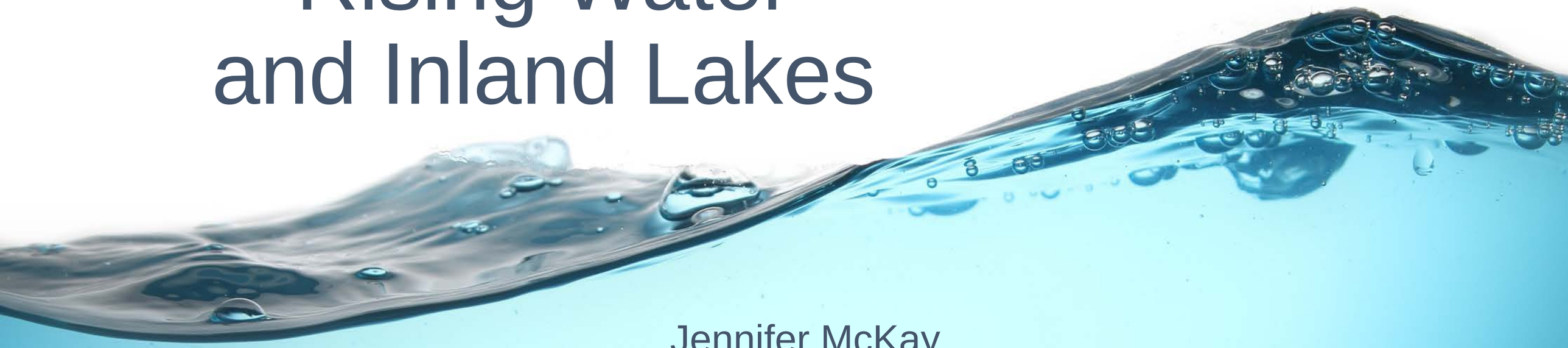
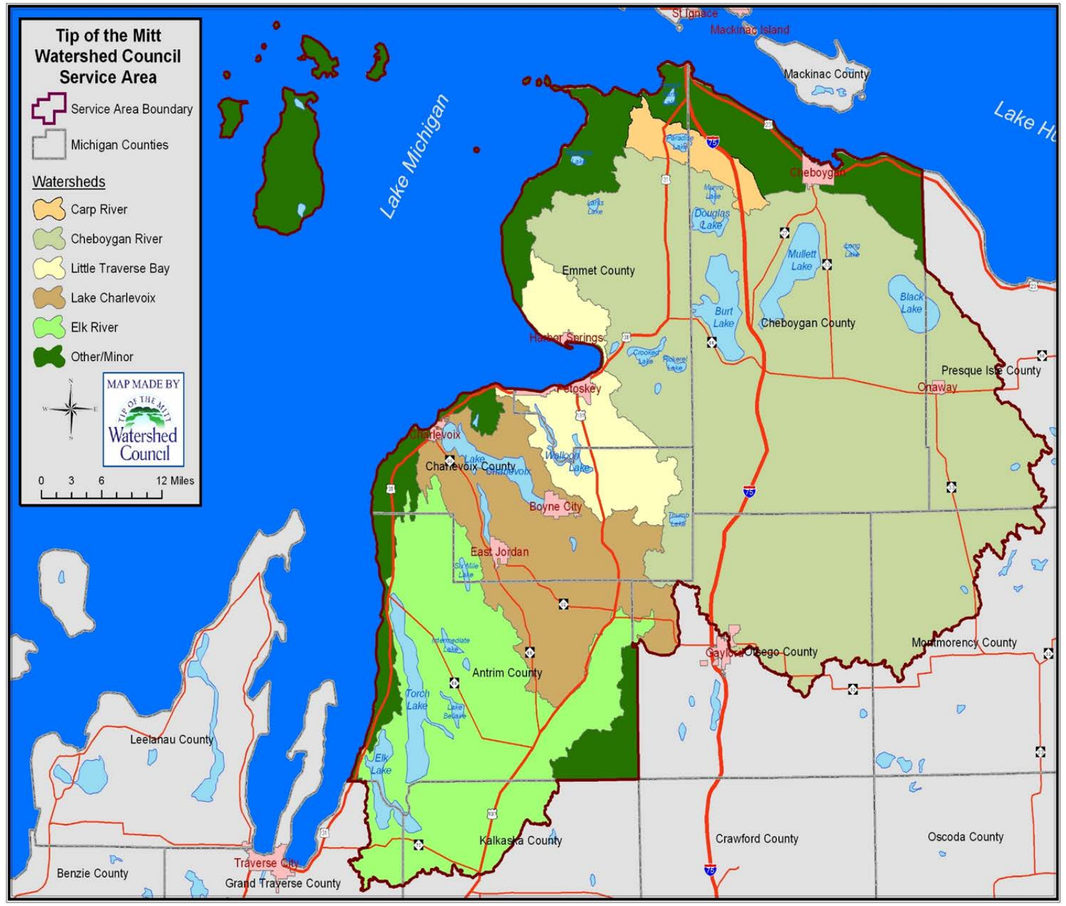
Rising Water and Inland Lakes



Jennifer McKay
Policy Director
Tip of the Mitt Watershed Council

April 17, 2020

Tip of the Mitt Watershed Council



- Nonprofit formed in 1979
- Over 2,700 members

The Watershed Council is dedicated to protecting our lakes, rivers, wetlands, and groundwater through respected advocacy, innovative education, technically sound water quality monitoring, and thorough research.

Photo Credit: Jeff J. Cashman

Photo Credit: Mark Breederland, Michigan Sea Grant

Photo Credit: Brian Wells,Times Herald

Photo Credit: Steve Zucker, Petoskey News Review

Water Level Data

- Water levels are reported as an elevation above sea level (not a depth).
- Levels are referenced to the International Great Lakes Datum of 1985.
- Lake Michigan and Lake Huron are viewed as one lake
- Water levels are based on still water conditions, and do not take meteorological forcing into account.
- Daily reported levels are based on a network of water level gauges
- Coordination with Environment and Climate Change Canada (ECCC).
- Detroit District of the USACE is the keeper of the official monthly water level statistics from 1918-2019.

