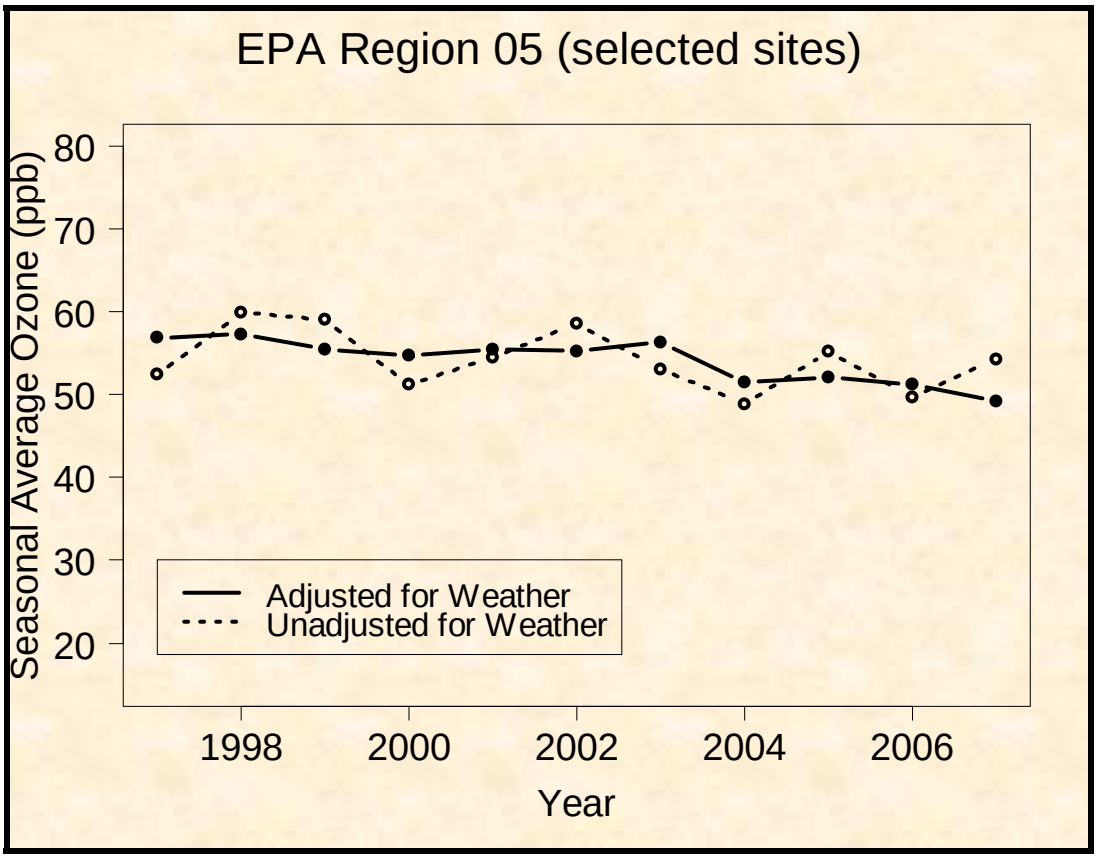
Weather Makes a Difference: 8-hour Ozone Trends for 1997-2007

State and Local Information for EPA Region 5

Illinois
Indiana
Michigan
Minnesota
Ohio
Wisconsin

Composite trend for available sites in these states:



U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards

April 2008

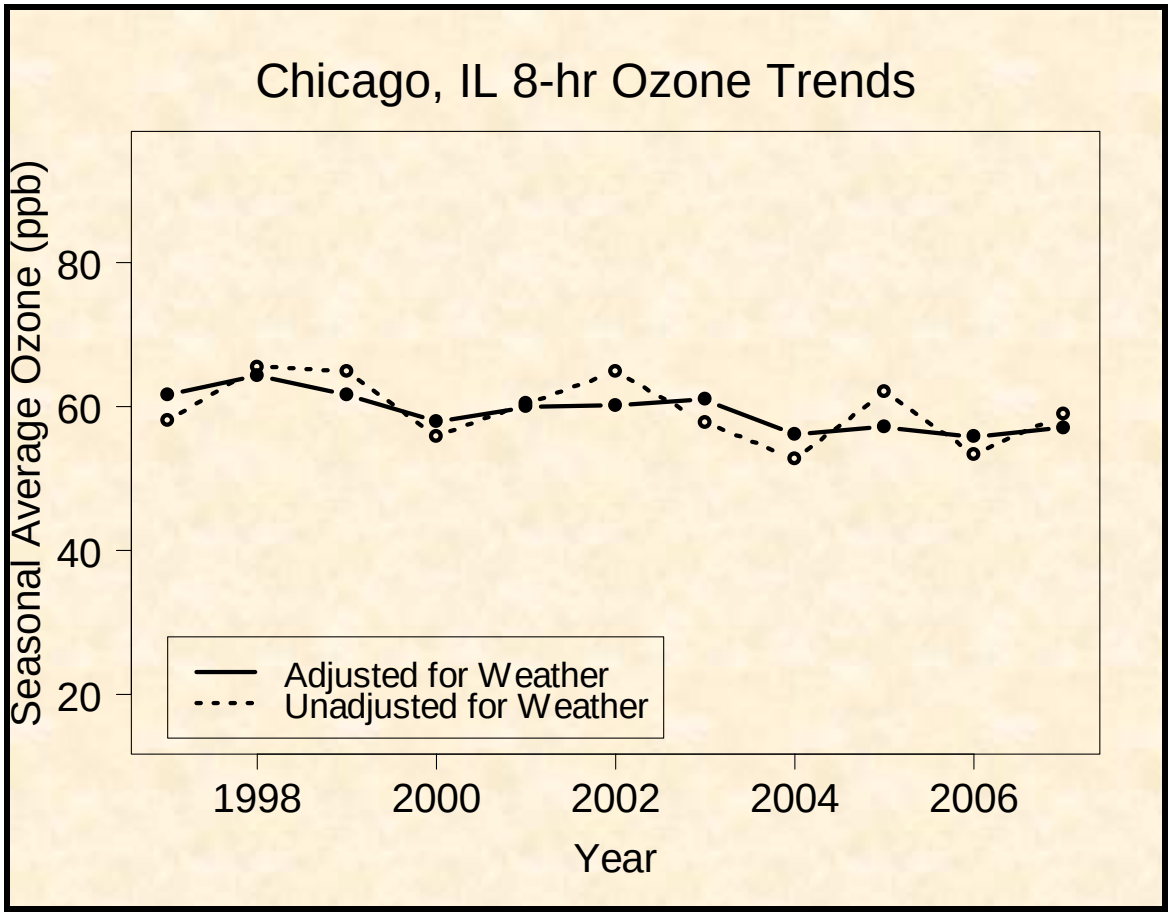
Illinois

Ozone

In Chicago ozone adjusted for weather conditions declined 7 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

