SAN JOAQUIN VALLEY
AIR POLLUTION CONTROL DISTRICT

Exceptional Event Demonstration for
August 2020 PM2.5 Exceedances due to Wildfires

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Executive Summary

The analysis in this report demonstrates that the exceedances of the 1997 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) recorded on August 20-24, 2020, were caused by wildland fires. Pursuant to Exceptional Event requirements under the Clean Air Act, the data may be excluded from regulatory decisions for PM2.5 NAAQS.

Excessive fuel build-up in the California's wildlands, widespread drought-driven tree mortality, higher average temperatures, and drier conditions in recent years have contributed to extended and more intense wildfire seasons in the western United States. Leading up to the 2020 wildfire season, California experienced extreme dry conditions and hot summer temperatures that continued to scorch and desiccate wildland areas, particularly during July and August 2020. Starting August 15, 2020, a severe dry lightning storm passed through the central and northern portions of California, resulting in over 15,000 lightning strikes to the surface across the region, causing hundreds of new fires to erupt across the state simultaneously. The resulting fires, later named the 2020 August Lightning Siege (ALS) wildfires, ignited the extremely dry landscape conditions. A subsequent strong high-pressure system brought hot, dry dominant winds, which promoted rapid fire growth and began what would later become the worst wildfire season in California history.

Despite being on track to reach attainment of the 1997 PM2.5 NAAQS, smoke from the 2020 wildfires overwhelmed the San Joaquin Valley Air Pollution Control District's (District) rigorous particulate matter emissions controls and led to historically high PM2.5 concentrations throughout the San Joaquin Valley. The Valley experienced severe smoke impacts and elevated PM2.5 concentrations from mid-August through November 5, 2020, when smoke no longer impacted the San Joaquin Valley. Decreased fire activity and high winds on November 5, 2020, led to reduced smoke impacts and a clearing of the Valley Air Basin. Table ES-1 shows select PM2.5 concentrations that were impacted by wildfire smoke during August 20-24, 2020, that impact EPA's regulatory decision for the 1997 24-Hour PM2.5 NAAQS[1]. Other San Joaquin Valley sites were impacted by wildfire smoke during the 2018-2020 period; however, those sites and dates are not shown in Table ES-1 because their exceedances did not cause the 2020 design value for the site to exceed the 1997 24-hour PM2.5 NAAQS. As demonstrated in this document, PM2.5 concentrations observed during smoke impacts in the third quarter 2020 were at least three times higher than typical concentrations the same quarter for the previous 5 years.

[1] USEPA, (62 FR 38652-38760) *National Ambient Air Quality Standards for Particulate Matter*. Federal Register, Volume 62, July 18, 1997, p. 38652-38760

Table ES-1: 24-hour Average PM2.5 Concentrations from August 20-24, 2020 Requested for Exclusion from Regulatory Decisions for San Joaquin Valley

Date	Site AQS ID	Site Name	PM2.5 Concentration µg/m³
20-Aug-20	06-099-0006	Turlock	108
20-Aug-20	06-099-0005	Modesto-14th St.	102.2
20-Aug-20	06-077-2010	Manteca	102
20-Aug-20	06-077-1002	Stockton-Hazelton	88.8
20-Aug-20	06-019-2016	Fresno-Foundry	74.9
21-Aug-20	06-099-0006	Turlock	96.5
21-Aug-20	06-099-0005	Modesto-14th St.	90.1
21-Aug-20	06-077-2010	Manteca	100.8
21-Aug-20	06-031-1004	Hanford-Irwin	135.1
21-Aug-20	06-031-0004	Corcoran	115.2
21-Aug-20	06-077-1002	Stockton-Hazelton	76.3
21-Aug-20	06-019-2016	Fresno-Foundry	128.3
22-Aug-20	06-099-0006	Turlock	97.2
22-Aug-20	06-099-0005	Modesto-14th St.	68
22-Aug-20	06-031-1004	Hanford-Irwin	147
22-Aug-20	06-031-0004	Corcoran	140.1
22-Aug-20	06-019-2016	Fresno-Foundry	153.5
22-Aug-20	06-029-0016	Bakersfield-Planz	158.6
23-Aug-20	06-031-1004	Hanford-Irwin	116.7
23-Aug-20	06-031-0004	Corcoran	93.2
23-Aug-20	06-077-2010	Manteca	79.3
23-Aug-20	06-099-0005	Modesto-14th St.	67.6
23-Aug-20	06-019-2016	Fresno-Foundry	100.5
24-Aug-20	06-099-0006	Turlock	99.1
24-Aug-20	06-099-0005	Modesto-14th St.	84.7
24-Aug-20	06-077-1002	Stockton-Hazelton	78.2
24-Aug-20	06-077-2010	Manteca	87.6
24-Aug-20	06-031-1004	Hanford-Irwin	107
24-Aug-20	06-019-2016	Fresno-Foundry	99.4
24-Aug-20	06-031-0004	Corcoran	89.8

To support this demonstration, satellite images for each exceedance day were used to clearly show the presence of smoke impacting the San Joaquin Valley. A trajectory and meteorology analysis show that the Lake Napa Unit (LNU), Santa Clara Unit (SCU), and Santa Cruz Unit (CZU) Lightning Complex Fires, and the Woodward, River, Carmel, and Dolan Fires were the primary sources of the smoke transported into the San Joaquin Valley, where the elevated PM2.5 concentrations resulted in many unhealthy air quality days. A summary of these wildland fire events is shown in Table ES-2. The District published "Health Cautionary Statement" press releases and Air Quality Alerts (Appendix D), posted to social media (Appendix I) and conducted media interviews (Appendix I) to help inform the public of the adverse health effects

of wildfire smoke and advise the public to avoid the smoke during the wildfire event.

Table ES-2: Wildland Fires that impacted the San Joaquin Valley from August 20-24, 2020

Incident/Fire Name	Location of Incident (County)	Fire Start Date	Total Consumed Acres
Lake Napa Unit (LNU Complex)	Sonoma, Lake, Napa, Yolo, and Solano	8/17/2020	363,220
Santa Clara Unit (SCU Complex)	Stanislaus, Santa Clara, Alameda, Contra Costa, and San Joaquin	8/17/2020	396,624
Santa Cruz Unit (CZU Complex)	San Mateo and Santa Cruz	8/16/2020	86,509
Woodward	Marin	8/19/2020	4,929
River	Monterey	8/16/2020	48,088
Carmel	Monterey	8/18/2020	6,905
Dolan	Monterey	8/18/2020	124,924

This report meets all U.S. Environmental Protection Agency (EPA) documentation requirements for Exceptional Events (see Section 1). Pursuant to federal regulations, with EPA concurrence, the August 20-24, 2020 PM2.5 measurements shown in Table ES-1 would be excluded from consideration regarding the NAAQS (40 Code of Federal Regulations (CFR) 50.14(b)) and any other regulatory purposes).

The District requests that EPA concur with the exclusion from regulatory decisions the PM2.5 concentrations that were above the federal 1997 24-hour PM2.5 standard and were influenced by the wildland fires included in this demonstration. With EPA's concurrence, the San Joaquin Valley Air Pollution Control District will be able to demonstrate attainment of the federal 1997 24-hour PM2.5 standard of 65 $\mu g/m^3$.

Section I. Introduction

1.1 Overview

This Exceptional Event Demonstration shows that several San Joaquin Valley air monitoring sites were impacted by smoke from wildfires across California in 2020, causing daily PM2.5 concentrations at select sites to exceed the 1997 PM2.5 24-hour National Ambient Air Quality Standard (NAAQS) of 65 µg/m^3 over many days. Despite being on track to reach attainment of the 1997 24-hour PM2.5 NAAQS, smoke from the 2020 wildfires overwhelmed the San Joaquin Valley Air Pollution Control District's rigorous particulate matter emissions controls and led to historically high PM2.5 concentrations throughout the San Joaquin Valley. The NAAQS exceedances included in this demonstration span five days from August 20 – 24, 2020, and were the result of smoke impacts from the August Lightning Siege wildfires, as described in this document.

The District requests that EPA concur with the exclusion from regulatory decisions the specified PM2.5 concentrations in Table 8-1, which were above the federal 1997 PM2.5 24-hour standard, influenced by the wildland fires included in this demonstration, and impact regulatory decisions about the Valley's attainment of the NAAQS. The days and sites for which the District is requesting concurrence were impacted by an event consistent with EPA's definition of "unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state, or local air agencies may implement in order to attain and maintain the [NAAQS]" (USEPA, 2020a).

Table 1-1 is from Section C of the District's Initial Notification Summary Information form, which was electronically submitted to EPA on April 12, 2021, and is included in Appendix A. The 2018-2020 design values shown in Table 1-1 demonstrate the regulatory significance of excluding the exceedances that were a result of smoke impacts from the ALS Wildfires from August 20-24, 2020. EPA Region IX's response to the District's Initial Notification submittal, dated April 21, 2021, is included in Appendix A.

Table 1-1: Summary of 2018-2020 24-hour PM2.5 Design Values and Effects of Removing Selected Exceedances Influenced by Wildland Fires

Air Monitoring Stations	PM2.5 Design Values <u>including</u> wildfire-influenced exceedances	PM2.5 Design Values <u>excluding</u> wildfire-influenced exceedances
Stockton-Hazelton (06-077-1002)	69 µg/m^3	64 µg/m^3
Modesto-14th St (06-099-0005)	70 µg/m^3	65 µg/m^3
Turlock (06-099-0006)	71 µg/m^3	64 µg/m^3
Fresno-Foundry (06-019-2016)	89 µg/m^3	64 µg/m^{3*}
Hanford-Irwin (06-031-1004)	69 µg/m^3	64 µg/m^3

Air Monitoring Stations	PM2.5 Design Values including wildfire-influenced exceedances	PM2.5 Design Values excluding wildfire-influenced exceedances
Corcoran-Patterson (06-031-0004)	69 µg/m^3	64 µg/m^3
Manteca (06-077-2010)	68 µg/m^3	59 µg/m^3 *
Bakersfield-Planz (06-029-0016)	63 µg/m^3 *	55 µg/m^3 *

* Values in Table 1-1 with an "*" indicate an invalid 2020 Design Value since the value is below the NAAQS and one or more quarters in one of the three years included in the DV calculation did not meet the data completeness requirements from Appendix N to 40 CFR Part 50[2].

1.2 Clean Air Act Requirements

The U.S. Environmental Protection Agency's (EPA) 1997 PM2.5 National Ambient Air Quality Standard (NAAQS, or standard) has two components: an annual average standard of 15 micrograms per cubic meter (µg/m³), and a 24-hour average standard of 65 µg/m³. The 24-hour PM2.5 standard is met when the 98th percentile 24-hour concentration is less than or equal to 65 micrograms per cubic meter (40 CFR part 50 section 50.7). The EPA classified the Valley as a "Moderate" nonattainment area under Clean Air Act (CAA) Subpart 4 in June 2014. EPA reclassified the Valley to Serious nonattainment for the standard in April 2015. EPA did not act on 2015 Plan for the 1997 PM2.5 Standard by mandated date of July 2016 and, as a result, EPA issued a Finding of Failure to Attain by the "Serious" attainment deadline of December 2015, thus a "Serious" area 5% Plan was required[3].

On November 15, 2018, the District adopted the 2018 Plan for the 1997, 2006 and 2012 PM2.5 Standards (2018 PM2.5 Plan, or Plan) to address the federal 1997 annual PM2.5 standard of 15 µg/m³ and 24-hour PM2.5 standard of 65 µg/m³; the 2006 24-hour PM2.5 standard of 35 µg/m³; and the 2012 annual PM2.5 standard of 12 µg/m³. The California Air Resource Board (CARB) adopted the 2018 PM2.5 Plan on January 24, 2019, and on May 10, 2019, CARB submitted the Plan to EPA for incorporation into the State Implementation Plan. The attainment demonstration within the 2018 PM2.5 Plan indicated that the 24-hour 1997 PM2.5 standard would be attained by December 31, 2020. This exceptional event document shows that the Valley will be in attainment of the 1997 24-hour PM2.5 standard using 2020 design values if EPA concurs with the request to exclude the PM2.5 concentrations in Table 1-2.

1.3 Exceptional Event Rule Requirements

EPA's Treatment of Data Influenced by Exceptional Events (Exceptional Event Rule) (81 FR 68216) provides the requirements that air agencies must meet when requesting EPA to exclude exceptional event-related concentrations from regulatory determinations.

[2] Paragraph 4.2 in Appendix N to 40 CFR Part 50: https://www.ecfr.gov/cgi-bin/text-idx?SID=1453b86250dee785996e2ff5c7479b9e&mc=true&node=ap40.2.50_119.n&rgn=div9
[3] https://www.govinfo.gov/content/pkg/FR-2018-12-06/pdf/2018-26359.pdf

The following are requirements under 40 CFR 50.14(c)(3)(iv)(A–E):

A. A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s); **(See Section III of this document)**
B. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation; **(See Section IV of this document)**
C. Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement in paragraph (c)(3)(iv)(B) of this section. The Administrator shall not require a State to prove a specific percentile point in the distribution of data; **(See Section IV of this document)**
D. A demonstration that the event was both not reasonably controllable and not reasonably preventable; and **(See Section V of this document)**
E. A demonstration that the event was a human activity that is unlikely to recur at a location or was a natural event. **(See Section VI of this document)**

The Exceptional Events Rule further provides that for wildfire exceptional events, the wildfire must occur predominantly on wildland.

> 40 CFR 50.14(b)(4): *Wildfires.* The Administrator shall exclude data from use in determinations of exceedances and violations where a State demonstrates to the Administrator's satisfaction that emissions from wildfires caused a specific air pollution concentration in excess of one or more national ambient air quality standard at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Provided the Administrator determines that there is no compelling evidence to the contrary in the record, the Administrator will determine every wildfire occurring predominantly on wildland to have met the requirements identified in paragraph (c)(3)(iv)(D) of this section regarding the not reasonably controllable or preventable criterion.

The definition for "wildland" is provided in 40 CFR Part 50, §50.1(o). The term "wildland" is used in this document consistent with this definition.

> 40 CFR 50.1(o): *Wildland* means an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

This demonstration addresses the above requirements in showing that the smoke from the 2020 ALS wildfires caused the PM2.5 exceedances in the San Joaquin Valley. In addition, the District will provide the opportunity for the public to comment on this demonstration. The public comment period will be opened for 30 days.

1.4 Wildfire Impacts on the San Joaquin Valley's 24-Hour PM.25 Design Value

The 24-hour PM2.5 design value (DV) is calculated using the 3-year average 98th percentile for the maximum site anywhere in District. Figure 1-1 shows the trend of the District 24-hour PM2.5 design value through 2020. The solid blue line shows the design value including all exceptional events impacts for each year. The dotted red line represents the design value if all data impacted by wildfire exceptional events were removed from 2016 through 2020 data. This document demonstrates only selected event impacts removed from the 2020 data year. The Valley exceeded the federal 1997 24-hour PM2.5 standard as a result of extreme wildfires in 2018 and 2020 that significantly impacted Valley monitors with smoke. Table 1-2 lists the sites and concentrations that will be demonstrated in this document.

Figure 1-1: San Joaquin Valley 24-Hour PM2.5 Design Value Trend

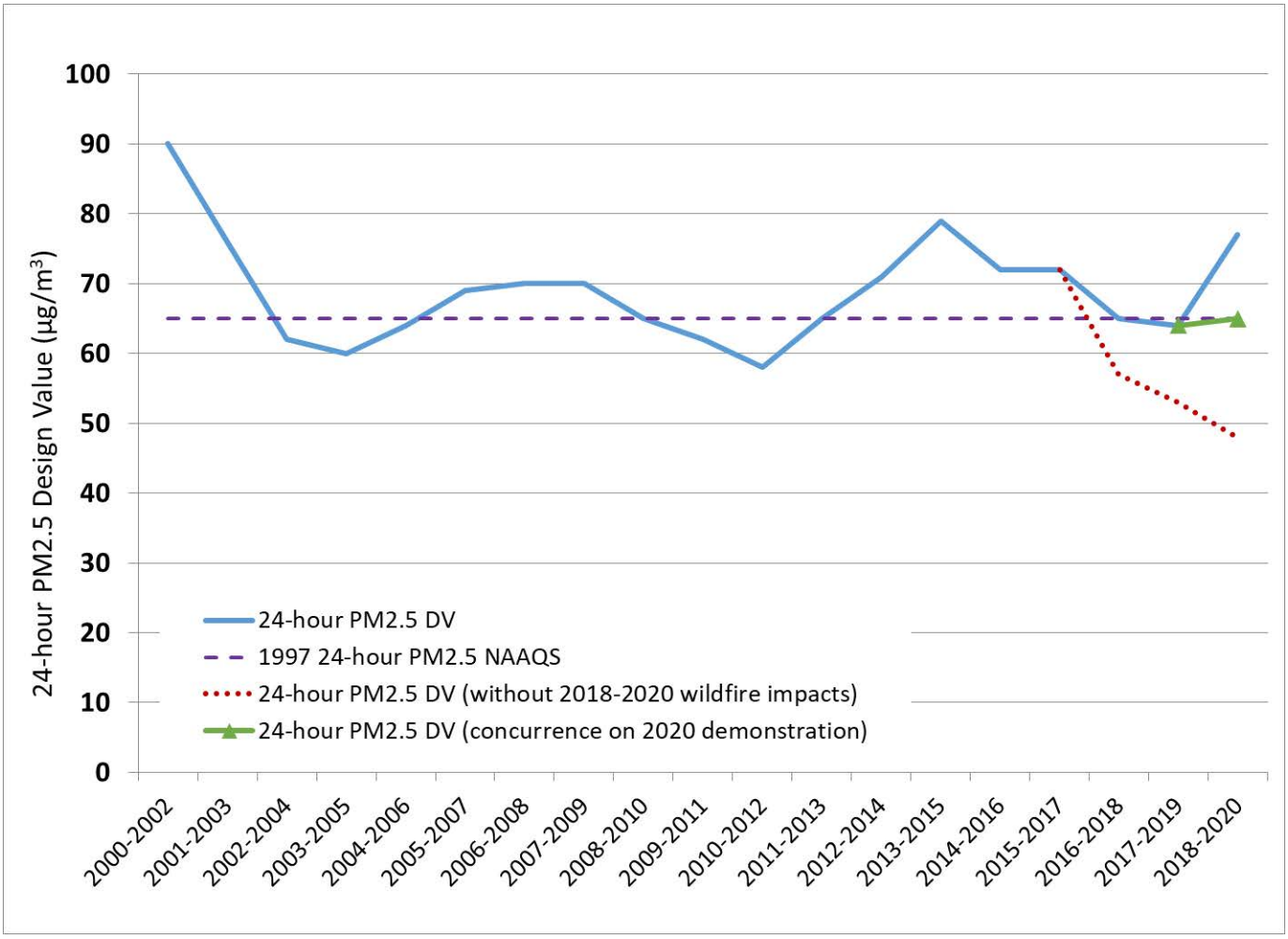


Table 1-2: Exceedances of the 1997 PM2.5 NAAQS at select San Joaquin Valley sites

	PM2.5 Concentration (µg/m³)				
Site Name	8/20/2020	8/21/2020	8/22/2020	8/23/2020	8/24/2020
Stockton-Hazelton	88.8	76.3		65.9*	78.2
Manteca	102	100.8		79.3	87.6
Modesto-14th St.	102.2	90.1	68	67.6	84.7
Turlock	108	96.5	97.2	67.7*	99.1
Fresno-Foundry	74.9	128.3	153.5	100.5	99.4
Hanford-Irwin	77*	135.1	147	116.7	107
Corcoran	69*	115.2	140.1	93.2	89.8
Bakersfield-Planz			158.6		

* These PM2.5 concentrations are not included in this exceptional event demonstration since excluding this data does not affect regulatory decisions for the 1997 24-hour PM2.5 NAAQS. These values, along with exceedances at other sites and on additional dates, may be included in analysis for future regulatory decisions.

1.5 Action Requested

This report meets all U.S. Environmental Protection Agency (EPA) documentation standards for Exceptional Events (see Section 1.4). Pursuant to federal regulations, the District requests EPA concurrence that the August 20-24, 2020, concentrations shown in Table 1-2 were caused by an exceptional event and should be excluded from regulatory decisions for the PM2.5 National Ambient Air Quality Standards and any other applicable regulatory purposes (40 CFR §50.14(b)). A copy of the AMP 350 report from EPA's AQS system is included in Appendix B and shows the data included in this demonstration has the "rt" flag applied.

Section II. Overview of San Joaquin Valley Air Pollution Control District's Ambient Air Monitoring Network

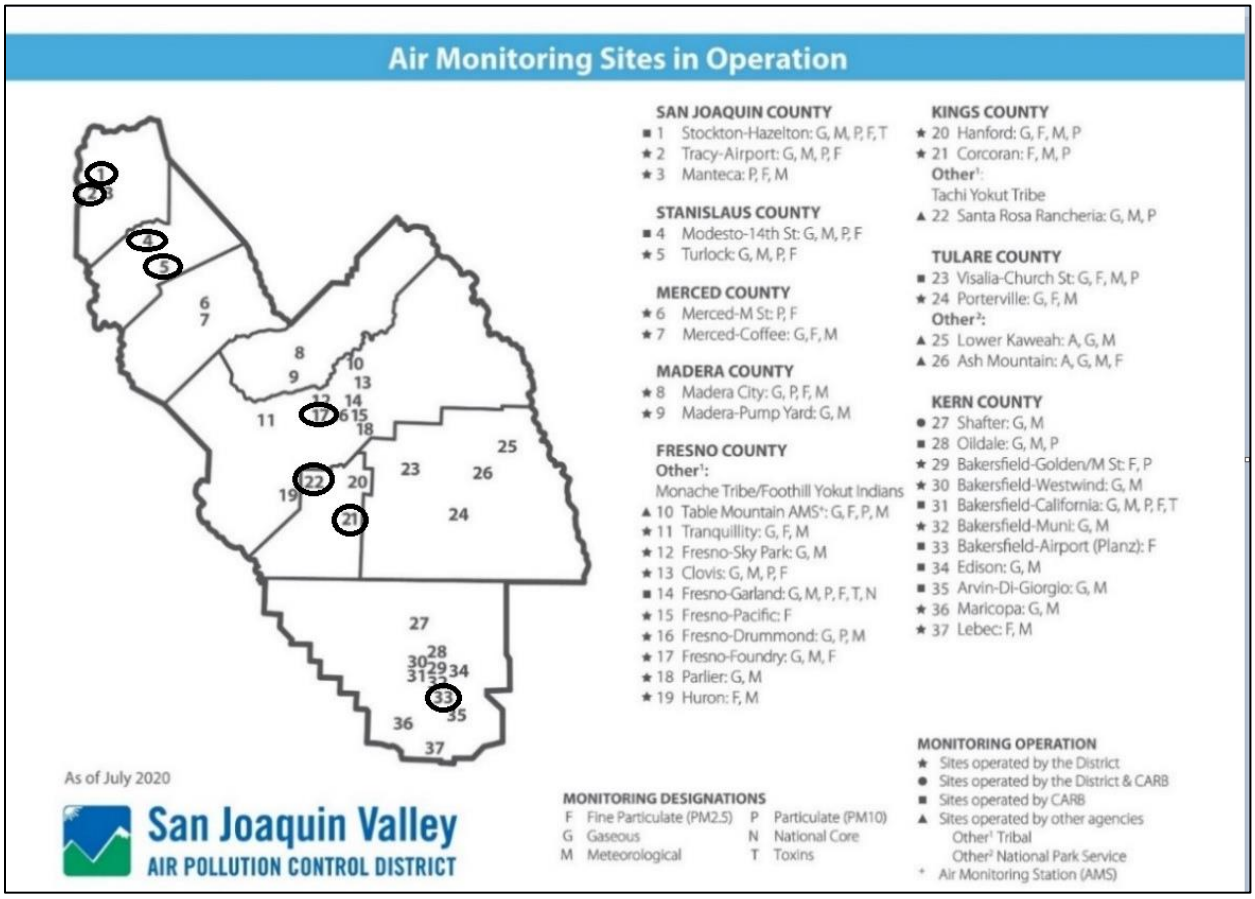
The District's air monitoring network measures a variety of pollutants and has a long record of criteria pollutant data. A map of the District's air monitoring network and the general network assessment study domain is shown in Figure 2-1. In addition to District-operated sites, there are several sites in the San Joaquin Valley that are operated by other agencies (California Air Resources Board –CARB and National Park Service) and jurisdictions (federally-recognized tribes). The District's air monitoring network measures pollutant concentrations necessary to show progress toward attainment of the NAAQS. The network also provides real-time air quality measurements used for daily air quality forecasts, residential wood-burning declarations, Air Quality Alerts, and the District's public-facing Real-time Air Advisory Network (RAAN).

Air quality monitoring networks are designed to monitor areas with high population densities, areas with high pollutant concentrations, areas impacted by major pollutant sources, and areas representative of background concentrations. Figure 2-1 shows where air monitoring sites were located throughout the San Joaquin Valley in 2020, with circles used to indicate the sites included in this demonstration. The data collected from the PM2.5 monitors in the San Joaquin Valley Air Basin is used to calculate design values for the 24-hour and annual PM2.5 standards, as outlined in EPA guidance and regulations.[4,5]

[4] Environmental Protection Agency [EPA]: Office of Air Quality Planning and Standards. (1999, April). *Guideline on Data Handling Conventions for the PM NAAQS* (EPA-454/R-99-008). Retrieved from http://www.epa.gov/ttn/oarpg/t1/memoranda/pmfinal.pdf

[5] Interpretation of the National Ambient Air Quality Standards for PM2.5, 40 CFR Pt. 50 Appendix N (2012).

Figure 2-1: San Joaquin Valley Air Monitoring Sites in 2020



The seven PM2.5 air monitoring stations that are incorporated in this exceptional event demonstration are also indicated in blue in Table 2-1. These stations are operated by either the District or CARB. Each monitor, shown below, is discussed in more detail in the District's 2020 Air Monitoring Network Plan[6]. Together, the District, CARB, and other agencies operate 37 air monitoring stations throughout the Valley. Most air monitoring sites in the Valley represent population exposures and/or maximum concentrations representative of neighborhood and regional scales.

[6] San Joaquin Valley Air Pollution Control District 2020 Air Monitoring Network Plan: https://www.valleyair.org/aqinfo/Docs/2020-Air-Monitoring-Network-Plan.pdf

Table 2-1: Particulate Matter (PM2.5) Monitoring Stations in the San Joaquin Valley

Site Name
Stockton–Hazelton
Tracy–Airport
Manteca
Modesto–14th St
Turlock
Merced–M St
Merced–Coffee
Madera–City
Tranquillity
Clovis–Villa
Fresno–Garland
Fresno–Pacific
Fresno–Foundry
Huron
Hanford–Irwin
Corcoran–Patterson
Visalia–Church St
Porterville
Sequoia–Ash Mountain
Bakersfield–Golden / M St
Bakersfield–California
Bakersfield–Airport (Planz)
Lebec

Section III. Narrative Conceptual Model

This section satisfies the following federal requirement:

A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s); (*40 CFR 50.14(c)(3)(iv)(A)*

The Exceptional Event Rule requires that demonstrations include a narrative conceptual model describing the event. This section will describe the 2020 August Lightning Siege wildland fires that affected public health and impacted District monitors and the general meteorological conditions that caused the wildfires across California to spread so quickly. PM2.5 pollution from the wildland fires smoke impacted District monitors and caused air quality concentrations that exceeded the NAAQS and were well above normal conditions across the San Joaquin Valley.

3.1 2020 August Lightning Siege Wildland Fires

Excessive fuel build-up in the California's wildlands, widespread drought-driven tree mortality, higher average temperatures, and drier conditions in recent years have contributed to extended and more intense wildfire seasons in the western United States. Leading up to the 2020 wildfire season, California experienced extreme dry conditions and hot summer temperatures that continued to scorch and desiccate wildland areas, particularly during July and August 2020. Pollutant emissions from wildfires are enormous and greatly exceed all mobile, areawide, and stationary source emissions in the Valley, easily overwhelming all control measures when smoke is transported into the San Joaquin Valley Air Basin.

In 2020, more than 9,900 wildfires were recorded in California, with nearly 4.3 million acres burned across the state, over double the previous statewide record of approximately 2 million acres burned in 2018. In addition, six of the top 20 largest wildfires in California history all occurred during 2020, highlighting the severity of the 2020 wildfire season. An extremely dry January through March 2020 period left meager moisture available. This lack of precipitation led to a rapid drying of fuels throughout California. The State plunged back into drought conditions with August being the hottest on record.[7]

Starting August 15, 2020, a severe dry lightning storm passed through the central and northern portions of California, resulting in over 15,000 lightning strikes to the surface across the region, causing hundreds of new fires to erupt across the state simultaneously. The resulting fires, later named the 2020 August Lightning Siege (ALS) wildfires, ignited the extremely dry landscape conditions. A subsequent strong high-pressure system brought hot, dry dominant winds, which promoted rapid fire growth and began what would later become the worst wildfire season in California history. According to Cal-Fire's *2020 Fire Siege* report[8],

[7] *2020 Fire Siege* report; Cal Fire, p.18, https://www.fire.ca.gov/media/hsviuuv3/cal-fire-2020-fire-siege.pdf
[8] *2020 Fire Siege* report; Cal Fire, p.20, https://www.fire.ca.gov/media/hsviuuv3/cal-fire-2020-fire-siege.pdf

> *"Fires were established simultaneously in multiple CAL Fire Units and national forests. The volume of incidents challenged available resources and immediately strained the California mutual aid system."*

Figure 3-1 shows where the wildland fires were occurring across California on August 19, 2020. The fires were occurring in the California wildland as shown in Figure 3-2, which indicates where the land ownership and wildland urban interface (WUI) is located in California. The wildland fires that directly impacted the San Joaquin Valley air quality from August 20 through August 24, 2020, are listed in Table 3-1 and their locations are shown in Figure 3-3 and Figure 3-4. For further information on how smoke from the described fires impacted the SJV, refer to section 4.3 of this document.

Figure 3-1: Wildland Fires across California on August 19, 2020

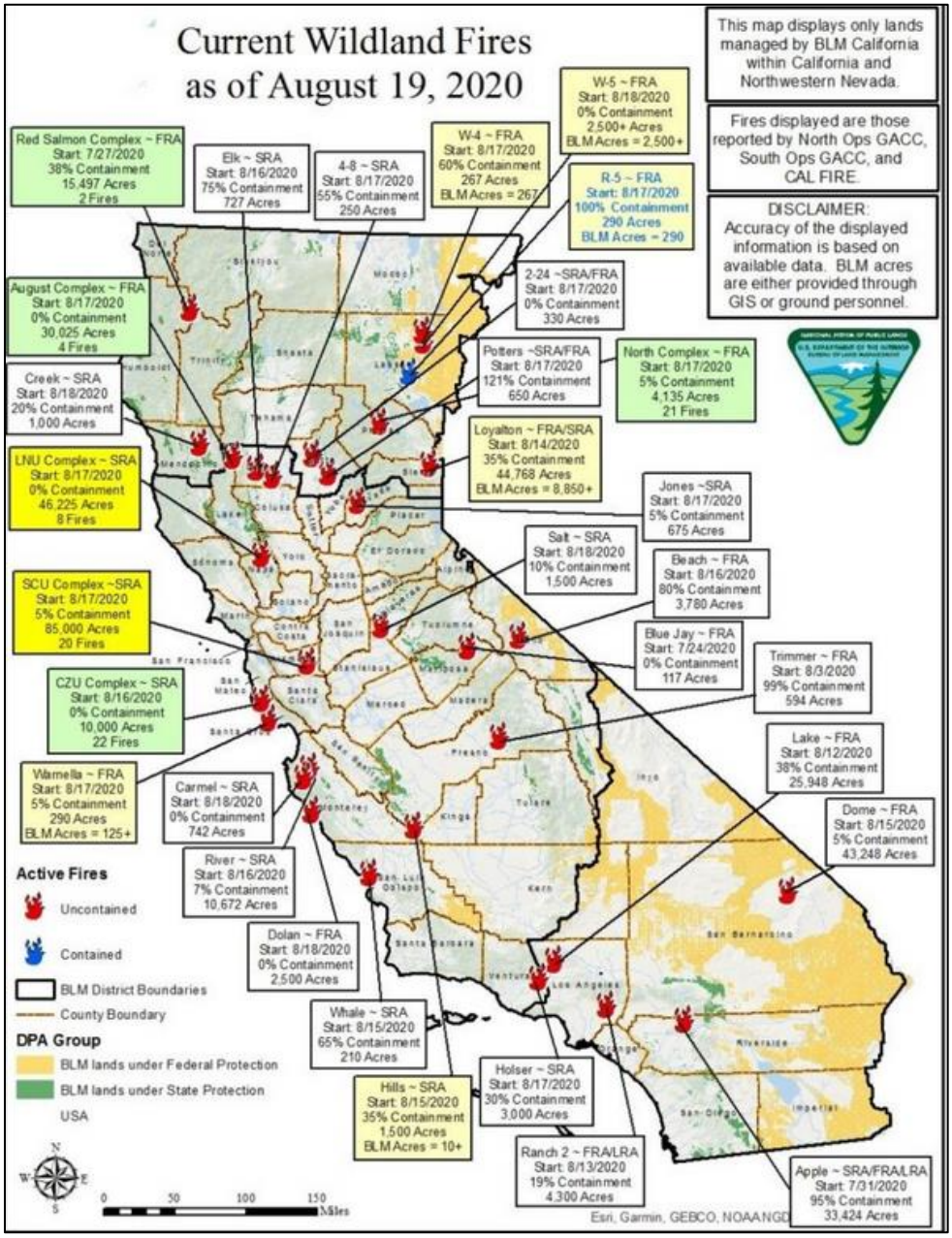


Figure 3-2: California Land Ownership and Wildland Urban Interface (WUI) Maps[9]

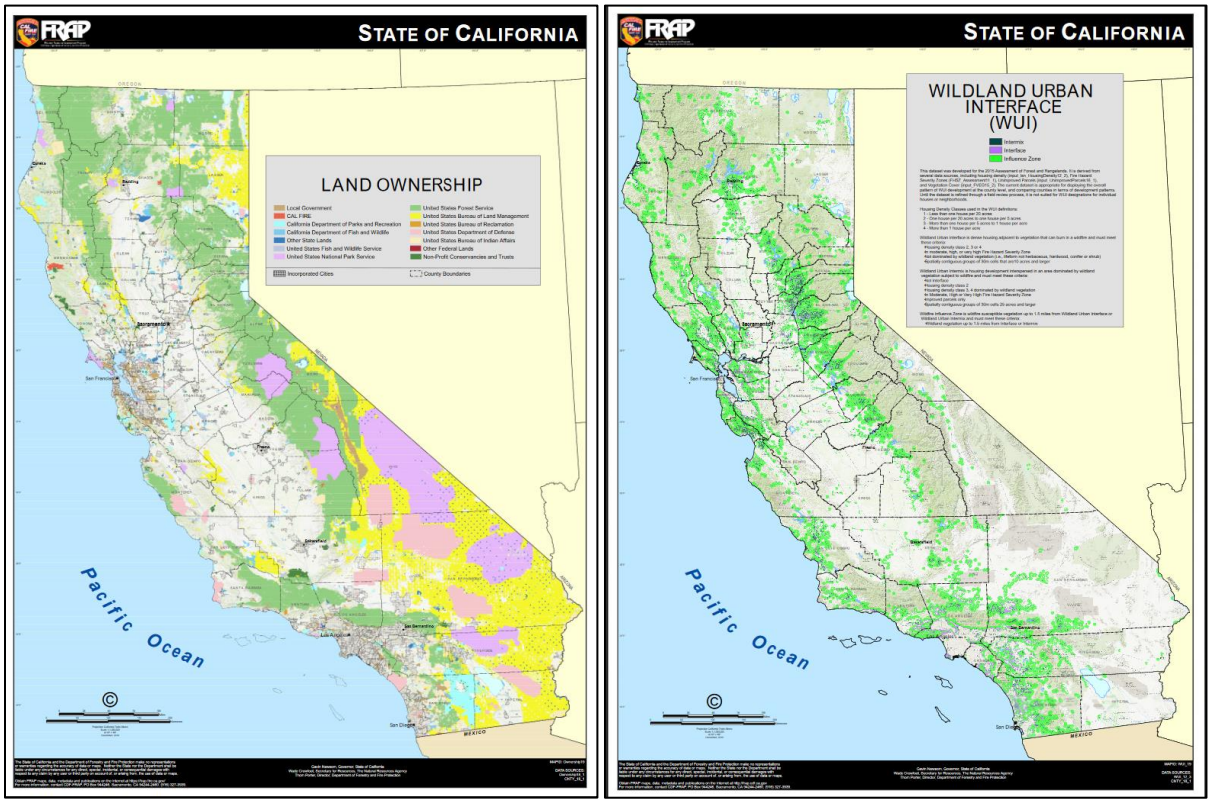


Table 3-1: Wildland Fires that impacted the San Joaquin Valley from August 20-24, 2020

Incident/Fire Name	Location of Incident (County)	Fire Start Date	Total Consumed Acres
Lake Napa Unit (LNU Complex)	Sonoma, Lake, Napa, Yolo, and Solano	8/17/2020	363,220
Santa Clara Unit (SCU Complex)	Stanislaus, Santa Clara, Alameda, Contra Costa, and San Joaquin	8/17/2020	396,624
Santa Cruz Unit (CZU Complex)	San Mateo and Santa Cruz	8/16/2020	86,509
Woodward	Marin	8/18/2020	4,929
River	Monterey	8/16/2020	48,088
Carmel	Monterey	8/18/2020	6,905
Dolan	Monterey	8/18/2020	124,924

[9] Maps obtained from the Fire and Research Assessment Program (FRAP) website, CA Department of Forestry and Fire Protection, https://frap.fire.ca.gov/

Description of Wildland Fires:

LNU:
The LNU Lightning Complex fires were a large complex of wildfires that burned from August 17 to October 2, 2020, across Sonoma, Lake, Napa, Yolo, and Solano Counties. Multiple fires merged to form the LNU Lightning Complex including the; Gamble; Hennessey, which joined with the Aetna, Green, Markley, Morgan, Round and Spanish fires; Meyers; and Walbridge, which burned with the Stewarts fire[10]. The Hennessey Fire eventually grew to 192,000 acres by itself, and the LNU Complex had a total burn area of 363,220 acres[11]. At the time of containment, the LNU Lighting Complex was the fourth-largest wildfire in the recorded history of California.

SCU:
The SCU Lightning Complex fires were a complex of wildfires that burned from August 16 to October 1, 2020, across Santa Clara, Alameda, Contra Costa, San Joaquin, Merced, and Stanislaus. The SCU Complex was comprised of approximately 20 separate fires which burned a total area of 396,624 acres[12].

CZU:
The CZU Lightning Complex wildfires burned from August 16 to September 22, 2020, across San Mateo and Santa Cruz Counties. The fires burned a total area of 86,509 acres. The complex was comprised of multiple fires, including the Waddell, Warrenella, and additional smaller fires in San Mateo and Santa Cruz counties[13].

Woodward:
The Woodward fire, originally named the 4-6 fire, burned from August 18th to October 1, 2020 across Marin County.[14] The fire burned 4,929 acres of coastal shrub, timber, brush, and chaparral due to a lightning strike within the Point Reyes National Seashore[15]. The interior of the fire continued to burn until January 12, 2021.

River:
The River fire burned from August 16 to September 4, 2020, east of Salinas, CA. During that time it burned a total of 48,088 acres, destroying 30 structures, damaging 13 structures, and injuring 4 people[16].

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[10] InciWeb developed and maintained by USDA Forest Service, Fire and Aviation Management. "LNU Lightning Complex.", https://inciweb.nwcg.gov/incident/7027/
[11] Solano County - LNU Lightning Complex Fire, https://solanocounty.com/depts/oes/lnu_lightning_complex_fire/default.asp
[12] InciWeb developed and maintained by USDA Forest Service, Fire and Aviation Management. "SCU Lightning Complex.", https://inciweb.nwcg.gov/incident/7056/
[13] InciWeb developed and maintained by USDA Forest Service, Fire and Aviation Management. "CZU August Lightning Complex.", https://inciweb.nwcg.gov/incident/7028/
[14] "Woodward Fire." National Parks Service, U.S. Department of the Interior, www.nps.gov/pore/learn/management/firemanagement_woodwardfire.htm
[15] InciWeb developed and maintained by USDA Forest Service, Fire and Aviation Management. "Woodward Fire, https://inciweb.nwcg.gov/incident/7062/
[16] California Department of Forestry and Fire Protection (CAL FIRE). "River Fire." www.fire.ca.gov/incidents/2020/8/16/river-fire/

Carmel:
The Carmel fire burned from August 18 to September 4, 2020, in Carmel Valley, CA. The fire burned a total of 6,905 acres, destroyed 73 structures, and damaged 7 structures[17]. There were no injuries from this fire.

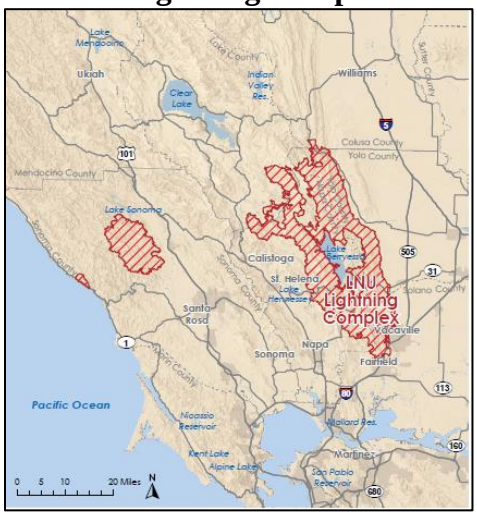
Dolan:
The Dolan fire burned from August 18 to December 31, 2020, North of Limekiln State Park, 10 miles South of Big Sur. The fire burned a total of 124,924 acres of chaparral, short grass, and brush. Due to low fuel moistures, and poor humidity a fire behavior advisory was in place in Southern California[18].

[17] California Department of Forestry and Fire Protection (CAL FIRE). "Carmel Fire www.fire.ca.gov/incidents/2020/8/18/carmel-fire/
[18] InciWeb developed and maintained by USDA Forest Service, Fire and Aviation Management. "Dolan Fire." https://inciweb.nwcg.gov/incident/7018/

Figure 3-3: Locations of Wildland Fires that impacted the San Joaquin Valley from August 20-24, 2020

Figure 3-4: Boundary Maps of Wildland Fires that impacted the San Joaquin Valley from August 20-24, 2020[19]

A. LNU Lightning Complex



B. SCU Lightning Complex

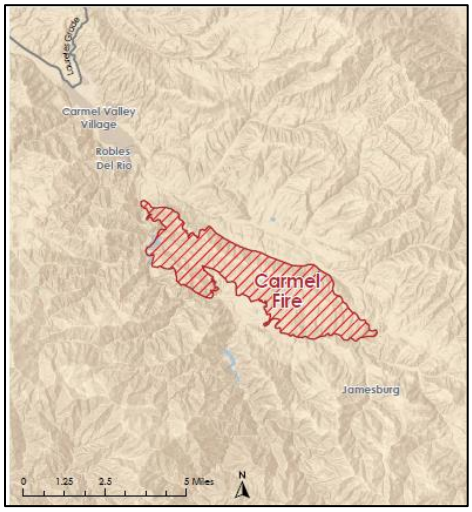
C. Woodward Fire

D. CZU Lightning Complex

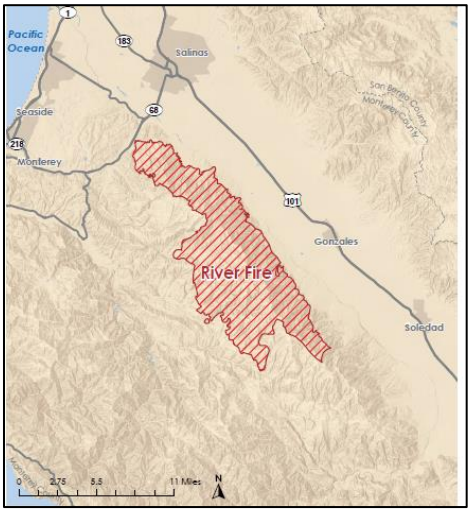
[19] *2020 Fire Siege* report; Cal Fire, p.20, https://www.fire.ca.gov/media/hsviuuv3/cal-fire-2020-fire-siege.pdf

Figure 3-4: Boundary Maps of Wildland Fires that impacted the San Joaquin Valley from August 20-24, 2020 (cont.)

