On-Field Ohio!

Evaluate/Revise
Ohio Phosphorus Risk Index

Elizabeth (Libby) Dayton, SENR, OSU
Kevin King, USDA-ARS

OEPA Lake Erie Phosphorus Task Force

One Major Finding

Agriculture is a primary source of P to Lake Erie

Research Needs

Consensus: Examine/Revise
Ohio Agricultural P management Tools
To reduce P transport

OEPA Lake Erie Phosphorus Task Force II

Goal: Recommend P Loading Targets of WLEB

Final Report 2010
http://www.epa.state.oh.us/portals/35/lakeerie/ptaskforce/Task_Force_Final_Report_April_2010.pdf

ODNR Distressed Watershed Rules
Grand Lake St Marys

http://www.dnr.state.oh.us/portals/12/water/watershedprograms/GLSM/Watershed_in_Distres_FactSheet.pdf

Ohio Agriculture is Being Targeted due to P transport into Ohio surface waters

P is culprit for harmful algal blooms

Ohio Agriculture CAN take the lead in protecting water quality while maintaining production

Avoid additional regulation
Good Public Relations
Good Stewardship

So What's the Path Forward?

On-Field Ohio

USDA-NRCS Nat'l
Conservation Innovation Grant

$1 million Federal award
$1 million matching funds from Ohio farmers

Evaluation/Revision
of the Ohio Phosphorus Risk Index (Ohio P Index)
Using Field-Scale, Edge-of-Field Monitoring Data

Project Objectives

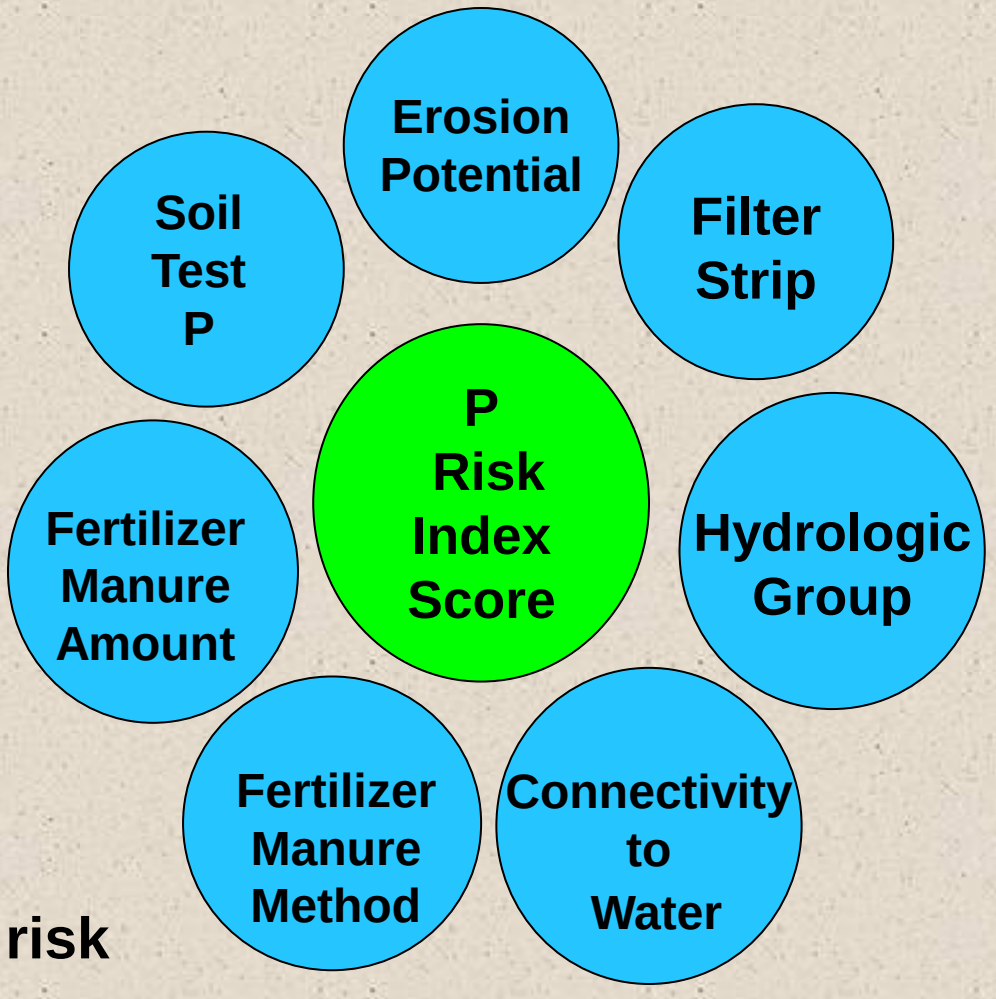
Because the Ohio P Index provides a field-scale estimate of *Risk* of P transport off farm fields

Used to judge performance !!

