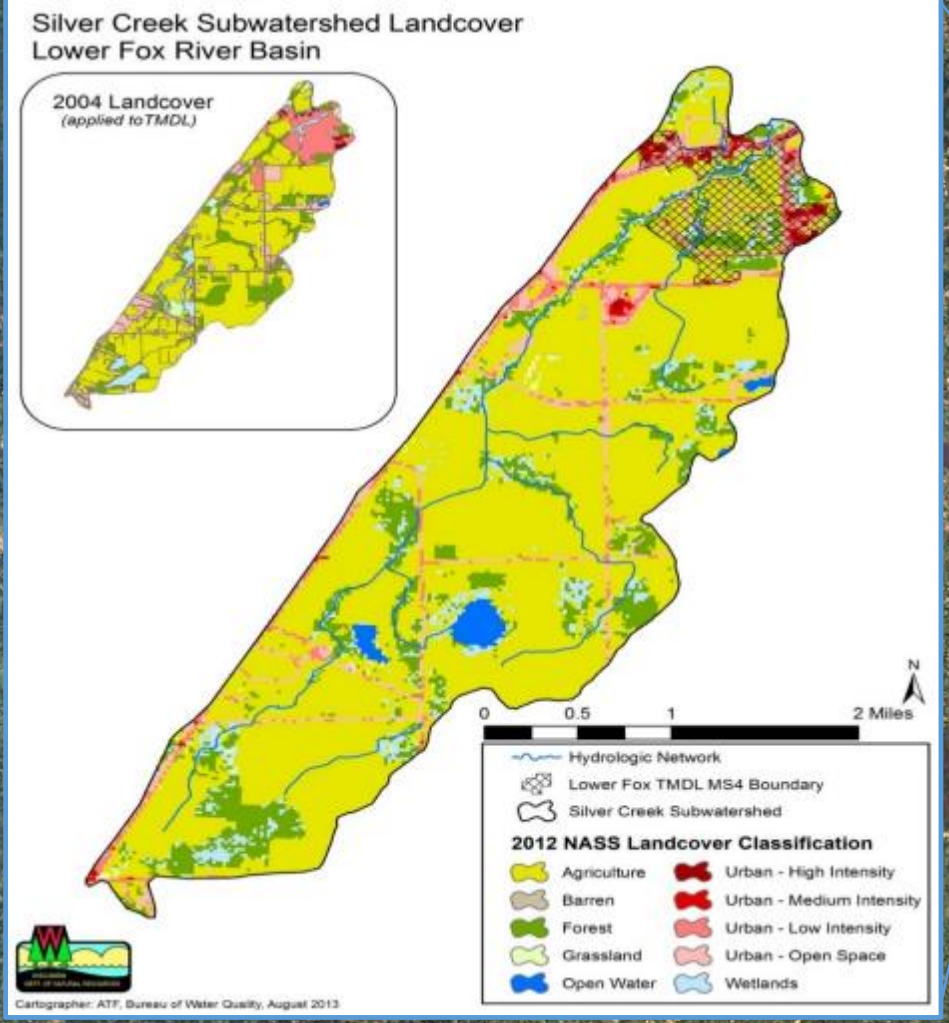




# Silver Creek Project



*Partnering  
for Water Quality*



NEW  
Water

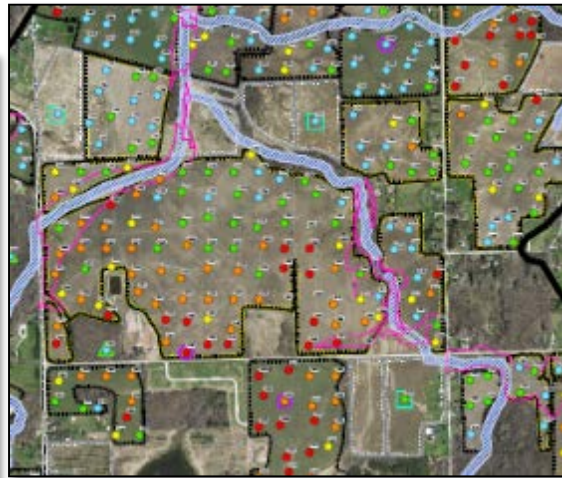
- Watershed Size: 4,800 Acres
- Land Use: 48% Agriculture
- Stream Length: 15 Miles



# Silver Creek Pilot Project – From the Beginning

## 2014 – Project Kickoff

- Developed project partners
- Water quality sampling
- Soil sampling
- Stream surveys

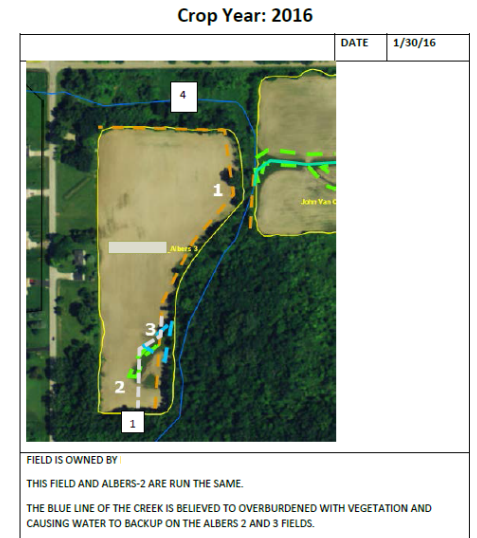


## 2015 – Watershed Inventory

- Comprehensive field evaluations
- Arc GIS tablet application
- Conservation planning meetings
- Developed conservation and enhanced nutrient mgmt. plans



## CONSERVATION & ENHANCED NUTRIENT MANAGEMENT PLAN



# Silver Creek Pilot Project – 2016 & 2017



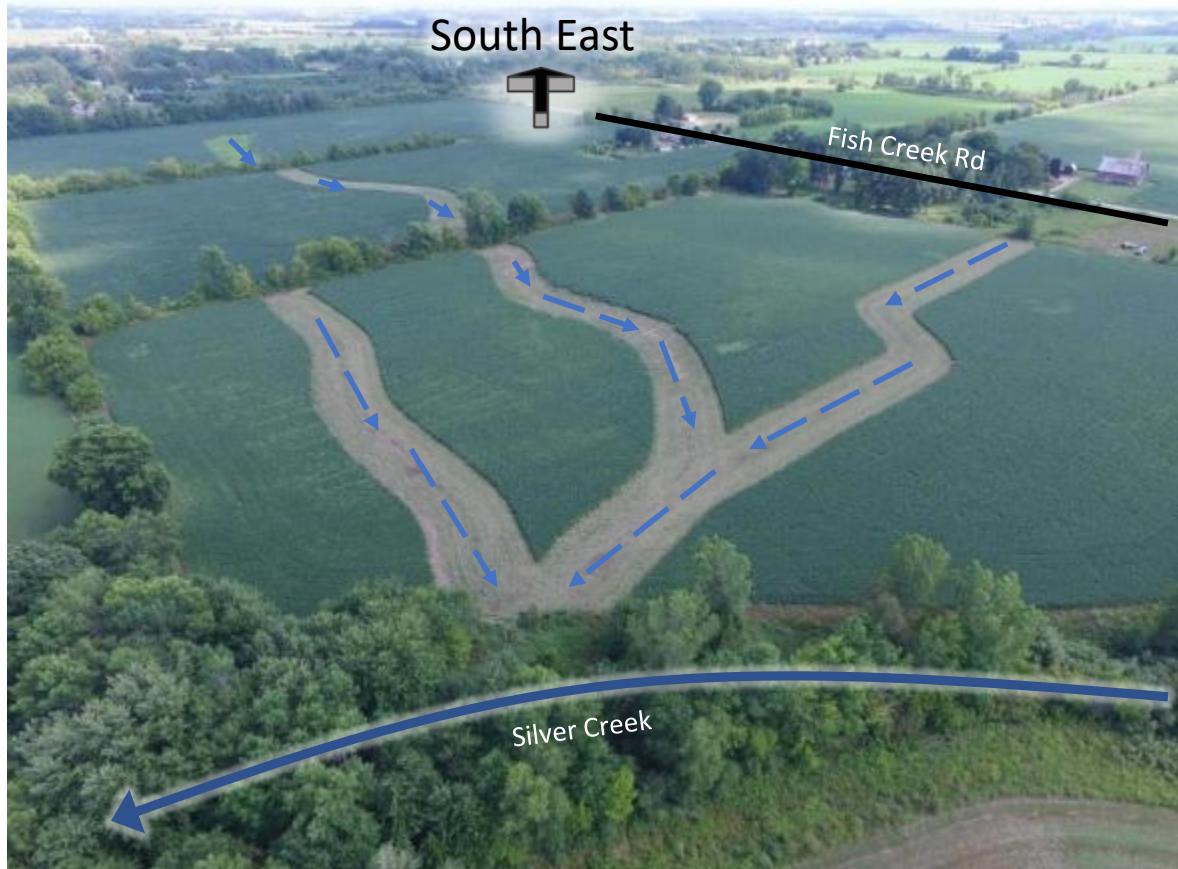
- Water quality monitoring
- Field planning
- Cost share agreements
- Best Management Practices (BMPs) installation
  - Filter strips (buffers)
  - Critical area plantings
  - Grassed waterways
  - Cover Crops
  - Residue Management
  - Etc.
- BMP Verification
- Coordination, coordination, coordination....