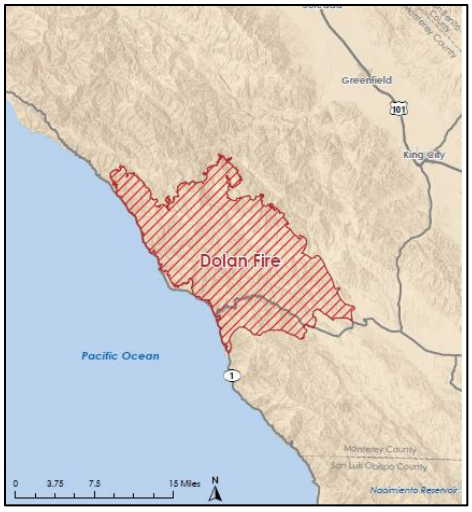
E. Carmel Fire



F. River Fire



G. Dolan Fire



3.2 Meteorological and Climatological Conditions

The summer of 2020 was much warmer than average across most of California (Figure 3-5), with much of the state experiencing record heat in the middle of August 2020. The monthly average temperatures at Bakersfield, Fresno, and Merced were 4.8°F, 4.5 °F, and 5.1°F above normal, respectively. Most of California experienced below-average precipitation from June through August 2020 (Figure 3-6) further exacerbating the drought conditions that were plaguing the state (Figure 3-7), with drought covering over 21% of California on August 18, 2020. Figure 3-5 and Figure 3-6 are courtesy of the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information website.[20]

[20] National Temperature and Precipitation Maps, National Oceanic and Atmospheric Administration (NOAA), https://www.ncdc.noaa.gov/temp-and-precip/us-maps/3/202008#us-maps-select

Figure 3-5: County Average Temperature Ranks from June through August 2020

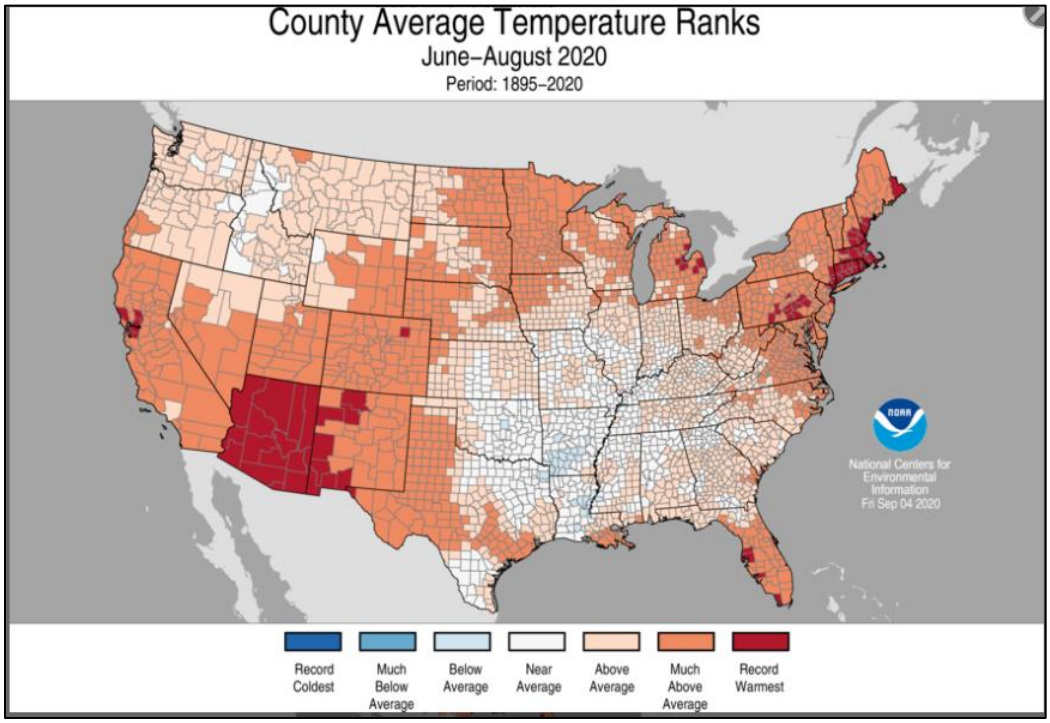
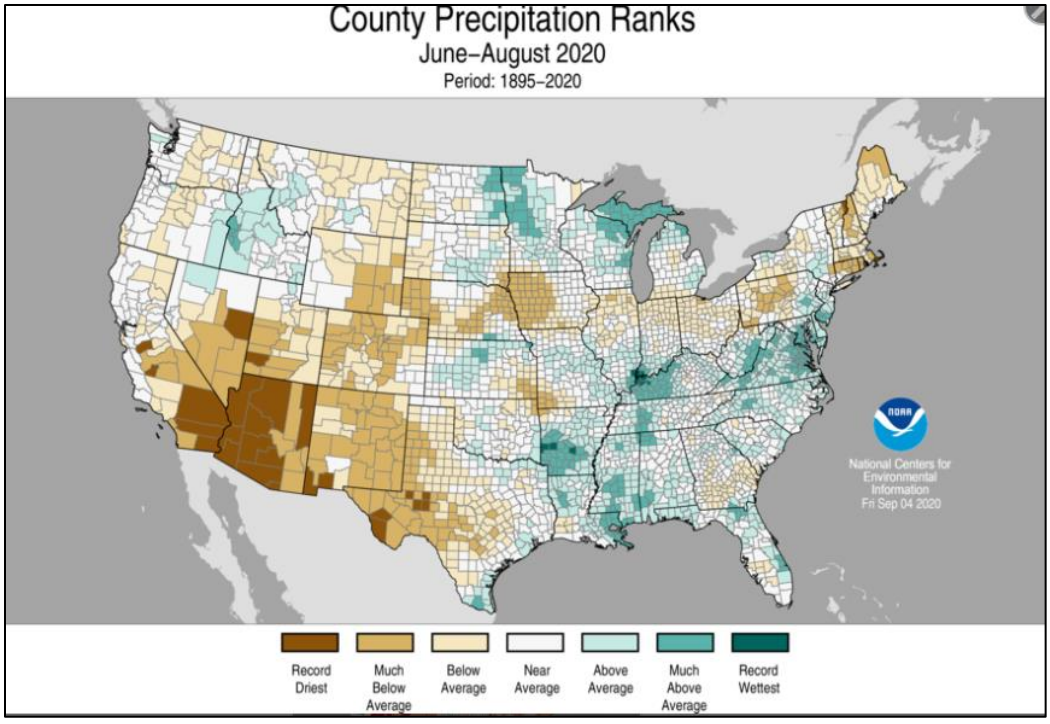
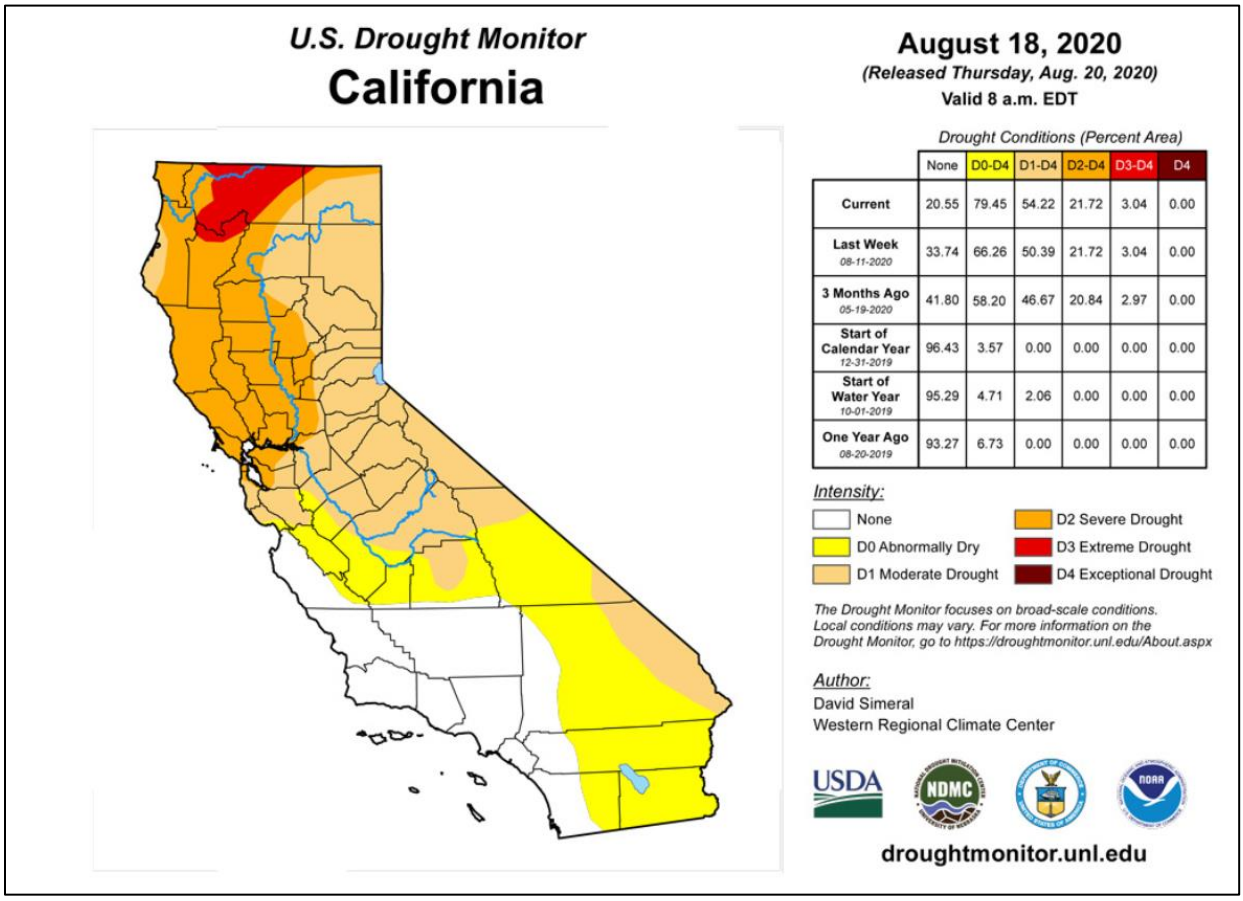


Figure 3-6: County Precipitation Ranks from June through August 2020



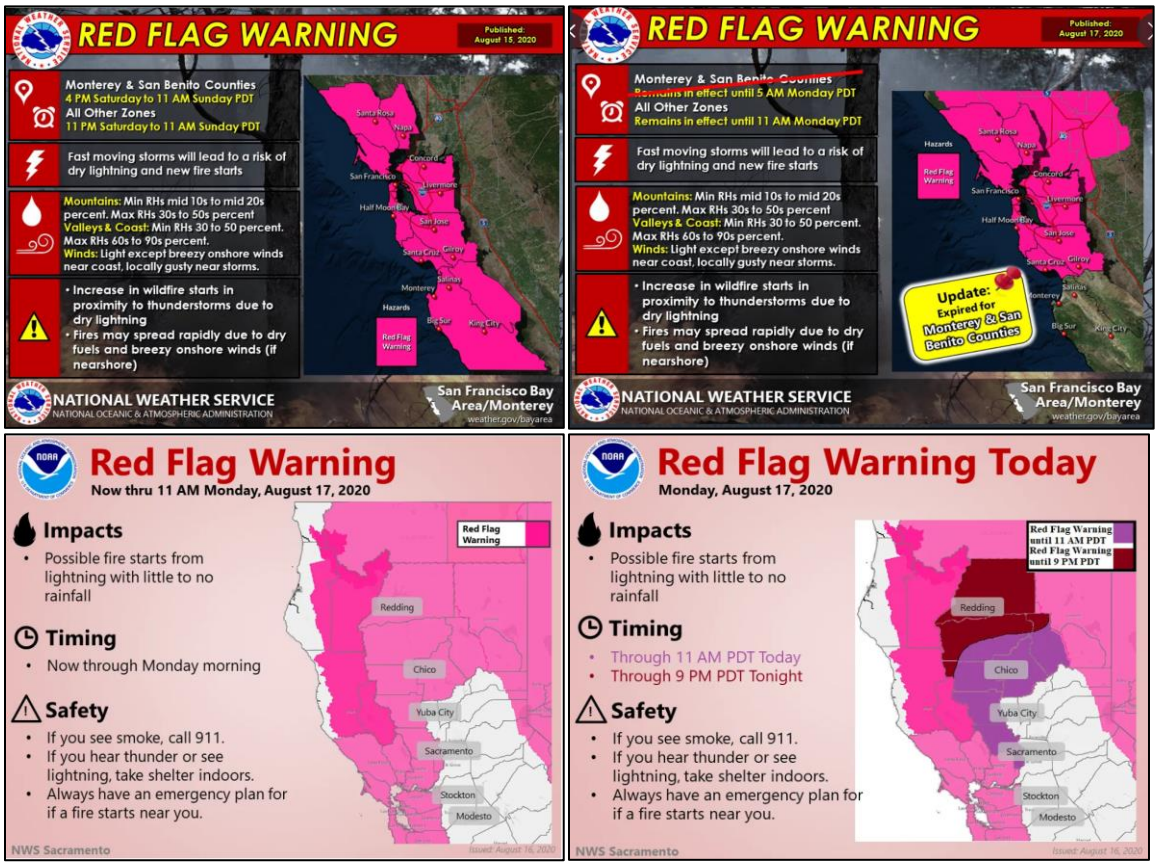
Note: Brown colors reflect drier than average conditions.

Figure 3-7: Drought conditions that existed across California on August 18, 2020



The National Weather Service (NWS) in San Francisco Bay Area and Sacramento issued a Red Flag Warning for their respective County Warning Areas (CWA), for August 15, 16, and 17, 2020, due to hot temperatures, low relative humidity, and "dry" lightning as shown in Figure 3-8.

Figure 3-8: Red Flag Warnings issued by NWS Sacramento and San Francisco Bay Area for August 15, 16 and 17, 2020



The San Francisco Bay Area National Weather Service Forecast Discussion on Sunday, August 16, 2020, at 5:09 PM PDT (Appendix C) described the thunderstorm situation and unique nature of the event.

> *"In terms of impacts the main focus is once again on t-storm chances. The last 24 hours has been quite a unique time in terms of summertime convection. This 20 year forecaster cant recall such a widespread convective event on the heels of such a heat wave. June 2008 would be a good proxy but dont recall the Bay Area getting nearly as much convection. Sept 1999 ahead of the Kirk Complex was perhaps similar as well.*
>
> *Anyway, its stunning to see the models showing a similar setup once again tonight to what was observed last evening. There is a clear moisture plume over NorCal that extends back to Tropical Storm Fausto which is located well west of Baja. It appears another shortwave/vortmax rotating out of the monsoon will eject northward once again tonight. The nam model is perhaps slightly slower than last night in the development with the 18z gfs now showing the peak period of convection somewhere between 10-15z Monday. The Oakland sounding is very wet so the storms clearly wont be purely dry.*

> *However the speed of storm movement and the very dry fuels allowed for very efficient ignition of new fires and for now would expect the same."*[21]

Due to the extreme fire danger that existed, an extraordinary amount of "dry" lightning caused wildland fires (including those identified in Table 3-1) to erupt across the region. Figure 3-9 shows a tweet posted to the official Twitter account of Cal Fire on August 19, 2020 highlighting large number of lightning strikes and new wildfires[22]. With the dry landscape and scarce resources, the swarm of fires quickly spread unimpeded, producing massive amounts of smoke emissions into the atmosphere. The resultant emissions were carried by light transport wind flow under very strong temperature inversions, causing widespread air quality impacts across California.

Figure 3-9: Tweet from Cal-Fire, August 19, 2020, Highlighting 10,849 Lightning Strikes and 367 New Wildfires

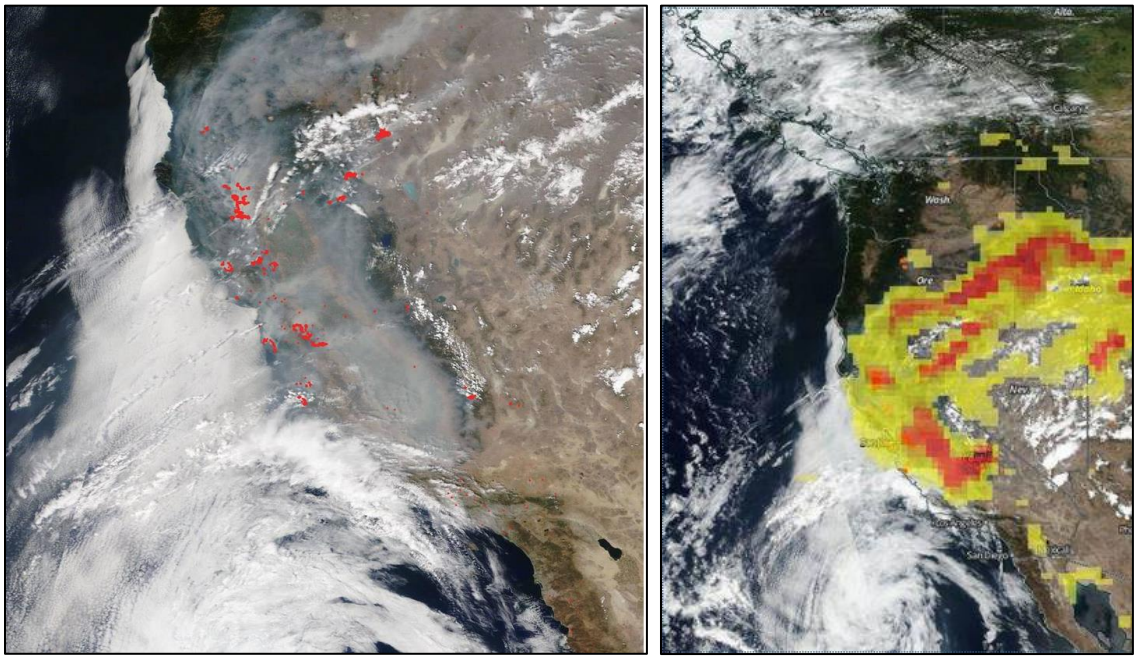
[21] "Area Forecast Discussion, NWS San Francisco Bay Area, 506 PM PDT Sun Aug 16 2020": https://mesonet.agron.iastate.edu/wx/afos/p.php?pil=AFDMTR&e=202008170009

[22] Twitter: https://twitter.com/CAL_FIRE/status/1296209793414135809

3.3 Fire Progression and Smoke Impacts

In the first week of the 2020 August Lightning Siege (ALS) wildfires (8/16/2020 – 8/23/2020), explosive fire growth burned tens-of-thousands to hundreds-of-thousands of acres per day under extreme hot, dry conditions. As the ALS wildland fires burned, they generated enormous amounts of smoke. Initially, smoke from these fires heavily impacted areas around the fires as strong high pressure resulted in light transport winds. However, a shortwave trough moving into the Pacific Northwest on August 19, 2020, enhanced the onshore (west to northwesterly) wind flow across central California, directing huge amounts of smoke emissions into the San Joaquin Valley. The spatial extent of the smoke from the wildfires was vast. The Terra satellite and Suomi NPP Aerosol image in Figure 3-10 shows the smoke covered a large portion of heavily-populated areas in northern and central California. The aerosol index provides information about the presence of particles in the air. According to NASA Worldview: "The Aerosol Index is a unit less range from < 0.00 [clear] to >=5.00, where 5.0 [deepest red] indicates heavy concentrations of aerosols that could reduce visibility or impact human health."[23] In addition, the NASA/NOAA Cloud-Aerosol Lidar and Infrared Pathfinder (CALIPSO) satellite detected smoke over California and the West Coast.

Figure 3-10: Terra Satellite (left) and Suomi NPP (right) Aerosol on August 24, 2020



Within the blue rectangle in Figure 3-11 on August 23, 2020, smoke and aerosols were detected in multiple layers of the atmosphere at the surface and around 3–5 kilometers (km) above the ground over California and the West Coast. The aerosol subtype image shows smoke (colored black) and the total attenuated backscatter image indicating strong aerosol returns coded in

[23] *"NASA's Terra Satellite Shows Smoky Pall Over Most of California"*, August 24, 2020: https://www.nasa.gov/feature/goddard/2020/nasa-s-terra-satellite-shows-smoky-pall-over-most-of-california

yellows and reds[24]. The CALIPSO orbit track is inlcuded in Figure 3-11 to show the path of the satellite over the West Coast.[25]

Figure 3-11: CALIPSO satellite image over California on August 23, 2020

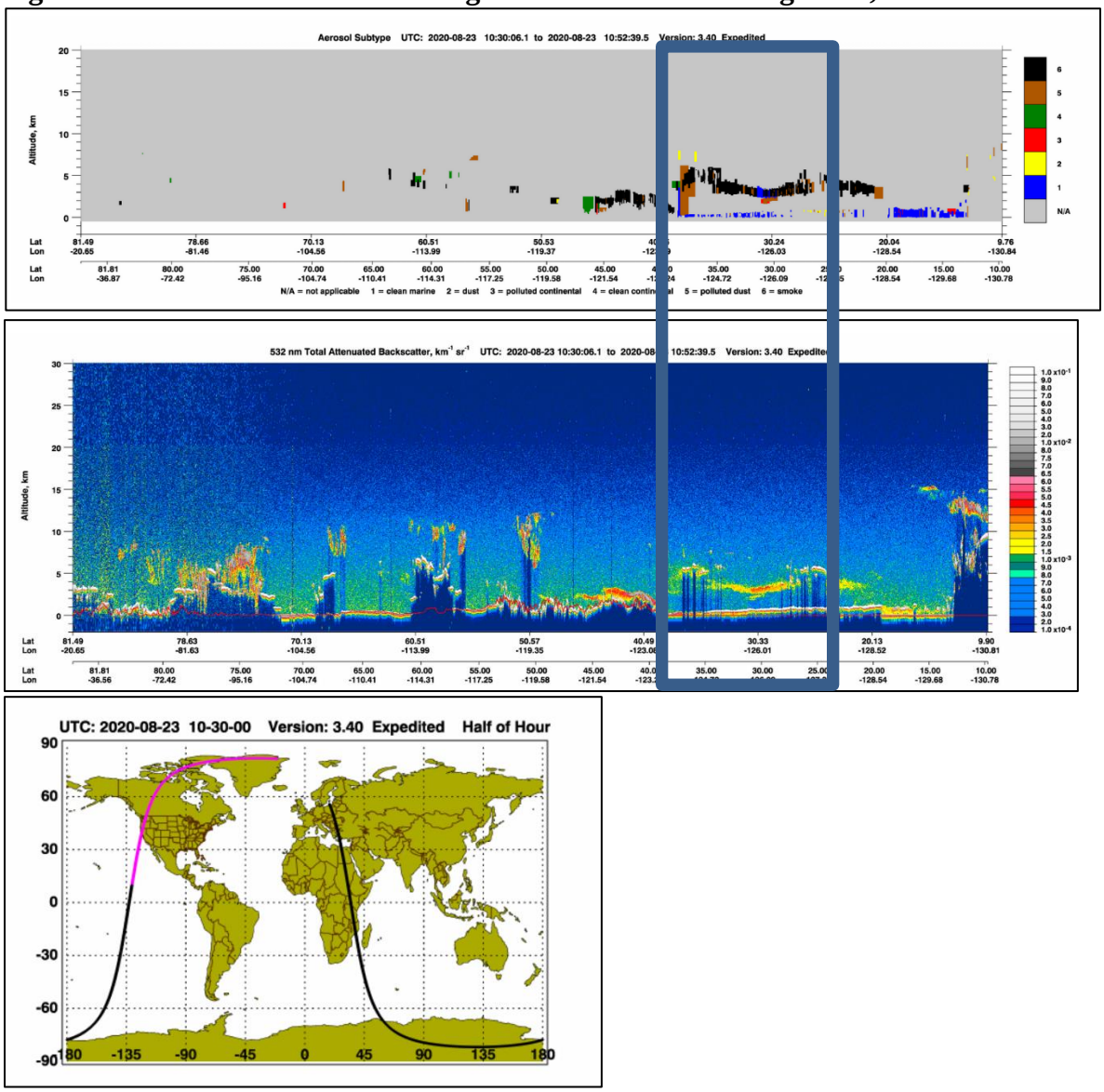


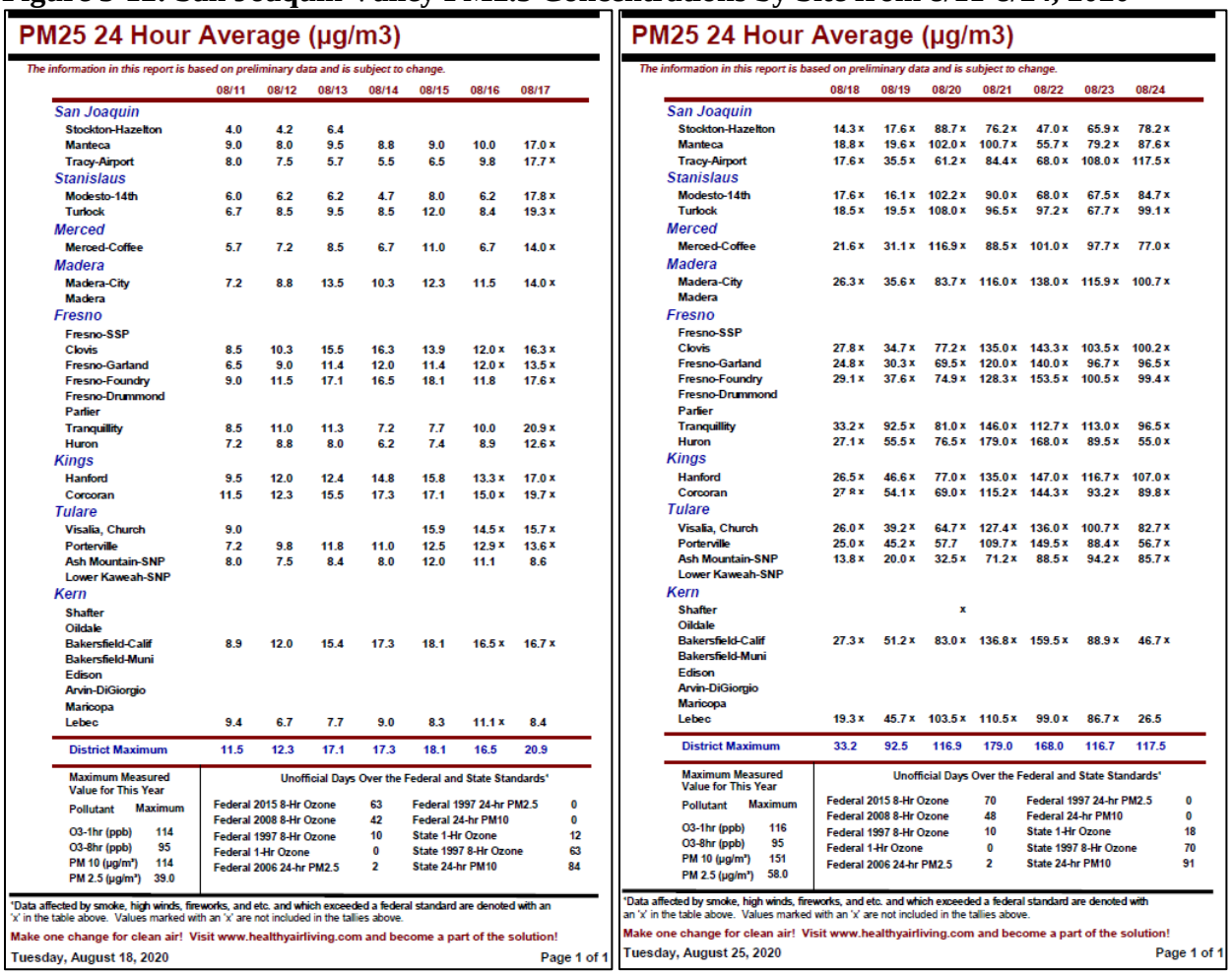
Figure 3-12 is a snapshot of the District's daily public-facing publication of criteria pollutant concentrations at all Valley sites and shows the PM2.5 concentrations prior to the 2020 August Lightning Siege wildfire impacts. PM2.5 basin-wide maximum concentrations ranged between 11.5 µg/m^3 on August 11 to 18.1 µg/m^3 on August 15, 2020. Wildfire impacted concentrations are marked by an 'x' in Figure 3-12. Shortly after the lightning fire ignitions, the PM2.5

[24] Description of CALIPSO images: https://www-calipso.larc.nasa.gov/resources/calipso_users_guide/browse/index.php

[25] CALIPSO images obtained from: https://www-calipso.larc.nasa.gov/products/lidar/browse_images/show_detail.php?s=expedited&v=V3-30&browse_date=2020-08-23&orbit_time=10-30-00&page=1&granule_name=CAL_LID_L1_Exp-Prov-V3-40.2020-08-23T10-30-00Z.hdf

concentrations rapidly climb from the basin-wide maximum PM2.5 concentration of 16.5 µg/m^3 on August 16 to 179 µg/m^3 on the peak PM2.5 concentration day of August 21, 2020. The San Joaquin Valley air monitoring network captured the smoke impacts and recorded PM2.5 concentrations in the Unhealthy to Very Unhealthy AQI range beginning on August 19 and continuing through the demonstration period of August 24, 2020. More detailed trend analysis in Appendix G.

Figure 3-12: San Joaquin Valley PM2.5 Concentrations by Site from 8/11-8/24, 2020



PM25 24 Hour Average (µg/m3)

The information in this report is based on preliminary data and is subject to change.

	08/11	08/12	08/13	08/14	08/15	08/16	08/17
San Joaquin							
Stockton-Hazelton	4.0	4.2	6.4				
Manteca	9.0	8.0	9.5	8.8	9.0	10.0	17.0 x
Tracy-Airport	8.0	7.5	5.7	5.5	6.5	9.8	17.7 x
Stanislaus							
Modesto-14th	6.0	6.2	6.2	4.7	8.0	6.2	17.8 x
Turlock	6.7	8.5	9.5	8.5	12.0	8.4	19.3 x
Merced							
Merced-Coffee	5.7	7.2	8.5	6.7	11.0	6.7	14.0 x
Madera							
Madera-City	7.2	8.8	13.5	10.3	12.3	11.5	14.0 x
Madera							
Fresno							
Fresno-SSP							
Clovis	8.5	10.3	15.5	16.3	13.9	12.0 x	16.3 x
Fresno-Garland	6.5	9.0	11.4	12.0	11.4	12.0 x	13.5 x
Fresno-Foundry	9.0	11.5	17.1	16.5	18.1	11.8	17.6 x
Fresno-Drummond							
Parlier							
Tranquillity	8.5	11.0	11.3	7.2	7.7	10.0	20.9 x
Huron	7.2	8.8	8.0	6.2	7.4	8.9	12.6 x
Kings							
Hanford	9.5	12.0	12.4	14.8	15.8	13.3 x	17.0 x
Corcoran	11.5	12.3	15.5	17.3	17.1	15.0 x	19.7 x
Tulare							
Visalia, Church	9.0				15.9	14.5 x	15.7 x
Porterville	7.2	9.8	11.8	11.0	12.5	12.9 x	13.6 x
Ash Mountain-SNP	8.0	7.5	8.4	8.0	12.0	11.1	8.6
Lower Kaweah-SNP							
Kern							
Shafter							
Oildale							
Bakersfield-Calif	8.9	12.0	15.4	17.3	18.1	16.5 x	16.7 x
Bakersfield-Muni							
Edison							
Arvin-DiGiorgio							
Maricopa							
Lebec	9.4	6.7	7.7	9.0	8.3	11.1 x	8.4
District Maximum	**11.5**	**12.3**	**17.1**	**17.3**	**18.1**	**16.5**	**20.9**

Maximum Measured Value for This Year

Pollutant	Maximum
O3-1hr (ppb)	114
O3-8hr (ppb)	95
PM 10 (µg/m³)	114
PM 2.5 (µg/m³)	39.0

Unofficial Days Over the Federal and State Standards'

Federal 2015 8-Hr Ozone	63	Federal 1997 24-hr PM2.5	0
Federal 2008 8-Hr Ozone	42	Federal 24-hr PM10	0
Federal 1997 8-Hr Ozone	10	State 1-Hr Ozone	12
Federal 1-Hr Ozone	0	State 1997 8-Hr Ozone	63
Federal 2006 24-hr PM2.5	2	State 24-hr PM10	84

'Data affected by smoke, high winds, fireworks, and etc. and which exceeded a federal standard are denoted with an 'x' in the table above. Values marked with an 'x' are not included in the tallies above.

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PM25 24 Hour Average (µg/m3)

The information in this report is based on preliminary data and is subject to change.

	08/18	08/19	08/20	08/21	08/22	08/23	08/24
San Joaquin							
Stockton-Hazelton	14.3 x	17.6 x	88.7 x	76.2 x	47.0 x	65.9 x	78.2 x
Manteca	18.8 x	19.6 x	102.0 x	100.7 x	55.7 x	79.2 x	87.6 x
Tracy-Airport	17.6 x	35.5 x	61.2 x	84.4 x	68.0 x	108.0 x	117.5 x
Stanislaus							
Modesto-14th	17.6 x	16.1 x	102.2 x	90.0 x	68.0 x	67.5 x	84.7 x
Turlock	18.5 x	19.5 x	108.0 x	96.5 x	97.2 x	67.7 x	99.1 x
Merced							
Merced-Coffee	21.6 x	31.1 x	116.9 x	88.5 x	101.0 x	97.7 x	77.0 x
Madera							
Madera-City	26.3 x	35.6 x	83.7 x	116.0 x	138.0 x	115.9 x	100.7 x
Madera							
Fresno							
Fresno-SSP							
Clovis	27.8 x	34.7 x	77.2 x	135.0 x	143.3 x	103.5 x	100.2 x
Fresno-Garland	24.8 x	30.3 x	69.5 x	120.0 x	140.0 x	96.7 x	96.5 x
Fresno-Foundry	29.1 x	37.6 x	74.9 x	128.3 x	153.5 x	100.5 x	99.4 x
Fresno-Drummond							
Parlier							
Tranquillity	33.2 x	92.5 x	81.0 x	146.0 x	112.7 x	113.0 x	96.5 x
Huron	27.1 x	55.5 x	76.5 x	179.0 x	168.0 x	89.5 x	55.0 x
Kings							
Hanford	26.5 x	46.6 x	77.0 x	135.0 x	147.0 x	116.7 x	107.0 x
Corcoran	27.8 x	54.1 x	69.0 x	115.2 x	144.3 x	93.2 x	89.8 x
Tulare							
Visalia, Church	26.0 x	39.2 x	64.7 x	127.4 x	136.0 x	100.7 x	82.7 x
Porterville	25.0 x	45.2 x	57.7	109.7 x	149.5 x	88.4 x	56.7 x
Ash Mountain-SNP	13.8 x	20.0 x	32.5 x	71.2 x	88.5 x	94.2 x	85.7 x
Lower Kaweah-SNP							
Kern							
Shafter			x				
Oildale							
Bakersfield-Calif	27.3 x	51.2 x	83.0 x	136.8 x	159.5 x	88.9 x	46.7 x
Bakersfield-Muni							
Edison							
Arvin-DiGiorgio							
Maricopa							
Lebec	19.3 x	45.7 x	103.5 x	110.5 x	99.0 x	86.7 x	26.5
District Maximum	**33.2**	**92.5**	**116.9**	**179.0**	**168.0**	**116.7**	**117.5**

Maximum Measured Value for This Year

Pollutant	Maximum
O3-1hr (ppb)	116
O3-8hr (ppb)	95
PM 10 (µg/m³)	151
PM 2.5 (µg/m³)	58.0

Unofficial Days Over the Federal and State Standards'

Federal 2015 8-Hr Ozone	70	Federal 1997 24-hr PM2.5	0
Federal 2008 8-Hr Ozone	48	Federal 24-hr PM10	0
Federal 1997 8-Hr Ozone	10	State 1-Hr Ozone	18
Federal 1-Hr Ozone	0	State 1997 8-Hr Ozone	70
Federal 2006 24-hr PM2.5	2	State 24-hr PM10	91

'Data affected by smoke, high winds, fireworks, and etc. and which exceeded a federal standard are denoted with an 'x' in the table above. Values marked with an 'x' are not included in the tallies above.

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Table 3-2 shows the number of acres burned, percent contained, and excerpts from the Bay Area and Hanford National Weather Service Area Forecast Discussions from August 17 through August 24, 2020, with the containment date listed for the Lake Napa Unit (LNU) Complex fire. In addition, Table 3-3 shows the Santa Clara Unit (SCU), Santa Cruz Unit (CZU), Woodward, Carmel, River, Dolan Fires number of acres burned, and percent contained. The excerpts describe the extreme dry thunderstorm activity that sparked the event to the stifling heat and poor air quality that followed. In addition, the Hanford National Weather Service Area Forecast Discussion on August 19 2:10 PM stated the following:

"The main concern for our area for the next few days will be smoke from several large uncontrolled wildfires in the region. The smoke will reduce visibility and air quality over our area for the next several days."[26]

Table 3-2: Timeline of Lake Napa Unit (LNU Complex) Containment and National Weather Service Forecasts

Date	Fire Burned (acres)	Percent Contained	Excerpts from San Francisco Bay Area (NWS Bay Area) and Hanford (NWS Hanford) National Weather Service Forecast Discussion (Issued by: NWS Bay Area or NWS Hanford, CA; Times in PDT)
8/17/2020	Ignition-2,400	0%	**NWS Bay Area:** The synoptic scale pattern has not varied much since yesterday with a 600dm 500mb monsoon ridge centered over Vegas ... Any thunderstorms that do develop will move quickly with lightning strikes outpacing any unlikely) wetting rains at the surface... Finally, the final concern aside from the heat and thunderstorms is the number of active wildfires that started after Saturday night's extreme lightning event (2:55 AM).
8/18/2020	32,025	0%	**NWS Bay Area:** While many on social media are sharing their picturesque qualities, the have initiated a number of fires around the Bay Area and the Central Coast injecting smoke into the upper atmosphere. Smoke and haze is expected to remain aloft, lingering around the South Bay and southward through Monterey County, decreasing through Tuesday. (2:55 AM). **NWS Hanford:** Otherwise, much of the central California interior will be plagued by stifling heat and humidity and areas of smoke aloft with continued poor air quality in the San Joaquin Valley. (2:34 PM)

[26] "Area Forecast Discussion, NWS Hanford, 210 PM PDT Wed Aug 19, 2020": https://mesonet.agron.iastate.edu/wx/afos/p.php?pil=AFDHNX&e=202008192110

Date	Fire Burned (acres)	Percent Contained	Excerpts from San Francisco Bay Area (NWS Bay Area) and Hanford (NWS Hanford) National Weather Service Forecast Discussion (Issued by: NWS Bay Area or NWS Hanford, CA; Times in PDT)
8/19/2020	124,100	0%	**NWS Hanford:** The main concern for our area for the next few days will be smoke from several large uncontrolled wildfires in the region. The smoke will reduce visibility and air quality over our area for the next several days. An Air Quality Alert remains in effect for the San Joaquin Valley through next Tuesday. (2:10 PM) **NWS Bay Area:** We have received a number of reports tonight from spotters receiving fine scale ash coating parts of their residential exteriors. HRRRx model is displaying smoke and haze through Wednesday, mainly with a southeasterly flow, on account of the prevailing northwest surface wind pattern. While there are a number of wildfires around the region we could talk about, just wanted to mention one that may have an impact to our operations: the CZU Lightning Complex, located on the border of San Mateo and Santa Cruz Counties in the Santa Cruz Mountains. With mostly northwest flow, all smoke and haze are traveling to the southeast of the complex. (2:58 AM)
8/20/2020	215,000	0%	**NWS Hanford:** Particle pollution, mainly in the form of smoke and haze will impact most of Central California for the next several days. Ash from surrounding wildfires may fall in Merced County, especially Friday. Exposure to this level of particle pollution may cause health problems, aggravate lung disease, cause asthma attacks, and increase the risk of respiratory infections. Avoid prolonged outdoor physical activities and remain indoors if possible. (3:19 AM) **NWS Bay Area:** Extremely busy morning so will keep this short. Currently dealing with numerous fires across most of our wooded areas that have showed explosive growth as the mid to late afternoon sea breeze hits the fires during the period of the lowest humidity/hottest temperatures. (9:30 AM)

Date	Fire Burned (acres)	Percent Contained	Excerpts from San Francisco Bay Area (NWS Bay Area) and Hanford (NWS Hanford) National Weather Service Forecast Discussion (Issued by: NWS Bay Area or NWS Hanford, CA; Times in PDT)
8/21/2020	302,388	15%	**NWS Hanford:** The big story on Thursday was the heavy smoke that has settled into the area from the surrounding wildfires. Smoke has reduced visibilities in the valley to as low as 2 miles, and there was even some tiny specs of ash falling from the sky this morning in Hanford. It's looking as though we'll keep the smoke and very poor air quality for today and at least through the weekend. Best thing to do is limit your time outdoors, close all windows and turn on the air conditioner. (4:20 AM) **NWS Bay Area:** The many fire complexes burning around the Bay Area and Central Coast will keep skies hazy and smoky, at least in the short term. (3:00 AM)
8/22/2020	325,128	15%	**NWS Hanford:** Smoke from area fires continues to plague the region, producing poor air quality across much of our area. The smoke has also been thick enough to limit insolation in many locations, shaving a few degrees off of high temperatures, mainly in the San Joaquin Valley and surrounding hills. (4:24 AM) **NWS Bay Area:** Additionally, this nose of high pressure will weaken winds today and, in conjunction with an approaching boundary associated with a trough to the northwest, result in the backing of what has been predominate northwest winds towards westerly winds through the day before settling on southwest winds across the region late tonight into Sunday. ...Given that we already have numerous wildfires burning in complex terrain and with very little containment, this wind shifts and potential increase through coastal/mountain gaps could cause local aggravations of the fire lines in areas exposed to these winds, primarily the coastal and southern flank of the LNU complex and through the mountain passes near the SCU complex. Subtle shifts towards more southwesterly favored winds overnight at other fires is possible as well, such as the River and Carmel, while the CZU complex remains more driven by coastal winds and the Monterey Bay "otter eddy" (there is no one solution to the different wildfires given complex terrain, microclimates, and fuels). (10:12 AM)

Date	Fire Burned (acres)	Percent Contained	Excerpts from San Francisco Bay Area (NWS Bay Area) and Hanford (NWS Hanford) National Weather Service Forecast Discussion (Issued by: NWS Bay Area or NWS Hanford, CA; Times in PDT)
8/23/2020	347,630	21%	**NWS Hanford:** Unfortunately, smoke from the surrounding wildfires will continue to impact much of Central California with unhealthy air quality for at least the next couple of days and perhaps longer. We will continue to coordinate with the local air pollution control districts regarding this situation. Visibility of around a couple of miles, and possibly lower at times, will likely last for the early part of this week, due to this smoke. Until these fires are extinguished, expect at least some hazy skies to persist beyond this period, especially over the Central Valley. Winds will be generally light through at least Monday, as we are situated under the western edge of the upper-level high pressure (2:13 AM) **NWS Bay Area:** Smoky and hazy conditions are expected through the course of the day. (9:06 AM)
8/24/2020	351,817	25%	**NWS Hanford:** Continuation of smoke across the forecast area for the next few days due to widespread fires throughout California. (1:29 PM) **NWS Bay Area**: As for the week ahead, smoke and haze from the fires is expected to linger over the region for the next few days as firefighting efforts continue across the State. (3:03 AM)
10/2/2020	363,220	100%	Date Contained

Table 3-3: Santa Clara Unit (SCU), Santa Cruz Unit (CZU), Woodward, Carmel, River, Dolan Containment

Note: For NWS Forecast Excerpts for each day, see Table 3-2 above.

Wildland Fire Name	Date	Fire Burned (acres)	Percent Contained
Santa Clara Unit (SCU Complex) Started 8/17/2020	8/17/2020	Ignition-25,000	0%
	8/18/2020	35,000	0%
	8/19/2020	102,000	5%
	8/20/2020	157,475	5%
	8/21/2020	274,968	10%
	8/22/2020	339,968	10%
	8/23/2020	343,965	10%
	8/24/2020	360,055	15%
	10/1/2020	396,624	100%
Santa Cruz Unit (CZU Complex) Started 8/16/2020	8/16/2020	Ignition-90	0%
	8/17/2020	1,000	0%
	8/18/2020	7,500	0%
	8/19/2020	10,000	0%
	8/20/2020	40,000	0%
	8/21/2020	50,000	0%
	8/22/2020	63,000	5%
	8/23/2020	71,000	8%
	8/24/2020	78,000	13%
	9/22/2020	86,509	100%
Woodward (Started 8/18/2020)	8/18/2020	Ignition-700	0%
	8/19/2020	1,100	0%
	8/20/2020	1,500	0%
	8/21/2020	2,000	0%
	8/22/2020	2,259	5%
	8/23/2020	2,487	5%
	8/24/2020	2,739	5%
	10/2/2020	4,929	100%
Carmel (Started 8/18/2020)	8/18/2020	Ignition-1,200	0%
	8/19/2020	2,150	0%
	8/20/2020	4,285	0%
	8/21/2020	4,732	0%
	8/22/2020	5,523	5%
	8/23/2020	6,695	10%
	8/24/2020	6,695	20%
	8/25/2020	6,695	30%
	1/11/2021	6,905	100%
River	8/16/2020	Ignition-2,800	10%

Wildland Fire Name	Date	Fire Burned (acres)	Percent Contained
(Started 8/16/2020)	8/17/2020	3,793	10%
	8/18/2020	4,509	7%
	8/19/2020	15,050	7%
	8/20/2020	33,653	7%
	8/21/2020	39,464	9%
	8/22/2020	44,957	12%
	8/23/2020	Unavailable	15%
	8/24/2020	Unavailable	23%
	9/4/2020	48,088	100%
Dolan (Started 8/18/2020)	8/19/2020	Ignition- 2,500	0%
	8/20/2020	6,700	0%
	8/21/2020	6,780	0%
	8/22/2020	8,500	0%
	8/23/2020	14,000	10%
	8/24/2020	19,267	10%
	12/31/2020	124,924	100%

Figures 3-13 (a-h) show Surface Analysis Weather Maps for August 17–24, 2020, 15 Z (8:00 AM Pacific Daylight Time (PDT)) from the National Weather Service Weather Prediction Center.[27] Figure 3-14 (a-h) depicts 500 millibar (MB) Analysis Weather maps for August 17–24 12Z (5:00 AM PDT) from National Weather Service Storm Prediction Center.[28] These maps show the state of the atmosphere from August 17–24, 2020. The surface map from August 17, 2020, depicts Tropical Storm Fausto south to southwest of California, with surface high pressure firmly established over the western United States. A very strong high pressure ridge was centered over western Utah. Monsoonal and remnant moisture from dissipating Tropical Storm Fausto streamed over California, resulting in widespread dry lightning occurring across a parched California landscape. The pressure analysis in these figures shows weak pressure gradients over much of California from August 17–18, which caused stagnant conditions. However, a shortwave trough moving into the Pacific Northwest on August 19, 2020, enhanced the onshore (west to northwesterly) wind flow across central California, directing huge amounts of smoke emissions from the fires in the California Coastal Range and Coast into the San Joaquin Valley. Shortly thereafter, the high pressure ridge rebuilt over the region causing poor dispersion conditions to trap smoke over the Valley.

According to National Weather Service Hanford August 2020 Weather Summary for the Central California Interior,

> *Temperatures began to moderate by the afternoon of the 19th, as dense smoke from surrounding large wildfires (quite a few ignitions due to lightning) near the Central*

[27] Weather Prediction Center Surface Analysis Archive, National Weather Service: https://www.wpc.ncep.noaa.gov/archives/web_pages/sfc/sfc_archive_maps.php?arcdate=08/17/2020&selmap=2020081715&maptype=namussfc

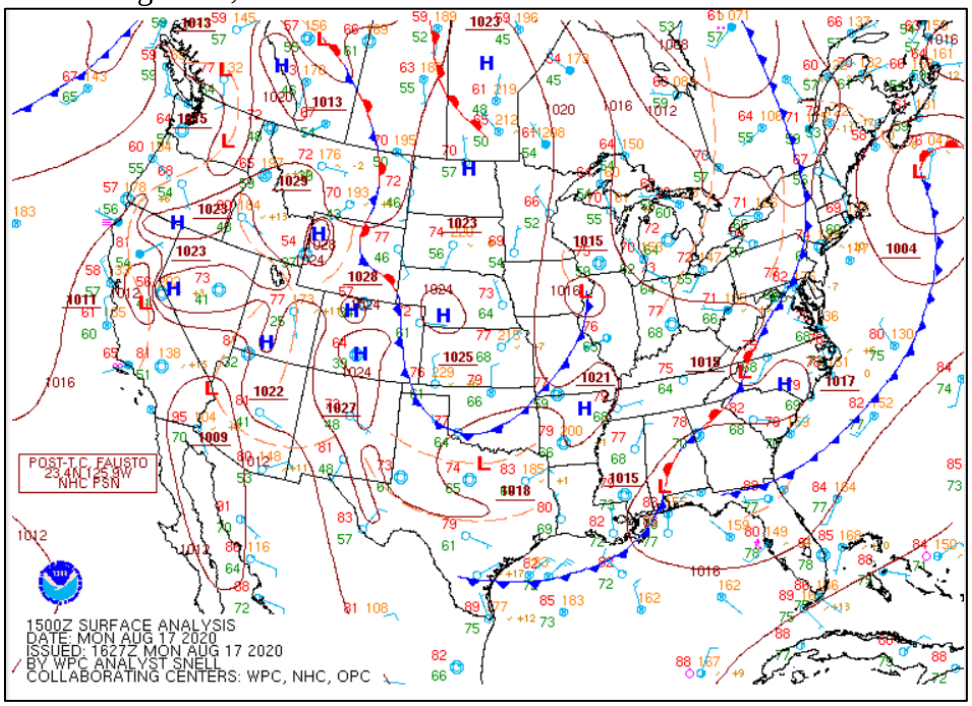
[28] Surface and Upper Air Maps, Storm Prediction Center, NOAA, https://www.spc.noaa.gov/obswx/maps/

> *California coast and in Northern California filtered out much of the sunlight. The dense smoke and ash reached the ground in much of the region over the next several days, or from the 19th and afterward. As a result, haze reduced visibility to around a half mile or less at times, but failed to improve beyond 2-3 miles during this period.*[29]

From the analysis of the surface charts in Figure 3-13, there is no frontal activity across central California that would produce wind and precipitation that could reduce smoke concentrations. The weather conditions depicted on the charts were consistent with persistent heavy smoke production from the 2020 August Lightning Siege wildfires and increasing concentrations throughout California as the smoke inundated and remained over the region under stable high pressure conditions. The high pressure finally began to weaken on August 24, allowing for a slight reprieve to the elevated PM2.5 concentrations that had been plaguing the San Joaquin Valley. Smoke and air quality impacts continued through most of the summer as wildfires continued to ravage California until early November. Finally, a low pressure system moved through the area with enough energy to scour the smoke and pollution out of the Valley on November 7. This system also produced enough precipitation to quell the worst wildfire season in California history.

