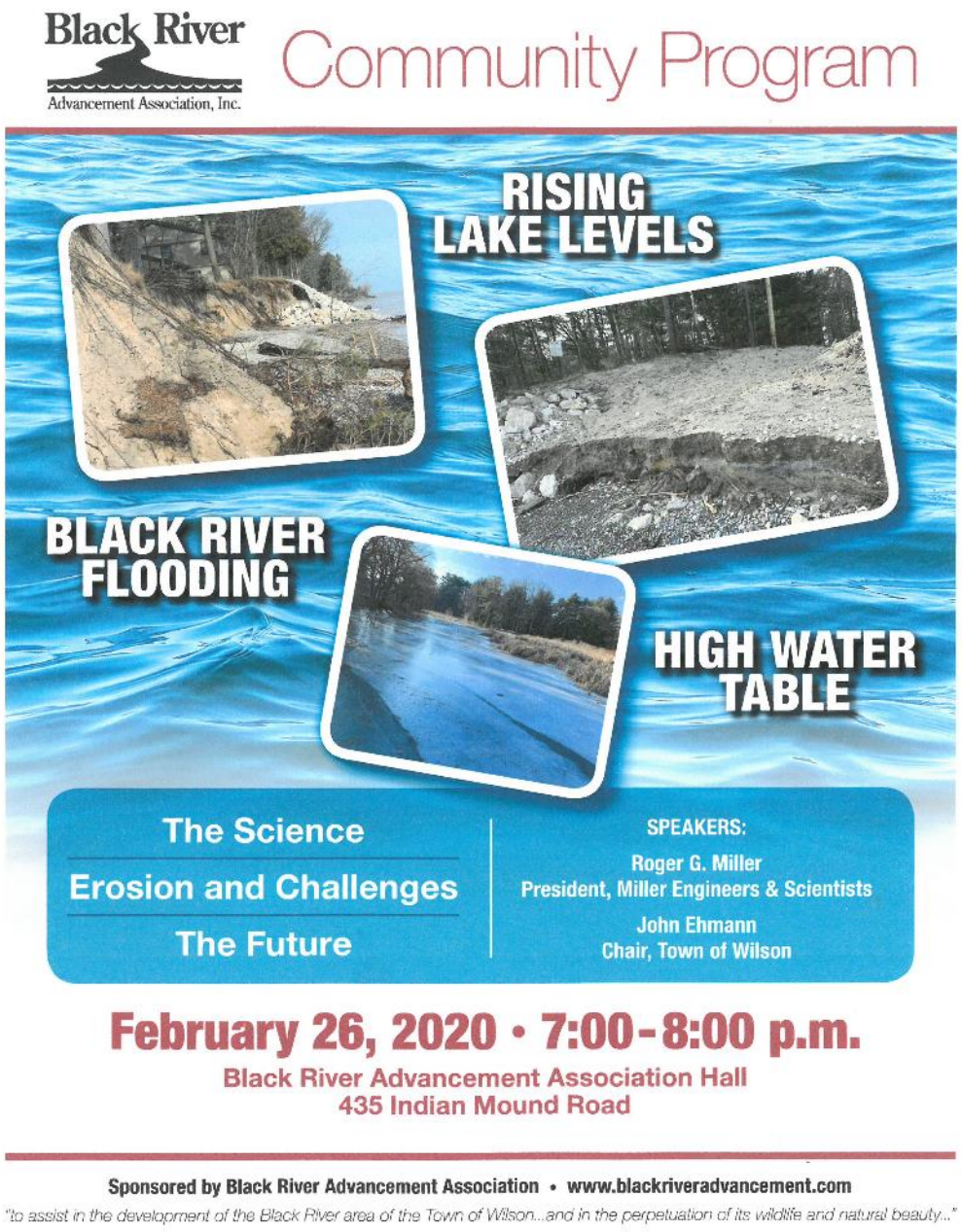


Roger G. Miller, PE

MILLER
ENGINEERS
SCIENTISTS

Designing in Harmony with the Environment

Geological History of Glacial Lake Algonquin and the Upper Great Lakes

U.S. GEOLOGICAL SURVEY BULLETIN 1801

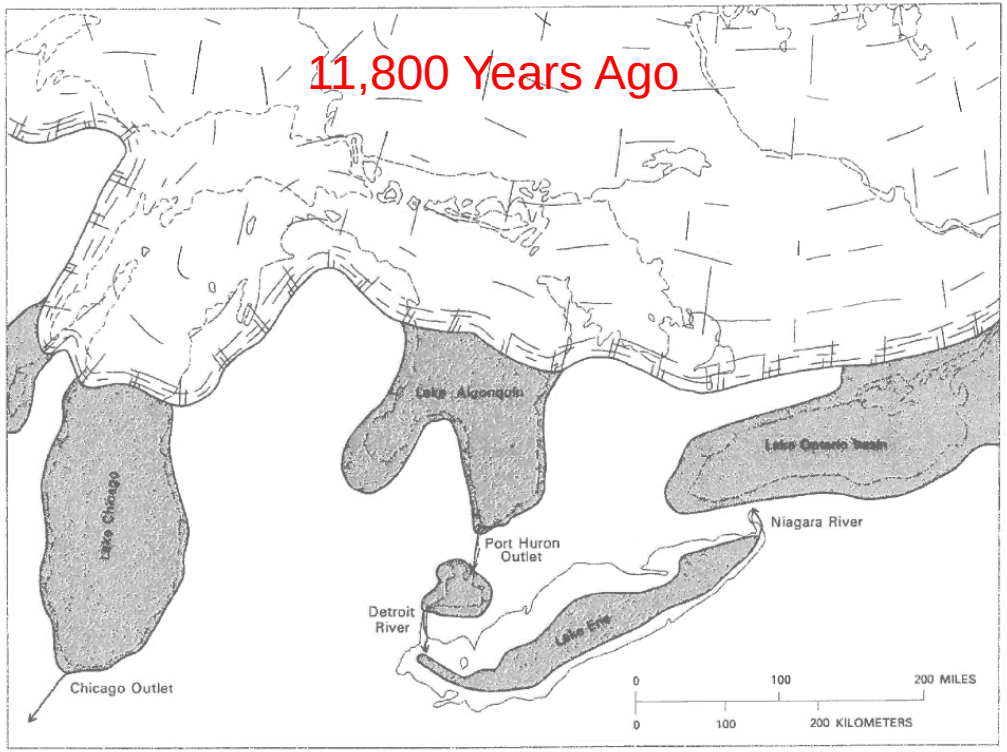


Figure 15. Calumet-level Lake Chicago and Early Lake Algonquin. Overflow was to the south at Chicago and Port Huron at the maximum advance of Two Rivers ice about 11,800 yr B.P. Early Lake Erie drained to the Lake Ontario basin.

Nipissing and Algoma Great Lakes

Once drainage to the south was established, the outlet configurations and probable paleoclimatic influences on water volume became major variables in the system. Lake level fluctuated about a mean altitude adjusted to the cross sections of the southern outlets. Before 4,500 yr B.P., the record of lake-level change is poorly known; however, distinct high levels occurred at 4,500, 4,000, and 3,200 yr B.P. (Larsen, 1985a,b). These highs, referred to as the Nipissing I, Nipissing II, and Algoma levels, are identified by terraces that rise exponentially with distance from the southern shores of Lake Michigan to the North Bay region (Larsen, 1985b). They reflect probable high-amplitude fluctuations related to runoff variations in the drainage basins. The permanent outlet channel linking North Bay with the Mattawa River maintained a level adjusted to its rising sill. Isostatic uplift finally raised the North Bay sill above the southern outlets between 4,500 and 4,000 yr B.P. The Chicago outlet was abandoned after 4,000 yr B.P., and the modern drainage system at Port Huron came into being (fig. 20). Since then, lake levels have continued to fluctuate adjusted to a single outlet channel.

CONCLUSION

The uplifted Lake Algonquin terraces of the northern Lake Michigan and Lake Huron basins are progressively deformed from youngest to oldest to the north. Profiles drawn along the eastern shore of Lake Michigan and erected normal to isobases of historic vertical movement show that these late glacial terraces fit exponential curves directed toward the former centers of glacial-ice loading near Hudson Bay. The Main Algonquin through Fort Brady terraces of Leverett and Taylor (1915) show concave-upward slopes that decrease in steepness with both distance and time, implying a decrease in the rate of uplift. Vertical movement, monitored over the Great Lakes

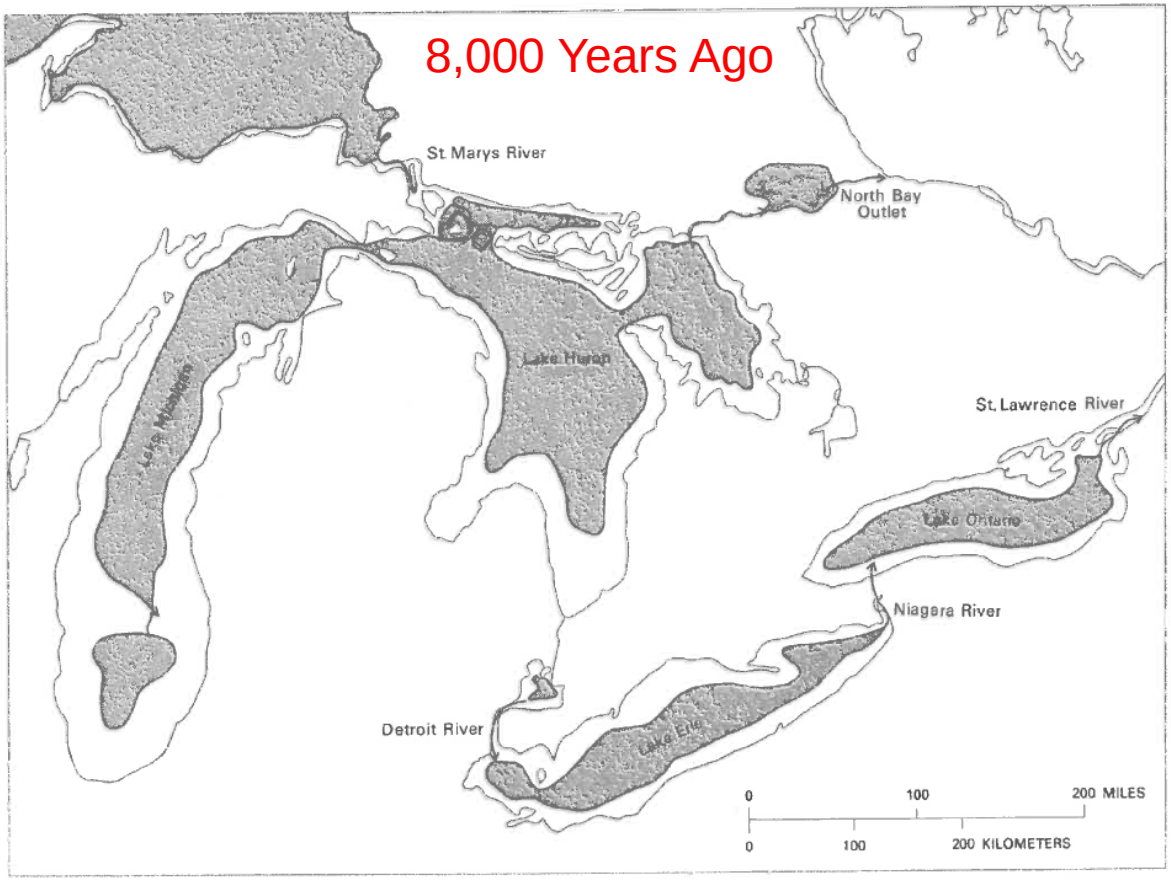


Figure 19. Pre-Nipissing transgression. Overflow through the rising North Bay outlet reflooded the Lake Michigan and Lake Huron basins, creating a confluent lake system (about 8,000 yr B.P.). Lake Erie and Lake Ontario continued their rise westward. Lake Michigan and Lake Huron began a tandem transgression controlled by the rising North Bay outlet (fig. 5, case 3).

