

Quinte Conservation Climate Change Strategy



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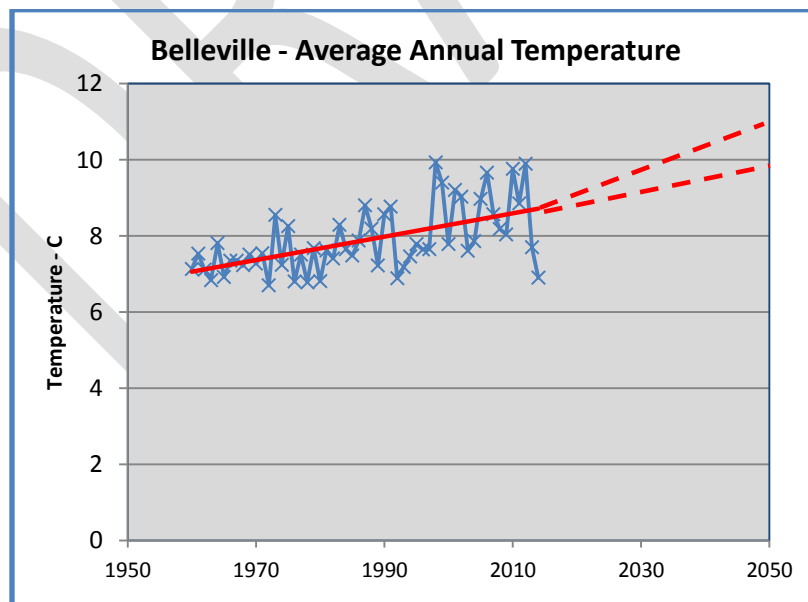
As stewards of the local watersheds, Quinte Conservation has been active in assessing and monitoring climate change and is proposing to continue with these activities through the development of a Climate Change Strategy. Recognizing that climate change is a reality with the occurrence of extreme weather events related to flooding, drought and intense rainfall, the need to be prepared and reduce the effects of climate change is a priority. The main purpose of the strategy is:

Help our watershed community understand the impacts of climate change and promote actions that both mitigate and adapt to these impacts.

The following document summarizes the current situation in the Quinte Area, including what activities have already been done to address Climate Change and a proposed strategy for moving forward.

Is the Quinte Area Climate Changing?

Temperature and precipitation levels for the Belleville area are recorded by Environment Canada. A review of climate data for the Belleville area, collected by Environment Canada, since 1960 shows that mean annual temperatures have risen by 1.4 °C with annual precipitation also increasing by 84 mm (approximately 10%). Precipitation events also appear to be larger and more intense including more winter rain storms. Climate models and projection of future climate for Ontario suggest that by 2050 the average annual temperature will rise by approximately 2 to 3 °C with average annual precipitation also increasing by 5 to 10%.



