

**DISAPPEARING BEACHES**



Photo By – Kathy Osterman – Chicago Tribune

**TODAY'S WEATHER:**

[www.wunderground.com/us/mi/kewadin](http://www.wunderground.com/us/mi/kewadin)

**STORM CENTRAL**

[www.gtlakes.com/storm-central/](http://www.gtlakes.com/storm-central/)

**SAND LOST FOREVER?**

Thinning sand layer on the L. Michigan bottom is more troubling than erosion.

Amount of sand protecting the shoreline from waves dropped by 83% in Illinois since early 1800s.

The coast is at risk of more and more erosion likely in State of Michigan also.

In Michigan, rivers are a primary source of sand to the lakeshore. But this sand supply is diminished by dams.

Some say sand was displaced by pier and harbor construction over 200 years. Then, 'nuisance' sand was, dumped in deep waters and lost.

Without that thick layer of sand as a cushion, the primarily clay lakebed in shallow waters has been eroding as it takes more of the brunt of waves.

As this process deepens, the lakebed erodes each year inch by inch, to create conditions for taller, more violent waves, which accelerate shoreline erosion.

20th century science discovered that a more complex problem might lie below the surface. Studies of L. Michigan near-shore bottom found massive sand loss.



The question is, can 'lost' sand be used to nourish beaches as in the Netherlands?

**NOTE:** Editor was born below sea level in the red area of the Netherlands near Amsterdam where cities, people & land have been protected for 1000 years.

**LAKE MICHIGAN HAS SWALLOWED UP 2 CHICAGO BEACHES THIS SUMMER. EXPERTS SAY THE WORST COULD STILL BE ON THE WAY.**

Please read the entire article at the link below

<https://www.chicagotribune.com/news/environment/ct-lake-michigan-high-water-levels-impact-20190801-jmhmy4ylgbatlavbny3lv26dui-story.html> By TONY BRISCOE - CHICAGO TRIBUNE - AUG 01, 2019 | 2:24 PM

EXCERPT: For the second straight month, L. Michigan has crested to its highest mark in over three decades — one inch shy of record highs in 1986. It takes 780 billion gallons of water to raise L. Michigan 1 inch. Since 2013, the lake has risen nearly 6 feet from record lows. In Chicago, no part of the shoreline eis unscathed.

“Fall is the time . . . when wave conditions are historically most severe on the Great Lakes,” said David Bucaro, US Army Corps of Engineers Chicago District. “We’re at a calmer period right now. But that October, November time period is when we really experience historically the most powerful coastal storms.”

This year, water has [swallowed at least 2 Chicago beaches entirely](#) and closed others. It has [swiped fishermen from piers](#), swimmers from beaches and submerged jetties, creating hazards for boaters. It has flooded parts of lakefront bicycle and pedestrian paths, leaving stretches underwater and crumbling.

**EDITOR'S NOTE:** The foregoing article links to 2015 reporting of sand loss by the same author.

**EXPERTS WARN OF STRONGER LAKE MICHIGAN WAVES AS EROSION TAKES ITS TOLL (2015)** Please read the entire article at the link below

<https://www.chicagotribune.com/news/breaking/ct-lake-michigan-lakebed-erosion-big-waves-met-20150823-story.html> By TONY BRISCOE - CHICAGO TRIBUNE - AUG 24, 2015 | 7:33 AM

Beach erosion has long been a worry for L. Michigan's coastal residents. But the thinning veneer of sand on the lake floor may be a more troublesome problem.

The amount of sand that flows south of the (Wisconsin) border, protecting Illinois shoreline from pounding waves, has dropped by an estimated 83% since the early 1800s, putting the coast at risk for more and more erosion. Experts say, some sand displaced by the construction of piers and harbors over nearly two centuries, considered a nuisance, was dumped in deep waters and lost forever.

Without that thick layer of sand to serve as a cushion, the clay lakebed in shallow waters has been slowly eroding as it takes more of the brunt of incoming waves. This irreversible process deepens the lakebed each year inch by inch to create conditions for taller, more violent waves, which accelerate shoreline erosion.