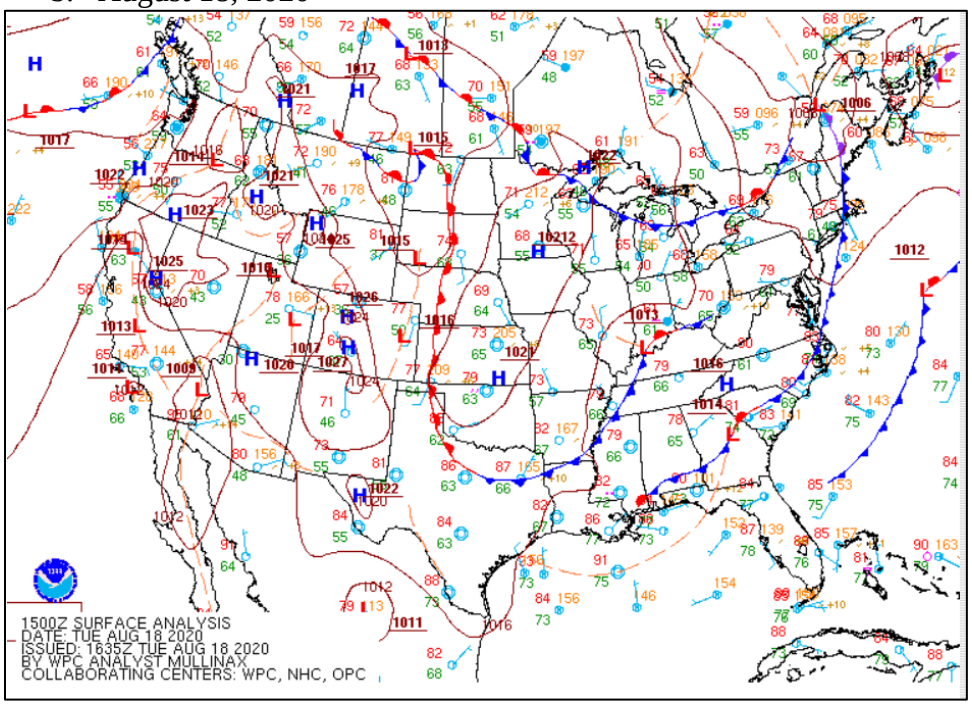
Figure 3-13 (a-h): National Weather Service Weather Prediction Center (August 17 – August 24, 2020) CONUS Surface Analysis (15Z = 8 AM PDT)

a. August 17, 2020

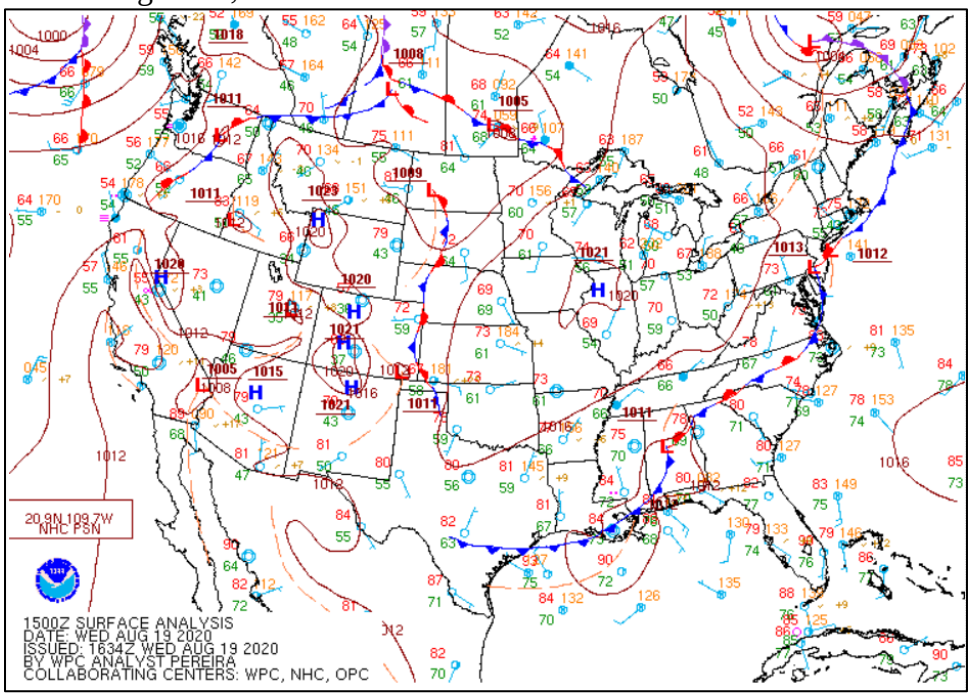


[29] "*August 2020 Weather Summary for the Central California Interior*", NWS Hanford, https://www.wrh.noaa.gov/hnx/wxsummaries/2020/AUGUST%202020%20WEATHER%20SUMMARY.pdf

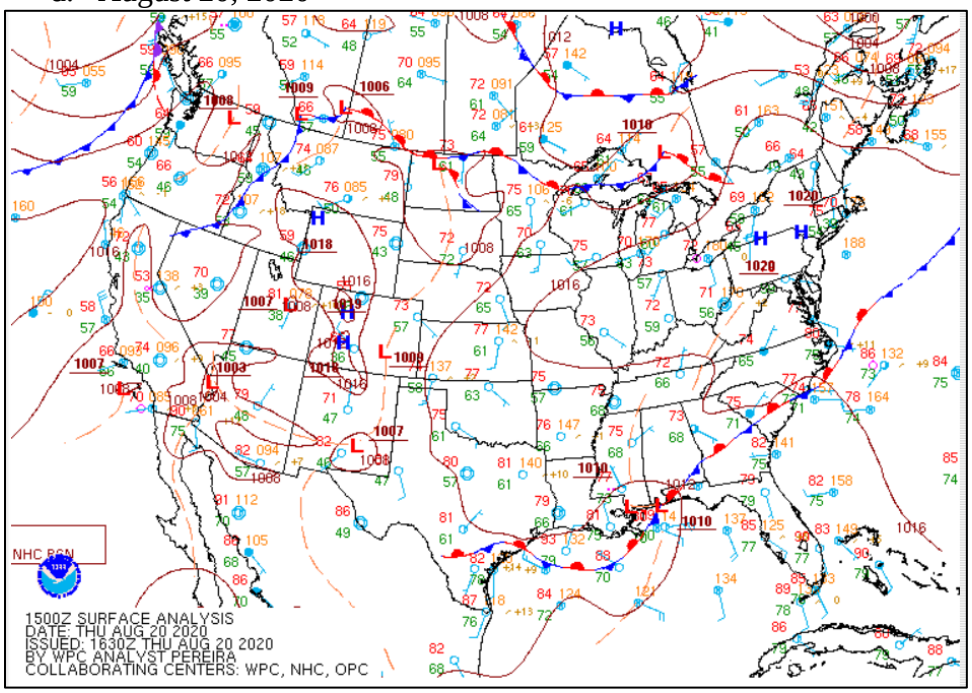
b. August 18, 2020



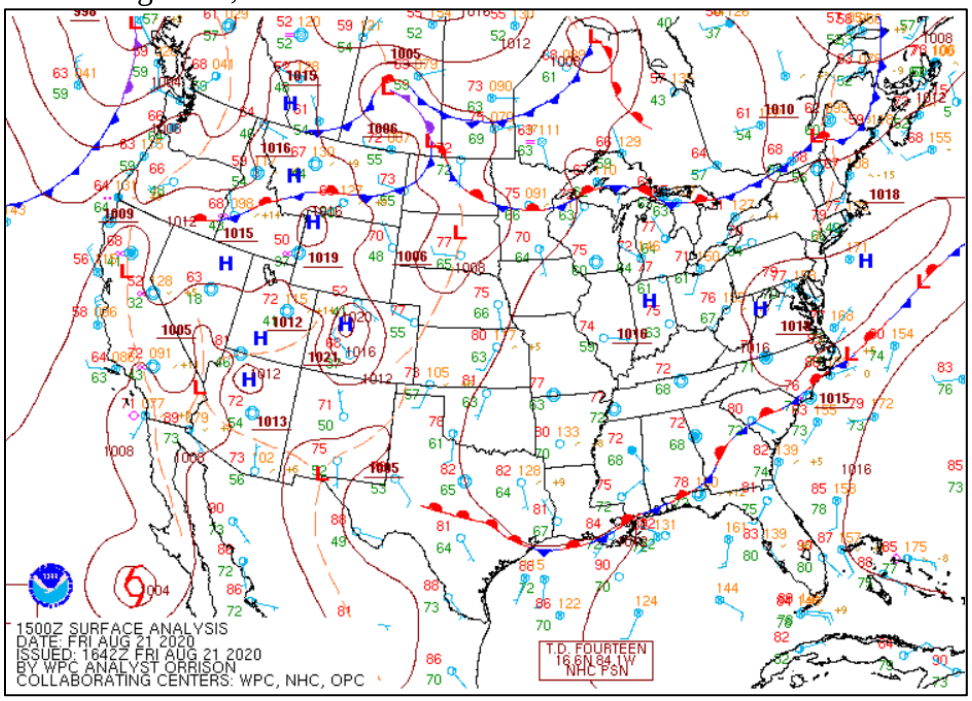
c. August 19, 2020



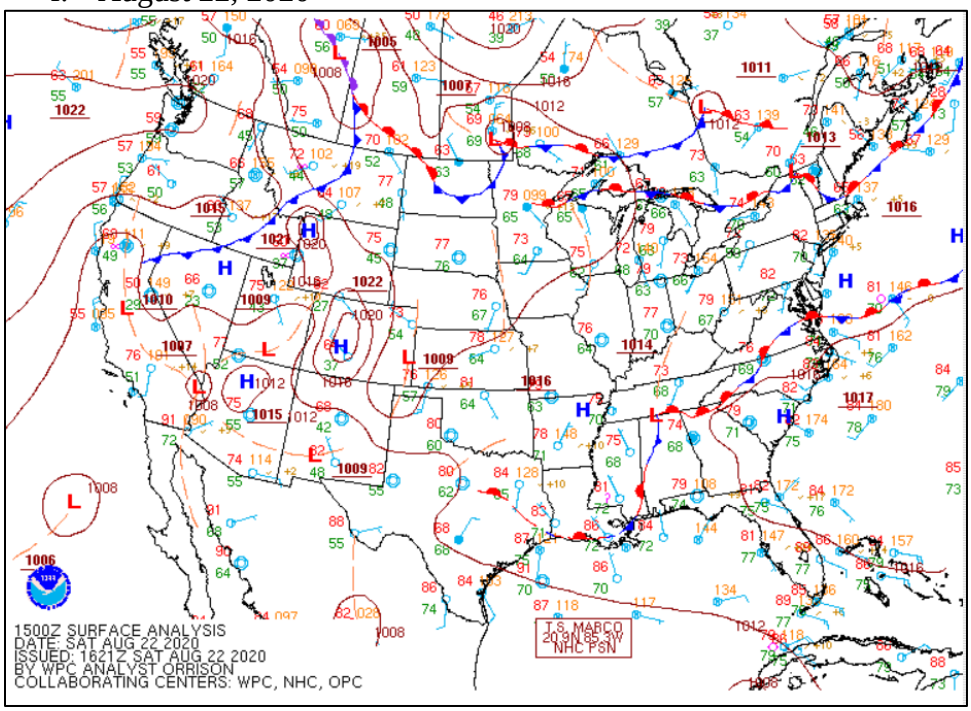
d. August 20, 2020



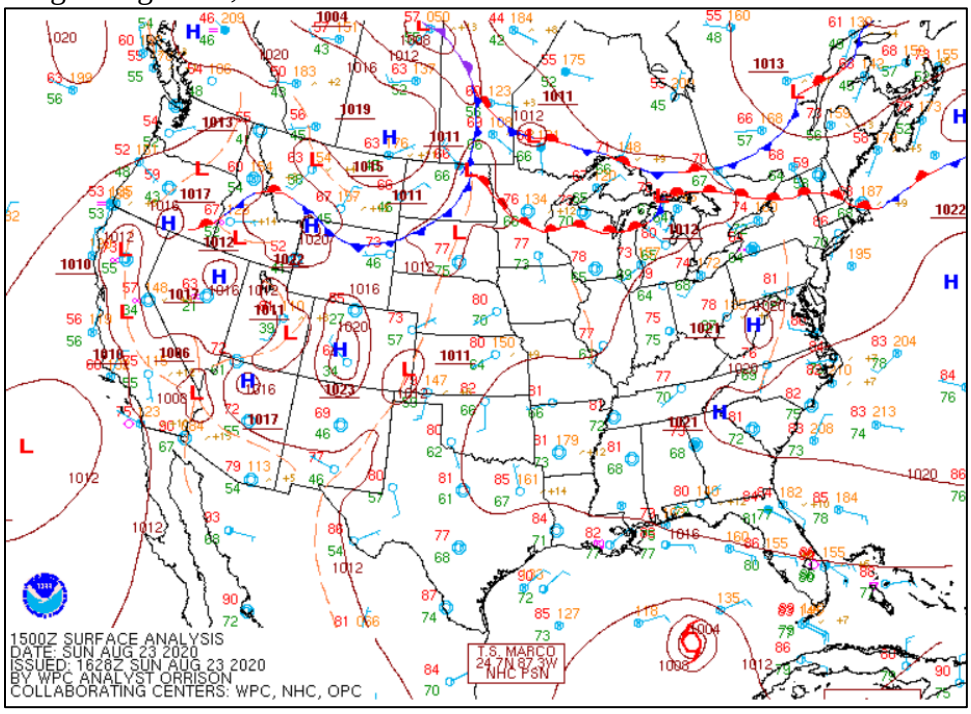
e. August 21, 2020



f. August 22, 2020



g. August 23, 2020



h. August 24, 2020

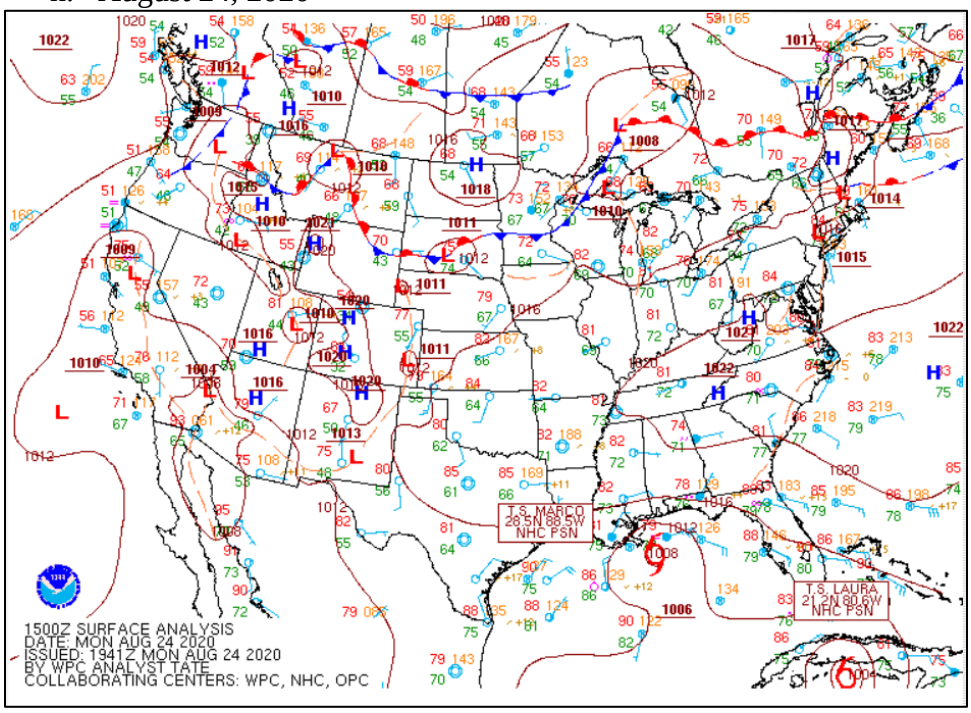
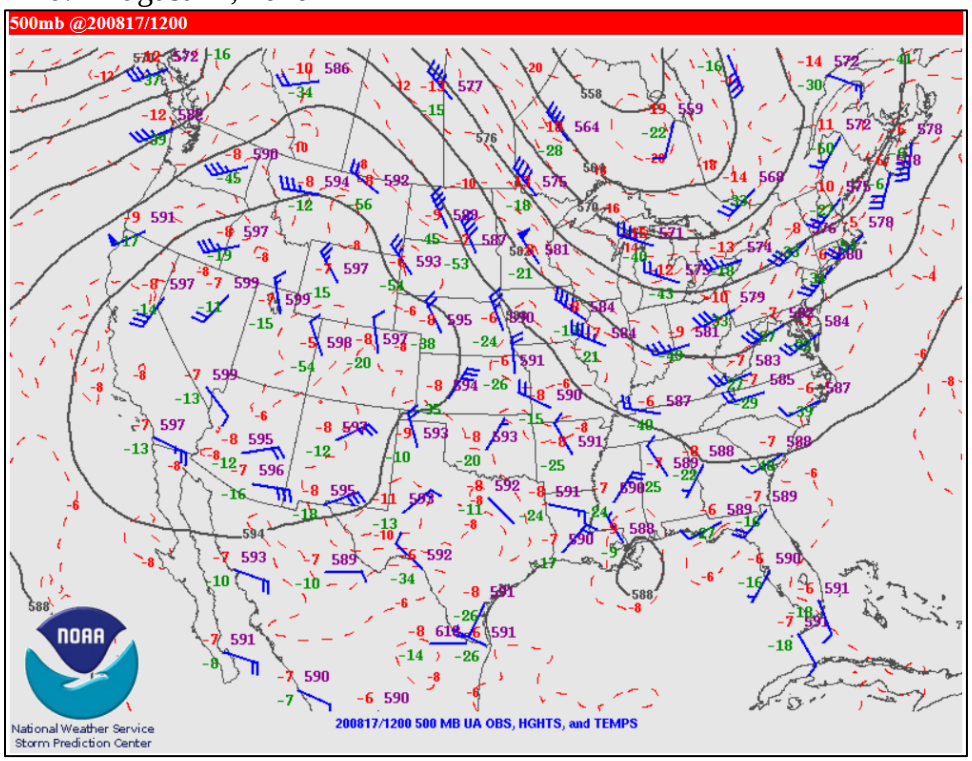
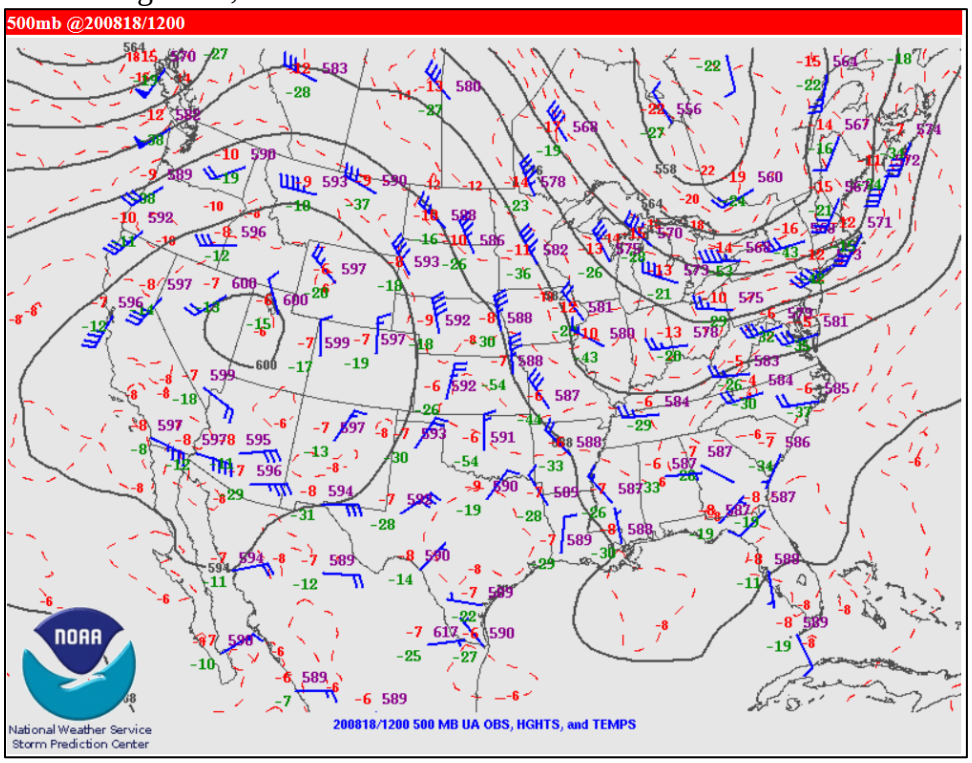


Figure 3-14 (a-h): National Weather Service, Storm Prediction Center (August 17 – August 24, 2020) 500 MB Analysis (12Z = 5 AM PDT)

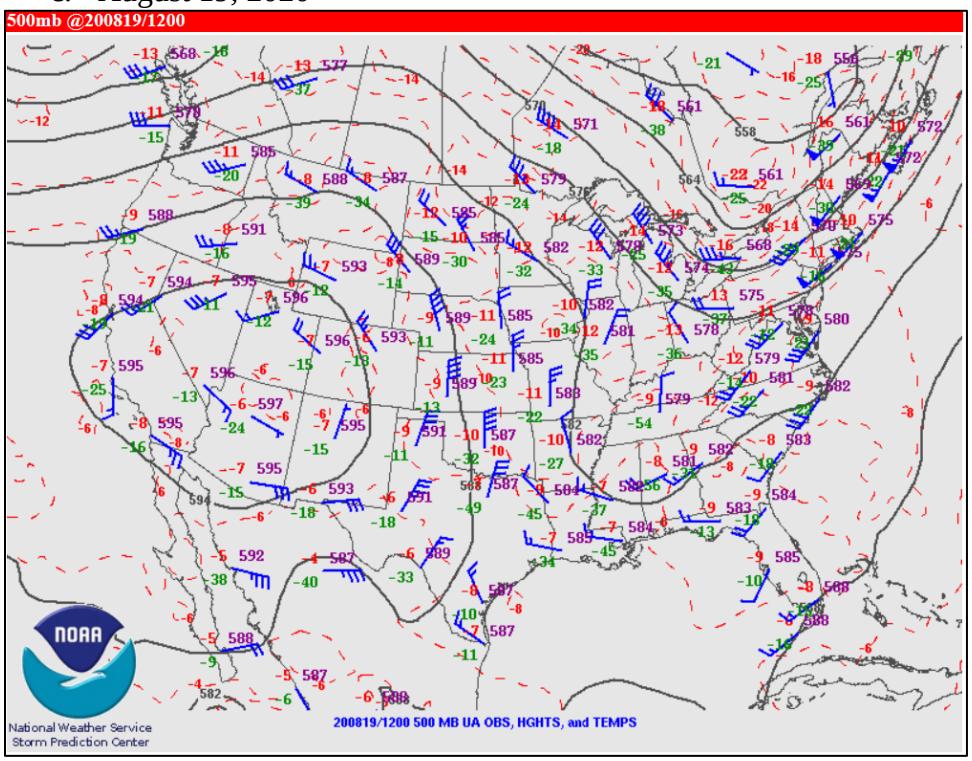
a. August 17, 2020



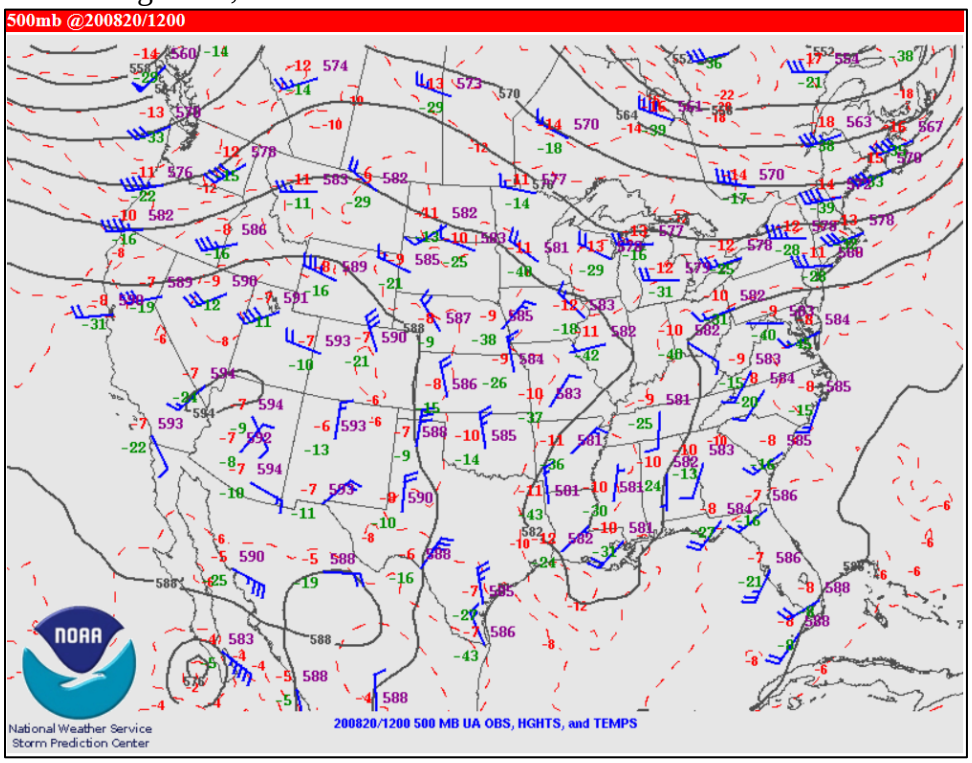
b. August 18, 2020



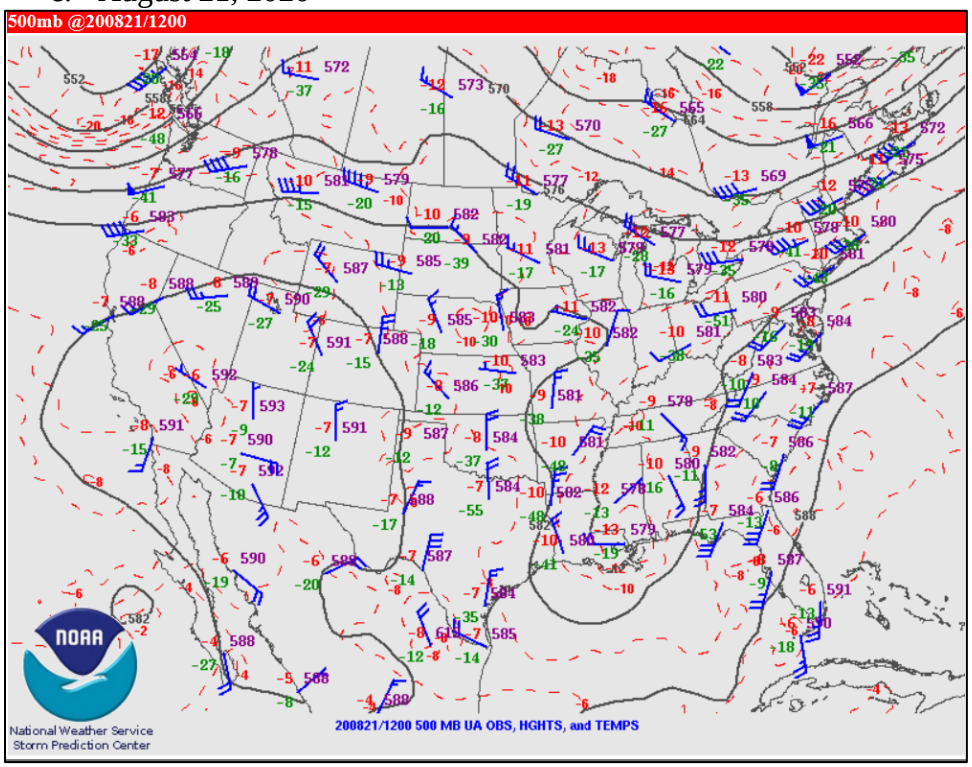
c. August 19, 2020



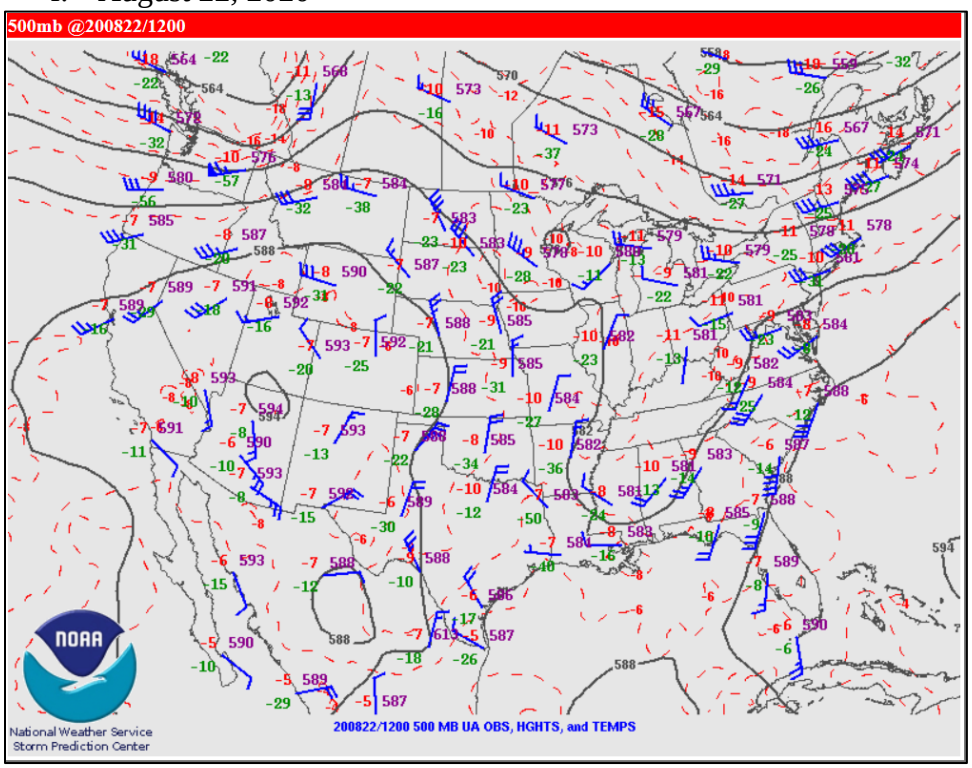
d. August 20, 2020



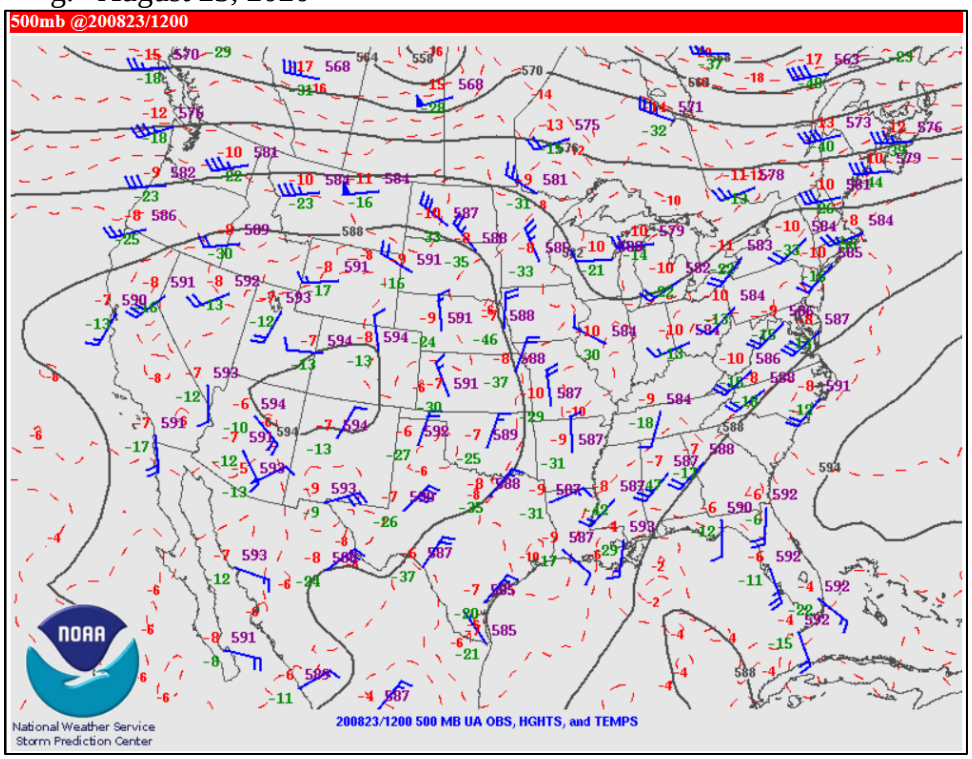
e. August 21, 2020



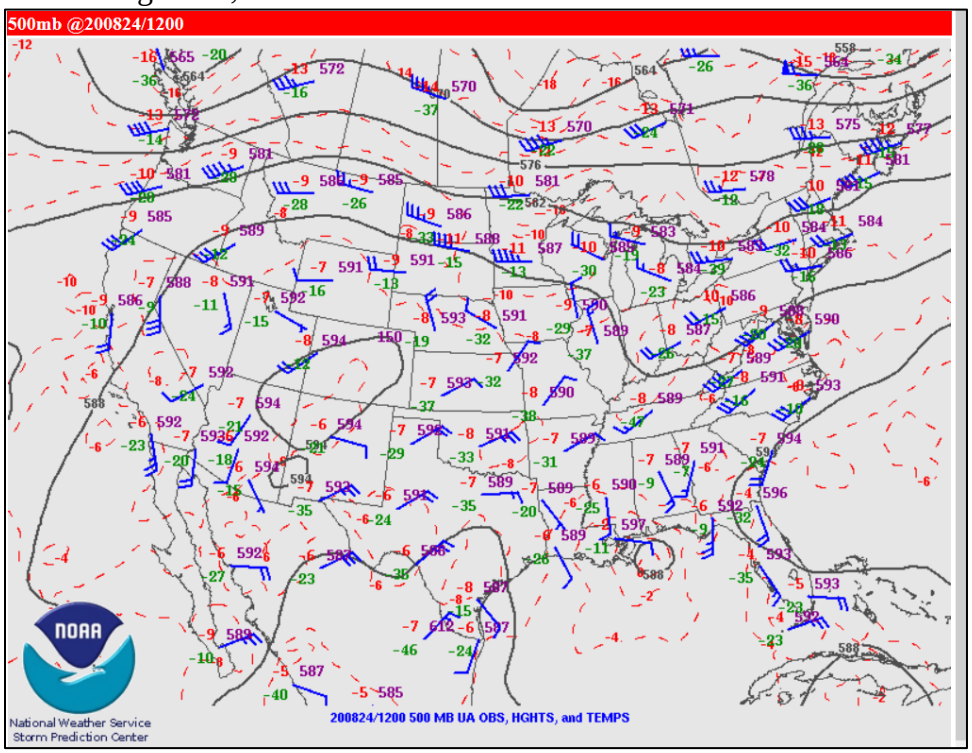
f. August 22, 2020



g. August 23, 2020



h. August 24, 2020



3.4 Affected Region

The smoke impacts from the 2020 August Lightning Siege wildfires extended across most of northern and central California. Although smoke impacted many counties, for the purpose of this demonstration, the affected region is San Joaquin Valley; which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern Counties. These counties are within the San Joaquin Valley PM2.5 Serious Nonattainment Planning Area.

Monitors Impacted

Table 3-4 shows each exceedance in this demonstration and includes a rank of that exceedance compared to all PM2.5 24-hour averages in the Valley for the 5-year period of 2016-2020. The table also includes a rank of the exceedance concentration compared to all other 24-hour PM2.5 averages at the same site, also based on 2016-2020 data. For Bakersfield-Planz, Corcoran-Patterson, and Hanford, the PM2.5 concentrations recorded during the 2020 August Lightning Siege Fires ranked the highest recorded 24-hour average concentration for the site for the 5-year period of 2016-2020. If the 2018 Camp Wildfire smoke impacts were removed from the dataset, the "Exceedance Rank by Site" values would have been higher for Manteca, Stockton-Hazelton, Modesto-14th, and Turlock. EPA's concurrence of the PM2.5 concentrations listed in Table 3-4, which are attributed to the 2020 August Lightning Siege Wildfires, would result in a 2020 24-hour PM2.5 design value for the Valley that is less than or equal to 65 µg/m^3. This would allow the area to demonstrate attainment of the 1997 24-hour PM2.5 National Ambient Air Quality Standard.

Table 3-4: Exceedances of the 1997 PM2.5 NAAQS at select San Joaquin Valley sites impacted by wildfires (ranks based on 2016-2020 data)

Date	Site AQS ID (POC)	Site Name	Exceedance Concentration (µg/m^3)	Exceedance Rank for Whole District	Exceedance Rank for the Site
8/20/2020	06-031-1004 (3)	Hanford-Irwin	77*	236	21
8/20/2020	06-077-2010 (3)	Manteca	102	82	9
8/20/2020	06-099-0005 (3)	Modesto-14th St.	102.2	81	10
8/20/2020	06-077-1002 (3)	Stockton-Hazelton	88.8	147	16
8/20/2020	06-099-0006 (3)	Turlock	108	69	7
8/20/2020	06-019-2016 (3)	Fresno-Foundry	74.9	255	11
8/20/2020	06-031-0004 (8)	Corcoran-Patterson	69*	297	27
8/21/2020	06-031-1004 (3)	Hanford-Irwin	135.1	30	2
8/21/2020	06-077-2010 (3)	Manteca	100.8	89	10
8/21/2020	06-099-0005 (3)	Modesto-14th St.	90.1	141	15
8/21/2020	06-077-1002 (3)	Stockton-Hazelton	76.3	243	21
8/21/2020	06-099-0006 (3)	Turlock	96.5	117	14

Date	Site AQS ID (POC)	Site Name	Exceedance Concentration (µg/m^3)	Exceedance Rank for Whole District	Exceedance Rank for the Site
8/21/2020	06-019-2016 (3)	Fresno-Foundry	128.3	40	3
8/21/2020	06-031-0004 (8)	Corcoran-Patterson	115.2	55	2
8/22/2020	06-031-1004 (3)	Hanford-Irwin	147	17	1
8/22/2020	06-099-0005 (3)	Modesto-14th St.	68	305	22
8/22/2020	06-099-0006 (3)	Turlock	97.2	114	13
8/22/2020	06-019-2016 (3)	Fresno-Foundry	153.5	13	2
8/22/2020	06-031-0004 (1)	Corcoran-Patterson	140.1	26	1
8/22/2020	06-029-0015 (1)	Bakersfield-Airport (Planz)	158.6	10	1
8/23/2020	06-031-1004 (3)	Hanford-Irwin	116.7	52	4
8/23/2020	06-077-2010 (3)	Manteca	79.3	216	17
8/23/2020	06-099-0005 (3)	Modesto-14th St.	67.6	310	23
8/23/2020	06-077-1002 (3)	Stockton-Hazelton	65.9*	327	23
8/23/2020	06-099-0006 (3)	Turlock	67.7*	309	22
8/23/2020	06-019-2016 (3)	Fresno-Foundry	100.5	94	5
8/23/2020	06-031-0004 (8)	Corcoran-Patterson	93.2	130	8
8/24/2020	06-031-1004 (3)	Hanford-Irwin	107	73	7
8/24/2020	06-077-2010 (3)	Manteca	87.6	155	14
8/24/2020	06-099-0005 (3)	Modesto-14th St.	84.7	171	16
8/24/2020	06-077-1002 (3)	Stockton-Hazelton	78.2	225	20
8/24/2020	06-099-0006 (3)	Turlock	99.1	103	11
8/24/2020	06-019-2016 (3)	Fresno-Foundry	99.4	101	6
8/24/2020	06-031-0004 (8)	Corcoran-Patterson	89.8	143	10

*These PM2.5 concentrations are not included in this exceptional event demonstration since excluding this data does not affect regulatory decisions for the 1997 24-hour PM2.5 NAAQS. These values, along with exceedances at other sites and on additional dates, may be included in analysis for future regulatory decisions.

3.5 Summary

The conceptual model describes the meteorological conditions that occurred during the 2020 August Lightning Siege Wildfire event. Monsoonal and remnant moisture from dissipating Tropical Storm Fausto streamed over California, resulting in widespread dry lightning occurring across a parched California landscape beginning on August 15. Due to the extreme fire danger that existed, an extraordinary amount of "dry" lightning caused the wildland fires identified in Table 3-1 to erupt across the region. The fires across California quickly spread due to dry conditions from a lack of precipitation and hot temperatures. The surface pressure analysis

charts in Figures 3-13 and 3-14 show that, from August 17 through 18, 2020, weak pressure gradients over much of California caused stagnant conditions. However, a shortwave trough moving into the Pacific Northwest on August 19 enhanced the onshore (west to northwesterly) wind flow across central California directing huge amounts of smoke emissions from the fires in the California Coastal Range and Coast into the San Joaquin Valley. Shortly, thereafter the high pressure ridge rebuilt over the region causing poor dispersion conditions to trap smoke over the Valley. These emissions were then carried by light transport wind flow under very strong temperature inversions causing widespread air quality impacts across California.

Section IV. Clear Causal Relationship

This section satisfies the following federal requirements:

- The event affected air quality in such a way that there exists a clear, causal relationship between the specific event and the monitored exceedance(s) or violation(s). (*40 CFR 50.14(c)(3)(iv)(B)*)
- Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site(s) at other times. (*40 CFR 50.14(c)(3)(iv)(C)*)

The Exceptional Event Rule requires that a clear causal relationship exists between the measured exceedances and the exceptional event to demonstrate that the exceptional event caused a specific air pollution concentration at a particular air quality monitoring location. The analysis provided in this section is consistent with the clear causal relationship examples provided in the Final Rule on the Treatment of Data Influenced by Exceptional Events.[30]

The clear causal relationship shows that the LNU Complex, SCU Complex, CZU Complex, Woodward, River, Carmel wildland fires caused the elevated PM2.5 concentrations in the San Joaquin Valley that exceeded the PM2.5 24-hour NAAQS of 65 µg/m^3. An analysis was done showing how much higher these concentrations were when compared to historical data. HYSPLIT Trajectory modeling, wind patterns, Moderate Resolution Imaging Spectroradiometer (MODIS) satellite photos, and PM2.5 concentrations from AIRNOW tech's website[31] were used to show how smoke from the wildland fires listed in table 3-1 was transported into the San Joaquin Valley to cause the exceedances on the five affected days. Smoke was even transported across the entire northern and central California where air quality advisories were also issued.

4.1 Comparison of Event-Related Concentrations to Historical Concentrations

The Exceptional Event Rule requires a comparison of concentrations related to the event to historical data.[32] Figure 3-12 showed that PM2.5 concentrations a week prior to the wildfire smoke impact event were between 11.5 to 18.1 µg/m^3, whereas the PM2.5 concentrations were almost 10 times as high (179 µg/m^3) on the peak day of the demonstrated period on August 21, 2020.

Average PM2.5 concentrations measured during August 2020 compared to historical data for the same month in 2016, 2017, 2018 and 2019 (Table 4-1) was three (3) times higher than the average PM2.5 concentration for the month of August in 2019, with the exception of Manteca.

[30] (81 FR 68216 – 68282) *Treatment of Data Influenced by Exceptional Events*. Federal Register, Volume 81, October 3, 2016, p. 68216-68282, Table 1 and 2.
[31] AIRNOW TECH website: https://www.airnowtech.org/
[32] *Treatment of Data Influenced by Exceptional Events*. Federal Register, Volume 81, October 3, 2016, p. 68216-68282.

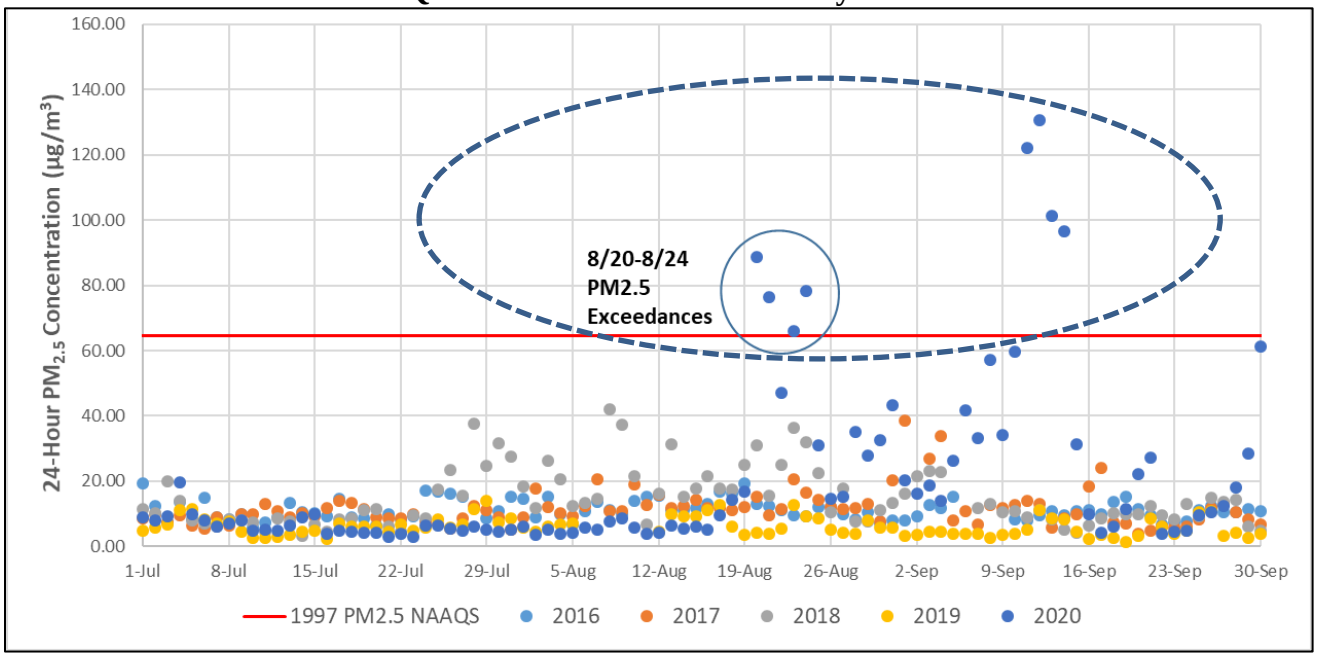
Table 4-1: Average PM2.5 Concentrations (µg/m^3) 2016-2020 in August

Year	Bakersfield-Planz	Corcoran	Fresno-Foundry	Hanford	Manteca	Modesto-14th	Stockton-Hazelton	Turlock
2016	17.8	14.8	No Data	14.6	9.2	9.2	11.8	9.0
2017	16.7	15.3	No Data	16.7	13.3	12.0	13.2	14.0
2018	23.6	24.9	No Data	23.3	17.2	19.6	19.8	24.0
2019	12.8	9.9	No Data	9.4	33.3	5.5	6.9	8.6
2020	36.6	33.3	33.6	33.9	26.9	24.8	22.0	29.2

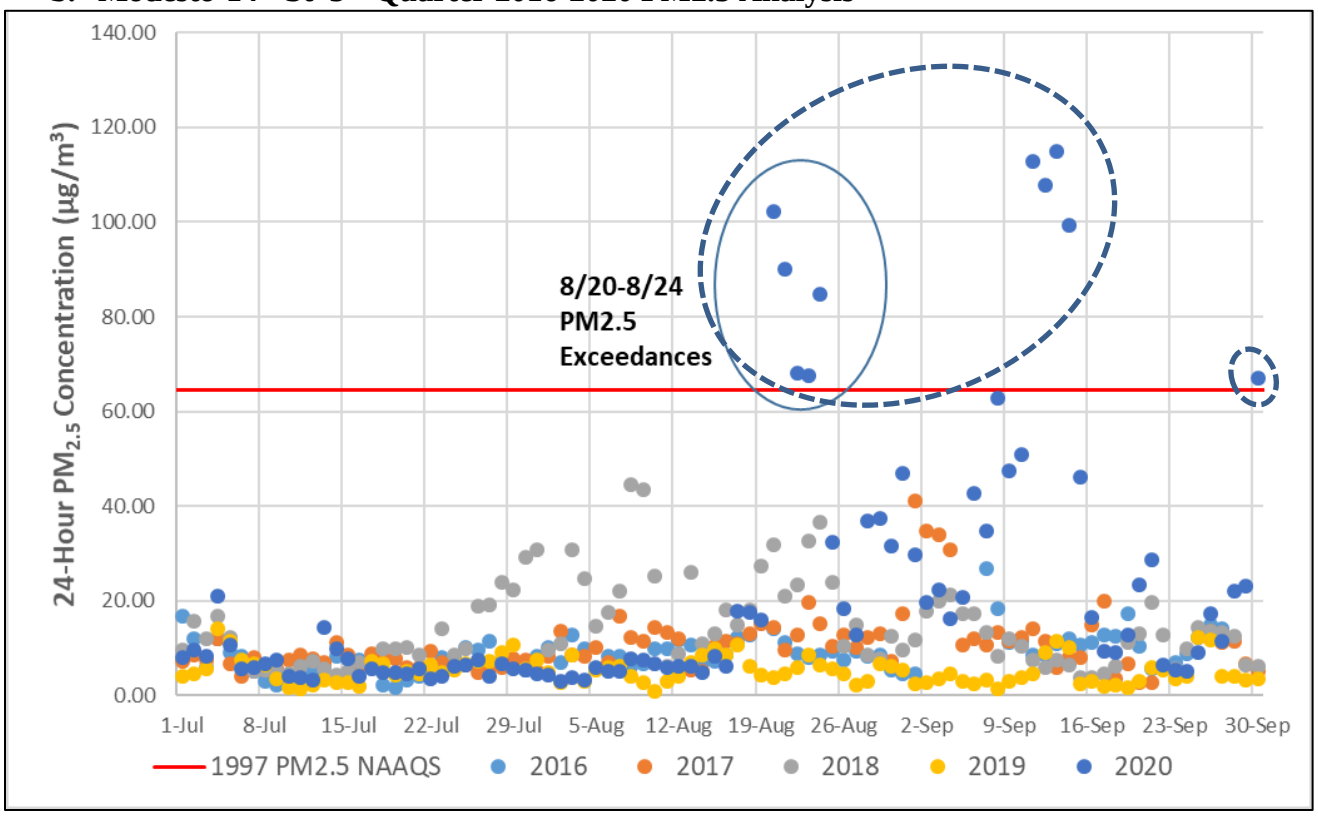
Figure 4-1 (a-g) show 24-hour PM2.5 concentrations at the seven monitoring stations from quarter 3 of 2016 through 2020. Since Fresno-Foundry began PM2.5 monitoring in 2020, there is no historical data to compare to and this site is not included in Figure 4-1. The 24-hour PM2.5 concentrations that are over the 1997 NAAQS that were impacted by wildfires are encompassed in the dashed circle, and those that exceed the NAAQS and are included in this demonstration are identified by the solid circle. From 2016 through 2020, 83 exceedances have occurred during the 3rd Quarter, all of which were recorded in 2020. These figures are consistent with previous tables, which also show that these were the highest average PM2.5 concentrations in San Joaquin Valley in the last 5 years.

