

TODAY'S WEATHER:

www.wunderground.com/us/mi/kewadin

STORM CENTRAL

www.gtlakes.com/storm-central/



"From 1901 to 2015, annual precipitation increased 10 % in the Great Lakes region vs. 4% rise for the whole nation." J Carl Ganter, [Circle of Blue](#)

TNN - A debate is brewing on the impact of climate change on the Great Lakes Region relative to other regions. Could our area be a climate refuge? Here are excerpts from two competing views.

PLEASE READ ENTIRE ARTICLES ON-LINE AT THE LINKS PROVIDED

YES, Water could make Great Lakes a climate refuge. Are we prepared?

By: Keith Schneider, [Circle of Blue](#)

In 1991, UM 10,000-acre Biological Station near Petoskey studied effects of global warming on creatures. Ferns, fish, and mammals common to southern mixed-hardwood forests of the Midwest and East were migrating into northern Michigan, some at 10 miles per year.

Three decades later, this analysis serves as a preview to questions gaining relevance for human migration: Will fierce meteorological turbulence cause people to move — away from danger, and toward safety? Will people stay or go?

Anecdotal evidence indicates the Great Lakes region is already attracting new residents to the region's comparative climate safety. A financial investment manager from Texas, bought a home near Marquette, to hedge against climate disruption, according to his realtor.

Am. Society of Adaptation Professionals is convening researchers who anticipate that warming winters, ample reserves of fresh water, and forests not prone to wildfire are ecological benefits that will attract millions of new residents to the Great Lakes and reverse decades of slow population growth.

<https://www.bridgemi.com/michigan-environment-watch/water-could-make-great-lakes-climate-refuge-are-we-prepared>

NOT YET Great Lakes Region Is Not a 'Climate Haven. (Please see page 2)

FLOODED BY THE POWER OF WATER? ADAPT AND IMPROVISE FOR RESILIENCE.

Recent focus of TNN News has been on impact of record setting Lake Michigan-Huron water levels, which rose to an all- time high in July 2020. So shore-line protection was featured. In particular offshore breakwaters built last year on coved beaches and dunes along the Bay. Sand accumulated right away. Impressive beaches grew 45 feet into the water in a few months and remained stable for a year. Endemic erosion alongshore was reversed. Then a sudden change, water levels declined 17 inches in a year while urban areas flooded by 100 year storms and neglected infrastructure ~ 5000 homes flooded in SE Michigan.

DOWNSTATE FLASH FLOOD IN LOWER LEVEL DESTROYED ALL CONTENTS.

A social function took me downstate on June 30 to our Township home in Oakland County. The lower level had flooded; the high water mark was 4½ feet. The water was gone, but the result was utter destruction. Five days later all wet contents had been removed including a lifetime of memories, drywall, furnace-A/C, water heater and internet gear. Dryers/dehumidifier eliminated the damp – four more times until the root cause of flooding was solved. Neither Township nor County government accepted responsibility. Restoration services were overwhelmed and could not help. All work was done by family, friends, and contractors. Our summer on Grand Traverse Bay was lost.



THE PROBLEM WAS SOLVED BY A PROMINENT CIVIL ENGINEERING FIRM.



A principal of the firm observed that, "It made no sense that a 12 inch storm drain is clear when there is upstream flooding." Township officials' eyes were opened. A crew was allowed to inspect the storm drain three weeks after the initial flood. A blockage was found and removed - a 5 gallon bucket. Flooding stopped! Then for added protection, we cleared the backyard ditch, created a detention basin, improved berms, and installed French drains.

POWER OF WATER DEVASTATES WHEN OUT OF THE BOUNDS OF MODERN LIFE.

Four and a half feet of water even without sewage is a knock-down blow. The power of water damaged a 12 foot door-wall, flooded in then ran out through the drainage system in slow motion. And it happened for the first time in 37 years of our residency. Remodel of the interior is delayed by supply chain problems. For example new door-wall not until mid-November – the opening has been boarded-up for three months.



HOW DOES SUBURBAN FLOOD RELATE TO THE ANTRIM COUNTY BAY SHORE EROSION?

Adapt and improvise for resiliency to extremes in weather and water levels that seem to have become more severe. What can be done? Friends of TNN observed that downstate flooding is not unusual at the same time as shore damage. Collapsing earthen dams; storm and sewage drain overflows; pumping failures for roads and sanitation have been in the news. The common thread is 100 year storms and outdated drainage systems. It's about infrastructure!

Cont'd from page 1



View of L. Superior, from Duluth, touted as a potential climate haven .Photo: Ariana Lindquist-Bloomberg.

NOT YET The Great Lakes Region Is Not a 'Climate Haven'.

