Back to the Future: A Perspective on History and Events That Shaped Michigan's Lakes and Streams

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This article provides an overview of historical events that transformed Michigan's lakes and streams. It is not intended to be a comprehensive account of history, but rather focuses on past events and activities that directly impacted Michigan's lakes and streams. It is hoped this article will provide the reader a perspective of Michigan history and the rapid pace at which change can occur.

The Glaciers: In The Beginning

The Great Lakes and the inland lakes and streams of Michigan are a product of glacial activity that ended about 10,000 years ago. In all, Michigan experienced four distinct glacial advances and retreats. At times, the glacial ice mass was well over a mile thick and so massive that it depressed the earth's crust. Lands in Canada were depressed to a level that the Great Lakes drained north and were lowered several hundred feet below present day levels. Conversely, as the glaciers retreated and the land rebounded, water began to drain back to the lakes and the water levels rose dramatically. These major fluctuations in the levels of the Great Lakes occurred in a relatively brief period that ended only about 3,000 years ago.

The glaciers that covered Michigan plowed and sculpted the land creating the hills, valleys, soils, and water features that exist today. With the final retreat of the glaciers, Michigan was left with over 26,000 inland lakes and ponds greater than an acre, nearly 42,000 miles of rivers and streams, and over 4,000 miles of Great Lakes shoreline. Many inland lakes are "kettle lakes" that were created when large blocks of ice were shed from retreating glaciers. In some parts of Michigan, such as the area from Oakland to Jackson Counties, thousands of kettle lakes exist. Houghton Lake, the largest lake in the state, is a kettle lake. Along the west shore of Michigan, a number of lakes were formed as a result of the fluctuating water levels in the glacial Great Lakes. As water levels fluctuated up and down, sand bars formed along many of the coastal river mouths creating natural impoundments. Lakes formed in this manner include Crystal Lake, Hamlin Lake, Pentwater Lake, Silver Lake, Spring Lake, and Lake Macatawa. At the north end of the Lower Peninsula, Burt, Mullett and Black Lakes sit in depressions scoured by receding glaciers.

Michigan is traversed by numerous rivers and streams, with rivers in the Lower Peninsula tending to flow in an east or west direction, and the rivers in the Upper Peninsula flowing to the north or south. Many lakes in Michigan were artificially created via construction of dams on natural waterways. Some examples include the Dead River Storage Basin in Marquette County; Kent, Ford and Belleville Lakes on the Huron River; and the Hardy and Croton Dam Ponds on the Muskegon River.

Lake Baikal in Russia (top) is estimated to be 25 to 30 million years old, and the Grand Canyon in Arizona (bottom) has been millions of years in the making. At a mere 10,000 years old, Michigan lakes and streams are in their infancy.

Pre-Settlement Times: Calm Before the Storm

Prior to European settlement, Michigan was inhabited by native peoples, lakes and streams were used primarily for fishing and travel, and the canoe was the primary mode of transportation. Michigan's vast forests provided prime habitat and fertile hunting grounds for deer, elk, fox, mink, and beaver. French fur trappers established trading

posts throughout the region to exploit this valuable resource, and British occupation soon followed. To this point, man's impact on the region's lakes and streams was minimal. Lakes were pristine, the great forests remained intact, rivers and streams flowed unimpeded, and indigenous fish were abundant. The Great Lakes supported native whitefish, lake trout, muskellunge, and sturgeon. Arctic grayling thrived in many of the northern rivers and streams.

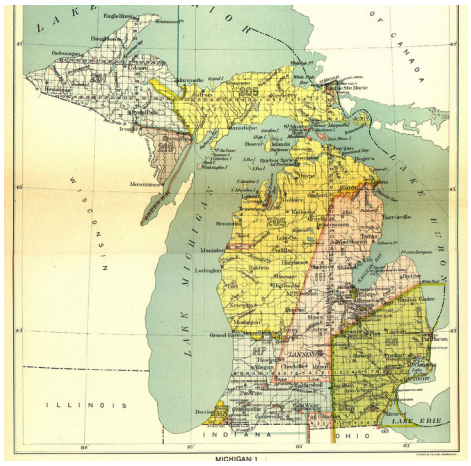
Michigan DNR

Virgil Beck

Arctic grayling (above), lake sturgeon (below).

The Michigan Survey

Shortly before Michigan attained statehood in 1837, a survey of the region was commissioned by the Surveyor General of the United States. An east-west base line and a north-south meridian line were established from which all additional measurements were to be based.