Figure 4-1(a-g): 24-hour PM2.5 concentrations in San Joaquin Valley from 2016-2020 (3rd Quarter). Concentrations over 1997 NAAQS impacted by wildfires in dashed circle, included in demonstration in solid circle

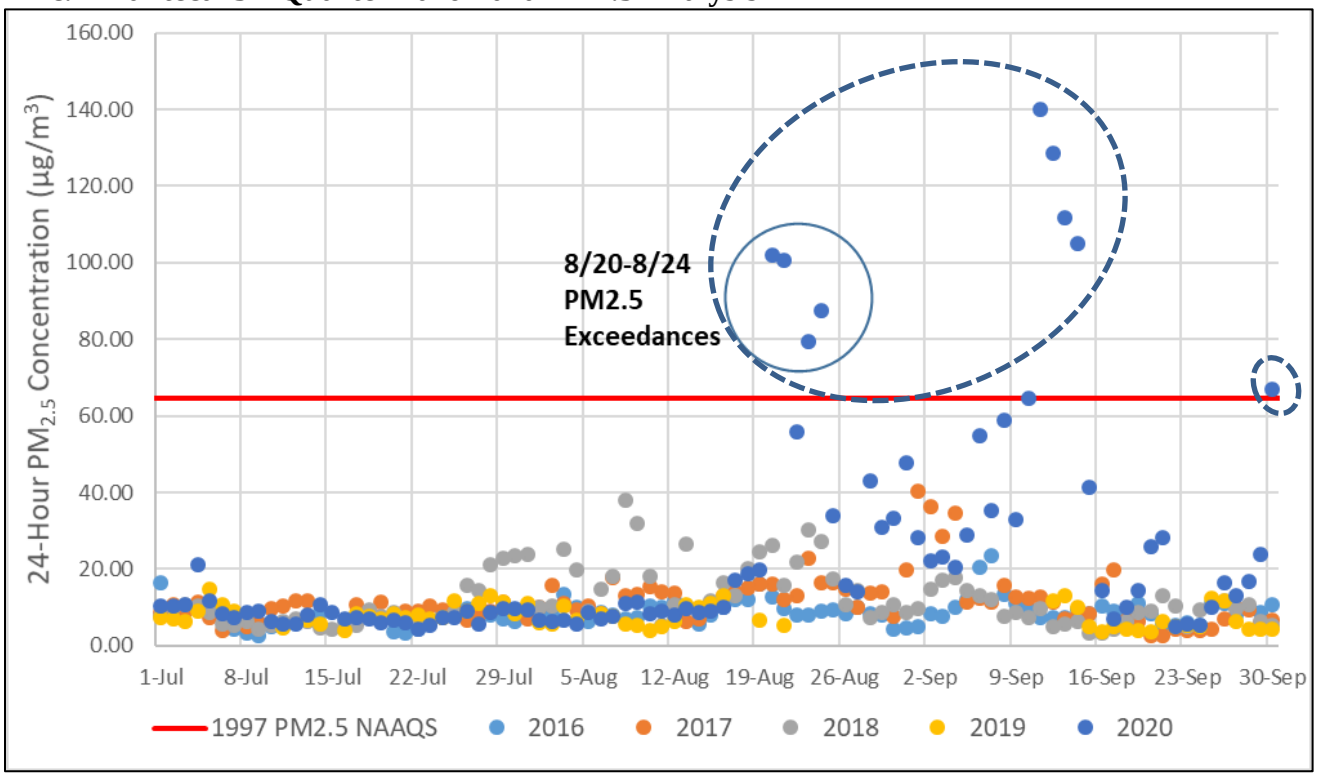
a. Stockton-Hazelton 3rd Quarter 2016-2020 PM2.5 Analysis



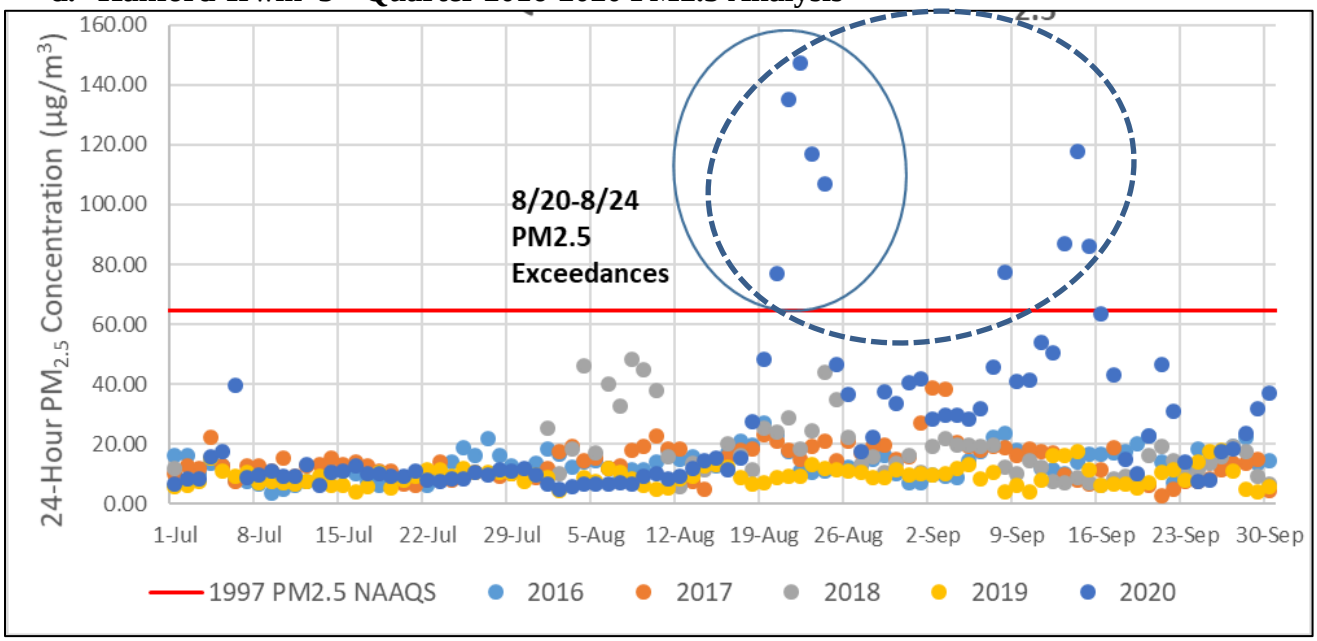
b. Modesto-14th St 3rd Quarter 2016-2020 PM2.5 Analysis



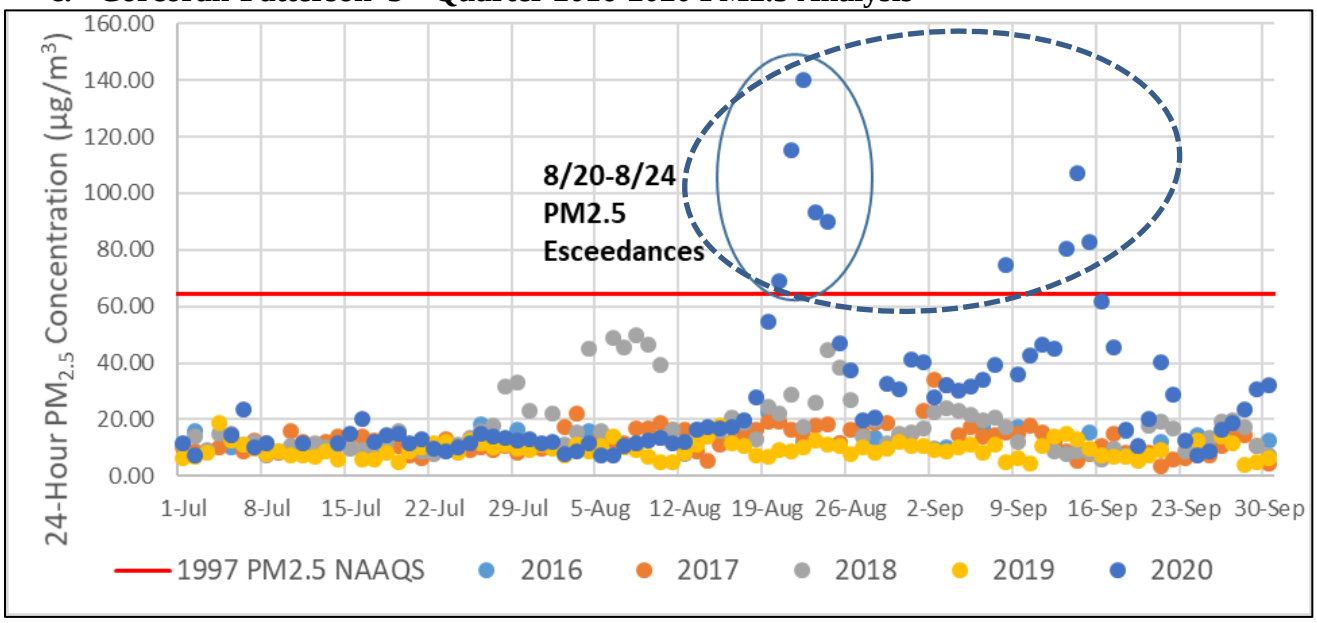
c. Manteca 3rd Quarter 2016-2020 PM2.5 Analysis



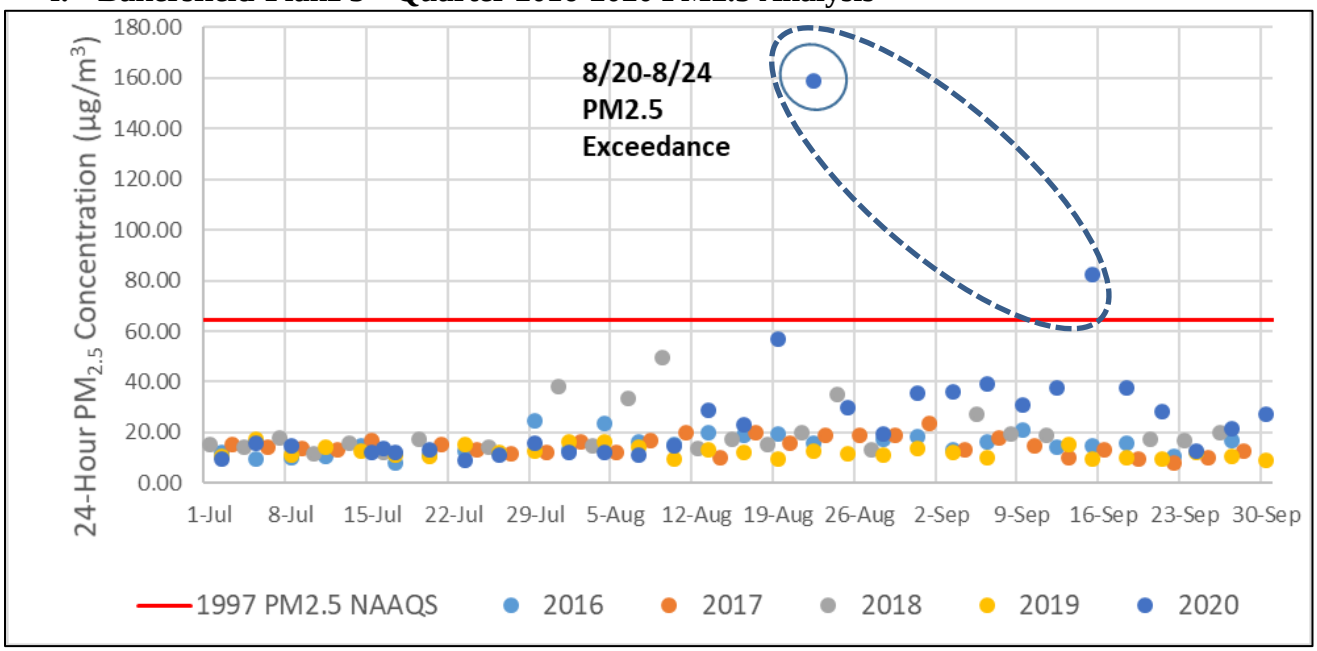
d. Hanford-Irwin 3rd Quarter 2016-2020 PM2.5 Analysis



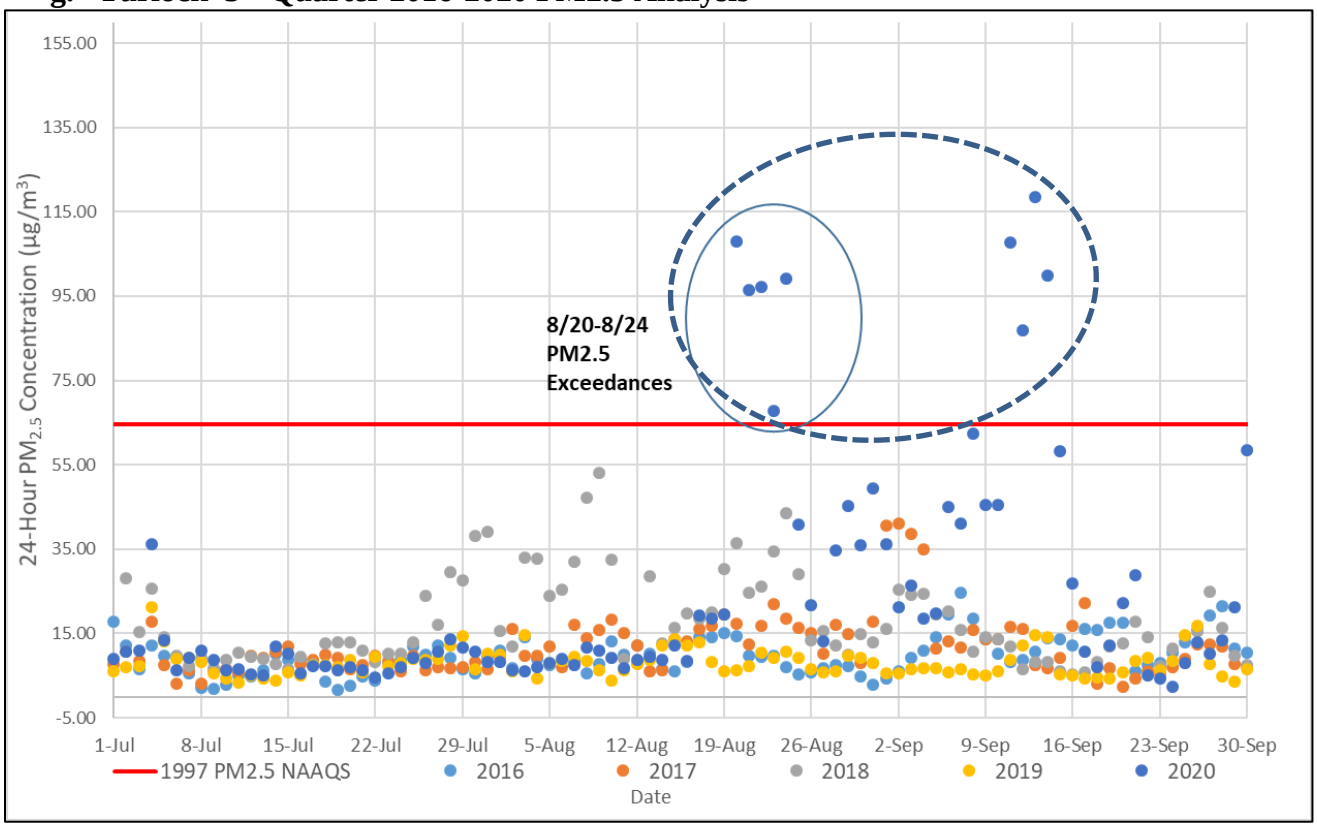
e. Corcoran-Patterson 3rd Quarter 2016-2020 PM2.5 Analysis



f. Bakersfield-Planz 3rd Quarter 2016-2020 PM2.5 Analysis



g. Turlock 3rd Quarter 2016-2020 PM2.5 Analysis

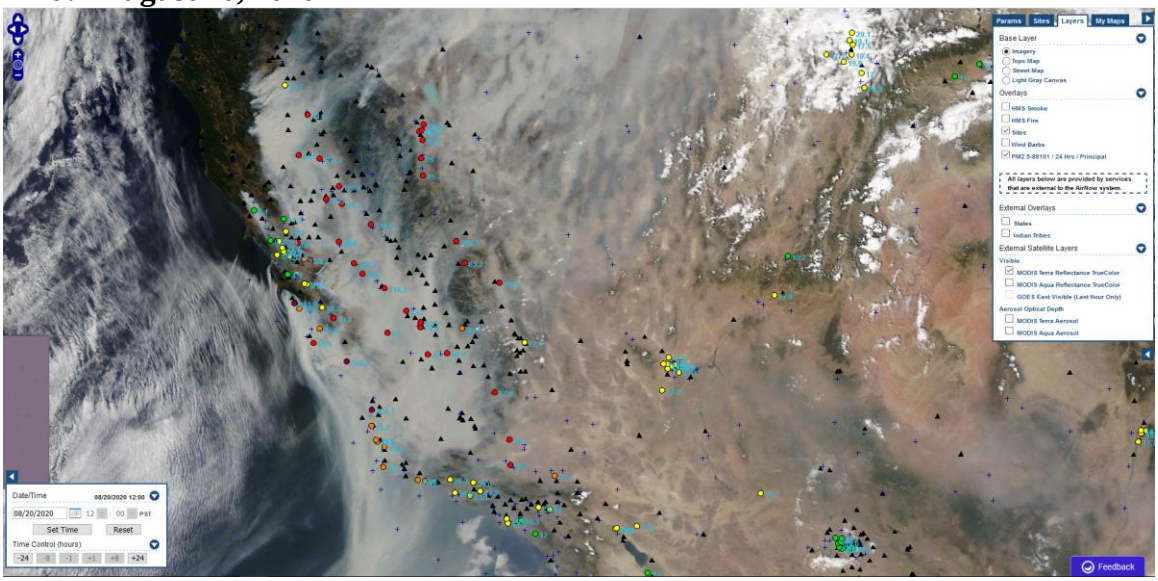


4.2 Geographic Extent of Wildfire Smoke Impact

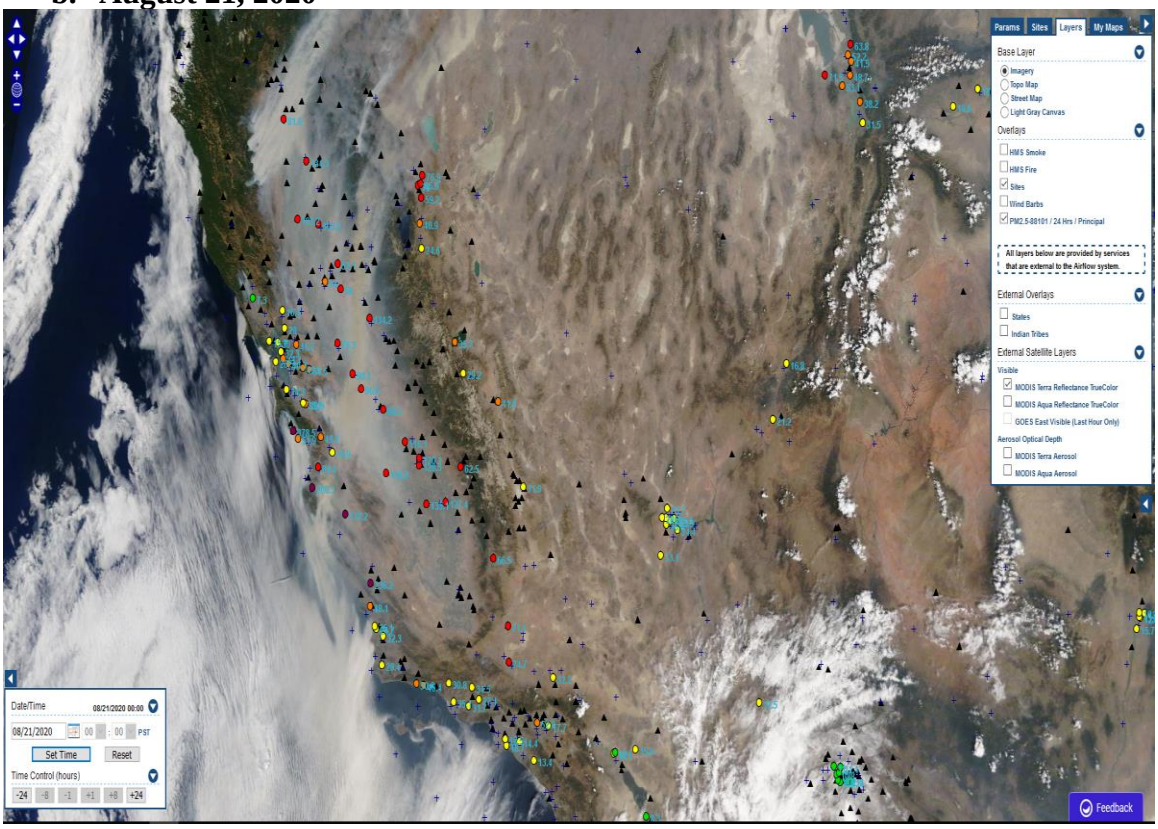
This section provides Moderate Resolution Imaging Spectroradiometer (MODIS) satellite imagery to display the impact of the 2020 August Lightning Siege wildfires, and then describes how the District notified the public through Health Cautionary Statements and Air Quality Alerts. Figures 4-2 (a-e) show the daily geographic extent of smoke impacts from August 20-24, 2020 on the San Joaquin Valley and the rest of California's PM2.5 concentrations. Smoke from the fires detailed in Section III, tables 3-1, 3-2, and 3-3, was transported into the Valley by August 20th, causing elevated PM2.5 concentrations to occur throughout the District. Additional MODIS products, including aqua and terra aerosol images, are included in Appendix H. Section 4.3 further discusses the sources and transportation of emissions throughout the San Joaquin Valley.

Figure 4-2 (a-e): MODIS Terra Satellite Imagery showing the geographic extent of wildfire smoke on August 20, 2020

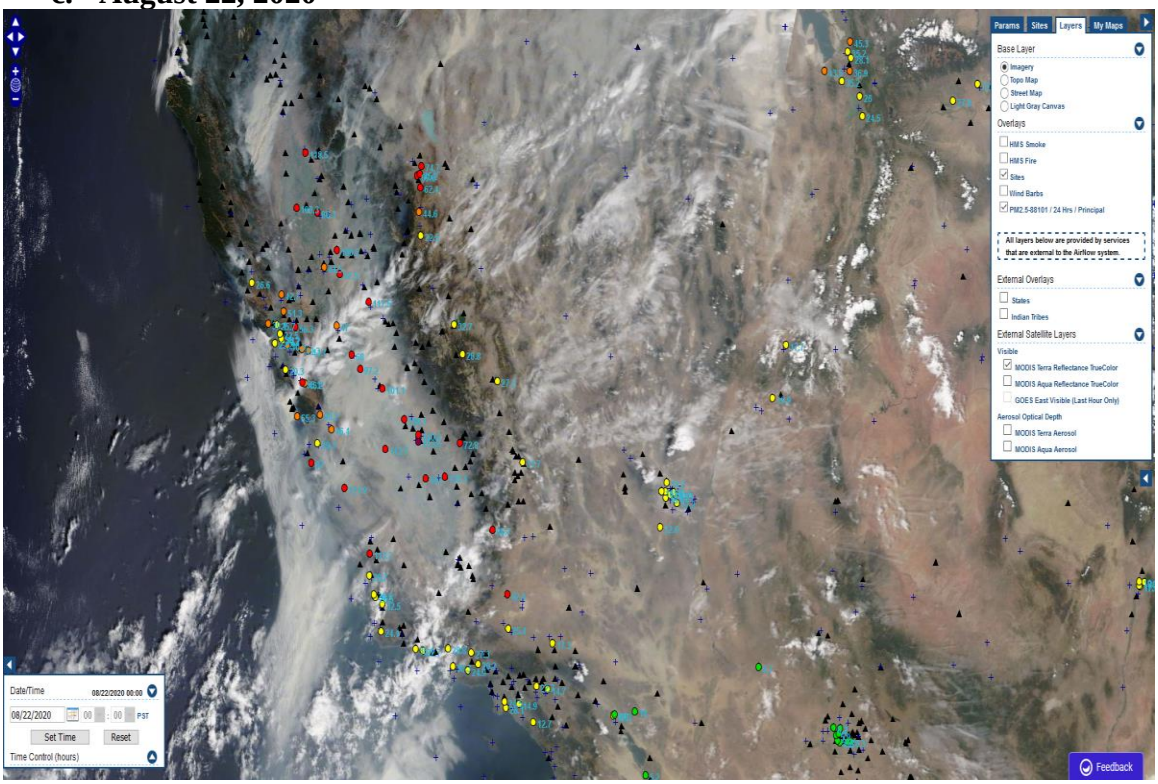
a. August 20, 2020



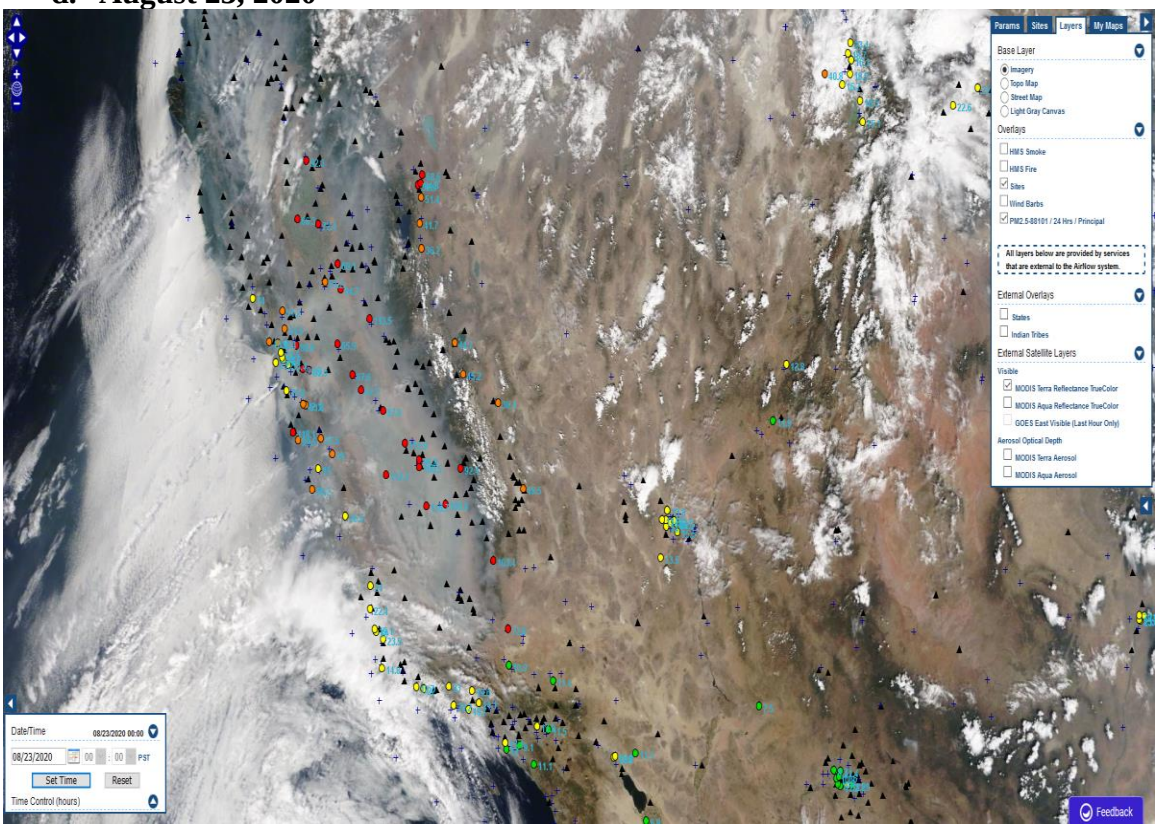
b. August 21, 2020



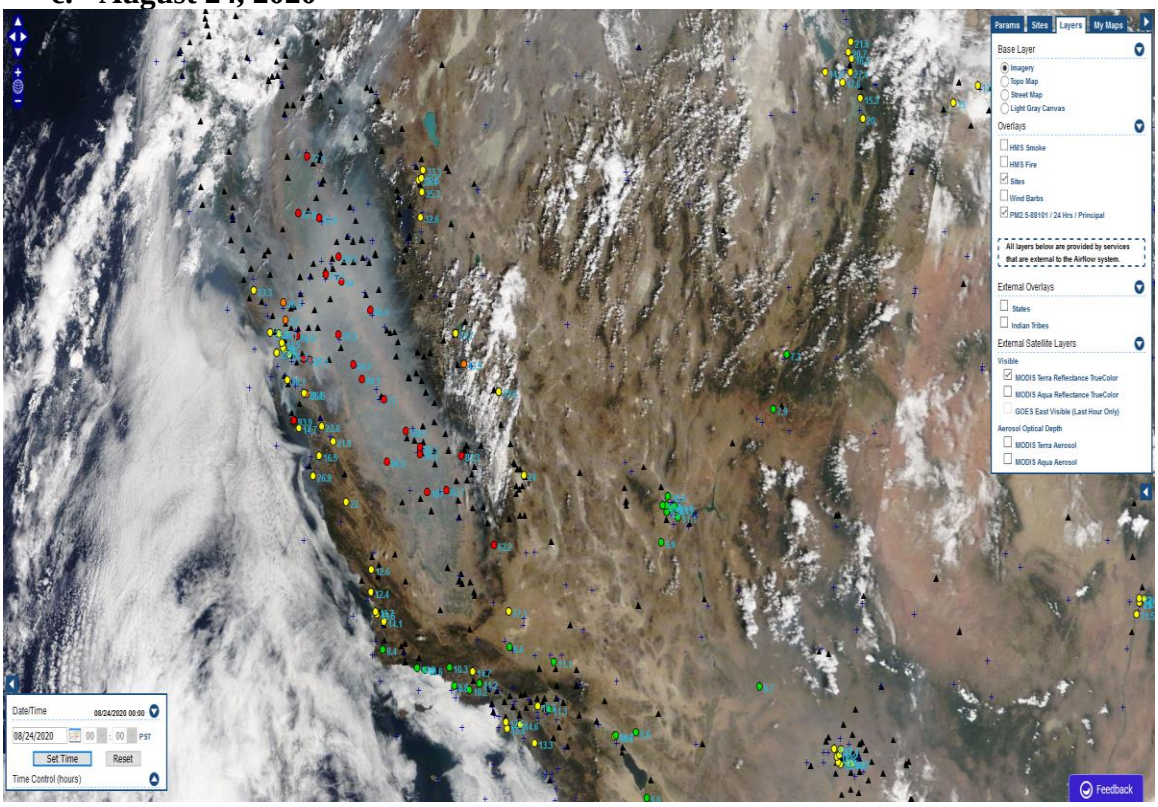
c. August 22, 2020



d. August 23, 2020



e. August 24, 2020



4.3 Public Notifications of Wildfire Smoke Impacts on the San Joaquin Valley

The San Joaquin Valley Air District issued multiple bilingual Health Cautionary Statement press releases to Valley residents and media throughout the month of August 2020. Multiple fires surrounding the Valley caused smoke impacts to San Joaquin, Stanislaus, Merced, Fresno, Kings, Tulare, and the Valley portion of Kern Counties beginning August 17, 2020, prompting the District to issue the first of several press releases urging residents to reduce exposure to the particulate matter (PM) emissions by remaining indoors in effected areas. Throughout the following week, PM2.5 concentrations continued to cause smoke impacts to all counties, resulting in air quality in the "Very Unhealthy" AQI category across the region. The persistent smoke impacts triggered the San Joaquin Valley Air District to issue a second Health Cautionary Statement on August 21, 2020, which remained in place until the fires were extinguished.

In addition to the Health Caution Statements, the District worked with the National Weather service to issue a Valley-wide Air Quality Alert on August 17, 2020, due to wildfire smoke impacts. The District and the National Weather Service extended the Air Quality Alert on August 19, 2020, due to continuing smoke impacts throughout the Valley. See Appendix D for copies of the advisories.

4.4 Source-Receptor Analysis: Transport of Emissions

Satellite images were used in conjunction with the Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPLIT) and MODIS satellite imagery to determine the sources, transport of emissions, and the pathway of the smoke to the air monitoring stations (referred to as forward and backward trajectories). The trajectory models calculate the position of particles with time and considers the trajectory of the air parcel using wind speed and direction. The forward and backward trajectories show the movement of smoke over a 24 – 48hr period towards the monitoring stations. The determination of 24, 36, or 48 hour trajectories is based on the distance the monitor was from the fire, and how fast the smoke was modelled to begin impacting the site(s) in question.

The trajectory models were run using EPA AirNow-Tech, Navigator and the HYSPLIT Trajectory Model provided by National Oceanic and Atmospheric Administration's (NOAA) Air Resources Laboratory. The HYPSLIT[33] Trajectory Model used North American Mesoscale Model (NAM) 12 kilometer (km); which, contains pressure level forecast data every 3 hours from forecast hours 0 to 84 on a 12 km 614 x 428 grid covering the United States and Southern Canada.[34]

The satellite imagery layer with the trajectory overlay clearly shows wildfire smoke plumes being transported throughout California. There were three input layers used in this model: 1) at 50 meters (m) (red); 2) at 500 meters (blue), and; 3) at 1000 meters (green) above the surface. These three heights provide an indication of how the smoke was transported in the lower portion of the atmosphere. The initiating heights were chosen to provide insight into relevant vertical levels, which could impact surface air quality in the San Joaquin Valley. An important

[33] ARL HYSPLIT information: https://www.ready.noaa.gov/HYSPLIT.php
[34] ARL Ready NAM12 KM description: https://www.ready.noaa.gov/READYmetdata.php

measurement was boundary layer height, which is critical in determining ground-level smoke impacts. During the morning hours, it was marked by a stable layer, which can trap pollutants such as smoke near the surface. Due to afternoon heating, smoke at the surface and aloft would mix and fumigated the surface further. Due to site communication issues, ceilometer data is not available during the demonstration period to analyze boundary layer mixing heights. CARB staff have not been able to visit the sites to diagnose the issues due to COVID-19 travel restrictions.

The movement of each trajectory provided information on the speed and direction of wind within the lower portion of the atmosphere. In general, wind speeds increases with height, as friction decreases and wind direction will change as well.

Modesto-14th St., Hanford, and Bakersfield-Planz are shown in this section of the demonstration as examples of air parcel movement (trajectories) from the northern, central and southern regions of the San Joaquin Valley. Trajectories for Stockton-Hazleton, Manteca, Turlock, Fresno-Foundry, and Corcoran are included in Appendix E.

4.5 Source-Receptor Analysis: Backward Trajectories

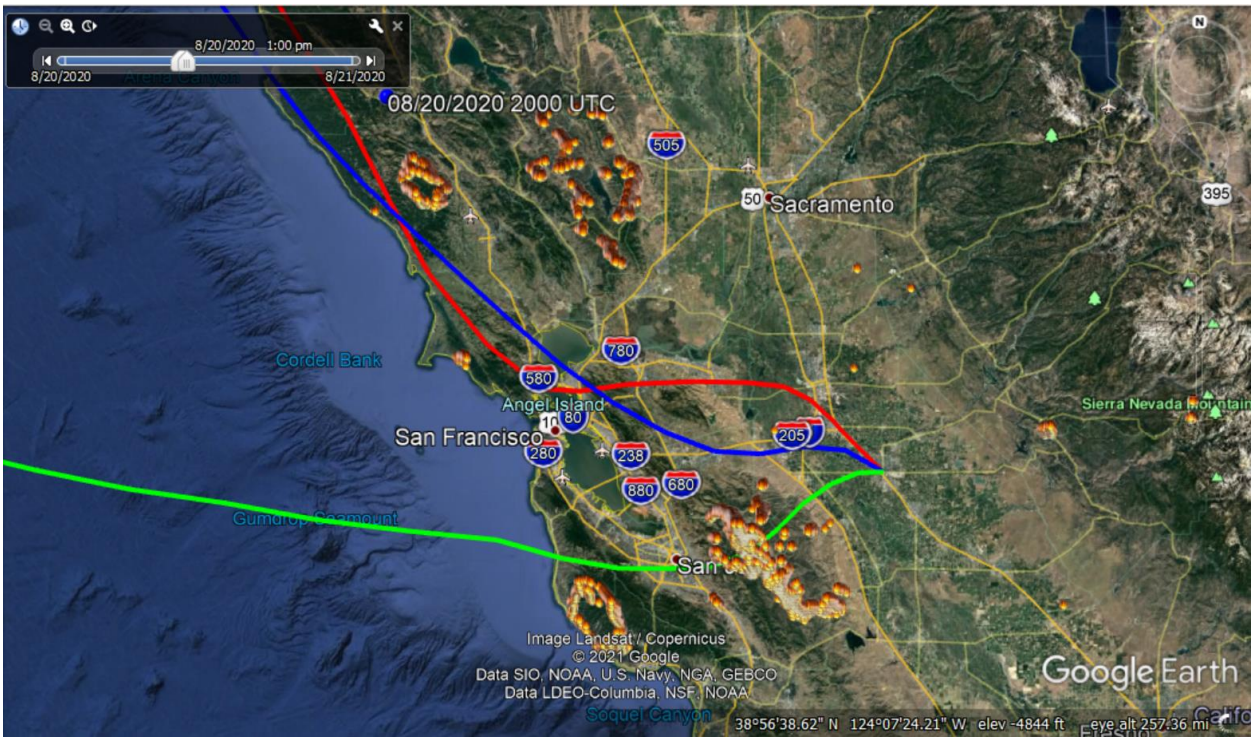
To determine the transport of smoke to the monitors, the District conducted 24 hour to 48 hour HYSPLIT backward trajectories. The following figures labeled 'Backward Trajectory – NAM 12 KM' correspond to event dates August 20-24, 2020, and are backward trajectories from air monitoring stations included in this demonstration as exceptional event sites. These figures show that smoke impacting San Joaquin Valley monitoring stations and the surrounding monitoring stations originated from smoke plumes generated by multiple wildfires. The hour at which each backwards trajectory was modeled from is determined by the hour the highest daily peak PM2.5 concentration recorded. These hours are listed in the tables below in Pacific Standard Time (PST); however, the trajectories are based on Coordinated Universal Time (UTC). UTC measures time approximately 7 hours ahead of PST, and in some cases may cause for a trajectory to show the next day on the time stamp, ex: 2000hr on August 21st would be shown as 0300 UTC on August 22nd in a backwards trajectory model. The 50-meter trajectories (shown in red) for the following trajectories consistently showed where the source of smoke was transported to the monitors. The backward trajectories for Modesto-14th, Hanford, and Bakersfield-Planz are shown below. Trajectories for Stockton-Hazleton, Manteca, Turlock, Fresno-Foundry, and Corcoran are included in Appendix E.

4.5.1 Modesto-14th Street Backward Trajectories

The following trajectory analysis depicts emissions transported to the Modesto-14th Street air monitoring site for August 20, 2020 through August 24, 2020. The modeling and observations show that the smoke originated at the LNU and SCU Complexes and Woodward fires west-northwest of Modesto. The model trajectory analysis takes the air parcel east-southeast toward the Modesto area, leading to the elevated PM2.5 concentrations reported at the Modesto-14th air monitoring station.

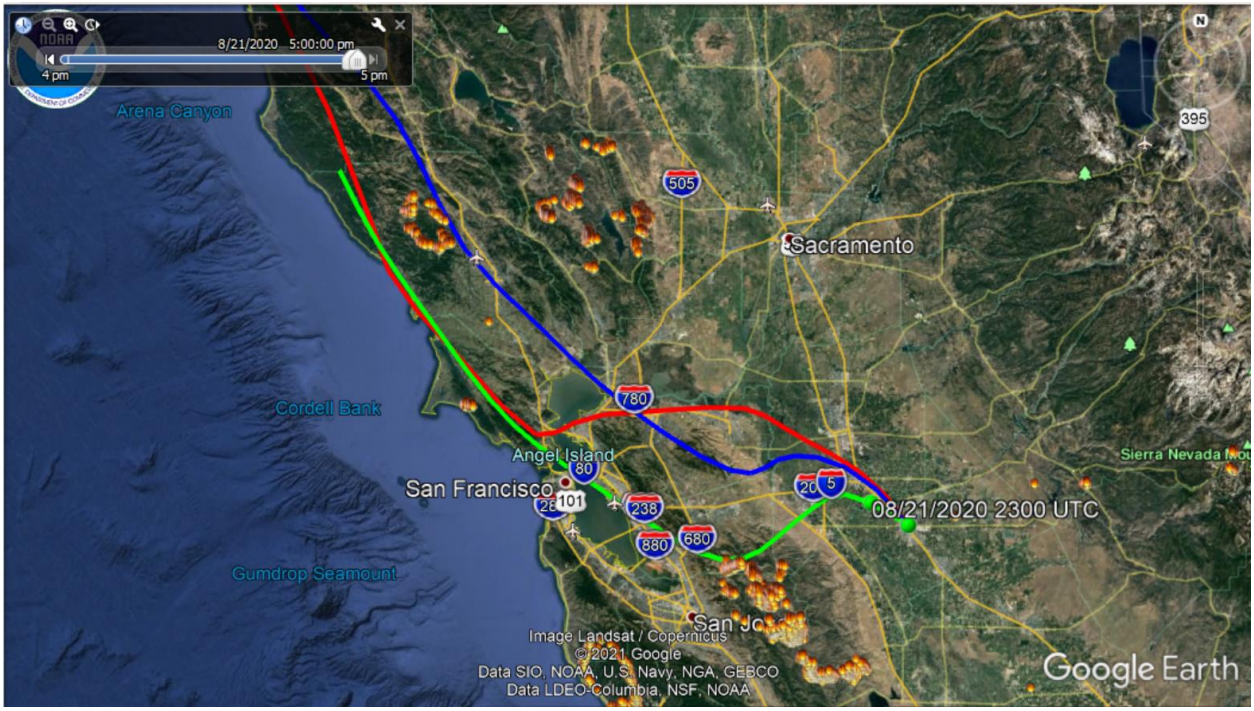
In Figure 4-3, backward trajectory analysis for August 20, 2020, shows the origination location of air mass arriving at Modesto at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 207 µg/m^3 was recorded. Onshore (west-northwest) winds on August 19 and 20, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Modesto area.

Figure 4-3: Backward Trajectory (24-hour) for August 20, 2020, showing location of air mass arriving in Modesto at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM



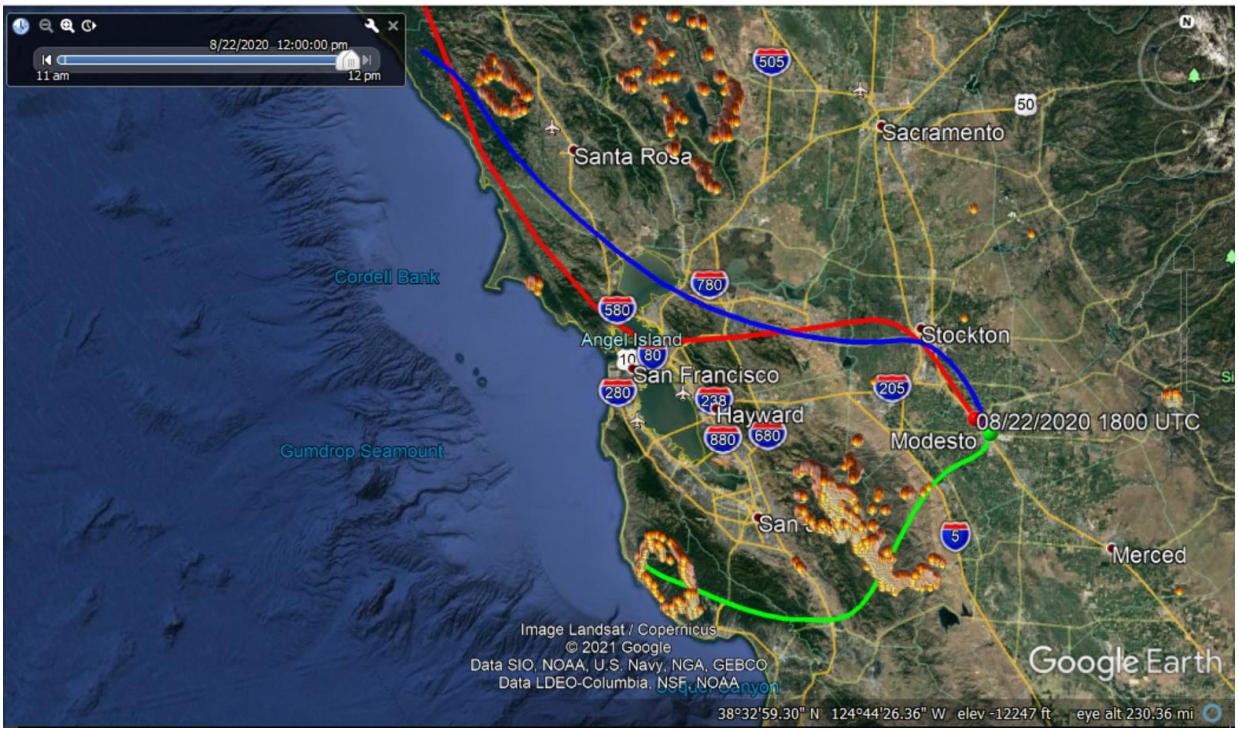
In Figure 4-4, backward trajectory analysis for August 21, 2020 shows the origination location of air mass arriving at Modesto at the 50, 500, and 1,000 meter height levels around 5:00 PM PST, where a peak concentration of 150 µg/m^3 was recorded. West-northwest winds on August 20 and 21, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Modesto area.

Figure 4-4: Backward Trajectory (24-hour) for August 21, 2020 showing location of air mass arriving in Modesto at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 5:00 PM



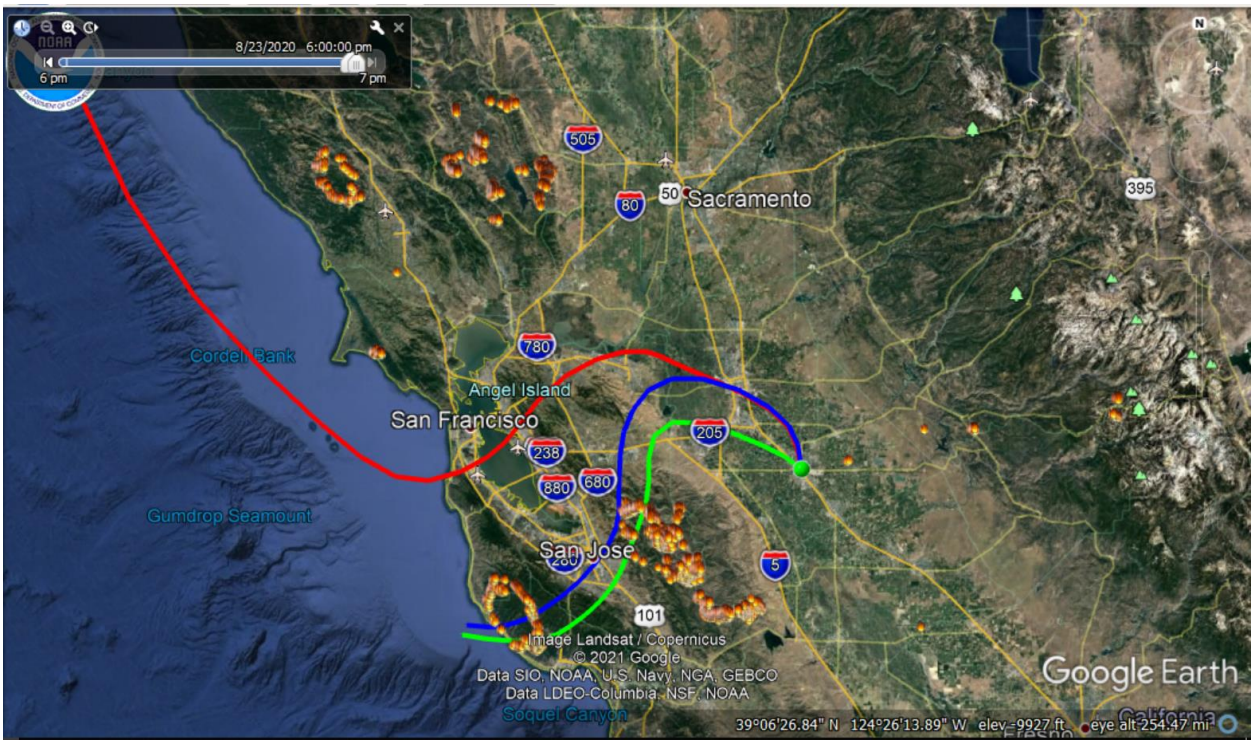
In Figure 4-5, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Modesto at the 50, 500, and 1,000 meter height levels around 12:00 PM PST, where a peak concentration of 101 µg/m^3 was recorded. West-northwest winds on August 21 and 22, 2020, transported smoke from the LNU Complex and Woodward fire toward the Modesto area.

Figure 4-5: Backward Trajectory (24-hour) for August 22, 2020, showing location of air mass arriving in Modesto at 50 (red), 500 (green), and 1,000 (red) meter height levels around 12:00 PM



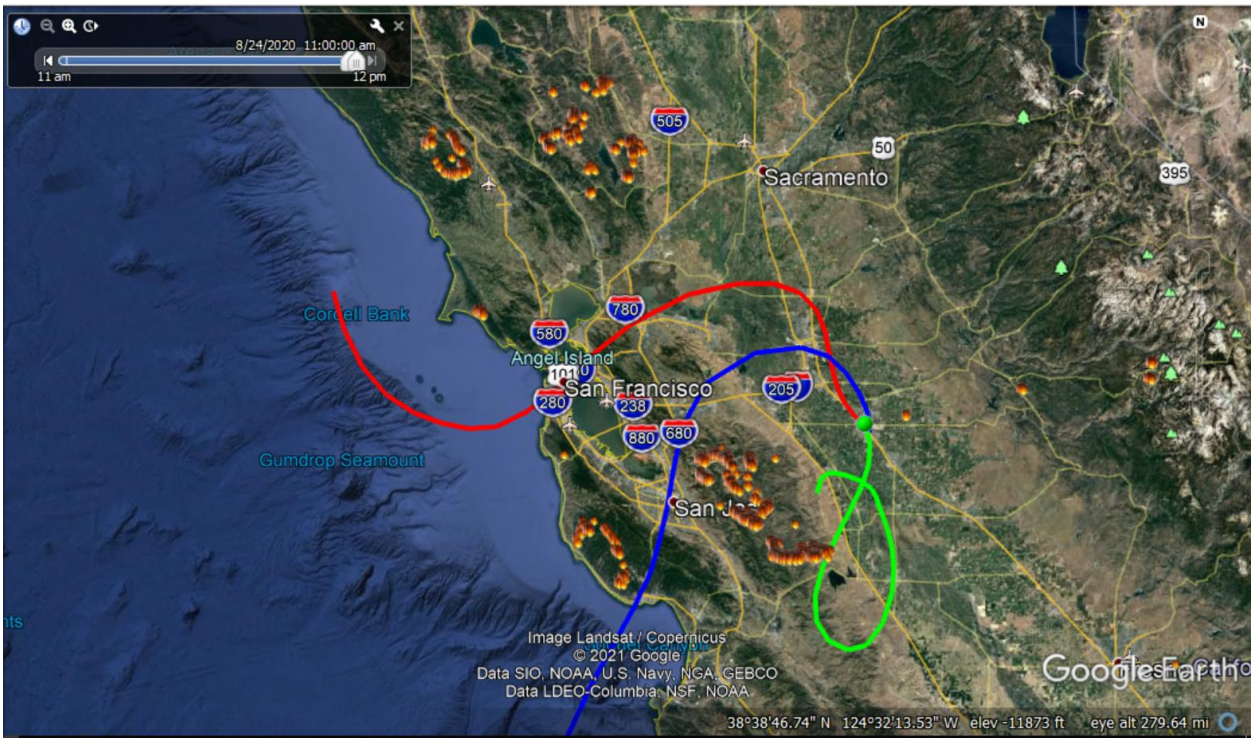
In Figure 4-6, backward trajectory analysis for August 23, 2020, shows the origination location of air mass arriving at Modesto at the 50, 500, and 1,000 meter height levels around 6:00 PM PST, where a peak concentration of 157 µg/m^3 was recorded. West-northwest winds on August 22 and 23, 2020, transported smoke from the SCU Complex and Woodward fire toward the Modesto area.

Figure 4-6: Backward Trajectory (24-hour) for August 23, 2020, showing location of air mass arriving in Modesto at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 6:00 PM



In Figure 4-7, backward trajectory analysis on August 24, 2020, showed the origination location of air mass arriving at Modesto at the 50, 500, and 1,000 meter height levels around 11:00 AM PST, where a peak concentration of 155 µg/m^3 was recorded. West-northwest winds on August 23 and 24, 2020, transported smoke from the SCU Complex and Woodward fire toward the Modesto area.

