

Lake Michigan 101

Basic History and Facts of the Lake Michigan Basin

Acknowledgements



Presented by the Lake Michigan Forum & Watershed Academy, with funding from the U.S. Environmental Protection Agency and the Great Lakes Restoration Initiative

Lake Michigan Basin

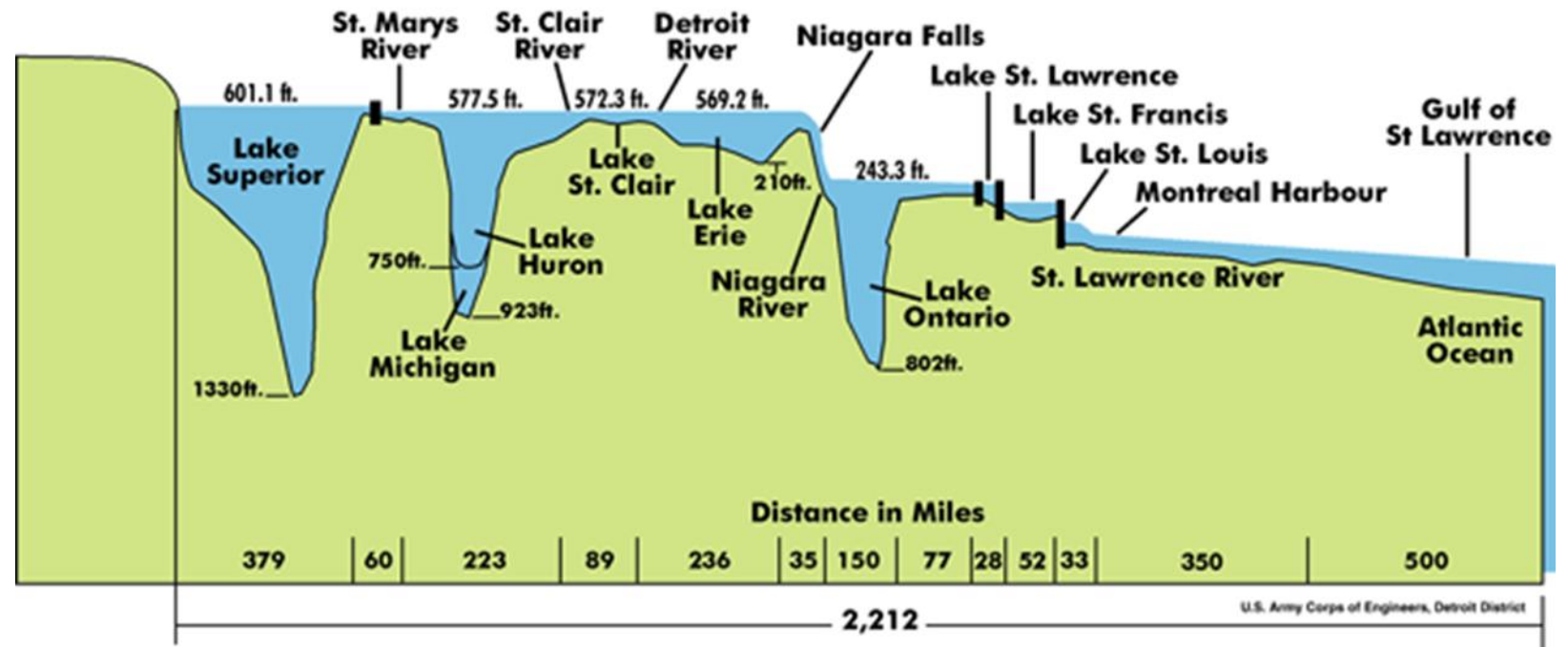
- Elevation 577.5 feet
- Length 307 miles
- Breadth 118 miles
- Avg. Depth 279 feet
- Max. Depth 923 feet
- Volume 1.29 quadrillion gal
- Surface Area 22,300 sq.miles
- Drainage Area 45,600 sq.miles
- Shoreline 1,640 miles
- Retention 99 years
- Population ~12,000,000



