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www.Michigan.gov/EgleEcoli

Climate Preppers: Michigan Edition

Climate Change in Michigan TMDLs

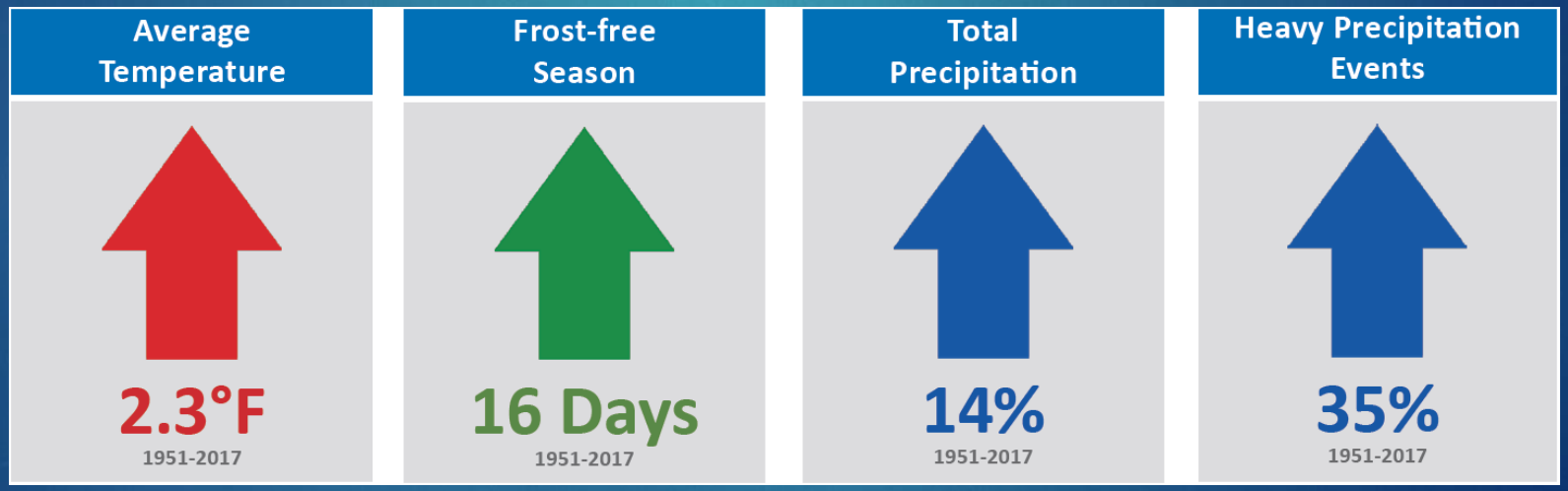
- *E. coli* TMDL (statewide)
- Ford and Belleville Lakes (Phosphorus TMDL)

