

THE AIR QUALITY CASE FOR CLIMATE ADAPTATION:

Investigating the impact of wildfire smoke on
ozone in the Sacramento Region



Ozone & wildfire



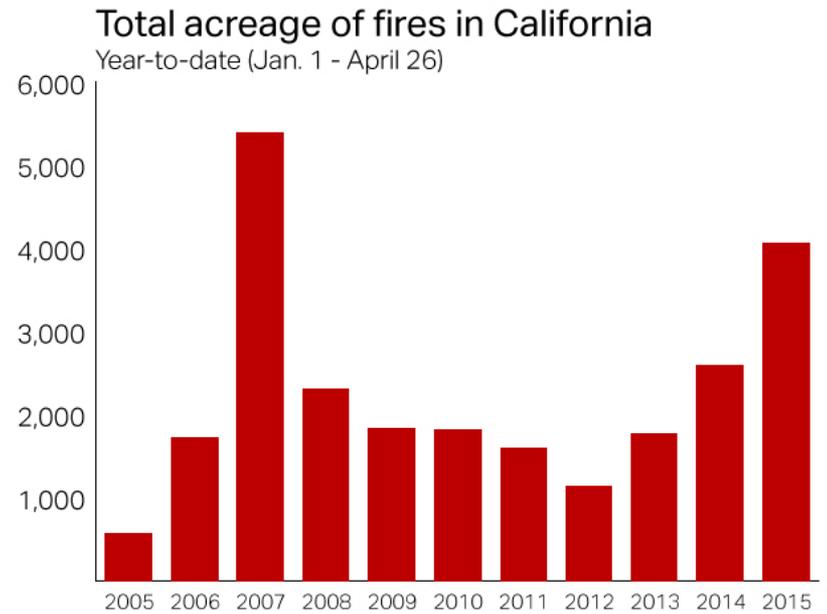
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- Ozone is an air pollutant but is not directly released – it forms from sunlight acting upon volatile organic compounds and nitrogen oxides.
- **How do wildfires impact air quality in the Sacramento region?**

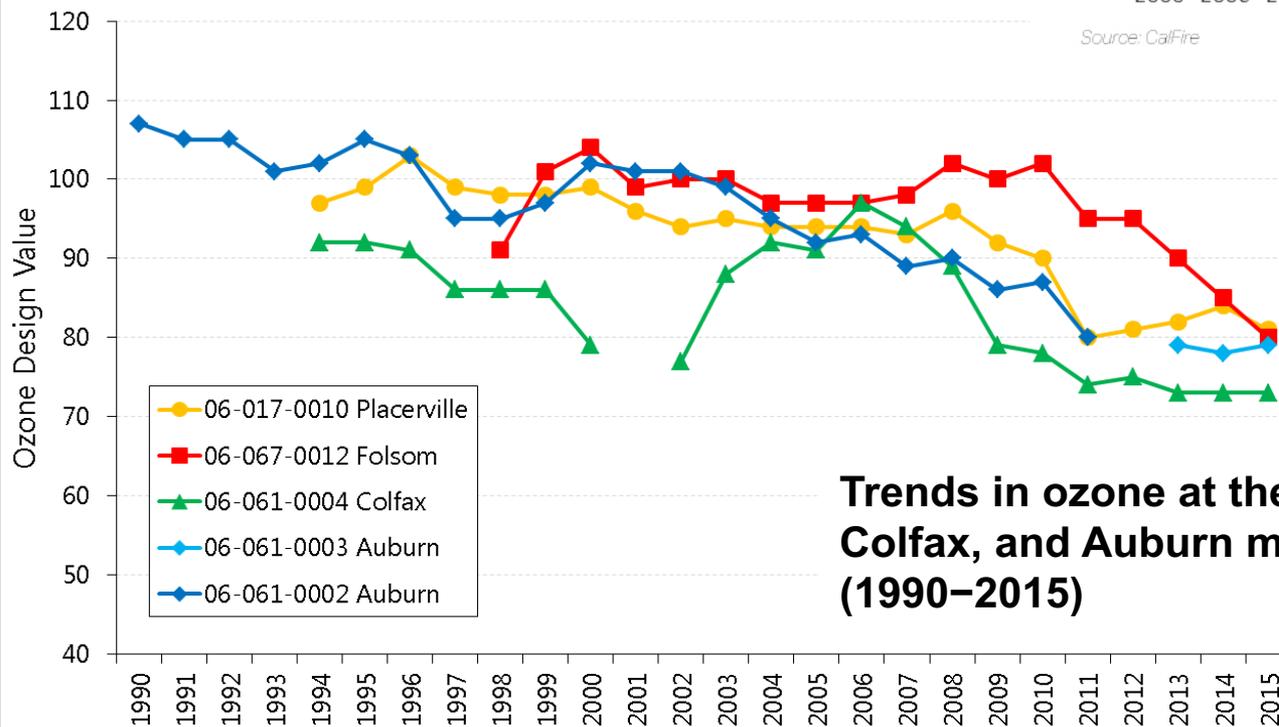
Health & environmental effects:

