

Design and Implementation of an Adaptive Management Pilot Project for the Silver Creek Watershed

AWRA

March 5, 2015



NEW Water
The brand of the Green Bay
Metropolitan Sewerage District

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AgVentures

TILTH
AGRONOMY

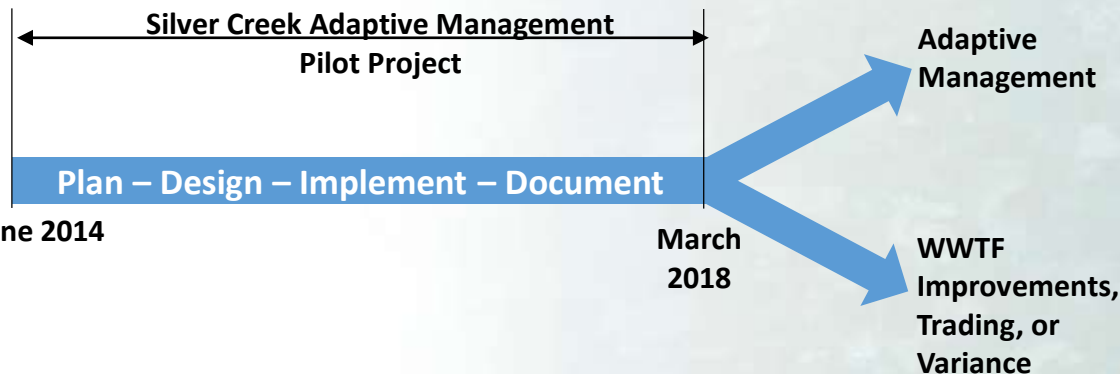
McMAHON
ENGINEERS ARCHITECTS

Background

- TMDL
- Permit compliance options
 - Trading
 - Variance
 - WWTF Improvements
 - ~\$220M + \$2M annual O&M)
 - Adaptive Management



Photo credit: Steve Seilo (www.photodynamix.com) Photo April 15, 2011



Silver Creek Pilot Watershed

■ Partners

- Private landowners and growers
- Ducks Unlimited, Nature Conservancy, US Fish and Wildlife Service NRDA, NRCS, agronomists, UW-Green Bay, USGS, and Oneida Tribe

■ Manageable size (5 sq mi)