Statewide *E. coli* TMDL

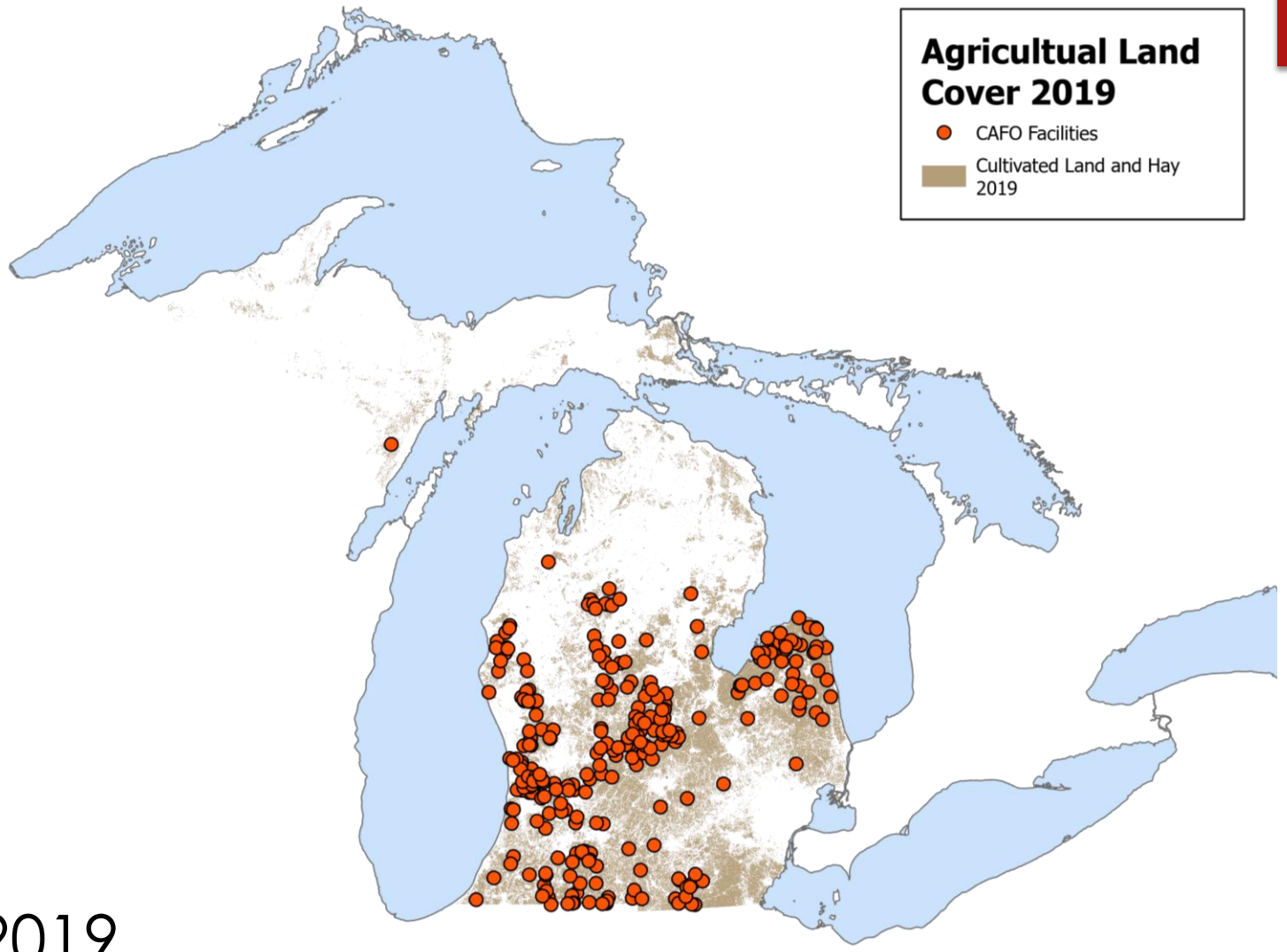
- Climate Resiliency:
  - Concentration based (not LOAD based), which means it applies under all flow conditions.
  - The Michigan pathogen standard applies to all waters and is protective of public health year-round for partial body contact.
  - The total body contact season (May-October) is probably 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

