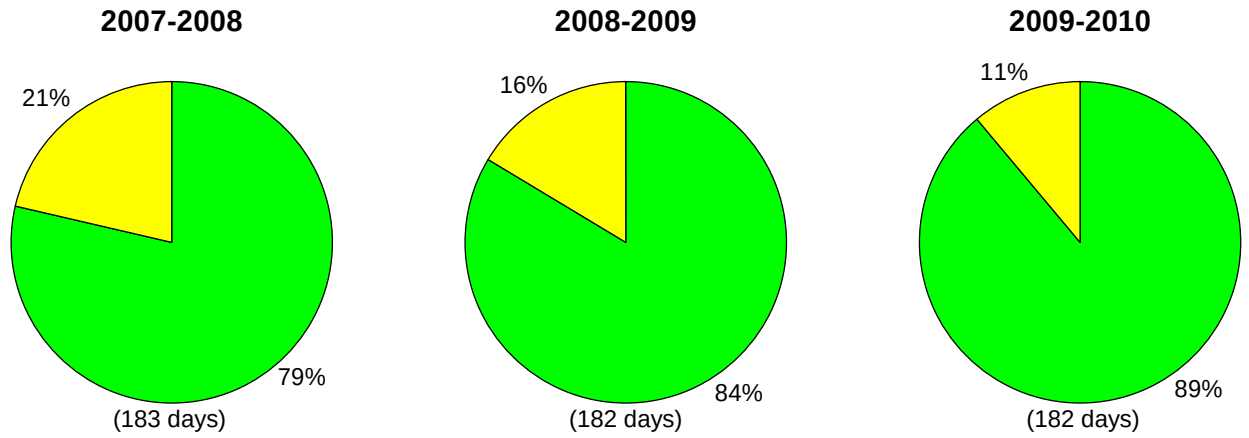
Air Quality Summary

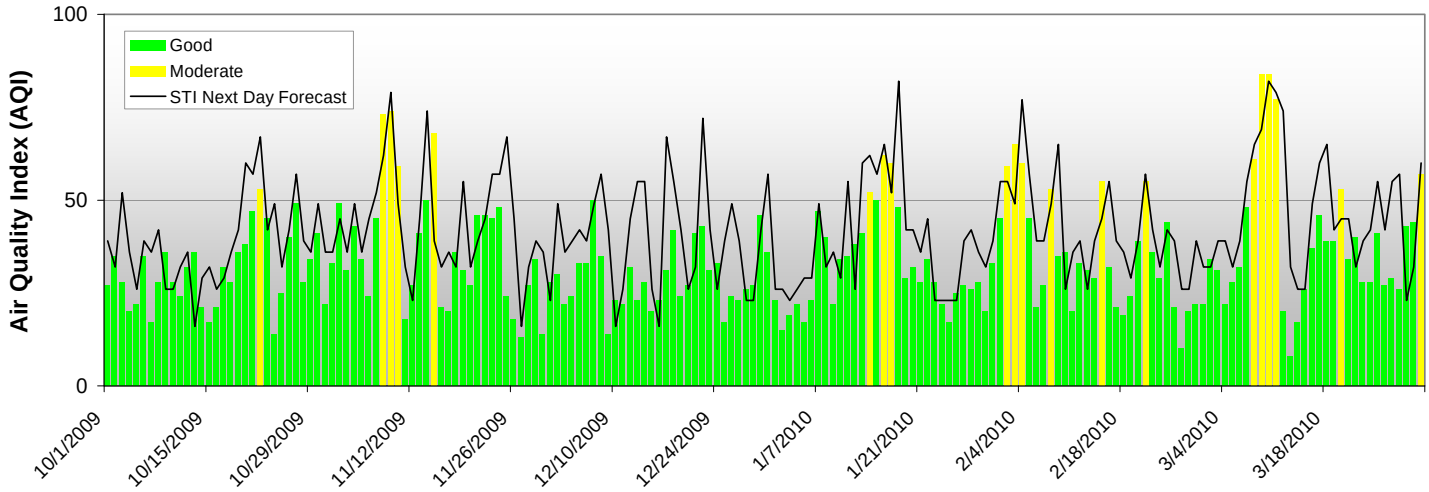
Youngstown: October 1, 2009, through March 31, 2010