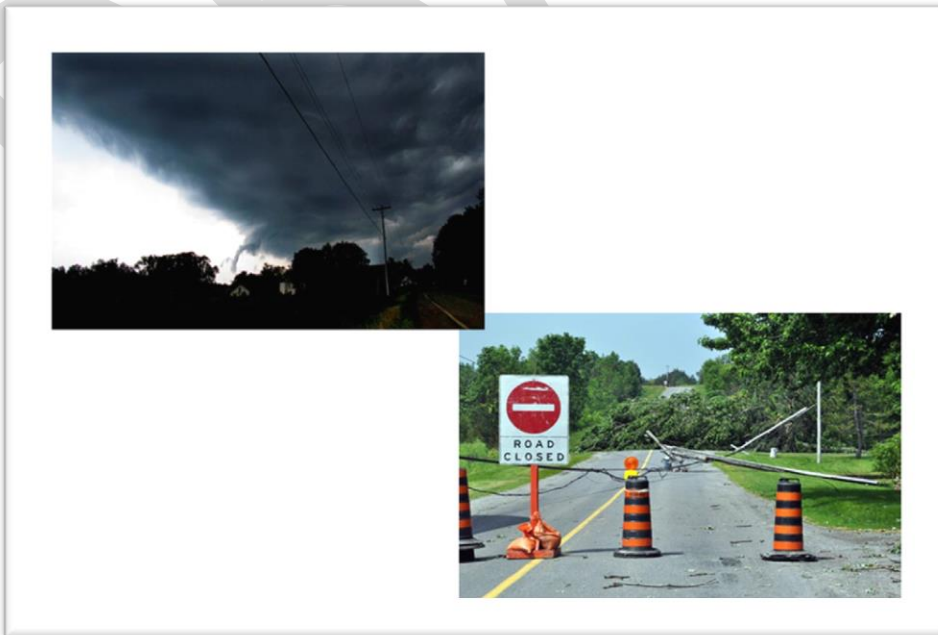
Stemming from these changes in climate have been extreme weather events related to intense rainfall, flooding, drought, extreme heat, erosion, microbursts, and more. Such events have impacted on the watershed and resulted in significant expense to municipalities and private citizens. With changes to the climate in the future there is greater potential for more extreme weather events of greater intensity (i.e. longer heat waves, more intense rainfall and associated flooding, etc.). The Intergovernmental Panel on Climate Change (2014) has concluded that *“human influence on the climate system is clear and recent anthropogenic emissions of greenhouse gases are the highest in history with unprecedented impacts on human and natural systems”*. Continued emission of greenhouse gases will cause further warming and long lasting changes in all components of the climate system increasing the likelihood of severe and irreversible impacts for people and ecosystems. Limiting climate change will require substantial and sustained reductions in greenhouse gas emissions which together with adaptation can limit climate change risks. Such impacts can relate to changes in water quality and quantity, human health, agriculture, energy consumption and economic. More frequent extreme weather relating to significant snow fall, heavy rainfall, drought and microbursts are already impacting the lives of people living in the Quinte area.

Rain causing flooding across Quinte

Brice McVicar, Ernst Kuglin, Luke Hendry QMI Agency
Monday, January 25, 2010 5:01:00 EST PM