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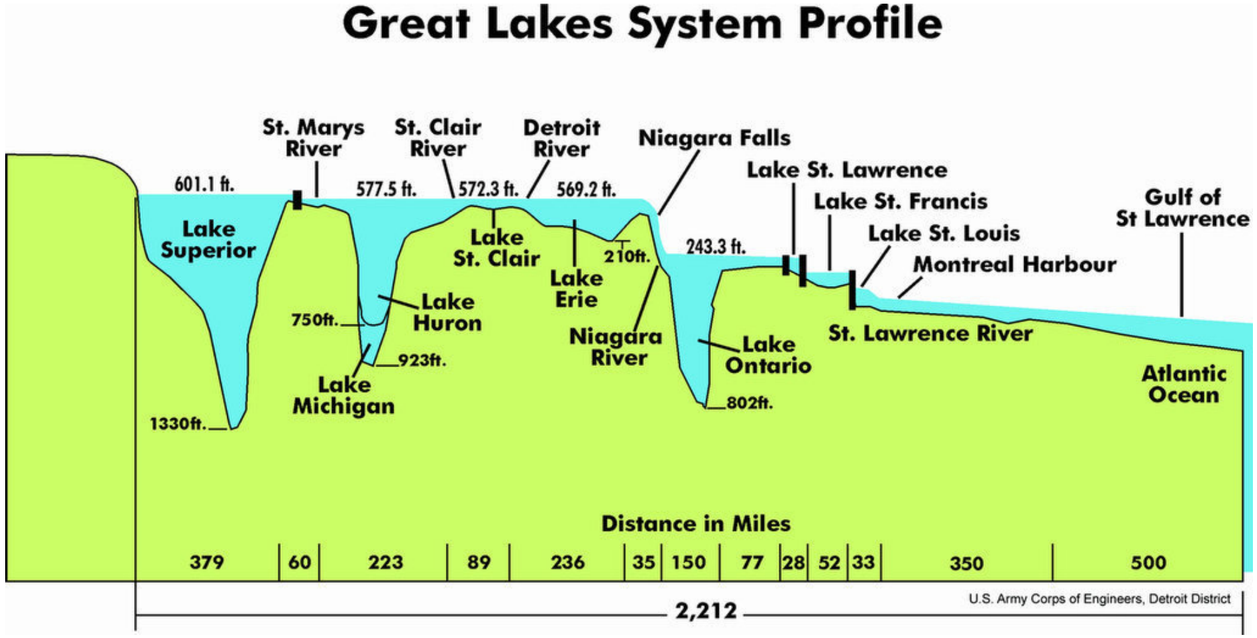
Great Lakes Ecosystem



Credit: USACE

Credit: USEPA

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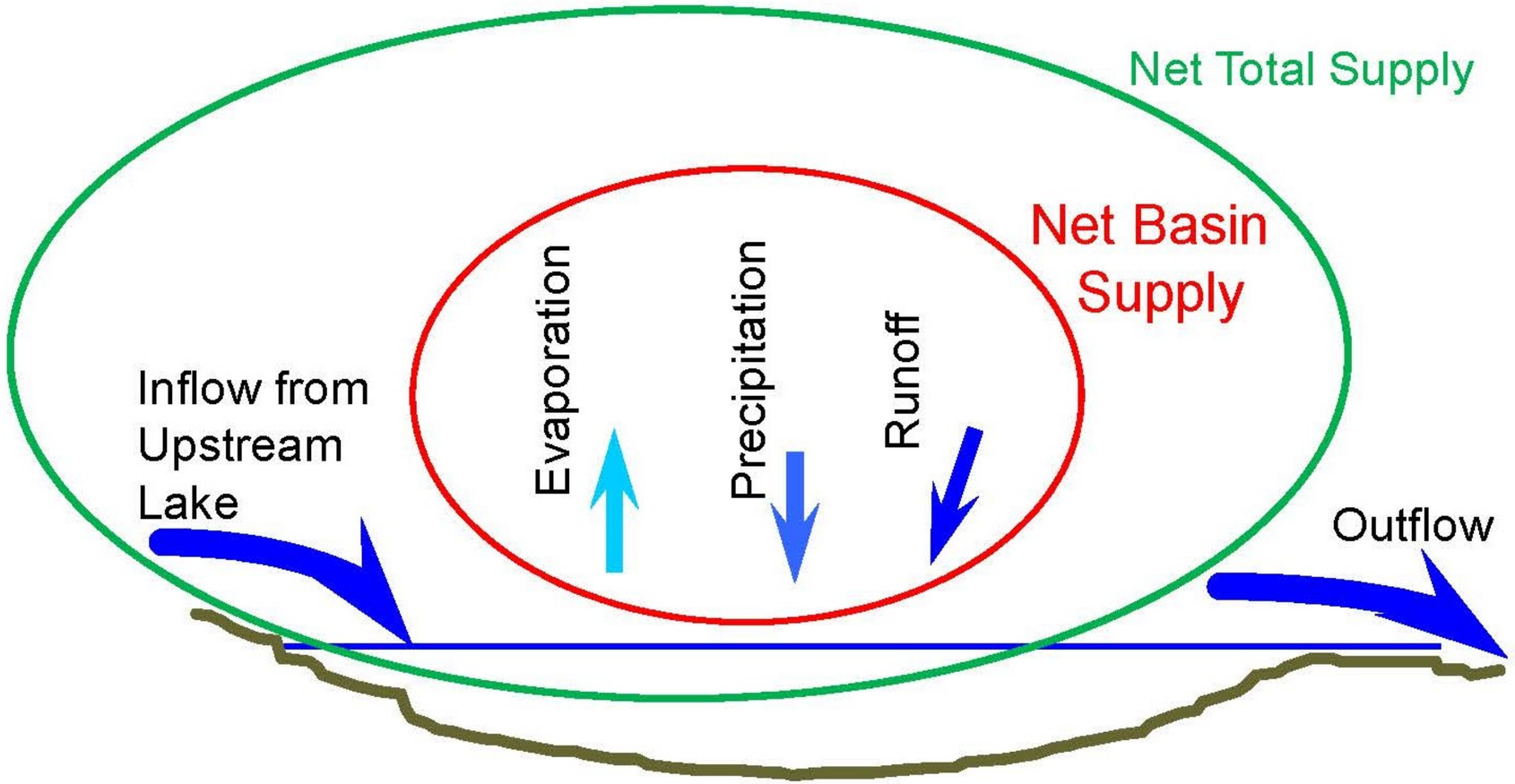
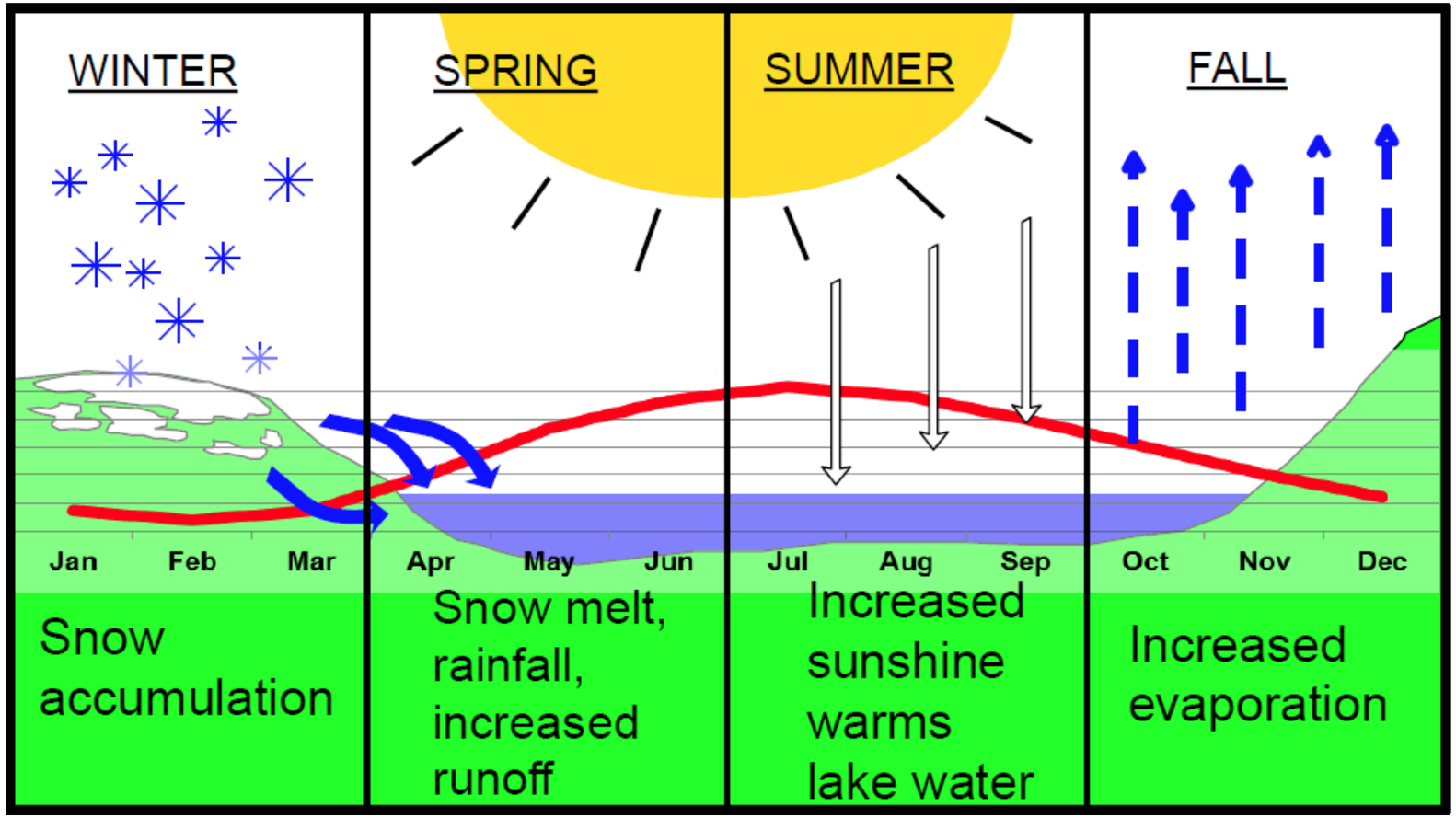
Factors Affecting Water Levels



