

What Can I Do?

Residents of the Annapolis River watershed can protect the river’s health for years to come.

- 1. **Keep shorelines green.** Planting native vegetation, including trees, shrubs and herbaceous plants, along watercourses provides a home for wildlife, keeps waters cool, filters out pollution, and reduces erosion.
- 2. **Curb chemical inputs.** Look for phosphate-free and biodegradable cleaning products. Reduce or eliminate the cosmetic use of pesticides for lawns and gardens. Maintain healthy riparian buffers to reduce the transport of chemicals into natural watercourses.
- 3. **Conserve water.** Rivers rely on inputs from groundwater to maintain flow during the dry summer season. Installing low-flow appliances, modifying existing fixtures and collecting rain water for gardening can conserve water.
- 4. **Keep sewage where it belongs.** Ensure that septic tanks are maintained and pumped out every 3-5 years, and that municipal sewage treatment plants are operated to the highest standards.
- 5. **Become a member of CARP.** Membership supports implementation of CARP’s various conservation and stewardship initiatives. Please see www.annapolisriver.ca/membership for further details.
- 6. **Volunteer.** Opportunities are available throughout the year for activities such as nature monitoring, field activities, special events and participation on the board of directors. Please see www.annapolisriver.ca/volunteer for further details.



COUNTY of ANNAPOLIS
NATURALLY ROOTED

The 2020 River Guardians Program was made possible thanks to the financial support of the Municipality of the County of Annapolis

Other CARP Projects

Wood Turtle Monitoring & Stewardship

The Wood Turtle is a species at risk listed as threatened both federally and provincially. CARP’s program focuses on engaging volunteers to support data collection activities, and working with landowners to implement stewardship actions on their properties. Volunteers assist with visual surveys, nest surveys and nest protection.

Citizen Science Angling Program

In collaboration with a wide range of partners, CARP is working to pilot a citizen science program that engages volunteer anglers in monitoring activities in order to improve knowledge of the distribution of aquatic invasive species in Nova Scotia, particularly chain pickerel and smallmouth bass. This data is then shared with partners such as NS Inland Fisheries, so it can be used for program planning and delivery.

Agriculture, Climate Change , and Biodiversity

In collaboration with local farmers, CARP is working to support and showcase beneficial management practices that help the agricultural sector adapt to climate change and support biodiversity. For example, in 2018 CARP partnered with Spurr Brother’s Farms to install tile drain level control devices that can be used to hold water in crop fields when it is needed during the summer. In partnership with the Canadian Forage and Grassland Association, Nova Scotia Department of Agriculture and Nova Scotia Federation of Agriculture, CARP is working to develop a Habitat and Biodiversity Assessment Tool for farms in Nova Scotia.

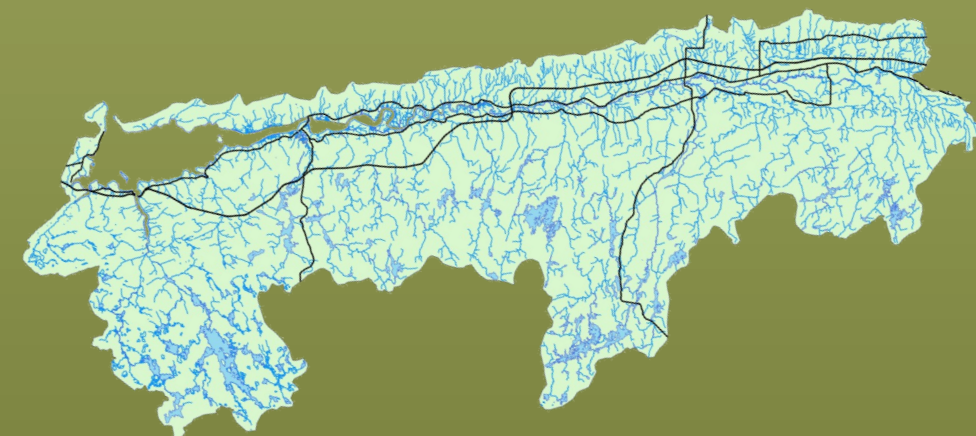
Clean Annapolis River Project

Annapolis River Watershed 2020 Report Card



Our Watershed

A watershed represents the drainage area of a water body. Water from lakes, streams, runoff and ground water all empty into a central body of water, in our case, the Annapolis River. The watershed is the third largest in Nova Scotia, with an area of about 2,300 m², and stretches from Berwick to Digby.



