



WATERSTRIDER



Clean Annapolis River Project

Fostering the conservation, restoration and sustainable use of Nova Scotia's Annapolis River and its watershed

Muddy waters - particulates in the Annapolis River

Article by Jeffrey Glenen, Water Quality Analyst

There are many properties of a water body that can provide indicators of its overall health, including water chemistry, plant life, animal community and physical properties. CARP's River Guardians program has monitored many of these different parameters over the years and in 2008, the suspended sediment load of the river was added to this list.

Sediments are organic and inorganic materials that settle at the bottom of a water body but are light enough to be carried by the flow. The most common of those are silt and wood fibres.

High suspended sediment load interferes with the photosynthesis of aquatic plants, feeding mechanisms of zooplankton and respiration of fish. The sediment load of a water body varies with weather, but many factors can cause elevated sediment levels even during periods of low precipitation, including shoreline erosion, pulp and paper operations and construction.

The suspended sediment load of a water body can be measured using several different procedures. Turbidity refers to the apparent cloudiness of the water and is measured by determining the amount of light that is scattered by the sample. A total suspended solid (TSS) measurement



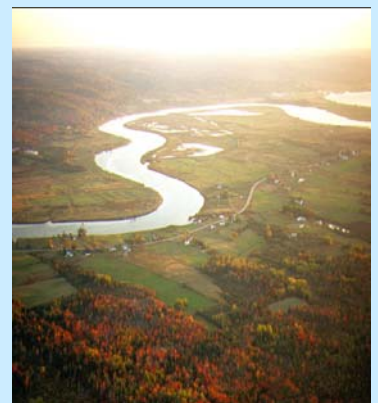
Farm along the Annapolis River in Paradise

involves filtering out a sample's sediment content and measuring its mass.

Turbidity measurements are simple and can be performed in the field whereas TSS measurements must be performed in the lab and are relatively time consuming. However, TSS measurements are more valuable because they gauge a physical property while turbidity measurements are relative and must be calibrated. TSS and turbidity are related, but this relationship is unique to every watershed.

CARP monitored both TSS and turbidity in 2008 and will continue to do so in 2009 in order to develop a mathematical relationship between the two variables. After this, it is planned that turbidity monitoring of the Annapolis River will continue in future seasons. The results are useful in CARP's annual reporting, especially in the calculation of the water quality index.

The Clean Annapolis River Project is a community-owned corporation dedicated to fostering the conservation, restoration and sustainable use of the freshwater and marine ecosystems of south-western Nova Scotia's Annapolis River and its watershed.



We never know the worth of water till the well is dry. ~Thomas Fuller, *Gnomologia*, 1732

The Nictaux River—a historical review

Article by Levi Cliche, Fish and Wildlife Technician

The Nictaux River is the largest tributary to the Annapolis River. Its headwaters include the Molly Lake system and McGill Lake that flow into the Nictaux River through Shannon River, Trout Lake and East Lake that drain into Shannon Lake, and Waterloo Lake that drains into the Nictaux through the Waterloo River.

For most of its length, it is bordered by continuous forested riparian buffer zones that provide temperature-regulating shade to the river, help moderate flows by intercepting precipitation and runoff, stabilize the channel, contribute structure-forming large woody debris to the channel, and contribute to nutrient regulation of the system.

This river contains a wide variety of favourable habitat features including deep runs, large pools, shallow riffles, cascades, gravel bars and various forms of instream structure.

Many watercourses in Nova Scotia are of limited productivity due to naturally low pH, as well as acidification by acid precipitation. The section of the Nictaux River from the NS Power reservoir downstream maintains pH levels within the range needed for salmonid fishes to thrive. This is likely due to the presence of the limestone-bearing Torbrook geological formation in the area. Limestone contributes a buffering capacity which minimizes the effects of acidification.

The Nictaux River at one time supported large runs of Atlantic salmon. This contributed to the well-being of the community through the economic and social benefits provided by commercial fisheries, traditional native use of the resource, and recreational angling by locals and tourists.

