

Climate Change and the Great Lakes

The Great Lakes are a globally unique resource — there is nothing like them anywhere else in the world. The total area of the lakes is a bit less than 100,000 square miles, but they hold enough water to cover the entire United States to a depth of nearly ten feet. That's more than enough to drown everyone!

Rain and snow from about 300,000 square miles goes into the Great Lakes. That is the total area of the Great Lakes basin – the total area you get when you add a bit more than 200,000 square miles of land to nearly 100,000 square miles of lake. All of the rivers and creeks from that land eventually empty into the Great Lakes.

The total of 300,000 square miles in the Great Lakes basin is only one half of one percent of the total area in the world, but the Great Lakes basin has more than 20% of the fresh water in the world. In other words, each square mile in the Great Lakes area has 40 times as much water as the average square mile in the world.

Moreover, four of the Great Lakes are at nearly the same elevation. Boats can therefore travel easily from one to another. The Welland Canal can help boats move to the last lake in the system, Lake Ontario. These boats help connect more than 30 million people who live in a dozen large cities and more than 20 medium-sized cities around the lakes.

Unfortunately, the Great Lakes are likely to change if climate changes. According to the latest prediction models, the temperature around the Great Lakes may go up by 2 or 3 degrees in the next 100 years. All by itself, that does not sound like much. But the rainfall is also expected to change. More rain is expected in winter and less in summer. This may cause lake levels to go up in winter and down in summer.

When they combine temperature and precipitation for all seasons of the year, many of the models predict that the average water level may go down about one foot. Some models predict a drop of nearly 6 feet. A few models say the water level might actually go up.

At the same time, the warmer temperature may change the ice cover of the lakes. Many people have observed that their parts of the lakes freeze later and melt sooner than they did 50 years ago. The total amount of ice cover has also decreased, from an average of nearly 60 percent in the 1960s to less than 40 percent in the 2000s.

Less ice cover means more waves in winter. Stronger storms mean more waves in both summer and winter. As a result, houses and docks near the shore may have more damage.

Things become even more complicated when scientists try to predict what might happen to plants and animals in the lakes. Higher temperatures might cause some fish species to move farther north. Shallower water might allow some shoreline plants to grow faster. Higher temperatures might stimulate algae growth and reduce the level of oxygen in the water. Warm-water species might find the new conditions more favorable. Some species of fish and shellfish may decrease due to changing conditions and new competition.

In short, temperatures a few degrees higher could have many effects in the Great Lakes.