Silver Creek Project

Partnering for Water Quality

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Agenda

- Welcome
- Introductions
- Overview
  - Goals of the pilot and what has led up to today
  - Accomplishments in 2017
  - Water Quality Monitoring Results
  - Break
  - Special Projects
  - Demonstration Farm Update
  - Silver Creek Next Steps
  - Full Scale Adaptive Management Evaluations and Next Steps in 2018

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Goals of the Silver Creek Pilot Project

- Assess the ability to collaborate with a diverse group of partners
- Test the willingness of landowners and growers to participate in a volunteer/incentive-based program
- Measure water quality response after conservation practice installation
- Evaluate the capacity of partners to assist
- Estimate overall cost of Adaptive Management
- Develop a framework for full scale Adaptive Management

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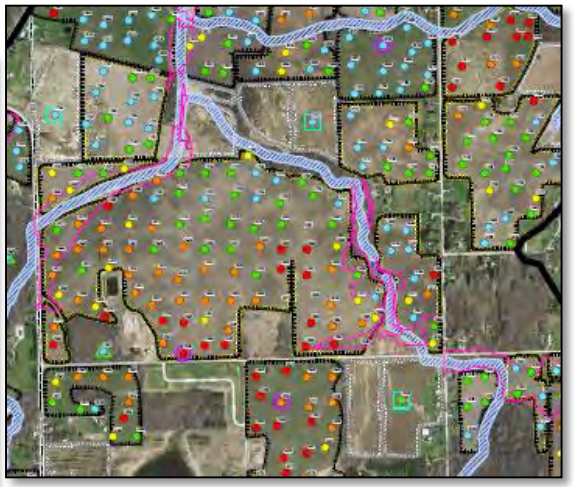
Silver Creek Pilot Project – From the Beginning

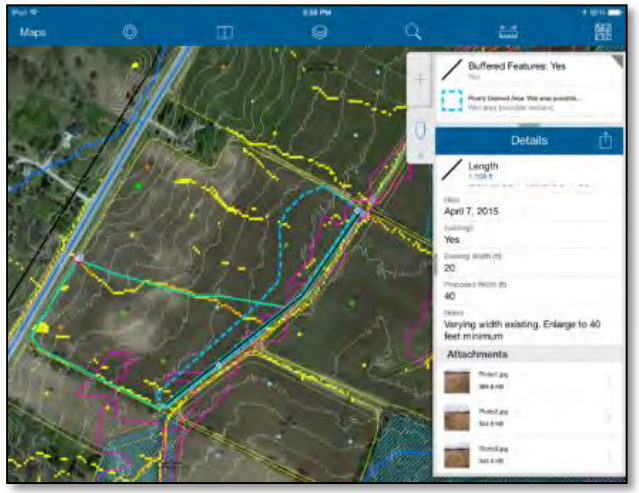
2014 – Project Kickoff

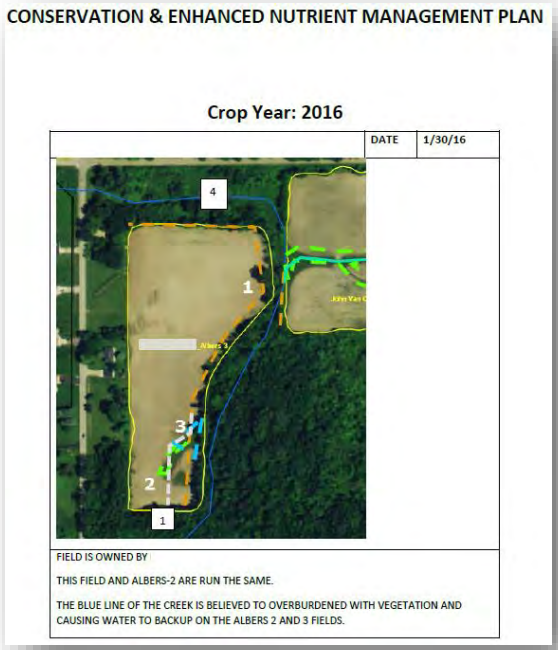
- Developed project partners
- Water quality sampling
- Soil sampling
- Stream surveys



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

Crop Year: 2016

DATE 1/30/16

FIELD IS OWNED BY

THIS FIELD AND ALBERS-2 ARE RUN THE SAME.

THE BLUE LINE OF THE CREEK IS BELIEVED TO OVERBURDENED WITH VEGETATION AND CAUSING WATER TO BACKUP ON THE ALBERS 2 AND 3 FIELDS.

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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….

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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%

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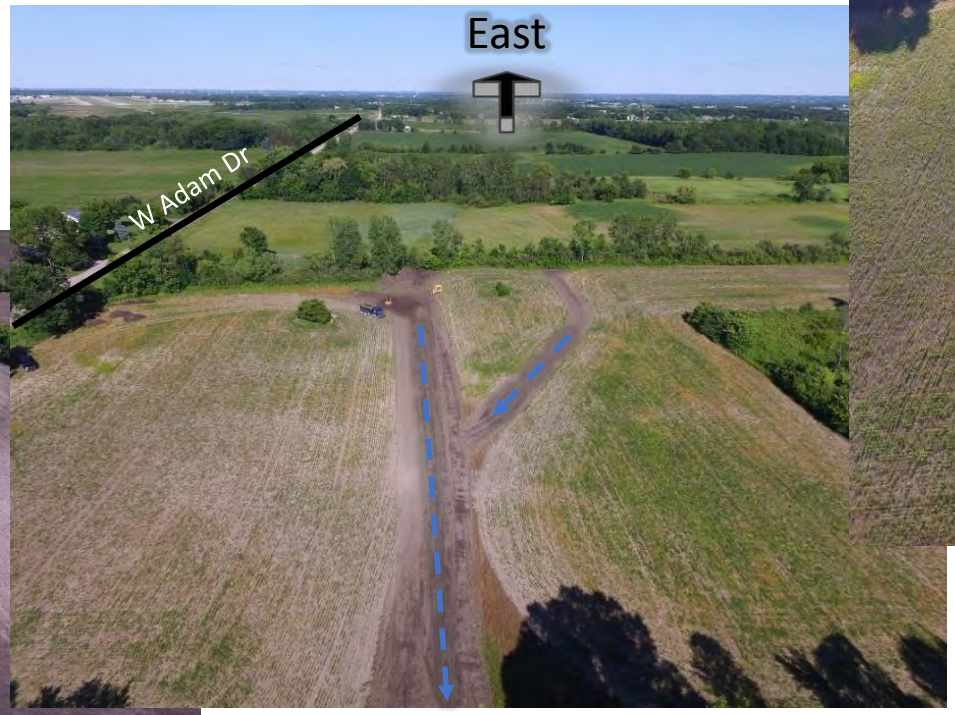
Timeline of Project #1

June 30, 2016



June 28, 2016

May 31, 2016

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Timeline of Project #1

Aug. 26, 2016

Oct. 4, 2016

Nov 29, 2016

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Timeline of Project #1

Dec 1, 2017

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Timeline of Project #2

Aug. 17, 2016

Aug. 26, 2016

Oct. 4, 2016

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Timeline of Project #2

Mar 23, 2017

June 13, 2017

Aug. 23, 2017

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Timeline of Project #2

Dec 1, 2017

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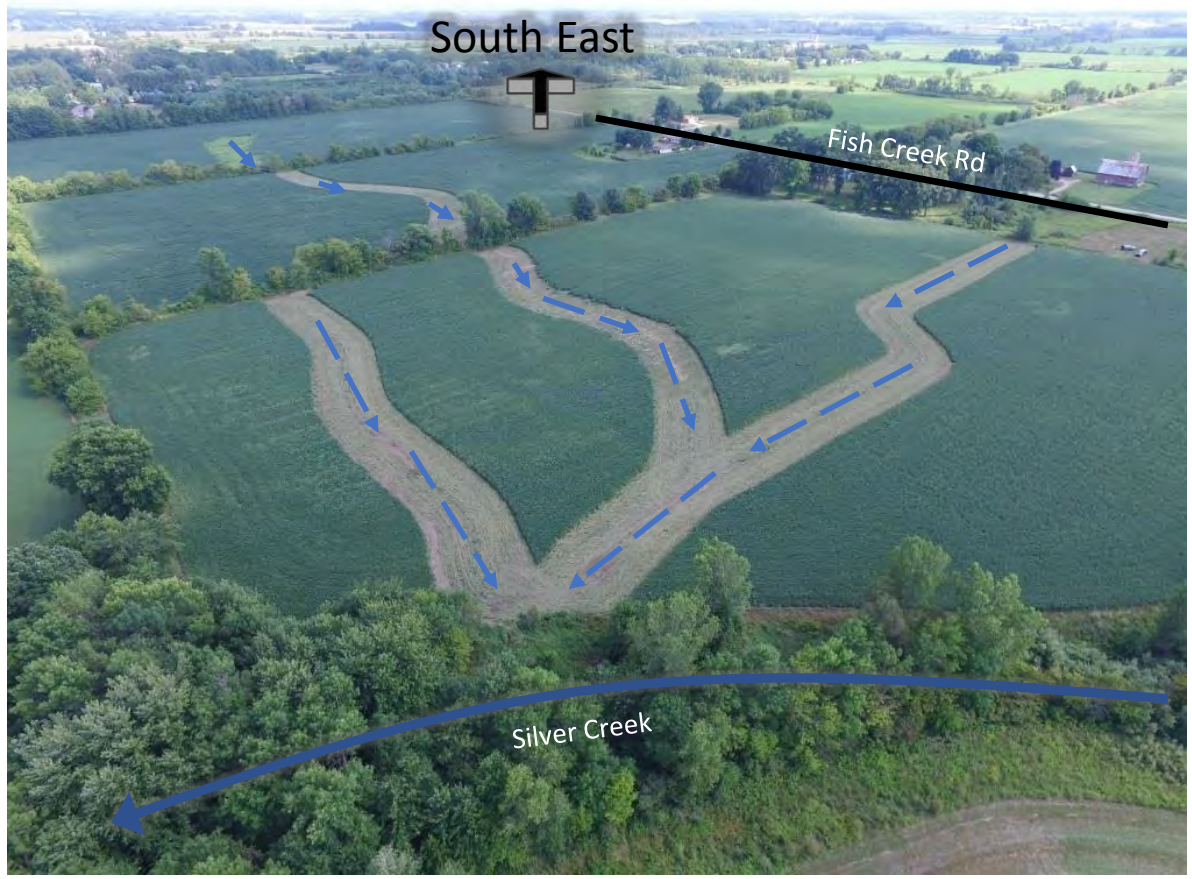
Timeline of Project #3



Aug. 16, 2016

Aug 31, 2016

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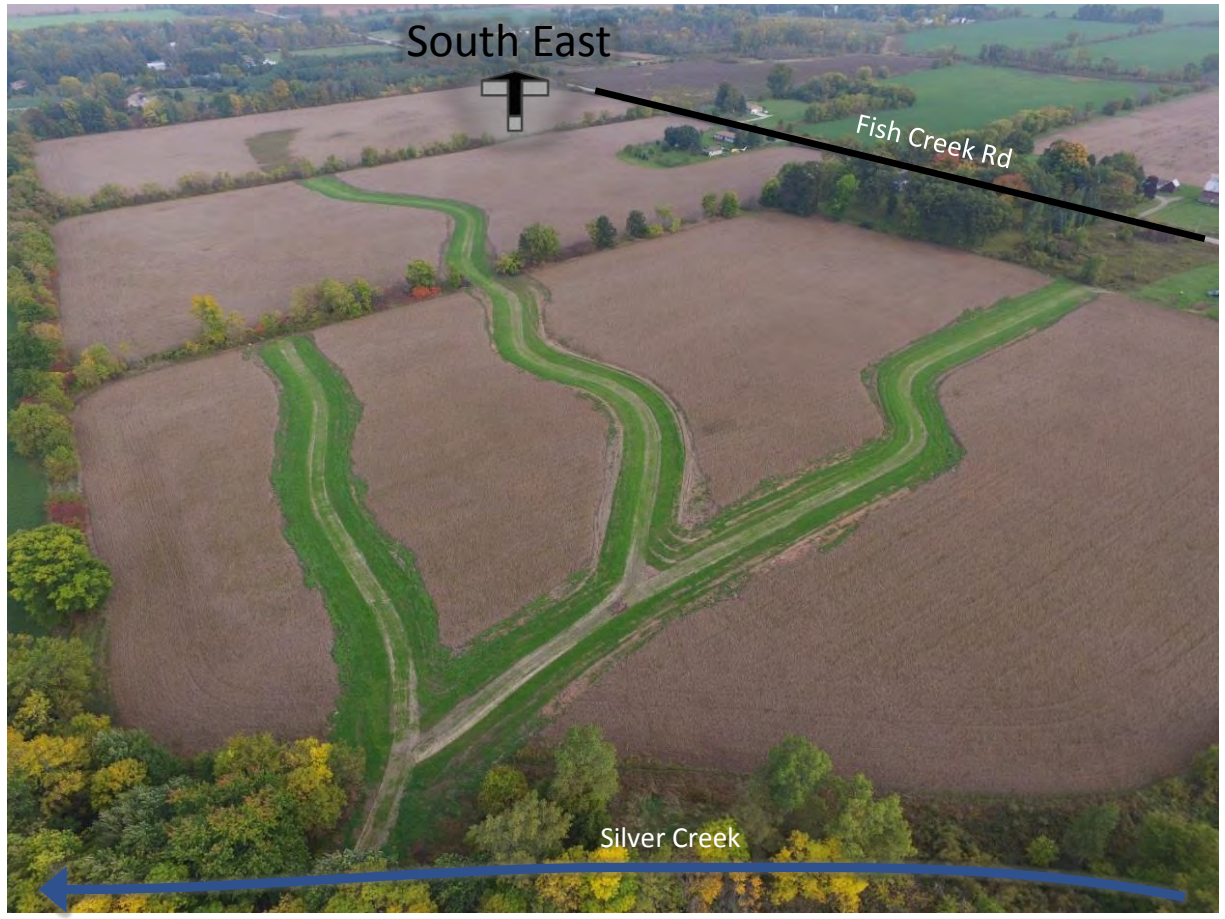
Timeline of Project #3



Oct. 4, 2016

Nov. 29, 2016

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Timeline of Project #3

June 13, 2017

Oct 9, 2017

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Timeline of Project #3

Dec 1, 2017

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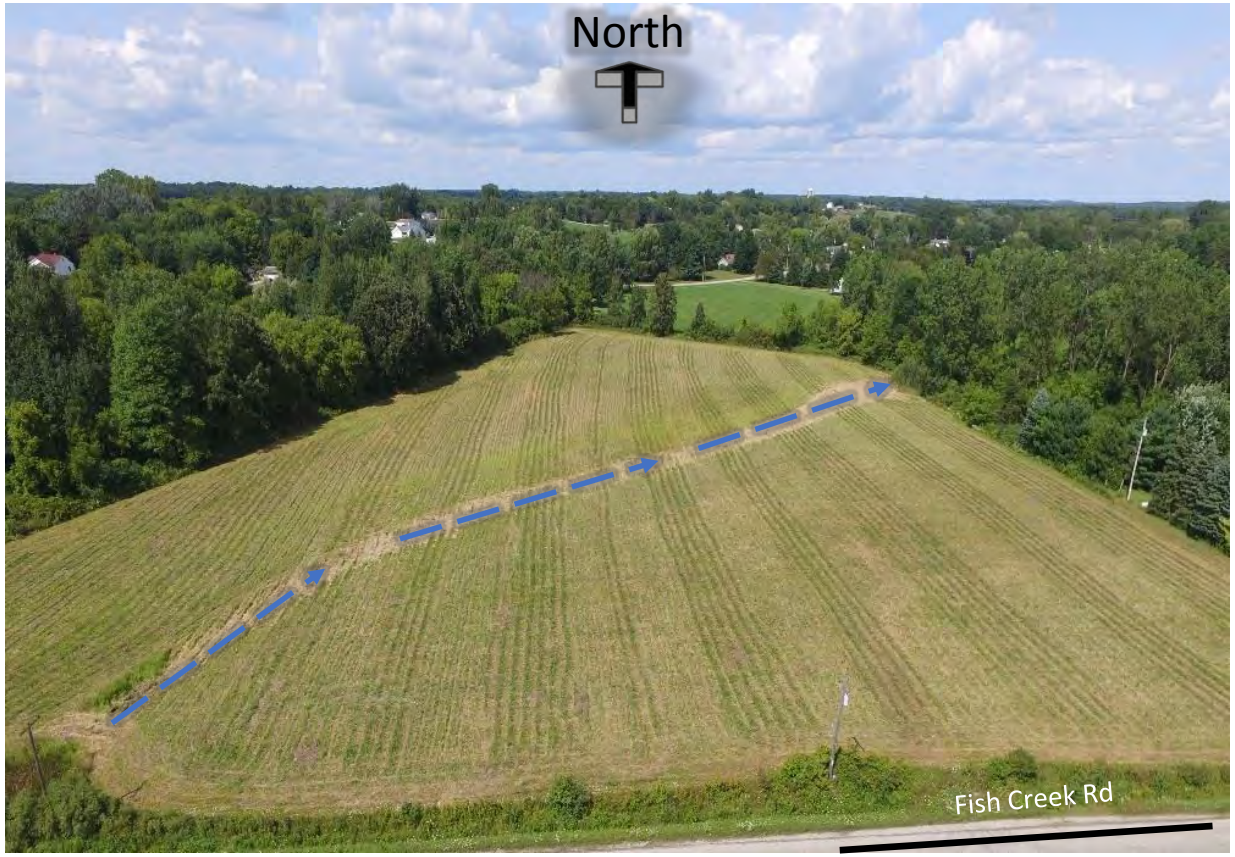
Timeline of Project #4

Mar. 27, 2017



Aug. 23, 2017

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Timeline of Project #4

Sept. 19, 2017

Dec 1, 2017

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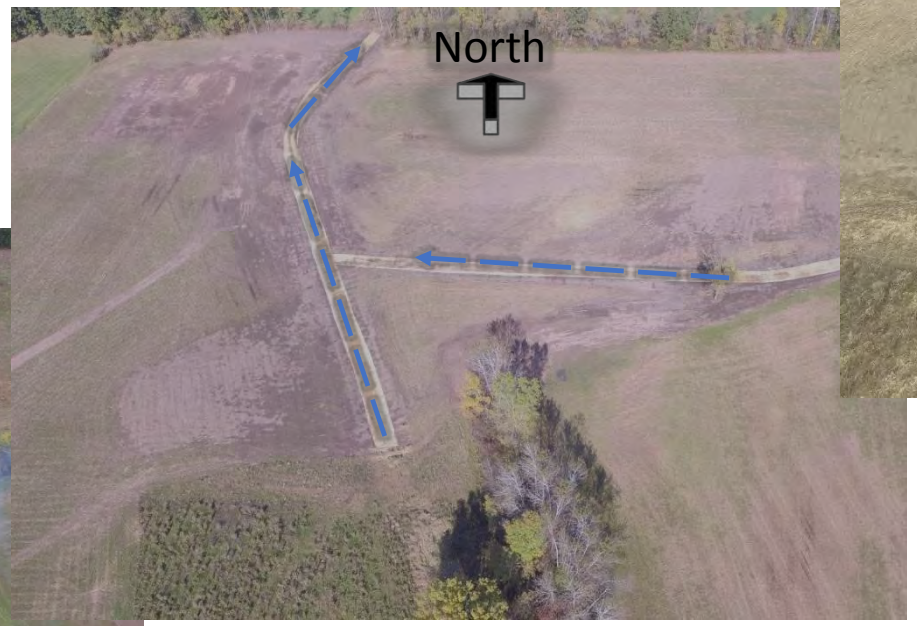
Timeline of Project #5

Sept. 29, 2017



Oct. 9, 2017

Dec 1, 2017

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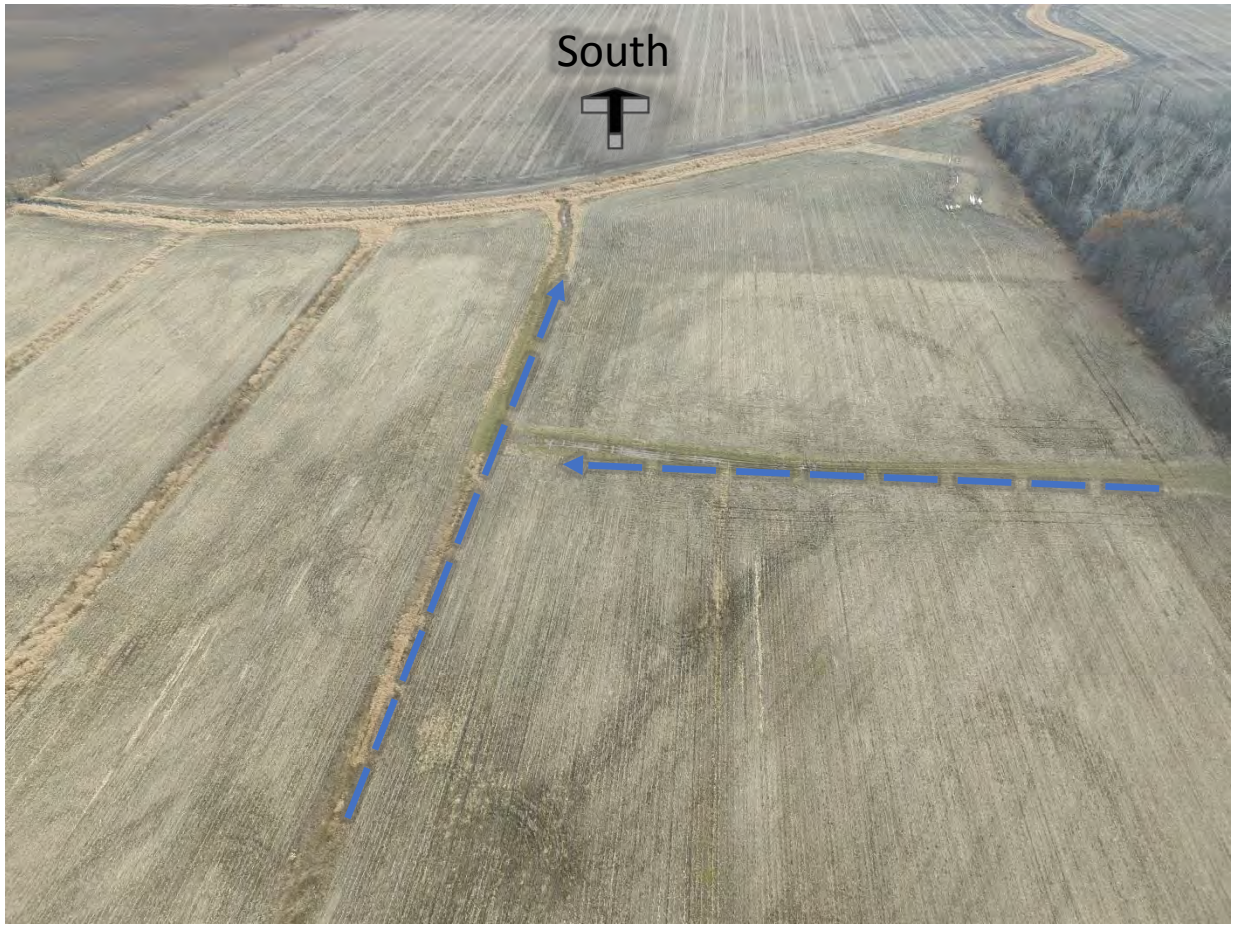
Timeline of Project #6

Dec 1, 2017



Dec 1, 2017

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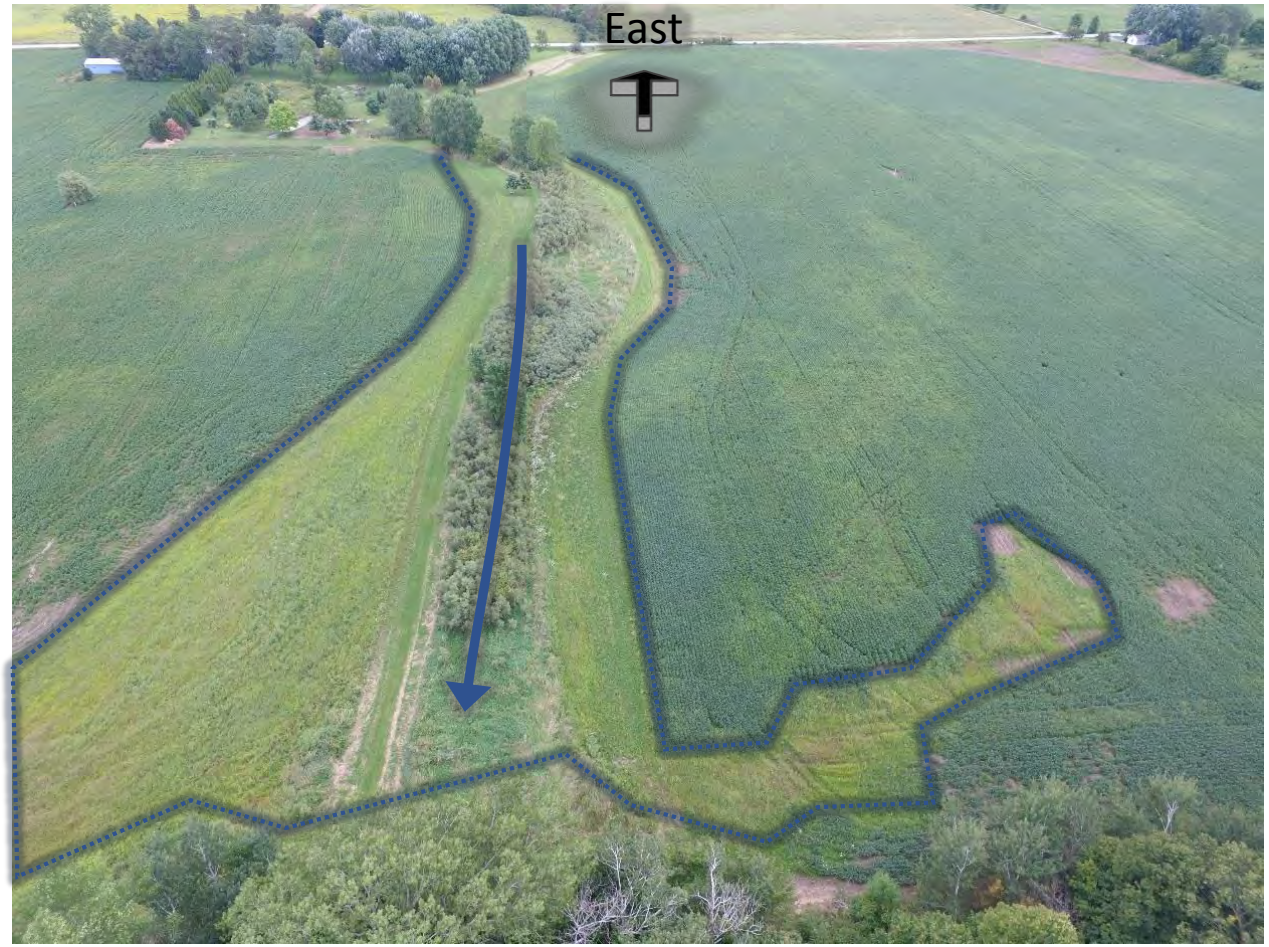
Filter Strips Projects



Aug. 23, 2017

Dec 1, 2017

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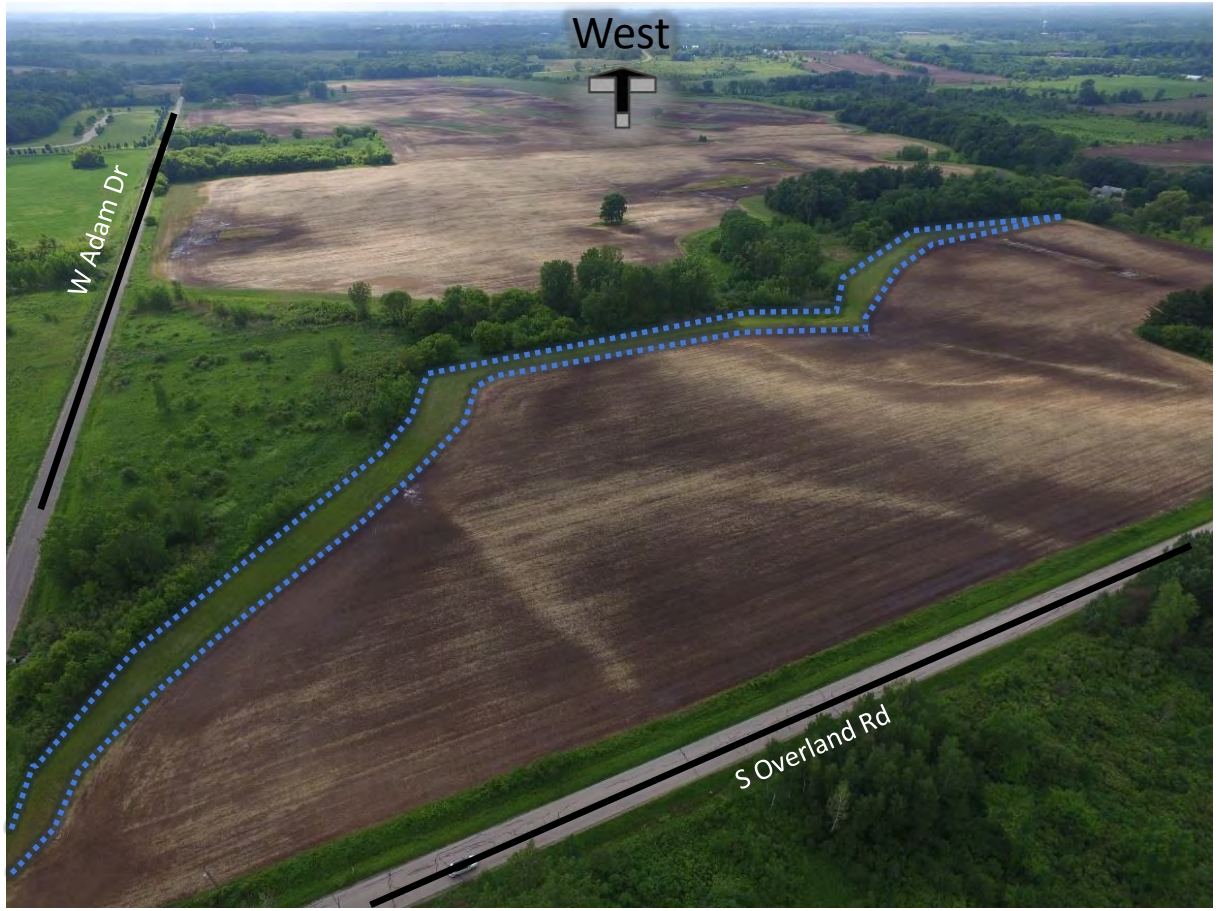
Filter Strips Projects



June 13, 2017

Dec 1, 2017

Water and Sediment Control Basins (WASCOB)

