

Getting to Know Your Michigan Watersheds Map

The *Michigan Watersheds* map illustrates that all waterways in Michigan eventually flow into the Great Lakes, and therefore, our actions on land influence what happens downstream. This guide is designed to explain map details and how to use the map as a tool.

MAP DATA SOURCES*

This map is based on high-resolution geographic data that was processed by partners at the USGS Great Lakes Science Center. The original data layers came from:

- *Watershed boundaries and lakes:* Michigan Geographic Data Library
- *Great Lakes:* Institute for Fisheries Research Great Lakes GIS
- *Rivers, Political borders and cities:* Michigan Geographic Data Library and GIS-based software from ESRI

EXPLORING BOUNDARIES

Watersheds are often referred to as drainage or catchment basins and are defined as the land area that drains – or sheds – water to a particular river, stream or body of water. Watershed boundaries, referred to as drainage divides, are determined by high points in the landscape.

For general information about watersheds, see: <http://water.usgs.gov/education.html>

CLASSIFYING WATERSHEDS

Watershed boundaries can be represented in a number of different ways and at different scales. Large river basins can be subdivided into an almost infinite number of smaller watersheds, depending on the level of detail needed. The U.S. Geological Survey developed a hierarchical system for classifying watersheds into Hydrologic Unit Codes (HUCs), by dividing the U.S. into 21 hydrologic regions and then dividing

A Few Questions to Get Started

- Which watershed do you live in?
- Is it part of a Greater Watershed?
- Can you follow the flow of water from your watershed to one of the Great Lakes?
- Which Great Lake basin does it drain to?
- What are the largest watershed basins in Michigan?



each of those regions into smaller and smaller units. Many agencies organize watershed data using 8-digit HUCs, identified by an official 8-digit code.

The watershed boundaries on this map are smaller watershed divisions than those 8-digit HUCs. The boundaries are those used by the Michigan Department of Natural Resources and Environment (MDNRE). The level of detail was chosen in order to define the watersheds in relation to the Great Lakes, where each river eventually ends.

To learn about watershed divisions, see: <http://water.usgs.gov/wsc>

GREATER WATERSHEDS

Watershed names beginning with “Greater” refer to the whole drainage area for a large river that has been divided into distinct sub-watersheds to make management of the water resources easier.

MAP PROJECTION

When developing a map of a relatively large area, projecting geographic information from the spherical earth surface to a two-dimensional map surface with minimal distortion of shapes, sizes and distances is a challenge. The *Michigan Watersheds* map uses the Albers Equal Area Conic Projection. The Albers Projection helps to ensure that the sizes of landmasses are proportional to each other and helps maintain a 90-degree angle between lines of latitude and longitude. However, shapes are still slightly distorted due to the limitations of viewing a two-dimensional version of the surface of the earth.

To learn more, see: <http://egsc.usgs.gov/isb/pubs/MapProjections/projections.html>

River vs. Lake

Most land and creeks in Michigan drain to one of the major rivers shown on the *Michigan Watersheds* map. However, along the Great Lakes coasts, drawing watershed boundaries becomes more complicated. There are numerous small streams that flow directly into a Great Lake, many of which are too small to show on the map. For educational purposes, some small, adjacent coastal streams were merged into a single watershed unit following the conventions used by the MDNRE.

Those that drain directly into one of the Great Lakes are named based on a nearby watershed and are indicated with an “L-”.

For example: Between the Ontonagon River and Presque Isle River watersheds in the Upper Peninsula, you will find L-Presque Isle, which includes several streams like the Big Iron River that flow directly into Lake Superior.



See: www.miseagrant.umich.edu/publications

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The Michigan Watersheds map is a fantastic opportunity to learn more about Michigan's water resources. The *Introduction to Michigan's Watersheds: A Guide for Teachers, Students and*

Residents provides a great overview as well as more in-depth background information, graphics and inquiry-based questions on watersheds.

* The *Michigan Watersheds* map was produced by Michigan Sea Grant and the U.S. Geological Survey using the best possible data from many sources. Every effort has been made to use accurate and verified information, however, a degree of error is inherent in all maps. If you notice any errors, please contact Michigan Sea Grant at msgpubs@umich.edu.