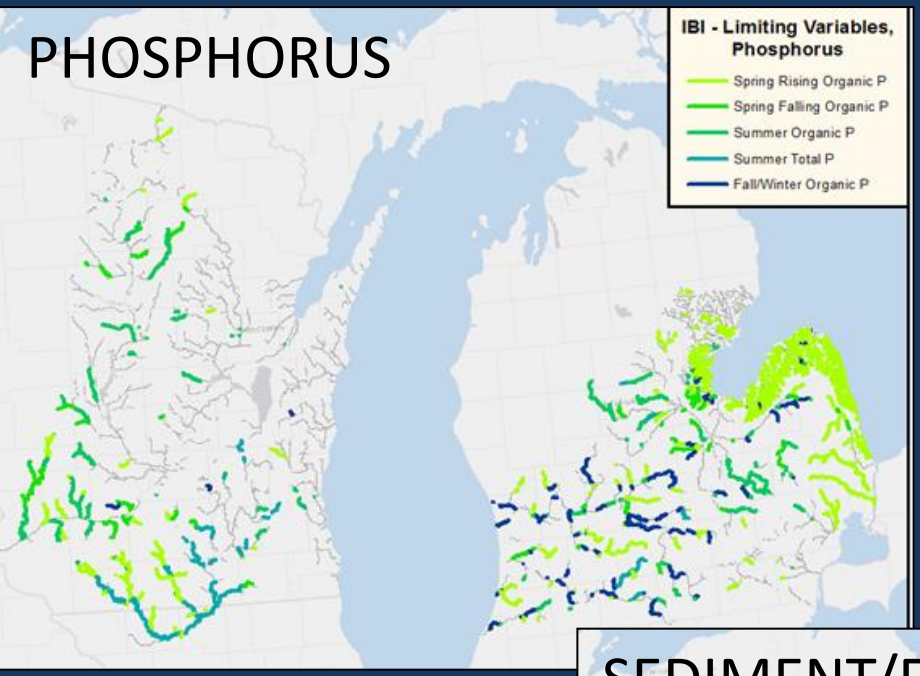
Phase 1: Identify Ceilings to Set Goals

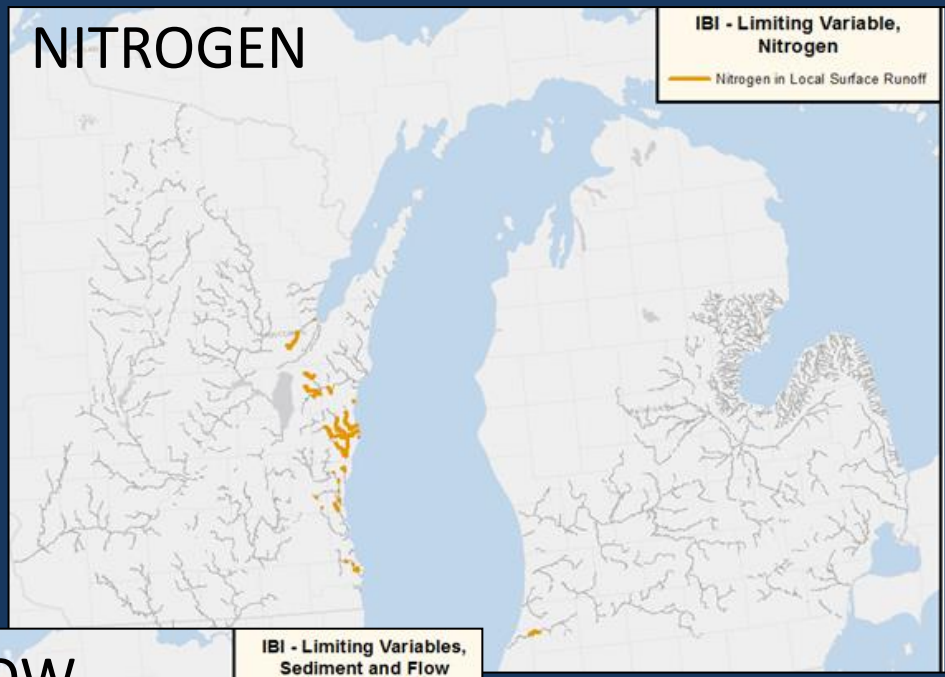
Deciphering Wedge Plots/Envelopes

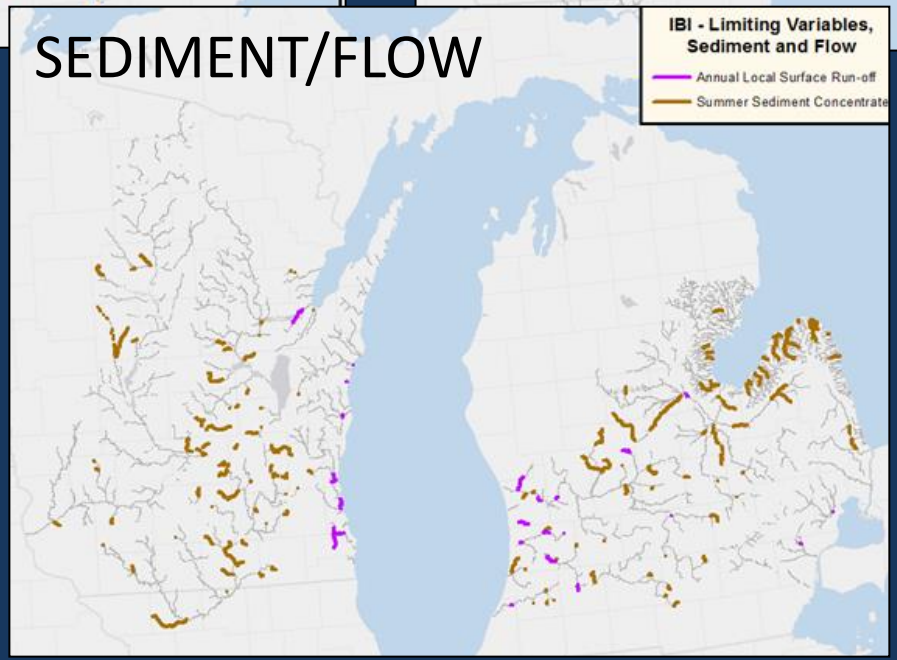
- At what point are water quality variables no longer limiting?
- Other factors are still often limiting



Which Variables Are Limiting and Where?

