

Cumulative Ozone Exceedances—A Measure of Current Year Ozone Levels Compared to Historical Trends

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Introduction

The U.S. Environmental Protection Agency (EPA) maintains a historical record of air pollutant data in the EPA Air Quality System (AQS), which is overseen by the Office of Air Quality Planning and Standards. This database provides quality-assured pollutant measurement data from a network of monitoring stations in metropolitan areas and regions throughout the United States. The AQS usually contains the most recent 10-year period of monitored data. Pollutant measurement data are entered into the AQS by state and local agencies maintaining the network of monitoring stations. These data are entered on a continuous basis throughout the year but are usually complete within about 3 months after the end of the calendar year.

Ozone is one of the principal pollutants measured at a network of monitoring stations throughout the United States. The historical ozone database maintained in the AQS provides a unique opportunity to conduct analyses to investigate and characterize the ozone levels in these metropolitan areas and regions. Comparisons of historical data with the most recent year of data in the AQS can provide an indication of the current magnitude of ozone pollutant levels in metropolitan areas and regions throughout the United States compared to historical levels and can show whether ozone levels are

worse, better, or about the same in the most recent year compared to recent historical trends.

Origin of Data

The ozone monitoring “season” occurs in the period from April through October in most major metropolitan areas throughout the United States. Frequently states, EPA Regional Offices, and EPA Headquarter Offices are asked how this year’s ozone season compared to that of previous years. These queries occur particularly when there may have been several ozone “episodes” during the year or if there were periods of especially high ozone measurements prompting air quality alerts that may have been widely reported in the media.

One potentially useful way to compare ozone seasons is to depict the seasonal trend in ozone by counting the number of days in which ozone exceedances are measured in selected metropolitan areas and/or regions. The measure of ozone exceedances that is most widely reported in the media is the EPA Air Quality Index (AQI). The AQI contains categories of ozone levels based on health effects and includes (1) Moderate, (2) Unhealthy for Sensitive Groups, (3) Unhealthy, (4) Very Unhealthy, and (5) Hazardous.

The Unhealthy for Sensitive Groups category is based on the 8-hour National Ambient Air

Quality Standards (NAAQS) for ozone (≥ 0.085 ppm). Other categories (Unhealthy, Very Unhealthy, and Hazardous) are based on ozone levels of increasing severity. By tracking the number of days ozone measurements exceed the NAAQS (e.g., Unhealthy for Sensitive Groups) during the ozone season as reported in the AQS, a comparison can be made of the most recent year’s ozone measurements with previous or historical year measurements. Based on this comparison, a qualitative assessment of the “severity” of the most recent year’s ozone measurements with historical year measurements can be made.

In this analysis, we use ozone data measured from the network of monitors assigned to the *USA Today* newspaper cities, for which the AQI is forecasted during the ozone season. Monitoring data from additional cities could be used as well, but we chose the *USA Today* cities as an illustration of the type of comparisons that can be done and because it the most widely reported measure of ozone levels in the media.

EPA maintains a list of monitors that are assigned to these *USA Today* cities (see Table 1).¹ Using these same monitors, the historical ozone data can be obtained for each of the *USA Today* cities from previous years’ data reported in the AQS. In this analysis, we use the 2002 data reported in the AQS as the most recent year data and the previous

Table 1. Monitoring Sites for *USA Today* Cities

City	AIRS_ID	Site	City	AIRS_ID	Site
Atlanta	130570001	130570001	Baltimore	245100051	245100051
Atlanta	130670003	130670003	Baltimore	245100053	245100053
Atlanta	130770002	130770002	Boston	250091002	250091002
Atlanta	130890002	130890002	Boston	250091201	250091201
Atlanta	130893001	130893001	Boston	250092006	250092006
Atlanta	130970002	130970002	Boston	250093001	250093001
Atlanta	130970004	130970004	Boston	250093102	250093102
Atlanta	131130001	131130001	Boston	250094001	250094001
Atlanta	131210034	131210034	Boston	250094003	250094003
Atlanta	131210053	131210053	Boston	250094004	250094004
Atlanta	131210055	131210055	Boston	250170004	250170004
Atlanta	131215001	131215001	Boston	250171001	250171001
Atlanta	131215002	131215002	Boston	250171002	250171002
Atlanta	131350002	131350002	Boston	250171005	250171005
Atlanta	131510002	131510002	Boston	250171102	250171102
Atlanta	132230001	132230001	Boston	250173003	250173003
Atlanta	132230002	132230002	Boston	250176001	250176001
Atlanta	132230003	132230003	Boston	250211001	250211001
Atlanta	132470001	132470001	Boston	250212002	250212002
Atlanta	132558001	132558001	Boston	250213003	250213003
Baltimore	240030001	240030001	Boston	250232001	250232001
Baltimore	240030014	240030014	Boston	250250002	250250002
Baltimore	240030019	240030019	Boston	250250015	250250015
Baltimore	240031003	240031003	Boston	250250021	250250021
Baltimore	240032002	240032002	Boston	250250041	250250041
Baltimore	240050003	240050003	Boston	250250042	250250042
Baltimore	240050010	240050010	Boston	250250081	250250081
Baltimore	240051007	240051007	Boston	250251003	250251003
Baltimore	240053001	240053001	Charlotte	371090004	371090004
Baltimore	240054002	240054002	Charlotte	371090099	371090099
Baltimore	240056001	240056001	Charlotte	371190011	371190011
Baltimore	240130001	240130001	Charlotte	371190018	371190018
Baltimore	240250080	240250080	Charlotte	371190019	371190019
Baltimore	240251001	240251001	Charlotte	371190026	371190026
Baltimore	240259001	240259001	Charlotte	371190028	371190028
Baltimore	240270005	240270005	Charlotte	371190030	371190030
Baltimore	245100004	245100004	Charlotte	371190033	371190033
Baltimore	245100011	245100011	Charlotte	371190034	371190034
Baltimore	245100018	245100018	Charlotte	371190041	371190041
Baltimore	245100019	245100019	Charlotte	371191005	371191005
Baltimore	245100036	245100036	Charlotte	371191009	371191009
Baltimore	245100040	245100040	Charlotte	371590021	371590021
Baltimore	245100050	245100050	Charlotte	371590022	371590022
Charlotte	371790003	371790003	Chicago	170314006	170314006
Charlotte	450910002	450910002	Chicago	170314007	170314007
Charlotte	450910004	450910004	Chicago	170314201	170314201

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Charlotte	450910006	450910006	Chicago	170315001	170315001
Charlotte	450911004	450911004	Chicago	170315002	170315002
Chicago	170310001	170310001	Chicago	170316002	170316002
Chicago	170310002	170310002	Chicago	170317002	170317002
Chicago	170310003	170310003	Chicago	170318001	170318001
Chicago	170310004	170310004	Chicago	170318003	170318003
Chicago	170310006	170310006	Chicago	170370002	170370002
Chicago	170310007	170310007	Chicago	170430003	170430003
Chicago	170310009	170310009	Chicago	170431002	170431002
Chicago	170310025	170310025	Chicago	170436001	170436001
Chicago	170310026	170310026	Chicago	170438002	170438002
Chicago	170310027	170310027	Chicago	170890003	170890003
Chicago	170310032	170310032	Chicago	170890005	170890005
Chicago	170310033	170310033	Chicago	170890006	170890006
Chicago	170310034	170310034	Chicago	170970001	170970001
Chicago	170310036	170310036	Chicago	170970006	170970006
Chicago	170310037	170310037	Chicago	170970007	170970007
Chicago	170310038	170310038	Chicago	170970008	170970008
Chicago	170310039	170310039	Chicago	170970009	170970009
Chicago	170310040	170310040	Chicago	170971002	170971002
Chicago	170310042	170310042	Chicago	170971003	170971003
Chicago	170310044	170310044	Chicago	170971007	170971007
Chicago	170310045	170310045	Chicago	170973001	170973001
Chicago	170310050	170310050	Chicago	171110001	171110001
Chicago	170310053	170310053	Chicago	171111001	171111001
Chicago	170310062	170310062	Chicago	171970005	171970005
Chicago	170310063	170310063	Chicago	171971007	171971007
Chicago	170310064	170310064	Chicago	171971008	171971008
Chicago	170310072	170310072	Chicago	171971011	171971011
Chicago	170310075	170310075	Cincinnati	180290003	180290003
Chicago	170311002	170311002	Cincinnati	210150003	210150003
Chicago	170311003	170311003	Cincinnati	210151002	210151002
Chicago	170311501	170311501	Cincinnati	210370003	210370003
Chicago	170311601	170311601	Cincinnati	210371001	210371001
Chicago	170312002	170312002	Cincinnati	210374001	210374001
Chicago	170312301	170312301	Cincinnati	211170007	211170007
Chicago	170313001	170313001	Cincinnati	211910002	211910002
Chicago	170313005	170313005	Cincinnati	390250002	390250002
Chicago	170314002	170314002	Cincinnati	390250020	390250020
Chicago	170314003	170314003	Cincinnati	390250022	390250022
Cincinnati	390610003	390610003	Columbus	390970006	390970006
Cincinnati	390610006	390610006	Columbus	390970007	390970007
Cincinnati	390610010	390610010	Columbus	391298001	391298001
Cincinnati	390610019	390610019	Dallas-Fort Worth	480850004	480850004
Cincinnati	390610020	390610020	Dallas-Fort Worth	480850005	480850005
Cincinnati	390610034	390610034	Dallas-Fort Worth	480850010	480850010

