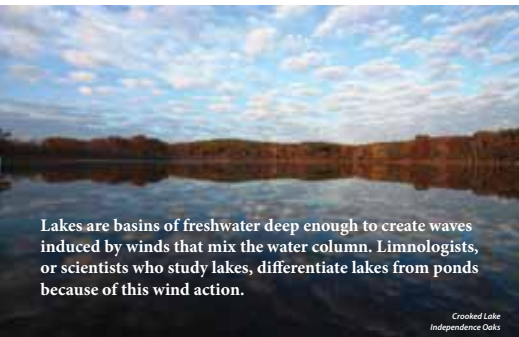


# The Land of Lakes



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Michigan has more than 11,000 inland lakes, and the highest concentration of these lakes is found in Oakland County. Lakes are large basins of surface water that shimmer in the sunlight, drawing people to them. They add to our quality of life and are one of our most precious assets.

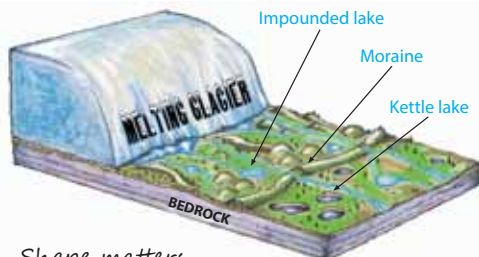


Lakes are basins of freshwater deep enough to create waves induced by winds that mix the water column. Limnologists, or scientists who study lakes, differentiate lakes from ponds because of this wind action.

Crooked Lake  
Independence Oaks

## Glacial Forces Shaped Our Lakes

Glaciers once covered Michigan for more than 2.5 million years. These glaciers advanced southward during colder periods and retreated to the north as the temperatures warmed. The last glacial period in southeast Michigan ended about 10,000 years ago. The movement of glacial ice changed the land; when glaciers melted, walls of glacial till interrupted natural drainage, and in other areas glacial ice created depressions in which water accumulated.

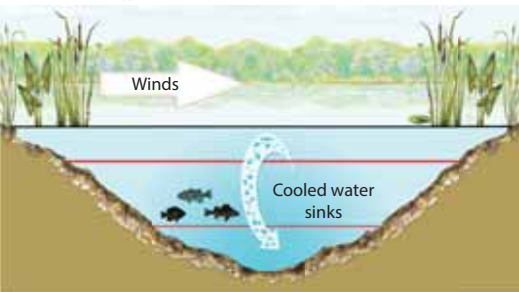


## Shape matters

The shape of a lake affects how it functions. Characteristics like length, width, depth and volume influences water quality. Changes on land impact lakes: removing natural vegetation, disturbing soil and the amount of impervious surface area increases surface runoff and adds nutrients to lakes.

## Water has unique properties

Natural lakes benefit from the way water molecules behave. In temperate climates, the heating and cooling of water affects its density—warm water is lighter than cool water; cold water sinks and warm water rises. Temperature differences help circulate and cycle nutrients and oxygen.

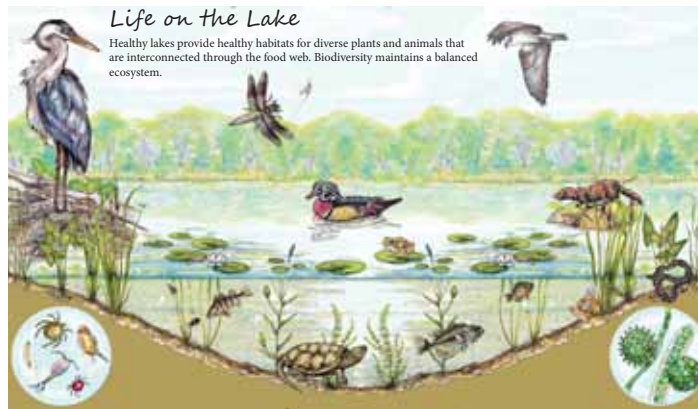


Water is the only natural substance found in all three physical states (solid, liquid and gas) at temperatures normally seen on Earth.

Water density is greatest at 39°F or 4°C.

Water freezes at 32°F or 0°C. As water transforms to ice, molecules arrange in a lattice-like pattern and ice floats above the denser, liquid water.

Ice also insulates the water beneath, protecting life in the lake.



## Life on the Lake

Healthy lakes provide healthy habitats for diverse plants and animals that are interconnected through the food web. Biodiversity maintains a balanced ecosystem.



Widow Skimmer - Libellula taenioides



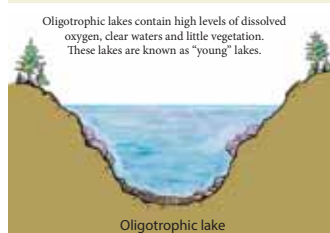
Green Frog - Rana clamitans



Stewart Lake  
Grovefield Oaks

## Lake Life Stages

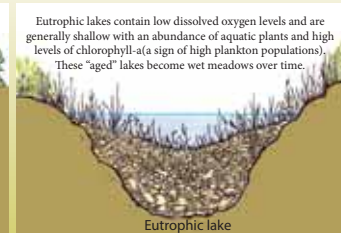
Lakes change over time, and nutrients washing into lakes accelerate "aging." The life stages of lakes are classified and measured by characteristics such as oxygen content, clarity and algal growth.



