

Starry stonewort,
Nitellopsis obtusa
WI Lakes Convention
April 1st, 2016

Heidi Bunk, Lakes Biologist, WDNR
Bradley Steckart, Washington and
Waukesha County AIS Coordinator
Tim Plude, WDNR to MDNR

Tim in Action



What is starry stonewort?

- Starry stonewort, *Nitellopsis obtusa* is a member of the Characeae family
- Characeae are macrophytic green algae that can range in size from centimeters to meters
- *Chara* and *Nitella* species are found around the world.

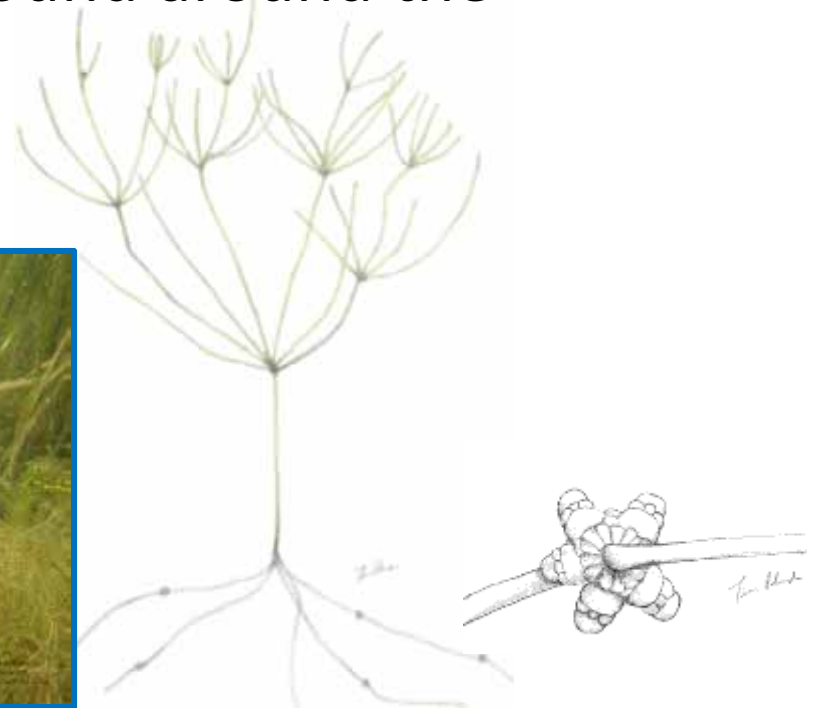
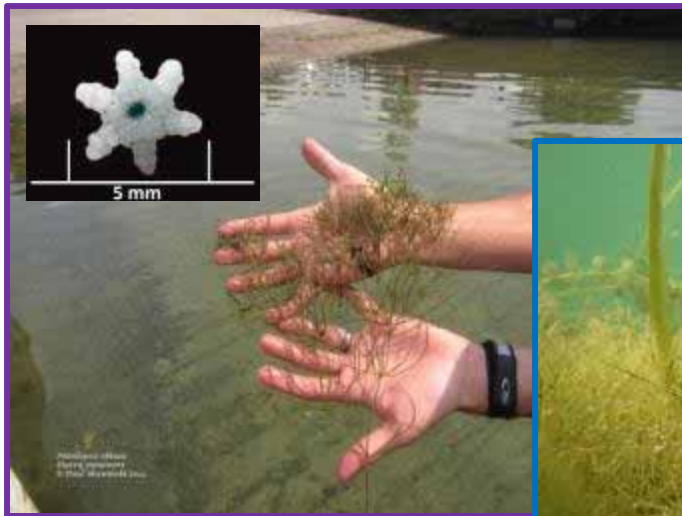
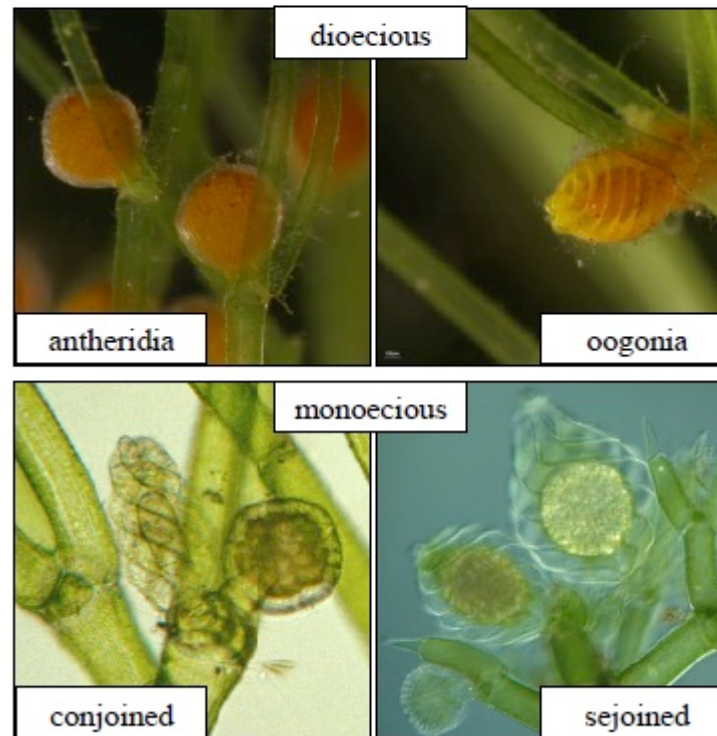


Photo credit: Paul Skawinski

Reproductive and Dispersal Capacity



Characeae sexual state



- Capable of sexual and asexual reproduction
- North American clones are all male – no zygotes produced
- Asexual reproduction occurs by bulbil or plant fragments

Why is it a Problem?



