Lessons of an Accidental Beach

Recreational Water Quality Monitoring Report
The North Saskatchewan River in Edmonton

November 2017
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ABOUT US

North Saskatchewan Riverkeeper was founded in 2009 with a mission to protect our great river from its headwaters in the Rockies right to the Forks at Prince Albert. Through water literacy programming that connects communities with local water bodies as well as with the powerful tools needed to protect them, Riverkeeper aims to ensure that everyone in our watershed has access to clean water for swimming, drinking, and fishing.

Riverkeeper works closely with Swim Drink Fish Canada on a number of programs, and together with Swim Drink Fish partners in Vancouver, Toronto, Ottawa, and beyond, we are building a nation-wide movement to protect our rivers, lakes, streams, and oceans.

Swim Drink Fish Canada envisions a future where water is swimmable, drinkable, and fishable for everyone.

We represent a network of 1.9-million people in communities where access to clean water is threatened. We teach water literacy and support grassroots efforts to combat beach closures, drinking water threats, and disappearing habitat.

Our flagship projects fuse science, culture, law and digital media and we work closely with local Waterkeepers in Edmonton, Vancouver, Toronto, and Ottawa to implement a variety of programs including Swim Guide and Watermark Project, among others.

Watermark Project – A digital archive for personal stories and local knowledge about water bodies that creates a historical record of our ever-changing relationship with water.

Swim Guide – The world’s most comprehensive beach information service. Since 2011, Swim Guide has empowered 1.8 million people to find beaches, check water quality reports, and report pollution.

SWIMMABLE, DRINKABLE, FISHABLE WATER FOR EVERYONE.
Introduction

Perceptions of the North Saskatchewan River have long been murky. This summer, that changed. The excitement and novelty of a surprise tropical paradise in the heart of the City captured the hearts of Edmontonians from all walks of life. Even those who previously turned their noses at the sediment-heavy river found themselves outside enjoying the water and the sunshine.

In the heat of the excitement and as City Council explores the possibility of constructing a permanent beach (or perhaps even a number of them), the same question that has plagued Edmontonians for years remains largely unanswered: Is it safe to swim in the river?

This summer, Riverkeeper launched a recreational water quality monitoring program to help answer that question. By collecting regular water samples and applying federal recreational water quality guidelines, the program published weekly test results through its popular Swim Guide app and, for the first time, made recreational water quality information readily available to users of the North Saskatchewan River.

“The newfound love for the North Saskatchewan River brought on by Edmonton’s ‘Accidental Beach’ may create a movement to keep the water clean.” – EJ
Water Testing

The Riverkeeper monitoring team collected weekly samples at four recreational access points on the North Saskatchewan River within the City of Edmonton from August 1st to September 12th. Locations included:

- Fort Edmonton Footbridge Sandbar
- Sir Wilfred Laurier Park Boat Launch
- Cloverdale Beach (Accidental Beach)
- Gold Bar Park Boat Launch

The river accesses listed above were selected based on situation within city limits, distribution along the length of the river, suitability for various forms of water-based recreation, and intensity of use by the public.

A private environmental lab, Exova Group, processed the samples and Riverkeeper used the results to determine if water quality was compliant with Health Canada guidelines for recreational water quality. Each week, the respective sites were posted “pass” or “fail” accordingly. It is important to note that test results only reflect water quality at the time of sampling.

<table>
<thead>
<tr>
<th>Recreational Access Point</th>
<th>Total # Results</th>
<th>Pass</th>
<th>Fail</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Edmonton Footbridge Sandbar</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Sir Wilfred Laurier Park Boat Launch</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>57%</td>
</tr>
<tr>
<td>Cloverdale Beach (Accidental Beach)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Gold Bar Park Boat Launch</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>43%</td>
</tr>
<tr>
<td><strong>Combined Results</strong></td>
<td><strong>13</strong></td>
<td><strong>9</strong></td>
<td><strong>5</strong></td>
<td><strong>59%</strong></td>
</tr>
</tbody>
</table>

Over the course of six weeks during the peak of the swimming season, Riverkeeper produced a total of 22 results. Overall, 13 tests met Health Canada guidelines. Nine results exceeded the guidelines. Each of these results were posted to the Riverkeeper website and to our Swim Guide smartphone app.

Pass or Fail?