Oligotrophic lakes contain high levels of dissolved oxygen, clear waters and little vegetation. These lakes are known as "young" lakes.



Mesotrophic lakes are called "middle-aged" lakes. They contain emergent and submergent plants and support fisheries and other life.



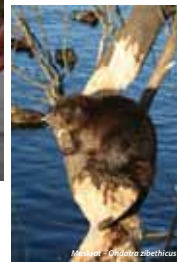
Eutrophic lakes contain low dissolved oxygen levels and are generally shallow with an abundance of aquatic plants and high levels of chlorophyll-a (a sign of high plankton populations). These "aged" lakes become wet meadows over time.

## Natural Shorelines

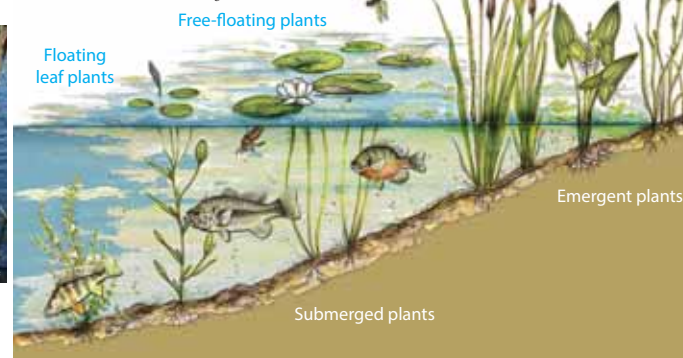
Maintaining a vegetated shoreline helps protect water quality and slows the aging process of a lake. Natural shorelines also help create habitat for wildlife and lessen the scouring action of the waves.



Pumpkinseed Sunfish - Lepomis gibbosus



Beaver - Castor fibericus



Free-floating plants

Floating leaf plants

Emergent plants

Submerged plants

## Lakes Matter

Beyond habitat for wildlife, lakes provide recreation, aesthetics, economic value and other useful services. Lakes are living resources that can be threatened. By understanding these threats everyone can help protect lakes.

- Learn about Aquatic Invasive Species (AIS) that damage freshwater resources.
- Clean and inspect all water recreational equipment thoroughly after each use to stop AIS from hitchhiking into waterways.
- Prevent nutrients and other sources of pollution from entering water. Maintain a vegetative buffer along the lake's edge.
- Reduce fertilizer use. The water quality of a lake is affected by surrounding land use. Be phosphorus smart—it is the law!
- Never release a plant or animal into a lake unless you took it from that lake.
- Follow local, state and federal laws.
- Support educational efforts to protect Michigan lakes.

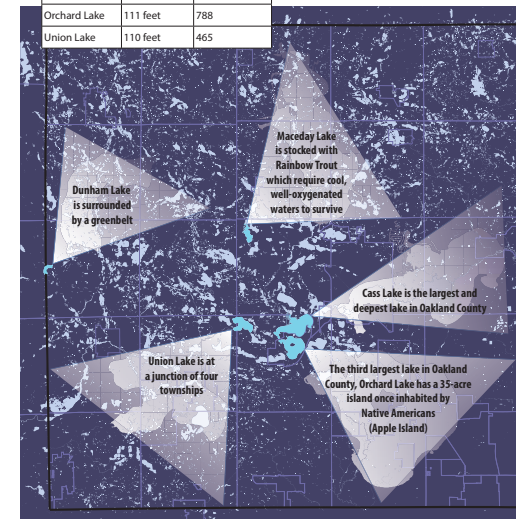
The value of Michigan inland lakes is linked to water quality—poor water quality reduces the value of lake property as much as 40%. Michigan inland lakes generate approximately \$15 billion in direct and indirect economic activity annually—lakes are truly priceless gems.

## Oakland County Lakes

Lake	Maximum Depth	Total Acreage
Cass Lake	125 feet	1,280
Dunham Lake	118 feet	110
Maceday Lake	118 feet	219
Orchard Lake	111 feet	788
Union Lake	110 feet	465

Oakland County is home to 1,468 lakes and the headwaters of five major watersheds.

Five of the top 20 deepest inland lakes in Michigan are located in Oakland County.



Dunham Lake is surrounded by a greenbelt

Maceday Lake is stocked with Rainbow Trout which require cool, well-oxygenated waters to survive

Cass Lake is the largest and deepest lake in Oakland County

Union Lake is at a junction of four townships

The third largest lake in Oakland County, Orchard Lake has a 35-acre island once inhabited by Native Americans (Apple Island)

In 2004, more than 29,000 waterfront parcels were valued at over \$10.6 billion in Oakland County. Lakes hold millions of gallons of water and mitigate storm damage events and flooding.

Visit one of the lakes at the Oakland County Parks.



Lake Sixteen  
Orion Oaks