

Conservation Technology Information Center

P-Trading Kickoff Meeting



THE
FERTILIZER
INSTITUTE



Funded by: **Great Lakes RESTORATION** 



EPA GLRI – Market Solutions

- **EPA Memo on Market-based Water Quality Solutions**
- **Funded by the Great Lakes Restoration Initiative**
- **A new approach to pay for conservation**



Program Overview

- **Program Timeline – Through end of 2022**
- **Program Location – Maumee, Sandusky, and Cedar Portage Watersheds**
- **Low-cost, low-touch measurement**
- **Supply-chain focused**
- **Watershed outcomes**



Program Overview

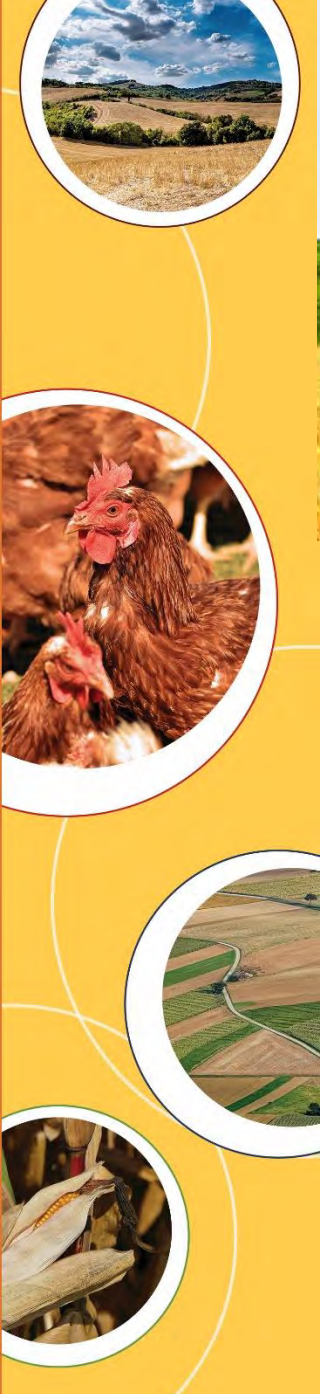
- **Not a regulatory program**
- **Complementary to existing efforts**
- **Focused on partnerships**



Goals for Today

- **Begin a relationship with participants**
- **Answer and ask questions**
- **Prepare ourselves for program sign-up**
- **Start formulating next steps**





ECOSYSTEM SERVICES MARKET CONSORTIUM

June 2020



ESMC MISSION

To advance ecosystem service markets that incentivize farmers and ranchers to improve soil health systems that benefit society

ECOSYSTEM
SERVICES MARKET
CONSORTIUM

Ecosystem Services Markets for Agriculture

Ecosystem Services Markets Conceived and Designed...

...for Agriculture

...to Overcome Past Market Challenges

*...to Recognize and Reward Farmers &
Ranchers for their Impacts*

ECOSYSTEM
SERVICES MARKET
CONSORTIUM

ESMC/ESMRC Members

Founding Circle Members



Legacy Partner Members



ESMC Funders



The Ida and Robert Gordon
Family Foundation



MCKNIGHT FOUNDATION



WALTON FAMILY
FOUNDATION



ESMC Markets for Agriculture:

How is ESMC Different?

- **Non-profit** organization
 - all net proceeds from credits go to farmers and ranchers whose actions create ecosystem services impacts demanded by society
- Collaborative effort with **entire ag supply chain** at the table
 - buyers and sellers are connected and working together to build and scale the market
- **Investment of \$22M+** to develop technologically advanced quantification and verification approaches to drop costs, reduce producer burden and implement program at scale

ESMC Markets for Agriculture:

How is ESGC Different?

- Systems-based and **practice-agnostic**
 - producers decide what to do, how much to do, & ESGC quantifies & pays for multiple impacts, not individual practices
- **Science and outcomes-based**
- Pays producers for **4 credits in 1 process**
 - Soil C, net GHG, water quality & water conservation
- Generation of credits for **multiple markets**
 - corporate social responsibility reporting, voluntary carbon offset markets, compliance water markets

ESMC Protocol:

Tiered, modular design

Scope	Environmental Assets Generated by Protocol		
	GHGs ^a	Water Quality ^b	Water Quantity
Scope 1	Scope 1 GHG Credit	Scope 1 Water Quality Credit	N/A
Scope 3	Scope 3 GHG Asset	Scope 3 Water Quality Asset	Scope 3 Water Efficiency Asset

- Soil carbon can be reported separately from net GHGs.
- Separate credits and assets can be issued for phosphorus, nitrogen, and sediment.