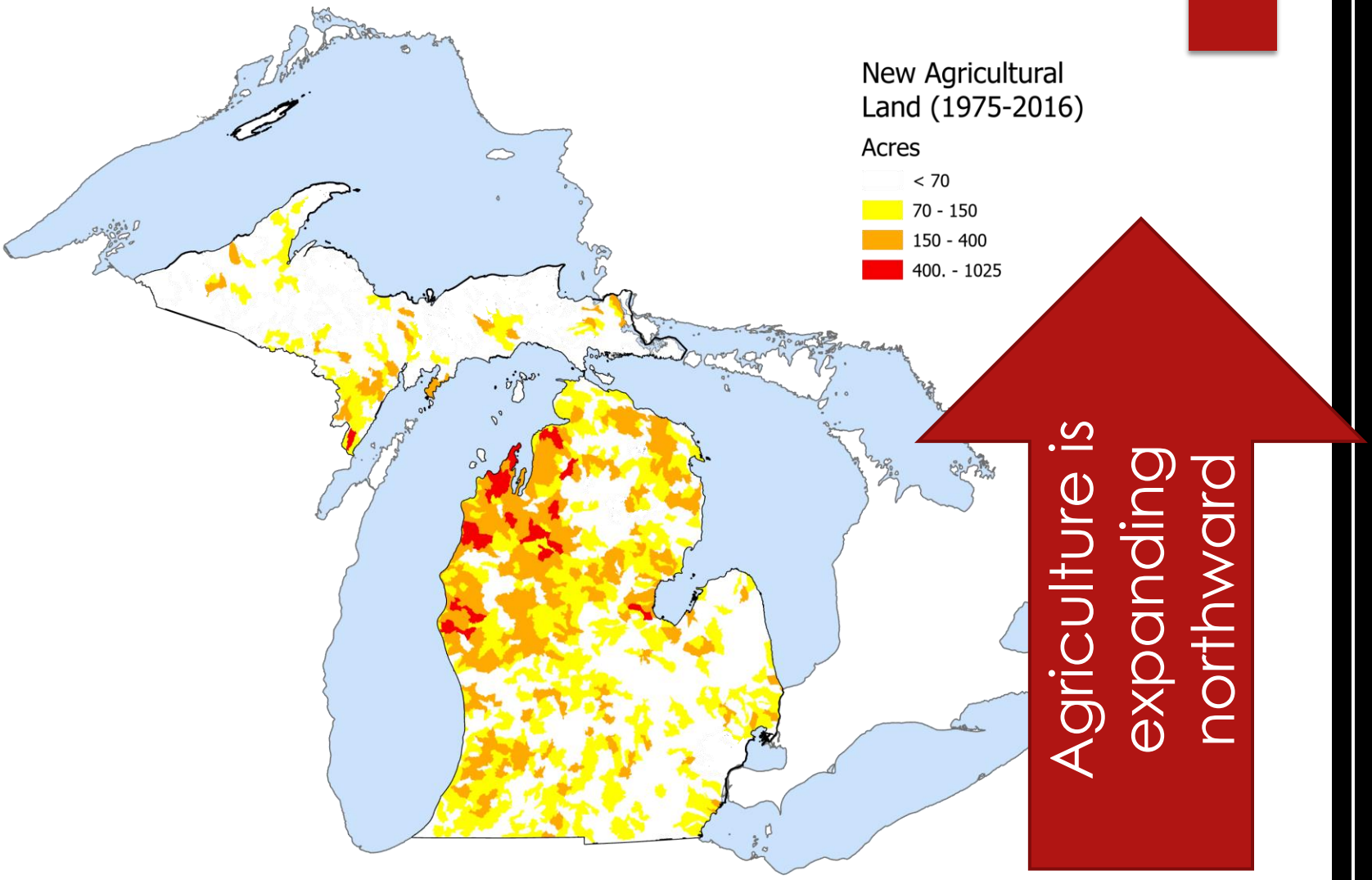
- Document includes a "Planning for Change" section:
  - Gives the facts of climate changes over the past century
  - Discusses land cover changes which are already occurring.
  - Hypothesizes how these changes may impact *E. coli*



Climate Change in the Great Lakes Region References | GLISA (umich.edu)


Agricultual Land Cover 2019
CAFO Facilities
Cultivated Land and Hay 2019

2019


New Agricultural Land (1975-2016)
Acres
< 70
70 - 150
150 - 400
400. - 1025
Agriculture is expanding northward

What impacts can we expect with these land cover changes?

