### Selected Findings from Confronting Climate Change in the Great Lakes Region

# Impacts on Water: Our Region's Vital Resource

Impacts on Our Communities and Ecosystems

> The Great Lakes basin contains 20 percent of Earth's surface fresh water. A rapidly changing climate will alter water availability and quality, not only in the Great Lakes but also in the region's groundwater and in the hundreds of thousands of smaller lakes, wetlands and streams that dot or flow acrros the area.

#### **Climate Projections**

In general, throughout this century, the region's climate is expected to become considerably warmer in both summer and winter. Although average annual precipitation may not change much, projected changes in seasonal precipitation patterns are more distinct: winter and spring precipitation is expected to increase while summer rain could decrease by as much as 50 percent. Yet at the same time, heavy summer downpours are likely to become more frequent with dry periods in between. Soil moisture and stream flow will reflect these changes in rainfall, and lake levels are expected to drop overall. Some of these changes have already been detected in regional climate trends.

#### **People Depend on Water**

ountless small communities and major cities such as Chicago, Detroit, and Toronto are situated on the shores of the Great Lakes. Sewage and run-off, especially during heavy downpours, can overwhelm outdated water infrastructure and contaminate streams and lakes. Moreover, the region's economy is large and diversified, and freighters ply the lakes and seaway corridors to the Atlantic Ocean carrying goods and commodities worth billions of dollars. All of these activities rely on water for drinking, irrigation, industrial processes, and shipping. In the process, communities and industries can and do pollute and overdraw both surface and groundwater.



ABOVE: Port Calcite, Rogers City, MI. RIGHT: East Grand Forks, MN, 1997.

## The Changing Character of Our Region

Some of the expected impacts on the water-rich Great Lakes region include:\*

- More heavy rainfall and flooding;
- Worsening water quality due to higher water temperatures and heavy run-off that transports pollutants, nutrients, and sediment;
- Lower groundwater recharge rates;
- Less soil moisture in summer, harming crops, forests, and ecosystems;
- Wetland and wildlife habitat losses and reduction of flood-retention and water-purifying functions;
- Drying up of smaller streams during the summer season as a result of earlier iceout and snow melt and lower summer water levels;
- Changes in fish distribution due to warmer lake and stream water temperatures; increased risk of dead-zones in lakes; and
- Lower lake levels due to higher evaporation and reduced ice cover.

[\* To review the level of scientific confidence accorded each of the impacts listed above, see *Confronting Climate Change in the Great Lakes Region* pages 68–69.]



Photo: David Saville/FEMA News Photo

The continued and increasing impact of humans on water will coincide with changes in rainfall, runoff, lake levels, and soil moisture. Water and fisheries managers must increase their flexibility and adaptive capacity to respond to rising temperatures, shifting precipitation patterns, increasing climate variability, and changing water quality and availability. Managers must ensure that:

- Ground and surface water quality and supplies, as well as aquatic habitats and the species living in them, are protected;
- Effective water-conservation strategies are implemented for all users during summer months, and are considered year-round for water-intensive users;
- Sewer and septic systems are upgraded, and non-point source pollution from urban areas, farmland, etc. are reduced;
- Water extractions and diversions are planned with climate change in mind to reduce conflicts within and beyond the region; and
- Heat-trapping gases are reduced as quickly and aggressively as possible to avoid the worst impacts of a changing climate.

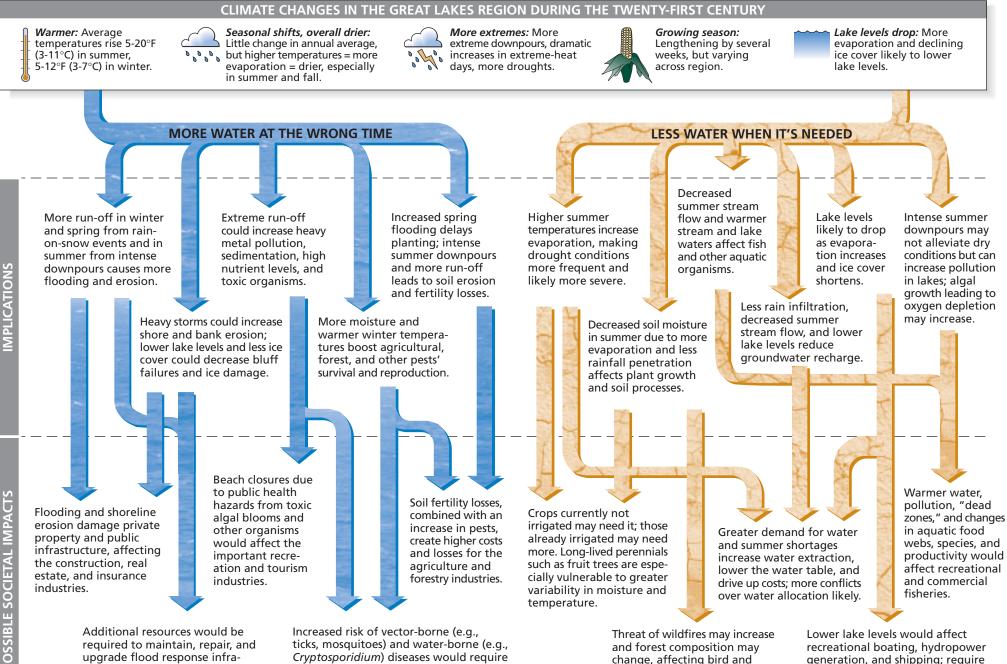


This fact sheet is based on the findings of *Confronting Climate Change in the Great Lakes Region*, a report published in April 2003 by the Union of Concerned Scientists and the Ecological Society of America. The report was written by 10 regional experts under the leadership of George Kling (University of Michigan).

The full report is available from UCS at <u>www.ucsusa.org/greatlakes</u> or call (617) 547-5552.

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### THE CASCADING EFFECTS OF CLIMATE CHANGE ON GREAT LAKES WATER RESOURCES



animal species, recreation,

and the timber industry.

more dredging; and force changes

to shore facilities and water

infrastructure.

greater education, surveillance, prevention,

and response from the public health system.

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structure, manage run-off, and

recover from flood damages.