Credit: USACE

Annual Water Levels and Hydrologic Cycle



Credit: USACE

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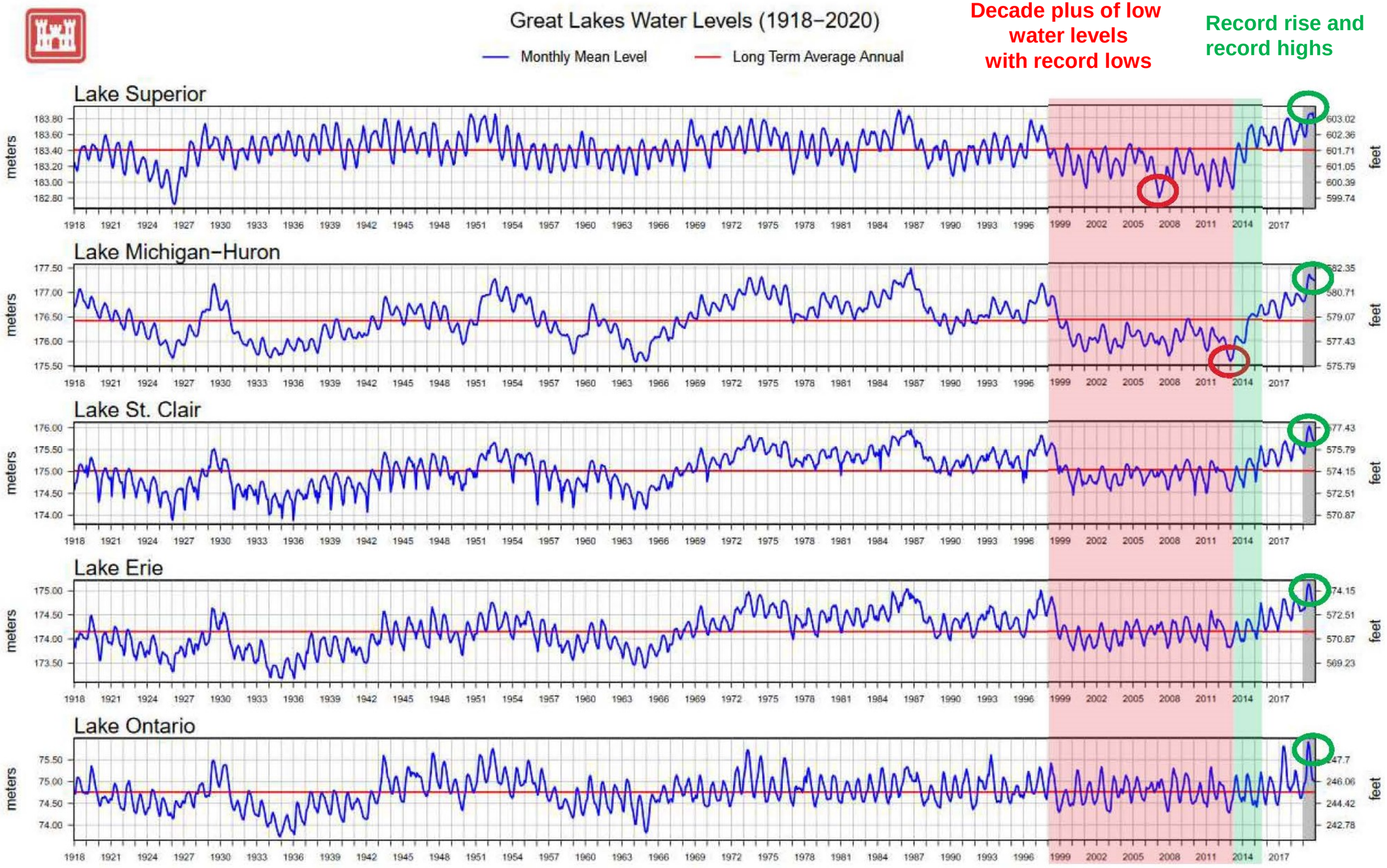

