

Climate Change: Adapting to the new normal

Scientists have identified that climate trends are changing our local environment, and that we will need to try to adapt to a new range of conditions brought on by climate change. Changes in temperature, precipitation and water levels affect our living along the coast. Being prepared for what to expect will help in identifying what changes you will need to make in order to adapt to the impacts of these changes.

Regional studies by Environment Canada and the US Environmental Protection Agency have identified future trends based on computer modeling. The Maitland Valley Conservation Authority recently conducted an evaluation of historic temperature and precipitation trends in the Maitland River watershed over the past 50 years. The trends observed in the data indicate that these changes are taking place, consistent with the conclusions reached in regional studies.

What can we expect?

Precipitation

Overall, the trends indicate that total annual precipitation is increasing, particularly in the fall, winter and spring seasons. Precipitation intensity is also increasing in the area. Precipitation intensity is mainly showing an increase during the summer months. Extreme

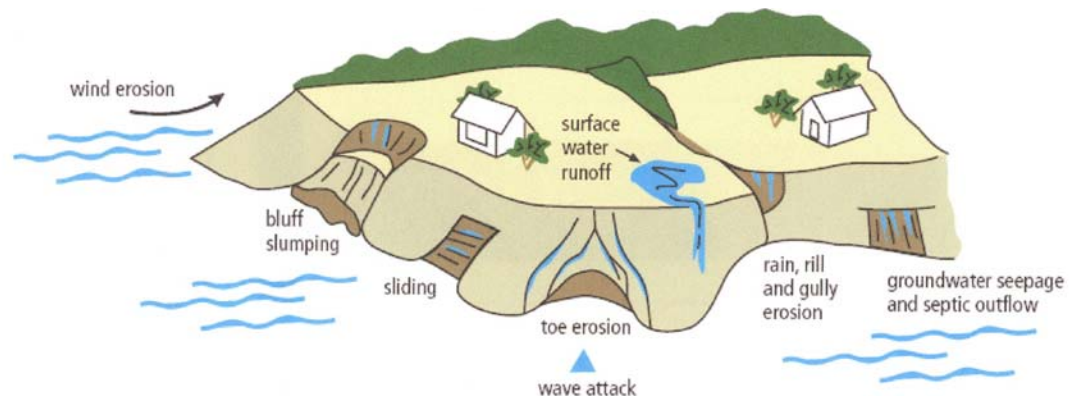
precipitation is likely to become more frequent and intense, particularly in summer.

Increased precipitation may have significant negative impacts on developed areas in the watershed. The small streams and gullies which drain directly into Lake Huron are particularly vulnerable. The clay-rich soils are prone to erosion, especially where vegetation has been removed, or the slopes have had a history of erosion. The landscape in Huron County also tends to be extensively drained, and straightened channels can further accentuate any potential erosion issues by increasing overall flow of surface water runoff. Flood forecasting systems do not have adequate coverage to accurately predict and measure short duration convective rainfall events, so it may be likely that public agencies will not be able to provide sufficient advance warning.

Trends indicate that areas within the traditional snowbelt area to the lee of Lake Huron will likely see an increase in lake-effect snowfall due to warmer lake temperatures and less ice cover on Lake Huron.

Temperature

Temperatures have been also increas-



Causes and Effects of Coastal Erosion



74 Hamilton St.
Goderich, Ontario, Canada
N7A 1P9

Main office: (519) 955-6269
Technical office - (519) 523-4478
Email: coastalcentre@lakehuron.on.ca

***Providing Leadership in Coastal
Conservation***

www.lakehuron.ca

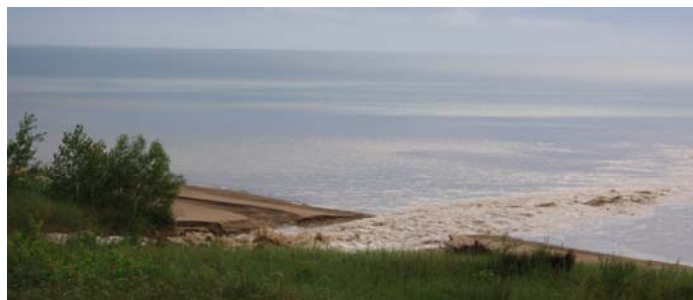
References

AMEX, 2006. Coastal Zone and Climate Change on the Great Lakes. Report to Natural Resources Canada. 162 pp.

Global Climate Change Impacts in the United States: Regional Climate Impacts – Midwest. Pp 117-122.

Huron Geosciences, 2010. Climate Trends in the Maitland Valley Watershed – 1950-2006. Unpublished report to the Maitland Valley Conservation Authority.

Extreme rainfall events will produce heavier runoff and erosion of streams and gullies along Lake Huron



(LHCC photos)

ing locally. Heat units are up across local watersheds. The number of days where maximum temperatures exceed 30°C has increased, which identifies a trend toward warmer summer seasons. As a result, expect an increased risk of drought and more hot days (over 30° C) during summer.

The most profound trend documented in the MVCA study related to winter months, where the data showed a decrease in the number of days where temperatures stayed below 0°C. Shorter winters and more frequent, longer duration winter thaw events will become more common. Winter thaw events, in particular, will increase the probability of unstable and eroding bluffs. As the snow pack melts, water infiltrates quickly into the soils and both groundwater and surface runoff can promote slope failure.

As air temperatures increase, so will water temperatures. Waterborne pathogens will present an increasing risk to public health because many pathogens thrive in warmer conditions. Beach postings and algae blooms may become more frequent.

Lake Levels

There has also been a decrease in lake ice on the Great Lakes. Reduced lake ice increases evaporation in winter, contributing to the decline. Mean annual Lake Huron water levels could decrease by as much as 1 m by the middle of this century and up to 1.4 m by late in the century. As a result, we would likely see a reduction in lake-effect bluff erosion. However, in historically erosion prone parts of Lake Huron, this could be a temporary situation. As lakebed erosion continues and deepens the nearshore, more wave energy will reach the shore, and bluff erosion would eventually re-activate.

Other Effects of a Changing Climate:

- Increased temperatures may reduce the survival rate of trees planted in shoreline environments.
- The increased number of hot days could result in conditions conducive to a higher incidence of poor air quality days. Some of the poorest air quality in Ontario occurs along the eastern Lake Huron shore, affected by lake-land breeze circulations.
- Increased rainfall will increase the flow rates of some of the streams and rivers increasing scouring and sediment deposits
- A longer growing season for aquatic algae may lead to greater algal problems depending on nutrient availability. Warmer temperatures will also increase frequency and extent of algae wash-ups which will reduce water use for swimming and increase water treatment costs for municipal water supplies.