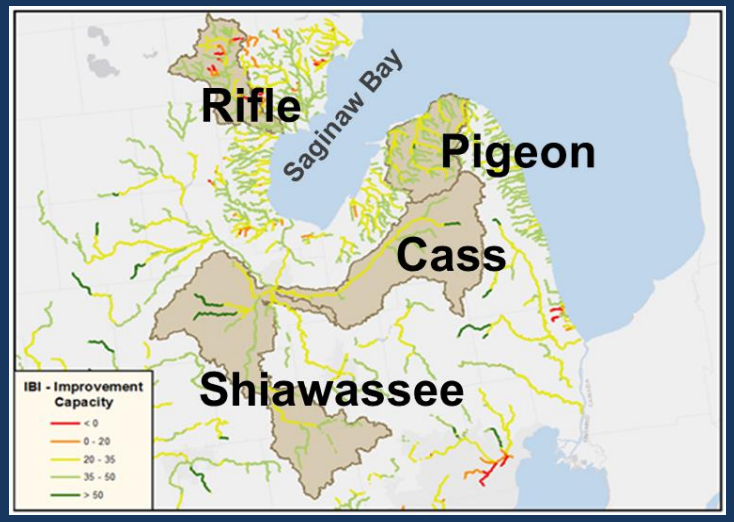




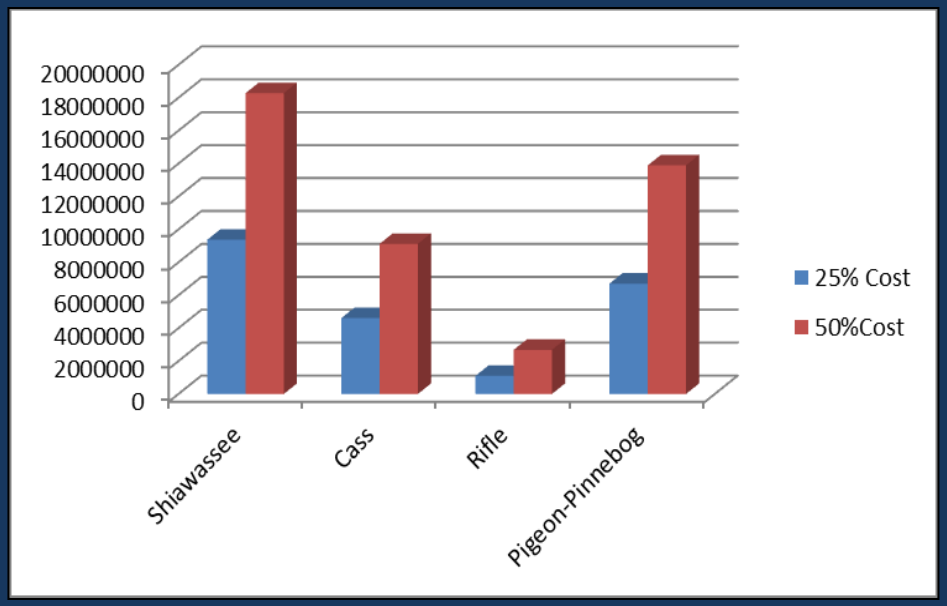


Phase 2:
Linking Practices to Water Quality and Fish

- Within 4 watersheds of Saginaw Bay

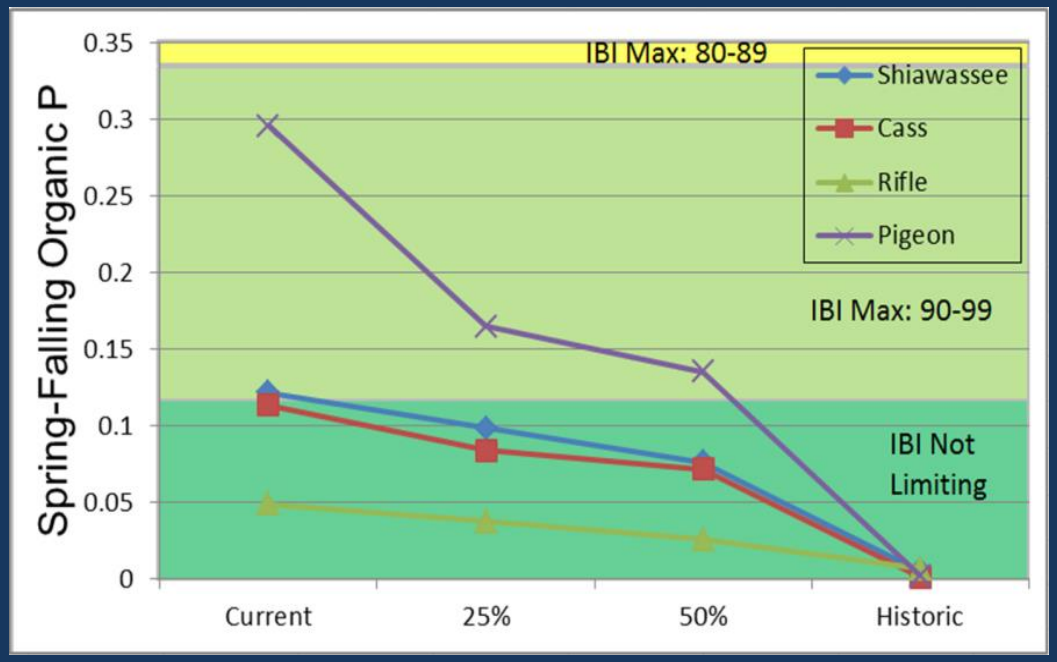


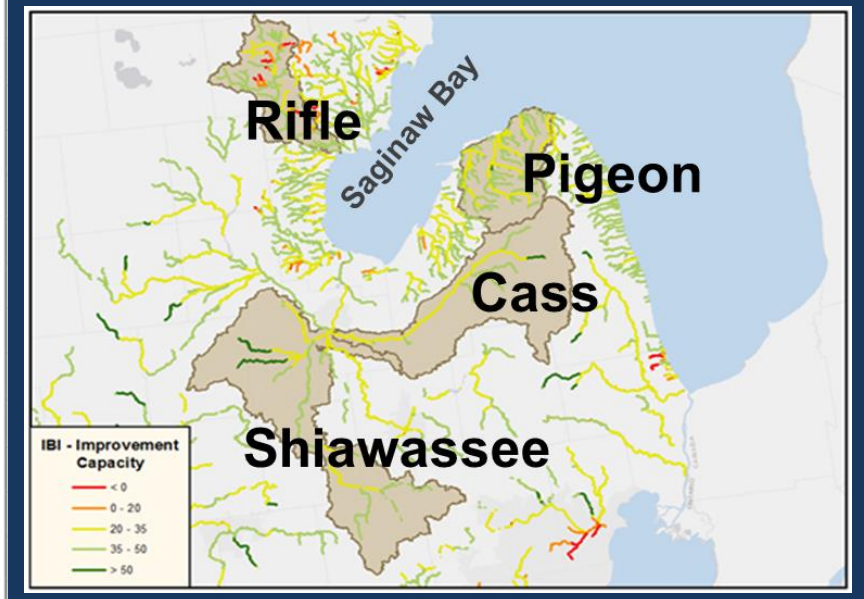
- Used SWAT to model changes in water quality under different scenarios (12 BMPs)
  - Current condition
  - Medium (25%)
  - High (50%)
  - Historic Condition



- Assess costs and benefits
  - 25% scenario costs $22 M
  - 50% scenario costs $44 M

Phase 2: Assessing Costs and Benefits





- Can never achieve non-limiting conditions in the Pigeon
- ~$7.7 M to achieve non-limiting conditions for all 8 variables at the OUTLET of the other 3 sub-watersheds