4,000 to 4,500 Years Ago

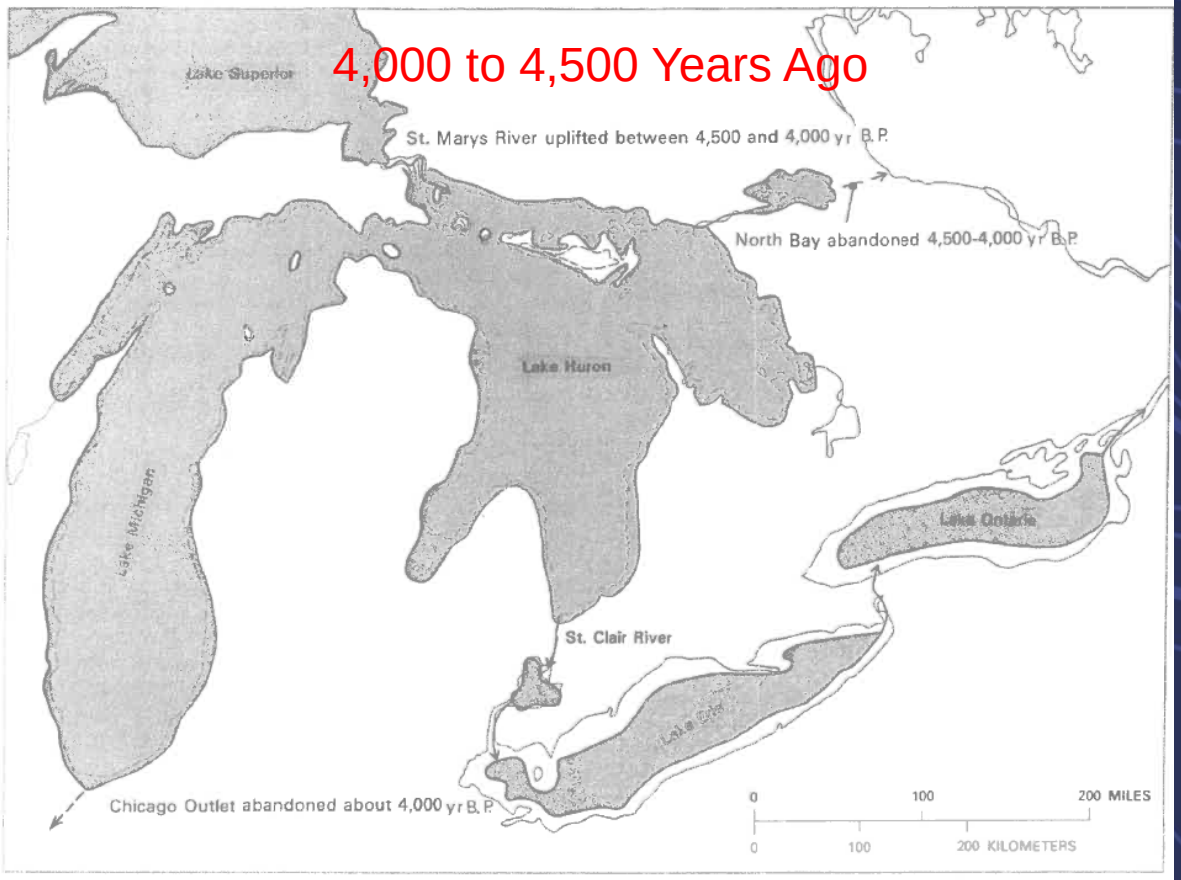


Figure 20. Late Nipissing and Algoma Great Lakes. The rising North Bay outlet reflooded the Lake Michigan, Lake Superior, and Lake Huron basins until overflow returned to first the Port Huron (St. Clair River) and then the Chicago outlets. Lake level rose above the present levels to leave the prominent Nipissing and Algoma terraces. For a brief time, overflow was through three outlets, but the North Bay outlet was abandoned between 4,500 and 4,000 yr B.P. when uplift raised it above the southern outlet controls. Uplift also raised the St. Marys River at about this time, creating a separate Lake Superior. Overflow through the Chicago outlet ceased by 4,000 yr B.P. and may have accommodated a climate-related rise in lake level (Nipissing I). This time period, 4,000 yr B.P., marks the onset of the hydrologically modern upper Great Lakes that continue to overflow through the St. Marys and St. Clair Rivers. Deformation of former Lake Michigan and Lake Huron shorelines now follows the pattern of figure 5, case 2. Lake Erie and Lake Ontario continue to rise in concert with their uplifting eastern outlets.

LAKE MICHIGAN-HURON WATER LEVEL FLUCTUATIONS

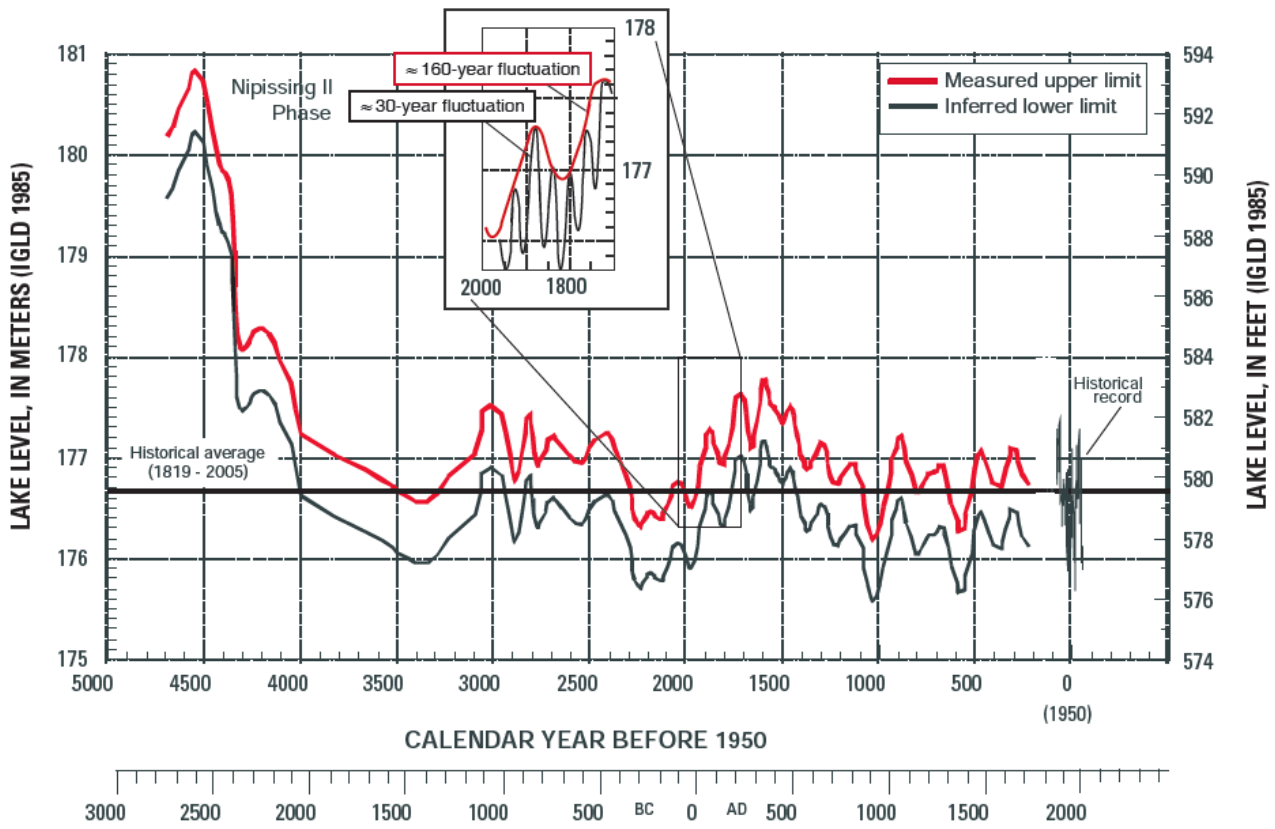
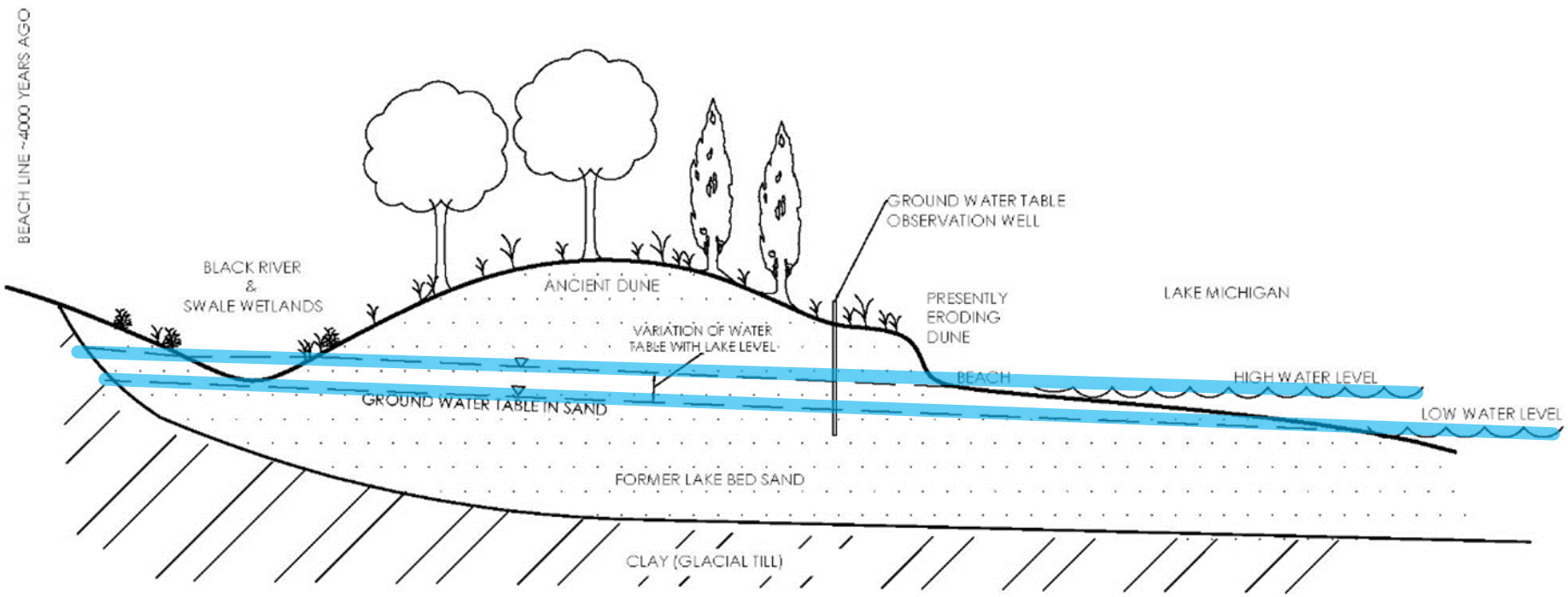


Figure 8. Hydrograph of late Holocene lake level and historical lake level for Lake Michigan-Huron. The red line is interpreted from beach-ridge studies, whereas the lower black line is an inferred lower limit using the range of the historical record as a guide.

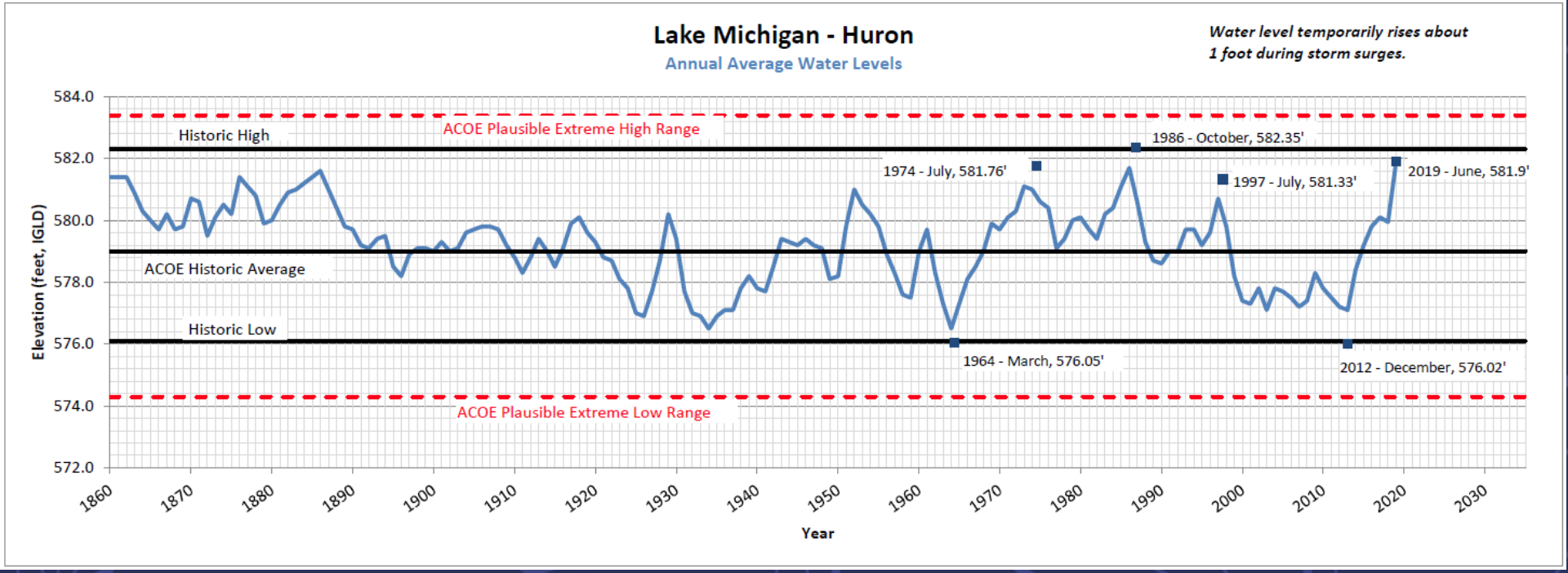
Image Courtesy of USGS

SHORELINE 4500 YEARS AGO
Black River Point
Southside Cem
Tailings Pond
Jackson Sch
Immaculate Conception Cem
Golf Course
Christ Ch
W I L S O N
Camp Taswood
Black River
TERRY ANDRAE STATE PARK
42'30"
40'
3471 III NE (SHEBOYGAN FALLS)
PORT WASHINGTON 24 MI.
OOSTBURG 6.1 MI.
0.4 MI. TO U.S. 141
0.7 MI. TO U.S. 141