# 2017 .... By The Numbers

- Sampling
  - January 1, 2017- October 30, 2017
    - 187 – grab samples
    - 75 event samples
- Conservation and Enhanced Nutrient Management Plans
  - Over 1500 acres
- Cost Share Agreements
  - 9 Structural BMP Contracts
    - 3 Deed recordings completed
  - 7 Operational BMP Contracts
- Structural Best Management Practices
  - 5 Critical area plantings
  - 15 Filter strips (buffers)
  - 1 Rock Crossing
- Winter Cover in Fields
  - 540 acres of cover crops
  - 85% of cropland covered by either alfalfa, cover crops, winter wheat, forage, pasture, or grass
    - 2016 – 70%
    - 2015 – 30%



# Timeline of Grassed Waterway Project



Aug. 16, 2016



Aug 31, 2016



# Timeline of Grassed Waterway Project



Oct. 4, 2016



Nov. 29, 2016



# Timeline of Grassed Waterway Project



June 13, 2017



Oct 9, 2017



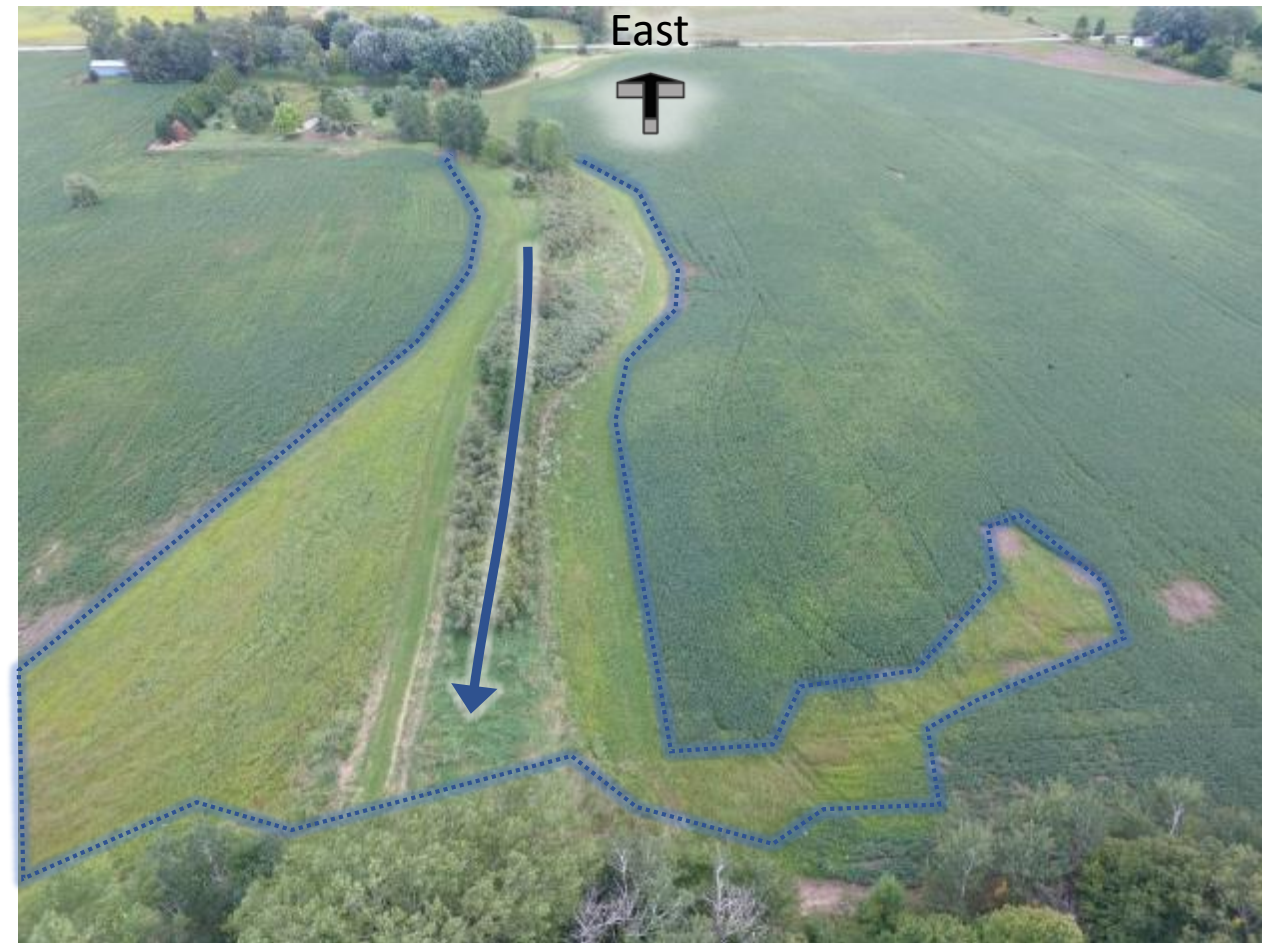


