

Managing NPS Programs or Solving Water Quality Problems?

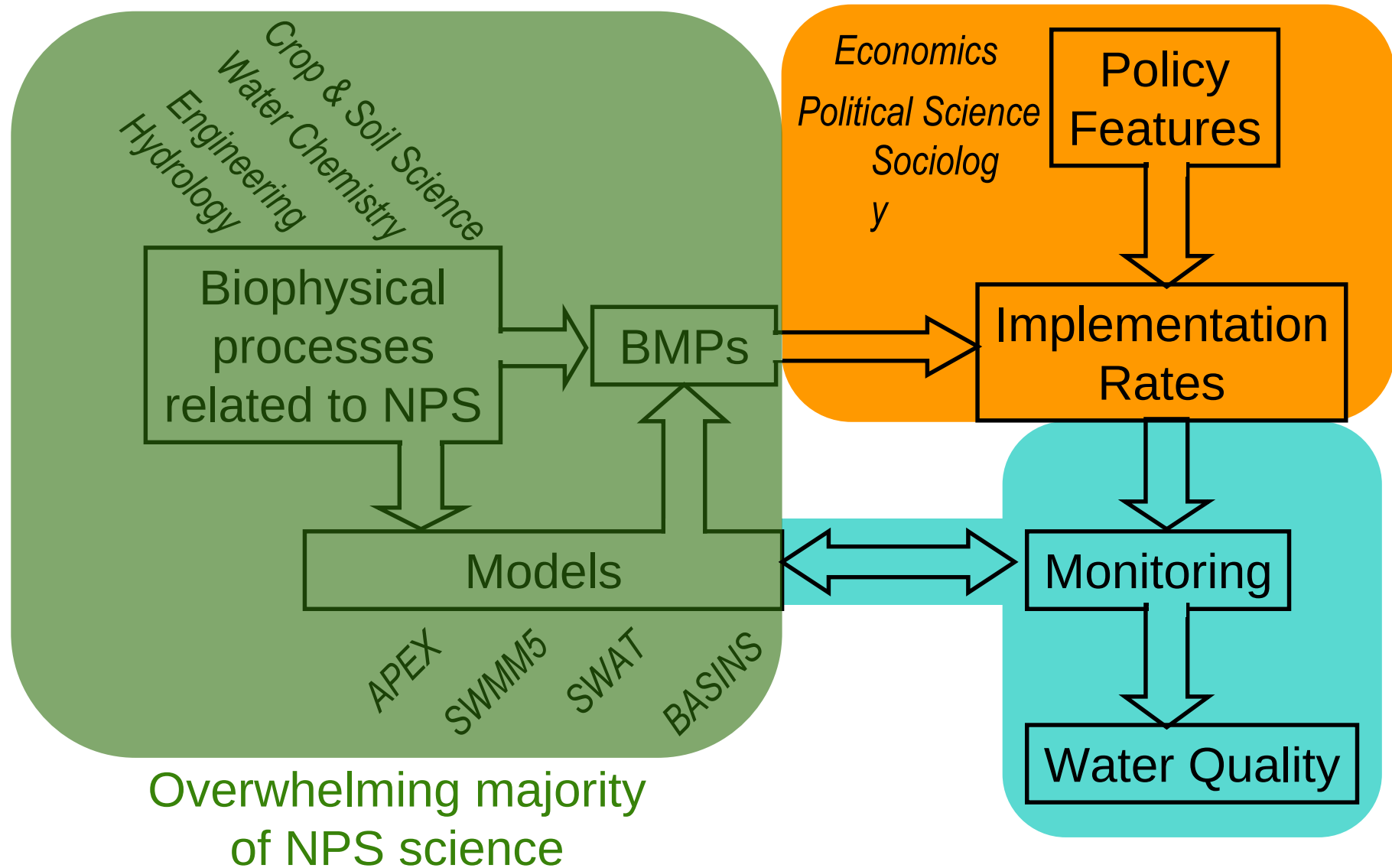
*18th National Nonpoint Source Monitoring Workshop
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Why Do We Monitor?

1. Advance the sciences associated with hydrologic and biophysical interactions.
2. Required management component for water quality programs.
3. Monitoring water quality parameters for model validation and/or development.
4. Periodically inform citizens on what is found in their waters.
5. Assess the extent we are solving water quality problems.