RAISED GROUND WATER TABLE



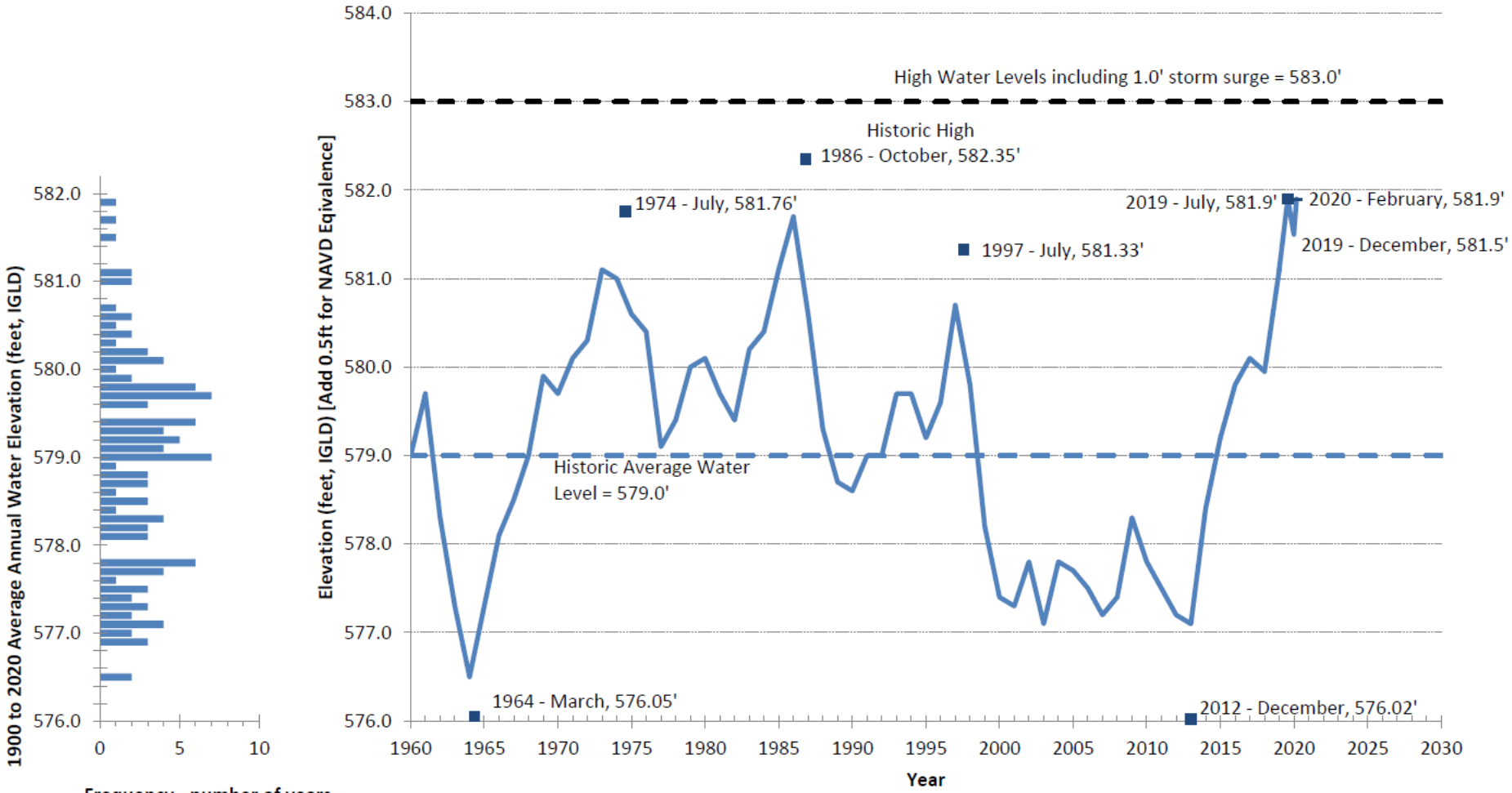
LAKE MICHIGAN-HURON WATER LEVEL FLUCTUATIONS



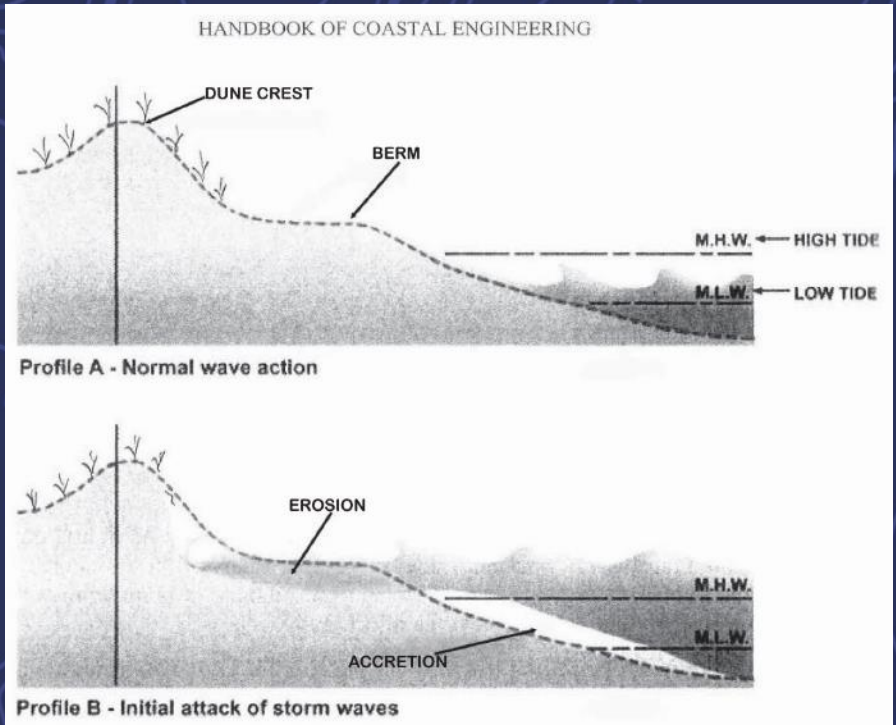
Lake Michigan - Huron Historic Water Levels

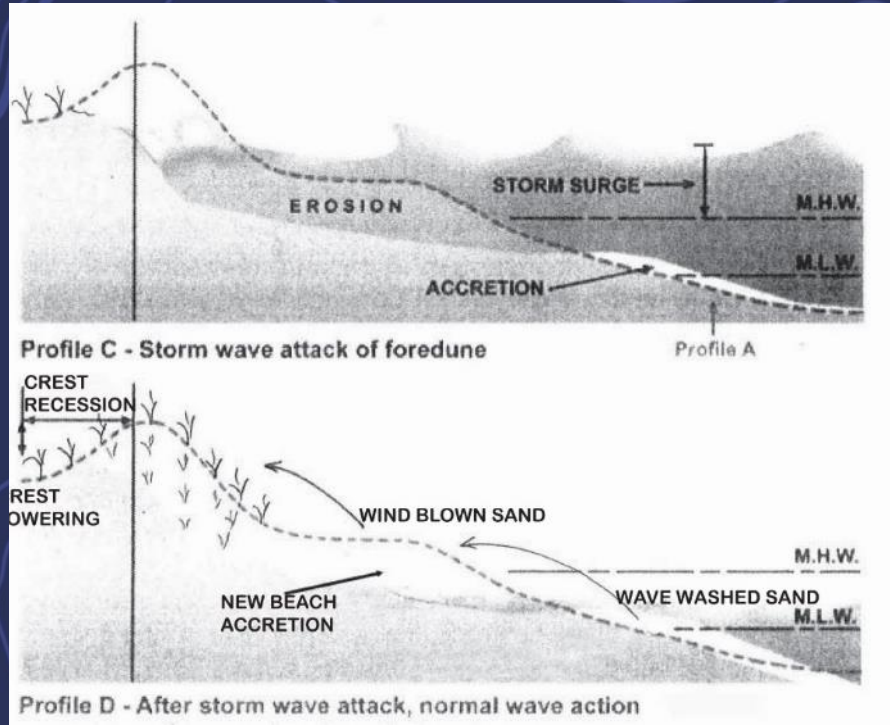
Average Annual Historic Water Levels and Histogram

(Based on USACE records)



WATER LEVELS AND SAND MOVEMENT





LOW WATER LEVEL – WIDE BEACH

HIGH WATER LEVEL - BEACH ERODES

LONG TERM RECESSION RATES

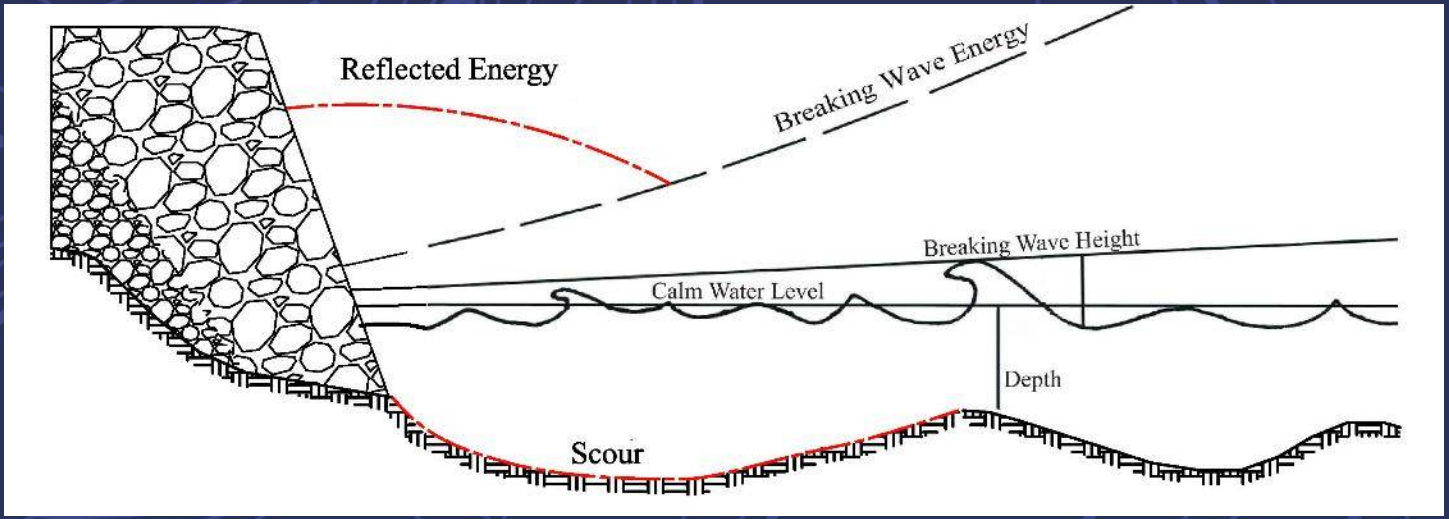
50-100 feet per century on western shore of Lake Michigan

100-200 feet per century on eastern shore of Lake Michigan

- Revetments only work short term (30-50 years)
- Beach nourishment is a method for reducing long term recession

HARD SURFACES IMPAIR NATURAL PROCESSES

- **Any shoreline work must be compatible with the natural littoral sediment processes of the larger scale "reach" in which it is located.**
- **Revetments that project into the lake cause lakebed "downcutting". The consequent deeper water allows larger breaking waves that accelerate revetment destruction.**



From Ruins to Dunes: The Benefits of Buried Revetments

Planted dune grass is an important component of the buried revetment system.

Introduction

BEACH and dune restoration is best done using the tools developed by Mother Nature. Natural qualities can be achieved in Lakeshore restoration even when a revetment is needed by placing the revetment in the right place and "burying" it, using beach nourishment if necessary. Even without beach nourishment, the shore of Sheboygan's Harbor Centre South Pier District Peninsula, where the Sheboygan River flows into Lake Michigan along the Wisconsin shoreline, was effectively transformed with the help of a buried revetment and dune grass. Beach nourishment will become important here as the level of Lake Michigan rises, and deserves more attention in the Great Lakes region to counter the effects of revetments being built to protect increasing development along the shore.

Historical Activities

The Harbor Centre South Pier District Peninsula had been a busy commercial port ever since European immigrants began pouring into the upper Midwest around 1850. Originally, the river had meandered around a narrow sand spit, which formed a barrier to an estuarine marsh just upstream of the mouth. Between 1852 and 1856, a straight channel was dredged across the spit, creating a port big enough for schooners plying the lakes at the time. The marsh was filled in behind timber bulkheads to make land.

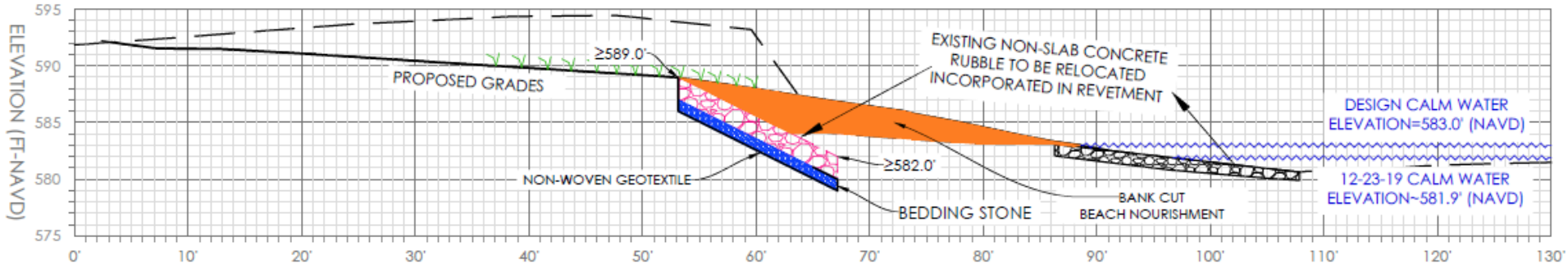
Early exports of lumber, potash, and fish gave way primarily to the import of coal by the mid-1900's to fuel local industries. In the 1950's, concrete breakwaters were built more than a half mile

The first step in construction of a buried revetment is excavation for its toe, with the sand placed outboard to later become a fore-dune.