Seasonal Average 8-hour Ozone Trends



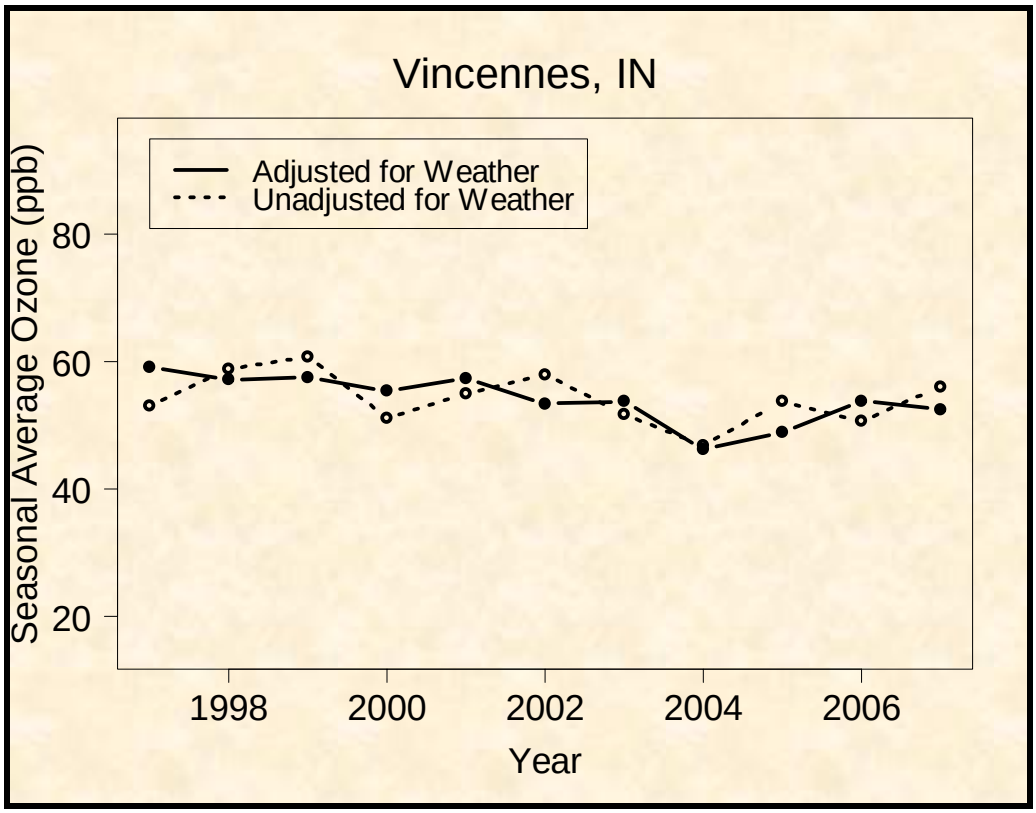
Indiana

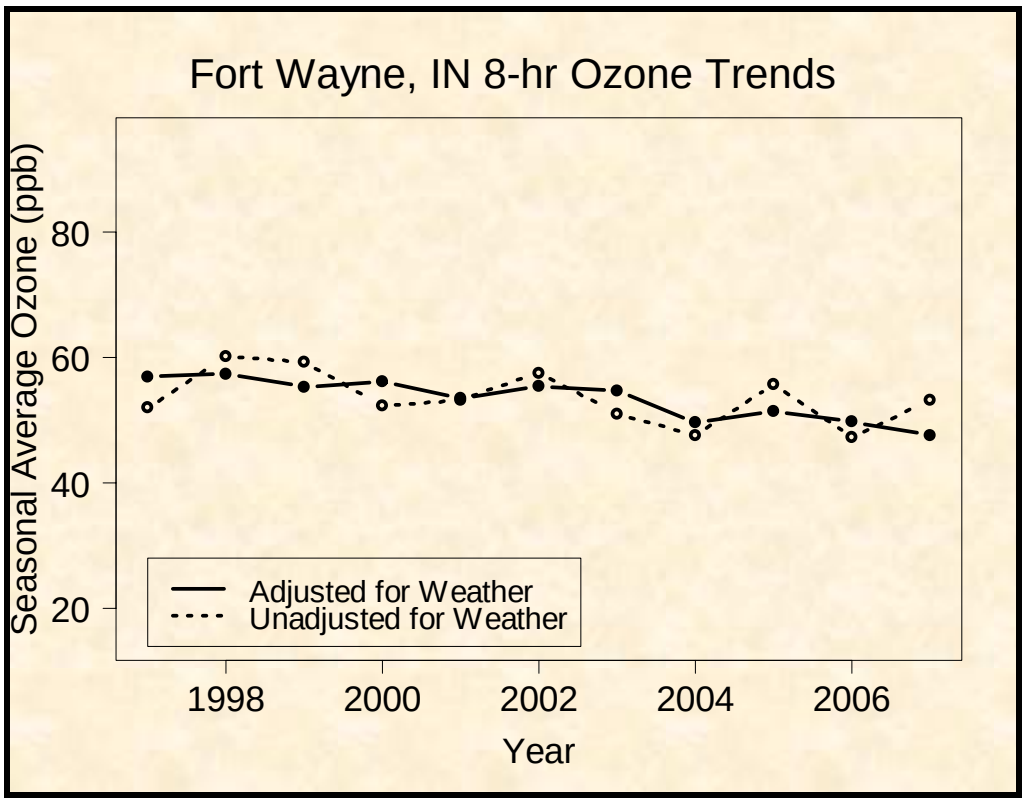
Ozone

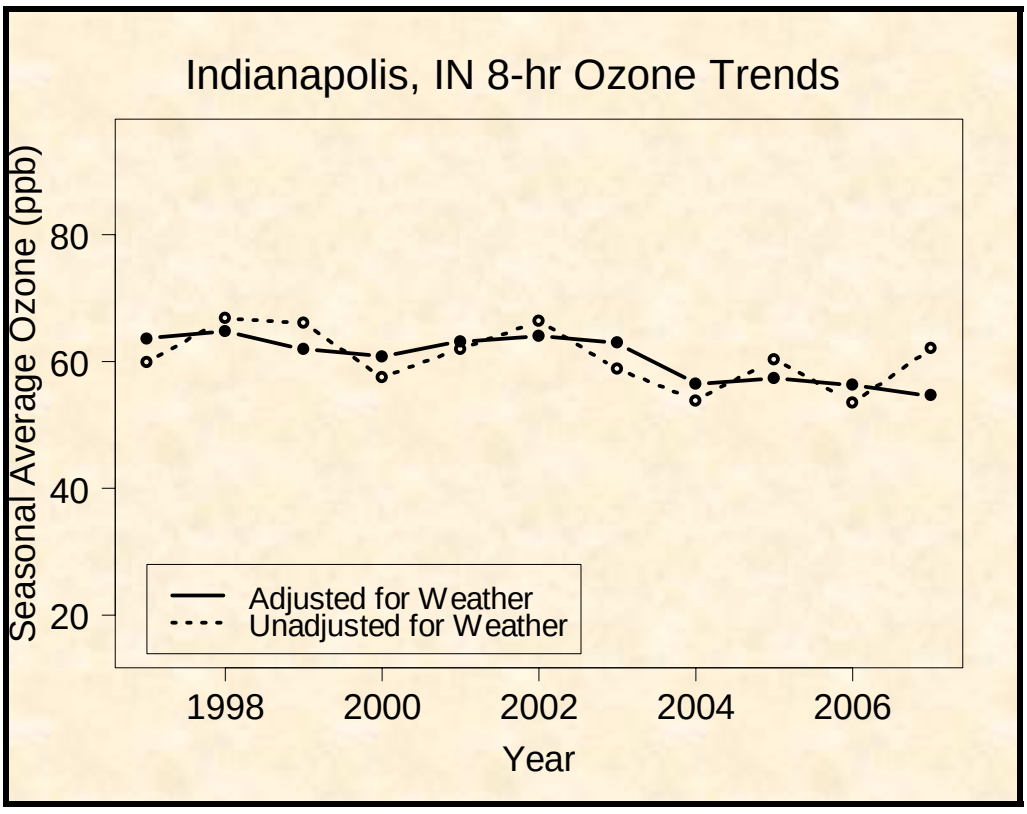
On average, ozone adjusted for weather conditions declined 14 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

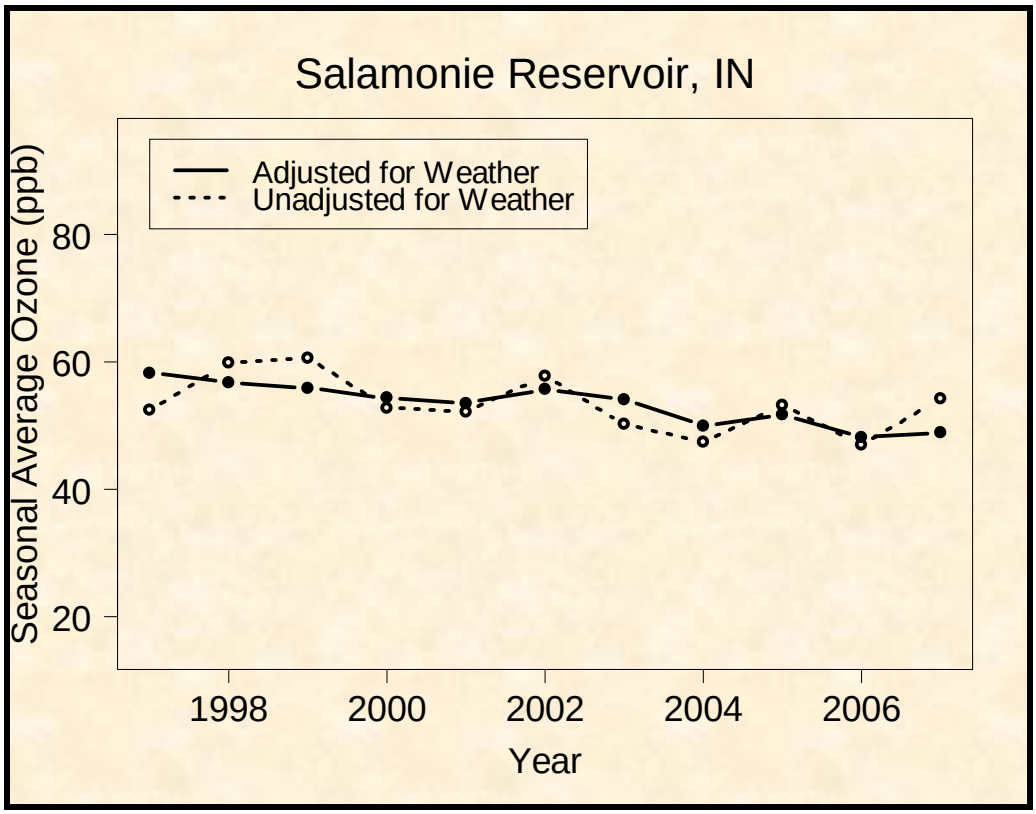
Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

