

The Annapolis Watershed

2006 Report Card



Evaluating the Annapolis River

How healthy is the Annapolis River? Are conditions deteriorating or improving? What can we do about it? These are all questions asked by residents of the Annapolis Watershed. The Annapolis River Guardians try to answer these questions by learning more about the Annapolis River. The River Guardians are a volunteer water quality monitoring group who, with the help of staff from the Clean Annapolis River Project (CARP), monitor conditions on the Annapolis River.



The Annapolis River Guardians is one of the longest-running and most extensive volunteer based water monitoring programs in Eastern Canada. Started in 1992, the program has involved over 90 volunteers who have collected over 3500 water samples. The River Guardians are all residents of the Annapolis Watershed, and come from many different backgrounds. With over 15 years of data, the program has contributed significantly to our understanding of the Annapolis River. This report card summarizes the program and its findings for the 2006 monitoring season. Read on to discover what has been happening in your watershed!

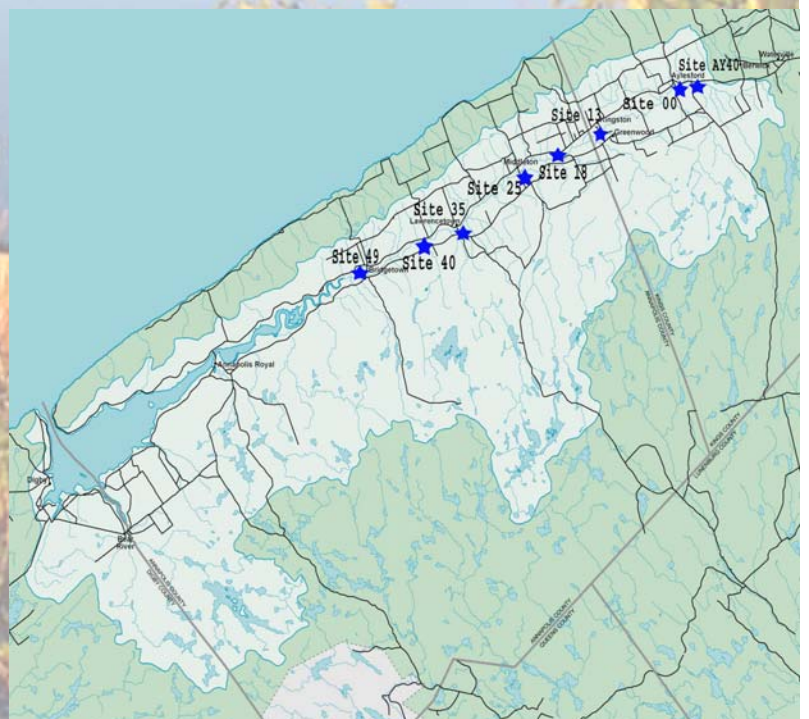
What is a Watershed?

A watershed represents the drainage basin or catchment area for a particular body of water. In the case of the Annapolis Watershed, the water body that we refer to is the Annapolis River. Any drop of water that falls into the white area on the map below will eventually drain into the Annapolis River. This area represents our watershed, which extends from Berwick to Digby, making it the third largest watershed in the province.

A watershed is determined in part by the natural elevation the land takes, being based on the shape of the land instead of municipal boundaries. The Annapolis Watershed lies across three counties: Kings, Annapolis and Digby.

There are several issues of environmental concern in the Annapolis Watershed: contamination by fecal bacteria, elevated summer water temperatures, the levels of oxygen dissolved in the water, nutrients such as nitrogen and phosphorous, and erosion along riverbanks.

The stars on the map represent the sites where the Annapolis River Guardians collect their water samples. There were eight sampling sites in 2006: Aylesford Road, Aylesford at Victoria Road, Kingston, Wilmot, Middleton, Lawrencetown, Paradise and Bridgetown.



What do we measure?

E.coli Bacteria

E.coli are bacteria that live in the digestive tract of warm-blooded animals. Because they occupy the same ecological niche as many disease-causing organisms (human pathogens), E.coli are used as indicators for the possible presence of potentially dangerous pathogens. These bacteria have been identified as a major source of concern in the Annapolis watershed. The potential sources of E.coli in the watershed include malfunctioning central sewage treatment plants, poorly maintained on-site septic systems, aquatic wildlife (i.e. beavers, muskrats, waterfowl), domestic animals, and livestock.



Dissolved Oxygen

Dissolved oxygen (DO) is a widely used and important general indicator of the health of a river system. Aquatic organisms, such as fish, require oxygen in solution, just as terrestrial organisms need oxygen to breathe. Oxygen in the atmosphere, which is readily available to terrestrial organisms, must be dissolved into the water where it is present in much lower concentrations. Sewage, manure, or elevated nutrient levels can result in lower dissolved oxygen levels. Wind, wave action, rainfall and photosynthesis help aerate waterways and increase dissolved oxygen levels.

Water Temperature

Water temperature also serves as a broad indicator of water quality. The temperature of water has a direct bearing on the aquatic species present and their abundance. For example, trout and salmon species experience stress at water temperatures in excess of 20 degrees Celsius, with death occurring after prolonged exposure to temperatures over 24 degrees Celsius.

Acidity


















pH is a measure of the acidic/basic nature of water. It is expressed on a scale from 0 to 14, with 0 being the most acidic, and a pH of 7 being neutral. To ensure the health of freshwater aquatic life, pH levels should not vary beyond a range of 6.5 to 9.0. Levels below 5.0 are known to negatively affect many species of fish, such as salmon and trout. pH varies naturally, but it can also be influenced by human factors, such as acid rain inputs.

