

An open letter to the California Air Resources Board

March 22, 2024

Re: CO₂ Coalition Evidence of NO Climate Crisis in California

Dear Sir or Madam:

There is no climate crisis in California. In fact, the CO₂ Coalition, a nonprofit organization with the goal of determining and propagating the facts regarding carbon dioxide (CO₂) and the climate (CO₂ Coalition, 2024), has compiled scientific data that verify this claim.

In contrast, the California Air Resources Board (CARB) (California Air Resources Board, 2024) failed to verify the claims made in Senate Bill 253 regarding the climate, such as: “Californians are already facing devastating wildfires, sea level rise, drought, and other impacts associated with climate change that threaten the health and safety of Californians” (State of California, 2023). In fact, the California State Auditor recommended that CARB “refine its GHG emissions estimates,” and as late as October 2023, “CARB continues to implement changes in response to this recommendation” (California State Auditor, 2024). In other words, CARB still cannot properly estimate greenhouse gas (GHG) emissions, while being assigned “to develop and adopt regulations requiring businesses with total annual revenues over \$1 billion and operating in California to disclose their greenhouse gas emissions” under Senate Bill 253 (Newsom, 2023). Such negligence is not acceptable.

Having said that, below are the findings of the CO₂ Coalition, which serve as rebuttals to the claims made in Senate Bill 253 regarding the climate in California.

The temperature data (Figure 1) reported by the U.S. Historical Climatology Network (USHCN), under the National Oceanic and Atmospheric Administration (NOAA), suggest that California has experienced modest warming since 1895, with the annual average maximum temperature increasing by about 1.7°F (0.95°C), and the annual average mean temperature increasing by about 3.4°F (1.9°C).

However, three factors come into play in the recent warming observed in the USHCN temperature database: (1) Urban heat island effects (i.e., the placement of temperature sensors near buildings or heat sinks such as asphalt, concrete, or brick), (2) adjustments to the temperatures reported by the temperature stations to the values that scientists at NOAA believe they should be, and (3) the use of models to quantify the temperatures for those temperature stations that did not report temperatures at any particular time (Soepyan et al., 2024). A comparison of the raw temperatures reported by the temperature stations against the final temperatures reported by the USHCN (Figure 2) shows that the warming that occurred after 2005 has been exaggerated by these factors.

Is the warming of California a negative development? During 2000-2019 in the Northern American continent, for every 100,000 residents, there were 50 cold-related excess deaths, compared to 6 heat-related excess deaths (Zhao et al., 2021). In other words, the cold has killed more people than the heat, which means that Californians should be more concerned about a cooling climate, rather than a warming climate. The warming climate has also lengthened the growing season in the

United States (Figure 3) (Kunkel et al., 2004; United States Environmental Protection Agency, 2023a), where in 2020, the western half of the United States has experienced a growing season that is 18 days longer from the average. The lengthened growing season, along with the rising atmospheric CO₂ concentrations (which will be discussed shortly), has proven to be beneficial for Californian crops. For instance, the production of the top five crops (grapes, almonds, lettuce, strawberries, and pistachios) in California has increased over the years (Figure 4) (California Department of Food and Agriculture, 2024; USDA National Agricultural Statistics Service, 2024). Such increases in agricultural production would not have been possible had there been a climate crisis.

As for CO₂, contrary to the claim made in Senate Bill No. 253 regarding “carbon pollution,” CO₂ has proven to be beneficial. First and foremost, plants need CO₂, as well as sunlight, water, and nutrients from the soil (nitrogen, phosphorus, potassium, etc.), to produce food and oxygen, both of which are essential for human and animal lives (Happer et al., 2023). Furthermore, studies have confirmed that when plants are exposed to higher concentrations of CO₂, plants’ growth and food production increase, as well as their water-use efficiency (Idso and Kimball, 1993, 1997, 2001; Leavitt et al., 2003), where the latter increases the plants’ resistance to drought (Happer et al., 2023). In fact, doubling the atmospheric CO₂ concentrations from about 400 parts per million (ppm) to 800 ppm can potentially increase food production by 40% to 60% (Happer et al., 2023). Finally, Earth has experienced a significant increase in vegetation (i.e., Earth has been greening) during 2001-2020, with 55.15% of areas experiencing greening, compared to 7.28% of areas experiencing decreasing vegetation (i.e., browning) (Chen et al., 2024). NASA has confirmed that CO₂ “fertilization” is 70% responsible for this greening (Hille, 2016).

In terms of precipitation, the annual precipitation record in California (Figure 5a) shows significant fluctuation year to year, during 1895-2023, with only a very slight decrease of less than 1 percent over nearly 130 years. Similarly, the Palmer Drought Severity Index (PDSI) (Figure 5b), which “estimates relative soil moisture conditions” using “simplified soil water balance” (NOAA National Integrated Drought Information System, 2024), shows fluctuations with only a slight decrease in PDSI from 1895 to 2024. These observations suggest that California is in no danger of unusual or prolonged drought. This assertion is further confirmed with measurements of the annual snowfall in the 22 ski resorts in California (Figures 6 and 7), where 21 of these 22 ski resorts experienced increasing trends in annual snowfall from 2012 to 2023. Therefore, ski resorts in California are in no danger of losing snow.

