

The background image shows a scenic view of a river. In the foreground, there's a stone wall with a concrete structure at the water's edge. A person is riding a bicycle on a path behind the wall. In the background, a tall, modern apartment building with many windows and balconies stands against a clear blue sky. A bridge is visible on the right side of the image.

Case Study

WATER QUALITY MONITORING PROGRAM REVIEW

Upper Thames River
Conservation Authority



WATER QUALITY MONITORING PROGRAM REVIEW

About the Project

Background

Climate change is increasingly affecting the Thames River watershed, with rising temperatures and shifting precipitation patterns leading to hotter summers, warmer winters, and a greater risk of flooding and drought. In this highly developed region with significant agricultural land use, these changes pose a serious threat to water quality. The Upper Thames River Conservation Authority (UTRCA) monitors surface water quality through the Provincial Water Quality Monitoring Network and other provincial and national protocols. UTRCA also tracks watershed health via Report Cards using three key indicators: total phosphorus, bacteria, and benthic invertebrates. However, no formal program currently exists to track water quality data specifically to support climate adaptation efforts.

Project Description

This project was designed to support the UTRCA with tailoring, enhancing, and effectively communicating water quality monitoring efforts to further climate adaptation work in the Upper Thames River Watershed. Insights from a comprehensive literature review on methods and approaches for adaptation-focused water quality monitoring efforts were synthesized and applied to current UTRCA initiatives, culminating in a final report assessing existing monitoring and planning programs and recommended next steps to safeguard water quality amid climate change. A supporting document outlining resources and potential funding opportunities was created to help move recommendations into action.

Objectives

- To undertake a comprehensive review of the UTRCA Water Quality Monitoring Program to identify opportunities for incorporating adaptation considerations into ongoing and future efforts; and
- To support a robust local response to climate change impacts on watershed health.

Work Completed

Summary of Activities

This research project unfolded in multiple phases. First, an initial review of the current Water Quality Monitoring Program was conducted using key resources on water quality and climate change. This review helped to identify how current Watershed Report Card data could be leveraged to track climate change impacts on waterway health and support local action. Next, a literature review of 45 resources explored best practices and innovative solutions for climate-related water quality monitoring challenges. Alongside this, a high-level gap analysis identified inconsistencies in data collection and additional metrics that could enhance adaptation-focused monitoring. This process led to five key takeaways and 26 recommendations at the general, monitoring, and programmatic levels. Finally, a supplementary document was created to outline collaborative opportunities, tools, databases, and potential funding sources to help implement the recommendations.

Challenges

- **Data Volume and Usability:** The current monitoring program collects data from over 60 sources at multiple points throughout the year, providing a wealth of information. However, without a system specifically designed to assess climate change impacts, it can be difficult to identify trends and root causes, creating barriers to informed action.
- **Water Quantity vs Water Quality:** Research on climate change impacts has focused more on water quantity than water quality. While water quantity changes influence water quality, long-term data needed to assess these connections remains limited.
- **High Costs of Monitoring Technologies:** Advanced methods for tracking climate-related water quality changes, such as real-time monitoring and projection modeling, can be expensive, posing financial barriers to implementation.



London, Ontario skyline from the Thames River. Photo Source: Canva Pro, 2025.

Impact & Key Learnings

Positive Outcomes & Impacts

- **Leveraging Existing Data and Synergies:** The program review identified opportunities to combine and maximize existing data from various programs and departments, creating a foundation for more effective climate change tracking while supporting adaptation efforts.
- **Fostering Collaboration:** The recommendations and supplementary resources outline opportunities for both internal and external relationship-building to encourage data sharing and the co-creation of adaptation solutions.
- **Laying the Groundwork:** The recommendations provide a starting point for developing a long-term tracking framework to support ongoing adaptation monitoring.

Key Learnings

- **Water Quality Data is an Important Adaptation Tool:** Water quality data can be used across adaptation work for establishing and updating outcome-oriented processes, building the case for investment in adaptation, and highlighting the interconnection between human and environmental health.
- **Value of Data Sharing:** Bringing together different forms of data such as water quality, environmental, utility, and public health data can contribute to more robust and effective adaptation solutions.
- **Adaptation Planning for Conservation Authorities:** Having an adaptation plan in place can help with designing programs and projects that meaningfully contribute to watershed resilience.

Looking Ahead

The UTRCA plans to incorporate adaptation considerations into ongoing and future water quality monitoring efforts in support of local ecosystem and watershed resilience.

Learn More

To learn more about ongoing surface water quality monitoring efforts in the Upper Thames Watershed, connect with the [Upper Thames River Conservation Authority](#).