Seasonal Average 8-hour Ozone Trends




Fort Wayne, IN 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Indianapolis, IN 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

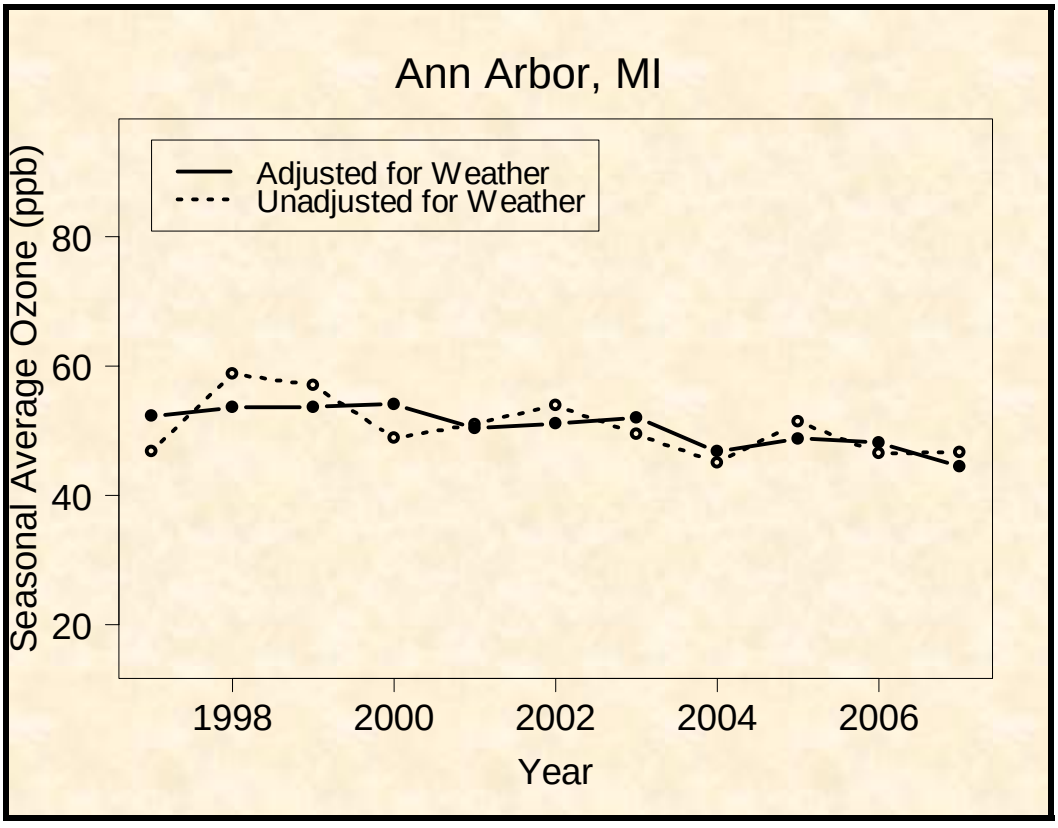

Salamonie Reservoir, IN
Adjusted for Weather
Unadjusted for Weather
Seasonal Average Ozone (ppb)
80
60
40
20
1998
2000
2002
2004
2006
Year

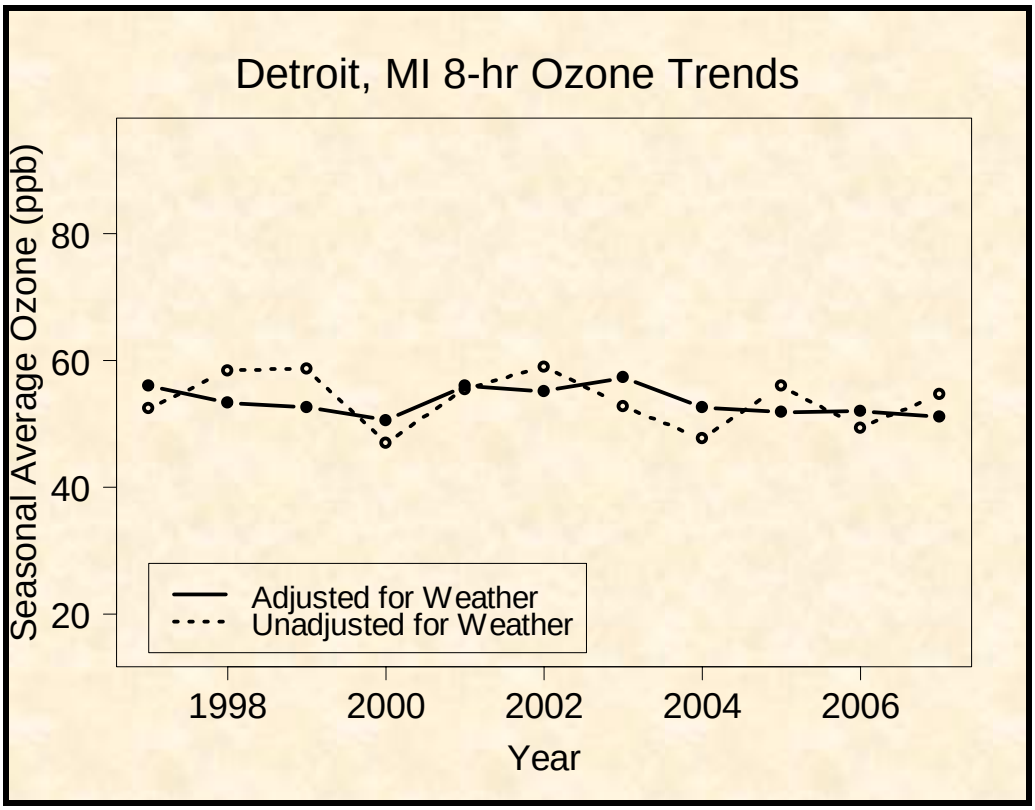
Michigan
Ozone

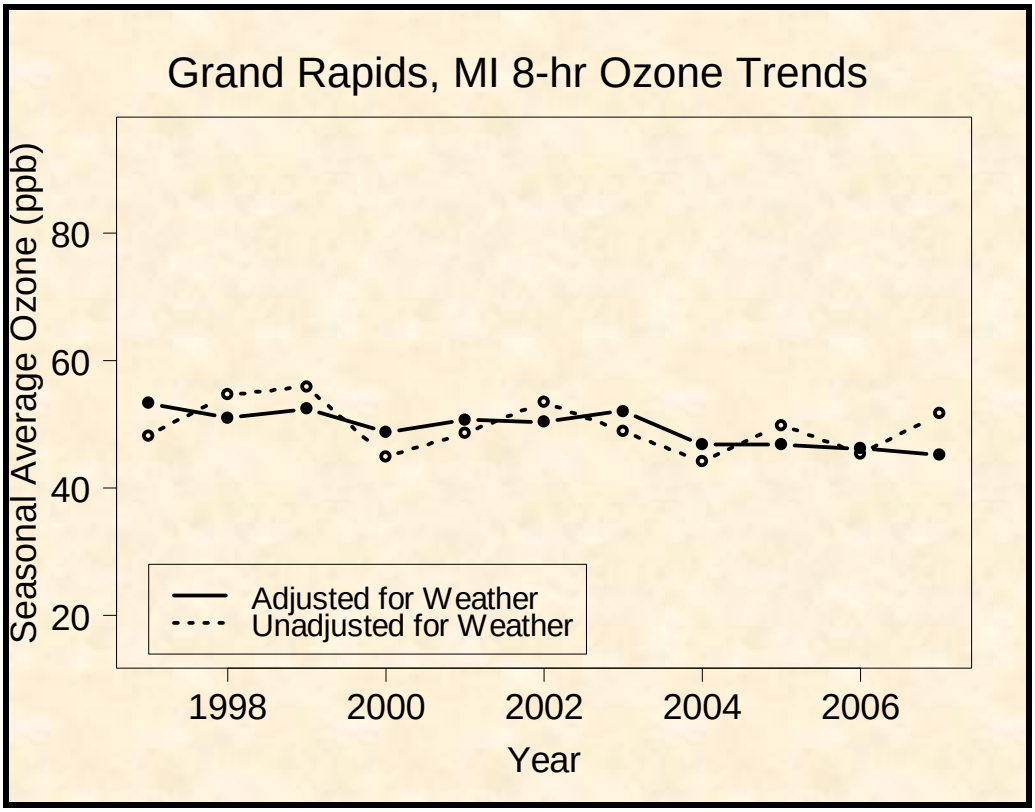
On average, ozone adjusted for weather conditions declined 12 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