Image & Data from Michigan Sea Grant

Profile

Great Lakes System Profile



Geology

Formation began 10,000 years ago from glacial melt water

Some glaciers were a mile thick

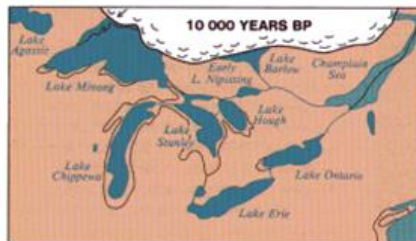
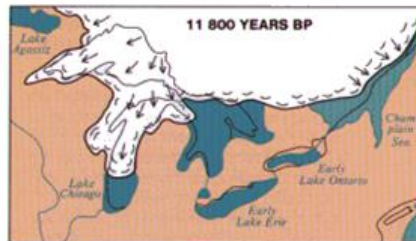
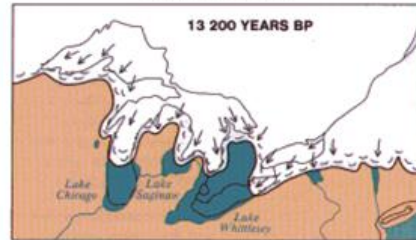
No single retreat – periods of warming & cooling

After retreat, land started decompressing, which still occurs today – “Isostatic Rebound”

Sand, silt, clay and boulders were deposited in various mixtures, known as glacial drift

STAGES IN THE EVOLUTION OF THE GREAT LAKES

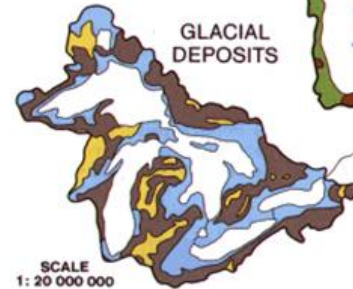
SCALE 1: 20 000 000



NOTE: The maps on left are “snapshots” of a continuously changing situation during the retreat of the Wisconsin icesheet. They should not be viewed as a simple sequence, since many intermediate stages are omitted. The letters BP denote before present.

GEOLOGY AND MINERAL RESOURCES

SCALE 1: 7 500 000



SCALE 1: 20 000 000



Bedrock areas where the glacial cover is absent (e.g. parts of Canadian Shield) are not distinguished.



The extraction of minerals such as sand, gravel and limestone is widespread and not mappable at this scale. Other minerals, such as salt and gypsum, are omitted to preserve clarity.

GEOLOGICAL PERIODS	
Pennsylvanian	Carboniferous 345 - 290 BP
Mississippian	
Devonian	400 - 345 BP
Silurian	440 - 400 BP
Ordovician	500 - 440 BP
Cambrian	570 - 500 BP
Precambrian	4500 - 570 BP

Figures denote age in millions of years before present (BP).

