



APPROACHING DUST STORM IN MIDDLE WEST.

#525
GONARD

Molly Beland Rippke
Michigan Dept of
Environment, Great Lakes,
and Energy
www.Michigan.gov/EgleEcoli

Climate Preppers: Michigan Edition



Climate Change in Michigan TMDLs

E. coli TMDL (statewide)

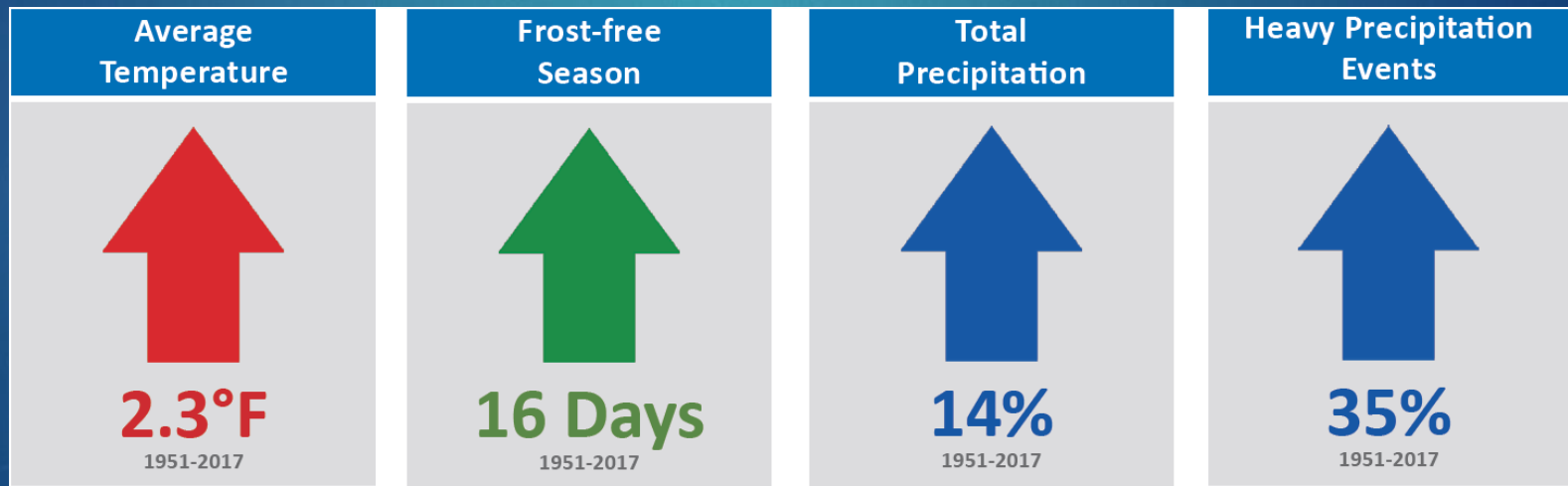
Ford and Belleville Lakes (Phosphorus TMDL)

Statewide *E. coli* TMDL

- ▶ Climate Resiliency:
 - ▶ Concentration based (not LOAD based), which means it applies under all flow conditions.
 - ▶ The Michigan pathogen standard applies to all waters and is protective of public health year-round for partial body contact.
 - ▶ The total body contact season (May-October) is probably sufficient for the foreseeable future.
 - ▶ The TMDL goals will not need to be revised because of climate change.
 - ▶ BUT, climate will impact *E. coli* concentrations in Michigan. We will see those “critical conditions” more often.