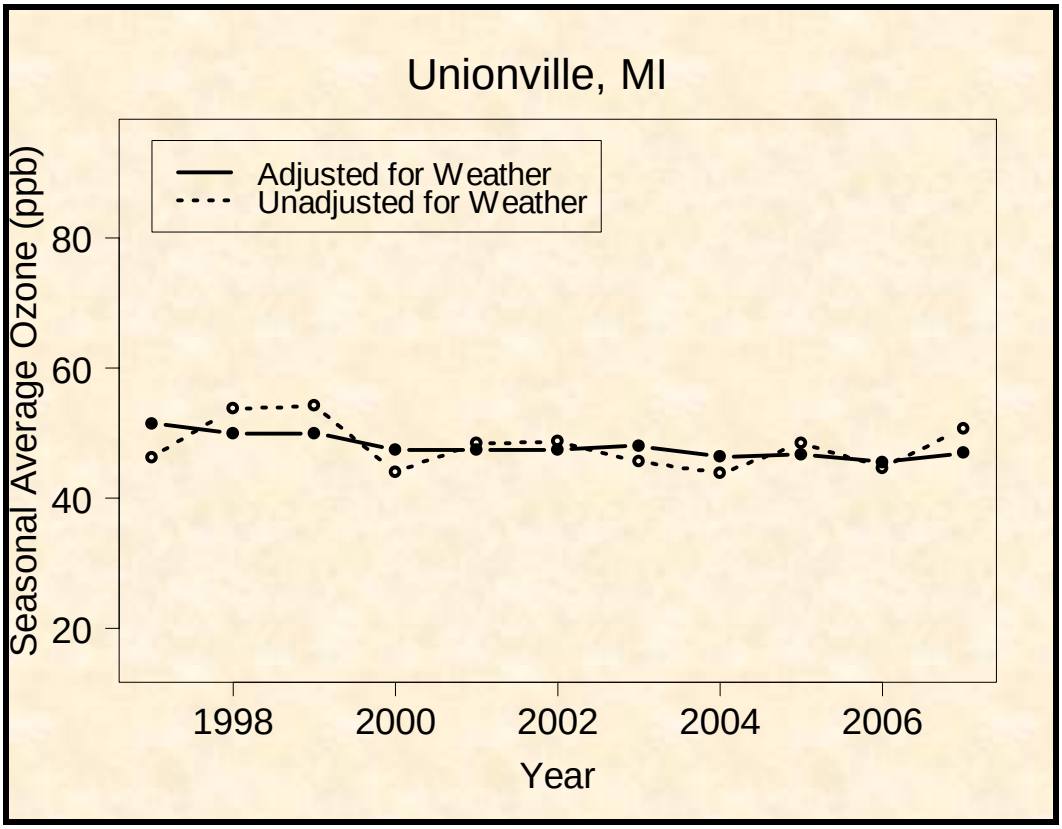
Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

Seasonal Average 8-hour Ozone Trends




Detroit, MI 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Grand Rapids, MI 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Unionville, MI
Adjusted for Weather
Unadjusted for Weather
Seasonal Average Ozone (ppb)
80
60
40
20
1998
2000
2002
2004
2006
Year

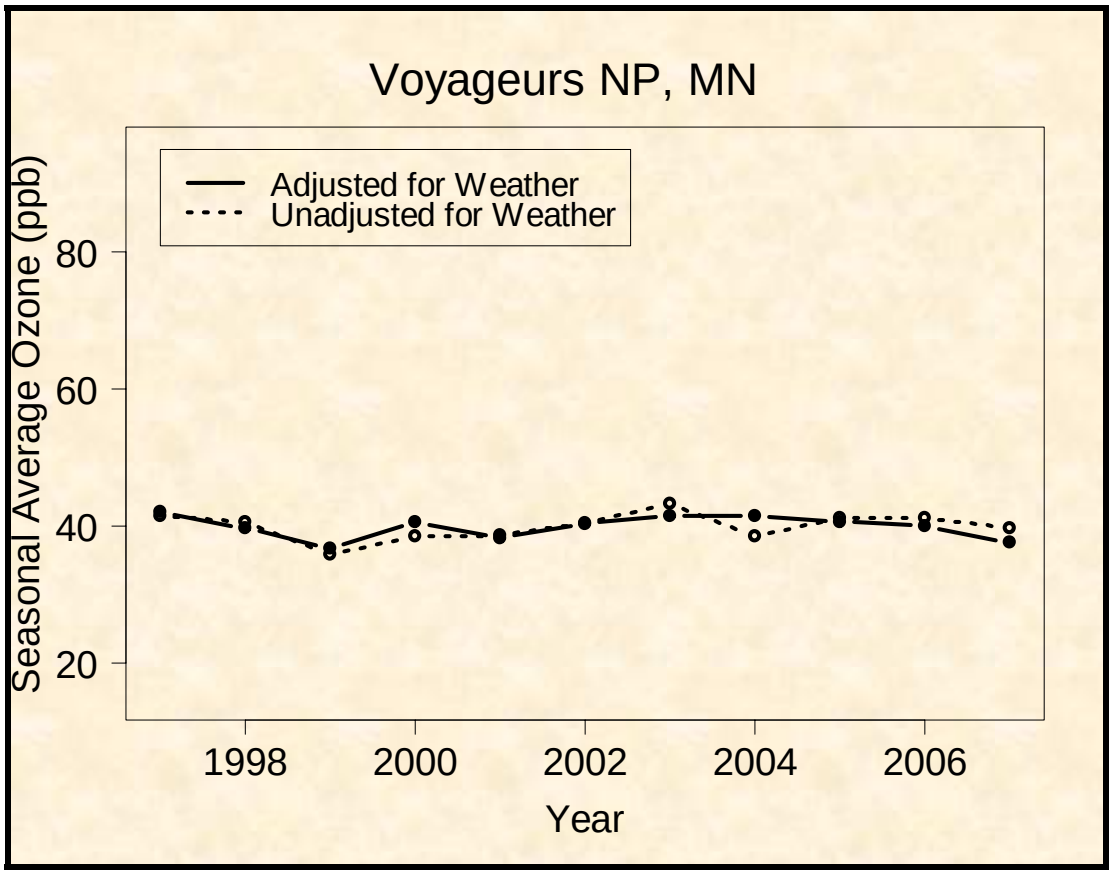
Minnesota

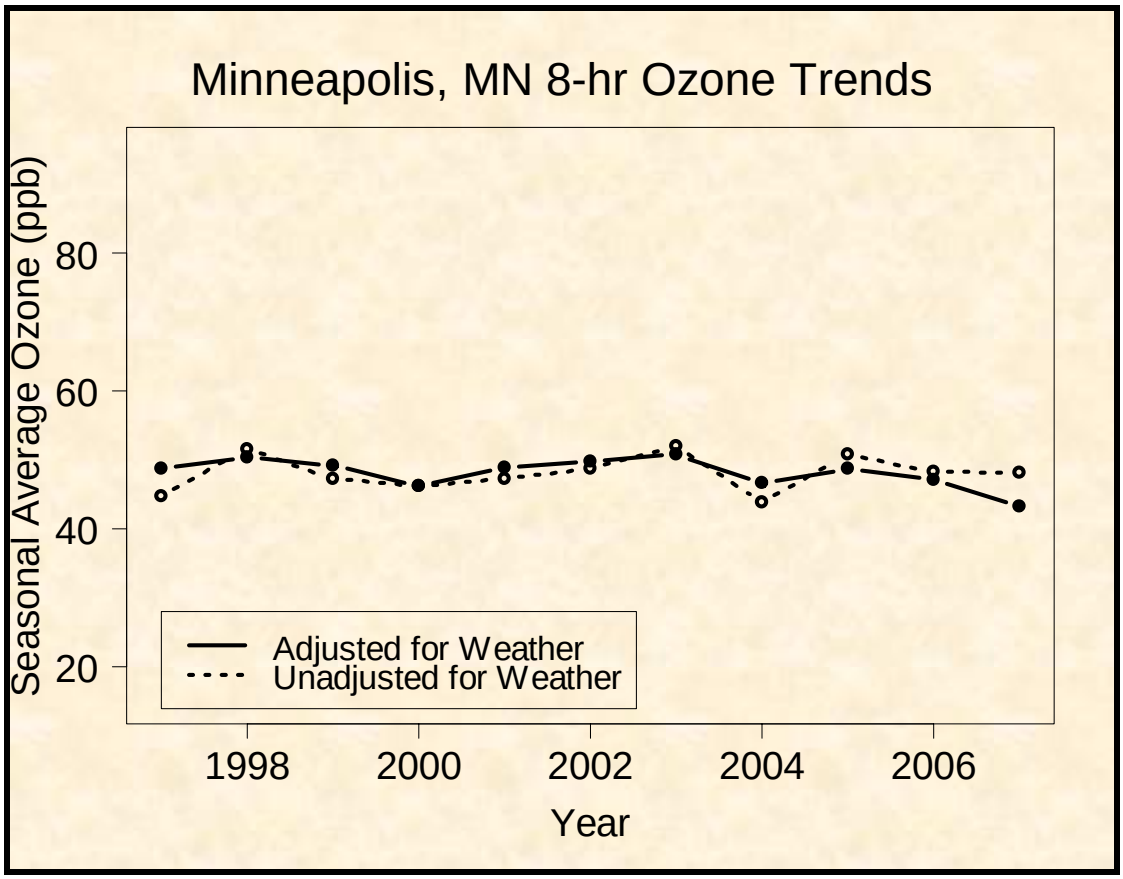
Ozone

On average, ozone adjusted for weather conditions declined 11 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

