

Meteorology

Ohio is located in what is meteorologically termed the Mid-Latitudes. For pollutant dispersion, the most important meteorological parameter is wind speed and wind direction. In this region, surface weather systems predominantly travel from west to east, guided by either the sub-tropical or polar jet streams. The resulting surface transport winds associated with these systems will generally have a western component with additional southern components in the summer and northern components in the winter, although, on any given day, winds can blow from any direction.

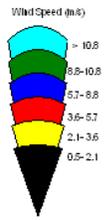
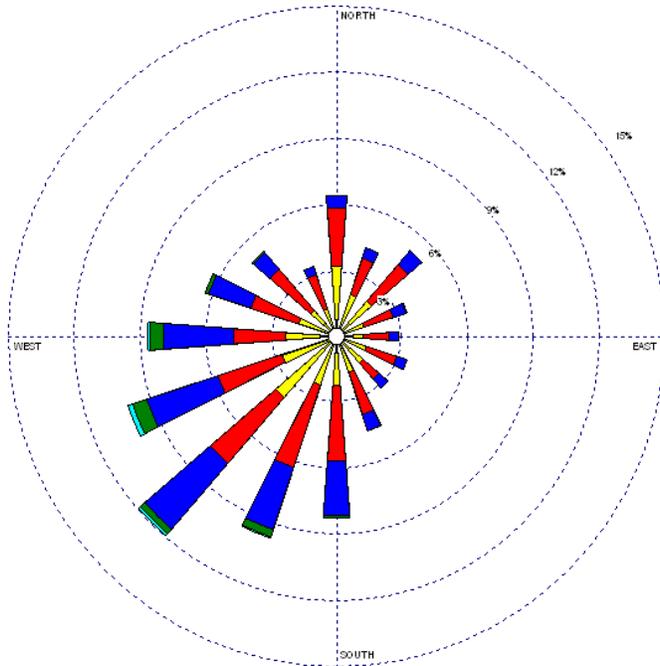
Below are representative wind roses for several locations in-and-around Ohio. The regional nature of mid-latitude wind distributions may best be represented by the Columbus and Dayton airport wind roses. Columbus and Dayton are located in a relatively flat area in the central part of the state, generally unaffected by significant orographic or other surface features (e.g., Lake Erie).

These general wind patterns can be modified by two general geographic features. Ohio is bounded on the north by Lake Erie which can provide localized modifications to the general flow, primarily by the introduction of land breezes and lake breezes along the Lake during periods of low synoptic wind speeds. These effects would best be represented by the Toledo and Cleveland airport wind roses.

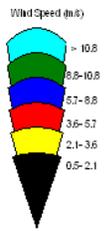
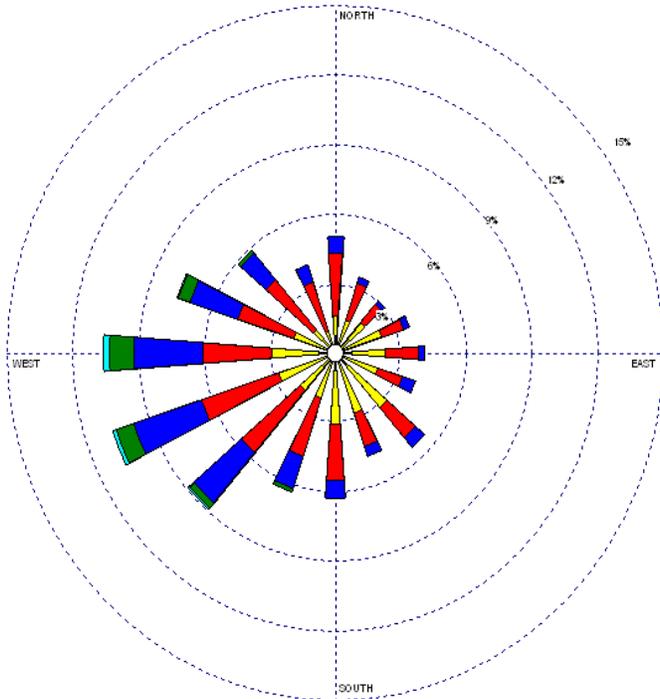
The second major geographic feature affecting winds in Ohio is the hilly terrain located in the east, south and southeast portions of the state. While the remainder of the state is primarily agricultural, these portions of the state, which represent the foot hills of the Appalachians, have significant forested areas which modify the surface roughness lengths and can impact wind speed and wind direction. The Covington, Huntington and Pittsburgh airport wind roses best illustrate the range of deviations that can occur as compared to the Columbus and Dayton examples.