Statewide *E. coli* TMDL

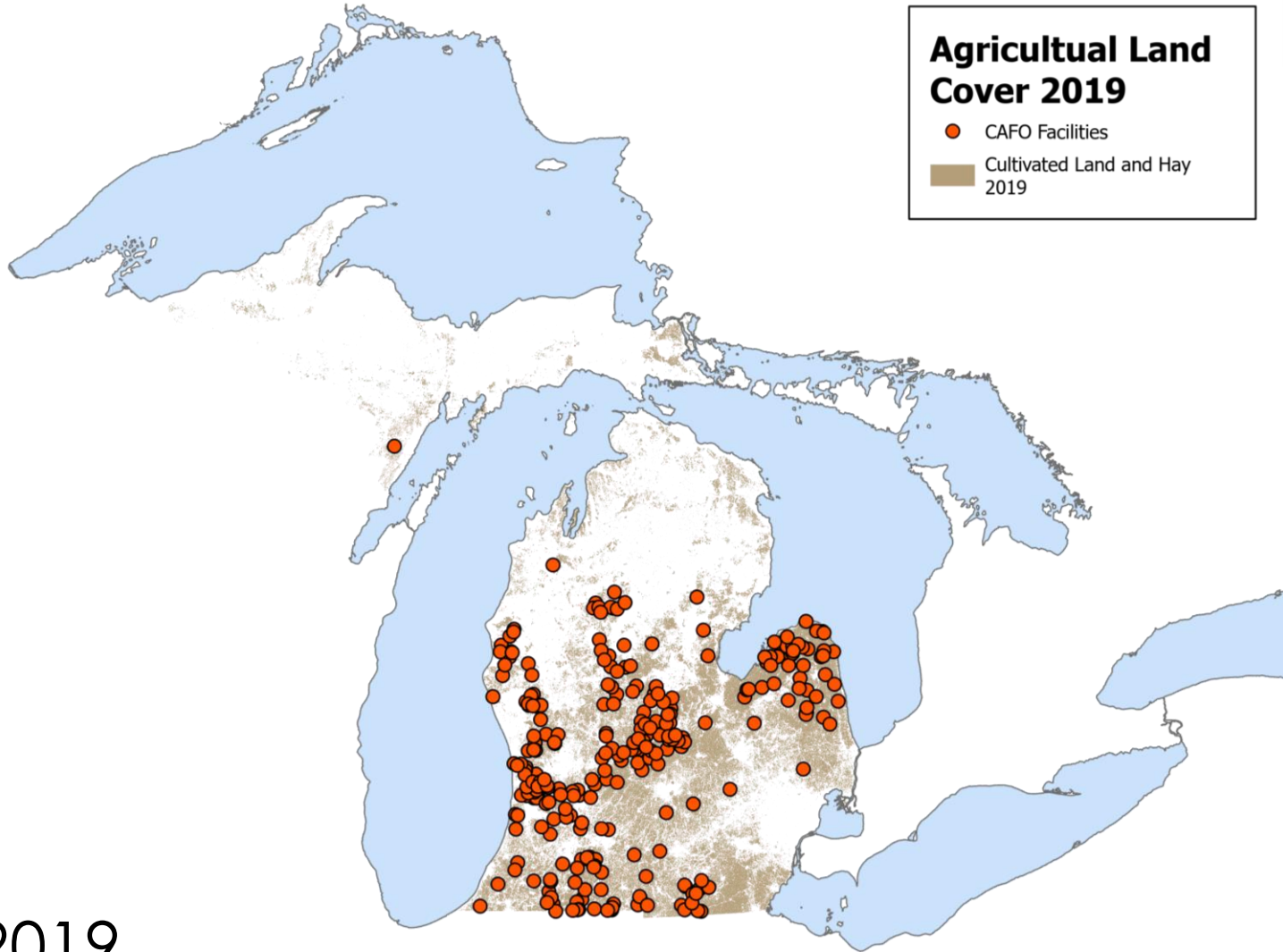
- ▶ Document includes a “Planning for Change” section:
 - ▶ Gives the facts of climate changes over the past century
 - ▶ Discusses land cover changes which are already occurring.
 - ▶ Hypothesizes how these changes may impact *E. coli*