# Timeline of Grassed Waterway Project



Dec 1, 2017

# Filter Strips Projects



Aug. 23, 2017



Dec 1, 2017



# Water and Sediment Control Basins (WASCOB)



June 13, 2017



Oct. 9, 2017

# Vegetated Water Treatment Systems





# Cover Crop Interseeder





# Managed Grazing Operation



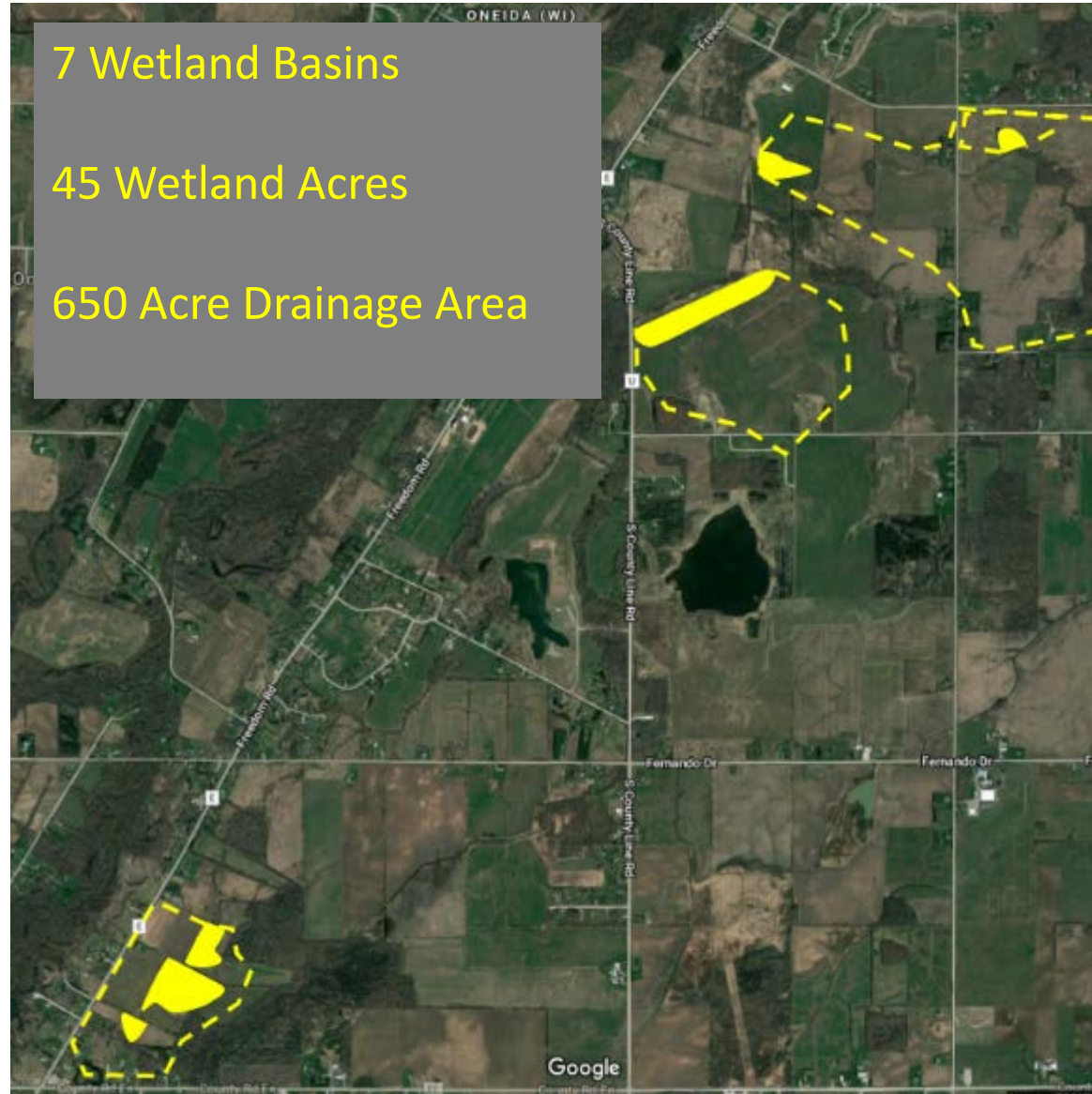


# Wetland Restoration Efforts

7 Wetland Basins

45 Wetland Acres

650 Acre Drainage Area

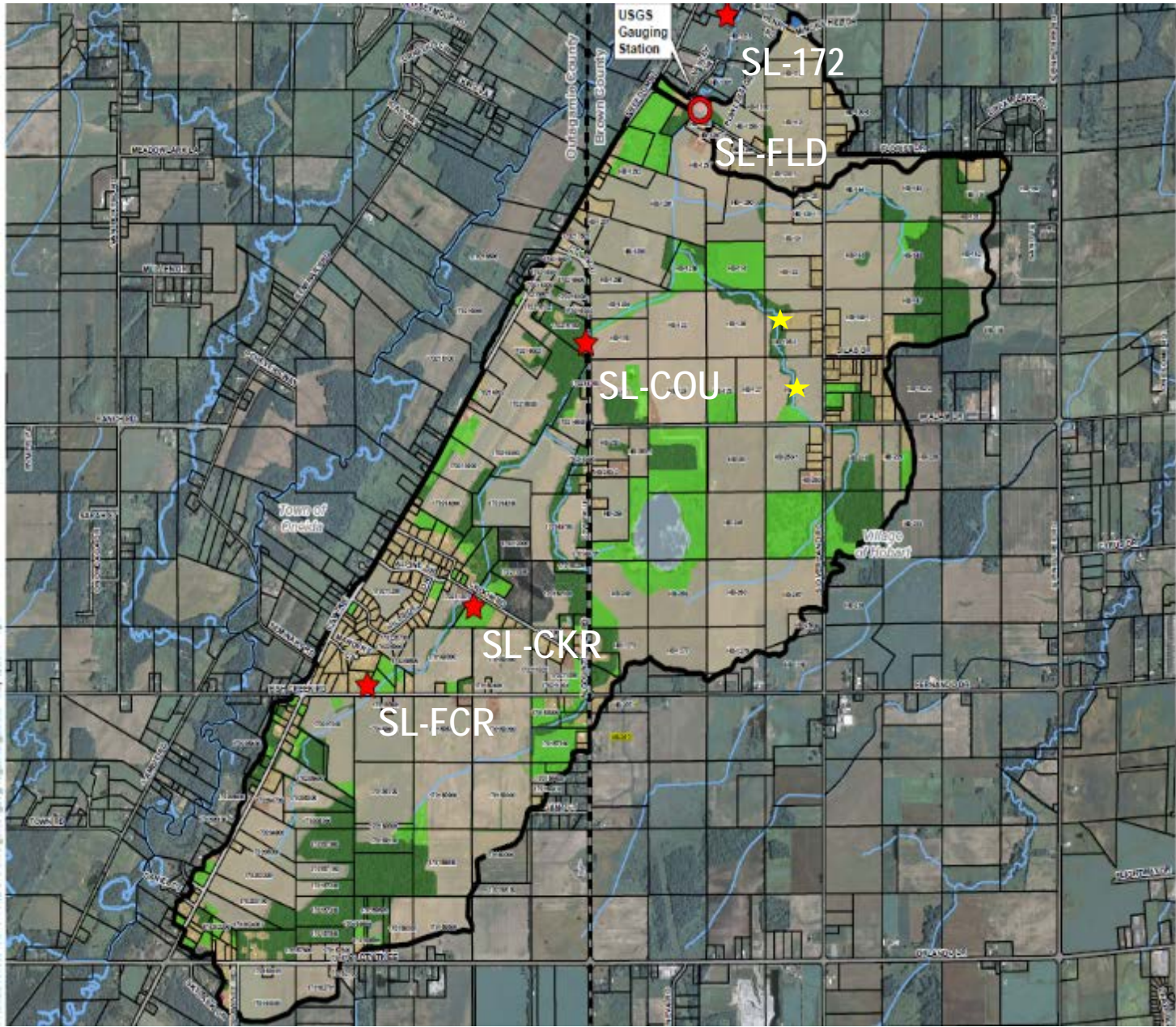




# Wetland Restoration Efforts









# Stream Sediment and Drain Tile Sampling



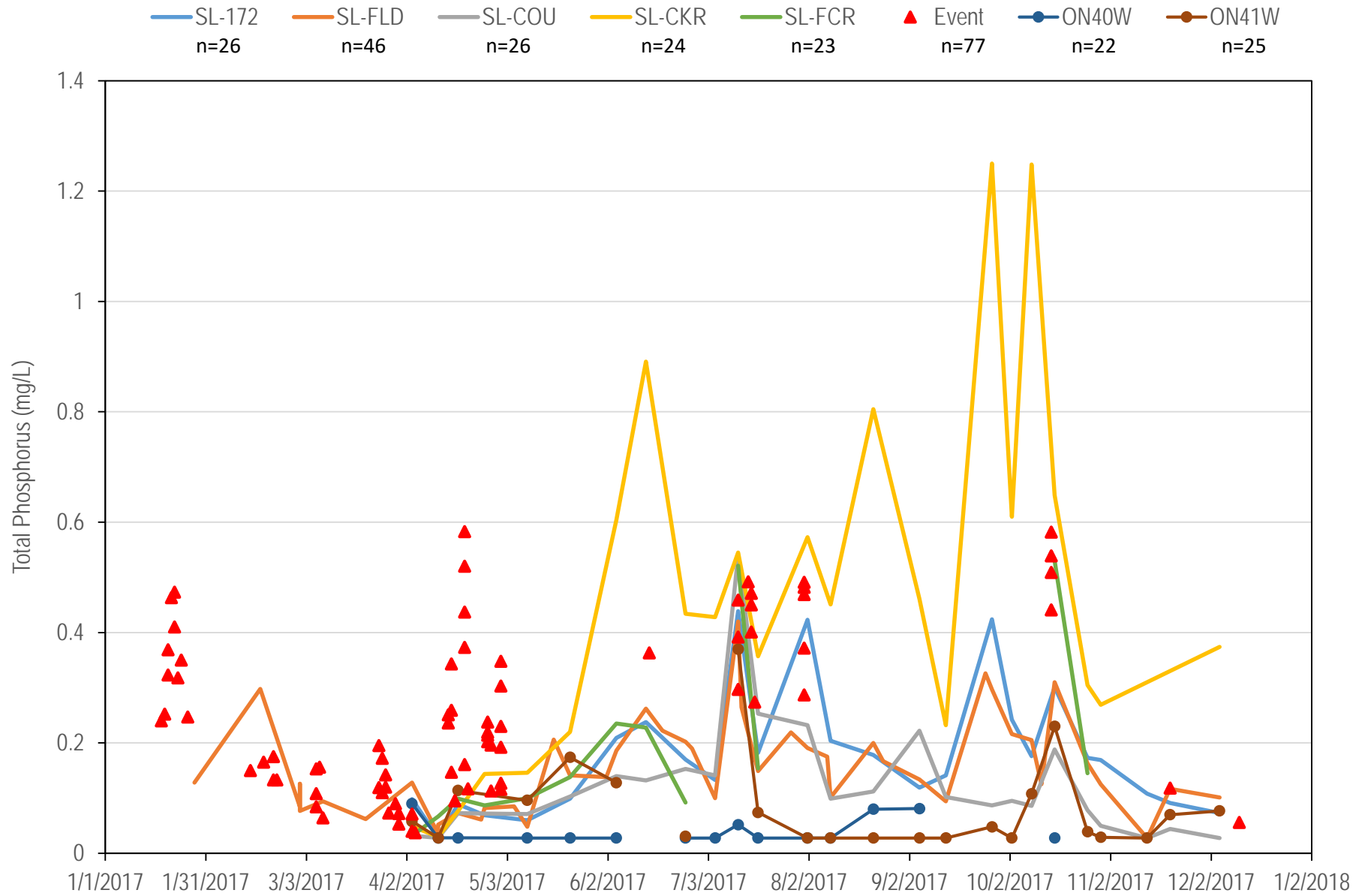


# 2017 Silver Creek Summary

- SL-172: 26 grab samples
- SL-FLD: 46 grab samples
- SL-EVT: 77 event samples
- SL-COU: 26 grab samples
- SL-CKR: 24 grab samples
- SL-FCR: 23 grab samples
- Tile Sites:
  - ON40W: 22 grab samples
  - ON41W: 25 grab samples

