Great Lakes water temperatures are blowing away records and could climb higher

Jason Samenow

Beachgoers fill Grand Haven State Park and City Beach on Lake Michigan on July 7. (Cory Morse/Grand Rapids Press/AP)

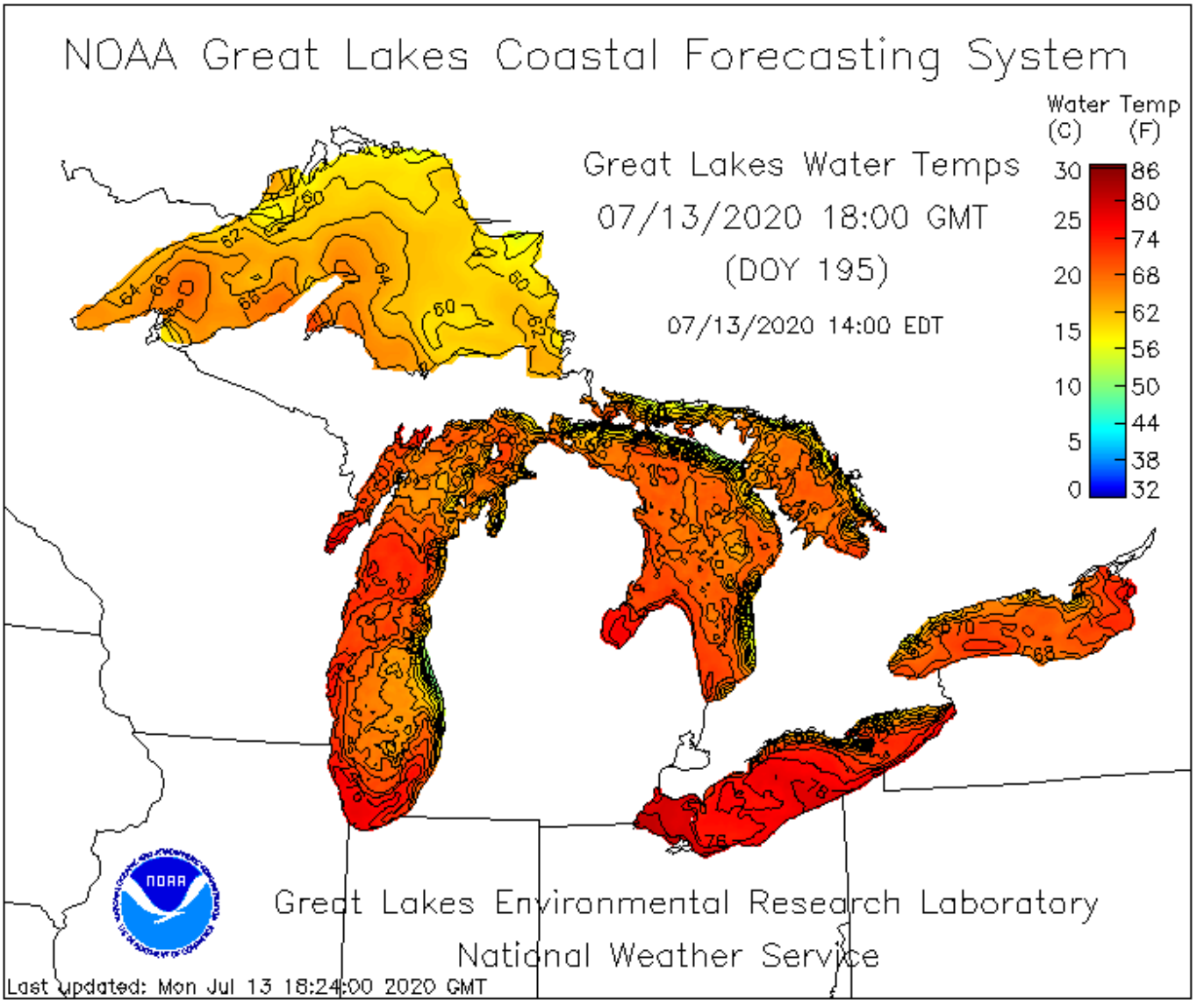
You don’t expect to see 75- or even 80-degree water in the Great Lakes in early July or, in most years, anytime. But an exceptionally hot weather pattern has pushed water

temperatures in most of the lakes to the highest levels on record so early in the summer. Over lakes Erie and Ontario, the water is the warmest it has been since records began being kept, and could warm more in the coming weeks.