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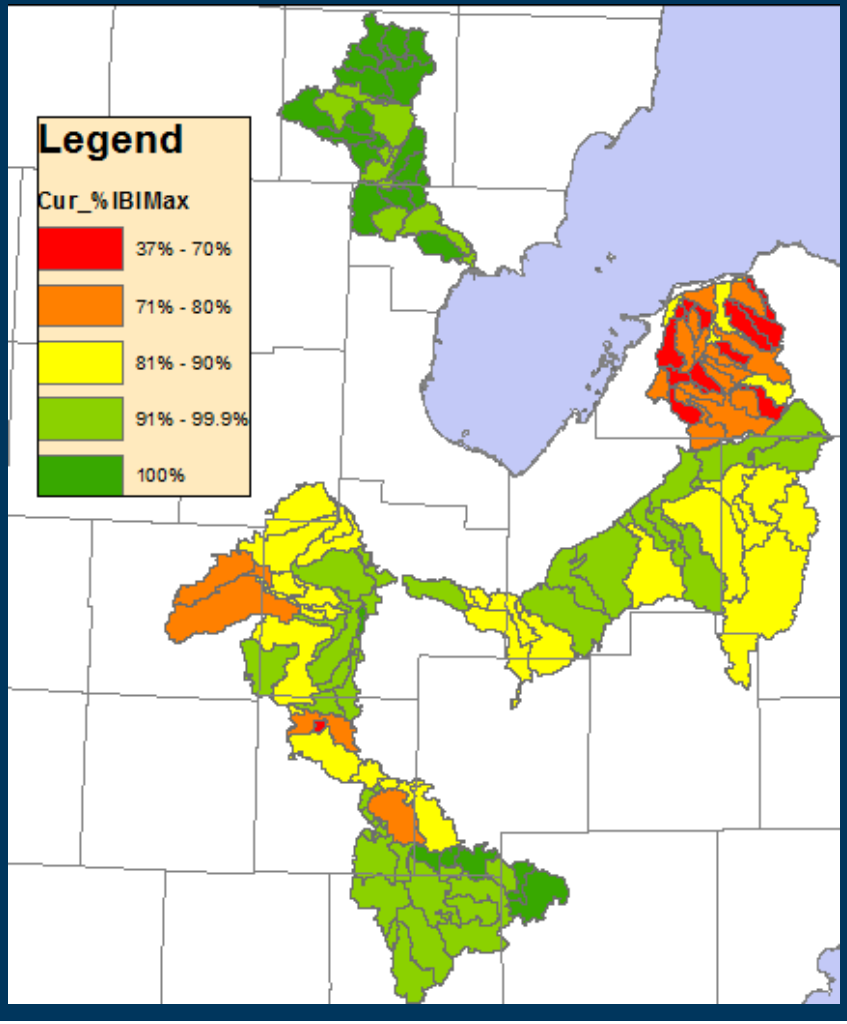
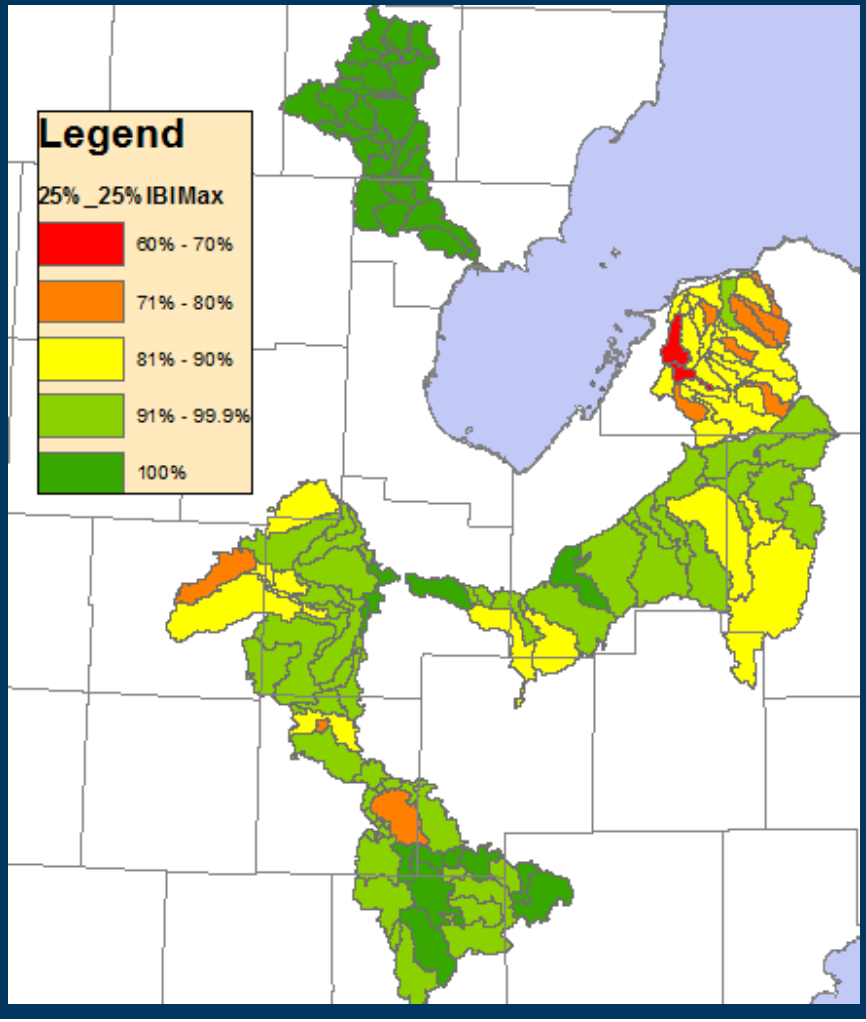
Sub-watershed Comparison: Fish Community Health