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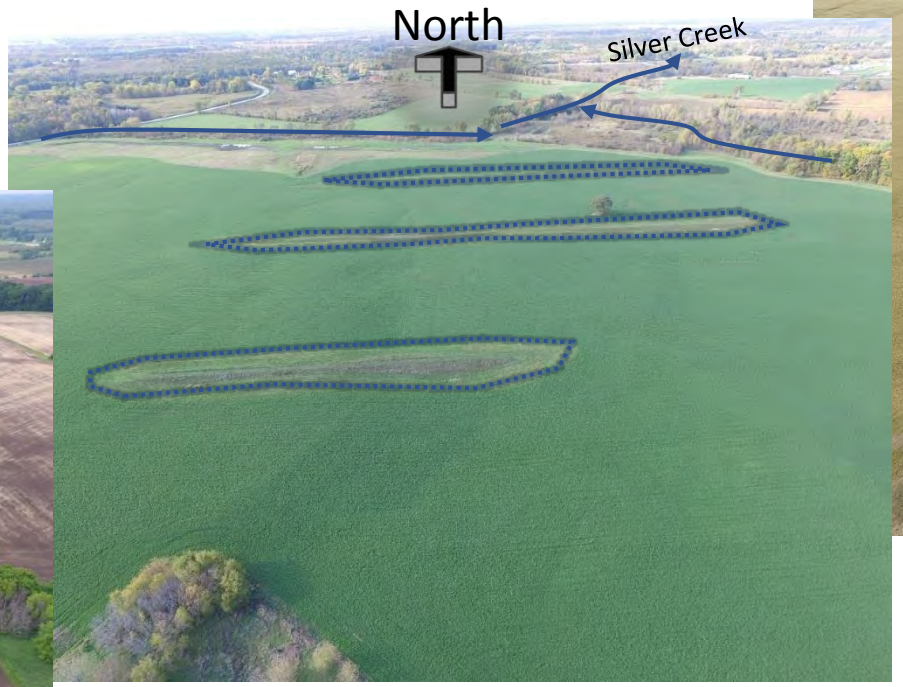
Water and Sediment Control Basins (WASCOB)

June 13, 2017



Oct. 9, 2017

Dec. 1, 2017

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No-Cost Critical Area Planting

Oct. 4, 2016

Oct. 9, 2017

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Cover Crop Interseeder

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Outreach Events

- 3rd 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

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Landowner/Grower Appreciation Luncheon

December 5, 2017

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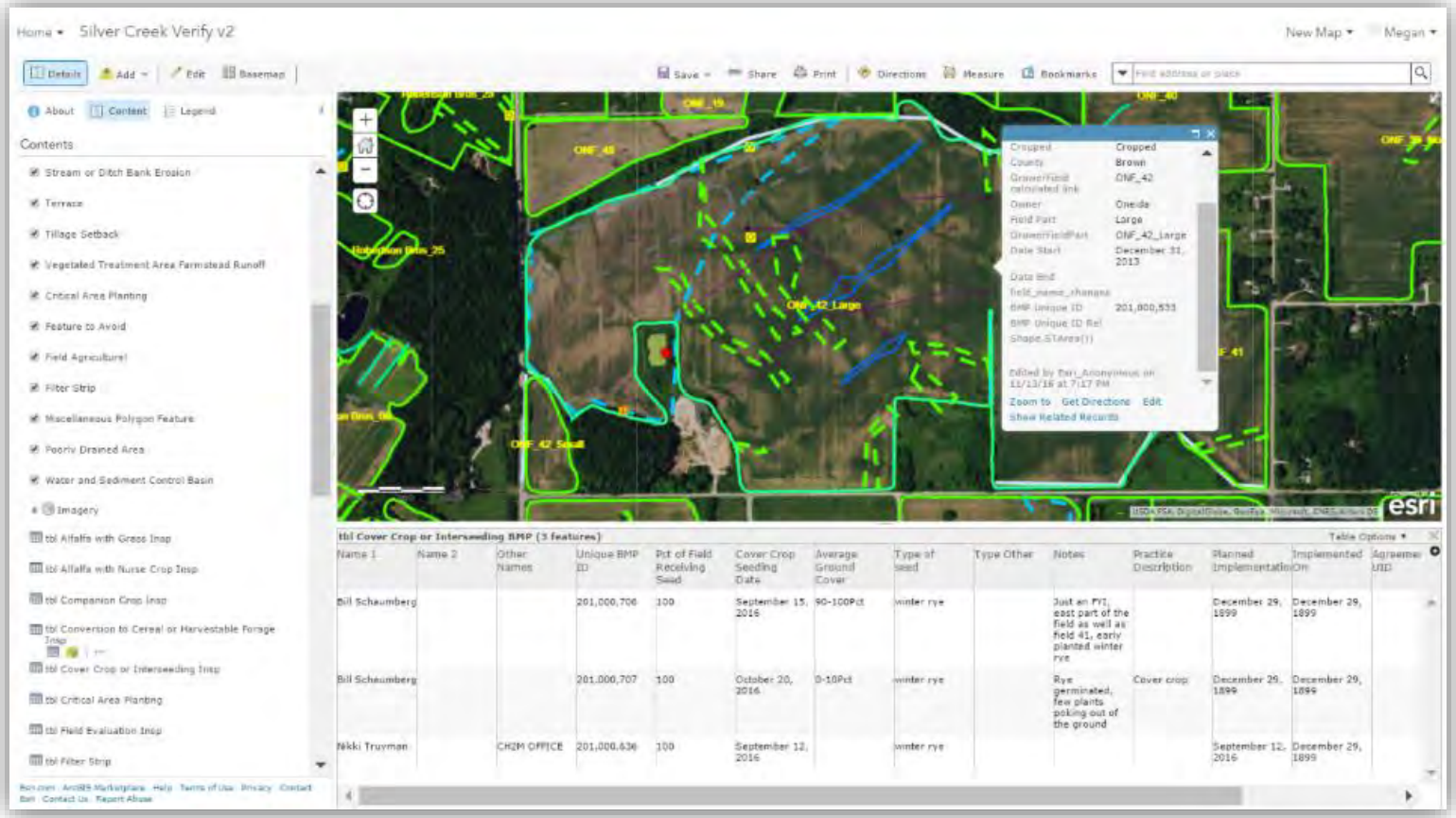
Collector App - Verification

- Verify practices before, during, and post-construction/implementation
- Inspection tables utilized
  - Structural practices
    - Pre-construction, During Construction, 100% Complete, and Maintenance inspections
  - Operational practices
    - BMP table related to field boundary
    - Inspection table related to BMP table



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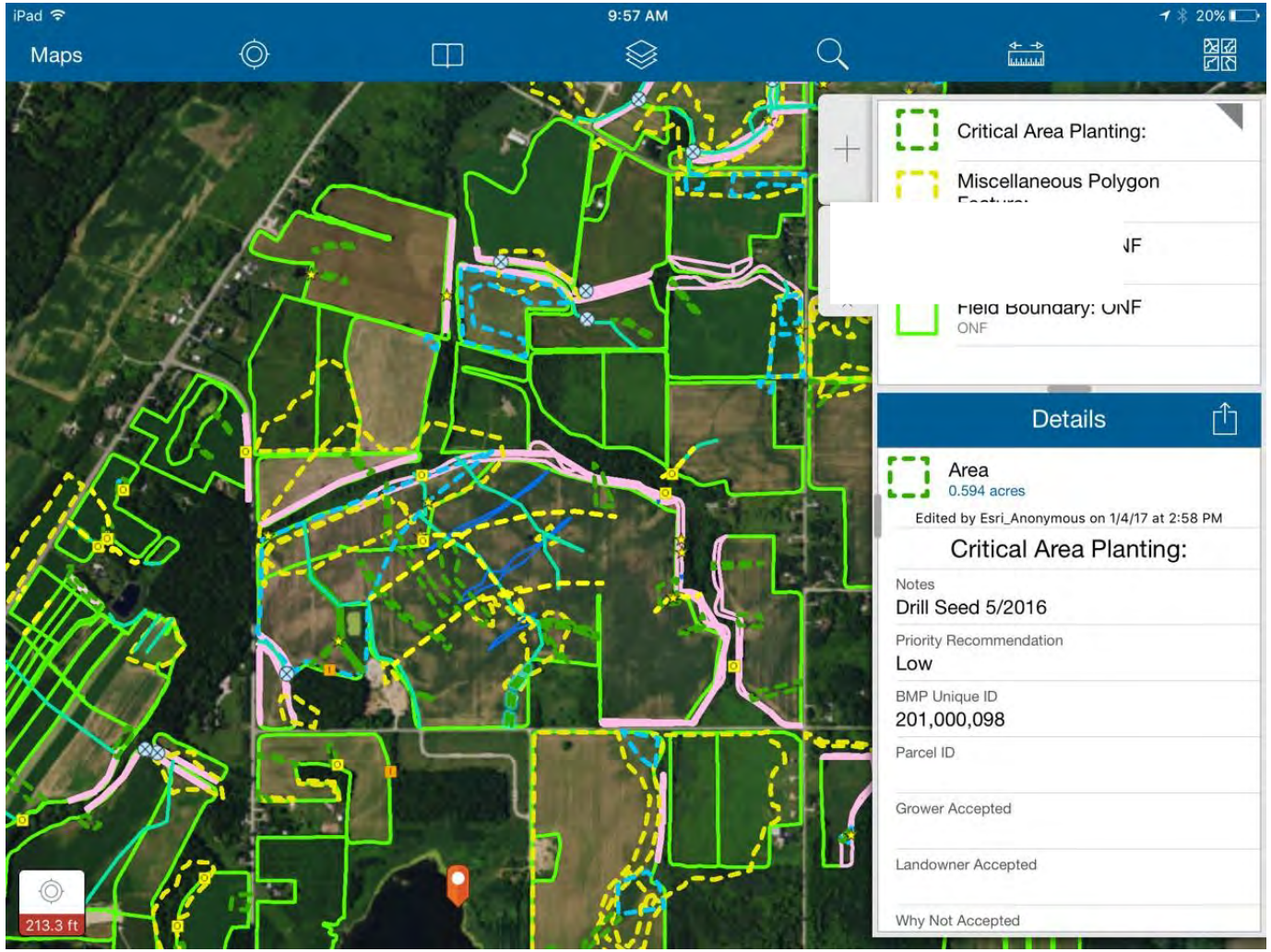
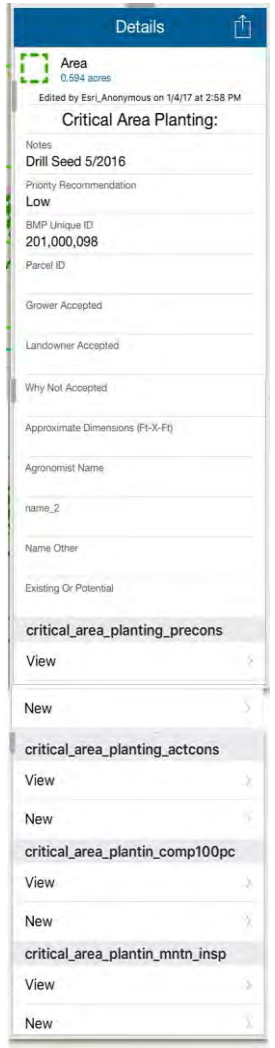
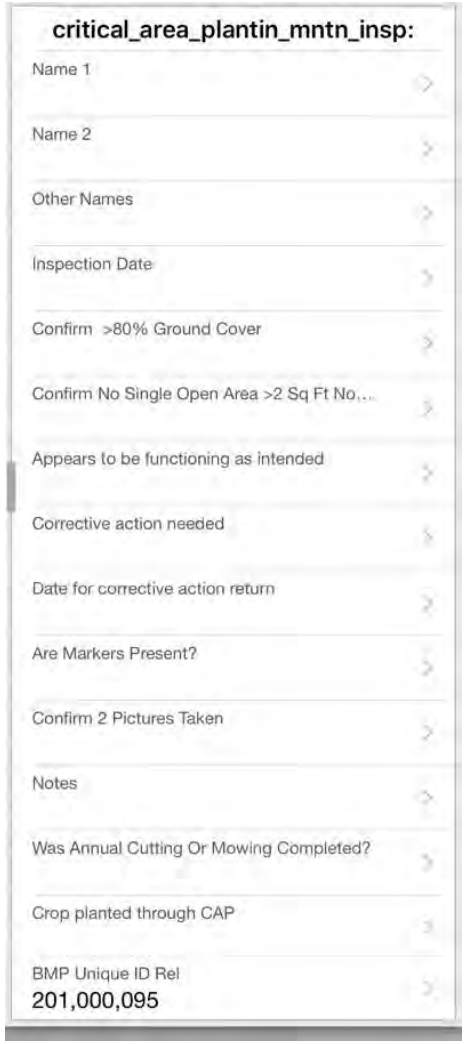
Collector App - Verification

- Structural Practices







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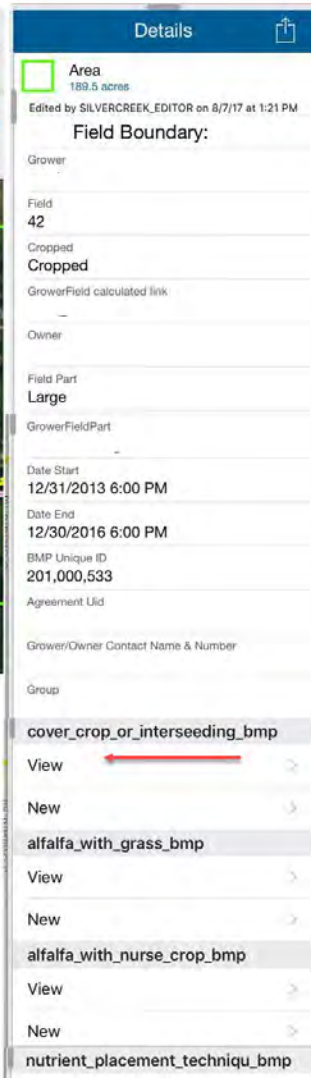
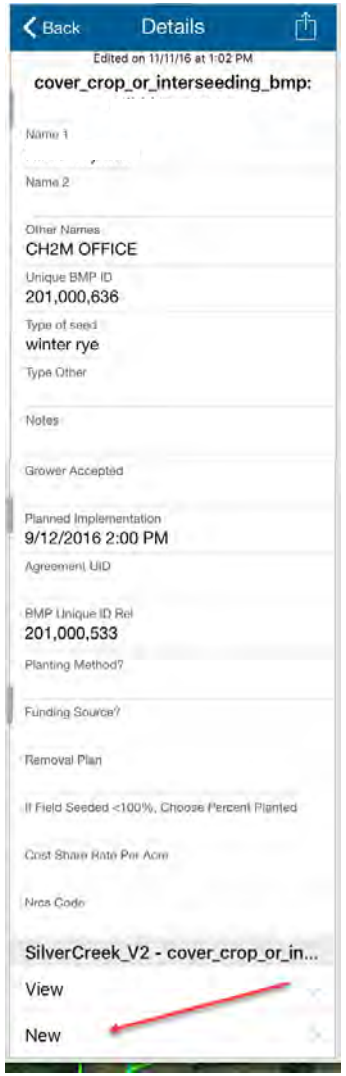
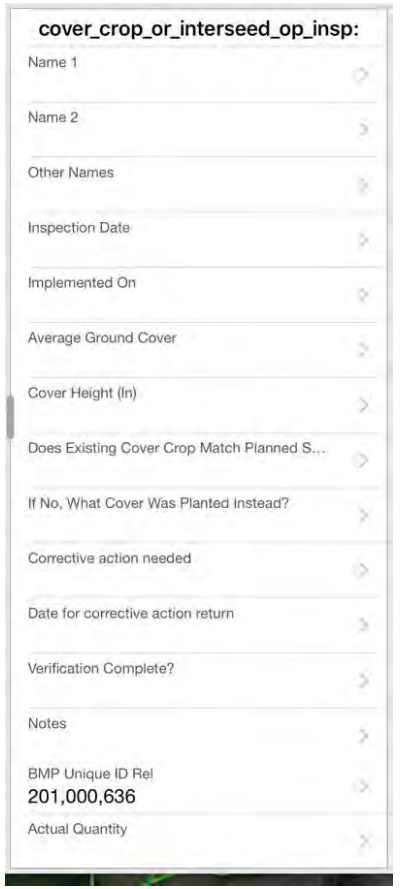
Collector App - Verification

- Operational Practices – all tables related to a field boundary







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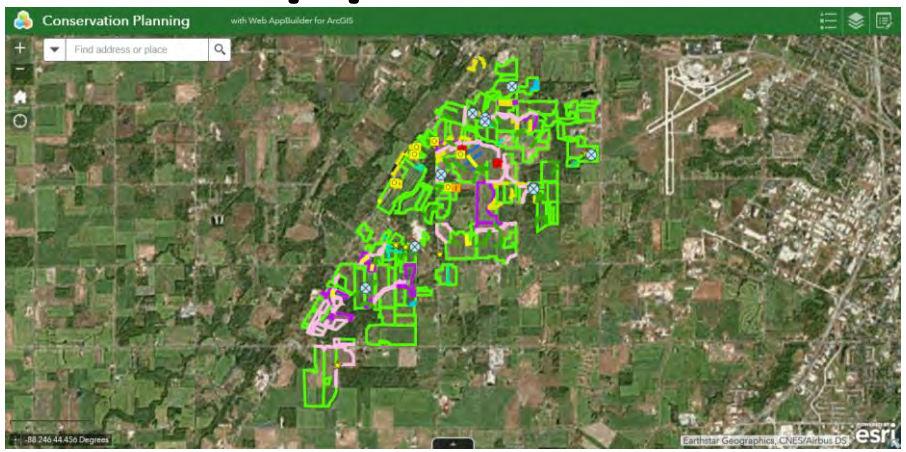
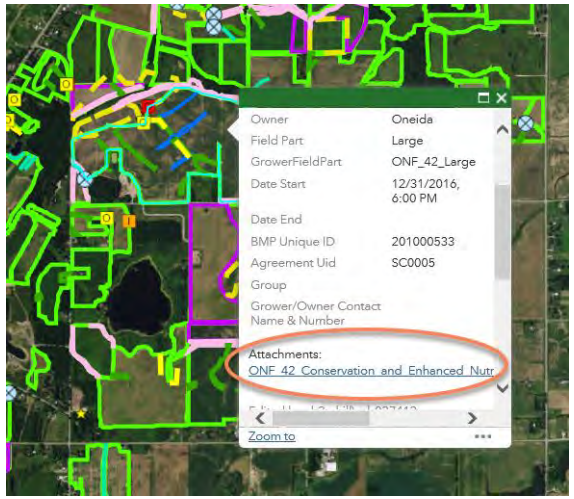
Collector App - Verification

Conservation & Enhanced Nutrient Management Plan available in AGOL as HTML link





CONSERVATION & ENHANCED NUTRIENT MANAGEMENT PLAN

Crop Year: 2018

ONF 42 2017-11-27

2015: THIS FIELD IS OPERATED THE SAME AS ONF 41. MANY HARD AND SOFT PRACTICES ARE THE SAME BETWEEN ONF 41 AND 42. CONSEQUENTLY IMPLEMENTATION OF THE PRACTICES ON BOTH FIELDS COULD BE COMPLETED AT THE SAME TIME. THIS FIELD IS OPERATED THE SAME AS ONF 41. MANY HARD AND SOFT PRACTICES ARE THE SAME BETWEEN ONF 41 AND 42. CONSEQUENTLY IMPLEMENTATION OF THE PRACTICES ON BOTH FIELDS COULD BE COMPLETED AT THE SAME TIME.

2016: THIS FIELD IS OPERATED THE SAME AS ONF 41. MANY HARD AND SOFT PRACTICES ARE THE SAME BETWEEN ONF 41 AND 42. CONSEQUENTLY IMPLEMENTATION OF THE PRACTICES ON BOTH FIELDS COULD BE COMPLETED AT THE SAME TIME. THIS FIELD IS OPERATED THE SAME AS ONF 41. MANY HARD AND SOFT PRACTICES ARE THE SAME BETWEEN ONF 41 AND 42. CONSEQUENTLY IMPLEMENTATION OF THE PRACTICES ON BOTH FIELDS COULD BE COMPLETED AT THE SAME TIME.

2017: IN WINTER RYE. E RYE PLANTED EARLY. W PLANTED AFTER WASCB. KILL OFF RYE IN SPRING. NO TILL PLANT ALFALFA INTO FIELD. VERT TILL ON E. MANUREPIT GONE PLANTED W CC. RE WALK PIT SPRING 2017 SEE WHERE DRAINAGE IS GOING CURRENTLY POSSIBLE RE SHAPE OF CONCENTRATED FLOW AREA WATERWAY BETWEEN L42 S42. ALFALFA PLANTING LATE SPRING TILE BLOW OUTS FIXED SAME TIME AS VWTS. TIME VWTS WITH 1ST ALF CUT IN WINTER RYE. E RYE PLANTED EARLY. W PLANTED AFTER WASCB. KILL OFF RYE IN SPRING. NO TILL PLANT ALFALFA INTO FIELD. VERT TILL ON E. MANUREPIT GONE PLANTED W CC. RE WALK PIT SPRING 2017 SEE WHERE DRAINAGE IS GOING CURRENTLY POSSIBLE RE SHAPE OF CONCENTRATED FLOW AREA WATERWAY BETWEEN L42 S42. ALFALFA PLANTING LATE SPRING TILE BLOW OUTS FIXED SAME TIME AS VWTS. TIME VWTS WITH 1ST ALF CUT

2018:

RECOMMENDED STRUCTURAL OR "HARD" PRACTICES

Hard Practice Feature Class				Conservation Plan Table				100% Complete Table
BMP Unique ID	BMP	Accepted? (Grower, Owner, Both)	Why Not Accepted?	Planning Year	Priority (High, Low, NR)	Comments	Implementation Planned (month/year)	Implementation Actual (Month/year)

Select a field boundary and scroll to the list of attachments to find the Conservation Plan Report

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Silver Creek Reflections

A Silver Creek Reflection

No-Cost Critical Area Planting

The Background

Silver Creek growers and land owners are working to improve their operations, while improving the soil and runoff water quality. The Silver Creek team worked with land owners and growers to install critical area plantings (CAPs) in areas where concentrated flow would cause soil erosion. CAPs are a conservation practice where ground cover remains even after crops are harvested, herbicides are applied, or fields are tilled. Different than grassed waterways, CAPs can be driven and planted through.

The Concern

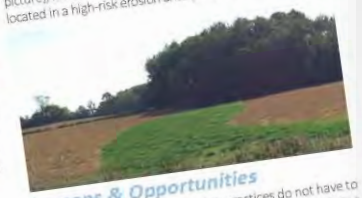
The Silver Creek team was concerned that concentrated flow areas would not be protected due to delayed CAP seeding until after harvest or herbicide spraying would prevent the seed mix from establishing prior to winter, especially if the harvest were late and weather conditions did not favor seed growth. There were also several areas that needed CAPs but funding was limited.

The Plan

The Silver Creek team worked with owners and growers whose fields required CAPs and were planted in rye grass or alfalfa, to simply leave in-place the cover to function as a cover crop. This required modifying the herbicide spraying plan to avoid killing-off the desired cover. The owner and growers agreed and the areas meant to remain as CAPs were mapped out, coordinated with the applicator, and not sprayed off after harvest.

These high-risk erosional areas were protected by a well-established wheat mixture that can be planted and harvested through.

On another example where the rotation was corning out of alfalfa, the existing alfalfa was sprayed off in all but the locations where CAPs were desired (dark green in above picture), resulting in a well-established conservation practice located in a high-risk erosion area (below picture).



Lessons & Opportunities

Critical area planting conservation practices do not have to be difficult or expensive to install. Simply leaving existing alfalfa or grass mixtures in place by avoiding spraying them with the rest of the field is all that can be required for an installed conservation practice.

Constant established cover is important for depressions and poorly drained areas and the No-Cost CAP is a simple and cost-effective way of implementation.

Utilizing CAPs protects fields from erosion when a grassed waterway is not needed or would not be acceptable to the grower. CAPs can also allow the grower to plant through which would not reduce the plantable acreage of the field.

The Result

The above photo shows the successful No-Cost CAP where wheat was not sprayed at the desired locations, and CAPs were essentially 'installed' at no-cost.

Ask your Silver Creek team how this experience could benefit you.

Jeff Smudde/NEW Water – 920-438-1071 | Nikki Truyman/Outagamie County LCD – 920-832-6077

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Great Lakes RESTORATION | Silver Creek Project | NEW Water

A Silver Creek Reflection

Aerial Seeding Cover Crop on Corn and Soybean Fields

The Background

Silver Creek growers and land owners are working to improve their operations, while improving the soil and water quality runoff. The Silver Creek team worked with land owners and growers to plant three fields with cover crops in 2016 – one corn and two soybean. Originally, the corn field was going to show new interseeding technology using a three-clover seed mix, but the equipment was not available in time. With this setback, we thought we'd have to wait to plant cover crop until after harvest.

The Concern

The Silver Creek team was concerned that delaying cover crop planting would not allow the cover crops to establish prior to winter, especially if the harvest were late and weather conditions did not favor back-to-back harvesting and planting. There was also concern if there would be sufficient time to complete both activities in the busy fall season, and that cover crops would not get planted on these sensitive fields.

The Contingency Plan

The Silver Creek team talked with the owner and grower to aerial seed the corn and soybean fields. Both agreed and a rye seed mix was selected. A date was picked that could have worked for both crops: yellow leaf soybeans prior to leaf drop and about two weeks prior to the anticipated corn silage harvest. Approximately 50% more seed was used for this method in comparison to inter-seeding.

Slow germination and growth on soybean field due to late aerial seeding and leaf litter preventing good seed-to-soil contact.

The Result

The soybean field may have been seeded a few days late because leaves had begun to fall and we think it prevented good seed-to-soil contact. Seed germination was present, but leaf litter prevented a dense growth of the cover crop. The corn field seeding was very successful; the timing was perfect.

Weed pressure in parts of the corn field seemed to shade-out the cover crop, but in areas where weeds were well controlled, that cover crop filled in beautifully, and will provide excellent soil erosion protection over the winter.

Lessons & Opportunities

Beautiful stand of winter rye cover crop in a corn field!

Aerial seeding corn and soybeans can work successfully. The cover crop did not impact crop yield and it will provide cover over the winter and soil erosion protection in the spring.

When timing aerial seeding application on soybean fields, seeding earlier rather than later prior to significant soybean leaf drop, will help ensure good seed-to-soil contact for germination.

Corn Field	Inter-Seeding		Aerial Seeding	
Cost Analysis:	3-clover Seed	Equipment	Rye Seed	Equipment
Cost ($/acre)	$30	$15	$21	$22
Total ($/acre)	$45		$43	

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A Silver Creek Reflection

Interseeding corn for a jumpstart on establishing cover crops

The Background

Silver Creek growers and land owners are working to improve their operations, while improving soil health and runoff water quality. Maintaining cover on fields over winter is important for keeping soil and nutrients on the fields, and out of the creek. Northern climates like that of Silver Creek can be challenging for establishing cover crops if planted after harvest. Interseeding can change that.

The Concern

The traditional linear approach of planting cover crops after harvest could lead to instances of less cover and poorly established cover crops. The decreased functionality of cover crops results in poor nutrient and soil retention.

The Plan

The Silver Creek team worked with Brown County and the Furid for Lake Michigan to purchase a 6-row interseeder from InterSeeder™ Technologies. This equipment is available and free of charge for growers in the Lower Fox River watershed interested in planting cover crops. The team worked with an interested grower to demonstrate interseeding between corn rows, and ensure herbicides would not negatively impact cover crop establishment.

The Result

The previous winter's rye cover crop was terminated in May by crimping, and a standard 30-inch row no-till corn planter was used shortly afterwards. When the corn reached V4 stage, the field was interseeded with soybeans, red clover, white clover, vetch, and radish in a single pass. Urea was applied at 150 lb/acre shortly after interseeding.

The machine maintained the correct spacing and the V4 corn remained un-harmed throughout the seeding. There was no negative impact on yield. Yield differences between fields which were interseeded and those that were not were thought to be due to soil and moisture differences. In fact, yield may be greater because some of the cover is harvested with the corn. An additional benefit was the established cover crop significantly reduced muddying the field and therefore reduced rutting and tracking of mud onto roadways when harvesting the corn silage.

Lessons & Opportunities

Cover crops are important conservation practices for soil, nutrient, and moisture retention of fields, and do not need to be planted in the traditional linear timeline that weather and late harvest can influence greatly. Using the InterSeeder™ to plant cover crops earlier in the season ensures cover crops mature to serve as fall and winter forage, while holding more nutrients and moisture and increasing organic matter to improve soil health. While an herbicide program may need to be adjusted to ensure proper cover crop establishment, agronomists in the Silver Creek project are aware and understand the needs for interseeding.

For more information on the InterSeeder™ including a fact sheet for its applicability to your fields, please visit www.newwater.us/projects/silver-creek-project/.

Ask your Silver Creek team how this experience could benefit you.

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Future Reflections

- Shaped Critical Area Plantings
- Grassed Waterways
- Filter Strips
- WASCBs
- Grazing
- Wetlands
- Vegetated Water Treatment Systems
- Additional Examples
  - Critical Area Plantings, interseeding, aerial seeding
- Other Ideas?

A Silver Creek Reflection

Interseeding corn for a jumpstart on establishing cover crops

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The machine maintained the correct spacing and the V4 corn remained un-harmed throughout the seeding. There was no negative impact on yield. Yield differences between fields which were interseeded and those that were not were thought to be due to soil and moisture differences. In fact, yield may be greater because some of the cover is harvested with the corn. An additional benefit was the established cover crop significantly reduced muddying the field and therefore reduced rutting and tracking of mud onto roadways when harvesting the corn silage.

Lessons & Opportunities

Cover crops are important conservation practices for soil, nutrient, and moisture retention of fields, and do not need to be planted in the traditional linear timeline that weather and late harvest can influence greatly. Using the InterSeeder™ to plant cover crops earlier in the season ensures cover crops mature to serve as fall and winter forage, while holding more nutrients and moisture and increasing organic matter to improve soil health. While an herbicide program may need to be adjusted to ensure proper cover crop establishment, agronomists in the Silver Creek project are aware and understand the needs for interseeding.

For more information on the InterSeeder™ including a fact sheet for its applicability to your fields, please visit www.newwater.us/projects/silver-creek-project/.

Ask your Silver Creek team how this experience could benefit you.