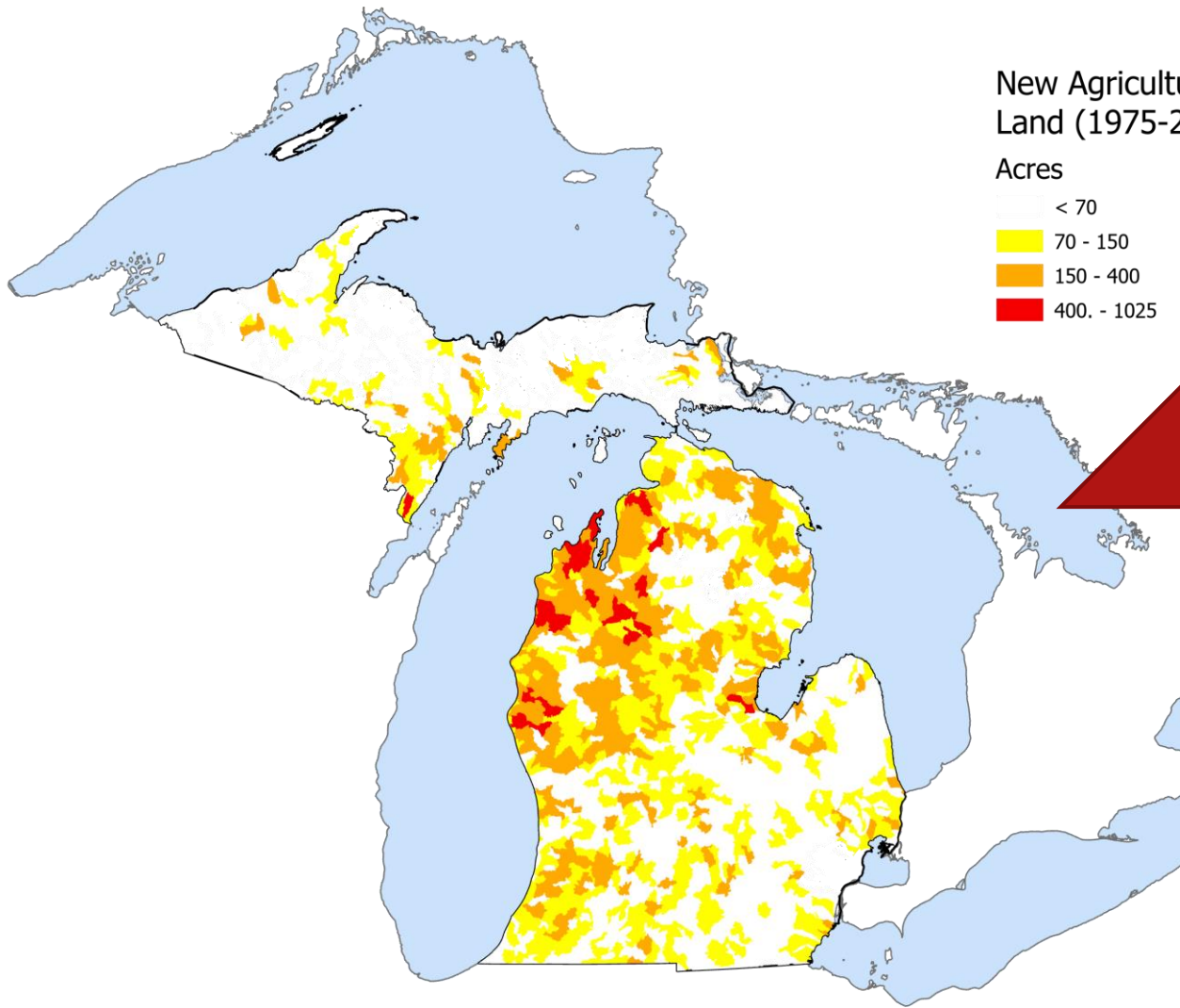
[Climate Change in the Great Lakes Region References | GLISA \(umich.edu\)](#)

Agricultural Land Cover 2019

- CAFO Facilities
- Cultivated Land and Hay 2019



2019



Agriculture is
expanding
northward

What impacts can we expect with these land cover changes?

