North Minneapolis Fine Particle Monitoring

Results from January 1, 2013 – June 30, 2013

On January 1, 2013, the Minnesota Pollution Control Agency (MPCA) began a 1-3 year monitoring study to assess fine particle pollution in an industrial area of North Minneapolis. Located on the roof of a commercial building, the monitoring site (green star on map) is bordered by North Lowry Avenue to the north, the west bank of the Mississippi River to the east, North 31st Avenue to the south, and Pacific Street to the west. The surrounding area contains a mix of land uses including metal recyclers, manufacturing facilities, and retail. The nearest residential area is located approximately ¼ mile from the monitoring site.

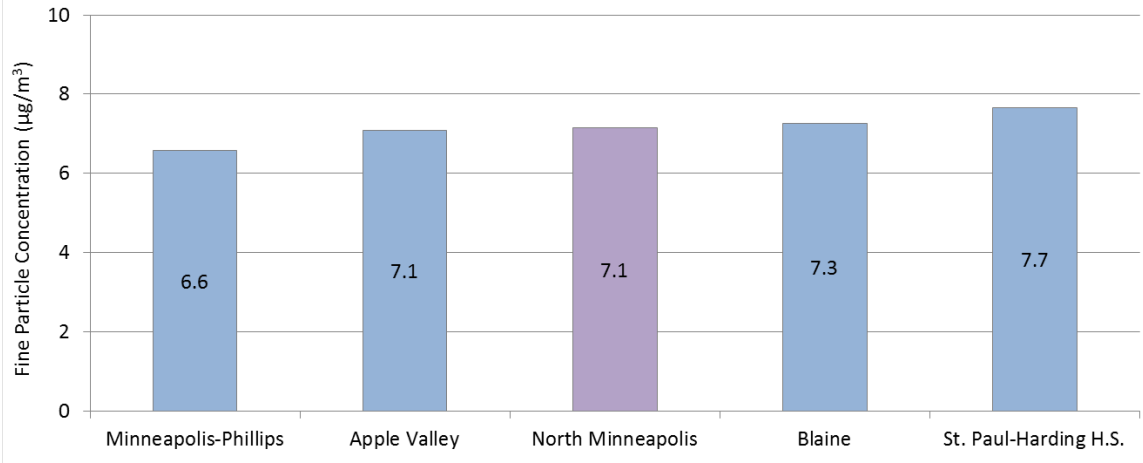
North Minneapolis monitoring site

The monitoring site includes hourly measurements of fine particles, wind direction and wind speed. All data is collected hourly by the MPCA and automatically reported to the Air Quality Index website, http://www.pca.state.mn.us/kppq8kxu. Monitoring results are reviewed and submitted to the U.S. Environmental Protection Agency's air quality database quarterly.

Initial results

Initial monitoring results indicate that on the majority of days fine particle concentrations at the North Minneapolis monitoring site closely match fine particle measurements at other Twin Cities monitoring sites including monitors in South Minneapolis, St. Paul, Apple Valley, and Blaine. Compared to these sites, the difference in the average fine particle concentration at the North Minneapolis monitor is less than 1 µg/m^3 (micrograms per cubic meter), which is statistically insignificant.