Just as California is in no danger of drying, California is not facing imminent danger from rapidly rising sea level. The data for the sea level rise, taken in 15 locations (Figure 8), show that the sea level has been rising since the early 1900s, when the atmospheric CO₂ concentrations were less than 300 ppm, only slightly higher than the pre-Industrial Revolution level of about 280 ppm. This observation implies that CO₂ is not responsible for the sea level rise. In fact, the highest rate of sea level rise of 0.005 meter/year, observed in North Spit, CA (Figure 8), means that if this rate were to continue over the next 100 years, the sea level could rise by 0.5 meter (1.64 feet) in 100 years. Such an increase is not enough to drown the Californian coast, meaning that California is in no danger of being inundated from the rising sea level. Finally, at Crescent City, the sea level has been falling at a rate of 0.0008 meter/year (Figure 8), which means that in Crescent City, “the land is rising more quickly than the ocean” (NOAA National Ocean Service, 2024).

In terms of natural disasters, the threat from wildfires in the United States has decreased over the past 90 years (Figure 9), where the recent number of wildfires are smaller compared to those reported during 1926-1982, and the acres burned by wildfires has significantly decreased since 1931. Global wildfires are also in decline according to the Copernicus satellite data (launched in 2003). The increasing size and intensity of fires since 1983 in California (though still much lower than 90 years ago) can be directly linked to changes in forest management, not any climate change-related factors.

Furthermore, tornadoes happen infrequently in California (Figure 10), where better reporting of tornadoes, rather than an increase in the frequency of tornadoes (Alimonti and Mariani, 2023; Happer et al., 2023), could be the reason behind the increase in the reported number of tornadoes from 1951 to ~2000. Finally, California has had no landfalling hurricane reported from 1851 to 2023 (National Oceanic and Atmospheric Administration, 2023; NOAA Atlantic Oceanographic & Meteorological Laboratory, 2023) and no tropical depression reported from 1950 to 2023 (NOAA National Centers for Environmental Information, 2024b), and the last two tropical storms that affected California were reported in 2023 (Tropical Storm Hilary) and 1997 (Tropical Storm Nora) (NOAA National Centers for Environmental Information, 2024b), which suggests that tropical storms are rare occurrences in California. These observations refute the claim regarding the increase in the frequency of natural disasters in California.

Lastly, the air quality in California has improved over the years. In fact, the atmospheric concentrations of various pollutants in the West (Figure 11), which consists of California and Nevada (NOAA National Centers for Environmental Information, 2024c), have decreased since 2000, with the atmospheric concentrations of carbon monoxide, nitrogen dioxide, PM₁₀, and sulfur dioxide well below the limits specified by the National Ambient Air Quality Standards (NAAQS) (United States Environmental Protection Agency, 2024). Likewise, the U.S. national atmospheric concentrations of lead (the data for the atmospheric concentrations of lead in the West are not provided by the U.S. EPA) have decreased since 2010 and are well below the limit specified by NAAQS (Figure 11). Finally, the atmospheric concentrations of ozone in the West in 2022 is 0.069 ppm, which is slightly smaller than the limit of 0.070 ppm specified by NAAQS, and the atmospheric concentrations of PM_{2.5} in the West in 2022 is 9.4 µg/m³, which is slightly higher than the limit of 9.0 µg/m³ specified by NAAQS. But given the downward trends in the concentrations of these pollutants in the West since 2000, the atmospheric concentrations of ozone and PM_{2.5} in the West are well on their way to becoming smaller than the limits specified by NAAQS. And notice, there are seven pollutants listed by the U.S. EPA (Figure 11), and CO₂ is not included.

In conclusion, the scientific data have verified that there is no climate crisis in California, and that CO₂ is essential for all lives on Earth. Therefore, the CO₂ Coalition asks that you thoroughly review the facts regarding CO₂ and the climate prior to enacting policies based on an alleged climate crisis.

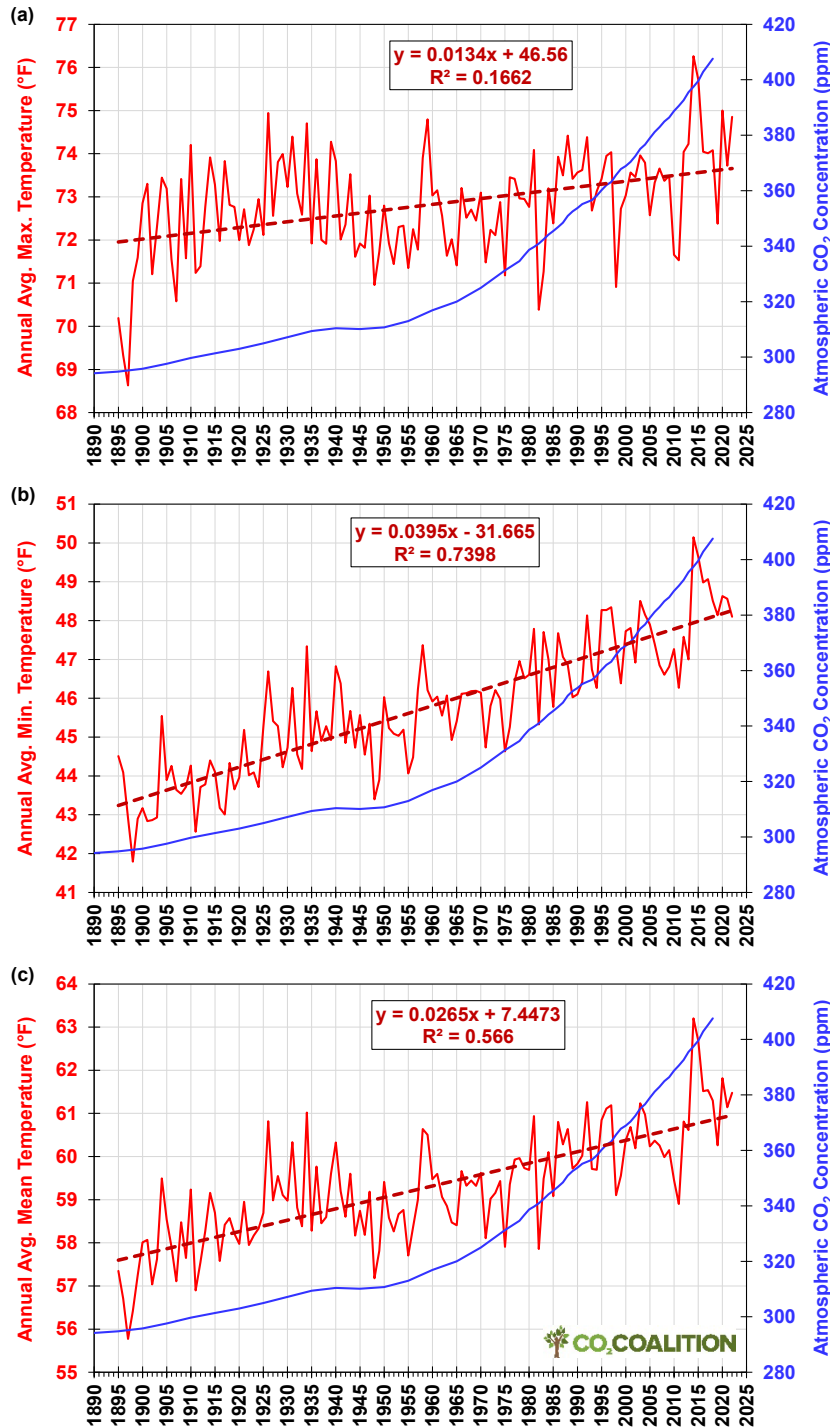
Please let me know if you need additional details, and the CO₂ Coalition will be happy to respond to any inquiries you may have. Various members of the CO₂ Coalition, including 2022 Nobel Laureate Dr. John Clauser, who resides in Northern California, will be happy to meet with you to further discuss the subject of climate science.