- ▶ Less forest and natural areas to 'soak up' and filter pollutants
- ▶ Loss of riparian buffers
- ▶ Manure land application and/or chemical fertilizer in new areas
- ▶ Lower water table is possible – less dilution of pollution in the summer:
 - ▶ Water withdrawals for irrigation may increase,
 - ▶ Field tiles lower the water table



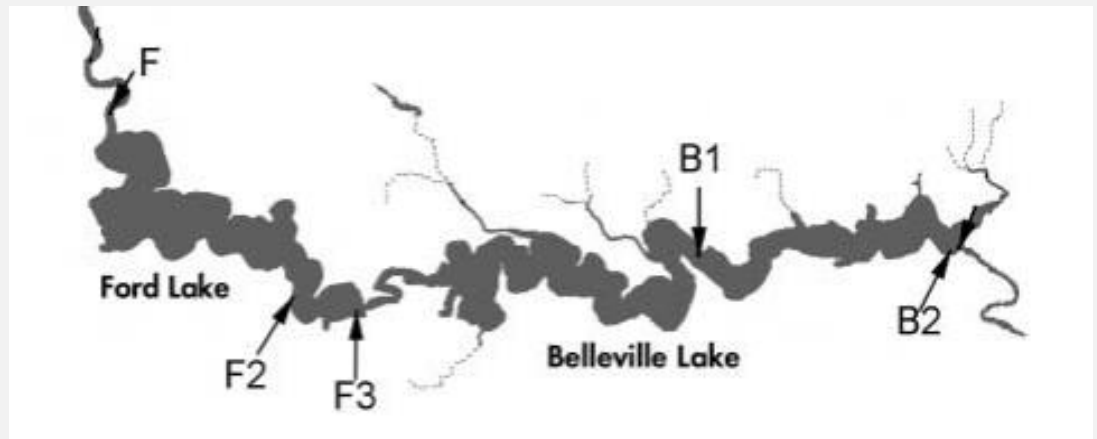
FORD AND BELLEVILLE PHOSPHORUS TMDLS

- Developed to address nuisance and harmful algal blooms.
- First approved in 1996.
- Minor revision in 2004.
- Revised again in 2019 by court order (version which considered climate change).



REVOKED (OLD) TMDL PHOSPHORUS GOAL

- Previous goal was 50 $\mu\text{g}/\text{L}$ coming into the chain of lakes, and an in-lake goal 30 $\mu\text{g}/\text{L}$ in the most downstream lake (Belleville).
- Loading capacity to meet this goal (NPDES waste load allocations) were implemented from April-September only.
- In 1996 it was believed that this would eliminate nuisance algae blooms.