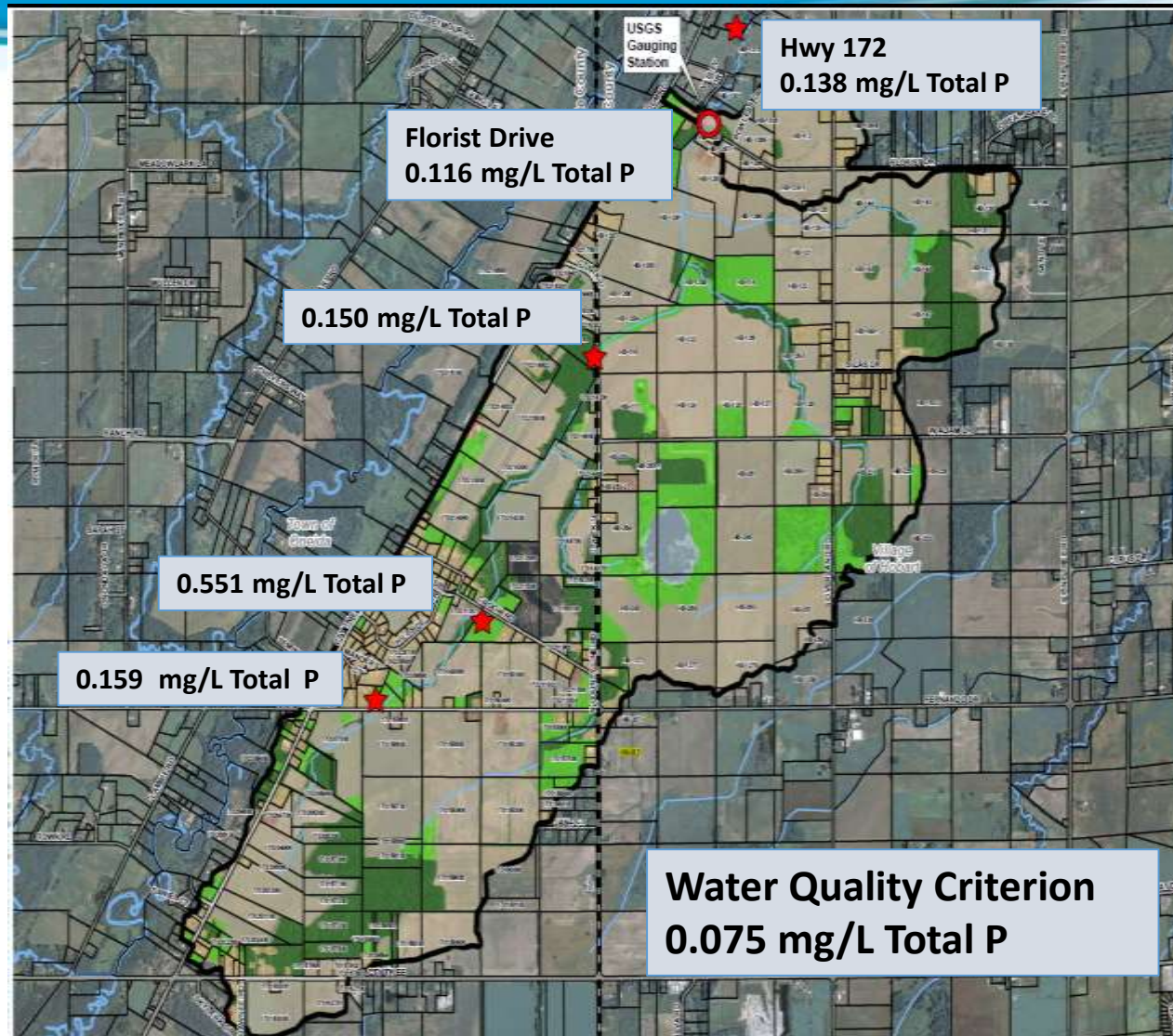
■ Opportunities

- Growers
- Ag-dominated
- Momentum

■ Challenges



Silver Creek Water Quality



Purpose

- Reduce uncertainty
 - Collect data to provide information
 - Identify road blocks and solutions
 - Ability to scale-up
 - Informed decision making
 - Permitting and facility strategy
 - Support future permit renewals
 - Adaptive Management implementation guidance
 - Implementable schedule
- Or...
- be confident in alternative compliance option

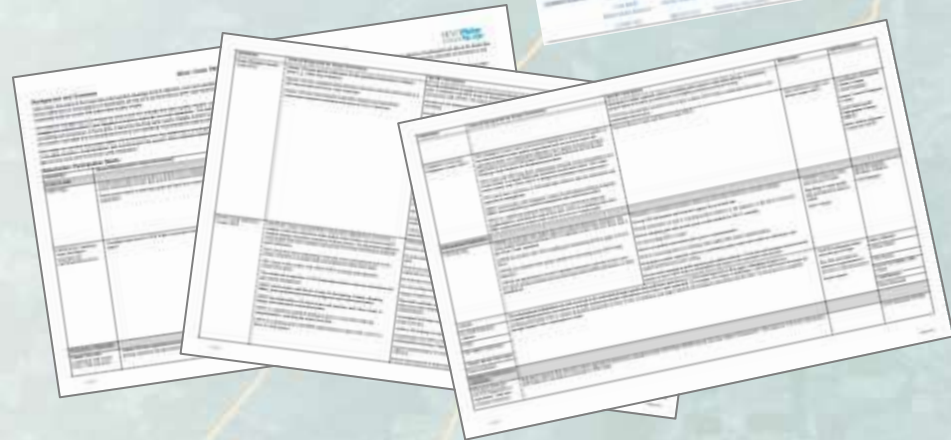
Example Pilot Project Goals

■ Example questions to answer

- Can we demonstrate AM in a 4 yr pilot?
- Can the Pilot result in water quality improvement?
- What does compliance mean?
- Can we demonstrate AM in 20 years for permit compliance?
- What will it cost?
- Can AM be a viable permit compliance approach?
- Is this the best approach for our ratepayers?
- Are there willing stakeholders and landowners/growers?
- What barriers exist to full scale implementation? Can they be overcome?