BY: Joel Brammeier September 16, 2021

Great Lakes residents like to believe that our water will save us. I want this to be true, because I love this part of the world and stand in awe on the shores of the lakes. I want to believe that someday, more of America's people will come to the Great Lakes for opportunity, a healthy environment in which to thrive and a "Blue Economy" that benefits our diverse and resilient communities.

We tell ourselves that being surrounded by this incredible resource and standing tall 600 feet above sea level means we'll be the winners in a climate lottery. But it's too soon to buy that ticket.

The Region knows the consequences of working against nature . . . evident in poisoning of rivers and harbors . . . writhing invasive species . . . and toxic algae. . . Observers (note) that climate change is causing high water cycles to get higher and low cycles to get lower . . . Stronger storms pose a major threat.

You can't call the Great Lakes a climate refuge if the people already here are the ones seeking refuge. Before we spend more time and energy imagining that people might return if things get bad enough elsewhere, we'd be well served to turn our gaze inward to communities that are under water stress right now. The Great Lakes region is a few steps ahead in our capacity to adapt.

Our future can be bright. Let's use the time we've got wisely and build an equitable Great Lakes region for the people and wildlife that depend on them today, and for the diversity of potential climate refugees who may one day turbocharge a shared prosperity.

<https://www.bloomberg.com/news/articles/2021-09-16/the-great-lakes-region-is-not-a-climate-refuge>

PLEASE READ ENTIRE ARTICLE ON-LINE

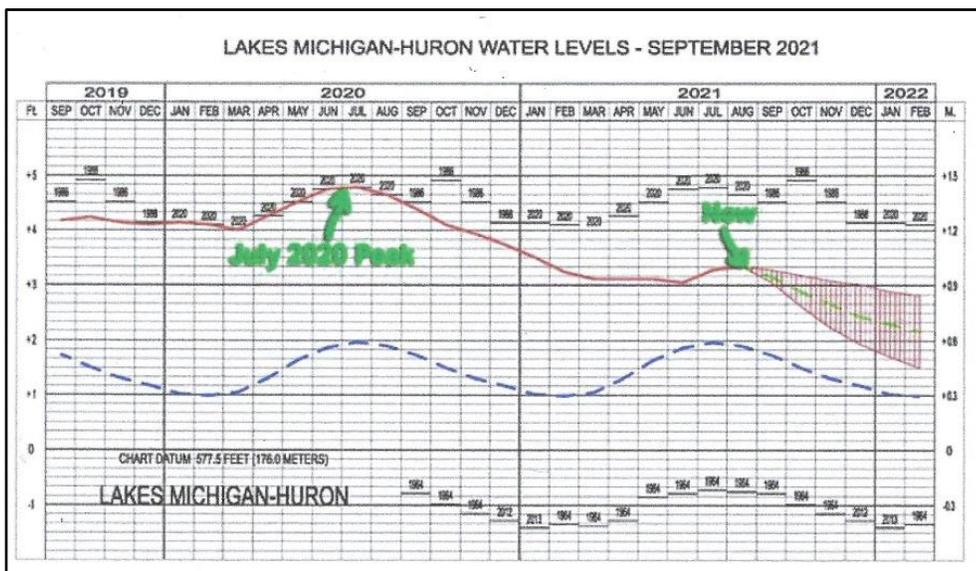
LAKE MI AND LAKE HURON LOST ALMOST 14 TRILLION GALLONS IN THE PAST YEAR; WHY?

By Mark Torregrossa <https://www.mlive.com/> EXCERPT Please read entire article.

Most of the Great Lakes continue to have declining water levels from the record-high levels over the past few years. The water level decline of Lake Michigan and Lake Huron has been the most amazing.

Remember: Lake Michigan Lake Huron share the same water level because the lakes are connected by free flowing water through the Straits of Mackinac.

Water levels have been gradually increasing in Lake Michigan - Huron since 2014, typically peaked last July in this recent water level rise. Now in the past year, Lake Michigan - Huron are declining rapidly. The US Army Corps of Engineers measured the decline in water levels on Lake Michigan - Huron at 17 inches since July of 2020.

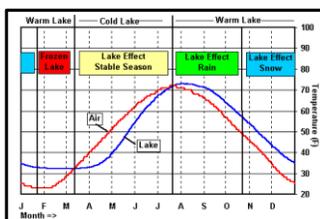


One inch of water at Lake Michigan – Huron represents 800 billion gallons of water. Getting out the big number calculator shows a 17 inch decline is 13.6 trillion gallons of water on Lakes Michigan and Huron.