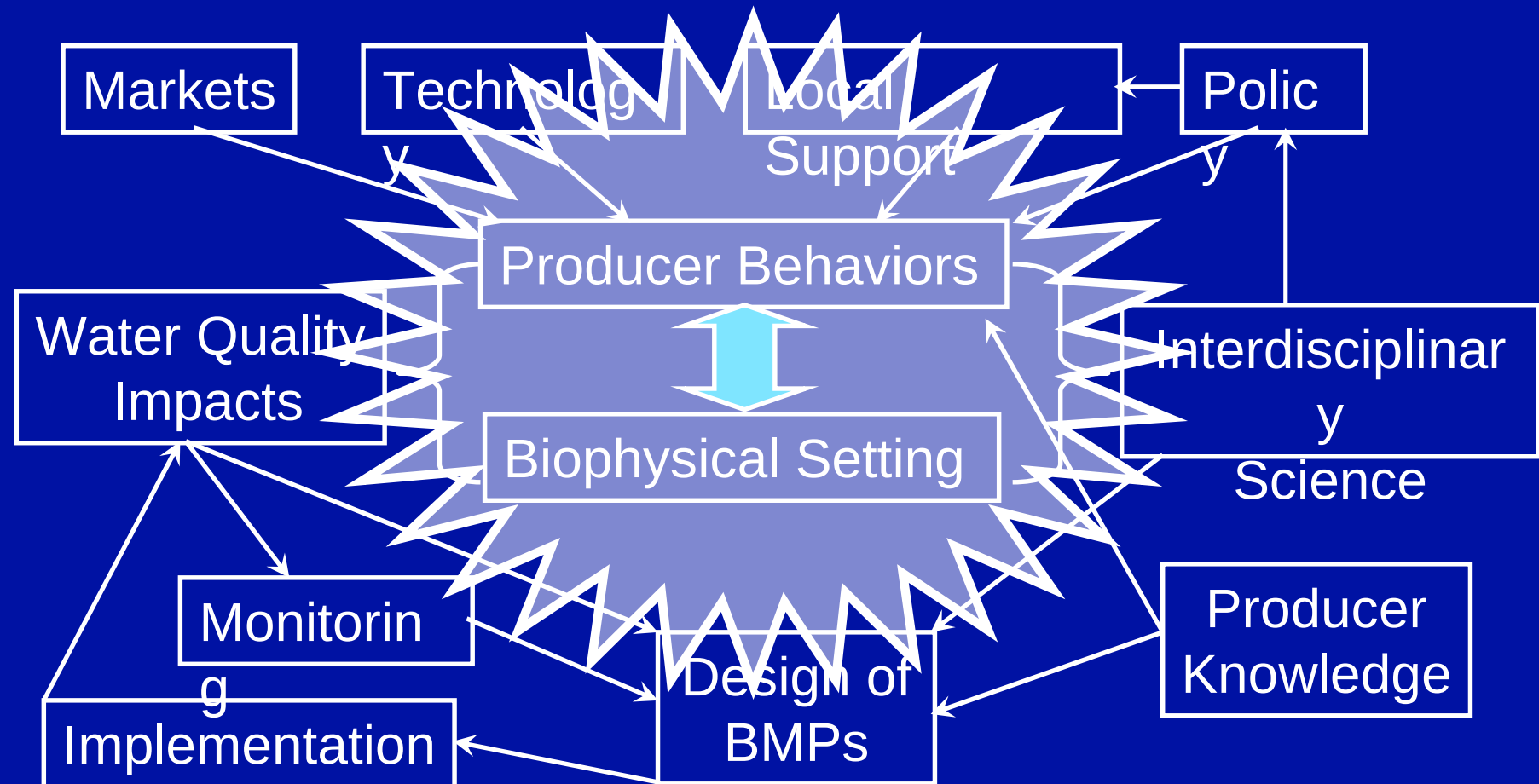
The Current System



An aerial photograph of a rural landscape. A winding road or path cuts through the scene, surrounded by green fields, dense forests, and some small buildings or farm structures. The terrain appears to be hilly or uneven. The text is overlaid in the center of the image.

My Thesis:
This current system is ineffective
for solving WQ problems.

Solving WQ Problems



Status of the Core Interaction

~Secondary data
~Assume average
~Assume prescriptions
~BMP dynamics
~Low adoption