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Cincinnati	390610035	390610035	Dallas-Fort Worth	480850085	480850085
Cincinnati	390610037	390610037	Dallas-Fort Worth	481130039	481130039
Cincinnati	390610040	390610040	Dallas-Fort Worth	481130044	481130044
Cincinnati	390616002	390616002	Dallas-Fort Worth	481130045	481130045
Cincinnati	391650006	391650006	Dallas-Fort Worth	481130047	481130047
Cincinnati	391651002	391651002	Dallas-Fort Worth	481130052	481130052
Cleveland	390071001	390071001	Dallas-Fort Worth	481130055	481130055
Cleveland	390350002	390350002	Dallas-Fort Worth	481130069	481130069
Cleveland	390350033	390350033	Dallas-Fort Worth	481130075	481130075
Cleveland	390350034	390350034	Dallas-Fort Worth	481130086	481130086
Cleveland	390350035	390350035	Dallas-Fort Worth	481130087	481130087
Cleveland	390350064	390350064	Dallas-Fort Worth	481131047	481131047
Cleveland	390350081	390350081	Dallas-Fort Worth	481133003	481133003
Cleveland	390352001	390352001	Dallas-Fort Worth	481210002	481210002
Cleveland	390353003	390353003	Dallas-Fort Worth	481210033	481210033
Cleveland	390354003	390354003	Dallas-Fort Worth	481210034	481210034
Cleveland	390355002	390355002	Dallas-Fort Worth	481210054	481210054
Cleveland	390550004	390550004	Dallas-Fort Worth	481390015	481390015
Cleveland	390850001	390850001	Dallas-Fort Worth	481390082	481390082
Cleveland	390850003	390850003	Dallas-Fort Worth	482570001	482570001
Cleveland	390853002	390853002	Dallas-Fort Worth	482570005	482570005
Cleveland	390930013	390930013	Dallas-Fort Worth	483970001	483970001
Cleveland	390930017	390930017	Dallas-Fort Worth	483970081	483970081
Cleveland	390931002	390931002	Denver	80010600	080010600
Cleveland	390931003	390931003	Denver	80013001	080013001
Cleveland	391030002	391030002	Denver	80017015	080017015
Cleveland	391030003	391030003	Denver	80050002	080050002
Cleveland	391032001	391032001	Denver	80050003	080050003
Columbus	390410002	390410002	Denver	80051002	080051002
Columbus	390490004	390490004	Denver	80310002	080310002
Columbus	390490009	390490009	Denver	80310009	080310009
Columbus	390490015	390490015	Denver	80310010	080310010
Columbus	390490028	390490028	Denver	80310011	080310011
Columbus	390490029	390490029	Denver	80310014	080310014
Columbus	390490037	390490037	Denver	80350002	080350002
Columbus	390490081	390490081	Denver	80350603	080350603
Columbus	390890005	390890005	Denver	80590002	080590002
Denver	80590004	080590004	Houston	482010047	482010047
Denver	80590005	080590005	Houston	482010051	482010051
Denver	80590006	080590006	Houston	482010055	482010055
Denver	80590011	080590011	Houston	482010059	482010059
Denver	80590600	080590600	Houston	482010062	482010062
Denver	80590601	080590601	Houston	482010066	482010066
Detroit	260990009	260990009	Houston	482010070	482010070
Detroit	260991003	260991003	Houston	482010075	482010075
Detroit	261150037	261150037	Houston	482010099	482010099

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Detroit	261150745	261150745	Houston	482011003	482011003
Detroit	261250001	261250001	Houston	482011034	482011034
Detroit	261250902	261250902	Houston	482011035	482011035
Detroit	261251002	261251002	Houston	482011036	482011036
Detroit	261470003	261470003	Houston	482011037	482011037
Detroit	261470005	261470005	Houston	482011039	482011039
Detroit	261470030	261470030	Houston	482011050	482011050
Detroit	261630001	261630001	Houston	482017001	482017001
Detroit	261630009	261630009	Houston	482910089	482910089
Detroit	261630014	261630014	Houston	483390078	483390078
Detroit	261630016	261630016	Houston	483390088	483390088
Detroit	261630018	261630018	Houston	483390089	483390089
Detroit	261630019	261630019	Houston	484730001	484730001
Detroit	261630020	261630020	Indianapolis	180110001	180110001
Detroit	261630025	261630025	Indianapolis	180570004	180570004
Detroit	261630062	261630062	Indianapolis	180571001	180571001
Detroit	261632002	261632002	Indianapolis	180590001	180590001
Detroit	261632003	261632003	Indianapolis	180590002	180590002
Honolulu	150031001	150031001	Indianapolis	180590003	180590003
Honolulu	150031004	150031004	Indianapolis	180590004	180590004
Houston	480710900	480710900	Indianapolis	180591001	180591001
Houston	480710901	480710901	Indianapolis	180630004	180630004
Houston	480710902	480710902	Indianapolis	180810001	180810001
Houston	480710903	480710903	Indianapolis	180810002	180810002
Houston	481570004	481570004	Indianapolis	180950009	180950009
Houston	482010007	482010007	Indianapolis	180950010	180950010
Houston	482010024	482010024	Indianapolis	180970004	180970004
Houston	482010026	482010026	Indianapolis	180970021	180970021
Houston	482010027	482010027	Indianapolis	180970025	180970025
Houston	482010028	482010028	Indianapolis	180970030	180970030
Houston	482010029	482010029	Indianapolis	180970031	180970031
Houston	482010038	482010038	Indianapolis	180970033	180970033
Houston	482010039	482010039	Indianapolis	180970037	180970037
Houston	482010046	482010046	Indianapolis	180970042	180970042
Indianapolis	180970050	180970050	Las Vegas	320030043	320030043
Indianapolis	180970057	180970057	Las Vegas	320030071	320030071
Indianapolis	180970070	180970070	Las Vegas	320030072	320030072
Indianapolis	180970073	180970073	Las Vegas	320030073	320030073
Indianapolis	180970082	180970082	Las Vegas	320030538	320030538
Indianapolis	180970901	180970901	Las Vegas	320030601	320030601
Indianapolis	180970902	180970902	Las Vegas	320031001	320031001
Indianapolis	180970903	180970903	Las Vegas	320031005	320031005
Indianapolis	180970904	180970904	Las Vegas	320031007	320031007
Indianapolis	180970905	180970905	Las Vegas	320031019	320031019
Indianapolis	180970906	180970906	Los Angeles	60370001	60370001
Indianapolis	180972001	180972001	Los Angeles	60370002	60370002

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Indianapolis	181090001	181090001	Los Angeles	60370004	060370004
Indianapolis	181090003	181090003	Los Angeles	60370016	060370016
Indianapolis	181090004	181090004	Los Angeles	60370018	060370018
Indianapolis	181090005	181090005	Los Angeles	60370019	060370019
Indianapolis	181450001	181450001	Los Angeles	60370030	060370030
Kansas City	200910005	200910005	Los Angeles	60370031	060370031
Kansas City	201030002	201030002	Los Angeles	60370113	060370113
Kansas City	201210001	201210001	Los Angeles	60370206	060370206
Kansas City	202090001	202090001	Los Angeles	60371002	060371002
Kansas City	202090011	202090011	Los Angeles	60371004	060371004
Kansas City	202090017	202090017	Los Angeles	60371102	060371102
Kansas City	202090021	202090021	Los Angeles	60371103	060371103
Kansas City	290370002	290370002	Los Angeles	60371104	060371104
Kansas City	290370003	290370003	Los Angeles	60371105	060371105
Kansas City	290470003	290470003	Los Angeles	60371106	060371106
Kansas City	290470004	290470004	Los Angeles	60371201	060371201
Kansas City	290470005	290470005	Los Angeles	60371301	060371301
Kansas City	290470018	290470018	Los Angeles	60371401	060371401
Kansas City	290470025	290470025	Los Angeles	60371601	060371601
Kansas City	290472004	290472004	Los Angeles	60371701	060371701
Kansas City	290950022	290950022	Los Angeles	60371902	060371902
Kansas City	290950036	290950036	Los Angeles	60372002	060372002
Kansas City	291650003	291650003	Los Angeles	60372005	060372005
Kansas City	291650023	291650023	Los Angeles	60372101	060372101
Las Vegas	320030005	320030005	Los Angeles	60372301	060372301
Las Vegas	320030007	320030007	Los Angeles	60372401	060372401
Las Vegas	320030009	320030009	Los Angeles	60374001	060374001
Las Vegas	320030016	320030016	Los Angeles	60374002	060374002
Las Vegas	320030020	320030020	Los Angeles	60374101	060374101
Las Vegas	320030021	320030021	Los Angeles	60375001	060375001
Las Vegas	320030022	320030022	Los Angeles	60376002	060376002
Los Angeles	60376012	060376012	Minneapolis-St. Paul	271636015	271636015
Los Angeles	60377001	060377001	Minneapolis-St. Paul	271710009	271710009
Los Angeles	60378001	060378001	Minneapolis-St. Paul	551090001	551090001
Los Angeles	60379002	060379002	Minneapolis-St. Paul	551091002	551091002
Los Angeles	60379006	060379006	Nashville	470370011	470370011
Los Angeles	60379033	060379033	Nashville	470370012	470370012
Memphis	50350005	050350005	Nashville	470370026	470370026
Memphis	280330002	280330002	Nashville	470430007	470430007
Memphis	470470103	470470103	Nashville	470430009	470430009
Memphis	471570012	471570012	Nashville	471490101	471490101
Memphis	471570021	471570021	Nashville	471650007	471650007
Memphis	471570024	471570024	Nashville	471650101	471650101
Memphis	471570032	471570032	Nashville	471870103	471870103
Memphis	471571004	471571004	Nashville	471870105	471870105
Miami	120250008	120250008	Nashville	471870106	471870106

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Miami	120250021	120250021	Nashville	471890103	471890103
Miami	120250023	120250023	New Orleans	220510003	220510003
Miami	120250026	120250026	New Orleans	220511001	220511001
Miami	120250027	120250027	New Orleans	220512001	220512001
Miami	120250029	120250029	New Orleans	220710005	220710005
Miami	120250030	120250030	New Orleans	220710011	220710011
Miami	120251006	120251006	New Orleans	220710012	220710012
Miami	120251008	120251008	New Orleans	220710082	220710082
Miami	120251009	120251009	New Orleans	220710083	220710083
Miami	120254002	120254002	New Orleans	220711001	220711001
Minneapolis-St. Paul	270030002	270030002	New Orleans	220870002	220870002
Minneapolis-St. Paul	270031001	270031001	New Orleans	220890001	220890001
Minneapolis-St. Paul	270031002	270031002	New Orleans	220890003	220890003
Minneapolis-St. Paul	270032002	270032002	New Orleans	220890100	220890100
Minneapolis-St. Paul	270370006	270370006	New Orleans	220930001	220930001
Minneapolis-St. Paul	270371007	270371007	New Orleans	220930002	220930002
Minneapolis-St. Paul	270376018	270376018	New Orleans	220950002	220950002
Minneapolis-St. Paul	270530022	270530022	New York	360050003	360050003
Minneapolis-St. Paul	270530027	270530027	New York	360050006	360050006
Minneapolis-St. Paul	270530047	270530047	New York	360050073	360050073
Minneapolis-St. Paul	271230001	271230001	New York	360050080	360050080
Minneapolis-St. Paul	271230003	271230003	New York	360050083	360050083
Minneapolis-St. Paul	271230030	271230030	New York	360050110	360050110
Minneapolis-St. Paul	271230031	271230031	New York	360470007	360470007
Minneapolis-St. Paul	271410001	271410001	New York	360470011	360470011
Minneapolis-St. Paul	271410002	271410002	New York	360470018	360470018
Minneapolis-St. Paul	271410008	271410008	New York	360470076	360470076
Minneapolis-St. Paul	271630027	271630027	New York	360610005	360610005
New York	360610010	360610010	Philadelphia	421010023	421010023
New York	360610050	360610050	Philadelphia	421010024	421010024
New York	360610056	360610056	Philadelphia	421010025	421010025
New York	360610061	360610061	Philadelphia	421010026	421010026
New York	360610063	360610063	Philadelphia	421010027	421010027
New York	360790005	360790005	Philadelphia	421010029	421010029
New York	360810004	360810004	Philadelphia	421010136	421010136
New York	360810070	360810070	Phoenix	40130009	040130009
New York	360810097	360810097	Phoenix	40130013	040130013
New York	360810098	360810098	Phoenix	40130014	040130014
New York	360810124	360810124	Phoenix	40130015	040130015
New York	360850067	360850067	Phoenix	40130016	040130016
New York	361191002	361191002	Phoenix	40130018	040130018
New York	361192004	361192004	Phoenix	40130019	040130019
New York	361195003	361195003	Phoenix	40131003	040131003
Orlando	120690002	120690002	Phoenix	40131004	040131004
Orlando	120950008	120950008	Phoenix	40131006	040131006
Orlando	120952002	120952002	Phoenix	40131010	040131010