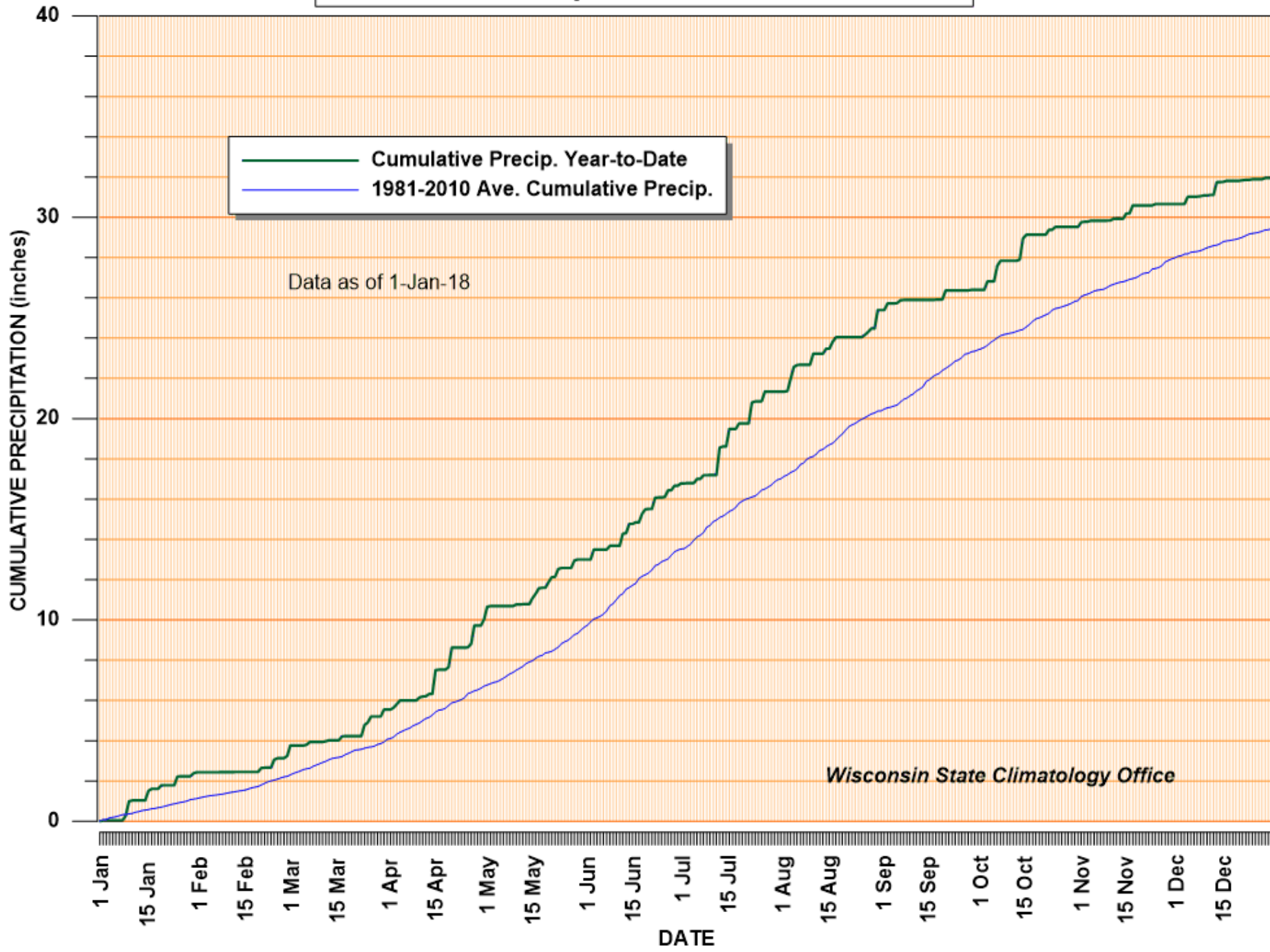


# 2017 Total Phosphorus: January - December 2017





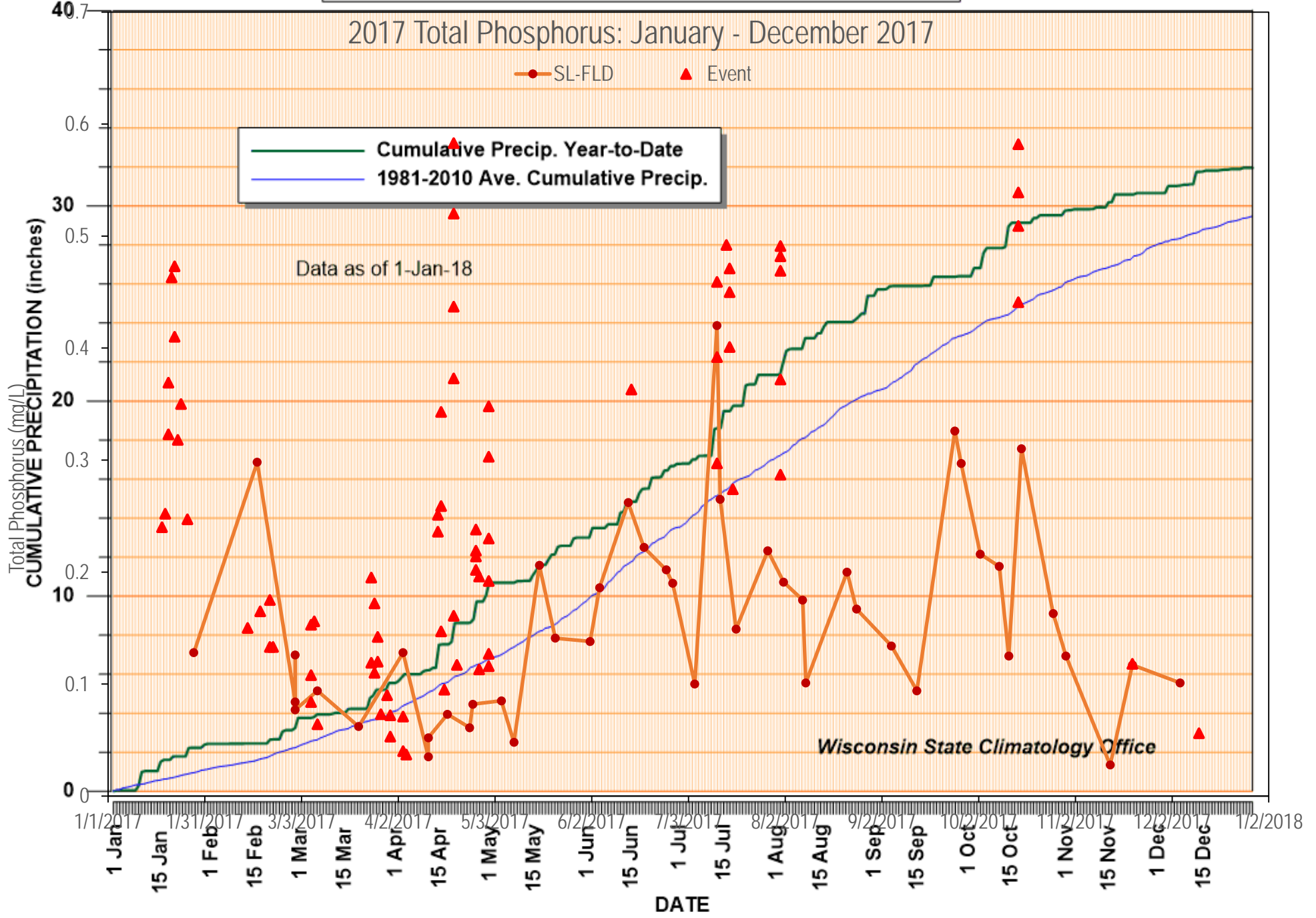
# Cumulative Precipitation: GREEN BAY 2017



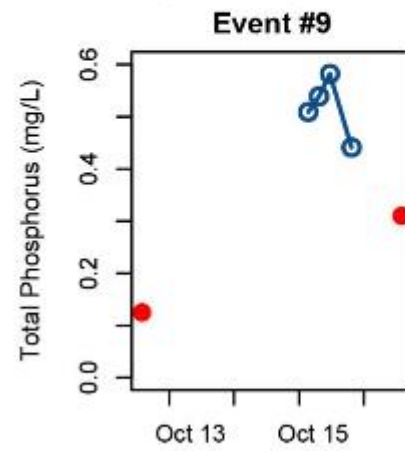
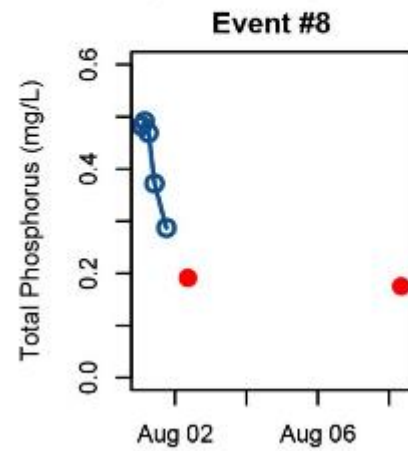
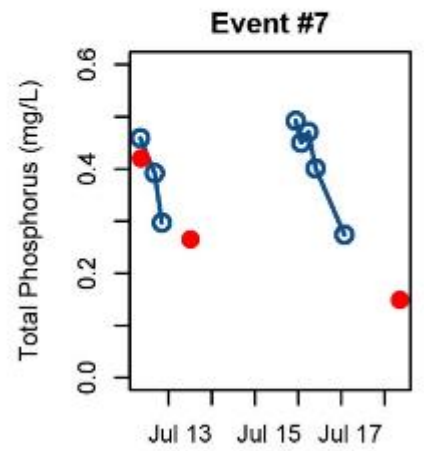
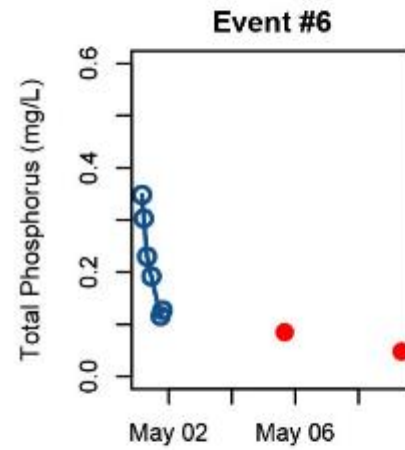
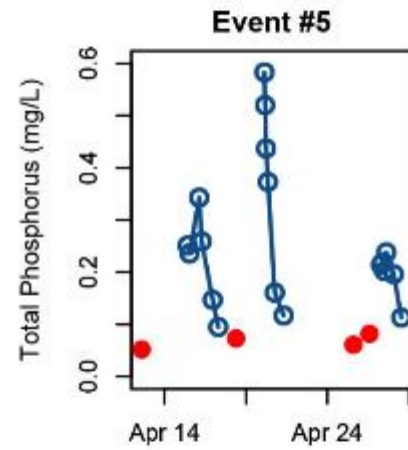
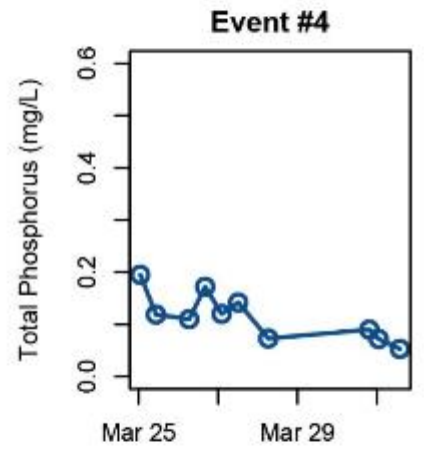
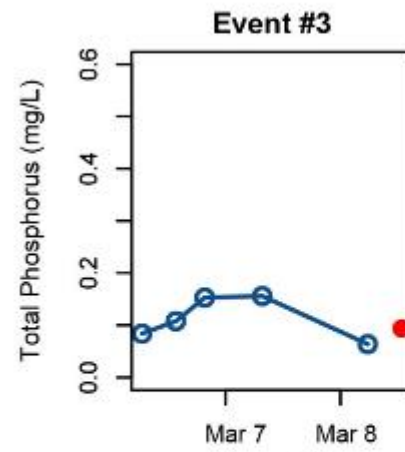
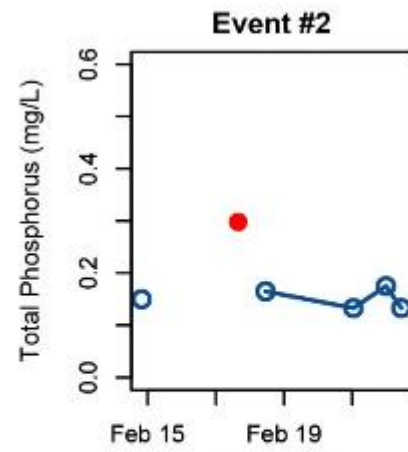
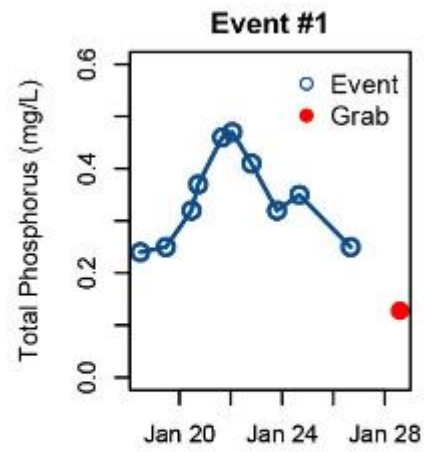
Data as of 1-Jan-18