Monitoring the Annapolis River

Clean Annapolis River Project (CARP) has been monitoring conditions in the Annapolis River watershed for 29 years, using a variety of sampling and geospatial analysis techniques. One of the main indicators that CARP uses to determine the health of the river is the monitoring of surface water quality through the Annapolis River Guardians program. The River Guardians program has historically relied on an extensive volunteer-based monitoring network to collect water samples at eight established monitoring sites along the river. This report card provides a snapshot of the 2020 monitoring results.

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What Do We Measure?

Surface water quality can be affected by a wide variety of pollution sources. In the Annapolis River watershed, some sources of pollution include urban and agricultural runoff, poorly maintained septic systems, malfunctioning sewage treatment plants and straight pipes. Examples of pollutants include bacteria, nutrients, heavy metals, and sediment, all of which can adversely impact the health of aquatic ecosystems.

- ♦ **Water temperature** — High summer water temperatures can stress or kill sensitive aquatic species such as trout or salmon.
- ♦ **Dissolved oxygen** — Many aquatic organisms high dissolved oxygen to survive. High temperatures and/or nutrient concentrations in water can decrease dissolved oxygen, harming aquatic health.
- ♦ **pH** — This measures the acidity of water. Low pH levels can adversely impact the reproduction and survival of many aquatic species.
- ♦ **Bacteria (*E. coli*)** — The presence of *E. coli* can result from livestock waste, poorly maintained septic systems, and malfunctioning sewage treatment plants. *E. coli* is a health concern for humans and livestock.
- ♦ **Nutrients (Nitrogen and Phosphorus)** — Elevated amounts of nutrients can degrade water quality by causing algal blooms that can reduce dissolved oxygen levels, and also by changing the natural state of aquatic ecosystems.

How Healthy is the Watershed?

Variable	Status (2020)	Trend (1992 to 2020)
E. Coli	Poor	↓ 2 sites ↑ 2 sites ↔ 4 sites
Dissolved Oxygen	Good	↓ 6 sites ↔ 2 sites
Water Temperature	Good	↑ 7 sites ↓ 1 site
pH	Poor	↑ 7 sites ↔ 1 sites
Nitrogen	Good	↔ 1 site*
Phosphorus	Good	↔ 1 site*
Trend Legend	↑ Increasing ↓ Decreasing ↔ No trend detected	