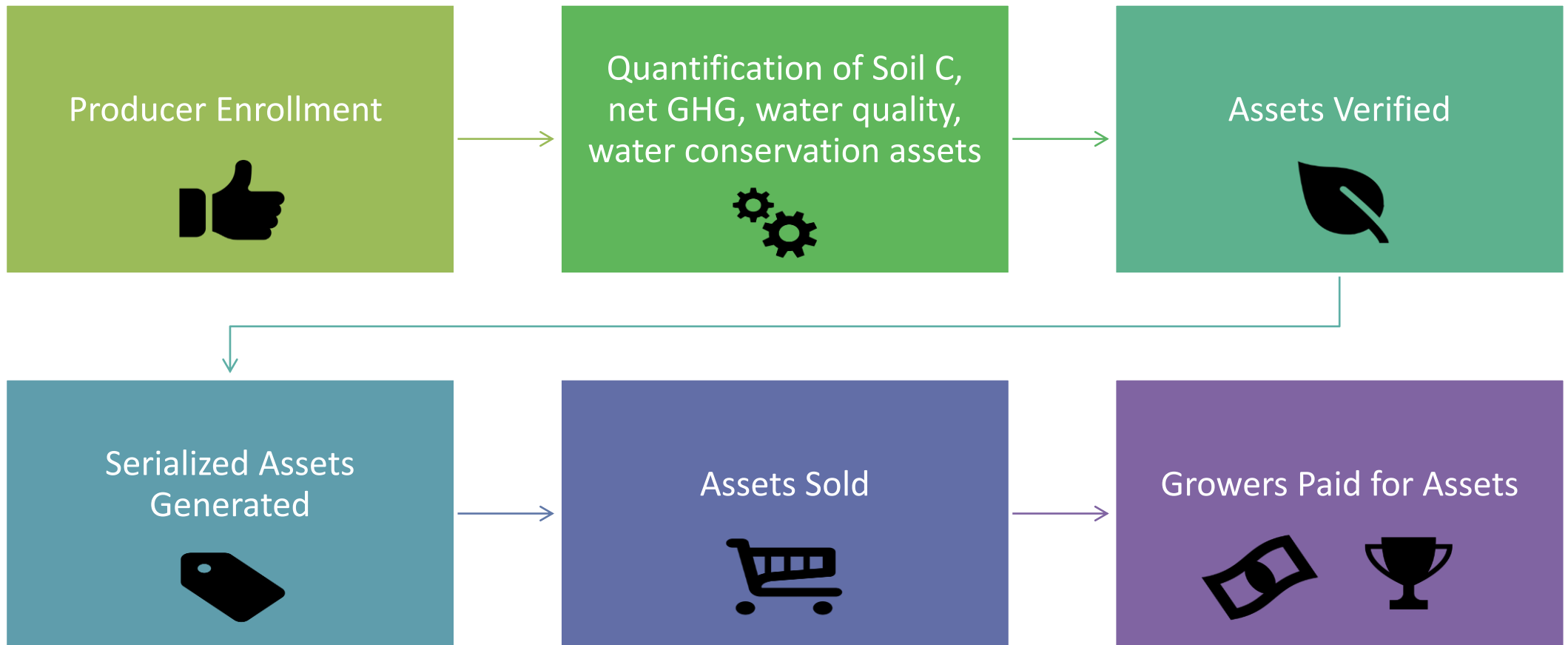
Ecosystem Asset Pricing in ESMC Pilot Projects

During pilot projects, ESMC has proposed to establish asset or credit prices as follows:

- **Price paid to producers:** the price a producer will be paid for each asset
- **Buyer price:** the total amount paid for the ecosystem asset
- **ESMC asset generation costs:** covers ESMC's costs to quantify, verify, and certify the assets, and to facilitate the transaction



ESMC Market Function Overview:



Assets

Scope 3 Assets

- ESMC's market refers to certified generation of verified and quantified outcomes

Who are possible Scope 3 Asset Buyers in ESMC's Market?

- ESMC members who have made public commitments to reduce their environmental footprints for **GHGs**:
 - ADM, Bunge, Cargill, Bayer, Danone, General Mills, Tyson, Mars, McDonald's, Nestle and Nutrien
- These same companies and others have committed to reduce water risk in their supply chains and may be potential buyers of **water quality** assets
- Non-member companies with agriculture in their supply chain are also prospective buyers

ESMC Pilot Projects

➤ ***Goals through 2022***

- ✓ Testing & refining all program aspects:
 - ✓ Protocols, methodologies, alignment, technical assistance, asset generation & sale, etc.
- ✓ Scaling through partnerships & pilots with members