Sincerely,

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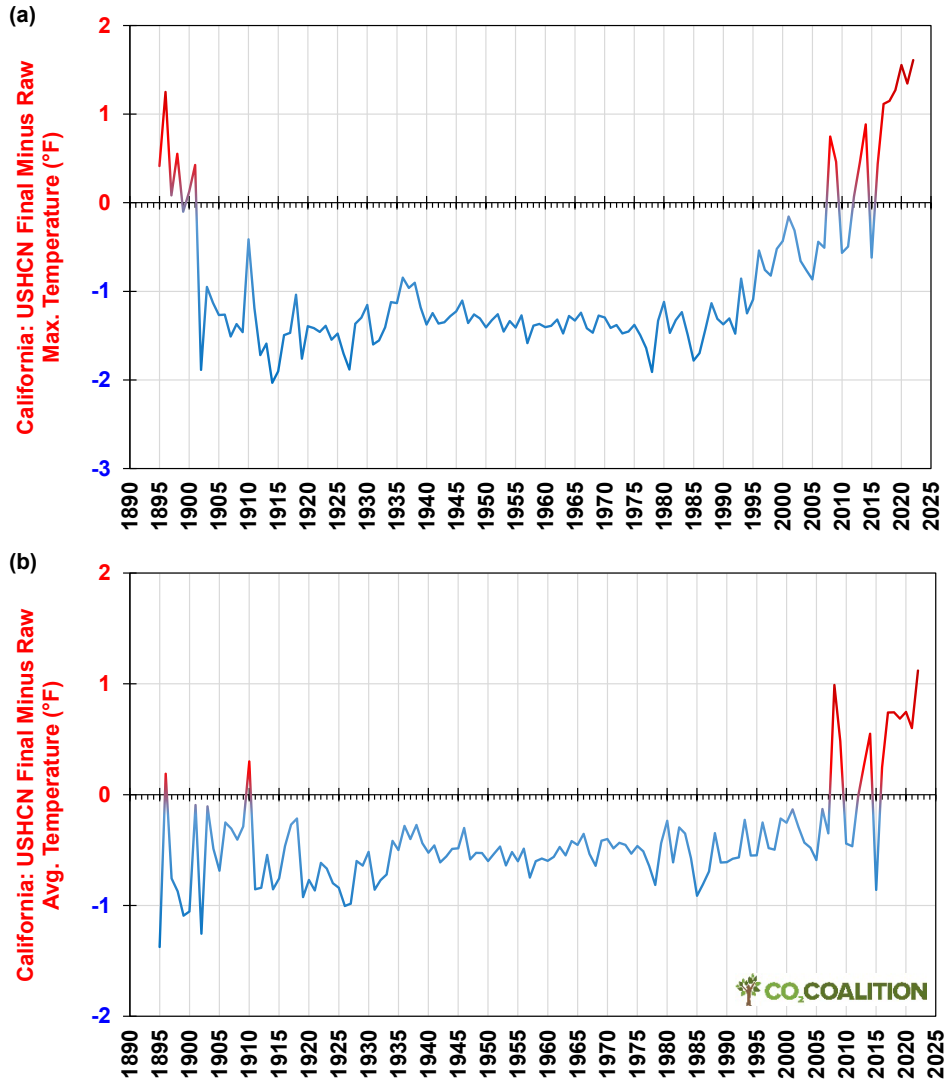
Appendix

Figure 1: (a) Annual average maximum temperature, (b) annual average minimum temperature, and (c) annual average mean temperature in California, plotted with the atmospheric CO₂ concentrations.