While shoreline and lake bed erosion are natural processes, they began to accelerate in the early 1800s, when piers and jetties were built on Lake Michigan, interrupting the natural flow of sand along the lake bed and causing dunes to form on the north side of the structures,

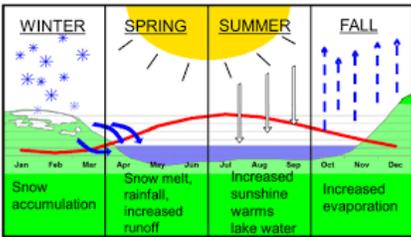


Photo of Grand Traverse Bay by TNN

according to Charles Shabica, a civil engineer and retired Northeastern Illinois University professor. Accidental beaches formed in areas like present-day Streeterville, the Chicago neighborhood named after the ship captain who squatted on the land.

(Continued on Page 3)

**WHY ARE BEACHES ERODING?  
TOO MUCH PRECIPITATION  
EXCESS FLOW FROM L.SUPERIOR  
TOO LITTLE SAND**



Great Lakes water levels are the result of natural forces and human intervention.

2019 Too much water; rainy cold spring.

2019 Excess water releases by the Lake Superior Board of Control.

The Board refuses to reduce excess water releases from backwards flowing Long Lac-Ogoki this year as it did in 1952, 1973, 1985

Also, the Board keeps Lake Superior within a 4-foot range by dumping water into Lake Michigan-Huron which has a 6½ foot range.

The Board is authorized to ease erosion under current rules and treaties by lowering water level in Lake M-H 4 inches.

**SAND FORMATION BY RIVERS**

Sand is formed over a long period of time by water, wind, gravity, and tectonics, among other forces. Water provides movement of sediment from the beginning of streams and inland areas down through the land. While heavier sediment settles along riverbanks and streams, lighter sediment gets carried to the Great Lakes.

Dams block this flow of sand

**LOCAL SAND LOSS – SHORT HISTORY**

Boardman River Dam - ca 1867

Elk River Dam - ca 1860s

Mining in Elk Rapids ca 1875 - 1911

Boyne River Dam ca 1906

Bear River Dam ca 1910s

**WATER DIVERSIONS IN THE GREAT LAKES BASIN**

BY: U.S. Army Corps of Engineers Detroit District - Great Lakes Update Volume 175 April 2009  
<https://www.lre.usace.army.mil/portals/69/docs/greatlakesinfo/docs/updatearticles/update175.pdf>

Please read the entire article at the link provided

**EXCERPT: The Long Lac and Ogoki Diversions**

During the 1940s two diversions into the Lake Superior basin were completed at Long Lac and Ogoki in Ontario, Canada. The two diversions operate under an exchange of diplomatic notes between the United States and Canada dating back to 1940 and under the Niagara Treaty of 1950. They enabled Canada to increase its electricity supply during World War II.

The Long Lac Diversion, completed in 1941, connects the headwaters of the Kenogami River with the Aguasabon River, which naturally outlets into Lake Superior 150 miles east of Thunder Bay. The Ogoki Diversion completed in 1943 connects the upper portion of the Ogoki River to Lake Nipigon and from there flows into Lake Superior 65 miles from Thunder Bay.

Control of the diverted water lies solely with the Canadian Government, although during times of emergency there have been consultations between the U.S. and Canada. **Examples of cooperation occurred in 1952, 1973 and 1985, when Canada temporarily halted the diversions to combat problems caused by high water.**

Today the Long Lac and Ogoki diversions continue to provide hydropower generation capability to northern Ontario. Ontario Power Generation (OPG) 5 operates many power plants in the region from their facility in Thunder Bay.

Combined, the flow of water in the Long Lac and Ogoki diversions averages 5,000 cubic feet per second. The hydrologic effect of these diversions increased the net supply of water to the Great Lakes. The mean level of the Great Lakes has increased as follows:

- Lake Superior increased by 3 inches,
- Lakes Michigan-Huron by 4 inches,
- Lake Erie by 3 inches
- Lake Ontario by 3 inches.

NOTE: ROWI: In-cycle maximum water levels may be double these figures.

Summit Dam, sitting on the divide between the Hudson Bay and Lake Superior watersheds.



North of the Summit Dam, the 1700 foot Waboose Dam, is more than 450 feet longer than Hoover Dam.



**PIPING PLOVER THREATS:**

**Sleeping Bear Dunes National Lakeshore Takes Action**

BY: [Emily DeRuiter](#) – 9 and 10 News - June 17, 2019

<https://www.9and10news.com/2019/06/17/piping-plover-threats-sleeping-bear-dunes-national-lakeshore-takes-action/>

Please read entire article and the link provided EXCERPT: Officials at the Sleeping Bear Dunes National Lakeshore are doing what they can to protect an already endangered shorebird from rising water levels in the Great Lakes.