The abnormally warm waters, consistent with climate-change trends in recent decades, could compromise water quality and harm marine life in some areas.

Surface water temperatures averaged over all of the Great Lakes, except the deep and choppy Lake Superior, have risen well into the 70s while Lake Erie has flirted with 80 degrees. That's about the same water temperature as the surf off Virginia Beach.

[The Atlantic hurricane season is off to a record fast start and is likely to get worse]



Great Lakes water temperatures as of Monday. (NOAA)

These water temperatures over the Lakes are some 6 to 11 degrees warmer than normal.

Here is how warm each of the lakes has become over the past week:

- Lake Michigan's average water temperature reached 75.1 degrees on July 8, nearly 11 degrees above normal, and the warmest mark on record so early in the year. The water temperature in July has only been this

warm one other time, at the end of the month in 1999.

- Lake Huron's average water temperature reached 72.2 degrees on July 9, nearly 11 degrees above normal, and the warmest mark on record so early in the year.
- Lake Ontario's average water temperature reached 77.1 degrees on July 10, more than 10 degrees above normal, and the warmest mark on record for any month (although it was similarly warm in mid-August 1995)
- Lake Erie's average water temperature reached 79.6 degrees on July 10, over 8 degrees above normal, and the warmest mark on record for any month (although it was similarly warm in mid-August 1995).
- Lake Superior's average water temperature reached 55.8 degrees on July 8, over 6 degrees above normal.

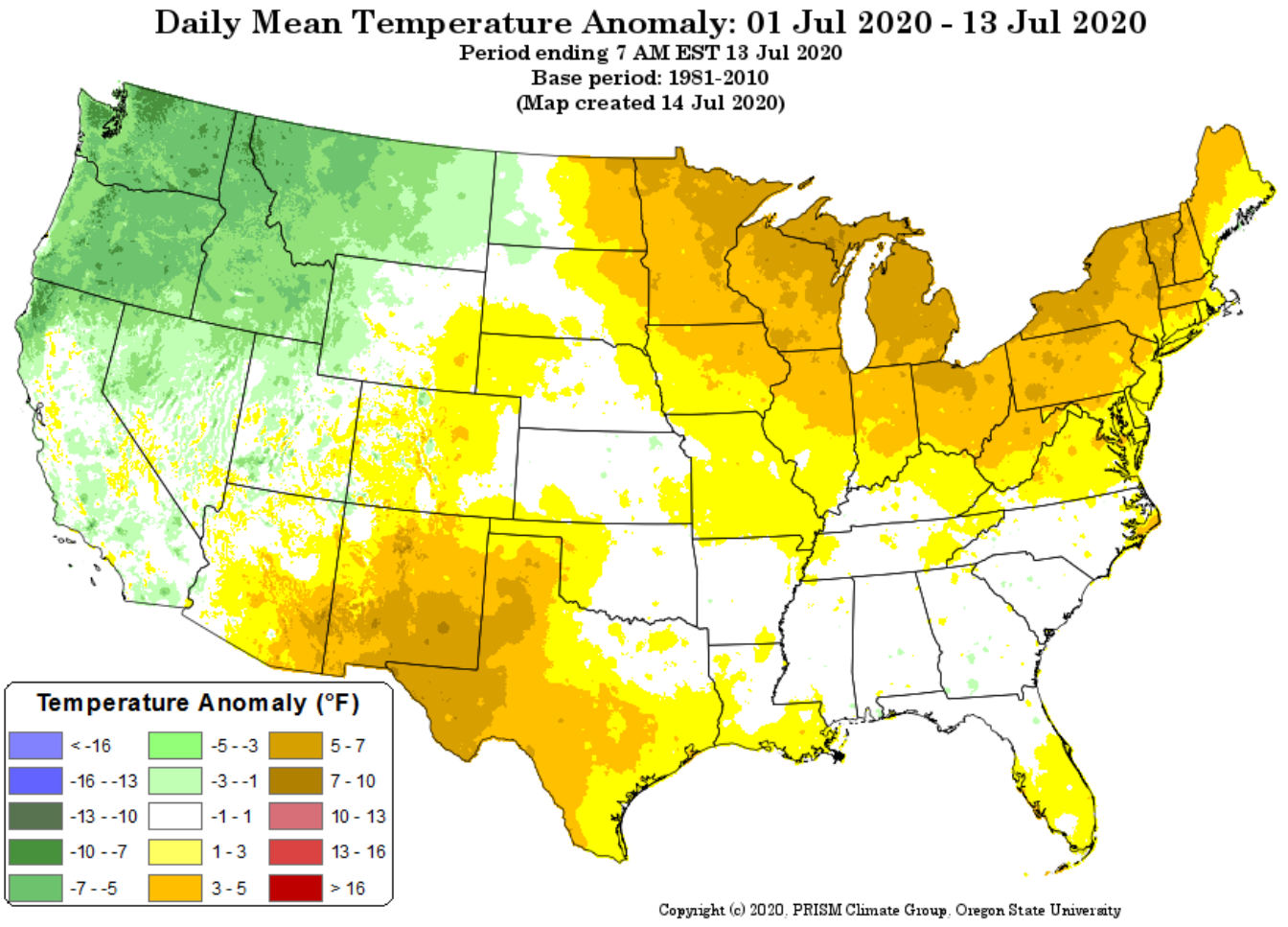
The unusually warm water is a reflection of blistering heat over the Great Lakes region in recent weeks set up by a persistent ridge of high pressure.