Jeff Smudde/NEW Water – 920-438-1071
Nikki Raimer/Outagamie County LCD – 920-832-6077

Great Lakes RESTORATION | Silver Creek Project | NEW Water

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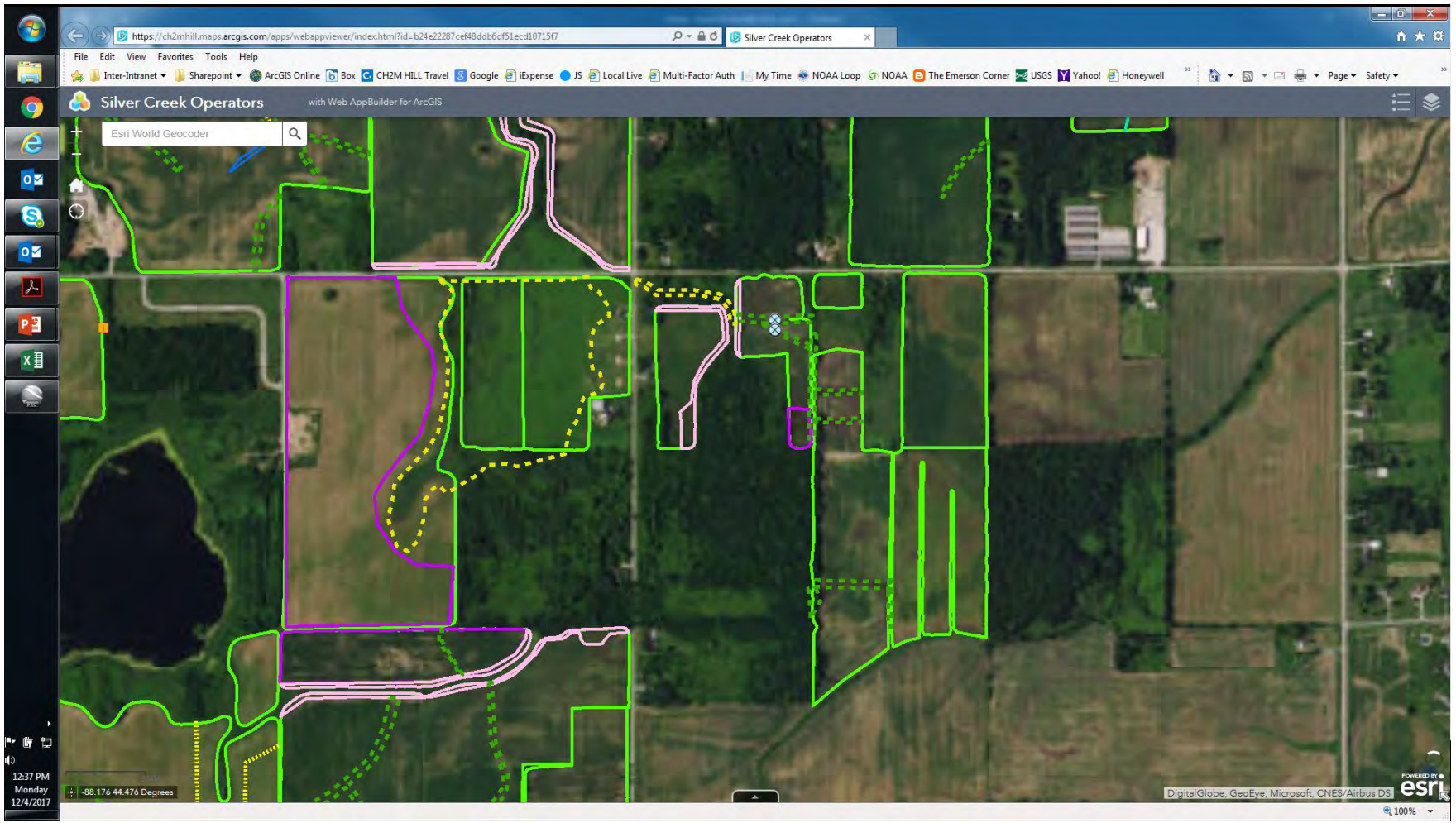
Live Map Showing Conservation Practices

https://ch2mhill.maps.arcgis.com/apps/webappviewer/index.html?id=b24e22287cef48ddb6df51ecd10715f7



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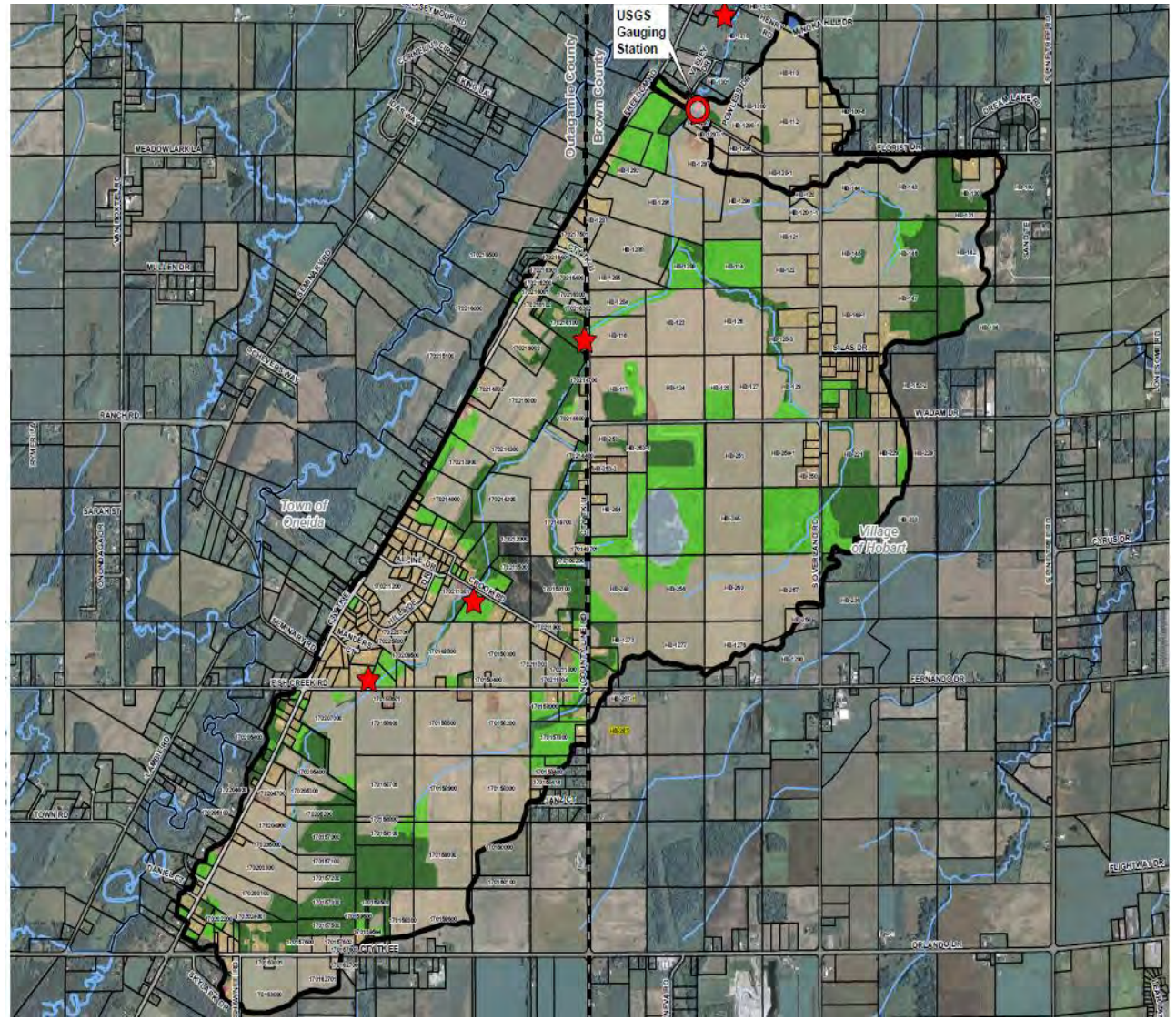
Water Quality Monitoring



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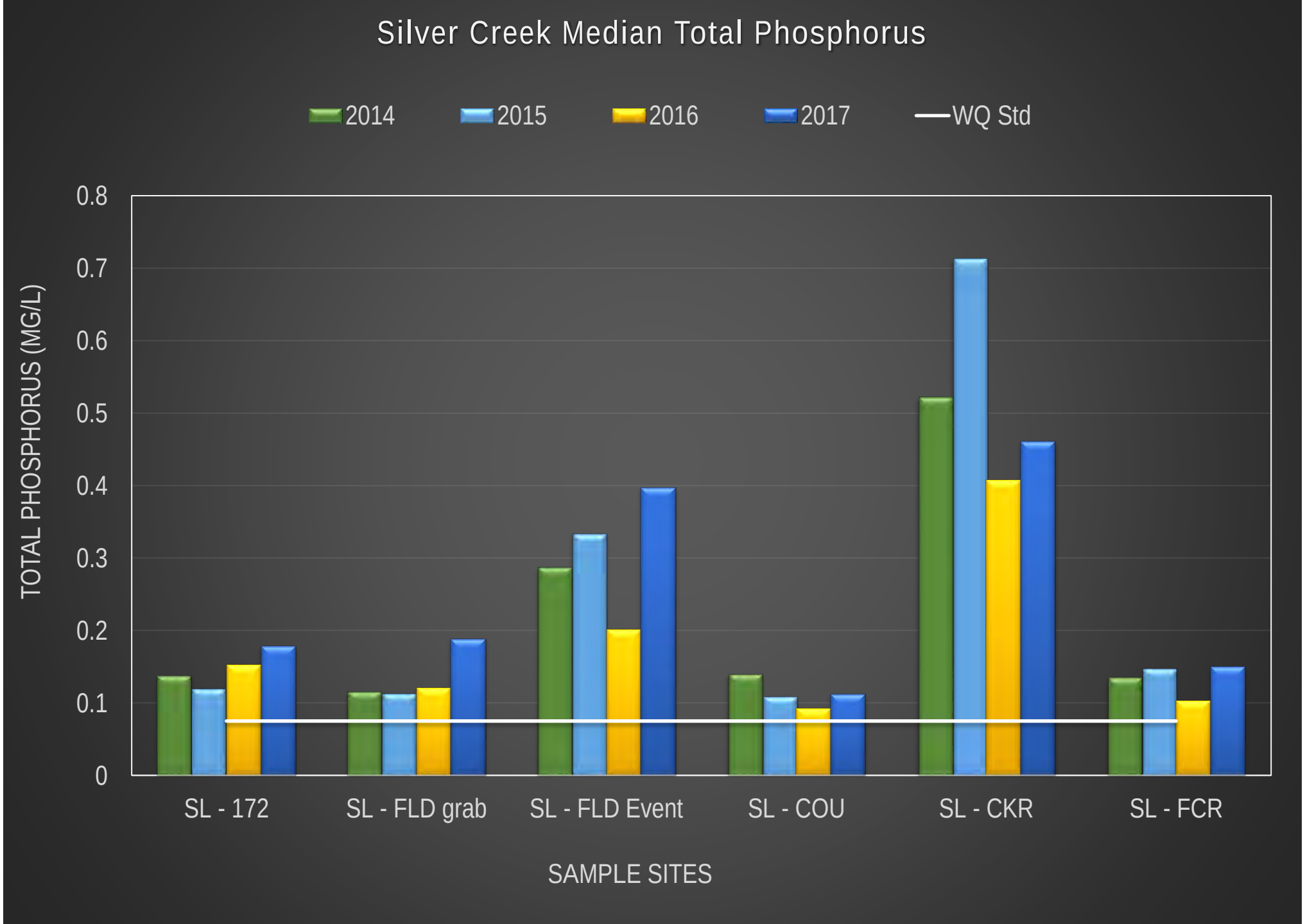
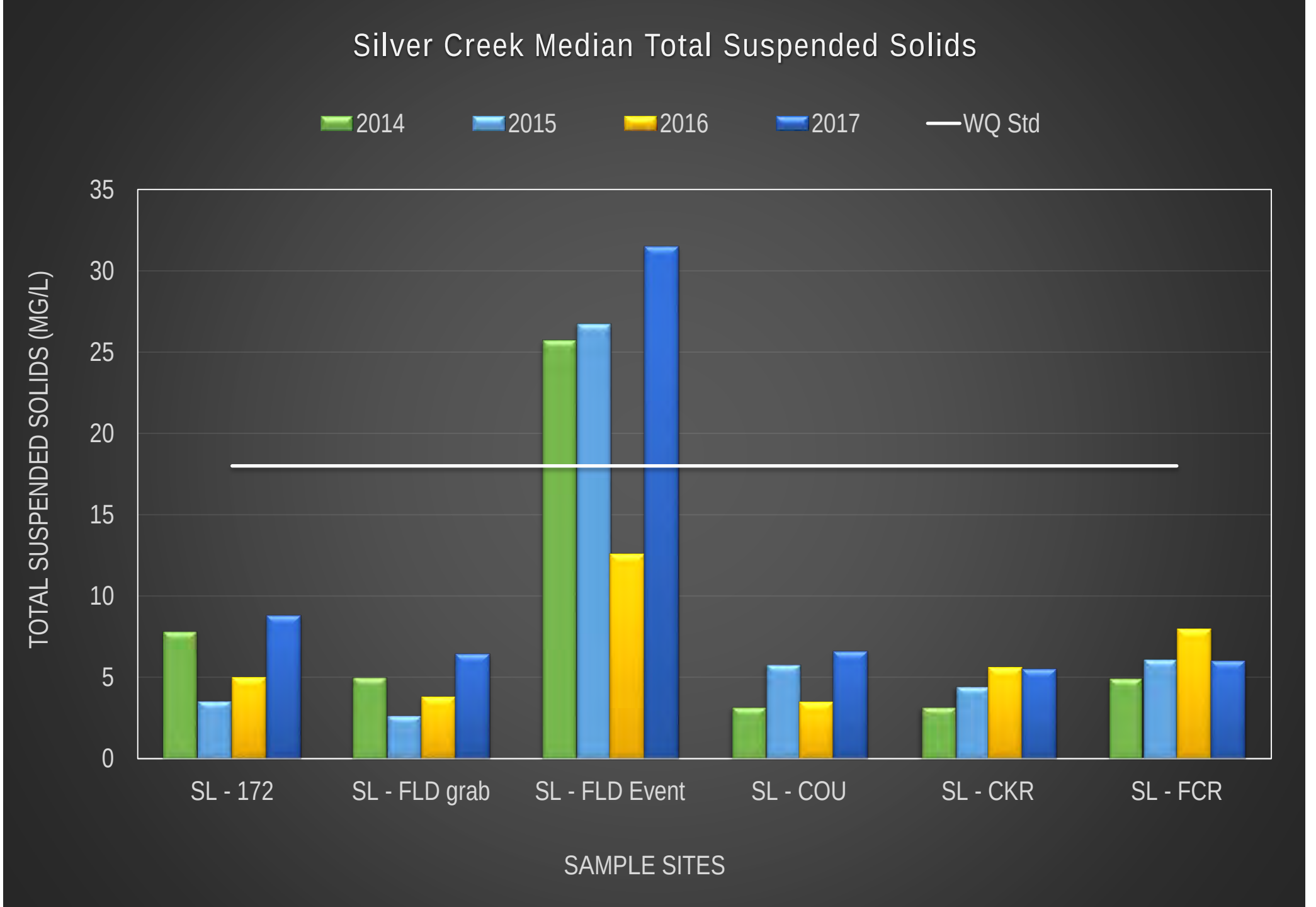
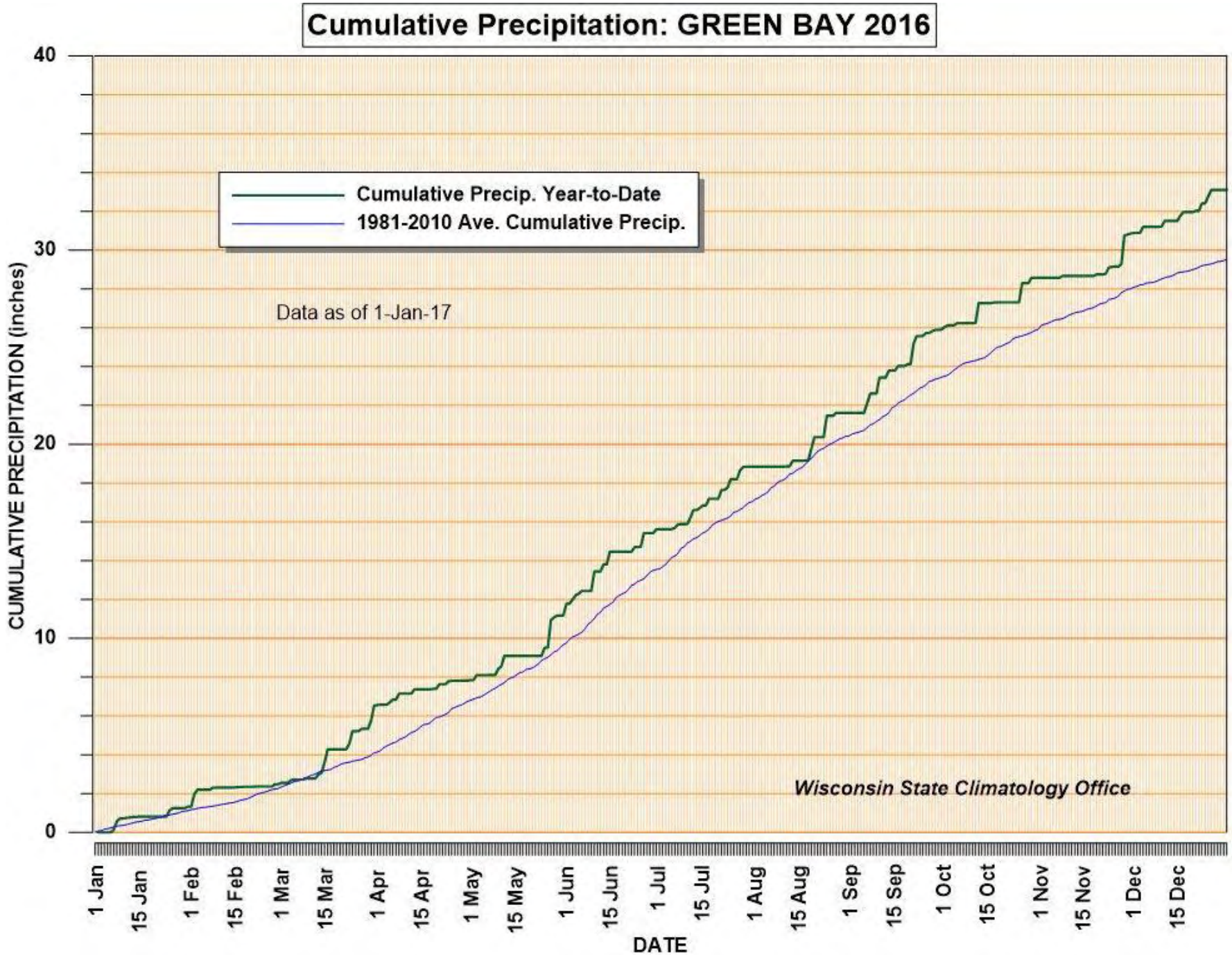

Silver Creek Median Total Phosphorus
2014
2015
2016
2017
WQ Std
TOTAL PHOSPHORUS (MG/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SL - 172
SL - FLD grab
SL - FLD Event
SL - COU
SL - CKR
SL - FCR
SAMPLE SITES


Silver Creek Median Total Suspended Solids
2014
2015
2016
2017
WQ Std
TOTAL SUSPENDED SOLIDS (MG/L)
35
30
25
20
15
10
5
0
SL - 172
SL - FLD grab
SL - FLD Event
SL - COU
SL - CKR
SL - FCR
SAMPLE SITES



NEW Water
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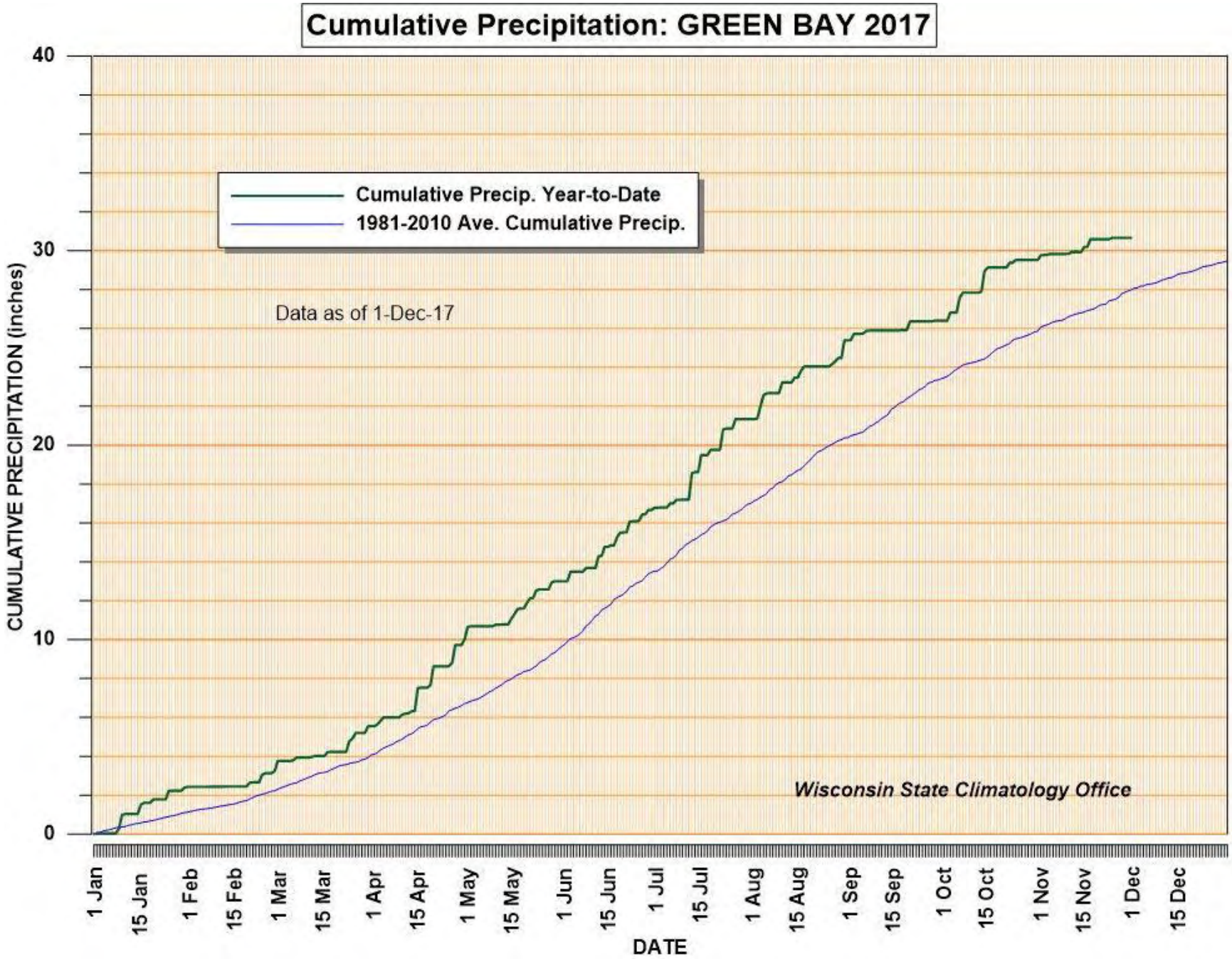

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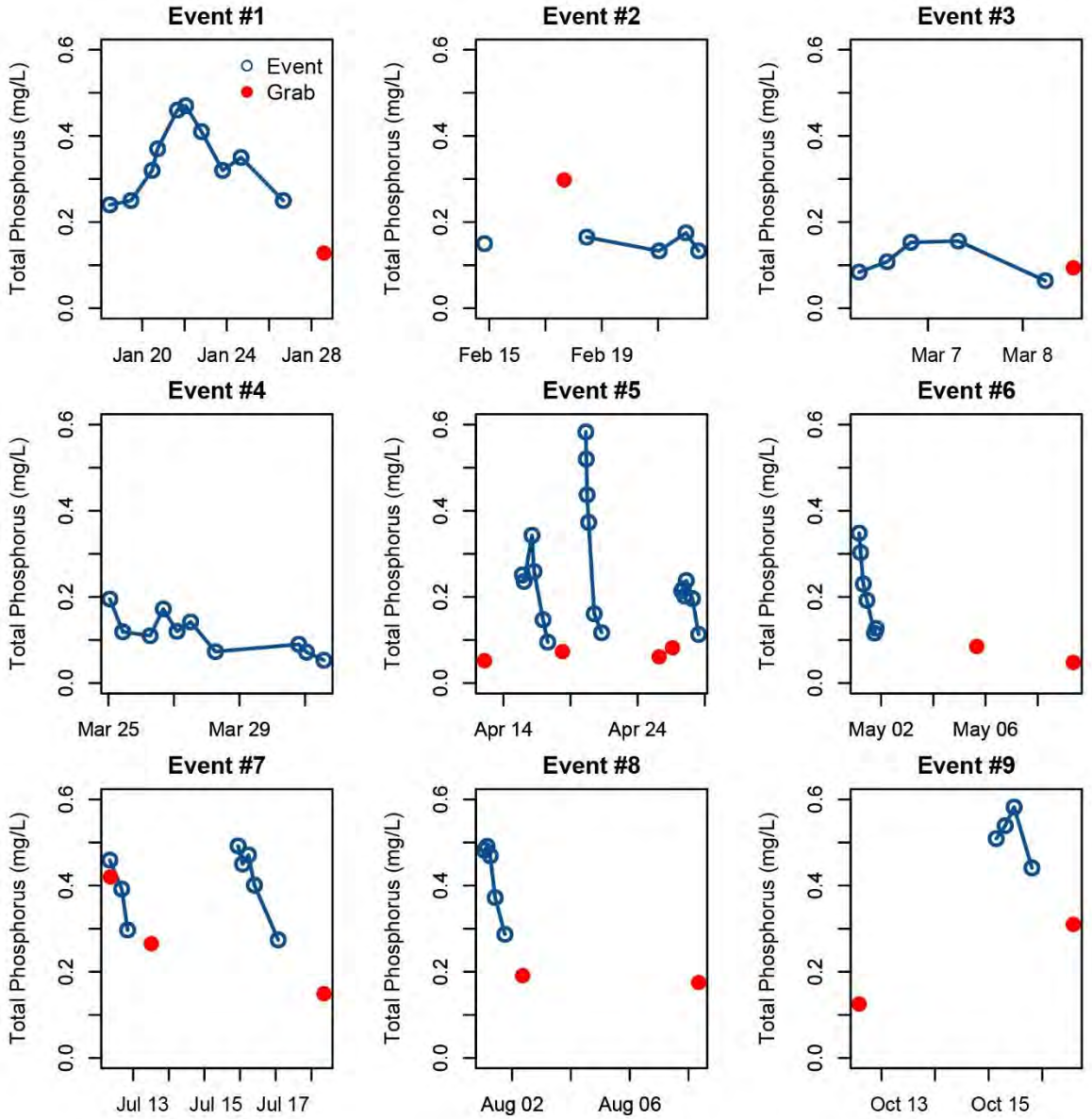
SL-FLD Event Sampling – Total P



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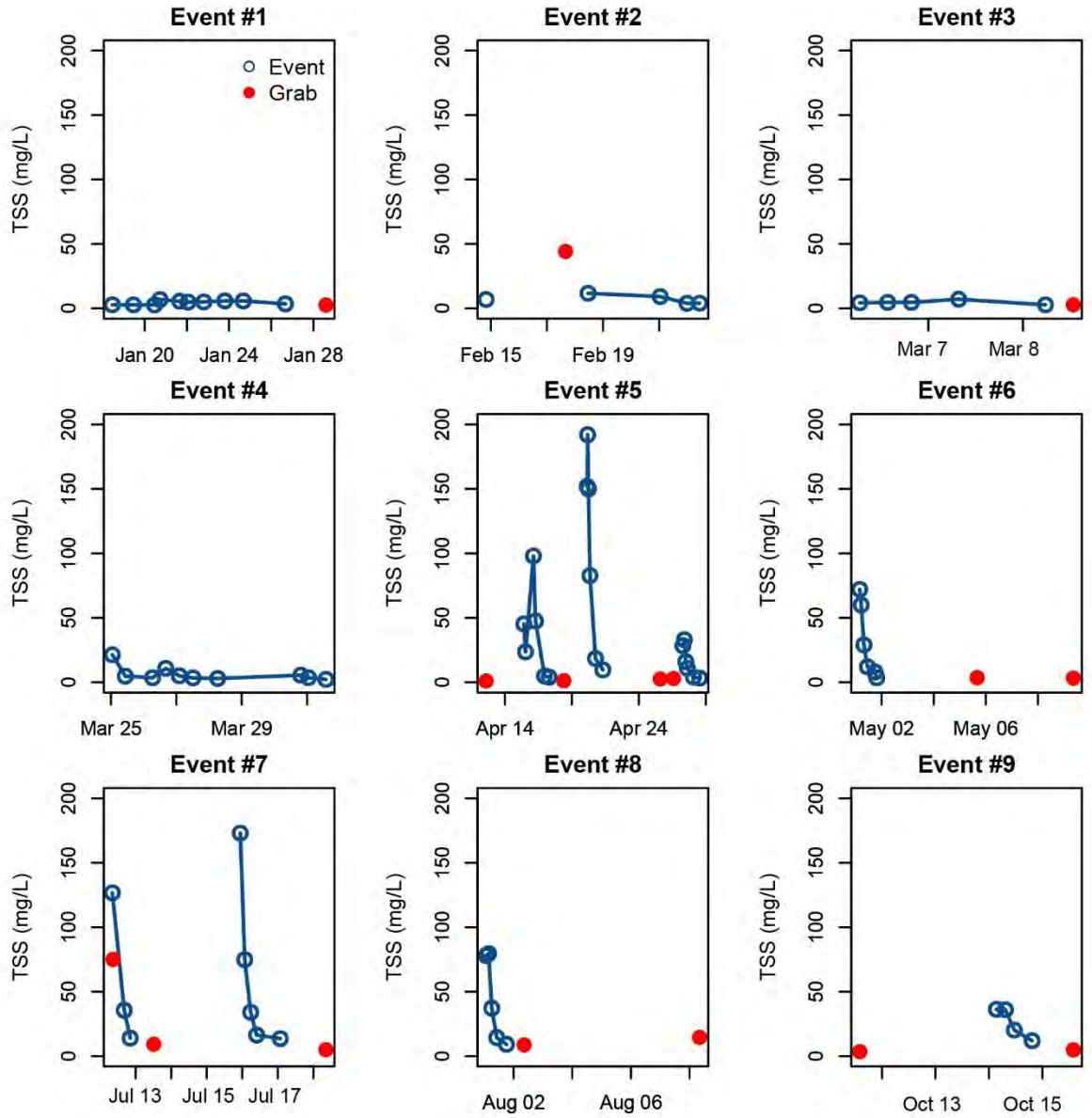
SL-FLD Event Sampling – TSS