Wisconsin State Climatology Office

# Cumulative Precipitation: GREEN BAY 2017





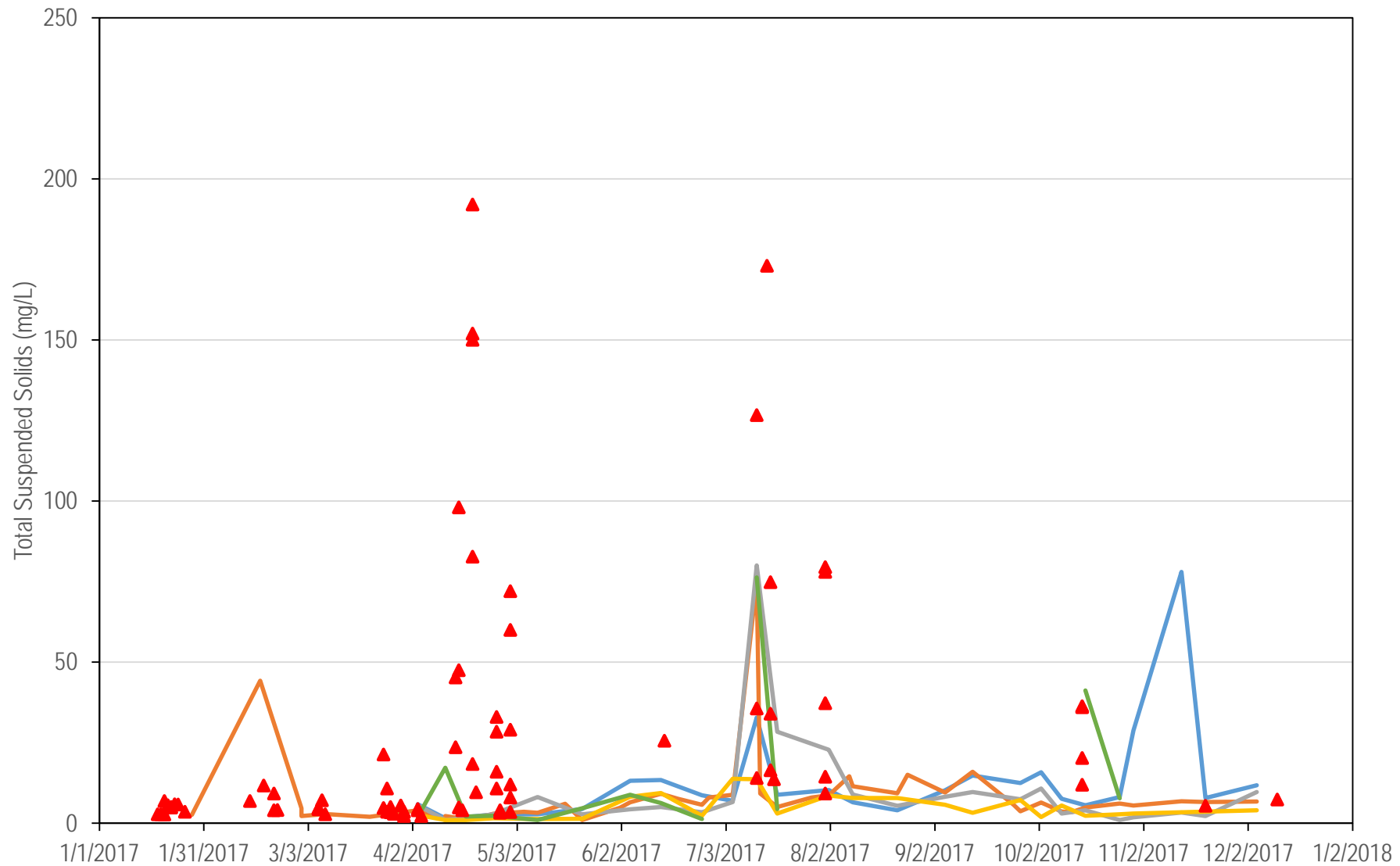




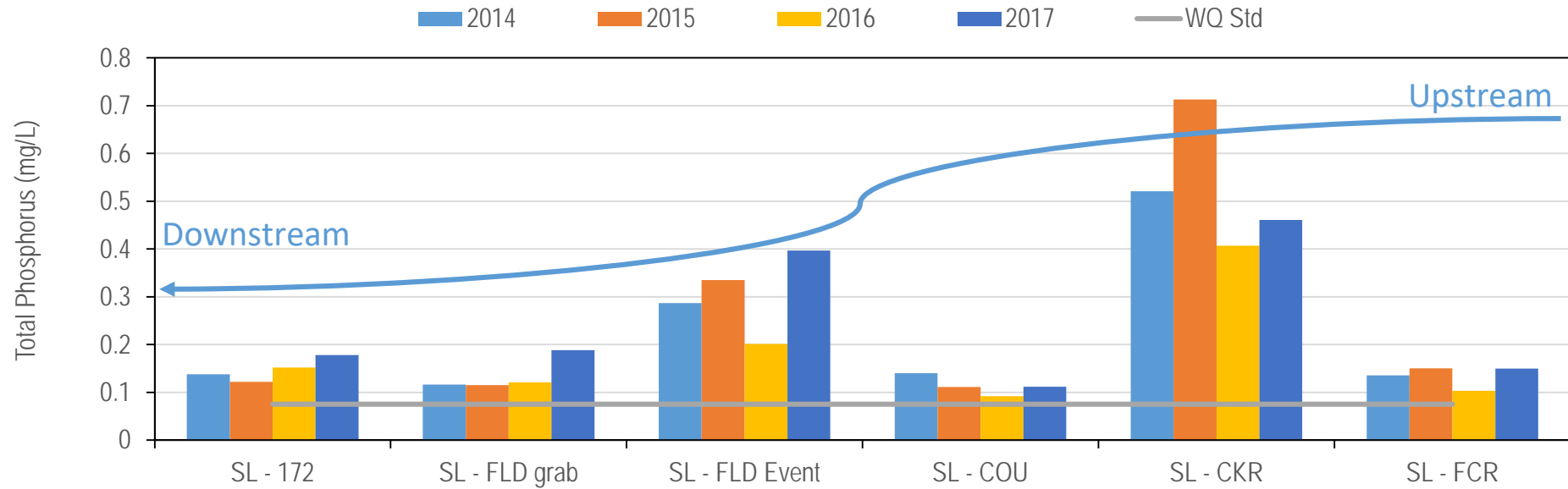


# 2017 Total Suspended Solids: January - December 2017

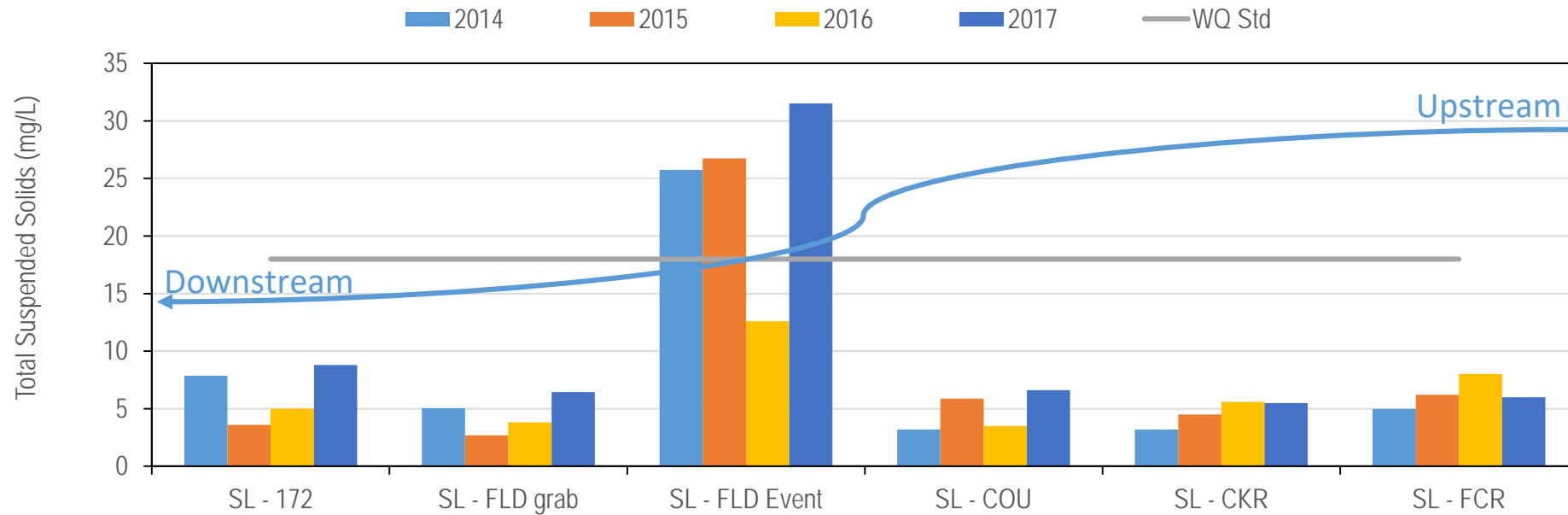
— SL-172 n=26    — SL-FLD n=46    — SL-COU n=26    — SL-CKR n=24    — SL-FCR n=23    ▲ Event n=77



