

Water Quality Report – WQ-1

2022 Field Season

OUR ORGANIZATION

The Shediac Bay Watershed Association (SBWA) was founded in 1999 as a result of growing concerns among residents from various local communities over the ecological health of the Bay of Shediac.

Our Vision – Communities working together to foster a healthy ecosystem that will sustain the quality of water for future generations.

Our Mission – The SBWA will accomplish its vision through education and community stewardship.



OUR WATERSHED



The Shediac Bay watershed covers 420 km² of land area and stretches along 36 km of coastline, from Cap Bimet to Cap de Cocagne. The Shediac Bay watershed is composed of two major river systems emptying into Shediac Bay: the Shediac River and the Scoudouc River. The Shediac and the Scoudouc rivers are characterized by dendritic patterns of small tributaries covering watersheds of 201.8 and 143.3 km², respectively.

WHAT DO WE MEASURE?

Water Temperature

Water needs to be cold enough for some species (like salmon and trout) to survive.

Dissolved Oxygen

Ecosystems need a minimum amount of oxygen in the water to support healthy aquatic life.

Dissolved Solids

Dissolved solids can be anything from organic material, to minerals, to pollutants. Too many dissolved solids harm aquatic life and may indicate contaminated runoff.

Nutrients

While some nutrients are healthy, too many nutrients (like phosphorus and nitrogen) can cause algae and harm ecosystems. Nutrients often come from manure and fertilizer in runoff.

E. Coli

Escherichia coli is one of the many species of bacteria living in the lower intestines of mammals. The presence of *E. coli* in water is a common indicator of fecal contamination.

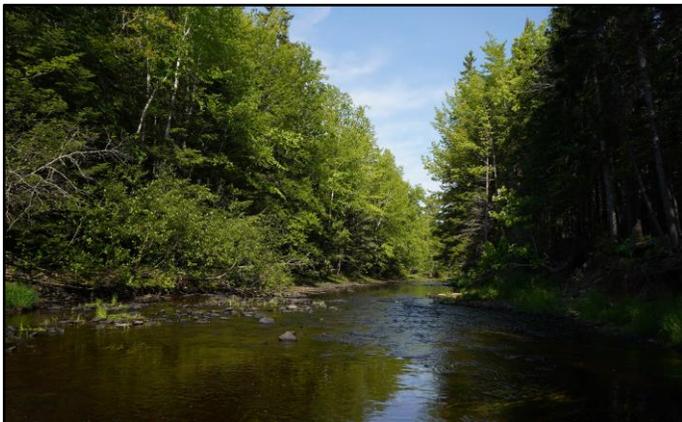
Metals

Metals can be introduced into water from weathering and erosion of soils or rocks. This can happen naturally, or at an increased rate due to human activities.

pH

This measures how acidic/basic the water is- neutral levels are best for fish. Changes to the natural pH might impact the nutrients or toxins in the water.

THE WATER QUALITY INDEX



Using the Canadian Council of Ministers of the Environment water quality guidelines, the Water Quality Index (WQI) combines multiple parameters into a single value that summarizes water quality at a site. It is calculated based on:

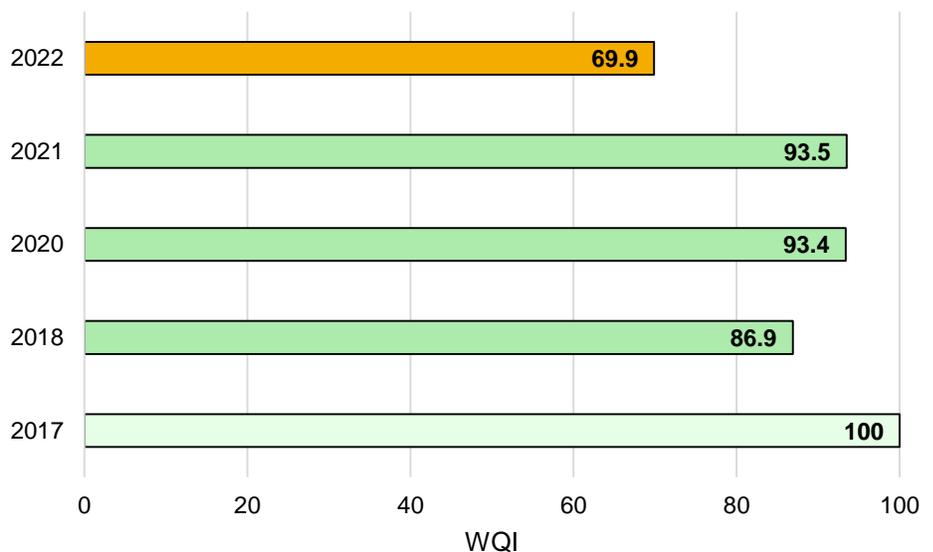
- the number of parameters that exceed guidelines,
- the number of times guidelines are exceeded,
- and the amount by which they are exceeded.