Although the Nictaux River was closed to commercial salmon harvesting before the early 20th century, runs of salmon migrating toward the Nictaux were continually harvested on the Annapolis River. From this harvest, and likely other local harvests, it was estimated that four to five tons of salmon were being

shipped from Middleton per week in the 1907 run (The Outlook, June 22, 1907).

Nictaux Falls was a traditional gathering site during the fall salmon run for the Mi'kmaq people. They would make camp for several days while salmon were caught and smoked for winter keeping.

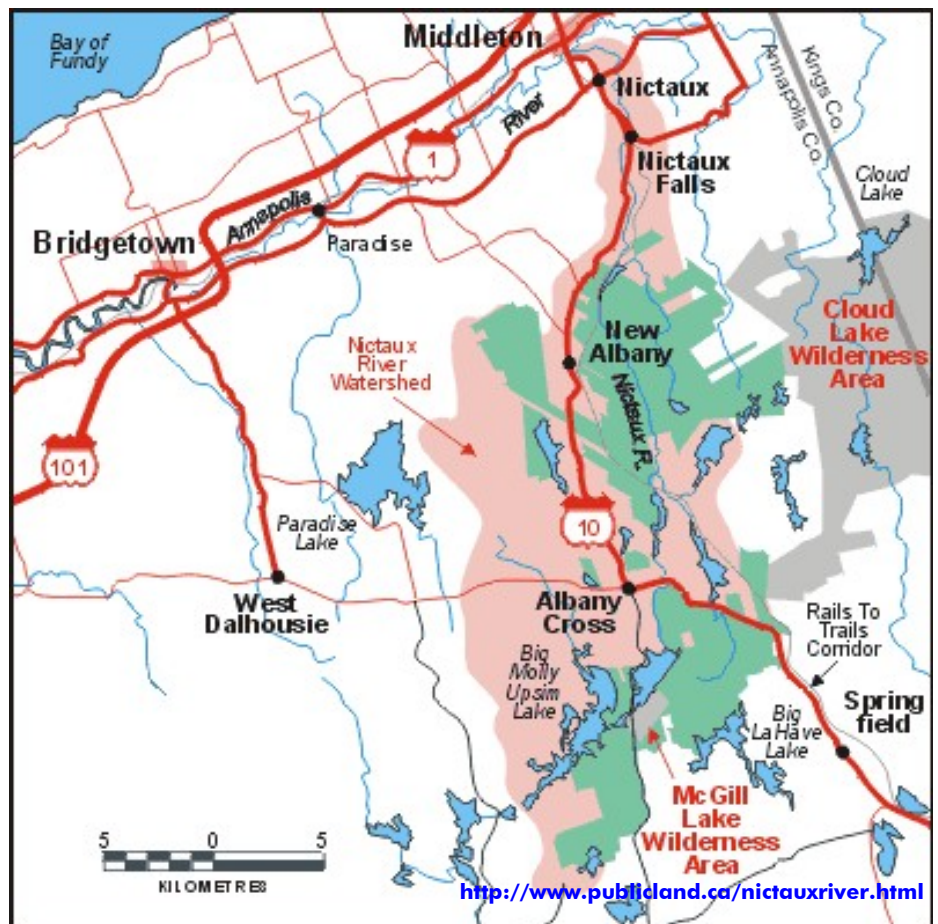
The Nictaux River was once a popular angling destination. By 1916 at the latest, one Steward S. Stevens managed pools downstream from Roger's Dam (Martyn's Mill) off Highway 201 for recreational use by traveling anglers and locals (The Outlook, May 12, 1916). By 1919 he had built what is now the Falcourt Inn, which served as both his home and a lodge to host traveling anglers (predominantly American). Guests paid \$100 per night for lodging, and to fish the river 200 yards away (Kingston Historical Society, 1994).