Each water quality status provided to the public is based on Health Canada guidelines for recreational water quality, which are designed to limit the risk of contracting a waterborne illness to 1-2%. If water quality is within the guidelines, it is possible that 10 to 20 people for every 1,000 swimmers will contract a waterborne illness – this is true not only for the North Saskatchewan River, but also for the many popular recreational lakes.
and beaches across Alberta. When water quality fails to meet the guidelines, the risk of contracting an illness increases.

In accordance with the guideline, recreational water samples are tested for *E. coli*, which is a well established indicator of fecal and sewage contamination. High levels of *E. coli* can be harmful to human health as well as aquatic life. The current Health Canada standard for *E. coli* is set at 200 colony forming units per 100ml of water (CFU/100ml). A set of samples with levels of *E. coli* greater than 200 CFU/100ml lead to a ‘fail’ and those with levels equal to or less than 200 CFU/100ml lead to a ‘pass’.

The chart below illustrates the particular locations that exceeded 200 CFU/100ml on a given sampling day.

![E. coli counts by date and access point](image)

**Testing Methods: Additional Notes**

At each location, five individual samples from five distinct sites were collected along the shoreline at a depth of approximately 30cm on a given sampling day. Sites were selected so as to represent the length of the beach in accordance with Health Canada guidelines. Each of the five samples from a given location is tested individually and the resulting *E. coli* counts are then combined using a geometric mean. The mean constitutes the final test result and is compared directly against the standard of 200CFU/100ml.
The Big Picture

Riverkeeper’s weekly water quality data provide recreational water users with regular reference points that are helpful in determining the status of river health and the implications for human and aquatic health. Although water quality changes from day to day, and even hour to hour under some conditions, the water quality data are instrumental toward developing a stronger understanding of the patterns that reflect our relationships to the river.

The map below illustrates the degree of compliance with Health Canada guidelines at each of our testing locations. River water generally meets the guidelines as it enters the City of Edmonton and as it passes Fort Edmonton Park. However, by the time the river has passed through the downtown core toward Gold Bar Park (and the wastewater treatment plant shortly after), E. coli levels are often higher and frequently exceed 200 CFU/100ml. Data from the water intakes at the E. L. Smith Water Treatment Plant in “upstream” Edmonton and from the Rossdale Water Treatment Plant in “downstream” Edmonton confirm this pattern.

The main reason for the decline in water quality as the river moves through the city is the discharge of stormwater and, at times, raw sewage directly into the river via our streets, drainage infrastructure, and wastewater treatment plant bypass. The further the river
meanders through Edmonton, the more stormwater and combined sewer outfalls add to its flow.

A second key pattern that emerges from the first relates to the impact of precipitation. The more it rains, the more the stormwater and combined sewer outfalls flow and the more the wastewater treatment plant bypass opens. Fluctuations in precipitation are highly correlated with *E. coli* levels for this reason and represent one of the main risk factors for contracting a waterborne illness.

**Is it Safe to Swim?**

Swimming in the North Saskatchewan River or in any body of water always poses a certain level of risk. Although water quality is always changing, by conducting regular tests it is possible to begin understanding what the risks are likely to be at different times and under different conditions. The results from the summer monitoring activities demonstrate that the risk of contracting an illness after swimming in the North Saskatchewan River is at times very low, and at times very high.

In addition to water quality concerns, moving water also presents physical risks that demand careful discretion of swimming ability and river conditions.

The monitoring program results are consistent with the following guidelines that should be considered when determining the level of risk associated with recreational activities on the North Saskatchewan River:

- **Choose an upstream location**
  Generally, the further you go upstream, the cleaner the water will be. Riverkeeper’s results support the conclusion that water is generally cleanest as it enters the City of Edmonton and more polluted as it leaves.

- **Delay swimming for 48 hours after a rainfall**
  Precipitation leads to increased stormwater and sewage discharges into the river, which are two of the most significant impacts on water quality within the City of Edmonton.

- **Avoid stormwater outfalls**
  There are dozens of outfalls throughout the City of Edmonton and it is not possible to avoid their discharges completely except when it is extremely dry. However, river users should be aware of the closest outfalls and avoid entering the water directly in the vicinity.

- **Swim at moderate flow levels**
  At high water levels, the current is stronger and careful discretion should be exercised before swimming. Under these conditions, there is often more debris floating in the river, including large fallen trees, and water quality may be poorer due to increased run off.
With the right precautions and under the right conditions, the more upstream stretches of the North Saskatchewan River can offer excellent opportunities for swimming and enjoying the water and sunshine. This summer, Cloverdale Beach served as a powerful reminder of the incredible body of water that we have access to right in the heart of our city — thanks to the new beach, countless Edmontonians rediscovered their love for the North Saskatchewan River and they are few and far between who are ready to let go of it again anytime soon.