For an accurate WQI, a site is required to have 4 samples per year with at least 4 parameters measured.

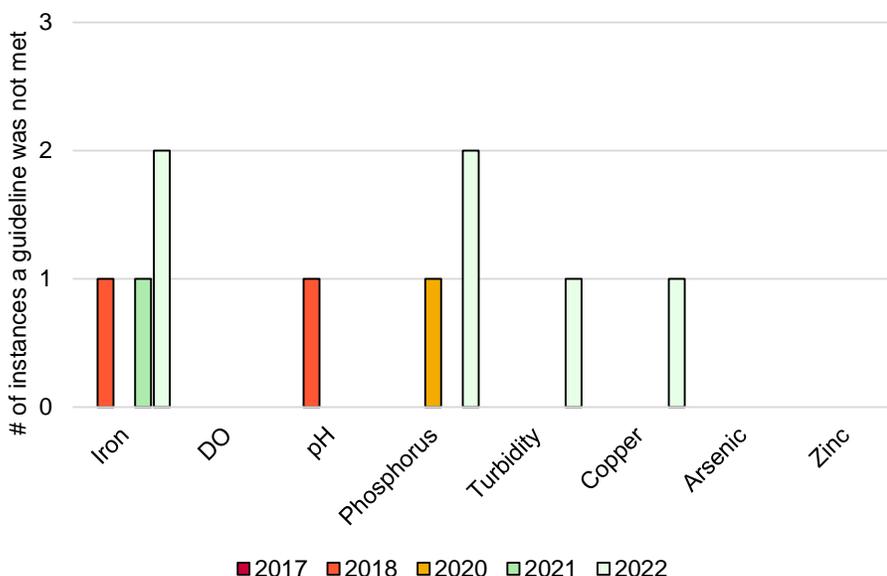
OUR WATER QUALITY INDEX SCORES

The WQI was calculated using: ammonia, arsenic, copper, dissolved oxygen, iron, nitrate, pH, phosphorus, turbidity, and zinc. These are the same parameters used by the NB Department of Environment and Local Government. Chloride was excluded from the calculation of the WQI at these sites due to their proximity to the Shediac Bay.

WQI scores for water quality site “WQ-1” have fallen within the “Excellent”, “Good”, and “Fair” categories in the past five years. A rating of “Excellent” means water quality almost never exceeds the guidelines, and conditions are close to natural levels. A rating of “Good” means water quality rarely exceeds the guidelines, and conditions rarely depart from natural or desirable levels. A rating of “Fair” means water quality occasionally exceeds the guidelines, and conditions sometimes depart from natural or desirable levels.



