

# Great Lakes water

Looking at quality, quantity, and availability

In the Great Lakes region, as elsewhere, there are competing demands for a limited supply of water, including agricultural irrigation, public water supply, industrial production, and cooling in the generation of electricity. In addition to these off-stream uses, Great Lakes water is used for transporting goods, hydroelectric power generation, recreation, and fisheries. The US EPA's Great Lakes Program Office reports that the various uses of water in the region translate into total economic production of more than \$2 trillion annually.

Alex Mayer believes that freshwater is at the foundation of our economic, societal, and environmental well-being. However, water is often treated as a free resource in that no charge is imposed for withdrawing water from its source.

"Users may pay for the transport of water from its source to its place of use, and perhaps for treatment of the water and disposal of the return flows, but the water itself apparently has no value," Mayer notes.

He is leading an NSF-sponsored team to determine the impact of direct and indirect drivers on water quality, quantity, and availability in the North American Great Lakes region—and ultimately the economic value of this freshwater.

Mayer's team will use integrated physical and economic models. These models will be used to predict water availability and quality over the next thirty years—under various scenarios of population growth, climate change, land use, emissions, and governance. The team will develop cost frameworks for capturing the value (i.e., energy, materials, opportunity costs) of having a specific amount of water available at a given purity, time, and location.

"We hope to demonstrate that sufficient supplies of clean water are critical to our society, and should be valued as such," says Mayer.



**Alex Mayer**  
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**The Great Lakes hold 21 percent of the world's supply of available fresh surface water. Despite this staggering amount of fresh water, only 1 percent of the Great Lakes' volume is replenished each year by rain and snow.**