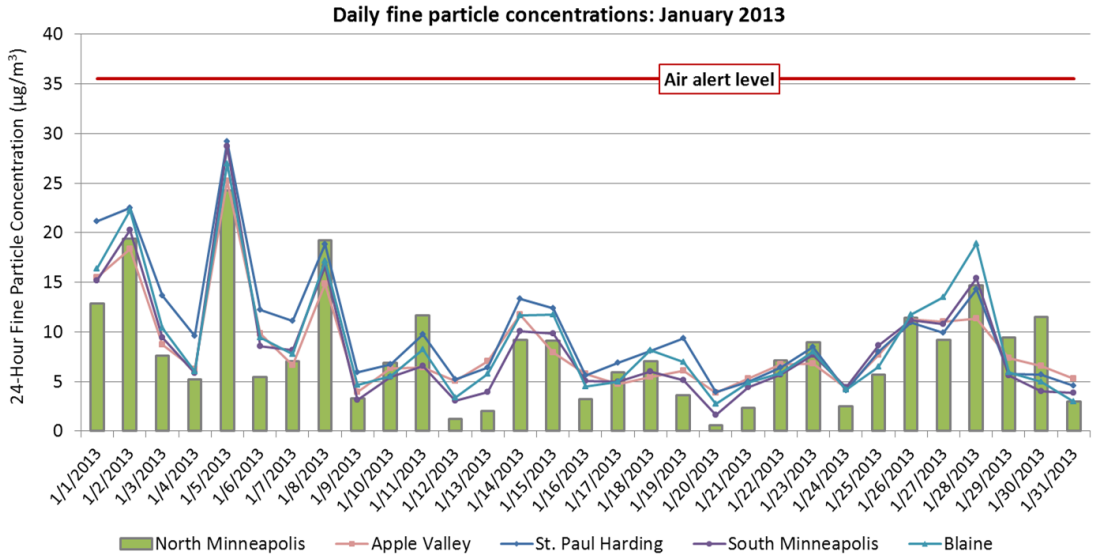
Average fine particle concentrations at Twin Cities area sites: January – June 2013