Air temperatures in early July, especially in the eastern Great Lakes, were among the warmest on record.

Buffalo hit at least 90 degrees on eight straight days ending Friday, its longest streak. Muskegon, Mich., on the shores of Lake Michigan, also notched its longest 90-degree streak, tallying nine straight days ending July 7.

Massena, N.Y., about 90 miles north of Lake Ontario in

Upstate New York, hit 99 degrees Friday, its second highest temperature recorded.

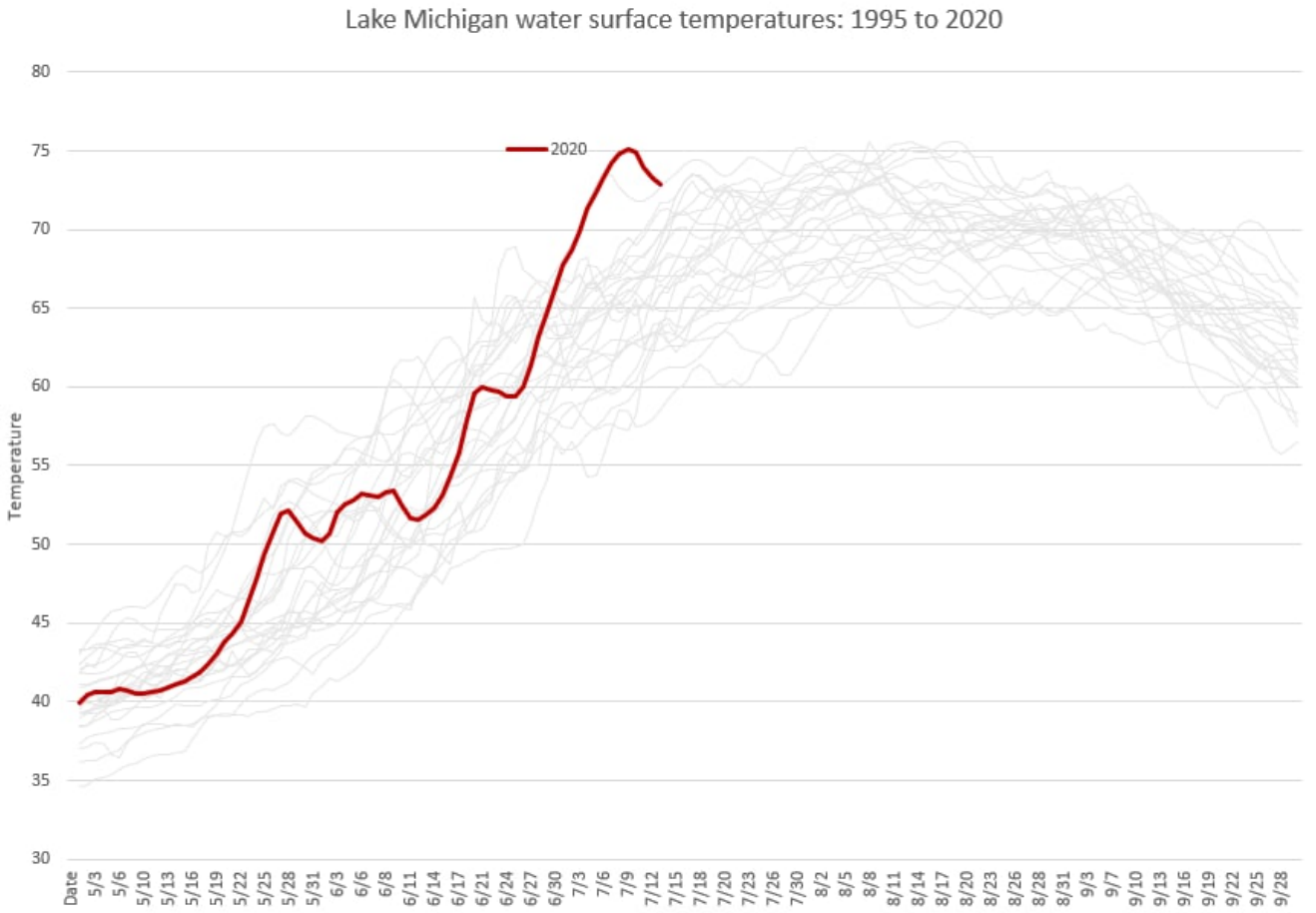


Temperature differences from normal during July across the Lower 48 states. (PRISM Climate Group)

The heat has meant water temperatures are “abnormally high compared to the most recent years,” said Andrea Vander Woude, manager of the Great Lakes CoastWatch program at the National Oceanic and Atmospheric Administration. “Last year was really cold and there was a lot of rain. This year there hasn’t been as much rain, and it’s been persistently hot.”

The water temperatures spiked late in the past week before

a weekend cold front unleashed windy, stormy weather which helped draw deep, cold water back toward the surface of the lake, in a process known as upwelling. This has caused water temperatures to drop slightly.



Lake Michigan water temperatures between 1995 to 2020. Each line represents a different year. 2020 is shown in red. (Data: NOAA CoastWatch Great Lakes Node/Joeseph Smith)

