

Tip of the Mitt Watershed Council Climate Change in Michigan Position Statement

Recognizing the profound effects climate change may have in the Great Lakes region, the Watershed Council incorporates and considers climate change impacts in our watershed management planning and implementation, restoration actions, and outreach and education efforts, and all that we do to improve the resiliency of our water resources.

The world's scientific community has concluded that the Earth's environment is warming at a rate that is unprecedented in the past 1,300 years. Since 1900, annual average air temperatures have increased by 2.0 °F in the U.S. Great Lakes region. By 2100, average air temperatures are projected to rise by 3.6 to 11.2°F. A 2003 climate model predicts by the end of the century that the Great Lakes region will warm by 3 to 12° F in the winter and 5 to 20° F in the summer. Newer models may indicate a wider temperature range.

Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in the frequency and intensity of severe storms, as well as increased risk of droughts and flooding and more frequent and severe heat waves. The planet's oceans and glaciers have also exhibited significant changes – oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. As these and other changes become more pronounced in the coming decades, they will present challenges to our society and our environment.

In Michigan during this century, the climate is predicted to become considerably warmer resulting in shorter winters, more frequent and extreme summer heat events, heavy rain, and more lake-effect snowfall. As a result of these changes, by 2040-2059, summers in Michigan may feel more like current-day Ohio. By 2080-2095, summers will resemble that of current Arkansas with winters that feel like Ohio winters.

Along with the changing winters, the Great Lakes are warming. Average Great Lakes ice coverage has declined 71 percent from 1973 to 2010. Lake Superior, the fastest warming of the Great Lakes, could have little to no open-lake ice cover during a typical winter within the next 30 years. Growing seasons will continue to increase so that by the end of the century it may be four to nine weeks longer than over the period 1961-1990.

These climate changes are having, and will continue to have, a profound effect on the Great Lakes region's ecology and economy, including:

- Economic impacts to transportation, industry, and public drinking water supplies, resulting from increased flooding, drought, and extreme weather events, that could significantly alter the quality and quantity of water.
- Potential economic impacts to shipping, recreational boating, the fishing industry, and winter tourism due to reductions in ice cover and warming water temperatures.

- Changes to fish and wildlife, including increases in invasive species, disappearance of native species, reduction in overall biomass productivity in lakes and streams, and alterations in range and distribution, as species will need to migrate to adapt to rising temperatures and loss of habitat.
- Expansion of hypoxic dead zones, toxic algal blooms, and fish kills due to stronger storms, more runoff, warmer temperatures, and increased nutrient loading.
- Decrease in water availability from warmer and shallower rivers, shrinking wetlands, and dried-up streams.
- Changes to forest habitats including the disappearance of iconic species from our northern forests, introduction of forest pests and diseases, and expectations of large severe forest fires.
- Agricultural vulnerabilities from extreme rain events, proliferation of adverse pests and disease, and projections of a 30% decrease in summer soil moisture.
- Increased public health threats, beach closings and higher costs to water supplies due to worsening water quality.

Recognizing the profound effects climate change may have in the Great Lakes region, the Watershed Council incorporates and considers climate change impacts in our watershed management planning and implementation, restoration actions, and outreach and education efforts, and all that we do to improve the resiliency of our water resources. We also advocate for the following actions from government agencies, businesses, other organizations, and individuals. Specifically we encourage:

- **Natural resource management guided by the precautionary principle; i.e., *“When an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically”* (Wingspread Conference 1998).**
- **Protection, management, and restoration of Great Lakes Basin ecosystems to increase the ability of these systems to withstand stress and increase resiliency. Programs should protect and restore wetlands and riparian habitats, combat the spread of invasive species, restore natural hydrologic regimes, conserve water in the face of uncertain lake levels, and manage for diverse, connected, and complex food webs.**
- **Ecosystem and watershed protection, restoration, and enhancement, focusing on entire communities or systems of connected communities, rather than single species or artificially delineated groups of species.**

- **Reduction of greenhouse gas emissions, conserving water, supporting non-polluting energy technologies and initiatives, and managing local habitats to maximize resilience.**

Scientific research used in the development of this position statement include –

The Union of Concerned Scientists (Confronting Climate Change in the Great Lakes, Union of Concerned Scientist and Ecological Society of America, 2003, page 24)

The Great Lakes Integrated Sciences and Assessments Program (GLISA), from the Climate Summary Information (a summary of the best available research) which can be accessed at <http://glisa.umich.edu/resources/summary>.

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