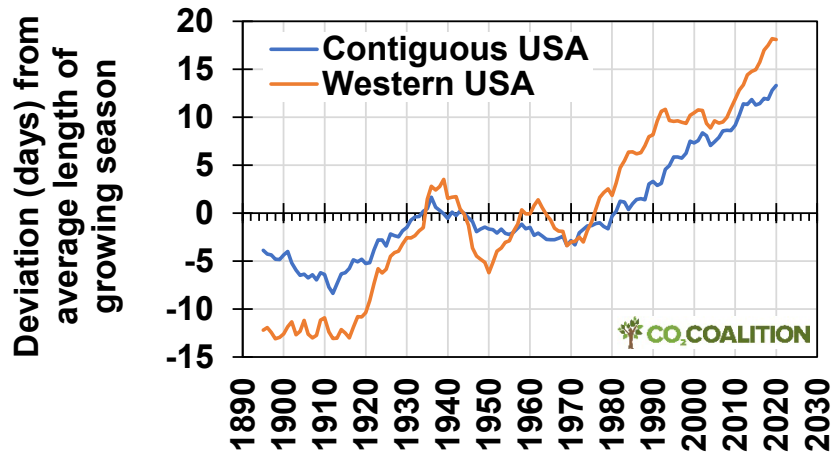
Temperature: USHCN (2023); NOAA National Centers for Environmental Information (2024d)
Atmospheric CO₂ Concentrations: European Environment Agency (2019)

Figure 2: Comparison of the temperatures recorded by the USHCN relative to the raw temperatures reported by the temperature stations in California: (a) Maximum temperature and (b) mean temperature.



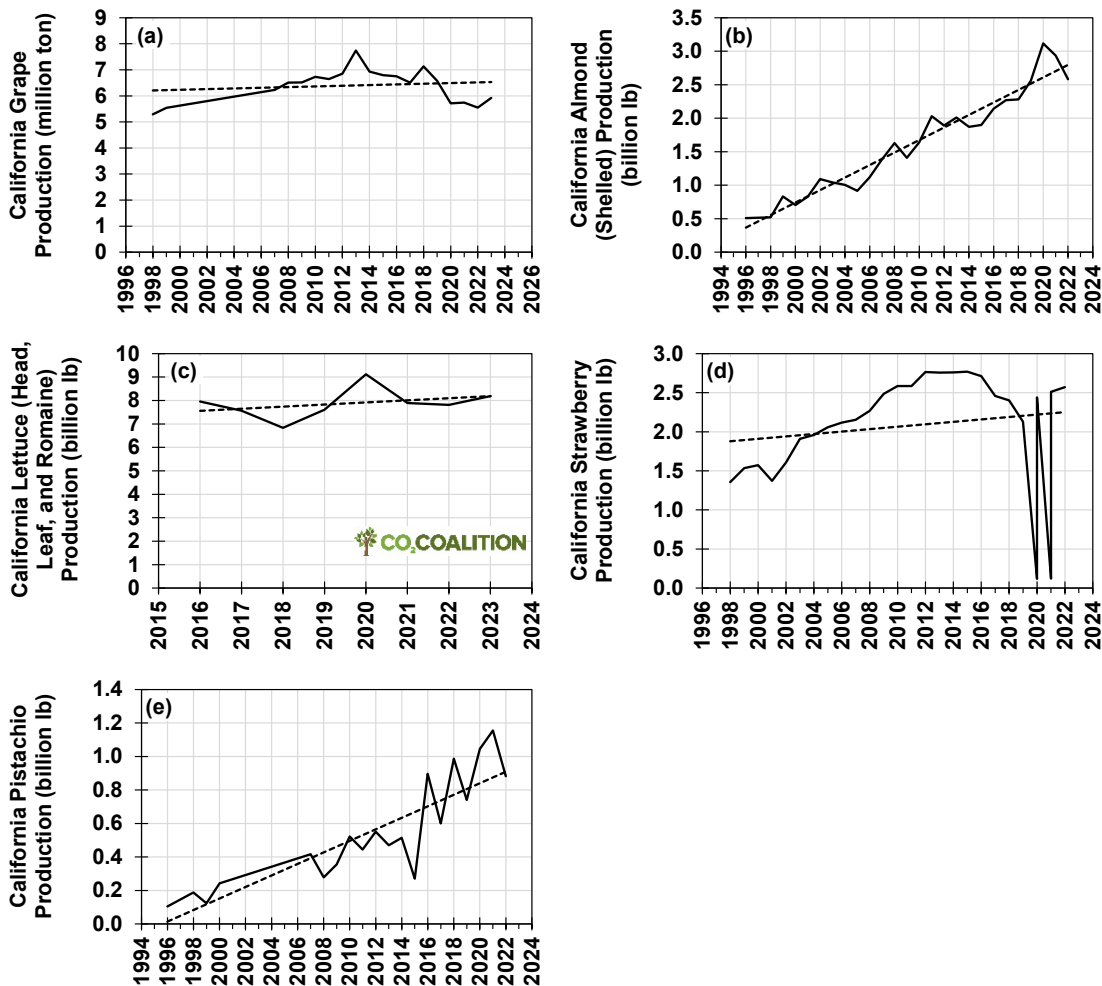
Sources: USHCN (2023); NOAA National Centers for Environmental Information (2024d)

Figure 3: Increase in the length of growing seasons in the United States.



