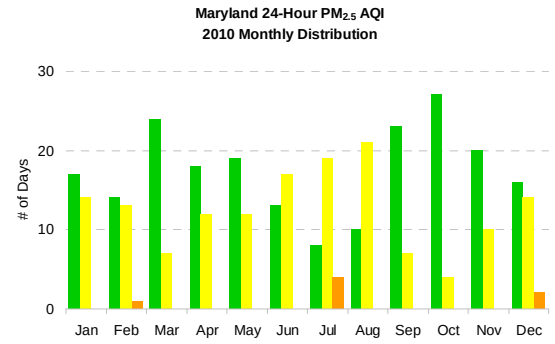
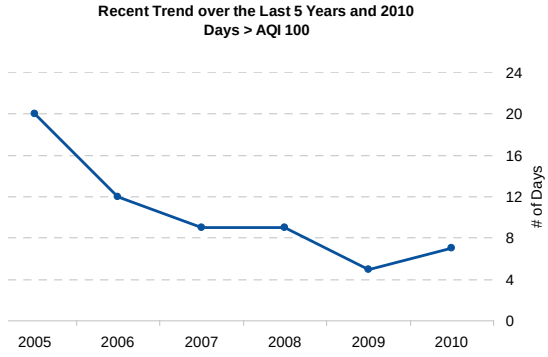
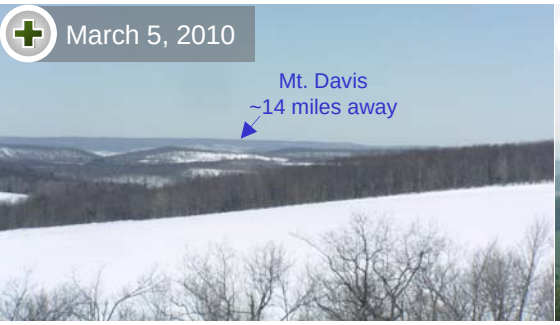
MARYLAND
Department of the Environment

Seasonal Report

2010 Fine Particles







During 2010, fine particles ($PM_{2.5}$) were largely in the Good and Moderate AQI ranges in Maryland with much fewer high $PM_{2.5}$ days observed when compared to the annual number of high $PM_{2.5}$ days over the last 5 years (2005 - 2009). Only 7 days[1] exceeded the Air Quality Index[2] (AQI, see color bar below) value of 100 in 2010 which is similar to the past 2 years with 5 days above an AQI of 100 in 2009 and 9 days in 2008. Each year, the severity of $PM_{2.5}$ is measured by the number of days when $PM_{2.5}$ exceeds the AQI value of 100 based on the daily 24-hour average $PM_{2.5}$ concentration. Visibility can also help gauge air quality conditions. On March 5th, Good air quality is apparent in the Haze Cam image to the left of Frostburg, MD. Distant mountains can be viewed with ease. In contrast on July 8th, it is more difficult to see Mt. Davis, for instance, due to poor air quality conditions. On this particular day, $PM_{2.5}$ was Unhealthy for Sensitive Groups (USG) AQI.

SEASONAL HIGHLIGHTS

Maryland experienced $PM_{2.5}$ levels in the Good range more often than Moderate or greater AQI throughout the year except for the summer months of June - August (see Maryland 24-Hour $PM_{2.5}$ AQI chart). This increase is common for $PM_{2.5}$ due to the increase in temperature and moisture content during this time. Weather trends proved to be extreme in 2010 from experiencing the 4th warmest summer on record in the Northeast and Mid-Atlantic, to record breaking snowfall amounts during the 2009 - 2010 winter season. Most high $PM_{2.5}$ days were in July corresponding to the hot and humid conditions; however, additional days occurred in February and December (see table). Based on air monitoring data from the last 5 years, an average of 11 days above AQI 100 per year were measured. By comparison, 2010 saw fewer days with 7 total (see Recent Trend over the Last 5 Years and 2010 chart). Through the years, it is apparent that fine particle pollution has significantly improved with a noticeable downward trend of poor air quality days since 2005 largely due to emissions control programs.