Seasonal Average 8-hour Ozone Trends



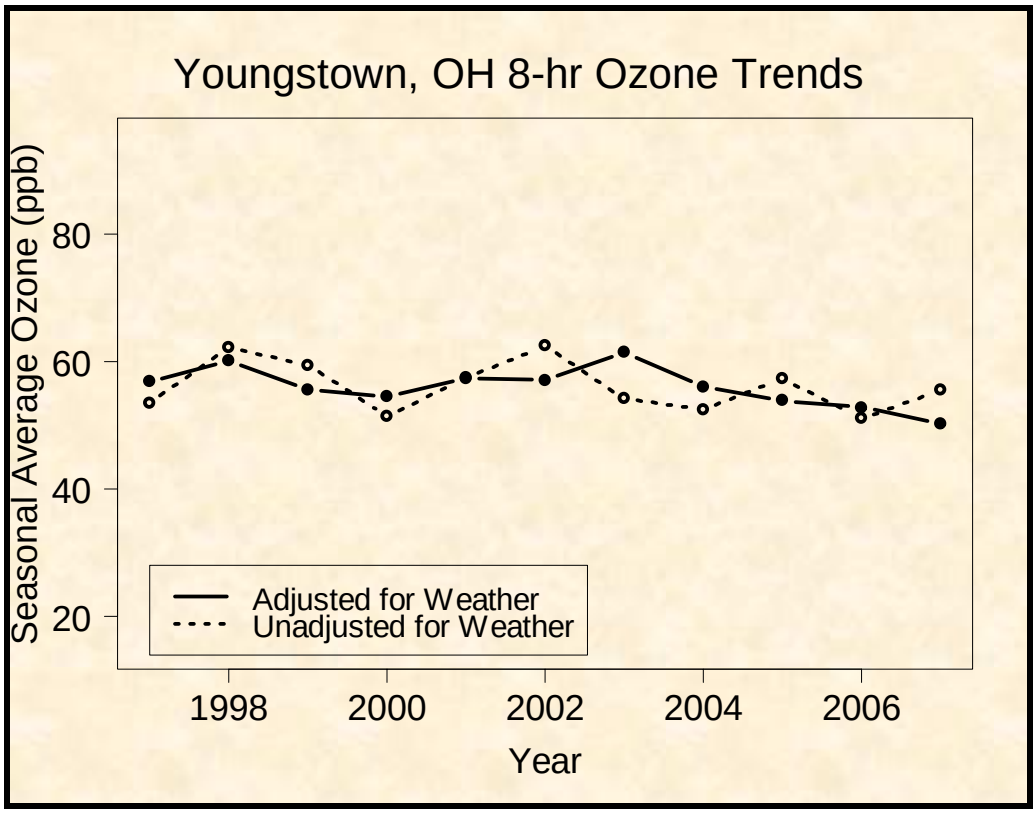

Minneapolis, MN 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

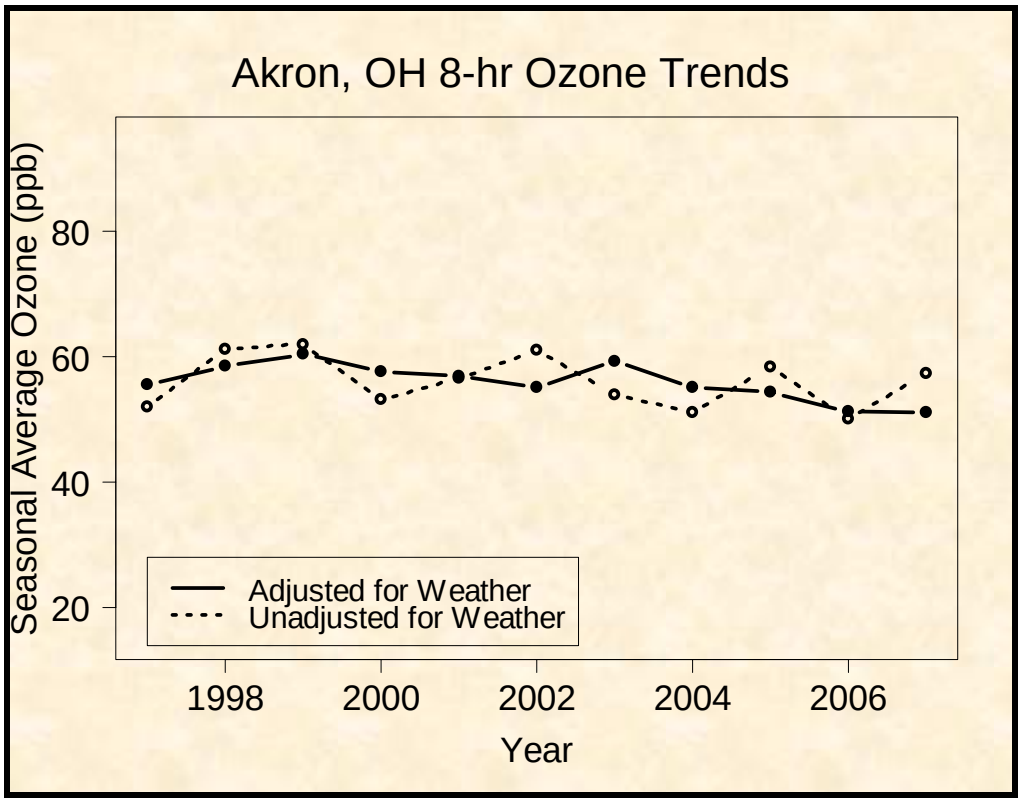
Ohio
Ozone

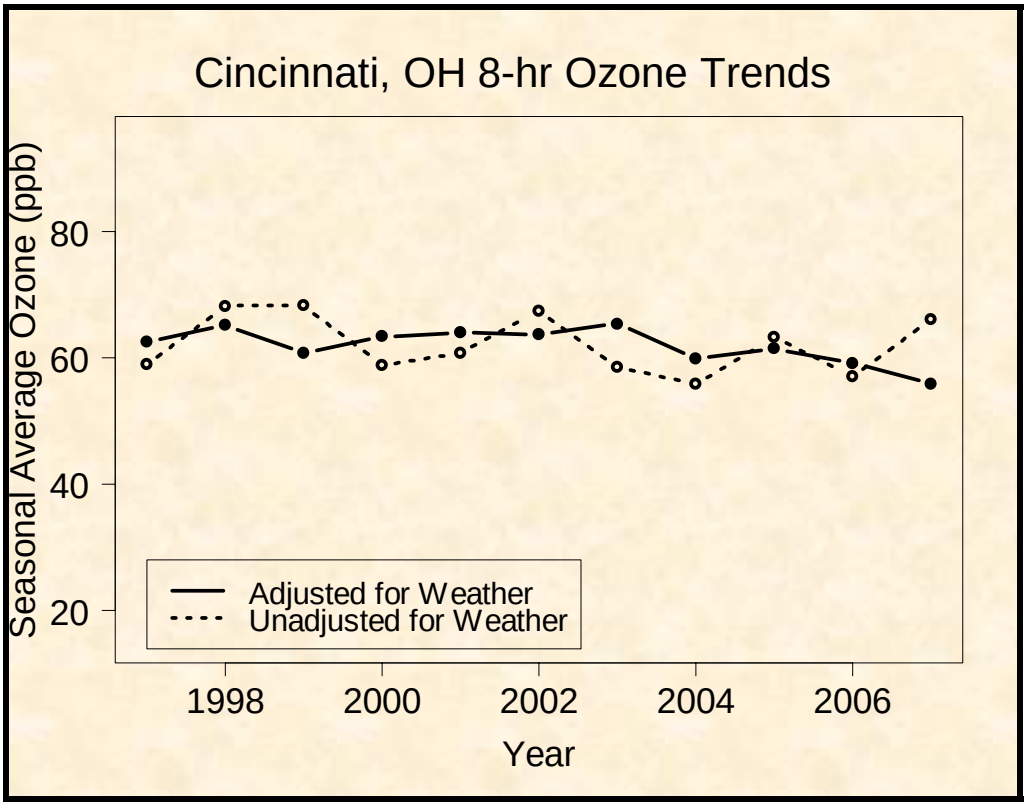
On average, ozone adjusted for weather conditions declined 15 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

