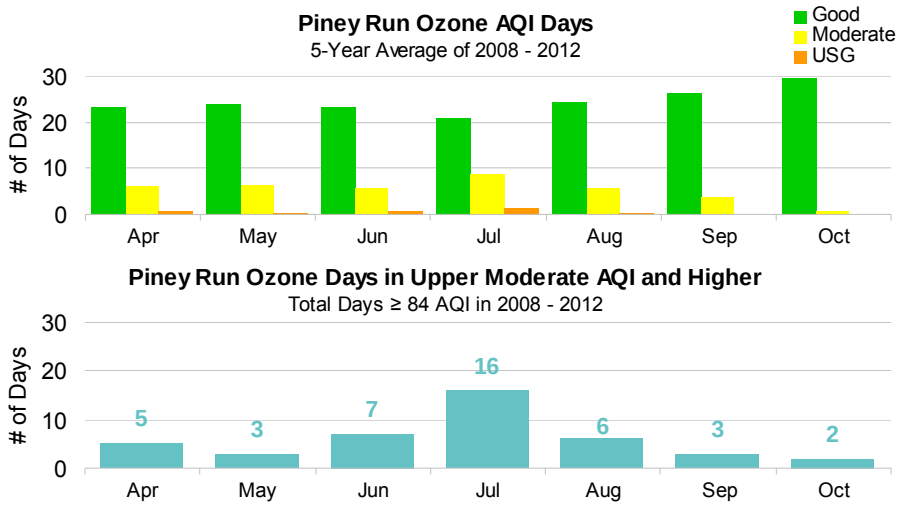
Version: *August 2013*

Air Quality Facts

Ozone at High Elevation

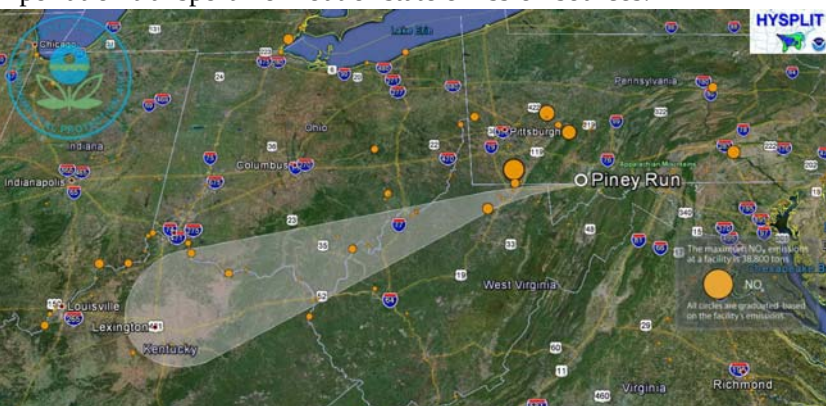
HOW DOES OZONE BEHAVE AT HIGH ELEVATIONS?

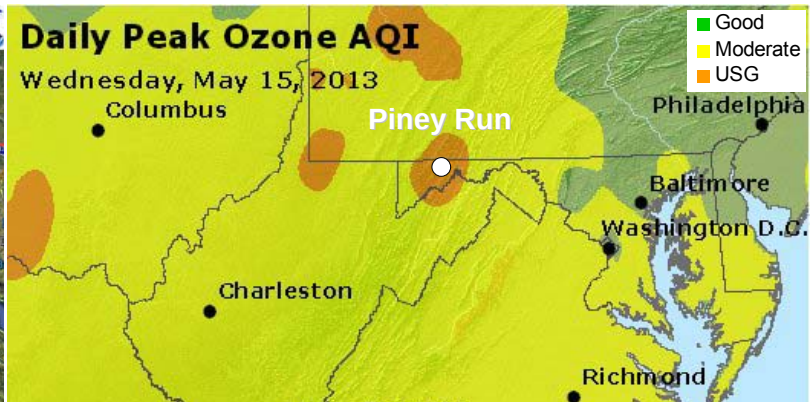
Piney Run, the mountaintop ambient air monitor in western Maryland.



Ambient Air Monitoring at High Elevation

Maryland Department of the Environment (MDE) operates an air monitoring site located on top of a mountain peak in western Maryland's Garrett County called Piney Run. Piney Run is positioned on a mountaintop to track the impact of pollutant transport on air quality in Maryland. Because of its high elevation of 781 m, or 2,563 ft, and its rural setting along the State's western boundary, Piney Run can often measure ozone pollution that travels from out of state at higher levels in the atmosphere. Much of this pollution is known to be transported further east and affect the Baltimore and Washington metropolitan areas. Generally, the Piney Run site observes Good and Moderate Air Quality Index (AQI) days. However, on average for the past 5 years (2008 – 2012), approximately 5% of the ozone season days reach Unhealthy for Sensitive Groups (USG) range (*top chart*). Furthermore, the total number of days reaching upper Moderate to USG AQI at Piney Run from 2008 - 2012 have been 42 days during the ozone seasons (*bottom chart*). Other high elevation sites in nearby states have observed similar ozone trends. Many of these days are likely the result of westerly pollution transport from out of state emission sources.





On May 15, 2013, Piney Run's ambient air originated from the lower Midwest region 12 hours prior, as indicated the white cone (left). The Midwest is home to several emission sources of nitrogen oxides (NO_x), shown as orange circles. The larger the emission source, the larger the orange circle. As a result, Piney Run measured ozone in the Unhealthy for Sensitive Groups (USG) range (right).

What Causes Piney Run's Bad Air Days?

Piney Run is located in a rural area with very few air pollution emission sources nearby. Pollution at Piney Run is frequently caused by ozone and its precursors traveling into Maryland from out of state due to westerly transport. Ozone precursors are pollutants such as nitrogen oxides (NO_x) that chemically react in warm temperature conditions to form ozone. Many major NO_x emission sources like power plants are located in the Ohio River Valley and Pennsylvania. These sources are shown as orange circles in the image above (*left image*). A bad air day on May 15, 2013 illustrates westerly transport's role. The white cone shows Piney Run's ambient air originated from the lower Midwest intersecting several emission sources along the way. In Maryland, only Piney Run measured USG conditions on this day (*right image*). These air quality conditions may have been more widespread if not for extensive cloud cover east of the Appalachian Mountains. These pollution transport trends shown by air monitoring also support results from EPA modeling that indicate, in addition to local sources, many of Maryland's neighboring states significantly contribute to Maryland's ozone problems.

AQI	0-50 Good	51-100 Moderate	101-150 USG*	151-200 Unhealthy	201-300 Very Unhealthy	301-500 Hazardous

* USG: Unhealthy for Sensitive Groups

Note: Data used in this report should not be used for regulatory purposes. This report is based on the 2008 ozone AQI.

Sources: AirNow, EPA AirData, EPA Clean Air Markets, NOAA HYSPLIT

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