Planning for Success

- Leverage existing relationships among partners
 - Counties, NRCS, Oneida, crop consultants, etc.
- Openness and consistent messages
- Leverage existing data
- Understand stakeholders roles and limitations
- Document stakeholder participation
- Endorse team charter
- Prepare contingency planning



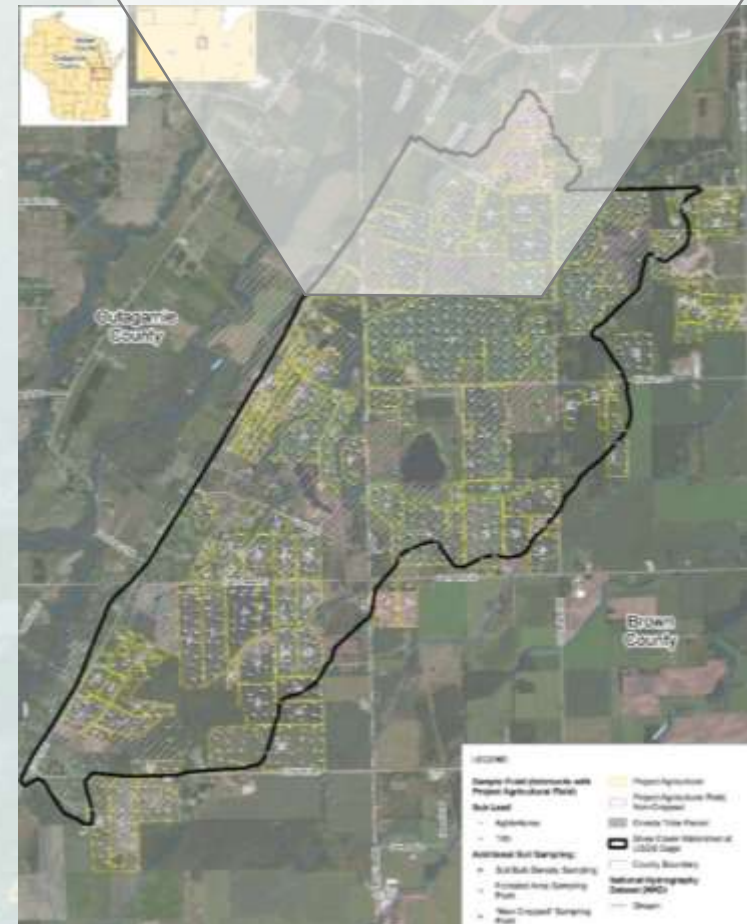
The Reality of Success

- Farming is intensely personal
- Skepticism of “another program”
- Large yet small community
- Inviting vs. being invited
- Less than 4 yrs to baseline, design, implement and monitor watershed response
- Media



Accomplishments in 2014

- Stakeholder meetings to review and confirm commitments
 - Oneida financial support, others
- Team chartering and kickoff meeting
- Identify landowner and growers
- Field delineations
- Soil sample locations



Accomplishments in 2014

- Soil sampling program @ 2.5 acre field grids
 - Sampling parameters
 - Sampling locations (fields and pasture, non-crop, forests)
 - Sampling protocol
 - Field training
- iPad application for field data collection
- Field training
 - Multiple teams require consistent procedure
 - GIS database
 - iPad allows field teams to be paperless



