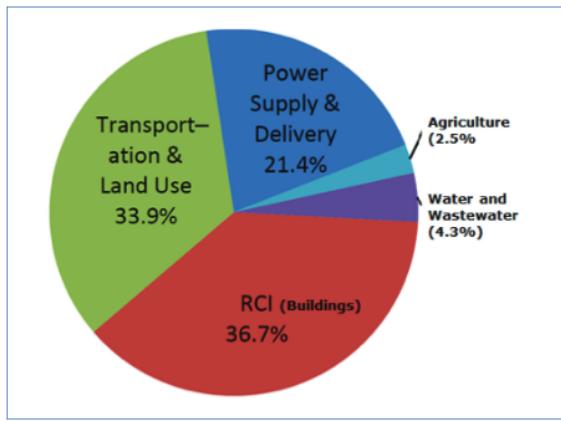


This section includes additional information on climate conditions and projections as they relate to greenhouse gas emissions, changes in temperature, the incidence of extreme temperatures, precipitation patterns, and air quality.

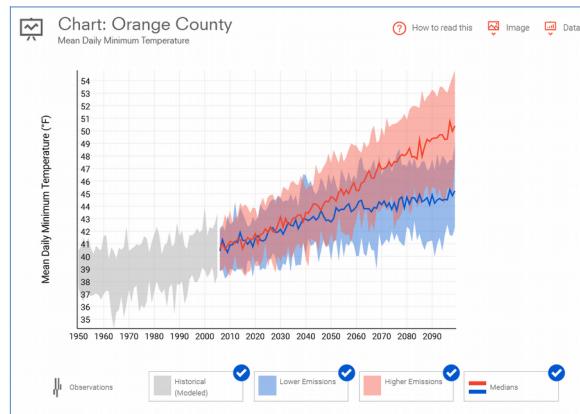
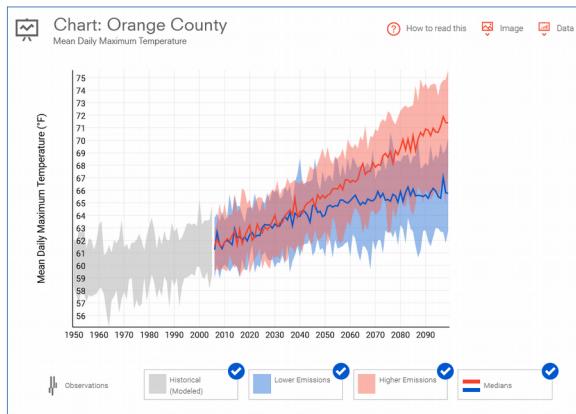
## Greenhouse Gas Emissions



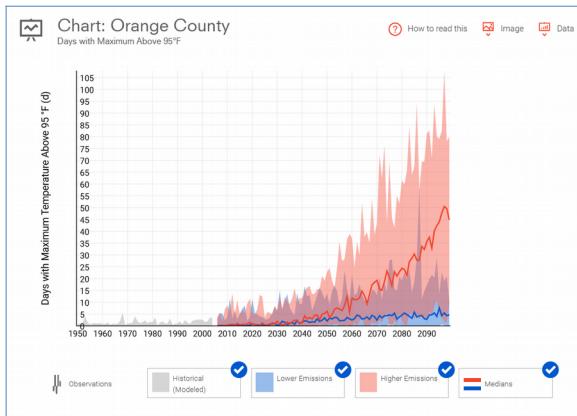
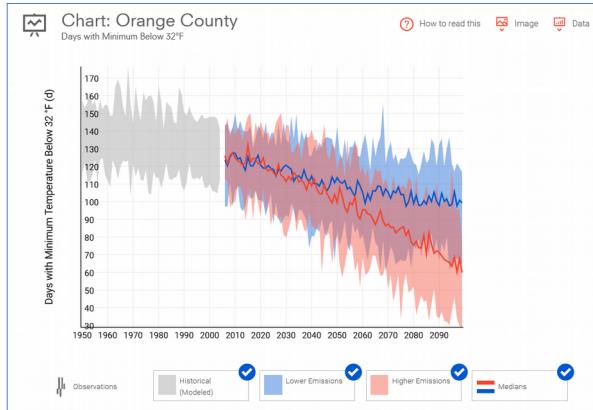
Greenhouse gases (GHGs) are a naturally-occurring phenomena that, at an appropriate level, keep our planet perfectly warm. GHGs include carbon dioxide, methane, and nitrous oxide. With the Industrial Revolution, our production practices resulted in large additions of GHGs that have begun trapping more warmth in our atmosphere than needed. The residential, commercial/institutional, and industrial sectors are responsible for the greatest generation of GHG emissions. GHG emissions “are produced primarily from electric power generation, heating and cooling buildings, industrial process, and transportation

and land use.” Sources: [Current & Future Trends in Extreme Rainfall across New York State](#) and [The Earth’s Changing Climate](#).