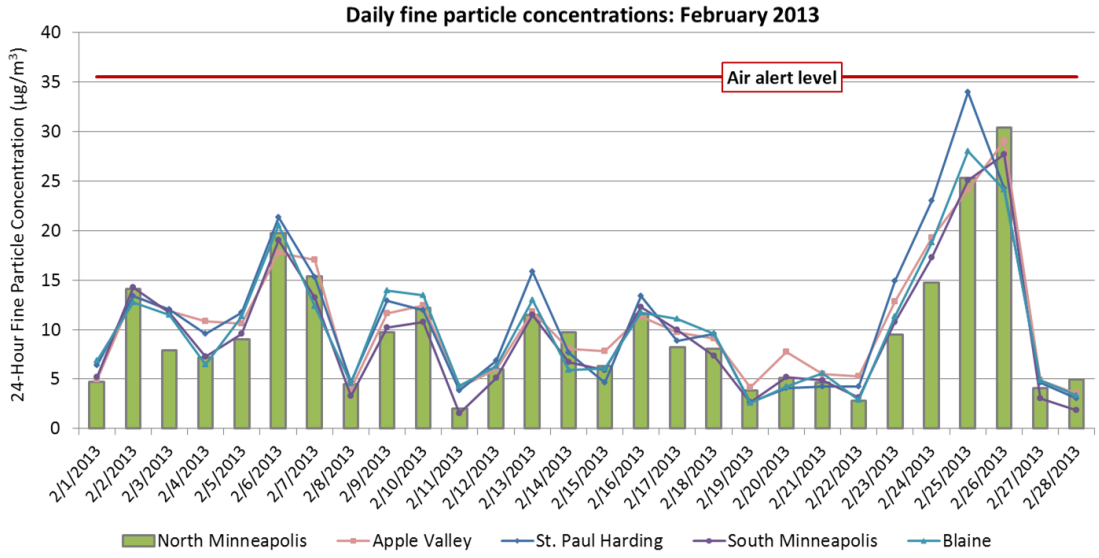


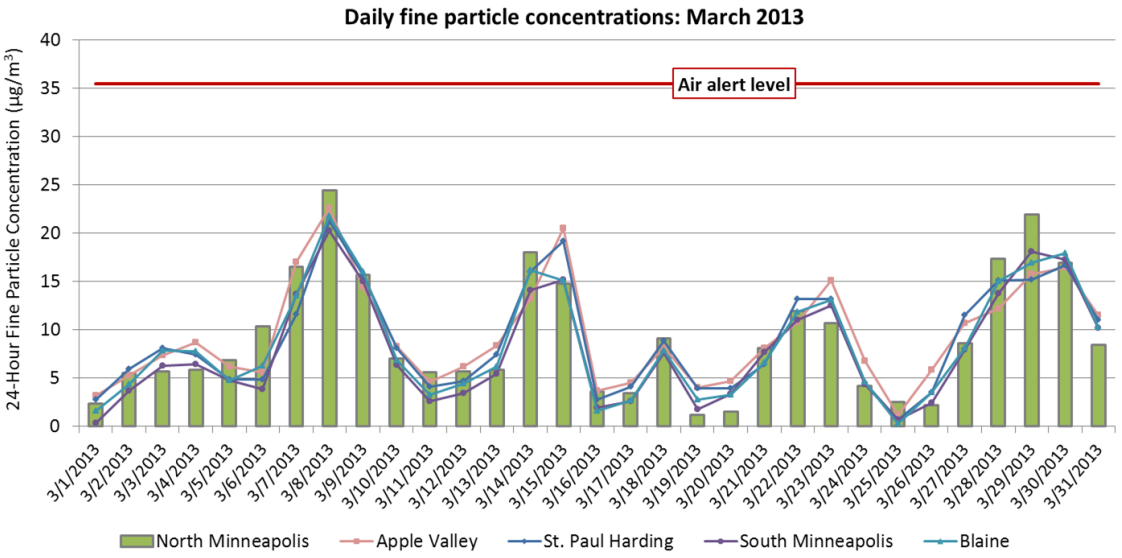
To date, all 24-hour average fine particle concentrations measured at the North Minneapolis monitoring site are below the federal 24-hour fine particle standard of 35 µg/m^3, which is also the level at which the MPCA issues an air pollution health alert. Monthly summaries of the 24-hour average fine particle concentrations measured at the North Minneapolis (bars) and other Twin Cities area fine particle monitoring sites (lines) are included below.

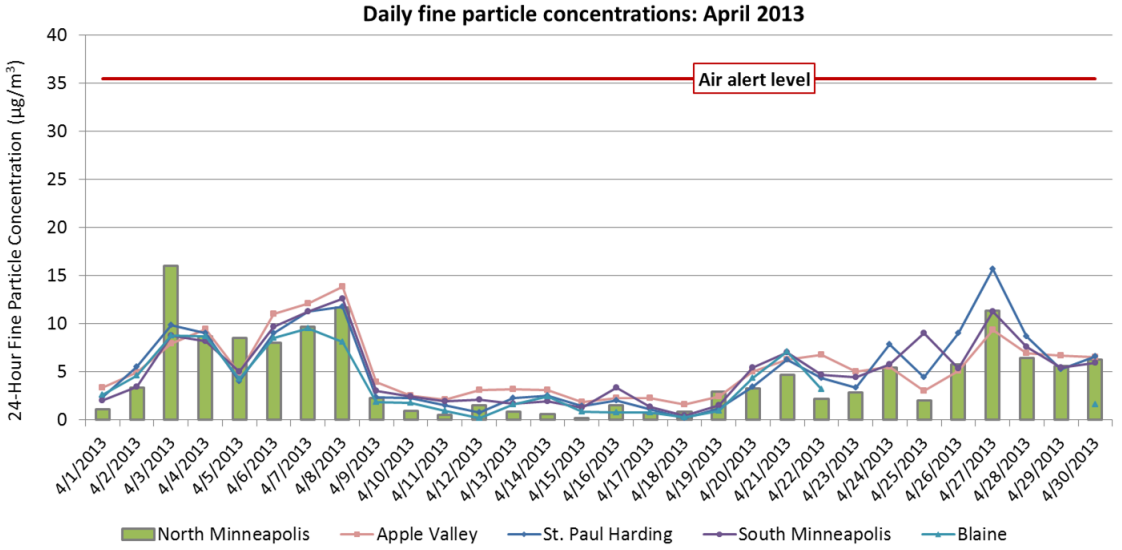
On the vast majority of days, the daily fine particle concentration at the North Minneapolis monitoring site closely matches other Twin Cities sites. However, occasionally monitoring results at the North Minneapolis monitoring site are significantly different than other area sites, suggesting that local fine particle emissions sources may be contributing to intermittent increases in fine particle concentrations in the area around the North Minneapolis monitoring site. The highest daily fine particle concentration recorded thus far at the monitor is 31 µg/m^3 (as seen in February graph below). The fine particle levels measured that day were similar to pollution levels measured at other area monitoring sites, indicating the elevated concentration was likely due to a regional increase in fine particle pollution and not the result of an emissions event in the area surrounding the monitor.