Detailed measurements
Robust data sets
Infrastructure support

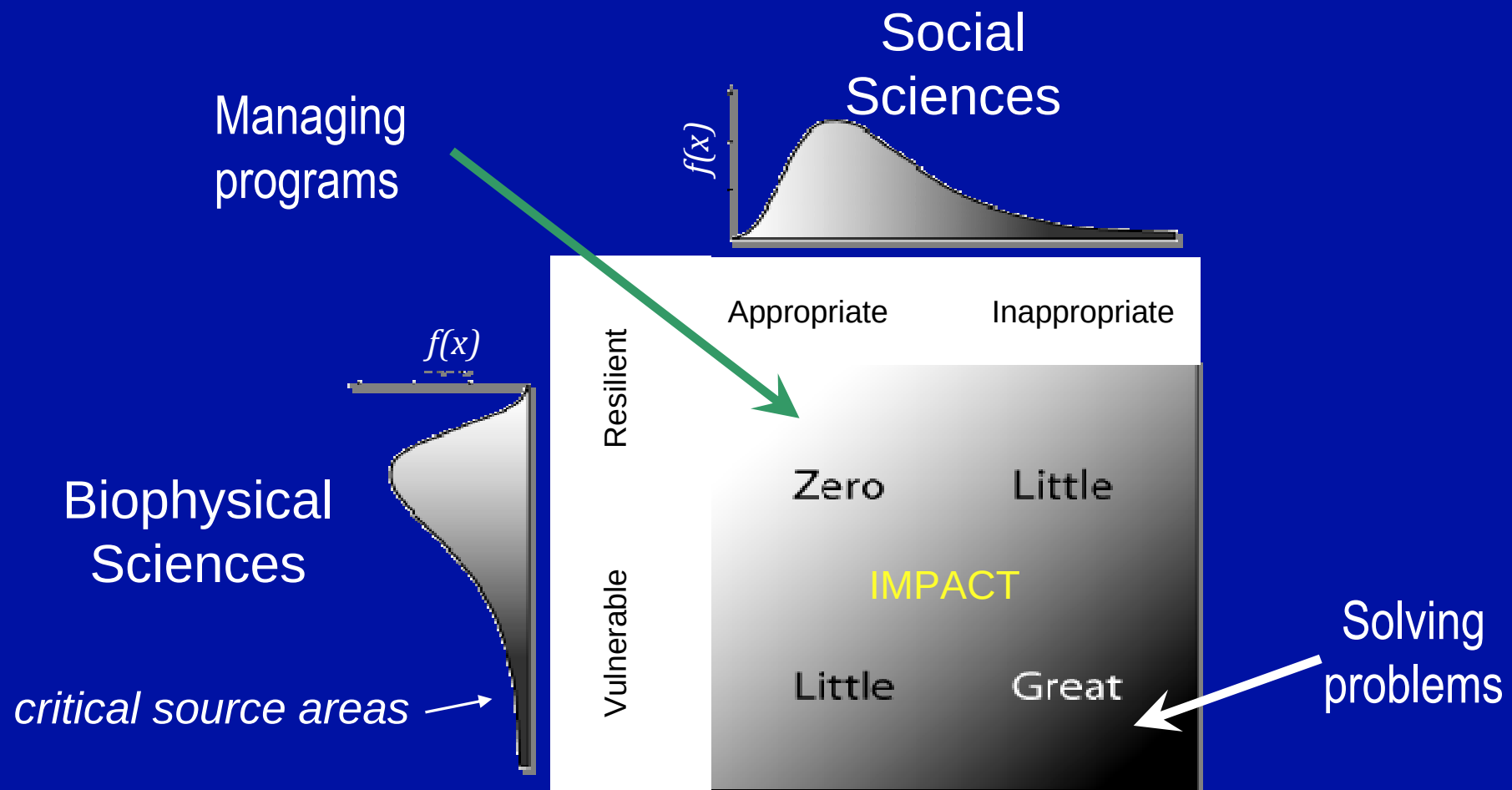
Producer Behaviors



Biophysical Setting

*Even with problems and deficiencies we
can still move forward on solving problems*

Disproportionality: The context of the interaction



Hypothesis

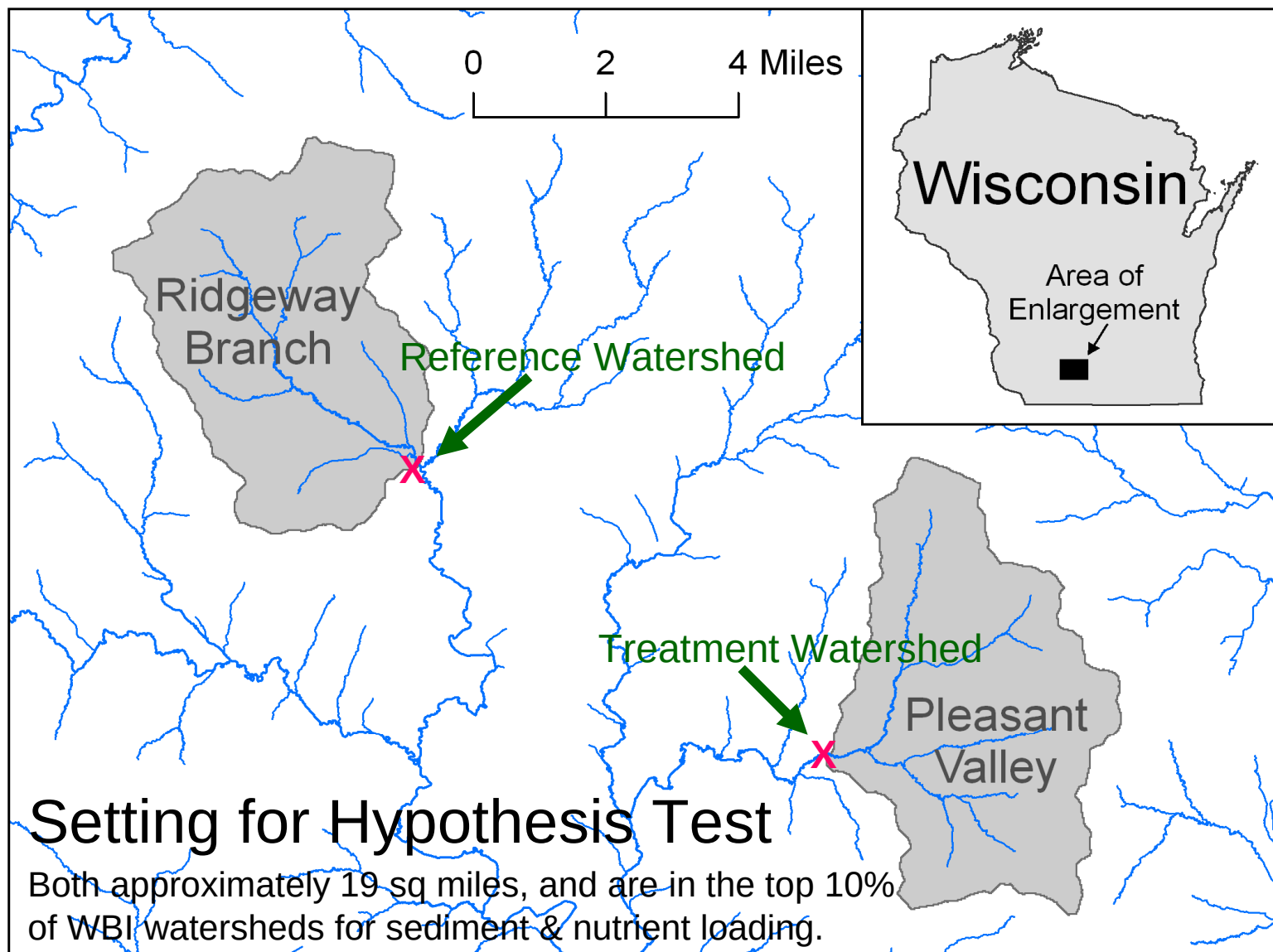
We can significantly enhance the effectiveness and efficiency of our NPS efforts by targeting disproportionality in small agricultural watersheds. In other words, we can begin to solve problems by focusing the the “tail that wags the watershed.”