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Orlando	120972002	120972002	Phoenix	40132001	040132001
Orlando	121171002	121171002	Phoenix	40132004	040132004
Philadelphia	340050007	340050007	Phoenix	40132005	040132005
Philadelphia	340053001	340053001	Phoenix	40133002	040133002
Philadelphia	340070003	340070003	Phoenix	40133003	040133003
Philadelphia	340071001	340071001	Phoenix	40133004	040133004
Philadelphia	340150002	340150002	Phoenix	40133006	040133006
Philadelphia	340333001	340333001	Phoenix	40133009	040133009
Philadelphia	420170012	420170012	Phoenix	40133010	040133010
Philadelphia	420290050	420290050	Phoenix	40134003	040134003
Philadelphia	420290070	420290070	Phoenix	40134004	040134004
Philadelphia	420290100	420290100	Phoenix	40134005	040134005
Philadelphia	420450002	420450002	Phoenix	40134006	040134006
Philadelphia	420450102	420450102	Phoenix	40134007	040134007
Philadelphia	420450103	420450103	Phoenix	40139508	040139508
Philadelphia	420910013	420910013	Phoenix	40139604	040139604
Philadelphia	420910069	420910069	Phoenix	40139701	040139701
Philadelphia	420910101	420910101	Phoenix	40139702	040139702
Philadelphia	421010002	421010002	Phoenix	40139704	040139704
Philadelphia	421010004	421010004	Phoenix	40139706	040139706
Philadelphia	421010014	421010014	Phoenix	40139707	040139707
Philadelphia	421010019	421010019	Phoenix	40139805	040139805
Philadelphia	421010020	421010020	Phoenix	40139993	040139993
Philadelphia	421010021	421010021	Phoenix	40139994	040139994
Philadelphia	421010022	421010022	Phoenix	40139995	040139995
Phoenix	40139997	040139997	Sacramento	60171002	060171002
Phoenix	40139998	040139998	Sacramento	60172002	060172002
Phoenix	40218001	040218001	Sacramento	60610002	060610002
Pittsburgh	420030008	420030008	Sacramento	60610004	060610004
Pittsburgh	420030010	420030010	Sacramento	60610006	060610006
Pittsburgh	420030067	420030067	Sacramento	60610810	060610810
Pittsburgh	420030080	420030080	Sacramento	60611003	060611003
Pittsburgh	420030081	420030081	Sacramento	60613001	060613001
Pittsburgh	420030088	420030088	Sacramento	60670001	060670001
Pittsburgh	420031001	420031001	Sacramento	60670002	060670002
Pittsburgh	420031005	420031005	Sacramento	60670003	060670003
Pittsburgh	420070002	420070002	Sacramento	60670005	060670005
Pittsburgh	420070003	420070003	Sacramento	60670006	060670006
Pittsburgh	420070004	420070004	Sacramento	60670010	060670010
Pittsburgh	420070005	420070005	Sacramento	60670011	060670011
Pittsburgh	420070014	420070014	Sacramento	60670012	060670012
Pittsburgh	420070501	420070501	Sacramento	60670013	060670013
Pittsburgh	420190501	420190501	Sacramento	60671001	060671001
Pittsburgh	421250005	421250005	Sacramento	60675001	060675001
Pittsburgh	421250200	421250200	Sacramento	60675002	060675002
Pittsburgh	421250501	421250501	Sacramento	60675003	060675003

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Pittsburgh	421255001	421255001	Salt Lake City	490110001	490110001
Pittsburgh	421290006	421290006	Salt Lake City	490110002	490110002
Pittsburgh	421290008	421290008	Salt Lake City	490350002	490350002
Pittsburgh	421290101	421290101	Salt Lake City	490350003	490350003
Portland	410050004	410050004	Salt Lake City	490350004	490350004
Portland	410051006	410051006	Salt Lake City	490350009	490350009
Portland	410052001	410052001	Salt Lake City	490351001	490351001
Portland	410052002	410052002	Salt Lake City	490351002	490351002
Portland	410053001	410053001	Salt Lake City	490351005	490351005
Portland	410054001	410054001	Salt Lake City	490352004	490352004
Portland	410090004	410090004	Salt Lake City	490353001	490353001
Portland	410511002	410511002	Salt Lake City	490353003	490353003
Portland	530110007	530110007	Salt Lake City	490353006	490353006
Portland	530110009	530110009	Salt Lake City	490353007	490353007
Portland	530110011	530110011	Salt Lake City	490570001	490570001
Portland	530111001	530111001	Salt Lake City	490570003	490570003
Sacramento	60170006	060170006	Salt Lake City	490570007	490570007
Sacramento	60170009	060170009	Salt Lake City	490571001	490571001
Sacramento	60170010	060170010	Salt Lake City	490571002	490571002
Sacramento	60170011	060170011	Salt Lake City	490571003	490571003
Sacramento	60170012	060170012	San Diego	60730001	060730001
Sacramento	60170020	060170020	San Diego	60730002	060730002
San Diego	60730003	060730003	St. Louis	171192005	171192005
San Diego	60730005	060730005	St. Louis	171192006	171192006
San Diego	60730006	060730006	St. Louis	171192007	171192007
San Diego	60731001	060731001	St. Louis	171192008	171192008
San Diego	60731002	060731002	St. Louis	171193007	171193007
San Diego	60731003	060731003	St. Louis	171198001	171198001
San Diego	60731004	060731004	St. Louis	171331001	171331001
San Diego	60731005	060731005	St. Louis	171332001	171332001
San Diego	60731006	060731006	St. Louis	171630008	171630008
San Diego	60731007	060731007	St. Louis	171630009	171630009
San Diego	60731008	060731008	St. Louis	171630010	171630010
San Diego	60731009	060731009	St. Louis	171631001	171631001
San Diego	60732007	060732007	St. Louis	171631006	171631006
San Diego	60734001	060734001	St. Louis	171631007	171631007
San Diego	60737001	060737001	St. Louis	171631008	171631008
San Francisco	60410001	060410001	St. Louis	171631009	171631009
San Francisco	60410002	060410002	St. Louis	290990012	290990012
San Francisco	60750003	060750003	St. Louis	291830002	291830002
San Francisco	60750004	060750004	St. Louis	291830005	291830005
San Francisco	60750005	060750005	St. Louis	291830008	291830008
San Francisco	60810002	060810002	St. Louis	291831002	291831002
San Francisco	60811001	060811001	St. Louis	291831004	291831004
Seattle	530330010	530330010	St. Louis	291890001	291890001
Seattle	530330017	530330017	St. Louis	291890002	291890002

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Seattle	530330018	530330018	St. Louis	291890004	291890004
Seattle	530330023	530330023	St. Louis	291890006	291890006
Seattle	530330058	530330058	St. Louis	291890007	291890007
Seattle	530330059	530330059	St. Louis	291890008	291890008
Seattle	530330080	530330080	St. Louis	291890009	291890009
Seattle	530330088	530330088	St. Louis	291890010	291890010
Seattle	530332001	530332001	St. Louis	291892002	291892002
Seattle	530337001	530337001	St. Louis	291893001	291893001
Seattle	530337002	530337002	St. Louis	291894001	291894001
Seattle	530610007	530610007	St. Louis	291895001	291895001
Seattle	530612001	530612001	St. Louis	291897001	291897001
St. Louis	170830001	170830001	St. Louis	291897002	291897002
St. Louis	170831001	170831001	St. Louis	291897003	291897003
St. Louis	171190005	171190005	St. Louis	295100002	295100002
St. Louis	171190006	171190006	St. Louis	295100007	295100007
St. Louis	171190008	171190008	St. Louis	295100061	295100061
St. Louis	171190012	171190012	St. Louis	295100062	295100062
St. Louis	171191004	171191004	St. Louis	295100063	295100063
St. Louis	171191009	171191009	St. Louis	295100064	295100064
St. Louis	295100066	295100066	Washington	110010043	110010043
St. Louis	295100067	295100067	Washington	110011000	110011000
St. Louis	295100068	295100068	Washington	240090010	240090010
St. Louis	295100069	295100069	Washington	240170010	240170010
St. Louis	295100070	295100070	Washington	240210034	240210034
St. Louis	295100071	295100071	Washington	240210037	240210037
St. Louis	295100072	295100072	Washington	240310005	240310005
St. Louis	295100080	295100080	Washington	240310006	240310006
St. Louis	295100086	295100086	Washington	240311001	240311001
Tampa	120570025	120570025	Washington	240311004	240311004
Tampa	120570074	120570074	Washington	240313001	240313001
Tampa	120570081	120570081	Washington	240330002	240330002
Tampa	120570110	120570110	Washington	240330003	240330003
Tampa	120571021	120571021	Washington	240330004	240330004
Tampa	120571022	120571022	Washington	240338001	240338001
Tampa	120571035	120571035	Washington	240338002	240338002
Tampa	120571042	120571042	Washington	510130008	510130008
Tampa	120571052	120571052	Washington	510130020	510130020
Tampa	120571055	120571055	Washington	510590005	510590005
Tampa	120571065	120571065	Washington	510590014	510590014
Tampa	120571068	120571068	Washington	510590018	510590018
Tampa	120574004	120574004	Washington	510590030	510590030
Tampa	121010005	121010005	Washington	510591004	510591004
Tampa	121012001	121012001	Washington	510595001	510595001
Tampa	121030003	121030003	Washington	510610002	510610002
Tampa	121030004	121030004	Washington	511071005	511071005
Tampa	121030012	121030012	Washington	511530008	511530008

Table 1. Monitoring Sites for *USA Today* Cities (continued)

City	AIRS_ID	Site	City	AIRS_ID	Site
Tampa	121030018	121030018	Washington	511530009	511530009
Tampa	121030020	121030020	Washington	511790001	511790001
Tampa	121030021	121030021	Washington	511870002	511870002
Tampa	121030023	121030023	Washington	515100009	515100009
Tampa	121033001	121033001	Washington	516000005	516000005
Tampa	121035002	121035002	Washington	516300003	516300003
Tampa	121037001	121037001	Washington	540030003	540030003
Washington	110010003	110010003			
Washington	110010008	110010008			
Washington	110010011	110010011			
Washington	110010013	110010013			
Washington	110010014	110010014			
Washington	110010017	110010017			
Washington	110010018	110010018			
Washington	110010025	110010025			
Washington	110010041	110010041			

5 years (1997 through 2001) of data from the AQS for developing the historical data.

Procedures

Using the data described above, we observed the following procedure for determining an ozone exceedance day for a particular *USA Today* city. For each day of the year, if one of the monitors assigned to a particular city measured an 8-hour ozone level ≥ 0.085 ppm, that one measurement resulted in one exceedance day for the city. Even if more than one of the city's assigned monitors recorded an 8-hour ozone level ≥ 0.085 ppm on a given day, the exceedance count for that day and city remained one. The number of days exceedances are measured are then accumulated over the year to obtain a count of days (or cumulative count) of exceedance measurements.