Maryland's 2010 $PM_{2.5}$ Days > AQI 100

Date	No. of Monitors	Monitor with Highest AQI	24-Hour Average $PM_{2.5}$ AQI
3-Feb	1	Fire Dept. 20	105
5-Jul	3	HU-Beltsville	112
6-Jul	4	HU-Beltsville	107
7-Jul	4	Hagerstown	110
8-Jul	1	Piney Run	102
7-Dec	1	Oldtown	107
31-Dec	1	Essex	105

FEATURED EPISODE: FEBRUARY 3, 2010

A high $PM_{2.5}$ event was observed in Maryland on February 3rd while a storm moved up the East Coast dropping 3 - 5 inches of snow in the Mid-Atlantic. Prior to this storm, snow cover was already present so that by the 3rd, there was as much as 4 - 10 inches of snow on the ground in the Baltimore and Washington D.C. areas (see 24-Hour $PM_{2.5}$ AQI and Estimated Snow Depth). The February 3rd system was a large coastal storm that moved in from the south and brought in moisture from the Atlantic Ocean to enhance precipitation (see Satellite Image). The resultant fresh snow cover helped strengthen a temperature inversion at the surface through much of the day. This means the air just above the surface became colder than the air higher in the atmosphere. This cold layer of air was trapped near the surface limiting vertical mixing which would have otherwise helped disperse pollutants. Light, northerly surface winds caused partial stagnation and allowed for further pollutant accumulation leading to a 105 AQI at the Fire Dept. 20 air monitoring site (see Wind Profile chart). In addition, a view of Baltimore showed hazy conditions due to high $PM_{2.5}$ AQI values (see Haze Cam at Baltimore, MD). Other air monitoring sites in Maryland and in surrounding states also measured high hourly $PM_{2.5}$ AQI values in the morning and afternoon hours of the 3rd (see $PM_{2.5}$ AQI Trends). Air quality conditions improved by the evening when gusty winds arrived as the storm exited the region and the temperature inversion broke down.

Air Quality Index (AQI)

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

[1] Report based on official $PM_{2.5}$ data
[2] AQI based on the 2006 proposed $PM_{2.5}$ AQI

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Martin O'Malley, *Governor* | Anthony G. Brown, *Lt. Governor* | Robert M. Summers, Ph.D, *Secretary*

MDE

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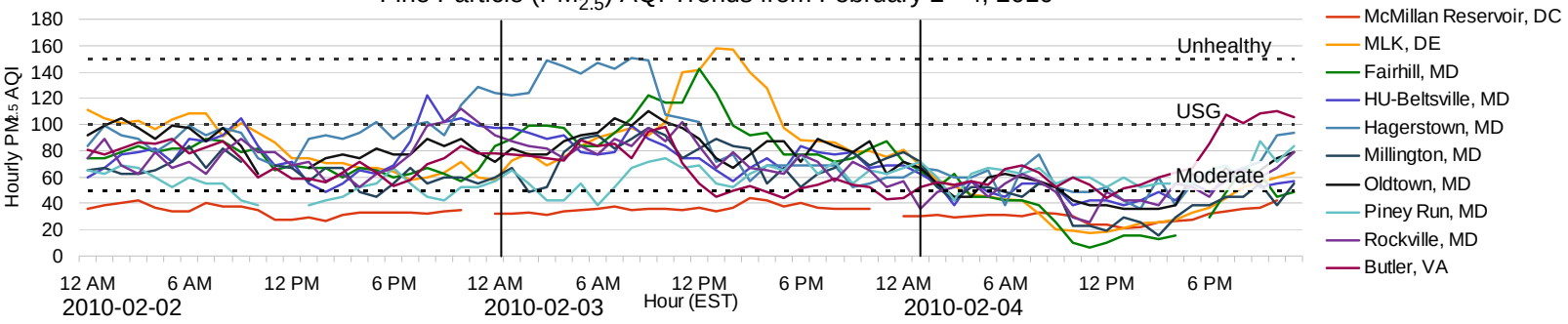
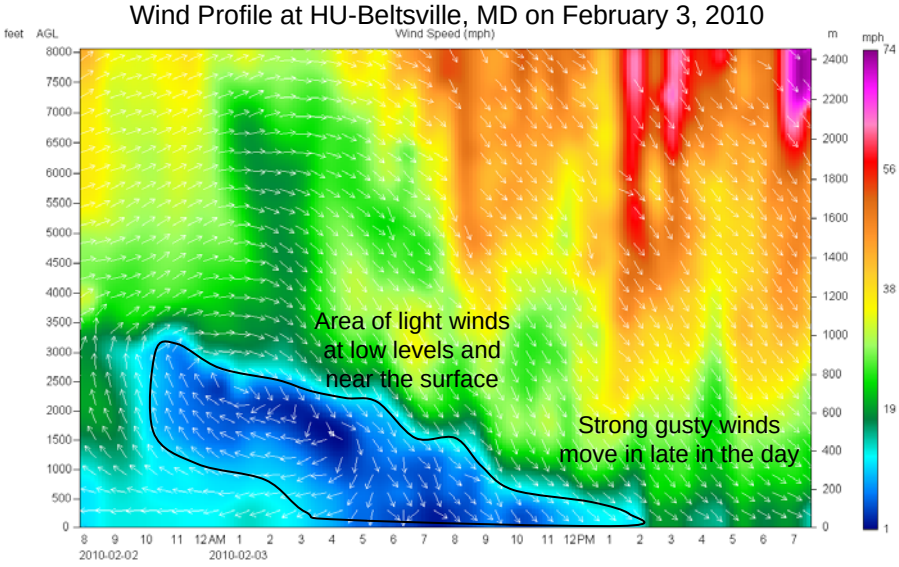
Fine Particle ($PM_{2.5}$) AQI Trends from February 2 - 4, 2010