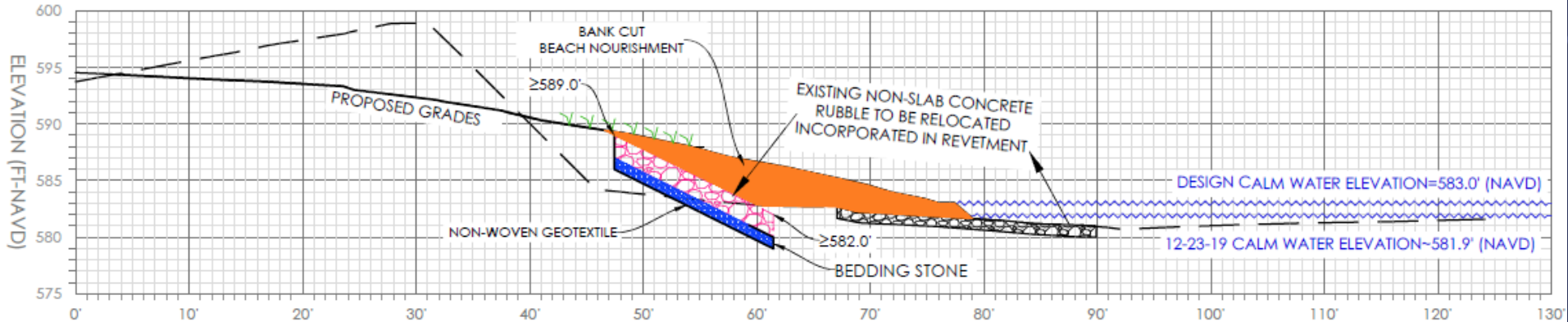
The next step of a buried revetment is completely conventional. Fabric, bedding stone, then armor stone are placed in succession.

PROPOSED ADDITION
FREY RESIDENCE
4475 N EVERGREEN DR
SHEBOYGAN, WI
EXISTING CONTOURS (NAVD)
PROPOSED CONTOURS (NAVD)
SET NEW IRON PIPE
LARSON RESIDENCE
4449 N EVERGREEN DR
SHEBOYGAN, WI
DECK
PATIO
DO NOT DISTURB ROOTS
DO NOT DISTURB ROOTS
LIMESTONE STAIRWAY
WOOD STAIRWAY BY OWNER
FOOTPATH BY OWNER
PROPOSED REVETMENT
(CONSTRUCTED OF SALVAGED CONCRETE RUBBLE & IMPORTED ARMOR STONE)
SALVAGED CONCRETE RUBBLE STAIRWAY
BENCHMARK
IRON PIPE
ELEV.=598.1
EXISTING CONCRETE RUBBLE
EXISTING CONCRETE RUBBLE
F1
F2
L1
GRAPHIC SCALE
(IN FEET)
1 inch = 20ft.

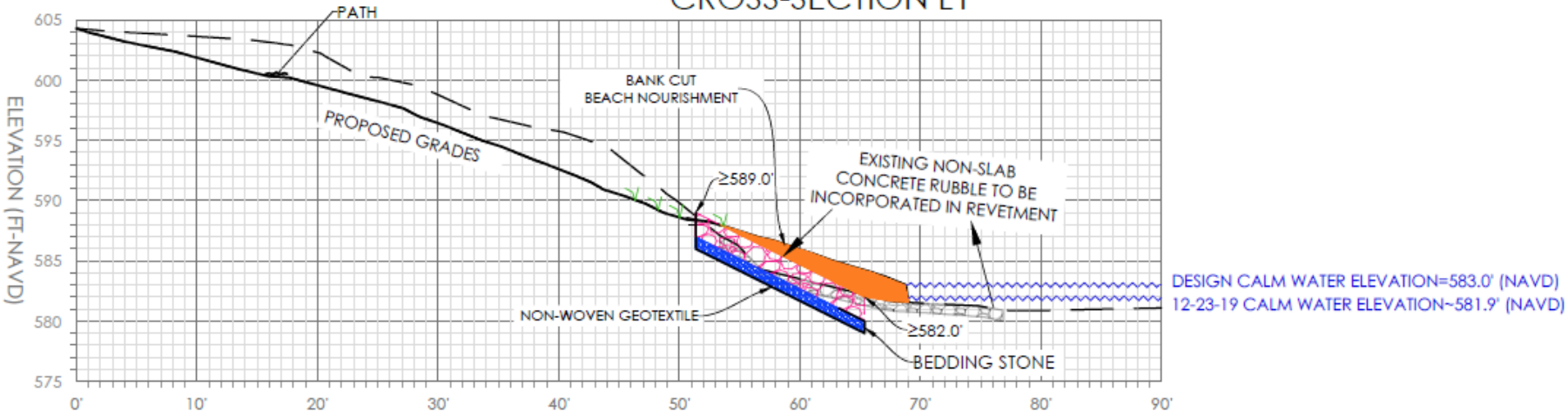
CROSS-SECTION F1



CROSS-SECTION F2



CROSS-SECTION L1



BUILDING ALONG THE SHORELINE

- **All new construction of capital improvements should be located as far inland from the beach or bluff as possible in order to leave room for the natural shoreline recession rate.**
- **This avoids the need for shoreline "hardening".**
- **Minimum statutory setbacks are NOT THE OPTIMUM of what property owners should do.**

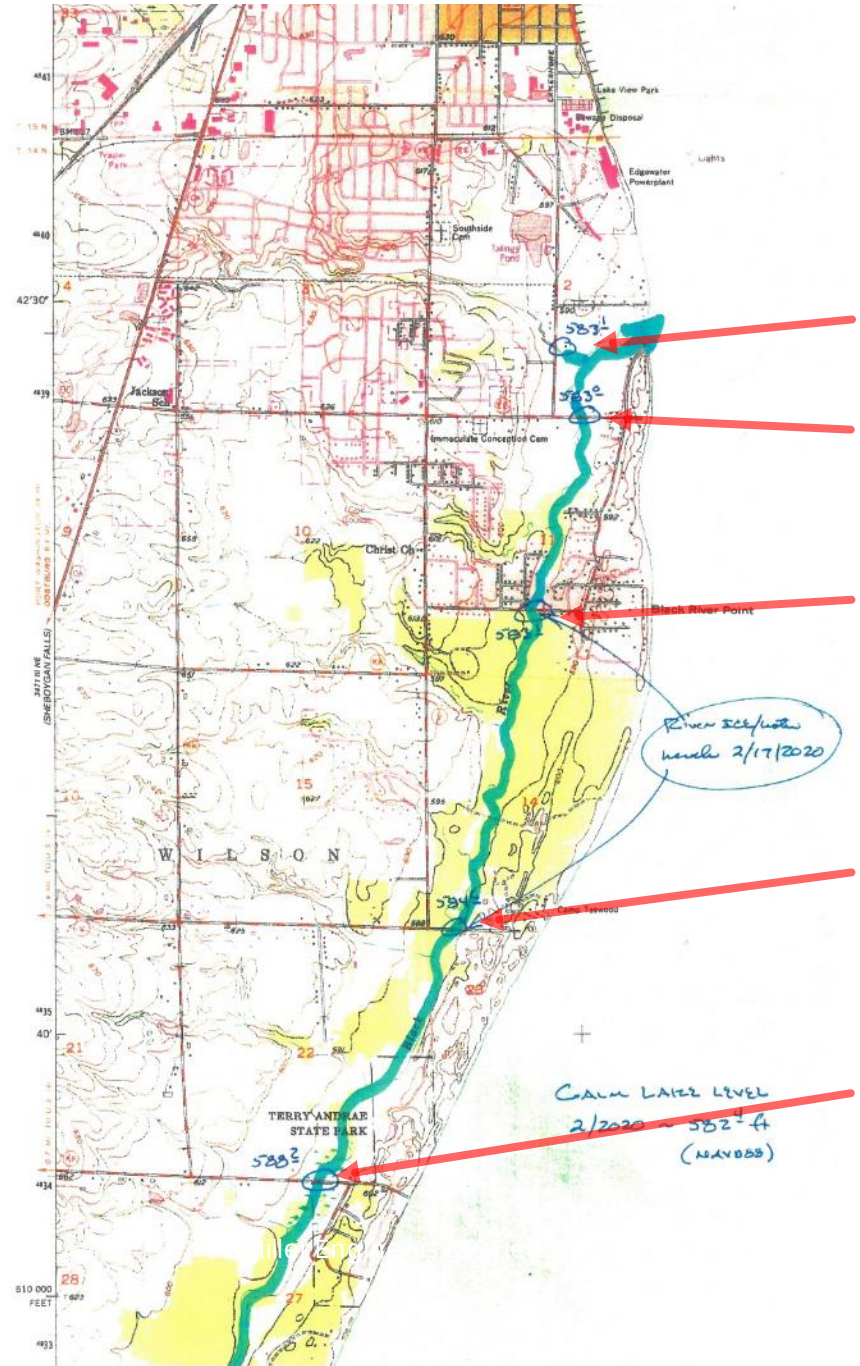
The Wisconsin Legislature's recent reduction of setback to 75' for Lake Michigan, merely to be consistent with setbacks along inland lakes (which do not experience significant shoreline recession), was a misguided step and should be changed back to at least 100'. Recently revised State statutes now prevent counties from doing that locally.

BUILDING ALONG THE SHORELINE

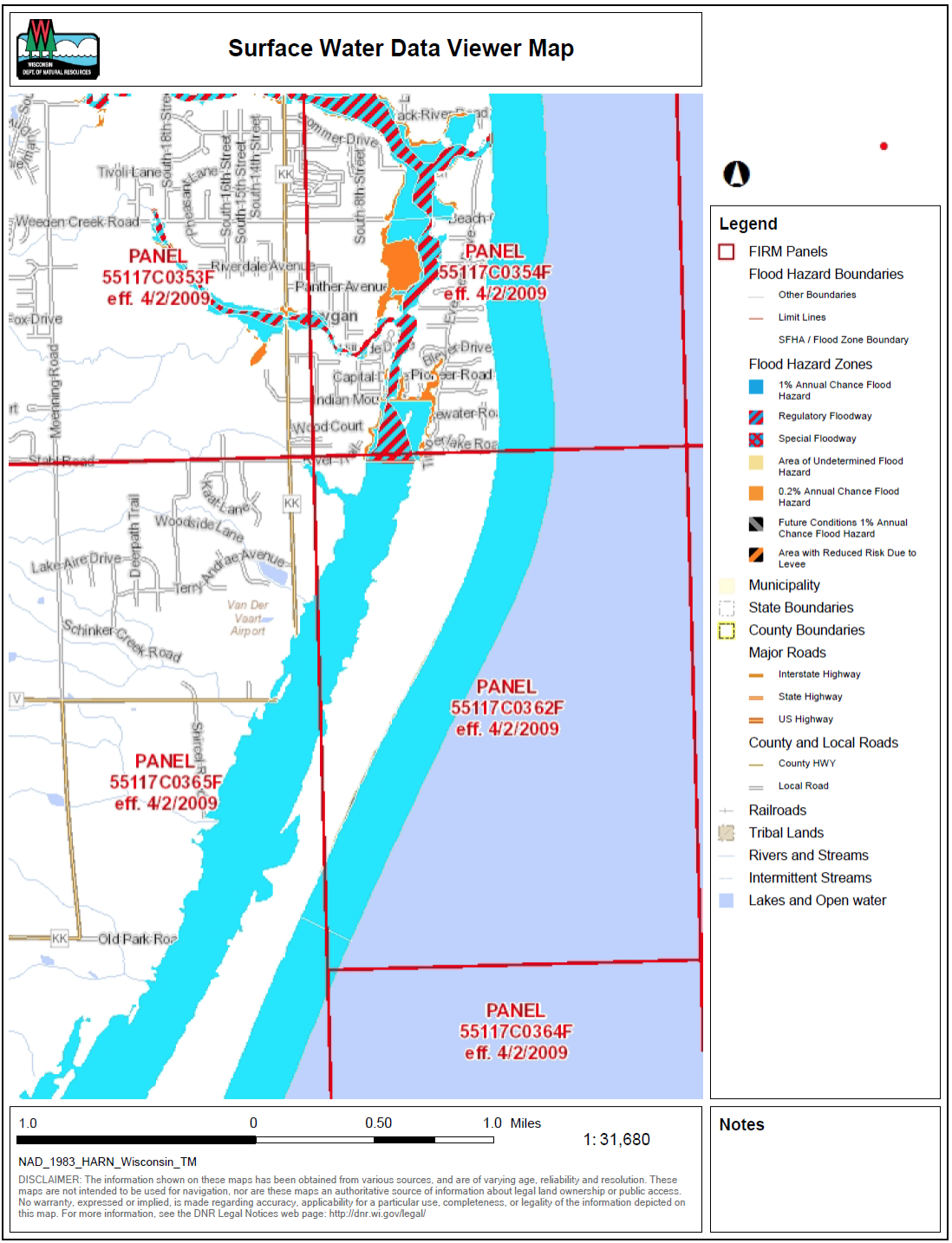
- **Obsolescence should be planned for old structures that have become at risk of natural shoreline recession over time.**
- **Beach nourishment on a "reach scale" should be considered in lieu of, or in combination with, "buried" revetments where intensive development precludes obsolescence of existing structures.**