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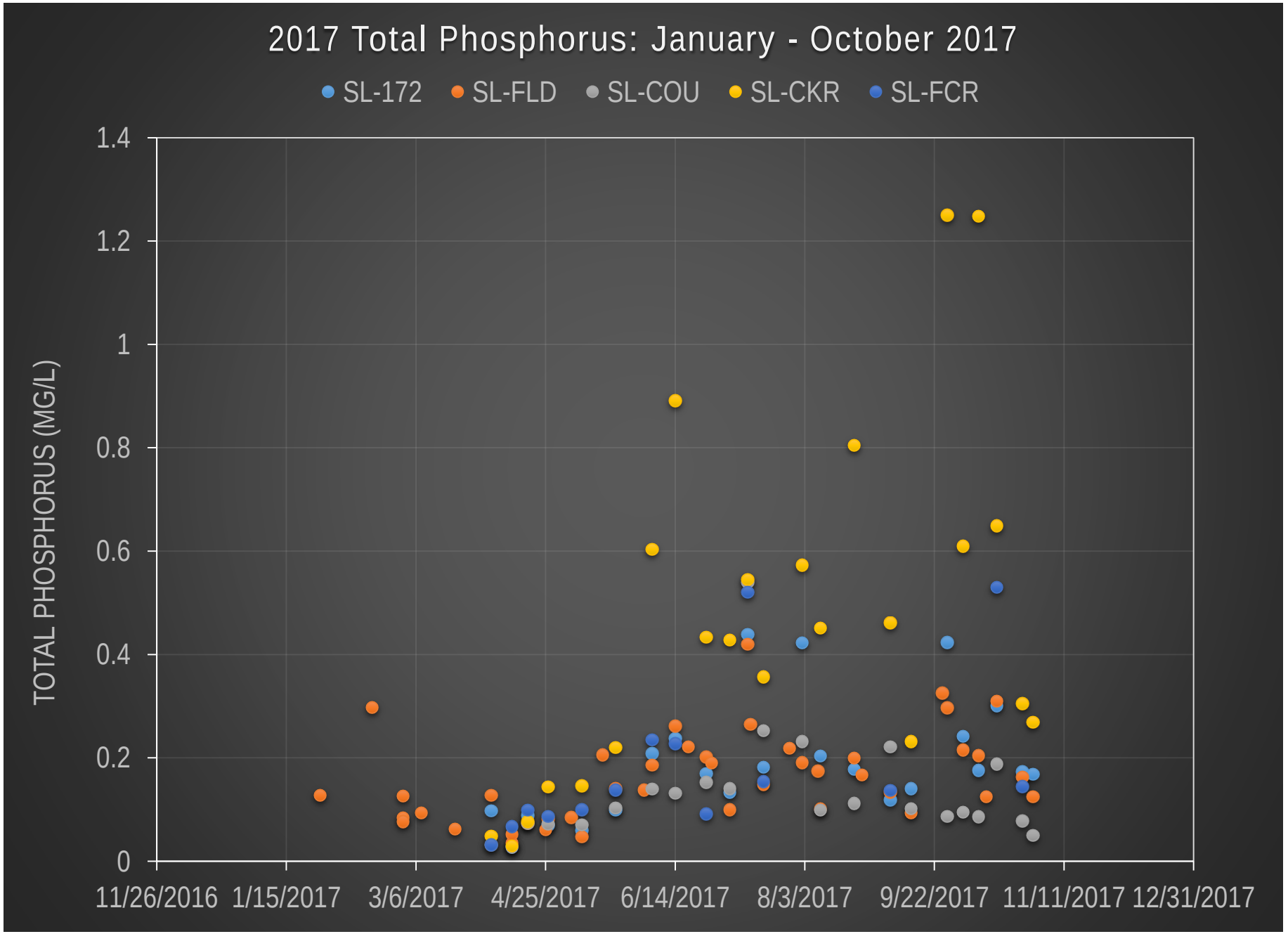

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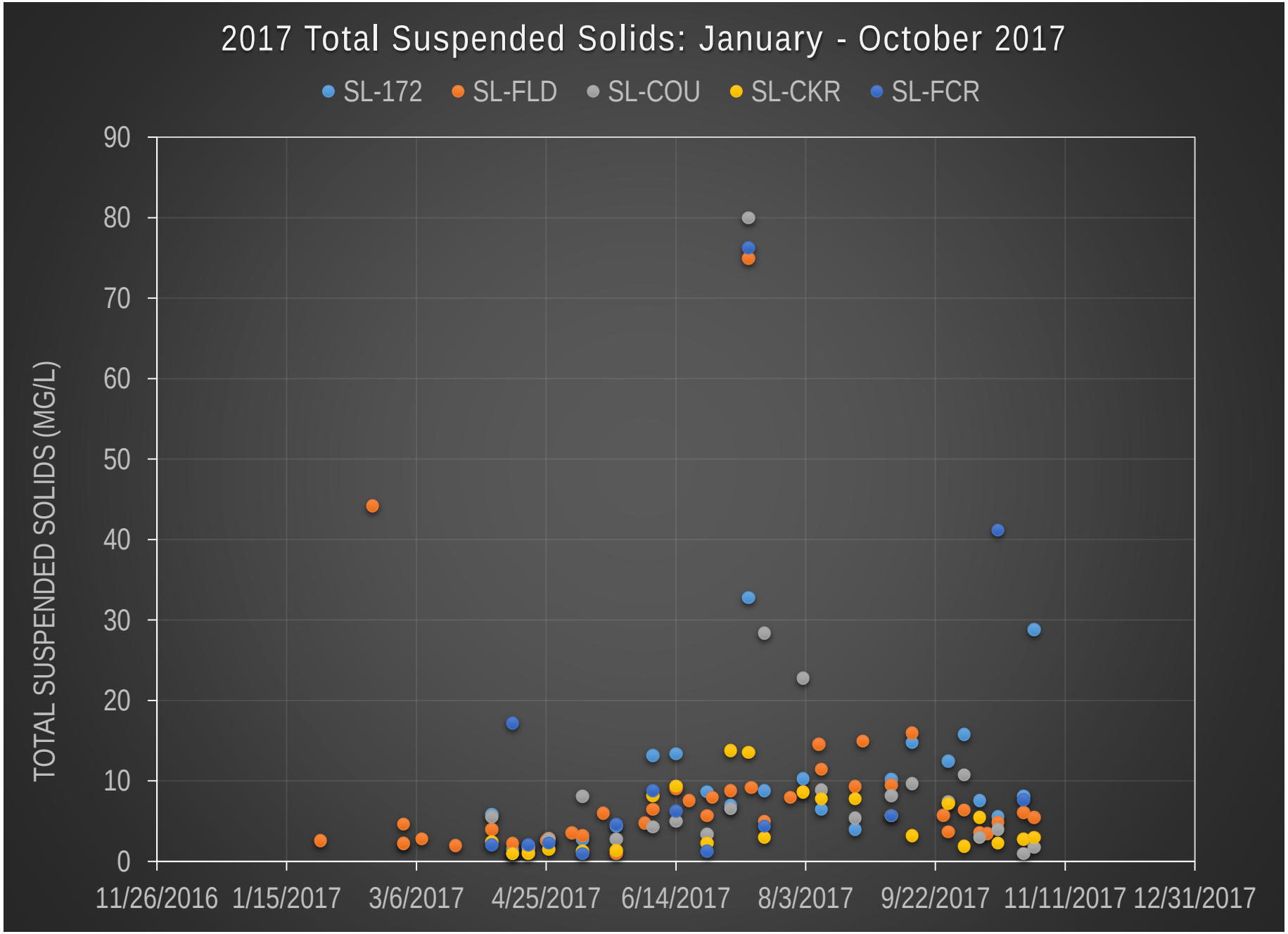

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Break

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Special Projects Updates

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Biological Monitoring of Silver Creek

Pre-Restoration

December, 2017
Stakeholder's Meeting Update

ONEIDA

A good mind. A good heart. A strong fire.

ONEIDA

A good mind. A good heart. A strong fire.

ONEIDA

A good mind. A good heart. A strong fire.

ONEIDA

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ONEIDA

A good mind. A good heart. A strong fire.

Oneida Nation
Water Resources Program
Aquatic Invertebrate Data Sheet

Date of sample collection: 6/2/2017
Sample location: Silver Creek @ Arrowhead Dr. Sample collected by: JL. Snitgen
Sieve mesh size: 500µm Collection method: Qualitative
Date sorted: Sorted by: LSRI
Date identified: 11/24/17 Identified by: JL Snitgen

Taxon	No.	Taxon	No.
Diptera		**Diptera - Other**	
Chironomidae		Simulium sp.	6
Brillia flavifrons	1		
Chironomus sp.	3		
Corynoneura sp.	13		
Cricotopus bicinctus	4	**Trichoptera**	
Cricotopus sp.	1		
Diplocladius sp.	4	Hydropsychidae	2
Eukiefferiella claripennis group	5		
Micropsectra sp.	3	Hydropsyche betteni	1
Paratrichocladius sp.	8		
Parametriocnemus sp.	2	**Ephemeroptera**	
Paratanytarsus sp.	1	Baetis sp.	2
Polypedilum aviceps	18		
Pseudosmittia sp.	2		
Orthocladius sp.	4		
Rheotanytarsus sp.	5		
Stictochironomus sp.	19		
		Plecoptera (small)	3
Thienemanniella xena	27	Perlesta decipiens	2
Orthocladiinae	6		
		Coleoptera	
Cricotopus trifascia	2		
		Dytiscidae	1
		Odonata	
		Aeshna sp.	1

Oneida Nation
Water Resources Program
Aquatic Invertebrate Data Sheet
(Continued)

Taxon	No.	Taxon	No.
Hemiptera		**Oligochaeta**	
Amphipoda			
Gammarus pseudolimnaeus	112		
Isopoda		**Others**	
Caecidotea sp.	1		
Pelecypoda		Oreonectes sp.	1
Gastropoda			

Date data entered: 12/8/17 Data entered by: JS.
Total taxa: 26 Total no. organisms: 260
HBI taxa: 25 HBI total no. organisms: 247

Seasonality adjusted HBI total no. organisms: 5.41

EPT = 3

Table 1. Water quality ratings for HBI values (from Hilsenhoff 1987)

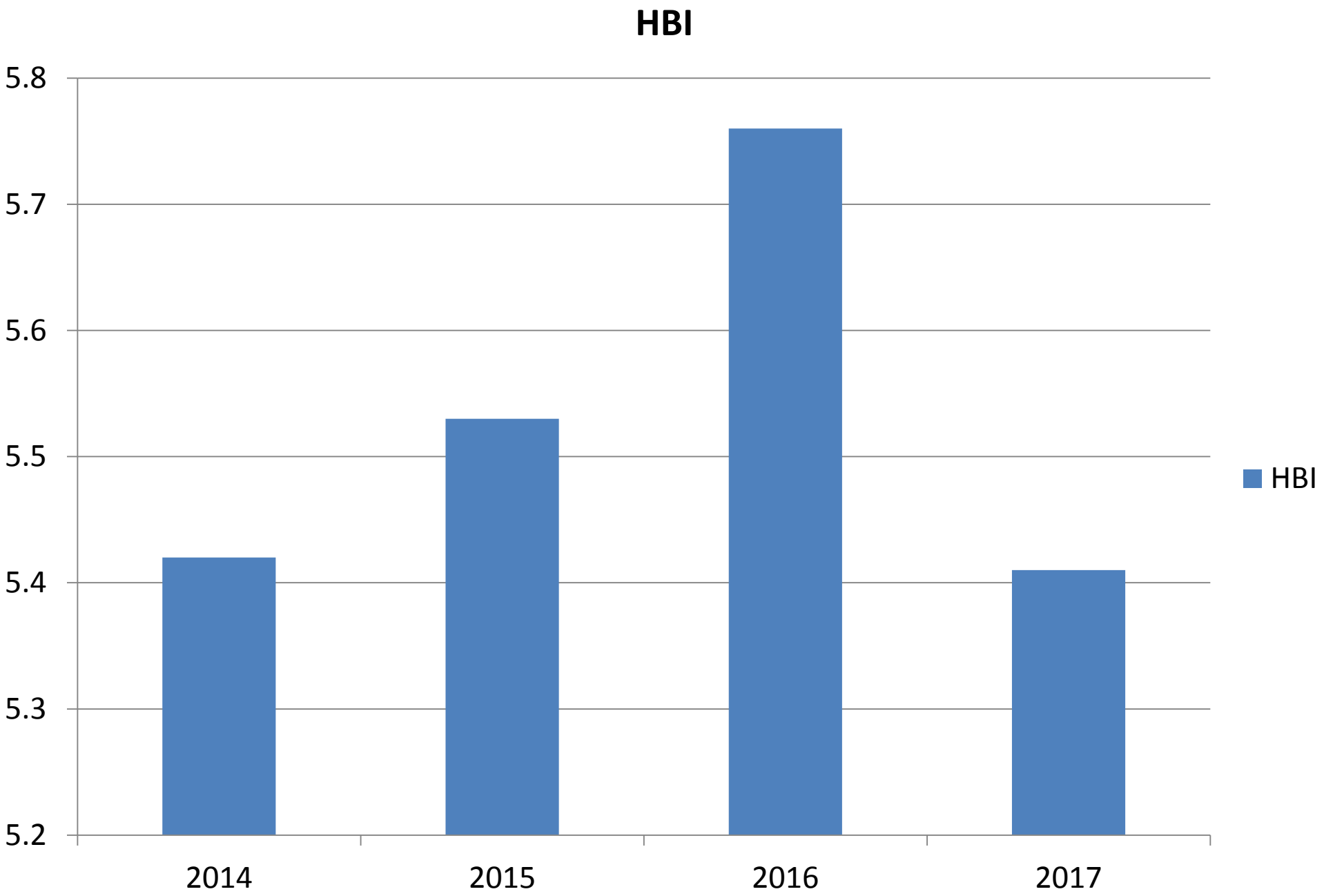
HBI Value	Water Quality Rating	Degree of Organic Pollution
≤ 3.50	Excellent	None Apparent
3.51-4.50	Very Good	Possible Slight
4.51-5.50	Good	Some
5.51-6.50	Fair	Fairly Significant
6.51-7.50	Fairly Poor	Significant
7.51-8.50	Poor	Very Significant
8.51-10.00	Very Poor	Severe

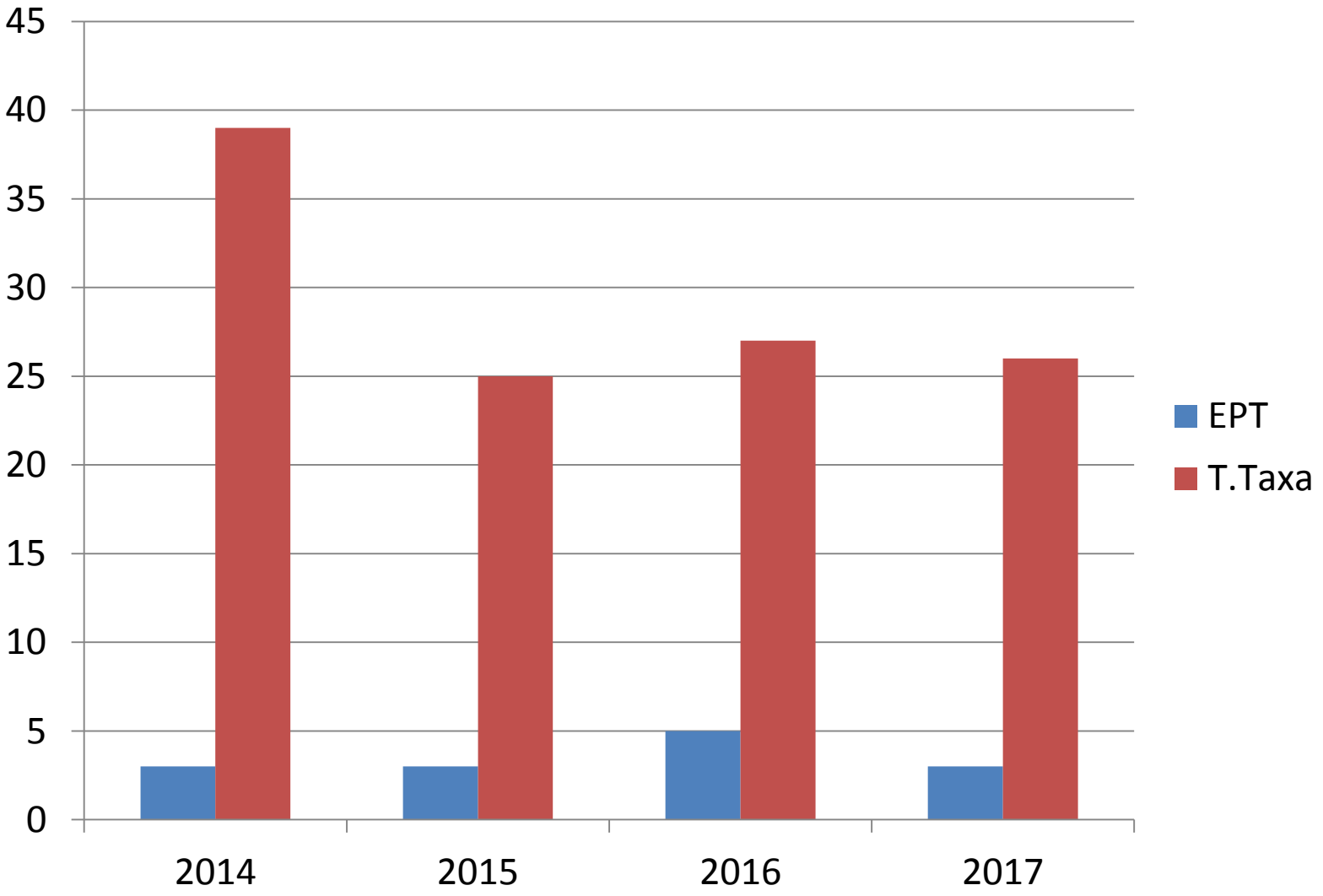
2017

HBI = 5.41

EPT = 3

Total taxa = 26


HBI
5.8
5.7
5.6
5.5
5.4
5.3
5.2
2014
2015
2016
2017
HBI



Other notes: 2 different stoneflies in 2015 sample,
the rare midge *Acalcarella* in 2016 sample, in stream habitat
Enhancement + water quality improvements should show significant changes

Vegetated Water Treatment Systems

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Silver Creek Partnership

Vegetated Water Treatment System Update

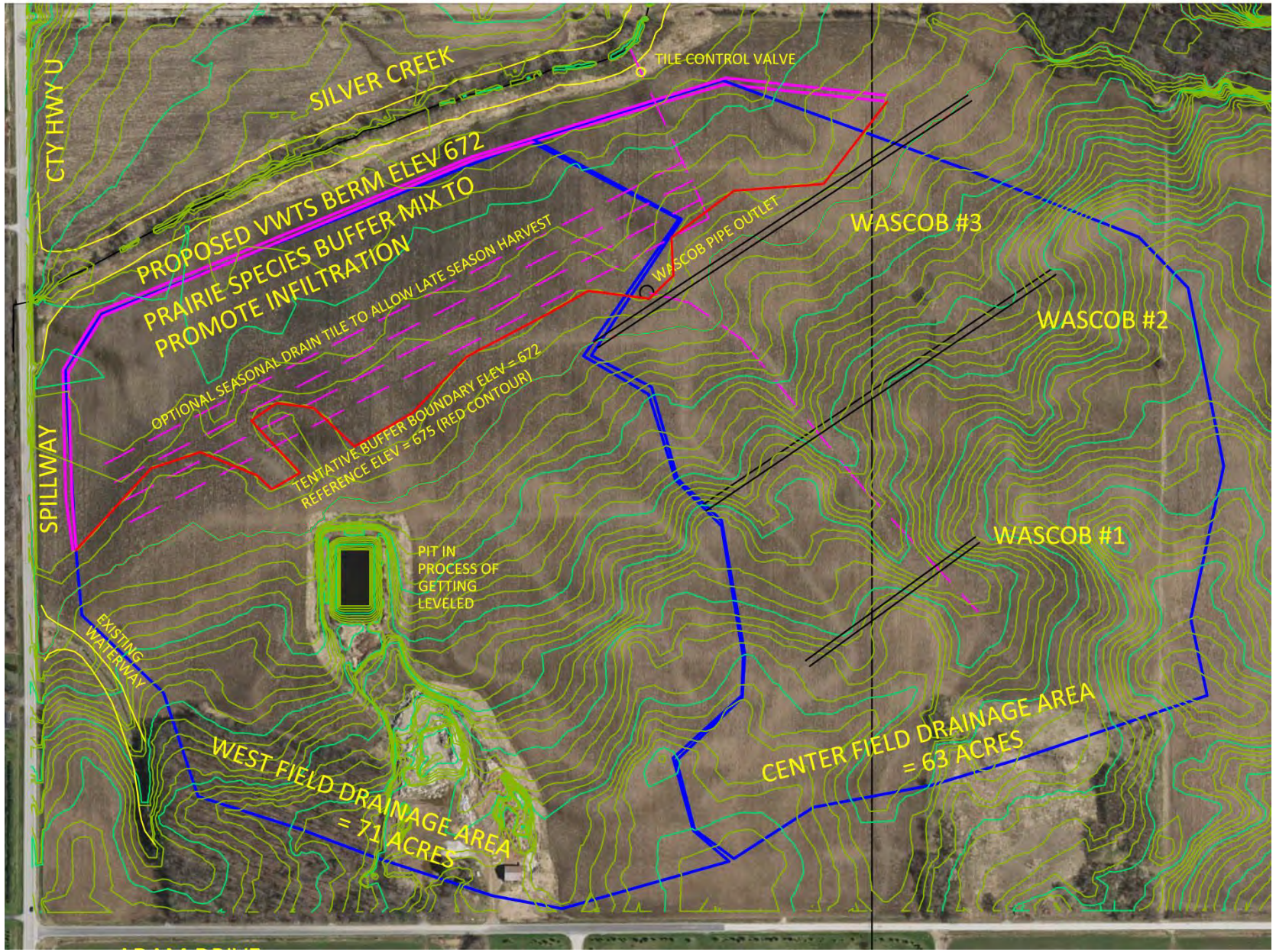
December 19, 2017

Michael Troge, Oneida Nation

EW WATER / ONEIDA NATION SILVER CREEK WATERSHED PROJECT
EGETATED WATER TREATMENT SYSTEM DESIGN DEVELOPMENT UPDATE
ICHAEL TROGE, ONEIDA NATION ENVIRONMENTAL PROJECT MANAGER
ecember, 2016

LOCATION: FORMER RUEDEN PROPERTY, FIELD 42
NE OF CTY U - ADAM DR INTERSECTION AND
WITHIN SILVER CREEK BUFFER

N




VWTS location
WASCOBs
Cty Hwy U
Adam Drive


Early construction, looking east

Looking west

Two basins, two outlet structures

Seed berm after construction

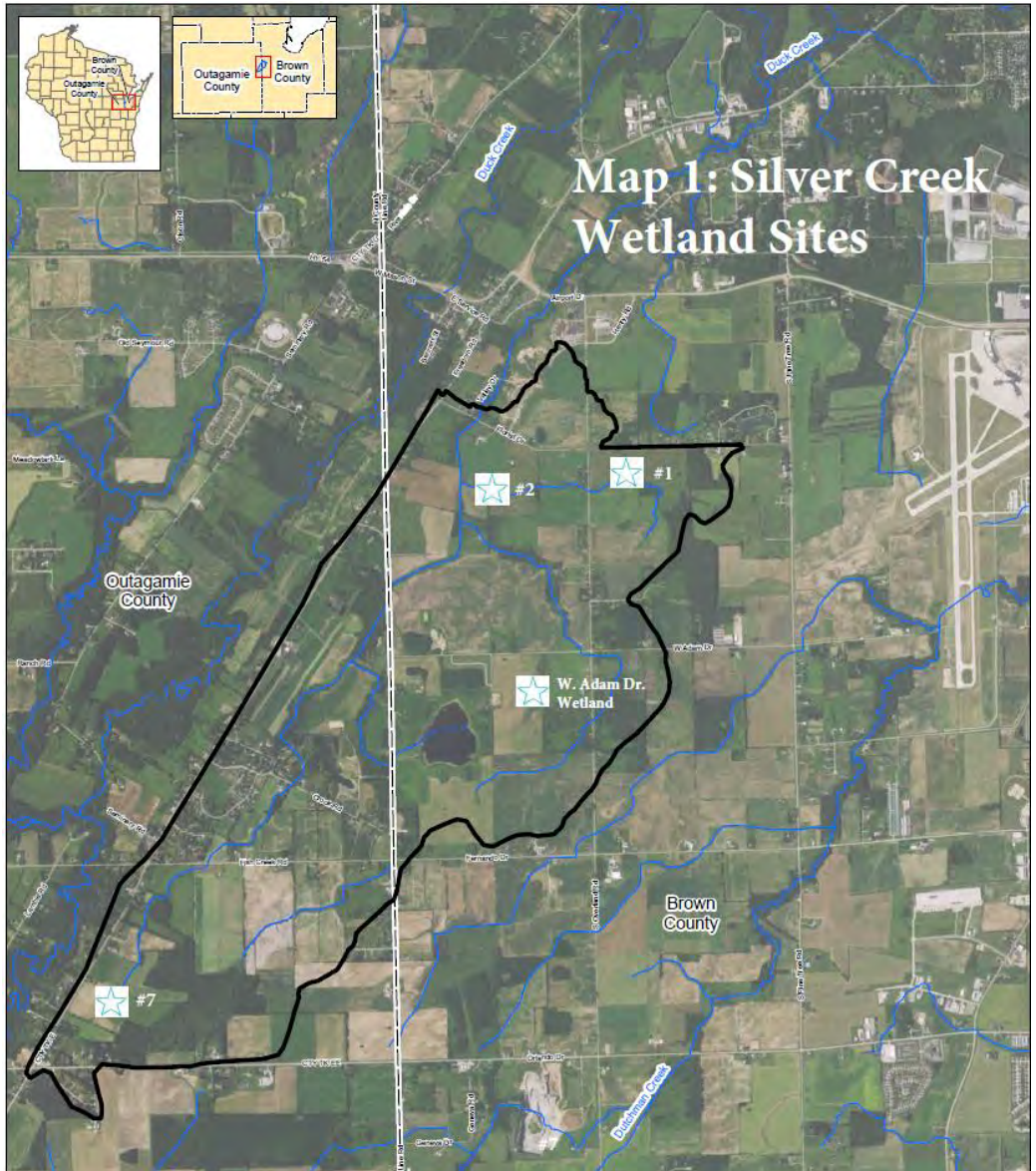
Prepping to seed the rest of the project site

4 acres: hydric mix
16 acres: mesic mix

Thanks to:

Gary Vanvreede
Reena Bowman
Tony Kuchma
Mike Arce
Jordan Powless
Jon Habeck
Wes Johnson
Jim Snitgen
Chris Danforth
Oneida Farm
Jim Powleit
Jeff Smudde
NEW Water
Karl’s Excavating

Wetlands Team Update



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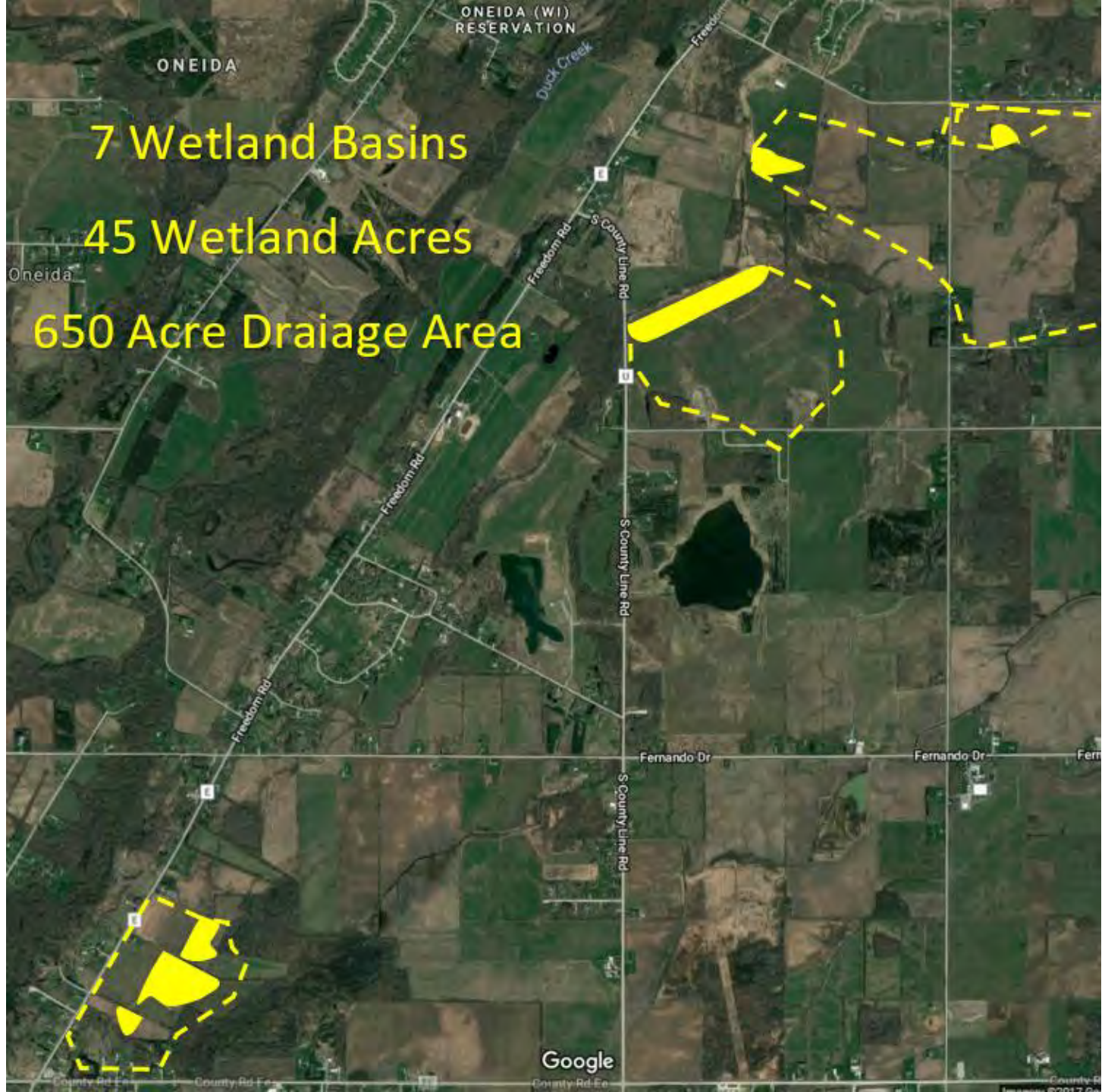
ONEIDA (WI) RESERVATION
ONEIDA
Duck Creek
7 Wetland Basins
45 Wetland Acres
650 Acre Draiage Area
Oneida
Freedom Rd
S County Line Rd
Fernando Dr
Google


CAT
345B
CAT


Earl's Excavating Inc.