Air quality in Youngstown was slightly improved during the winter season of 2009-2010 compared with the preceding two winter seasons. The primary winter season pollutant, $PM_{2.5}$, is the only pollutant discussed in this report. Between October 2009 and March 2010, air quality remained Good on the Air Quality Index (AQI) on 89% of all days (162 days), compared with 79% and 84% of days in the winter seasons of 2007-2008 and 2008-2009, respectively (see pie charts below). Conversely, air quality reached Moderate AQI levels on 11% of days (20 days total), compared with 21% and 16% of days in the winters of 2007-2008 and 2008-2009, respectively. Air quality did not reach the Unhealthy for Sensitive Groups (USG) level this winter season. There have been zero USG days in Youngstown in the past nine winter seasons. Sonoma Technology, Inc.'s (STI) next-day forecasts captured the trend of observed air quality at the Moderate and Good AQI levels (see bar-line chart below).

Percentage of Days at Each AQI Level



Daily Maximum AQI Values and Forecasts



Good 0 - 50	Moderate 51 - 100	Unhealthy for Sensitive Groups 101 - 150	Unhealthy 151 - 200	Very Unhealthy 201 - 300

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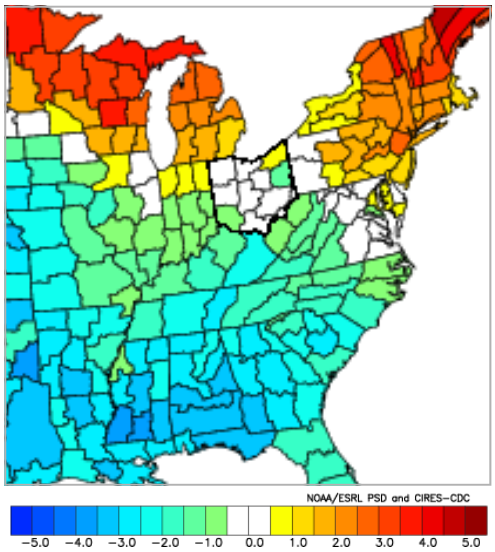
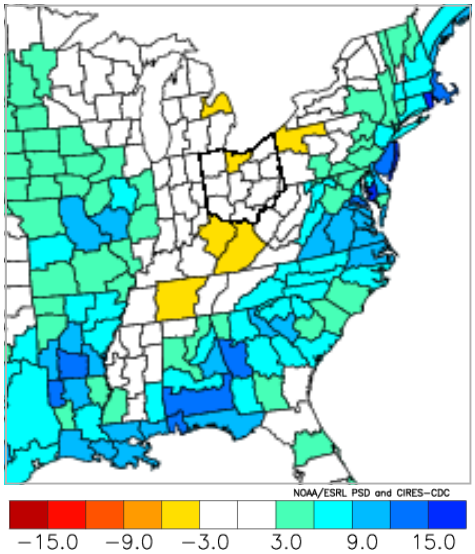
Seasonal Weather Summary, Highest AQI, and Alert Days

Temperature and precipitation in Youngstown during the winter season of 2009-2010 (see maps below) were both fairly consistent with the 57-year average (1950-2007), despite heavy snowfall across much of the northern Plains and upper Midwest. Youngstown's snowfall amount from October 2009 to March 2010 was about 50% more than the long-term average, primarily due to a record 36.3 inches of snowfall during the month of February.

Temperature Departure from Normal (ºF)



Precipitation Departure from Normal (inches)



Winter 2009-2010 Highest Observed AQI Days

During the winter 2009-2010 season, Youngstown's five highest observed AQI days ranged from 73 to 84 on the AQI. The same-day forecasts for the five highest days were all within 12 AQI units of observation, and the next-day forecasts were within 15 AQI units of observation.

Date	Observed AQI	Same-Day Forecast	Next-Day Forecast
11/8/2009	73	67	62
11/9/2009	74	82	79
3/9/2010	84	84	69
3/10/2010	84	84	82
3/11/2010	77	89	79

Winter 2009-2010 Air Quality Alert Days

Eastgate did not call any Air Quality Alert Days during the winter 2009-2010 season, which is the same as the previous two winter seasons.