## Temperature



The above charts present the increases in temperature under lower and higher GHG emission scenarios, beginning with historical data from 1950 through to projected data to 2100. In the lower scenario (blues), global emissions stop increasing and become stable; the higher scenario (pink/red) assumes business-as-usual, with continued increasing emissions. **Regardless of the scenario, there is an upward trend in temperature projected for Orange County.** There is an approximately 7F difference between the two scenarios for both the mean daily maximum temperature (left) and the mean daily minimum temperature (right). Source: [Climate Explorer](#).



**The number of days below 32F is projected to decrease regardless of the emissions scenario applied**, dropping from our current average of approximately 130 days annually to 105 day annually in a low emissions scenario and 60 days annually in a high emissions scenario. Our tourism and winter recreation sectors will be impacted, as will plants that require a certain number of below-freezing days before they will bud or bloom.

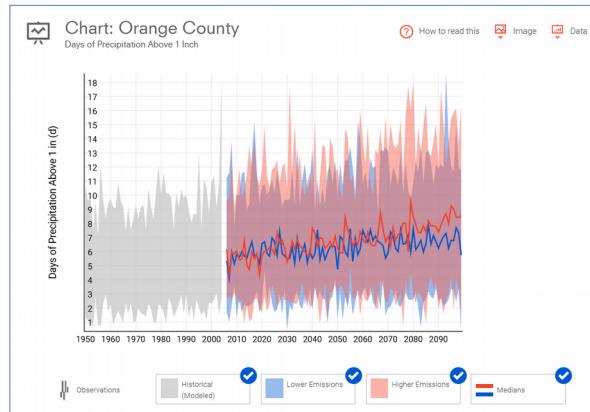
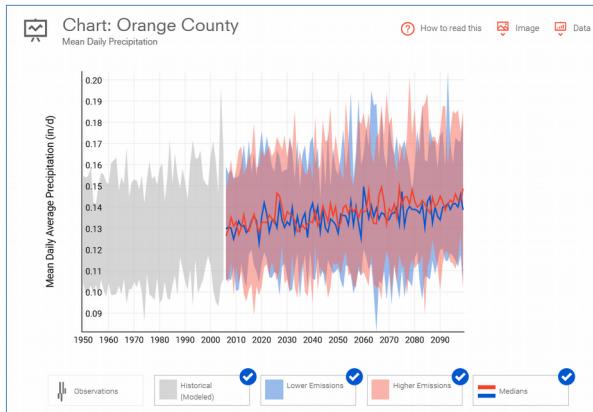
Source: [Climate Explorer](#).

### Extreme Temperatures

This chart shows the increasing number of days with temperatures above 95F. In the low emissions scenario, the number of extremely hot days is projected to increase from our current average of 5 per year to 10 per year by 2100. In the high emissions scenario, the number of extremely hot days is projected to increase to 50 per year. **“Depending upon humidity, wind, and access to air-conditioning, humans may feel very uncomfortable or experience heat stress or illness on very hot days.”** Prolonged hot days can also negatively impact our agricultural production, animal health, and

infrastructure as well as increase our demand for energy for cooling. Source: [Climate Explorer](#).

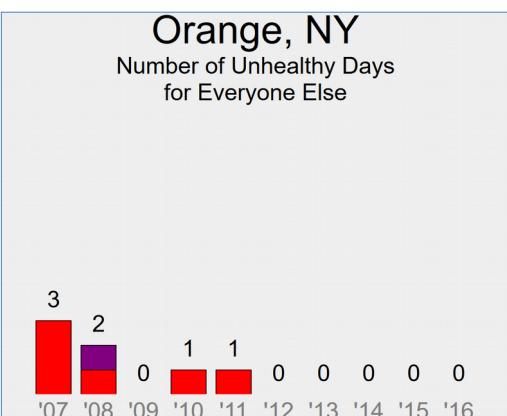
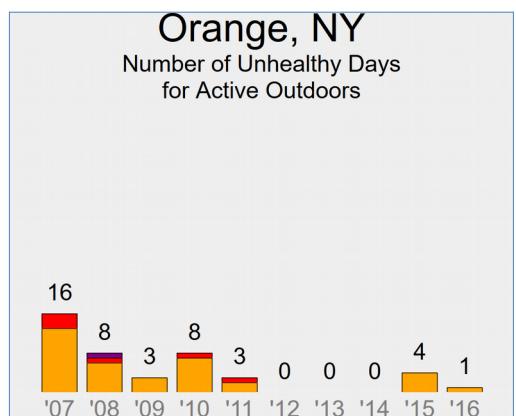
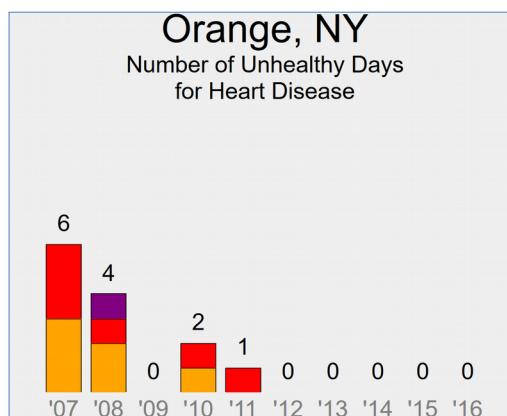
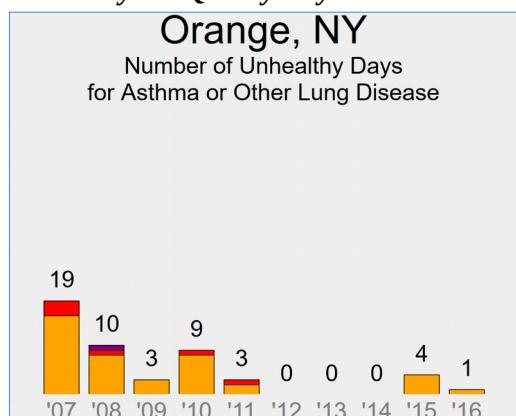
### Precipitation Patterns