Prince Edward County Microburst – June 2011

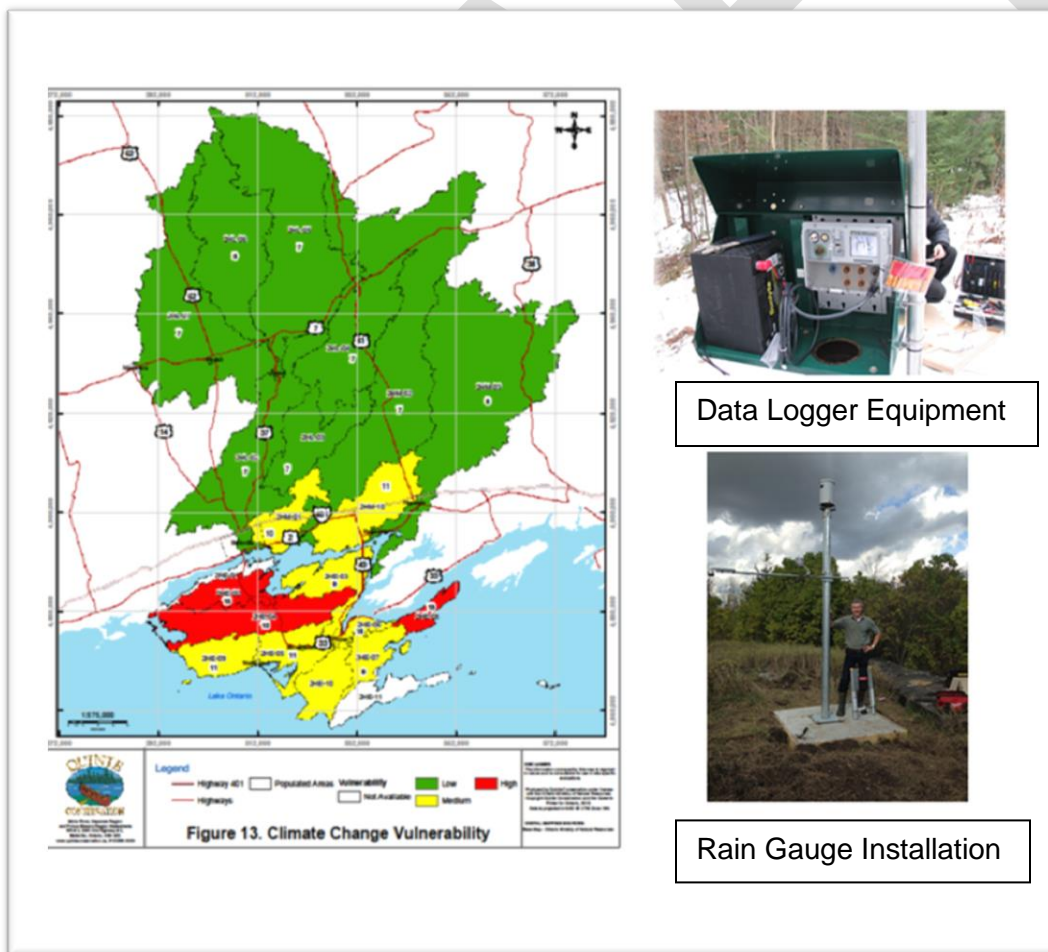


Climate Change Activities to Date

Quinte Conservation has been continuing our efforts to better understand the effects of a changing climate through continued monitoring and assessment of our watershed. Assessment of the vulnerability of subwatersheds to climate change was completed indicating that some areas are highly sensitive due to potential for low water conditions, drought, shallow wells drawing from an aquifer of low storage capacity and low baseflow in our local streams and rivers. As a result of this work a provincially significant climate change monitoring station was established in the Skootamatta watershed near Tweed through partnership with the Province. In addition four other stations were established throughout the region all with an enhanced level of monitoring. These stations provide useful information for assisting in determining changes to watershed conditions and potential impacts.

In terms of adaptation updates have been started on stormwater design guidelines and surface water flow models to accommodate the forecast of changes to the watershed hydrology.

Quinte Climate Change Vulnerability & Monitoring Equipment



Climate Change Strategy Principles

Given warnings and projections for continued warming of the climate with more extreme weather events of greater intensity the immediate need for a strategy is apparent. According to the Intergovernmental Panel on Climate Change the climate is changing and will continue to change with increasing level of greenhouse gases put into the environment. To keep the climate from warming less than 2 °C by 2050 a reduction of 80 % greenhouse gas emissions is required.

One of the leading principles of this strategy will be to support actions that promote both mitigation and adaptation of climate change. For the purpose of this plan the following definitions may apply:

Adaptation: Prepare for changes that are occurring or are likely to occur in the future while reducing the negative impacts of climate change and taking advantage of positive effects,

Mitigation: Reducing the amount of greenhouse gases emitted into the atmosphere or taking measures to reduce existing atmospheric greenhouse gases,

Mitigation is necessary to reduce the emissions of greenhouse gases to curb the effect of climate change. However, as the impacts of climate change are already evident it is necessary to adapt to a changing environment while at the same time as attempting to mitigate potential negative impacts. The basic approach for this strategy would be as follows:

- Improve our understanding of climate change and impacts in the Quinte watershed,
- Share the information with watershed residents and municipal partners,
- Take actions to both adapt and mitigate the potential impacts of climate change,
- Promote sustainability and set the example by reducing our own carbon footprint to reduce emission of greenhouse gases.

Quinte Climate Change Strategy

Several action items have been developed with the aim of meeting our goal in helping watershed residents both adapt and mitigate to climate change. These actions are proposed based on our current level of knowledge and may evolve as we continue to learn about the effects and impact of climate change.