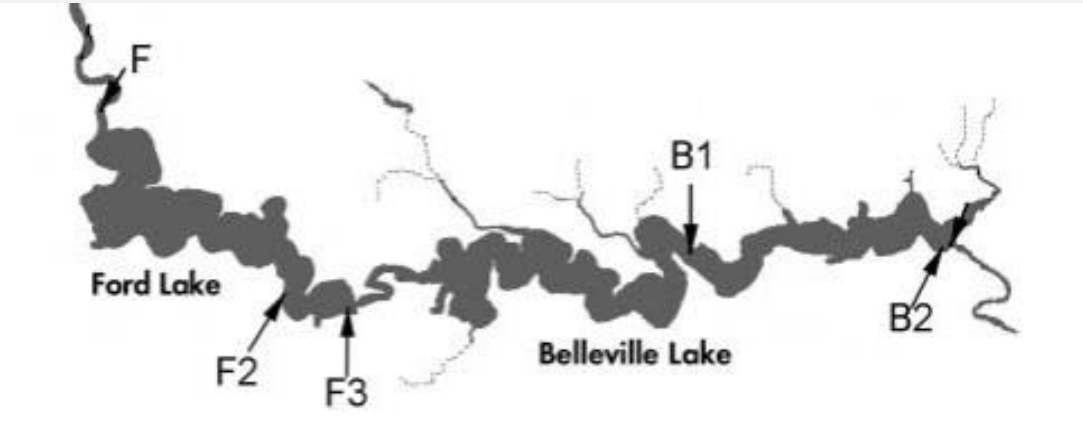
- Less forest and natural areas to ‘soak up’ and filter pollutants
- Loss of riparian buffers
- Manure land application and/or chemical fertilizer in new areas
- Lower water table is possible – less dilution of pollution in the summer:
  - Water withdrawals for irrigation may increase,
  - Field tiles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

FORD AND BELLEVILLE PHOSPHORUS TMDLS