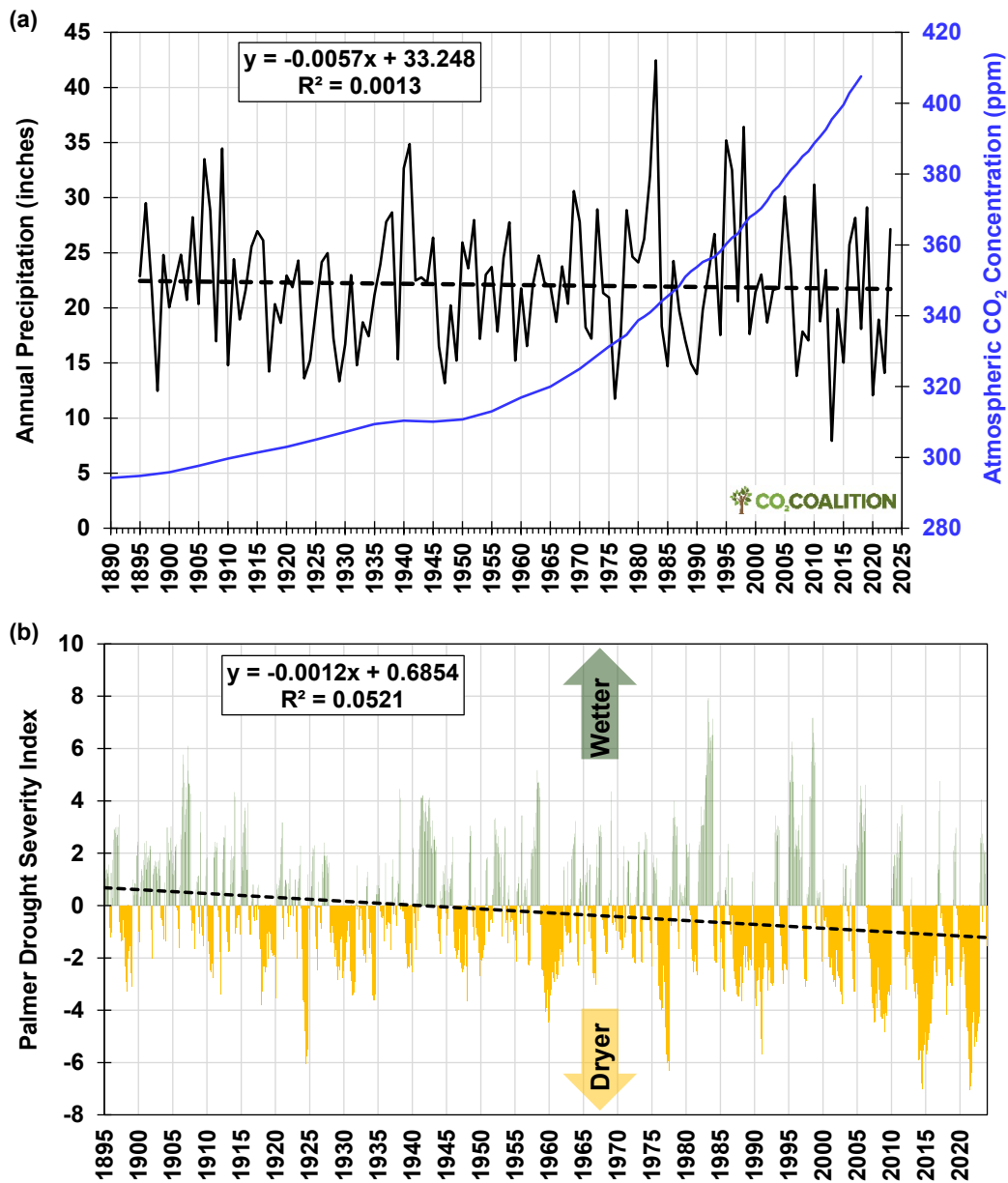
Source: United States Environmental Protection Agency (2023a)

Figure 4: Production of the top five crops in California: (a) grapes, (b) almonds, (c) lettuce, (d) strawberries, and (e) pistachios.



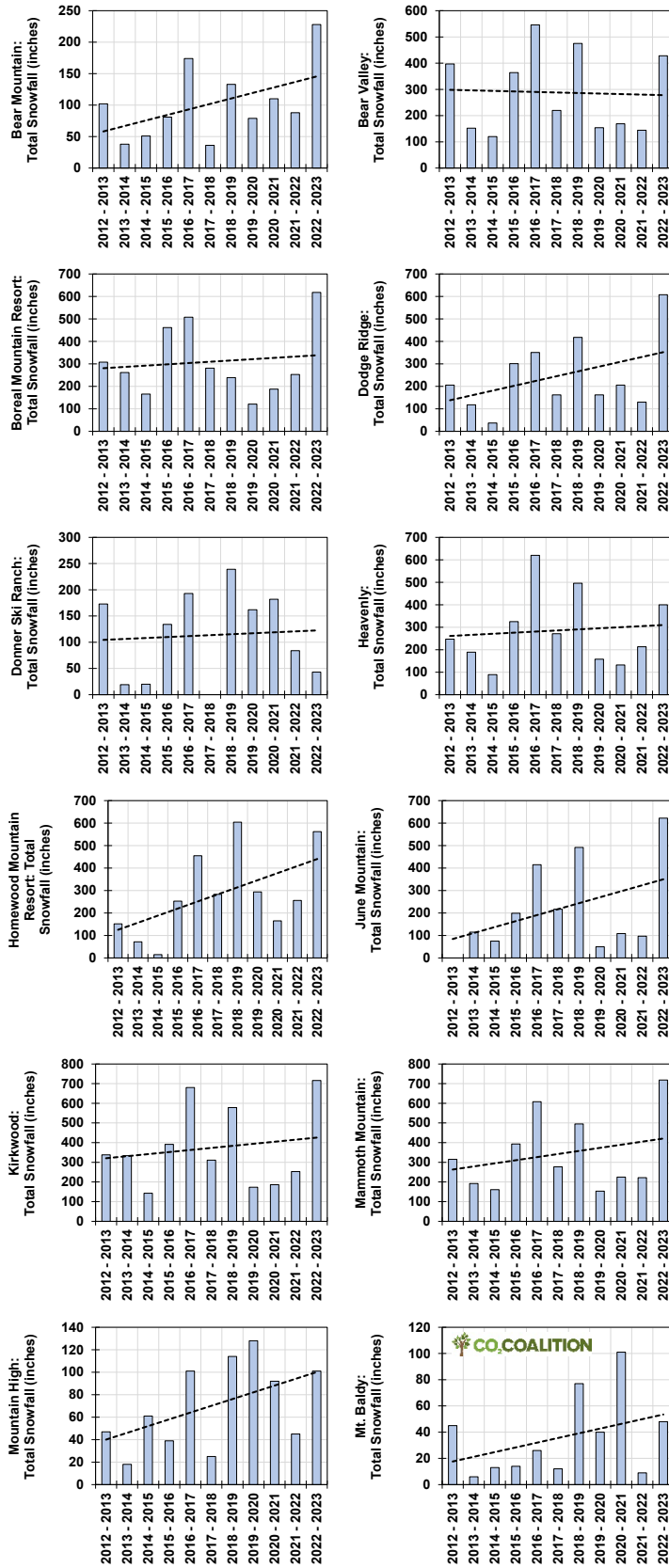
Source: USDA National Agricultural Statistics Service (2024)