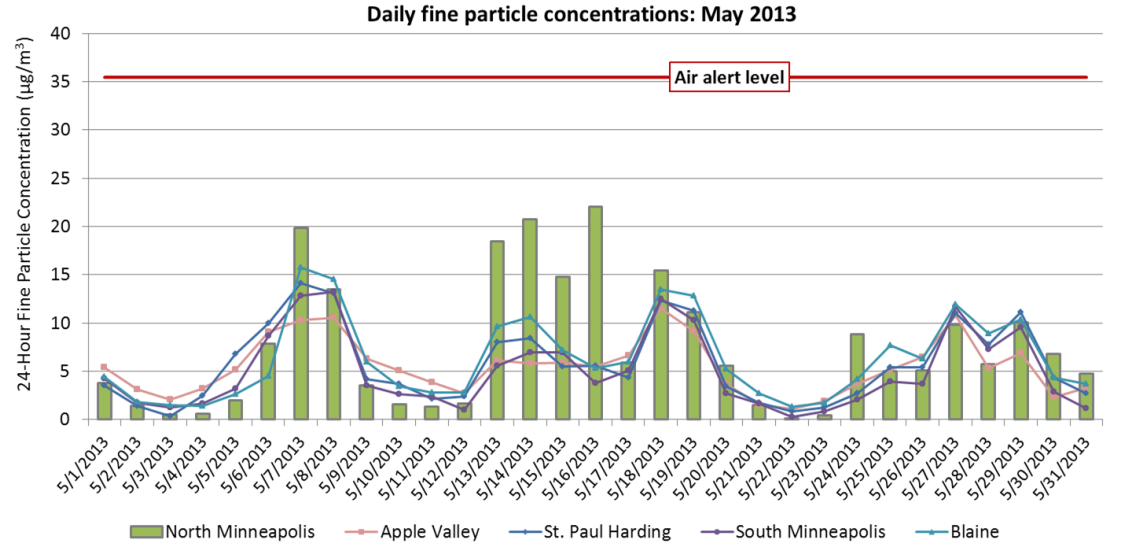
Monthly summaries of daily fine particle monitoring results, January – June 2013