While, as stated above, at any location within the state, winds can blow from any direction. In the initial version of the PM_{2.5} standard, the annual standard was most constraining, in the version of the standard for which the state is now making recommendations, the 24-hour standard is equally important. A given 24-hour period could have average winds from any direction, thus making counties in all directions from the urban industrial core area potentially important emission source areas.

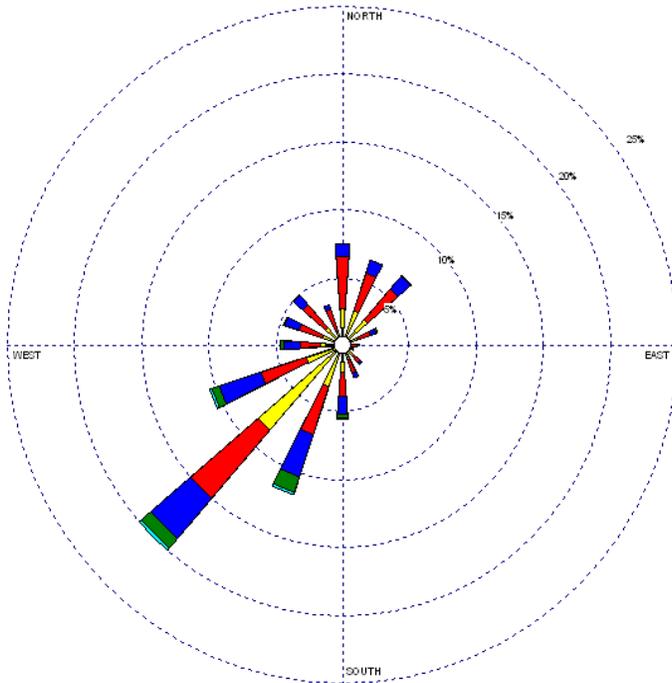
Station #14895 - AKRON/AKRON-CANTON REGIONAL, OH - January 1 - December 31



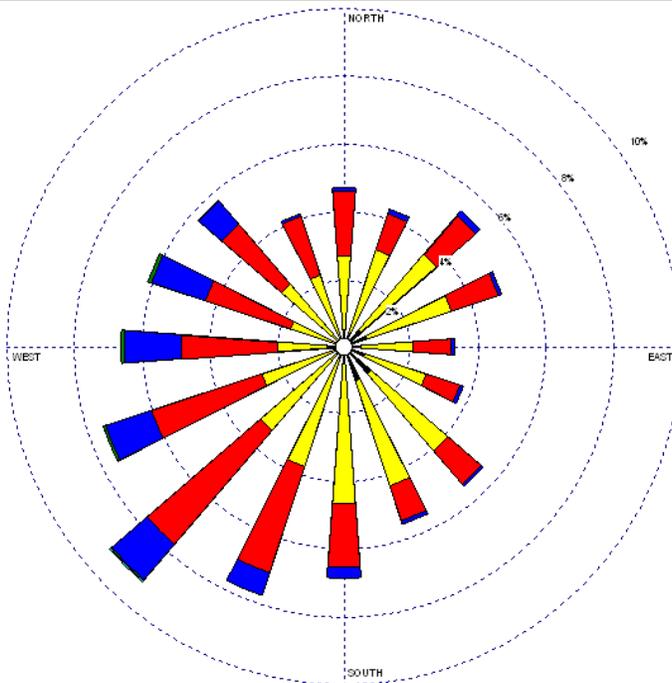
Station #94823 - PITTSBURGH/WSCOM 2 AIRPORT, PA - January 1 - December 31