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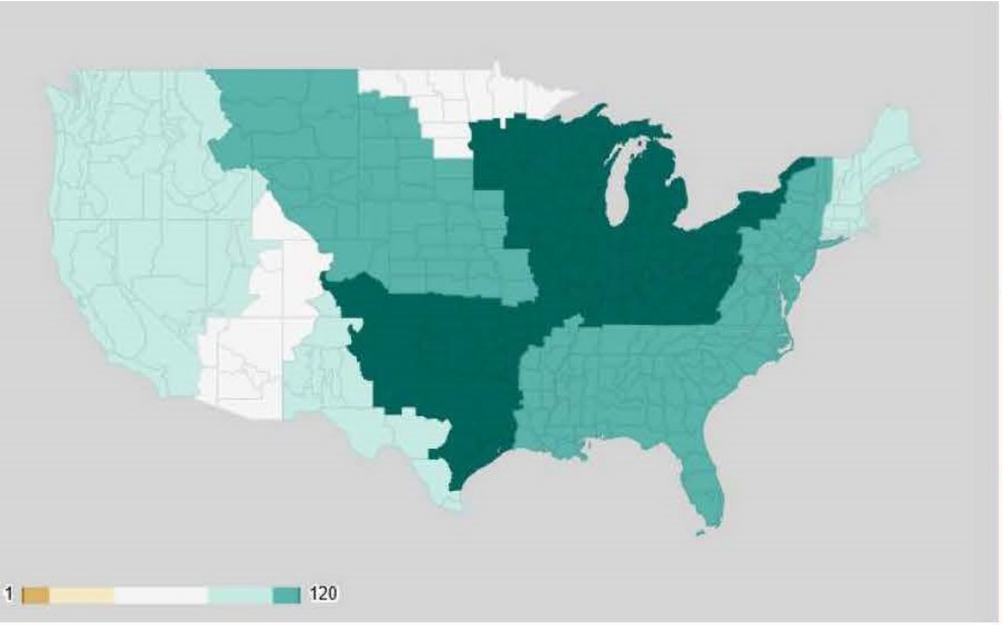
Why are Levels So High? Precipitation



Wettest 12 – 60 month periods in 120 plus years for the Great Lakes

NOAA National Centers for Environmental information, Climate at a Glance

Credit: USACE

PERIOD	VALUE	1901-2000 MEAN	ANOMALY	RANK (1895-2020)	WETTEST/DRIEST SINCE	RECORD
Feb 2019–Jan 2020 12-Month	42.75" (1,085.85mm)	32.77" (832.36mm)	9.98" (253.49mm)	125th Driest	Driest since: 2019	1931
				1st Wettest	Wettest to Date	2020
Aug 2018–Jan 2020 18-Month	63.66" (1,616.96mm)	48.89" (1,241.81mm)	14.77" (375.15mm)	124th Driest	Driest since: 2019	1931
				1st Wettest	Wettest to Date	2020
Feb 2018–Jan 2020 24-Month	81.78" (2,077.21mm)	65.53" (1,664.46mm)	16.25" (412.75mm)	124th Driest	Driest since: 2019	1964
				1st Wettest	Wettest to Date	2020
Feb 2017–Jan 2020 36-Month	121.84" (3,094.74mm)	98.30" (2,496.82mm)	23.54" (597.92mm)	123rd Driest	Driest since: 2019	1965
				1st Wettest	Wettest to Date	2020
Feb 2016–Jan 2020 48-Month	159.08" (4,040.63mm)	131.07" (3,329.18mm)	28.01" (711.45mm)	122nd Driest	Driest since: 2019	1964
				1st Wettest	Wettest to Date	2020
Feb 2015–Jan 2020 60-Month	193.85" (4,923.79mm)	163.82" (4,161.03mm)	30.03" (762.76mm)	121st Driest	Driest since: 2019	1935
				1st Wettest	Wettest to Date	2020

Great Lakes Water Levels

New Record Highs in 2019

- May: Superior, St. Clair, Erie
- June: Superior, St. Clair, Erie* and Ontario*
- July: Superior, St. Clair, Erie* and Ontario*
- August: Superior (tied), St. Clair, Erie
- September: Superior (tied), St. Clair, Erie
- October: none
- November: none
- December: none

New Record Highs in 2020

- January: Superior, Michigan-Huron, St. Clair (tied)
- February Superior, Michigan-Huron, Erie
- March: Michigan-Huron, Erie, St. Clair