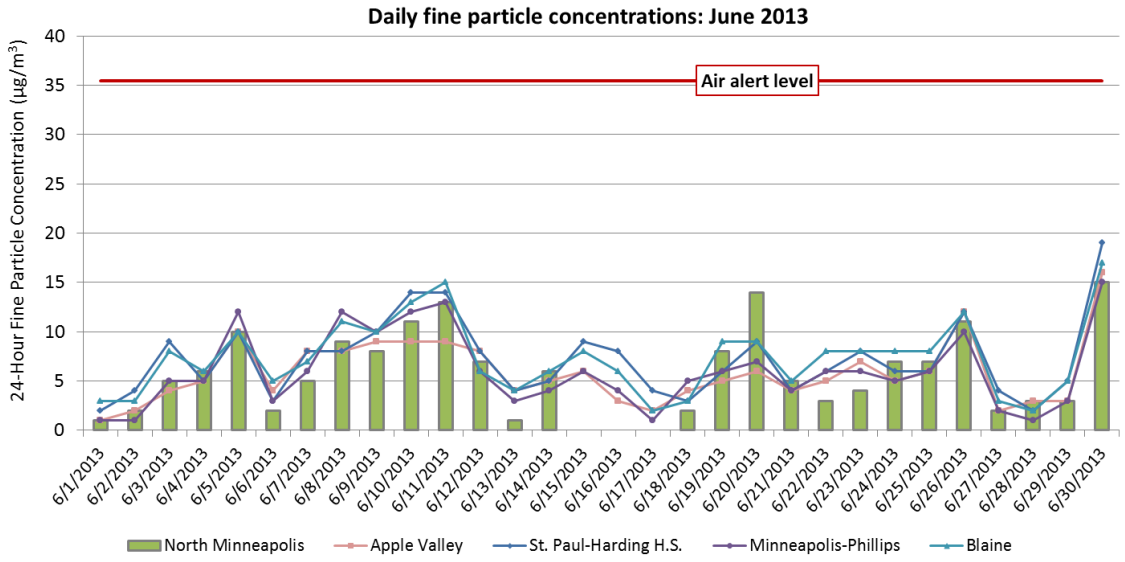





Daily fine particle concentrations: March 2013
24-Hour Fine Particle Concentration (µg/m³)
Air alert level
North Minneapolis
Apple Valley
St. Paul Harding
South Minneapolis
Blaine


Daily fine particle concentrations: April 2013
24-Hour Fine Particle Concentration (µg/m³)
Air alert level
North Minneapolis
Apple Valley
St. Paul Harding
South Minneapolis
Blaine


Daily fine particle concentrations: May 2013
24-Hour Fine Particle Concentration (µg/m³)
Air alert level
North Minneapolis
Apple Valley
St. Paul Harding
South Minneapolis
Blaine



Assessment of elevated fine particle results

On the majority of days, fine particle concentrations measured at the North Minneapolis monitoring site match closely with other Twin Cities area fine particle monitoring sites. However, from January – June 2013, on eight days the daily average fine particle concentration at the North Minneapolis site was appreciably higher than other Twin Cities monitoring sites. While the fine particle concentrations on these days did not exceed the daily fine particle standard of 35 µg/m^3, these elevated concentrations may indicate that intermittent activities at local pollution emission sources can significantly influence fine particle concentrations in the area surrounding the monitor.

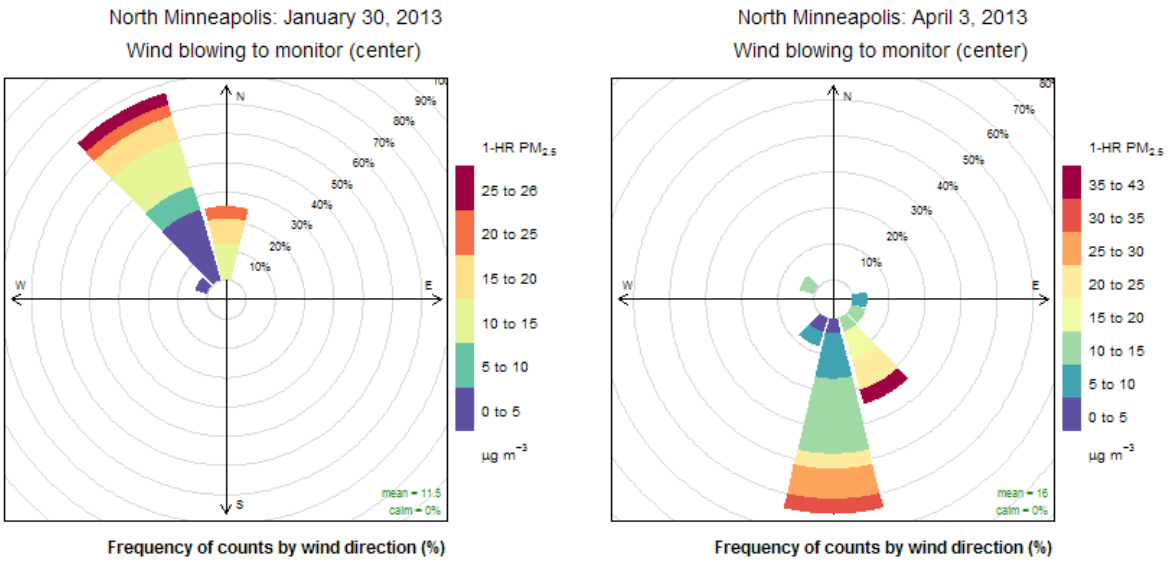
Aerial view of North Minneapolis monitoring site and surrounding land use