Orange County will continue a gradual, upward trend for mean daily precipitation, becoming wetter slowly over time (left chart). **By the end of the century, we will also see a greater number of days with precipitation greater than 1 inch**, ranging from approximately 6 in a low emissions scenario to 9 in a high emissions scenario (right). The increase in heavy precipitation events may result in more flooding, requiring implementation of flood mitigation measures. Source: [Climate Explorer](#).

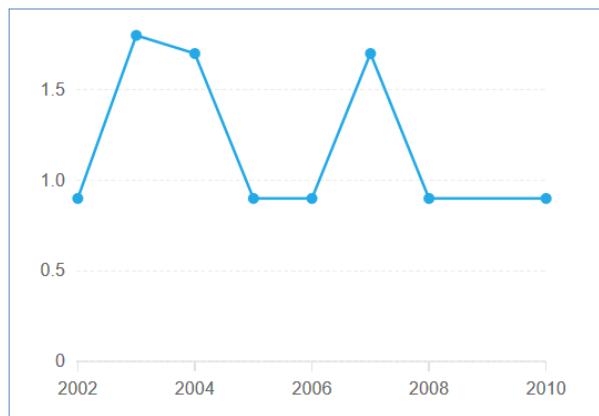
## Air Quality

### Unhealthy Air Quality Days



These four charts show that there has been a general downward trend in the number of unhealthy air quality days in Orange County over the 10 year period analyzed. The number of unhealthy days for sufferers of asthma and other lung disease mirrors that of older adults and children. Source: [AirCompare](#).

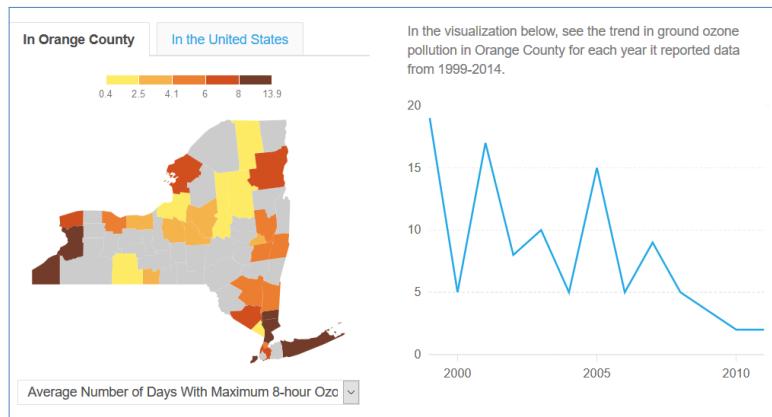
## Particulate Matter Pollution



Particulate matter pollution is comprised of airborne solid and liquid particles, such as dust, dirt, soot, smoke, and liquid droplets from various combustion sources, including cars, power plants, factories, construction activity, fires, and natural windblown dust. Particles smaller than 2.5 micrometers are more harmful because they are easily breathed into our lungs; they can affect our breathing, worsen existing respiratory and cardiovascular diseases, damage lung tissue, and contribute to cancer with long-term exposure. The above graph shows no trend; Orange County had

0.6% of days per year on average in excess of the maximum PM2.5 concentration for data reported from 1999-2014. Sources: [Scorecard](#) and [Healthgrove](#).

## Ozone Pollution



experienced an average of 6.4 days with maximum 8-hour ozone concentrations in excess of the National Ambient Air Quality Standard (NAAQS). Sources: [Scorecard](#) and [Healthgrove](#).

Ground-level ozone is created by the chemical reaction between sunlight, nitrogen oxides, and various organic compounds. It is a major component of smog. High ozone levels can damage lung tissue, reduce lung function, and cause lungs to be more sensitive to other irritants. **The above graph shows the decreasing trend in ground ozone pollution in Orange County. Over this same period, Orange County**