Objectives:

1. **Evaluate/revise Ohio P Index, provide confidence that Ohio P Index scores accurately reflect risk of P transport at the edge-of-field**
2. **Increased management options (BMPs) integrated into the Ohio P Index for fields with high scores**
3. **Broad implementation of revised and improved Ohio P Index to protect Ohio surface water quality**

1. Evaluate/Revise Current Ohio P Index:
Ensure P Index Scores accurately reflect P transport RISK at the field-scale using, edge-of field monitoring

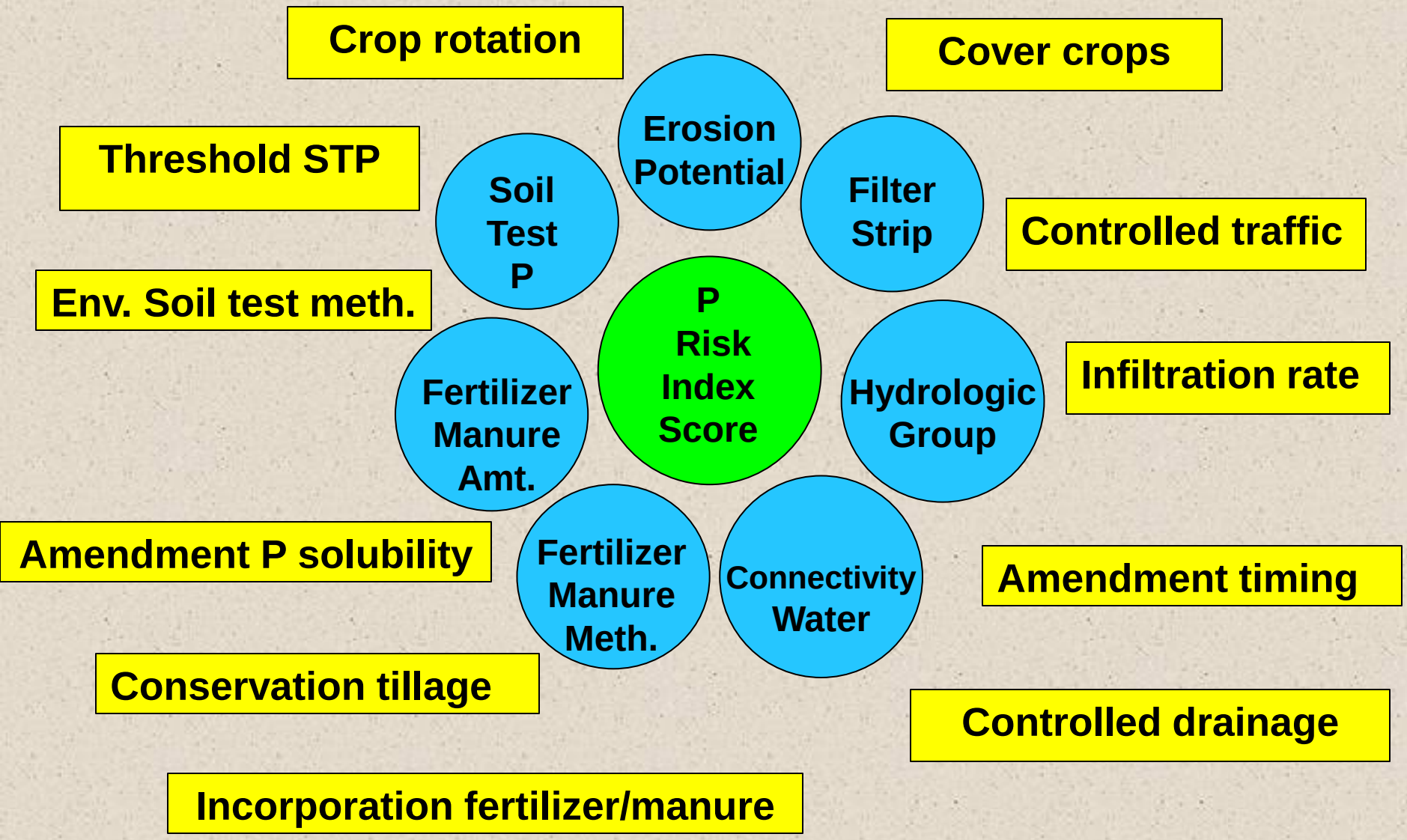


Current Parameters in *Ohio P Index to calculate scores

Low, medium, high & very high risk

*http://efotg.nrcs.usda.gov/references/public/OH/Nitrogen_and_Phosphorous_Risk_Assessment_Procedures.pdf

2. Integrate additional (BMPs) into P Index
Give Farmers more management options:



3. Implement Revised Ohio P Index

On-Line Interactive Tool

Develop easy to use on-line, interactive, GIS based tool so farmers can calculate their Index Score

Further! Additional BMP options to choose from to reduce P transport risk and Ohio P Index score

Important !!