*highest monthly mean on record for all months

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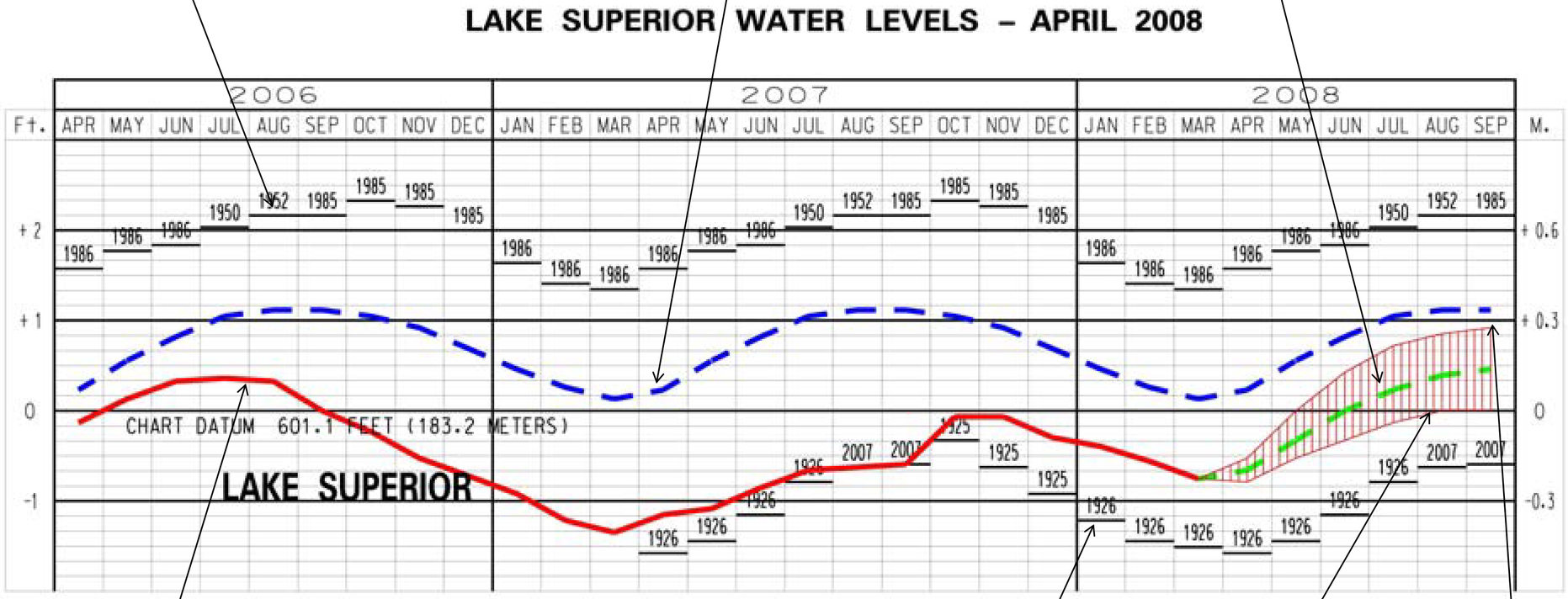
Highest monthly levels (1918-2007)

Long term average levels (1918-2007)

Most likely water level forecast (1 to 6 months)



Recorded levels

Lowest monthly levels (1918-2007)

Range of projected levels (1 to 6 months)

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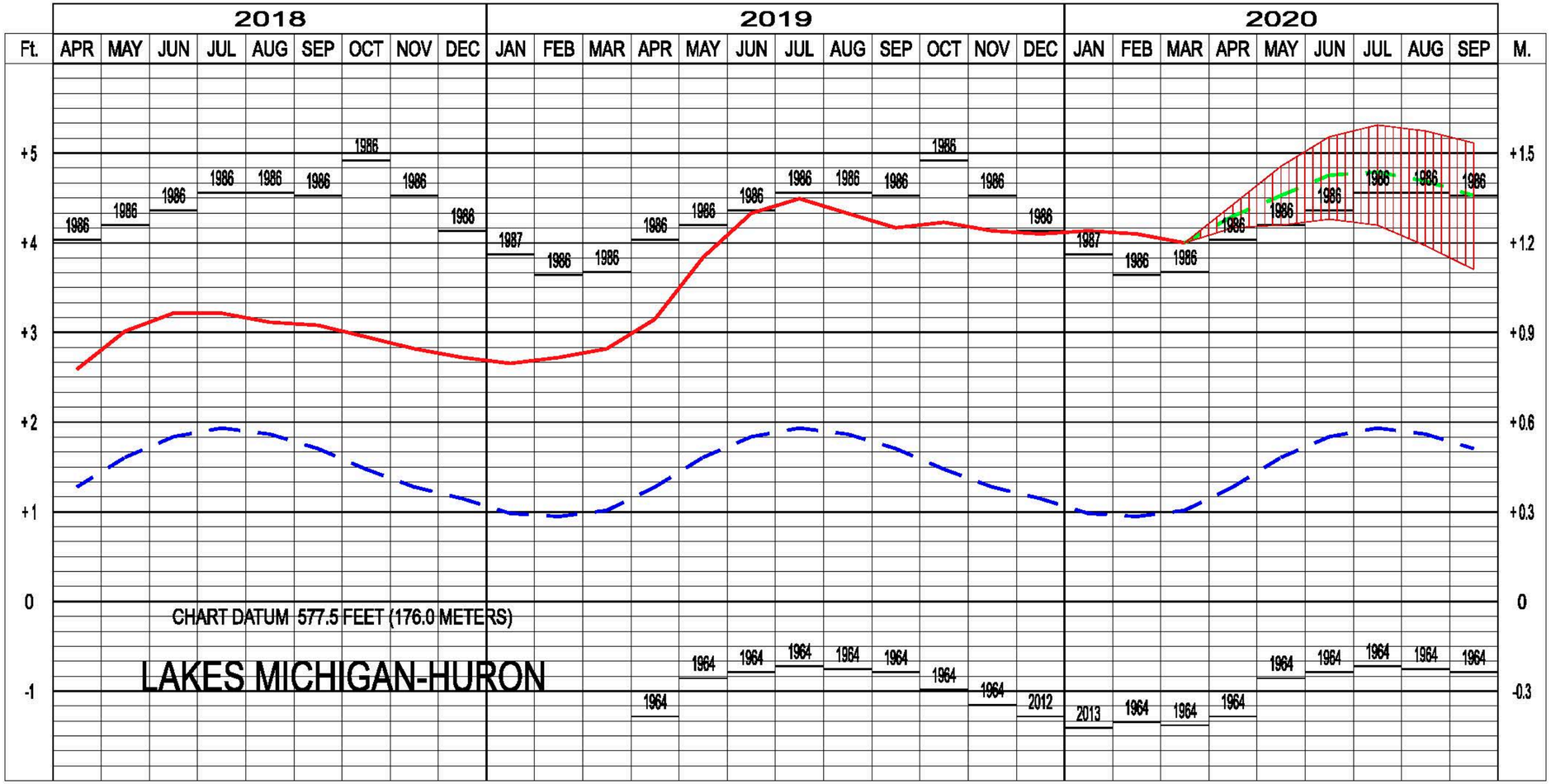
LAKES MICHIGAN-HURON WATER LEVELS - APRIL 2020