Figure 4-7: Backward Trajectory (24-hour) for August 24, 2020, showing location of air mass arriving in Modesto at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 AM

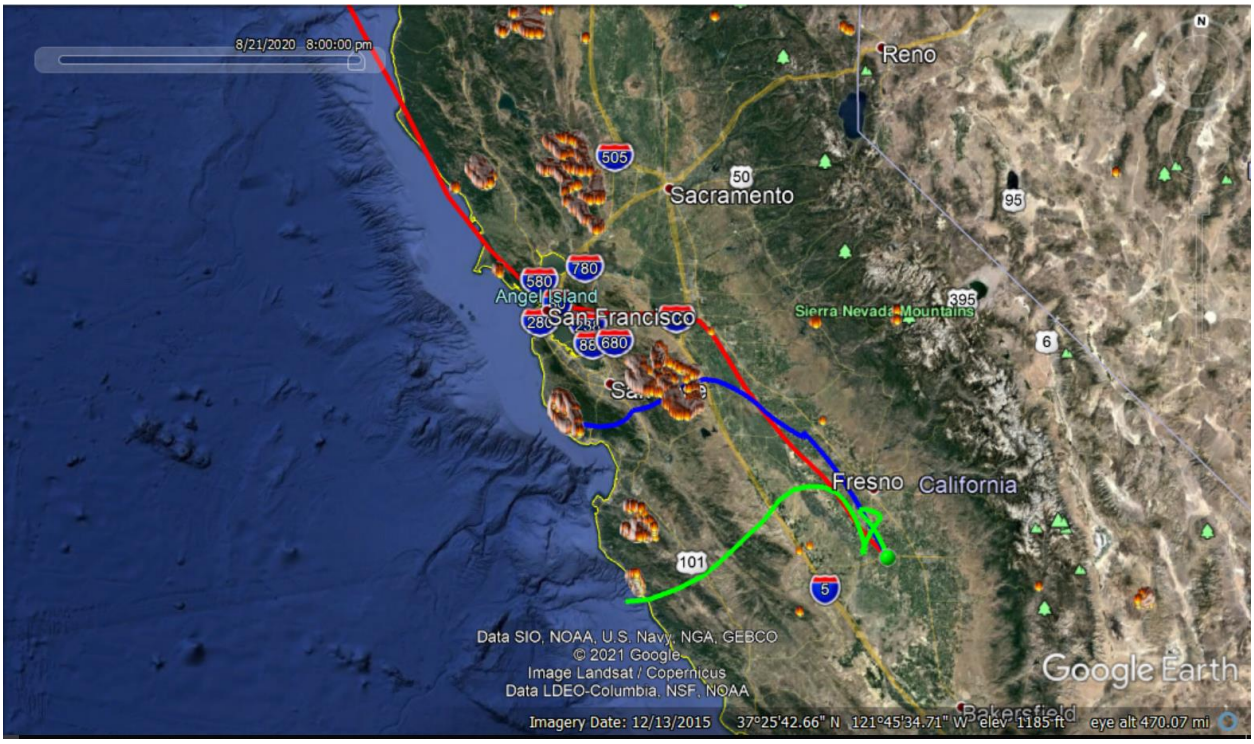


4.5.2 Hanford-Irwin Backward Trajectories

The following trajectory analysis depicts emissions transported to the Hanford-Irwin air monitoring site for August 20, 2020 through August 24, 2020. The modeling and observations show that the smoke originated at the LNU and SCU Complexes and Woodward fires northwest of Hanford. The model trajectory analysis takes the air parcel southeast toward the Hanford area, leading to the elevated PM2.5 concentrations reported at the Hanford air monitoring station.

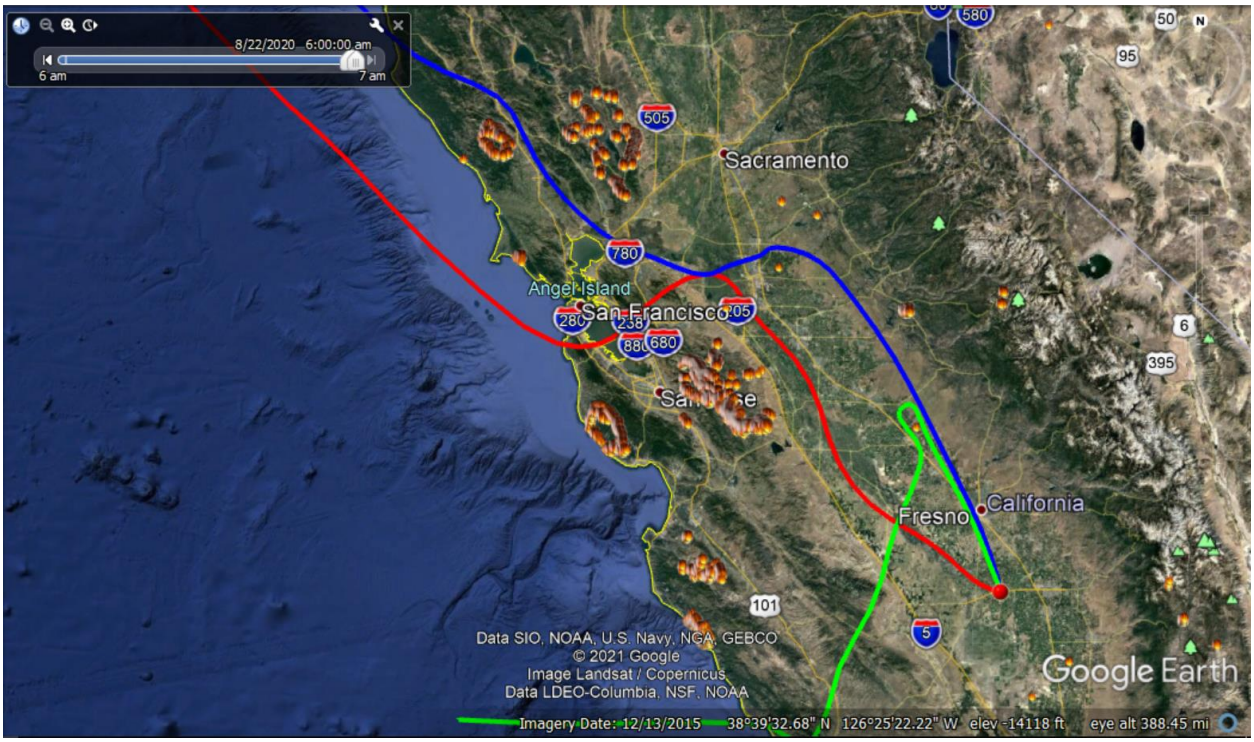
In Figure 4-8, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Hanford at the 50, 500, and 1,000 meter height levels around 6:00 PM PST, where a peak concentration of 198 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Hanford on this day. Northwest winds on August 20 and 21, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Hanford area.

Figure 4-8: Backward Trajectory (36-hour) for August 21, 2020, showing location of air mass arriving in Hanford at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 6:00 PM



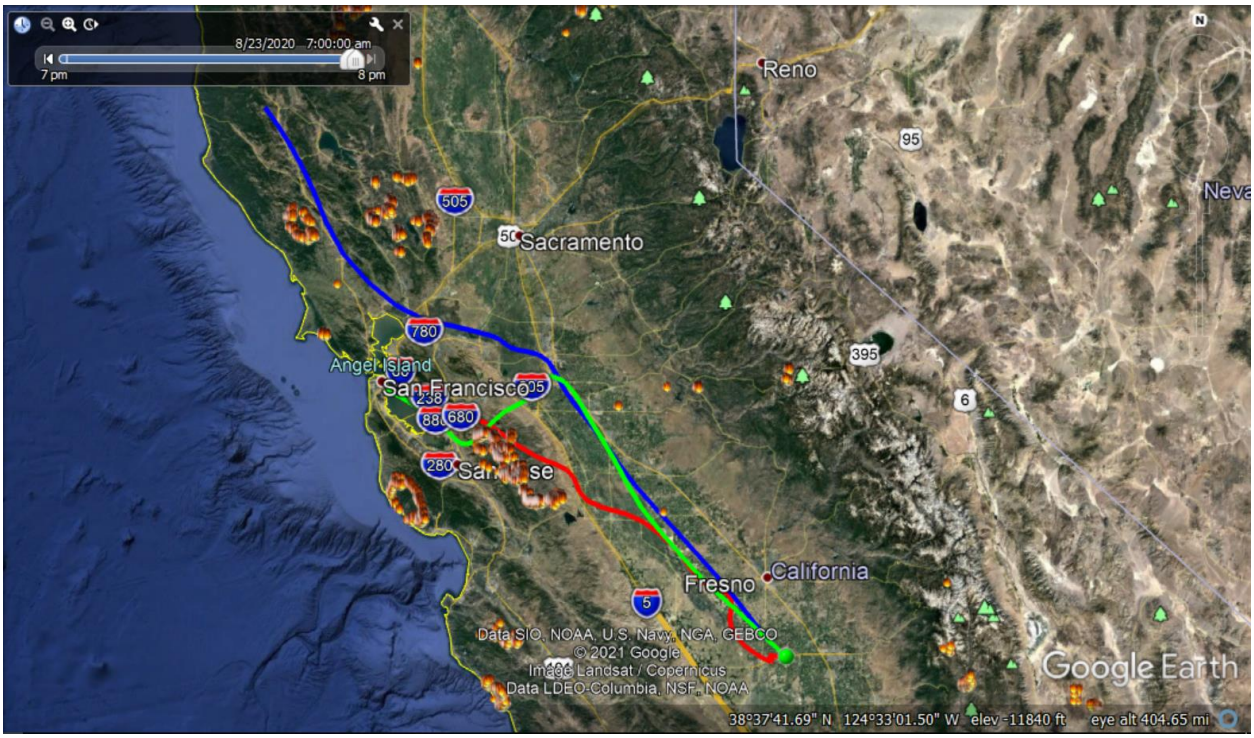
In Figure 4-9, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Hanford at the 50, 500, and 1,000 meter height levels around 4:00 AM PST, where a peak concentration of 230 µg/m^3 was recorded. A backward trajectory of 48 hours was used to capture the origin of the smoke that impacted Hanford on this day. Northwest winds on August 20, 21, and 22, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Hanford area.

Figure 4-9: Backward Trajectory (48-hour) for August 22, 2020, showing location of air mass arriving in Hanford at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 4:00 AM



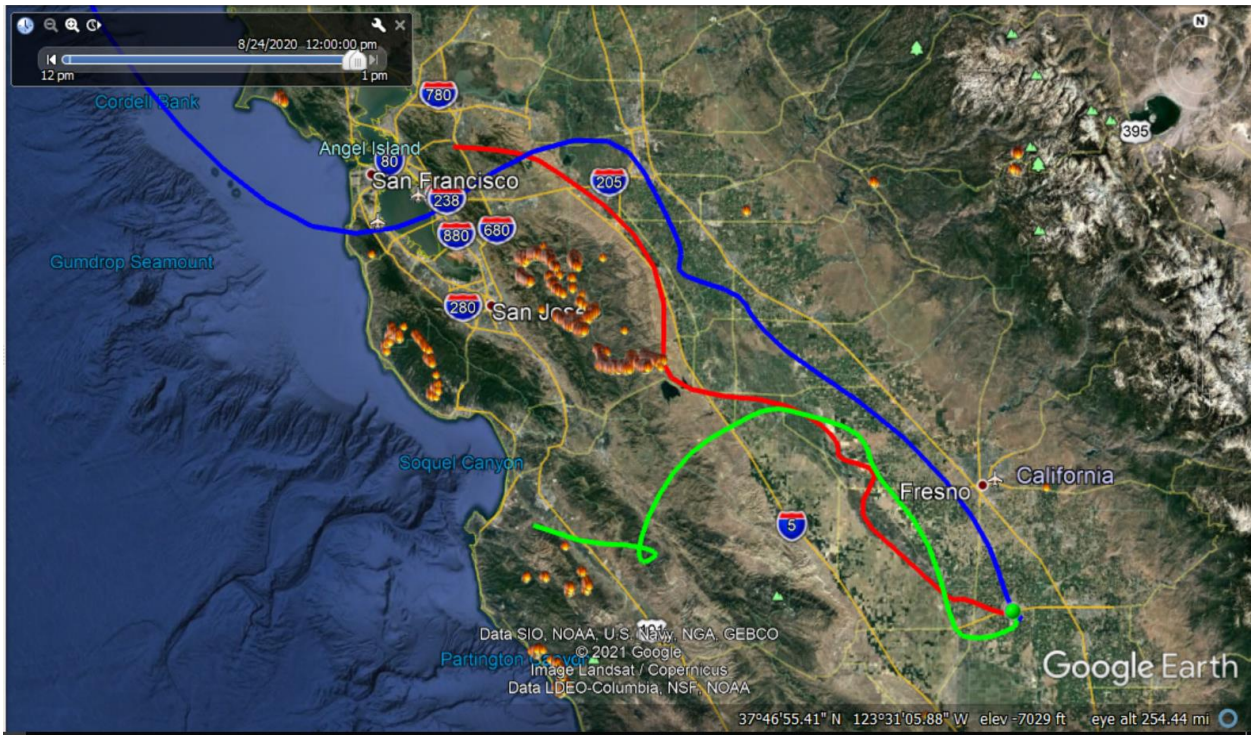
In Figure 4-10, backward trajectory analysis for August 23, 2020, shows the origination location of air mass arriving at Hanford at the 50, 500, and 1,000 meter height levels around 5:00 AM PST, where a peak concentration of 160 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Hanford on this day. Northwest winds on August 22 and 23, 2020, transported smoke from the LNU and SCU Complexes toward the Hanford area.

Figure 4-10: Backward Trajectory (36-hour) for August 23, 2020, showing location of air mass arriving in Hanford at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 5:00 AM



In Figure 4-11, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Hanford at the 50, 500, and 1,000 meter height levels around 11:00 AM PST, where a peak concentration of 145 µg/m^3 was recorded. A backward trajectory of 48 hours was used to capture the origin of the smoke that impacted Hanford on this day. Northwest winds on August 22, 23, and 24, 2020, transported smoke from the LNU and SCU Complexes toward the Hanford area.

Figure 4-11: Backward Trajectory (48-hour) for August 24, 2020, showing location of air mass arriving in Hanford at 50 (red), 500 (green), and 1,000 (blue) meter height levels around 11:00 AM

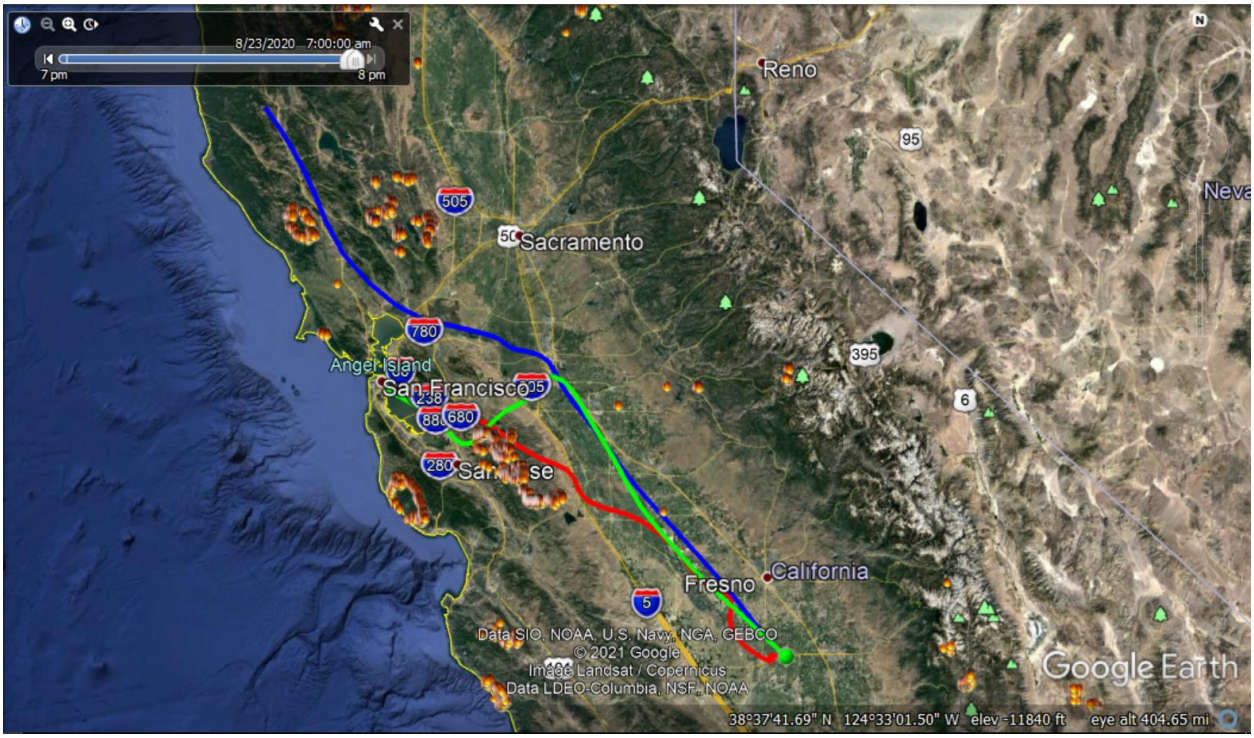


4.5.3 Bakersfield-Planz Backward Trajectories

The following trajectory analysis depicts emissions transported to the Bakersfield-Planz air monitoring site on August 22, 2020. The modeling and observations show that the smoke originated at the LNU and SCU Complexes and Woodward fires northwest of Bakersfield-Planz. The model trajectory analysis takes the air parcel southeast toward the Bakersfield area, leading to the elevated PM2.5 concentrations reported at the Bakersfield-Planz air monitoring station.

In Figure 4-12, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Bakersfield at the 50, 500, and 1,000 meter height level around 12:00 AM. A backward trajectory of 48 hours was used to capture the origin of the smoke that impacted Bakersfield on this day. Northwest winds on August 20, 21, and 22, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Bakersfield area

Figure 4-12: Backward Trajectory (48-hour) for August 22, 2020, showing location of air mass arriving in Bakersfield at 50 (red), 500 (green), and 1,000 (blue) meter height levels around 12:00 AM



4.6 Source-Recptor Analysis: Forward Trajectories

Satellite imagery is shown for each of the affected monitoring locations, for the days in which the exceptional events took place, and are labeled in the following figures. The satellite images for each of these figures show the smoke plume was generated by the active wildfires and encompasses the PM2.5 monitors in the San Joaquin Valley where exceedances of the PM2.5 standard were recorded. The smoke is present for multiple days, which resulted in the monitors showing PM2.5 concentrations above the standard. During each of these days, the fires created a massive smoke plume, which moved south and southeast and transported smoke at multiple heights. Hot spots, or the locations of the wildfire, are shown as red triangles.

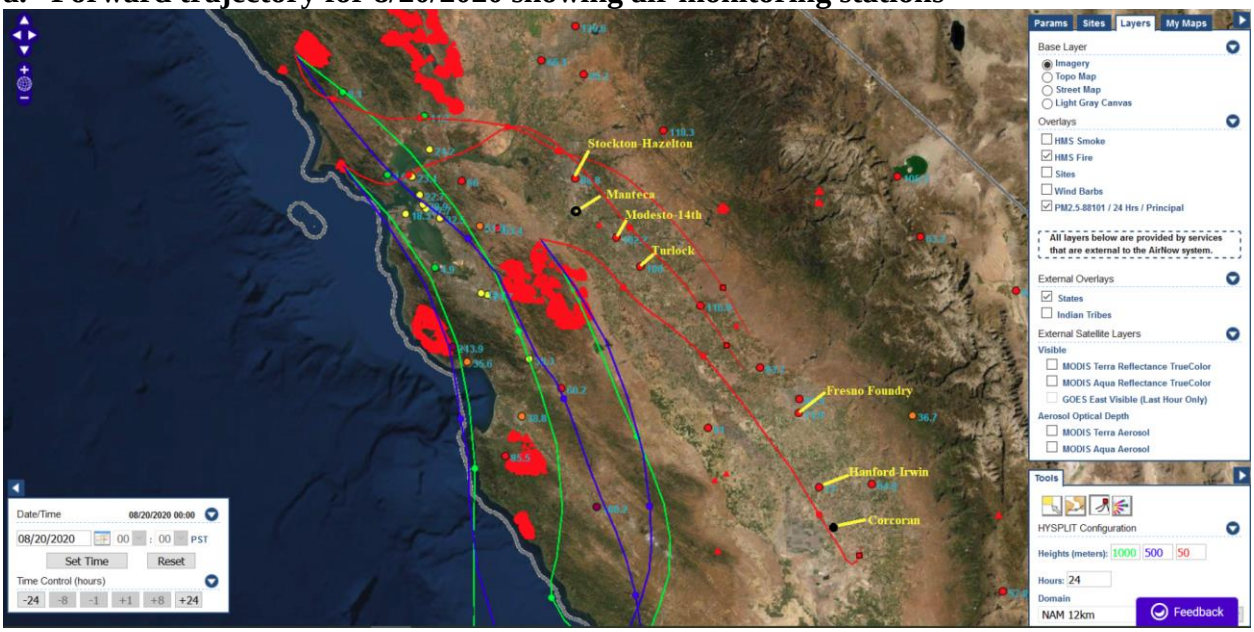
MODIS was developed by the National Aeronautics and Space Administration (NASA) was used to display the images of the wildfire in the backward trajectory images. MODIS has 36 discrete spectral bands, and these sensors are very sensitive to detection of fires. MODIS is an extensive program using sensors on two satellites that each provide complete daily coverage of the earth. The MODIS sensor is carried on both the Terra satellite, which provides morning images and the Aqua satellite, which provides afternoon images.[35] The MODIS satellite imagery provides true color images of what the smoke plume was like for each of the five dates included in this demonstration.

As shown in Figure 4-13a, the NAM 12 km 24-hour forward trajectory from the Woodward Fire, LNU and SCU Complex on August 19, 2020, shows the parcel trajectory arriving at Stockton Hazelton, Manteca, Modesto-14th St., Turlock, and Fresno-Foundry air monitoring stations on August 20. Figure 4-13b also shows the forward trajectory overlaid on the satellite imagery and air quality data from August 20 clearly displaying smoke from the Woodward Fire, LNU and SCU Complex impacting the San Joaquin Valley, especially the PM2.5 monitors included in this demonstration.

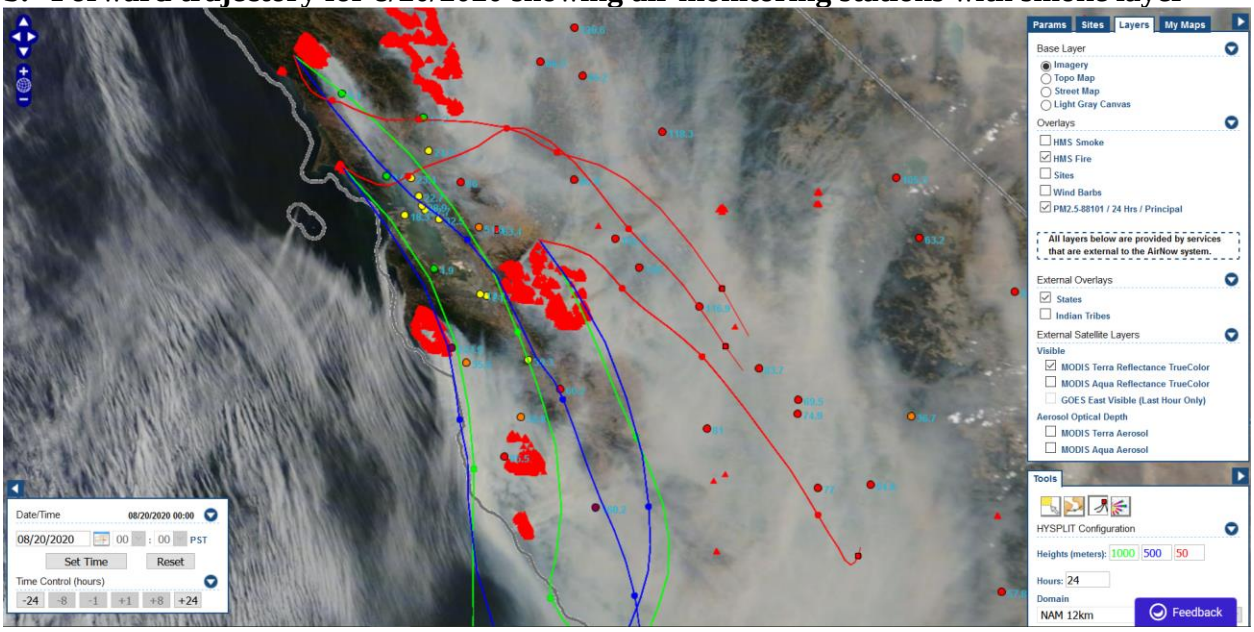
[35] "Exceptional Event Demonstration for November 2018 PM10 Exceedances in Sacramento County Due to Wildfires." Sacramento Metropolitan Air Quality Management District, 12 Feb. 2021, pp. 1–91.

Figure 4-13(a-b): Forward Trajectories (24-hour) for August 20, 2020, at 50 (red), 500 (green), and 1,000 (blue) meter height levels starting at the Woodward, LNU, and SCU Complex Fires on August 19, 2020

a. Forward trajectory for 8/20/2020 showing air monitoring stations



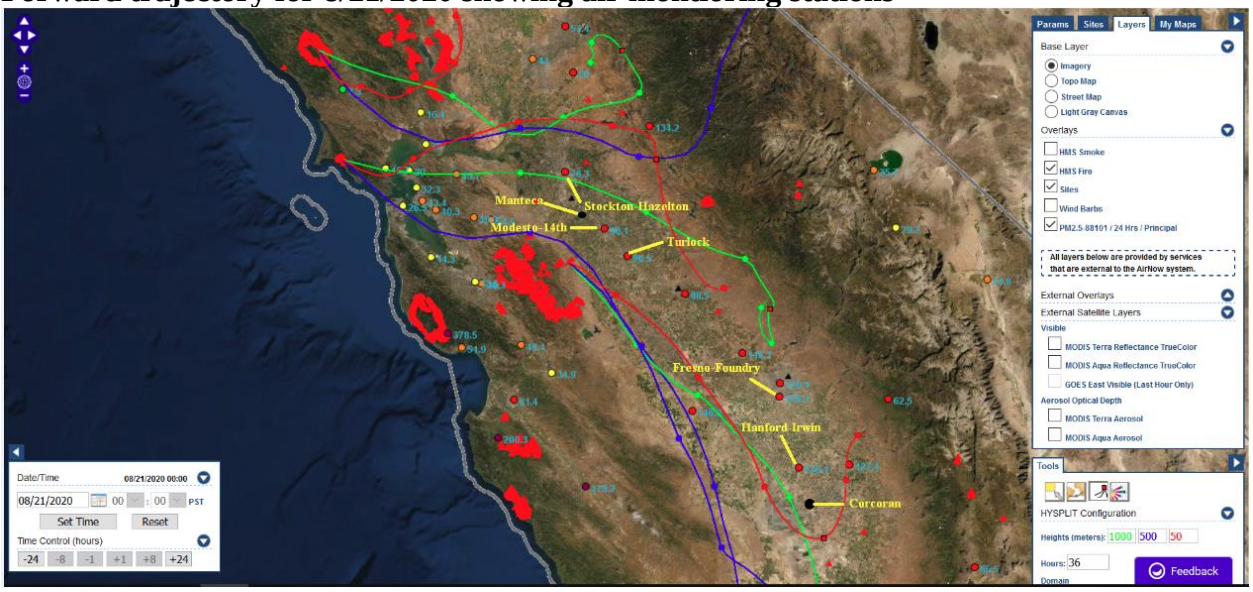
b. Forward trajectory for 8/20/2020 showing air monitoring stations with smoke layer



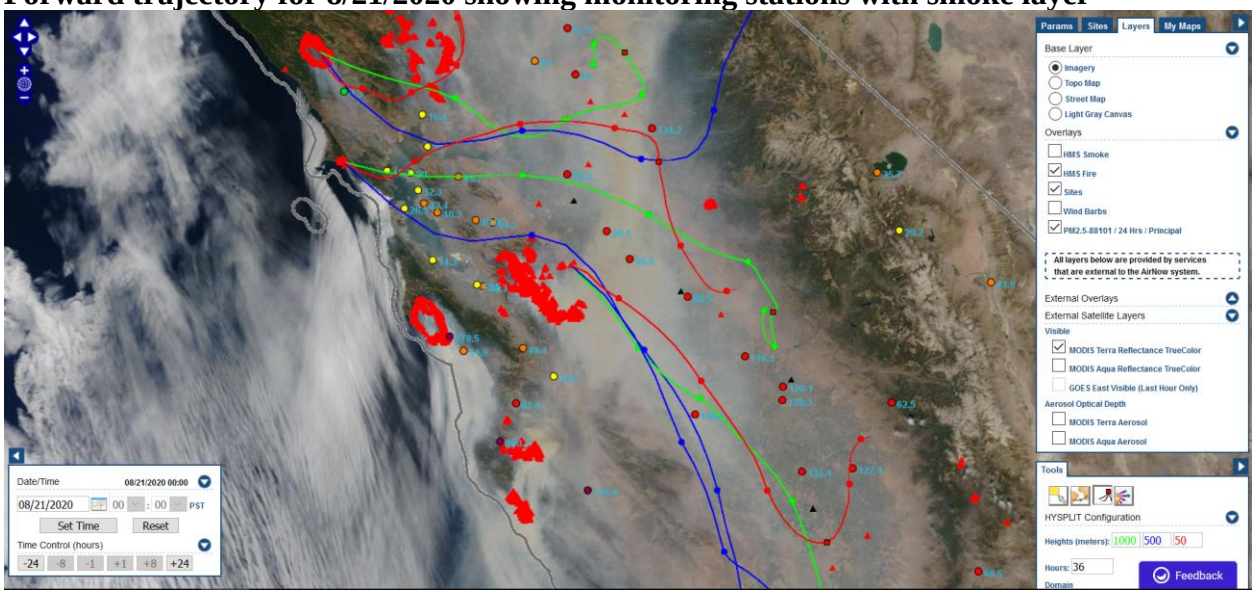
As shown in Figure 4-14a, the NAM 12 km 36-hour forward trajectory from the Woodward Fire, LNU and SCU Complex on August 20, 2020, shows the parcel trajectory arriving at Stockton-Hazelton, Manteca, Modesto-14th St., Turlock, Fresno-Foundry, Hanford-Irwin, and Corcoran air monitoring stations on August 21. Figure 4-14b also shows the forward trajectory overlaid on the satellite imagery and air quality data from August 21 clearly displaying smoke from the Woodward Fire, LNU and SCU Complex impacting the San Joaquin Valley, especially the PM2.5 monitors included in this demonstration.

Figure 4-14(a-b): Forward Trajectories (36-hour) for August 21, 2020, at 50 (red), 500 (green), and 1,000 (blue) meter height levels starting at the Woodward, LNU, and SCU Complex Fires on August 20, 2020

a. Forward trajectory for 8/21/2020 showing air montioring stations



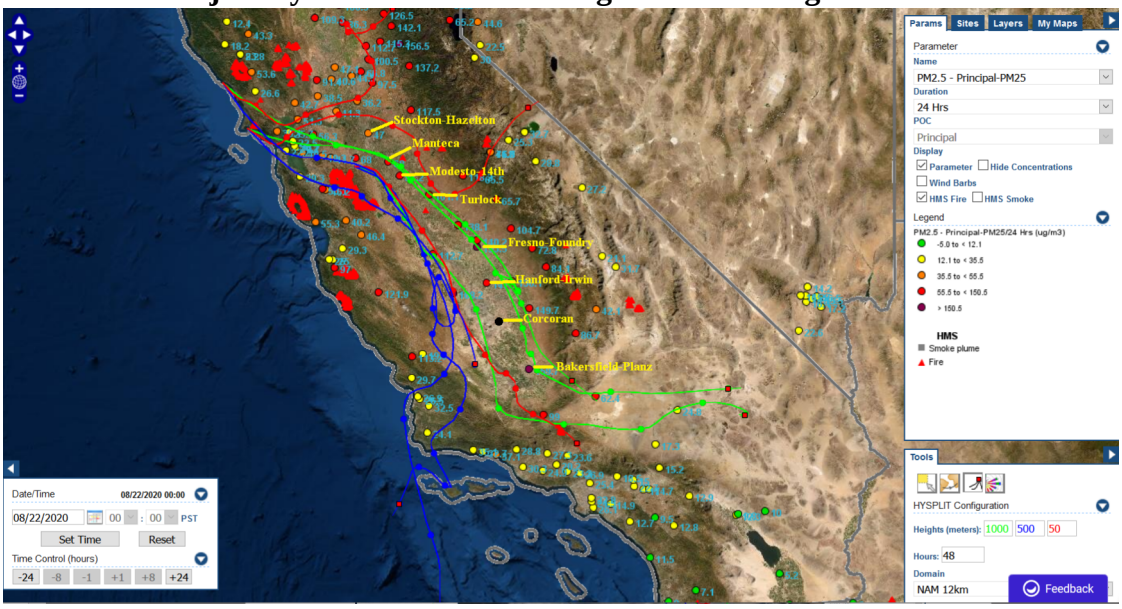
b. Forward trajectory for 8/21/2020 showing monitoring stations with smoke layer



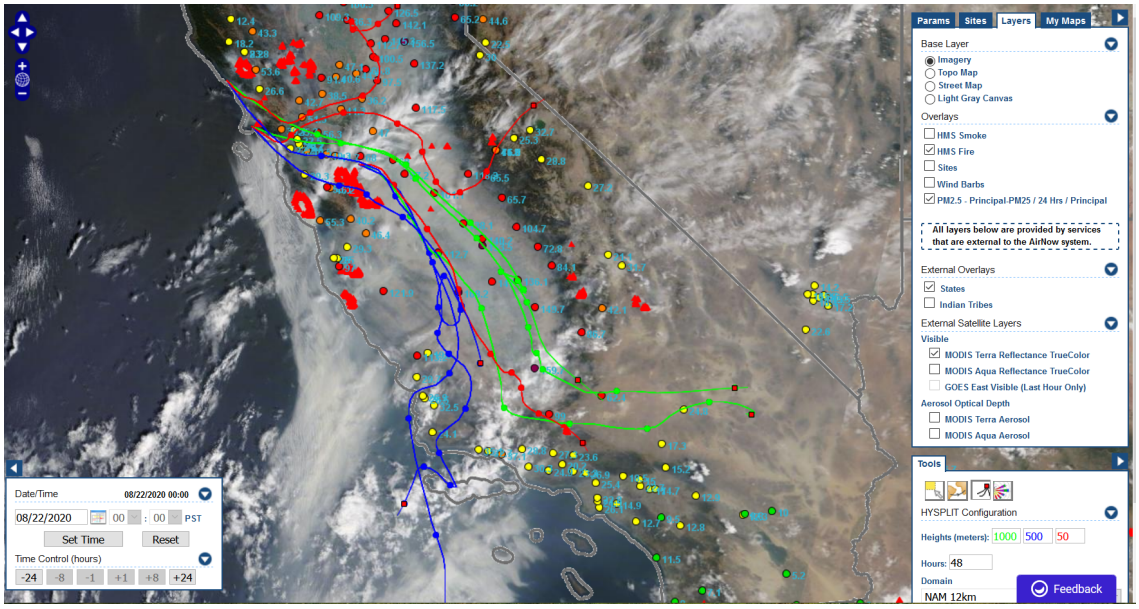
As shown in Figure 4-15a, the NAM 12 km 48-hour forward trajectory from the Woodward Fire, LNU and SCU Complex on August 20, 2020, shows the parcel trajectory arriving at Modesto-14th St., Turlock, Fresno-Foundry, Hanford-Irwin, Corcoran, and Bakersfield-Planz air monitoring stations on August 22. Figure 4-15b also shows the forward trajectory overlaid on the satellite imagery and air quality data from August 22 clearly displaying smoke from the Woodward Fire, LNU and SCU Complex impacting the San Joaquin Valley, especially the PM2.5 monitors included in this demonstration.

Figure 4-15(a-b): Forward Trajectories (48-hour) for August 22, 2020, at 50 (red), 500 (green), and 1,000 (blue) meter height levels starting at the Woodward, LNU, and SCU Complex Fires on August 20, 2020

a. Forward trajectory for 8/22/2020 showing air monitoring stations



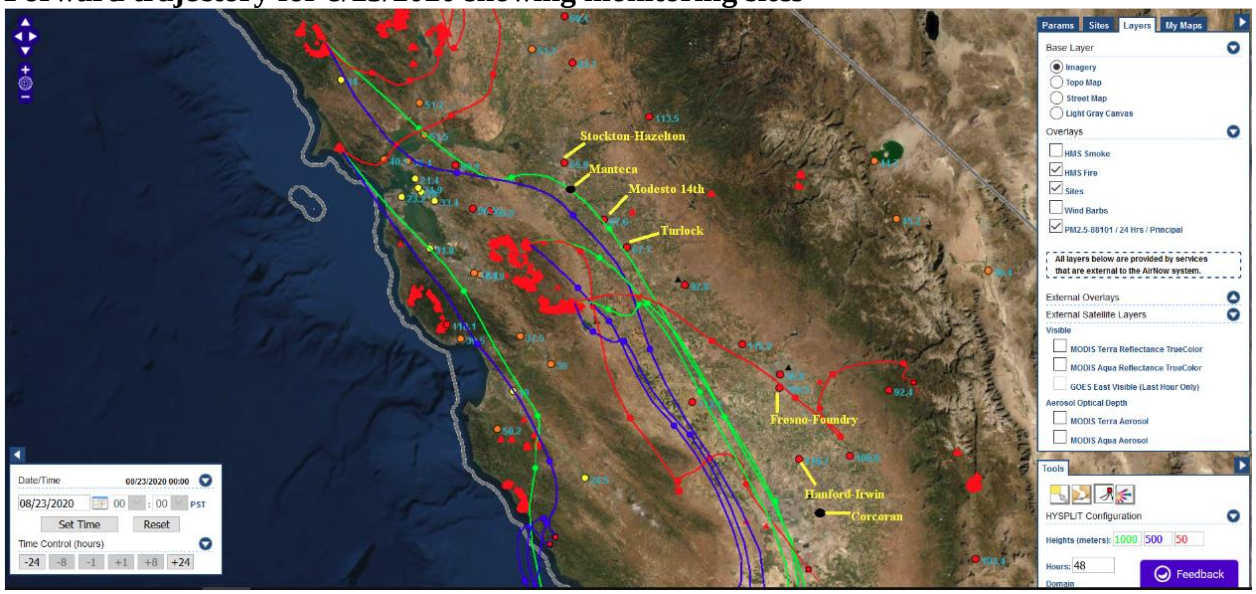
b. Forward trajectory for 8/22/2020 showing monitoring sites with smoke layer



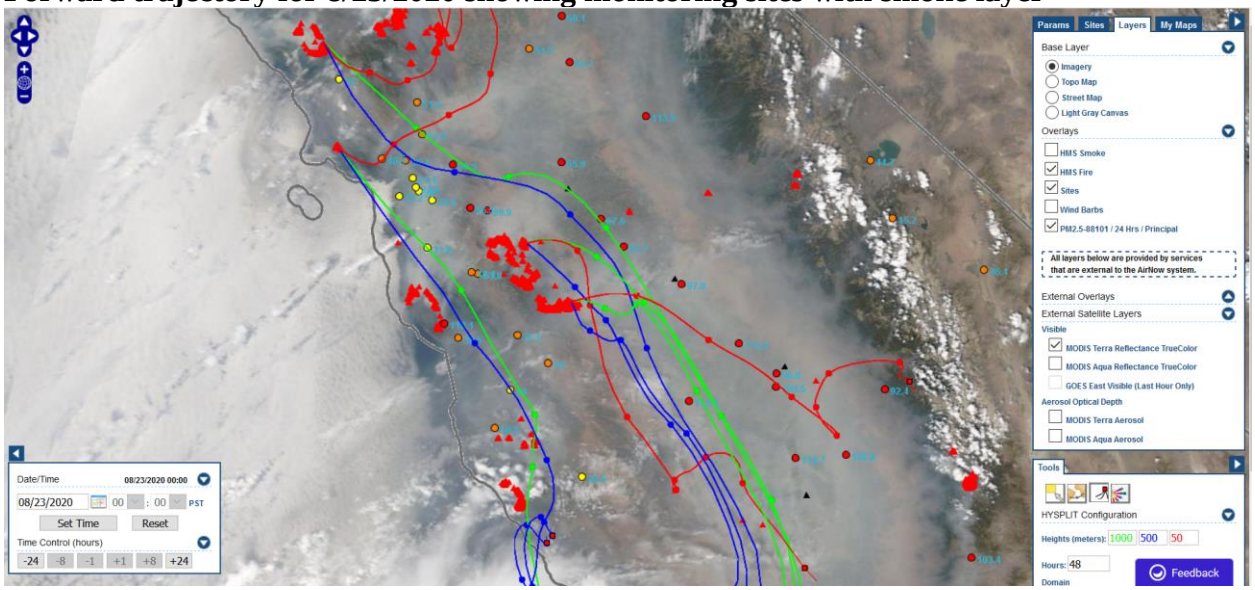
As shown in Figure 4-16a, the NAM 12 km 48-hour forward trajectory from the Woodward Fire, LNU and SCU Complex on August 21, 2020, shows the parcel trajectory arriving at Manteca, Modesto-14th St., Fresno-Foundry, Hanford-Irwin, and Corcoran air monitoring stations on August 23. Figure 4-16b also shows the forward trajectory overlaid on the satellite imagery and air quality data from August 23 clearly displaying smoke from the Woodward Fire, LNU and SCU Complex impacting the San Joaquin Valley, especially the PM2.5 monitors included in this demonstration.

Figure 4-16(a-b): Forward Trajectories (48-hour) for August 23, 2020, at 50 (red), 500 (green), and 1,000 (blue) meter height levels starting at the Woodward, LNU, and SCU Complex Fires on August 21, 2020

a. Forward trajectory for 8/23/2020 showing monitoring sites



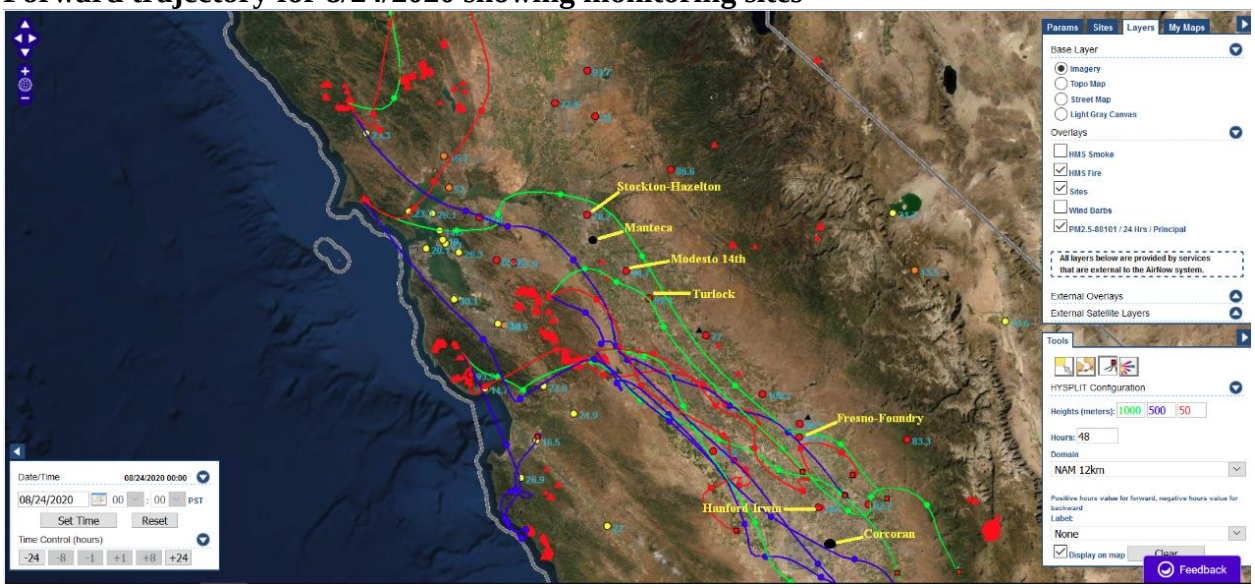
b. Forward trajectory for 8/23/2020 showing monitoring sites with smoke layer



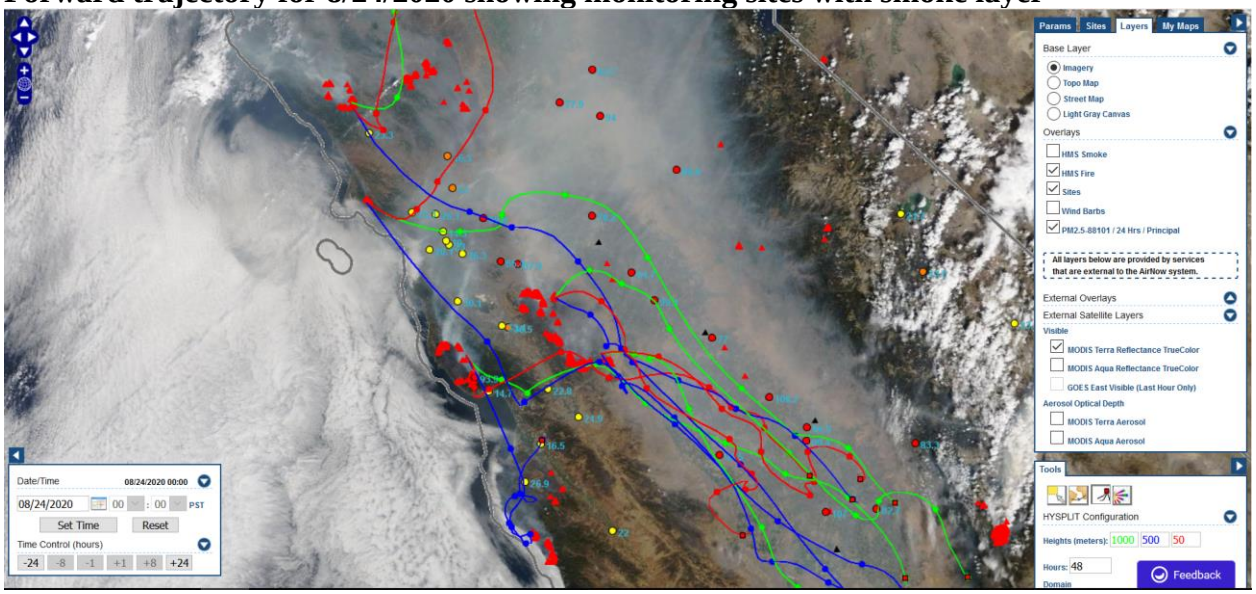
As shown in Figure 4-17a, the NAM 12 km 48-hour forward trajectory from the Woodward Fire, LNU, CZU, and SCU Complex on August 22, 2020, shows the parcel trajectory arriving at Stockton-Hazelton, Manteca, Modesto-14th St., Turlock, Fresno-Foundry, Hanford-Irwin, and Corcoran air monitoring stations on August 24. Figure 4-17b also shows the forward trajectory overlaid on the satellite imagery and air quality data from August 24 clearly displaying smoke from the Woodward Fire, LNU, CZU, and SCU Complex impacting the San Joaquin Valley, especially the PM2.5 monitors included in this demonstration.

Figure 4-17(a-b): Forward Trajectories (48-hour) for August 24, 2020, at 50 (red), 500 (green), and 1,000 (blue) meter height levels starting at the Woodward, LNU, CZU, and SCU Complex Fires on August 22, 2020

a. Forward trajectory for 8/24/2020 showing monitoring sites



b. Forward trajectory for 8/24/2020 showing monitoring sites with smoke layer



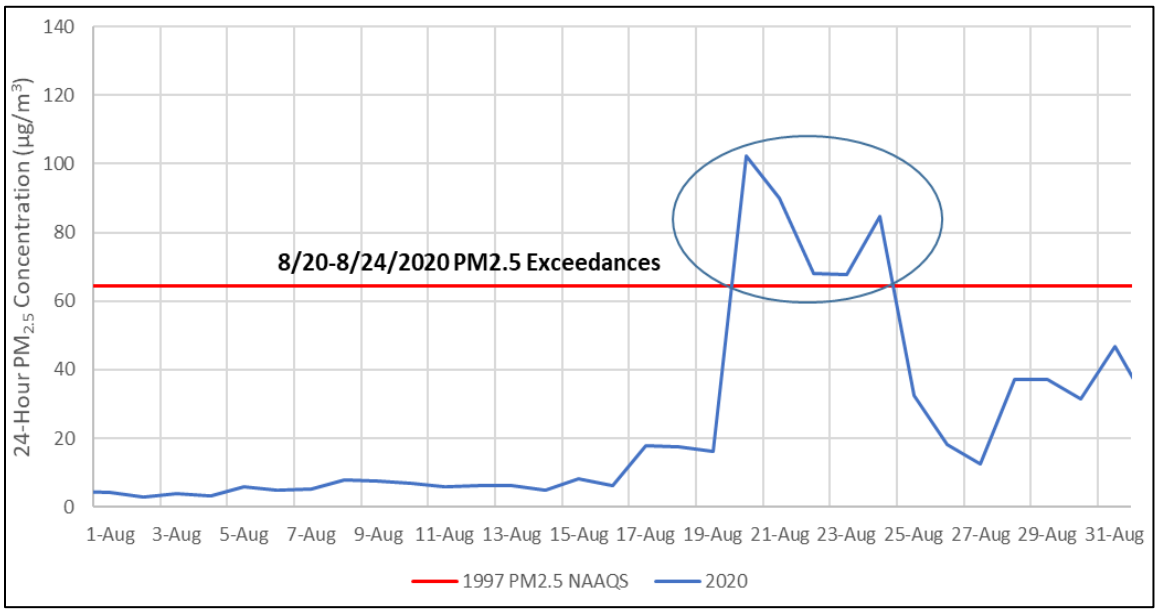
4.7 24-hour PM2.5 Concentration Trends

Daily PM2.5 concentrations are typically low during the month of August, as shown in the historic graphs in Figures 4-18 through 4-20. PM2.5 concentrations during non-event days August 1-19, 2020, clearly show the PM2.5 concentrations followed historical PM2.5 patterns for the early part of the month. Due to wildfires across California, PM2.5 values began to rise over the NAAQS in mid-August. The figures below further demonstrate the effects of the wildfires by comparing PM2.5 concentrations for Modesto, Hanford, and Bakersfield-Planz for the month of August 2020. PM2.5 concentrations for Stockton-Hazelton, Manteca, Turlock, Fresno-Foundry, and Corcoran are located in Appendix G. As further support for the site impacts from wildfire smoke, Appendix F includes weather surface observations showing surface impacts from smoke.