- Bulbils are small and easily hid
- Bulbils are not susceptible to herbicide
- Nodes can form into bulbils
- Species is hard to ID

One Positive Note:

Only Male plants have been found in USA = only reproducing via asexual means



Photo Credit: right-hand side Brad Steckart, left-hand side Paul Skawinski

How might starry stonewort affect a lake?

- May outcompete native aquatic plants
- Thick “meadows” can prevent fish from spawning
- Can become a navigational nuisance in shallow waters (< 6 feet)
- Meadows may increase water clarity by minimizing sediment re-suspension

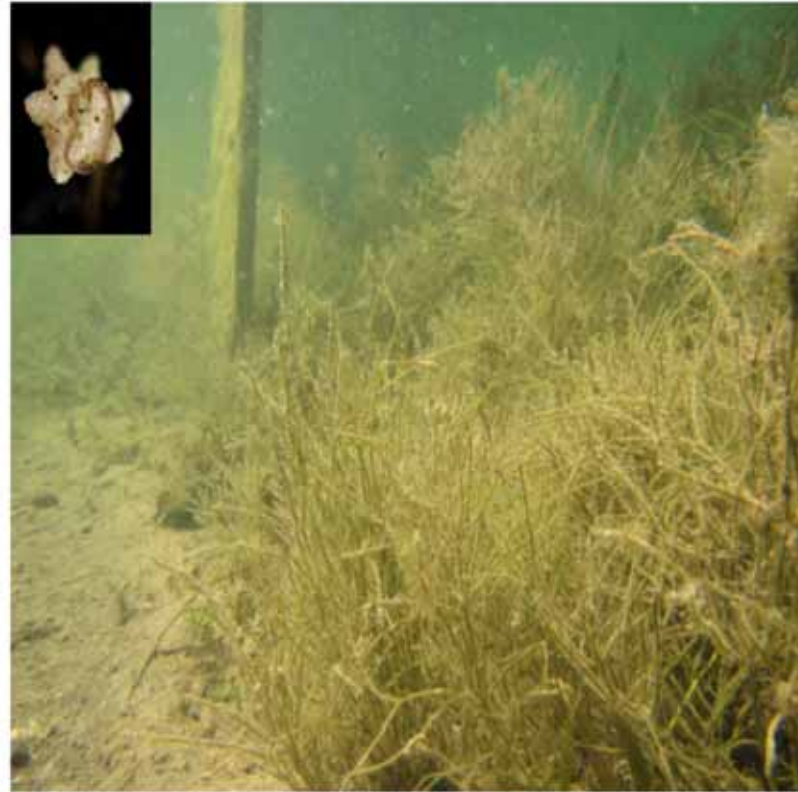
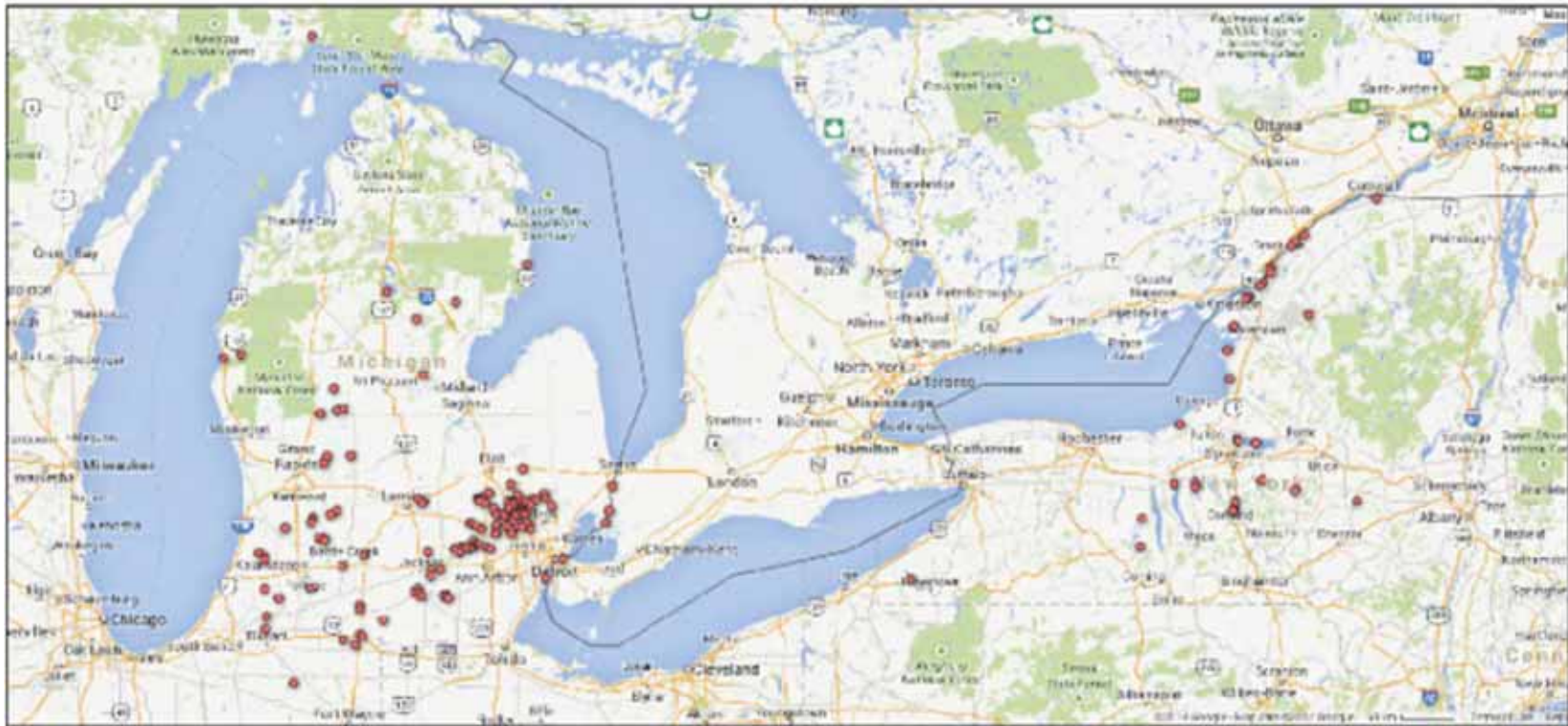