Current Condition



25% BMP



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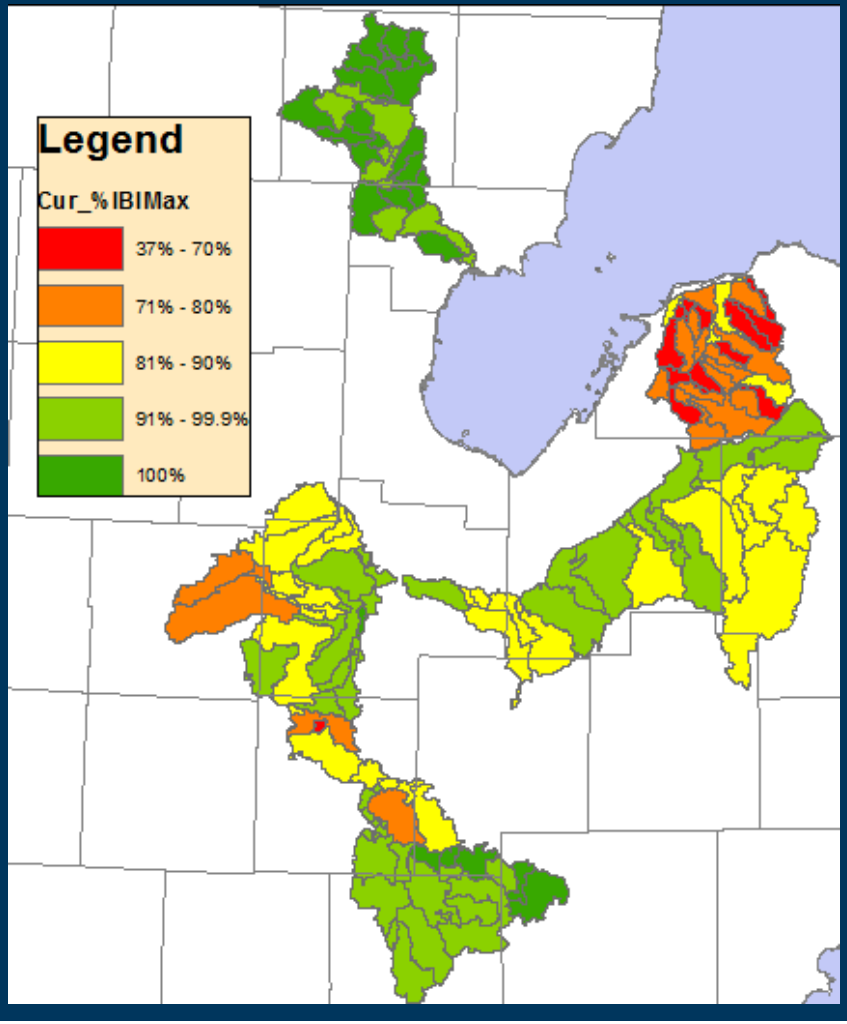
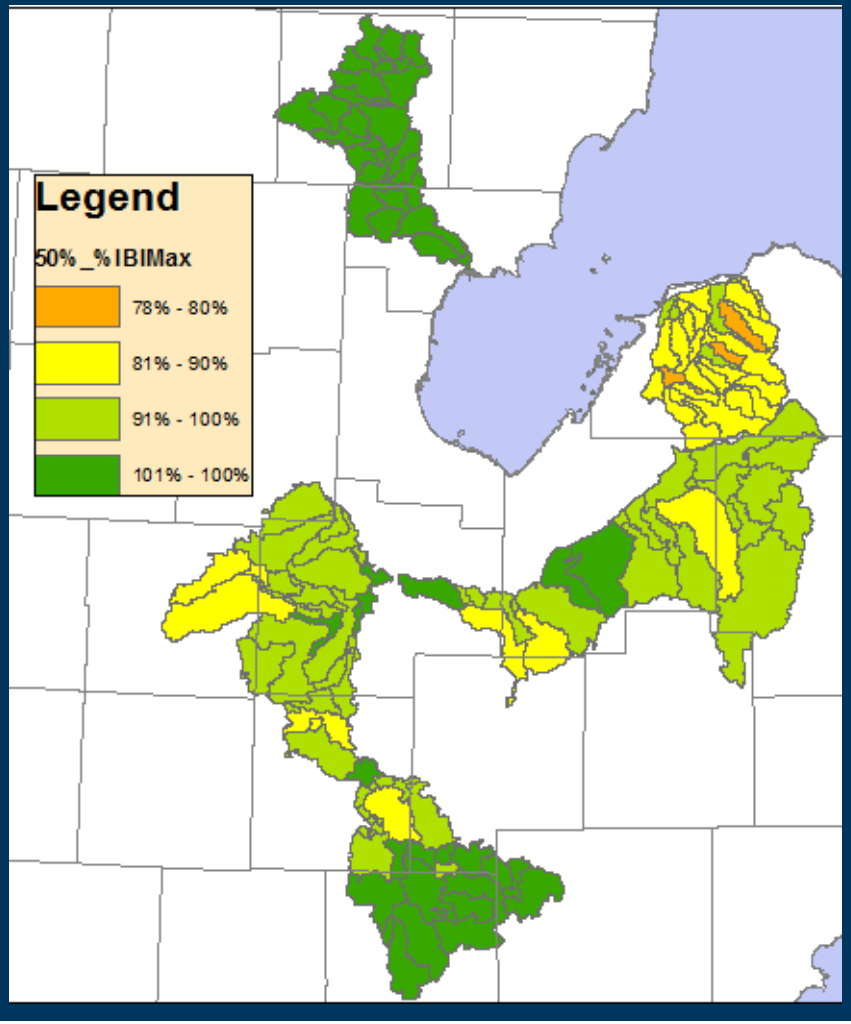
Sub-watershed Comparison: Fish Community Health