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

REVOKED (OLD) TMDL PHOSPHORUS GOAL

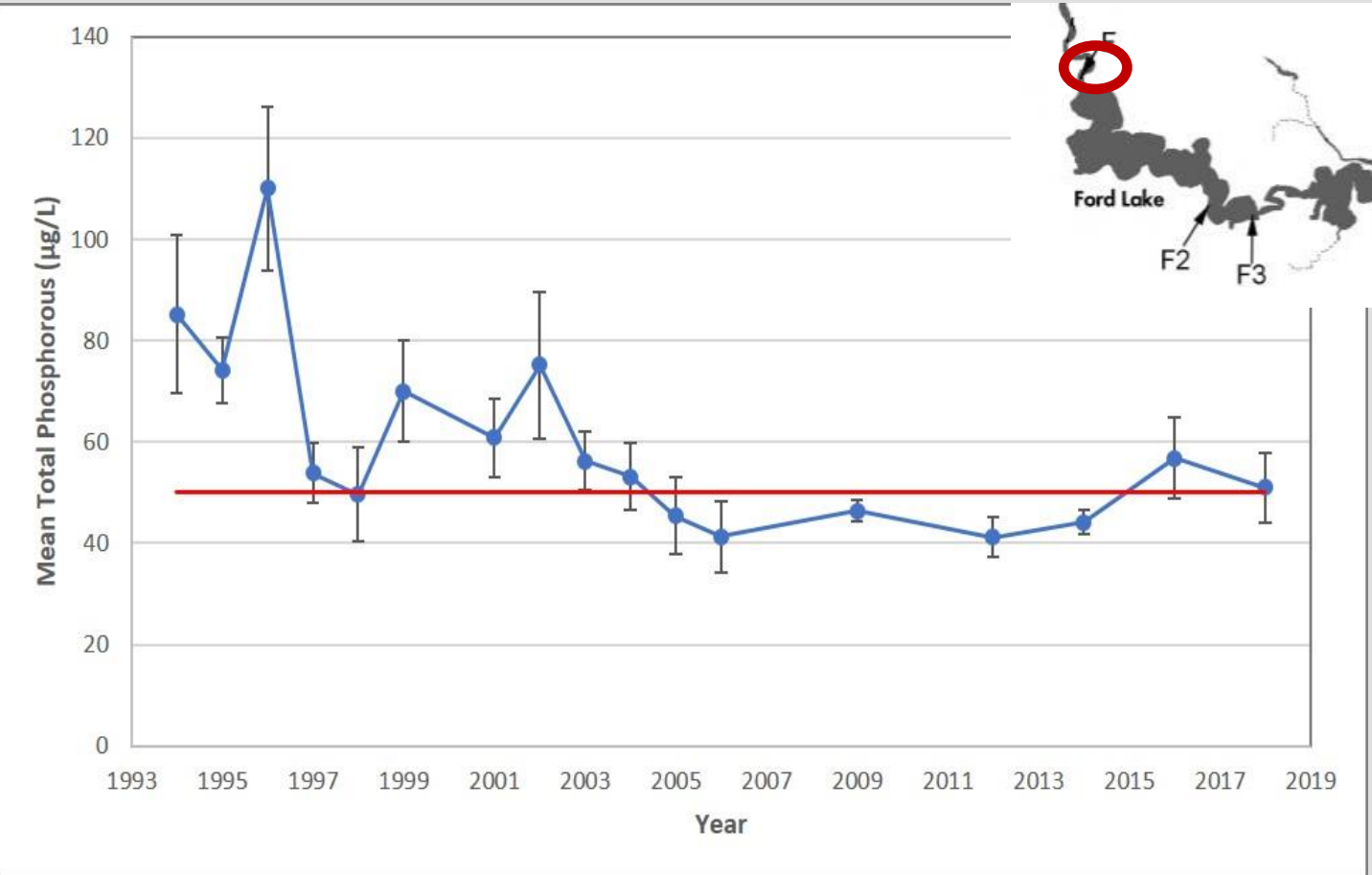
- Previous goal was 50 ug/L coming into the chain of lakes, and an in-lake goal 30 µg/L in the most downstream lake (Belleville).
- Loading capacity to meet this goal (NPDES waste load allocations) were implemented from April-September only.
- In 1996 it was believed that this would eliminate nuisance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