The survey was an extraordinary undertaking. Surveyors traveled on foot and carried their supplies on long journeys through the wilderness. A noted Michigan historian described the work of the surveyor:

> The task of the surveyor was to run a line exactly straight in a given direction and to measure that line in units of one mile. He required two chainmen to measure the line and an axeman worked with a compass set on a tripod…Surveyors were required to mark all trees along the line and to carefully record the crossing of streams, ravines, and hills, the character of the soil, timber, and minerals, and a description of each township that they surveyed.
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> From: *Michigan: A History of the Wolverine State* (Dunbar 1975)

With the survey complete, tracts of land throughout the state could be described and geographically referenced. A basis now existed for future land divisions, claims, and sales, and land offices were established throughout the state to record and document the process. As civilization continued to encroach and the population increased, Michigan's landscape began a major transformation.

Did you know…

1 acre = 43,560 square feet
40 acres = quarter-quarter section
160 acres = quarter section
640 acres = 1 section or 1 square mile
Typical township:
36 sections = 36 square miles

*The standardized system of measurement used today that is based on a township having 36 square miles was mandated by the federal **Land Ordinance of 1785**. Michigan has 83 counties and 1,242 townships.*

*It has been estimated that over 50% of Michigan's original wetlands have been destroyed. In fact, the federal **Swamp Land Act of 1850** allowed title of federal swamplands to be transferred to private parties that agreed to drain the land for agricultural and other "productive" purposes.*

*In 1862, the **Homestead Act** was signed by President Abraham Lincoln. Under this act, an individual could lay claim to 160 acres of surveyed government land and ultimately be granted title to the land provided they grew crops, constructed a small dwelling and lived on the land for 5 years. Title could also be acquired after 6 months if the claimant paid the government $1.25 per acre.*

*Some of the more prominent lakes in Michigan are named after some the state's early surveyors and geologists: Douglass **Houghton**, William **Burt**, Sylvester **Higgins**, and John **Mullett** to name a few.*

Copies of the original survey maps of Michigan are available on the Michigan Department of Natural Resources General Land Office website.

The Lumber Boom: The Inexhaustible Resource

Lumbering had a profound impact on the land and waters of Michigan. At the onset of the lumbering era, Michigan's forests were thought to be inexhaustible. Much of the state was heavily forested, and the northern portion of the Lower Peninsula in particular contained vast stands of white pine, prized because it grew straight and tall.

Michigan's lumber trade quickly became big business. Log runners (also called timber cruisers) were sent into the forests to scout and lay claim to select tracts of lumber. Temporary lumber camps were constructed and, once an area was logged, new camps were rapidly built. Laws were passed to ensure loggers had equal rights to the rivers where log runs became commonplace. The ends of logs were required to be stamped with distinct log marks to identify ownership, and the log marks had to be recorded in the county in which the logs were to be manufactured into lumber.

In the early logging days, most work was done during the winter months and logs were hauled with horse-drawn sleds on ice-covered roads to the banks of rivers. Initially, due to the difficulties involved in hauling logs, tree cutting was limited to areas close to rivers. Logs were typically stored along river banks until spring and rolled into the river and floated downstream to sawmills. During spring river runs, rivers were completely strewn with logs. If flow was inadequate to transport logs, dams would be built to impound water and then breached to create sufficient flow to float logs downstream. White pine was heavily favored for harvest because, unlike hardwoods that would sink, pine was buoyant. During this era, a primary use of many Michigan lakes and streams was to convey timber.

Various innovations in the harvesting techniques were developed to meet the ever-increasing demand for Michigan lumber. One innovation was the "Big Wheel," a specially designed log hauler that could carry logs across open land or dirt roads. The Big Wheels allowed trees to be cut further from the rivers and extended the logging season year-round, since they did not require icy conditions to operate efficiently. Another innovation was narrow-gauge railways. Rail lines were quickly lain and small steam engines were used to haul logs even greater distances. Once an area was cleared of trees, new tracks were laid elsewhere. Now, clear-cutting was largely unimpeded, and hardwoods could be economically harvested. Hardwoods were used in shipbuilding, furniture manufacturing, and as fuel for copper and iron smelting in the Upper Peninsula. In some areas, it was now possible to transport logs directly to main-line railroads and to avoid the time, labor, and expense of the river run entirely.