➤ ***2022 and beyond***

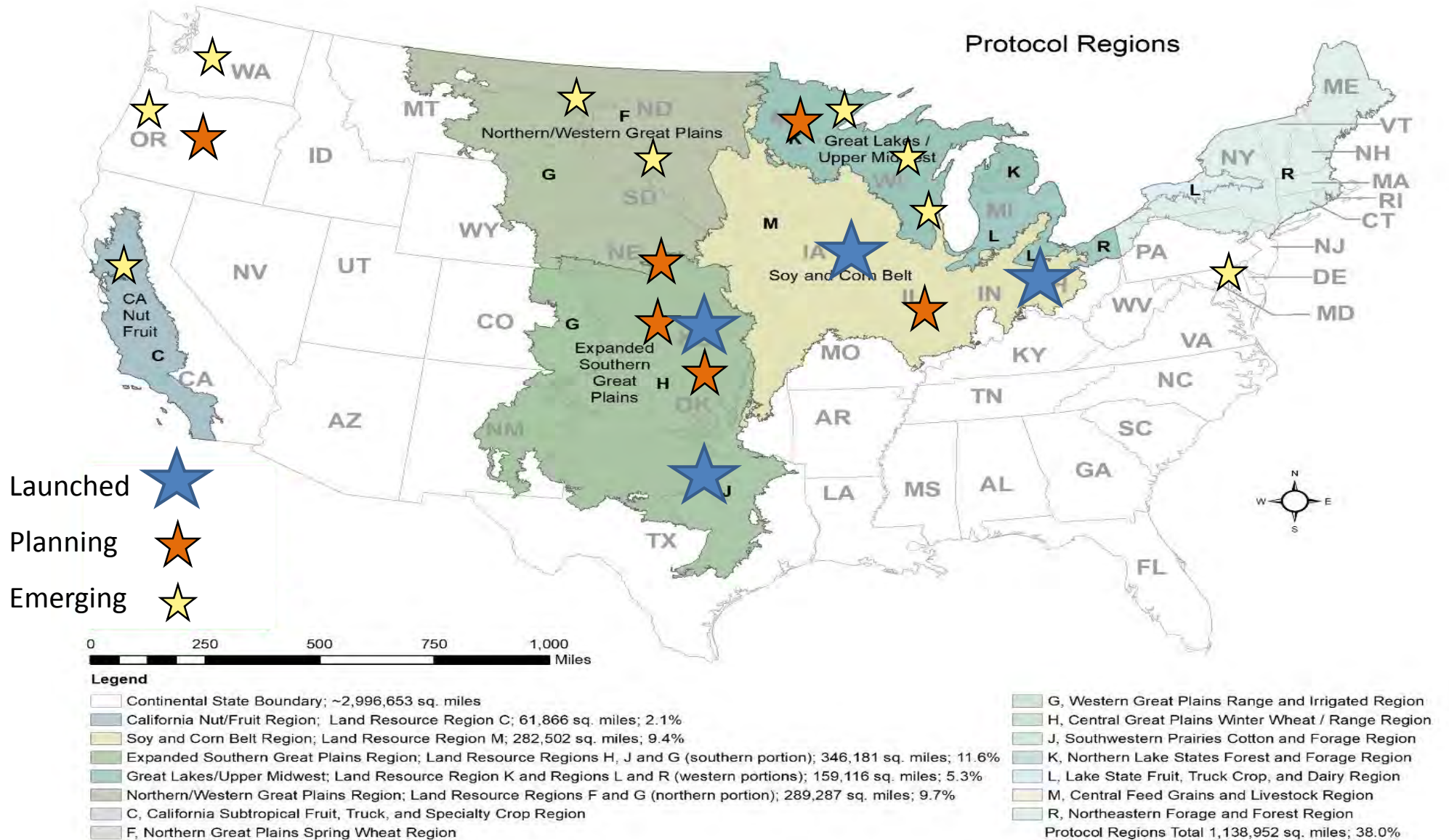
- ✓ ***Pilot project participants will be able to roll into full program at market launch***
- ✓ Scale throughout contiguous US
- ✓ Additional credit/asset generation to be added, including biodiversity, habitat conservation, etc.

ESMC Pilot Project Research

Pilot project research modules

- Testing producer enrollment process and data collection
- Exploration of remote sensing technologies for data collection and verification
- Evaluation of innovative soil C measurement tools
- Comparing water quality modeling approaches
- Bringing down the cost of quantification and asset generation
- Comparing outcomes from other programs and tools
- Economic evaluation of impact of conservation + market incentives

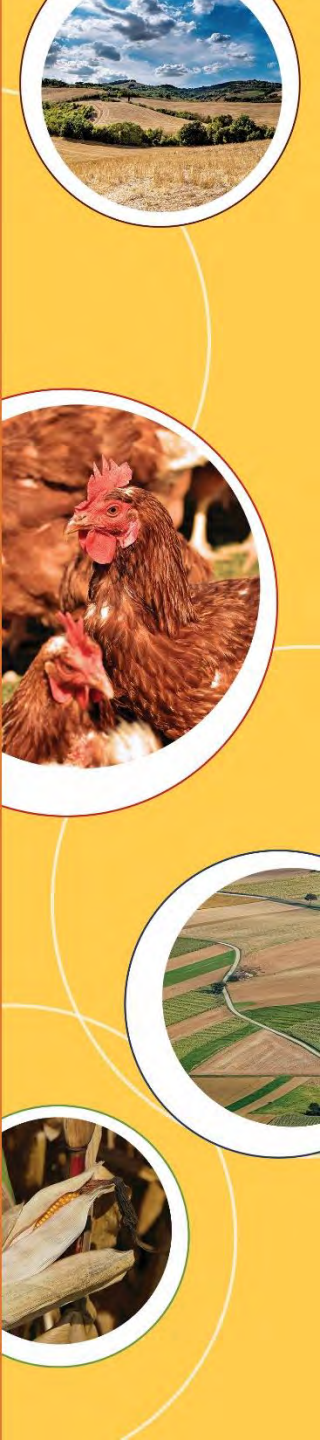
ESMC Current Pilot Project Locations



ESMC Pilot Project Participants

What type of producer is a good fit for this pilot?

- Owner operators
- Innovators, adaptive, willing to experiment
- Interested in implementing new practices
- Looking to meet downstream supply chain sustainability goals



Thank You

QUESTIONS?

