

The Importance of Ice Cover for Lake Superior

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Run Time: 5:10

Intro: This is Superior Science News. Today's program explores the importance of ice cover for Lake Superior.

NAT SOUND: waves

Researchers have witnessed many changes in the Great Lakes in the wake of abnormally warm winters and summers in recent years. Many lake scientists are examining the impact of warmer temperatures on Lake Superior. Jay Austin is a researcher with UMD's Large Lakes Observatory. He says ice plays a number of roles in the lake.

"The role that we've been exploring most recently is the role it plays in regulating the temperature throughout the course of the year. When you have years with high ice cover--ice is very light colored and light colors are very good at reflecting sunlight. If you have a year with lots of ice, a lot of that sunlight that hits the lake in the late winter, early spring just gets reflected back out into space and the lake takes a lot longer to start warming up."

"We're seeing about half as much ice cover now as we did a century ago. One thing we're really interested in is why relatively small changes in the climate seem to be leading to these relatively large changes in ice cover."

Minnesota Sea Grant educator Cynthia Hagley says data seem to imply global warming is having a definite impact on the lake.

"You can see a very, very distinct increase. The increase is getting more and more steep, so each year we're seeing a kind of magnifying effect in terms of how much global temperatures are increasing. Now, scientists are working very hard on improving regional models and having a better idea of what's happening to temperature regionally like in the Great Lakes Region."

Euan Reavie with UMD's Natural Resources Research Institute says scientists are reluctant to pin down climate change as the sole cause of diminishing ice on Lake Superior.

"It's likely there's a climate change effect, but we've also got these other stressors in the Great Lakes like invasive species, nutrient enrichment and so on. All of which are having simultaneous effects. Teasing them out can be quite difficult. And we've seen a number of impacts in Lake Superior that are likely limited to this change in temperature, but saying it is truly linked to that can be difficult."

Austin says it's one of those things where you answer one question and uncover two more. Still, Austin and his team are determined to isolate factors that contribute to less ice cover.

"We will be putting equipment out this summer which will help us to measure not just surface temperatures, which is what most of the research is focused on, simply because that's what's available, we're really interested in the total heat content of the lake. How far down is that warm temperature found in any given year? How does it vary from year to year? So, right now, what we're doing is preliminary designs for an array of moorings that we'll have out in the lake this summer. Finally, we're doing a handful of exercises with numerical models inside of computers that allow us to simulate different climate conditions and observe how the lake responds to those."

Reavie says things like lower lake levels and disappearing ice can't be ignored.

"There's going to come a time when the Great Lakes are going to be the primary source of freshwater for the entire continent, and it's one of those things where we really need to identify what the future socio-economic and environmental problems are going to be related to, for instance, this change in ice cover in the lake."

Hagley says that's where she comes in.

"One of the things that we're trying to do at Sea Grant is work with the scientists who are putting out the buoys to make the data that come from those buoys really easy for local governments and lay people to understand and interpret. We're also doing a lot of data collection -- looking at how our streams are changing and warming, streams flowing into Lake Superior, and trying to connect that to some of the things we're seeing in the lake in terms of what's living there and how well things are doing."

Austin believes their research could give them insight on, not only what is affecting Lake Superior, but also other bodies of water across the globe.

"There are things we can learn by studying a much more accessible, much more straight-forward system like Lake Superior that we can apply or are there lessons we can learn from that that we can apply to developing a better understanding of the much more important arctic ocean, which has multi-year sea ice, is very very difficult to get to, has lots of inflows and outflows that complicate the matter . . . are there ways that we can use what we learn about Lake Superior to tell us more about how the world works."

All three say that it's going to take everyone working together to examine the problem and provide solutions.

For Superior Science News, I'm Marie Zhuikov.

Outcue: This is a production of the Minnesota Sea Grant Program at UMD and KUWS Radio.