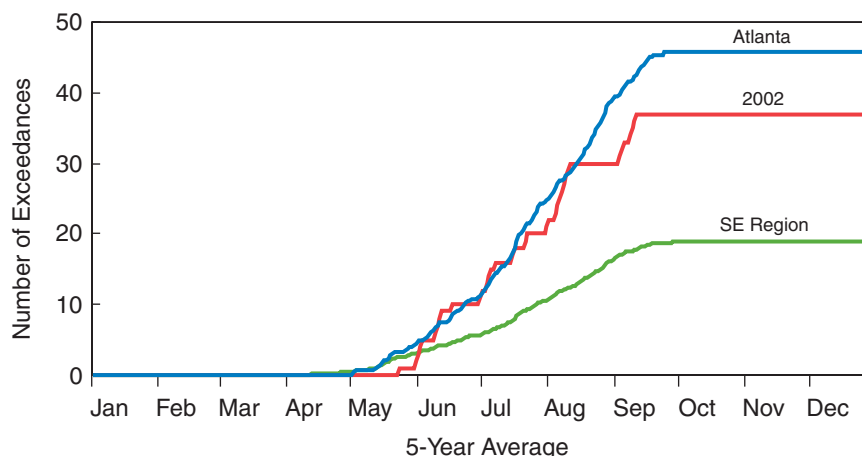
For 2002, the cumulative count of days was obtained from the AQS database described above for each city. For the historical 5-year period (i.e., 1997 through 2001), the average number of the cumulative count of

days was obtained over the 5-year period for each set of monitors assigned to each city to yield a 5-year trend. We decided to use an average value as a comparison instead of a year-to-year comparison because the year-to-year cumulative count of days will vary, making comparisons with the most recent year less meaningful.

Using these data, we generated graphs showing the 5-year average cumulative count of days with the 2002 cumulative count of days for

selected cities. Figure 1 provides the graph for Atlanta, which shows that the cumulative count of days in 2002 for the Atlanta area closely matches the 5-year average trend in the cumulative count of days through approximately the middle of August. After the middle of August, the 2002 count of days was less than the 5-year average, and, by the end of the ozone season, the cumulative count of days for 2002 was 37 compared to the 5-year average trend of 46.

Figure 1. Cumulative exceedances—5-year average (97–01) (Atlanta) compared to 2002 data and SE region average.



We also added a regional aspect for comparison to the individual city data. We grouped the *USA Today* cities into geographic regions and then calculated a 5-year regional average cumulative count of days based on the individual city data within the region. This regional average was also depicted on the individual city graphics to offer a comparison of the city data to regional data.

As shown in Table 2, the *USA Today* cities were grouped into southeast, northeast, midwest, and southwest regions. Dallas, Houston, and Los Angeles were treated as individual cities because of their unique geographic locations and—especially in the case of Los Angeles—unique emission density characteristics compared to other *USA Today* cities. The combination of cities included in the regional average cumulative count of days was somewhat subjective for this illustration, and other combinations could be done for different comparative purposes.

Discussion of Graphical Depictions of Cumulative Count of Days

The following sections discuss the graphical depictions of the cumulative count of days for 30 of the 36 *USA Today* cities used in this analysis. The *USA Today* cities of Portland (OR), Seattle, Denver, Honolulu, Salt Lake City, and San Francisco were not included because ozone exceedances are typically minimal in these locations.

Southeast U.S. Region

We have included the following cities in the Southeast (SE) U.S. Region: Atlanta, Charlotte, Memphis, Nashville, New Orleans, Miami, Orlando, and Tampa. The graph for

Table 2. Regional Groupings of *USA Today* Cities

Southeast U.S. Cities	Atlanta Charlotte Memphis Nashville	New Orleans Miami Orlando Tampa
Northeast U.S. Cities	Boston New York Philadelphia	Baltimore Washington, D.C.
Midwest U.S. Cities	Chicago Cleveland Cincinnati Columbus Detroit	Indianapolis Kansas City Minneapolis Pittsburgh St. Louis
Southwest U.S. Cities	Las Vegas Phoenix	Sacramento San Diego
Individual U.S. Cities	Dallas Houston	Los Angeles

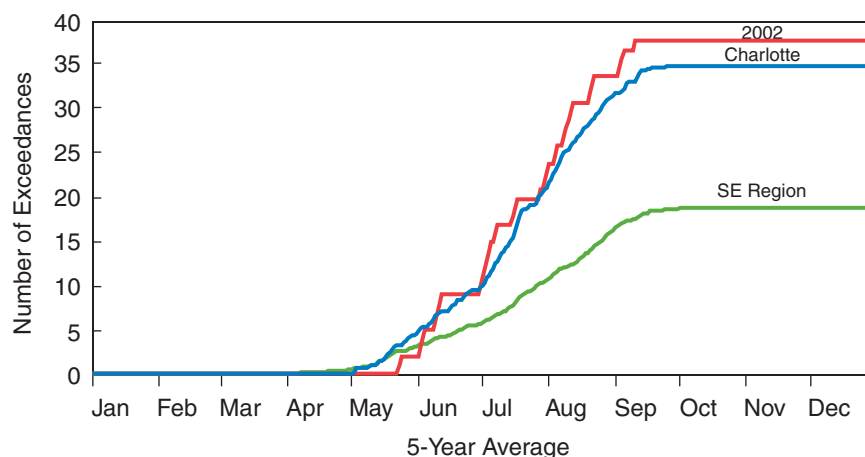
each SE city depicts the city 5-year average cumulative count of days, the combined 5-year average for all SE Region cities, and the 2002 cumulative count of days for the city.

The Atlanta graph (see Figure 1) shows that the 2002 count of days was tracking the Atlanta 5-year average rather closely through approximately the middle of August then trended less than the 5-year average for the remainder of the year. An ozone episode of several days is depicted on the graph in early August, when the count of days increased from 22 days to 30

days. For comparative purposes, the Atlanta data are higher than those for the combined SE Region average; that is, the Atlanta 5-year average cumulative count of days is about 46 days per year, whereas the SE Region average is approximately 18 days per year.

For Charlotte (Figure 2), the 2002 count of days trended slightly less than the 5-year average through early June but then trended slightly greater than the 5-year average from early July onward. Ozone episodes are noted in early July and early August. Also, the Charlotte data are comparatively higher than those for

Figure 2. Cumulative exceedances—5-year average (97–01) (Charlotte) compared to 2002 data and SE region average.



the combined SE Region average. The Charlotte data show that the city's 5-year average cumulative count of days is about 35 days per year, whereas the combined SE Region average is about 18 days per year.

The graph for Memphis (Figure 3) shows that the 2002 data were trending less than the Memphis 5-year average count of days throughout the year. As a result, the total cumulative count of days for 2002 was 16, whereas the 5-year average total is approximately 23 days. Again, an ozone episode is noted in early August for Memphis, similar to those noted in Atlanta and Charlotte.

As with the graph for Memphis, the graph for Nashville (Figure 4) also shows the 2002 data trending slightly less than the 5-year average throughout the year. The total count of days for 2002 was 21 days, whereas the 5-year average count of days is approximately 25 days. Notable ozone episodes are shown in early August and early September.

The graph for New Orleans (Figure 5) shows the count of days for 2002 trending less than the 5-year average throughout the year. The 2002 total was 2 days, whereas the 5-year is 8 days.

Figure 3. Cumulative exceedances—5-year average (97–01) (Memphis) compared to 2002 data and SE region average.

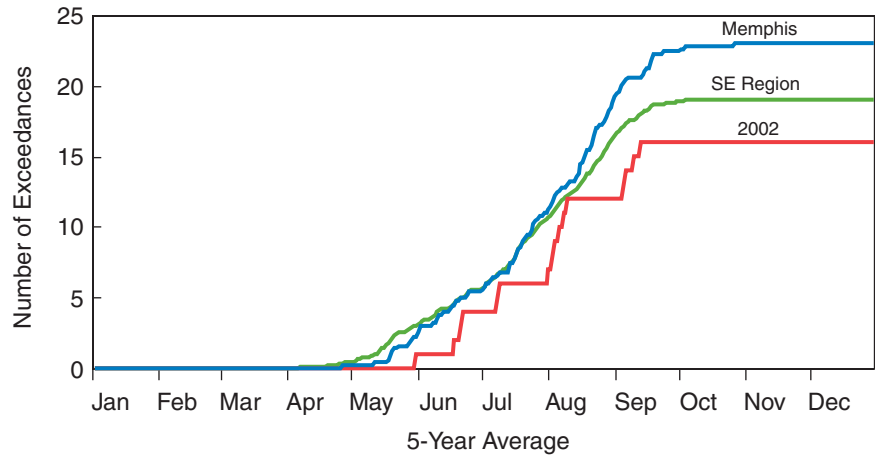


Figure 4. Cumulative exceedances—5-year average (97–01) (Nashville) compared to 2002 data and SE region average.

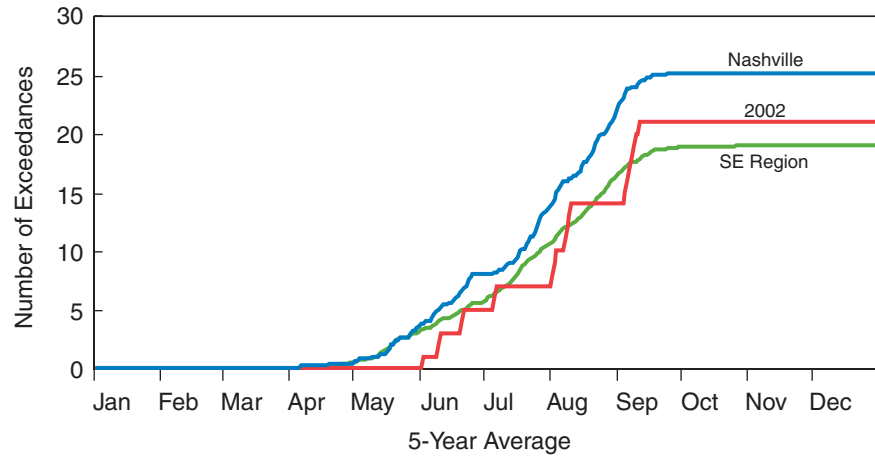


Figure 5. Cumulative exceedances—5-year average (97–01) (New Orleans) compared to 2002 data and SE region average.

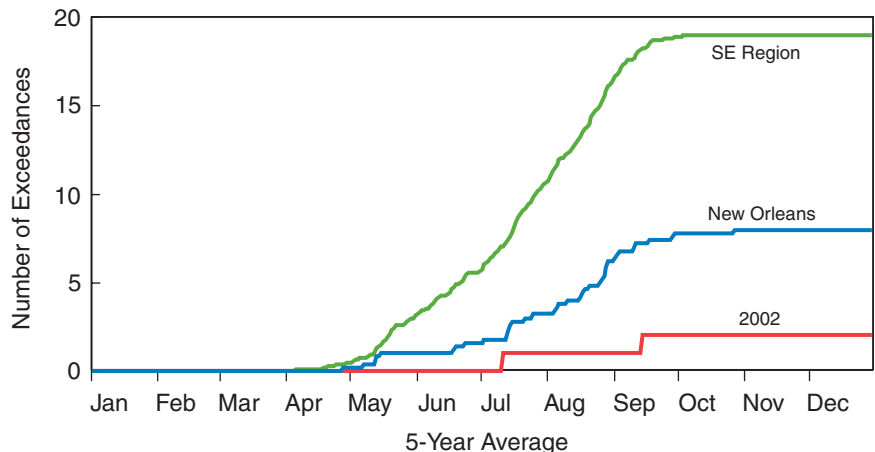


Figure 6. Cumulative exceedances—5-year average (97–01) (Miami) compared to 2002 data and SE region average.