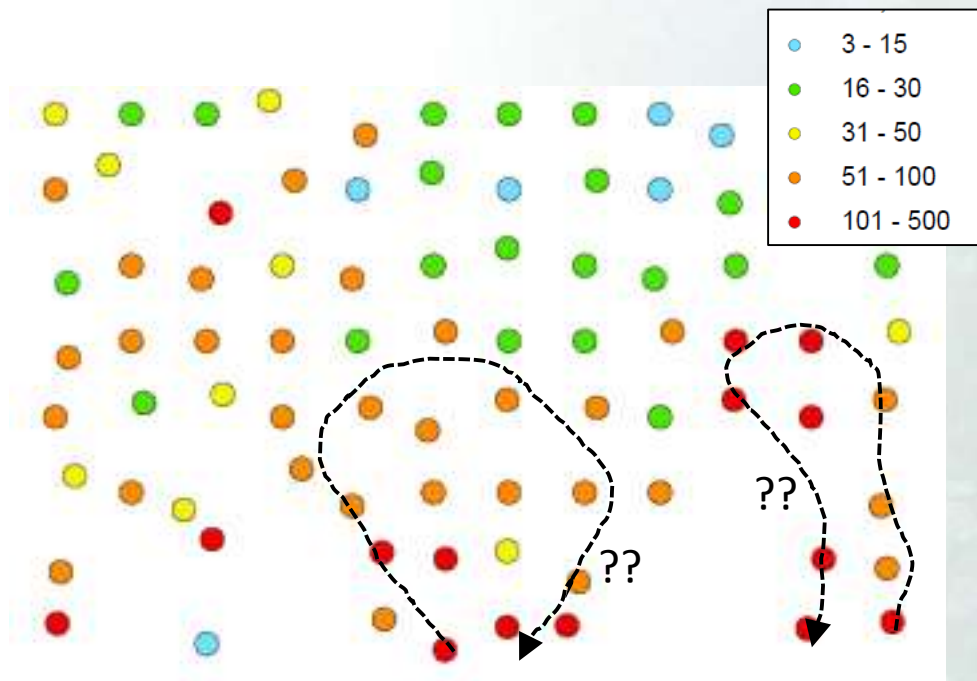
Accomplishments in 2014

- 123 of 124 fields permission
- 100% specialized sampling completed
- 100% forest samples completed
- 100% non-cropland completed
- 100% modeling parameters completed
- All fields sampled except standing corn or soybean
 - ~900 of 960 samples complete (>90%)
 - Finish sampling in Spring 2015

