

The FAN

Fresh Air News

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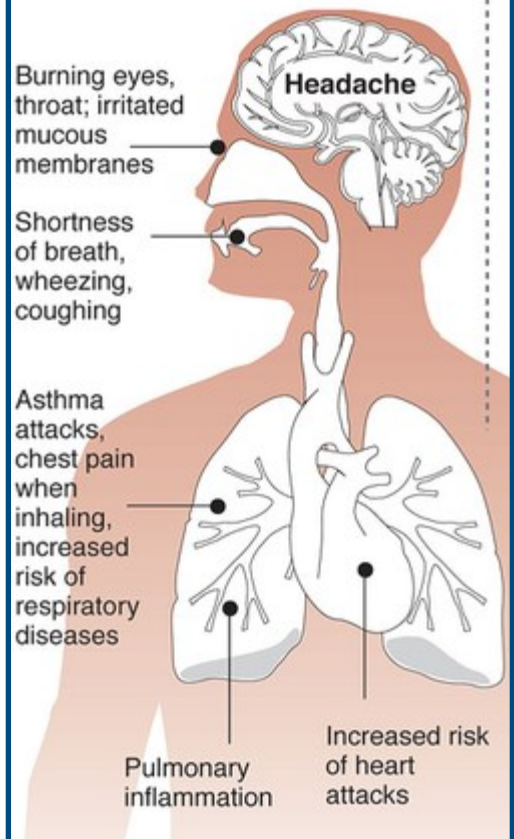
Decoding the Air Quality Index

You probably know by now that the National Ambient Air Quality Standard (NAAQS) for ground-level ozone is 70 parts per billion (ppb)—a level chosen by the Environmental Protection Agency (EPA) to protect the health of children, the elderly, those with lung disease, outdoor workers, and those who take part in outdoor activities. Ozone levels fluctuate day by day—a high reading one day does not necessarily mean that our region is destined for non-attainment status; however, a high reading could very well be detrimental to your health—especially if you have breathing problems. So, how

can you tell if it is safe for you to go outside? You may want to consider consulting the AQI or Air Quality Index.

The AQI is a daily report of air quality—letting you know how good or bad the air is in your region. The AQI is calculated for five major air pollutants: ground level ozone, particle pollution or particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Ground-level ozone and particulate matter pose the greatest threats to health in the United States. The AQI has a range of 0 to 500, and in this case, bigger is not better. The lower the number, the cleaner the air. A value of 100 generally corresponds to the NAAQS limit. For example, a 100 on the AQI corresponds to the 70 ppb limit of ground level ozone. This 0 – 500 range is divided into six color coded categories—each one representing a different health concern (1).

Effects on health

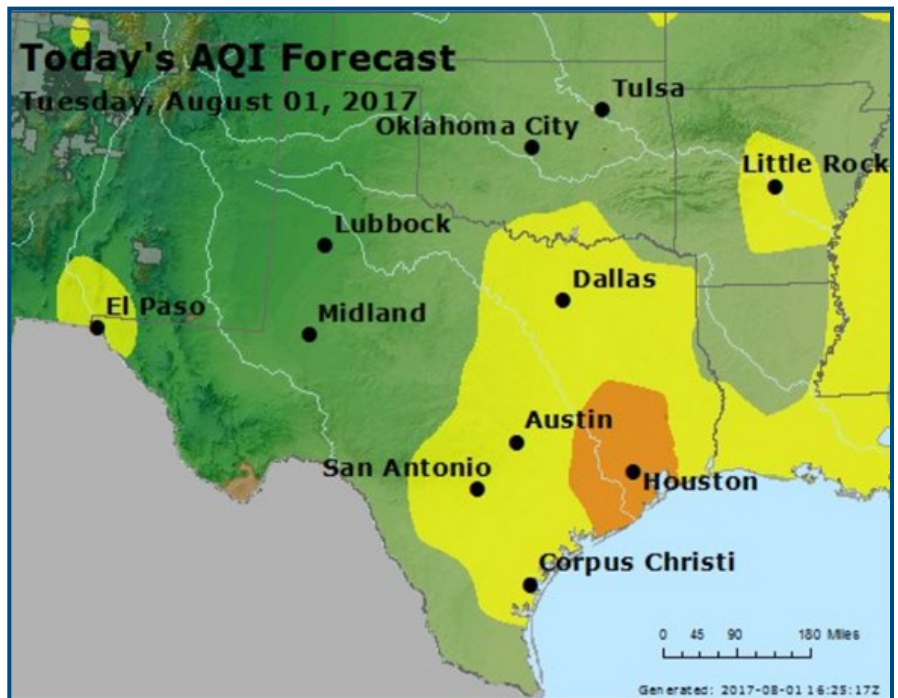


Air pollution can have various effects on our health. These include asthma, irritation of eyes, nose and throat and cardiovascular disease.