If a BMP NOT Officially in Ohio P Risk Index Farmer does NOT get CREDIT for it

Field Site Selection

Ohio P Index Score = **Transport Factors** + **Source Factors**

Transport Factors

- Runoff potential
- Erosion potential
- Connectivity to water
- Filter Strip yes/no

Source Factors

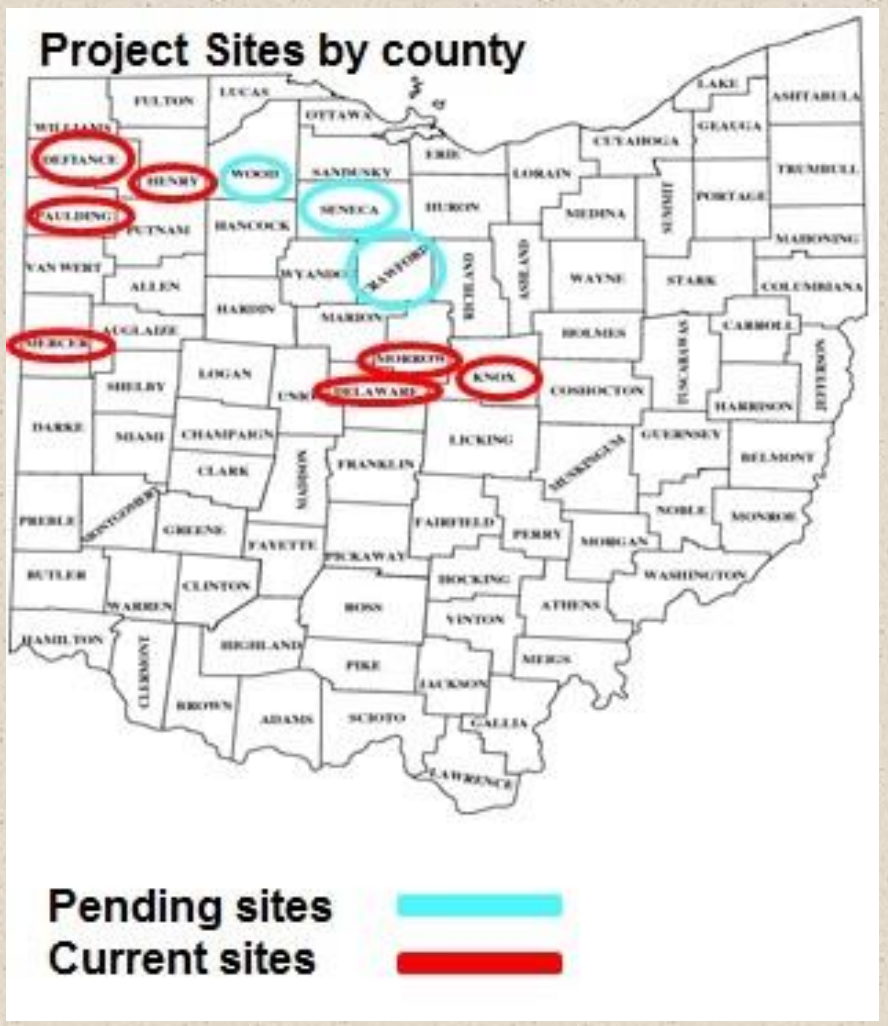
- Soil test P (STP)
- Planned P
- Application amount & method

Fairly "fixed" field/soil characteristic

Fairly Changeable management practices

Need robust distribution across study fields
Similar to distribution in Ohio agriculture