GENERALIZED CROSS-SECTION



Image from the U.S. EPA Great Lakes Atlas

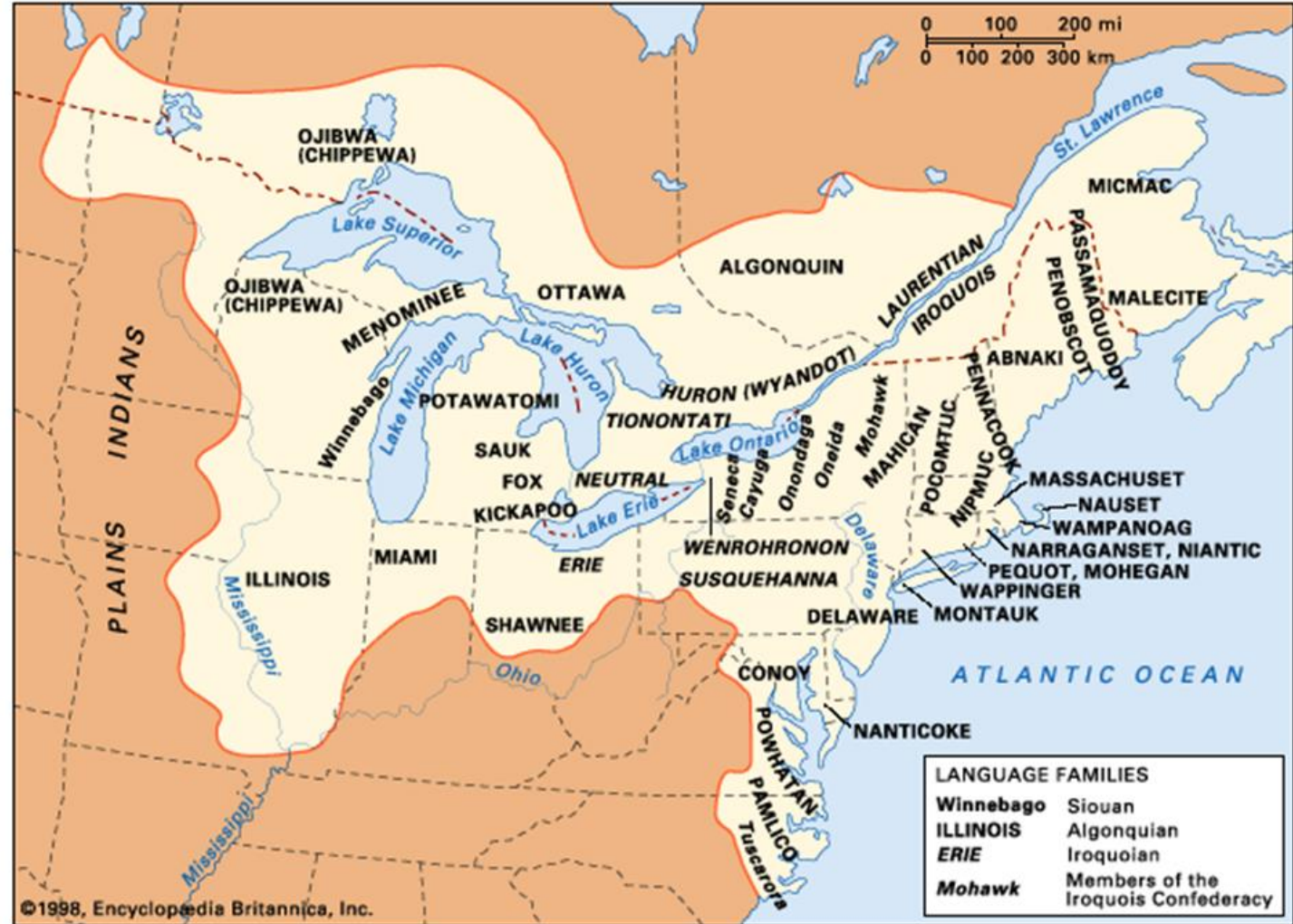
History

Earliest human inhabitants thought to be Hopewell Tribe– 800A.D.