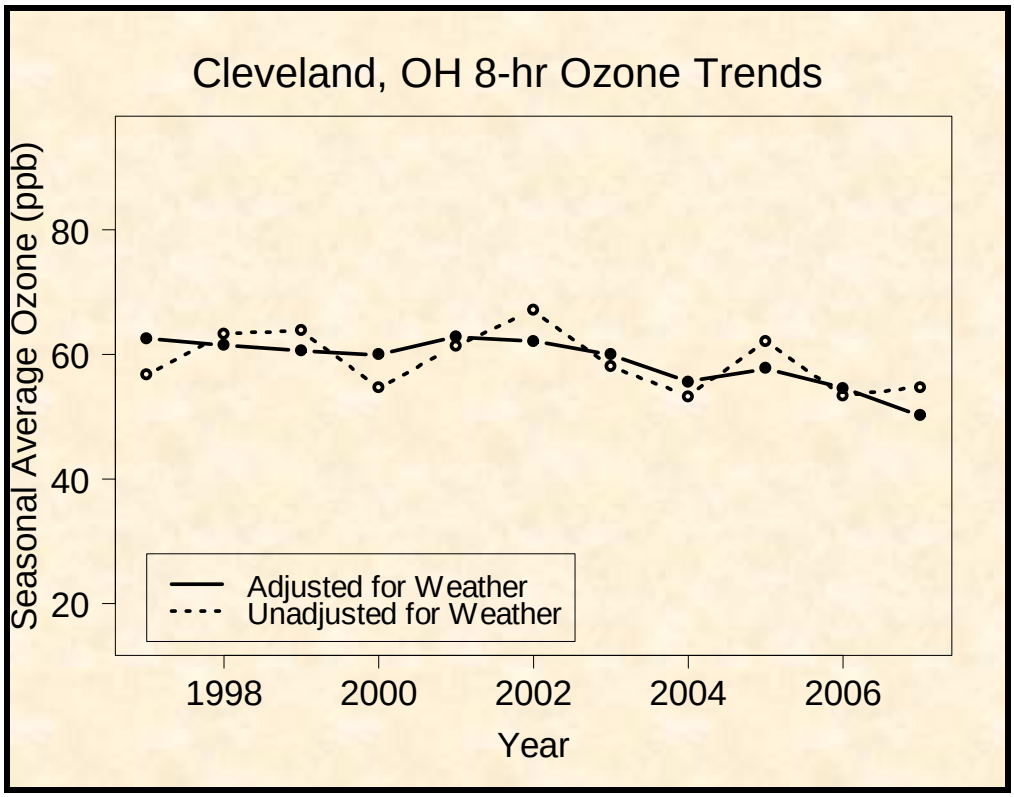
Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