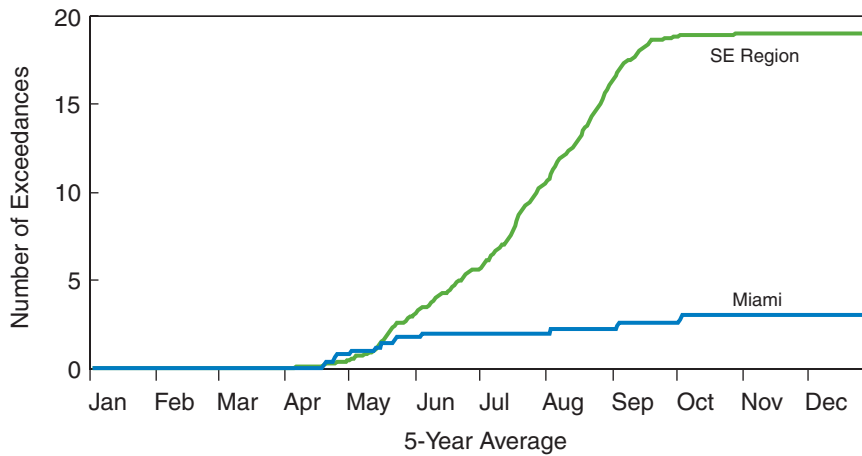


Figure 7. Cumulative exceedances—5-year average (97–01) (Orlando) compared to 2002 data and SE region average.

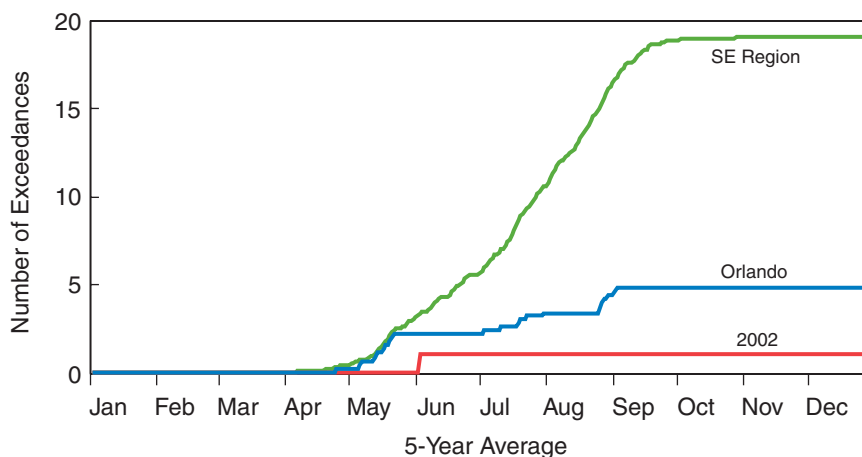
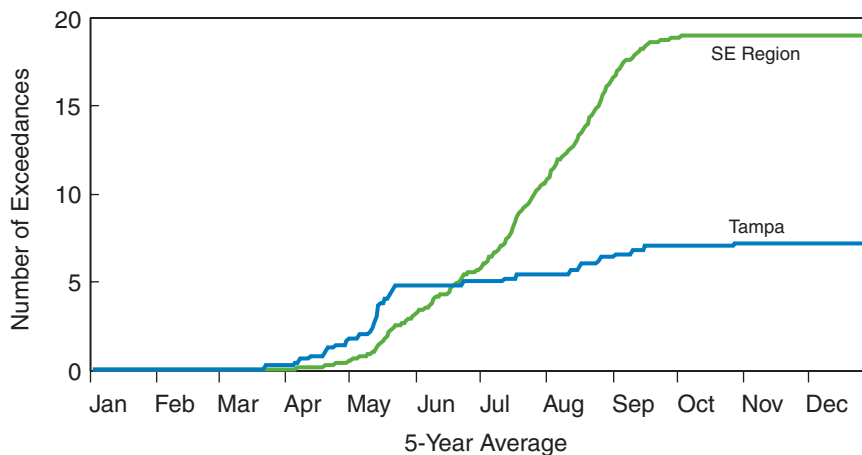


Figure 8. Cumulative exceedances—5-year average (97–01) (Tampa) compared to 2002 data and SE region average.



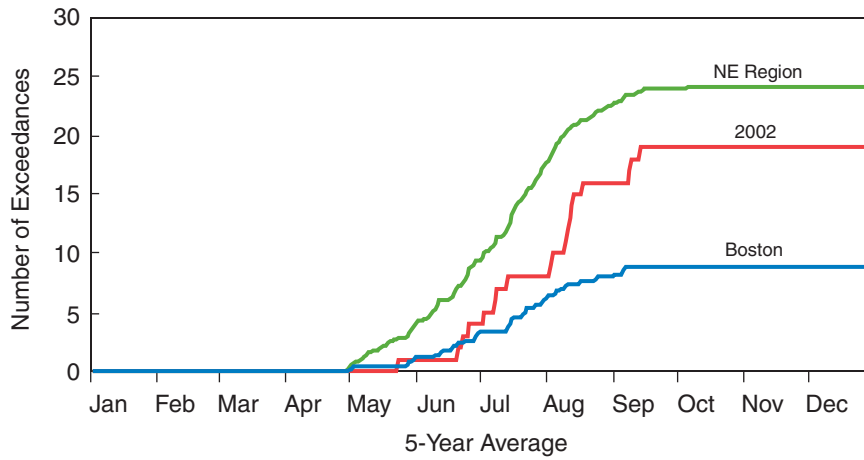
Miami (Figure 6), Orlando (Figure 7), and Tampa (Figure 8) all show 2002 cumulative counts of days throughout the year less than the 5-year average. Miami and Tampa show no exceedances counted for 2002. In comparison, Miami averaged 5 days for the 5-year period, and Tampa averaged 7 days.

Northeast U.S. Region

The following cities were included for the Northeast (NE) U.S. Region: Boston, New York, Philadelphia, Baltimore, and Washington, DC. The graph for each NE city depicts the city 5-year average count of days, the combined 5-year average count of days for all NE cities, and the city's 2002 count of days.

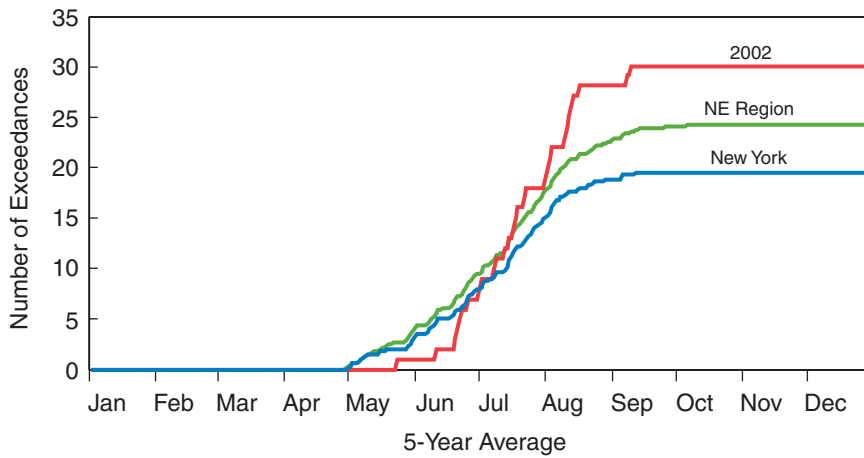
The graphical depiction for the Boston area (Figure 9) shows that the 2002 data trended greater than the 5-year average from approximately late June onward. A notable ozone episode of high ozone with several days of measured exceedances occurred during early to mid-August. The total count of days in the Boston area for 2002 was 18, whereas the 5-year average count of days is approximately 8 days.

Figure 9. Cumulative exceedances—5-year average (97–01) (Boston) compared to 2002 data and NE region average.



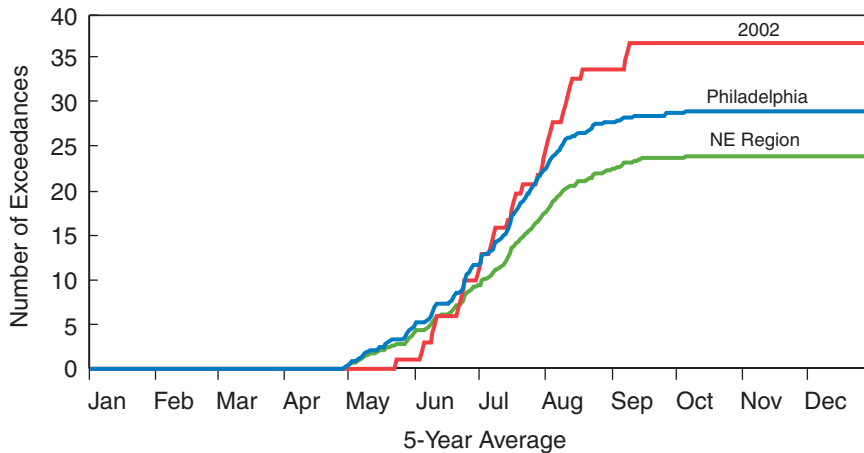
The graph for the New York area (Figure 10) shows a trend similar to the one in Boston, with the 2002 data trending greater than the 5-year average from approximately the beginning of July onward. The New York data also show an ozone episode in early to mid-August. The total count of days for 2002 was 30, compared to the 5-year average of 19 days.

Figure 10. Cumulative exceedances—5-year average (97–01) (New York) compared to 2002 data and NE region average.



For Philadelphia (Figure 11), the graph shows the 2002 data trending similar to the 5-year data until the beginning of August. After that, the 2002 data trend greater, with a 2002 total count of days of 37, whereas the 5-year average is approximately 29 days. As with Boston and New York, the ozone episode is evident in early to mid-August.

Figure 11. Cumulative exceedances—5-year average (97–01) (Philadelphia) compared to 2002 data and NE region average.



The graph for Baltimore (Figure 12) shows a pattern nearly identical to that of Philadelphia. The 2002 total count of days was 39, whereas the 5-year average is approximately 33 days.

The Washington, DC, graph (Figure 13) shows a pattern similar to that of Philadelphia and Baltimore, with the 2002 data showing a greater trend than the 5-year average from approximately the beginning of August onward. The total 2002 count of days for Washington was 37, as compared to the 5-year average of 31 days.

Midwest U.S. Region

The following cities were included in the Midwest U.S. Region: Chicago, Cleveland, Cincinnati, Columbus, Detroit, Indianapolis, Kansas City, Minneapolis, Pittsburgh, and St. Louis.

