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## Huge snowfall unlikely to boost Lake Michigan's water level

By **JO SANDIN**  
of the Journal Sentinel staff

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Despite the record amount of snow that's fallen here so far, Great Lakes hydrologists aren't holding out a lot of hope for higher water levels in Lake Michigan this spring.

Not even the hip-high snow drifts heaped along the Wisconsin-Michigan shore will help because this winter's snow is too dry, says Roger Gauthier, who watches such things for the U.S. Army Corps of Engineers in Detroit. Also, he said, much of the snow is in the wrong place - in Michigan and Wisconsin (instead of Minnesota) and on the leeward side of Lake Michigan (across the lake from Wisconsin).

That's bad for lake levels because, as Gauthier put it, "evaporation is working in overdrive."

Because of the marked contrast between air and water temperatures, he said, until there is significant ice cover, evaporation is highest in the winter months. Prevailing westerly winds bring most of that evaporated moisture as snow to the eastern shore of the lake. Those snow masses often release half their moisture directly into the atmosphere, where it isn't available to melt off in the spring thaw.

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water levels in Lake Michigan last year were the lowest in 40 years, creating serious problems for recreational boaters, cargo ships and others.

Milwaukee may still have more than 2 feet of snow on the ground, but its water content isn't high. The 49.5 inches that gave the city an all-time record for December would melt into no more than 2.41 inches of water, according to National Weather Service calculations.

Lake Michigan also is affected by the level of Lake Superior, which "is still in a state of drought," said Gauthier, a supervisory hydrologist.

"Water flows downhill, and 25 percent of all the water in Lake Michigan-Huron comes from Lake Superior," he said. "That tells you that, in the long term, unless Superior is replenished you're likely to see lower levels in the middle and lower Great Lakes."

Gigantic snow drifts that used to be standard on the north shore of Lake Superior, the largest of the Great Lakes, have shrunk in the recent warm winters. This December, which thickly blanketed much of Wisconsin, left Duluth with no more than 19.2 inches of snow, the equivalent of less than an inch of water.

That relatively skimpy precipitation pattern, which has dominated in the last few years, has brought Lake Superior to its lowest point in 75 years.

December's average level for Superior waters was 16 inches lower than the long-term monthly average level for December - and a full 31 inches below the highest level recorded in December 1985. It was just a scant 4 inches above the lake's record low, measured in 1925.

When Lake Superior is this low, hydrologist Frank Quinn explained, an absolute minimum of water is released through gates in the St. Marys River into Lakes Michigan and Huron, which are considered a single body of water.

"The gatekeepers start starving your lake," said Quinn, who is senior hydrologist with the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory in Ann Arbor, Mich.

Relief, however, is in sight, along the shoreline draped with snow and ice.

"Ice armors the shoreline, so we're likely to have less erosion from winter storms," he said. "Ice cover prevents further evaporation from the lake surface."

Winter snowpack and spring melt-off are the forces driving most of the annual spring rise in water levels, he said. But *where* the pack accumulates and *when* it melts are more important still.

Add the location of this season's heaviest snowfall (not in Minnesota) to the extremely low level of stream flow from the Michigan-Huron basin into the combined lake, Quinn said, "and you've really got a problem."

Nevertheless, Quinn said, some snow is better than none.

"If we get more snow and if it all stays on the ground until spring and if it rushes out all at once, it will create more water that can flow out of Lake Superior (into Lake Michigan-Huron)," he said. "But if it trickles, a little at a time, we're not going to get a significant increase in lake levels."

The 10-day outlook for the Midwest from the National Weather Service indicates that the second possibility might be more likely. It calls for milder, snow-melting weather.

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