Figure 5: (a) Annual precipitation in California, plotted with the atmospheric CO₂ concentrations, and (b) the Palmer Drought Severity Index in California.



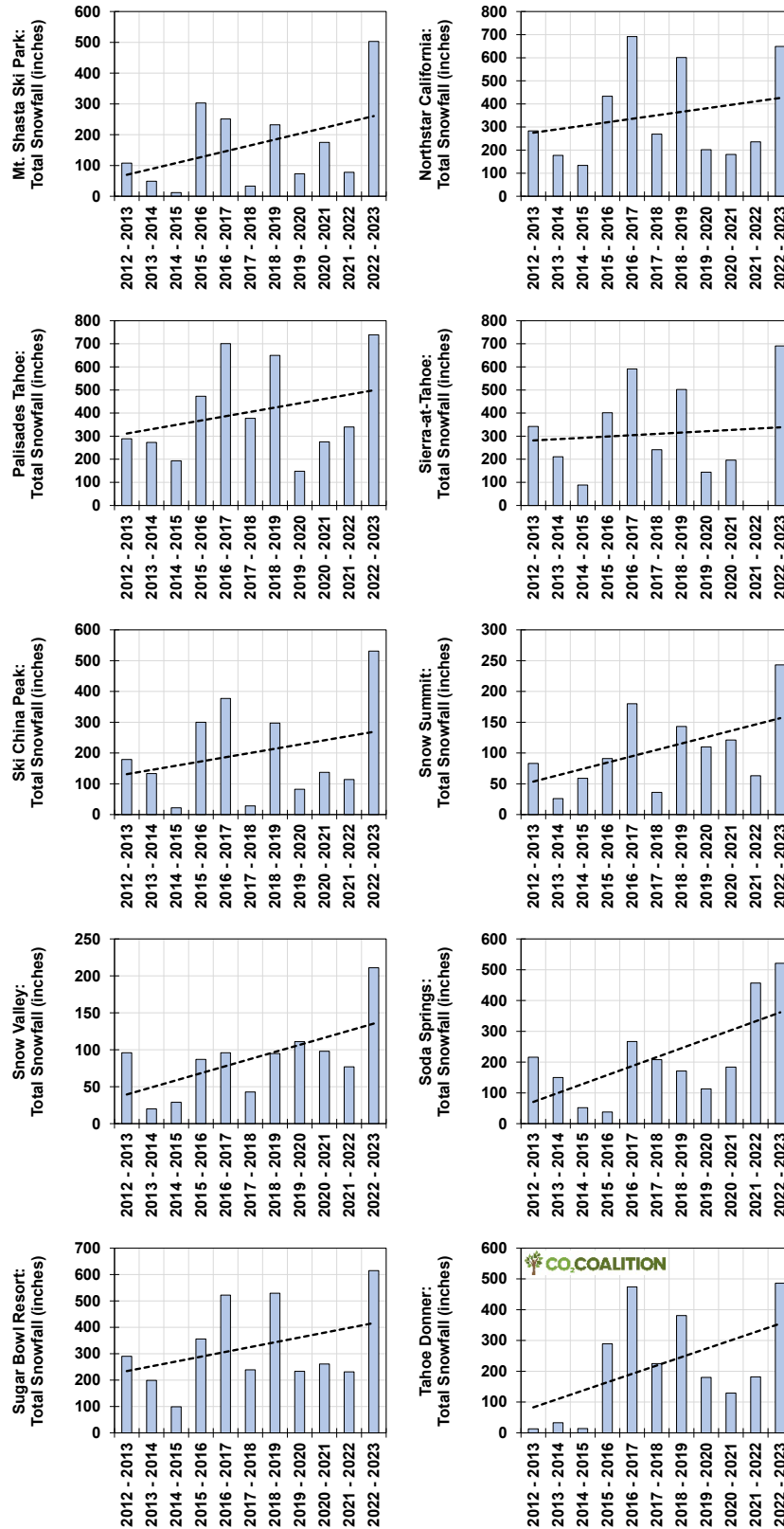
Precipitation and PDSI: NOAA National Centers for Environmental Information (2024a)
 Atmospheric CO₂ Concentrations: European Environment Agency (2019)

Figure 6: Annual snowfall in Californian ski resorts.