Adams Drive Wetland

NEW Water
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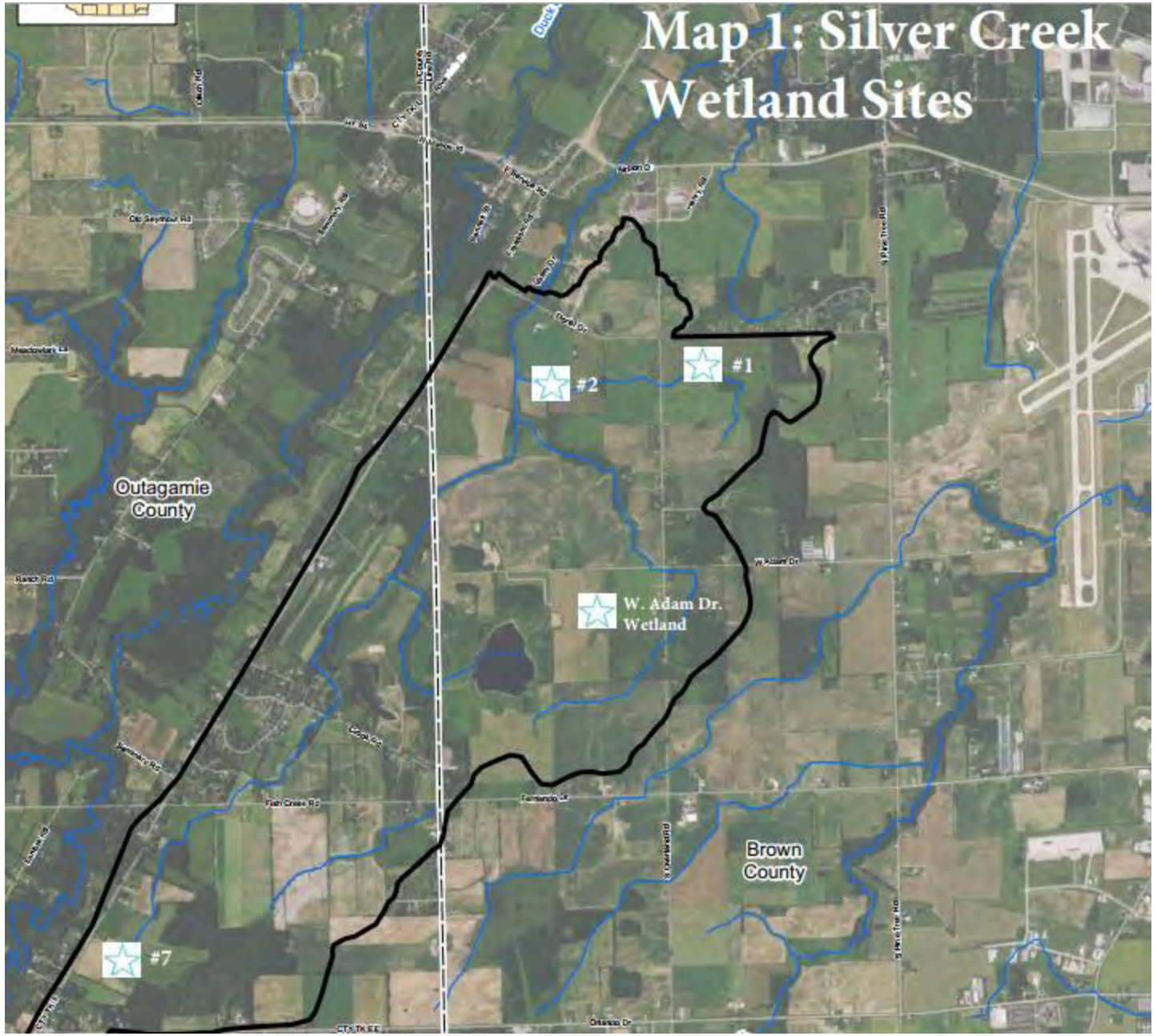
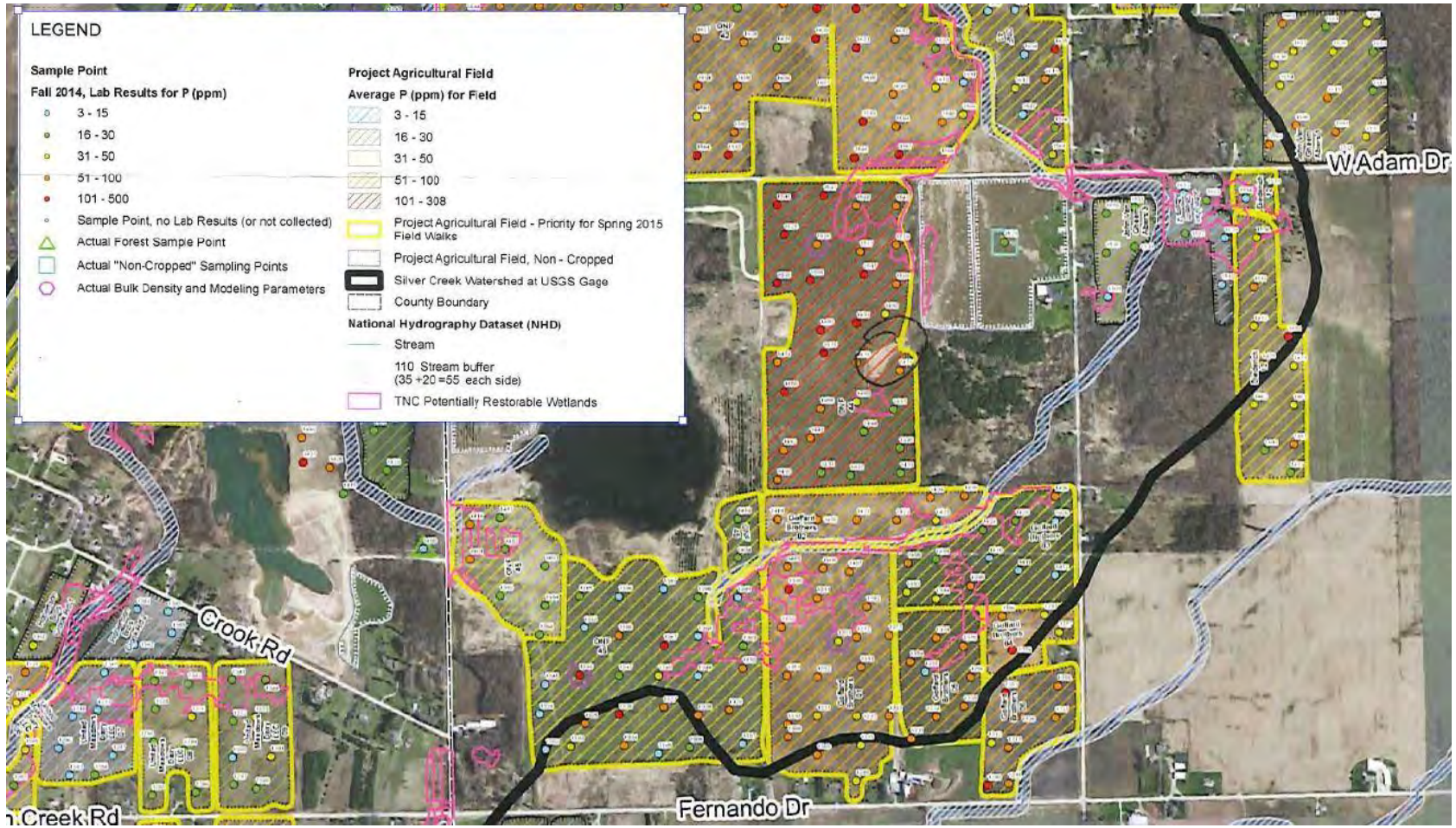
Silver Creek
W. Adams Dr. Restoration

December 19, 2017 Update

The Nature Conservancy
Protecting nature. Preserving life.


Map 1: Silver Creek Wetland Sites
#1
#2
#7
W. Adam Dr. Wetland
Outagamie County
Brown County


LEGEND
Sample Point
Fall 2014, Lab Results for P (ppm)
3 - 15
16 - 30
31 - 50
51 - 100
101 - 500
Sample Point, no Lab Results (or not collected)
Actual Forest Sample Point
Actual "Non-Cropped" Sampling Points
Actual Bulk Density and Modeling Parameters
Project Agricultural Field
Average P (ppm) for Field
3 - 15
16 - 30
31 - 50
51 - 100
101 - 308
Project Agricultural Field - Priority for Spring 2015 Field Walks
Project Agricultural Field, Non - Cropped
Silver Creek Watershed at USGS Gage
County Boundary
National Hydrography Dataset (NHD)
Stream
110 Stream buffer
(35 +20 =55 each side)
TNC Potentially Restorable Wetlands
W Adam Dr
Crook Rd
Fernando Dr


S Overland Rd
S Overland Rd
S Overland Rd
S Overland Rd
S Overland Rd
Lazy S Farm LLC
Google
Imagery ©2017 Google, Map data ©2017 Google
United States
Terms
Send fe

2015-16 Invasives Treatment & Permanent Cover in Ag Field

OPERATION & MAINTENANCE PLAN

Silver Creek Wetlands
Oneida Nation
Outagamie and Brown Counties, WI

Written in partnership by:
Oneida Nation
Ducks Unlimited
Outagamie County Land and Water Conservation
The Nature Conservancy
US Fish and Wildlife Service

Landowner or held in Trust for the benefit of:
Oneida Nation

Before- July 2015 Looking northeast


During Construction – October 2017


October 13, 2017


November 3, 2017


Outagamie
County
Site
Brown
County

Thank You:

Oneida Nation

NEW Water

Outagamie County

UW-Green Bay

USFWS

Fund for Lake Michigan

Grazing Paired Field Monitoring

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UW-Green Bay: PAIRED Grazing Study

Primary objectives

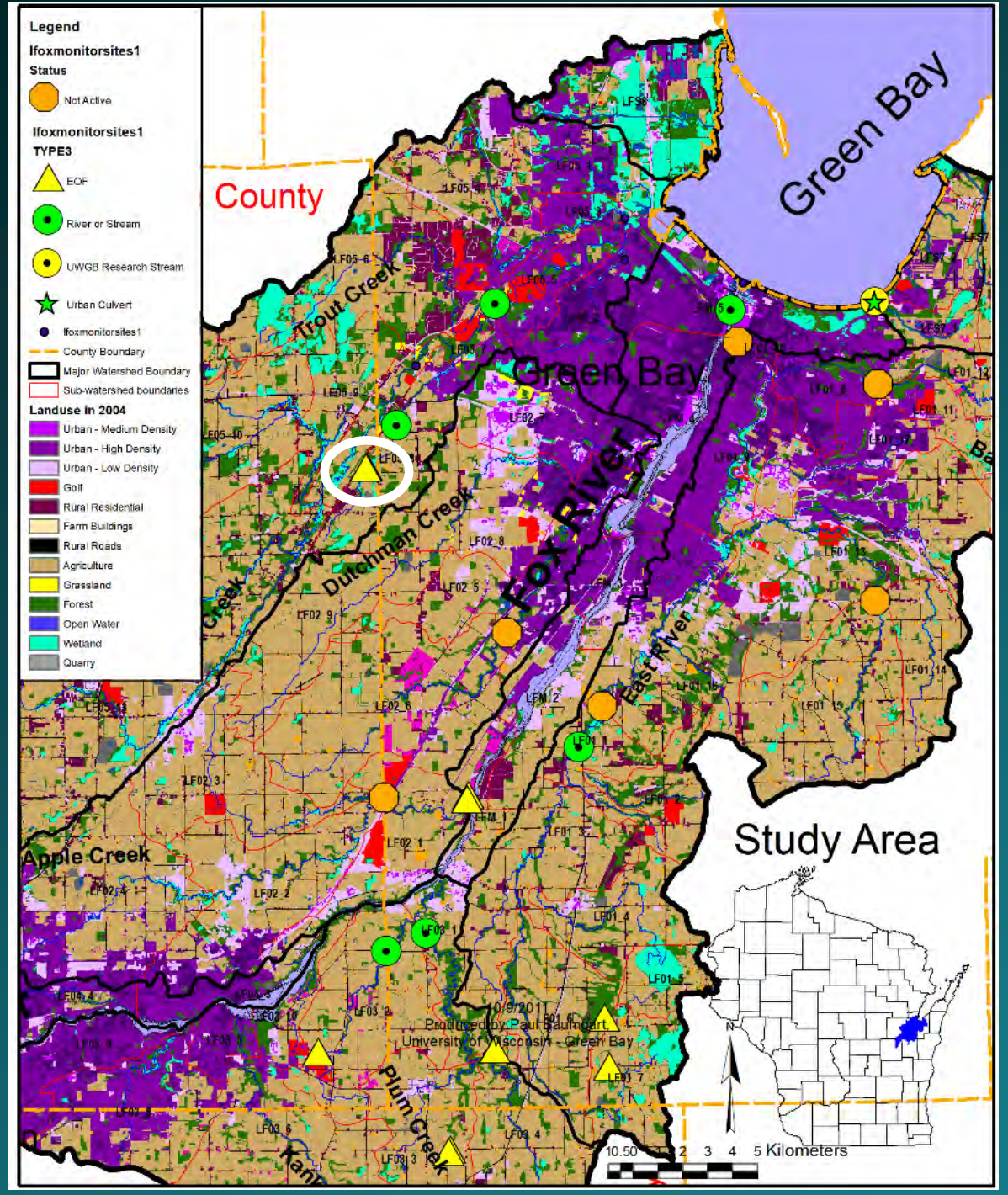
- Evaluate Effectiveness of Ag Treatments:
  - Silver Creek watershed --- Managed grazing compared to conventional dairy farm practice
- Metrics:
  - TSS, TP, dP (Event Mean Concentration, Total Event Mass)
  - Event Flow Volume
  - Turbidity, plus used as surrogate for other constituents (and Backup)

Paul Baumgart and Kevin Fermanich

University of Wisconsin – Green Bay

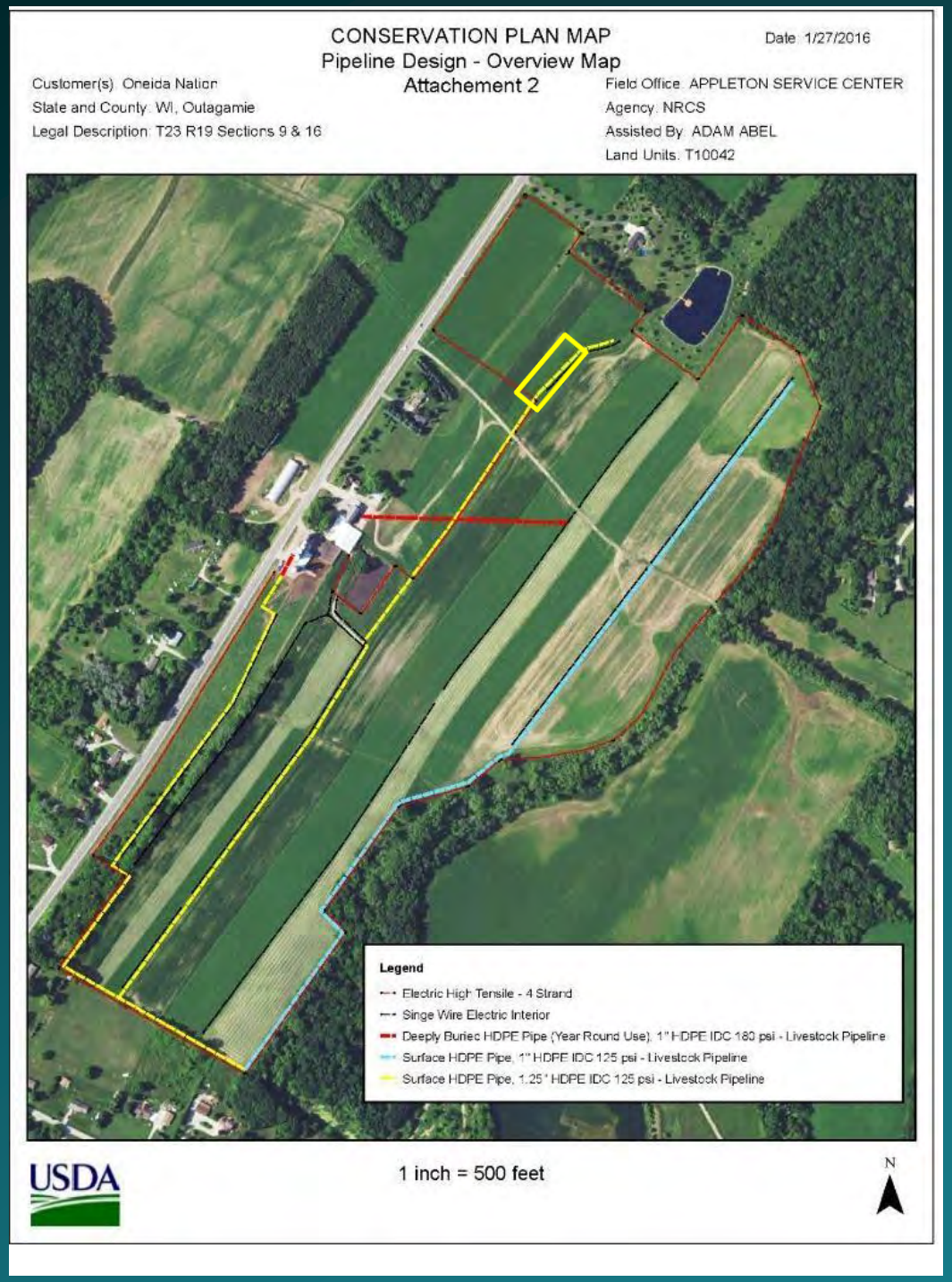
Silver Creek near Oneida: Grazing Study

- About the same equipment as most USGS EOF stations
- PAIRED Study --- two EOFS
- A bit less than 1 acre per site
- Continuous Silage Corn (cooperative farmer)
- Very limited residue
- Treatment: Managed Grazing when pretreatment data are sufficient



UWGB
Silver Creek – near Oneida
Paired EOF catchments

GLRI Grants
NEW Water



Dairy Farm Transitioning to More Managed Grazing

Study Site Paired Catchments

Silver Creek near Oneida: paired EOF catchments

Silver Creek/Oneida Paired EOFs

North Station

South Station

Retractable head CS OBS-501 turbidity probes (South EOF)

Campbell Scientific OBS-501 turbidity **pr**obe

South Station

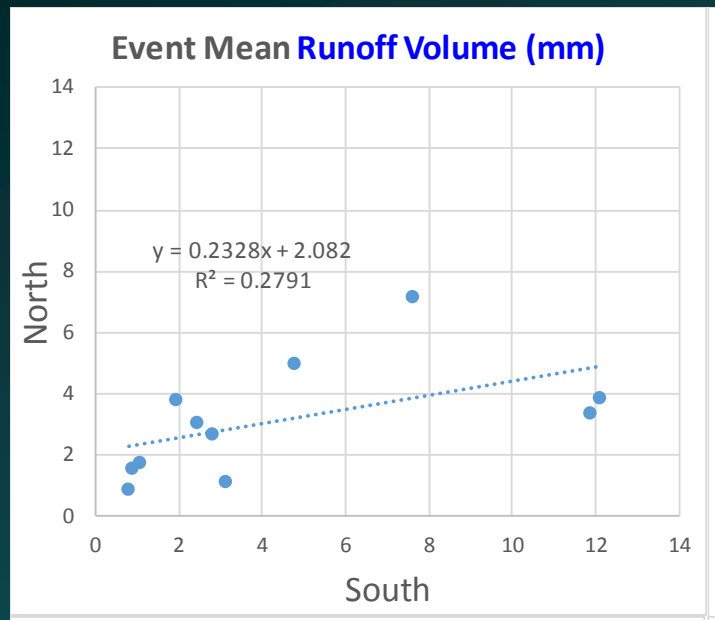
narrow 1’ HS flume

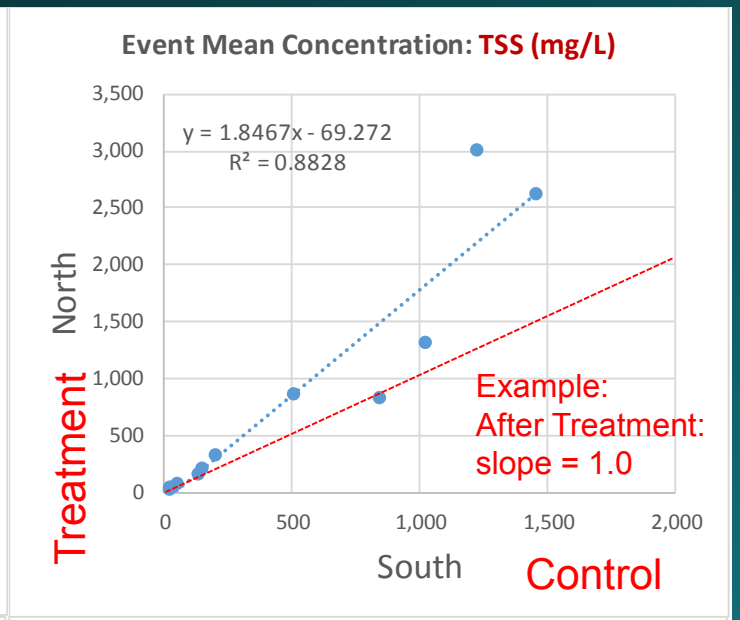
hence: 2”x3” mesh screen for “trash”

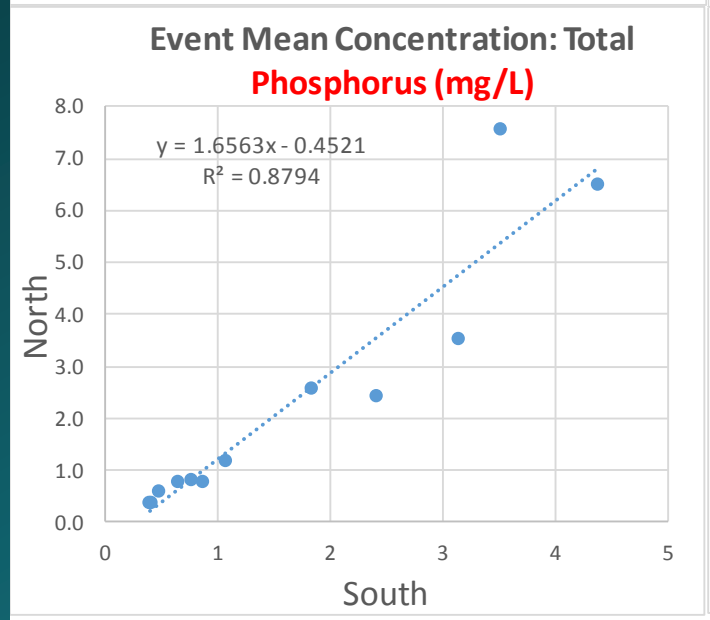
South Station

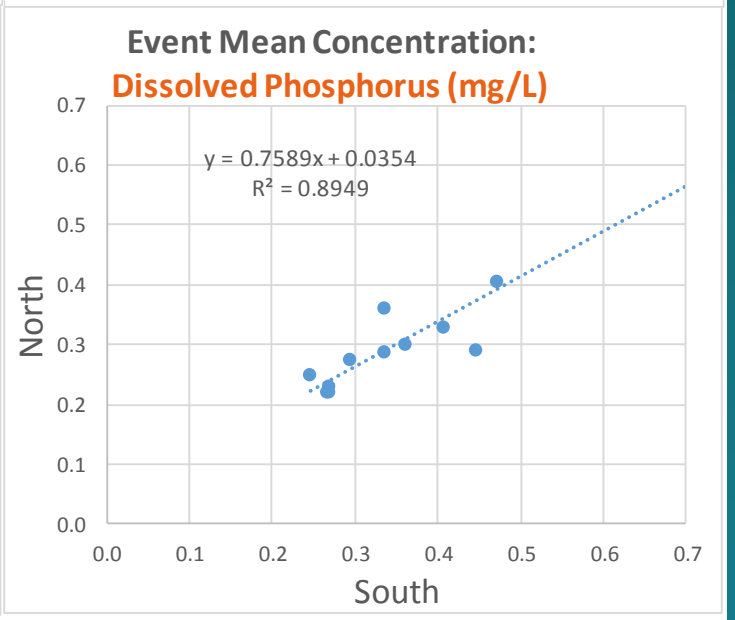
landscape

RESULTS









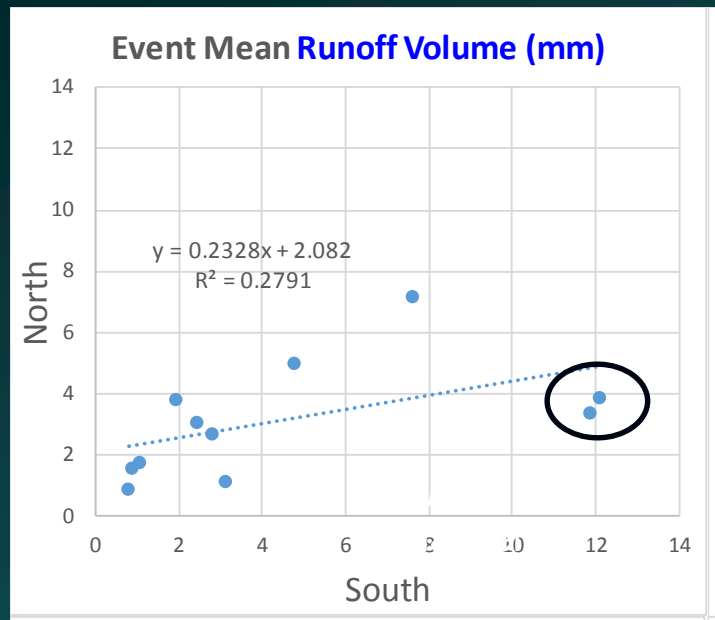
Silver Creek - Oneida Paired Managed Grazing Study

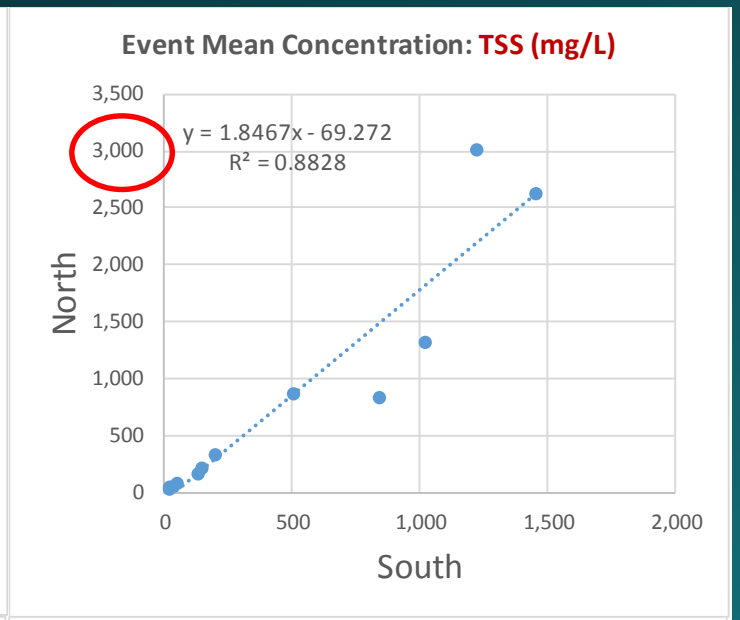
So far, most relationships appear to be satisfactory

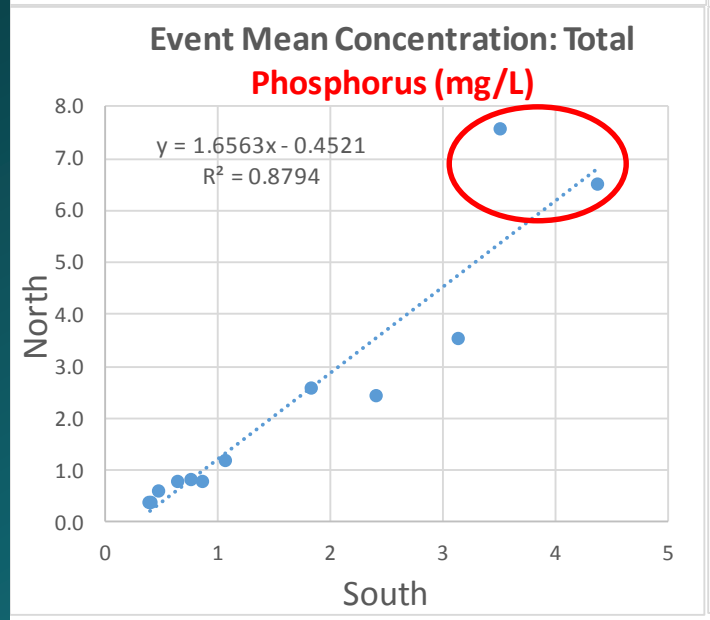
But not with Runoff (why?)

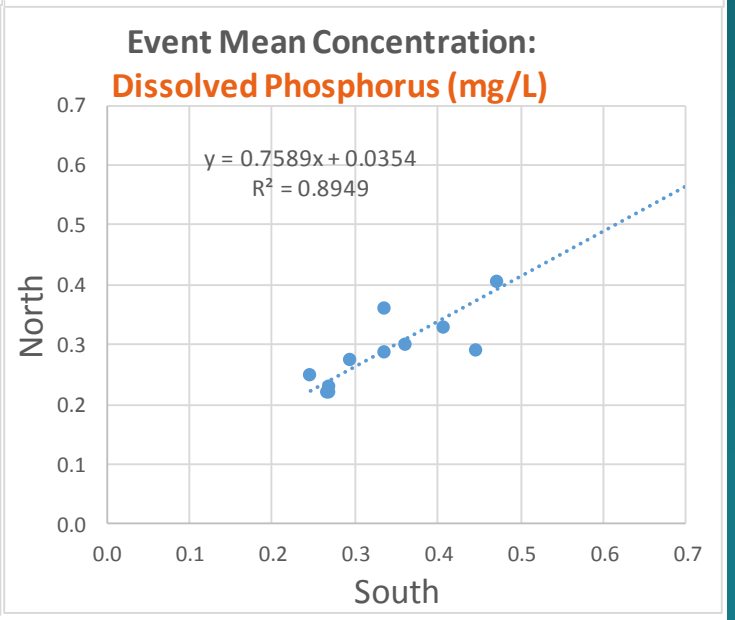
but better for dP compared to Plum (why?)