Modeling Team Update

DAVE GUSTAFSON

CONSERVATION TECHNOLOGY INFORMATION CENTER

REM CONFESOR

HEIDELBERG UNIVERSITY



Outline

Purpose of modeling

Field-scale: APEX & NTT

Watershed-scale: N-GAGE

Early observations

Next steps

Q & A



Purpose of the Modeling

Quantify the reduction in delivery of biologically-available P to Lake Erie associated with farmer-implemented conservation practices

(**Practice Effectiveness Factors**)

At field-scale: APEX & NTT

At watershed-scale: N-Gage

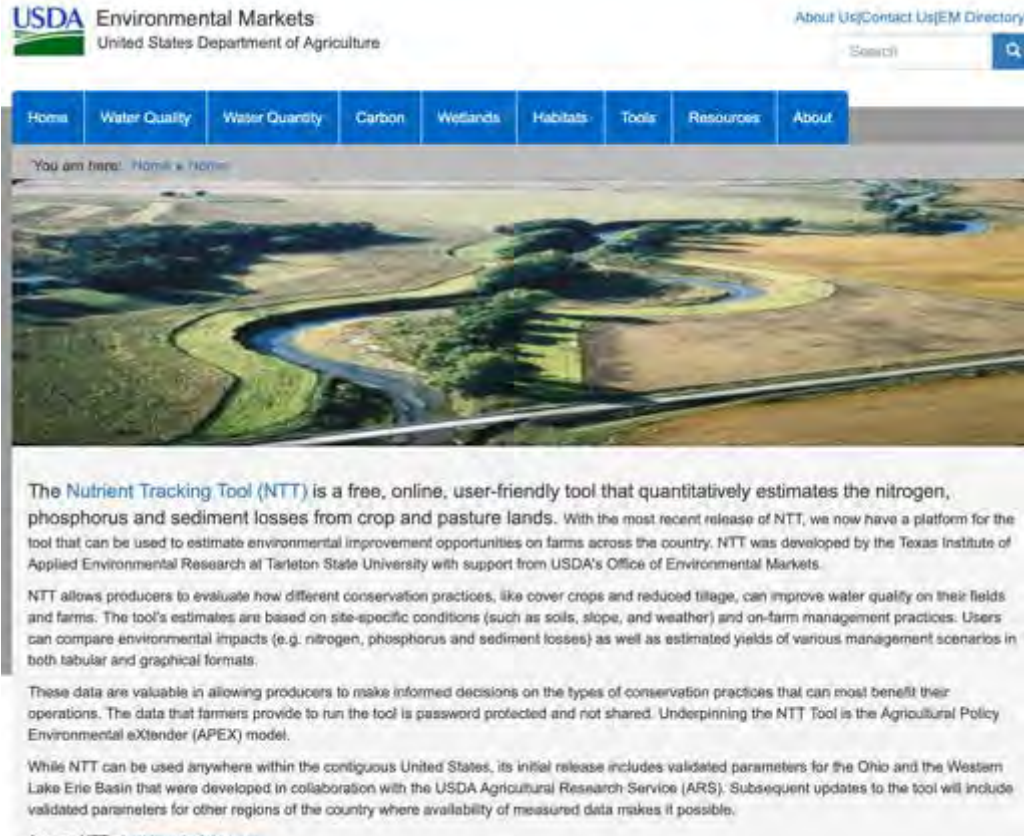


NTT: What is it?

The Nutrient Tracking Tool (NTT) is a free, online, user-friendly tool that quantitatively estimates N, P, and sediment losses from crop and pasture lands

Underlying simulation model is APEX (from Texas A&M), which has a large base of users, including ESMC

NTT is available at nnt.tiaer.tarleton.edu



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The [Nutrient Tracking Tool \(NTT\)](#) is a free, online, user-friendly tool that quantitatively estimates the nitrogen, phosphorus and sediment losses from crop and pasture lands. With the most recent release of NTT, we now have a platform for the tool that can be used to estimate environmental improvement opportunities on farms across the country. NTT was developed by the Texas Institute of Applied Environmental Research at Tarleton State University with support from USDA's Office of Environmental Markets.

NTT allows producers to evaluate how different conservation practices, like cover crops and reduced tillage, can improve water quality on their fields and farms. The tool's estimates are based on site-specific conditions (such as soils, slope, and weather) and on-farm management practices. Users can compare environmental impacts (e.g. nitrogen, phosphorus and sediment losses) as well as estimated yields of various management scenarios in both tabular and graphical formats.

These data are valuable in allowing producers to make informed decisions on the types of conservation practices that can most benefit their operations. The data that farmers provide to run the tool is password protected and not shared. Underpinning the NTT Tool is the Agricultural Policy Environmental eXtender (APEX) model.

While NTT can be used anywhere within the contiguous United States, its initial release includes validated parameters for the Ohio and the Western Lake Erie Basin that were developed in collaboration with the USDA Agricultural Research Service (ARS). Subsequent updates to the tool will include validated parameters for other regions of the country where availability of measured data makes it possible.

Access NTT at nnt.tiaer.tarleton.edu



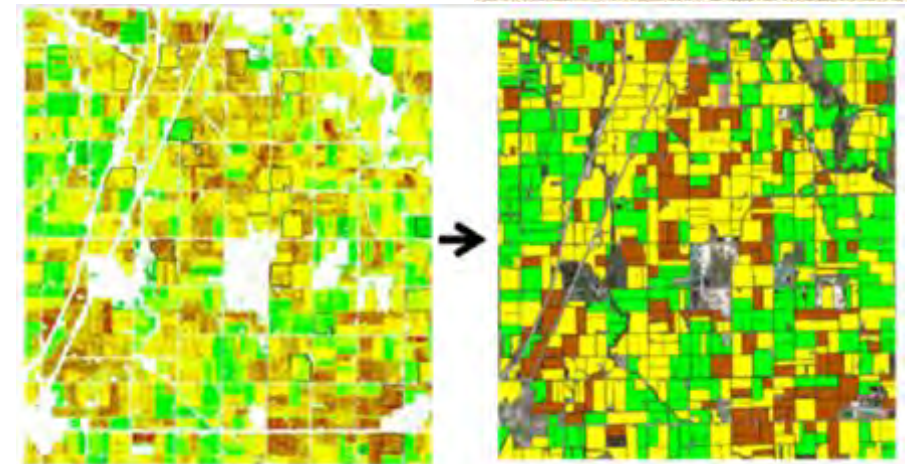
N-Gage: What is it?