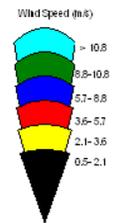
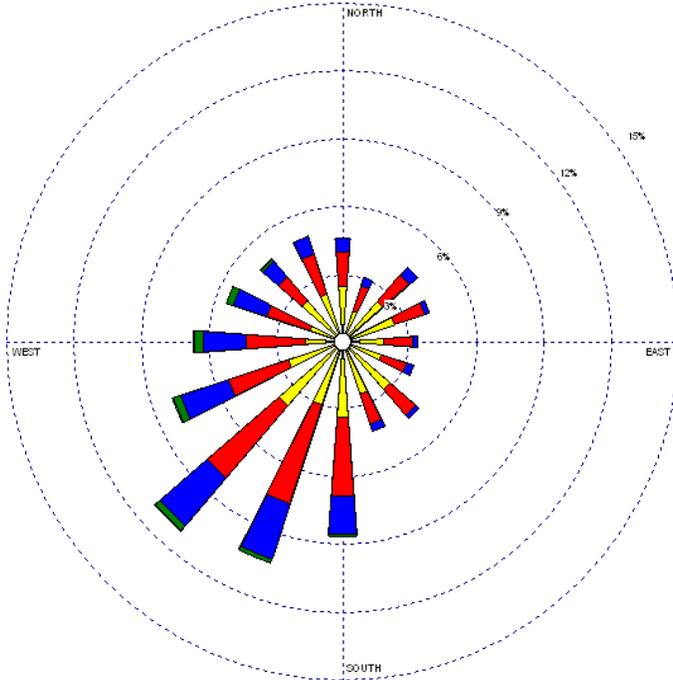
Station #14820 - CLEVELAND/HOPKINS INTL. ARPT, OH - January 1 - December 31



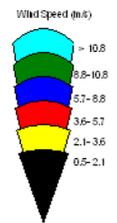
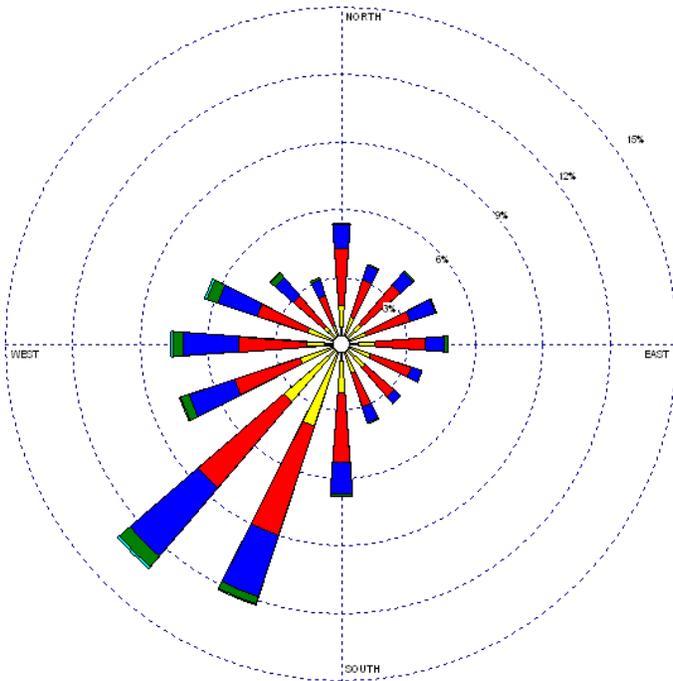
Station #14821 - COLUMBUS/PORT COLUMBUS INTL, OH - January 1 - December 31