Runoff: n=11
TSS, TP, DP n=12









Silver Creek - Oneida Paired Managed Grazing Study

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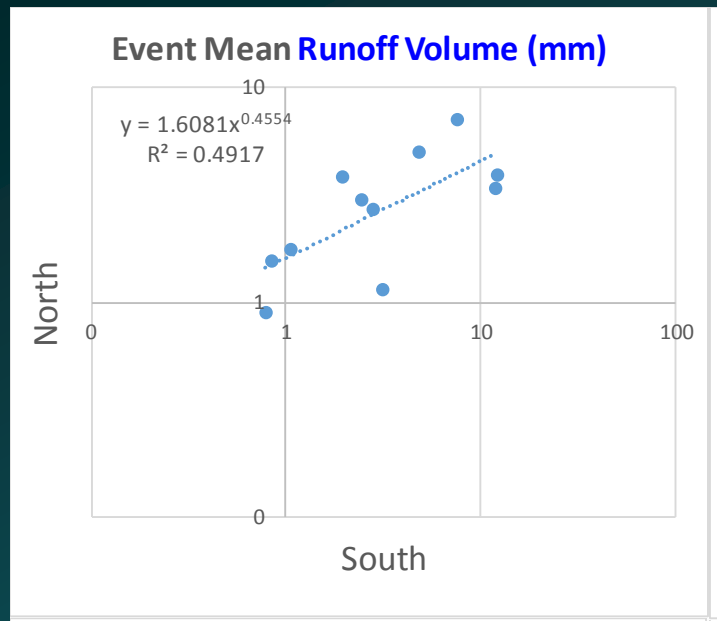
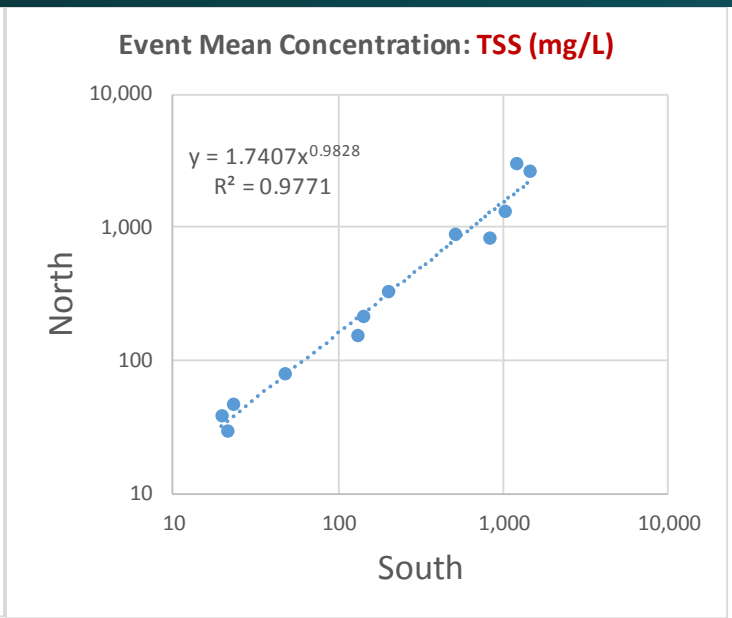
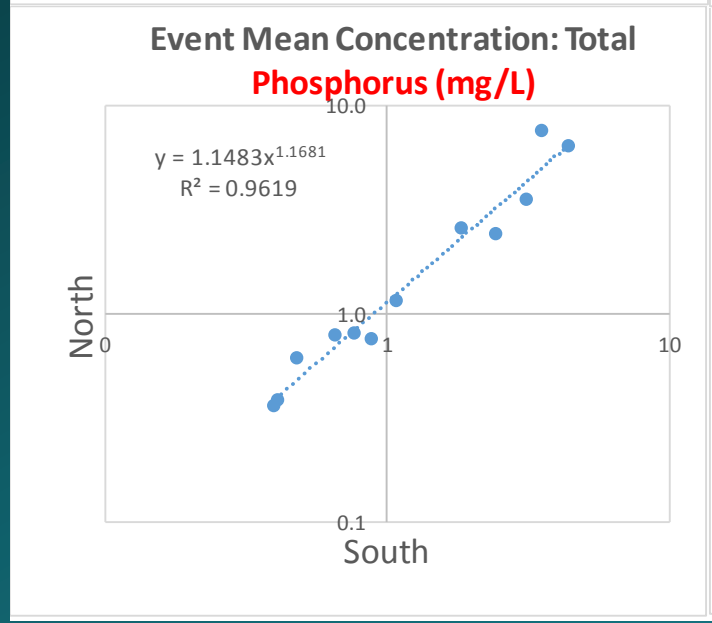
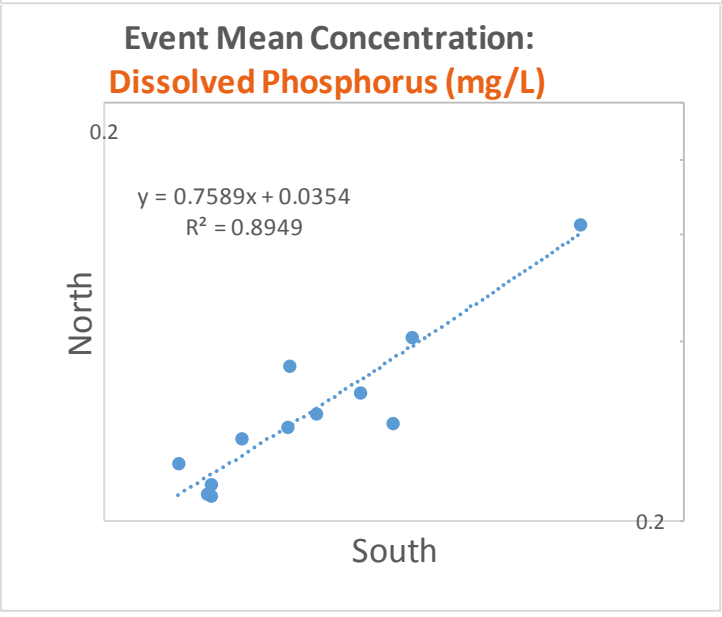
Runoff: n=11
TSS, TP, DP n=12









Silver Creek - Oneida Paired Managed Grazing Study

LOG-Space

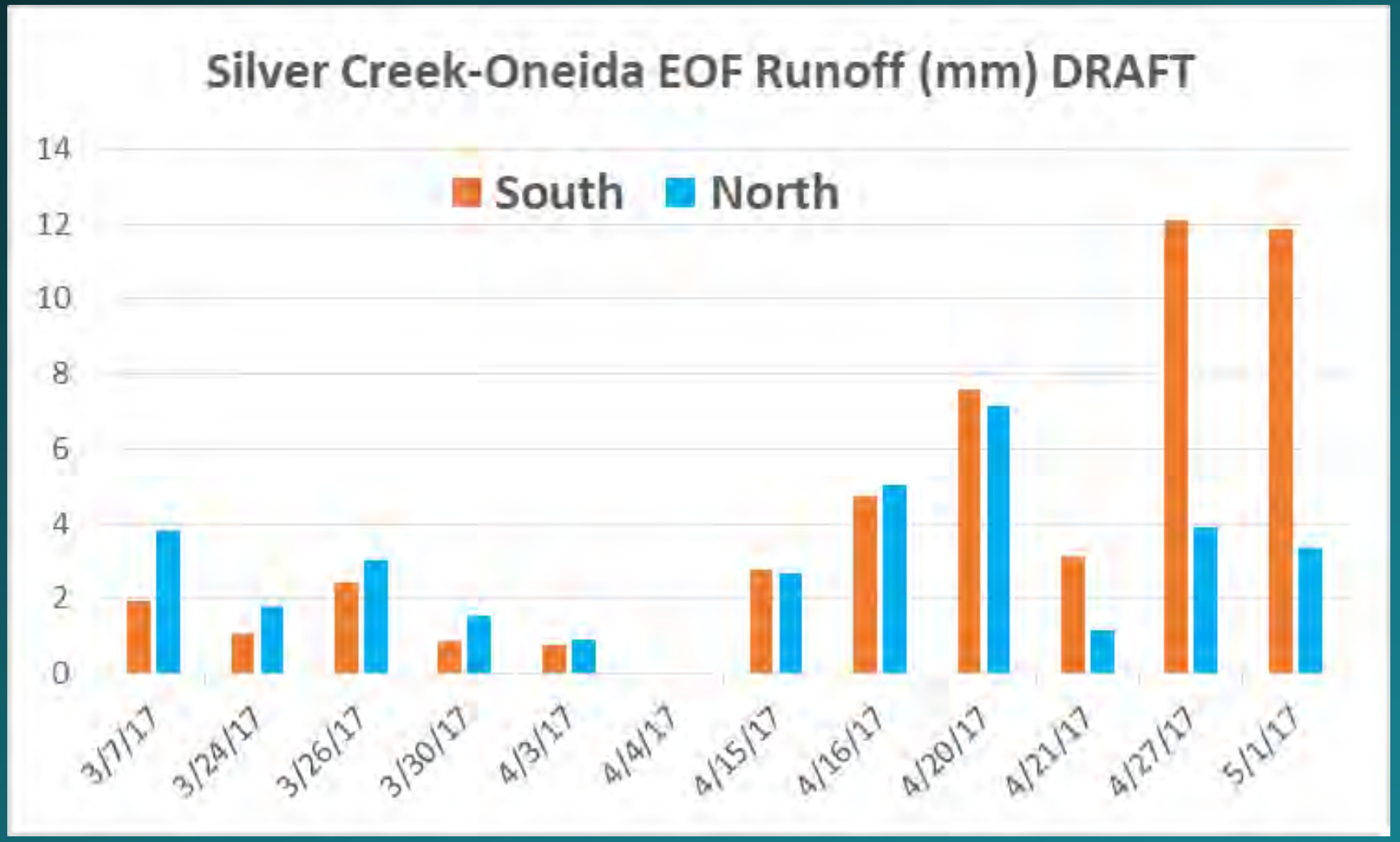
Runoff: n=11
TSS, TP, DP n=12

EOF Event mean vs Stream concentrations (mg/L): WY2017+

	TP	dP	TSS	
PF-E	1.19	0.29	491	EOF - composites
PF-W	1.52	0.24	809	EOF - composites
Plum Main	1.07	0.30	576	Stream - discretes
Plum West	1.14	0.50	430	Stream - discretes
Silver	0.28	0.24	26	Stream - discretes
OF-North	2.30	0.32	797	EOF - composites
OF-South	1.66	0.37	469	EOF - composites

- EVENTS: EOF Event mean concentrations similar to discrete samples from streams
- Therefore, reducing contributions from sources like our EOF sites, should translate to the watershed

Runoff Pattern changes: South vs North

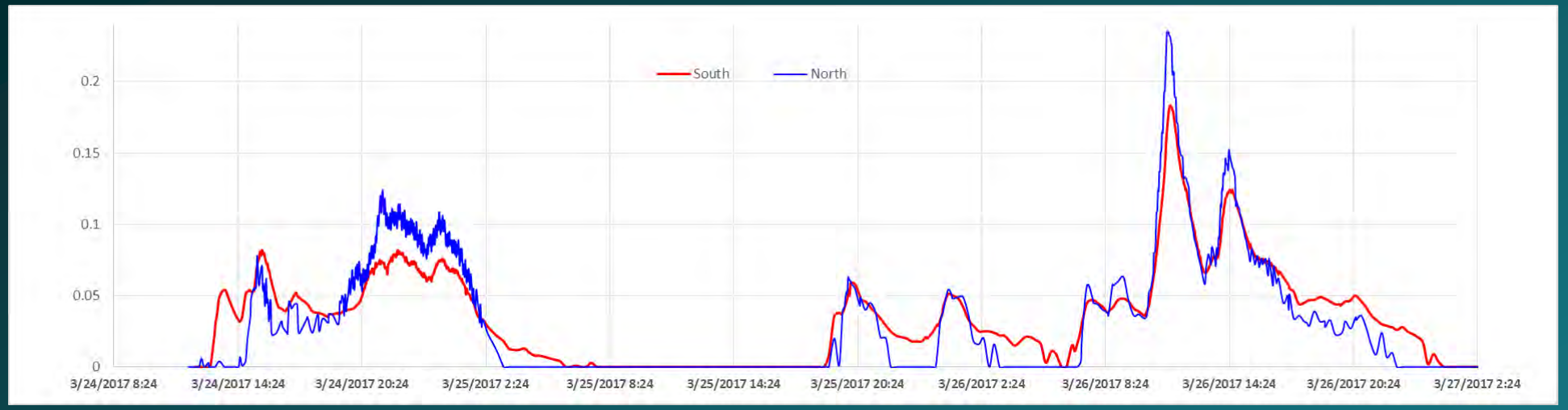


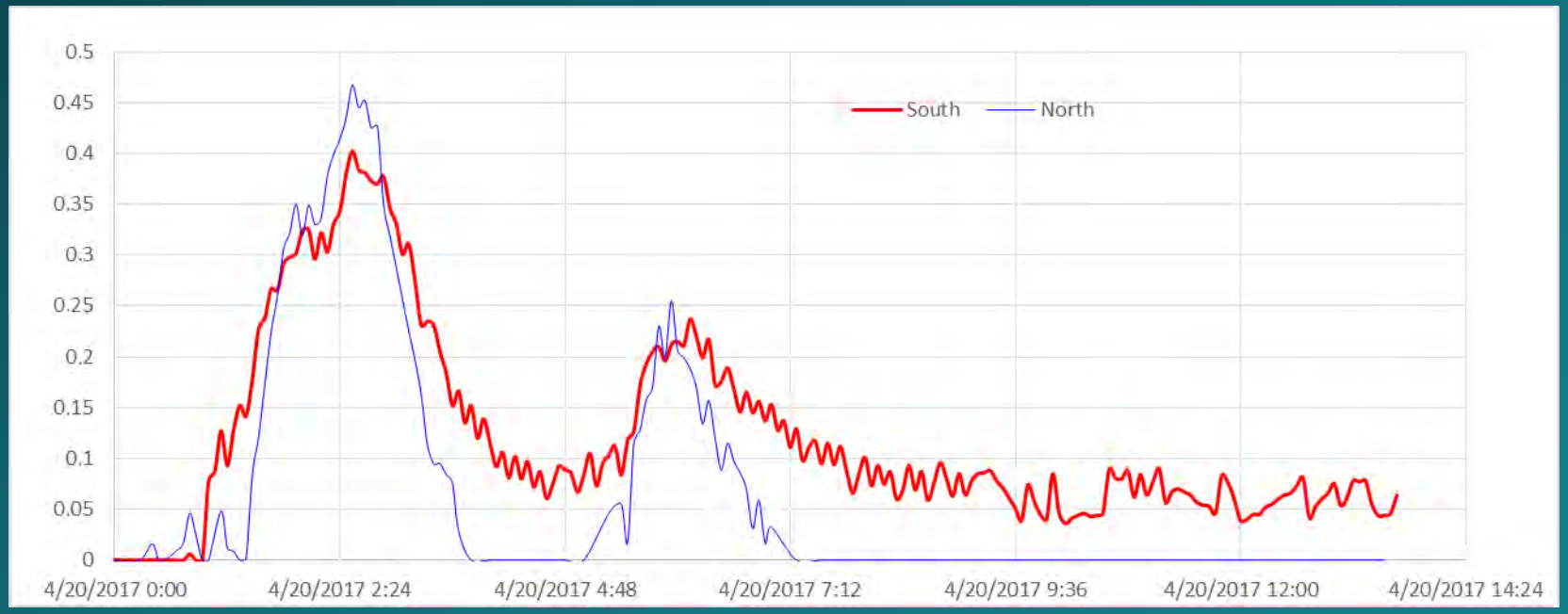
Silver Creek/Oneida Paired EOFs

Next Steps

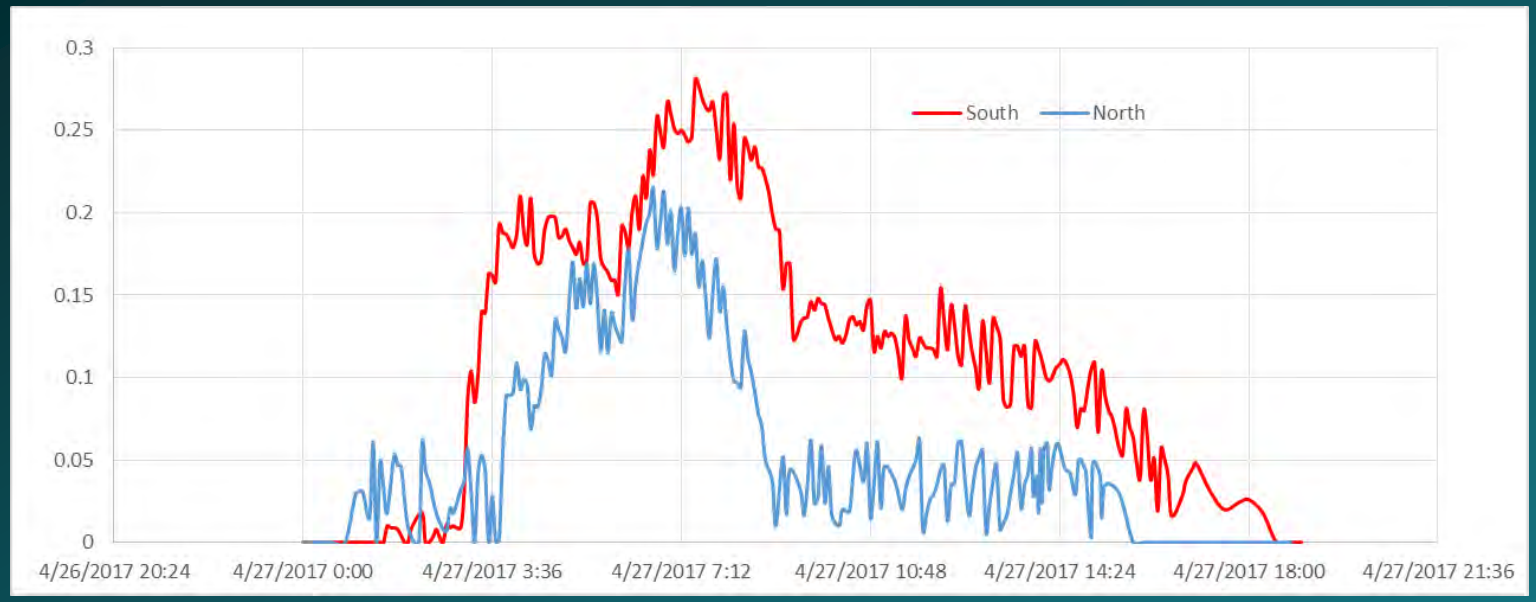
- Continue Pre-Treatment Phase at Silver Creek/Oneida Sites
- When sufficient data → Managed *Grazing* on one catchment
- ANALYSIS of Data/Summarize

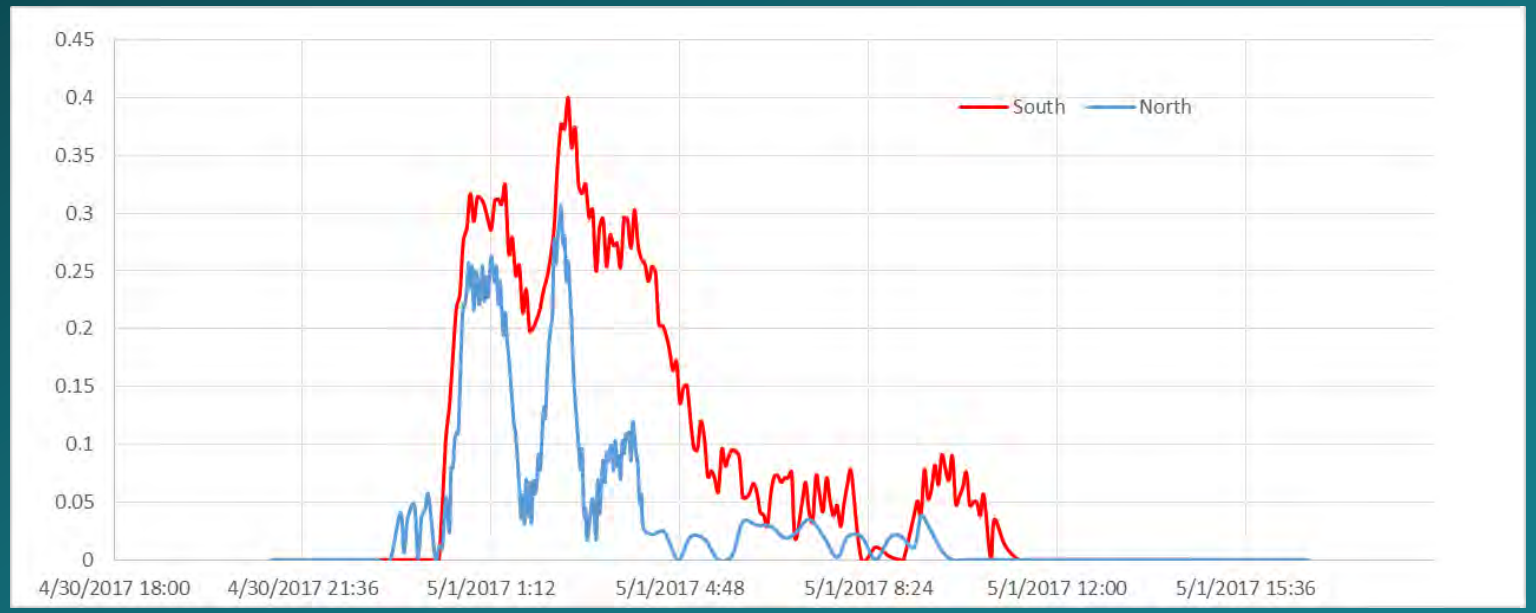
Hydrographs: North (blue) vs South (red)





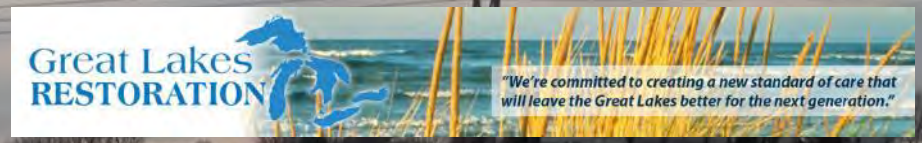
Hydrographs: North (blue) vs South (red)





Questions

THANKS!



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NRCS

FOX – WOLF
WATERSHED ALLIANCE

LOWER FOX
Demonstration Farms Network

UW Extension
University of Wisconsin Extension

ONEIDA NATION 1822

*** Phil Robertson ***

* Crop Consultants

The Nature Conservancy

* Outagamie and Brown County Land Conservation Departments

* Forrest Kalk, Josh Jarosz, Zach Ashauer, Gillian Ivanoff, Noel Craig
UWGB students

University of Wisconsin
GREEN BAY

Dec. 28, 2016 Oneida EOFs

Managed Grazing Operation

NEW Water
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Brown County Farm Demonstration Network

NEW Water
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Lower Fox Demonstration Networks
Silver Creek Stakeholder Meeting
12-19-2017

Brent Petersen
Lower Fox River Demo Manager

OUTAGAMIE COUNTY
LAND CONSERVATION DEPARTMENT

NRCS

Brown County
Established 1818








Greg Nettekoven

Trial of frost seeding red clover
Into winter wheat.

Seeding is done with a spinner truck,
Fertilizer is already being applied so
Cost for application is the same.

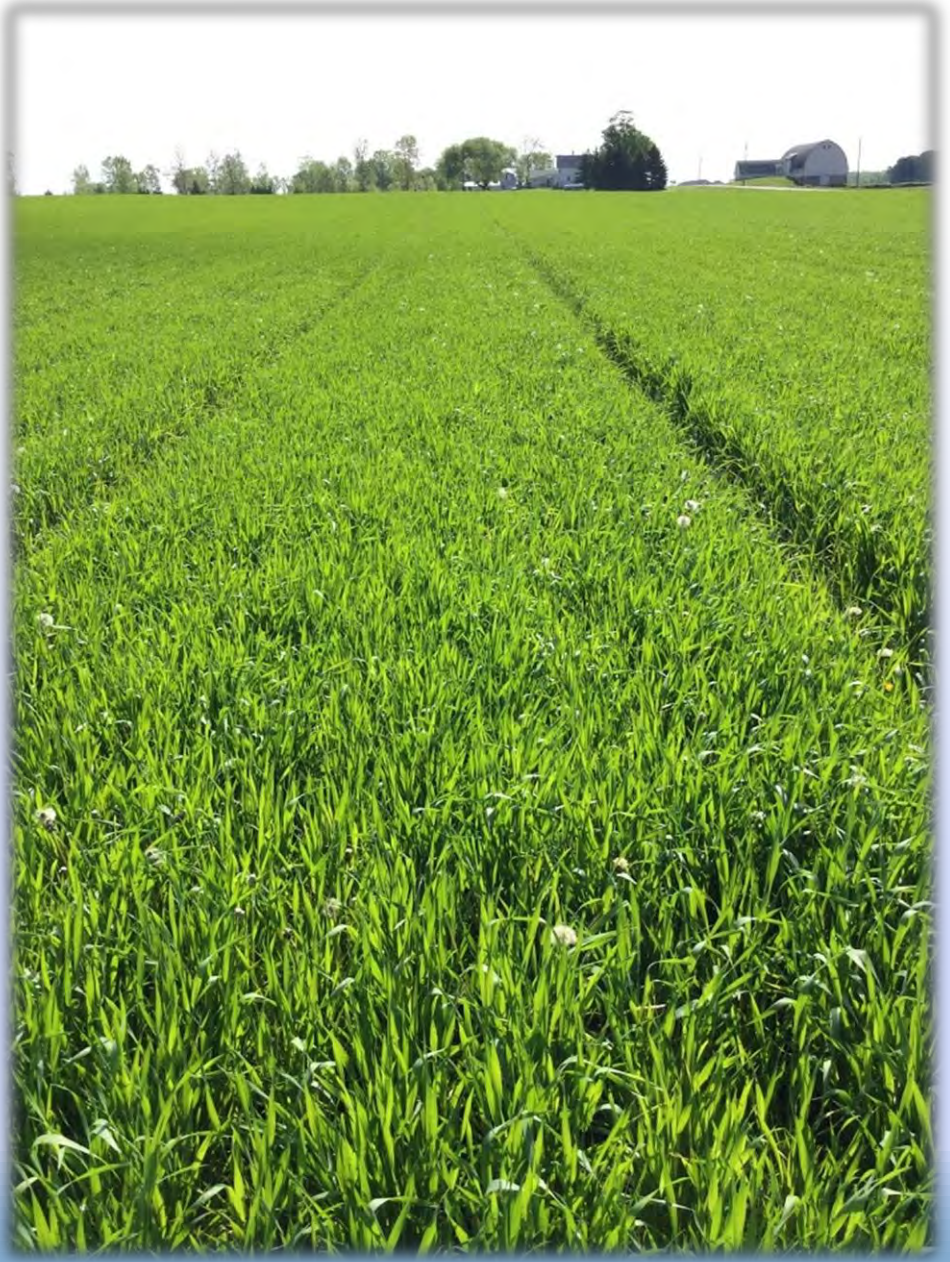
Red Clover costs at 10#'s/ac = $23 for
Seed.

MCPA Amine herbicide used .75 pt/ac.

The cost of this product is at $2.00/ac plus application which would have been needed either way.

Buctril herbicide is another option here, cost is higher though. Nearing the $12.00 acre range at full rate.

MCPA was a better option here because it goes after dandelions here as well.



Greg Nettekoven 2 years later, this is looking like a nice practice. The winter wheat overall in this field was yielding 79 bu at this point. The pictures are in a poor part of the wheat field. So, the red clover has a better jump. This may be more challenge for combing, but great for the clover. Greg did plant 3 fields like this, and the red clover established nicely in all 3 fields.

The red clover grows fast following winter wheat harvest. The picture far right doesn't do this field justice. The red clover has emerged on well over 95% of this field.

You may have to deal with red clover in the straw if wheat stand is poor in areas. The straw may be a little more challenging to dry out.

Depending on where it’s going this may not be a big deal.

Nitrogen is currently around the $.50 per unit range. Greg will try to gain a nitrogen credit of anywhere from 60 to 120 pounds of nitrogen for corn in 2018 growing year; or $30 - $60/acre plus soil benefits. Greg also gains on the stability of the nitrogen source.

This red clover has been left alive for the winter of 2017-2018. This crop will be killed off in the spring of 2018 and no till corn will be planted.

The late flowering of the Red clover also helps pollinators in the area store up for winter.

New Water (Green Bay Metropolitan) and Brown County LWCD received a grant from (The Fund of Lake Michigan) to purchase a unit similar to this. This unit is available in 2017. This is a 6 row unit that can be converted to a 15 ft no till grain drill for fall cover crop seeding. This unit has the ability to apply 28% side dress. A second unit is available through Plum Kankapot project.

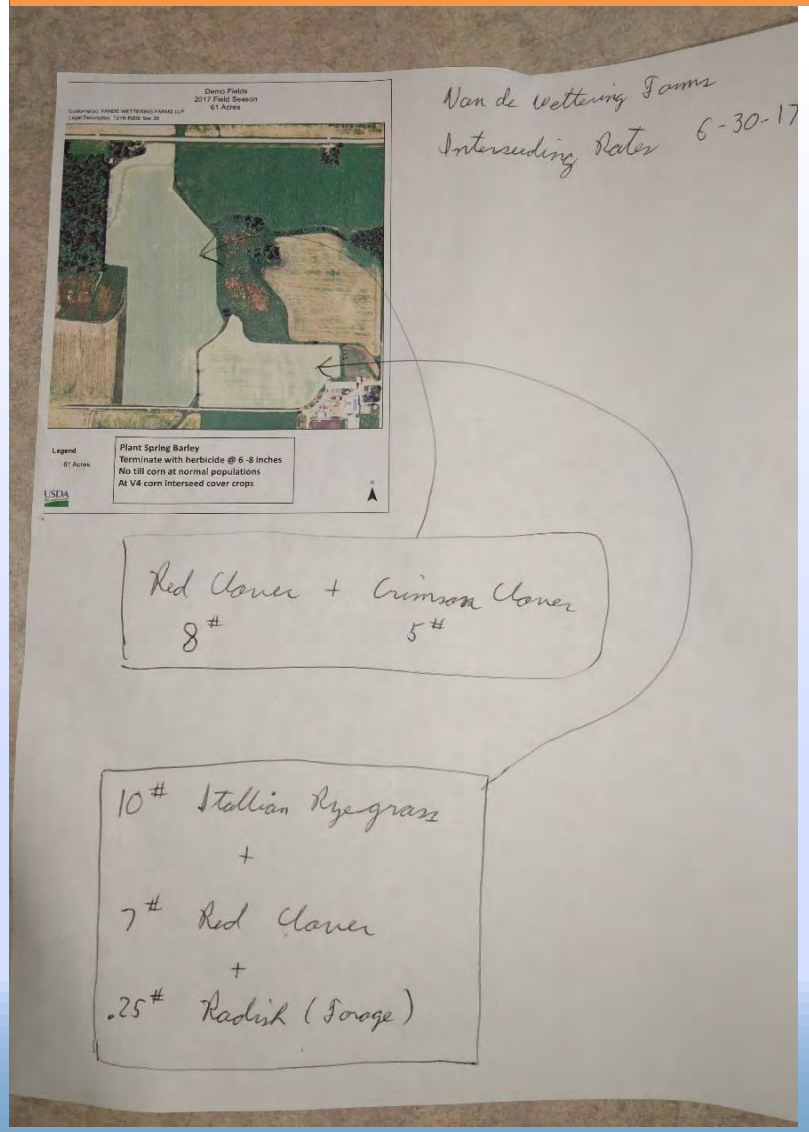
June 11th 2015 first plantings (VanWychen Farms)

The best fit's seems to be corn grain and grazing options. There are <u>many</u> options out there, but it's tough to beat the double disk opener. We seem to have had our best results this way.

Suggestions: Watch herbicides, plant earlier if high plant population stand and or corn silage (above 32,000 plant population). Decide what your goals are for the following year, (plan ahead!).

VandeWettering Farms Inter seeding and managed grazing:

Since Tom and Bill have started to move towards managed grazing. This became a potentially viable step. Early stages.



Oct 17th 2017

Red and Crimson Clover: Roundup ($4.50/ac) and Sharpen ($8.00/ac herbicide with a shorter carryover) Pre emerge

Oct 17th 2017

Italian Rye, Red Clover, and Radish Roundup only pre emerge, weedier, no Sharpen herbicide. Field was weedier with no sharpen

These field got grazed into late Fall of 2017. They will get grazed early in the Spring as well.

VandeWettering's: Here we have 63 dairy heifers grazing on inter seeded cover crops that were planted in June of 2017. (67.3 acres between two fields)

Our October/November best estimates (With help from Adam Able NRCS):

These dairy heifers have consumed approx. 1 ¼ ton/ac, (October and November) of dry matter since grazing started 2nd week of October 2017 till Nov 23 2017.

1 1/4 ton * $100/ton = $125/ac

$125/ac * 67.3 acres = $8,413

Manure application savings: If manure application is at $.018/gal.

63 dairy heifers with production of 13.8 gls/day/each.

870 gls/day *42 days = 36,540 gls of manure

36,540 gls * $ .018/gl = $657 of manure application savings

$657/67.3 acres = $9.72/acre savings

We will be looking to no till corn into these 2 field after grazing in Spring.

The covers will be live at that point:

We will probably look at two options for 2018. We will be dividing these fields.