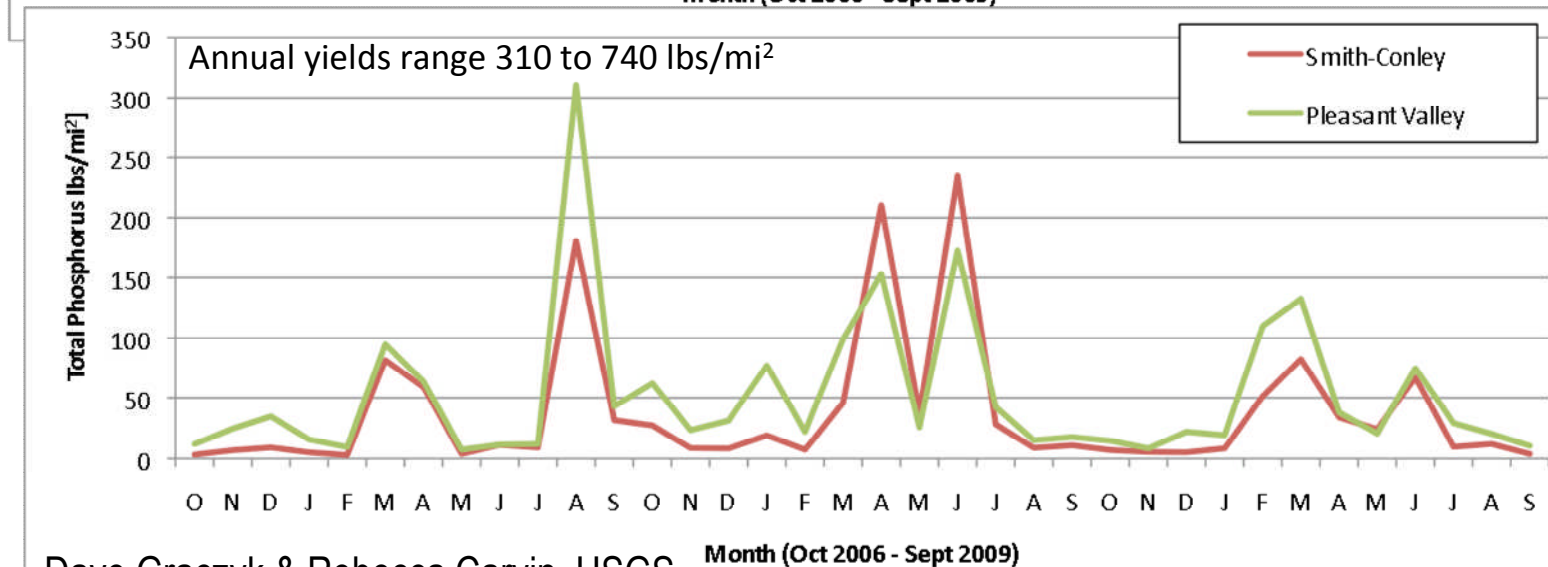
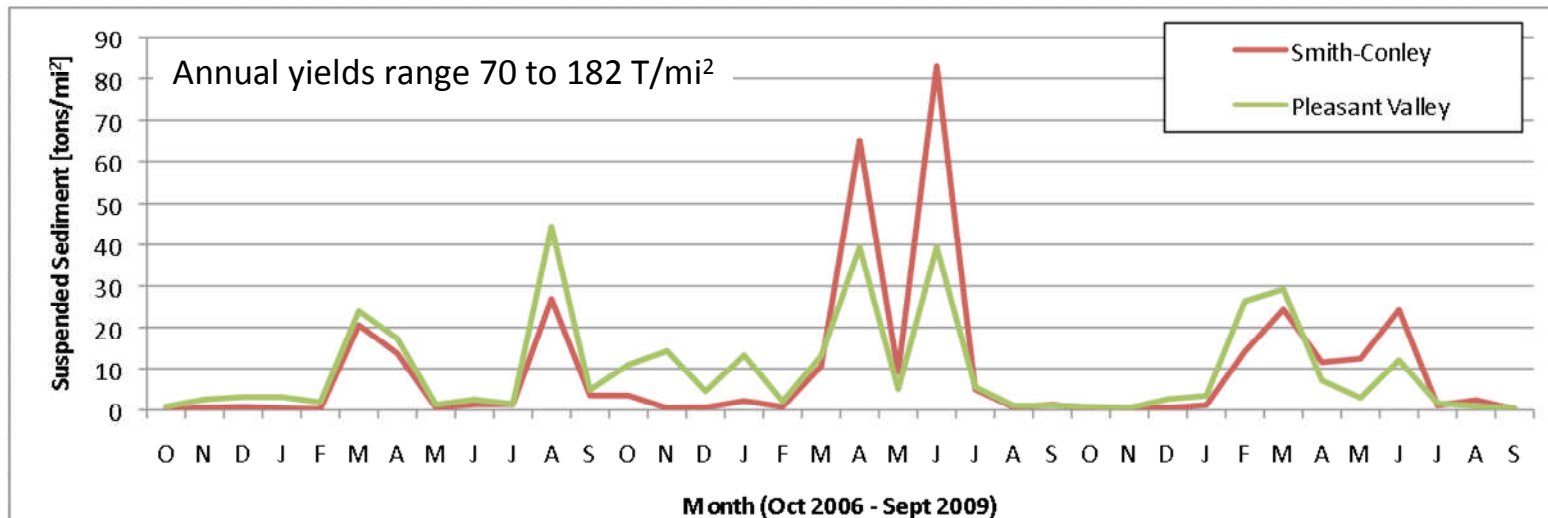
A Collaboration