Air Quality Index Chart

AQI Values	Level of Health Concern	Meaning	Colors
When the AQI is:	...air quality is:	...which means you may be affected in this way:	...look for this color:
0 to 50	Good	Air quality is considered satisfactory. Air pollution poses little or no risk	Green
51 to 100	Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Yellow
101 to 150	Unhealthy for Sensitive Groups	People with heart and lung disease, older adults and children are at greater risk from air pollution	Orange
151 to 200	Unhealthy	Everyone may begin to experience health effects, members of sensitive groups may experience more serious health effects.	Red
201 to 300	Very Unhealthy	Health alert; everyone may experience more serious health effects	Purple
301 to 500	Hazardous	Health warnings of emergency conditions. The entire population is more likely to be affected.	Maroon

The AQI can be found almost anywhere you find a weather forecast, or you can check out <http://aqicn.org/map/>. Click on any city of interest, and you will get a breakdown of pollutant levels in real time. You can compare your region to other regions in the United States and even the world. By comparing US cities to other world cities, you can see how fortunate we are in the US compared to cities in China or India. Unfortunately, roughly 92% of the world's population lives in places where outdoor air quality fails to meet World Health Organization (WHO) standards. This translates to



over 3 million deaths each year that can be attributed to air pollution⁽²⁾. Of course, the United States is not immune to air quality problems. In the 1940s and early 1950s, many areas of the United States had air quality similar to that occurring across parts of present day China. One incident caused the US to start seriously thinking about the quality of our air. *(Continued on Page 5)*

What's Up with High Ozone Days?

So, you have a high ozone day. Do you just let the day pass without giving it a second thought? You could, or you could dive into your handy bag of tricks and find out why. After all, why should a high reading count against you if it is not your fault? This scenario brings us to another type of technical study, a high ozone day analysis. A high ozone day analysis is just what it sounds like it would be—a study to determine the reason behind a high ozone reading.

The first thing you have to do is determine what defines a high ozone day. This one is easy. The National Ambient Air Quality Standard (NAAQS) has already been established for ground-level ozone: 70 ppb. Using this standard, a high ozone day would be when the maximum daily eight hour average (MDA8) for ozone would be greater than 70 ppb. The MDA8 is readily available from the two Continuous Air Monitoring Stations (CAMS) in Temple (C1045) and Killeen (C1047). These CAMS also monitor wind and temperature.

Once a high ozone day has been determined, several factors need to be assessed: the background ozone levels in Central Texas; weather patterns; the influence of local/regional emissions sources; and whether or not the day could have been influenced by exceptional events. This last case is extremely important, as exceptional event days are excluded from the design value calculation. In other words, "This reading is not typical for our region, and we can prove why!" Exceptional events are natural or uncontrollable events that meet the following characteristics: the event affected air quality in such a way that a clear relationship between the specific event and the monitored exceedance or violation can be proved; the event was not reasonably controllable or preventable; and the event was a natural event or a human activity that is unlikely to recur at that location. The most common types of exceptional events affecting ozone are fires and stratospheric ozone intrusion.

Perhaps an example might help to make things clearer. On May 1-2, 2015, the Temple monitor had a high MDA8 reading each day of 72 ppb. Bearing in mind the assessment factors listed above, an analysis of those days found the following:

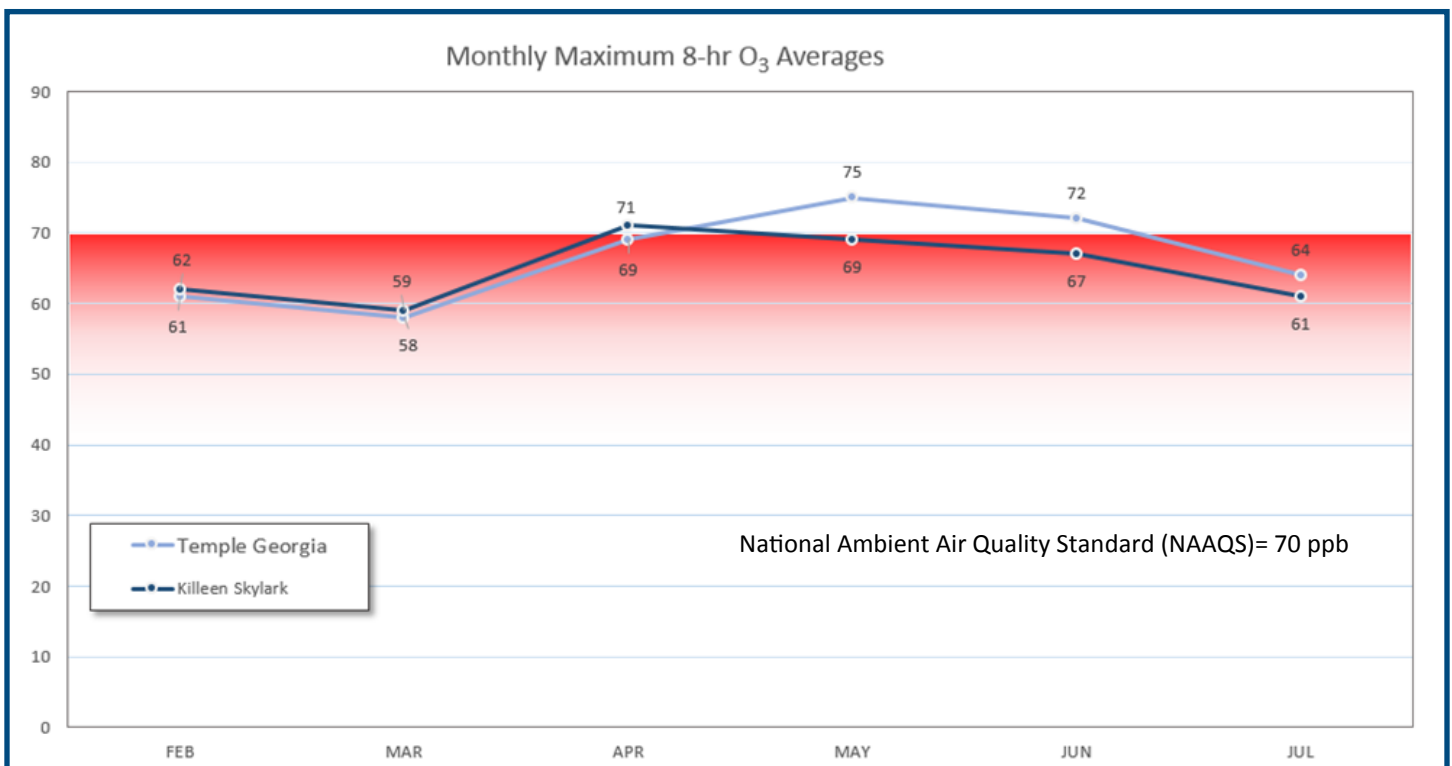
- April 29-May 2: Light smoke covered much of the central United States. Smoke was due to widespread agricultural burning across the central U.S. and southern Canada.
- April 29: Strong northerly winds in the region.
- April 30-May 2: Winds became stagnant.
- May 1: A continental air mass, influenced by agricultural burns, entered Texas from the north.
- May 1-2: Temperatures were 80 degrees, a relatively low temperature for a high ozone day. Ozone levels in Central Texas increased leading to the high reading in May. Data from other regional monitors indicated high regional background ozone at 60-65 ppb. Weather maps showed patterns consistent with the Texas ozone event, which was not a stratospheric ozone intrusion.
- May 3: Winds switched to strong southerlies which brought cleaner air and lower ozone.

What's Up with High Ozone Days?

It's tempting to say that the smoke from fires caused the high ozone reading, but the conclusion of the study was just the opposite: No clear causal connection between the fires or stratospheric air or high ozone at the monitors, so no further analysis was recommended. In other words, May 1-2nd was simply a high ozone day, and was not influenced by exceptional events. If those days had been found to be caused by exceptional events (the fires, in other words), TCEQ would petition to remove the readings so they would not count against the final design value.

This just goes to show that ground-level ozone has a bad day once in a while. As long as that bad day is the exception rather than the rule, we will all be O.K.

CTAIR Ozone Readings Update



**2014-2016
Design Value**
Temple: 67 ppb
Killeen: 67 ppb

**4th Highest Annual 8-Hour Ozone Value
(parts per billion)**

	2015	2016	2017	3 Year Average Calculated on August 1, 2017
Temple	72	64	69	68
Killeen	67	66	68	67

To view ozone readings, please visit https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_monthly.pl

Decoding the Air Quality Index continued....

U.S. Steel Corp. Donora Zinc Works and the American Steel & Wire Factory in Donora, Pennsylvania, provided employment to nearly half of the town's 14,000 population. They also provided endless streams of toxic smoke. Early one morning on October 28, 1948, a thick, yellow blanket of smog enveloped the town. "The smog created a burning sensation in your throat and eyes and nose," said Charles Stacey who was then a senior at the local high school, "but we still thought that was just normal for Donora." The air remained like this until October 31st. By then, 20 people had died, and 7,000 people were sick in the hospital or at home. The cause was later learned to be a temperature inversion—where cold air trapped the poisonous mixture of carbon monoxide, sulfur dioxide, and metal dust. This unfortunate incident helped lead to the Federal Air Pollution Control Act of 1955. This was the first national law specifically designed to improve air quality (3) (4).