1) Corn will be no tilled into living cover, then completely killed off (Potential Nitrogen Credit?).

2) We will stunt the red clover, and keep it living for the 2018 season. Those decisions will be made this winter.

Insight Trials By Winfield™

2017 Corn Silage Planting & Harvest Report

Grower Name:	Vande Wettering Farms LLP				
City:	Greenleaf	State	WI	Zip:	
County:	Brown		Retail Account #:		
SAA Name:			Retail Coop Name:		
Plot Type:			Lattitude :		
Crop:	CORN		Longitude :		
Prev Crop:			Organic Matter %:		
Planting Date:			N-P-K (lb/ac):		
Planting Pop:			Soil pH:		
Soil Drainage:			P205:		
Tillage Type:			K20:		
Irrigated:	No		Soil Type:		
Harvest Date:	0927/17		Manure Type:		
Harvested:	Yes		Man. Gal/Tn/Ac		

Comments
Put comments here

WINFIELD

Entry No.	Brand	Hybrid	Traits	Agrinomic Treatment	Harvest Pop	Nbr of Rows	Row Width	Plot Length	Silage Weight	Silage % Mst	Grn Tn Acre	Tn/Ac at 70% Mst	Starch % of DM	NDF % of DM	30-h NDFD %ofNDF	30-h IVDMD	TDN % of DM	Milk Per Ton	Milk Per Acre	Milk /Acre Rank
1	Cover Crop	1				6	30	584	11640.0	62.92	28.9	35.8	31.8	42.7	63.4		74.23	3428		
2	No Cover Crop	1				6	30	584	15060.0	64.91	37.4	43.8	31.9	42.4	65.3		76.18	3564		
3	No Cover Crop	1				6	30	584	12820.0	64.91	31.9	37.3	31.9	42.4	65.3		76.18	3564		
4	Cover Crop	1				6	30	584	11950.0	62.92	29.7	36.7	31.8	42.7	63.4		74.23	3428		
5																				
6																				
7																				
8																				
9																				
10																				

Charts signify adjust plot to 70% harvest moisture. Plots were combined: 2 plots inter seeded vs 2 plots not inter seeded.

Inter seeded

Please Insert values from your farm into the YELLOW boxes below:		
Determining the costs of corn silage standing in the field.		
Corn Price	$/bushel	$3.00
Silage Yield	wet tons/acre	36.3
Corn Silage Dry Matter	% dry matter	30.0
Corn Silage Yield (dry)	tons DM/acre	10.88
Estimated Grain Yield	bushels/acre	206.4
Corn Grain Harvesting and Drying Costs	$/acre	$100.00
Net Value of Stover Removed	$/ton of stover	$10.00
Corn Silage Value - Dry	$/ton of DM	$53.12
Corn Silage Value - Wet	**$/wet ton**	**$15.94**
Value Per Acre to Crop Grower	$/acre	$577.68
Determining the costs of corn silage at feeding.		
Harvest, Hauling and Storage Cost	$/wet ton	$3.07
Cost of Silage to Producer (before shrink)	$/wet ton	$19.00
Shrink	% of DM	15
Cost of Silage Lost to Shrink	$/wet ton	$2.39
Total Cost of Silage to Producer	**$/wet ton**	**$21.39**

No inter seeding

Please Insert values from your farm into the YELLOW boxes below:		
Determining the costs of corn silage standing in the field.		
Corn Price	$/bushel	$3.00
Silage Yield	wet tons/acre	40.6
Corn Silage Dry Matter	% dry matter	30.0
Corn Silage Yield (dry)	tons DM/acre	12.17
Estimated Grain Yield	bushels/acre	215.5
Corn Grain Harvesting and Drying Costs	$/acre	$100.00
Net Value of Stover Removed	$/ton of stover	$10.00
Corn Silage Value - Dry	$/ton of DM	$50.71
Corn Silage Value - Wet	**$/wet ton**	**$15.21**
Value Per Acre to Crop Grower	$/acre	$616.86
Determining the costs of corn silage at feeding.		
Harvest, Hauling and Storage Cost	$/wet ton	$2.74
Cost of Silage to Producer (before shrink)	$/wet ton	$17.95
Shrink	% of DM	15
Cost of Silage Lost to Shrink	$/wet ton	$2.28
Total Cost of Silage to Producer	**$/wet ton**	**$20.23**

	Inter seeded plot with Red Clover & Crimson Clover	No inter seeding plots	Gain or Loss Acre
Corn Silage $/ac $ 3.00 corn	$ 577.68 Value/ac	$ 616.86 Value/ac	$39.18 (if corn $4.50/ then $47.00)
Cover Seeding Cost Acre Crimson, Red Clover & Planting	$28/seed and $15 planting = $43/ac	No cost	$43.00
Grazing Value Oct and Nov 2017	1.25 ton dry matter = $125/ac	No forage value	$125.00
Manure Application Costs	No costs	$9.72/ac	$9.72

Basic Data results:

Overall gain in this scenario, but this is still a short sided look at the data. Tom and Bill will also graze in spring. Potentially, more than doubling these numbers.

$52.54/ac gain or

$3,535 across 67.3 acres.

Vande Wetterings has the potential to look like Tinedales in spring of 2018.

Ex. Tinedale Farms

What about the value of leaving the soil in place; what's the value of that to a producer?

Sep 27, 2017 Wisconsin Agriculturalist Article

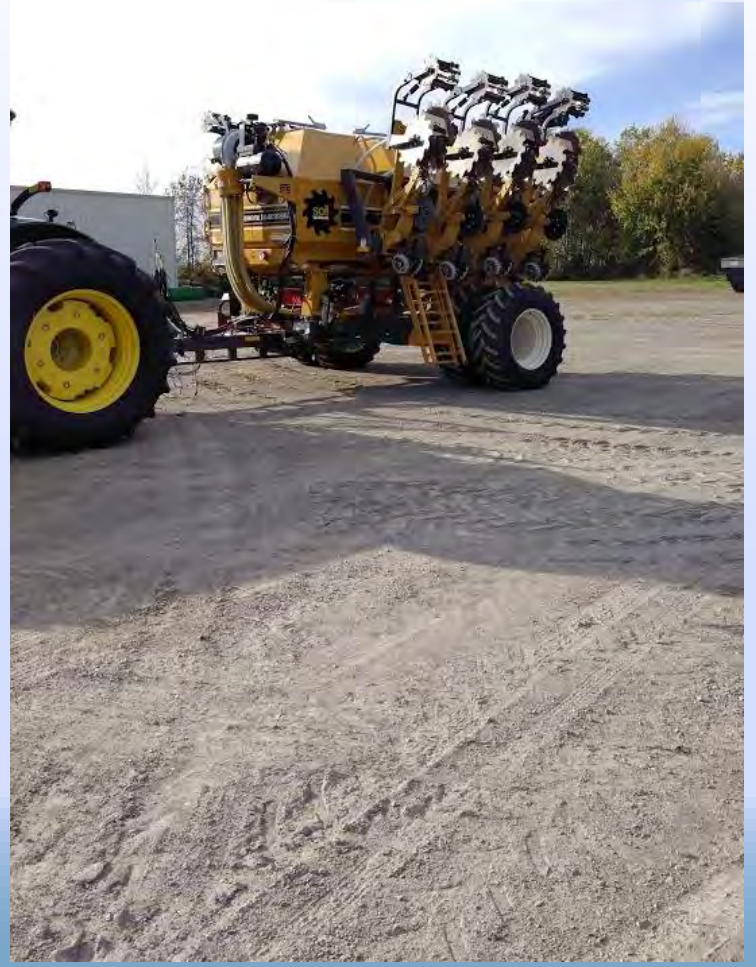
"University of Wisconsin-Madison soil scientist Francisco Arriaga estimates the nutrients present in 1 ton of an optimum soil are 2 pounds of nitrogen, 9 pounds of phosphorus and 31 pounds of potassium. The fertilizer value of these nutrients would total $12.80 per ton."

Soils in Brown and Outagamie counties, "acceptable" soil losses range from 3 to 5 ton the acre. In reality, why is that acceptable?

We are accepting losses of $38.40 to $64.00/ac per year. "Just in nutrient value"

The KhB "Kewaunee Silt Loams" soils at VanDe Wetterings allow for 3 tons/ac soil loss; or $38.40/ac year.

Strip tillage trials: Fall of 2017 and Spring of 2018. Several trials will happen with this type of a unit. We are working with ETS solutions and Riesterer & Schnell to introduce this practice to the area. This unit opens up minimal tillage in an 8” zone and can apply variable rate fertilizer. This unit is 12 rows and requires 350+ hp to keep the speed up.



Early operation on soybean ground.

Advantages:

1) Loosen planting area (8 inch band)
2) Apply fertilizer needs (variable rate)
3) Tills smaller area
4) Can do in cover crops in fall or spring
5) Helps to level seed zone after low disturbance manure application, so we can start planting next spring.
6) Warms up zone faster

Disadvantages:

1. Tills 8 inch band
2. $$'s for strip till unit
3. Additional pass in Fall or Spring
4. Larger tractor needed for speed

Vanwychen Farms: Here the strip till unit was run through a cover crop of Volunteer Wheat, Barley and Radish.

I feel we will have more of a benefit in spring with this unit but, time will tell as always.

Potential slug deterent? Some research suggests it.

Manure applications:

VandeHey's 9000 gls of manure on Winter Rye after corn silage harvest in late September. This is the same field, the cover was up with the application and this is the result. This will be harvested in the Spring of 2018, then no till corn with a light manure application after planting.

Brickstead Dairy:

Dan applied 10,000 gls of manure with an aerway this fall (2017). The aerway application manure moved into the soil profile in three ways. Earthworm channels, the aerway slots, and better than average infiltration. Cover crop planting was delayed 1 ½ weeks waiting for custom planter. This will change in 2018.

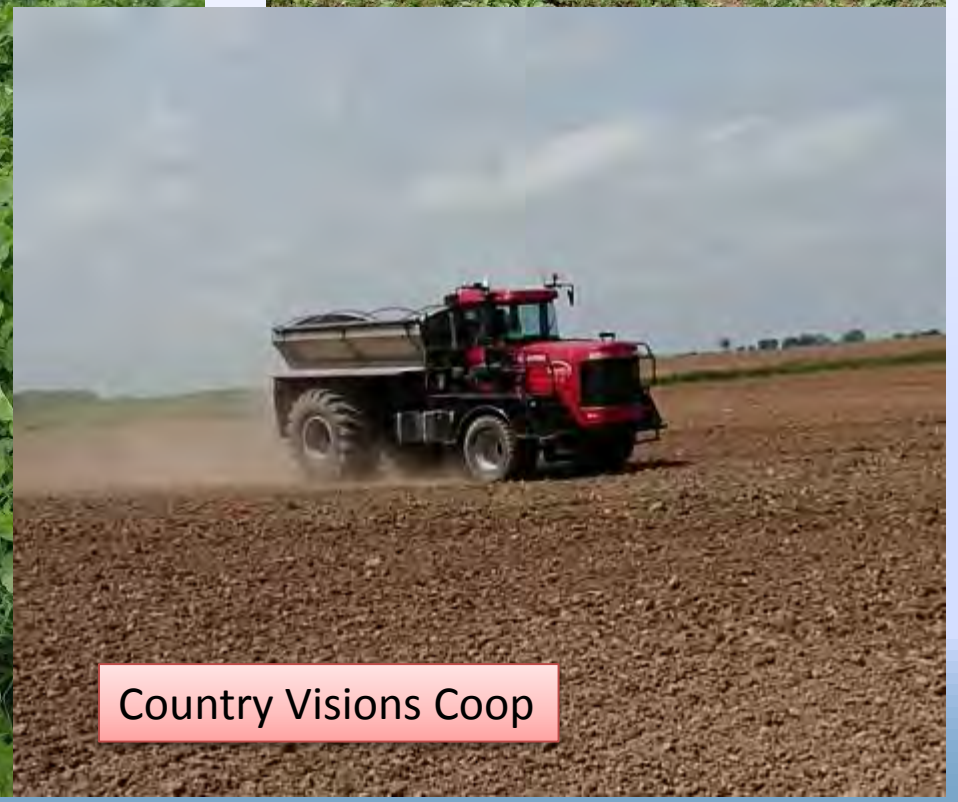
Cover crop planted into sand bedding after application. Diversified mix planted here. This is the second year trying this. Last year we failed, this year it worked much better.

Tinedale Farms: Fast cover planting

Radish, Red Clover and Cal sul (Carrier).

Different fields same results. This worked very well for Scott. This practice is super fast. Scott planted over 1000 acres this year with this practice alone.

Manure was applied on the middle field with a low disturbance applicator (Bazooka from Outagamie County) after Establishment. See middle field.



Derek and Dave VandeHey (New Horizon Dairy)

Here is a different field that had a application (8000 gls) with a dribble bar after the cover crop was around 12” tall. See, how it bounced back after the hose was dragged across it.

Pre Manure

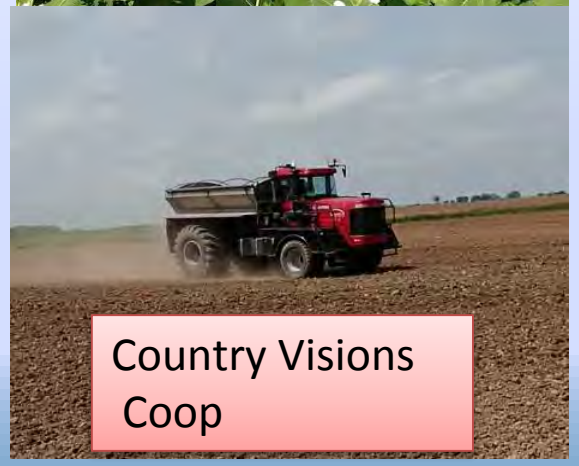
Post Manure

Post Manure, several weeks later

Oct 25th 2017

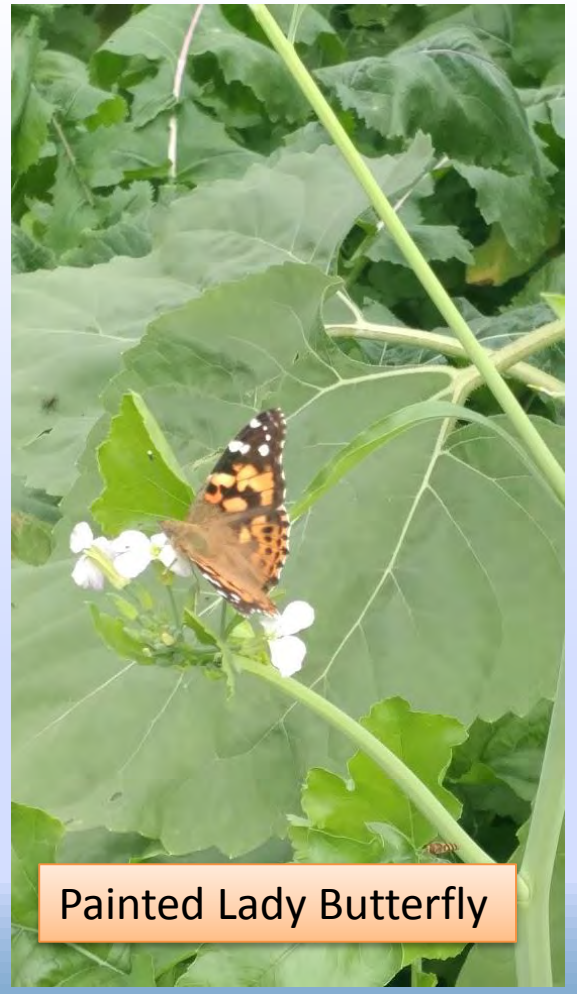
Work into the future

<u>What's the importance of diversification and cover crops in general.</u> This is a diversified cover crop field that New Horizons planted with the local fertilizer dealer and a vertical tillage unit. I feel that we can now make the next step with pollinators. We are hoping to bring UWGB on board with this over the winter. This field was wheat, sand bedding applied and vertical tilled. The local coop applied cover crop seed with a low rate of potash. Here is what they ended up with! Very nice stand. Some of you may have seen this field.

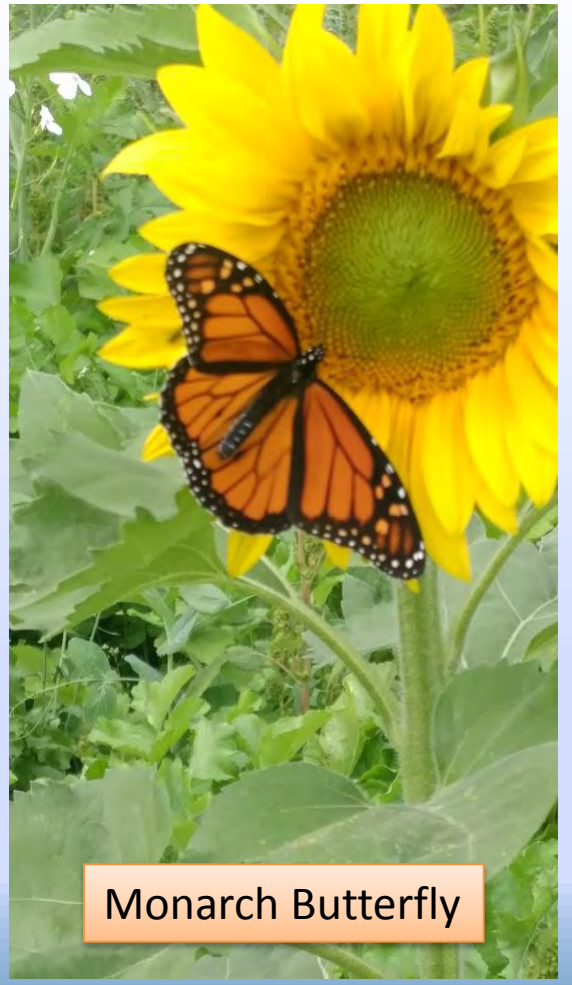


Country Visions Coop

Honey Bee



Painted Lady Butterfly



Monarch Butterfly


November 7th 2017 41 degrees

Thank You!

Brent Petersen
Farm Demo Network
Petersen_ba@co.brown.wi.us
920-391-4643

For more information follow:

Fox Demo Farms

on Facebook, Twitter & YouTube

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twitter

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www.foxdemofarms.org

Next Steps In Silver Creek

- Update conservation plans
- Planning for 2018 growing season
- Meetings with growers
- Continue installation of BMPs
- Continue water quality monitoring
- Verification of installed BMPs
- Special projects continue
- GLRI grant funding thru 2019

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Next Steps in Silver Creek

- 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?

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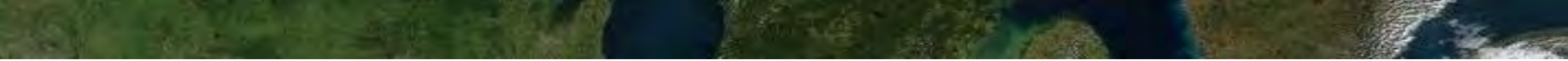

Full Scale Adaptive Management Evaluations and Next Steps in 2018

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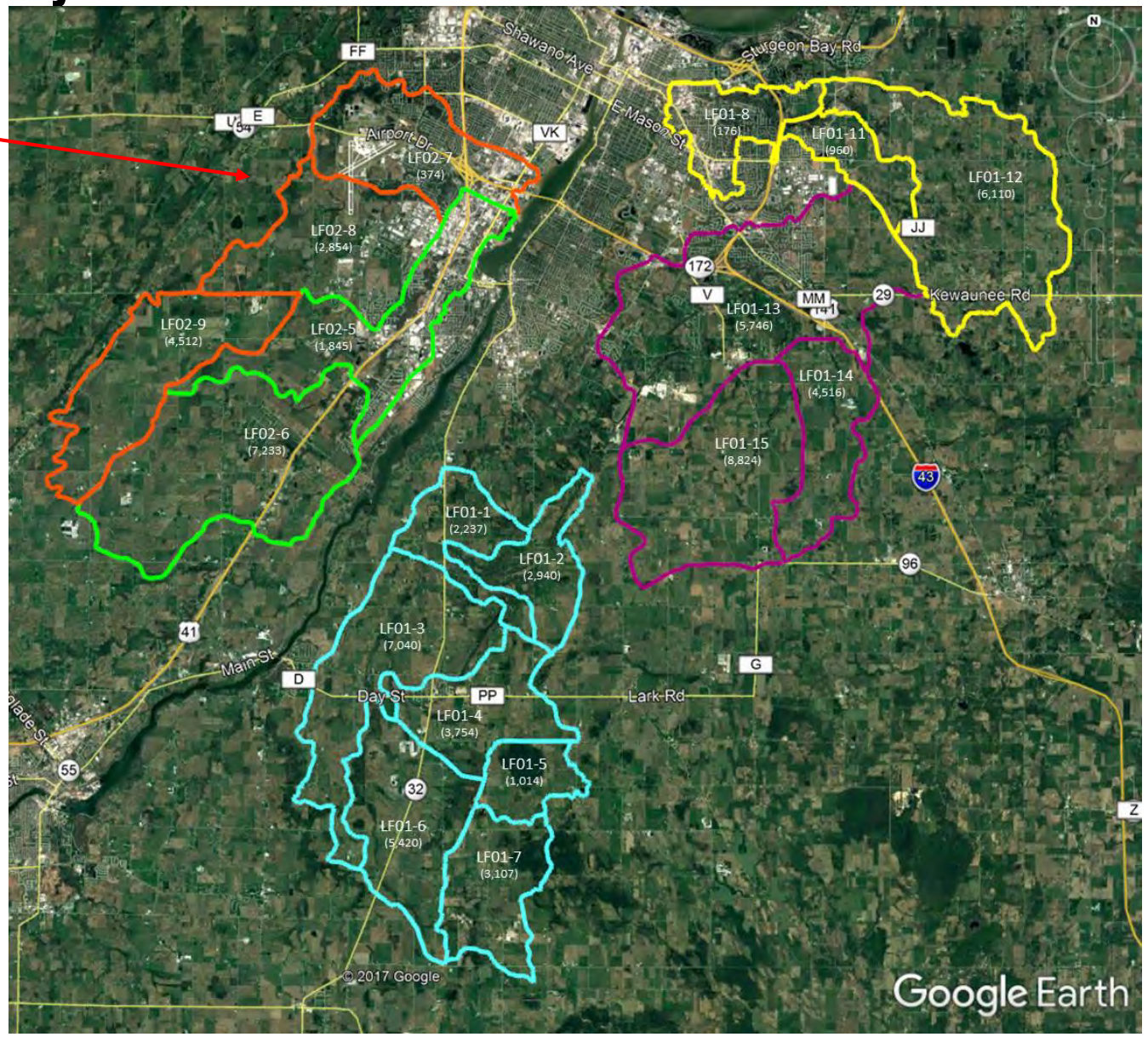
Opportunities in Adjacent Watersheds

Silver Creek



Legend

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

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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.

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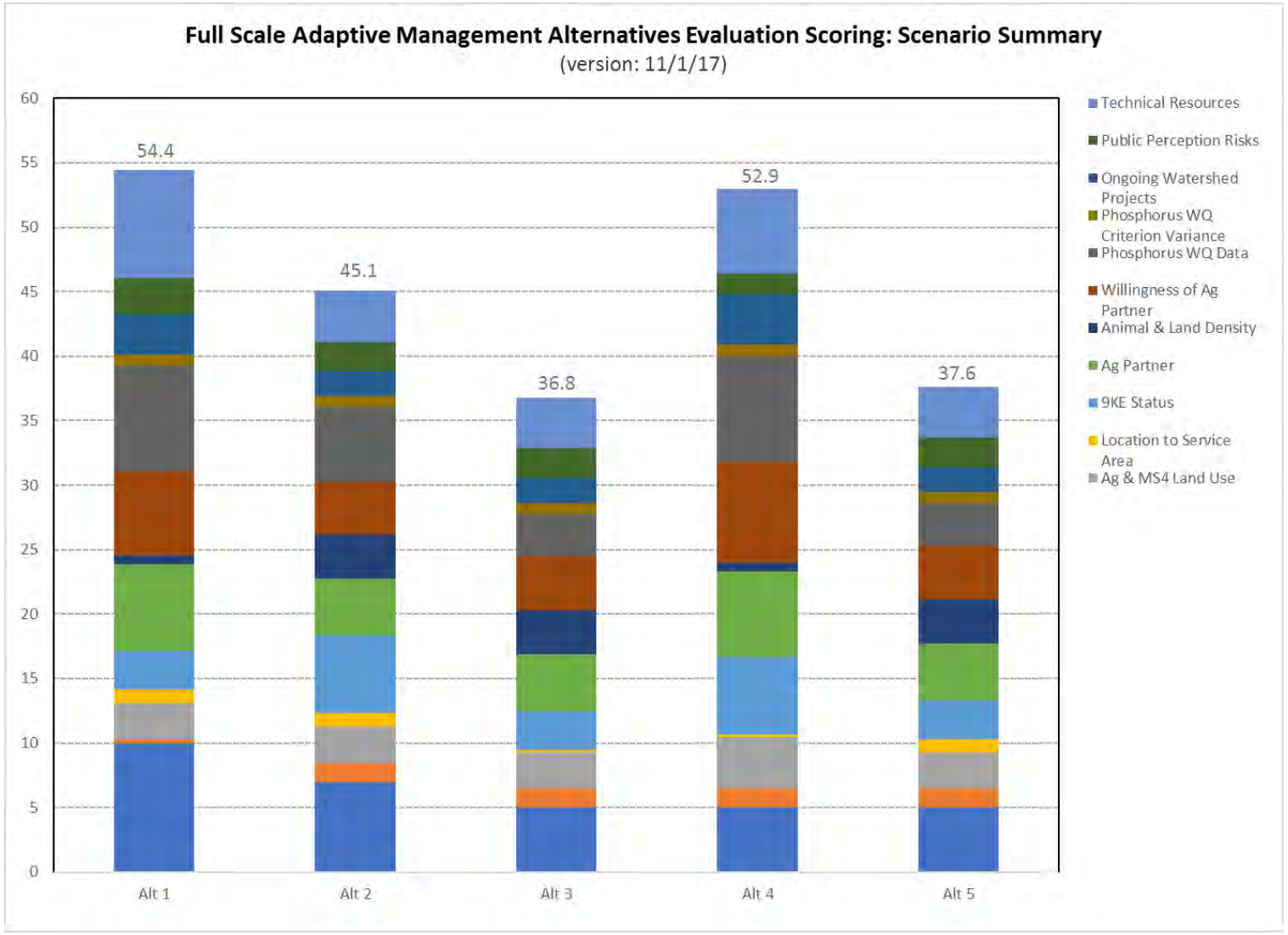
Criteria Inform Decision Making



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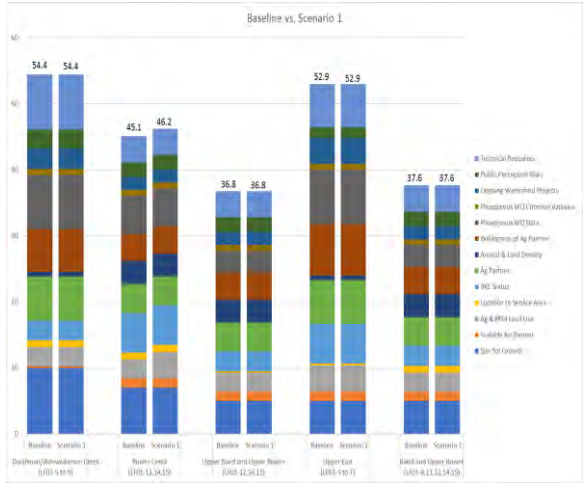
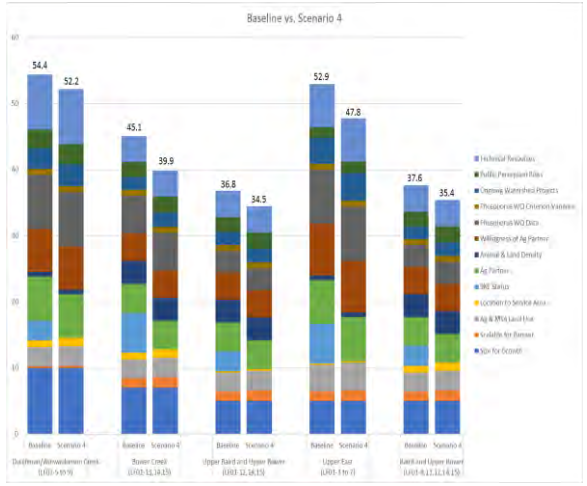
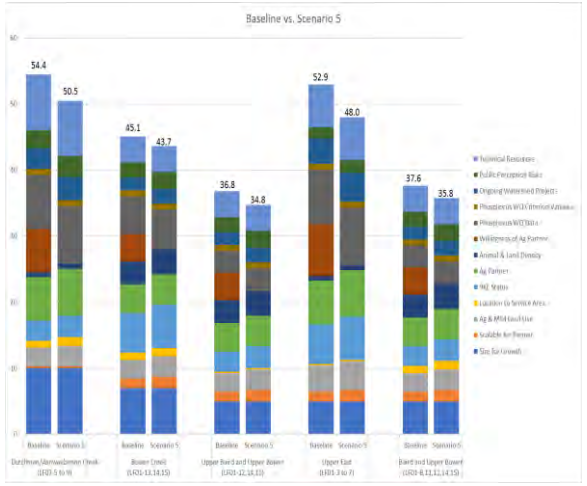
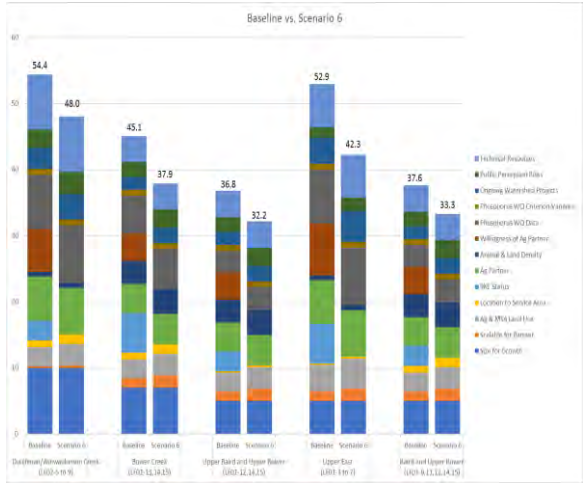
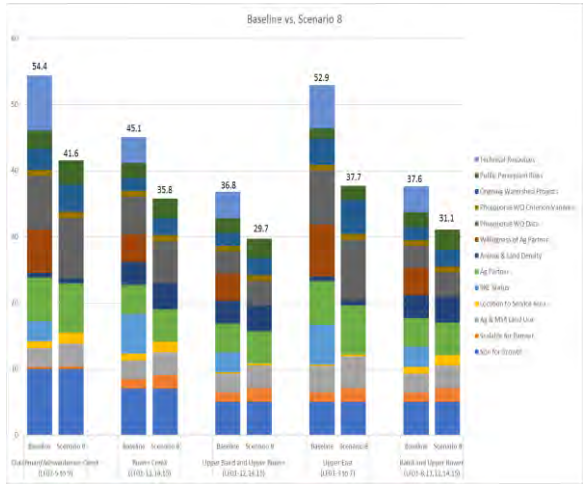
Multiple Scenarios Led to Similar Conclusions