Dane County, Land and Water Conservation Division; Wisconsin DNR; Iowa & Green County Land Conservation Depts.; UW-Extension; US Geological Survey; The Nature Conservancy; Wisconsin DATCP; Monsanto Corporation; McKnight Foundation; USDA Natural Resource Conservation Service; UW-Madison

Photo: Mark Godfrey

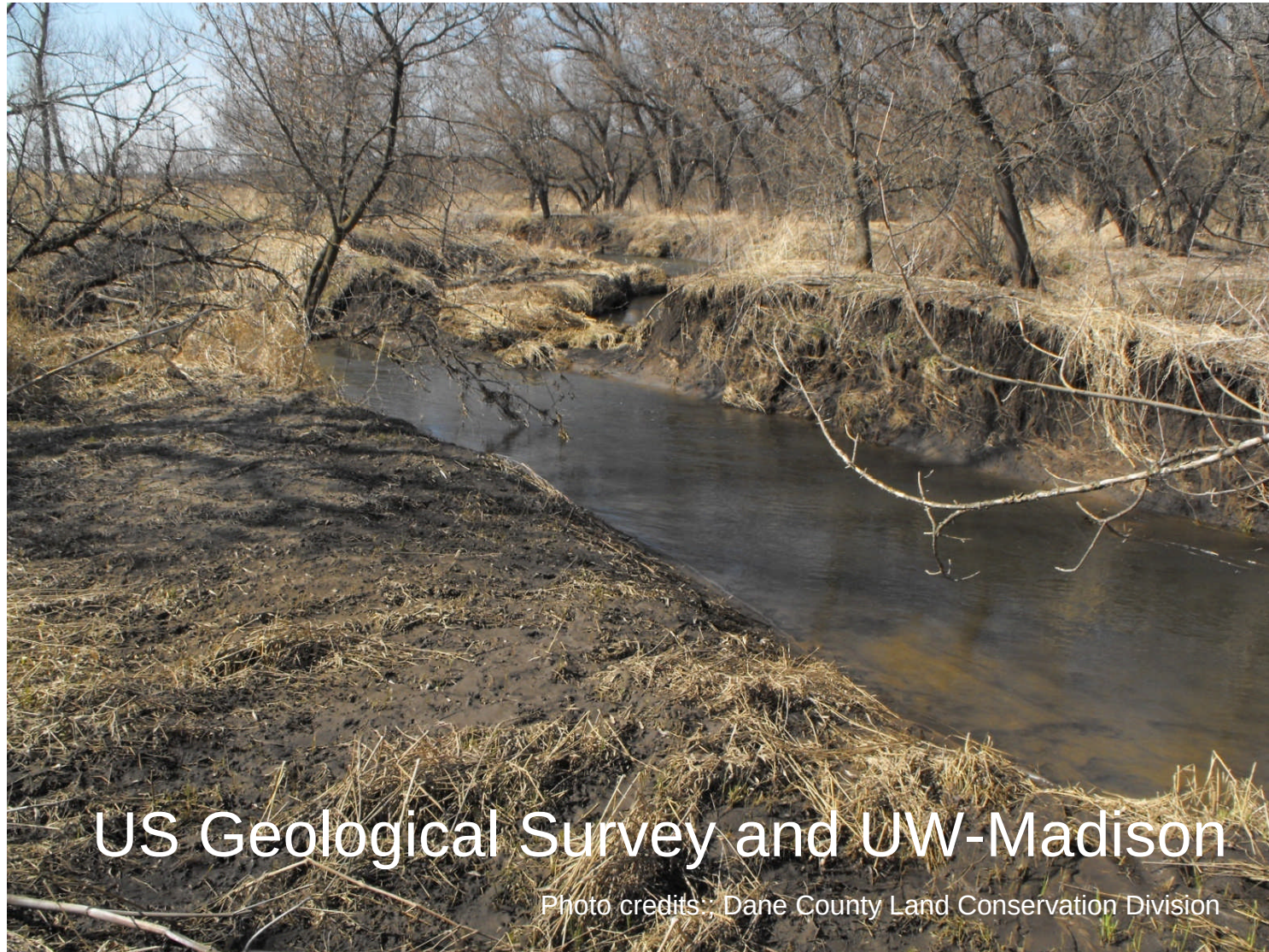


Baseline Yields of Suspended Sediment and Total Phosphorus



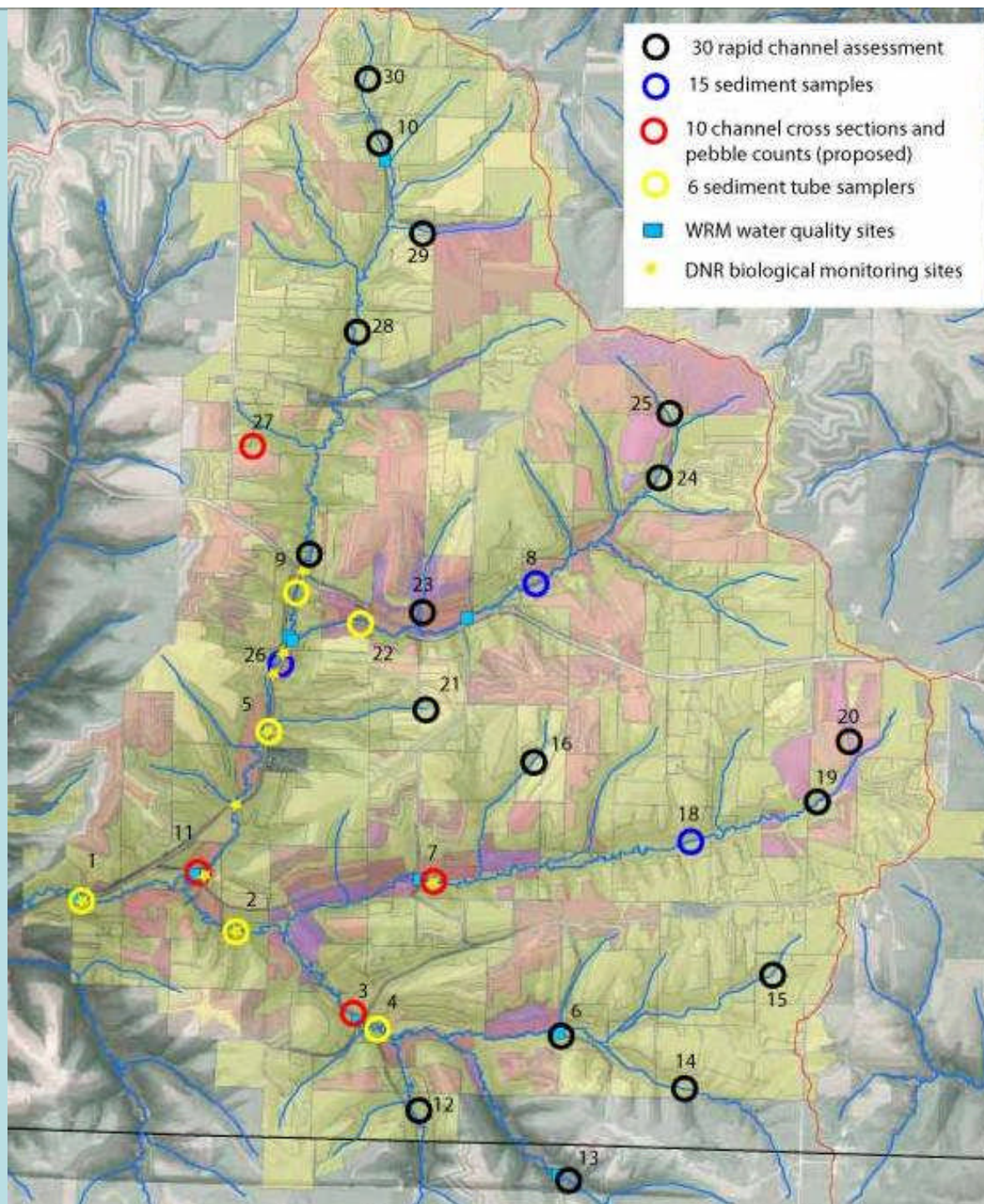
Dave Graczyk & Rebecca Carvin, USGS

Research & Modeling: Field-to-stream transport, stream sediment and P storage & release