Photo: Paul Skawinsky
Slide: Courtesy WDNR

US Distribution NY, VT, PA, MI, IN, WI, MN (Non-native Range)



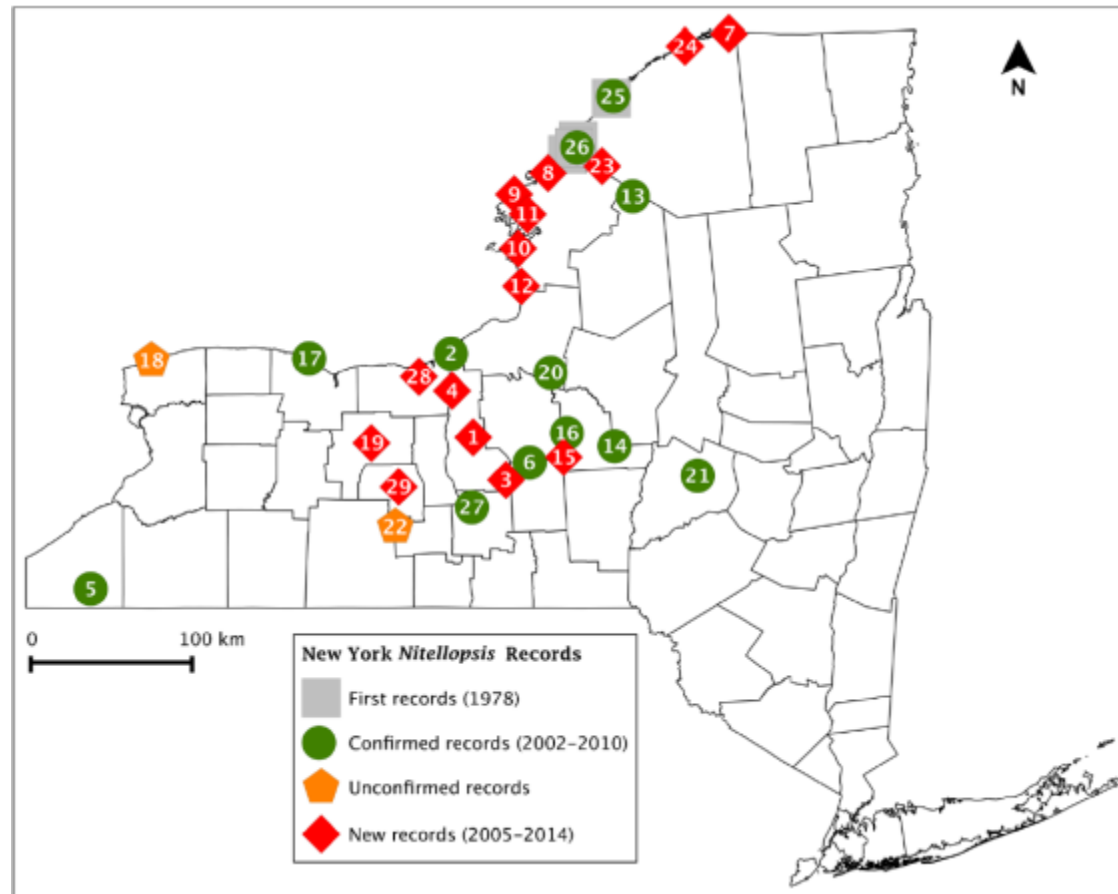
How did it get here?

Characeae distribution – *Nitellopsis*



- St Lawrence River – 1978 – thought to be from ballast
- St Clair River – 1983
- Michigan inland lakes in 2006 – unclear whether it took SSW a long time to move inland or whether it wasn't recognized until after it had been there for some time

New York



Sleith R.S. et al (2015)