4.7.1 Modesto-24th Street 24-hour PM2.5 Trend

At Modesto, the 24-hour average PM2.5 concentration for August remains below the 1997 24-hour NAAQS for the first 19 days of the month, with the highest concentration pre-event days being 17.8 µg/m^3 on August 17. From August 20-24, 2020, wildfire smoke caused concentrations to exceed the standard. As conditions began to clear and smoke dispersed, concentrations quickly decreased on August 24 to below the NAAQS. The circle indicates concentrations measured during the period included in this demonstration.

Figure 4-18: Modesto-14th St PM2.5 Concentrations for August 2020

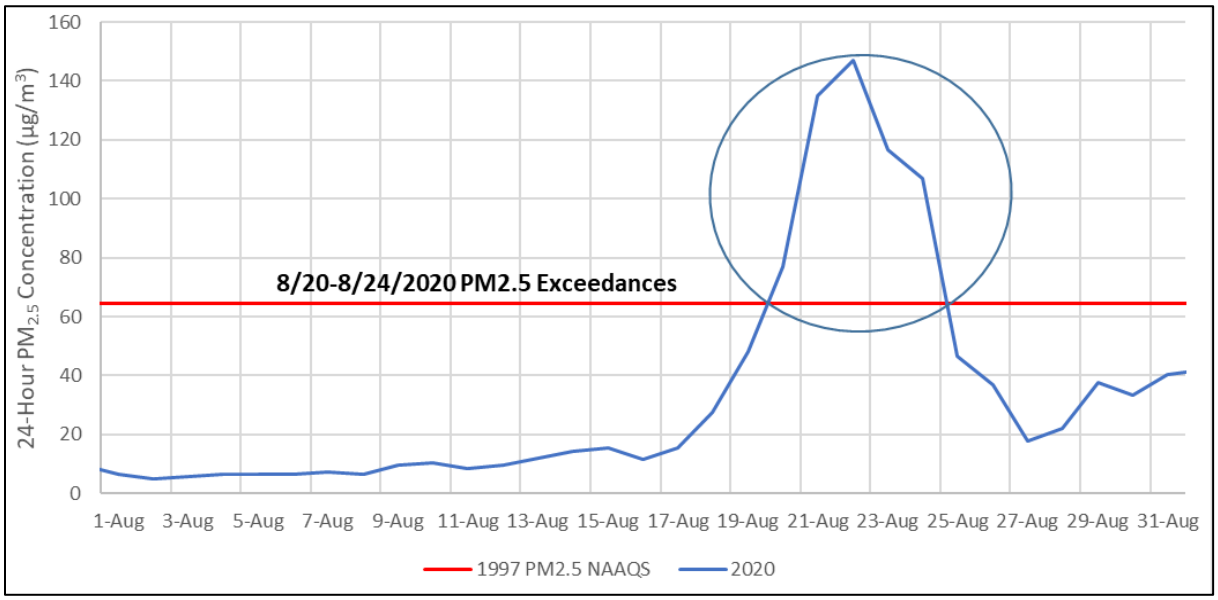


4.7.2 Hanford-Irwin 24-hour PM2.5 Trend

At Hanford, the 24-hour average PM2.5 concentration for August remains below the NAAQS for the first 19 days of the month, with the highest concentration of 48.3 µg/m^3 before the days included in this demonstration. There is a steady increase in PM2.5 concentrations beginning on

August 17th when the fires began, and peaking on August 22nd with a PM2.5 value of 144 µg/m^3. Wildfire smoke caused concentrations to remain above the standard from August 20–24, 2020. As conditions began to clear and smoke dispersed concentrations quickly decreased by 61 µg/m^3 between August 24 and 25. The circle indicates concentrations measured during the period included in this demonstration.

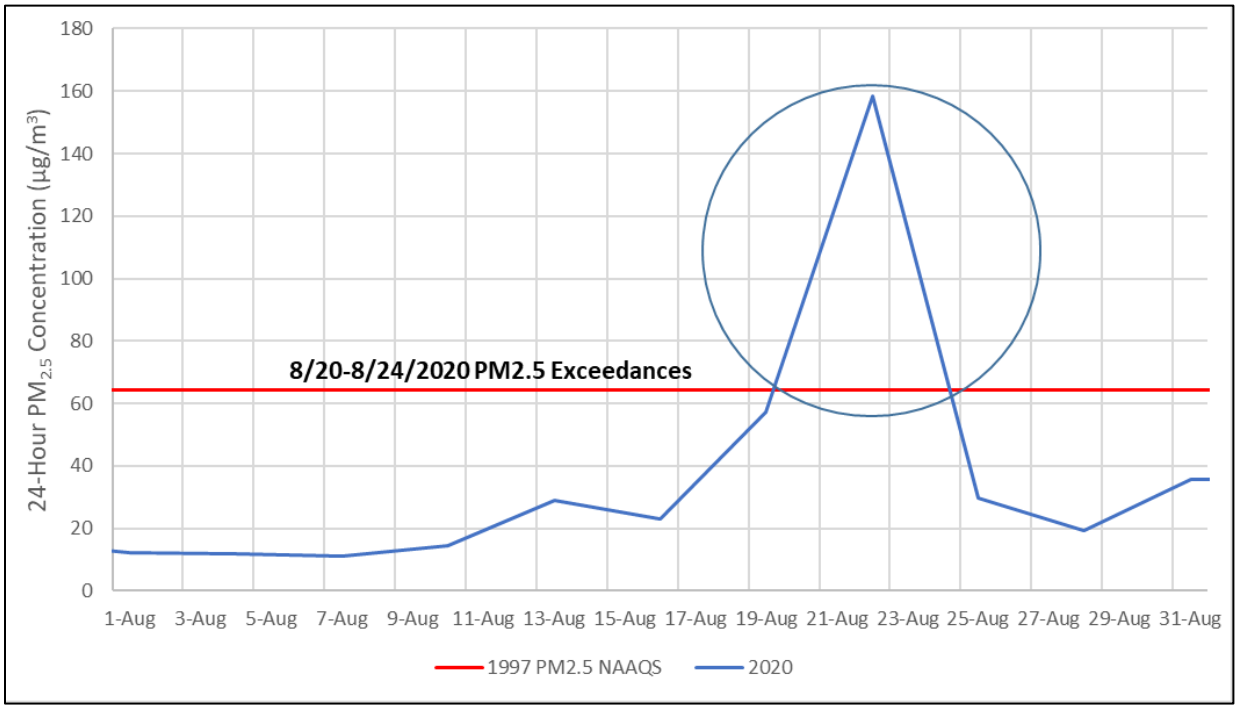
Figure 4-19: Hanford-Irwin PM2.5 Concentrations for August, 2020



4.7.3 Bakersfield-Planz 24-hour PM2.5 Trend

At Bakersfield-Planz, the 24-hour average PM2.5 concentration is measured every 3rd day. Leading up to and during the August 2020 wildfire siege, concentrations were measured on the 13th, 16th, 19th, 22nd, and 25th of August. There is an increase of PM2.5 values between the 23.2 µg/m^3 and 57.1 µg/m^3 on August 16th and 19th, which lines up with the beginning of multiple wildfires, and the transportations of smoke across the District. Concentrations remained below the standard for every day measured, with the exception of 158.6 µg/m^3 measured August 22, which occurred during wildfire smoke impacts. PM2.5 concentrations improve greatly between the 22nd and 25th with a decrease of 128 µg/m^3. The circle indicates concentrations measured during the period included in this demonstration.

Figure 4-20: Bakersfield-Planz PM2.5 Concentrations for August, 2020



4.8 PM2.5 and Carbon Monoxide Correlations

It has been documented that ambient PM2.5 and CO concentrations are correlated in the presence of wildfire smoke. In a 2017 study, Laing, et al. [36] determined enhancement ratios between PM2.5 and CO can be used as an indicator for smoke impacts. In Figure 4-21 through Figure 4-32, PM2.5 and CO at the Stockton-Hazelton, Modesto-14th, and Fresno-Foundry monitoring sites were plotted for the event days between August 20th and 24th, 2020, and then compared to plots for a non-event day, August 12, 2020, (equations below). These sites were chosen for this comparison since these each monitor PM2.5 and CO at the same air monitoring site.

In Stockton-Hazelton, the non-event day of August 12, 2020, had a slope of 1.44 $\mu g/m^3 ppmv^{-1}$ and a R^2 value of 0.0013, while the event day of August 20th at the same site had a slope of 128 $\mu g/m^3$ $ppmv^{-1}$ and a R^2 value of 0.8. By comparing the slope and R^2 values of the event days and non-event days at each site, there are clear indicators of wildfire smoke impacts for each day between August 20 and 24, 2020. This analysis enhances the weight of evidence that wildfire emissions reached the San Joaquin Valley and caused for increased PM2.5 concentrations across the District.

[36] Laing J.R., Jaffe D.A., Slavens A.P., LiW., Wang, W. Using ΔPM2.5/ΔCO and ΔNOy/ΔCO Enhancement Ratios to Identify Wildfire Smoke in Urban Areas. Submitted to Aerosol and Air Quality Research, Feb. 2017.

4.8.1 Stockton-Hazelton PM2.5 vs CO Comparison

Stockton-Hazelton Non-Event Slope (August 12, 2020)
y=1.4371x+3.7186 R^2 = 0.0013

Figure 4-21: Stockton-Hazelton Hourly PM2.5/CO – August 20, 2020

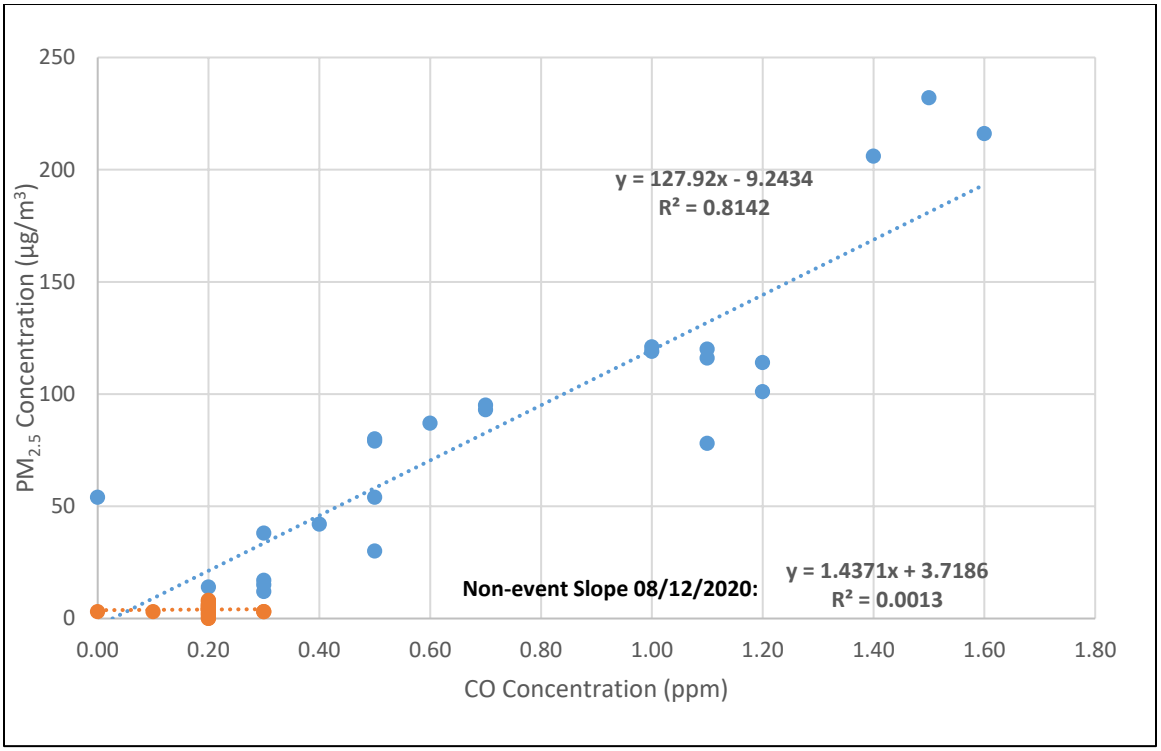


Figure 4-22: Stockton-Hazelton Hourly PM2.5/CO – August 21, 2020

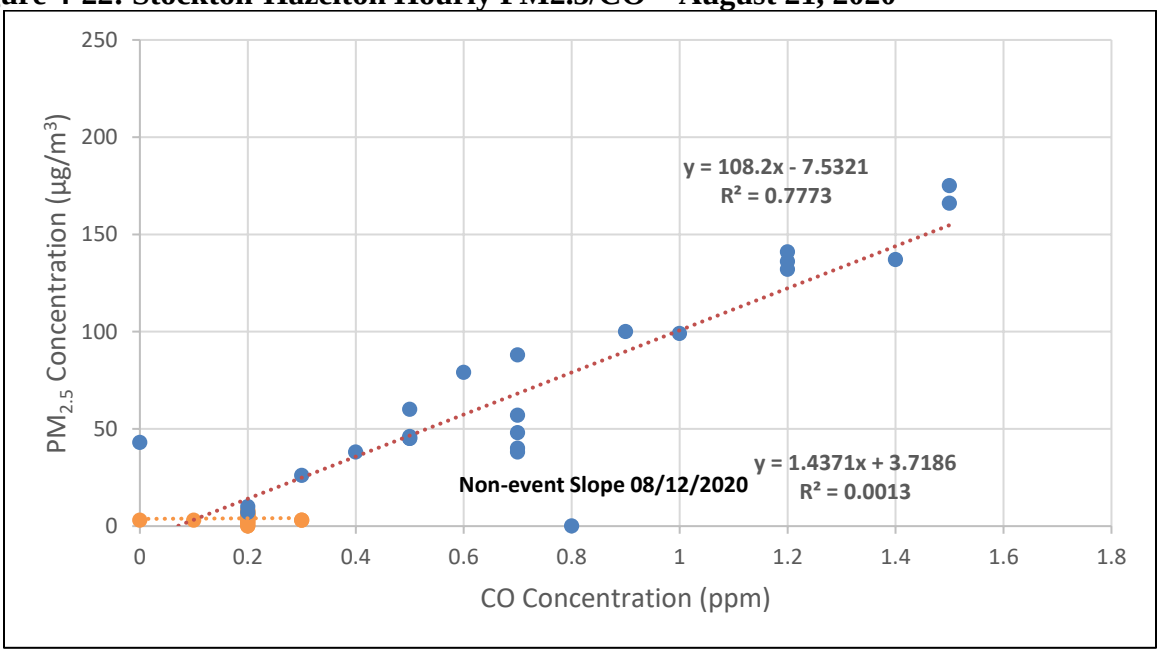
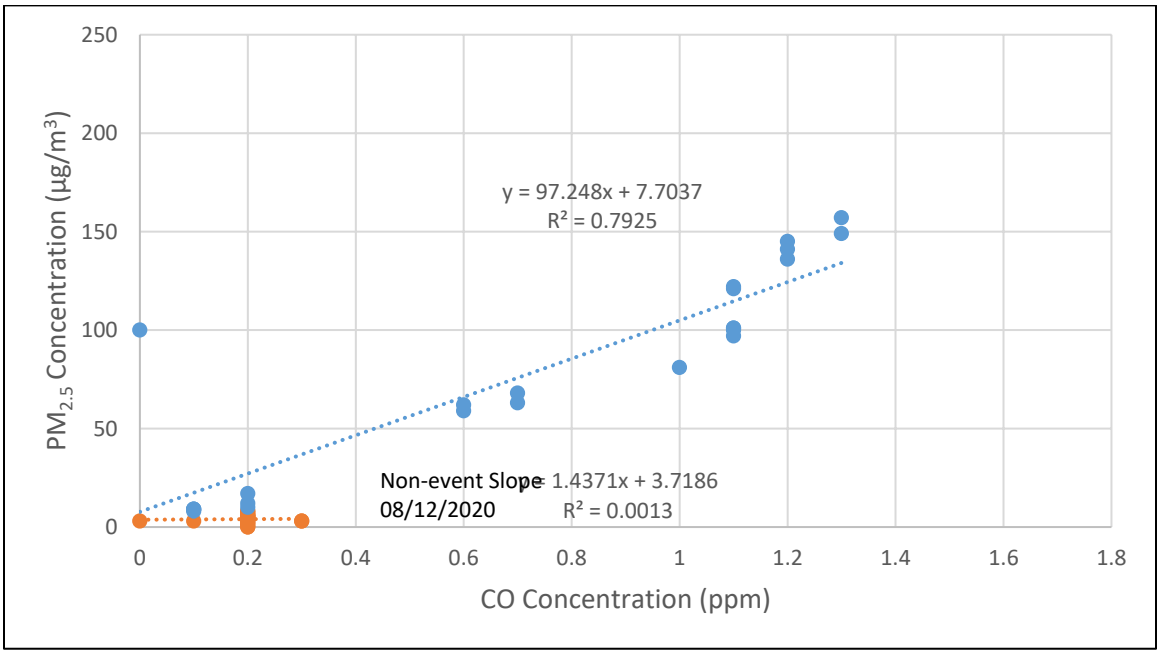


Figure 4-23: Stockton-Hazelton Hourly PM2.5/CO – August 24, 2020



4.8.2 Modesto-14th Street PM2.5 vs CO Comparison

Modesto-14th Non-Event Slope (August 12, 2020)
y=-3.2075x + 6.8931 R^2 = 0.0093

Figure 4-24: Modesto-14th Street Hourly PM2.5/CO – August 20, 2020

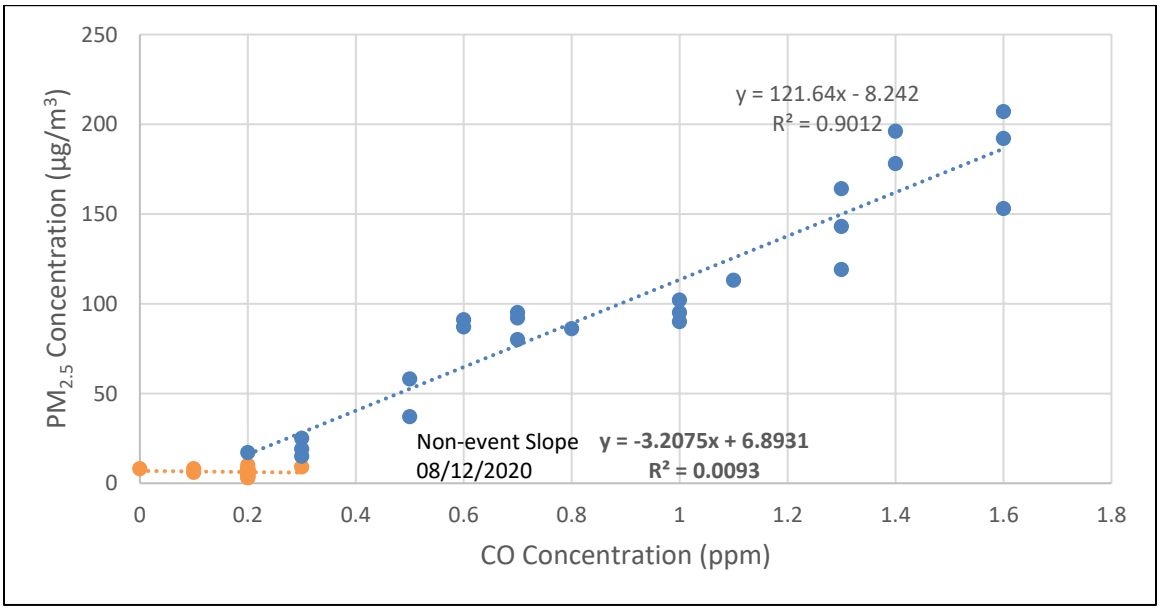


Figure 4-25: Modesto-14th Street Hourly PM2.5/CO – August 21, 2020

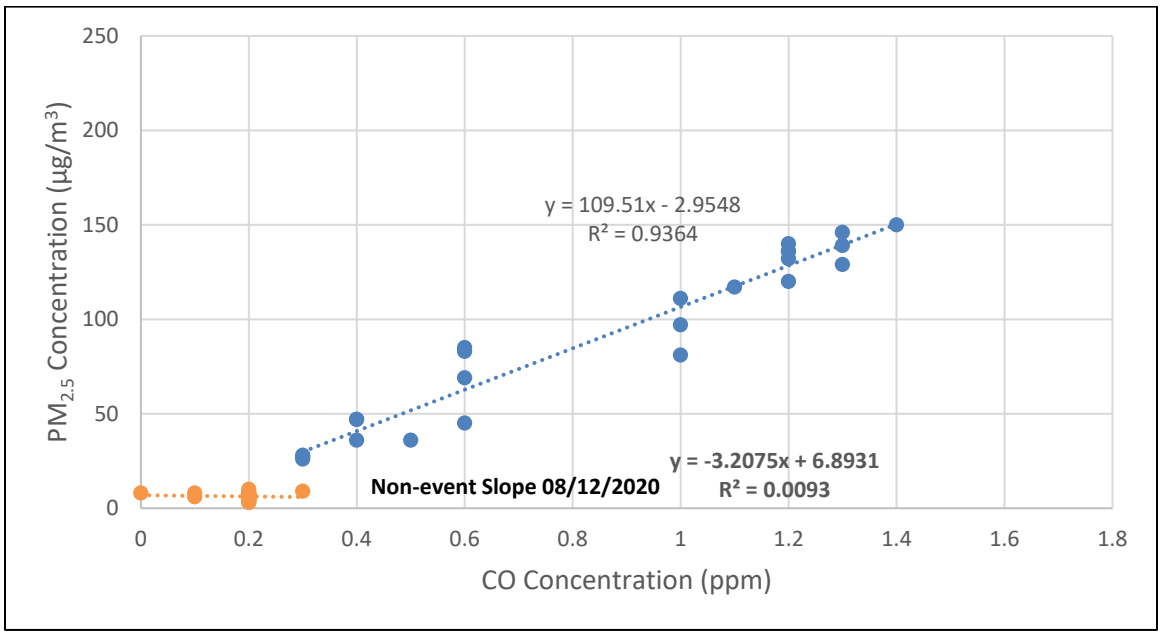


Figure 4-26: Modesto-14th Street Hourly PM2.5/CO – August 22, 2020

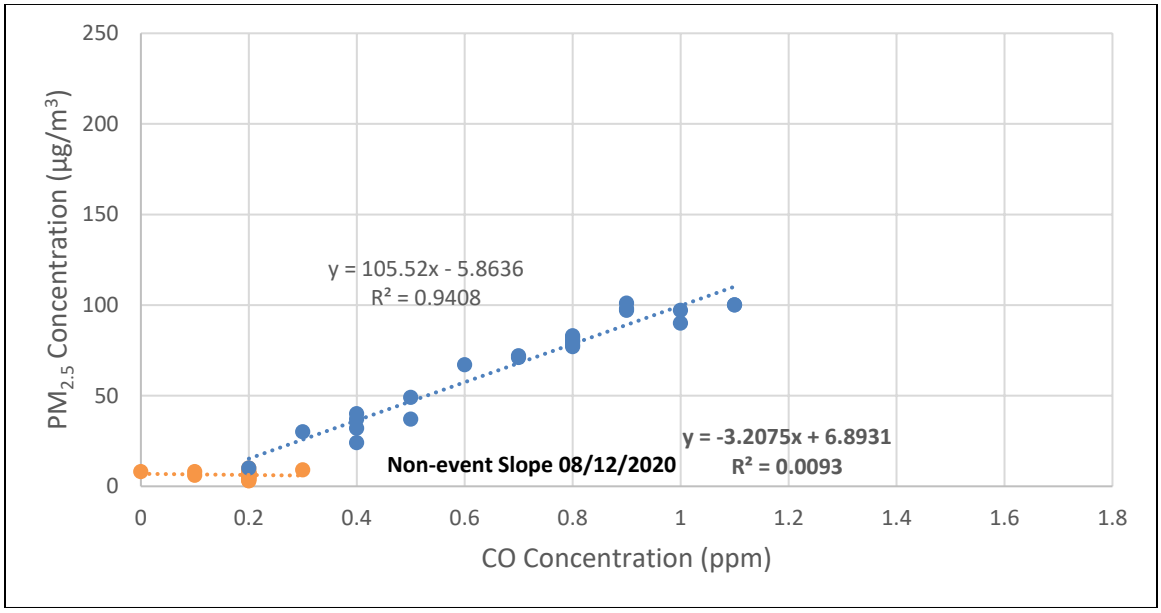
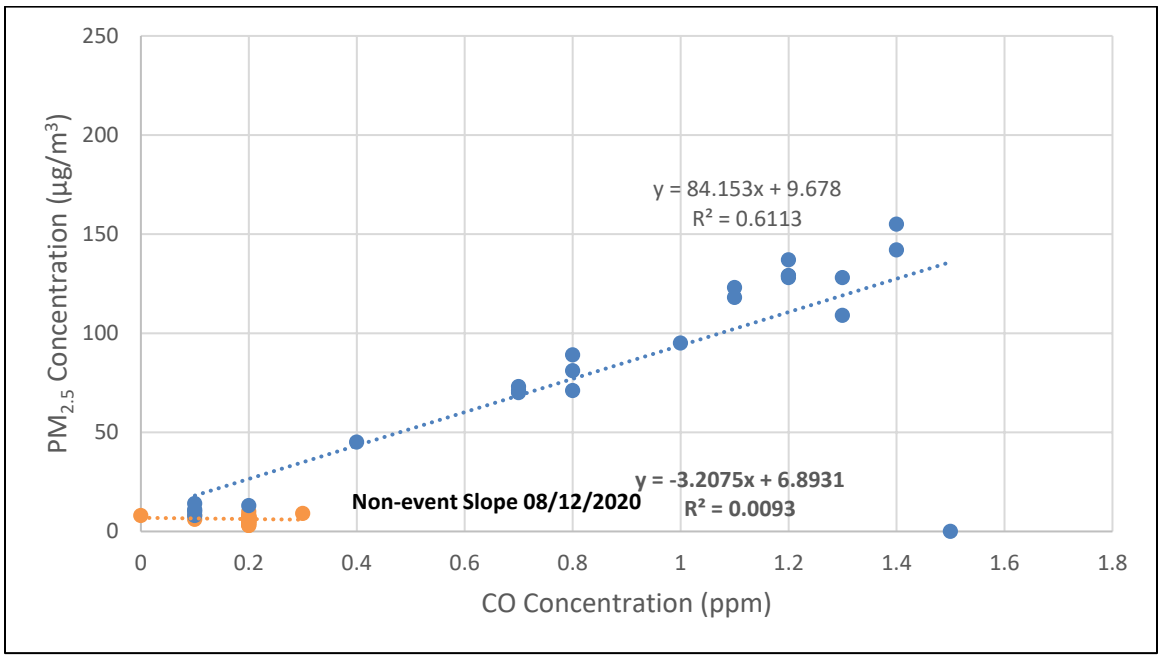


Figure 4-27: Modesto-14th Street Hourly PM2.5/CO – August 24, 2020



4.8.3 Fresno-Foundry PM2.5 vs CO Comparison

Fresno-Foundry Non-Event Slope (August 12, 2020)
$y = 1.1913x + 11.045$ $R^2 = 0.011$

Figure 4-28: Fresno-Foundry Hourly PM2.5/CO August 20, 2020

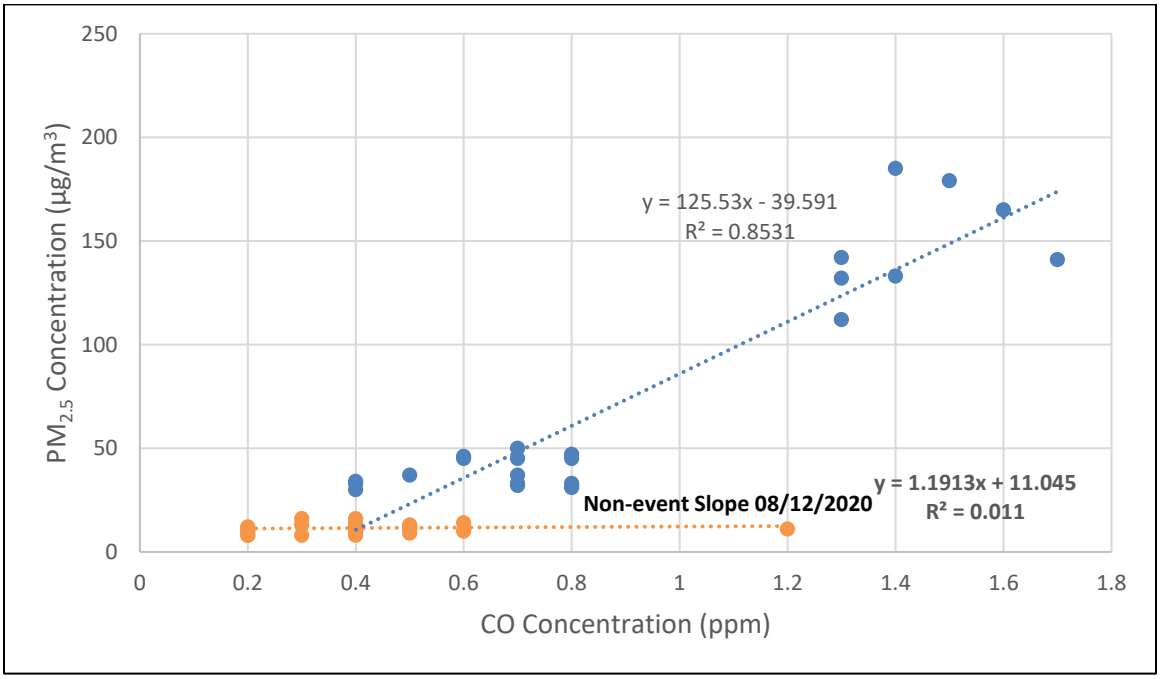


Figure 4-29: Fresno-Foundry Hourly PM2.5/CO – August 21, 2020

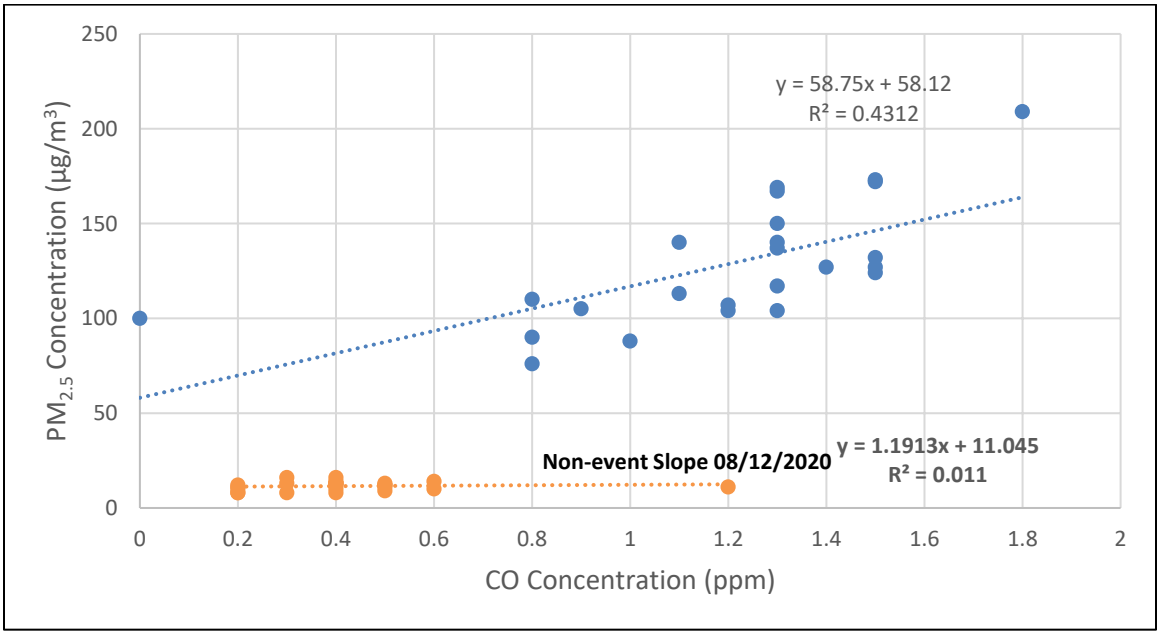


Figure 4-30: Fresno-Foundry Hourly PM2.5/CO – August 22, 2020

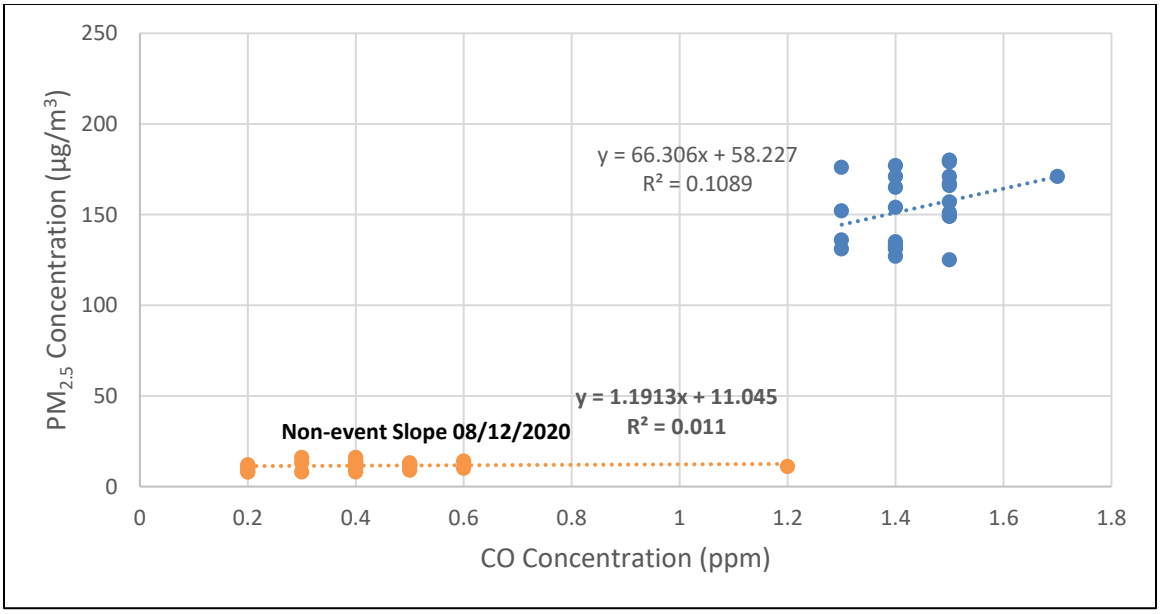


Figure 4-31: Fresno-Foundry Hourly PM2.5/CO - August 23, 2020

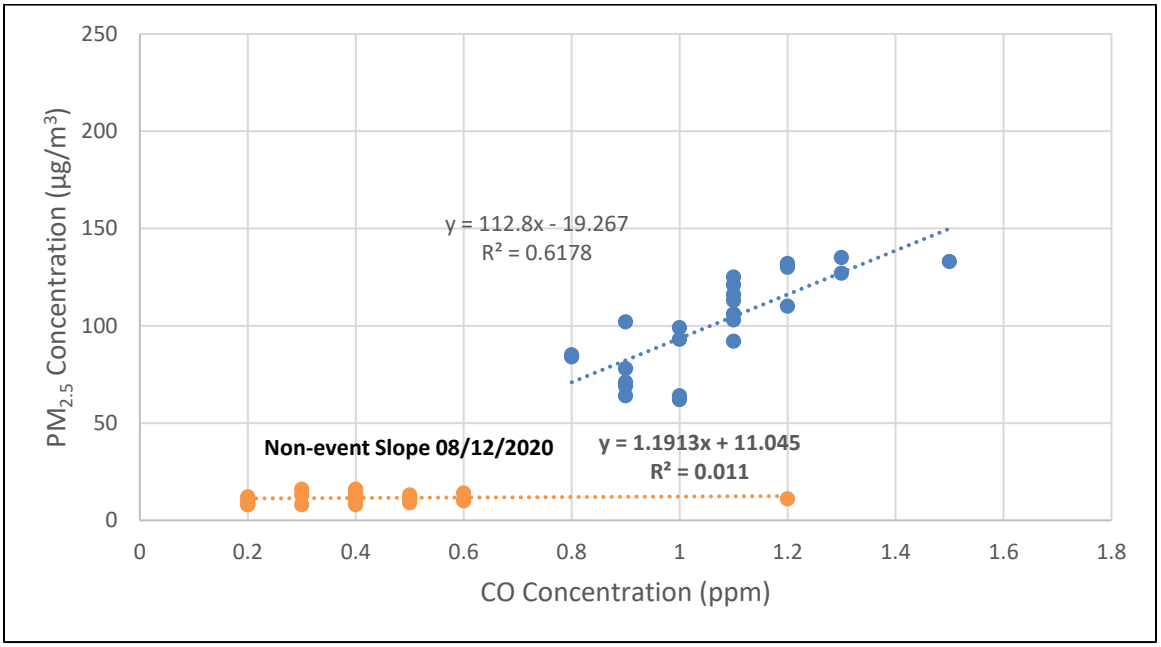
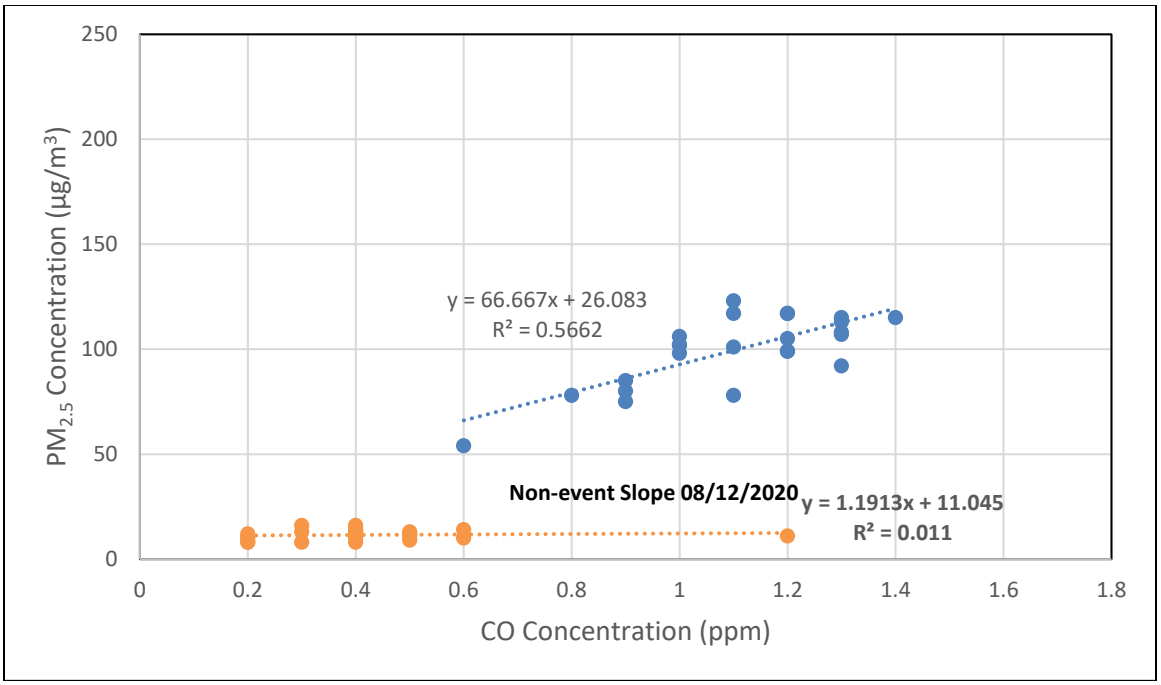


Figure 4-32: Fresno-Foundry Hourly PM2.5/CO – August 24, 2020



4.9 Analysis of PM2.5 Speciation Measurements

An analysis of PM2.5 speciation data was not completed for this demonstrations. Due to COVID-19 emergency restrictions, PM2.5 speciation data was not gathered during much of 2020 and is not available for the dates included in this demonstration.

4.10 Summary of Clear Causal Relationship

The weight of evidence provided in Section IV of this report has shown that smoke from multiple wildfires caused PM2.5 concentrations in the San Joaquin Valley to be above the NAAQS of 65 µg/m^3 on August 20, 21, 22, 23, and 24 in 2020. Additional information provided below supports the District's position that there exists a clear causal relationship between the specific event and the monitored exceedances, and thus, satisfies the clear causal relationship criterion.

- The average PM2.5 concentration at each monitoring station, with the exception of Manteca, for August 2020, was at least three (3) times higher than the average PM2.5 concentration for the month of August in 2019, and significantly higher than any one day throughout the same quarter in a five-year period of 2016-2020 (Table 4-1)

- For Quarter 3 throughout 2016-2020, 83 exceedances of the 24-hr PM2.5 1997 NAAQS have occurred, all of which were recorded during wildfire impacts in 2020

- The San Joaquin Valley Air District issued multiple bilingual Health Cautionary Statement press releases to Valley residents and media throughout the month of August 2020 and worked with the National Weather service to issue several Valley-wide "Air Quality Alerts" due to wildfire smoke impacts

- Satellite images were used in conjunction with the Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPLIT) and Moderate Resolution Imaging Spectroradiometer (MODIS) to determine the sources, transport of emissions, and the pathway of the smoke to the air monitoring stations (referred to as forward and backward trajectories) to demonstrate smoke transport from the fires and to the Valley air monitoring sites.

- PM2.5 and CO at the Stockton-Hazelton, Modesto-14th, and Fresno-Foundry monitoring sites were plotted for August 20-24, 2020, and then compared to plots for a non-event day, which showed a clear correlation between PM2.5 and CO on days where wildfires were visibly and measurably producing smoke and impacting the Valley residents.

Section V. Not Reasonably Controllable or Not Reasonably Preventable

This section satisfies the following federal requirements:

- The event was caused by a natural event (40 CFR 50.14(*(c)(3)(iv)(A) and 40 CFR 50.1(j),*
- An exceptional event is one that is not reasonably controllable or preventable (*40 CFR 50.14(c)(3)(iv)(D) and 40 CFR 50.14(b)(4)*

Section 40 CFR 50.14 (c)(3)(iv)(D) requires a demonstration that the event was both not reasonably controllable and not reasonably preventable. For wildfires, it is presumed according to 40 CFR 50.14(b)(4) that wildfires on wildland will satisfy both factors of the not reasonably controllable or not reasonably preventable unless there is evidence that demonstrates otherwise. As stated in 40 CFR 50.14(b)(4):

> The Administrator shall exclude data from use in determinations of exceedances and violations where a State demonstrates to the Administrator's satisfaction that emissions from wildfires caused a specific air pollution concentration in excess of one or more national ambient air quality standard at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Provided the Administrator determines that there is no compelling evidence to the contrary in the record, the Administrator will determine every wildfire occurring predominantly on wildland to have met the requirements identified in paragraph (c)(3)(iv)(D) of this section regarding the not reasonably controllable or preventable criterion.

As shown in Figure 3-1 and discussed in this exceptional event demonstration, extensive wildfire activity was occurring across the California wildland during the Summer and Fall of 2020. A majority of the fire activity was caused by a dry lightning storm that resulted in the August 2020 Lightning Siege. As demonstrated in Section III of this document, lightning caused the wildfire events on wildland. The District is not aware of any evidence clearly demonstrating that prevention or control efforts beyond those actually made would have been reasonable. Therefore, emissions from the August 2020 Lightning Siege fires were not reasonably controllable or preventable.

The District determined that the smoke from the August 2020 Lightning Siege fires was a natural, wildfire smoke event, and the wildfires occurred on wildland (see Section III of this demonstration); therefore, the event meets the not reasonably controllable and not reasonably preventable criterion in the Exceptional Event Rule. The August 2020 Lightning Siege fires occurrence could not have been prevented and could not have been controlled, and the excessive event-related emissions that caused exceedances of the NAAQS were caused by the wildfires and not the result of emissions from anthropogenic sources, as demonstrated in the clear causal relationship section of this demonstration (see Section IV).

Section VI. Human Activity Unlikely to Recur at a Particular Location or Natural Event

This section satisfies the following federal requirement:

- A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.
  (*40 CFR 50.14(c)(3)(iv)(E)*)

The Exceptional Event Rule requires a demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event (40 CFR 50.14(c)(3)(iv)(E)). The definition of wildfire in the Exceptional Events Rule is: "…is any fire started by an unplanned ignition caused by lightning; … A wildfire that predominately occurs on wildland is a natural event." As stated in Section III and IV, the origin and evolution of the 2020 August Lightning Siege Fires occurred across the California wildland. As shown in Figure 3-1 through Figure 3-4, the fires happened on land within national parks, national forest, wilderness areas, state forests, state parks, and state areas, which are generally considered wildland areas.

In the Exceptional Event Rule, EPA clarifies that an event could be considered a natural event by applying the reasonable interpretation that the anthropogenic source had ''little'' direct causal role.

Based on the documentation provided in Section III and Section IV of this demonstration, the event qualifies as a wildfire because lightning caused the unplanned wildfire event. The EPA generally considers the emissions of PM2.5 from wildfires on wildland to meet the regulatory definition of a natural event at 40 CFR 50.1(k), defined as one 'in which human activity plays little or no direct causal role.' This wildfire event occurred on wildland as shown in Figures 3-1 through Figure 3-4 and as documented in Section III and Section IV and accordingly, the San Joaquin Valley Air Pollution Control District has shown that the event is a natural event and should be considered for treatment as an exceptional event.

Section VII. Public Notification

This section satisfies the following federal requirement:
(A) Document that the State followed the public comment process and that the comment period was open for a minimum of 30 days, which could be concurrent with the beginning of the Administrator's initial review period of the associated demonstration provided the State can meet all requirements in this paragraph;

(B) Submit the public comments it received along with its demonstration to the Administrator; and

(C) Address in the submission to the Administrator those comments disputing or contradicting factual evidence provided in the demonstration. (*40 CFR 50.14(c)(3)(v)(A, B, C)*)

The San Joaquin Valley Air Pollution Control District will hold a 30-day public comment period to get public comment regarding the Exceptional Event Demonstration Plan. Notification of the public comment period will be posted on the San Joaquin Valley Air Pollution Control District website and emailed to interested stakeholders.

Section VIII. Conclusions and Recommendations

This Exceptional Event Demonstration shows that several San Joaquin Valley air monitoring sites were impacted by smoke from wildfires across California in 2020, causing daily PM2.5 concentrations at select sites to exceed the 1997 PM2.5 24-hour National Ambient Air Quality Standard (NAAQS) of 65 µg/m^3 over many days. Despite being on track to reach attainment of the 1997 24-hour PM2.5 NAAQS, smoke from the 2020 wildfires overwhelmed the San Joaquin Valley Air Pollution Control District's rigorous particulate matter emissions controls and led to historically high PM2.5 concentrations throughout the San Joaquin Valley. The NAAQS exceedances included in this demonstration span five days from August 20 – 24, 2020, and were the result of smoke impacts from the August Lightning Siege wildfires, as discussed in Section III.

The District requests that EPA concur with the exclusion from regulatory decisions the specified PM2.5 concentrations in Table 8-1, which were above the federal 1997 PM2.5 24-hour standard, influenced by the wildland fires included in this demonstration, and impact regulatory decisions about the Valley's attainment of the NAAQS. The days and sites for which the District is requesting concurrence were impacted by an event consistent with EPA's definition of "unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state, or local air agencies may implement in order to attain and maintain the [NAAQS]" (USEPA, 2020a).

Table 8-1: 24-hour Average PM2.5 Concentrations from August 20-24, 2020 Requested for Exclusion from Regulatory Decisions for San Joaquin Valley

Date	Site AQS ID	Site Name	PM2.5 Concentration µg/m^3
20-Aug-20	06-099-0006	Turlock	108
20-Aug-20	06-099-0005	Modesto-14th St.	102.2
20-Aug-20	06-077-2010	Manteca	102
20-Aug-20	06-077-1002	Stockton-Hazelton	88.8
20-Aug-20	06-019-2016	Fresno-Foundry	74.9
21-Aug-20	06-099-0006	Turlock	96.5
21-Aug-20	06-099-0005	Modesto-14th St.	90.1
21-Aug-20	06-077-2010	Manteca	100.8
21-Aug-20	06-031-1004	Hanford-Irwin	135.1
21-Aug-20	06-031-0004	Corcoran	115.2
21-Aug-20	06-077-1002	Stockton-Hazelton	76.3
21-Aug-20	06-019-2016	Fresno-Foundry	128.3
22-Aug-20	06-099-0006	Turlock	97.2
22-Aug-20	06-099-0005	Modesto-14th St.	68
22-Aug-20	06-031-1004	Hanford-Irwin	147
22-Aug-20	06-031-0004	Corcoran	140.1
22-Aug-20	06-019-2016	Fresno-Foundry	153.5
22-Aug-20	06-029-0016	Bakersfield-Planz	158.6

Date	Site AQS ID	Site Name	PM2.5 Concentration µg/m³
23-Aug-20	06-031-1004	Hanford-Irwin	116.7
23-Aug-20	06-031-0004	Corcoran	93.2
23-Aug-20	06-077-2010	Manteca	79.3
23-Aug-20	06-099-0005	Modesto-14th St.	67.6
23-Aug-20	06-019-2016	Fresno-Foundry	100.5
24-Aug-20	06-099-0006	Turlock	99.1
24-Aug-20	06-099-0005	Modesto-14th St.	84.7
24-Aug-20	06-077-1002	Stockton-Hazelton	78.2
24-Aug-20	06-077-2010	Manteca	87.6
24-Aug-20	06-031-1004	Hanford-Irwin	107
24-Aug-20	06-019-2016	Fresno-Foundry	99.4
24-Aug-20	06-031-0004	Corcoran	89.8

Section IX. Appendices

Appendix A: 2020 Initial Notification Summary Information Form w/ EPA Response
Appendix B: AQS AMP 350 showing RT flags applied
Appendix C: Weather Service Discussions
Appendix D: District Health Caution Statements and Weather Service Air Quality Advisories
Appendix E: Backward trajectories for Stockton-Hazelton, Manteca, Turlock, Fresno-Foundry, and Corcoran
Appendix F: Supporting Surface Observations
Appendix G: 24-hour PM2.5 Concentration Trends: Turlock, Stockton-Hazelton, Manteca, Fresno-Foundry, Corcoran
Appendix H: Aqua and Terra Aerosol Images
Appendix I: Media and Social Media reports

Appendix A

2020 Initial Notification Summary Information Form w/ EPA Response

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Sylvia Vanderspek
Chief, Air Quality Planning Branch
Air Quality Planning and Science Division
California Air Resources Board
P.O. Box 2815
Sacramento, California 95812

Dear Chief Vanderspek:

This letter provides a response to the San Joaquin Valley Air Pollution Control District (SJVAPCD) and California Air Resource Board (CARB) exceptional event (EE) Initial Notification Summary Information emailed to the EPA on April 12, 2021, regarding exclusion of 24-hour $PM_{2.5}$ data affected by EEs. The Initial Notification submittal stated that emissions from wildfires in August, September, and October 2020 caused exceedances of the 1997 24-hour $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) at the following monitoring sites within the San Joaquin Valley $PM_{2.5}$ Nonattainment Area: Stockton-Hazelton (AQS ID: 06-077-1002), Manteca (AQS ID: 06-077-2010), Modesto-14th Street (AQS ID: 06-099-0005), Turlock (AQS ID: 06-099-0006), Fresno-Foundry (AQS ID: 06-019-2016[1]), Clovis-Villa (AQS ID: 06-019-5001), Hanford-Irwin (AQS ID: 06-031-1004), Corcoran-Patterson (AQS ID: 06-031-0004), and Bakersfield-Airport (Planz) (AQS ID: 06-029-0016).