Modeling approach proposed by CTIC

Watershed-scale (HUC8 and larger) regression-based approach to quantify percent reduction in nutrient loads (N, P) associated with percent adoption of farmer practices

Input data are from OpTIS, which uses publicly-available remote sensing data to map & monitor adoption of tillage practices, cover crops, and multi-year crop rotations

OpTIS data are available at www.ctic.org

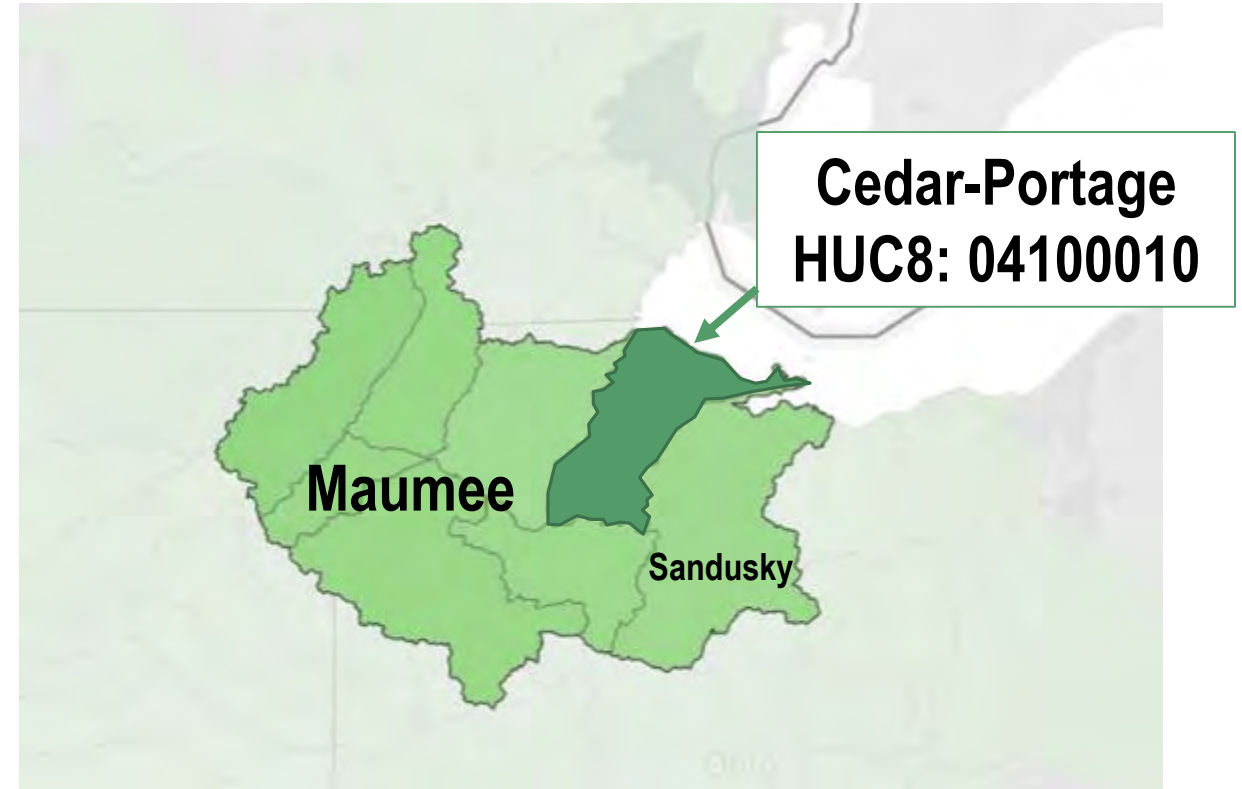


Project Area

Original proposal included only the Maumee and Sandusky River Basins

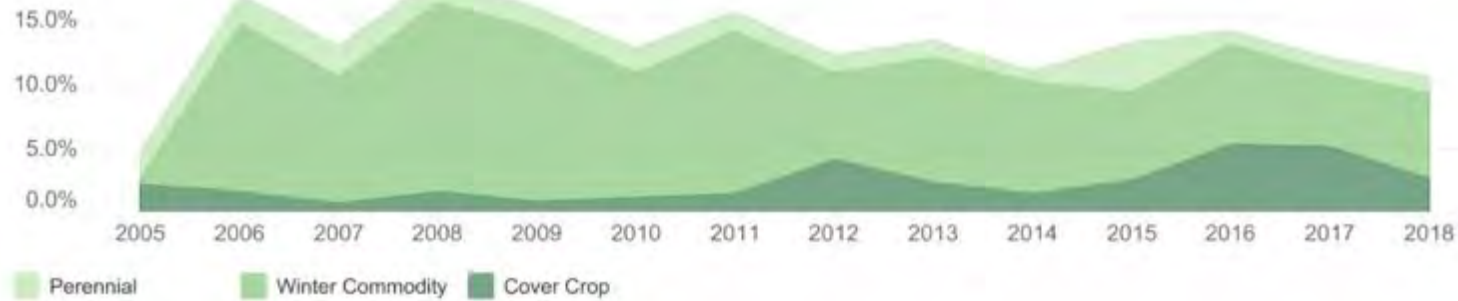
EPA recently approved addition of the Cedar-Portage HUC8