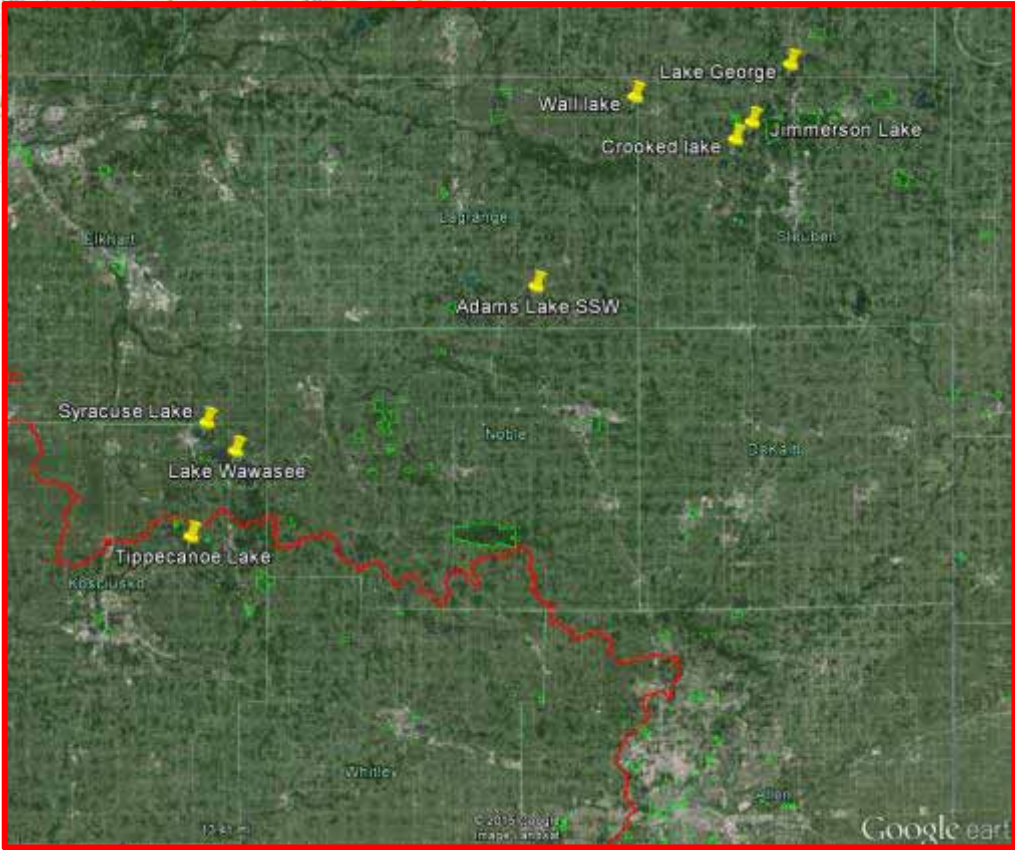
No Current Management Activities that we have been made aware

Michigan

- Aquatic Nuisance Control tracking system is under construction- no data to show
- Contractor conversations: 4 main contractors
- Unpredictable behavior
- Exponential increase in infested lakes identified
- 70-75°F for active growth
- Few anecdotal accounts of eradication (one with no management),
- One account of growth from 10 to 250 acres in 3 years (Lake Templane)



Indiana



Indiana

- 8 lakes in Indiana infested
- Treating starry stonewort for 7 years
- Working with Clemson Univ. and Applied Bio-chemists on algal assay
- Study Lakes: Crooked Lake & Lake George

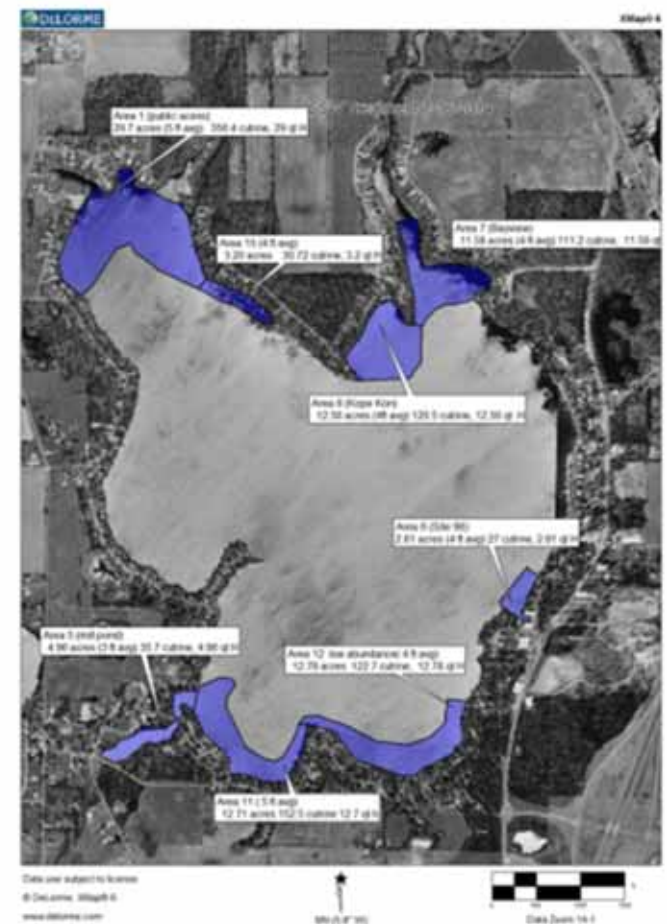
Lake George

- 2009, 1.1% freq.; **5 acres** treated (Fall)
- 2010, 5.9% freq.; June 1: **5ac.**, June 29: **5ac.**, Aug.: **2ac.**, Sept. **4.5ac.**
- 2011, 10.0% freq.; June 8: **7ac.**, June 22: **7ac.**, July 25: **7ac.**, Aug 12: **7ac.**, Sept 14: **24.7ac.**
- 2012, 6.3% freq.; May: **7ac.**, June: **29.2ac.**, July: **9.2ac.**, Oct.: **20.8ac.**
- 2013, 15.0% freq.; July 10: **42.86ac.**, Aug 22: **37.86ac.**, Sept 16: **17.87ac.**
- 2014, 28.8% freq.; July 15: **90.3ac.**, Aug 13: **90.3ac.**, Sept 26 4.96ac (mill pond)

2014 also reported a snail die-off possibly linked to treatment

Citrine ultra 2.4 gallons/ac-ft & Hydrothol 191
1quart/ac-ft

509 acres
Mean depth= 22 feet
Treating SSW since 2009
Also treats EWM



Crooked Lake, Steuben County

- 2011, 3% frequency
- 2012, 3% frequency
- 2013, 5 % frequency
- 2014, 10% frequency
- 9 acres treated in 2012
- 17 acres treated in 2014
- Chemicals used: Cutrine ultra and Hydrothol 191; 2.4 gallons/acre-ft

801 acres

Mean depth= 12 feet

Max Depth = 82 feet

Treating SSW since 2012

Also treats EWM and CLP

2014 Treatments on Crooked Lake



The Wisconsin Experience



Found in Wisconsin in September 2014

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Invasive algae found for the first time in a Wisconsin lake

Scott Brown

Stam stonewort, an invasive algae, was found for the first time in Wisconsin, in Little Muskego Lake in Walworth County. The algae has caused problems for boaters and fishermen in lakes in Michigan.