- Constricts & inflames airways, reduces lung function, harms lung tissue, and worsens existing respiratory illnesses (such as bronchitis & asthma)
- Harms vegetation and crops during growing season
- **Who's vulnerable?** Elderly, children, people with asthma, outdoor workers and people who are active outdoors

Ozone concentrations have been declining at most of the 17 monitoring sites in the Sacramento region – **but not in the Sierra foothill sites.**

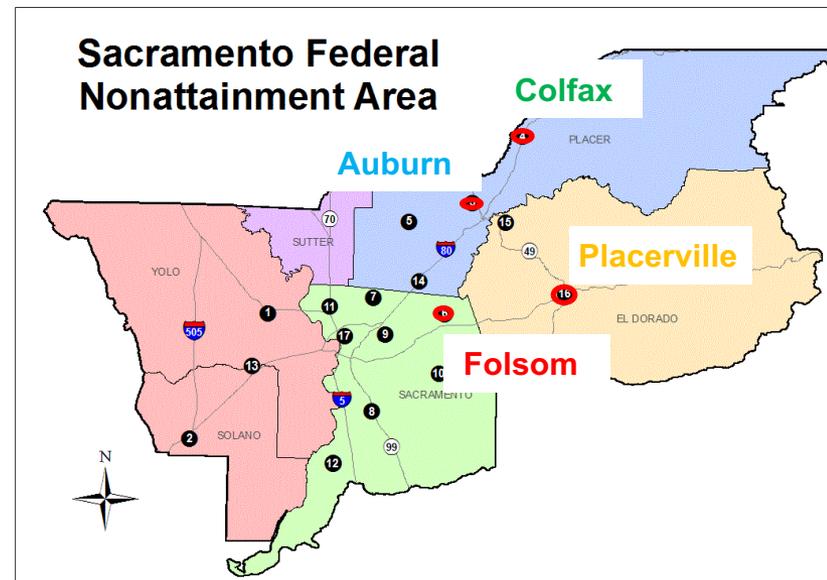


Source: CalFire



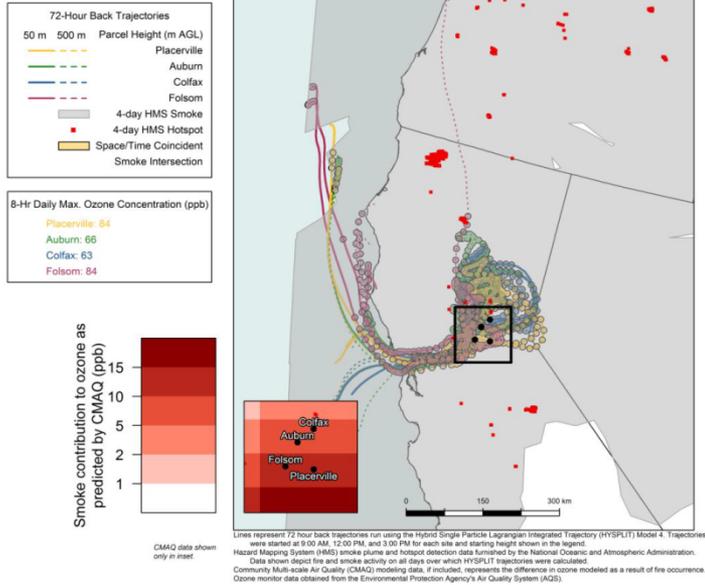
SMAQMD commissioned a study to understand wildfire impact on regional ozone:

