IAGLR
LAKES Letter

This issue explores climate change and its impact on large lakes around the world

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Responding to stresses facing the Great Lakes region in a changing climate

by **Don Wuebbles**



IT'S SUMMER TIME, beaches are open, and the Great Lakes shorelines await us. The Great Lakes are where many of us live, work, and play. And, right now, they need our help.

The science is clear: changes in climate are already having increasing impacts on the Great Lakes region. A 2019 state-of-the-science report paints a comprehensive picture of how a changing climate affects the Great Lakes and what these changes mean for public health and safety, agriculture, infrastructure, fish and wildlife, and our regional economies. Temperatures are generally increasing in the Great Lakes region, but more importantly, climate change is leading to growing concerns about heat waves, larger precipitation events, and more intense severe weather. More extreme weather events are projected across the Great Lakes: more flooding early in the year; more heat waves and drought in hotter months; and an overall decrease in snowfall, but more heavy lake-effect snowstorms.

As an important example of the impacts on the region, the warming trend has led to increased bacteria levels and exacerbated algae blooms. Both bacteria and algae blooms can make water unsafe to drink, thus significantly increasing water treatment costs. They can also make water unsafe for swimming, leading to more beach closures. Beaches, dunes, and shorelines will likewise be more vulnerable to coastal erosion as a result of changing weather patterns.

The Great Lakes have also garnered recent attention due to their at or near all-time high water levels. Although water levels fluctuate considerably over decades, high precipitation in the Great Lakes watersheds has contributed to the recent high levels. Longer-term water levels will depend on the balance between future amounts of rainfall in the watersheds and increasing evaporation in a warming climate. Both of these counteracting effects are increasing. While it is possible that higher water levels will be the new norm, the current expectation from the science community is that levels will continue to fluctuate. More definitive research studies are needed to better understand this issue.

Along with reducing the emissions driving climate change, efforts for adaptation and resiliency are crucial to planning the future of the Great Lakes region. Recommended policy solutions call for stepping up actions to achieve multiple benefits of mitigating climate change, protecting public health, and reducing stress on the Great Lakes ecosystem and our land. These include advancing green energy, improving energy efficiency, accelerating the adoption of cleaner transportation options, reducing agricultural runoff of phosphorus pollution, investing in green infrastructure, and funding to help protect fisheries, shorelines, and wetlands.

Climate change is one of, if not the biggest challenges of our time. The impacts are already being felt in the Great Lakes region, and they are likely to grow to be far-reaching and very costly. If we don't act now, the Great Lakes and all of us who enjoy and rely on our lakes for safe, clean drinking water, food, recreation, and commerce will pay an even greater price for decades to come.

Don Wuebbles is a professor of atmospheric sciences at the University of Illinois in Urbana, Ill. He is lead author of the 2019 report "An Assessment of the Impacts of Climate Change on the Great Lakes," written by 18 experts from the United States and Canada.