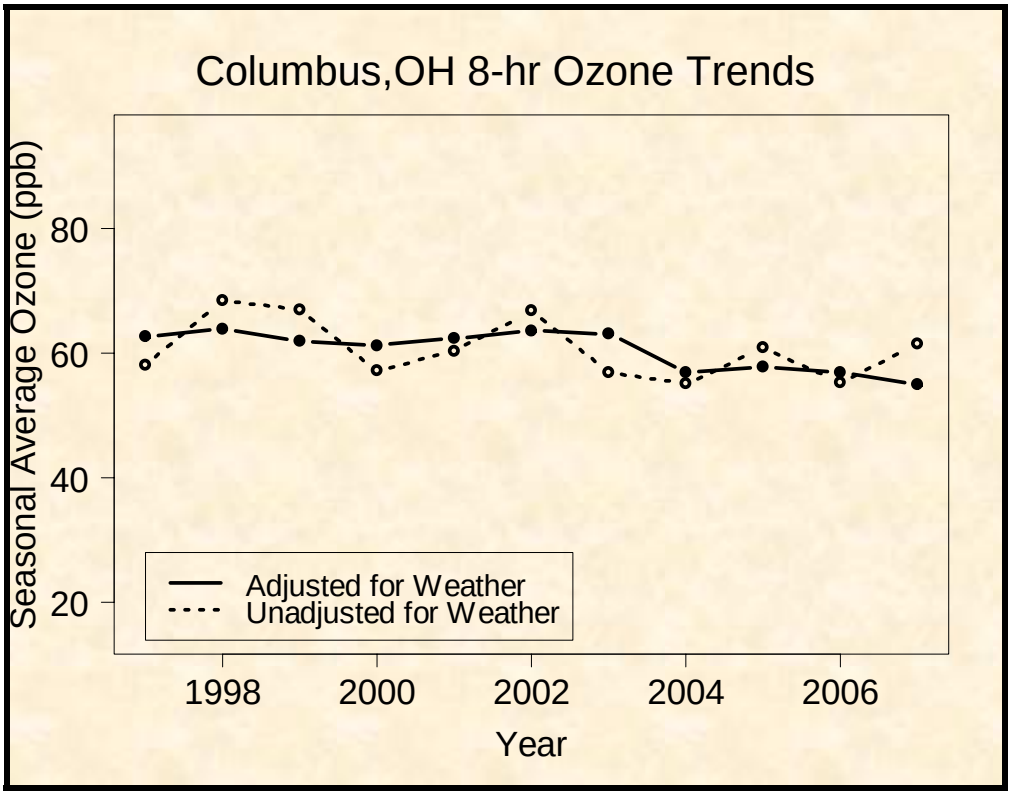
Seasonal Average 8-hour Ozone Trends

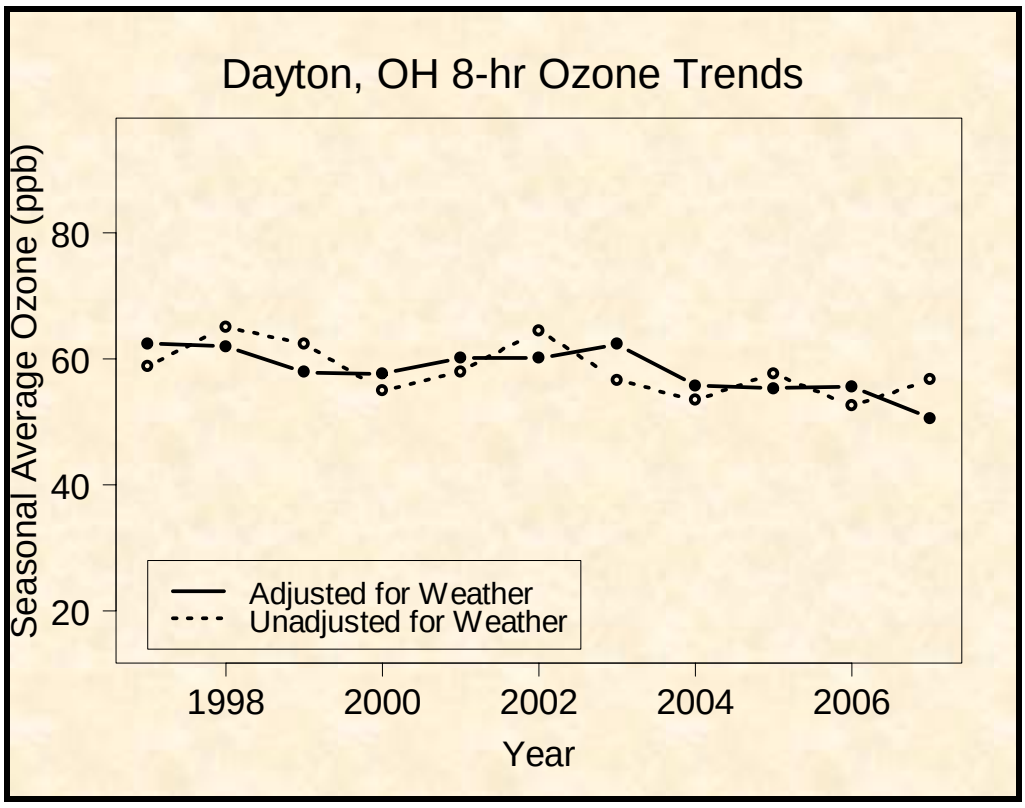


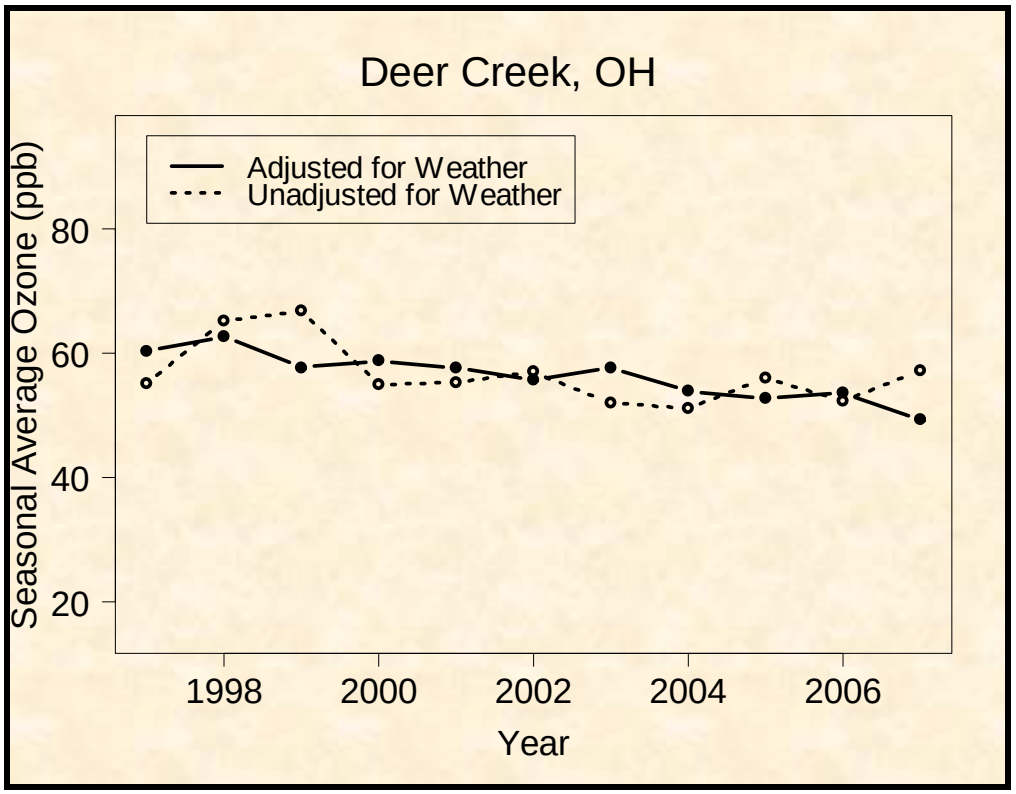

Akron, OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

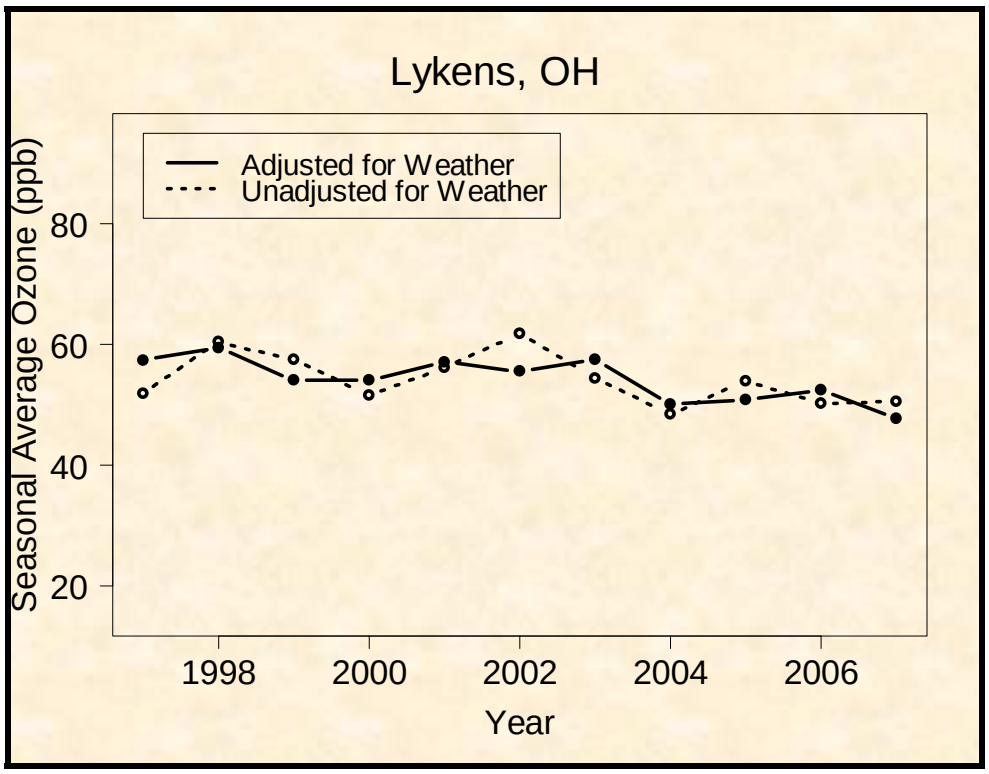

Cincinnati, OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

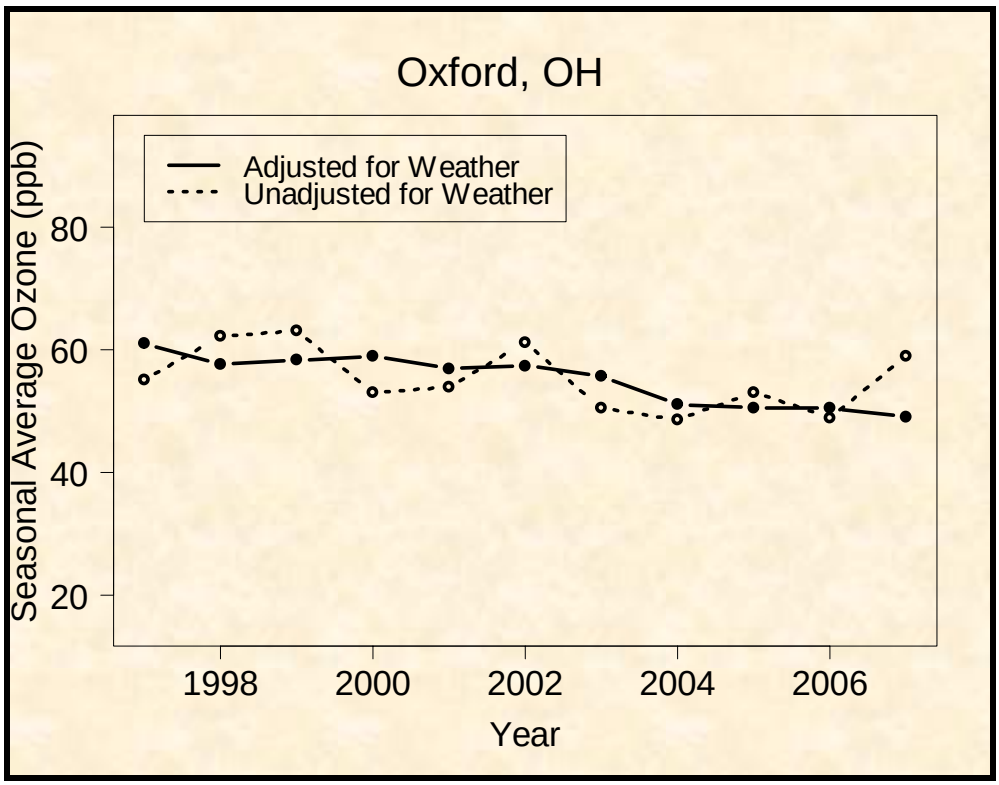

Cleveland, OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

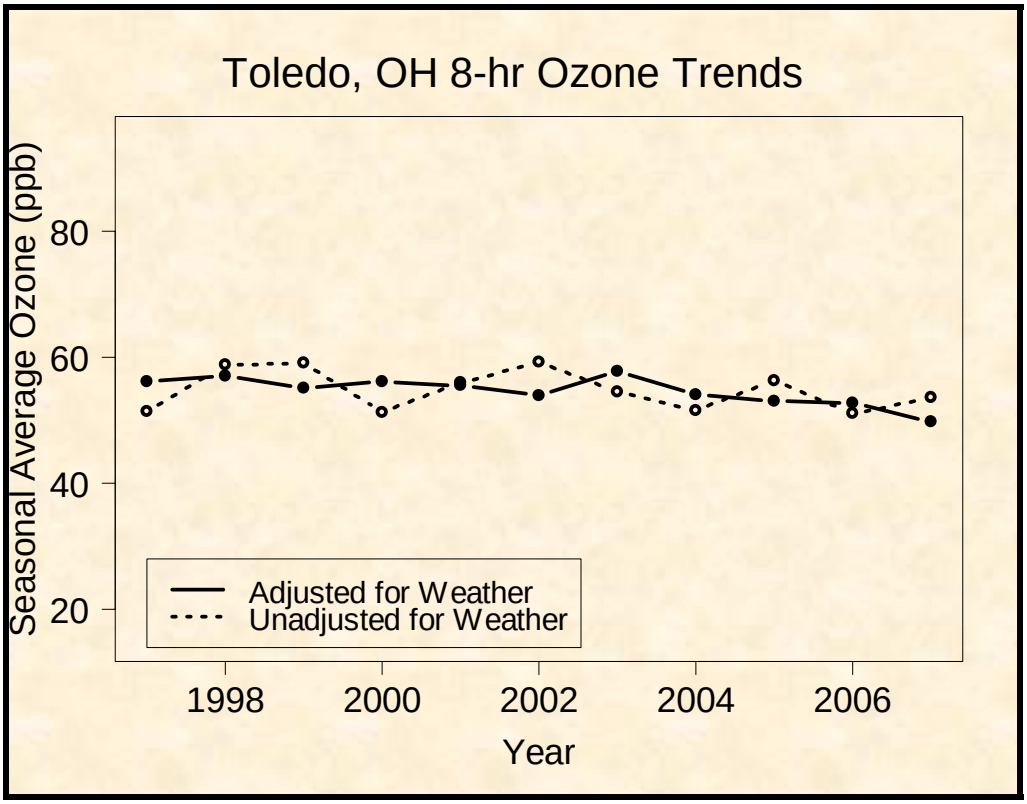

Columbus,OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Dayton, OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Deer Creek, OH
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year


