



Photo: 'Ice Eggs' by Barb Termaat

TODAY'S WEATHER:

www.wunderground.com/us/mi/kewadin

STORM CENTRAL

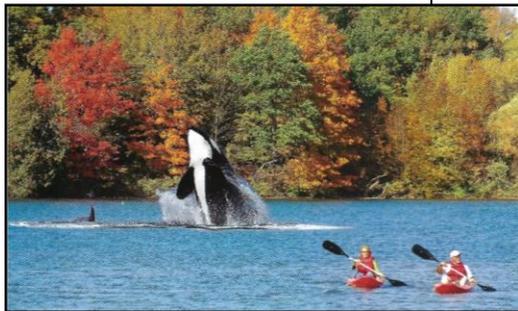
www.gtlakes.com/storm-central/

TNN 2020 – Advance a blend of natural and engineered solutions for stable beaches, vibrant aquatic life and watershed prosperity.

TNN 2020 - A voice in a chorus to cut manmade inflows in Canada add 4.3 in. to Lake M-H. Seawalls doubled to 14% vs. 7% in 2016.

TNN 2020 Partners: donors-STEM fans-scientists-volunteers, schools. Donations power field work along shore - Elk Rapids to Norwood.

TNN 2020 -Assess reefs, sandbars and aquatic life - EASTB coastal watershed including water quality.



TNN 2020 – Help kids keep joy of beach play – always. Treat, NOT land dispose, human waste locally.

TNN 2020 - Gifts of \$150+ power field work. PAY PAL on website – For checks use Form. Giving with employer match, IRA, 401k? Contact TNN.Mich@gmail.com.

THE LAST INCH - A Commentary BY: David Wolf, Restore Our Waters International (ROWI)

EXCERPT: PLEASE READ ENTIRE ARTICLE

EXCERPT: “As surging Great Lakes threaten Michigan, homeowners beg Canada for help” <https://www.bridgemi.com/michigan-environment-watch/surging-great-lakes-threaten-michigan-homeowners-beg-canada-help>.

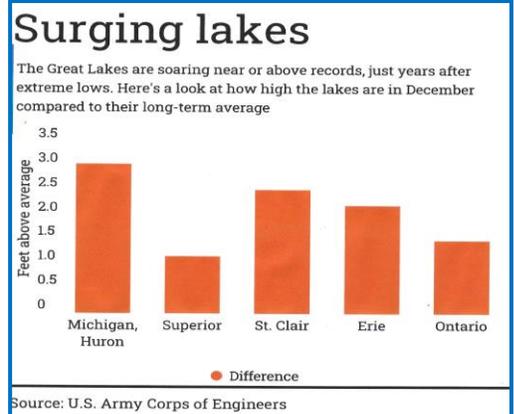
All the Great Lakes fluctuate within certain ranges. But L. Michigan-Huron and Georgian Bay (Canada) have, by far, the greatest range, 6½ feet*, and are 2.8 feet above average. These Lakes are also the largest not having controlled outflows.

L. Michigan - Huron and Georgian Bay have twice the shoreline (5,463 miles) of Lake Superior (2,725 miles), about seven times the shoreline of each L. Erie and Ontario. One would think that the largest lakes deserve the most attention when it comes to managing water level extremes.

This has not happened.

The 6½ foot range of Lake M - H & Georgian Bay may imply to some that extremes ought to be expected and may not be a big deal. **But that misses a major point:**

At either extreme - high or low water - the last inch has a much greater impact than fluctuation of two or three feet in the middle of the 6½ foot range! (Cont'd Page 3)



Whaling and Other Lake Michigan Tales

BY: Mike Norton - Reprinted by Permission Barefoot, the lifestyle magazine of Grand Traverse Resort and Spa.

The volunteers at the Traverse City Visitor Center get a lot of questions from visiting out-of-towners. The oddest might be the ones about whale-watching tours.

Traverse City is nearly 800 miles from the nearest ocean, but its long sandy beaches and maritime (ambiance) seem to persuade visitors they're at the seashore.

Visitors may also have been influenced by the Facebook page of the Lake Michigan Whale Migration Station, with its evocative photographs of humpbacks, orcas, belugas, and other cetaceans cavorting in West Grand Traverse Bay and swimming past the Sleeping Bear Dunes. The station page is followed by nearly 14,000 viewers, many of whom enjoy contributing their own stories about whale sightings and encounters, as well as tips about freshwater whaling.

The page attracted passionate fans and scornful detractors. For the record, scientists insist that no whales or other ocean mammals live in the Great Lakes. Sometimes the debate can get quite heated.

In any case, the controversy provides lots of April Fool's fodder at the Traverse City Visitor Center. For 2018, the center created an online video to promote whale watching tours, and there's been sporadic talk about starting an annual whale festival. (Image by Traverse City Tourism.com)

WHALE IN THE BAY

By: Keith Termaat, TNN News editor

We have all heard the idiom, the 'elephant in the room', to draw attention to a larger truth or issue that is being ignored. But what do we call larger truths when it comes to the waters of Grand Traverse Bay? I suggest the **'Whale in the Bay'**. The tongue in cheek article nearby notes that the nearest whales to GT Bay are about 800 miles away. (Cont'd Page 2.)