The Nictaux River system is a popular destination for canoeing and kayaking. A public launching site at

Shannon River on Highway #10 provides access to McGill and Big Molly Upsim Lakes, the Shannon River, and the Nictaux River paddling route. When flow conditions are right, this launch provides access to excellent canoeing ranging from casual paddling to overnight trips to rapids that provide a challenge for more advanced paddlers.

The Nictaux River system has been heavily altered by development for hydroelectric generation. Periods of extreme low flows affect aquatic habitat availability and quality. Periodic high flows from power generation occur quickly and vary drastically from the base flow.

Barriers to fish migration have prevented salmon from reaching traditional spawning grounds and contributed to the collapse of the population. Given the current and historical value of this river, it is important that these issues be addressed.



The true cost of water

Article by Nicole Oliver, Energy Conservation Advisor

Canadians are the second largest water consumers per capita. In 2004 the average Canadian used 329 L per capita per day, in 2001 the average use was 335 L and 343 L in 1999. These figures are significantly higher than many European countries (Figure 1).

How do Canadians consume such large volumes of water? The answer may be in the value that we assign water. Don Coursey, a PhD economy student with the University of Chicago stated: "We need to put costs for water and wastewater in context; people are willing to pay far more for soft drinks and other beverages than for tap

world's lake freshwater, we possess only 6.5% of the world's renewable supply. By 2011 Canadian municipal water use will be double what it was in the early nineties if growth and consumption pattern remain the same. This trend of rapidly escalating water use could mean water shortages for Canada.

The price we pay for municipal water and wastewater may be another significant factor. There is a concern among water experts that provincial and municipal water prices rarely reflect the true value of water. This skewed view can result in "over consumption, water use conflicts, deteriorating infrastructure, declining water quality, and stifled innovation in water-conserving technologies".

responsible way.

Simple, every day things can reduce water consumption. Examples include taking shorter (or less frequent) showers, only running your clothes and dish washers when full, installing low-flow showerheads, faucet aerators and toilet dams.

Outdoor tips include collecting rain water to water lawns and gardens, only watering in the early morning or evening to reduce the amount of water lost to evaporation in the heat of the day. As well, lawns are a luxury, try converting your lawn to a native species garden. Not only are these plants adapted to the climate, but they can be much lower maintenance than gardens made of non native species.

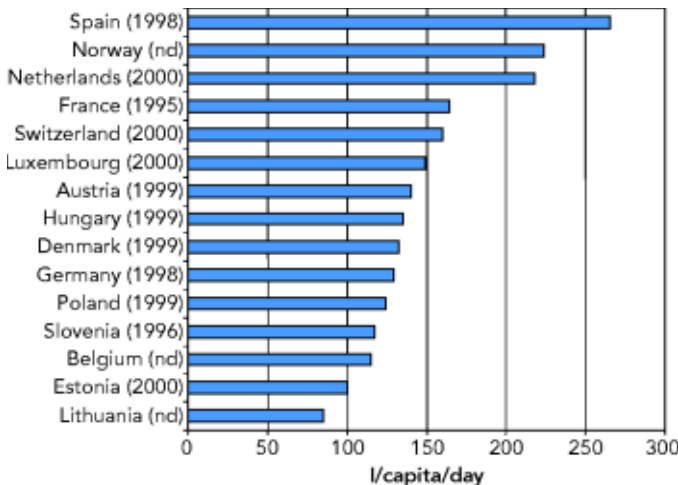


Figure 1. Water consumption in L/capita/day for selected European countries. Source: European Environment Agency, http://themes.eea.europa.eu/Specific_media/water/indicators/WQ02e,2003.1001/Figure05_11.png/view



The American Water & Energy Savers provide 49 Water Saving Tips on their website: <http://www.americanwater.com/49ways.htm>

Interesting Water Facts

- Once evaporated, a water molecule spends about 10 days in the air.
- Canada has about 25% of the world's wetlands – the largest wetland area in the world.
- One drop of oil can render up to 25 litres of water unfit for drinking.
- Approximately 300 litres of water are required to produce 1 kilogram of paper.
- Universal water metering has proven to reduce overall residential and ICI (Industrial-Commercial-Institutional) water consumption by 15 to 30 percent.
- Fifty percent of the world's wetlands have been lost since 1900.
- In Canada, there is more water underground than on the surface.