US Geological Survey and UW-Madison

Photo credits : Dane County Land Conservation Division



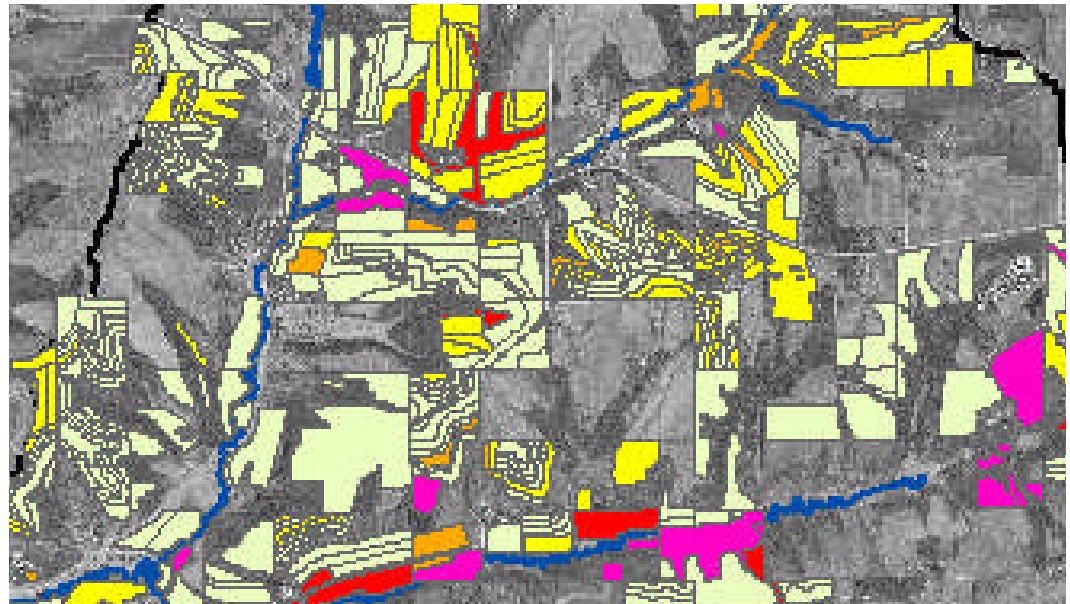
Gather Baseline Data: 2007-2010



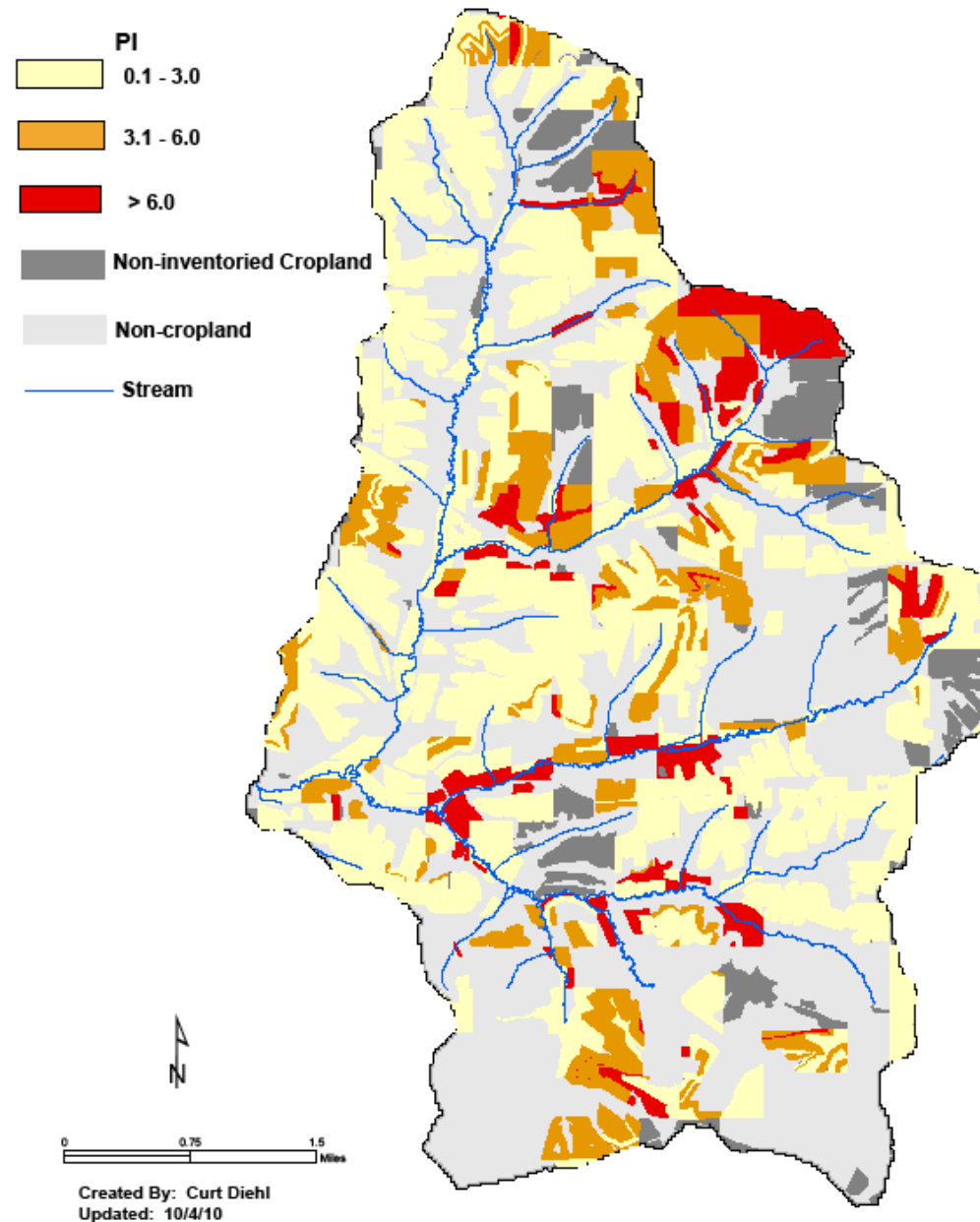
Interview operators and soil
sample fields

