

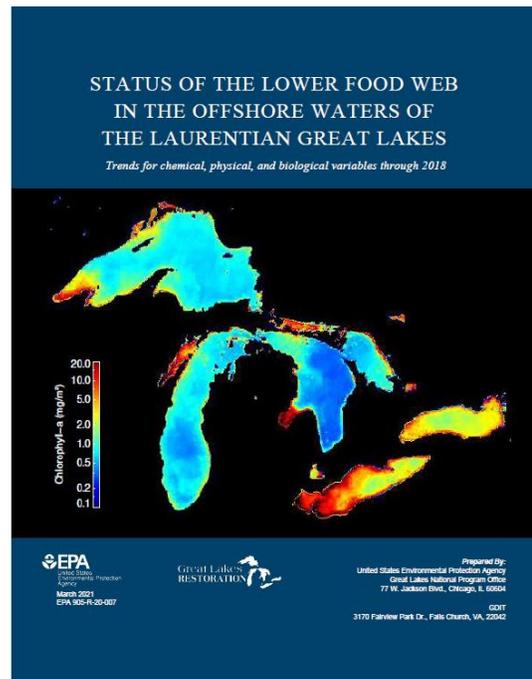
STATUS OF THE LOWER FOOD WEB IN THE OFFSHORE WATERS OF THE LAURENTIAN GREAT LAKES (US EPA, March 2021)

https://www.epa.gov/sites/production/files/2021-04/documents/2019_glbmp_annual_report_07-12-2019_508_compliant.pdf

Excerpts:

p5 -Lake Erie is currently the only Great Lake in which total phosphorus concentrations consistently (western and central basin) or intermittently (eastern basin) exceed interim substance objectives contained in the 2012 Great Lakes Water Quality Agreement (GLWQA).

Lake Superior is consistently classified as ultra-oligotrophic based on phytoplankton and nutrient conditions. No systematic change has been seen in chlorophyll-a since 1998, although increasing spring phytoplankton abundance and opposing trends in total phosphorus and soluble silica concentrations suggest a slight long-term increase in springtime productivity. However, little evidence of directional change has been seen in crustacean zooplankton or benthos communities.



p22 –The dramatic declines in TP seen in the 1980s/90s in Lake Ontario were accompanied by declines in chlorophyll and increased transparency; any further changes in these variables during the 2000s have been subtle.

The rapid shifts in the lower food web experienced by Lake Huron and, to a lesser extent, Lake Michigan, in the early to mid-2000s are showing signs of moderation.

Proliferation of *Dreissena* has been coincident with major food web changes in the Great Lakes, especially lakes Ontario, Michigan, and Huron. These mussels filter water, removing nutrients and phytoplankton from the lake and binding energy in benthic resources. Thus, they contribute to changes such as increased transparency and reduced nutrients and phytoplankton in offshore waters. Although there is still uncertainty about the mechanisms by which *Dreissena* impact water quality and the food web, there is a clear correlation between changing mussel abundances and trends in other components of the lower food web.

Lake Superior has exhibited the least change over the past decade; Lake Erie has exhibited the most. (See Figure 4 on next page)

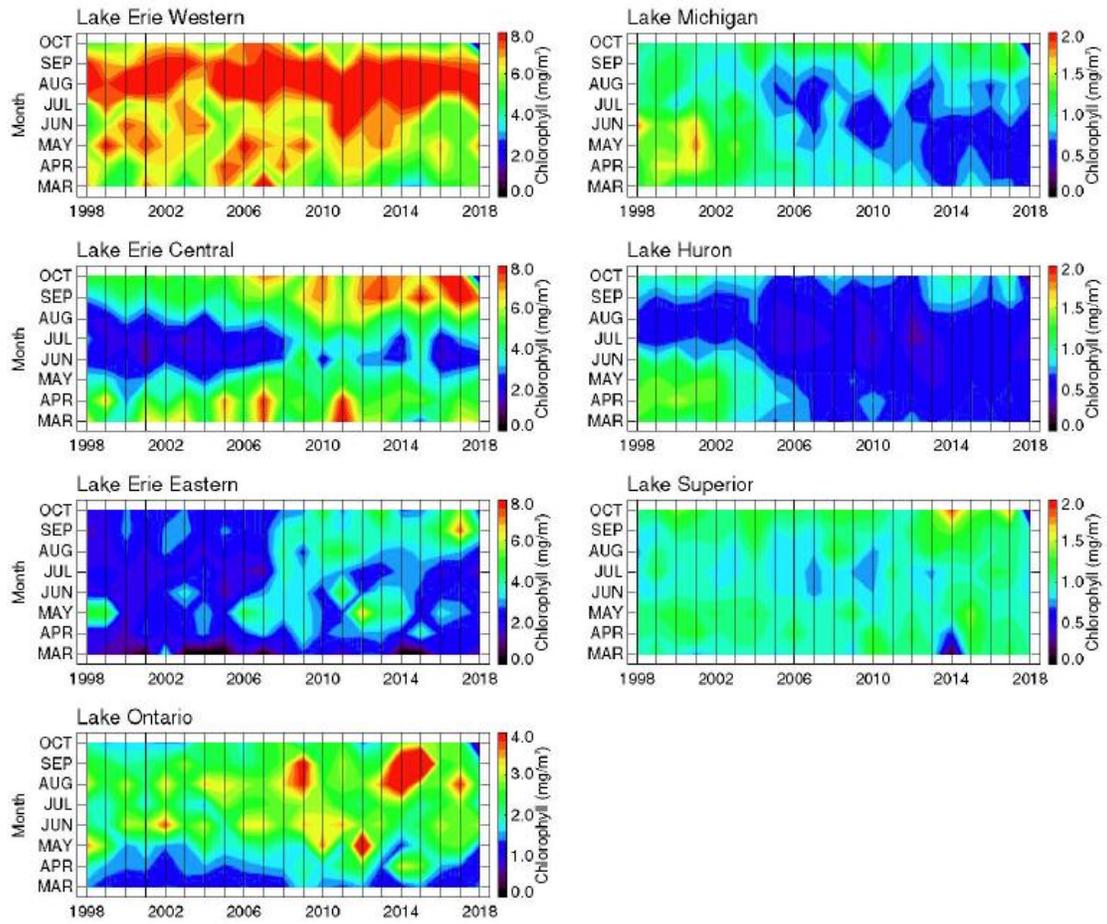


Figure 4. Monthly averaged (March–October) surface chlorophyll concentrations at GLNPO WQS station locations in the Great Lakes, 1998–2018. Note different color scales in Erie and Ontario compared to the other three lakes.