Silver Creek WDNR Median Total Phosphorus

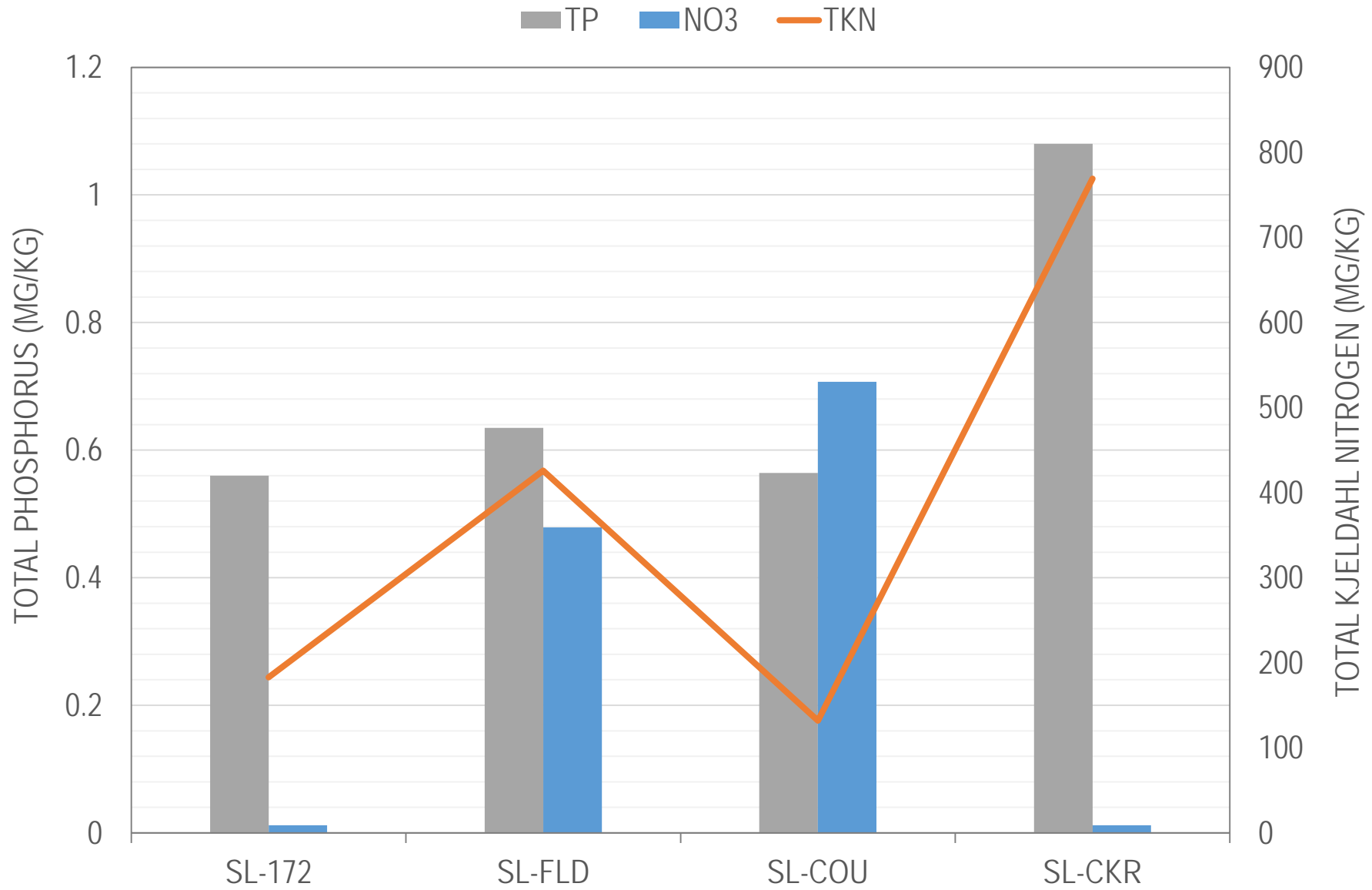


Silver Creek WDNR Median Total Suspended Solids

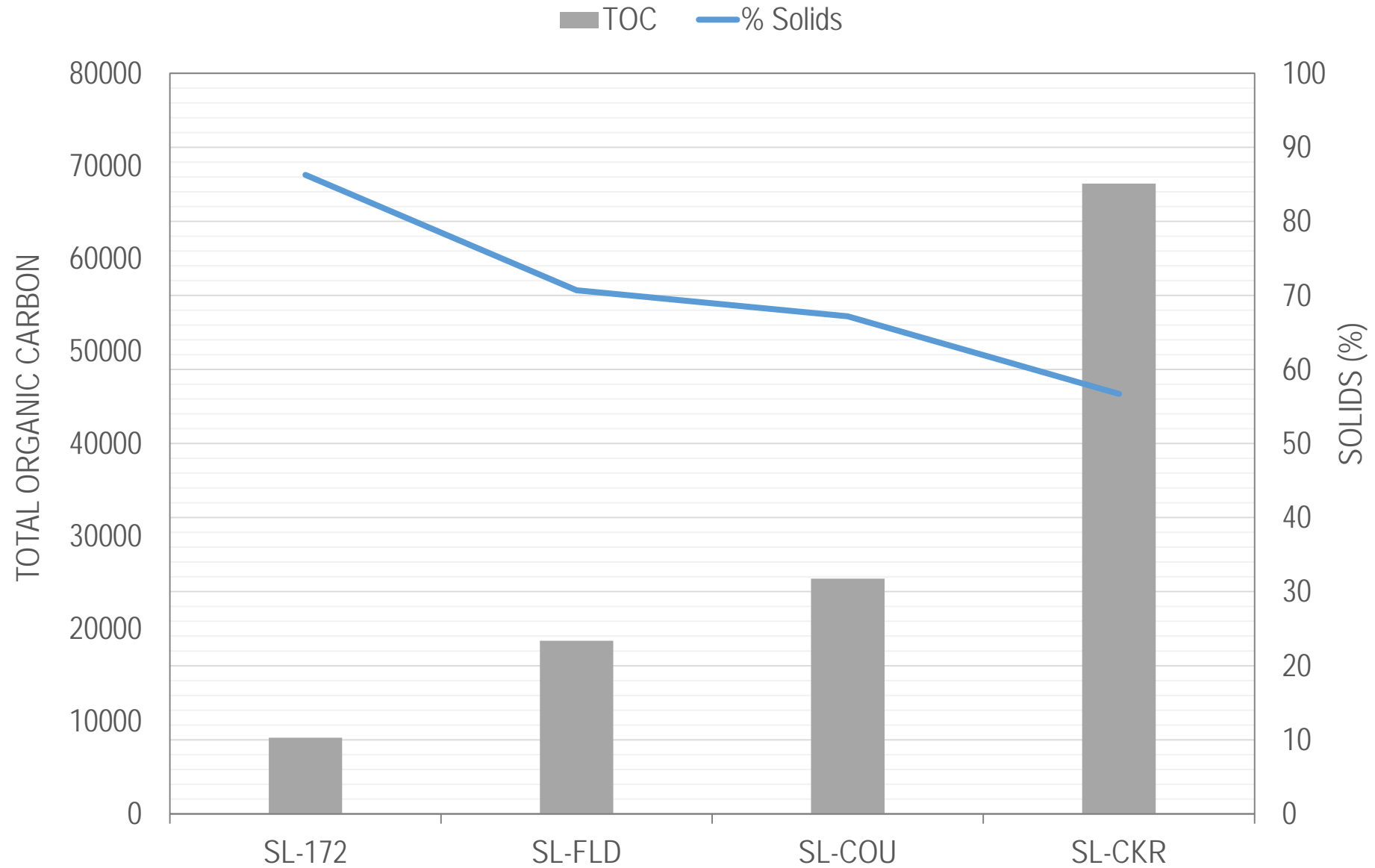




# Silver Creek Stream Bed Nutrients



# Silver Creek Stream Bed Solids





# 2017 Field Season Goals

- Silver Creek Pilot Project:
  - Collect stream and tile weekly samples in the spring and fall, bi-weekly samples during the summer for nutrients and suspended solids
  - Collect grab samples for comparison study with TNC – Fund for Lake Michigan wetland project
    - Add sample locations as additional wetland projects and other BMP's are installed and implemented
  - Paired grazing runoff monitoring project with UWGB
  - Work on data analysis, evaluation of BMPs and water quality improvement, plan and scout for future Adaptive Management work

# 2018 Field Season Goals

- Silver Creek Pilot Project :
  - Collect stream and tile weekly samples in the spring and fall, bi-weekly samples during the summer for nutrients and suspended solids
  - Collect grab samples for comparison study with TNC – Fund for Lake Michigan wetland project
    - Add sample locations as additional wetland projects and other BMPs are installed and implemented
  - Paired grazing runoff monitoring project with UWGB
- Adaptive Management Baseline:
  - New watershed exploration, stream walks, sample collection
  - Initial monitoring at select new locations to establish a baseline for nutrients and suspended solids



# Outreach Events

- 3<sup>rd</sup> Annual Student Monitoring Event
- Interseeder Dedication Ceremony
- Grazing and Cover Crop Field Day
- NRDA Trustees Tour
- State of Lake Michigan Conference Tour
- Over 25 presentations



# Next Steps in Silver Creek 2018-2019



- Cover Crops
  - How are cover crops going to be continued in the future?
- Residue and Tillage Management
  - How do we continue to encourage this in the future?
- Interseeding Cover Crops
  - How can we utilize the interseeder more?