Followed by Late Woodland Tribe

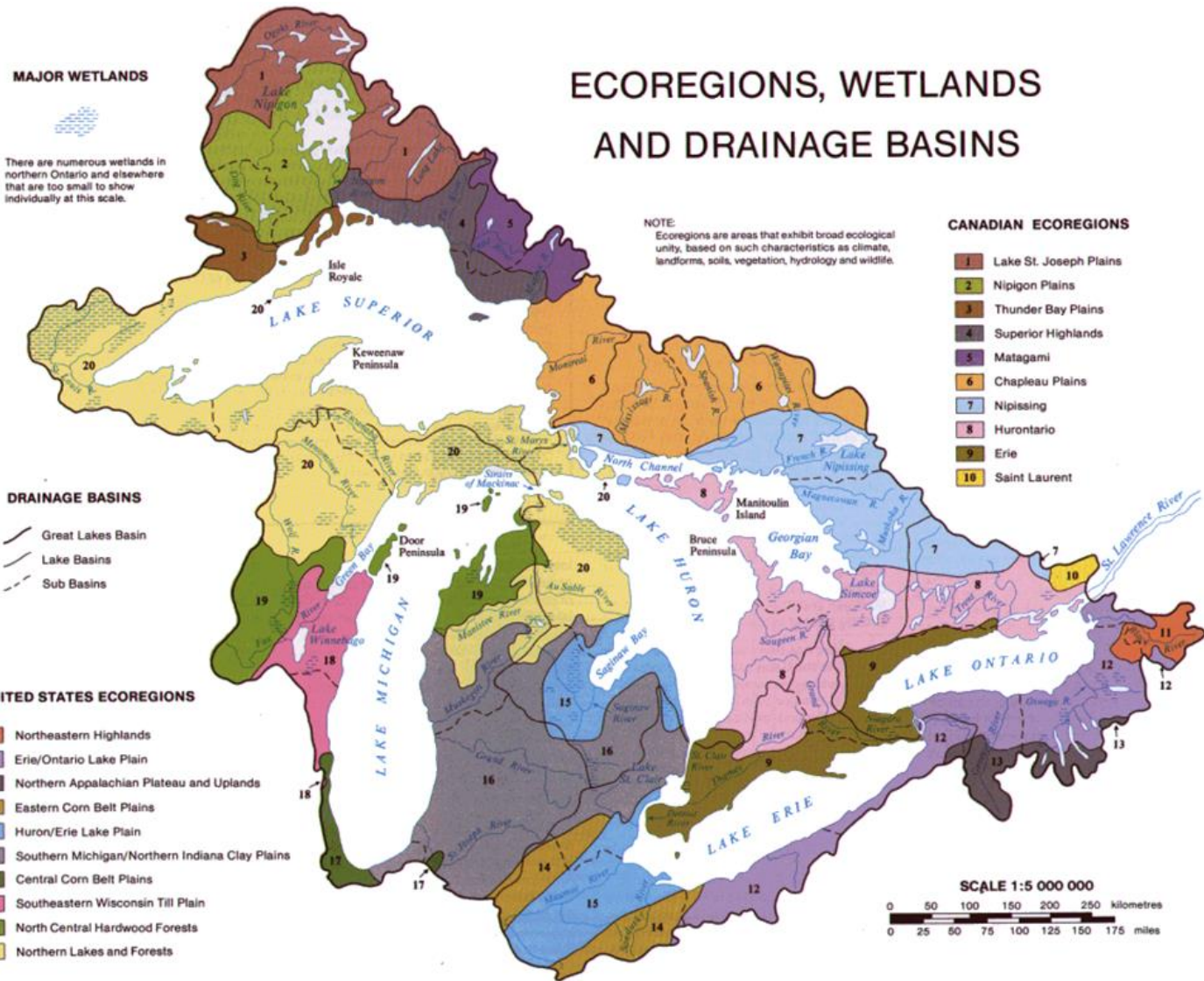
French explorer Jean Nicolet first non-native to reach Lake Michigan in early 1600's