This increases the availability of watershed-scale monitoring data without “dilution” of other project objectives

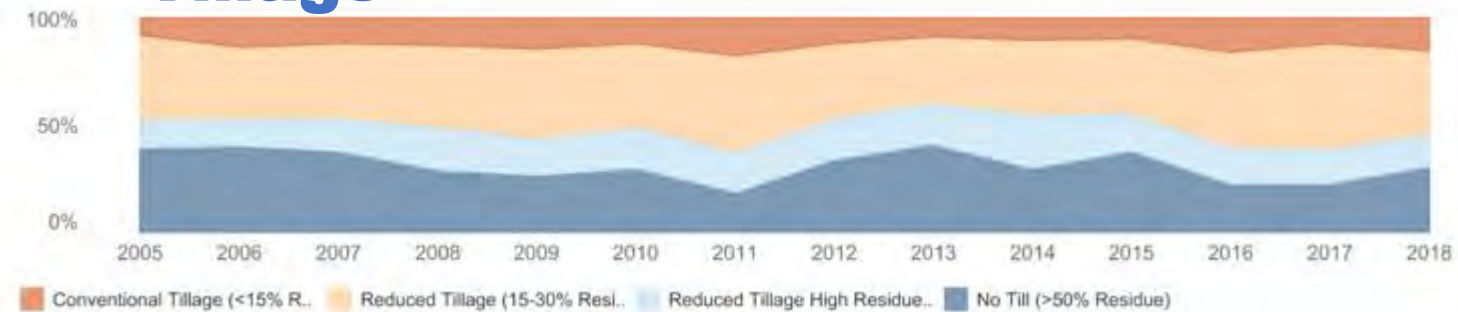


Recent Conservation Practice Trends in the Project Area

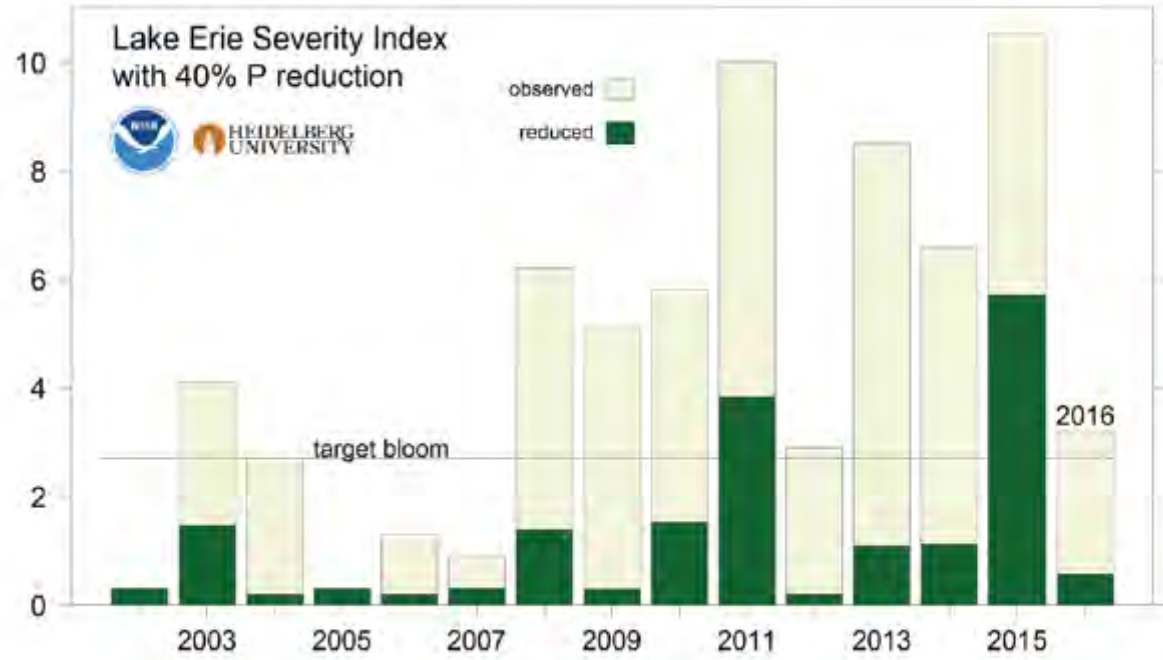
Winter Cover



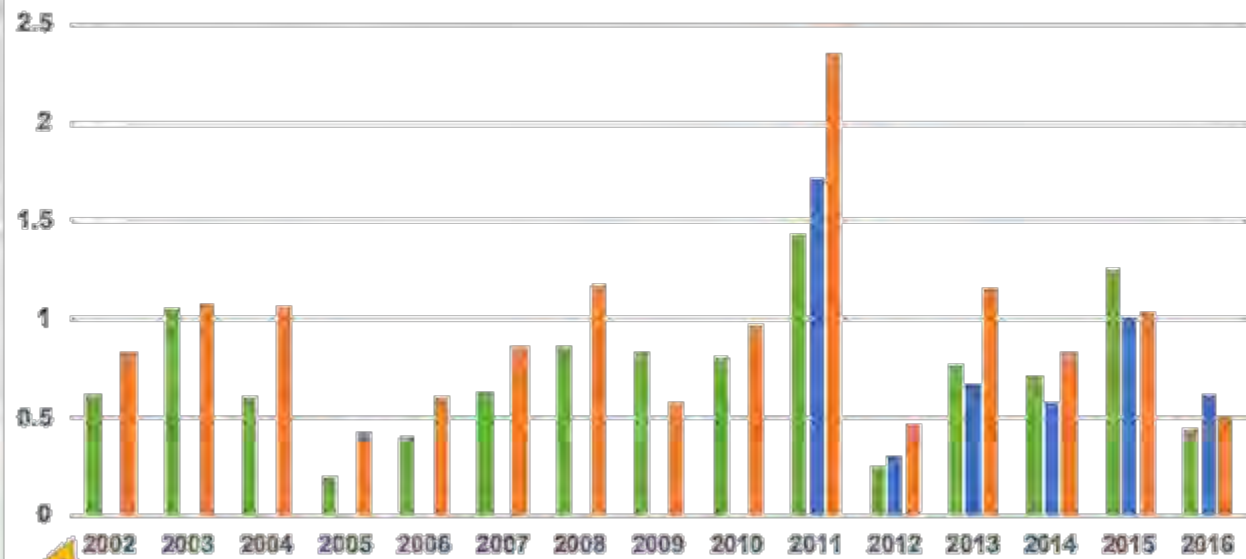
Tillage



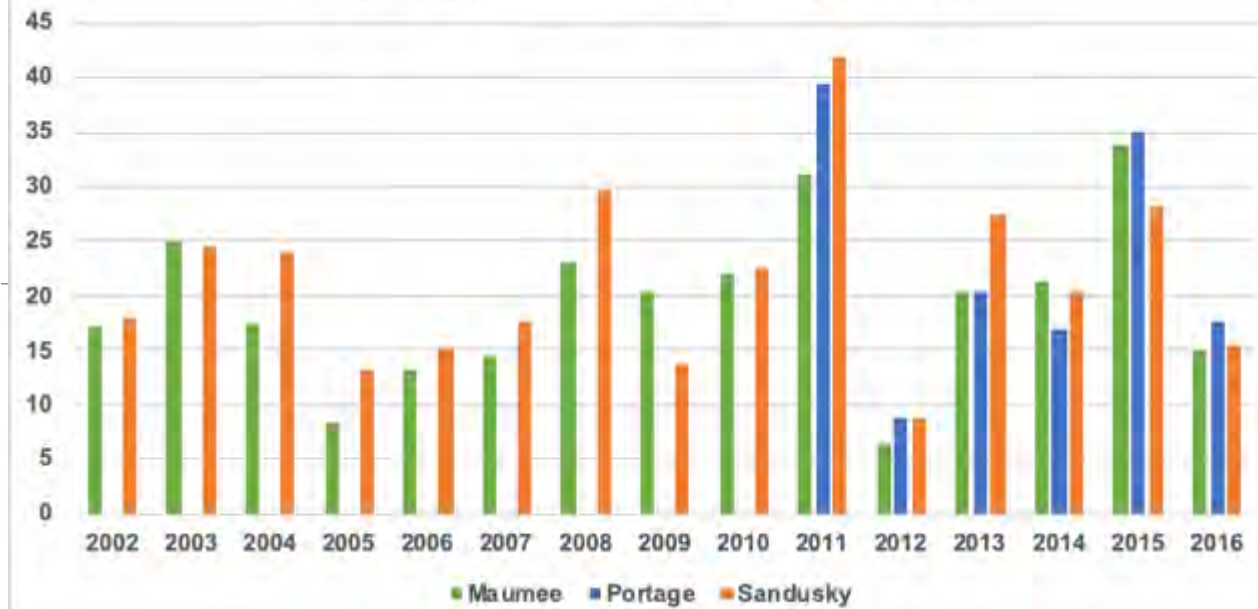
