Michigan's Climate

THE COCORAHS 'STATE CLIMATES' SERIES

Michigan Precipitation and Great Lakes Proximity

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Total annual precipitation across Michigan varies from less than 28 inches in the east-central and northeastern sections of the Lower Peninsula to just above 38 inches in the extreme western Upper and southwestern Lower Peninsulas. The former area is the driest climatologically in the U.S. east of the Mississippi River. In terms of seasonality, February is climatologically the driest month, while August or September are the wettest. About 60 percent of the annual total is recorded during the May-October growing season. The annual number of thunderstorms observed decreases from about 40 in the south to around 25 in the Upper Peninsula area with nearly 50 percent of these recorded during the June through August summer months. Months without any precipitation are rare across the state.

The frequency of floods is quite low in Michigan, with the greatest likelihood occurring in late winter or early spring, when sudden warming and rain may be combined with snowmelt. Mild meteorological drought conditions are not uncommon in Michigan, but meteorological droughts reaching severe conditions are infrequent and generally of short duration. The rather even annual distribution of precipitation and relatively low evapotranspiration rates observed in Michigan help to reduce periods of drought that are experienced in other areas of the upper Midwest.

Michigan experiences some of the heaviest seasonal snowfall totals and length of snow- cover duration in the U.S. east of the Rocky Mountains. The maximum average annual snowfall amounts (over 220 inches) occur at points along the escarpment which rises abruptly up to elevations of over 1,000 feet above Lake Superior, just inland from the northern shore of the Upper Peninsula. Another area with amounts exceeding 150 inches is centered in the western section of interior northwestern Lower Michigan. The prevailing westerlies, passing over the Great Lakes, deposit much of the moisture entrained while crossing the open water in the form of snow showers and squalls in these areas. Annual snowfall totals decrease rapidly from northwest to southeast across the state, with totals of less than 40 inches found in southeastern sections of the Lower Peninsula, where lake-effect snowfall is relatively light. The percentage of total snowfall amounts attributed to the lake effect or 'lake enhanced' snowfall (vs. snowfall associated with larger scale 'synoptic' weather systems) similarly falls from more than 60% in extreme northern sections to less than 10% in the far southeast. In addition, the presence of the lakes alters precipitation frequencies from one side of the lakes to the other, with relatively more wet days downwind of the lakes versus areas upwind during the cold months and relatively fewer wet days during the warm season. The difference decreases inland away from the lake shores.

Climatologically, climate extremes in Michigan are similar in magnitude to surrounding areas. Extreme precipitation totals in the central U.S. tend to decrease from south to north as the distance from the Gulf of Mexico water-vapor-source region increases. Not surprisingly, many extreme rainfall events in Michigan have occurred in southern sections of the state. The greatest yearly total on record of 56.38” occurred at Niles in 1954, while the lowest yearly total of 15.86” occurred four years later at Mt. Clemens. The greatest daily total recorded was 9.78” at Bloomingdale on September 1, 1914. Extreme snowfall events are concentrated in the lake-effect Snowbelt regions, especially the Keweenaw Peninsula. The greatest one-day total of 30” was recorded at Herman on December 19, 1996, and the greatest seasonal total of 391.9” was recorded at Delaware during the 1978-1979 winter. The maximum number of consecutive days with snowfall, 59, was recorded at Houghton during the period from December 17, 1993 through February 13, 1994.

To learn more about Michigan’s climate visit the Michigan Climate Office’s web site at: http://climate.geo.msu.edu/.

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