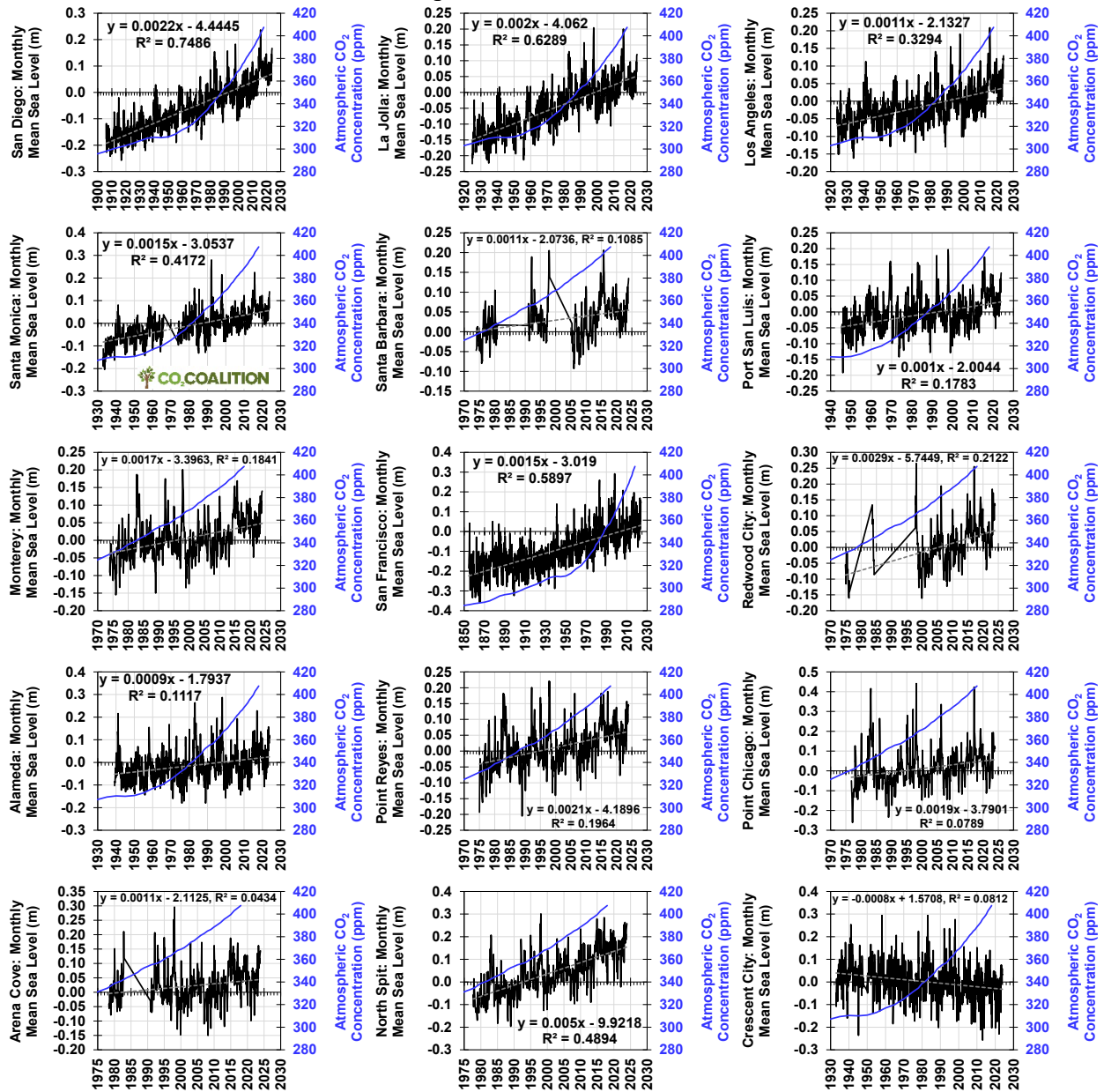
Source: Mountain News LLC (2024)

Figure 7: Annual snowfall in Californian ski resorts.



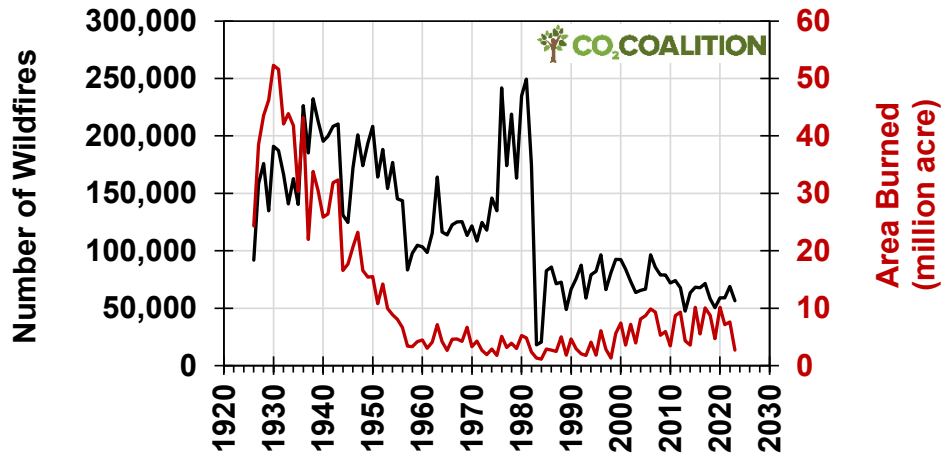
Source: Mountain News LLC (2024)

Figure 8: Monthly mean sea level in the Californian coast, relative to the Center for Operational Oceanographic Products and Services (CO-OPS) Mean Sea Level datum, plotted with the atmospheric CO₂ concentrations.