Current Condition



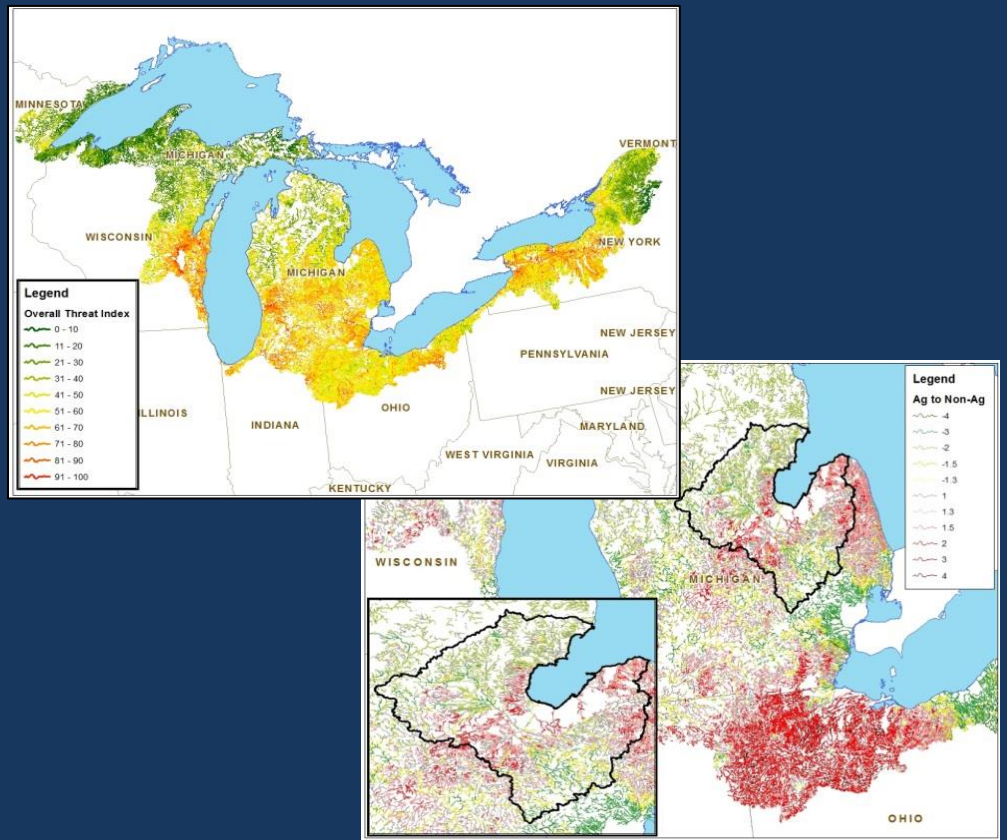
50% BMP



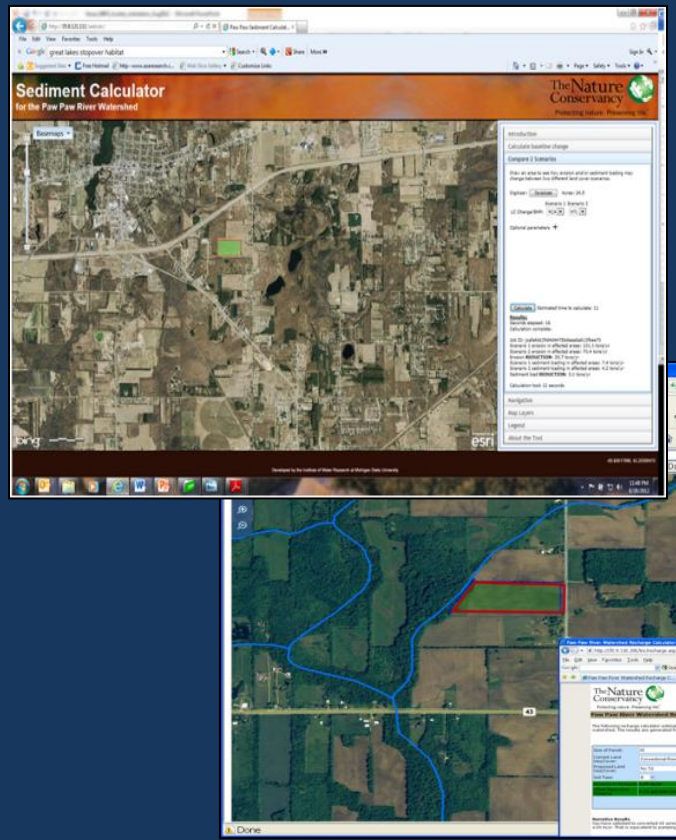
Phase 3: Decision Tools

- Getting the right information to the right people in the right format at the right time to