Concurrent with innovations in harvesting operations came innovations at the sawmills. The use of mechanized circular saws and band saws increased efficiency at the mills. By the late 1800s, Michigan was the king of lumber output, with the Saginaw River and Muskegon River watersheds in particular producing hundreds of millions of board-feet annually. With the nation's burgeoning population, demand for Michigan lumber was limitless. It is conservatively estimated that during the lumbering heyday, between 1840 and 1900, 160 billion board-feet of lumber were harvested in Michigan. However, by the early 1900s, Michigan's forests were essentially depleted and lumber production declined rapidly. In just a few decades, the logging industry in Michigan went from boom to bust; the "inexhaustible" resource had been depleted.

> A board-foot is equal to a piece of wood 1 foot long, 1 foot wide and 1 inch thick. A rough estimate used in the logging era was "five logs to the thousand" or 200 board-feet of lumber to the log. Using this rough estimate, the 160 billion board-feet of lumber harvested during Michigan's lumbering heyday equates to some 800,000,000 logs.

Unfortunately, during the logging era, there was no regard for the environmental impacts of logging. Logs choked miles of river marring stream banks and, as land was clear-cut and lay barren, erosion became widespread. During this time period, Michigan was swept by a series of uncontrolled wild fires that scorched the land and caused even more erosion. Sediment fouled streams smothering fish-spawning areas often warming the waters making them unsuitable for certain fish species. In short order, arctic grayling were extirpated from the region and, despite repeated attempts, programs to reintroduce the fish failed. Logging permanently altered

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US Forest Service

the stream habitat in which grayling thrived. Active erosion is still evident on many of Michigan's rivers today. For example, on the Muskegon River, stream banks at old log rollways continue to erode massive quantities of sand that accumulate in the lower stretches of the river. The removal of the forest canopy along river corridors not only increased water temperatures, but it removed a key source of woody structure that provided essential fish habitat.

Not only rivers, but many of Michigan's lakes bore the brunt of logging activity. Saw mills were commonly cited on lakes and mill wastes were typically discarded directly into the lakes. In a fishery report on Otsego Lake completed in 1950, a Department of Natural Resources fishery biologist noted that "large quantities of timber wastes were thrown into the lake near the mills. Submerged deadheads, slabs, and chips exist in considerable abundance yet to the day." Sediment cores from many lakes show a clear demarcation that coincides with the rampant erosion from the logging era.

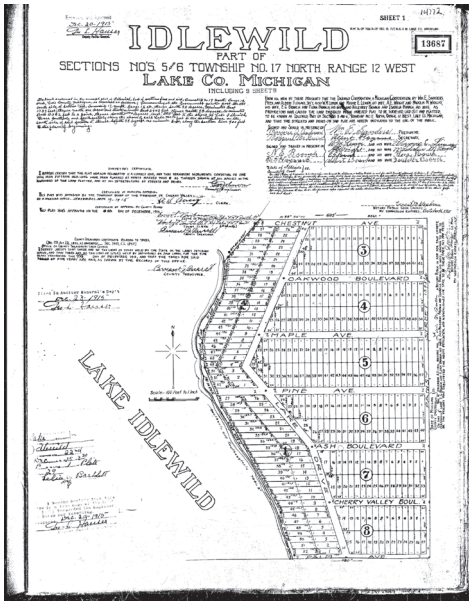
It is hard to picture the landscape in the post-lumbering era. The great forests were gone, lakes and streams were strewn with debris, and much of the state was a vast wasteland.

National Park Service

Michigan's Water Wonderland: The Allure of the Shoreline

As the logging era waned, additional sources of revenue were needed to help fill the economic void left by the demise of the logging industry. The network of railways across the state needed to adapt to the declining logging market. To attract customers, rail companies began to advertise Michigan's lakes and streams as vacation and leisure destinations. Railways were especially important in the development of resort communities in the northern portion of the state. Passenger lines were developed to bring outdoorsman to fish, hunt, and experience the beauty of the great north country. Fishing camps, lodges and resorts were established on lakes and streams to lure visitors.

In the post-depression years following World War II, as the auto industry grew and the economy improved, Michigan residents became much more mobile. Waterfront property was being quickly platted and marketed for sale. Lake plats typically contained lots that were quite small, but probably adequate for the times as most development consisted of modest seasonal cottages. Unfortunately, the early platting process set the stage for the congested shoreline development patterns that exist today.



Much of the early land development occurred in the absence of environmental regulations, and wetland areas were often drained, filled and developed. There was no understanding or consideration of the value of wetlands for the removal of pollutants, storage of flood waters, and fish and wildlife habitat. In an engineering evaluation of Houghton Lake prepared by the Michigan Department of Conservation in 1954, it was noted:

> Observations during past years indicate that considerable development has taken place around Houghton Lake and that low marshy areas, previously considered undesirable, have been developed into lots and sold. Large marsh areas were developed and very shallow fills placed over these areas to prepare cottage sites for sale. As the years have gone by, the recreational public has observed Houghton Lake during the latter part of summer and purchased lots when lake levels were low. After construction of cottages on these lots, at elevations very little above the ground surface, trouble developed from high water levels flooding out the land immediately around the cottages themselves. (Source: Michigan Department of Conservation.)