There are also the times when stretches of the river fail to meet Health Canada guidelines for recreational water quality and even the suggestion that there remain concerns about the water is enough to upset some of the most endeared beach-goers. It seems that the Beach at Cloverdale has provided an opportunity to nurture a long lost love and embrace a responsibility to care for the rivers, lakes, and streams that sustain our communities.

**Potential for Future Monitoring and Community Engagement**

The 2017 monitoring program was the first of its kind in Edmonton. Having completed the first summer of monitoring, future programming is well positioned to continue building on the progress to date.

First, recreational water quality monitoring presents a promising opportunity to engage volunteer community members in various aspects of field work. Already, Riverkeeper conducts a variety of water literacy outreach and, for example, provides citizens with tools for reporting pollution and engaging water issues with their communities through Swim Guide, Watermark Project, and various education activities directly in the community. Moving forward, the monitoring program could expand on a valuable fieldwork component that not only helps strengthen water literacy in Edmonton, but also creates unique opportunities in which community members can personally connect with the river and all that it has to offer.

The second area of growth emerges from the need for more frequent sampling. Because conditions change particularly quickly in moving water, water quality tests need to be done as often as possible. With a more expansive program, the information produced will be more valuable and it will at the same time create more extensive opportunities for a wider community of volunteers to spend time in the field and on the water.

Edmontonians are falling in love with a river that many members of the community used to turn their nose at. Edmontonians are also recognizing the need for improved water monitoring and are supporting a new drinking water monitoring program beginning in 2018. Clean drinking water is certainly a necessity and the Beach at Cloverdale has made it apparent that access to clean water for recreation is important too.
Recommendations to the City of Edmonton and Water Utility Service Providers

Beach-going, swimming, fishing, paddle-boarding, canoeing, and a number of other recreational water activities are important activities that Edmonton should encourage. They promote physical and mental health, build social cohesion, contribute to a high quality of life, and help to make Edmonton a great place to live and visit. These activities also contribute positively to local economies and support a range of small businesses. We should do everything we can to ensure that water users have a positive experience on the North Saskatchewan River. It is the heart of our city.

The City of Edmonton recently made significant improvements to combined sewer infrastructure. There remains a need for further upgrades including increased capacity to the wastewater treatment plant. As we increase our investments in important water infrastructure, additional short-term measures should also be pursued in order to improve people's experiences of the North Saskatchewan River, protect public health, and enhance public awareness of wastewater infrastructure challenges:

1. Ensure that members of the public have access to comprehensive and up-to-date recreational water quality information that supports safe and enjoyable recreation on and in the North Saskatchewan River.

2. Place signage at stormwater outfalls, combined sewer overflows, and the wastewater treatment plant bypass warning river valley users to avoid entering the water in the immediate vicinity due the discharge of harmful effluents.

3. Continue exploring river valley initiatives that promote meaningful and enjoyable connections to the water for Edmontonians of all walks of life. These initiatives require careful consideration of the River Valley's ecological integrity in balance with the benefits of public access to the water and green space.

4. Respond to community concerns regarding the need for additional bathroom facilities in the river valley as well as a continued and improved garbage collection strategy.

5. Provide real-time alerts to inform water users when sewage overflows occur (for example, see the City of Kingston’s real-time sewage overflow website). This keeps water users informed even when current bacteria results are not available.


7. Upgrade the capacity of the Gold Bar Wastewater Treatment plant to reduce or avoid bypass events.
Recommendations to River Enthusiasts

The most effective thing a river valley user can do to help protect the river they love is to report pollution, especially sewage and plastics debris. When you see pollution, report it to 311 Edmonton by calling 311 on your phone or emailing 311@edmonton.ca. This will alert the city to problem locations and create an official record of your concerns.

You can also report pollution directly to Riverkeeper’s monitoring team using the pollution reporting form on our website at www.thewimaguide.org/report or the Report Pollution button in the Swim Guide app.

And of course, spend time on the river and enjoy it! In what ways is the North Saskatchewan River special to you? We would love to hear your story and you can share it with us and with your friends through Watermark Project! Geo-tag any water body that has left an impression on you in some way and help ensure that it is protected into the future – submit your story today at www.watermarkproject.ca.

Acknowledgements

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