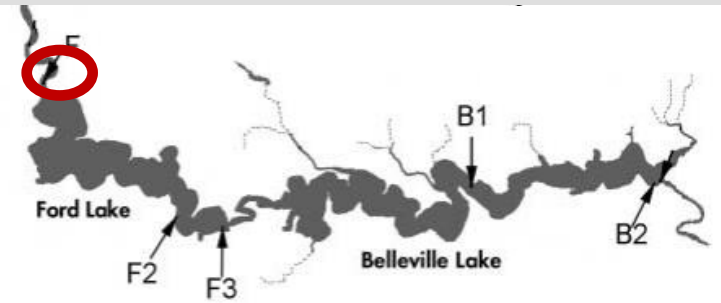
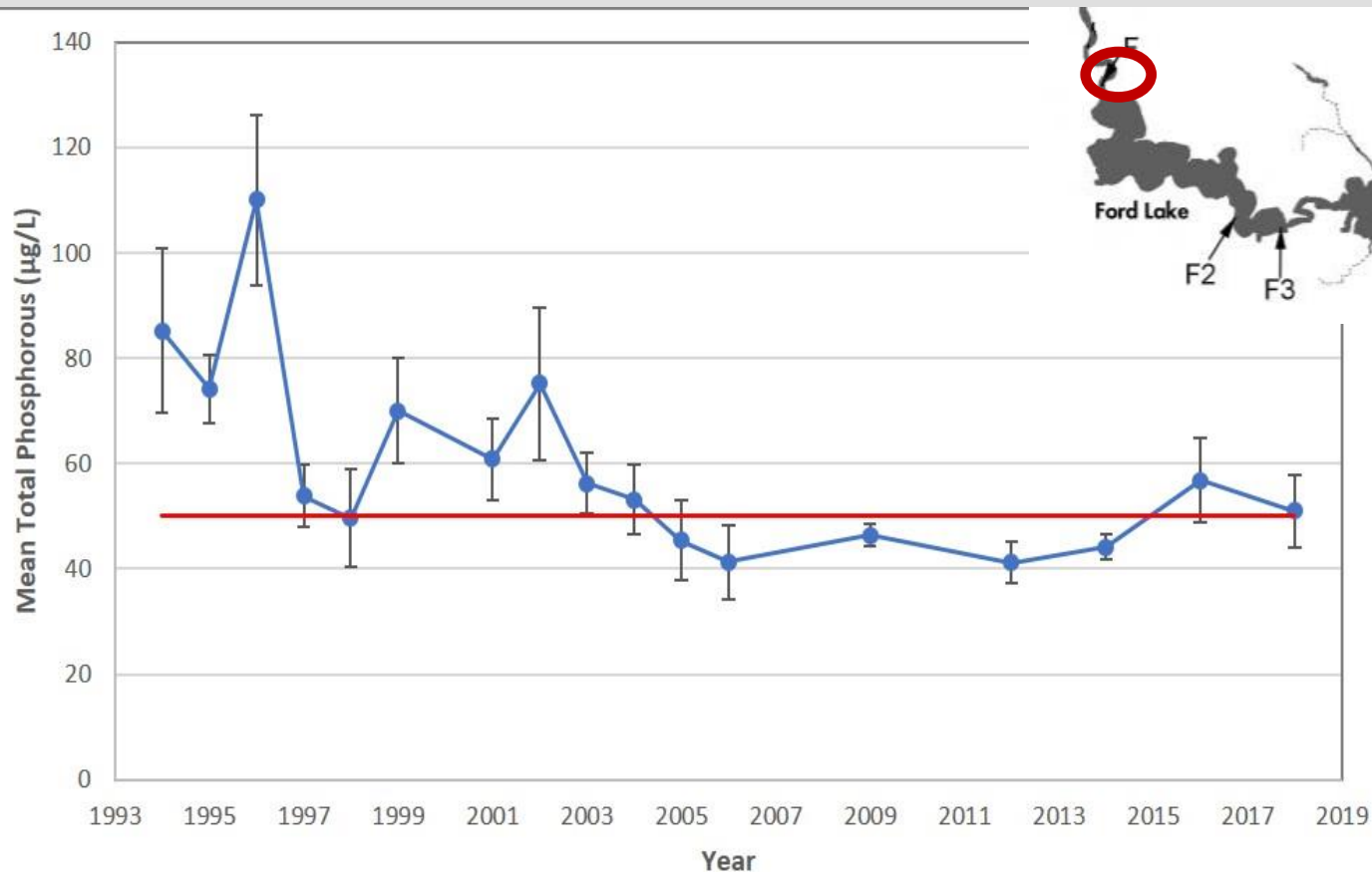