But Vander Woude expects they will rise again. Historically, water temperatures in the Great Lakes reach their maximum in August

“We haven’t even reached the tip of that curve that usually occurs later [in the summer]," she said.

The National Weather Service's Climate Prediction Center favors above normal temperatures over the Great Lakes in its 6-to-10-day and 8-to-14-day outlooks and a slight risk for "excessive heat." Computer models forecast a high pressure ridge or "heat dome" to sprawl over the eastern half of the Lower 48 for much of this period.

> With another heat wave in the forecast for the East and South, we could be looking at the hottest July on record for the lower 48.
>
> This upcoming heat wave will be most anomalous in the Midwest + Great Lake Region. Chicago has a 10-20% chance to see 100F this weekend. Scorcher. pic.twitter.com/72hT45Xc72
>
> — MJVentrice (@MJVentrice) July 13, 2020

This heat could push water temperatures to historic levels across all of the lakes with the likely exception of Lake Superior.

Some residents are rejoicing in the unusually warm waters.

"I'm loving this," Whitney Miller, a Traverse City, Mich.-based swim instructor, told the Record-Eagle, a newspaper serving the region. "Last year I was in a wetsuit up through the 15th of July. ... I was a popsicle."

A kiteboarder flies across waves as beachgoers play in Lake Michigan on Friday near Silver Beach in St. Joseph, Mich. (Don Campbell/Herald-Palladium/AP)