The graph for Chicago (Figure 14) shows a similar trend for 2002 count of days compared to the 5-year average trend through approximately the middle of June. Thereafter, the 2002 data show a notably greater trend than the 5-year average. A notable ozone episode of several days is evident in the middle of July. Other episodes are shown in early August and early September. The total count of days for 2002 in the Chicago area was 20, as compared to the 5-year average of approximately 9.

Figure 12. Cumulative exceedances—5-year average (97–01) (Baltimore) compared to 2002 data and NE region average.

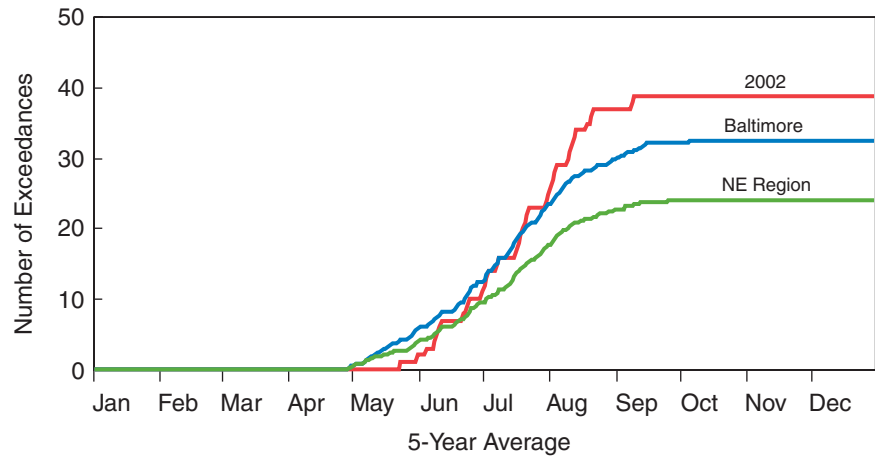


Figure 13. Cumulative exceedances—5-year average (97–01) (Washington, DC) compared to 2002 data and NE region average.

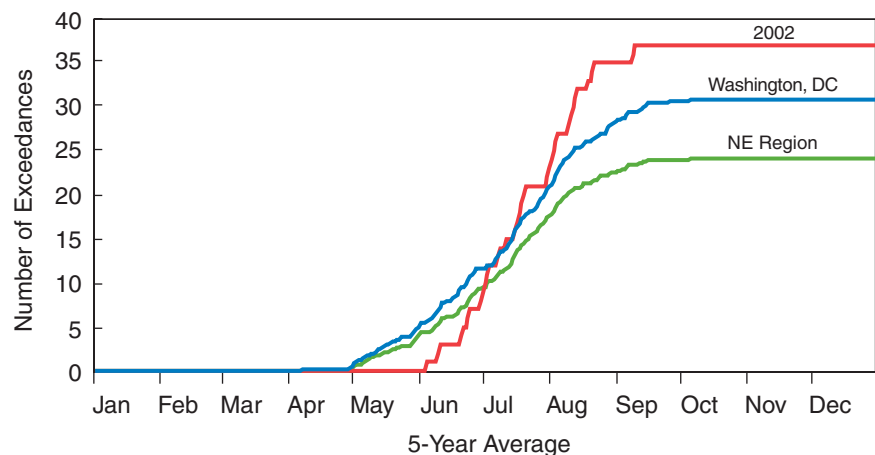
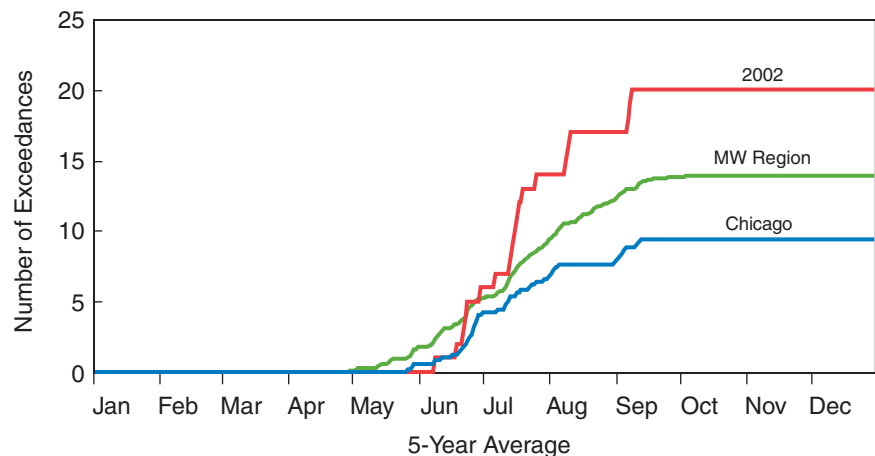


Figure 14. Cumulative exceedances—5-year average (97–01) (Chicago) compared to 2002 data and MW region average.



The graph for Cleveland (Figure 15) shows a pattern similar to the one for Chicago. There is a similar trend in the 2002 data and 5-year average data through the end of June, then a notably greater trend in the count of days from the middle of June onward. The total 2002 count of days was 31 compared to the 5-year average of approximately 18 days.

Cincinnati (Figure 16), Columbus (Figure 17), Detroit (Figure 18), Indianapolis (Figure 19), Pittsburgh (Figure 20), and St. Louis (Figure 21) all show a similar pattern, with the 2002 data trending less than the 5-year average until the middle or end of June, then trending notably greater than the 5-year average onward. All show ozone episodes around the beginning of August and in early September. Another episode common to all cities is seen in the middle of June. For Cincinnati, the 2002 total count of days was 28, compared to a 5-year average of approximately 17 days. For Columbus, the 2002 total was 27 days, compared to a 5-year average of approximately 16 days.

Figure 15. Cumulative exceedances—5-year average (97–01) (Cleveland) compared to 2002 data and MW region average.

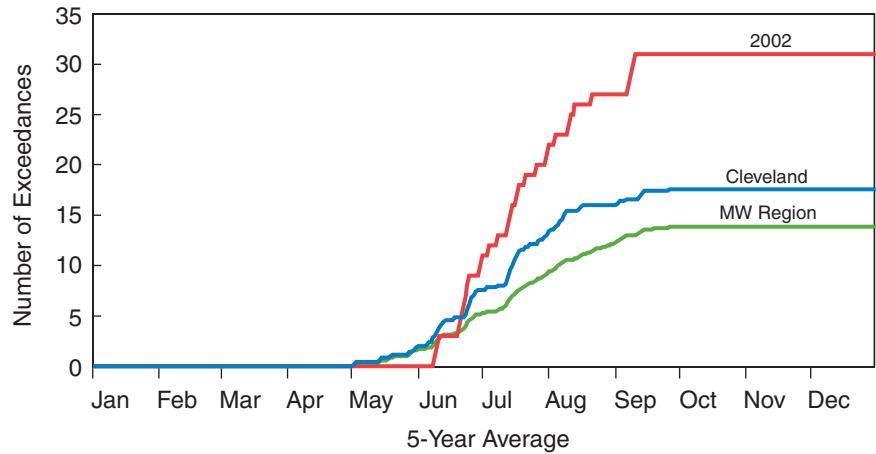


Figure 16. Cumulative exceedances—5-year average (97–01) (Cincinnati) compared to 2002 data and MW region average.

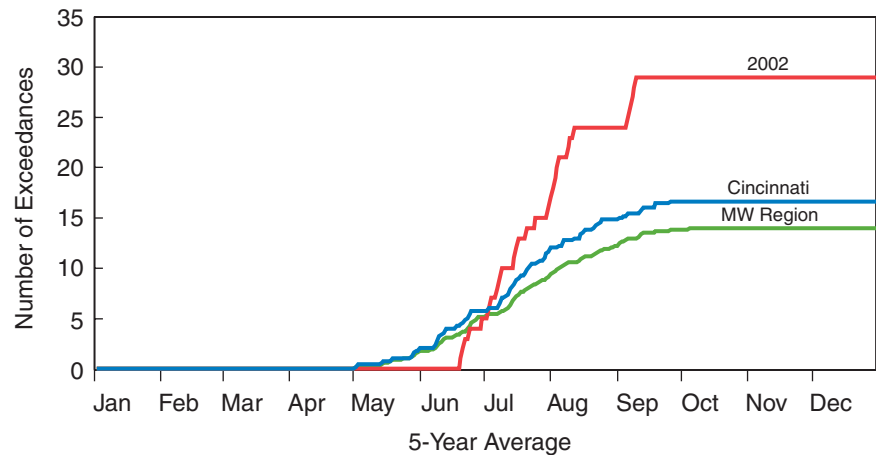
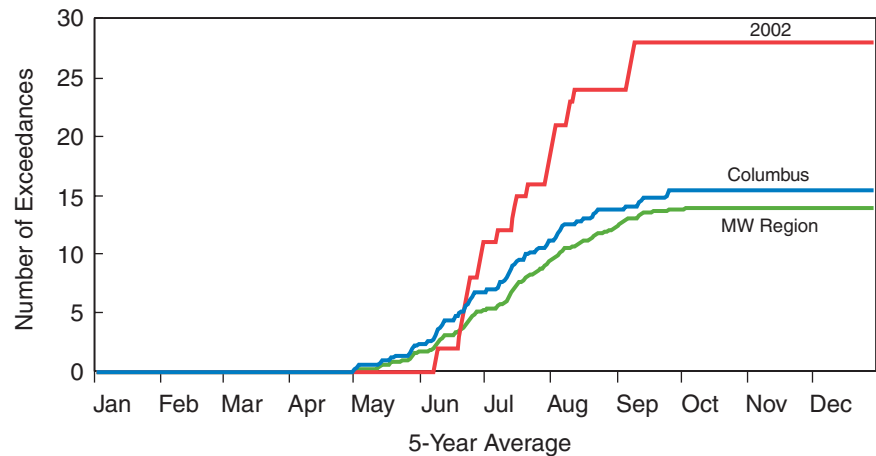


Figure 17. Cumulative exceedances—5-year average (97–01) (Columbus) compared to 2002 data and MW region average.



For Detroit, the 2002 total was 22 days, compared to approximately 12 days for the 5-year average. For Indianapolis, the 2002 total was 24 days, compared to approximately 15 days for the 5-year average.

For Pittsburgh, the 2002 total was 33 days, compared to a 5-year average of approximately 23 days.

Figure 18. Cumulative exceedances—5-year average (97–01) (Detroit) compared to 2002 data and MW region average.