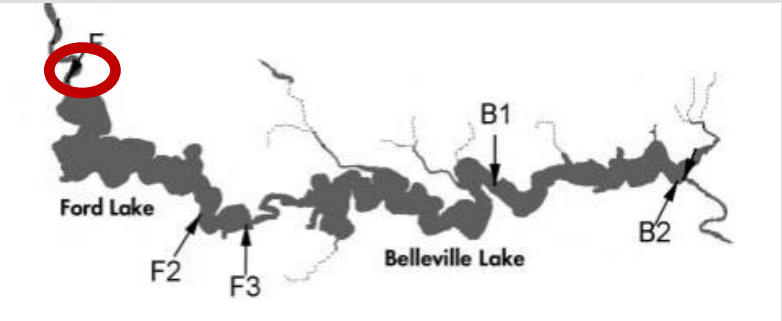


Algae Blooms Continued

INLET (HURON RIVER): 1994-2018 EGLE MONITORING

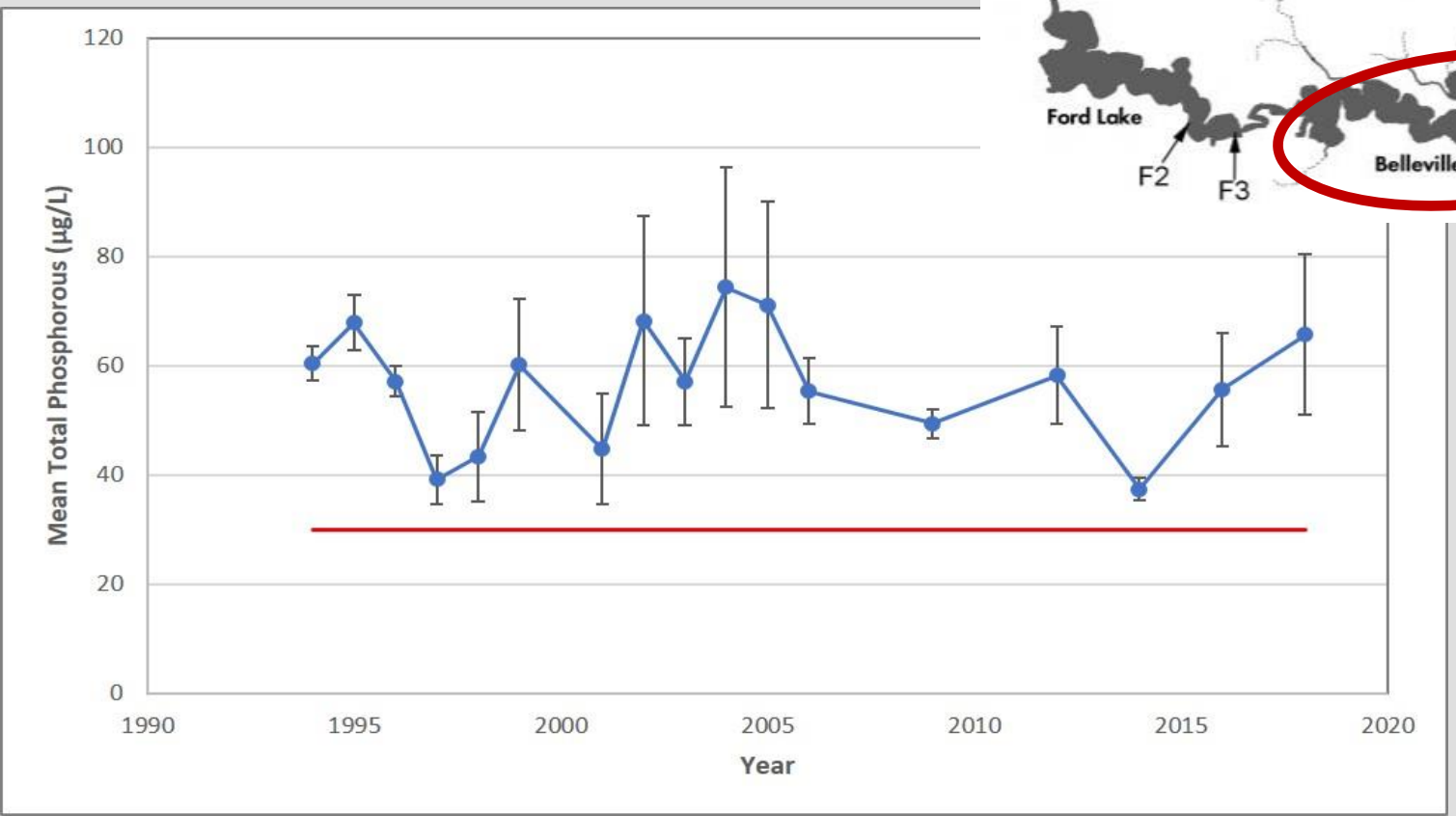
- Phosphorus decreased from1994 to 2018. The TMDL goal of 50 µg/L was met during many seasons.