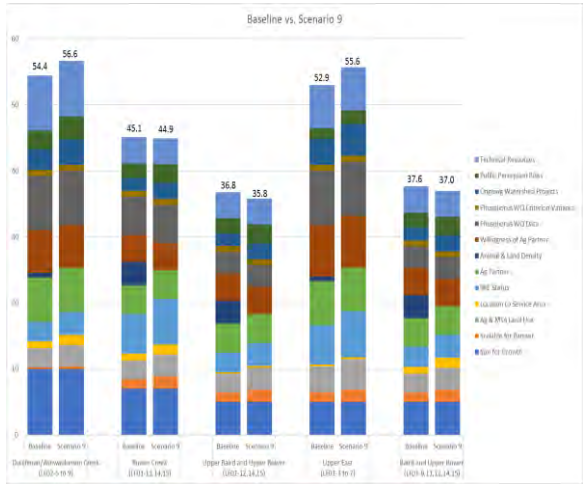


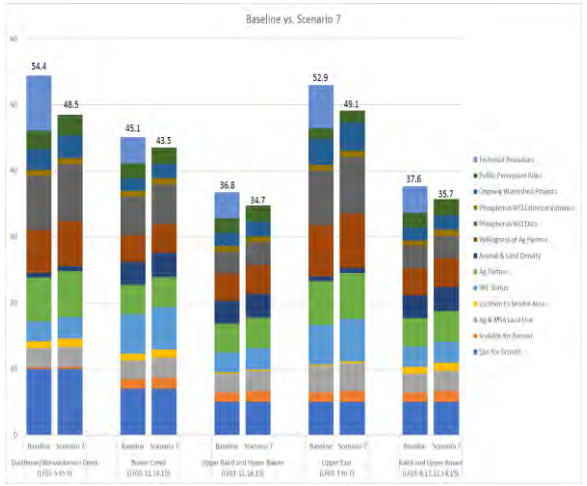












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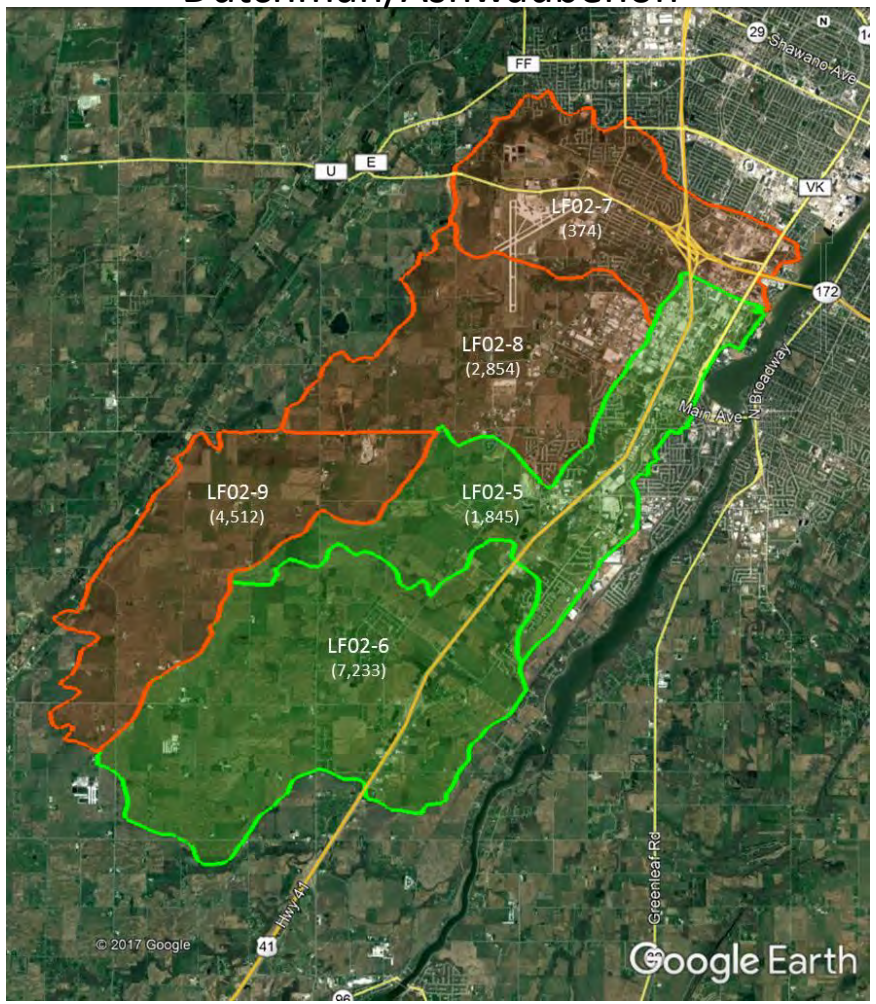
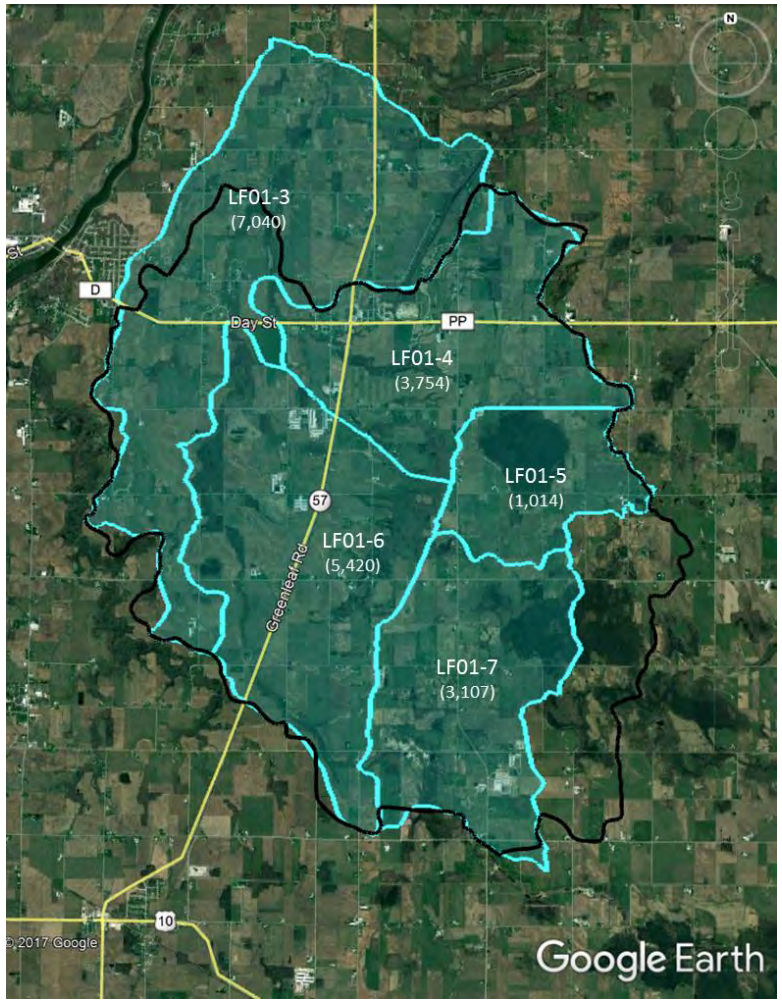
Continued Consideration for a Full Scale Program

Dutchman/Ashwaubenon



East River



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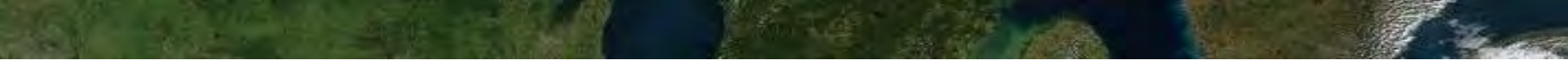

Next Steps for a Full Scale Program

- 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)

Anticipated Decision on AM Next Steps

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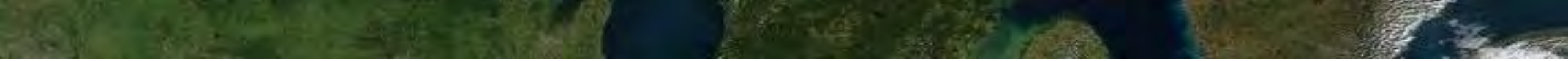

A Full Scale Program is Watershed Management

- NEW Water Commission Approved Full Scale Planning
  - 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
- Flow Monitoring

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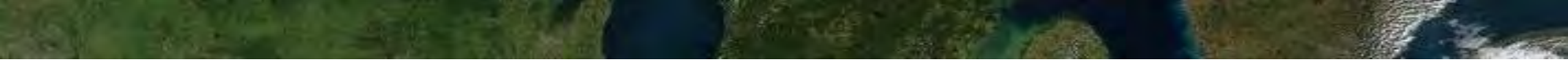

Two Workgroups to Advance Planning

- Biological Monitoring
  - Habitat assessments
  - Fish and marcoinvertebrate sampling plans
  - Select location(s) and frequency
  - Participation?
    - Jim Snitgen/Oneida
    - UWGB (Chris Houghton and Patrick Forsythe)
    -
    -

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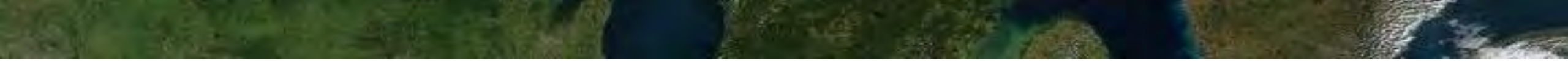

Two Workgroups to Advance Planning

- Watershed Inventory
  - Water resource opportunities beyond the farm field
  - Support prioritizing opportunities
  - How can this inventory benefit partners?
    - Streambank erosion and restoration opportunities
    - Wetland restoration/creation opportunities
    - Illicit discharges or exposed assets (exposed sewer crossing)
    - Information to benefit 9 Key Element Plans
  - Participation?
    - What to inventory and what information to collect?
    - Betsy Galbraith, Nicole Van Helden, Brian Glenzinski, Tony Kuchma, Sylvia Cornelius, Sarah Francart, Greg Baneck, Mike Mushinski, Jessica Schultz
    - WDNR - who?
    -

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Thank You!

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Comments and Open Discussion

Silver Creek Project
Partnering for Water Quality

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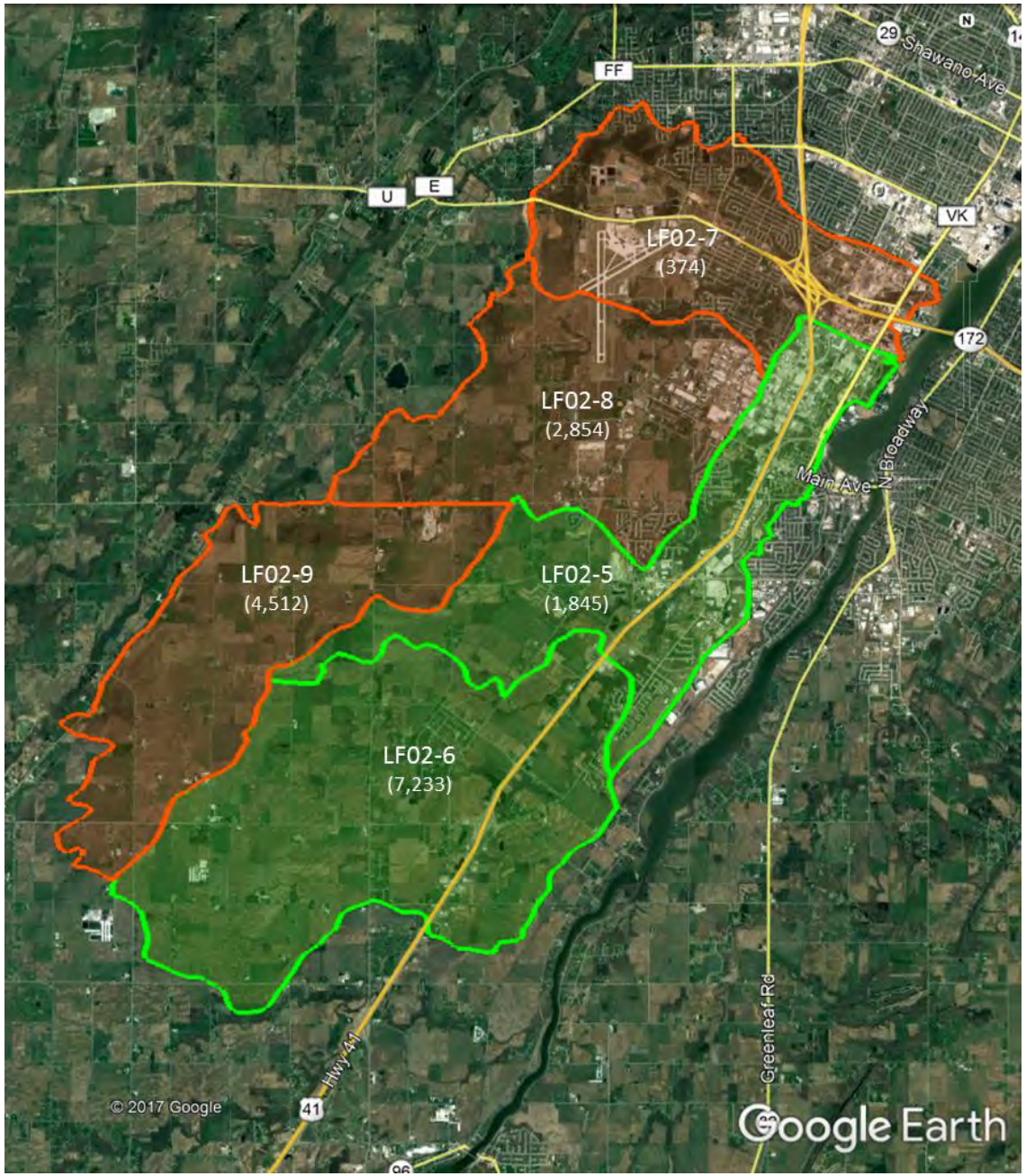
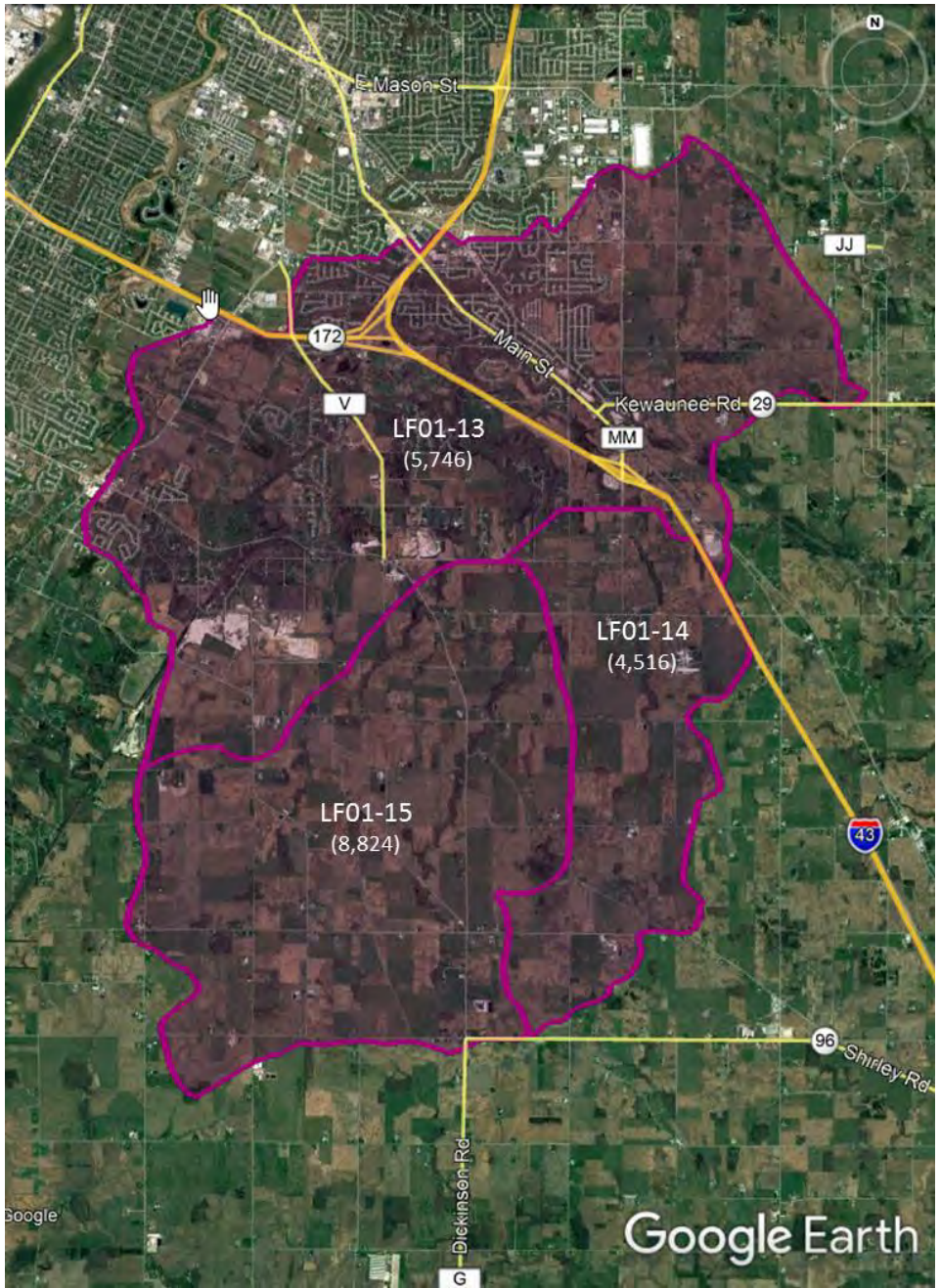
Ashwaubenon/Dutchman Creeks



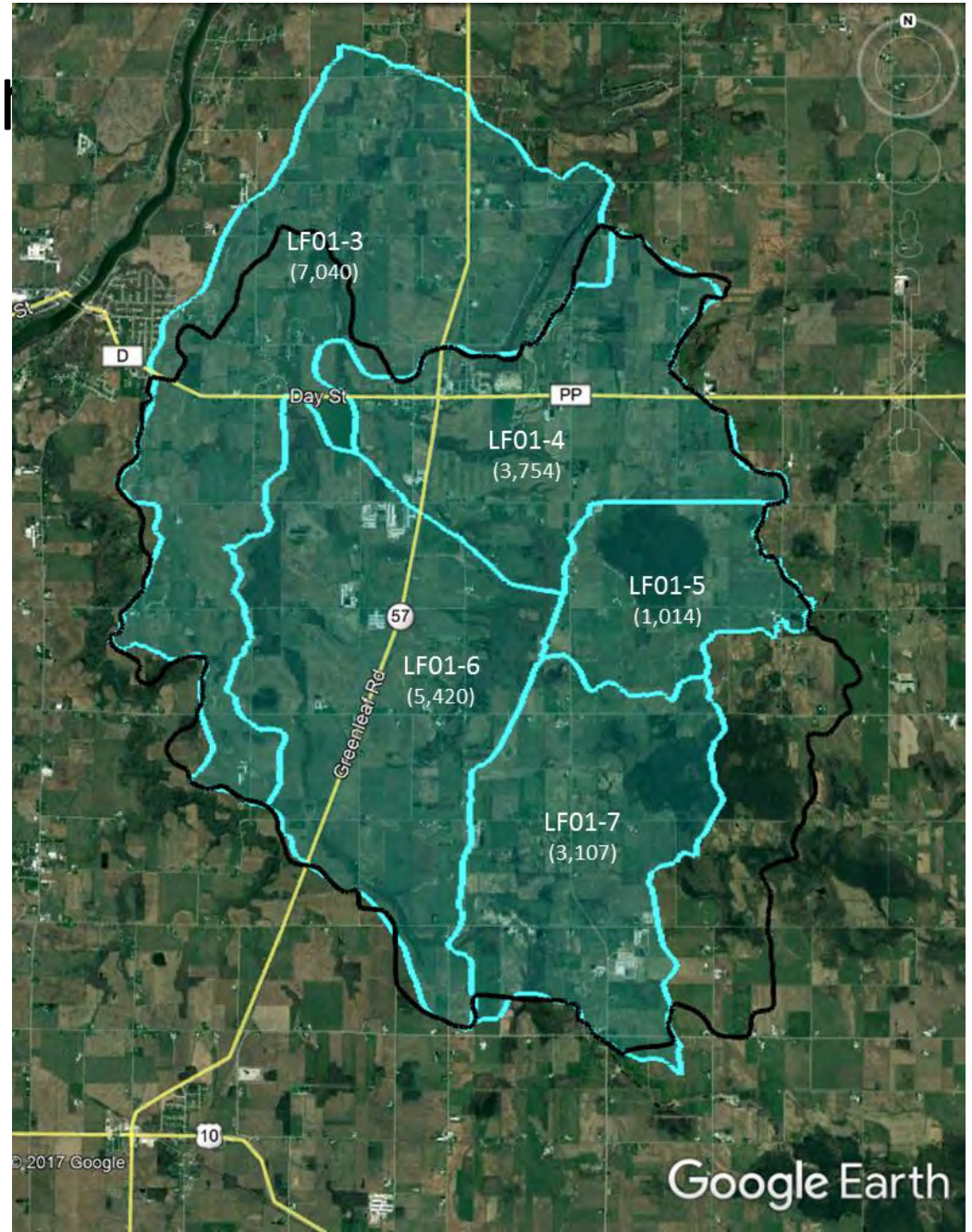
Bower Creek


E Mason St
172
Main St
JJ
V
LF01-13
(5,746)
Kewaunee Rd
29
MM
LF01-14
(4,516)
LF01-15
(8,824)
43
96
Shirley Rd
Dickinson Rd
G
Google Earth

Baird Creek

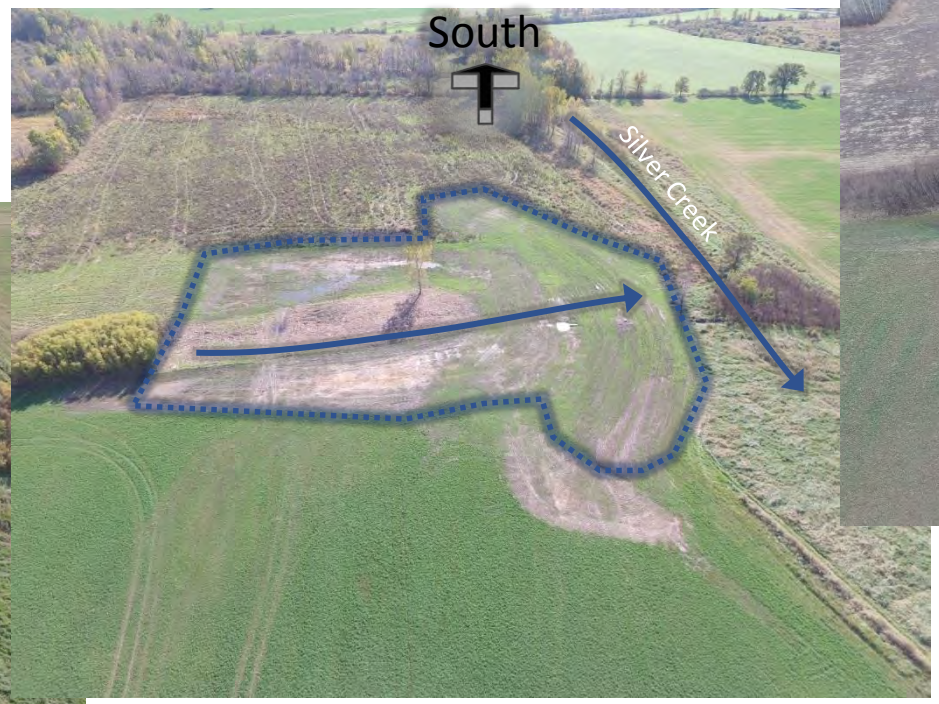

141
57
Sturgeon Bay Rd
University Ave
N Mason St
E Mason St
LF01-8
(176)
LF01-11
(960)
LF01-12
(6,110)
JJ
V
Main St
MM
Kewaunee Rd
Lime Kiln Rd
N

Upper East River



Wetland Restoration Projects

Sept. 19, 2017



Oct. 9, 2017

Dec 1, 2017

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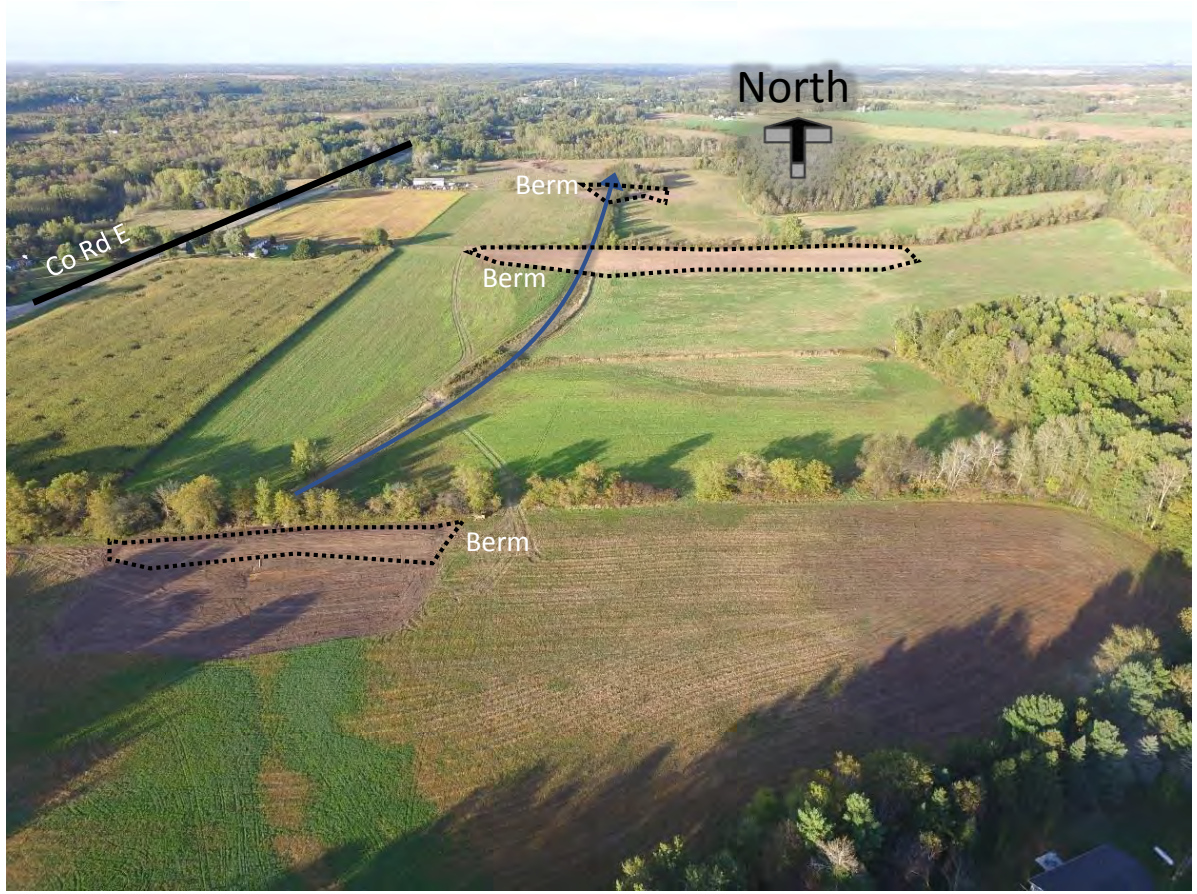
Wetland Restoration Projects

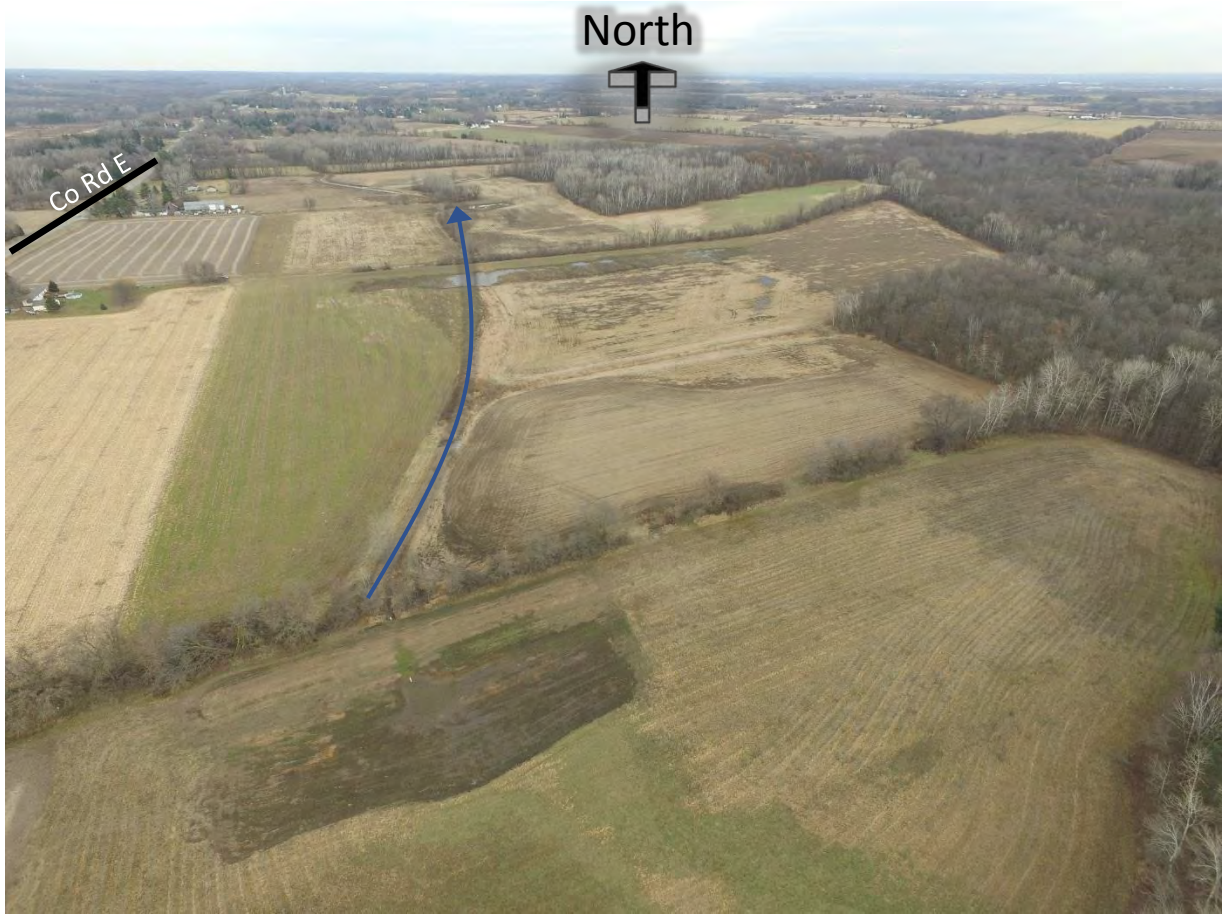
Oct. 9, 2017



Oct. 9, 2017

Wetland Restoration Projects

Dec 1, 2017



Dec 1, 2017

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