By Lee Bergquist of the Journal Sentinel Nov. 05, 2014

NewsWatch

- WIAA Division 3 State Baseball Lose Country Conference series with effort 1:07 p.m.
- Wisconsin's unemployment rate rose to 4.6% in May 1:18 p.m.
- Regulator orders Enbridge to pay \$17.8 million after arbitration hearing | Updated: 1:18 p.m.
- Ford play not expected in death of woman 1:11 p.m.
- DebitCard: Patchchecking the Wisconsin state budget 1:27 p.m.
- Haley sack climbs after buyback plan announced 1:27 p.m.
- Pond de Lac restaurant apologizes to local firefighters 1:00 p.m.
- Common Ground meets with Volkswagen CEO 1:00 p.m.

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Initial Response – Little Muskego

- Notification of Lake District and City of Muskego
- Consultation with other states
- Formation of partnership between LMLMD, LML Association, City of Muskego, DNR, Two Contractors
- Development of action plan for 2015 by the partnership
- Press Release
- Development of DNR monitoring plan for other lakes
- Spring Meeting

Little Muskego Lake

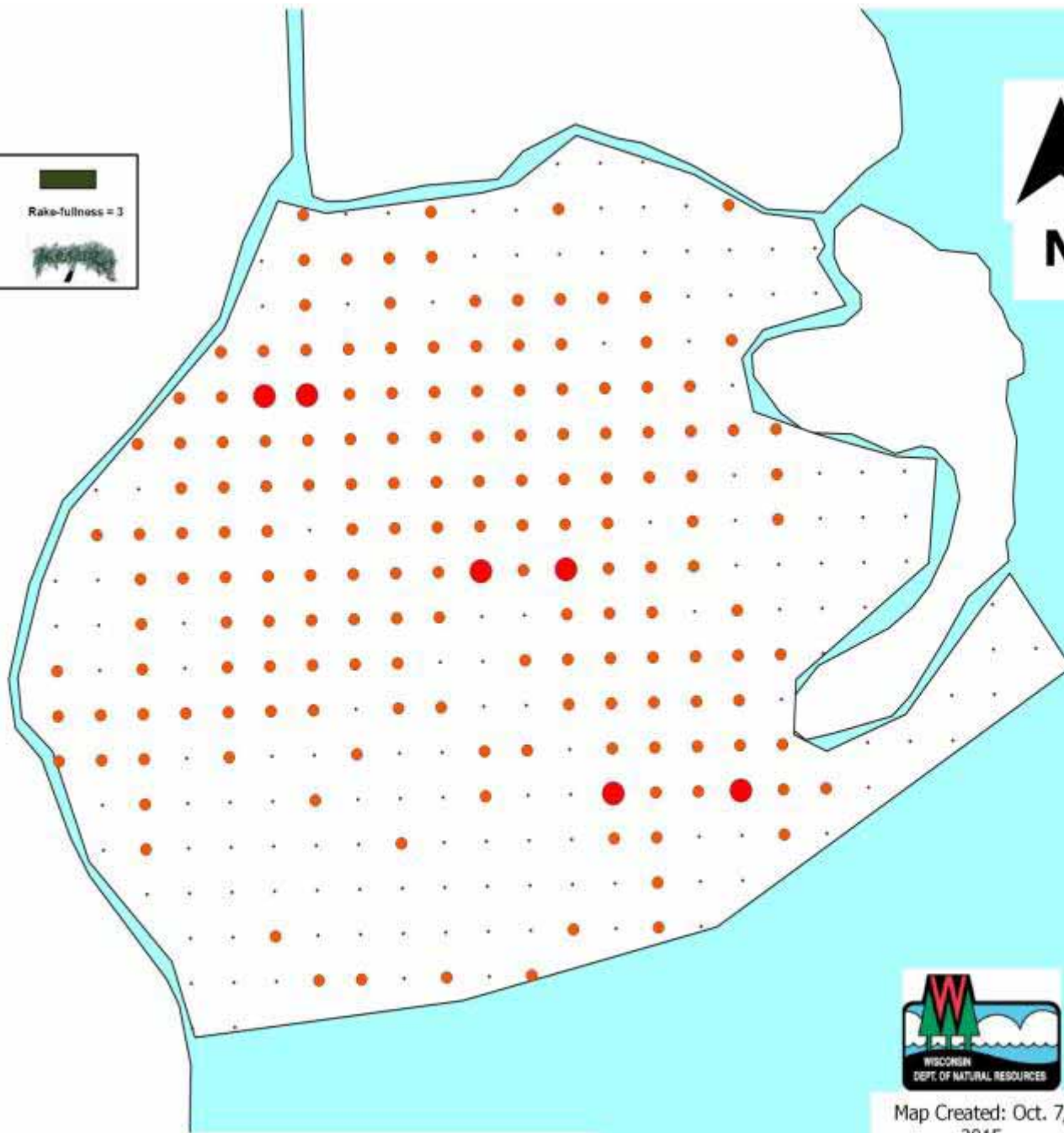
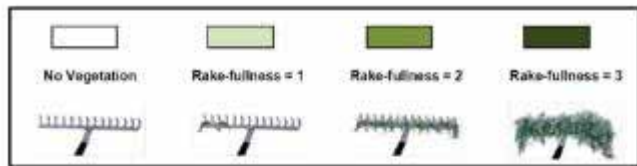
- Stakeholder team formed and met
- Apply for WI-DNR Rapid Response Grant
- Activities:
 - Riparian notification
 - Signage at Launches
 - CBCW
 - Multiple surveys
 - Hand-Pulling and DASH
 - Considering Drawdown & Chemical trials 2016
 - Possible Dredging 2017