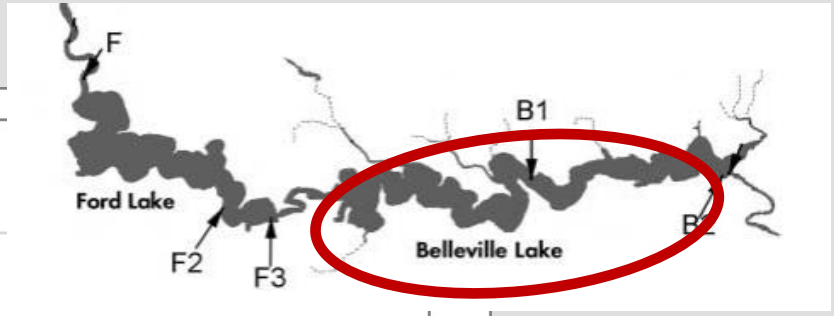




BELLEVILLE LAKE: 1994-2018 MONITORING

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

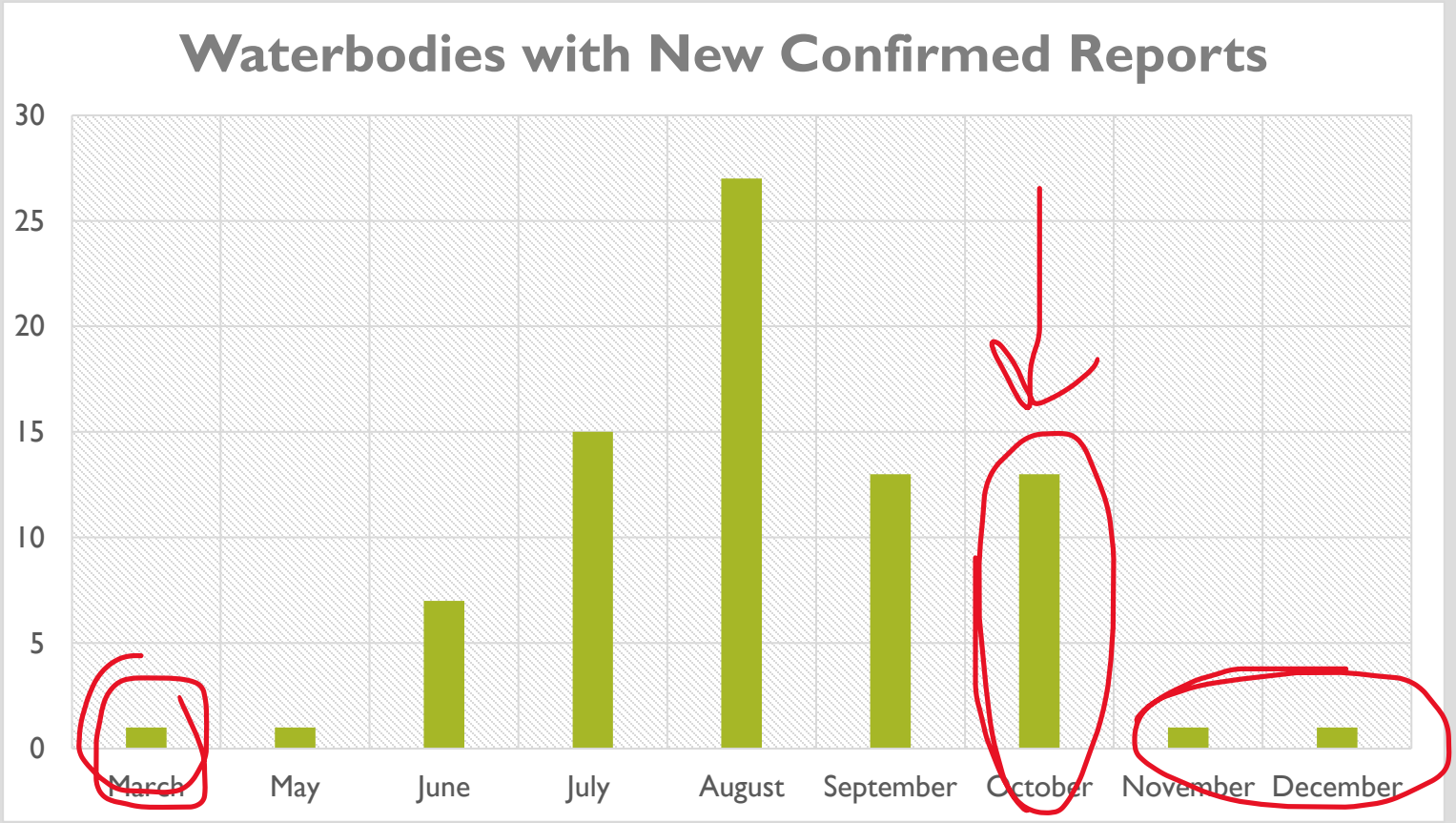




2019 REVISED TMDL

- 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



"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)