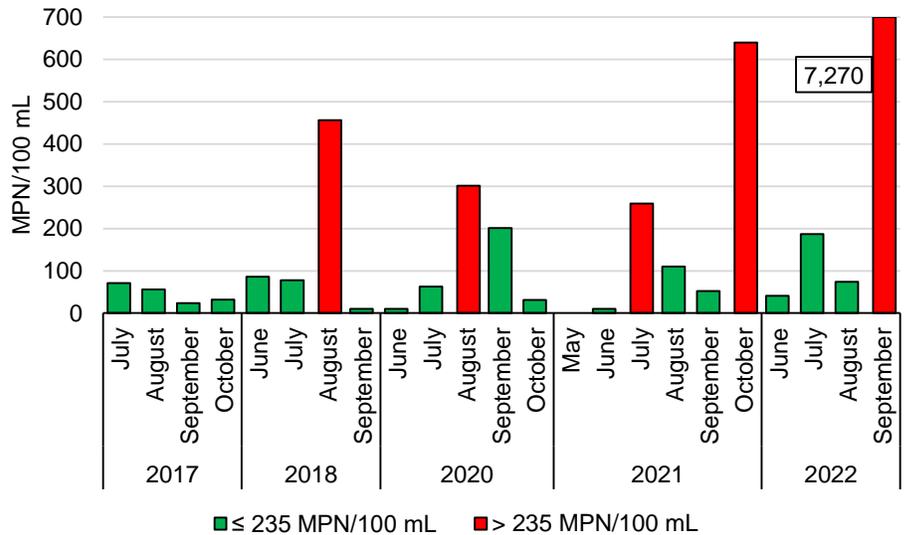
PARAMETER EXCEEDANCES



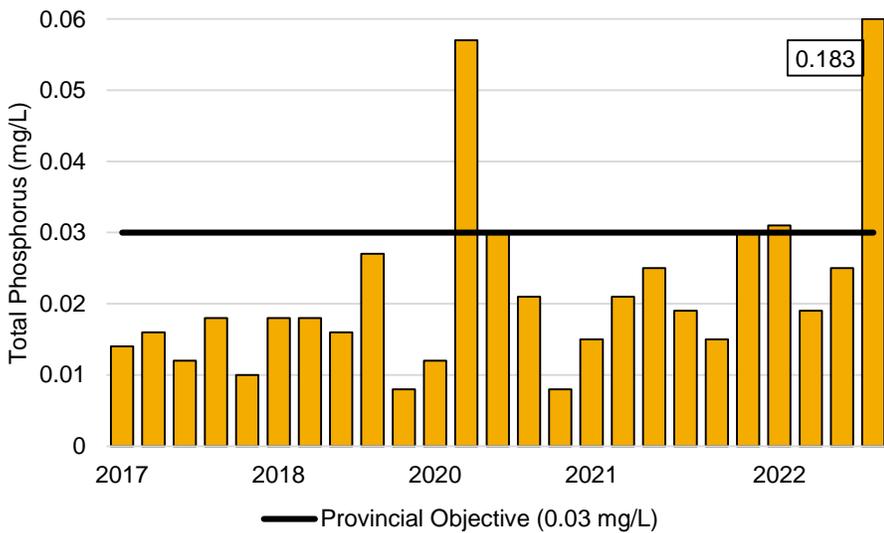
The graph on the left shows the number of exceedances of each parameter per year (values above the established guidelines). The combined effect of these exceedances lower the overall WQI score for each year. Iron and phosphorus have the most exceedances at this site. It is common to have elevated iron concentrations in New Brunswick due to natural geological influences.

E. COLI

E. coli levels surpassed the 235 MPN/100 mL guideline for Canadian Recreational Water Quality five times in the past five years at this site. The presence of *E. coli* in water is a common indicator of fecal contamination.



TOTAL PHOSPHORUS

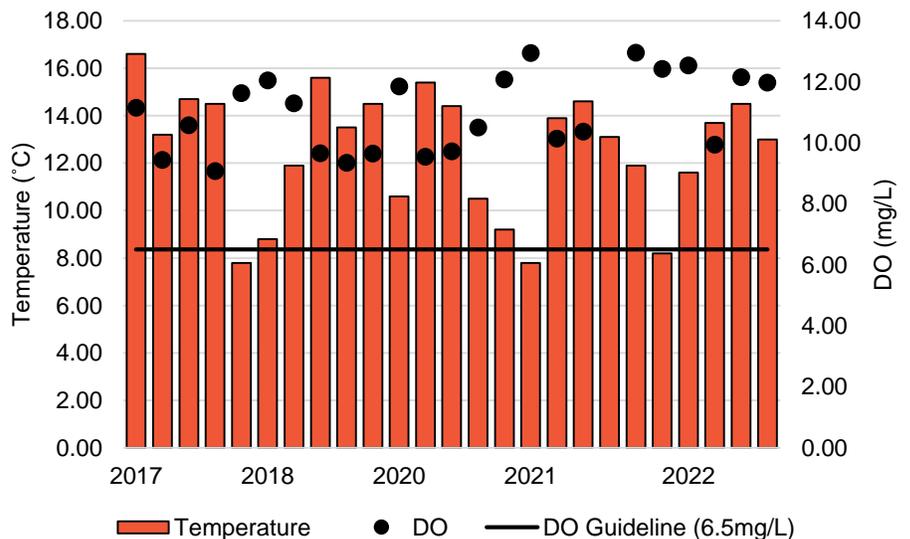


Total phosphorus at this site exceeded the provincial objective of 0.03 mg/L four times in the past five years. Elevated phosphorus levels in rivers can lead to an increase in growth of algae and aquatic plants. This excessive growth can decrease the amount of dissolved oxygen available to other aquatic life, like fish.