LEGEND

LAKE LEVELS

RECORDED

PROJECTED

AVERAGE **

MAXIMUM **

MINIMUM **

1985	1985	1973	1973
1936	1934	1926	1934

** Average, Maximum and Minimum for period 1918-2019

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Impacts of High Water

Credit: Brian Marshall, EGLE

Credit: Cory Morse, The Grand Rapids Press via AP

Shoreline Protection

Credit: Brian Marshall. Michigan Department of Environment, Great Lakes, and Energy

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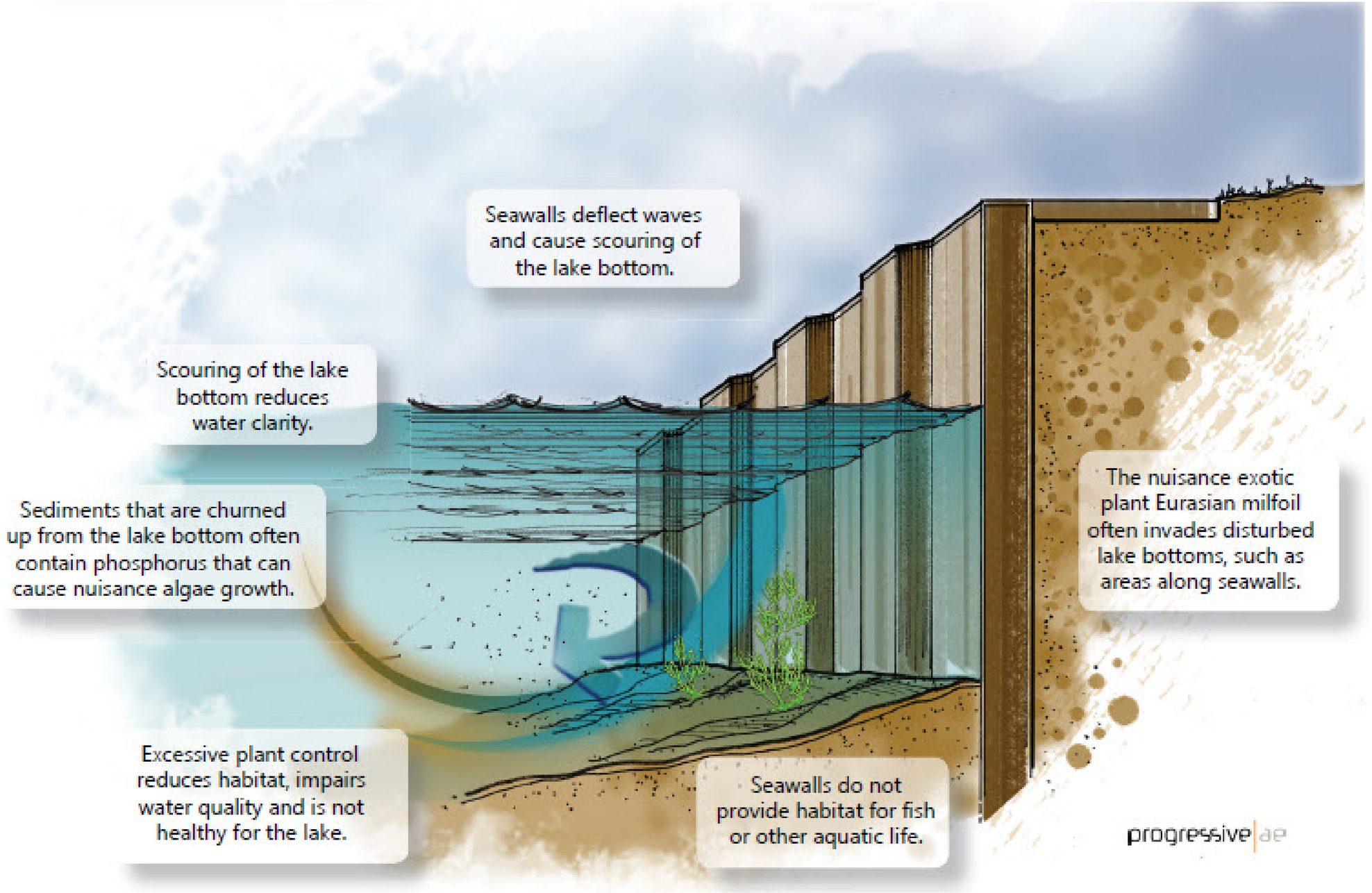
Shoreline Protection

Credit. WWMT, Will Hawnni



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Bioengineering

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Moving Homes

- Better long-term solution
- Actual move can be completed in a few days
- Cost: $12,000-$100,000 ($12-$16/square foot)
- List of home movers on EGLE and TOMWC websites
  - Michigan.gov/EGLEHighWater
  - https://www.watershedcouncil.org/home-moving.html

Credit: MLive

Home Movers in Michigan

Contractor	City/State	Contact	Phone Number
D & B House Movers	Monroe, MI	www.dbhousemovers.com	734-497-7956
Deitz House Moving Engineers, Inc.	Muskegon, MI	deitzmovers@aol.com	231-773-8964
Dingey Movers, Inc.	Zanesville, OH	www.dingeymovers.com	740-453-6724
HD House Movers, LLC	Lake City, MI	https://hdmoversllc.com/	231-229-4213
J & R Building Movers	Petoskey, MI		231-348-9571
Lykowski Construction Inc.	South Bend, IN	www.lykowskiconstruction.com	574-291-8858
Rollaway Movers, Inc	Grand Rapids, MI	www.rollawayhousemovers.com	616-453-0123
Talaski Building Movers	Bad Axe, MI		989-269-6008
Wolfe House and Building Movers	North Manchester, IN	https://www.wolfehousebuildingmovers.com/	260-982-0302

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Shoreline Permitting

- Great Lakes – Part 325, Great Lakes Submerged Lands Act
  - Also requires a permit from the USACE
- Inland Lakes – Part 301, Inland Lakes and Streams Act
  - EGLE only deemed a navigable water
- Joint Permit Application is submitted through Michigan.gov/MiWaters
- Other local regulations may also apply
- EGLE's Environmental Assistance Center - 800-662-9278 or by e-mail to EGLE-Assist@Michigan.gov

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EGLE Permitting

- If the water level is at or above the proposed structure, a permit is required regardless of the OHWM elevation
- Expediting review of permit applications
- Grant funding opportunities for local coastal communities for long-term planning related to coastal resiliency and master planning through EGLE's Coastal Zone Management Program