Piping plovers build their nests and raise their young on beaches around the Great Lakes.

Over time, development along shorelines has shrunk their habitat, causing their population to drop.

Rising water levels this year have taken even more nesting ground from the birds, and it comes as the plovers prepare for their eggs to hatch.

To help, national lakeshore officials have roped off piping plover nesting areas where waters are moving closer. They've also posted signs urging people to steer clear.



**ACTION:**

Shop for signs on the internet.

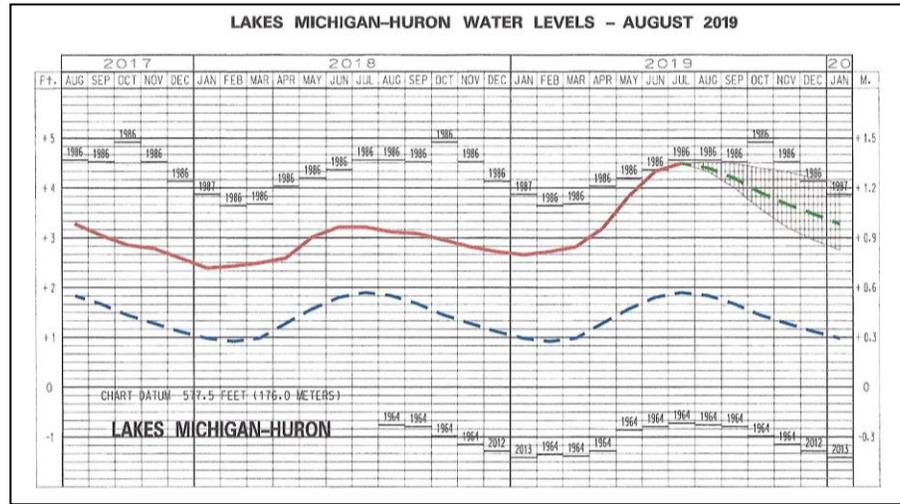
Place sign near nesting sites.

Keep dogs on a leash while walking nearby

**BREAKING NEWS AUGUST 16, 2019: Weekly Water Levels Update for Lakes M-H**

US ACE: Month to date rainfall for the Basin is 60% of average. Temperature was normal. Lake Michigan-Huron is 2 inches below its highest August level; declining 2 - 4 inches in past month. Projected change in water level next month shows a decline of 5 to 6 inches.

<https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Water-Levels/Water-Level-Forecast/Weekly-Great-Lakes-Water-Levels/>



**EROSION EXCERPT** (Cont'd Front Page) As sand continued to pile up near these structures, it became an annoyance, to the point that sand was hauled to deep waters and permanently disposed of by agencies including the Army Corps of Engineers. Researchers estimate that from 1889 to 1982, about 2.5 million cubic yards of sand were removed — an amount that would fill more than 12,950 rail cars. South of the structures, beaches continued to erode naturally, although they were getting much less sand.

It wasn't until the 20th century when scientists discovered that a more complex problem might lie below the surface. Studies of Lake Michigan's floor near the shore found massive sand loss in addition to more than an average rate of 2 inches of clay eroding each year from the lakebed in areas like Lake Bluff (IL).

Shabica forecasts that waves will carve another 3 feet out of the lakebed over the next 20 years at a site where he plans to build a beach. NOAA Hydrologists say waves generally break when their height reaches 80% of their depth, meaning, if Shabica's prediction is correct, and the water level remains around its current level, a wave breaking at 10 feet today would be nearly 3 feet higher in 2035.

There is a trend toward building "pocket beaches," which are protected with rock or steel piles on their fringes and, generally, a line of large headstones underwater that break waves farther from shore, Shabica said. The result is beaches with minimal sand loss that model themselves after natural bays.

"One thing about our business is that we are constantly learning from Mother Nature. We're learning to work with nature, not fight against it."



Tony Briscoe is an environmental reporter with the Chicago Tribune who has written extensively about issues facing the Great Lakes and the impacts of climate change in the Midwest. A graduate of Michigan State University, Briscoe began his career as a breaking news reporter at his hometown newspaper, The Detroit News.