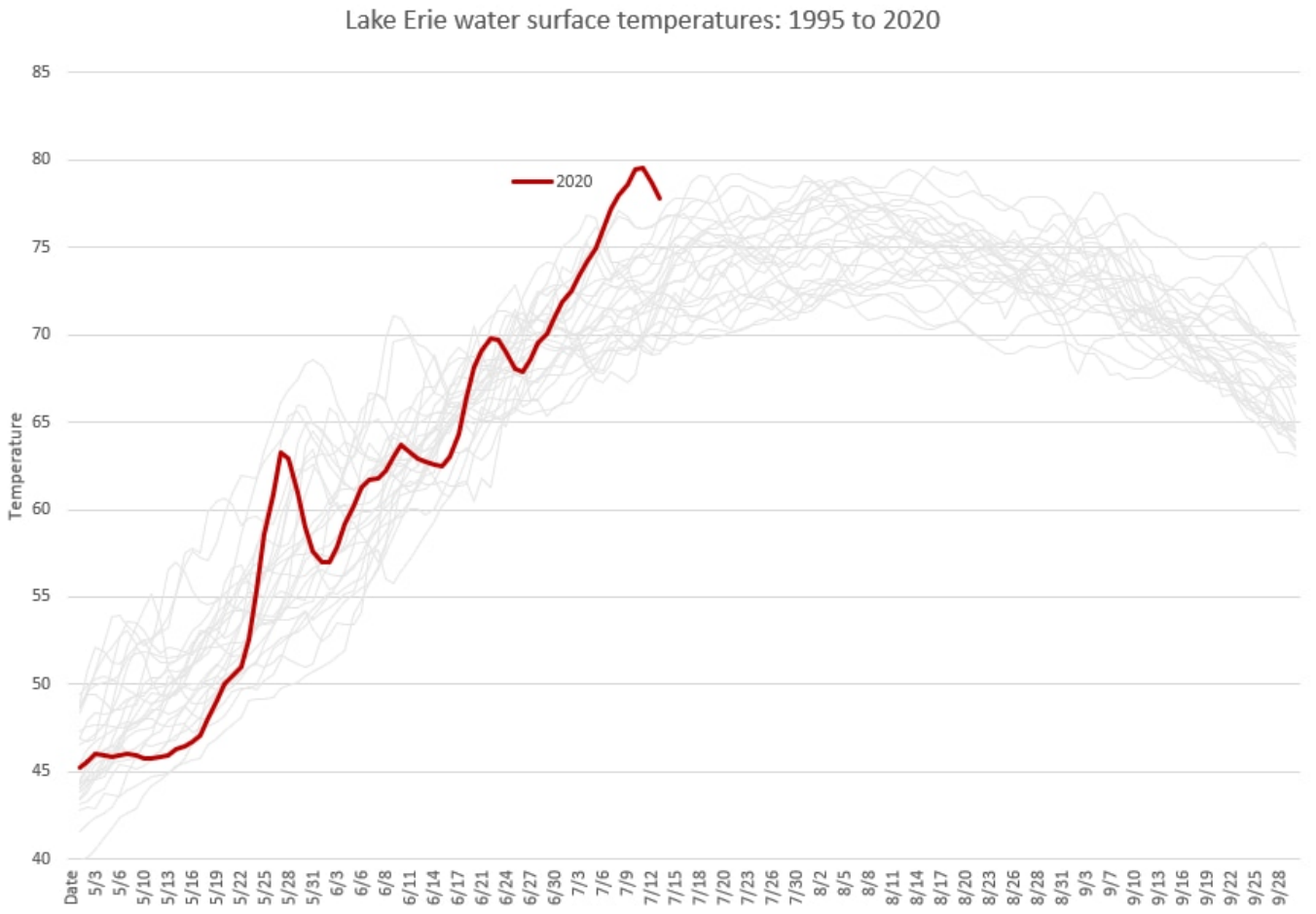
But the warm water could have detrimental effects on water quality and some aquatic species.

Vander Woude says NOAA aircraft have already photographed blue-green algae or cyanobacteria over western waters of Lake Erie in recent days. The foul-smelling algal blooms can harm fish and make people who are exposed to the water sick. In 2014, cyanobacteria from Lake Erie entered the water supply in Toledo, and residents were ordered not to drink or touch the water.

The jump-start to the algal bloom due to the warm water

temperatures means it will be around for several weeks longer than normal.

“This is the second earliest we’ve seen [the algae] in our data since 2002,” wrote Richard Stumpf, an oceanographer with NOAA, in an email. “The earliest was in late June in 2018.”