- **Goal:** Understand and quantify the impact of wildfire smoke and transport patterns (wind) on days when 8-hour ozone concentrations exceeded 70 ppb
- **Study period:** 2011 to 2015
- **Where:** Four monitoring sites in the Sacramento region – Auburn, Colfax, Placerville, and Folsom.



Results

- Wildfire smoke likely impacted ozone concentrations at the Auburn, Colfax, Folsom, and/or Placerville sites **on 35% of the days** in which ozone exceeded the national EPA standard of 70 ppb.
- Of the five days with the highest 8-hour maximum ozone concentrations in 2013 and 2014 at the Placerville site, wildfire smoke likely impacted **7 out of 10** of those days.

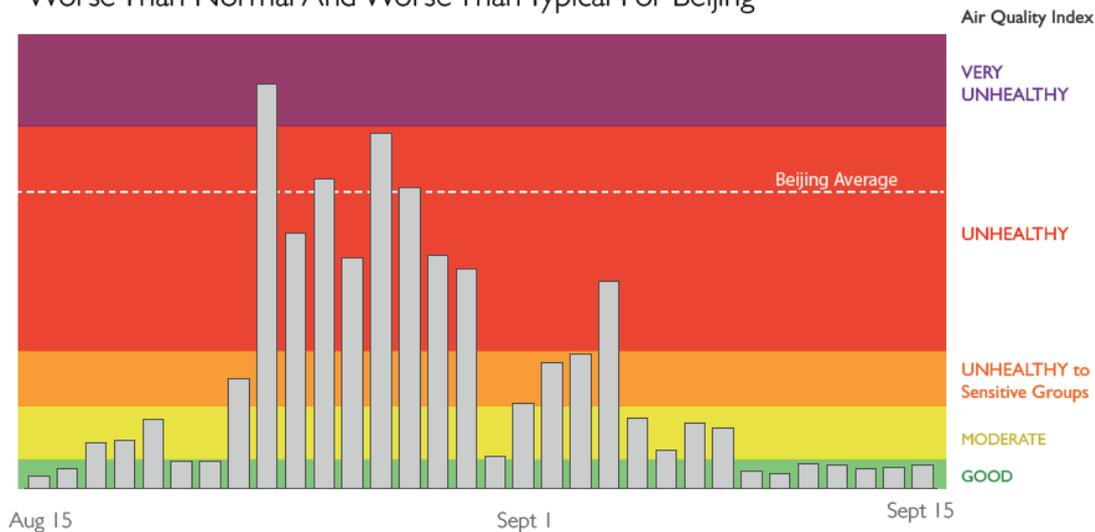


Without significant adaptation and mitigation efforts, climate change is likely to worsen air quality in the Sacramento region and make it more difficult for SMAQMD and other air districts to achieve their goal of clean, healthy air.

Other studies on wildfires & air quality

A national-level study by Colorado State University found that wildfire smoke contributed to 10-20 percent of days in which the ozone level exceeded 70ppb from 2005 to 2014 ([Brey and Fischer 2016](#)).

Air Quality In Carson City During the 2013 Rim Fire Was 15 Times Worse Than Normal And Worse Than Typical For Beijing



Climate Central's analysis of 11 recent wildfires in the Western U.S. found that they worsened air pollution 5 to 15 times worse than normal, resulting in the worst air quality of the year for nine cities.

Rising heat will also increase ozone formation



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For each 1 °F increase in temperature, the Union of Concerned Scientists found that ozone formation will increase by:

- ▣ Bay Area: 1.8-2.2 ppb
 - ▣ Sacramento Valley: 1.4-2 ppb
 - ▣ Los Angeles: 2-4.5 ppb
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- By 2020, this could result in as many as **443,000 cases of** respiratory illness throughout the state
 - Attainment of federal ozone standards