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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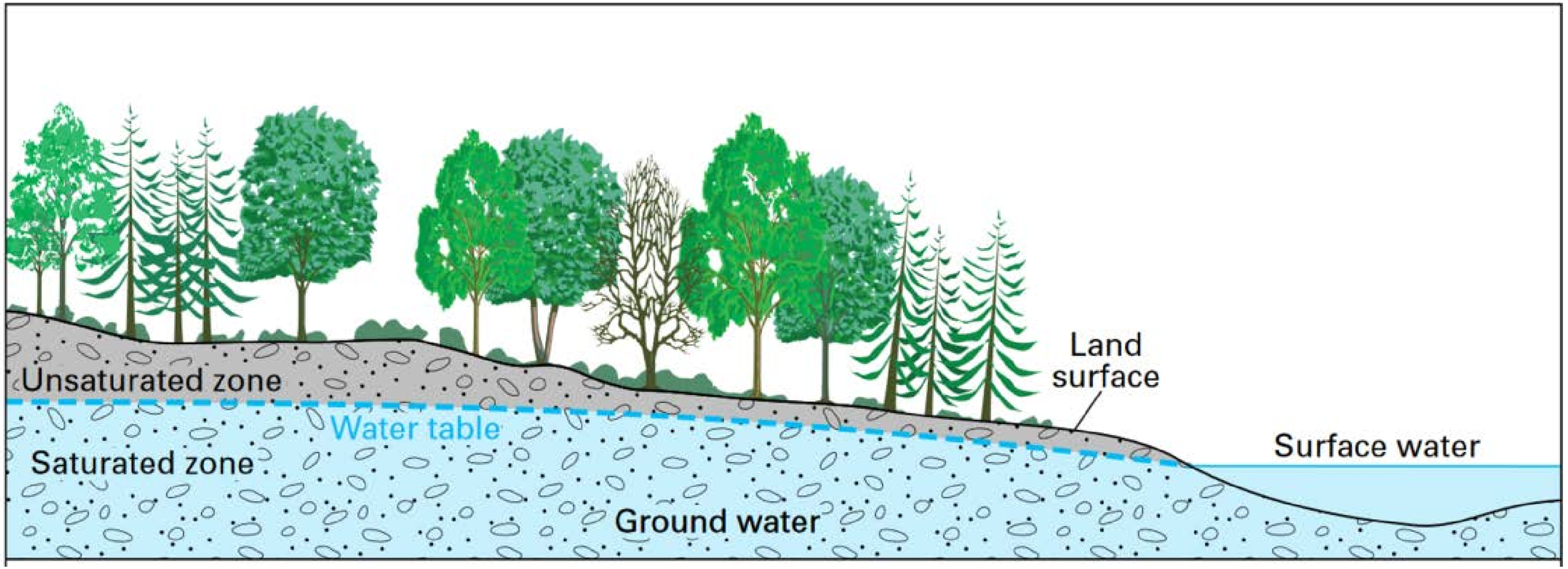
High Waters, High Water Table



Credit: Wisconsin DNR

Inland High Water Levels

Credit: Brian Marshall
Michigan Department of Environment
Great Lakes, and Energy

Credit: Brian Marshall
Michigan Department of Environment
Great Lakes, and Energy

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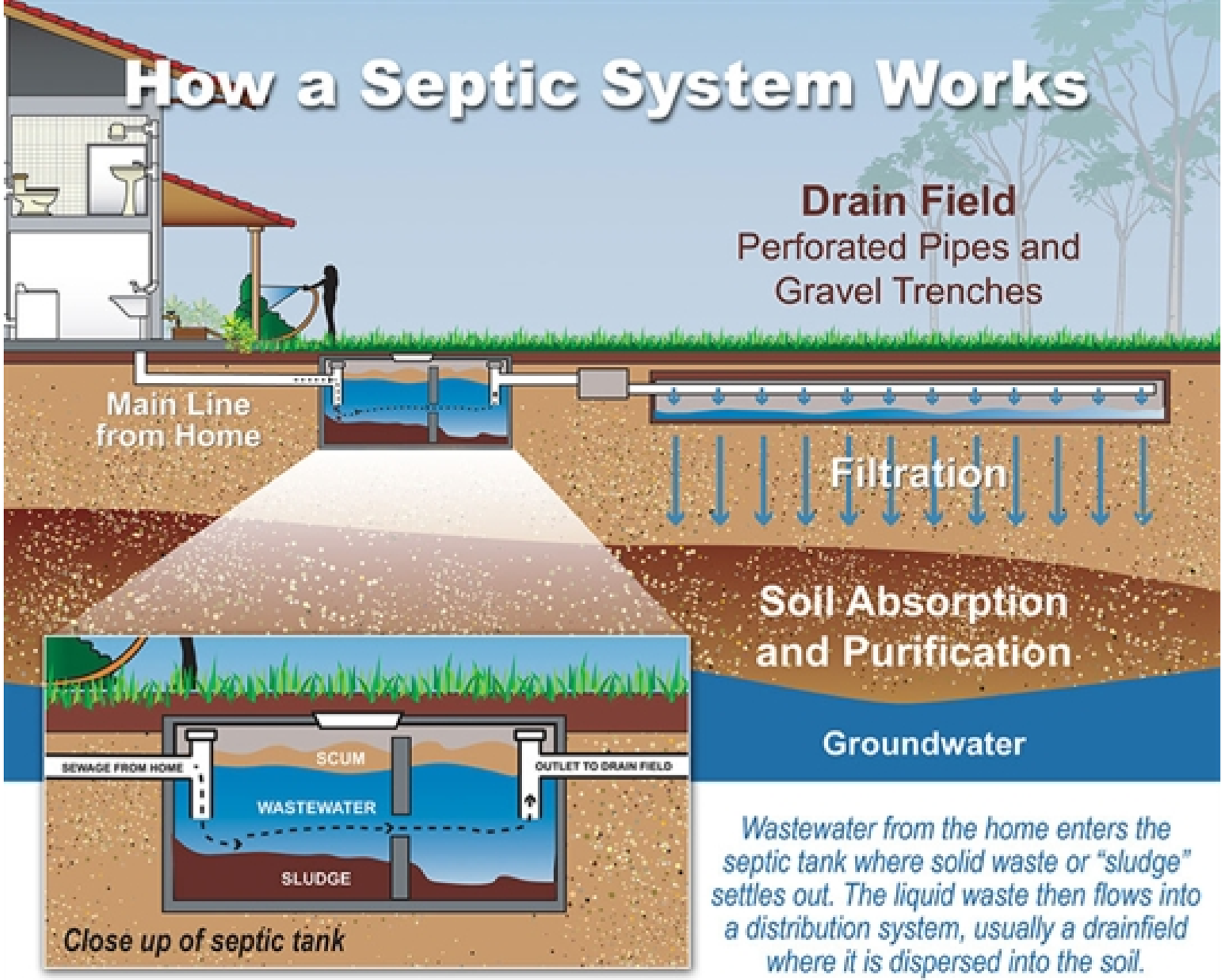
Council



Wastewater from the home enters the septic tank where solid waste or "sludge" settles out. The liquid waste then flows into a distribution system, usually a drainfield where it is dispersed into the soil.