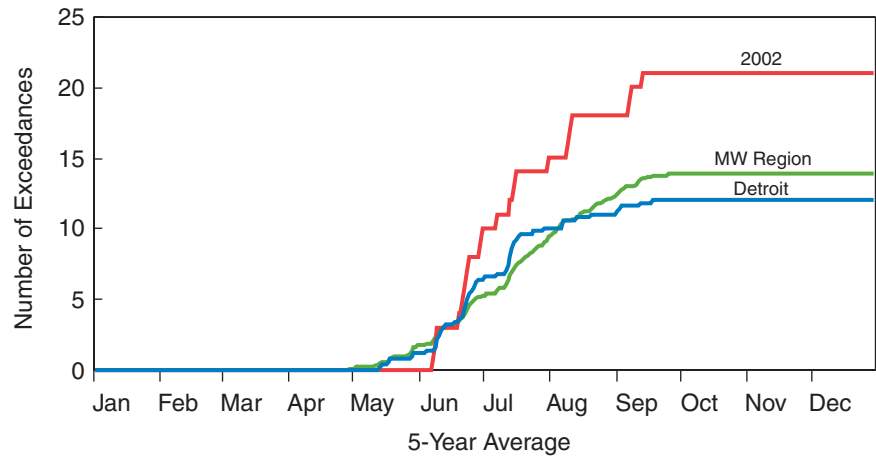


Figure 19. Cumulative exceedances—5-year average (97–01) (Indianapolis) compared to 2002 data and MW region average.

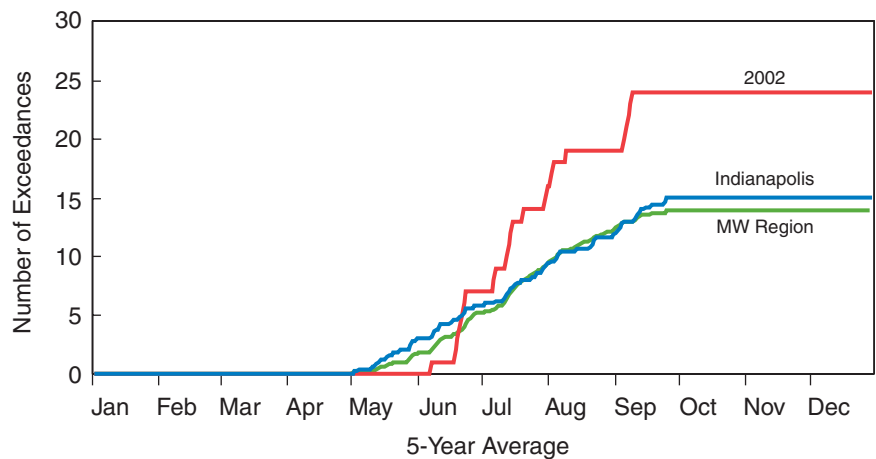
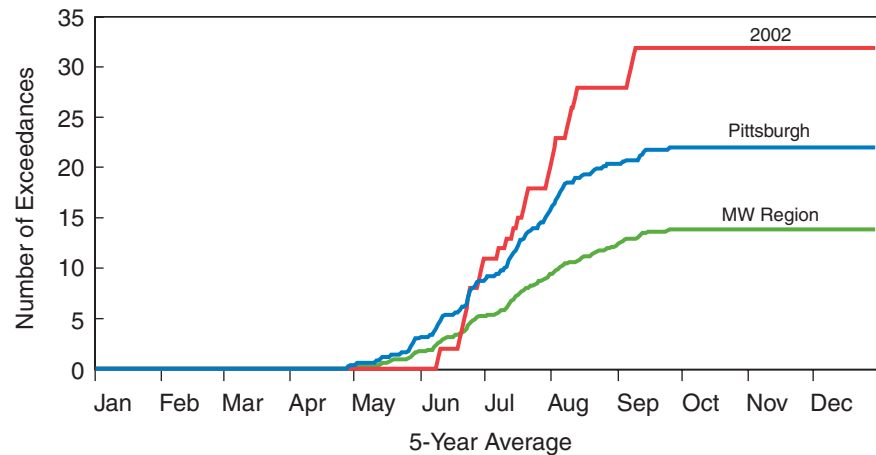


Figure 20. Cumulative exceedances—5-year average (97–01) (Pittsburgh) compared to 2002 data and MW region average.



For St. Louis, the 2002 total was 32 days, compared to a 5-year average of approximately 19 days.

The graph for Kansas City (Figure 22) showed no exceedances until early July. Ozone exceedances trended similar to the 5-year average for July and into August, then trended less than the 5-year average onward. The 2002 cumulative count of days was 7, whereas the 5-year average for Kansas City is approximately 11 days.

Minneapolis (Figure 23) historically has few exceedance days, averaging about 1 day over the 5-year period. The 2002 data show there were 2 exceedance days.

Figure 21. Cumulative exceedances—5-year average (97–01) (St. Louis) compared to 2002 data and MW region average.

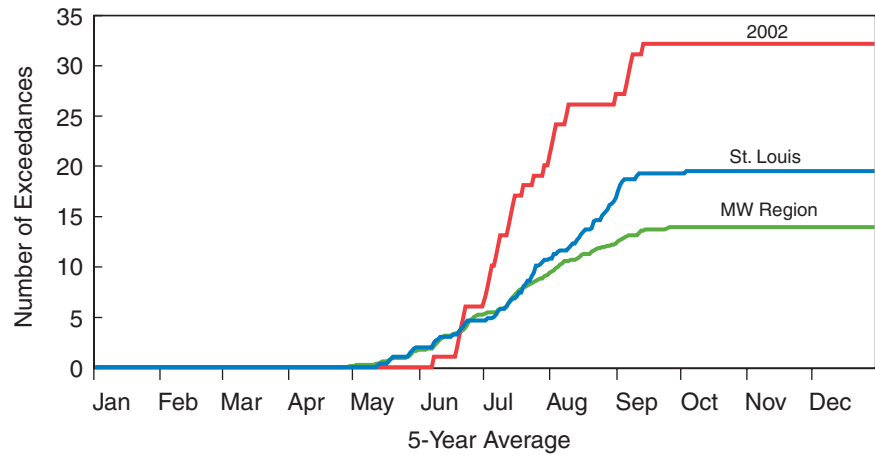


Figure 22. Cumulative exceedances—5-year average (97–01) (Kansas City) compared to 2002 data and MW region average.

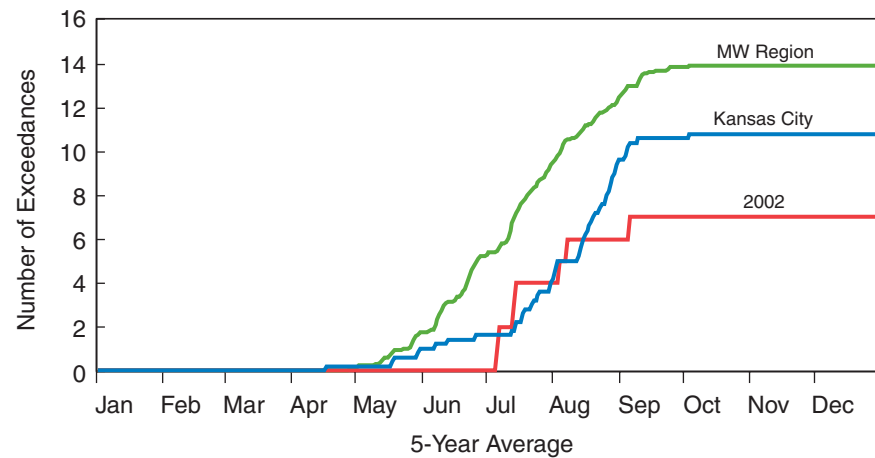
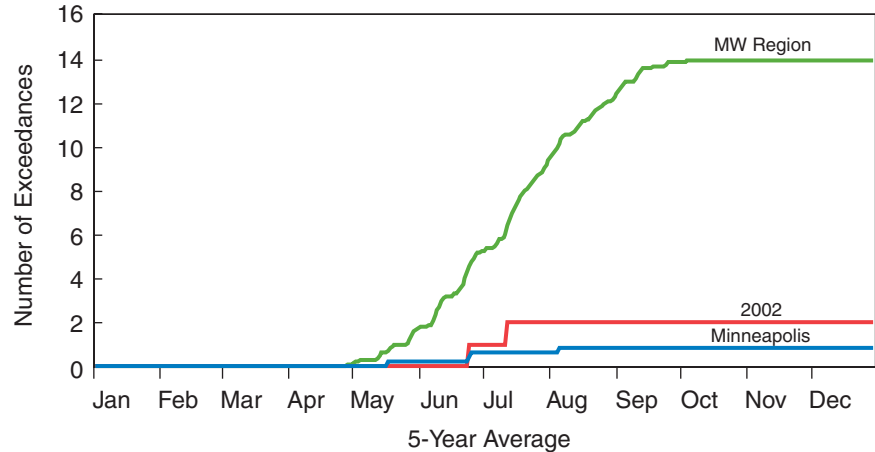


Figure 23. Cumulative exceedances—5-year average (97–01) (Minneapolis) compared to 2002 data and MW region average.



Southwest U.S. Region

The following cities were included in the Southwest (SW) U.S. Region: Las Vegas, Phoenix, Sacramento, and San Diego. Los Angeles was viewed separately for the SW Region. Also, any comparisons of the SW Region to individual cities may be less meaningful than comparisons in other regions because of the larger distances and more unique geographic and emission characteristics among the SW region cities.

For Las Vegas (Figure 24), the trend in the cumulative count of days for 2002 was similar to the 5-year average trend. The total number of days for 2002 was 6, whereas the 5-year average count of days is 3.

The 2002 cumulative count of days for San Diego (Figure 25) trended persistently less than the 5-year average throughout the year. The total count of days for 2002 was 13, as compared to the 5-year average of approximately 20 days.

The graph for Sacramento (Figure 26) showed a similar trend for 2002 as compared to the 5-year average through the beginning of July. Thereafter, the 2002 count of days trended greater than the 5-year average from early July onward. The total 2002 cumulative count of days was 45 days, whereas the 5-year average is approximately 35 days.

Figure 24. Cumulative exceedances—5-year average (97–01) (Las Vegas) compared to 2002 data and SW region average.

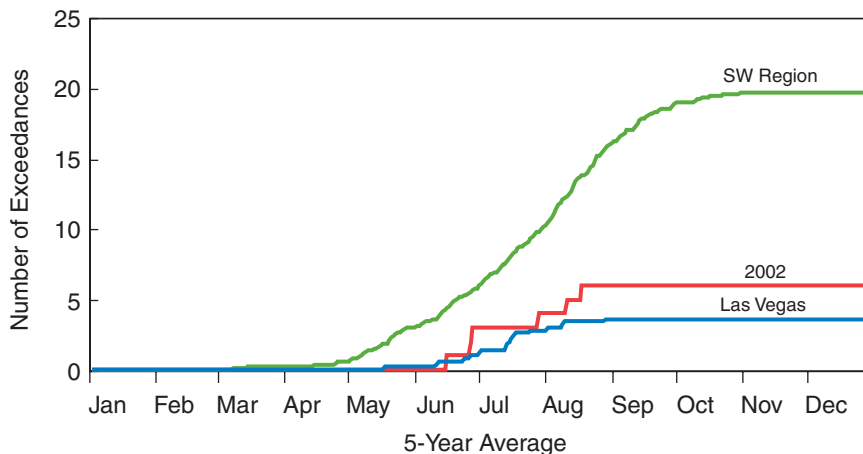


Figure 25. Cumulative exceedances—5-year average (97–01) (San Diego) compared to 2002 data and SW region average.