Lake Attributes:

- 470 acres
- Drainage Lake
- Waukesha County
- Max depth 65 feet
- Mesotrophic
- 4 public boat landings

Nitellopsis obtusa found throughout western bay approx. 30 acres (a few satellite populations south and east)





Nitellopsis obtusa

starry stonewort

Rake Densities



Map Created: Oct. 7, 2015

0

0.25 miles



Interstate Collaboration

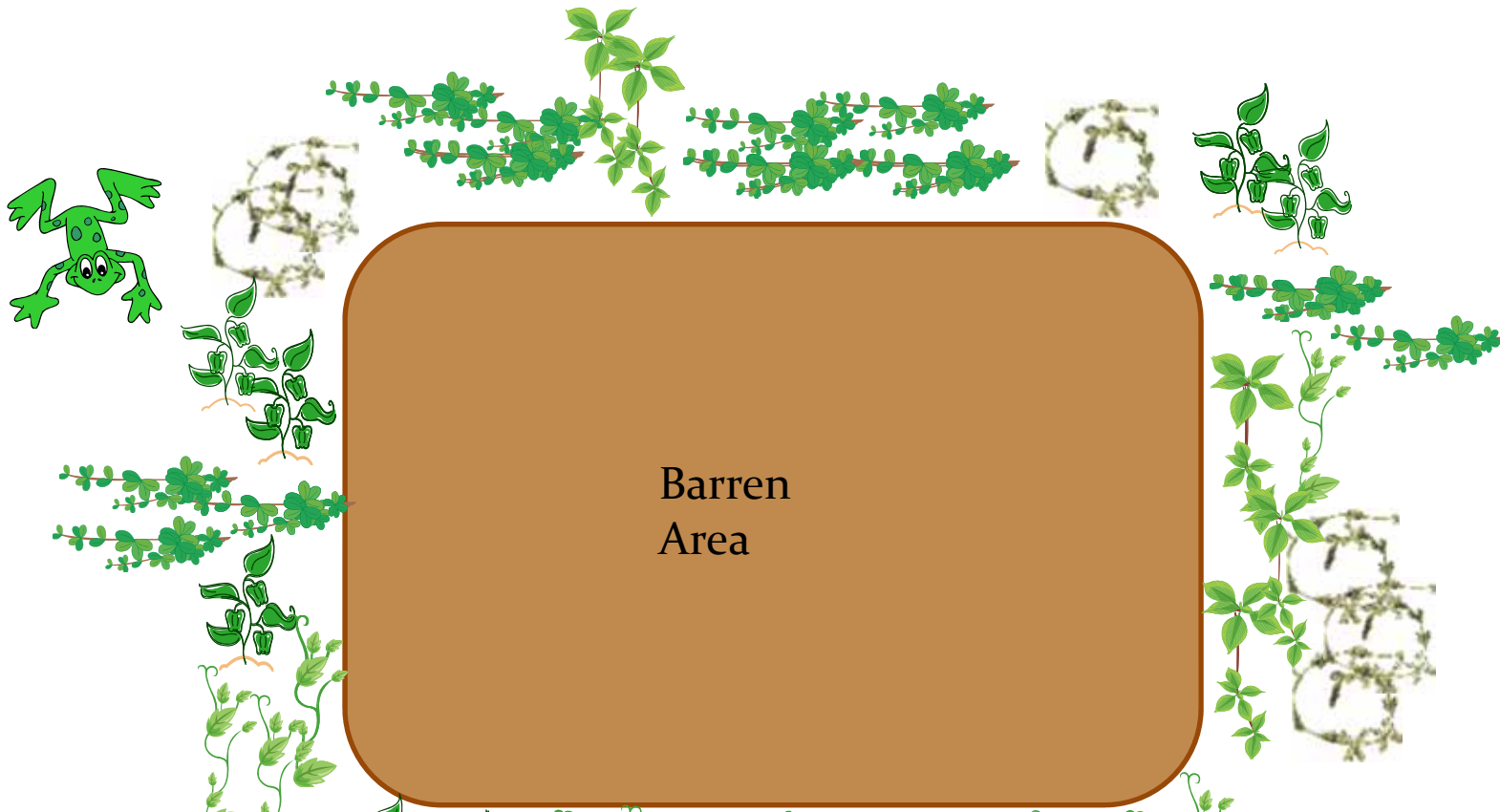
- WDNR contacted other states that have tried chemical treatment for Starry Stonewort
- Indiana (Mr. Eric Fischer)
- Michigan (Ms. Sarah LeSage)

Bob, Eric and Sarah in Conference



Take Home Messages

- Chemicals that have been tried in Indiana and Michigan tend to burn (chemically) the tops of the alga but does not completely kill it or completely remove it from a lake
- Chemical treatments damage native plant and alga species which opens up more lake bed for Starry Stonewort to colonize
- Chemical control that produces large impacts on natives may be acceptable for boat launch areas, however this is not something the WDNR will likely permit on a large scale