TEMPERATURE & DO

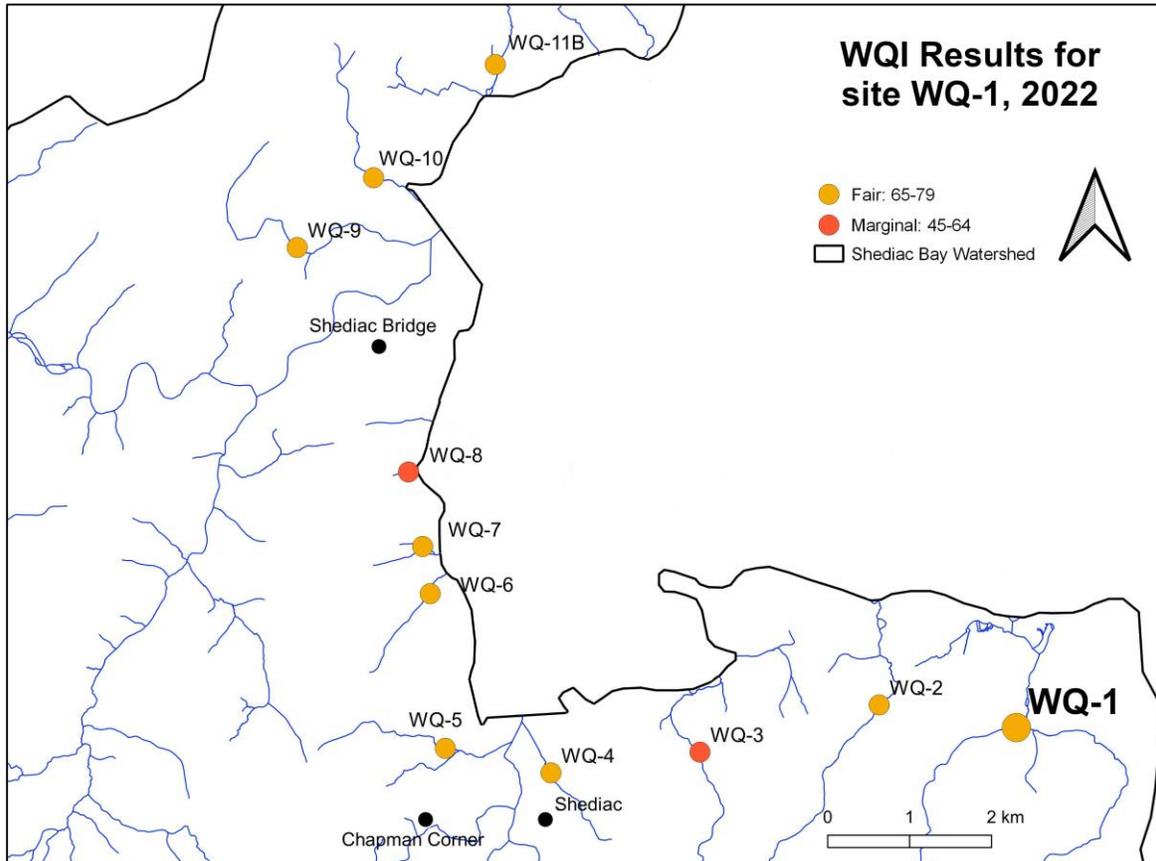
The amount of dissolved oxygen (DO) available to aquatic organisms decreases as water temperature increases. Impacts on aquatic life may occur at DO concentrations below 6.5 mg/L.

DO levels did not drop below the 6.5 mg/L guideline at this site in the past five years.

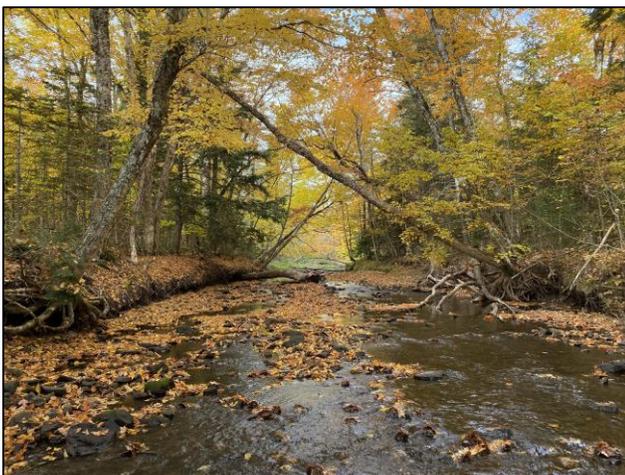


SITE INFORMATION

This site is located in a residential area in Boudreau-West, and is accessed from a private road off of Route 133. The samples are taken upstream of the culvert that crosses the dirt road. The surrounding land use includes agricultural fields, gravel pits, and Highway 15.



GET INVOLVED IN YOUR WATERSHED!



Want to learn more about how you can help to improve water quality in the Shediac Bay watershed?

Visit our website at www.shediacbayassociation.org

Acknowledgements

Thank you to the Environmental Trust Fund who helped make this work possible! And thank you to the Atlantic Water Network for providing the report template.

