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Climate Change implications for Planners

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In 2002, Jeff Celentano, then Chair of the Policy Committee, asked the Natural Resources Working Group (which I represent as a member of the Policy Committee) to prepare a draft statement on potential climate changes in Ontario. Using web-based sources and discussions with Dr. Iain Burton (University of Toronto), Dr. Barry Smit (University of Guelph), Dr. Quentin Chiotti (Pollution Probe) and Robert McLennan (University of Guelph), our Working Group drafted a statement outlining 9 projected impacts of climate change. In the spirit of the issues raised by the previous Journal article, I include the impacts together with a brief description of their implications to our practice.

- 1) More frequent and intense heat stress will occur. In southern Ontario, we will experience more than the usual 10 days that record maximum temperatures over 30 days degrees Celsius each summer along with an increase in the number of very hot days defined as over 35 degrees Celsius. We will have many poor air quality events; more water, food and vector borne diseases (e.g., the re-introduction of malaria in southwestern Ontario); increased risk to the health of vulnerable children and the elderly; and additional UV radiation. Because of poorer air quality and increased temperatures, summer energy peak demands will increase.
- 2) Natural heritage impacts include relocation of habitat and species, habitat loss and species extinction, changes to wetlands and shorelines and altered migration patterns. Ecosystems, natural areas, parks, conservation areas/reserves and species habitat will become more vulnerable when the usual linkages do not exist. Such keystone species as the polar bear could disappear in Ontario. Warmer conditions may make the survival of introduced forest pests (e.g., the Emerald Ash Borer) for which there are no natural predators more problematic.
- 3) More intense and frequent rainfall and flooding events with greater erosion and longer periods of drought will occur. The current changes in storm frequency and rainfall characteristics and the extrapolation of these changes into the future require adaptation of design standards for watershed, flood plain and storm water management planning and design. These climate changes may have a profound effect in older developed areas where flood risks and storm water infrastructure failure may occur during extreme weather events (such as recently experienced in Peterborough and North York) resulting in costly damages and re-development and intensification issues. Insurance costs are rising and individual coverage is becoming more costly as flooding risks increase.
- 4) Lower Great Lakes water levels by 1 m in 2050 and 2 m in 2100 are predicted. These level decreases will have profound effects throughout the Great Lakes and Lake St. Clair regions on coastal wetlands. Shipping and port facilities and water intake and sewage discharge infrastructure will have to be modified or changed. Potentially significant fisheries impacts are feared. At the same time, rising sea levels will flood Ontario's almost flat northern coast, home of the sub-arctic Cree as well as the Province's largest protected wilderness.
- 5) The lower annual and seasonal surface and ground water flows will produce much drier soil and agricultural conditions. The more substantial storms and dry conditions will also reduce infiltration and increase volume and contamination of surface runoff. Warm water fisheries will expand while cold water fisheries may be lost in southern Ontario.
- 6) Remote First Nation communities in Northern Ontario will become increasingly vulnerable as warmer winters result in snowfall and permafrost changes making it more difficult to construct and operate regional winter roads and snowmobile routes to import supplies from the south and access traditional lands for trapping and hunting. Climate changes are greater in northern regions. Habitat changes will severely impact traditional hunting, fishing and gathering resources and practices.

7) Depending upon their location in Ontario, forest ecosystems will experience increased drought, more frequent and extreme storms and wind damage, and more and expanded fire and insect outbreaks. These changes, and temperature changes beyond 2 degrees Celsius, may be beyond the adaptive capability of these forest communities. Some forecasts to 2100 estimate a 2 degree rise as the lower end of the range of predicted temperature increases with potentially significant impacts on forestry, parks and natural heritage features.

8) Agricultural areas will experience a longer growing season and less rainfall at different and likely crucial growing times.

9) Major recreational changes will take place. Activities relying upon snowfall or cold weather such as cross-country skiing and downhill skiing, snowmobiling, natural surface skating and ice fishing will become increasingly marginal in southern Ontario. The recreational attributes of our lakes regions, the substantially increased summer temperatures, the increased levels of UV radiation, and the poor outdoor air quality will change our recreation activities in ways which are difficult to predict.

In a New York Times article entitled "Preparing for Nature's Attack" by Ted Nordhaus and Michael Shellenberger in the New York Times ([Saturday April 1, 2006](#)), the authors stated

"we can agree to disagree on the causes of climate change. What we all must agree upon, though, is that it poses a risk - one for which we are woefully unprepared."

The authors recommend United States Federal and State legislation to address climate change risks, based on existing California legislation that addresses earthquake risks. This exemplary legislation provides for the mapping of earthquake vulnerable areas and their regulation to minimize risks. Comparable steps are required if Ontario and its constituent municipalities and Aboriginal communities are to address the implications of climate change in Ontario.

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