SURFACE FLOODING

Black River Water/Ice Levels 2/17/2020

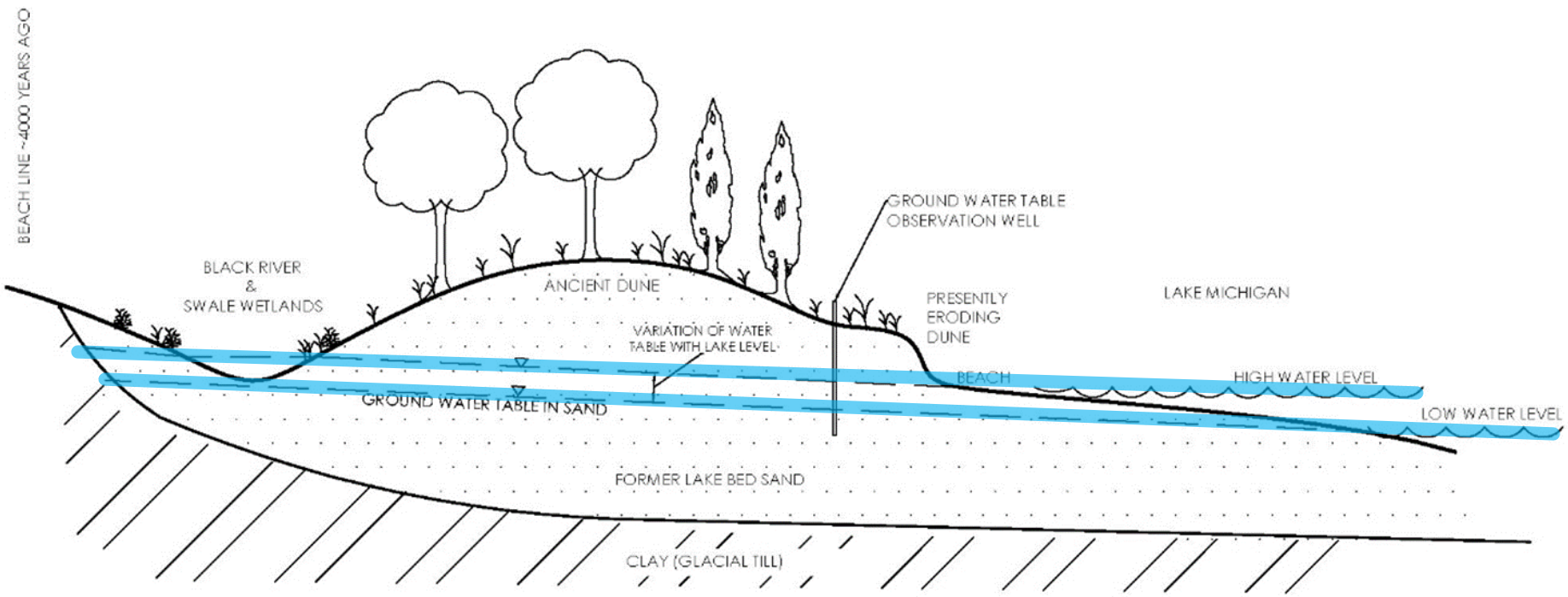


FEMA FLOOD MAP



- County and Local Regulations limit development in the flood prone areas

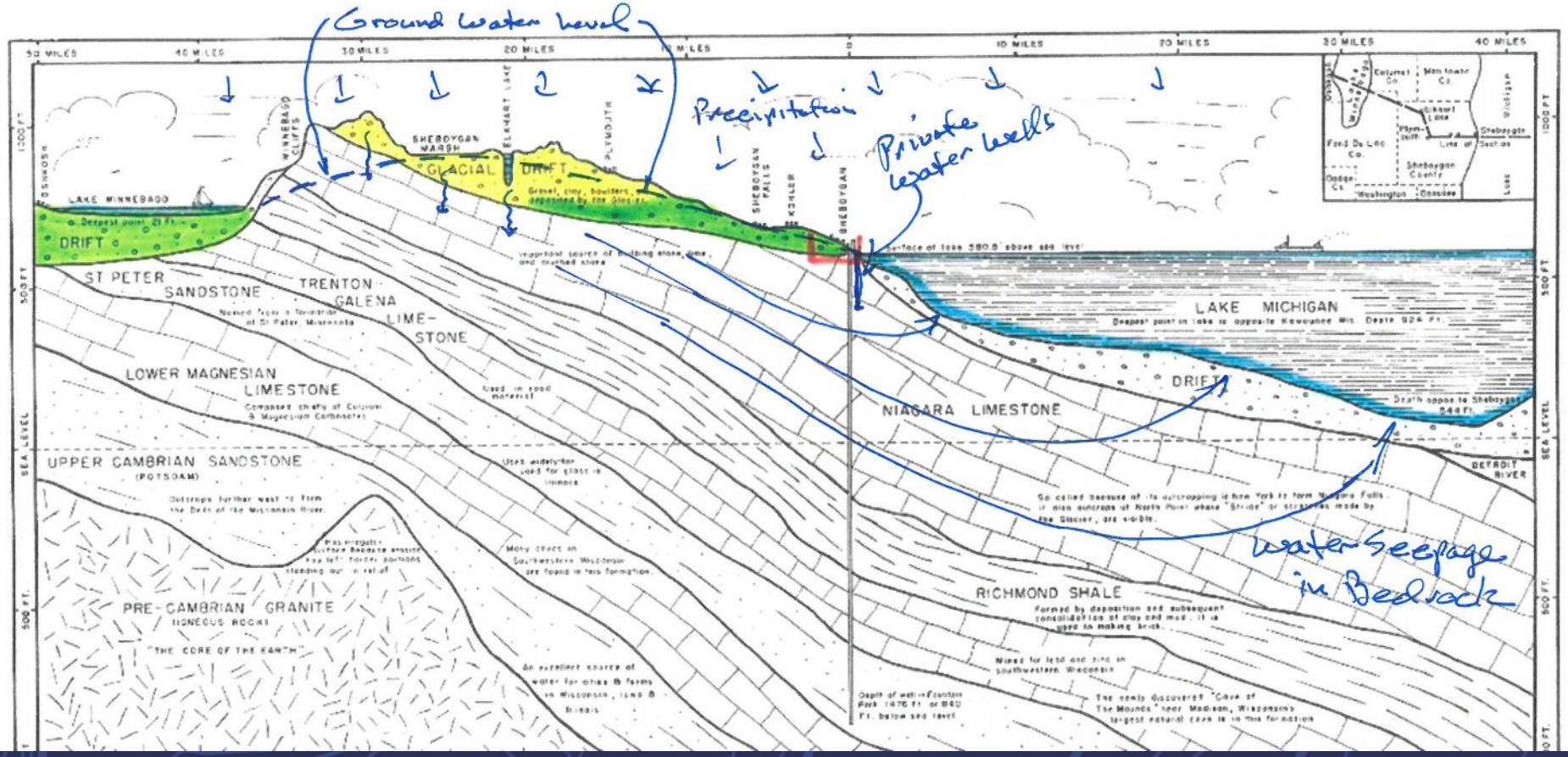
RAISED GROUND WATER TABLE



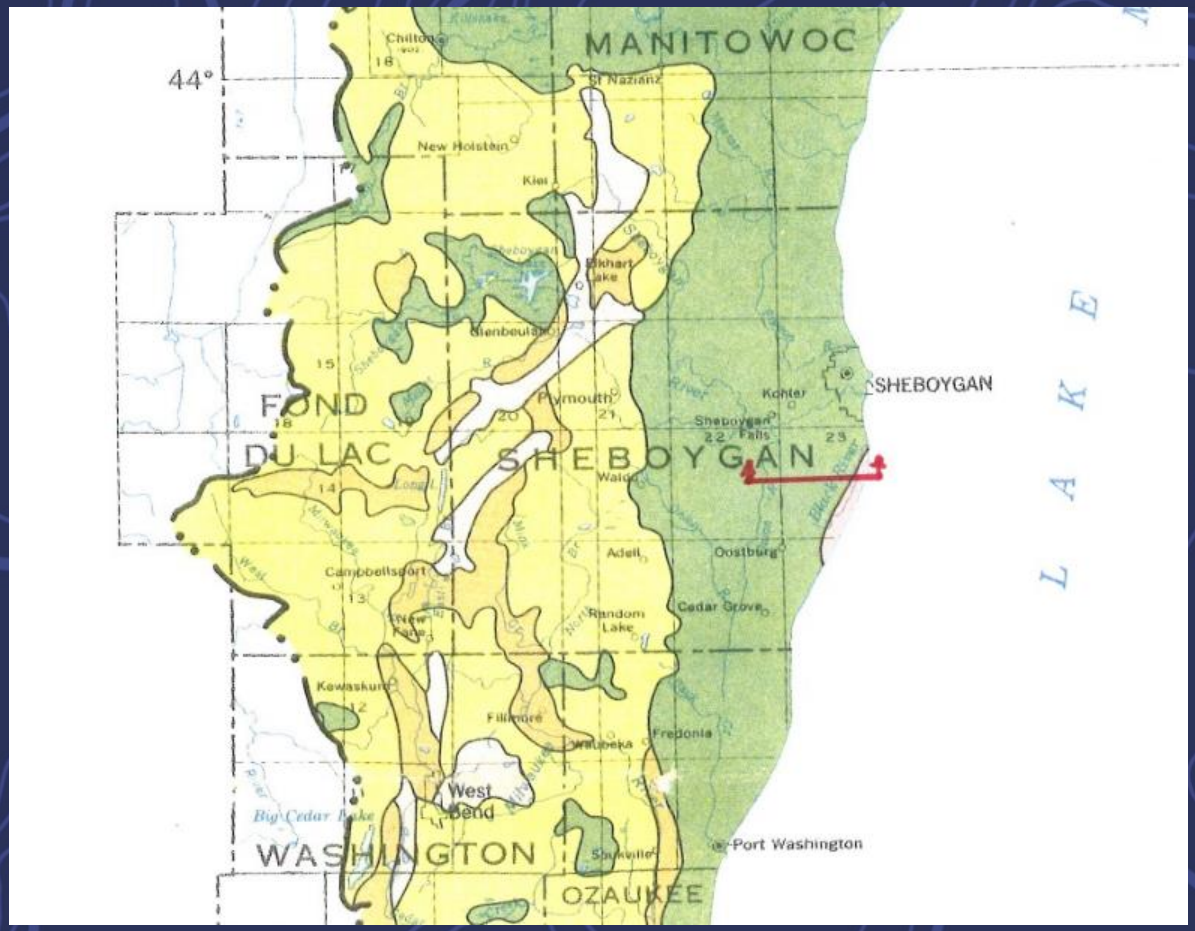
The Geology of Sheboygan County

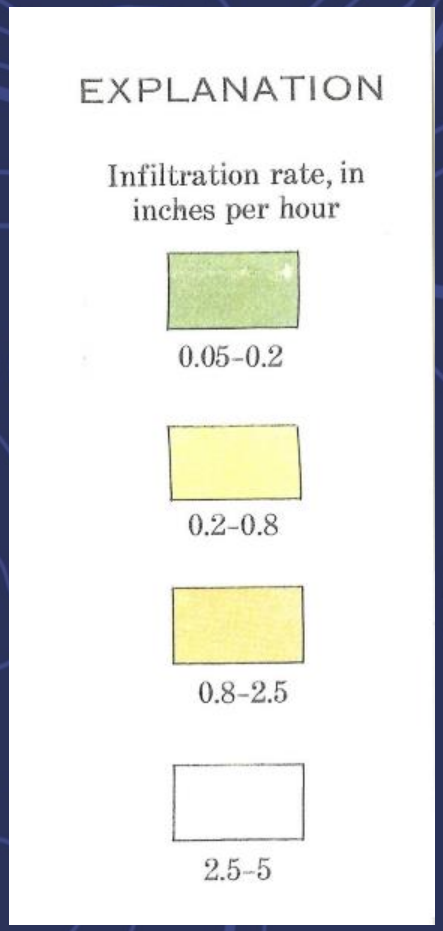
By E. F. Bean

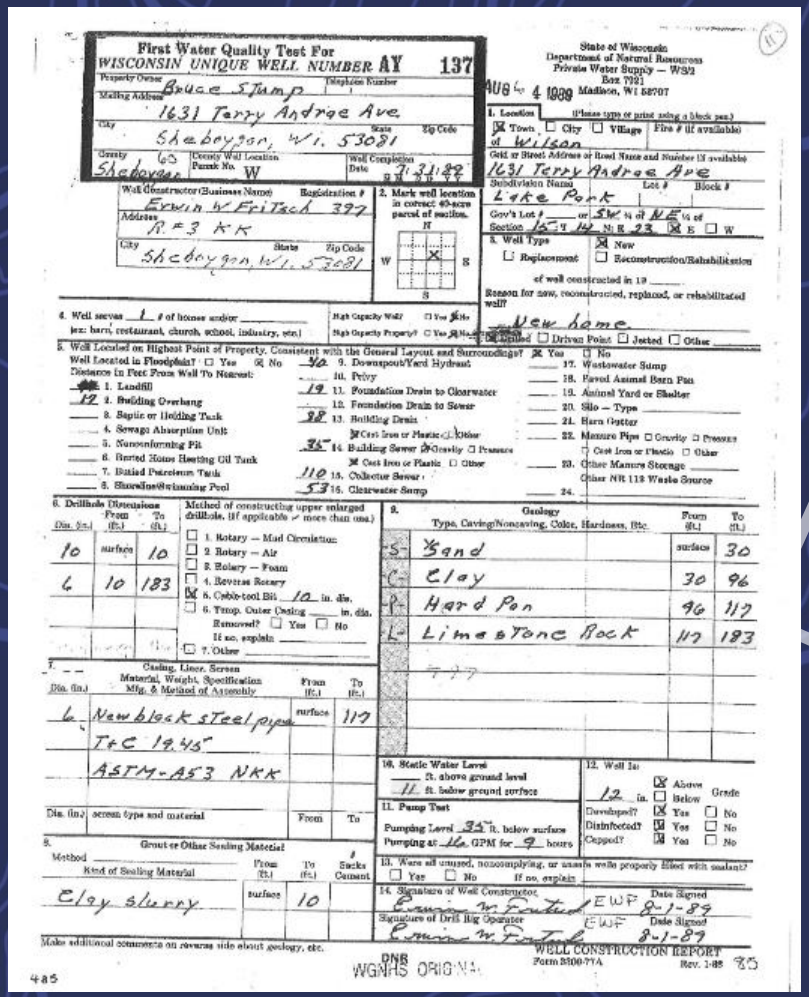
Ernest F. Bean, State Geologist for the State of Wisconsin, has made many valuable contributions to the State in line with his profession. He graduated from the University of Wisconsin in 1909, receiving his Master's Degree two years later. Since that time he has devoted his life to the study, teaching and practical application of his geological information. He is Professor of Geology at the University of Wisconsin and has been State Geologist since 1926. He was a member of the Alaska Glacial Expedition, chief of field parties of the Wisconsin Geological Survey, and a former member of the Wisconsin State Highway Commission. He is a member of numerous geological societies and the author of several articles and books on this subject. The article on Sheboygan County is a fine contribution to the records of the county.