Calculate soil loss and P Index
in Snap-Plus

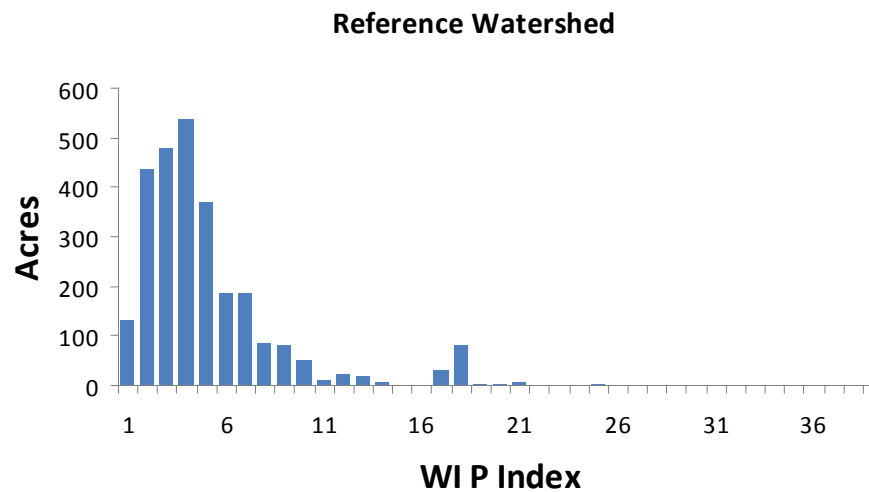
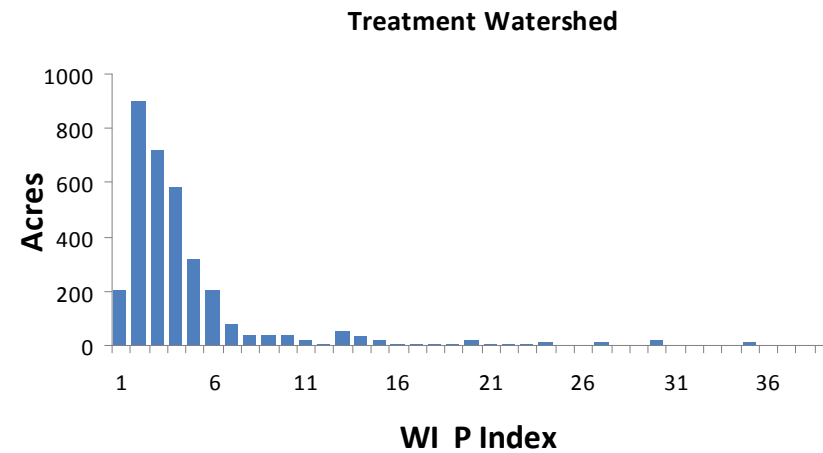
Map results



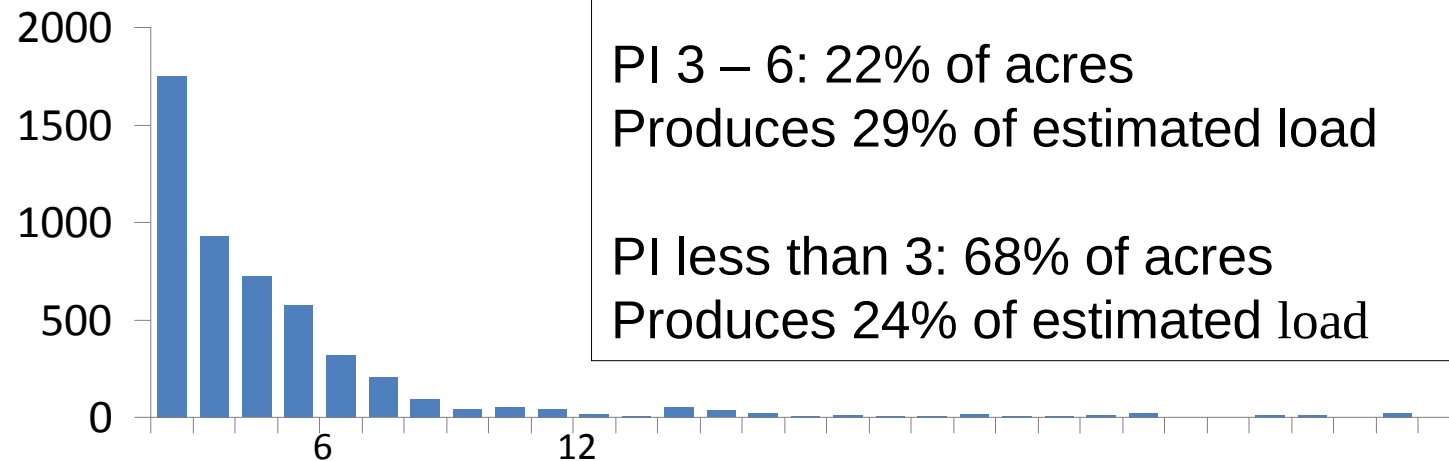
Wisconsin Phosphorus Index



Cropland P Index Distribution; Treatment and Reference Watersheds



Estimates of Disproportionality



Cropland, managed rotational grazing,
and dry lots

PI above 6: 10% of acres
Produces 47% of estimated load

PI 3 – 6: 22% of acres
Produces 29% of estimated load

PI less than 3: 68% of acres
Produces 24% of estimated load

WI P Index
Pleasant Valley

Step 1:

Target management on fields with PI above 6

- No-till
- Cover crops after silage
- Rotation change
- Harvestable buffer
- Nutrient mgmt. planning



Step 2: Change
management on
fields with PI 3-6

Work with producers to develop viable solutions



This resource-intensive strategy will work because you only need to work with a small minority of producers.

Bringing the producer back in.



Finding viable and long-lasting management solutions involves listening to professional problem solvers.

Conclusions

1. The hypothesis is that we have the scientific capacity to solve NPS problems in small agricultural watersheds.
2. Disproportionality speaks to both efficiency and effectiveness of WQ programs.
3. This approach needs to be tested in a variety of small watersheds.
4. It is a viable way to bring the human dimension back into WQ programs.