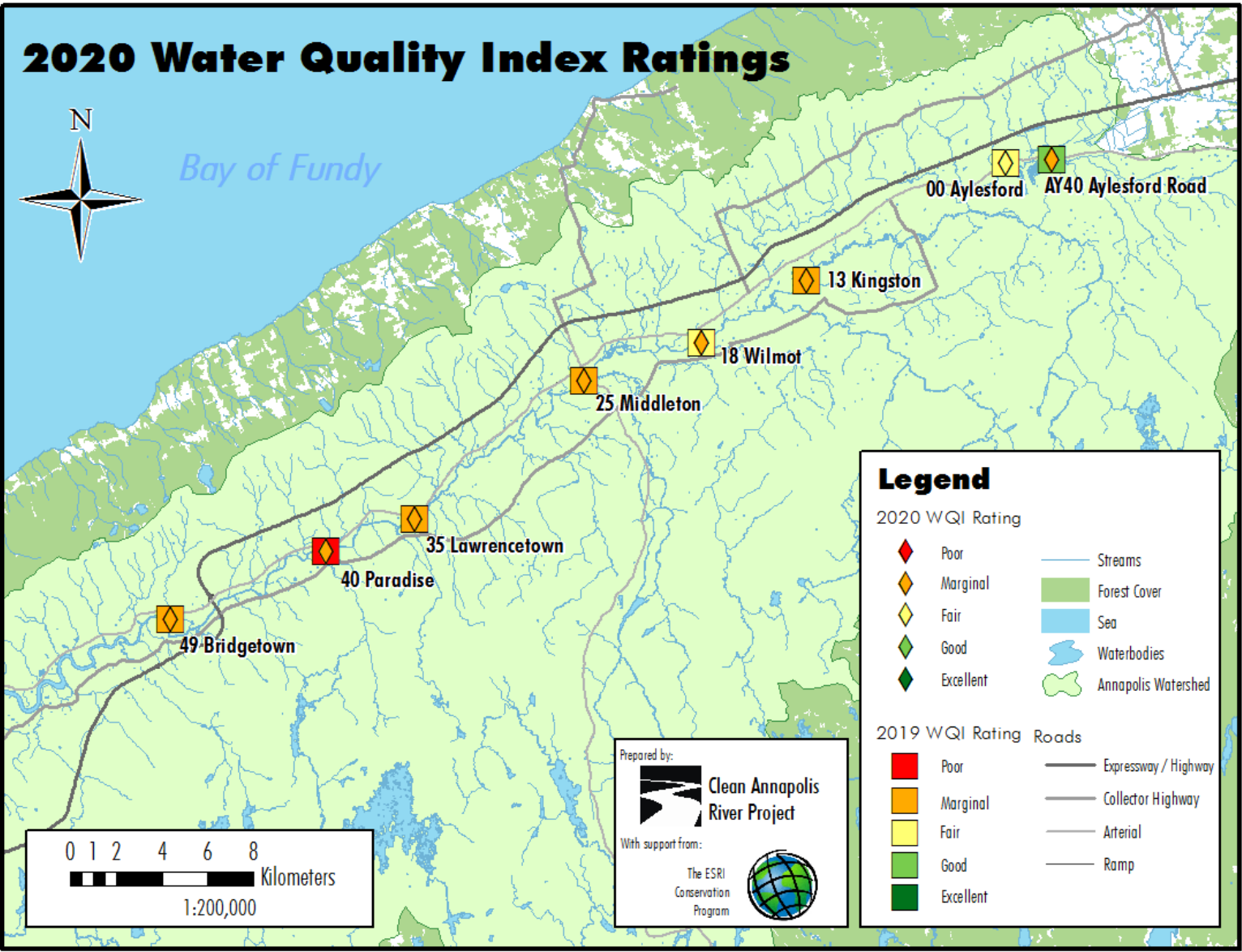
*Nutrients are sampled at only 1 location by Environment and Climate Change Canada. Trends are calculated based on data collected between 2006-2020. Fewer data were collected in 2020 relative to previous years, as ECCC’s monitoring program was limited due to Covid-19.

Due to the impacts of COVID-19, the 2020 monitoring season began two weeks later than in typical years on June 1st, rather than in mid May. As such, conditions were warmer from the onset of sampling this year, which may have influenced the WQI scores as water samples from the onset were several degrees warmer than in the 2019 sampling season.

Water Quality Rating

The Water Quality Index (WQI) is a score calculated using several water quality measures. Those used in this calculation were *E. coli* bacteria count, Dissolved Oxygen, Temperature, pH and nutrients. The map below shows WQI ratings for 2020 (Diamonds) and 2019 (Squares) for comparison purposes.

WQI	Water Condition
95-100	EXCELLENT <ul style="list-style-type: none">• Absence of threat• Almost pristine
80-94	GOOD <ul style="list-style-type: none">• Minor degree of threat• Usually at desirable levels
65-79	FAIR <ul style="list-style-type: none">• Occasional threat• Not always at desirable levels
45-64	MARGINAL <ul style="list-style-type: none">• Frequent threat• Often not at desirable levels
0-44	POOR <ul style="list-style-type: none">• Almost constant threat• Usually not at desirable levels



Interpretation

The scores for all 6 parameters are derived from the Canadian Council for Ministers of the Environment (CCME) Water Quality Guidelines.

E. Coli levels have been trending steadily upward for the past few years in Aylesford and Kingston. Downstream, levels are either trending downward or have exhibited no significant change.

To be considered “poor,” >30% of pH measurements fall outside of the range of 6.5 to 9.0. Many pH measurements fell between 6.0 and 6.5 (acidic). The headwaters of the Annapolis River watershed are fed by wetlands, and are therefore acidic due to the naturally occurring organic acids leached from wetland vegetation. Additionally, many of the soils within the Annapolis River watershed are naturally acidic, with some un-limed fields measuring pH 4.5. Thus, runoff from the watershed can contribute to the acidity of river water. One of several vital components in agricultural soil is microorganisms. These function best the closer pH is to 7, or neutral. However, many plants do prefer soil that is on the acidic side, such as blueberries, cranberries, and rhododendrons, among others.