

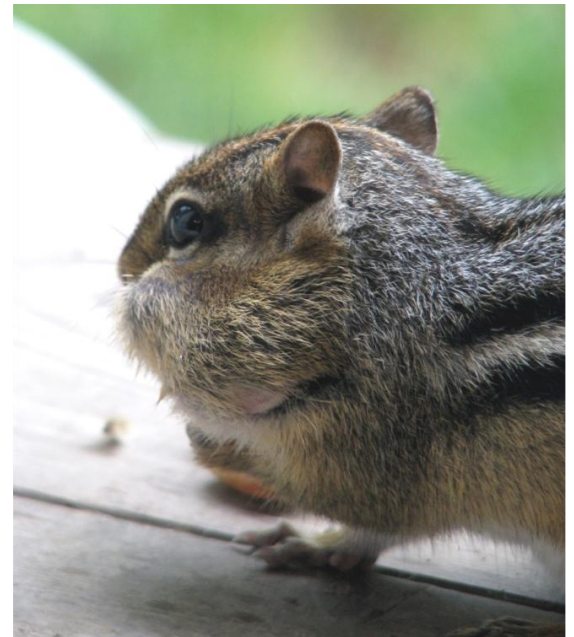
Ecosystems: in a changing climate

Climate plays an integral role in shaping the diversity of our natural ecosystems. Climate change has the potential to alter ecosystem structure and function to an extent that will pose considerable threats to plant and animal species. These changes will also affect species richness and biodiversity and may be beyond the limits of adaptation.

Ecosystems and Biodiversity

Ontario's ecological landscape, both aquatic and terrestrial, is being reshaped by the effects of climate change.

- Species that are currently stressed and highly sensitive to changes in climate may decline in number or face outright extinction (Blaustein et al, 2010)
- Warmer winter temperatures will result in changes to the range and abundance in pests and diseases (Sturrock et al, 2011)
- Changes to breeding and migration dates for animals and bird species will lead to imbalances in food and habitat availability (Hussel, 2003).
- Increases in water temperatures of aquatic systems and significant decreases in winter ice cover will lead to changes in the distribution of cold and warm water fish species (Jones et al, 2006)
- Increased temperatures and changes to water availability will increase the potential for plant and tree stress leaving them susceptible to diseases and pests (Millar et al, 2007)



Facts and Examples of Change:

- A **1°C** change to the annual average temperature is roughly equivalent to moving northwards **200-300 kilometers** in the climate of eastern North America
- The average annual air temperature has **increased** by as much as **1.3 °C** in Western Ontario in the last 50 years, with lesser increases noted for Eastern Ontario
- Eastern bluebirds are arriving at their summer breeding grounds almost **two weeks earlier** compared to 30 years ago
- Body conditions of polar bears on the shores of southern Hudson Bay have declined due to earlier melts of sea ice

(Expert Panel on Climate Change Adaptation, 2009)



ECOSYSTEMS

Adaptation Options for Ecosystems:

As the ability of plant and animal species to cope with climate change lessens, it is important for resource managers to understand their role in aiding adaptation in the natural environment. The following actions will help reduce the risks posed by climate change and increase ecosystem resiliency.

- Monitor current climate change impacts and conduct climate impact assessments to gauge future climate risks
- Integrate make complimentary adaptation and mitigation measures
- Assess the vulnerability of ecosystems and their components in order to prioritize adaptation efforts
- Sustain and grow biodiversity through the development of protected areas and through restoration and/or enhancement of other high quality habitats
- Create buffer zones around ecologically rich habitats
- Monitor the movement of aquatic and terrestrial invasive species and take prompt action to limit their movement into non-native territories
- Integrate ecosystem stewardship practices into the policies and practices of other economic sectors
- Solicit stakeholder participation to identify gaps in knowledge and to inform research needs

(Smithers et al, 2008)



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OCCIAR specializes in communication of climate impacts and supports adaptation planning to a wide range of stakeholders throughout the province of Ontario.

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