Counties with Current/Pending Project Sites

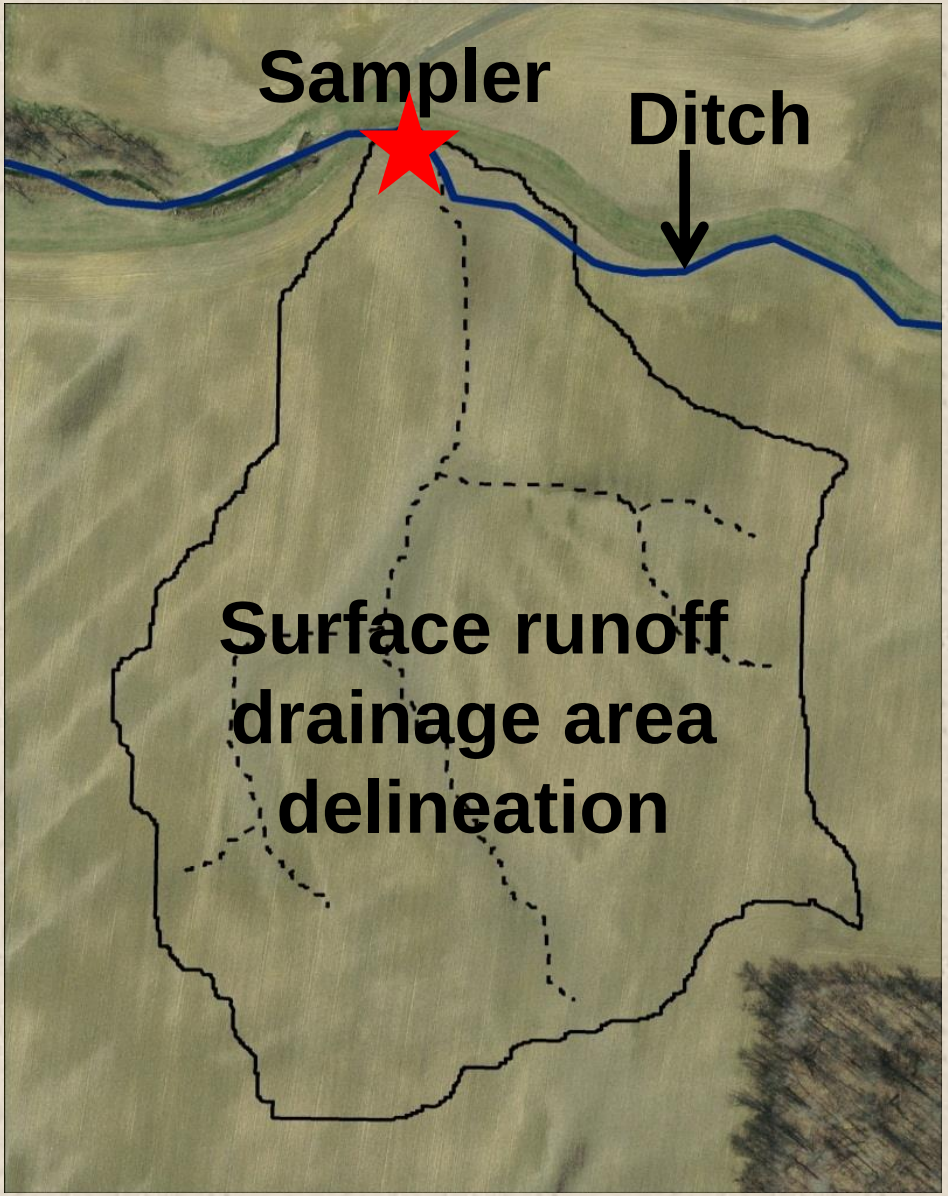


- 8 in GLSM
- 8 in Scioto
- 12 in WLEB

Plan on minimum 30 sites
Most with Surface
and
Sub-surface sampler

Special Thanks
to our
Participating Farmers

Surface Runoff Set-Up



- Delineate surface Runoff drainage area
- Install sampler
- Measure water flow
- Collect runoff samples

Sub-Surface Runoff Set-Up

- Delineate sub-surface drainage area
- Install sampler
- Measure water flow
- Collect sub-surface runoff samples

Surface and Sub-Surface Samplers in WLEB

Data Collection Overview

- **Field/Participating farmer management information**
  - **What they do, when and how, Yield**
- **Soil Physical Properties related to water infiltration**
  - **New consideration for P Index**
  - **Closer look at field water management**
- **Laboratory Analyses**
  - **Surface/Sub-Surface Runoff Samples**
    - **RTP, RDP, RTN, RDN$H_4$and NO_3, Sediment**
  - **Soil Samples**
    - **STP (4 methods/2 depths) PAN, pH, TN/OC, texture, Total P**

Soil Physical Properties "Quality" Data

Water Infiltration is the Key !!

Measured Properties

Texture
Aggregate Stability
Bulk Density
Organic Carbon
Water Holding Capacity
Penetration Resistance
Saturated Hydraulic Conductivity
% Residue Cover

⬇

As Related to Management Practices

⬇

As Related to Infiltration measured at the field-scale

In Other News

Evaluate Ohio N Leaching Procedure

- **Relative Index rating of N leaching Potential**
- **Potential based on combining soil's hydrologic soil grouping & local county annual and seasonal (Oct. 1 to March 1) rainfall**

Rating	N Leaching Potential
0 to 2	Low
3 to 10	Medium
10+	High
Tile drained	High

The Team…… So far

Conclusions

Ohio Agriculture is being TARGETED

- **Need to REDUCE P load to Ohio surface waters**
- **Ohio farmers are actively engaged in being part of the solution**
- **A revised Ohio P Risk Index can play an important role in P management**
- **Once revised, the P Risk Index will only be effective if it is routinely utilized**

Thank You !!

Questions ??

Libby Dayton, dayton.15@osu.edu

School of Environment and Natural Resources