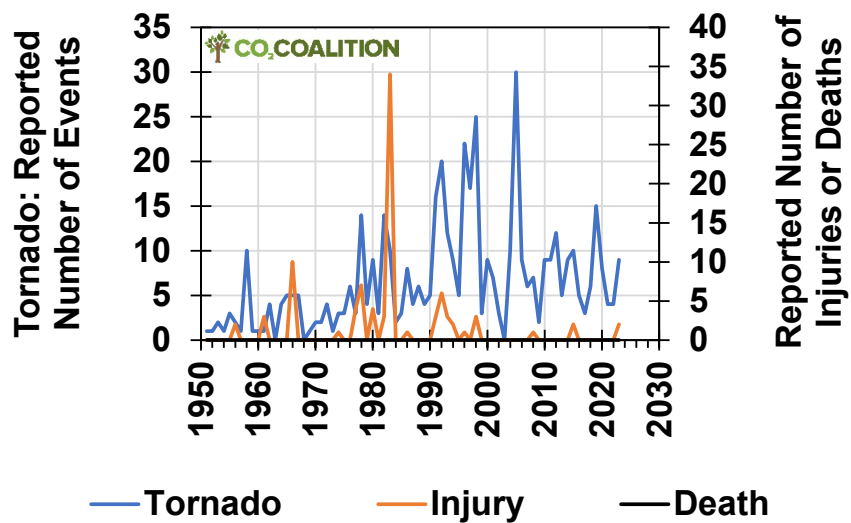
Sea Level: NOAA National Ocean Service (2024)
 Atmospheric CO₂ Concentrations: European Environment Agency (2019)

Figure 9: Number of wildfires and the areas burned by wildfires in the United States.



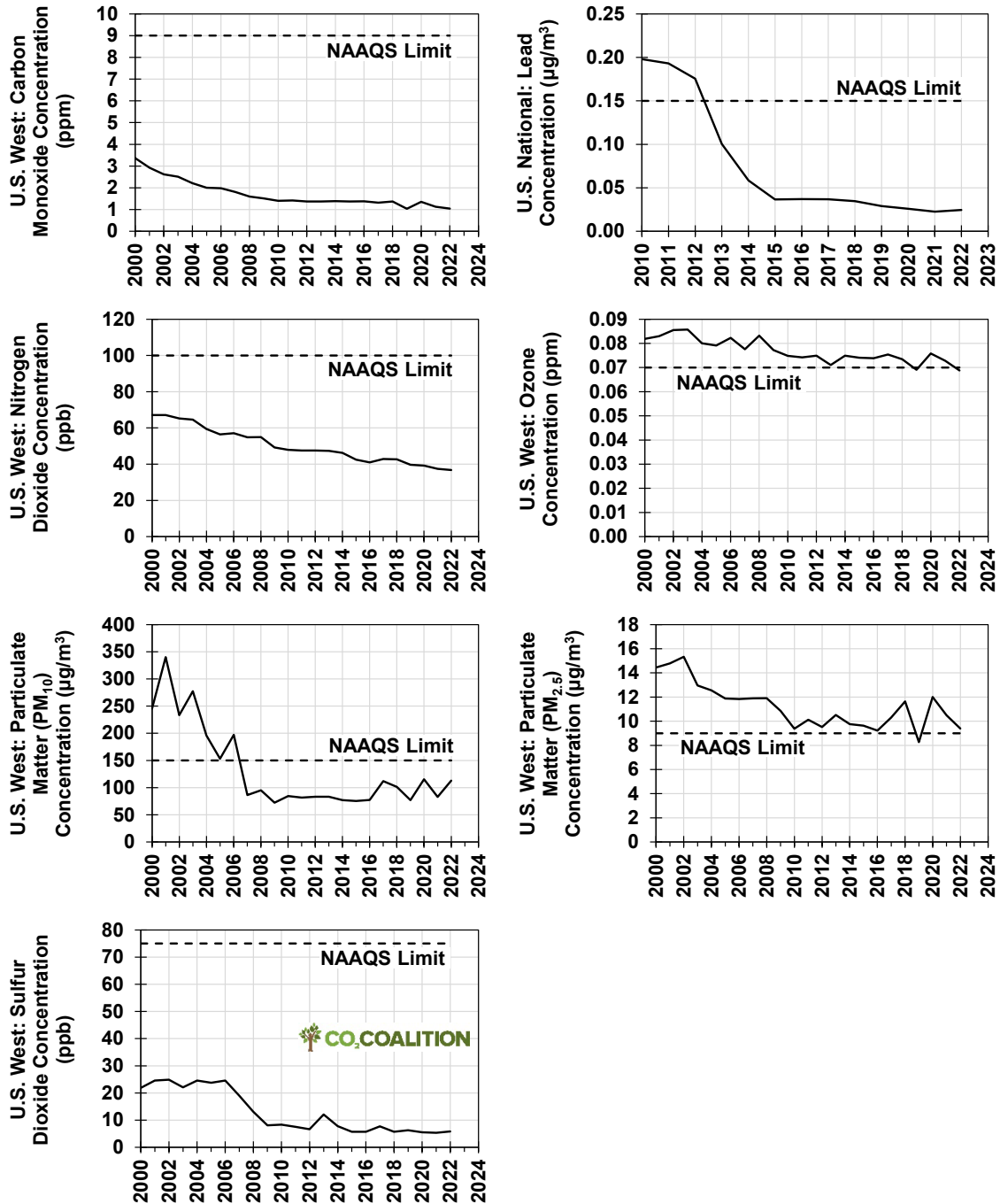
Source: National Interagency Fire Center (2020, 2024)

Figure 10: Reported number of tornadoes and the reported number of injuries and deaths that resulted from tornadoes in California.



Source: NOAA National Centers for Environmental Information (2024b)

Figure 11: Atmospheric concentrations of pollutants in the West and lead in the United States.



Pollutant Concentrations: United States Environmental Protection Agency (2023b)
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