Algae Blooms Continued



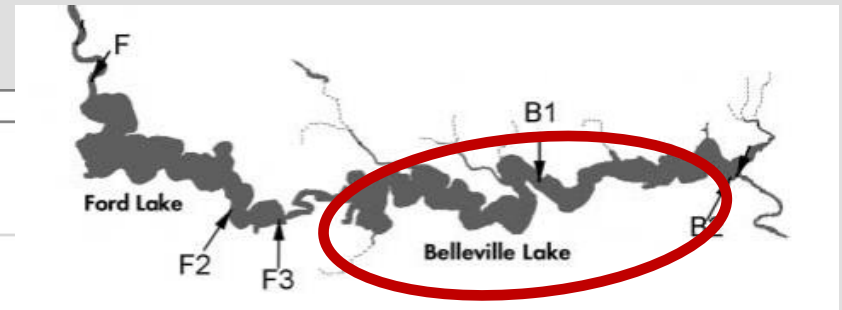
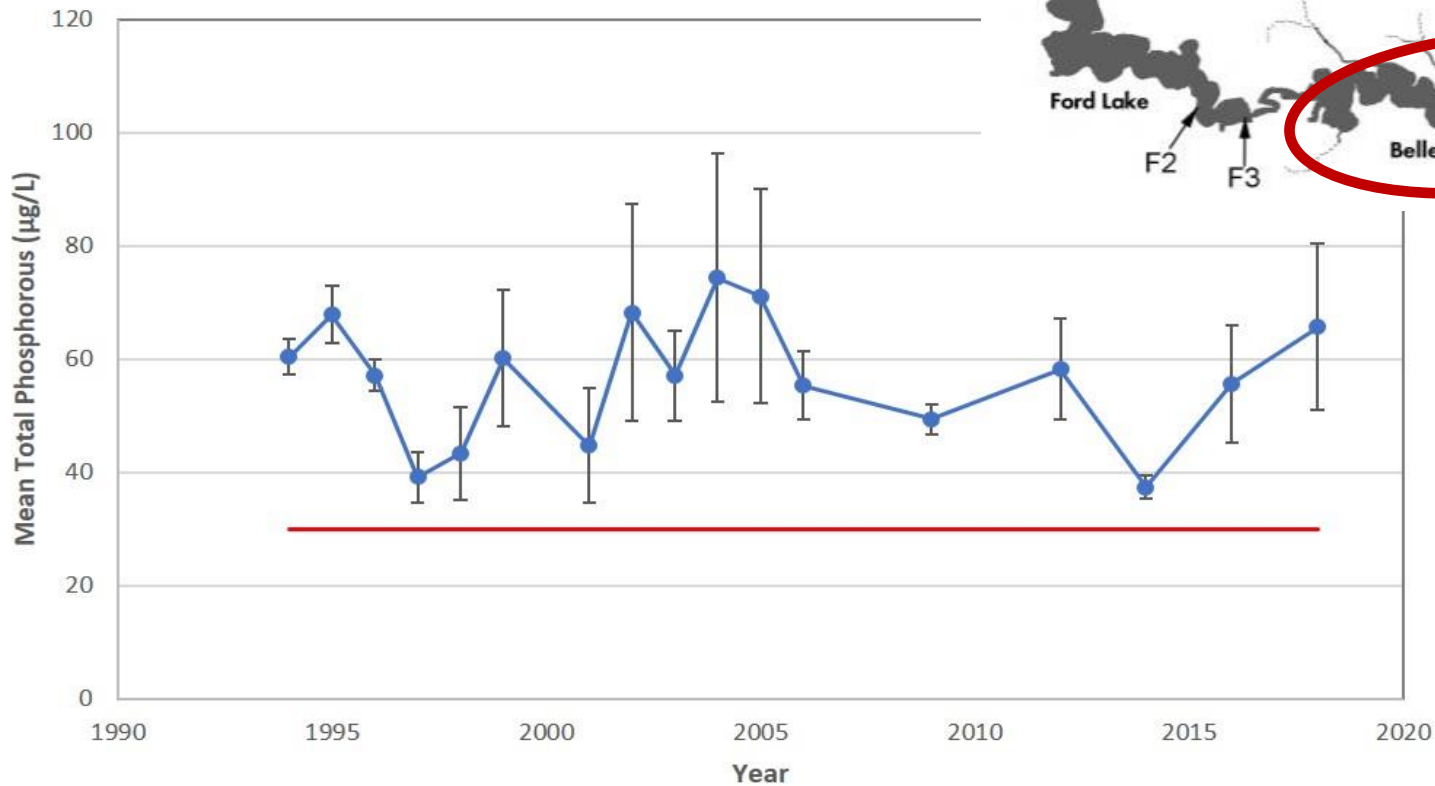
INLET (HURON RIVER): 2014-2018 EGLE MONITORING

- Phosphorus decreased from 1994 to 2018. The TMDL goal of 50 $\mu\text{g/L}$ was met during many seasons.



