

Summary: *Eutrophication or Undesirable Algae* (BUI #8)

Niagara River (Ontario) Area of Concern

It is recommended that the Niagara River (Ontario) RAP change the status of *Eutrophication or Undesirable Algae* BUI from “Impaired” to “Not Impaired”.

BACKGROUND

Algae are tiny plant-like organisms that are an important part of the food web as they are the main source of food for planktivorous fishes and zooplankton. However, when algae are overabundant (often referred to as an algal bloom) they can cause disruptions to the aquatic ecosystem, result in fish kills, pose a risk to human health and/or impair recreational enjoyment of the waterbody (boating, swimming). This is the reason *Eutrophication or Undesirable Algae* is listed as one of the 14 potential beneficial use impairments (BUIs) in the Niagara River Area of Concern (AOC). Pollution from human sources such as municipal and industrial wastewaters, agricultural runoff, fertilizers on lawns and golf courses, and poorly maintained septic systems are sources of nutrients that can contribute to “eutrophication”, a term that describes the enrichment of nutrients within a waterbody. Natural sources of nutrients from sediments (due to erosion) can also contribute to eutrophication.

The Niagara River AOC is a 58 km bi-national connecting channel linking Lake Erie to Lake Ontario. The watercourses that flow into the Niagara River (i.e., Welland River and other small creeks) are considered a potential source of pollution to the AOC but are not included in the AOC boundaries. A 1985 assessment of the BUI indicated it was not impaired in the Niagara River; however, a 1993 RAP Report indicated the status was “Impaired” for *Eutrophication* and “Not Impaired” for *Undesirable Algae* due to nutrient-related problems in the tributaries (i.e., Welland River and other creeks), not the Niagara River. Both parts of the BUI were changed to “Impaired” in 2009, however, because of poor water quality and observations of algae in the Welland River. No information was noted for the condition of the Niagara River.

An assessment initiated in 2014 examined all recent data (2003-2013) from multiple sources collected in the Niagara River (and Chippawa Creek/Niagara power canal) from multiple agencies for five key eutrophication metrics: total phosphorus (TP), phosphate/soluble reactive phosphorus (SRP), chlorophyll *a*, dissolved oxygen (DO) and Secchi disc depth. A scientific weight-of-evidence approach (as is used by other AOCs) was used to interpret data and determine the status of the *Eutrophication or Undesirable Algae* BUI. **The results of the assessment indicate that there is no eutrophication or undesirable algae impairment in the Niagara River.**



RESULTS OF BUI ASSESSMENT

Below is a summary of the scientific evidence indicating no eutrophication or undesirable algae impairment in the Niagara River AOC:

- Total phosphorus (TP) concentrations were evaluated against the Provincial Water Quality Objective (PWQO) criterion of 30 ug/L. The review identified that some values exceeded the PWQO likely due to known sources upstream of the Niagara River AOC. **TP concentrations upstream and downstream in the Niagara River showed no significant difference, suggesting minimal sources of TP within the AOC.**
- **Phosphate and chlorophyll *a* concentrations were generally equivalent to or less than those measured in comparable reference areas;**
- **Dissolved oxygen (DO) concentrations were generally above the screening criterion of 6.5 mg/L.** Of the two DO observations below 6.5 mg/L, impact to biota was not expected;
- **Historical Secchi disc depth values in the Niagara River were generally on par with or better than current day values in comparable reference areas;**
- The BUI is listed as “Not Impaired” on the New York side of the Niagara River because of declines in phosphorus and chlorophyll *a* levels in Lake Erie between 1968-1985, high levels of DO, and the absence of nuisance algal blooms.

Scientific evidence shows there are no issues related to excess nutrients or algae in the AOC.

FOR MORE INFORMATION

To obtain more information and to download the technical summary or detailed report, please visit: www.ourniagarariver.ca