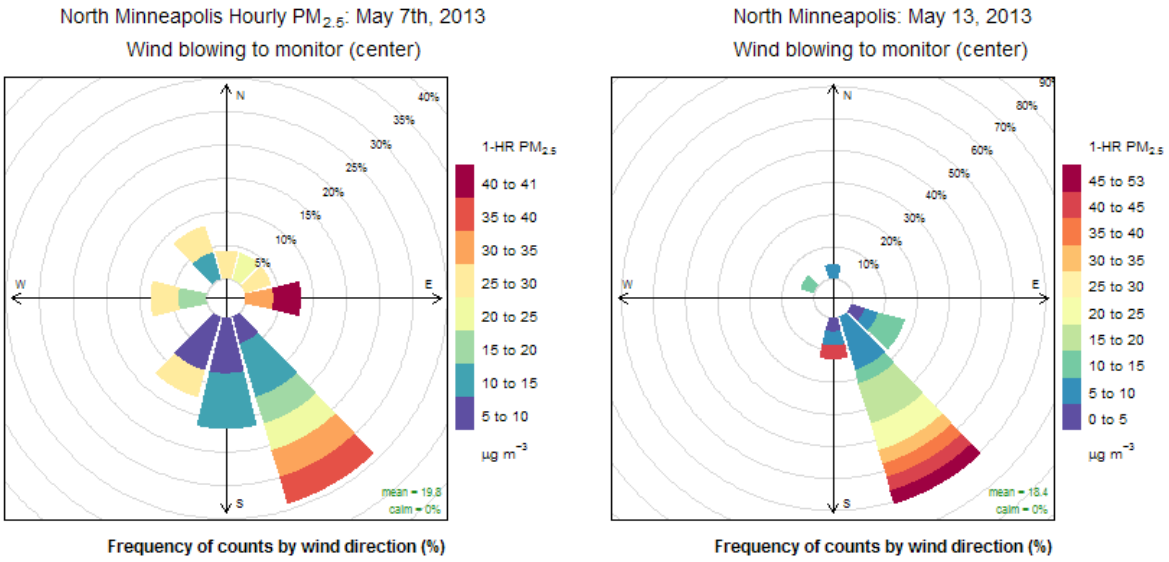
In addition to monitoring hourly concentrations of fine particles, the North Minneapolis monitoring site also measures hourly meteorological parameters including wind speed and direction. This information can be used to identify potential emission sources that are contributing to elevated fine particle concentrations. The pollution "roses" included on the next page summarize hourly fine particle and

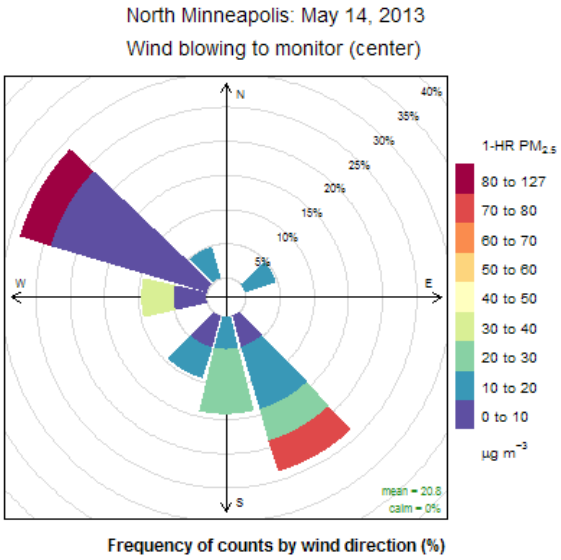
associated wind direction measurements. The center of the pollution "rose" represents the location of the air monitor. The colors of the rose describe the hourly fine particle concentrations from low to high (cool to warm colors, respectively) and the length of the paddle describes how frequently the wind blew from that direction. For example, paddle drawn in the upper left corner indicates that the wind is blowing from the northwest towards the air monitor.