Many cities, including Dallas (pictured above), continue to be plagued by poor air quality which affects other places in Texas. A majority of Ground-level ozone that is present in our region is transported in from major Texas Cities.

Air pollution in the United States has improved, but it is by no means perfect. The American Lung Association's State of the Air 2016 shows that 166 million people lived in counties with unhealthy air quality. Even with continued improvement, the State of the Air 2017 still finds more than 4 in 10 people (125 million or 38.9%) had unhealthy air quality in their communities, and ground-level ozone is the nation's most widespread pollutant (5).

Inhaling ground-level ozone causes it to react chemically (oxidizes) with the body's internal tissues leading to inflammation of the lungs—similar to a sunburn. Those especially vulnerable include: children and teens, those 65 or older, people with existing lung diseases, people with cardiovascular disease, and people who work or exercise outdoors.

During a four year period, all available research was assessed by a team of independent scientists and the EPA. Their findings were published in 2013, and they concluded that ground-level ozone poses a serious health threat. These health threats can affect a person's respiratory, cardiovascular, reproductive, developmental and central nervous system and can even lead to early death.

Due to these findings, the EPA strengthened the standards for ground-level ozone in 2015—from 75 ppb to 70 ppb. However, the new standard was not deemed low enough by the American Lung Association and other health and medical allies. (6)

Exactly what the NAAQS value for ground-level ozone should be will continue to be debated. What we can agree on is that we all play a role in keeping our air clean. Clean air improves our quality of life and benefits our region as a whole.

REMEMBER, DO YOUR SHARE FOR CLEANER AIR!!!

Sources:

- (1) <https://airnow.gov/index.cfm?action=aqibasics.aqi>
- (2) <http://www.cnn.com/2016/09/27/health/air-pollution-map-who/>
- (3) <http://www.npr.org/templates/story/story.php?storyId=103359330>
- (4) https://www.washingtonpost.com/news/capital-weather-gang/wp/2013/10/25/u-s-once-had-air-pollution-to-match-chinas-today/?utm_term=.3f6f18a519b7#comments
- (5) <http://www.lung.org/our-initiatives/healthy-air/sota/key-findings/>
- (6) <http://www.lung.org/local-content/california/documents/state-of-the-air/2017/ozone-pollution-fact-sheet.pdf>

DO YOUR SHARE FOR CLEANER AIR!

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Be sure to visit
our website
and take our
brief survey!



CTAIR Program Wrap Up

This installment of The FAN will be the final issue as the CTAIR program will come to a close on December 31, 2017. At the state level, the very program (Rider 7 State and Local Air Quality Program) that funds activities designed to reduce ozone in near non-attainment areas (the CTAIR program, for example), is not being funded for the 2018/2019 biennium.

Barely out of the starting gate, CTAIR made great strides in the fight against ground-level ozone. The CTAIR Advisory Committee was a considerable asset. The representatives not only took it upon themselves to increase their knowledge about ground-level ozone and air pollution, but helped to spread that awareness to the public. The Advisory Committee was also instrumental in helping to implement CTAIR's bike rack program. In total, 252 bike racks were distributed throughout the CTCOG seven county region, allowing a total of 504 bikes to be accommodated. Using bikes instead of vehicles will lower the risk of ground-level ozone formation.

In order to spread the message about the dangers of air pollution, CTAIR participated in several educational endeavors. Radio Public Service Announcements, a dedicated website, presentations to adults and school kids, this newsletter, and our brand new billboards serving the area of Temple, Belton, and Killeen are just a few of the efforts that have been made to teach people that ozone is "Good Up High but Bad Nearby," and to encourage all to "Do Your Share for Cleaner Air."

CTAIR was especially excited about our acceptance into the Environmental Protection Agency's Ozone Advance Program. This program is a voluntary program that promotes local actions (like the ones CTAIR was undertaking), to reduce ozone in order to continue to maintain NAAQS. The program encourages states, tribes, and local governments that want to take proactive steps to keep our air clean. CTAIR's Advisory Committee was very excited about this idea. We submitted our letter of request to join the program in late May and received our acceptance letter the very next month.

Whether or not this funding will return in the future is unknown, but CTAIR is hoping that you will take the knowledge you have gained from our outreach efforts and help to educate others. Keeping our air clean is the responsibility of everyone. Our very health, and the health of our planet, depends on it. May you all breathe cleanly for years and years to come.



One of three billboards purchased by the CTAIR Advisory Committee. This billboard is located on southbound I-35 approaching 6th Avenue between Belton and Temple.