See link: http://rredc.nrel.gov/wind/pubs/atlas/

The Great Lakes Region

The Great Lakes region consists of Illinois, Indiana, Michigan, Ohio, and Wisconsin. The major cities, lakes, rivers, and geographical features are shown in Map 3-14.

The topography of the region, relative to western sections of the United States, is not complex. The entire area is almost all glaciated; terrain ranges from flat in Indiana and Illinois to gently rolling in central and northern Wisconsin. The two exceptions are southeastern Ohio and extreme southwestern Wisconsin, where terrain is rugged and unglaciated. Areas near the Great Lakes have sandy bluffs and marshes. Glacial lakes are prevalent in Wisconsin and Michigan where the terrain is more hilly.

In the Great Lakes region, class 3 or higher wind energy potential is estimated for exposed coastal and offshore areas of Lakes Erie, Huron, Michigan, and Superior, hilltops and ridges in southwestern Wisconsin and in the upper part of Michigan's lower peninsula, and upland plains in west-central Illinois. Areas of highest wind energy potential in the region are the exposed coastal and offshore areas and islands of the Great Lakes. At least class 5 wind power can be expected over offshore areas of all the Great Lakes, with maximum wind power in the winter (class 6) and minimum wind power in the summer (class 3). Over offshore areas, prevailing strong winds are mostly from the northwest-to-southwest directions. Exposed coastal points along the eastern shore of Lake Michigan and along the northern and western part of Keweenaw Peninsula in Lake Superior are estimated to have class 5 wind power, because these areas are well exposed to the prevailing strong winds with a long fetch over the open waters.

Major wind resource areas in the Great Lakes region are described below in greater detail. Maps of annual average wind power are presented in Maps 3-15 through 3-19 for Illinois, Indiana, Michigan, Ohio and Wisconsin.

Lake Michigan

The annual average wind power for exposed coastal and offshore areas of Lake Michigan is estimated to range from class 3 to class 5. The abrupt increase in surface roughness inland from the coastline, because of vegetation and topography, rapidly attenuates the wind resource landward.

Areas of highest wind energy potential are the exposed offshore areas, islands and exposed capes, and points along the eastern shore of Lake Michigan. Class 5 wind power is estimated for these areas, with maximum wind power in the winter (class 6) and minimum wind power in the summer (class 3). Over the offshore areas, prevailing strong winds are mostly from the northwest-to-southwest directions. Exposed coastal points

along the eastern shore of Lake Michigan are well exposed to these prevailing strong winds, which have a long fetch over the open water. The class 5 estimate for exposed coastal points along the eastern shore of Lake Michigan is verified by approximately two years of wind measurements at 30 and 46 m (98 to 151 ft) on a DOE-installed tower at Big Sable Point.

The western shore of Lake Michigan forms the eastern edge of Wisconsin and has an annual average wind power of class 3. This reduced wind power on the western shore reflects the prevailing westerly winds. Eastward-moving storm systems during the winter and late autumn are responsible for the easterly winds that flow off the lake. Thus, on the annual average, the wind power on the western shore is less than on the eastern shore but still reflects the influence of Lake Michigan. Lake breezes, which are maximized in the spring, also enhance the wind power potential along this shoreline