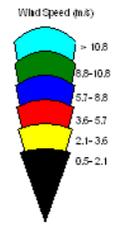
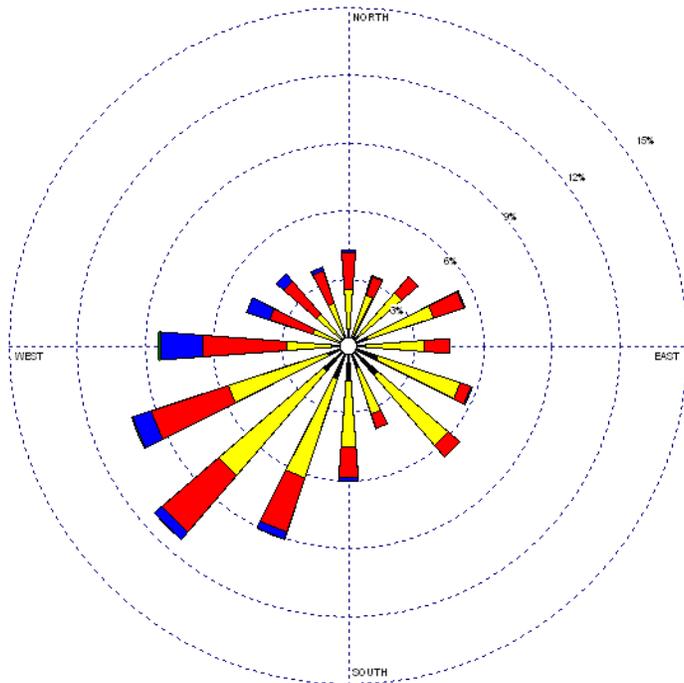
Station #93815 - DAYTONMNTL ARPT, OH - January 1 - December 31



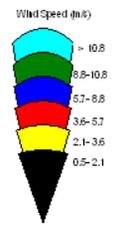
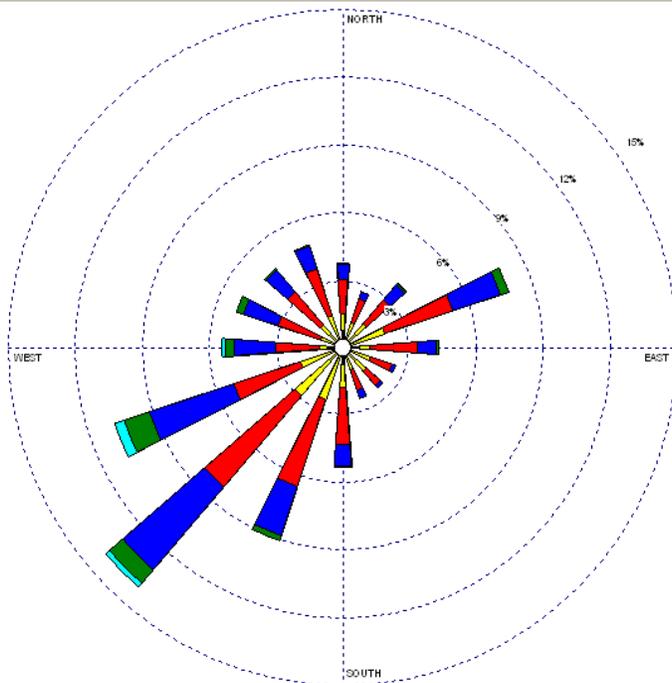
Station #93814 - COVINGTON/GREATER CINCINNATI, KY - January 1 - December 31



Station #3860 - , - January 1 - December 31



Station #94830 - TOLEDO/EXPRESS ARPT, OH - January 1 - December 31



Station #14852 - YOUNGSTOWN MUNICIPAL ARPT, OH - January 1 - December 31