Based on discussions with SJVAPCD and CARB, the EPA has determined that data identified in the Initial Notification submittal may affect anticipated regulatory actions for the 1997 24-hour $PM_{2.5}$ NAAQS. The EPA requests that CARB formally submit the demonstration for the critical events in August 2020 affecting the 2018-2020 design values no later than May 14, 2021. This deadline replaces the May 1, 2021 deadline stated in EPA's previous Initial Notification response, signed March 9, 2021. Note that in order for the EPA to receive a submittal by May 14, 2021, SJVAPCD may need to submit the demonstration to CARB by May 7, 2021. The EPA also recommends that CARB consider early certification of 2020 $PM_{2.5}$ data for sites located in the San Joaquin Valley $PM_{2.5}$ Nonattainment Area.

[1] In the Initial Notification, the Fresno-Foundry AQS ID is listed as both 06-019-2016 and 06-019-2020. The correct AQS ID is 06-019-2016.

These deadlines and recommendations are based on the EPA's anticipated timeframes for action on the submitted $PM_{2.5}$ attainment plan for the 1997 24-hour $PM_{2.5}$ NAAQS in the San Joaquin Valley Nonattainment Area. CARB may submit the EE demonstration to the EPA concurrent with its initiation of the public comment period, provided CARB subsequently submits all public comments received and CARB's responses thereto. We appreciate the close coordination between CARB, SJVACPD, and EPA to date, and encourage continued coordination throughout the development and submittal of this demonstration.

If you have any questions regarding this letter, please feel free to contact me at (415) 972-3183, Gwen Yoshimura at (415) 947-4134, or my staff lead, Dena Vallano, at (415) 972-3134.

Sincerely,

ELIZABETH ADAMS

Digitally signed by ELIZABETH ADAMS
Date: 2021.04.21 12:04:24 -07'00'

Elizabeth J. Adams
Director, Air and Radiation Division

cc (via email): Michael Benjamin, CARB
Theresa Najita, CARB
Alicia Adams, CARB
Sheraz Gill, SJVAPCD
Jon Klassen, SJVAPCD
Jessica Olsen, SJVAPCD
Robert Gilles, SJVAPCD

Tribal, QA Collocated, and Non-Regulatory Monitors not listed

EE Initial Notification Summary Information 24-Hour $PM_{2.5}$

Submitting Agency: San Joaquin Valley Air Pollution Control District
Agency Contact: Jessica Olsen (559) 230-5988
Date Submitted: April 7, 2021
Applicable NAAQS: 1997 24-Hour $PM_{2.5}$
Affected Regulatory Decision: EPA. (1997 24-Hour PM2.5) *Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 Standard. 80 Fed. Reg. 66. Pp. 18528-18535. (2015, April 7). (to be codified at 40 CFR Parts 52 and 81).* Retrieved from: https://www.govinfo.gov/content/pkg/FR-2015-04-07/pdf/2015-07765.pdf.

Form identifies data that is a blend of official and preliminary data.

A) **Information specific to each flagged site day that may be submitted to EPA in support of the affected regulatory decision listed above**[1]

[1] Per 40 CFR Appendix N to Part 50, only Primary PM2.5 monitors listed (when primary monitors were available; QA Collocated monitors, not shown)

B) Violating Sites Information (only considers events in 2020)

Site (AQS ID) (POC)	2018-2020 24-hour 98th Percentile PM2.5 (without EPA concurrence on all events listed in section A attached)	2018-2020 24-hour 98th Percentile PM2.5 (with EPA concurrence on all events listed in section A attached)
Stockton-Hazelton (06-077-1002) (POC 3)	69 µg/m³	54 µg/m³
Modesto-14th St (06-099-0005) (POC 3)	70 µg/m³	56 µg/m³
Turlock (06-099-0006) (POC 3)	71 µg/m³	57 µg/m³
Fresno-Foundry (06-019-2020) (POC3)	89 µg/m³	55 µg/m³
Hanford-Irwin (06-031-1004) (POC 3) [1]	68 µg/m³	55 µg/m³
Corcoran-Patterson (06-031-0004) [2]	68 µg/m³	57 µg/m³
Manteca (06-077-2010) (POC 3)[3]	105 µg/m³	64 µg/m³
Bakersfield-Planz (06-029-0016) (POC 1) [1]	70 µg/m³	59 µg/m³
Clovis-Villa (06-019-5001) [1, 2]	77 µg/m³	48 µg/m³

[1] Bakersfield-Airport (Planz), Clovis-Villa, Visalia-Church, Manteca, and Hanford-Irwin 98th Percentile calculation used data substitution rule per 40 CFR Appendix N to Part 50 4.2 for data within the 2018 year since both 98th Percentiles are above the standard.
[2] Multiple POCs used to calculate 24-hour mean

C) Summary of Maximum Design Value (DV) Site Information (Effect of EPA Concurrence on Maximum Design Value Site Determination)
(Two highest values from section B)

Maximum 2018-2020 24-hour 98th Percentile PM2.5 site (AQS ID) **without EPA concurrence** on any of the events listed in section A attached	24-hour 98th Percentile 105 µg/m³	Maximum 2018-2020 24-hour 98th Percentile PM2.5 site Manteca (06-077-2010	Comment Due to Data Substitution
Maximum 2018-2020 24-hour 98th Percentile PM2.5 site (AQS ID) **with EPA concurrence** on all events listed in section A attached	24-hour 98th Percentile 64 µg/m³	Maximum 2018-2020 24-hour 98th Percentile PM2.5 site Manteca (06-077-2010) Bakersfield CA (06-029-0014) Visalia (06-107-2002)	Comment For Bakersfield-CA and Visalia, not included in section A or section B; no EE demonstrations needed for those two sites.

D) List of any sites (AQS ID) within planning area with invalid design values (e.g. due to data incompleteness)

Fresno-Foundry (06-019-2020) (POC3) - PM2.5 monitoring at this (near-road) monitoring site began on January 1, 2020; therefore, no PM2.5 data collected in 2018 and 2019.

Date of Event	Type of Event	AQS Flag	Site AQS ID	POC	Site Name	Exceedance Concentration	Notes
20-Aug-20	Wildfire	IT	06-099-0006	3	Turlock	108	2020 Wildfire Siege: Hills Fire & Others
20-Aug-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	102.2	2020 Wildfire Siege: CZU + LNU Lightning Complex + North + August Complex & Others
20-Aug-20	Wildfire	IT	06-077-2010	3	Manteca	102	2020 Wildfire Siege: MOC Fire & Others
20-Aug-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	77	2020 Wildfire Siege: MOC Fire & Others
20-Aug-20	Wildfire	IT	06-031-0004	8	Corcoran	69	2020 Wildfire Siege: MOC Fire & Others
20-Aug-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	88.8	2020 Wildfire Siege: MOC Fire & Others
20-Aug-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	74.9	2020 Wildfire Siege: MOC Fire & Others
20-Aug-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	77.2	2026 Wildfire Siege: MOC Fire & Others
21-Aug-20	Wildfire	IT	06-099-0006	3	Turlock	96.5	2020 Wildfire Siege: Rivers Fire + Rattlesnake Fire & Others
21-Aug-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	90.1	2020 Wildfire Siege: Dolan + Carmel + Salt +Blue Jay Fires & Others
21-Aug-20	Wildfire	IT	06-077-2010	3	Manteca	100.8	2020 Wildfire Siege: Hosler Fire & Others
21-Aug-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	135.1	2020 Wildfire Siege: Hosler Fire & Others
21-Aug-20	Wildfire	IT	06-031-0004	8	Corcoran	115.2	2020 Wildfire Siege: Hosler Fire & Others
21-Aug-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	76.3	2020 Wildfire Siege: Hosler Fire & Others
21-Aug-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	128.3	2020 Wildfire Siege: Hosler Fire & Others
21-Aug-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	135	2020 Wildfire Siege: Hosler Fire & Others
22-Aug-20	Wildfire	IT	06-099-0006	3	Turlock	97.2	2020 Wildfire Siege: CZU + LNU Lightning Complex + North + August Complex & Others
22-Aug-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	68	2020 Wildfire Siege: SQF Complex & Others
22-Aug-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	147	2020 Wildfire Siege:
22-Aug-20	Wildfire	IT	06-031-0004	1	Corcoran	140.1	2020 Wildfire Siege:
22-Aug-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	153.5	2020 Wildfire Siege:
22-Aug-20	Wildfire	IT	06-029-0016	1	Bakersfield-Planz	158.6	2020 Wildfire Siege:
22-Aug-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	143.3	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-099-0006	3	Turlock	67.7	2020 Wildfire Siege: Dolan + Carmel + Salt +Blue Jay Fires & Others

23-Aug-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	67.6	2020 Wildfire Siege: MOC Fire & Others
23-Aug-20	Wildfire	IT	06-077-2010	3	Manteca	79.3	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	116.7	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-031-0004	8	Corcoran	93.2	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	65.9	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	100.5	2020 Wildfire Siege:
23-Aug-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	103.5	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-099-0006	3	Turlock	99.1	2020 Wildfire Siege: SQF Complex & Others
24-Aug-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	84.7	2020 Wildfire Siege: Hosler Fire & Others
24-Aug-20	Wildfire	IT	06-077-2010	3	Manteca	87.6	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	107	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-031-0004	8	Corcoran	89.8	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	78.2	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	99.4	2020 Wildfire Siege:
24-Aug-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	100.2	2020 Wildfire Siege:
08-Sep-20	Wildfire	IT	06-031-0004	8	Corcoran	74.6	2020 Wildfire Siege:
08-Sep-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	77.2	2020 Wildfire Siege:
08-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	66.4	2020 Wildfire Siege:
11-Sep-20	Wildfire	IT	06-099-0006	3	Turlock	107.6	2020 Wildfire Siege: Bobcat Fire & Others
11-Sep-20	Wildfire	IT	06-077-2010	3	Manteca	140	2020 Wildfire Siege:
11-Sep-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	112.7	2020 Wildfire Siege:
11-Sep-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	122.2	2020 Wildfire Siege:
12-Sep-20	Wildfire	IT	06-099-0006	3	Turlock	86.8	2020 Wildfire Siege:
12-Sep-20	Wildfire	IT	06-077-2010	3	Manteca	128.5	2020 Wildfire Siege:
12-Sep-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	107.7	2020 Wildfire Siege:
12-Sep-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	130.5	2020 Wildfire Siege:
12-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	81.7	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-099-0006	3	Turlock	118.5	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-077-2010	3	Manteca	111.9	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	86.9	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-031-0004	8	Corcoran	80.3	2020 Wildfire Siege:

13-Sep-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	114.9	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	101.2	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	123	2020 Wildfire Siege:
13-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	157.1	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-099-0006	3	Turlock	99.8	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-077-2010	3	Manteca	105	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	117.9	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-031-0004	8	Corcoran	106.9	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	99.2	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	96.5	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	157.2	2020 Wildfire Siege:
14-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	193.7	2020 Wildfire Siege:
15-Sep-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	86	2020 Wildfire Siege:
15-Sep-20	Wildfire	IT	06-031-0004	1	Corcoran	82.6	2020 Wildfire Siege:
15-Sep-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	95.5	2020 Wildfire Siege:
15-Sep-20	Wildfire	IT	06-029-0016	1	Bakersfield-Planz	82.4	2020 Wildfire Siege:
15-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	99.5	2020 Wildfire Siege:
16-Sep-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	82.7	2020 Wildfire Siege:
16-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	98.2	2020 Wildfire Siege:
17-Sep-20	Wildfire	IT	06-019-5001	3	Clovis-Villa	100.2	2020 Wildfire Siege:
30-Sep-20	Wildfire	IT	06-077-2010	3	Manteca	66.9	2020 Wildfire Siege:
30-Sep-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	67	2020 Wildfire Siege:
01-Oct-20	Wildfire	IT	06-077-2010	3	Manteca	84.2	2020 Wildfire Siege:
01-Oct-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	75.5	2020 Wildfire Siege:
01-Oct-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	80.5	2020 Wildfire Siege:
01-Oct-20	Wildfire		06-099-0006	3	Turlock	73.5	2020 Wildfire Siege:
02-Oct-20	Wildfire	IT	06-077-2010	3	Manteca	91.5	2020 Wildfire Siege:
02-Oct-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	72.5	2020 Wildfire Siege:
02-Oct-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	82	2020 Wildfire Siege:
02-Oct-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	83.7	2020 Wildfire Siege:
02-Oct-20	Wildfire		06-099-0006	3	Turlock	86.9	2020 Wildfire Siege:
02-Oct-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	78.7	2020 Wildfire Siege:

02-Oct-20	Wildfire		06-019-5001	3	Clovis-Villa	73	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-077-2010	3	Manteca	98.7	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	94.7	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-031-0004	1	Corcoran	85.7	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-099-0005	3	Modesto-14th St.	75.5	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-077-1002	3	Stockton-Hazelton	86.2	2020 Wildfire Siege:
03-Oct-20	Wildfire		06-099-0006	3	Turlock	84	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	88.8	2020 Wildfire Siege:
03-Oct-20	Wildfire	IT	06-029-0016	1	Bakersfield-Planz	81.4	2020 Wildfire Siege:
03-Oct-20	Wildfire		06-019-5001	3	Clovis-Villa	80.4	2020 Wildfire Siege:
04-Oct-20	Wildfire	IT	06-031-1004	3	Hanford-Irwin	89.5	2020 Wildfire Siege:
04-Oct-20	Wildfire	IT	06-031-0004	8	Corcoran	76.9	2020 Wildfire Siege:
04-Oct-20	Wildfire	IT	06-019-2016	3	Fresno-Foundry	69.4	2020 Wildfire Siege:
04-Oct-20	Wildfire		06-019-5001	3	Clovis-Villa	69.7	2020 Wildfire Siege:
05-Oct-20	Wildfire		06-019-5001	3	Clovis-Villa	70.5	2020 Wildfire Siege:

Appendix B

AQS AMP 350 showing RT flags applied

Fit one full page to window

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: RGILLES RAW DATA REPORT

Report Request ID: 1930803 Report Code: AMP350 May. 10, 2021

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	06	077	1002	88101							
	06	077	2010	88101							
	06	099	0005	88101							
	06	099	0006	88101							
	06	019	2016	88101							
	06	031	1004	88101							
	06	031	0004	88101							
	06	029	0016	88101							

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

SELECTED OPTIONS

Option Type	Option Value
INCLUDE NULLS	YES
DAILY STATISTICS	MAXIMUM
UNITS	STANDARD
RAW DATA EVENTS	INCLUDE EVENTS
MERGE PDF FILES	YES
AGENCY ROLE	PQAO

SORT ORDER

Order	Column
1	STATE_CODE
2	COUNTY_CODE
3	SITE_ID
4	PARAMETER_CODE
5	POC

DATE CRITERIA

Start Date	End Date
2020 08 20	2020 08 24

APPLICABLE STANDARDS

Standard Description
CO 1-hour 1971
Lead 3-Month 2009
Lead 3-Month PM10 Surrogate 2009
NO2 Annual 1971
Ozone 1-hour 1979
PM10 24-hour 2006
PM25 24-hour 2012
SO2 1-hour 2010

Selection Criteria Page 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-019-2016 POC: 3
COUNTY: (019) Fresno
CITY: (27000) Fresno
SITE ADDRESS: 2482 Foundry Park Ave
SITE COMMENTS:
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (2840) FRESNO, CA
LAND USE: INDUSTRIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 36.710833
LONGITUDE: -119.7775
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 87
PROBE HEIGHT:

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
3																									0	
4																									0	
5																									0	
6																									0	
7																									0	
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19																									0	
20	37.0rt	33.0rt	30.0rt	34.0rt	33.0rt	31.0rt	33.0rt	32.0rt	37.0rt	32.0rt	45.0rt	50.0rt	45.0rt	46.0rt	47.0rt	45.0rt	141.0rt	133.0rt	112.0rt	132.0rt	142.0rt	165.0rt	179.0rt	185.0rt	24	185.0
21	169.0rt	167.0rt	140.0rt	110.0rt	76.0rt	90.0rt	88.0rt	104.0rt	104.0rt	117.0rt	100.0rt	105.0rt	113.0rt	107.0rt	127.0rt	127.0rt	132.0rt	124.0rt	209.0rt	137.0rt	140.0rt	150.0rt	172.0rt	173.0rt	24	209.0
22	171.0rt	179.0rt	180.0rt	176.0rt	171.0rt	166.0rt	171.0rt	177.0rt	165.0rt	152.0rt	154.0rt	167.0rt	157.0rt	151.0rt	135.0rt	149.0rt	149.0rt	125.0rt	132.0rt	127.0rt	131.0rt	131.0rt	136.0rt	133.0rt	24	180.0
23	125.0rt	121.0rt	116.0rt	110.0rt	133.0rt	132.0rt	127.0rt	135.0rt	130.0rt	93.0rt	85.0rt	64.0rt	71.0rt	69.0rt	62.0rt	64.0rt	84.0rt	102.0rt	99.0rt	106.0rt	103.0rt	92.0rt	78.0rt	113.0rt	24	135.0
24	123.0rt	117.0rt	102.0rt	99.0rt	108.0rt	115.0rt	92.0rt	78.0rt	78.0rt	80.0rt	98.0rt	113.0rt	117.0rt	107.0rt	115.0rt	99.0rt	85.0rt	75.0rt	105.0rt	101.0rt	102.0rt	117.0rt	106.0rt	54.0rt	24	123.0
25																									0	
26																									0	
27																									0	
28																									0	
29																									0	
30																									0	
31																									0	
NO.:	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
MAX:	171.0	179.0	180.0	176.0	171.0	166.0	171.0	177.0	165.0	152.0	154.0	167.0	157.0	151.0	135.0	149.0	149.0	133.0	209.0	137.0	142.0	165.0	179.0	185.0		
AVG:	125.00	123.40	113.60	105.80	104.20	106.80	102.20	105.20	102.80	94.80	96.40	99.80	100.60	96.00	97.20	96.80	118.20	111.80	131.40	120.60	123.60	131.00	134.20	131.60		

MONTHLY OBSERVATIONS: 120 MONTHLY MEAN: 111.38 MONTHLY MAX: 209.0

Note: Qualifier codes with regional concurrance are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-029-0016 POC: 1
COUNTY: (029) Kern
CITY: (03526) Bakersfield
SITE ADDRESS: 410 E. PLANZ RD. BAKERSFIELD, CA 93307
SITE COMMENTS:
MONITOR COMMENTS: ANDERSEN SEQUENTIAL

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0680) BAKERSFIELD, CA
LAND USE: COMMERCIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 35.324636
LONGITUDE: -118.997627
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 0
PROBE HEIGHT: 2

SUPPORT AGENCY: (0145) California Air Resources Board
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (145) R & P Model 2025 PM-2.5 Sequential
PQAO: (0145) California Air Resources Board

REPORT FOR: 2020

DURATION: 24 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

Day	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1												
2												
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30												
31												
NO.:	0	0	0	0	0	0	0	1	0	0	0	0
MAX:								158.6				
MEAN:								158.60				

ANNUAL OBSERVATIONS: 1 ANNUAL MEAN: 158.60 ANNUAL MAX: 158.6

1 Values marked with 'P' exceed the PRIMARY STANDARD of: 35.5

1 Values marked with 'S' exceed the SECONDARY STANDARD of: 35.5

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

Page 2 of 11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-031-0004 POC: 1
COUNTY: (031) Kings
CITY: (16224) Corcoran
SITE ADDRESS: 1520 PATTERSON AVE.
SITE COMMENTS: SITE IS PARALLEL MONITOR TO 06-031-0003 WHICH IS TO BE CLOSED MID 97
MONITOR COMMENTS: ANDERSON SEQUENTIAL

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0000) NOT IN AN URBAN AREA
LAND USE: RESIDENTIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 36.102244
LONGITUDE: -119.56565
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 61
PROBE HEIGHT: 5

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (145) R & P Model 2025 PM-2.5 Sequential
PQAO: (0145) California Air Resources Board

REPORT FOR: 2020

DURATION: 24 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

Day	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1												
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22								P 140.1 rt				
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30												
31												
NO.:	0	0	0	0	0	0	0	1	0	0	0	0
MAX:								140.1				
MEAN:								140.10				

ANNUAL OBSERVATIONS: 1 ANNUAL MEAN: 140.10 ANNUAL MAX: 140.1

1 Values marked with 'P' exceed the PRIMARY STANDARD of: 35.5
1 Values marked with 'S' exceed the SECONDARY STANDARD of: 35.5

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

Page 3 of 11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-031-0004 POC: 8
COUNTY: (031) Kings
CITY: (16224) Corcoran
SITE ADDRESS: 1520 PATTERSON AVE.
SITE COMMENTS: SITE IS PARALLEL MONITOR TO 06-031-0003 WHICH IS TO BE CLOSED MID 97
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0000) NOT IN AN URBAN AREA
LAND USE: RESIDENTIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 36.102244
LONGITUDE: -119.56565
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 61
PROBE HEIGHT: 5

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (204) Teledyne Model 602 Beta plus w/VSC
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS:Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
3																									0	
4																									0	
5																									0	
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18																									0	
19																									0	
20	53.4IT	49.3IT	46.3IT	41.7IT	38.1IT	37.2IT	BA	BA	BA	58.9IT	49.0IT	48.4IT	44.4IT	93.8IT	87.2IT	62.0IT	44.7IT	78.4IT	110.7IT	86.6IT	89.4IT	99.3IT	109.9IT	122.1IT	21	122.1
21	139.2rt	127.3rt	111.4rt	104.1rt	104.0rt	89.4rt	89.1rt	74.2rt	73.3rt	91.3rt	96.1rt	102.0rt	94.8rt	81.6rt	83.5rt	91.6rt	128.5rt	145.6rt	152.3rt	154.3rt	152.9rt	157.4rt	156.4rt	165.3rt	24	165.3
22	164.6rt	188.0rt	218.7rt	229.3rt	227.4rt	211.0rt	234.0rt	210.4rt	168.5rt	120.3rt	114.7rt	131.5rt	105.1rt	88.6rt	101.6rt	92.7rt	78.9rt	84.5rt	105.7rt	99.1rt	113.7rt	121.0rt	132.3rt	123.1rt	24	234.0
23	133.8rt	128.9rt	94.2rt	98.5rt	125.2rt	120.5rt	129.0rt	130.6rt	131.3rt	108.8rt	105.2rt	100.1rt	95.6rt	76.9rt	74.6rt	65.6rt	63.6rt	52.4rt	54.7rt	62.7rt	73.5rt	64.8rt	74.9rt	71.4rt	24	133.8
24	81.1rt	85.5rt	83.1rt	77.9rt	62.4rt	63.1rt	87.8rt	114.1rt	107.6rt	112.6rt	117.0rt	123.4rt	119.6rt	104.3rt	88.7rt	115.2rt	99.2rt	97.8rt	98.2rt	59.1rt	17.6rt	50.1rt	102.3rt	88.4rt	24	123.4
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31																									0	
NO.:	5	5	5	5	5	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
MAX:	164.6	188.0	218.7	229.3	227.4	211.0	234.0	210.4	168.5	120.3	117.0	131.5	119.6	104.3	101.6	115.2	128.5	145.6	152.3	154.3	152.9	157.4	156.4	165.3		
AVG:	114.42	115.80	110.74	110.30	111.42	104.24	134.98	132.33	120.18	98.38	96.40	101.08	91.90	89.04	87.12	85.42	82.98	91.74	104.32	92.36	89.42	98.52	115.16	114.06		

MONTHLY OBSERVATIONS: 117 MONTHLY MEAN: 103.20 MONTHLY MAX: 234.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-031-1004 POC: 3
COUNTY: (031) Kings
CITY: (31960) Hanford
SITE ADDRESS: 807 SOUTH IRWIN ST., HANFORD
SITE COMMENTS: RELOCATED HANFORD-CAMPUS SITE & ADDED NO2 MONITORING ARB #1600716
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0000) NOT IN AN URBAN AREA
LAND USE: RESIDENTIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 36.31567
LONGITUDE: -119.643447
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 99
PROBE HEIGHT: 4.2

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
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15																									0	
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17																									0	
18																									0	
19																									0	
20	58.0IT	57.0IT	44.0IT	27.0IT	42.0IT	38.0IT	32.0IT	40.0IT	38.0IT	37.0IT	38.0IT	56.0IT	BA	67.0IT	50.0IT	52.0IT	113.0IT	144.0IT	116.0IT	114.0IT	118.0IT	144.0IT	166.0IT	180.0IT	23	180.0
21	180.0rt	165.0rt	130.0rt	89.0rt	84.0rt	79.0rt	80.0rt	77.0rt	89.0rt	109.0rt	118.0rt	119.0rt	114.0rt	105.0rt	114.0rt	137.0rt	161.0rt	167.0rt	198.0rt	188.0rt	180.0rt	181.0rt	191.0rt	189.0rt	24	198.0
22	188.0rt	191.0rt	190.0rt	199.0rt	230.0rt	217.0rt	213.0rt	227.0rt	128.0rt	99.0rt	89.0rt	70.0rt	90.0rt	110.0rt	101.0rt	82.0rt	78.0rt	98.0rt	127.0rt	141.0rt	165.0rt	173.0rt	160.0rt	162.0rt	24	230.0
23	157.0rt	145.0rt	156.0rt	158.0rt	151.0rt	160.0rt	149.0rt	155.0rt	155.0rt	142.0rt	156.0rt	123.0rt	104.0rt	102.0rt	86.0rt	78.0rt	70.0rt	65.0rt	66.0rt	67.0rt	77.0rt	91.0rt	95.0rt	94.0rt	24	160.0
24	95.0rt	122.0rt	102.0rt	99.0rt	113.0rt	120.0rt	110.0rt	83.0rt	94.0rt	104.0rt	127.0rt	145.0rt	135.0rt	134.0rt	126.0rt	100.0rt	92.0rt	73.0rt	76.0rt	98.0rt	105.0rt	114.0rt	110.0rt	91.0rt	24	145.0
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31																									0	

NO.:	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5
MAX:	188.0	191.0	190.0	199.0	230.0	217.0	213.0	227.0	155.0	142.0	156.0	145.0	135.0	134.0	126.0	137.0	161.0	167.0	198.0	188.0	180.0	181.0	191.0	189.0
AVG:	135.60	136.00	124.40	114.40	124.00	122.80	116.80	116.40	100.80	98.20	105.60	102.60	110.75	103.60	95.40	89.80	102.80	109.40	116.60	121.60	129.00	140.60	144.40	143.20

MONTHLY OBSERVATIONS: 119 MONTHLY MEAN: 116.92 MONTHLY MAX: 230.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-077-1002 POC: 3
COUNTY: (077) San Joaquin
CITY: (75000) Stockton
SITE ADDRESS: HAZELTON-HD, STOCKTON
SITE COMMENTS: ARB SITE NUMBER 3900252 STILL OPERATING
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (8120) STOCKTON, CA
LAND USE: RESIDENTIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 37.9507408985
LONGITUDE: -121.26852267
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 19
PROBE HEIGHT:

SUPPORT AGENCY: (0145) California Air Resources Board
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
3																									0	
4																									0	
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18																									0	
19																									0	
20	12.0rt	15.0rt	17.0rt	30.0rt	54.0rt	78.0rt	101.0rt	114.0rt	116.0rt	120.0rt	119.0rt	121.0rt	206.0rt	216.0rt	232.0rt	95.0rt	54.0rt	38.0rt	14.0rt	42.0rt	80.0rt	79.0rt	87.0rt	93.0rt	24	232.0
21	88.0rt	79.0rt	60.0rt	45.0rt	43.0rt	40.0rt	38.0rt	48.0rt	57.0rt	AX	99.0rt	132.0rt	166.0rt	175.0rt	141.0rt	136.0rt	137.0rt	100.0rt	10.0rt	7.0rt	26.0rt	38.0rt	46.0rt	45.0rt	23	175.0
22	40.0IT	32.0IT	22.0IT	25.0IT	51.0IT	27.0IT	48.0IT	74.0IT	64.0IT	40.0IT	38.0IT	34.0IT	44.0IT	52.0IT	59.0IT	54.0IT	50.0IT	49.0IT	56.0IT	51.0IT	76.0IT	57.0IT	45.0IT	42.0IT	24	76.0
23	27.0IT	40.0IT	41.0IT	30.0IT	34.0IT	17.0IT	14.0IT	13.0IT	17.0IT	19.0IT	33.0IT	72.0IT	122.0IT	146.0IT	138.0IT	220.0IT	81.0IT	48.0IT	40.0IT	49.0IT	58.0IT	78.0IT	129.0IT	117.0IT	24	220.0
24	62.0rt	63.0rt	97.0rt	100.0rt	100.0rt	68.0rt	81.0rt	101.0rt	101.0rt	121.0rt	122.0rt	141.0rt	149.0rt	157.0rt	145.0rt	136.0rt	59.0rt	17.0rt	12.0rt	9.0rt	9.0rt	9.0rt	10.0rt	8.0rt	24	157.0
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NO.:	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
MAX:	88.0	79.0	97.0	100.0	100.0	78.0	101.0	114.0	116.0	121.0	122.0	141.0	206.0	216.0	232.0	220.0	137.0	100.0	56.0	51.0	80.0	79.0	129.0	117.0
AVG:	45.80	45.80	47.40	46.00	56.40	46.00	56.40	70.00	71.00	75.00	82.20	100.00	137.40	149.20	143.00	128.20	76.20	50.40	26.40	31.60	49.80	52.20	63.40	61.00

MONTHLY OBSERVATIONS: 119 MONTHLY MEAN: 71.25 MONTHLY MAX: 232.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-077-1002 POC: 4
COUNTY: (077) San Joaquin
CITY: (75000) Stockton
SITE ADDRESS: HAZELTON-HD, STOCKTON
SITE COMMENTS: ARB SITE NUMBER 3900252 STILL OPERATING
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (8120) STOCKTON, CA
LAND USE: RESIDENTIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 37.9507408985
LONGITUDE: -121.26852267
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 19
PROBE HEIGHT:

SUPPORT AGENCY: (0145) California Air Resources Board
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
3																									0	
4																									0	
5																									0	
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17																									0	
18																									0	
19																									0	
20	14.0rt	16.0rt	12.0rt	29.0rt	54.0rt	76.0rt	107.0rt	114.0rt	109.0rt	116.0rt	119.0rt	122.0rt	205.0rt	213.0rt	226.0rt	95.0rt	55.0rt	40.0rt	15.0rt	45.0rt	81.0rt	84.0rt	88.0rt	87.0rt	24	226.0
21	88.0rt	80.0rt	54.0rt	43.0rt	39.0rt	44.0rt	41.0rt	51.0rt	58.0rt	AX	96.0rt	130.0rt	157.0rt	176.0rt	142.0rt	135.0rt	136.0rt	104.0rt	10.0rt	7.0rt	25.0rt	37.0rt	46.0rt	39.0rt	23	176.0
22	37.0IT	36.0IT	23.0IT	23.0IT	53.0IT	27.0IT	47.0IT	72.0IT	64.0IT	43.0IT	38.0IT	38.0IT	44.0IT	57.0IT	60.0IT	53.0IT	48.0IT	51.0IT	61.0IT	49.0IT	68.0IT	52.0IT	47.0IT	41.0IT	24	72.0
23	25.0IT	44.0IT	38.0IT	33.0IT	28.0IT	16.0IT	15.0IT	14.0IT	17.0IT	17.0IT	27.0IT	71.0IT	120.0IT	142.0IT	137.0IT	217.0IT	89.0IT	45.0IT	44.0IT	51.0IT	54.0IT	80.0IT	130.0IT	116.0IT	24	217.0
24	62.0rt	63.0rt	102.0rt	104.0rt	102.0rt	64.0rt	79.0rt	96.0rt	97.0rt	115.0rt	117.0rt	137.0rt	147.0rt	154.0rt	137.0rt	132.0rt	58.0rt	15.0rt	15.0rt	11.0rt	8.0rt	8.0rt	8.0rt	6.0rt	24	154.0
25																									0	
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30																									0	
31																									0	
NO.:	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
MAX:	88.0	80.0	102.0	104.0	102.0	76.0	107.0	114.0	109.0	116.0	119.0	137.0	205.0	213.0	226.0	217.0	136.0	104.0	61.0	51.0	81.0	84.0	130.0	116.0		
AVG:	45.20	47.80	45.80	46.40	55.20	45.40	57.80	69.40	69.00	72.75	79.40	99.60	134.60	148.40	140.40	126.40	77.20	51.00	29.00	32.60	47.20	52.20	63.80	57.80		

MONTHLY OBSERVATIONS: 119 MONTHLY MEAN: 70.58 MONTHLY MAX: 226.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-077-2010 POC: 3
COUNTY: (077) San Joaquin
CITY: (45484) Manteca
SITE ADDRESS: 530 Fishback Road Manteca, CA
SITE COMMENTS:
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0000) NOT IN AN URBAN AREA
LAND USE: RESIDENTIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 37.793392
LONGITUDE: -121.247874
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 11
PROBE HEIGHT: 6

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
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20	45.0rt	66.0rt	51.0rt	48.0rt	33.0rt	35.0rt	43.0rt	78.0rt	81.0rt	87.0rt	103.0rt	176.0rt	250.0rt	279.0rt	262.0rt	137.0rt	62.0rt	72.0rt	81.0rt	113.0rt	121.0rt	85.0rt	74.0rt	66.0rt	24	279.0
21	67.0rt	73.0rt	84.0rt	78.0rt	83.0rt	77.0rt	62.0rt	75.0rt	102.0rt	123.0rt	134.0rt	183.0rt	199.0rt	220.0rt	177.0rt	157.0rt	156.0rt	155.0rt	20.0rt	54.0rt	46.0rt	45.0rt	29.0rt	21.0rt	24	220.0
22	26.0IT	33.0IT	65.0IT	57.0IT	55.0IT	51.0IT	56.0IT	53.0IT	58.0IT	78.0IT	91.0IT	79.0IT	80.0IT	88.0IT	74.0IT	51.0IT	48.0IT	81.0IT	92.0IT	16.0IT	5.0IT	9.0IT	49.0IT	44.0IT	24	92.0
23	28.0rt	39.0rt	61.0rt	54.0rt	51.0rt	47.0rt	39.0rt	17.0rt	20.0rt	24.0rt	35.0rt	91.0rt	97.0rt	94.0rt	115.0rt	160.0rt	178.0rt	60.0rt	51.0rt	63.0rt	114.0rt	157.0rt	150.0rt	159.0rt	24	178.0
24	93.0rt	93.0rt	97.0rt	109.0rt	102.0rt	109.0rt	101.0rt	107.0rt	110.0rt	123.0rt	132.0rt	150.0rt	155.0rt	161.0rt	136.0rt	154.0rt	82.0rt	18.0rt	10.0rt	8.0rt	10.0rt	7.0rt	23.0rt	14.0rt	24	161.0
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MAX:	93.0	93.0	97.0	109.0	102.0	109.0	101.0	107.0	110.0	123.0	134.0	183.0	250.0	279.0	262.0	160.0	178.0	155.0	92.0	113.0	121.0	157.0	150.0	159.0		
AVG:	51.80	60.80	71.60	69.20	64.80	63.80	60.20	66.00	74.20	87.00	99.00	135.80	156.20	168.40	152.80	131.80	105.20	77.20	50.80	50.80	59.20	60.60	65.00	60.80		

MONTHLY OBSERVATIONS: 120 MONTHLY MEAN: 85.13 MONTHLY MAX: 279.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-099-0005 POC: 3
COUNTY: (099) Stanislaus
CITY: (48354) Modesto
SITE ADDRESS: 814 14TH ST., MODESTO
SITE COMMENTS: ARB SITE NUMBER 5000568. NEW SITE 7-15-81.
MONITOR COMMENTS:

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (5170) MODESTO, CA
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 37.642165
LONGITUDE: -120.994212
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 27
PROBE HEIGHT:

SUPPORT AGENCY: (0145) California Air Resources Board
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
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21	85.0rt	83.0rt	27.0rt	28.0rt	26.0rt	36.0rt	36.0rt	45.0rt	81.0rt	97.0rt	117.0rt	136.0rt	132.0rt	136.0rt	140.0rt	139.0rt	146.0rt	150.0rt	129.0rt	120.0rt	111.0rt	69.0rt	47.0rt	47.0rt	24	150.0
22	40.0rt	37.0rt	32.0rt	37.0rt	49.0rt	67.0rt	80.0rt	78.0rt	77.0rt	80.0rt	97.0rt	97.0rt	101.0rt	98.0rt	82.0rt	72.0rt	83.0rt	90.0rt	100.0rt	100.0rt	71.0rt	24.0rt	10.0rt	30.0rt	24	101.0
23	45.0rt	54.0rt	52.0rt	43.0rt	47.0rt	42.0rt	34.0rt	30.0rt	27.0rt	24.0rt	27.0rt	35.0rt	40.0rt	37.0rt	80.0rt	95.0rt	104.0rt	122.0rt	157.0rt	75.0rt	57.0rt	140.0rt	152.0rt	104.0rt	24	157.0
24	73.0rt	81.0rt	71.0rt	70.0rt	89.0rt	71.0rt	95.0rt	109.0rt	128.0rt	142.0rt	AX	155.0rt	137.0rt	129.0rt	123.0rt	128.0rt	118.0rt	129.0rt	45.0rt	13.0rt	11.0rt	8.0rt	10.0rt	14.0rt	23	155.0
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MAX:	85.0	83.0	71.0	70.0	89.0	119.0	153.0	109.0	128.0	142.0	117.0	155.0	192.0	207.0	178.0	164.0	196.0	150.0	157.0	120.0	111.0	140.0	152.0	104.0		
AVG:	52.00	56.00	40.20	38.60	49.60	67.00	79.60	70.40	81.60	89.00	88.50	113.20	120.40	121.40	120.60	119.60	129.40	115.40	102.20	73.20	67.40	66.60	62.00	58.00		

MONTHLY OBSERVATIONS: 119 MONTHLY MEAN: 82.53 MONTHLY MAX: 207.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

(88101) PM2.5 - Local Conditions

SITE ID: 06-099-0006 POC: 3
COUNTY: (099) Stanislaus
CITY: (80812) Turlock
SITE ADDRESS: 900 S MINARET STREET, TURLOCK, CA
SITE COMMENTS: REPLACES THE WESTLEY-I5 TRUCKSTOP AM STATION (5000572). STATION OPERATOR CHANGED
MONITOR COMMENTS: BAM 1020

STATE: (06) California
AQCR: (031) SAN JOAQUIN VALLEY
URBANIZED AREA: (0000) NOT IN AN URBAN AREA
LAND USE: RESIDENTIAL
LOCATION SETTING: SUBURBAN

CAS NUMBER:
LATITUDE: 37.488317
LONGITUDE: -120.836008
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 56
PROBE HEIGHT: 7

SUPPORT AGENCY: (0945) San Joaquin Valley Unified Air Pollution Control District
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (170) Met One BAM-1020 Mass Monitor w/VS
PQAO: (0145) California Air Resources Board

REPORT FOR: AUGUST 2020

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
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21	83.0rt	64.0rt	35.0rt	30.0rt	51.0rt	75.0rt	41.0rt	43.0rt	54.0rt	91.0rt	108.0rt	130.0rt	141.0rt	142.0rt	159.0rt	153.0rt	139.0rt	135.0rt	126.0rt	137.0rt	132.0rt	118.0rt	78.0rt	53.0rt	24	159.0
22	48.0rt	49.0rt	43.0rt	52.0rt	85.0rt	85.0rt	61.0rt	73.0rt	79.0rt	97.0rt	121.0rt	132.8rt	148.0rt	140.0rt	125.0rt	121.0rt	106.0rt	109.0rt	107.0rt	122.0rt	125.0rt	135.0rt	78.0rt	92.0rt	24	148.0
23	48.0IT	48.0IT	52.0IT	48.0IT	38.0IT	35.0IT	35.0IT	41.0IT	36.0IT	53.0IT	45.0IT	61.8IT	64.0IT	54.0IT	57.0IT	53.0IT	72.0IT	97.0IT	120.0IT	149.0IT	142.0IT	101.0IT	88.0IT	88.0IT	24	149.0
24	84.0rt	87.0rt	79.0rt	87.0rt	96.0rt	99.0rt	111.0rt	114.0rt	134.0rt	141.0rt	148.0rt	140.8rt	129.0rt	124.0rt	123.0rt	136.0rt	135.0rt	153.0rt	134.0rt	66.0rt	18.0rt	13.0rt	10.0rt	19.0rt	24	153.0
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NO.:	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
MAX:	84.0	87.0	79.0	87.0	96.0	99.0	111.0	114.0	134.0	141.0	187.0	146.8	151.0	216.0	251.0	208.0	172.0	153.0	145.0	149.0	142.0	135.0	91.0	92.0		
AVG:	55.80	52.80	44.40	47.60	58.20	65.40	68.20	71.60	85.60	102.00	121.80	121.80	126.60	135.20	143.00	134.20	124.80	128.40	126.40	113.60	97.40	88.20	69.00	67.60		

MONTHLY OBSERVATIONS: 120 MONTHLY MEAN: 93.73 MONTHLY MAX: 251.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk (**) indicates that the region has reviewed the value and does not concur with the qualifier.

Page 10 of 11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
RAW DATA REPORT

May. 10, 2021

QUALIFIER CODES:

Qualifier Code	Qualifier Description	Qualifier Type
AX	Precision Check.	NULL
BA	Maintenance/Routine Repairs.	NULL
IT	Wildfire-U. S.	INFORM
rt	Wildfire-U. S.	REQEXC

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional concurrence are shown in lower case.

Appendix C

Weather Service Discussions

IEM :: AFD from NWS HNX

daryl herzmann akrherz@iastate.edu

National Weather Service Raw Text Product

Displaying AFOS PIL: **AFDHNX** Received: **2020-08-19 21:10 UTC**

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878
FXUS66 KHNX 192110
AFDHNX

Area Forecast Discussion
National Weather Service Hanford CA
210 PM PDT Wed Aug 19 2020

.SYNOPSIS...A chance of thunderstorms will continue through this
evening over over the higher elevations of the Sierra, and over
the far eastern portion of the Kern County deserts. Dry conditions
will prevail on Thursday and Friday. Temperatures will cool down
on Thursday and Friday then level off over the weekend, but will
remain above average.

&&

.DISCUSSION...The large upper high pressure area centered over
the Great Basin which has provided our area with an oppressively
hot airmass for the past several days is finally going to weaken
tonight and Thursday as a strong shortwave trough pushes through
WA and BC. The system to our north will push a cold front
southward through central CA this evening which will finally bring
an end to the current heat wave which has been prevalent over the
San Joaquin Valley since last Friday. There will be a period of
increased wind gusts this evening over the valley this evening
then a cooling trend will take place on Thursday and Friday
although temperatures will remain above normal. The incoming
airmass is also dry and stable and as a result, no convection is
anticipated over the higher elevations in our area on Thursday
and Friday.

The main concern for our area for the next few days will be smoke
from several large uncontrolled wildfires in the region. The
smoke will reduce visibility and air quality over our area for the
next several days. An Air Quality Alert remains in effect for the
San Joaquin Valley through next Tuesday.

By this weekend, tropical moisture from Hurricane Genevieve
currently centered south of Cabo San Lucas near 21N/110W. the
hurricane is expected to track northwest and weaken by this
weekend, but RH progs are showing elevated moisture streaming
into central CA by Saturday night. NBM is progs a slight chance of
afternoon and evening showers and thunderstorms over the higher
elevations of the Sierra Nevada Sunday and Monday. However, with
the hurricane currently situated in a data sparse area, do not
have much confidence in this prognosis. This system has the
potential to provide for enough moisture and dynamics for
significant precipitation to take place across our area on Sunday
and Monday, and later shifts will need to monitor the prognosis of
Genevieve in case the models trend wetter. Temperatures will
remain above normal over the weekend through at least the middle
of next week although increased cloud cover on Sunday and Monday
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could keep daytime temperatures closer to normal. The elevated
tropcial moisture is expected to move east of our area by Tuesday
and a return to dry conditions are expected by the middle of next
week.

&&

.AVIATION...Isolated thunderstorms are expected in the Sierra
Nevada, Tehachapi Mountains and Kern County Deserts until 03z Thu
with local mountain obscurations possible. Otherwise, areas of
MVFR and local IFR visibility from smoke will prevail over the
central CA interior during the next 24 hours.

&&

.AIR QUALITY ISSUES...On Wednesday August 19 2020... Unhealthy
for sensitive groups in Fresno... Kern... Kings... Madera...
Merced and Tulare Counties and Sequoia National Park and Forest.
Further information is available at Valleyair.org

Air Quality Alert due to smoke impacts from surrounding wildfires
for San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings,
Tulare, and the Valley portion of Kern Counties. Please see
SFOAQAHNX.

&&

.CERTAINTY...

The level of certainty for days 1 and 2 is medium.
The level of certainty for days 3 through 7 is low.

Certainty levels include low...medium...and high. Please visit
www.weather.gov/hnx/certainty.html for additional information
an/or to provide feedback.

&&

.HNX WATCHES/WARNINGS/ADVISORIES...
Excessive Heat Warning until 9 PM PDT Thursday for CAZ179>191-
198-199.

Air Quality Alert until 11 AM PDT Tuesday for
CAC019-029-031-039-047-077-099-107.

&&

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public...DS
aviation....DS

weather.gov/hanford
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IEM :: AFD from NWS MTR

daryl herzmann akrherz@iastate.edu

National Weather Service Raw Text Product

Displaying AFOS PIL: **AFDMTR** Received: **2020-08-17 00:09 UTC**

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679
FXUS66 KMTR 170009
AFDMTR

Area Forecast Discussion
National Weather Service San Francisco Bay Area
509 PM PDT Sun Aug 16 2020

.SYNOPSIS...Isolated showers and thunderstorms shifting northward
this evening otherwise continued mostly clear and hot. Excessive
Heat Warnings and Heat Advisories remain in effect. Another round
of lightning is forecast to develop overnight with a Red Flag
Warning for dry lightning remaining in effect through Monday
morning. Continued hot and dry through midweek with some cooling
by later in the week.

&&

.DISCUSSION...as of 3:13 PM PDT Sunday...As noted earlier it has
been quite the day around here. There are probably around eight
relatively large fires burning across the district with several
smaller ones throughout the region and more popping up as we
write. The thunderstorms from this morning have mostly
transitioned to our north where more fires have developed across
Mendocino as well as Glenn county. There still are some radar returns
offshore so isolated showers or thunderstorms cant be completely
ruled out this evening. The morning clouds and thunderstorms
briefly put a damper on the heat but that was short lived and
afternoon highs are once again very hot. Bradley in southern
Monterey county is up to a scorching 111 degrees with five other
sites reporting 109 degrees including Hollister, Pinnacles and
Arroyo Seco. In the Bay Area Livermore and Concord have reached
104 degree. To be honest much of the focus today has been on
convection and fire support. Will let excessive heat warnings and
heat advisories remain in place for now. Next decision point will
be on if Heat Advisory will be extended again and that decision
will be made later this evening or overnight.

In terms of impacts the main focus is once again on t-storm
chances. The last 24 hours has been quite a unique time in terms
of summertime convection. This 20 year forecaster cant recall such
a widespread convective event on the heels of such a heat wave.
June 2008 would be a good proxy but dont recall the Bay Area
getting nearly as much convection. Sept 1999 ahead of the Kirk
Complex was perhaps similar as well.

Anyway, its stunning to see the models showing a similar setup
once again tonight to what was observed last evening. There is a
clear moisture plume over NorCal that extends back to Tropical
Storm Fausto which is located well west of Baja. It appears
another shortwave/vortmax rotating out of the monsoon will eject
northward once again tonight. The nam model is perhaps slightly
slower than last night in the development with the 18z gfs now
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showing the peak period of convection somewhere between 10-15z Monday. The Oakland sounding is very wet so the storms clearly wont be purely dry. However the speed of storm movement and the very dry fuels allowed for very efficient ignition of new fires and for now would expect the same. If storms slow down and trend wetter we could see more precip Monday morning but with widespread triple digit heat and warm nights in store and seeing the current active fire behavior it seem that more ignitions would be likely should the forecast verify.

Similar to today, would expect activity to shift northward by midday and out of the North Bay by afternoon. Drying trend and continued unseasonably warm beyond that with hot temps through midweek. Little to no time spent analyzing the mid and long range. NBM extended forecast grids will suffice for now.

&&

.AVIATION....as of 5:05 PM PDT Sunday...Thunderstorm activity has subsided over the area this afternoon. Still plenty of instability over the area and models forecast another surge of mid level moisture coming from the south tonight. Thus there is the threat of thunderstorms again tonight. Estimates for timing of VCTS is 03Z for the MRY Bay Area spreading into the SFO Bay Area after 06Z. Durations will be 6-9 hours. TAFs will be adjusted as moisture plumes begin to appear on satellite image. Low clouds could briefly appear in the thunderstorms as well. Activity should end by mid or late morning as mid level moisture decreass.