support the logistics of strategic conservation

Context



Target and Track



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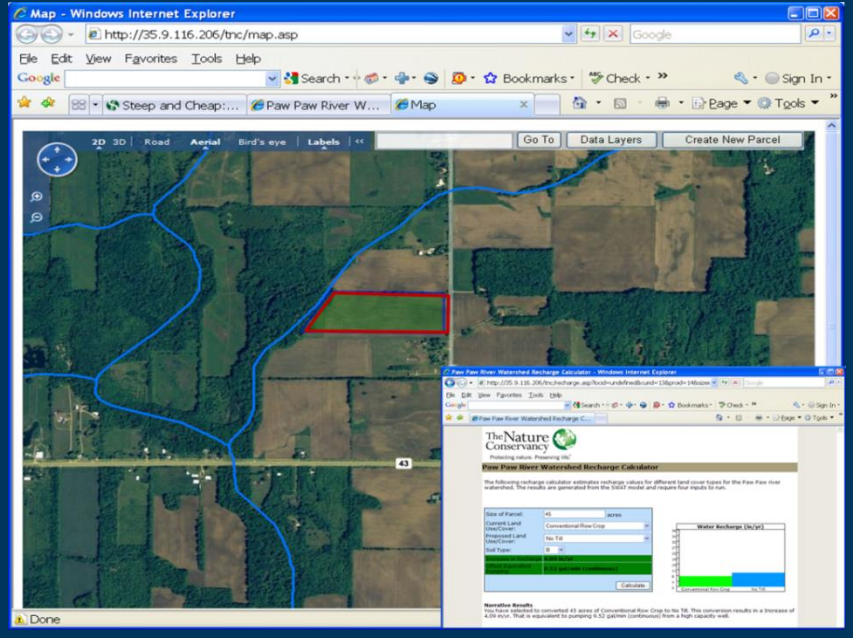
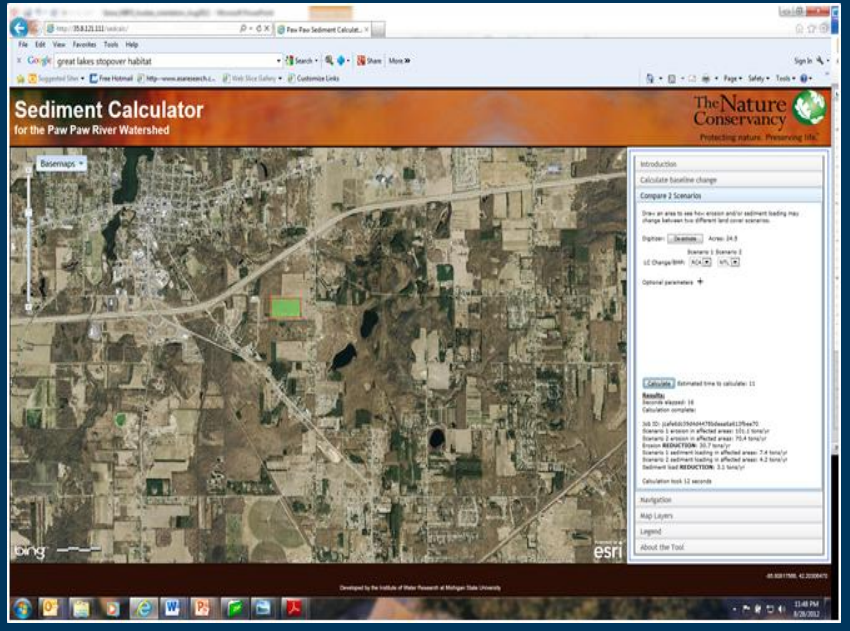
Online Decision Tools