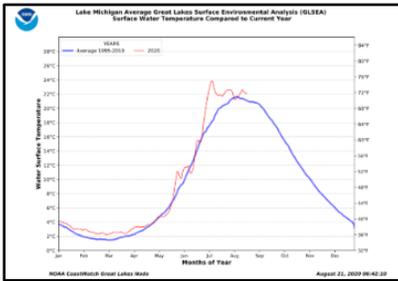
Why? Keith Kompoltowicz, hydrologists, US Army Corps of Engineers – Detroit says it is easy to explain. Dry weather is the cause of the fast lake level decline. The lack of precipitation last winter, spring and early summer was the cause. The biggest drivers of water levels on the Great Lakes are precipitation, evaporation and run-off.

Another oddity US ACE points out is the highest water level of this year. So far Lake Michigan - Huron have been at their highest watermark in January 2021. If January remains the peak, it marks only the 3rd time since 1918 for a beginning-of-the-year high.

If we stay dry and the lakes fall to the lower end of possibilities, the lakes will only be about 6 inches above long term average water level. How quickly water levels change.



Looking forward to springtime mirages. Cold lake – warmer land. Photo by Joe Charlevoix



WEATHER AND WATER TEMPERATURE

Weather affects water temperature (and vice-versa) through the year. Weather changes in water temperature are usually subtle. But seasonal weather changes cause dramatic variation in water temperature, causing waters to mix.

DAILY CHANGES

Strong winds cause large waves that mix a lake's water. Cloud cover is also important. Skies can be cloudy, clear or a mixture. On cloudy or foggy days, when visibility is low, the sun cannot warm top waters as quickly as on clear days. On clear, sunny days, lake's top waters become warm.

SEASONAL CHANGES

Winter - Sometimes the water near the surface freezes. During winter, the whole water column (surface to bottom) becomes uniformly cold and near freezing.

Spring - Sun warms the cold water near a lake's surface. At 39.2F it reaches its maximum density, and sinks. This process causes a lake's waters to mix. Winds get stronger during spring to help to mix the water column, top to bottom. This seasonal mixing also occurs in the fall to help circulate nutrients throughout lake.

Summer - Sun warms the surface waters of a lake. Winds die down and are no longer strong enough to mix the whole water column. Surface water becomes very warm, but the bottom water remains cold. Swimmers may notice this sharp temperature difference when they dive.

Fall - Great Lakes surface waters cool. When water it reaches its maximum heaviness, it sinks. Seasonal processes cause a lake's waters to mix again.

Seasonal inversions turn over the water column to regenerate macrobiotic life and temper our climate. A blessing of four seasons, unlike sub-tropical regions.

SUCCESS! OFF-SHORE BREAKWATER ALONG BEACH AND DUNE - ANTRIM COUNTY COAST

THEN NO BEACH IN 2020.



The breakwater was completed in late August 2020, and before the 2021 drop in water level. Stake marks OHWM 2 feet down. Neighbors have come by to see results for themselves. TNN is gratified that facts matter and

spread by word of mouth. There are reports of groynes being removed and of a break-water planned seaward of an existing sea wall to restore the beach by natural forces.



NOW - GRANDCHILDREN LOVE BROAD DEEP BEACHES.

So do Piping Plovers and other shore nesting birds. Kids again caught and released native crayfish, frogs, and fingerlings. Nearshore water is deeper at breakwater and beach as sand built seaward and landward by wave action. The timeless harmony of natural forces assisted by thoughtful human design prevailed. This breakwater has been replicated on dozens of other properties along the Antrim County coast, to work together with lower water levels.

PLEASE DONATE TO TNN, A 501(c)(3) Charity

Dear Neighbor,

In these challenging times, adversity brings out the best in us with perseverance and shared goals. Happily, TNN has always operated virtually – no physical facility - no staff – all volunteers. TNN engages support partners within the limits of resources.

TNN News publishes information curated to your interests. Your tax- deductible donation finances projects to help contend with challenges to our lifestyle and the vagaries of weather and climate. Priority: The TNN website needs a substantial upgrade.

We appreciate your renewed commitment.

Keith Termaat, TNN President

Mail check to: Township Neighbors Network - P.O. Box 887, Elk Rapids, MI 49629

For checks use attached form. PAY PAL on website.

Employer match, IRA, 401k? Contact Keith at TNN.Mich@gmail.com.

Published by: Township Neighbors Network, A 501(c) (3) Public Charity. P.O. Box 887, Elk Rapids, MI 49629. This newsletter is not to be construed as providing advice to shoreline property-owners on which shoreline structures or activities require permits. Contact the EGLE and U.S. Army Corps of Engineers to determine if permits are needed. TNN, its officers and directors are not liable to any person or entity for decisions made or actions taken that relies upon the information provided herein. All editorial comments, opinion and statements of fact appearing in this publication, represents the views of the respective authors and does not necessarily carry the endorsement of TNN or its officers and directors. Information in TNN News is gathered from sources considered to be reliable, but the accuracy of all information cannot be guaranteed. TNN is not responsible for errors and omissions of cited sources which are solely responsible for content.