These facts were collected from Environment Canada's Quickfacts site: http://www.ec.gc.ca/WATER/en/e_quickfacts.htm

water."

He went on to state that while Americans tend to have a greater understanding of global scale problems, such as global warming they lacked understanding of local issues such as producing and providing resources. Although this is a commentary on the American perspective, based on similarities between our countries it is safe to assume that it is also valid for many Canadians.

As well many Canadians perceive freshwater to be in abundant supply. Although Canada holds 25% of the world's wetlands and 20% of the

Canadian overuse of water costs billions of dollars in supply and wastewater infrastructure.

Aside from social and economic effects of water use, there is a suite of environmental impacts. Nearly every use of water degrades the quality in some way. No financial retribution for these impacts is incorporated into the price of water.

The 'theory of abundance', skewed water pricing and ignored social and environmental costs perpetuate wasteful water use. The fact that water is essential to many of our daily activities is undeniable. However, water can be used in a

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Exploring the Annapolis Royal Marsh



The sweet smell of success

Article by Nicole Oliver, Energy Conservation Advisor

It has been a long four years since a Middleton resident alerted CARP of foul odours at the Middleton Riverside Park. CARP followed up with investigations and water sample collections.

The source was found to be the Middleton sewage treatment plant (STP). Like many municipalities, Middleton's STP was in need of an upgrade. Heavy rains exceeded the capacity of the STP and it was overflowing into Lily Lake Brook and the Annapolis River.

Faced with a very expensive repair and serious health and environmental issues, Middleton undertook a temporary repair in the autumn of 2007 to prevent the STP from overflowing. Middleton and CARP partnered to find a solution to the STP issue.

With the assistance of ABL Environmental Consultants Ltd., the

town has completed a full design for a new two-lagoon sewage treatment plant and made an application for federal-provincial infrastructure funding.

On March 1st, it was announced by Greg Kerr, local MP and Carolyn Bolivar-Getson provincial cabinet member that the Town would receive \$3,936,900 to cover the cost of a new STP. The cost is to be shared equally by Ottawa, the province and the town itself.

This new STP and funding come at a good time, as provincial legislation requires a new standard in STP facilities. However, the Town of Middleton is going to the next level and exceeding the provincial standard to install a constructed treatment wetland.

This once foul problem has turned into an incredible opportunity. CARP congratulates the Town of Middleton on its perseverance and will work with the Town as this project continues to develop.



Annapolis River taken near Riverside park, Middleton

The environment is the economy

Editorial by Stephen Hawboldt, Executive Director

While most environmental issues are, in reality, economic concerns, the soft-shell clam industry in the Annapolis Basin clearly illustrates this connection. Land-based sources of marine pollution, mostly sewage from poorly functioning municipal treatment plants and on-site septic systems, has forced the closure of many clam harvesting beaches around the Basin. Last summer, most of the Basin was closed for most of the summer due to overloading of the treatment plant for the Town of Digby. A preliminary calculation by the Clean Annapolis River Project (CARP) estimated the losses in 2008 at about \$2.5 million. Gardner Pinfold Consulting Economists are undertaking a detailed study to determine the community economic benefits arising from the elimination of wastewater discharges.

Unlike most fisheries, the clam industry can be revived. CARP is working with various stakeholders to identify and remedy pollution sources and to reseed beaches depleted by over exploitation. Hand harvested soft-shell clams are rated by various agencies as the most environmentally friendly shellfish in the world creating substantial marketing opportunities. This industry clearly shows that the economy needs a healthy ecosystem.

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Contribution deadlines:

Spring: 1 March

Summer: 1 June

Autumn: 1 September

Winter: 1 December

Membership:

Adult \$7

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