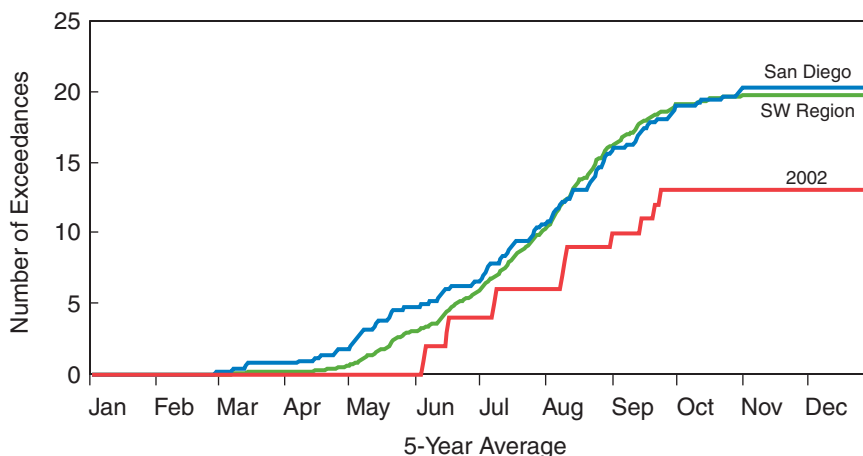
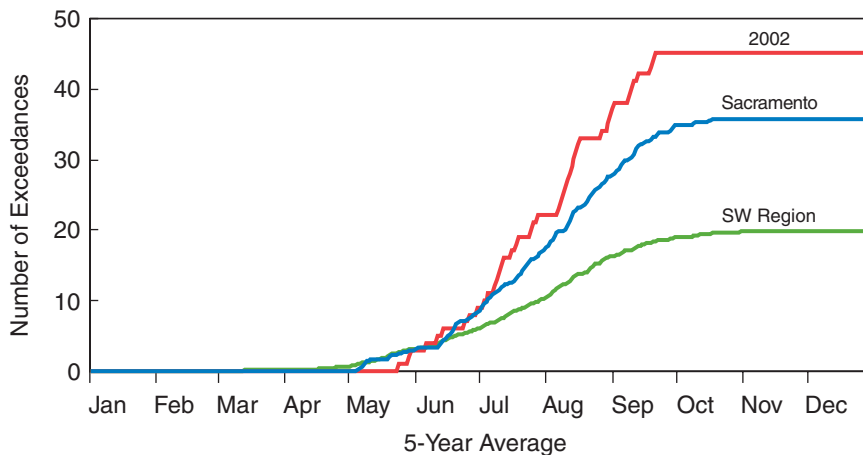


Figure 26. Cumulative exceedances—5-year average (97–01) (Sacramento) compared to 2002 data and SW region average.



The data for Phoenix (Figure 27) showed distinct ozone episodes in early June and early July. The resulting pattern for 2002 trended less than the 5-year average through early June but greater than the 5-year average for early July onward. After late July there were no additional exceedances reported in the AQS for the Phoenix area. For 2002, the total cumulative count of days was 14, whereas the 5-year average count of days is approximately 19.

Other Areas

Dallas, Houston, and Los Angeles were treated separately in this analysis due to their unique geographic locations and emission densities as compared to nearby locations.

For Dallas (Figure 28), the 2002 data trended close to the 5-year average data through early August then trended somewhat less than the 5-year average from early August onward. The 2002 count of days was 20 days, whereas the 5-year average count of days is approximately 33 days.

The 2002 data for Houston (Figure 29) was similar to that for Dallas in that it also trended lower than the 5-year average, especially after early August. For 2002, the total cumulative count of days was 22, whereas the 5-year average is approximately 36 days.

Figure 27. Cumulative exceedances—5-year average (97–01) (Phoenix) compared to 2002 data and SW region average.

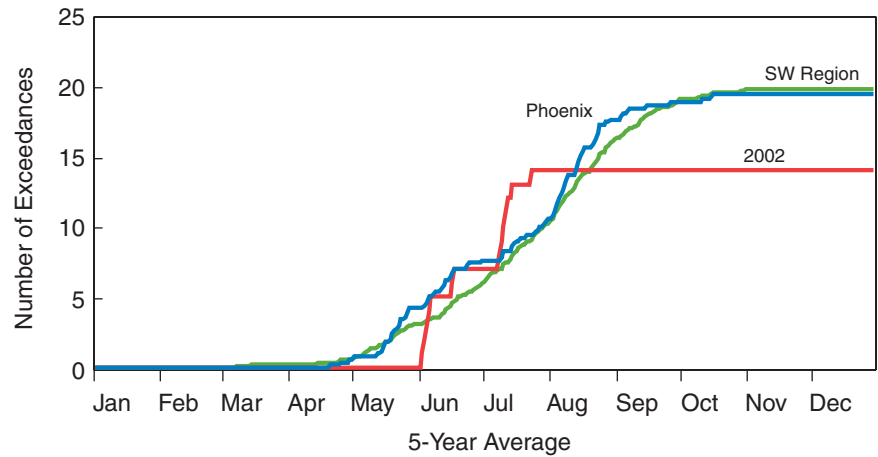


Figure 28. Cumulative exceedances—5-year average (97–01) (Dallas) compared to 2002 data.

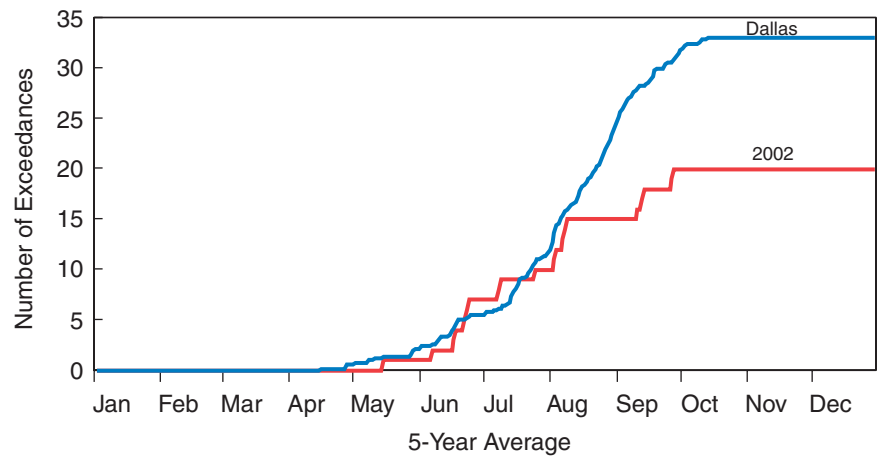
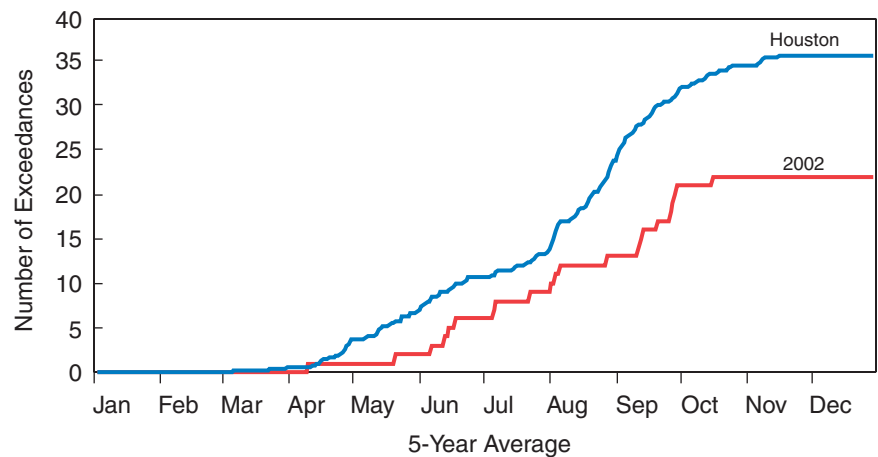


Figure 29. Cumulative exceedances—5-year average (97–01) (Houston) compared to 2002 data.



For Los Angeles (Figure 30), the 2002 data showed a similar trend to the 5-year average data through the beginning of June, then trended progressively greater than the 5-year average from early June onward. A notable episode occurred in early to mid-August. For 2002, the total count of days was 68, whereas the 5-year average is approximately 40 days.

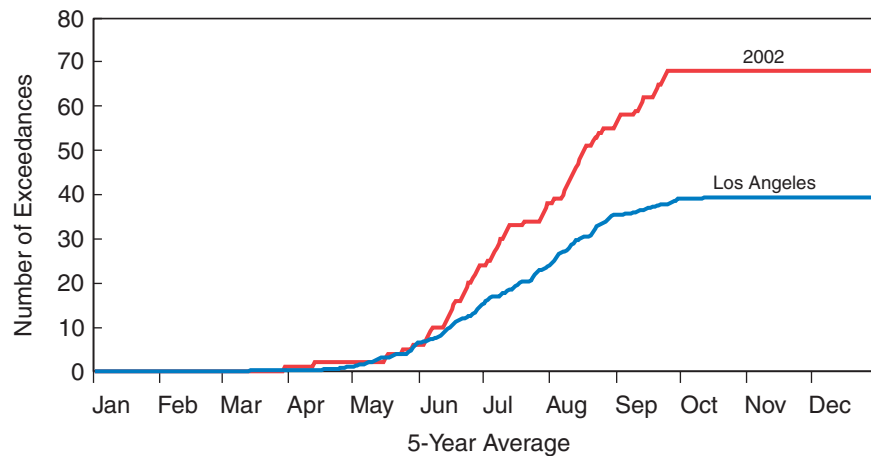
Summary

This analysis provided a comparative illustration of accumulated ozone exceedance days among *USA Today* cities throughout the United States. These comparisons were illustrated for distinct geographic regions due to the regional nature of ground-level ozone formation and transport.

The illustrations show distinctive differences among regions and also within regions when 2002 data are compared to historical 5-year average trends. For example, in the SE region, the 2002 accumulated count of days trended in a similar pattern to the 5-year average trend for some cities (e.g., Atlanta, Charlotte), whereas the 2002 data trended lower than the 5-year average for some other cities (e.g., Memphis, Nashville, New Orleans). In contrast, for most of the cities analyzed in this study in the NE region, the 2002 data trended lower than the 5-year average through approximately early July, then trended higher than the 5-year average from mid-July into mid-September.

The MW Region comparison presented different results than did the comparisons for the SE and NE regions. For example, for all cities in the core area of the MW region (Chicago, Cleveland, Cincinnati, Columbus, Pittsburgh, Indianapolis, Detroit, and St. Louis), the 2002 data trended less than the 5-year average

Figure 30. Cumulative exceedances—5-year average (97–01) (Los Angeles) compared to 2002 data.



through approximately mid- to late June, then trended progressively higher than the 5-year average from late June onward. Other cities outside the core MW Region (e.g., Kansas City, Minneapolis) showed 2002 data trending similar to or less than the 5-year average data.

Reference

1. John E. White. Information Transfer Group, Information Transfer and Program Integration Division, Office of Air Quality Planning and Standards, Research Triangle Park, NC. Personal communication, September, 2002.