AQI AIR QUALITY INDEX

Good 0 - 50	Moderate 51 - 100	Unhealthy for Sensitive Groups 101 - 150	Unhealthy 151 - 200	Very Unhealthy 201 - 300

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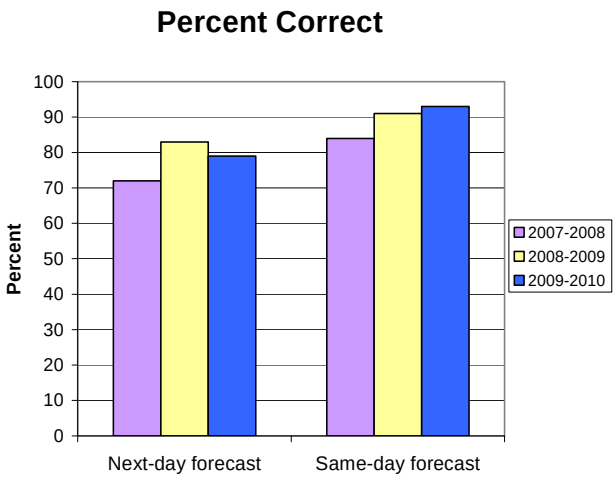
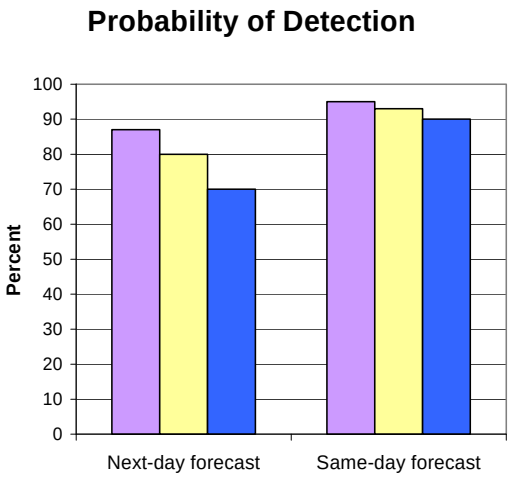
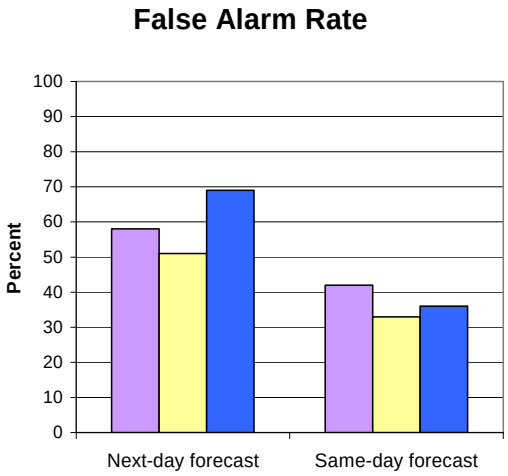
Forecast Performance

Same-Day and Next-Day Forecast Statistics for the Good-Moderate AQI Threshold

STI provides same-day, next-day, and extended AQI daily forecasts for Eastgate. A statistical summary of same-day and next-day forecasting performance is shown in the charts below using the measures described at the bottom of the page. Statistics are based on a comparison between forecasted and observed AQI levels for the Good-Moderate (51 AQI) threshold.







STI's forecast performance was very good during the 2009-2010 winter season (blue bars), with quite good Percent Correct (PC), Probability of Detection (POD), and False Alarm Rate (FAR) values for next-day forecasts and great values for same-day forecasts. Statistics from the preceding two winter seasons (purple and yellow bars) are provided for reference. Winter 2009-2010 PC scores were 79% for next-day forecasts and 93% for same-day forecasts, POD was 70% for next-day forecasts and 90% for same-day forecasts, and FAR was 69% and 36% for next-day and same-day forecasts, respectively.

Statistical Measures

Percent Correct The percentage of forecasts that matched observations.

Probability of Detection: The ability to correctly predict high-pollution events at or above a certain threshold.

False Alarm Rate: The percentage of cases for which a forecast of high pollution (at or above the threshold) was incorrect.

Although Sonoma Technology, Inc. prepares air quality forecasts using the highest professional standards, forecasting is an inexact science. Therefore, Sonoma Technology, Inc. cannot assume any liability or responsibility for any consequences which might arise due to the accuracy or inaccuracy of forecasts delivered under this Contract, or for any decisions or actions taken which are based on the forecasts provided.

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