Lake Michigan a primary trade route for European traders



Distribution of Eastern Woodlands Indians.
Courtesy Britannica

Ecosystem Types

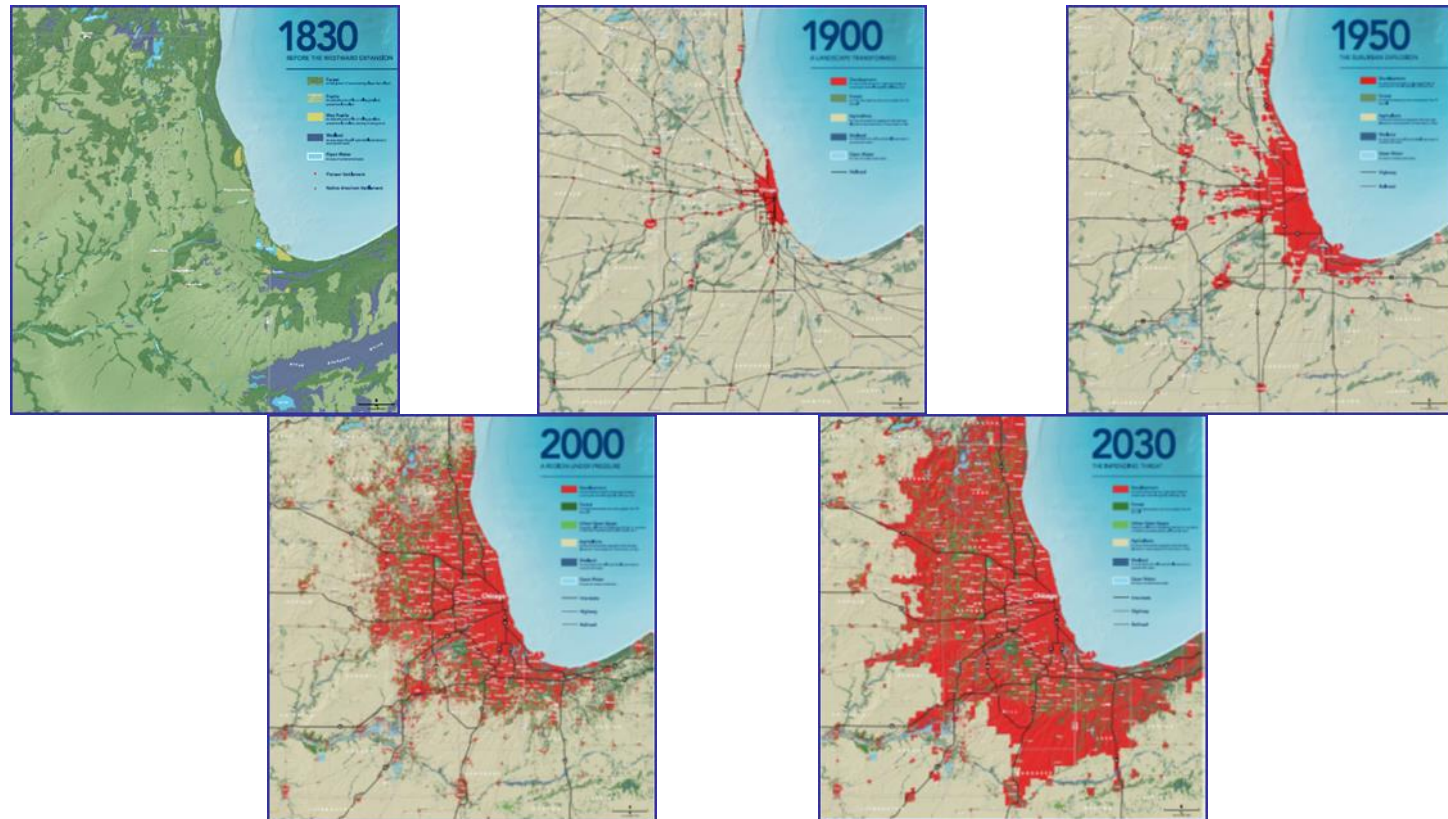


Biological Diversity

- The near shore Lake Michigan zone is among the most biologically productive in the region.
- Nearly 30 percent of the globally significant species and communities within the Great Lakes basin are associated with coastal shore systems
- See Lake Michigan Biodiversity Conservation Strategy for more information
- Biodiversity of Lake Michigan is at great risk from a variety of threats:
 - Invasive species
 - Climate change
 - Water pollution
 - Rapid and poorly planned residential and industrial growth
 - Altered hydrology
 - Incompatible agriculture
 - Forestry practices
 - Fisheries practices

Population Trends

- Population in the basin projected to grow by 40% by 2030
- Most population growth to be concentrated in southern third of the basin
- This pattern projected for many of the metropolitan areas in the basin



Images: Revealing Chicago, Openlands

Economics

- More than 1.5 million jobs are directly connected to the Great Lakes, generating \$62 billion in wages.
 - Manufacturing – 994,879 jobs
 - Tourism & Recreation – 217,635
 - Shipping – 118,550
 - Agriculture, Fishing & Food Production – 118,430
 - Science & Engineering – 38,085
 - Utilities – 10,980
 - Mining – 10,003



Policy

- Boundary Waters Treat of 1909
 - Established the International Joint Commission (IJC) to oversee treaty, manage water use, and regulate lake levels
- Great Lakes Water Quality Agreement (amended 2012)
 - First signed in 1972; New Agreement in 1978; Amended in 1987 and in 2012
 - Goal is to “restore and maintain the chemical, physical and biological integrity of the Great Lakes ecosystem”
 - New provisions address near shore environment, aquatic invasive species, habitat degradation and the effects of climate change
- Great Lakes Binational Toxics Strategy (1997)
 - Goal is to virtually eliminate toxic substances in Great Lakes
- Great Lakes Water Resources Compact (2008)
 - Focused on cooperative water management

Lake Michigan Trivia

- The Great Lakes contains 21% of world's freshwater and 84% of North America's freshwater
- Lake Michigan and Lake Huron are considered to be one lake hydrologically
- Lake Michigan is 2nd largest Great Lake and 5th largest lake in the world!
- Only Great Lake entirely within the U.S
- Southern basin is among the most urbanized areas in the Great Lakes system
- Lake Michigan is the size of Maryland, Delaware and Massachusetts –combined!
- Lake Michigan shoreline features the world's largest freshwater dunes

Questions

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