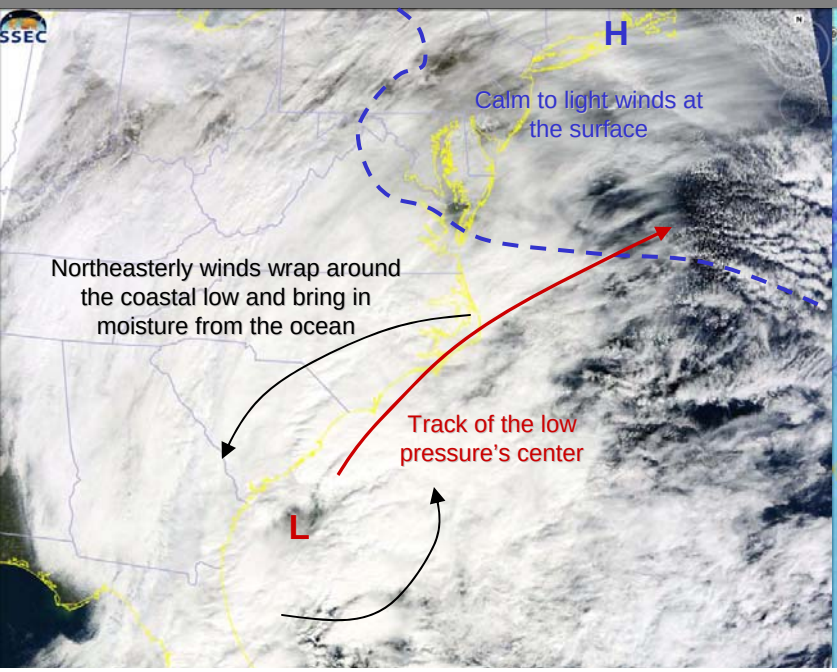


Haze Cam at Baltimore, MD on February 3, 2010

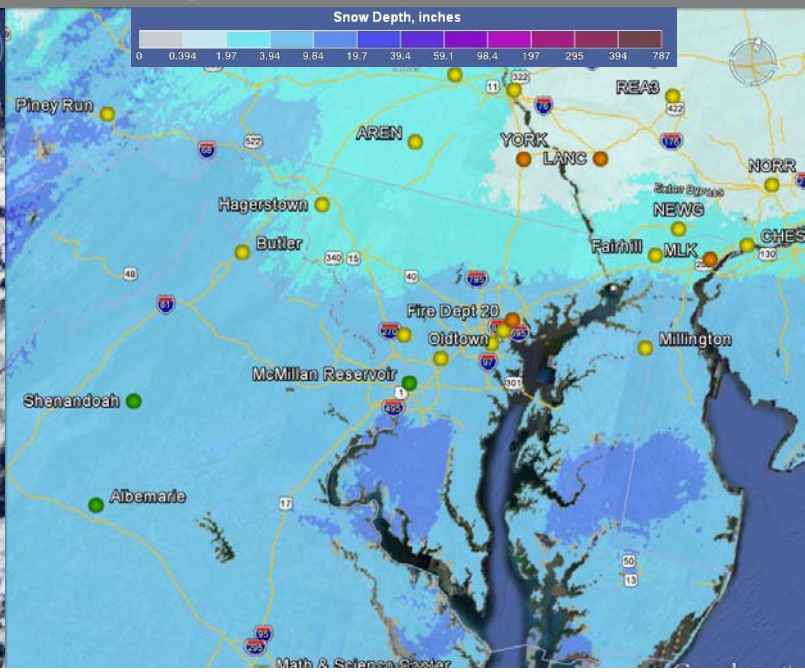
Wind Profile at HU-Beltsville, MD on February 3, 2010



Satellite Image of a Storm System Moving through the U.S. on February 2, 2010



24-Hour $PM_{2.5}$ AQI and Estimated Snow Depth on February 3, 2010



Visit www.mde.state.md.us/air for more information, current air quality conditions, and forecasts, or call the air quality hotline at 410-537-3247.

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

Data Sources: AIRNow-Tech, UW CIMSS/SSEC, NOAA NCDC, NOAA NOHRSC

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