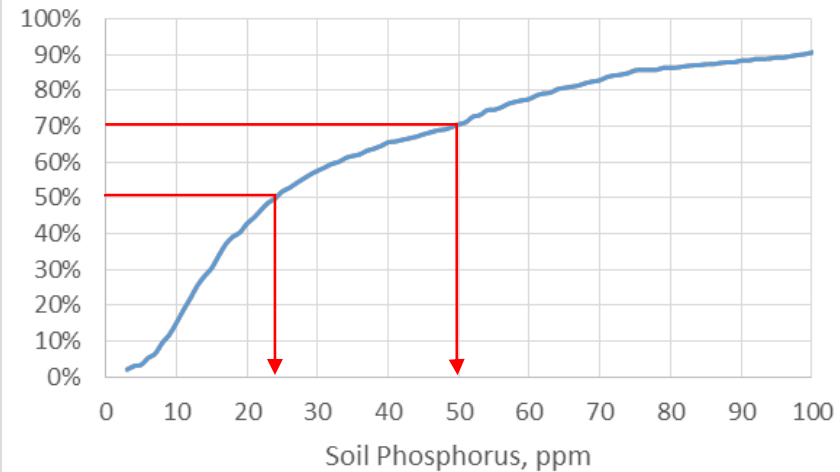


Initial Results

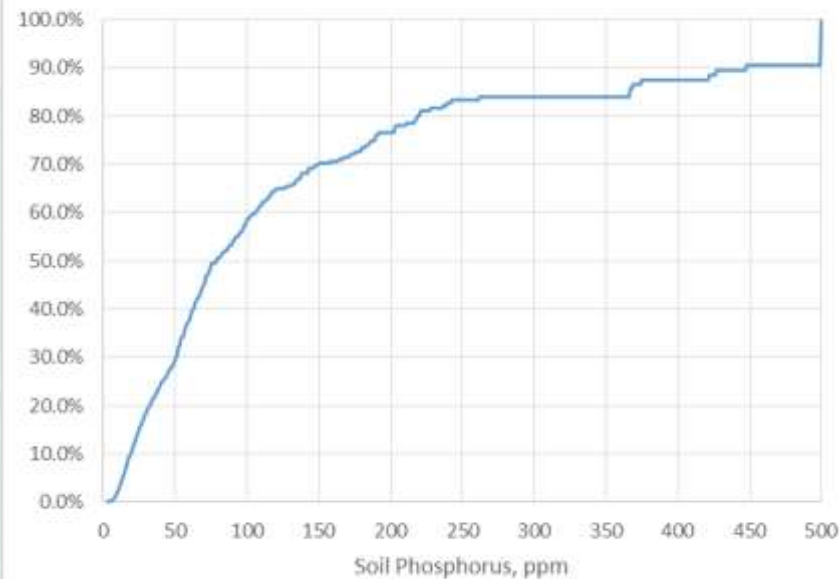
- Variability (surprise!)
 - Soil P: 3 to 553ppm
- Historic land use
- Nutrient spreading patterns



Soil P Concentrations, Cumulative Frequency Distribution

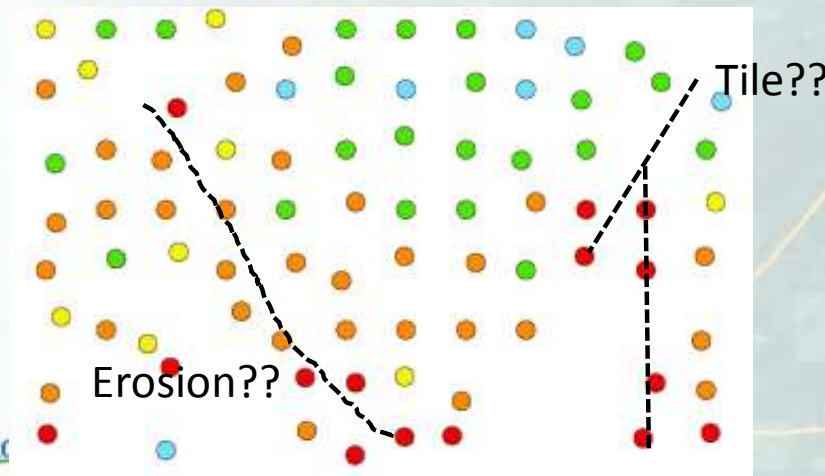


Soil P Mass, Cumulative Frequency Distribution



Potential Implications

- Generally, field averages $P < 50$ and nearly all growers have Nutrient Management Plans...
- Monitoring of Nutrient Management Plans
 - Follow, tweak, improve, or focus on soil retention?
- Targeted approach for manure and fertilizer (blend?) applications
- Need to correlate soil P with runoff potential



2015- The Year of Planning

- Nutrient Management Plans
- Desktop analysis
 - EVAAL
 - Other GIS review
- Field walks and Conservation Plans
 - iPad app to support field walks
 - Agronomist with County Conservationist
 - Potential conservation practices
- Grower meetings
- SWAT modeling (maybe)
- Implement some best management practices (BMPs)

Example Considerations for a Full Scale Adaptive Management

- Institutional capacity of planning and implementation
- Monitoring and tracking of Nutrient Management and Conservation Plans, and BMPs
- One-size-fits all has been tried...needs to be individual
- Programmatic approach for full scale implementation
- Weather impacts
- Education of landowner
- Permit timelines not unified



Questions?

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