Groundwater, Sediment, and Nutrients

- Facilitate strategic placement of BMPs
- Track cumulative placement of BMPs and progress toward goals
- Support many strategies



http://35.9.116.206/tnc/map.asp



http://35.8.121.111/sedcalc/

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Phase 4: Partner and Test Innovative Strategies

Cass River Watershed Pilot (Tuscola CD)

- Test if information and decision tools can foster changes via traditional Farm Bill to meet conservation action goals

Paw Paw River Watershed (Van Buren DC)

- Set ecologically meaningful sediment reduction goals and use models and decision tools to support Drain Fee/Tax Reduction

Saginaw Bay (Kellogg's and Star of the West)

- Set watershed scale sustainability goals and related conservation action goals to drive changes in behavior through supply chain demand

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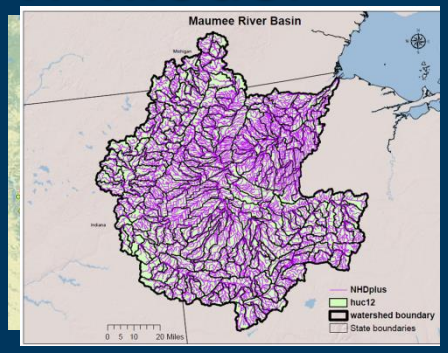
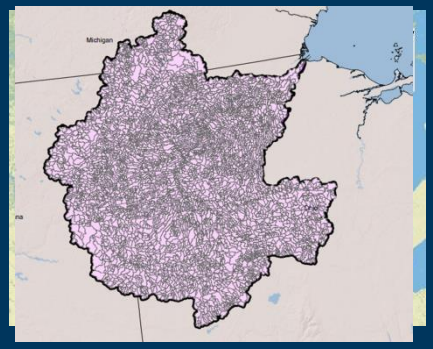
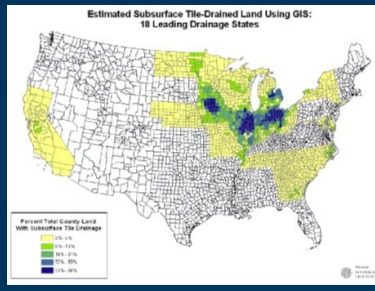
Major Improvements For Western Lake Erie CEAP

- Use multiple biological endpoints (fish and inverts)
- Many Improvements to SWAT Model
  - Downscale Model (NHDPlus)
    - 7-8digit; 395-12digit; 11,128-NHDPlus
    - Lost 75% of biological data in Great Lakes CEAP

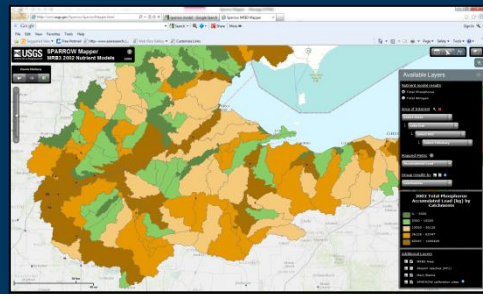




  - Better Land Use & Management Data
    - Downscaled NRI survey
    - Drain tiles



  - Spatially distributed WQ validation
    - Improve predictions away from gaged sites



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Summary

- We can link biological outcome goals to conservation action goals
- Can define the scope and cost of the problem, anywhere and at different spatial grains
- Very different answers between coarse- (outlet) and fine-scale (entire network) assessment of costs

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Summary Continued

- Results suggest that we either have to…
  - Significantly increase conservation provision Farm Bill
  - Think “outside the box” to develop new conservation practices and strategies
  - Lower our ecological goals, or
  - A combination of all three
- Body of work can and is supporting many strategies

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Acknowledgments

- USDA NRCS CEAP
- Mott Foundation, Herrick Foundation, and Americana Foundation
- Many, many, coauthors and collaborators

http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/