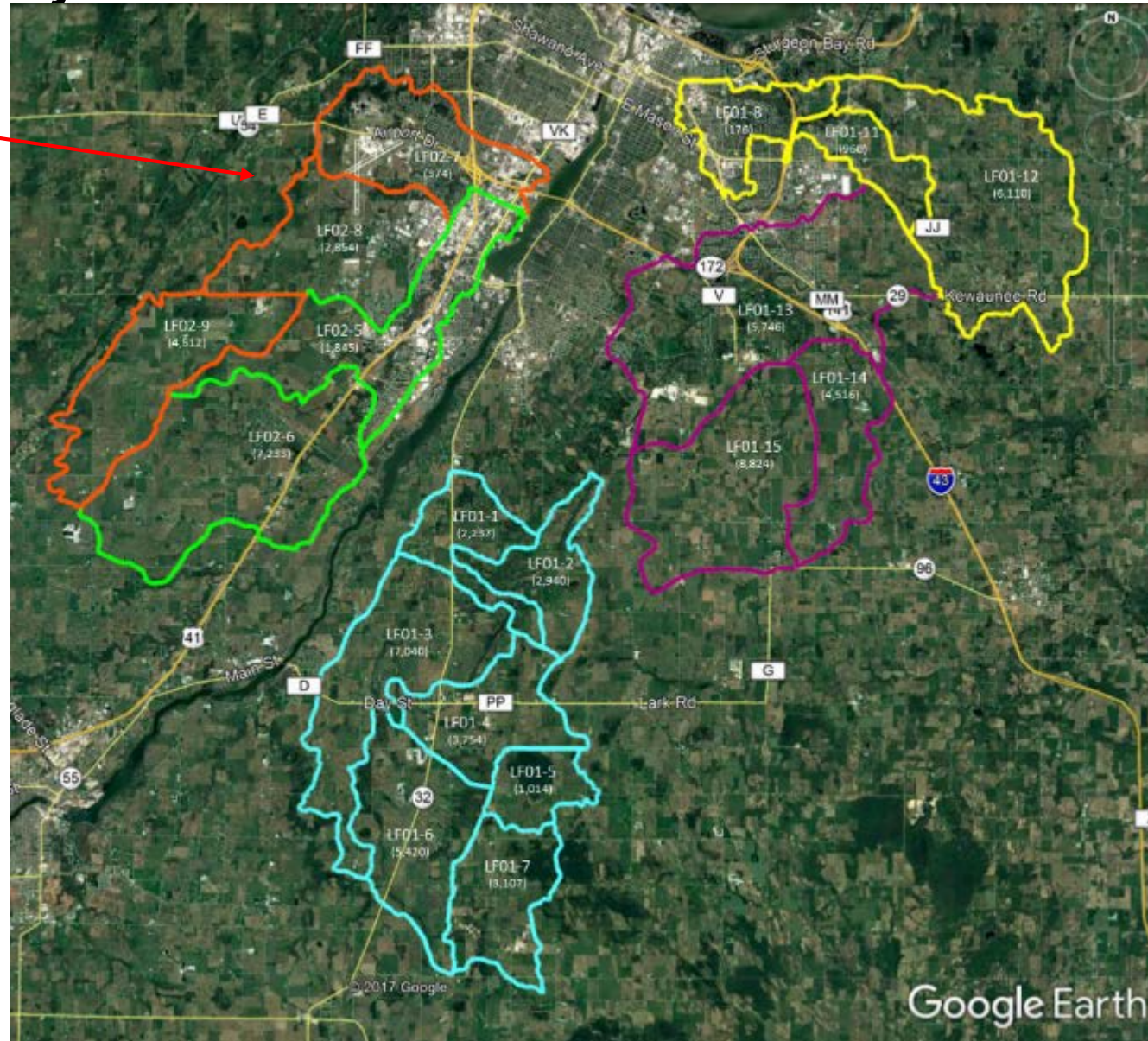




# Full Scale Adaptive Management Evaluations and Next Steps in 2018

# Opportunities in Adjacent Watersheds

Silver Creek



## Legend

- Dutchman Creek
- Ashwaubenon Creek
- Upper East River
- Bower Creek
- Baird Creek

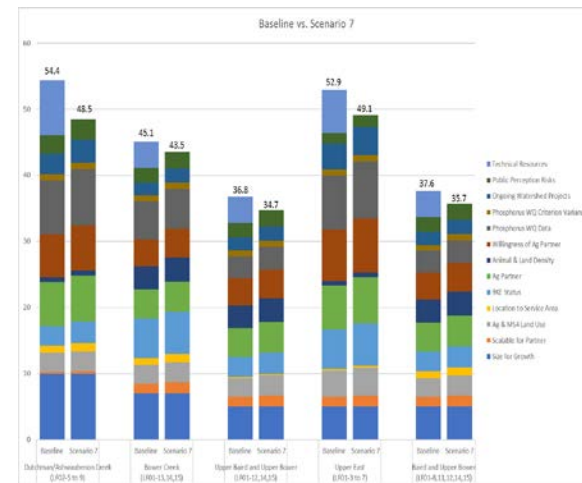
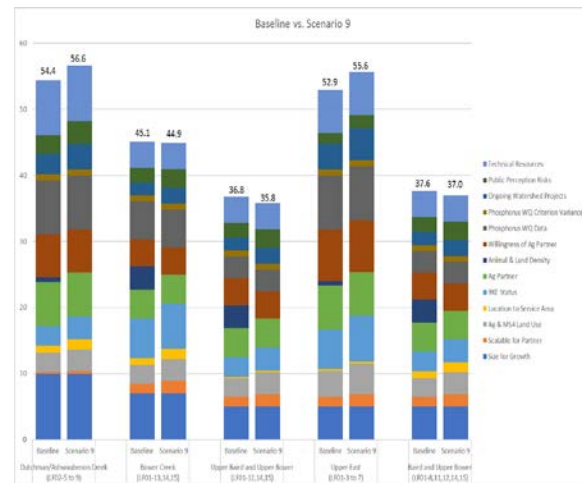
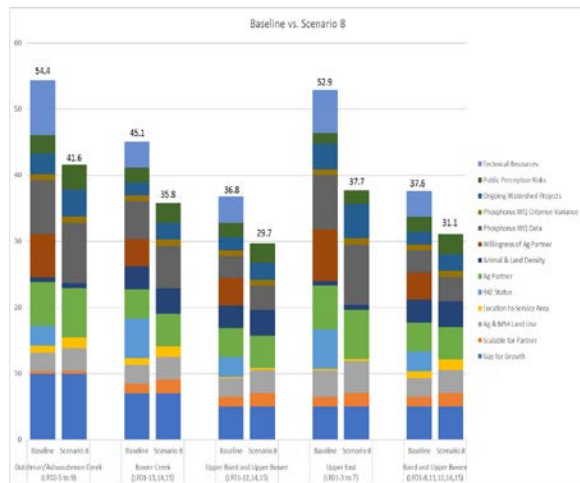
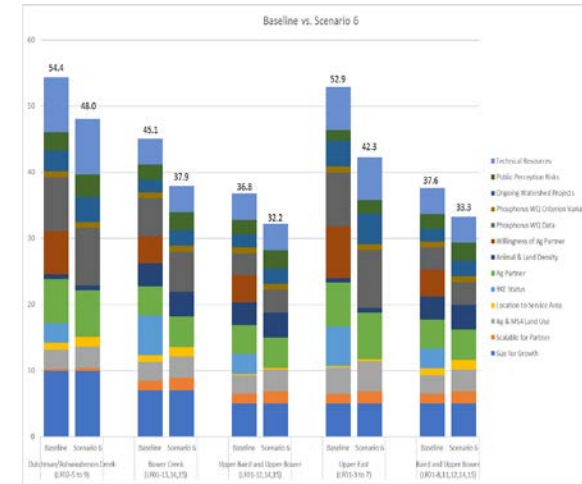
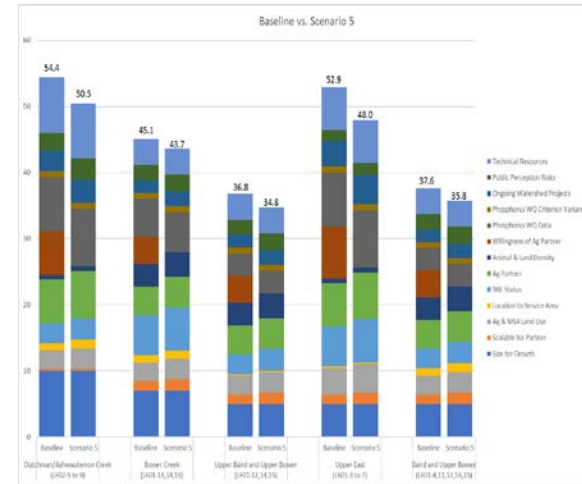
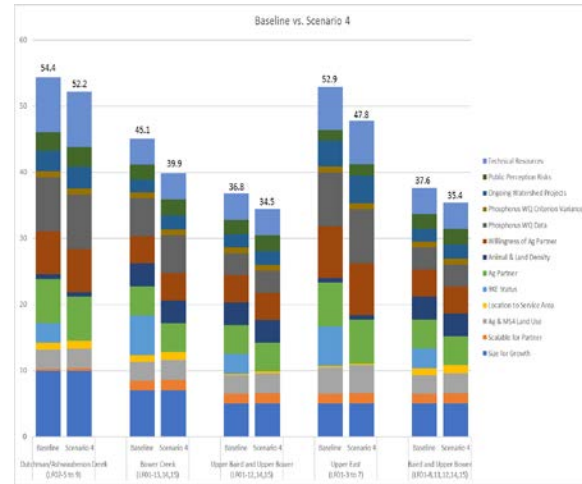
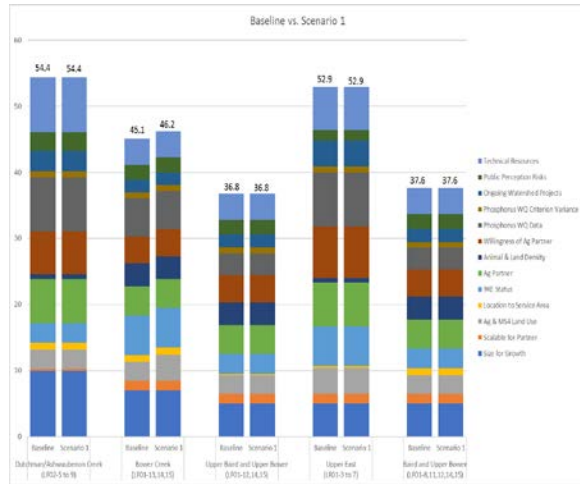
Google Earth