As demand for waterfront property grew and waterfront real estate increased in value, artificial canals and channels were often constructed to create more lakefront property.

During this period, the shorelines of many lakes were altered dramatically from their natural configurations and, as development intensified, additional stresses were placed on lakes. It was not uncommon to see shoreline areas cleared and stripped of vegetation. In the process, the pollution filtration and erosion protection functions of natural shorelines were lost. With development came increased runoff as roads, roof tops, and other impermeable surfaces prevented the infiltration of rain waters. Fertilizers, pesticides, and other pollutants could now drain unfiltered in lakes and

streams. With the absence of natural cover, seawalls were often constructed to control erosion. However, the seawalls themselves caused problems. Seawalls create unnatural barriers to the migration of frogs, turtles and other wildlife in and out of the water and prevented the natural dissipation of wave energy often creating additional scour and erosion problems.

In the 1960s, as public awareness and scientific knowledge regarding environmental impacts increased, the Michigan legislature began consideration of a number of environmental initiatives. In 1966 Michigan passed the Inland Lake Improvement Act and, by the late 1970s, several groundbreaking environmental laws were enacted. The dredging and filling of wetlands, canal and channel construction, earth-moving activities near lakes and streams, and development along designated sections of rivers all became regulated. Recognizing the role of phosphorus in stimulating aquatic plant growth, Michigan placed limits on the amount of phosphorus allowed in laundry detergents and, more recently, limited the phosphorus content in dishwater detergents and lawn fertilizers.

An Historical Perspective

Despite its relatively brief history, change in Michigan has occurred very quickly. Lakes and streams created just a few thousand years ago and settled just a few hundred years ago have undergone tremendous change.

It is interesting to note that many of the adverse environmental impacts associated with the settling and development of Michigan were predicated on the mistaken belief that Michigan's natural resources were inexhaustible. The concept of the sustainable use of resources was completely foreign. An important lesson learned from the environmental devastation of the lumber era was the need for sound forest conservation practices.

On many lakes today, shoreline areas are completely developed and small cottages and boats have given way to big houses and big boats. In some lakes, natural shoreline areas have been replaced almost entirely with seawalls, and shoreline vegetation is nearly non-existent. A recent nationwide study conducted by the U.S. Environmental Protection Agency found that the loss of natural shoreline habitat is the greatest threat to Michigan's lakes. Nationwide, lakes with poor shoreline habitat were three times more likely to be in poor biological condition.

Throughout Michigan's history there are numerous examples of environmental upheavals due to lack of regulation. Great Lakes whitefish stocks collapsed due to overfishing, unregulated sewage and industrial discharges fouled rivers and streams, and millions of acres of wetlands were drained. While there is a natural inclination to disdain regulation, it has become an important and essential component of sound environmental management and economic vitality in Michigan. Michigan's water-based tourist and recreation industry is one of the state's key economic engines.

At the time of pre-settlement, the lakes and streams of Michigan were in a state of equilibrium. Since the passing of the logging era and the developmental pressures that followed, lakes and streams have likely reached a new equilibrium, an altered state. While it may not be possible to completely turn back the hands of time and restore lakes and streams to their pre-development state, we can learn from history. Many opportunities and challenges lie ahead. Hopefully, a greater awareness of the past will provide a foundation for better decision-making in the future.

Historical Milestones

1620	French and British Occupation
1776	Declaration of Independence
1785	Federal Land Ordinance
1805	Territory of Michigan Established
1815	State Survey Initiated
1837	Michigan Statehood
1840	Michigan Lumber Era
1850	Swamp Land Act
1851	State Survey Completed
1862	Homestead Act
1865	Lincoln Assasinated
1900	Lumber Boom Over
1930	Great Depression Begins
1939	World War II
1945	Ascent of the Automobile
1957	Mackinaw Bridge Constructed
1961	MLSA Incorporated
1966	Inland Lake Improvement Act
1969	Governor Milliken Sworn In
1970	Natural Rivers Act
1972	Inland Lakes and Streams Act
1972	Soil Erosion Control Act
1977	Phosphorus Detergent Ban
1979	Wetland Protection Act
2010	Phosphorus Fertilizer Law