Barren Area

Starry

Slender Naiad

Chara

Sago Pondweed

Water Celery



Barren
Area



Curly-leaf
Pondweed

Starry

Sago
Pondweed

Chara



WDNR Survey Effort

- 57 boat launches checked in the summer of 2015
- 14 meander surveys conducted; 6 in the Muskego Area

Wisconsin



Lakes searched for starry stonewort in 2015 by DNR & partners



Results

- Long Lake found to have Starry Stonewort through DNR meander survey
- Routine P/I survey on Silver Lake by SEWRPC results in another discovery of a Starry Stonewort population
- Local partners (City of Muskego, Washington County) find Starry Stonewort at public boat launches

Concern and Questions Result in Four Informational Meetings



Big Muskego Lake

- District, DNR and City communicate
- Apply for WI-DNR grant
- Activities:
 - Manual removal of dense beds at launches
 - Riparian notification
 - Signage at Launches
 - CBCW
 - Plant survey (PI method)
 - 2015 Experimental chemical control at launches to decrease biomass at launches

0.75 ac w/Clipper 0.2ppm and
1.5 ac w/ Cutrine Ultra 0.8ppm & Hydrothol 191
0.17ppm Sept. 24, 2015

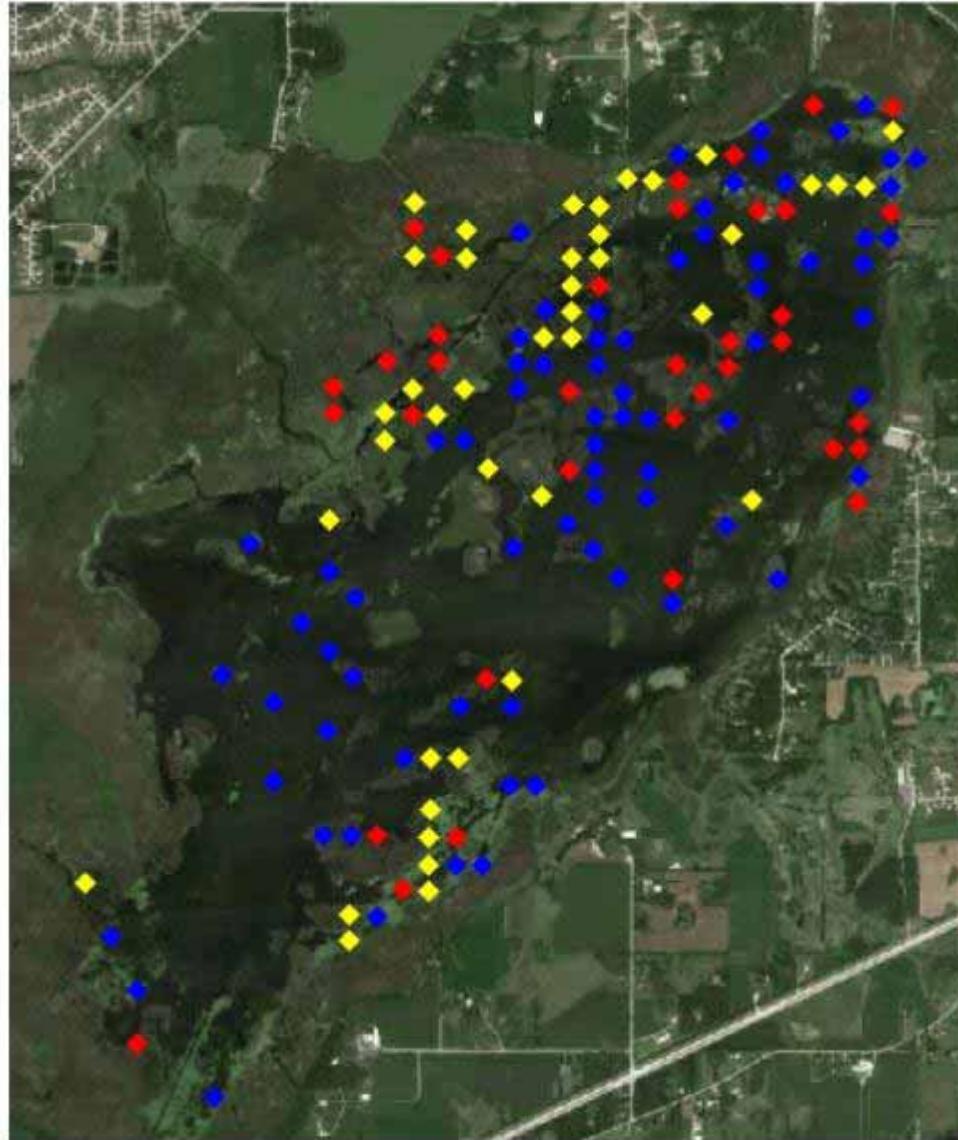


Lake Attributes:

- 2194 acres
- Drainage Lake
- Waukesha County
- Max Depth 3 feet
- Eutrophic
- 2 public boat landings

Big Muskego Lake, Waukesha County, WI

Sites with Starry Stonewort



Rake Fullness : ◆ 1
◆ 2
◆ 3
◆ (Visual)

Total # Sites: 152

Source:

Marine Biochemists
6302 W. Eastwood Ct.
Mequon, WI 53092
(888) 558-5106
www.marinebiochemists.com

Bass Bay Lake

- Working with the City of Muskego on next steps
- Low population per the Fall 2015 P/I survey