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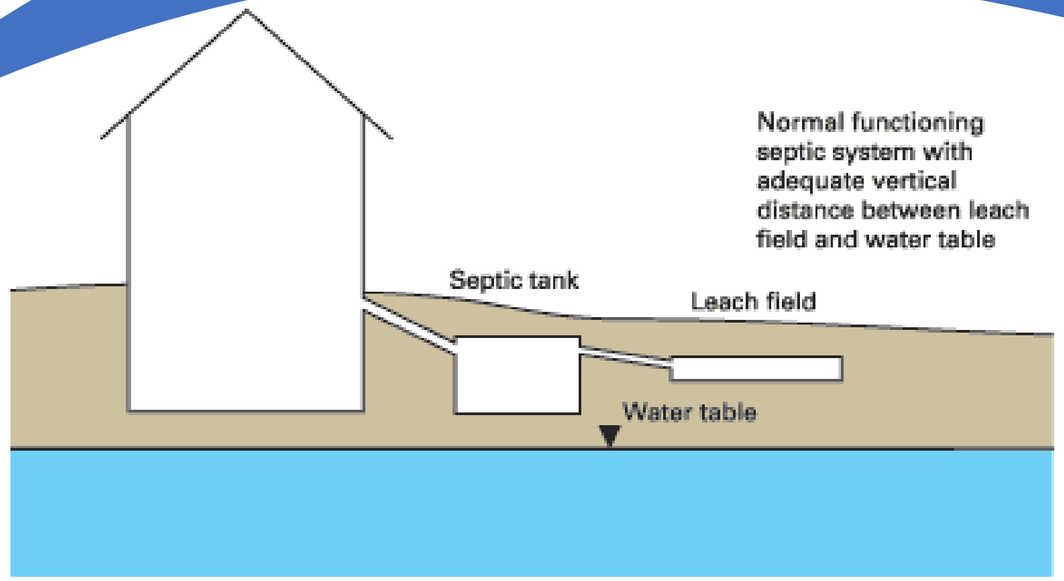

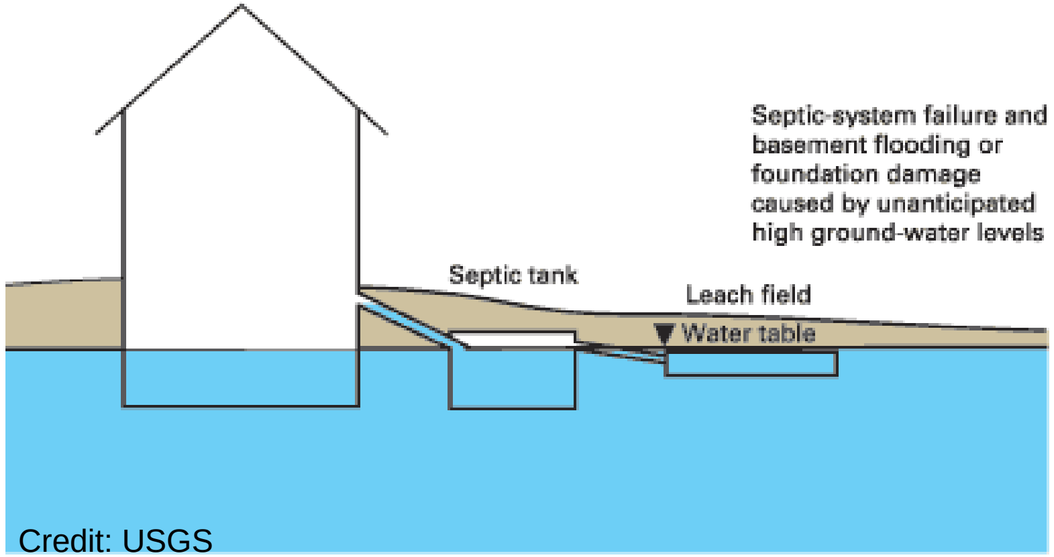

Credit: USGS

Not to scale

High water table =

- Septic system failure
- Basement flooding
- Foundation damage
- Drinking water well contamination
- Contamination of inland lakes
- And more

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Signs of Septic System Failure

Wet areas, lush grass, or foul odors around the drain field.

Sinks or toilets backing up or draining slowly, in spite of using plungers and drain cleaner

Noticeable algae and plant growth or a distinctly colored patch of bottom sediment

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Credit: Brian Marshall
Michigan Department of Environment, Great Lakes, and Energy

- **<u>Immediately call the local Health Department.</u>**
- Pump out septic tank
- Reduce water use
- Fence off the wet area around the drain field to minimize contact with wastewater

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Septic Operation and Maintenance

1. Have tank inspected and pumped regularly
2. Improve or upgrade system
3. Avoid harsh chemicals
4. Install a vegetative buffer
5. Direct rainwater away from drainfield
6. Construct septic system as far away from shoreline as possible
7. Do not apply fertilizer around a drainfield
8. Limit use of garbage disposal

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Drinking Water Wells

- Ensure your septic system is functioning properly
- Casing should extend 12 inches above the ground
- Extend well casing if needed
- Install watertight cap on wellhead
- If water reaches or covers top of well casing, assume well is contaminated
- Have well disinfected and tested by health department

Credit: Chuck Edwards,
Health Department of Northwest Michigan

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Other Concerns

- Electric currents in waters
- Contamination from basement/garage flooding
- Boating hazards

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Resources

- Michigan Department of Environment, Great Lakes, and Environment Great Lakes High Water Levels
- U.S. Army Corps of Engineers https://www.lre.usace.army.mil/About/Great-Lakes-High-Water/
- Tip of the Mitt Watershed Council – Home Moving Information https://www.watershedcouncil.org/home-moving.html

Thank You

Jennifer McKay

Policy Director

Phone: (231) 347-1181

jenniferm@watershedcouncil

Tip of the Mitt Watershed Council

426 Bay Street

Petoskey, MI 49770

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