Lake Erie water temperatures between 1995 to 2020. Each line represents a different year. 2020 is shown in red. (Data: NOAA CoastWatch Great Lakes Node/Joeseph Smith)

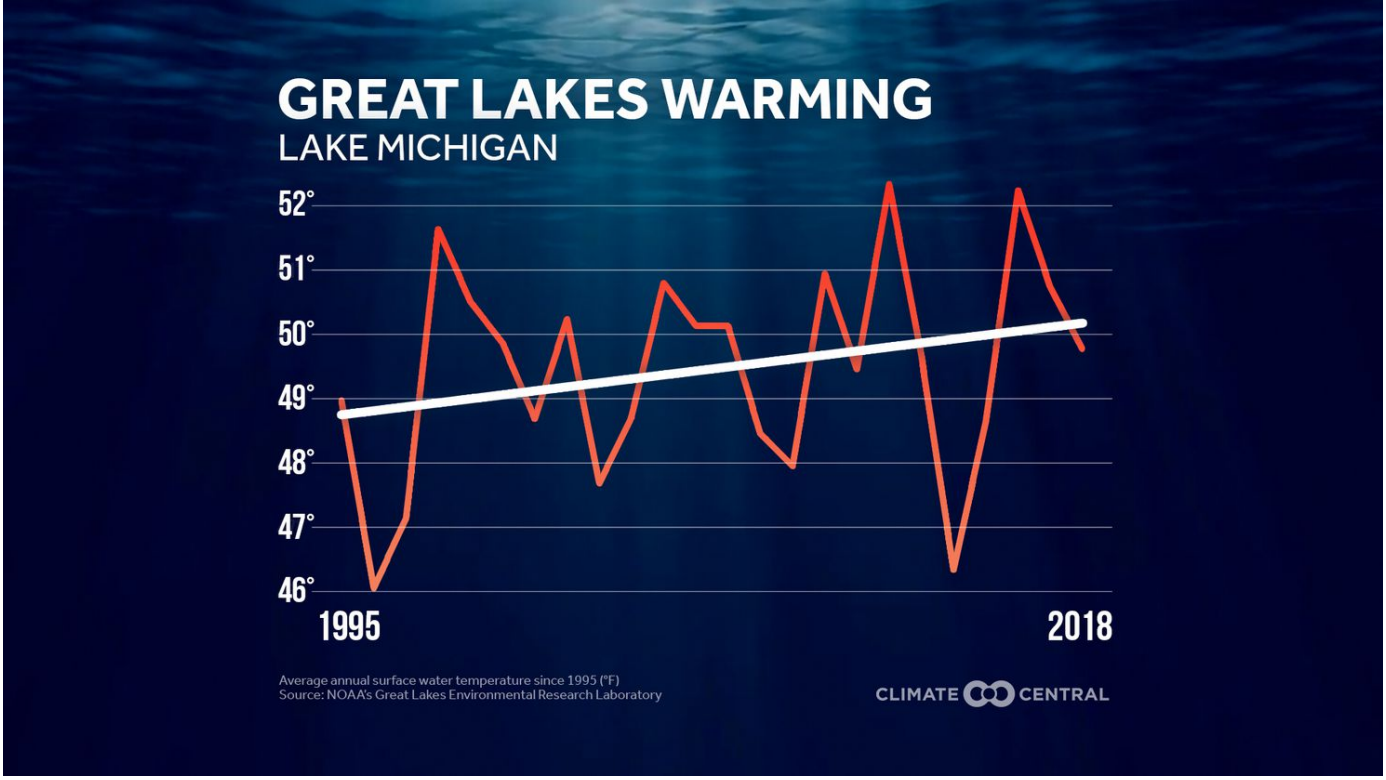
Because phosphorous levels, which make algal blooms worse, aren’t particularly high due to less rain than some years, Stumpf doesn’t anticipate 2020’s bloom to be among the biggest. But “it will still be quite visible and is a risk that

people need to avoid," he said.

NOAA publishes regular algal bloom forecasts and updates on its website.

In addition to the effects from algal blooms, Stumpf said the warm water can have other detrimental effects for fish. "Many fish do not do well in water that is too warm, so they get 'squeezed' into a smaller and smaller area between surface water that is too warm, and bottom water that doesn't have enough oxygen," he wrote.

The record-setting waters in July fit into the recent warming trend observed over the Great Lakes tied to climate change. "[E]very Great Lake has warmed at least 1.5F since 1995 (when data became available for all lakes), led by Lake Ontario at 2.2F," wrote Climate Central, the science communications nonprofit, in 2019.



The average temperature of Lake Michigan from 1995 to 2018. (Climate Central)