Nutrients

Nutrients such as Nitrogen (N) and Phosphorus (P) are necessary for all forms of life, but when they are present in elevated concentrations, they can cause oxygen depletion from algal blooms and affect aquatic life such as amphibians. Possible nutrient sources include human and animal waste, atmospheric inputs, industrial waste and artificial fertilizers.



The Annapolis Watershed in 2006

Variable	Status		Trend
E.coli Bacteria		42% of samples met guidelines for livestock watering and crop irrigation. 46% of samples were unsatisfactory for all uses.	
Dissolved Oxygen		Over most of the river, oxygen levels were high enough to support aquatic life. Some samples near Bridgetown, however, had very low levels of DO. These were found to be in the tidal salt water in late summer and early fall.	
Water Temperature		49% of the samples collected during the summer months had temperatures of 20 degrees Celsius or higher. This follows the same trend seen in past years.	
pH		Most pH values were between 5.5 and 7.5, a range that can support aquatic life.	
Nutrients		53% of nitrogen and 40% of phosphorus samples collected exceeded guidelines.	
Legend	 Good  Fair  Poor  Improving  Stable  Worsening  Insufficient Data		

A New Year, New Questions

Every sampling season brings new challenges. Below are some of the questions that were raised by the results of the 2006 sampling season.

- E.coli levels were significantly higher in 2006 compared to 2005, particularly during June, July and August, which received heavy precipitation. The monitoring program in 2007 will continue to investigate possible contamination sources.
- Low dissolved oxygen levels were found in the lower reaches of the river, where salt water is pushed up by the tide to Bridgetown. During 2007, CARP will track changes in dissolved oxygen levels between Annapolis Royal and Bridgetown and investigate what are the possible driving mechanisms?
- Elevated nutrient levels were observed in 2006. During 2007, we will try to identify possible sources.
- Regular temperature monitoring along the main stem of the Annapolis River and its major tributaries will attempt to identify where significant increases in water temperature are occurring.

Why do we care?

The Annapolis River provides many services to residents of the watershed. The river is used for recreational activities such as swimming, boating, and fishing. Farming has long depended on the river for both crop irrigation and livestock watering. Waterfowl, birds of prey, muskrats and fish all call the Annapolis River home. The river also has cultural value for the citizens of the Annapolis Valley. Stemming from the time when it was used by the Miikmaq people, the river has provided transportation for colonization, and boasts the oldest permanent European settlement on its shores. The Annapolis River, its tributaries and adjacent wetlands play a vital role in controlling flooding & erosion and serving to store water for gradual release during the dry summer months. The river also contributes to the recharge of groundwater and helps to moderate our climate.

What can I do?

There are things that each of us, as residents of the Annapolis Watershed, can do to ensure that our river stays healthy for years to come. Whether we act as individuals, or as part of larger organizations, these simple steps can make a big impact.

Protect vegetation along riverbanks and streams. Vegetation provides a home for wildlife, keeps waters cool, filters out pollutants and reduces erosion.

Support the fencing of streams. Livestock can trample riverbanks, increase erosion, stir up sediment that washes downstream, and are one of the sources of bacterial contamination in the river.



Get involved! Not sure where to start? Find an environmental organization in your area, and learn more about the place you call home.

Conserve water. Reducing shower times and installing low-flow appliances are two easy ways to conserve water. Rivers rely on inputs from groundwater to maintain flow during the dry summer season.

Keep sewage where it belongs. Ensure that domestic septic systems are pumped out and maintained regularly, and that municipal sewage treatment plants are operated to the highest possible standards.

Reduce the use of cosmetic pesticides. Pesticides used domestically and for cosmetic treatments of landscapes are often washed into river systems, where they can damage wildlife.

Clean Annapolis River Project

CARP is a charitable, community-owned corporation created to work with the community and interested organizations to foster the conservation, restoration and sustainable use of the freshwater and marine ecosystems of the Annapolis River and its watershed. Founded in 1990, we use a *multi-stakeholder* approach to improve the health of the river by working with individuals, businesses, academics, government and other non-profit organizations. CARP is not an advocacy group, but believes that by working together, residents of our watershed can create the sustainable communities and clean environment that we all deserve.

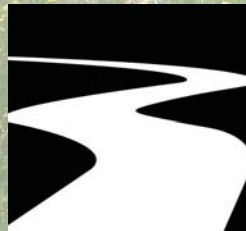
Want to know more?

This newsletter represents a summary of the 2006 Annapolis River Guardians Report. The full report, as well as other information on the watershed, can be downloaded from our website at www.annapolisriver.ca.

All monitoring results are available in an online searchable database at www.fundybay.com.

If you have any questions about the material presented in this newsletter, require further monitoring details, or would like a presentation on these results to your group or organization, please contact:

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Thank you

The Annapolis River Guardians is a volunteer-based program. Without the dedication of the volunteers, the program would not be the success that it is. We would therefore like to extend our thanks to the volunteers who contributed their time and energy during the 2006 season:

Claire Diggins, Marika Godwin and Ross Dickson, Harold and Pam Griffin, Ronald Jones, Ross McLaughlin, Tami and C.J. Parks, and Matthew Guy.

The following partners have worked with us to help deliver the Annapolis River Guardians program:

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