BELLEVILLE LAKE: 2014-2018 EGLE MONITORING

- Goal had not been met, nor had in-lake phosphorus decreased overall



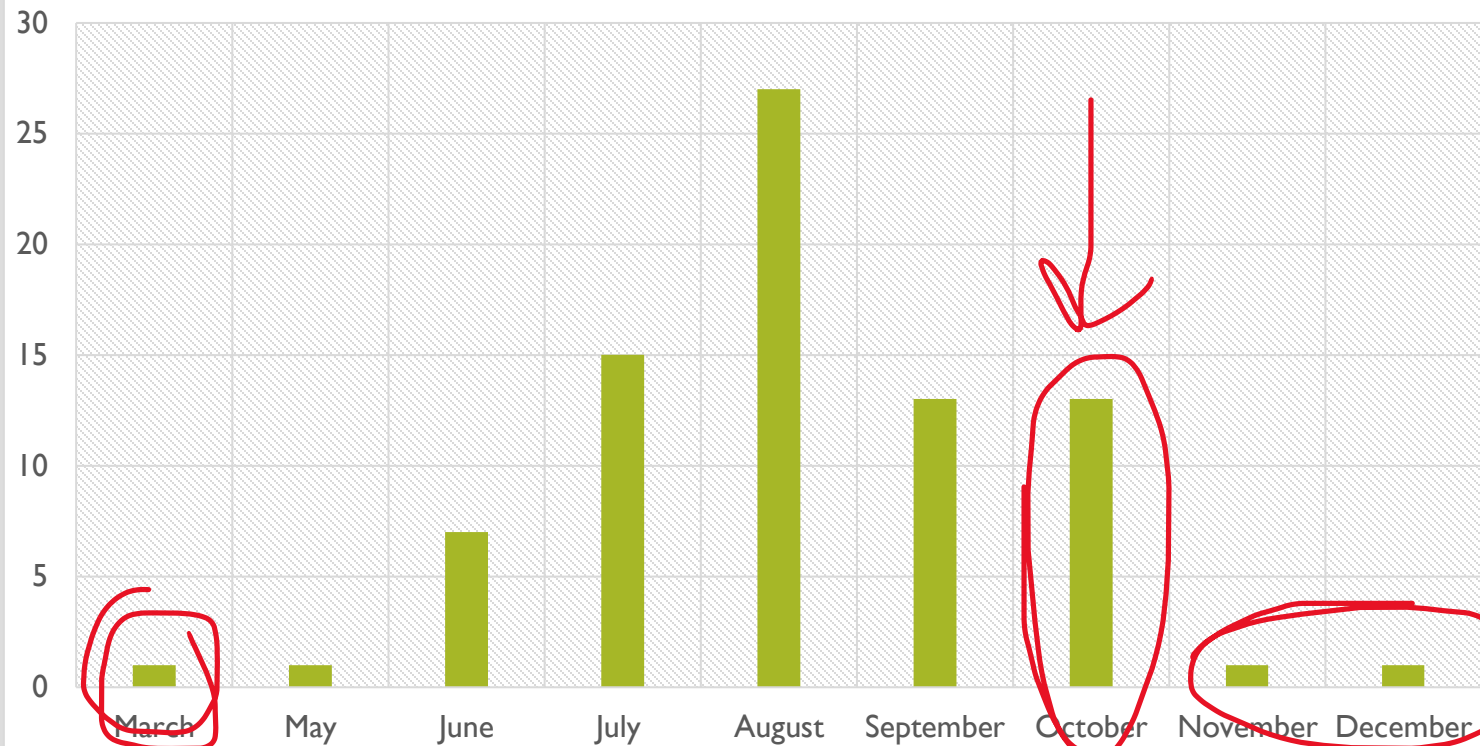


2019
REVISED
TMDL

- To be more protective of both Ford and Belleville Lakes given continued blooms:
 - New summer TMDL goal for both lakes is 30 µg/L, inlet goal (50) removed.
 - Most point sources were previously given allocations to meet the inlet goal, so WLAs were lowered accordingly
- Shifted from seasonal load allocations in the old TMDL (April to September) to a **year-round** load allocation in the revised TMDL:
 - Uncertainties and complexity in these and other upstream lakes
 - “Under current climate projections, one can reasonably expect that the algal growing season will increase into the future.”

REPORTS OF HARMFUL ALGAL BLOOMS STATEWIDE: 2022

Waterbodies with New Confirmed Reports



“More storm activity and flooding will likely increase the risk of watershed contamination and water-borne illnesses, while warmer surface waters amplify the risk of toxic algal blooms and fish contamination.”

- [Climate Change in the Great Lakes Region References | GLISA \(umich.edu\)](#)