SOIL INFILTRATION RATES







First Water Quality Test For
WISCONSIN UNIQUE WELL NUMBER AY 137

Property Owner: Bruce Stump
Mailing Address: 1631 Terry Andrae Ave
City: Sheboygan, Wi. State: 53081 Zip Code:
County: Sheboygan 60
County Well Location Permit No. W
Well Completion Date: 7-31-89

State of Wisconsin
Department of Natural Resources
Private Water Supply — WS/2
Box 7921
Madison, WI 53707

AUG 4 1989

1. Location (Please type or print using a block pen.)
☒ Town ☐ City ☐ Village Fire # (if available)
of Wilson
Grid or Street Address or Road Name and Number (if available): 1631 Terry Andrae Ave
Subdivision Name: Lake Park Lot # Block #
Gov't Lot # ___ or SW ¼ of NE ¼ of Section 15 T 14 N R 23 ☒ E ☐ W

Well Constructor (Business Name): Erwin W Fritsch 397
Registration #
Address: R#3 KK
City: Sheboygan, Wi. State: 53081 Zip Code:

2. Mark well location in correct 40-acre parcel of section.

3. Well Type ☒ New ☐ Replacement ☐ Reconstruction/Rehabilitation of well constructed in 19___
Reason for new, reconstructed, replaced, or rehabilitated well? New home
☒ Drilled ☐ Driven Point ☐ Jetted ☐ Other

4. Well serves 1 # of homes and/or ___ (ex: barn, restaurant, church, school, industry, etc.)
High Capacity Well? ☐ Yes ☒ No
High Capacity Property? ☐ Yes ☒ No

5. Well Located on Highest Point of Property. Consistent with the General Layout and Surroundings? ☒ Yes ☐ No
Well Located in Floodplain? ☐ Yes ☒ No
Distance in Feet From Well To Nearest:
- 1. Landfill
- 19 2. Building Overhang
- 3. Septic or Holding Tank
- 4. Sewage Absorption Unit
- 5. Nonconforming Pit
- 6. Buried Home Heating Oil Tank
- 7. Buried Petroleum Tank
- 8. Shoreline/Swimming Pool
- 40 9. Downspout/Yard Hydrant
- 10. Privy
- 19 11. Foundation Drain to Clearwater
- 12. Foundation Drain to Sewer
- 88 13. Building Drain ☒ Cast Iron or Plastic ☐ Other
- 35 14. Building Sewer ☒ Gravity ☐ Pressure ☒ Cast Iron or Plastic ☐ Other
- 110 15. Collector Sewer
- 53 16. Clearwater Sump
- 17. Wastewater Sump
- 18. Faced Animal Barn Pan
- 19. Animal Yard or Shelter
- 20. Silo — Type
- 21. Barn Gutter
- 22. Manure Pipe ☐ Gravity ☐ Pressure ☐ Cast Iron or Plastic ☐ Other
- 23. Other Manure Storage
- Other NR 113 Waste Source
- 24.

6. Drillhole Dimensions

Dia. (in.)	From (ft.)	To (ft.)
10	surface	10
6	10	183

Method of constructing upper enlarged drillhole. (If applicable ✓ more than one.)
☐ 1. Rotary — Mud Circulation
☐ 2. Rotary — Air
☐ 3. Rotary — Foam
☐ 4. Reverse Rotary
☒ 5. Cable-tool Bit 10 in. dia.
☐ 6. Temp. Outer Casing ___ in. dia. Removed? ☐ Yes ☐ No If no, explain
☐ 7. Other

7. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Mfg. & Method of Assembly	From (ft.)	To (ft.)
6	New black steel pipe	surface	117
	T+C 19.45		
	ASTM-A53 NKK		

Dia. (in.) screen type and material From To

8. Grout or Other Sealing Material

Method / Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
Clay slurry	surface	10	

9. Geology

	Type, Caving/Noncaving, Color, Hardness, Etc.	From (ft.)	To (ft.)
-S-	Sand	surface	30
-C-	Clay	30	96
-P-	Hard Pan	96	117
-L-	Limestone Rock	117	183
	777		

10. Static Water Level
___ ft. above ground level
11 ft. below ground surface

11. Pump Test
Pumping Level 35 ft. below surface
Pumping at 16 GPM for 9 hours

12. Well In: 12 in. ☒ Above ☐ Below Grade
Developed? ☒ Yes ☐ No
Disinfected? ☒ Yes ☐ No
Capped? ☒ Yes ☐ No

13. Were all unused, noncomplying, or unsafe wells properly filled with sealant? ☐ Yes ☐ No If no, explain

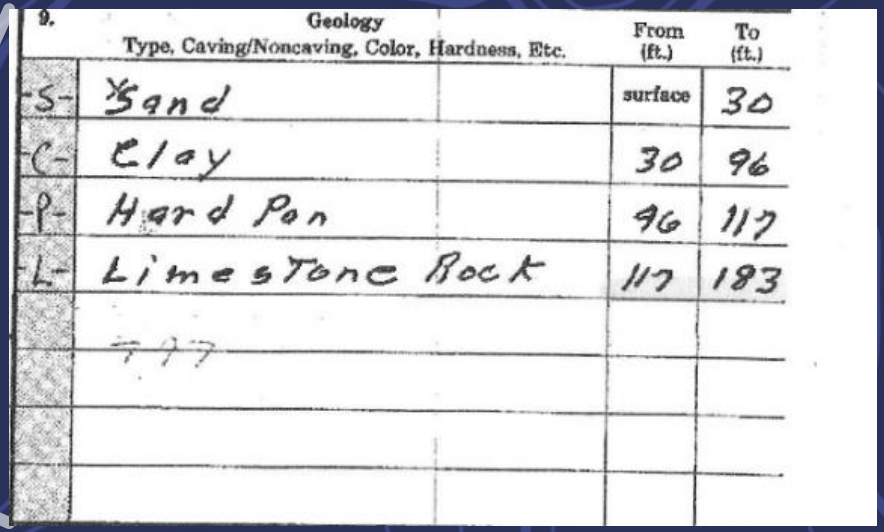
14. Signature of Well Constructor: Erwin W. Fritsch EWF Date Signed 8-1-89
Signature of Drill Rig Operator: Erwin W. Fritsch EWF Date Signed 8-1-89

Make additional comments on reverse side about geology, etc.

WGNHS ORIGINAL

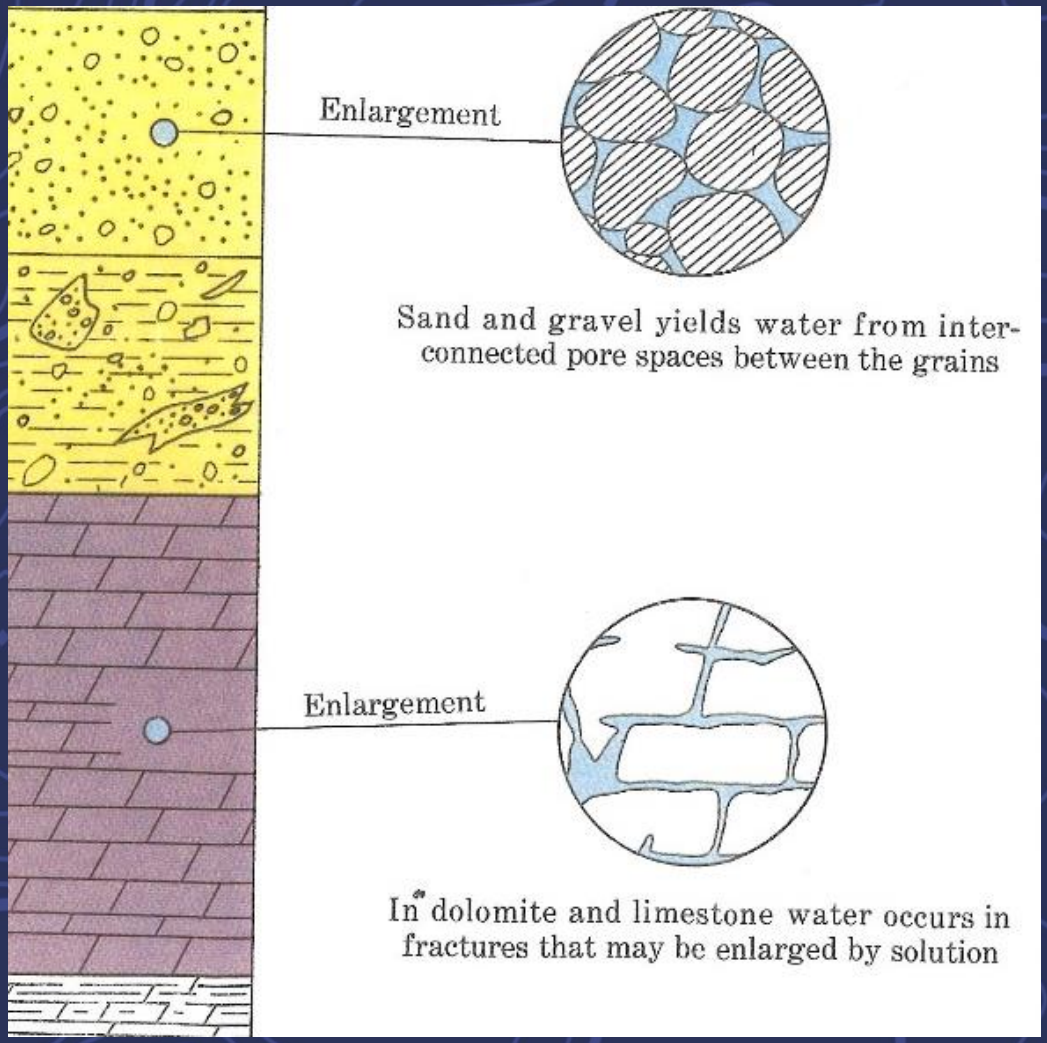
WELL CONSTRUCTION REPORT
Form 3300-77A Rev. 1-88 85

485

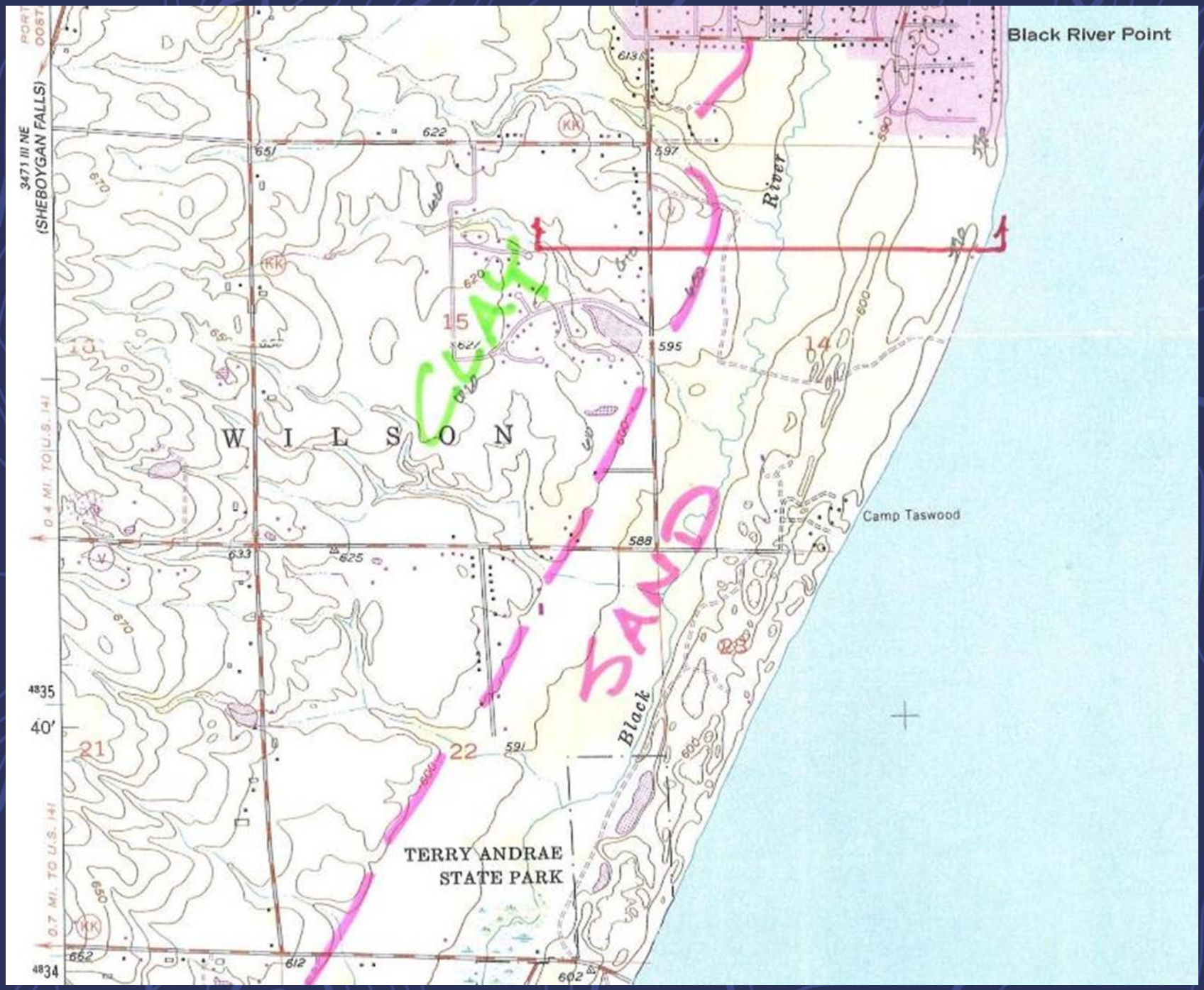


9. Geology

	Type, Caving/Noncaving, Color, Hardness, Etc.	From (ft.)	To (ft.)
-S-	Sand	surface	30
-C-	Clay	30	96
-P-	Hard Pan	96	117
-L-	Limestone Rock	117	183
	777		