Action 1: Improve understanding of climate change and how this may impact the Quinte Watershed and its residents:

To address climate change we need to continue to improve our understanding of how the watershed and communities may be impacted, what needs to be done to adapt to these impacts and what can be done to prevent these impacts.

To assist in achieving this goal we propose to continue our support of partners in their research and monitoring of climate change effects. Such partners include academic institutions such as Queens University and Loyalist College, provincial and federal government agencies, as well as other Conservation Authorities. Some tasks that we aim to accomplish are to develop current and new models of our watershed to allow consideration of projections of future climate condition and how this may change the watershed. Such an exercise would consider changes to the water budget completed under the Source Water Protection program and how future predictions could impact on the availability of water supply (both ground and surface water).

In addition to understanding long term predictions an increased level of understanding of potential impacts from extreme weather events (i.e heavy precipitation, wind storms, prolonged drought) on our water resources and infrastructure will be reached.

Action 2: Share Information & Encourage Action – Communicate to public and share information with other agencies.

As our knowledge of climate change and potential impacts improves it is imperative that this information be shared with watershed residents and other partners such as government agencies,

- Form community action groups (and/or municipal) to look at ways of dealing with climate change
- Encourage Quinte watershed residents to undertake climate change action
- Modify our communications and education and outreach program to include information about climate change
- Develop interactive communication tools to engage public about extreme weather events and watershed conditions
- Develop education and information on website, workshops and outreach sessions.

Action 3: Adaptation - Integrate improved knowledge and understanding to prepare for potential impacts of climate change:

With a better understanding of potential impacts to the watershed, relevant programs need to be modified to help adapt to these impacts. Such actions will be developed based on an improved knowledge and understanding of the impacts. Some preliminary ideas are provided as follows:

- Modify dam operations to assist in regulating flows and adapting to a new flow regime as well consideration to the adding or creating reservoir storage



- Enhance the flood forecasting and drought warning programs to keep watershed residents more informed
- Update floodplain mapping and identify high risk areas such as small watersheds and urban sewer sheds
- Identify areas prone to drought and low water conditions
- Continue monitoring programs (water quality, ecology and quantity) and adapt to better reflect high and low extremes
- Improve monitoring of shoreline erosion rates
- Incorporate new science into water resource management
- Adapt the Regulations and Planning program to reflect the highs and lows of extreme weather and natural hazards
- Adapt stormwater management to reflect extremes and promote the implementation of Low Impact Development (LID) stormwater practices.

Action 4: Mitigation - Enhance or develop new programs that support the mitigation, adaptation, and reduce vulnerability to impacts.

In consideration of future development it is important to incorporate best management practices and environmentally friendly practices into plans for development. Potential ideas include:

- Protection of existing forests and treed areas as well promoting the planting of additional trees
- Promoting low impact developments that minimize use of resources
- Implement low impact development methods for stormwater management to assist in mitigating flooding and erosion as well as groundwater recharge
- Minimize the potential for impact of development on the natural water budget to ensure maintenance or enhancement of groundwater resources that may be impacted by climate change
- Maintain and enhance our forests by promoting management techniques that create a sustainable healthy forest that will be resilient to potential impacts from climate change
- Promote stewardship programs that help private landowners improve and maintain natural areas.

Action 5: Be Leaders in Sustainability

- Change our daily operations to reduce our carbon footprint – energy requirements, vehicles, and technology that reduces paper and travel
- Try new things and share the information with the public (i.e. electric vehicles, pervious pavement, geothermal and solar energy).

Implementing & Reporting

Recognizing the importance of the need to adapt and mitigate the impacts of climate change the implementation of this strategy needs to begin immediately. However, in recognition of logistical barriers regular and minimum annual reporting is to be completed to allow an evaluation of progress and prioritization of required actions. Knowing what to expect in the future will greatly enhance the preparedness of our community to deal with potential change.