Lake Attributes:

- 104 acres
- Drainage Lake
- Waukesha County
- Max Depth 23 feet
- Eutrophic
- Boat access through Big Muskego Lake



Nitellopsis obtusa highly dense in channel to Big Muskego Lake

Figure 11

Bass Bay, Waukesha County, WI

Sites with Starry Stonewort



Rake Fullness :
 ◆ 1
 ◆ 2
 ◆ 3
 ◆ (Visu:

Total # Sites: 2

Source:

Marine Biochemists
6302 W. Eastwood Ct.
Mequon, WI 53092
(888) 558-5106
www.marinebiochemists.com

Long Lake

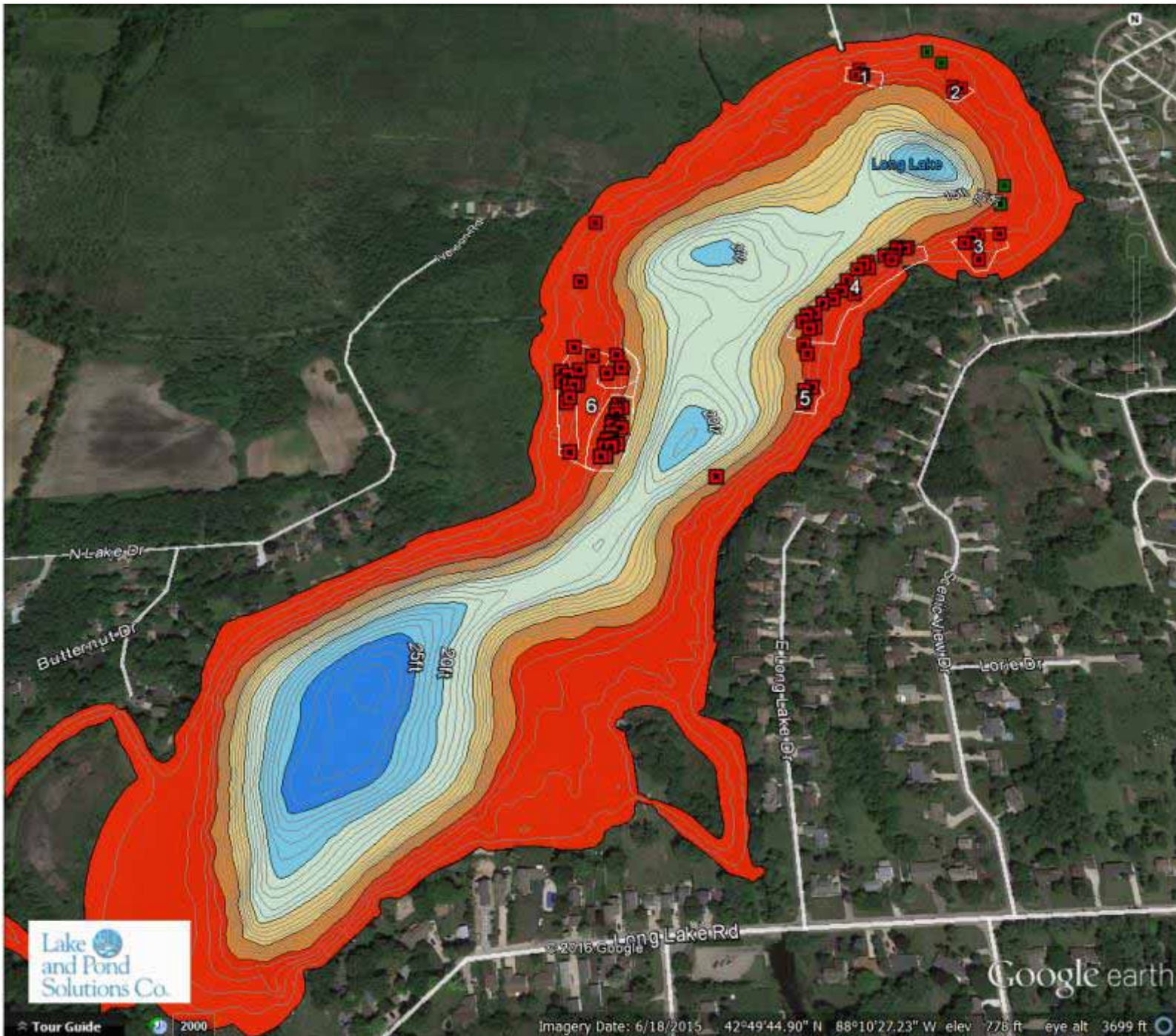
- District, DNR, Chemical Applicator
- Received AIRR grant
- Activities:
 - Multiple surveys
 - Riparian notification
 - Signage at Launch
 - Plant height monitored over year
 - Experimental chemical control near launch



Lake Attributes:

- 105 acres
- Drainage Lake
- Racine County
- Max Depth 25 feet
- Eutrophic
- 1 public boat landing

0.61 ac w/ Captain XTR 0.78ppm & Clipper 154.8ppb Sept. 17, 2015



Source: Lake and Pond Solutions Co., Jeff Stelzer

Contractor Partnerships

- Eco Waterways
- Marine Biochemists, a Lonza company
- Lake and Pond Solutions
- Clean Lakes

Upcoming Experimental Work

- NY Botanical Garden lab work on freezing and desiccation
- Partnership between Clemson University, Indiana DNR and Applied Biochemists on algal lab bioassay
- Pre and post data collection on chemical treatments in three Wisconsin Lakes
- Possible Drawdown
- Possible Dredging

Washington County



Photo Credit: Paul Skawinski