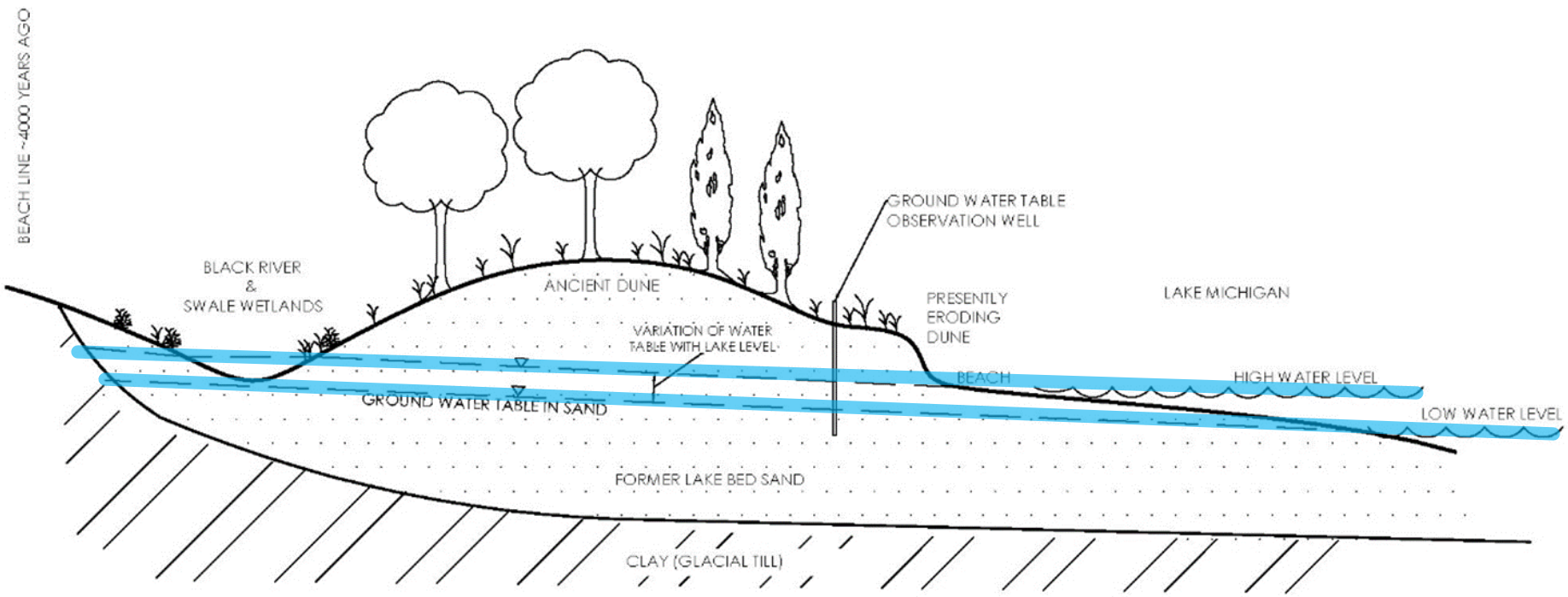

Enlargement
Sand and gravel yields water from interconnected pore spaces between the grains
Enlargement
In dolomite and limestone water occurs in fractures that may be enlarged by solution

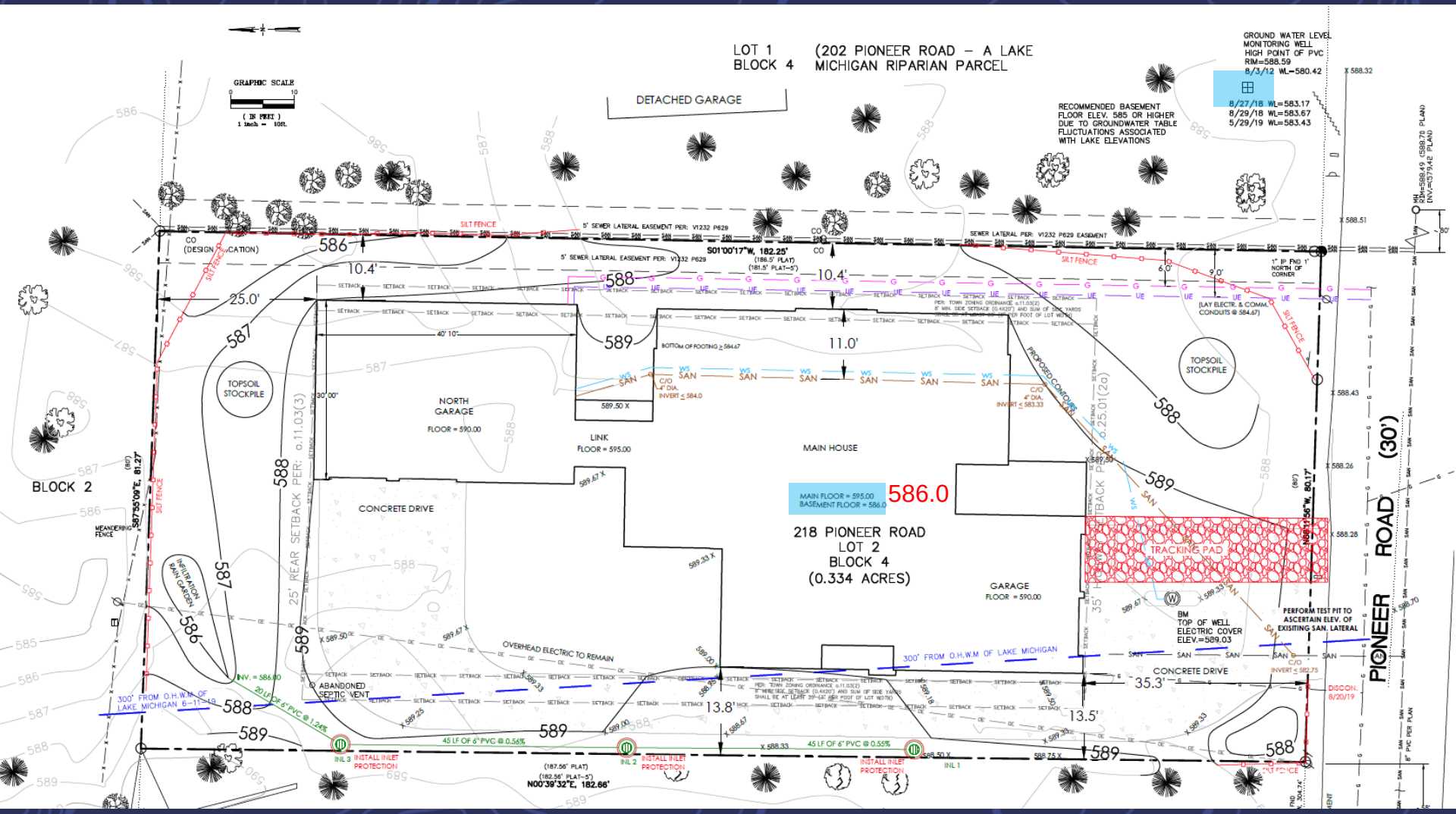
2 - CTH LS
3 - CTH EE Bridge
4 - Hartman Creek
5 - Indian Mound Rd
6 - Carol Creek
7 - KASP North
8 - KASP Entrance
9 - CTH V W
10 - CTH V
11 - Old Road Rd E
12 - Old Park Rd W
13 - Wilson Lima Rd
14 - CTH KK
16 - Weeden Creek
17 - Stahl Rd
Kohler-Andrae State Park
Black River
Wilson
Weedens
Riverdale Country Club
Holy Cross Cemetery
Blackwolf Run
TOWN OF WILSON
WATER QUALITY MONITORING
SAMPLE LOCATION MAP
6/24/2019
bing



Black River Point
3471 III NE
(SHEBOYGAN FALLS)
0.4 MI. TO U.S. 141
0.7 MI. TO U.S. 141
W I L S O N
CLAY
SAND
Black
River
Camp Taswood
TERRY ANDRAE
STATE PARK
15
14
22
21
23
622
651
597
595
588
633
625
591
612
602
652

RAISED GROUND WATER TABLE




LOT 1
BLOCK 4
(202 PIONEER ROAD – A LAKE MICHIGAN RIPARIAN PARCEL
DETACHED GARAGE
GRAPHIC SCALE
(IN FEET)
1 inch = 10ft.
GROUND WATER LEVEL MONITORING WELL HIGH POINT OF PVC RIM=588.59
8/3/12 WL=580.42
8/27/18 WL=583.17
8/29/18 WL=583.67
5/29/19 WL=583.43
RECOMMENDED BASEMENT FLOOR ELEV. 585 OR HIGHER DUE TO GROUNDWATER TABLE FLUCTUATIONS ASSOCIATED WITH LAKE ELEVATIONS
5' SEWER LATERAL EASEMENT PER: V1232 P629
SEWER LATERAL PER: V1232 P629 EASEMENT
S01°00'17"W, 182.25'
(186.5' PLAT)
(181.5' PLAT-5')
SILT FENCE
CO (DESIGN LOCATION)
TOPSOIL STOCKPILE
NORTH GARAGE
FLOOR = 590.00
LINK
FLOOR = 595.00
MAIN HOUSE
MAIN FLOOR = 595.00
BASEMENT FLOOR = 586.0
586.0
218 PIONEER ROAD
LOT 2
BLOCK 4
(0.334 ACRES)
GARAGE
FLOOR = 590.00
CONCRETE DRIVE
TRACKING PAD
BM
TOP OF WELL
ELECTRIC COVER
ELEV.=589.03
PERFORM TEST PIT TO ASCERTAIN ELEV. OF EXISITING SAN. LATERAL
PIONEER ROAD (30')
BLOCK 2
MEANDERING FENCE
INFILTRATION RAIN GARDEN
25' REAR SETBACK PER: o.11.03(3)
35' HIGHWAY SETBACK PER: o.25.01(2o)
OVERHEAD ELECTRIC TO REMAIN
300' FROM O.H.W.M. OF LAKE MICHIGAN
ABANDONED SEPTIC VENT
INV. = 586.00
20 LF OF 6" PVC @ 1.24%
45 LF OF 6" PVC @ 0.56%
45 LF OF 6" PVC @ 0.55%
INL 3
INL 2
INL 1
INSTALL INLET PROTECTION
(187.56' PLAT)
(182.56' PLAT-5')
N00°39'32"E, 182.66'
S87°55'09"E, 81.27'
N88°11'56"W, 80.17'
25.0'
10.4'
11.0'
13.8'
13.5'
35.3'
40' 10"
30' 00"
6.0'
9.0'
DISCON. 8/20/19
8" PVC PER PLAN

WHAT ABOUT THE FUTURE?