source: OpTIS Data, www.ctic.org/optis



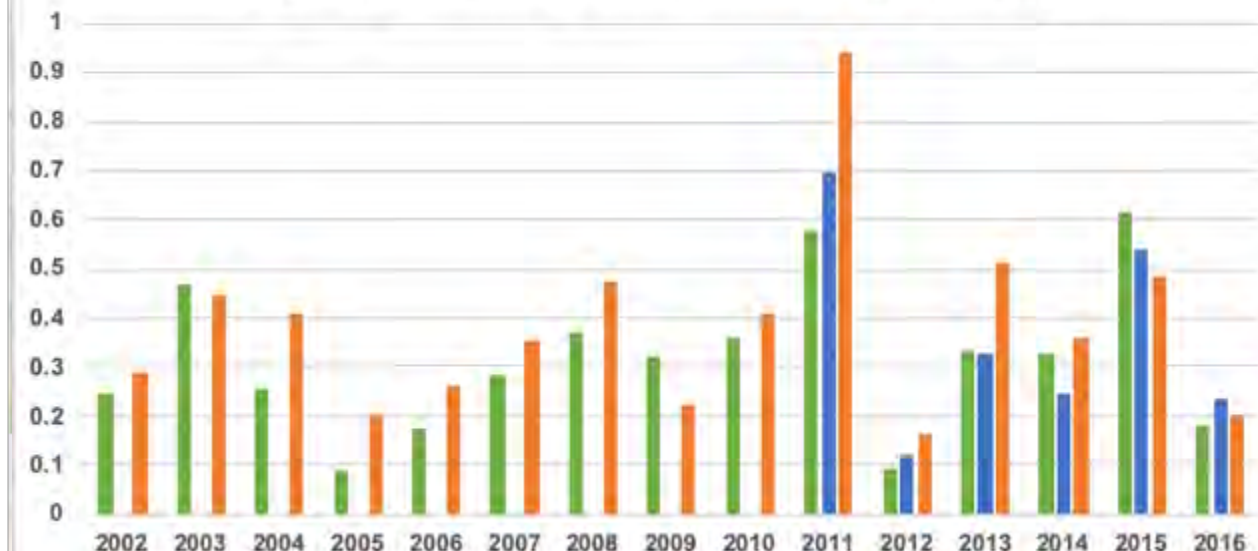
Spring/Summer Total P (kg/ha/yr)



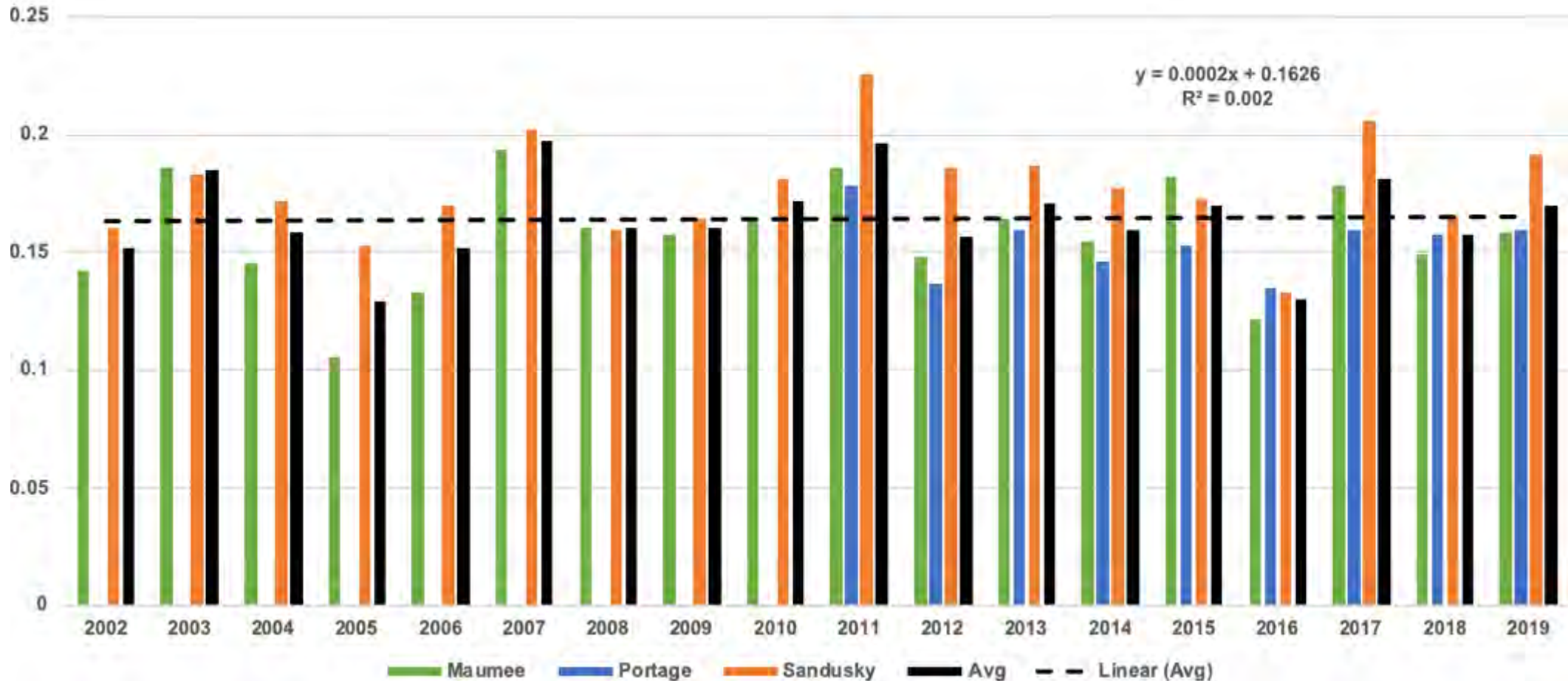
Spring/Summer Discharge (cm)



Spring/Summer Bioavailable P (kg/ha/yr)



Bioavailable-P per unit of Water Discharge to the Lake (kg/ha/mm/year)



Next Steps

APEX & NTT: Set-up and apply to farmer fields that are enrolled in the project; Ensure consistency with ESMC protocols

N-Gage: Continue model calibration to available watershed-scale monitoring data

Compare field-scale & watershed-scale estimates of **Practice Effectiveness Factors**



Questions?



Contact Information

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