Photo: University of Manitoba

EAST BAY AQUATIC LIFE

BY: Great Lakes Environmental Center.

Conclusion: Very few macro-invertebrates were found near the East Bay shore due to the lack of diverse habitat for colonization.



GONE! Total invertebrates ranged from 75 living in small woody debris to 8 in floating debris. The number of groups (taxa) ranged from 8 on small woody debris to 4 in small cobble.

HABITAT A woody plant was found rooted/living on the northern edge of the plot. This offered best habitat for macro invertebrate colonization. Small cobble and sand samples near shore and at 2.6 feet provide potential macro -invertebrate colonization. Afloat debris provided no opportunity.

OTHER AQUATIC LIFE No birds, amphibians, fish, aquatic plants to 3.3 feet was seen. No large cobble crayfish habitat was found. (NOTE: Grandkids caught 6 crayfish - 1/2 native in July). A bald eagle was seen flying near shore.



LOCAL MITCHELL CREEK

No sampling at Creek mouth detached from East Bay. Large cobble above water nearshore sampled filamentous green algae confirmed as Cladophora; volume is normal for the Great Lakes and NOT indicative of nutrient loading. [Final Report by E-mail request to - TNN.Mich@gmail.com](mailto:TNN.Mich@gmail.com) - with donation.

WHALE IN THE BAY (Cont'd from Page1)

to the northeast in Quebec and Manitoba. In truth whales are a bit closer in James Bay (off Hudson Bay) where Belugas are common.

Beluga whales are near the top of the food chain in these saline arctic waters (see diagram). Polar bears are at the very top except people.

No-one would say folks living near L. Michigan need to worry about polar bears as my James Bay friend Margaret Ann does. She relies on conservation officials to control polar bears.

Numerous Belugas overwinter in the brackish river mouths of the Severn River Estuary and near the shores of James Bay and Hudson Bay <https://www.ontario.ca/page/beluga-management-plan>. Beluga have been documented to swim considerable distance upstream in Canada's Moose River.

So, what does the Beluga's food chain have to do with Grand Traverse Bay?



The Whale in the Bay (or if you like, the elephant in the room) is that the Grand Traverse Bay food chain has been decimated largely by invasive deep-water Quagga mussels. The arctic food chain is doing reasonably well although threatened.

A recent joint TNN-GLEC-Newton's Road pilot study near shore East Bay (sidebar) reported there are very few macro-invertebrates.

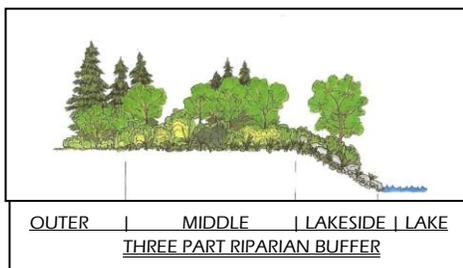
BELUGA WHALE FOOD CHAIN – Polar bear eats Beluga whale – Beluga whale eats only fish (favorites: White Fish, Black Fish, Grayling, Trout, Arctic Char) – Fish eats Krill – Krill eats plankton. <http://brilliantbelugawhales.weebly.com/food-chain/diet.html>

GRAND TRAVERSE BAY: Fish at the top of the food chain such as salmon are largely gone, once plentiful seagulls and terns have gone to feed on farms and dumpsters. There is little for them to eat alongshore. To restore the food chain, clearly invasive Quagga mussels have to be killed, removed, and controlled as were sea lampreys' generations ago. So that's the 'Whale in the Bay'.

Authorities show little urgency. Research proceeds slowly with ever more tests over a decade. There is currently no large-scale action to kill/remove Quagga mussels that arrived in bilge water of ocean-going vessels. Sadly, rules for bilge water took nearly two decades to enact.

The number and type of fish in the Bay will continue to worsen unless action is taken.

What is a "Riparian Buffer Zone" and Why is it Important?



BY: **THI TROUT HEADWATERS, INC.**
<https://www.troutheadwaters.com/what-is-a-riparian-buffer-zone-and-why-is-it-important/>

A riparian zone is the area of land directly adjacent to a waterway (lake, stream, river, or wetlands). Where these margin areas are healthy, they are characterized by hydrophilic plants (riparian vegetation). This vegetation plays an integral role in protecting water quality, ecological integrity and biodiversity.

Natural and restored buffer areas serve critical functions for nature and humans. Landowners and users benefit from improved fishing, hunting, and wildlife habitat. Cont'd on page 3

HOMEOWNERS NEAR THE GREAT LAKES FACE A 'VERY SCARY' CHALLENGE: HOW DO YOU HANDLE A GENERATION WORTH OF WATER LEVEL CHANGES IN A FEW YEARS?