# Watershed Evaluation Criteria

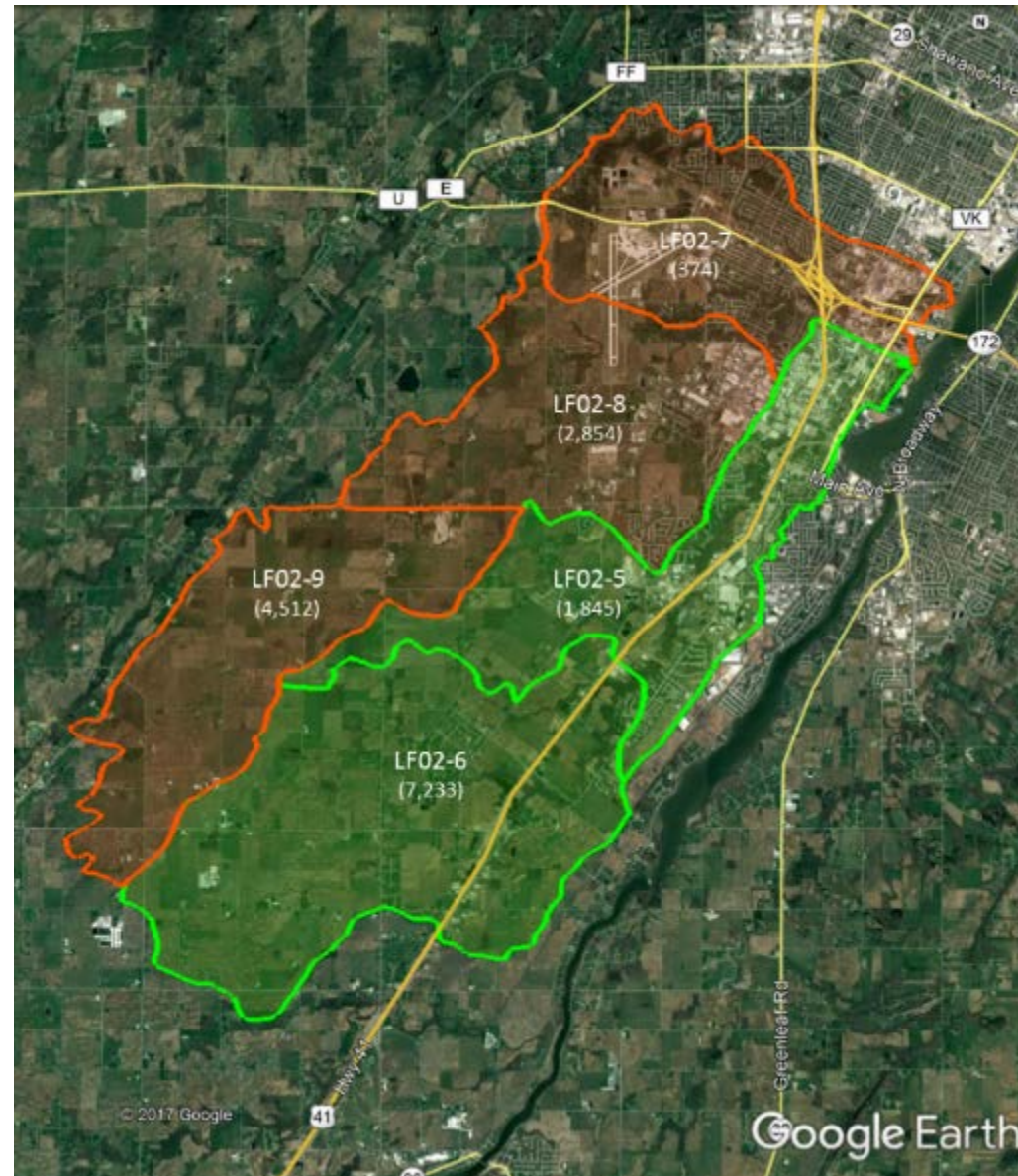
- **Sub-watershed Size:** The size of the Action Area to allow NEW Water to complete AM, while accounting for growth and partnerships, to satisfy TMDL mass allocations.
- **Sub-watershed Land Use and Agricultural Contribution:** The land use (e.g. MS4, forest, wetland, etc.) and agricultural phosphorus and total suspended sediment TMDL contributions from the Action Area.
- **Geographic Location:** The physical location within the Lower Fox River and NEW Water’s sewer service area (i.e. customer service area) and distance of the Action Area from NEW Water’s office.
- **Nine-Key Element Plan Status:** The status of Nine-Key Element Plans in the Action Area.
- **Potential Load Partners:** The potential partners that may exist in the Action Area who could join NEW Water in implementing an AM plan.
- **Flow and Water Quality Data:** The availability and thoroughness of in-stream flow and water quality data to evaluate progress and attainment of the AM Plan.
- **Ongoing Agricultural Watershed Projects:** The presence of other agricultural-focused watershed projects that have the potential to positively influence an AM plan.
- **Severity of Perceived Issues:** The identification technical or social “issues” in the Action Area that may positively or negatively impact implementation of an AM plan.
- **Technical Resources:** The presence of established technical resources that could be non-load based project partners and assist NEW Water with implementation of the AM plan, such as private agronomists, NRCS, or County staff.

# Multiple Scenarios Led to Similar Conclusions





# Ashwaubenon/Dutchman Creeks



# Next Steps for a Full Scale Program

- Memorandum of Understanding with WDNR
- Finalize Action Area Evaluation
- Preliminary Compliance Alternatives Plan (March 31, 2018)
  - Comparison to Treatment and Watershed Alternatives
  - Review with Commission
  - Chart path forward for compliance plan
- Adaptive Management Plan (December 31, 2018)
- Final Compliance Alternatives Plan (December 31, 2018)



# A Full Scale Watershed Management Program

- NEW Water Commission Approved Full Scale Planning in 2018
  - Position NEW Water to advance AM as part of the phosphorus and TSS compliance strategy
- Similar starting tasks as the Pilot
  - Workgroups and partnership agreements
  - Soil sampling
  - Field walks and conservation planning
- Water Quality Monitoring
- Flow Monitoring

# Two Workgroups to Advance Planning

- Watershed Inventory
  - Water resource opportunities beyond the farm field
  - Support prioritizing opportunities
- Biological Monitoring
  - Habitat assessments
  - Fish and macroinvertebrate sampling plans
  - Select location(s) and frequency



# Unique Opportunity

- The Environmental Programs Division is expanding upon a legacy of water quality attentiveness and monitoring.
- Adaptive Management provides a way for NEW Water to meet recent WPDES permit requirements through improving the health and quality of local watersheds.
- By linking the established AMP database with a new watershed database, NEW Water is uniquely situated to document future water quality improvement in Green Bay and area rivers.

# Partners in Silver Creek Pilot Project

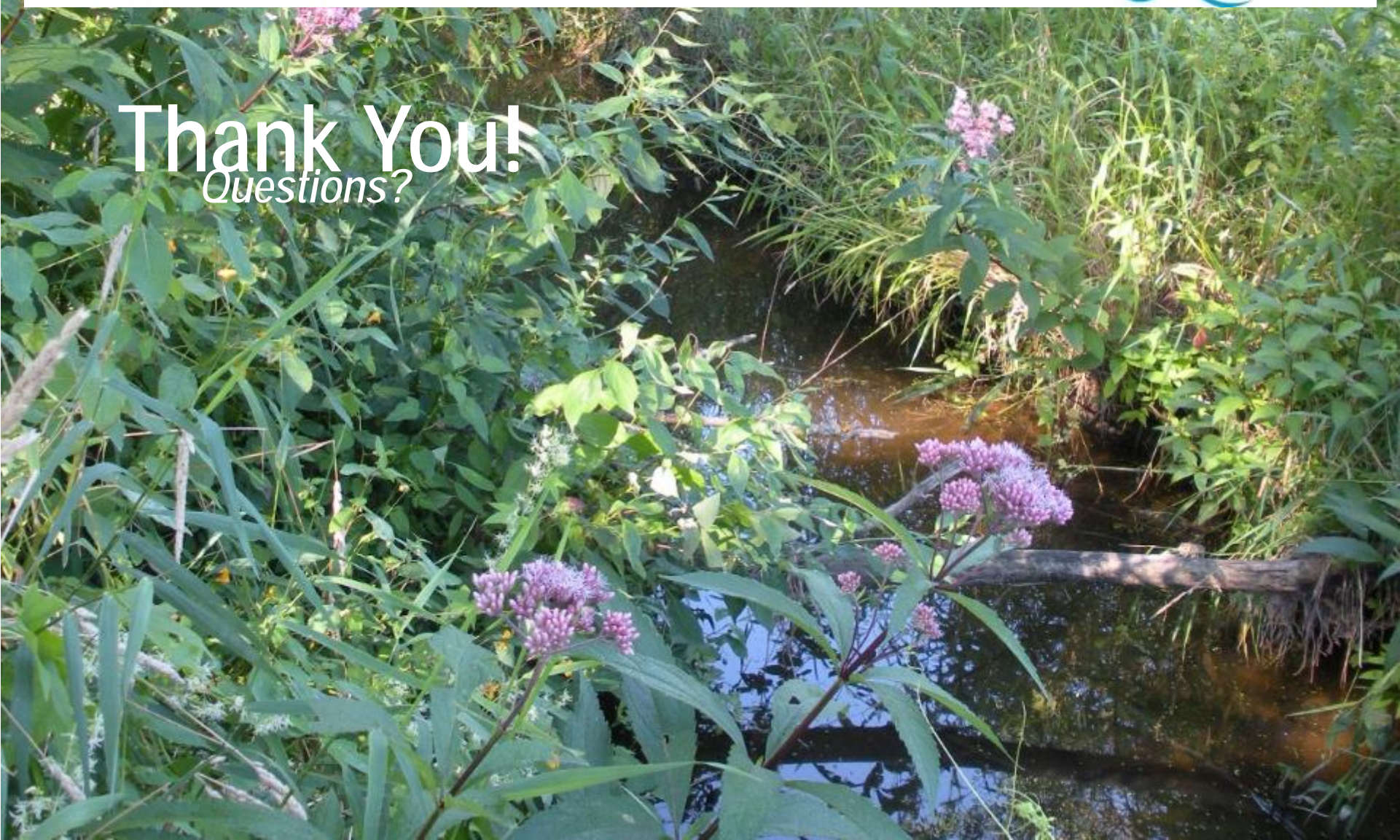






**NEW Water**  
The brand of the Green Bay  
Metropolitan Sewerage District

**Thank You!**  
*Questions?*



**Water**  
Green Bay  
Sewerage District



**Thank You!**