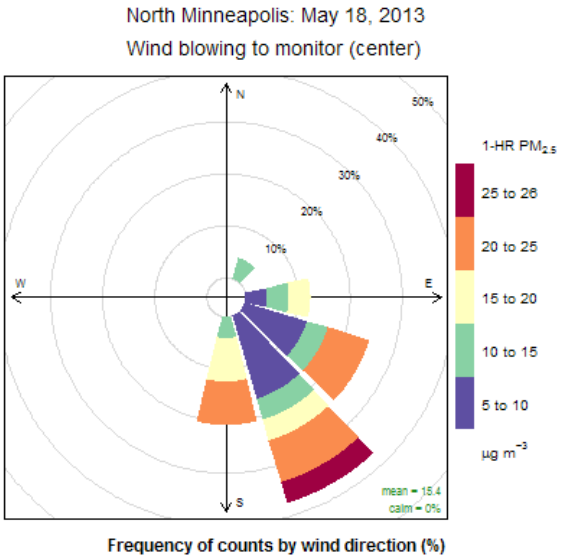
These pollution roses identify multiple wind directions associated with elevated fine particle concentrations, which suggests that there are likely multiple emissions activities and sources contributing to intermittent increases in fine particle concentrations at the North Minneapolis monitoring site. The MPCA will be working with the facilities in the area surrounding the monitor to identify activities or processes which may be contributing to these elevated fine particle concentrations.

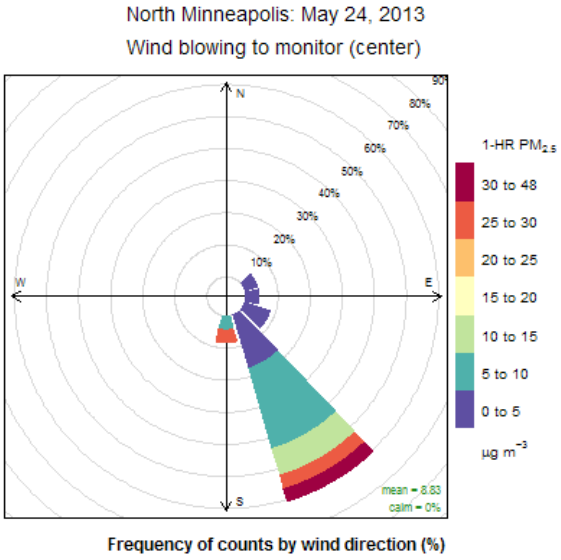
Fine particle pollution roses on days with elevated $PM_{2.5}$ results at the North Minneapolis monitor

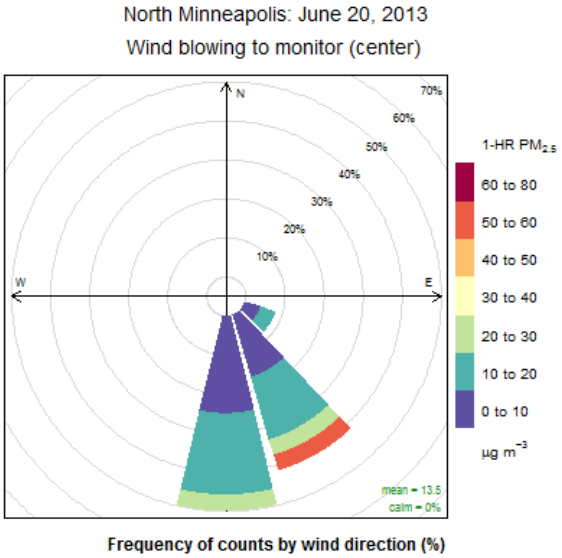












For more information

For more information on the North Minneapolis fine particle monitoring project results or locations of monitors, please call 651-296-6300 or 1-800-657-3864 and ask for air monitoring staff. For general information on fine particle pollution visit: http://www.pca.state.mn.us/6ackfqh. A fact sheet posted on that page provides more background on fine particle monitoring in Minnesota; the fact sheet may be accessed directly at http://www.pca.state.mn.us/index.php/view-document.html?gid=19057.