Lykens, OH
Adjusted for Weather
Unadjusted for Weather
Seasonal Average Ozone (ppb)
80
60
40
20
1998
2000
2002
2004
2006
Year


Oxford, OH
Adjusted for Weather
Unadjusted for Weather
Seasonal Average Ozone (ppb)
80
60
40
20
1998
2000
2002
2004
2006
Year


Toledo, OH 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year

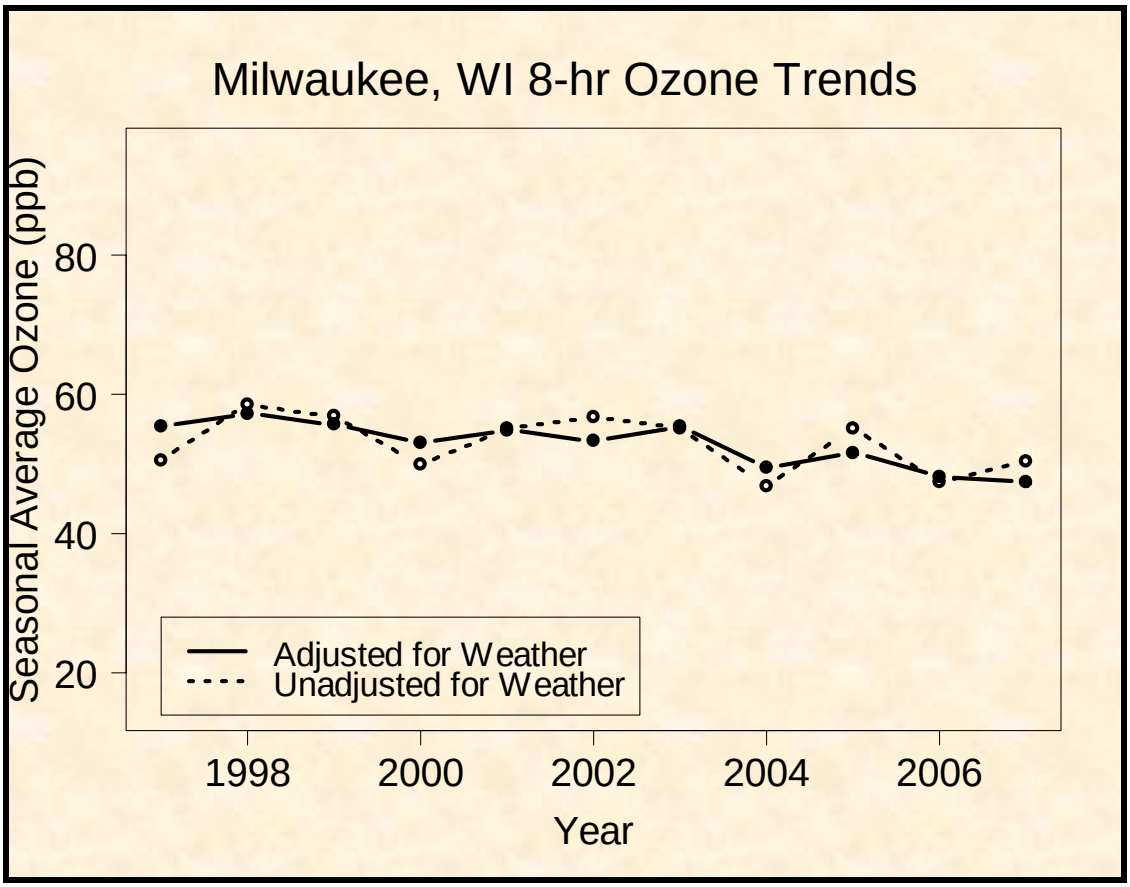
Wisconsin

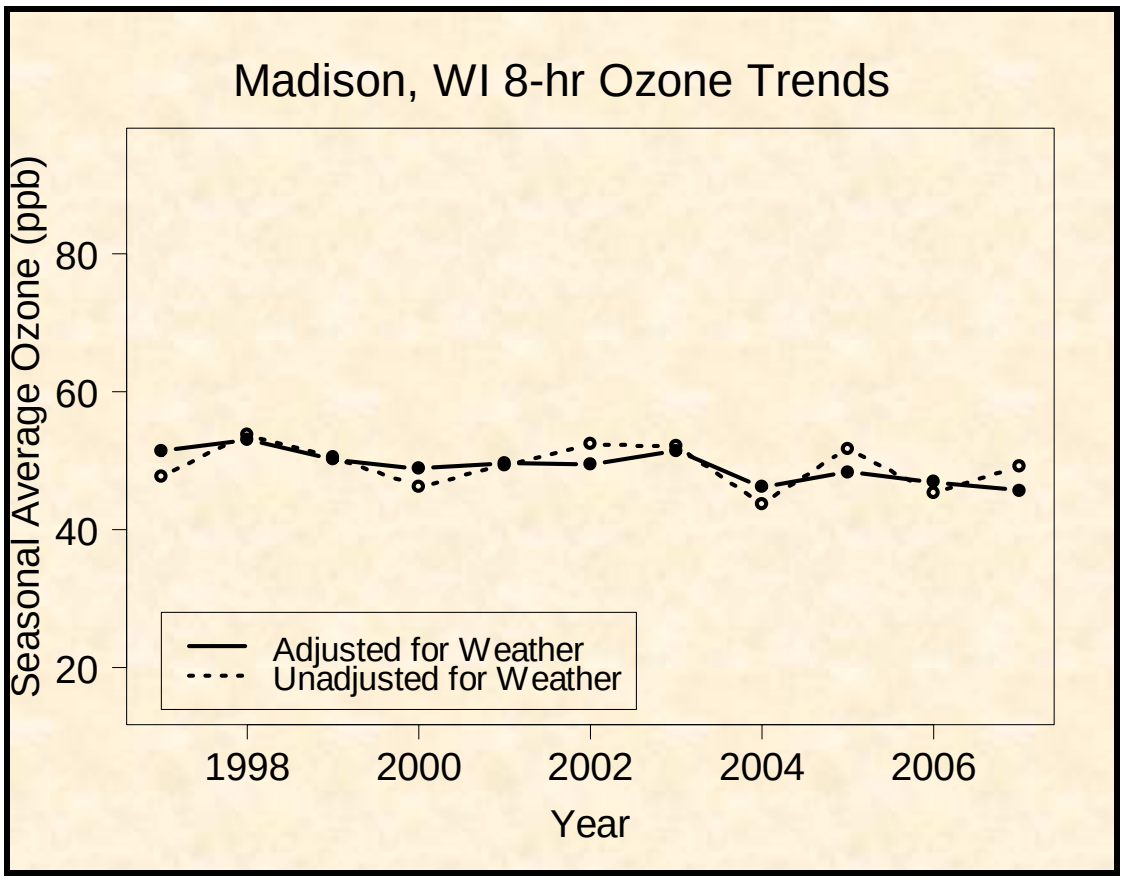
Ozone

On average, ozone adjusted for weather conditions declined 13 percent between 1997 and 2007. These improvements in ozone are in response to both state and regional reductions in NOx and VOC emissions. The level of ozone improvement varies from site to site.

Trends for 1997-2007 for rural sites and urban areas with complete ozone and meteorology data are presented below. Ozone season (May 1 - September 30) averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in weather conditions. The dotted line shows the trend in observed values at monitoring sites, while the solid line illustrates the underlying ozone trend after removing the effects of weather. The solid line serves as a more accurate ozone trend for assessing changes in emissions. Typical weather conditions are determined by averaging conditions (e.g., temperature, humidity, etc.) for the time period presented. The information provided is useful for reviewing the weather influence for a particular ozone season. The solid line represents ozone levels anticipated under typical weather conditions.

Seasonal Average 8-hour Ozone Trends




Madison, WI 8-hr Ozone Trends
Seasonal Average Ozone (ppb)
80
60
40
20
Adjusted for Weather
Unadjusted for Weather
1998
2000
2002
2004
2006
Year