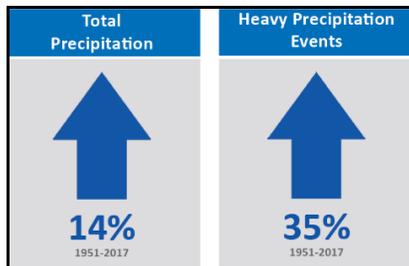
BY: Tony Briscoe. Chicago Tribune Jan 9, 2020

EXCERPT - PLEASE READ THE ENTIRE ARTICLE
<https://www.chicagotribune.com/news/environment/great-lakes/ct-lake-huron-climate-change-water-levels-20200109-oiw7nunhoh3hm2vg5lrfiimou-story.html>

Lake levels are governed by runoff, precipitation, evaporation; an equation that's extremely difficult to forecast over six months, let alone decades, according to scientists.

But researchers say they believe climate change is adding to steep swings between lows and highs; could become more (a) pronounced future.

As heat-trapping greenhouse gases spiked over a century, Earth's warmer atmosphere can hold more moisture, which scientists say results in more frequent and severe storms.



Source: <http://glisa.umich.edu/gl-climate-factsheet-refs>

In 2018 - 19, Great Lake States saw strings of the wettest years in 124.



Despite this, Captain Ken is an ardent optimist. He's renovating his Island home over the winter. "We made it through '86 water and will (again)."

The UP's Clark Township Supervisor, says, "the buzzwords of 'adaptive management' are polar opposites. You're either adapting or managing; together it's a train wreck."

Riparian Buffer Zone Cont'd from page 2

All residents in a watershed and society in general, benefit from improved water quality, lower costs of cleaning sediment from reservoirs and rivers, and increased wildlife diversity.

Properly functioning buffers can sequester more carbon than annually cropped fields or cool-season pastures. Natural and restored riparian areas improve quality of life for rural & urban citizens. Spring TNN News will lay-out choices for restoring riparian buffers on your property.

THE LAST INCH Cont'd from page 1

The Bridge Photos by Anthony Lanzilote

Commercial shipping, boaters, marina operators, municipalities, shoreline properties, and natural features (e.g. wet-lands, fish habitat) are negatively impacted by extremely low water AND by extremely high water, including commercial shipping as harbors and piers become submerged especially in storms.



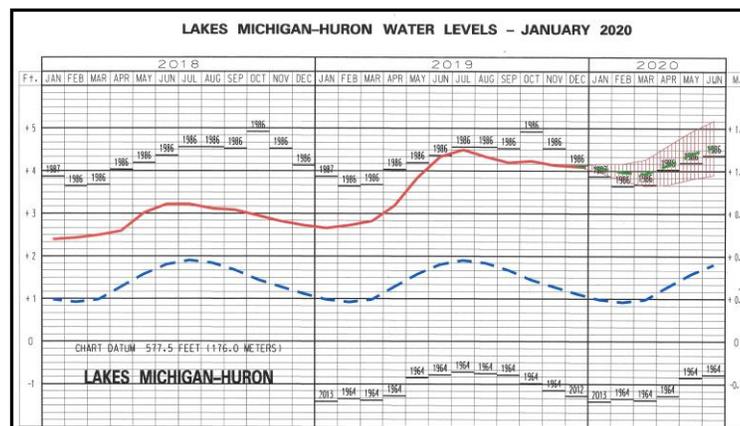
Water damage is cumulative, notably at the extremes. So, flows into and out of Lake Michigan - Huron and Georgian Bay deserve serious consideration by Canadian and U.S. authorities. Governments of both nations have neglected the highwater problem.

The Great lakes systems must be managed as a whole. To date, the International Joint Commission for the Great Lakes (IJC) has failed to dive into the deep water until recently. Reportedly, the IJC, did not approve greater outflows from L. Superior as it has done routinely in the past. It will take several months for the effects to be seen.

It is high time for coordinated policies, programs, and structures to trim high and low water extremes in L. Michigan - Huron and Georgian Bay. Spring run-off is coming!

* NOTE: L. Superior water level range was reduced by Treaty to 4 feet in 1914 by removing the bottom foot of its natural range to the detriment of economic & environmental interests of the lower lakes. Ogoki and Long Lac diversions from Hudson Bay into Lake Superior were built in 1943. These diversions add 4.3 inches to Lake Michigan - Huron.

US ARMY CORPS OF ENGINEERS WATER LEVEL FORECAST:



Forecasted January 31st Lake Superior and Lake Michigan-Huron water levels remain 4 and 19 inches respectively, higher than they were a year ago, January 31, 2019.

Lake Superior is expected to be 2 inches below its level a month ago;

Lake Michigan-Huron is forecasted to be an inch higher. Lakes Superior and Michigan-Huron are expected to continue their seasonal decline over the next month, falling 3 and 1 inches respectively by March 2nd. L. Superior outflow into L. M-H is forecasted to be above average.