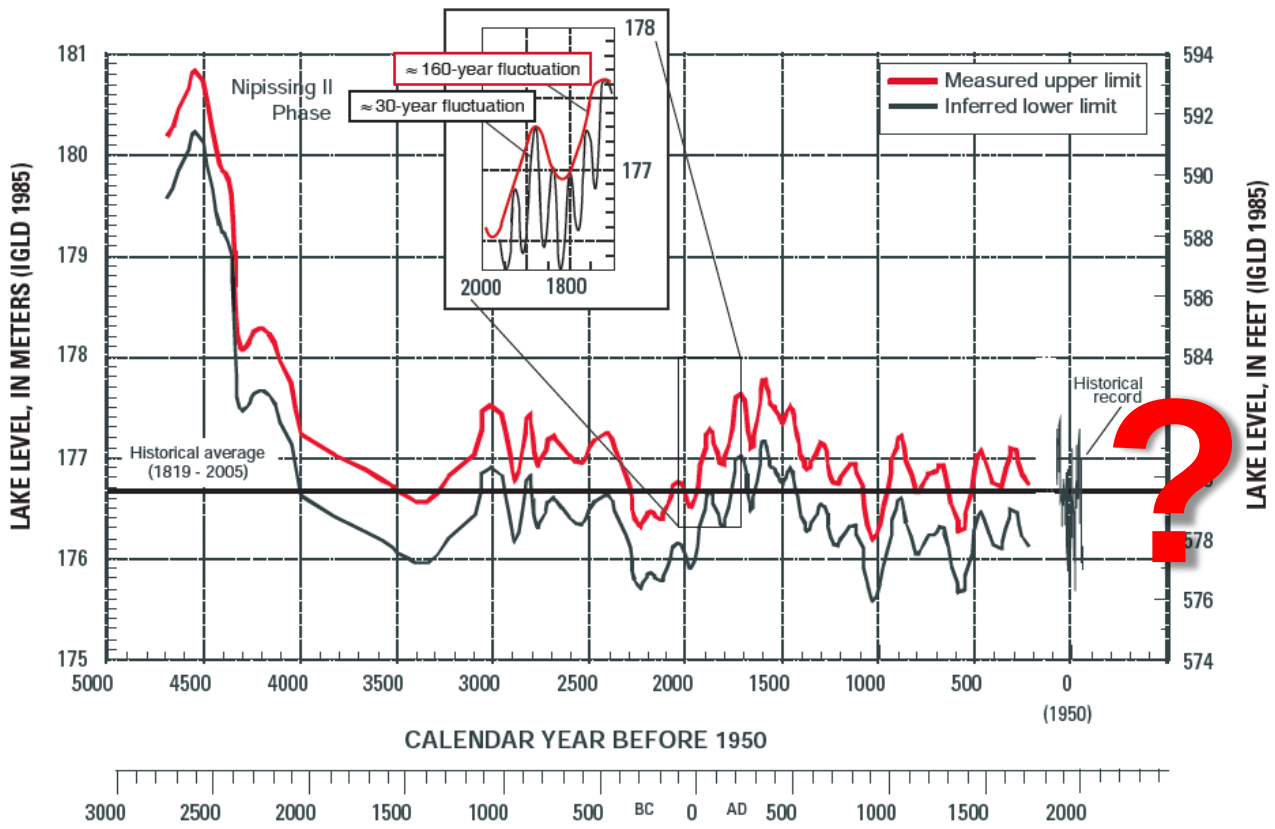
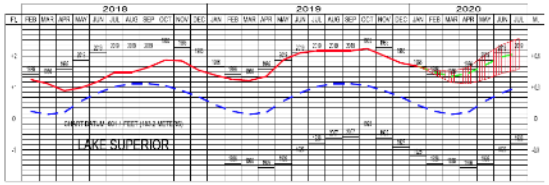
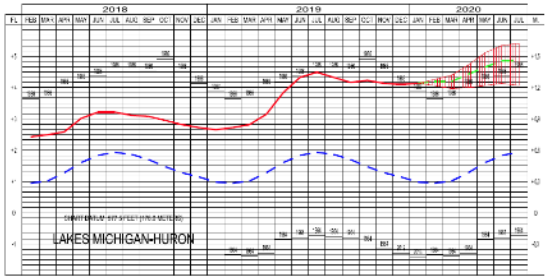
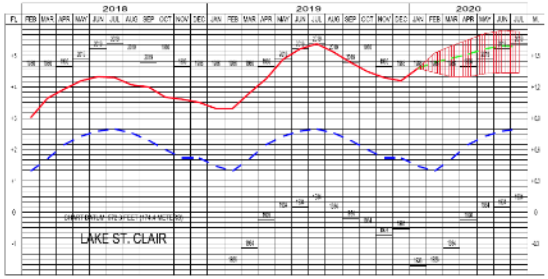


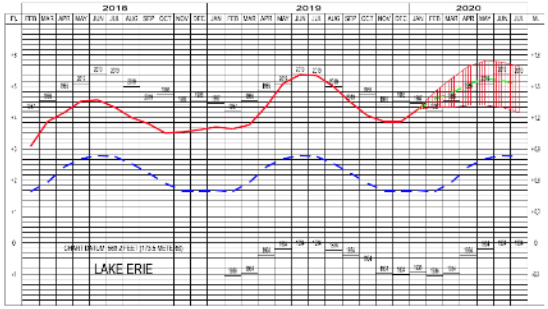
Figure 8. Hydrograph of late Holocene lake level and historical lake level for Lake Michigan-Huron. The red line is interpreted from beach-ridge studies, whereas the lower black line is an inferred lower limit using the range of the historical record as a guide.

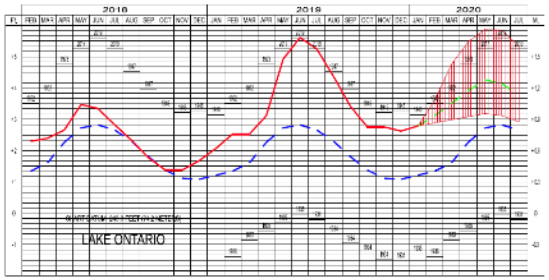
Image Courtesy of USGS











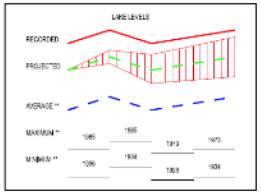
US Army Corps of Engineers
Detroit District

MONTHLY BULLETIN OF LAKE LEVELS FOR THE GREAT LAKES

FEBRUARY 2020

Monthly mean water levels for the previous year and the current year to date are shown as a solid line on the hydrographs. A projection for the next six months is given as a dashed line. This projection is based on the present condition of the lake basin and anticipated future weather. The shaded area shows a range of possible levels over the next six months dependent upon weather variations. Current and projected levels (solid and dashed lines) can be compared with the 1918-2019 average levels (dotted line) and extreme levels (shown as bars with their year of occurrence). The legend below further identifies the information on the hydrographs.

LEGEND



The levels on the hydrographs are shown in both feet and meters above (+) or below (-) Chart Datum. Chart Datum, also known as Low Water Datum, is a reference plane on each lake to which water depth and Federal navigation improvement depths on navigation charts are referred.

All elevations and plots shown in this bulletin are referenced to International Great Lakes Datum 1985 (IGLD 1985). IGLD 1985 has its zero base at Rimouski, Quebec near the mouth of the St. Lawrence River (approximate sea level).

ELEVATIONS REFERENCED TO THE CHART DATUM OF EACH RESPECTIVE LAKE

JANUARY MEAN LAKE LEVELS

(IGLD 1985)

		Superior	Mich-Huron	St. Clair	Erie	Ontario
* 2020	Ft.	602.72	581.56	576.77	573.49	246.23
	M	183.71	177.26	175.80	174.80	75.05
2019	Ft.	602.43	580.09	575.49	572.93	245.51
	M	183.62	176.81	175.41	174.63	74.83
	Ft.	602.69	581.30	576.77	573.89	246.09
** MAX.	M	183.70	177.18	175.80	174.96	75.16
	Yr.	1986	1997	1986	1967	1946
	Ft.	599.84	576.02	570.47	568.27	242.16
** MIN.	M	182.83	175.57	173.88	173.21	73.81
	Yr.	1926	2013	1936	1935	1935
** AVG.	Ft.	601.48	578.41	573.65	570.90	244.65
	M	183.33	176.30	174.85	174.01	74.57

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

How Are Great Lakes Water Level Regulation Plans Performing?

Arun Heer, Wendy Leger – IJC Great Lakes Adaptive Management Committee – October 06, 2017

Looking downstream at the St. Marys River. Credit: International Lake Superior Board of Control

The complex task of managing water levels and flows in the Great Lakes- St. Lawrence River system has received considerable attention recently following two notable regulatory changes and a series of unprecedented hydrologic events. Together, this presents a significant challenge and an important opportunity for the Great Lakes-St. Lawrence River Adaptive Management (GLAM) Committee (https://www.ijc.org/en_/GLAM) .

In January 2015, the International Joint Commission (IJC) implemented regulation Plan 2012, a new set of rules governing the amount of water to release from Lake Superior through the St. Marys River.

More recently, with the concurrence of the U.S and Canadian governments, the IJC implemented Plan 2014 (https://www.ijc.org/en_/Plan2014/home) in January 2017 for the regulation of outflows from Lake Ontario through the St. Lawrence River.

Both regulation plans were implemented following years of studies that looked at the impacts of past, present and potential future weather and climate conditions on water levels and outflow regulation, and how these factors affect socio-economic and environmental outcomes throughout the Great Lakes system.

Image courtesy US ACOE

PUBLIC POLICY NEEDS

- **Now that we're back into a sequence of high water levels for the next several decades, similar to the last half of the 1900's, and average annual precipitation is expected to increase for the next century at least as much as the 10% increase over the last century, it is important for State Governments throughout the Great Lakes drainage basin, and the US and Canada on a federal level, to update, through the International Joint Council (IJC) the several basin lake level management operating plans that still emphasize maximization of water levels.**

Regulation of Great Lakes' water levels possible, experts debate effects

By **Allison Bush (http://greatlakesecho.org/author/allisonbush/)** | June 1, 2009

51
SHARES

By Allison Bush, bushalli@msu.edu
Great Lakes Echo
June 9, 2009

Imagine turbines at the bottom of the St. Clair River that can control the height of the water on Lake Huron. What's more, they can generate electricity.

Sound farfetched? They're not, according to Craig Stow, a physical research scientist at the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory.

"Those sorts of things are technically feasible," he said. "But it depends on funding and the will and outlook of the Great Lakes community. "

Turbines like these are exactly what one very vocal Lake Huron community wants to keep water levels from getting too high or too low. Property owners belonging to the Georgian Bay Association in the northeast corner of the lake are worried that erosion is causing the level of lakes Michigan and Huron to drop at alarming rates.

Five diversions, like the Welland Canal between lakes Erie and Ontario, already have a hand in controlling Great Lakes water levels. Illustration: US Army Corps of Engineers

The Great Lakes water levels currently are controlled by several factors, including the Soo Locks, which regulate the outflow from Lake Superior, and five diversions that transfer water in and out of the Great Lakes basin, including the Welland Canal, which connects lakes Erie and Ontario. Lake Ontario is already completely regulated through various dams, locks and channel enlargements, with the lake levels being brought up and down in accordance with a particular schedule, Stow said.

"If we're willing to spend the money and take the risk, we can substantially regulate these lakes," he said.

But the current regulations do not have a large effect on either long-term lake level trends, and do not influence them significantly in the short term, according to Indiana's Department of Natural Resources, or DNR. Rather, regulation primarily helps to alleviate lake level extremes.

In the upper Great Lakes, the effects of regulation can take up to 15 years to be seen, experts say.

And although it is feasible to control the amount of water flowing through the Great Lakes from an engineering standpoint, the amounts of rainfall and evaporation "are totally outside of human control," said Roger Gauthier, a hydrologist at the Great Lakes Commission.

In addition, if the St. Clair River was regulated, it would mean that the Detroit and Niagara rivers would likely need to be regulated as well to mitigate the effects, Gauthier said.

Typically, regulated lakes are either fully or partially regulated, he said.

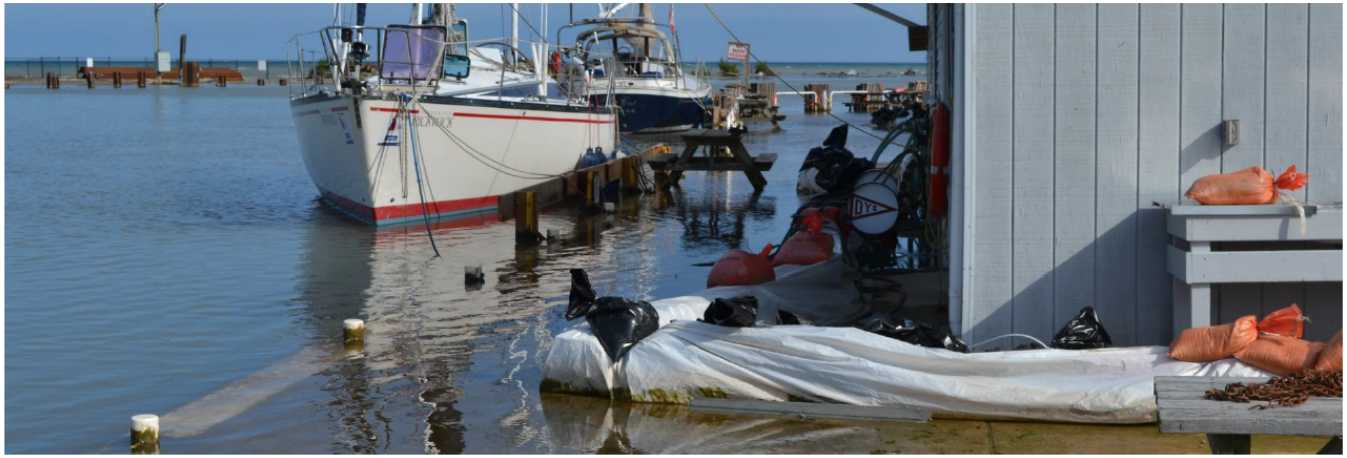
Full regulation requires the construction of a lock and dam system, and would interfere with the flow of commerce, Gauthier said. Partial regulation involves putting blocks, such as rock ledges, near the shore instead of in the middle of the shipping channel.

These ledges would offset the depth, and would have no interference if they were deeper than 30 feet, he said.

International Lake Superior
Board of Control

Semi-Annual Progress Report to the International Joint Commission

Covering the period March 1, 2019 to August 31, 2019



Great Lakes-St. Lawrence River Shoreline Landowners and Businesses 2019 High Water Impacts Questionnaire

(/#facebook) (/#twitter)

Were you impacted by high water levels along the Great Lakes and St. Lawrence River shoreline in 2019?

Wet conditions throughout the Great Lakes - St. Lawrence River basin in the spring of 2019 resulted in record-high or near record-high water levels in each of the Great Lakes. These high water level conditions caused tremendous challenges (which are still ongoing in certain areas) for people living and working along the Great Lakes – St. Lawrence River shoreline including direct damages to their homes and valued property.

The IJC's Great Lakes-St. Lawrence River Adaptive Management (GLAM) Committee (https://ijc.org/en_/GLAM/Directive) is working closely with the IJC's International Lake Ontario – St. Lawrence River Board (https://ijc.org/en/loslrb) (ILOSLRB) and the International Lake Superior Board of Control (https://ijc.org/en/lsbc) (ILSBC) to reach out to property and business owners who were directly affected by the high water levels in 2019.

Roger G. Miller, PE, President

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