Vicinity of KSFO...VFR with increasing mid clouds and a renewal of thunderstorm chances after 09Z lasting through 18Z. Bases 10000 feet or higher. Northwest winds 15-20 kt decreasing after 06Z.

SFO Bridge Approach...Similar to KSFO.

Monterey Bay Terminals...VFR through Monday. Models bring mid level clouds after 03Z tonight and there is the possibility of thunderstorms again lasting through 12Z.

&&

.CLIMATE...

Record High Temperatures for Sunday and Monday.

	August 16	August 17
Santa Rosa	100 in 2019	100 in 1939
Kentfield	101 in 2015	104 in 2015
Napa	104 in 2015	105 in 2015
Richmond	94 in 2015	93 in 2015
Livermore	105 in 1951	106 in 1939
San Francisco	90 in 2015	92 in 1892
SFO	90 in 2015	82 in 1993
Redwood City	101 in 2015	102 in 1939
Half Moon Bay	72 in 2015	72 in 2015
Oakland Dtown	92 in 2015	86 in 1984
San Jose	97 in 2015	99 in 1939
Gilroy	107 in 2019	107 in 2015
Santa Cruz	94 in 1983	88 in 1983
Salinas	94 in 1933	92 in 1941
Monterey	83 in 2015	81 in 1960
King City	103 in 2015	100 in 1939

&&

.MARINE...as of 04:33 PM PDT Sunday...Thunderstorm activity has diminished so far this afternoon across the coastal waters. Expecting another round of storms to move through the region tonight and tomorrow morning. Similar conditions are anticipated

```
with thunderstorms producing erratic and locally gusty winds as
well as possible lightning. Additionally, northwest winds will
increase more broadly across the waters  tomorrow and into mid-
week as surface high pressure strengthens  off the coast of
California. The strongest winds are forecast  along the Big Sur
Coast south of Point Sur. Mixed seas will  continue with a short
period northwest swell and a couple of  longer period southerly
swells.

&&

.MTR WATCHES/WARNINGS/ADVISORIES...
     .Tngt...Excessive Heat Warning...CAZ507-510-511-513-516>518
             Red Flag Warning...CAZ516>518-528-530
             Red Flag Warning...CAZ006-505>513-529
             Heat Advisory...CAZ006-506-508-512-528>530
             SCA...Pigeon Pt to Pt Pinos 0-10 nm from 3 PM
             SCA...Pt Pinos to Pt Piedras Blancas 0-10 nm from 3 PM

&&

$$

PUBLIC FORECAST: RWW
AVIATION: W Pi
MARINE: AS

Visit us at www.weather.gov/sanfrancisco

Follow us on Facebook, Twitter, and YouTube at:
www.facebook.com/nwsbayarea
www.twitter.com/nwsbayarea
www.youtube.com/nwsbayarea
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Appendix D

District Health Caution Statements and Weather Service Air Quality Alerts

Appendix D: District Health Cautionary Statements and Weather Service Air Quality Alerts

D.1 District Health Cautionary Statements:

August 17, 2020:

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

NEWS Release

HEALTHY AIR LIVING™

www.valleyair.org 24hr Media Cell Phone (559) 309-3336

For immediate release 08-17-2020

Attn: Local news, weather, health and assignment editors

Media Contact:
Heather Heinks (559) 230-5898
Spanish-language
Maricela Velasquez (559) 230-5849

Wildfires bring smoke into the Valley

District cautions Valley residents of increasing health impacts

Multiple wildfires surrounding the Valley are causing smoke impacts to all counties of the Valley air basin. As a result, the District is issuing a health caution, which will remain in place until the fires are extinguished.

The Canyon Fire, located in Stanislaus County near Turlock; the Hills Fire, located in Fresno County west of Avenal near Highway 33; and the Lake Fire located in Los Angeles County southeast of Lebec are producing smoke that is infiltrating into the San Joaquin Valley which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare Counties, and the valley portion of Kern county. Air pollution officials caution Valley residents to reduce exposure to the particulate matter (PM) emissions by remaining indoors in effected areas.

PM pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Individuals with heart or lung disease should follow their doctors' advice for dealing with episodes of PM exposure. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible to the health effects from this form of pollution. Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed. The common cloth and paper masks individuals are wearing due to COVID-19 concerns may not protect them from wildfire smoke.

Residents can use the District's Real-time Air Advisory Network (RAAN) to track air quality at any Valley location by visiting myRAAN.com. District air monitoring stations are designed to detect microscopic PM 2.5 particles that exist in smoke. However, larger particles, such as ash, may not be detected. If you smell smoke or see falling ash in your immediate vicinity, consider air quality "unhealthy" (RAAN Level 4 or higher) even if RAAN displays lower level of pollution.

The public can also check the District's wildfire page at www.valleyair.org/wildfires for information about any current and recently past wildfires affecting the Valley. In addition, anyone can follow air quality conditions by downloading the free "Valley Air" app on their mobile device.

For more information, visit www.valleyair.org or call a District office in Fresno (559-230-6000), Modesto (209-557-6400) or Bakersfield (661-392-5500). District Outreach and Communications personnel are also available for media interviews via Zoom or by phone.

August 21, 2020 : (English version)

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

NEWS Release

HEALTHY AIR LIVING

www.valleyair.org 24hr Media Cell Phone (559) 309-3336

For immediate release 08-21-2020

Attn: Local news, weather, health and assignment editors

Media Contact:
Heather Heinks (559) 230-5898
Spanish-language
Marcela Velasquez (559) 230-5849

Ongoing California Wildfires Causing Very Unhealthy Air Quality

District cautions Valley residents of increasing health impacts

Ongoing multiple wildfires across California and surrounding the Valley are continuing to cause smoke impacts to all counties of the Valley air basin. Through this week, PM2.5 concentrations have continued to increase, resulting in very unhealthy air quality across the region. As a result, the District is reissuing a health caution, which will remain in place until the fires are extinguished. The District anticipates unhealthy air quality to affect the Valley through the weekend and warns residents to stay indoors.

The SCU Lightning Complex Fire, located in multiple northern counties, including Stanislaus and San Joaquin Counties; the Hills Fire, located in Fresno County west of Avenal near Highway 33; the CZU August Lightning Complex Fire, located in various locations across San Mateo and Santa Cruz Counties; and the Lake Fire located in Los Angeles County southeast of Lebec are producing smoke that is infiltrating into the San Joaquin Valley which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare Counties, and the valley portion of Kern county. Air pollution officials caution Valley residents to reduce exposure to the particulate matter (PM) emissions by remaining indoors in affected areas.

PM pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Individuals with heart or lung disease should follow their doctors' advice for dealing with episodes of PM exposure. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible to the health effects from this form of pollution. Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed. The common cloth and paper masks individuals are wearing due to COVID-19 concerns may not protect them from wildfire smoke.

Residents can use the District's Real-time Air Advisory Network (RAAN) to track air quality at any Valley location by visiting myRAAN.com. District air monitoring stations are designed to detect microscopic PM 2.5 particles that exist in smoke. However, larger particles, such as ash, may not be detected. If you smell smoke or see falling ash in your immediate vicinity, consider air quality "unhealthy" (RAAN Level 4 or higher) even if RAAN displays lower level of pollution.

The public can also check the District's wildfire page at www.valleyair.org/wildfires for information about any current and recently past wildfires affecting the Valley. In addition, anyone can follow air quality conditions by downloading the free "Valley Air" app on their mobile device.

For more information, visit www.valleyair.org or call a District office in Fresno (559-230-6000), Modesto (209-557-6400) or Bakersfield (661-392-5500). District Outreach and Communications personnel are also available for media interviews via Zoom or by phone.

August 21, 2020 : (Spanish version)

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

AIRE LIMPIO. VIDA SANA™

Comunicado de Prensa

www.valleyair.org Número de Comunicación 24hr (559) 309-3336

Para publicación inmediata 08-21-20

Para: Noticias Locales, Clima, Salud y Editores de Asignación

Contacto:
Heather Heinks (559) 230-5898
Español:
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Continuos Incendios Forestales de California Causan Calidad del Aire muy Insalubre

El Distrito advierte a los residentes del Valle de los impactos en la salud

Los múltiples incendios forestales en California y los alrededores del Valle continúan causando impactos de humo en todos los condados de la cuenca de aire del Valle. Durante esta semana, las concentraciones de PM2.5 han seguido aumentando, lo que ha provocado una calidad del aire muy insalubre en toda la región. Como resultado, el Distrito está volviendo a emitir una advertencia de salud, que permanecerá vigente hasta que se apaguen los incendios. El Distrito anticipa que la mala calidad del aire afectará al Valle durante el fin de semana y advierte a los residentes que se queden adentro.

El incendio de SCU Lighting Complex Fire, ubicado en varios condados del norte, incluidos los condados de Stanislaus y San Joaquín; el incendio de Hills Fire, ubicado en el condado de Fresno al oeste de Avenal cerca de la autopista 33; el incendio de CZU August Lightning Complex, ubicado en varios lugares en los condados de San Mateo y Santa Cruz; y el incendio de Lake Fire ubicado en el condado de Los Ángeles al sureste de Lebec están produciendo humo que se está infiltrando en el valle de San Joaquín, que incluye los condados de San Joaquín, Stanislaus, Merced, Madera, Fresno, Kings, Tulare y la parte del valle del condado de Kern. Los funcionarios de contaminación del aire advierten a los residentes del Valle que reduzcan la exposición a las emisiones de material particulado (PM) permaneciendo adentro en las áreas afectadas.

La contaminación de partículas puede causar ataques de asma, agravar el bronquitis crónico y aumentar el riesgo de ataque cardíaco y ataque cerebral. Las personas con enfermedades cardíacas o pulmonares deben seguir los consejos de sus médicos para lidiar con episodios de exposición a PM. Aquellos con condiciones respiratorias existentes, incluyendo el COVID-19, los niños pequeños y personas de tercera edad, son especialmente susceptibles a los efectos de salud de esta forma de contaminación. Cualquier persona que experimente una mala calidad del aire debido al humo de los incendios forestales debe trasladarse al interior, a un ambiente con aire acondicionado y filtrado con las ventanas cerradas. Es posible que las máscaras comunes de tela y papel que usan las personas debido a preocupaciones de COVID-19 no las protejan del humo de los incendios forestales.

Los residentes pueden utilizar el Sistema de Notificación de la Calidad del Aire Actual (RAAN, por sus siglas en inglés) del Distrito para revisar la calidad del aire en cualquier ubicación del Valle visitando myRAAN.com. Las estaciones de monitoreo del aire del Distrito están diseñadas para detectar partículas microscópicas de PM 2.5 que existen en el humo. Sin embargo, es posible que no se detecten partículas más grandes, como cenizas. Si huele humo o ve cenizas que caen, considere la calidad del aire como "insalubre" (RAAN Nivel 4 o superior) incluso si RAAN muestra un nivel más bajo de contaminación.

El público también puede consultar la página de incendios forestales del Distrito en www.valleyair.org/wildfires para obtener información sobre los incendios forestales actuales y pasados que afecten al Valle. Además, cualquier persona puede seguir las condiciones de calidad del aire en la aplicación gratuita "Valley Air" en su teléfono móvil.

Para más información, visite www.valleyair.org o llame a una oficina del Distrito en Fresno (559-230-6000), Modesto (209-557-6400) o Bakersfield (661-392-5500). El personal de Comunicaciones y Alcance del Distrito también está disponible para entrevistas con los medios a través de Zoom o por teléfono.

D.2 National Weather Service Air Quality Alerts:

August 17, 2020:

Air Quality Alert Message
Relayed by National Weather Service Hanford CA
408 PM PDT Mon Aug 17 2020

CAC019-029-031-039-047-077-099-107-192300-
Fresno-Kern-Kings-Madera-Merced-San Joaquin-Stanislaus-Tulare-
408 PM PDT Aug 17 2020

The San Joaquin Valley Air Pollution Control District has issued an Air Quality Alert on August 17th, 2020, due to smoke impacts from surrounding wildfires for San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern Counties.

This Air Quality Alert is in effect until the fires are extinguished.

Exposure to particle pollution can cause serious health problems, aggravate lung disease, cause asthma attacks and acute bronchitis, and increase risk of respiratory infections.

Residents are advised to use caution as conditions warrant. People with heart or lung diseases should follow their doctor's advice for dealing with episodes of unhealthy air quality.

Additionally, older adults and children should avoid prolonged exposure, strenuous activities or heavy exertion, as conditions dictate.

For additional information, call your local San Joaquin Valley Air District office. Modesto 209-557-6400, Fresno 559-230-6000, Bakersfield 661-381-1809

Residents can also follow air quality conditions by downloading the free Valley Air app, available in the Apple store or Google Play.

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August 19, 2020:

Air Quality Alert Message
Relayed by National Weather Service Hanford CA
1024 AM PDT Wed Aug 19 2020

CAC019-029-031-039-047-077-099-107-251800-
Fresno-Kern-Kings-Madera-Merced-San Joaquin-Stanislaus-Tulare-
1024 AM PDT Wed Aug 19 2020

The San Joaquin Valley Air Pollution Control District is extending the Air Quality Alert issued on August 17, 2020, due to smoke impacts from surrounding wildfires for San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern Counties.

This Air Quality Alert is in effect until the fires are extinguished.

Exposure to particle pollution can cause serious health problems, aggravate lung disease, cause asthma attacks and acute bronchitis, and increase risk of respiratory infections.

Residents are advised to use caution as conditions warrant. People with heart or lung diseases should follow their doctor's advice for dealing with episodes of unhealthy air quality.

Additionally, older adults and children should avoid prolonged exposure, strenuous activities or heavy exertion, as conditions dictate.

For additional information, call your local San Joaquin Valley Air District office. Modesto 209-557-6400, Fresno 559-230-6000, Bakersfield 661-381-1809

Residents can also follow air quality conditions by downloading the free Valley Air app, available in the Apple store or Google Play.

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August 20, 2020:

Air Quality Alert Message
Relayed by National Weather Service Hanford CA
1121 AM PDT Thu Aug 20 2020

CAC019-029-031-039-043-047-077-099-107-109-271830-
Fresno-Kern-Kings-Madera-Mariposa-Merced-San Joaquin-Stanislaus-
Tulare-Tuolumne-
1121 AM PDT Thu Aug 20 2020

An Air Quality Alert is now in effect for Tuolumne County and
Mariposa County in addition to San Joaquin, Stanislaus,
Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of
Kern Counties until fires are extinguished.

Exposure to particle pollution can cause serious health problems,
aggravate lung disease, cause asthma attacks and acute bronchitis,
and increase risk of respiratory infections.

Residents are advised to use caution as conditions warrant. People
with heart or lung diseases should follow their doctor's advice for
dealing with episodes of unhealthy air quality.

Additionally, older adults and children should avoid prolonged
exposure, strenuous activities or heavy exertion, as conditions
dictate.

For additional information, call your local Air District office.
Tuolumne 209-533-5693, Mariposa 209-966-2220, Modesto 209-557-6400,
Fresno 559-230-6000, Bakersfield 661-381-1809

Residents can also follow air quality conditions by downloading the
free Valley Air app, available in the Apple store or Google Play.

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Select photos of ground observations in Valley

Figure D-1: Smoke on ground in Merced, California on August 20, 2020

Figure D-2: Smoke above Stockton, California on August 22, 2020

Appendix E

Backward Trajectories for
Stockton-Hazelton, Manteca, Turlock, Fresno-Foundry, and Corcoran

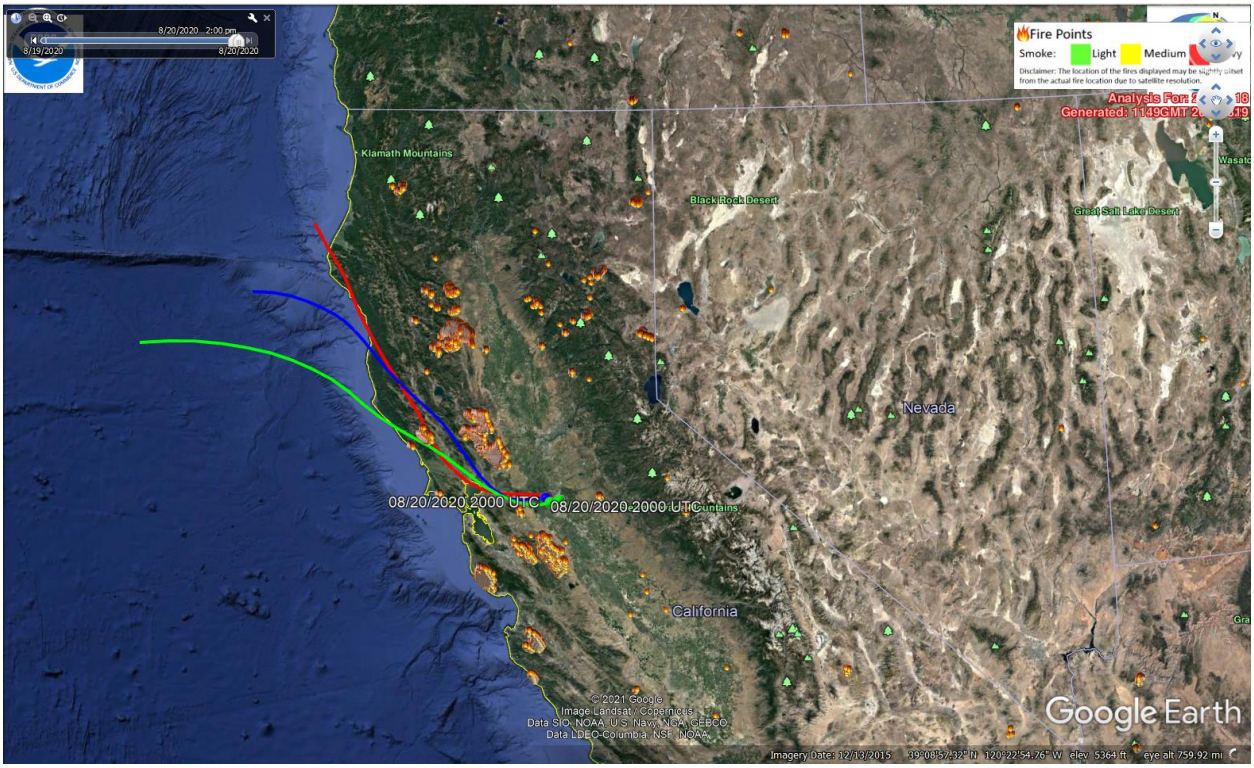
Appendix E: Backward trajectories for Stockton-Hazelton, Manteca, Turlock, Fresno-Foundry, and Corcoran

E.1 Stockton-Hazelton Backward Trajectories

The following trajectory analysis depicts emissions transported to the Stockton-Hazelton air monitoring site for August 20, August 21, and August 24, 2020. The modeling and observations show that the smoke originated at the LNU and SCU Complexes and Woodward fires west-northwest of Stockton-Hazelton. The model trajectory analysis takes the air parcel east-southeast toward the Stockton area, leading to the elevated PM2.5 concentrations reported at the Stockton-Hazelton air monitoring station.

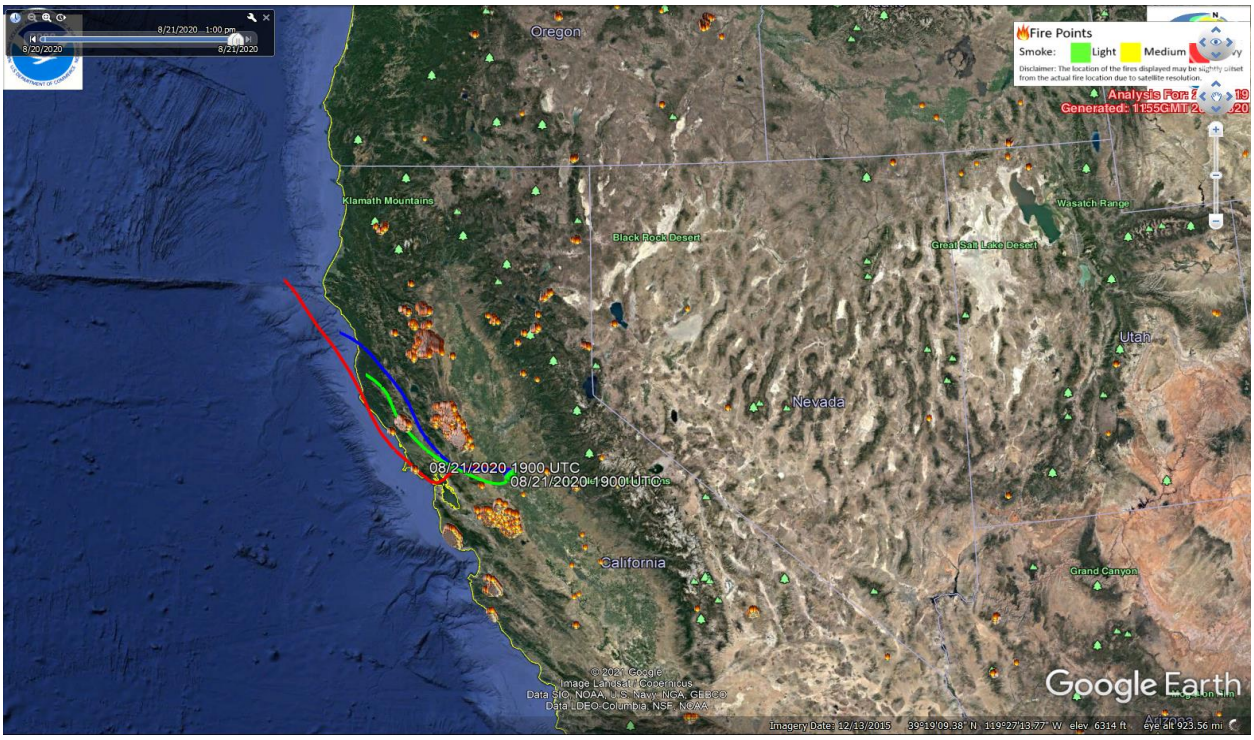
In Figure E- 1, backward trajectory analysis for August 20, 2020, shows the origination location of air mass arriving at Stockton at the 50, 500, and 1,000 meter height levels around 2:00 PM PST, where a peak concentration of 232 µg/m^3 was recorded. Onshore (west-northwest) winds on August 19 and 20, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Stockton area.

Figure E- 1: Backward Trajectory (24-hour) for August 20, 2020, showing location of air mass arriving in Stockton at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 2:00 PM



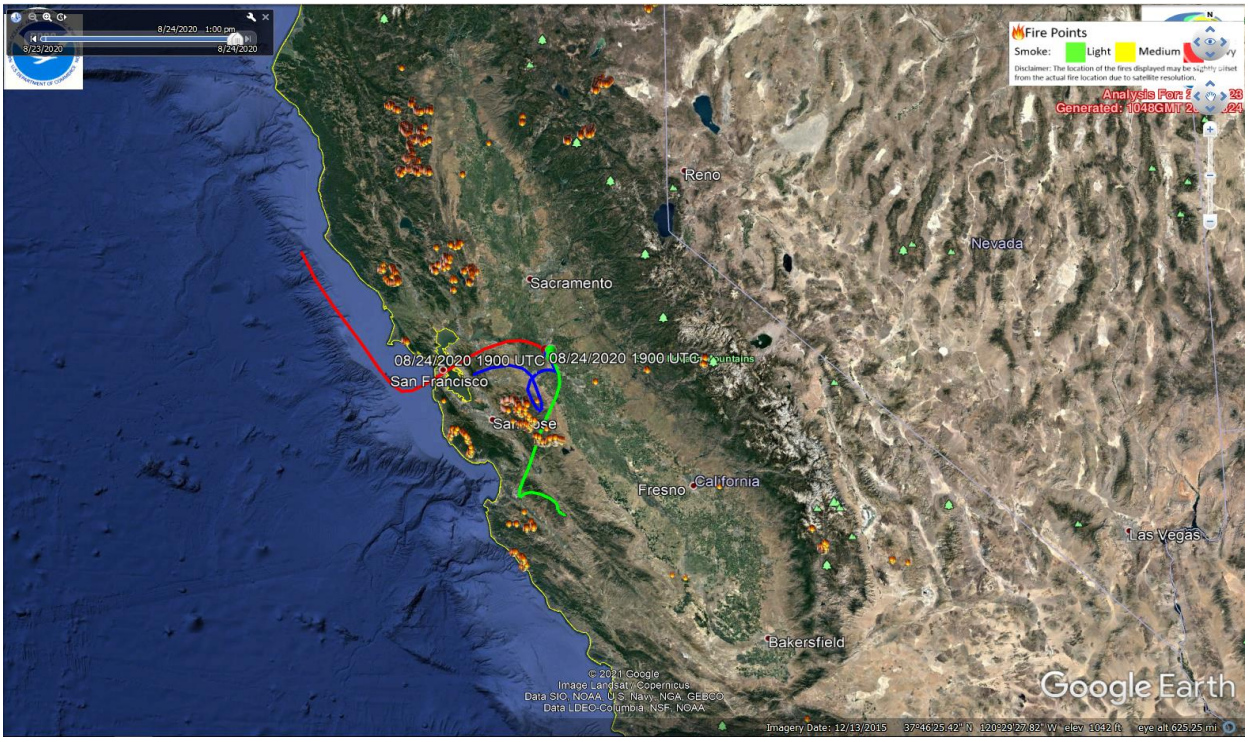
In Figure E-2, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Stockton at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 175 µg/m^3 was recorded. West-northwest winds on August 20 and 21, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Stockton area.

Figure E-2: Backward Trajectory (24-hour) for August 21, 2020, showing location of air mass arriving in Stockton at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM



In Figure E-3, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Stockton at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 175 µg/m^3 was recorded. West-northwest winds on August 23 and 24, 2020, transported smoke from the LNU and SCU Complexes and Woodward fire toward the Stockton area.

Figure E-3: Backward Trajectory (24-hour) for August 24, 2020, showing location of air mass arriving in Stockton at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM

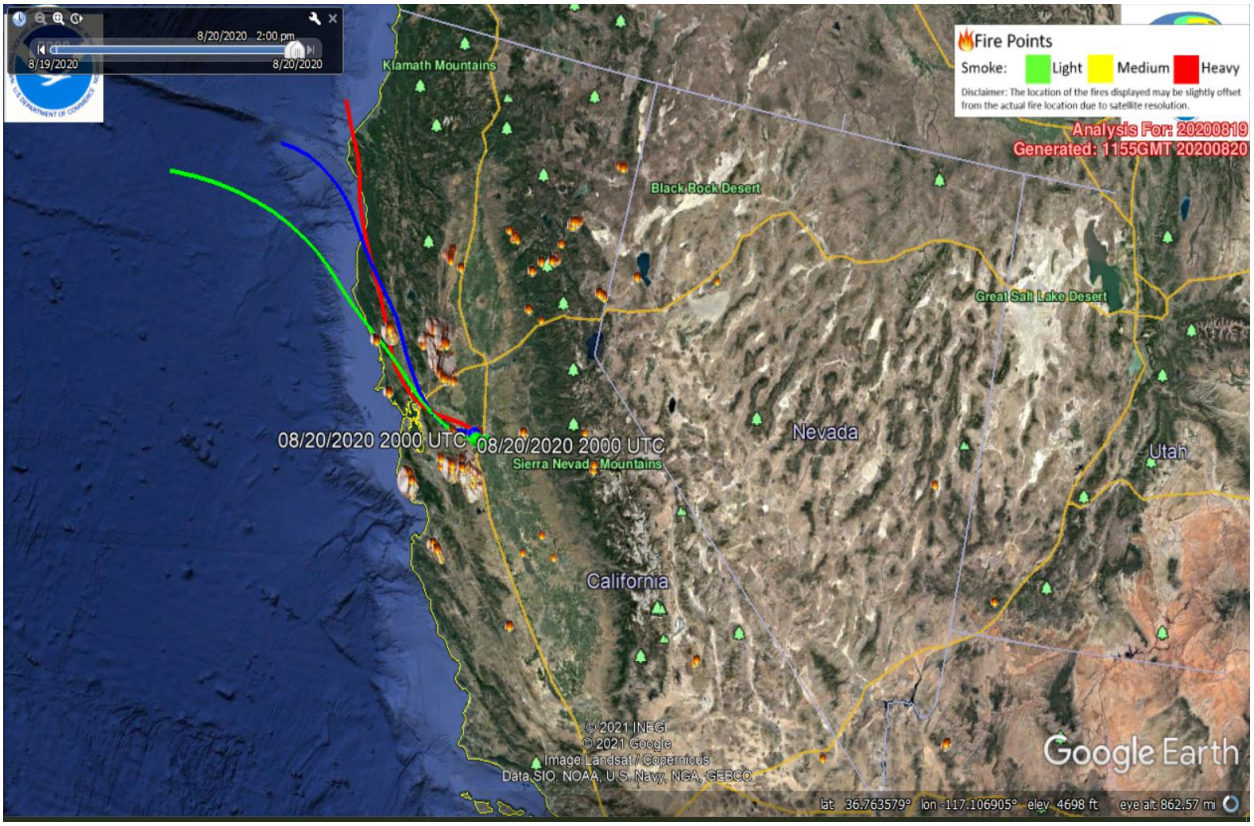


E.2 Manteca Backward Trajectories

The following trajectory analysis depicts emissions transported to the Manteca air monitoring site for August 20, August 21, August 23, and August 24, 2020. The modeling and observations show that the smoke originated at the LNU and SCU Complexes and Woodward fires west-northwest of Manteca. The model trajectory analysis takes the air parcel east-southeast toward the Manteca area, leading to the elevated PM2.5 concentrations reported at the Manteca air monitoring station.

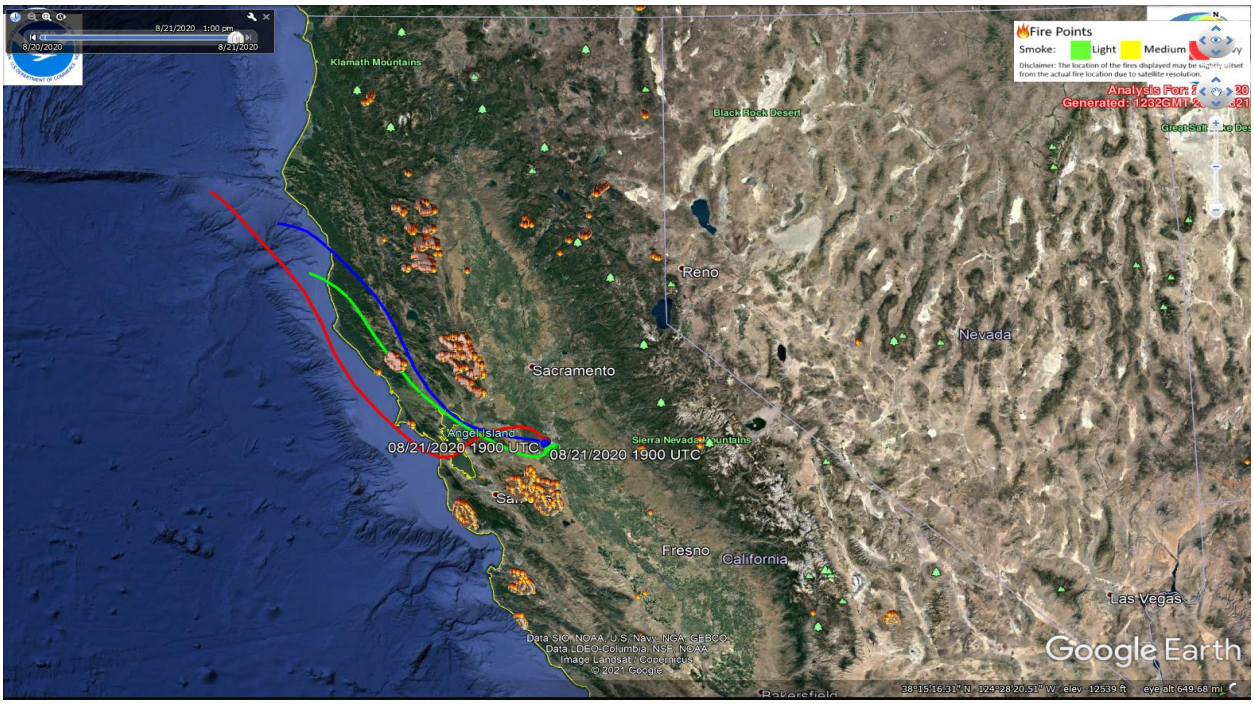
In Figure E-4, backward trajectory analysis for August 20, 2020, shows the origination location of air mass arriving at Manteca at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 279 µg/m^3 was recorded. West-northwest winds on August 19 and 20, 2020, transported smoke from the LNU and SCU Complexes toward the Manteca area.

Figure E-4: Backward Trajectory (24-hour) for August 20, 2020, showing location of air mass arriving in Manteca at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM



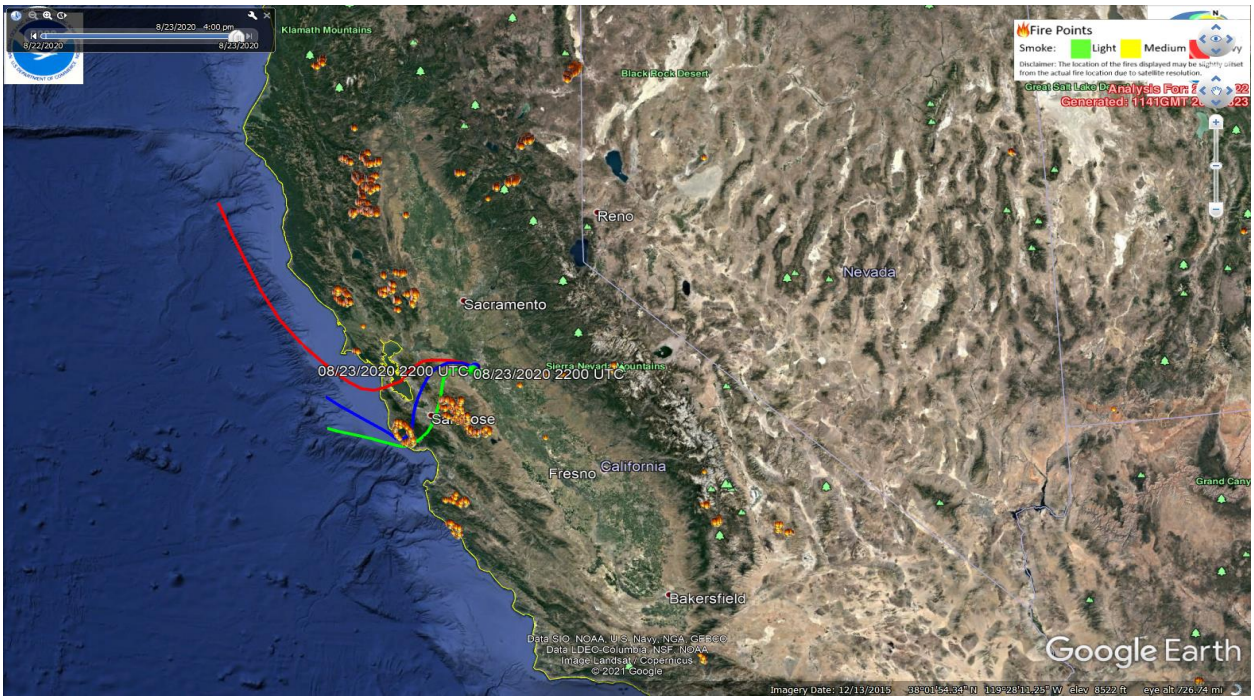
In Figure E-5, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Manteca at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 220 µg/m^3 was recorded. West-northwest winds on August 20 and 21, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Manteca area.

Figure E-5: Backward Trajectory (24-hour) for August 21, 2020, showing location of air mass arriving in Manteca at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM



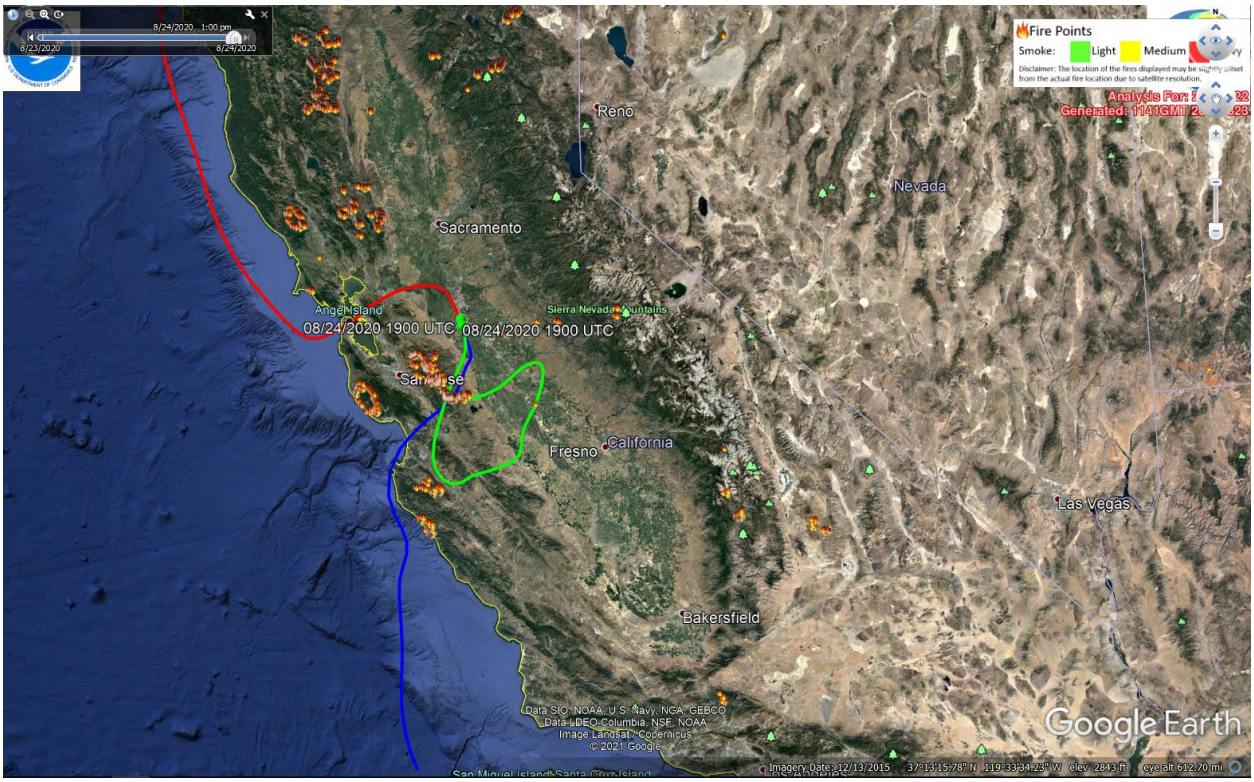
In Figure E-6, backward trajectory analysis for August 23, 2020, shows the origination location of air mass arriving at Manteca at the 50, 500, and 1,000 meter height levels around 4:00 PM PST, where a peak concentration of 176 µg/m^3 was recorded. West-northwest winds on August 22 and 23, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Manteca area.

Figure E-6: Backward Trajectory (24-hour) for August 23, 2020, showing location of air mass arriving in Manteca at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 4:00 PM



In Figure E-7, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Manteca at the 50, 500, and 1,000 meter height levels around 1:00 PM PST, where a peak concentration of 161 µg/m^3 was recorded. West-northwest winds on August 23 and 24, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Manteca area.

Figure E-7: Backward Trajectory (24-hour) for August 24, 2020, showing location of air mass arriving in Manteca at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 1:00 PM

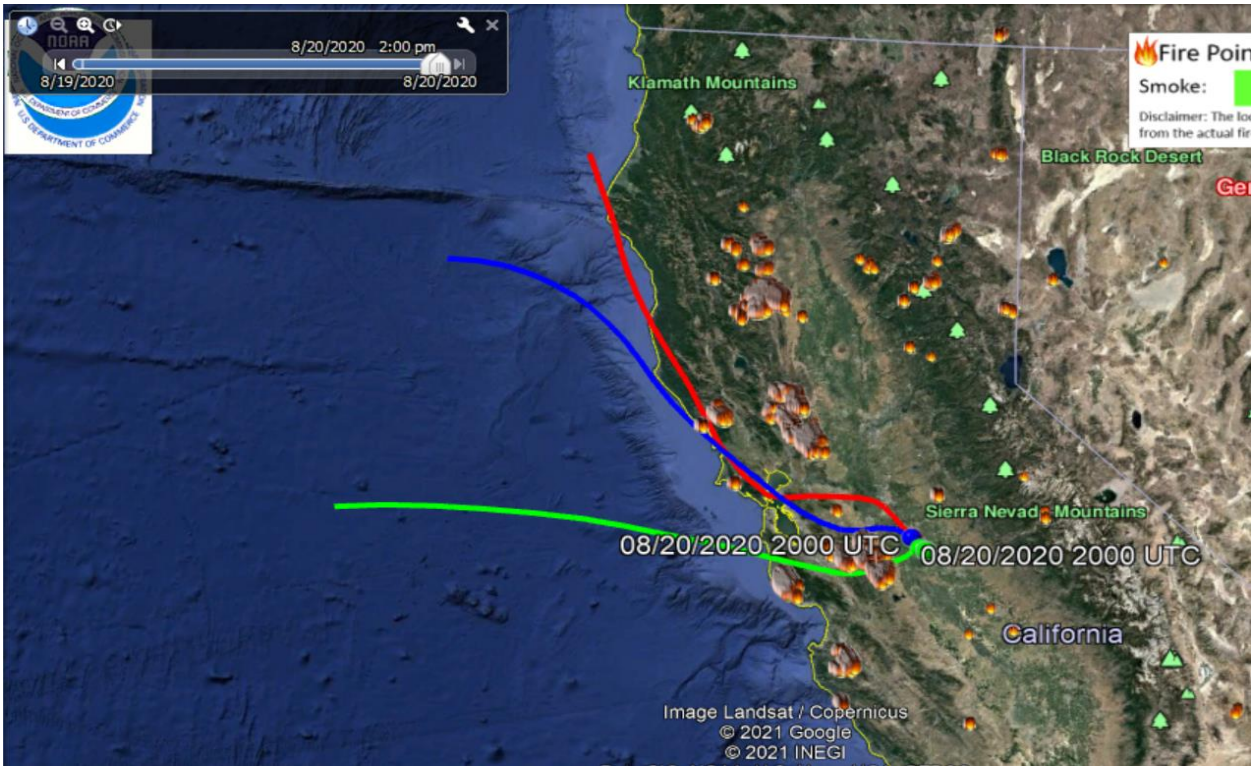


E.3 Turlock Backward Trajectories

The following trajectory analysis depicts emissions transported to the Turlock air monitoring site for August 20, August 21, August 22, and August 24, 2020. The modeling and observations show that the smoke originated at the Woodward fire, LNU, SCU, and CZU Complexes west-northwest of Turlock. The model trajectory analysis takes the air parcel east-southeast toward the Turlock area, leading to the elevated PM2.5 concentrations reported at the Turlock air monitoring station.

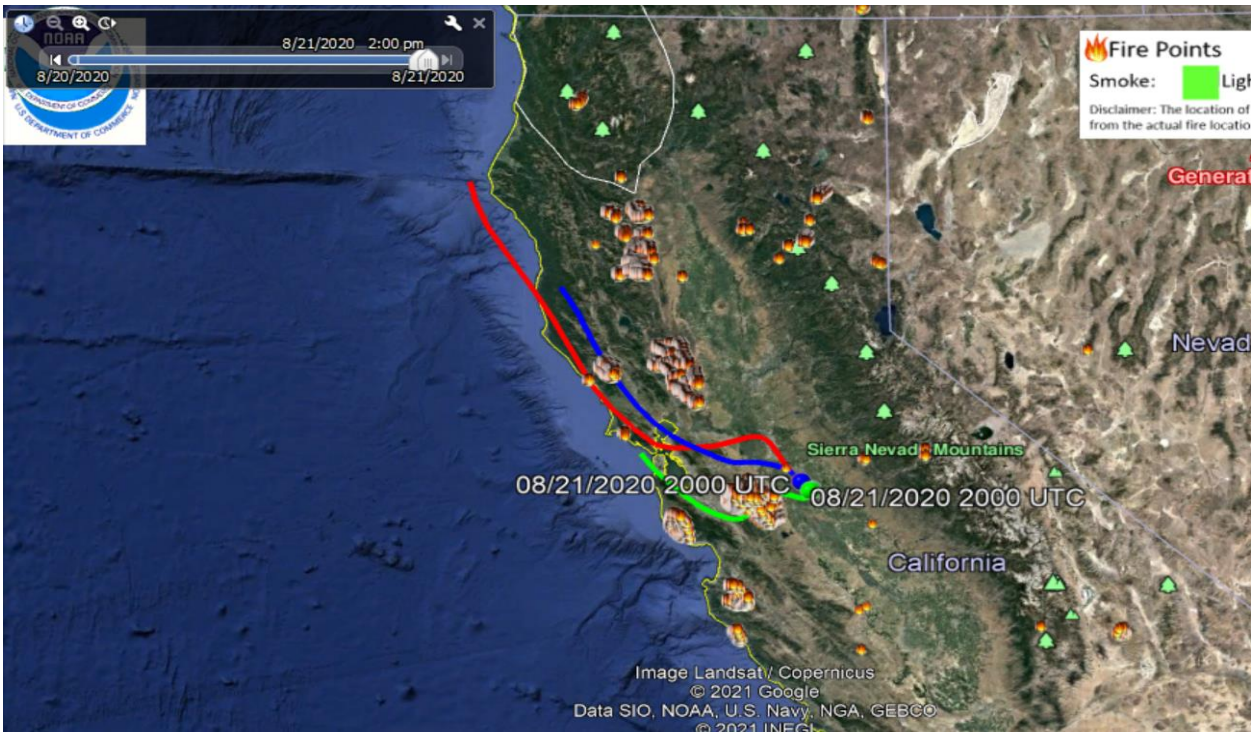
In Figure E-8, backward trajectory analysis for August 20, 2020, shows the origination location of air mass arriving at Turlock at the 50, 500, and 1,000 meter height levels around 2:00 PM PST, where a peak concentration of 251 µg/m^3 was recorded. West-northwest winds on August 19 and 20, 2020, transported smoke from the Woodward fire and LNU and SCU Complexes toward the Turlock area.

Figure E-8: Backward Trajectory (24-hour) for August 20, 2020, showing location of air mass arriving in Turlock at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 2:00 PM



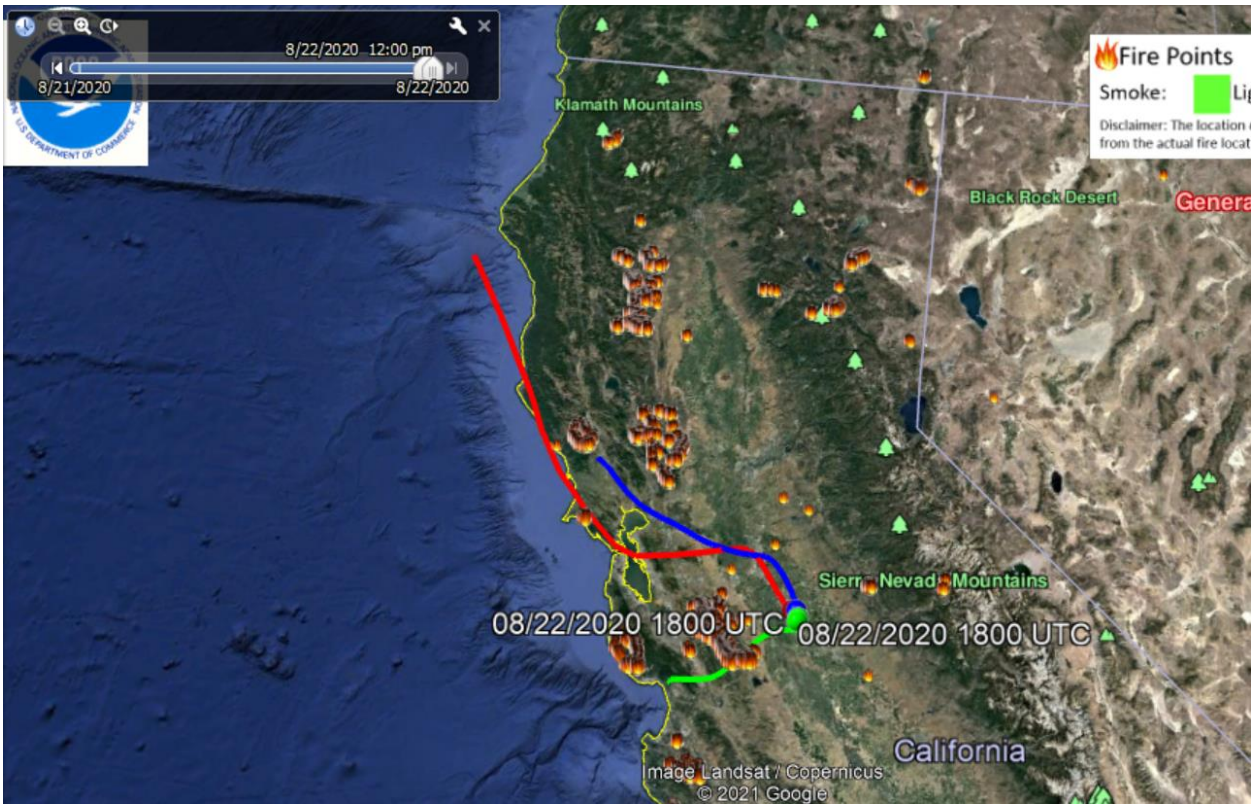
In Figure E-9, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Turlock at the 50, 500, and 1,000 meter height levels around 2:00 PM PST, where a peak concentration of 159 µg/m^3 was recorded. West-northwest winds on August 20 and 21, 2020, transported smoke from the Woodward fire and LNU and SCU Complexes toward the Turlock area.

Figure E-9: Backward Trajectory (24-hour) for August 21, 2020, showing location of air mass arriving in Turlock at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 2:00 PM



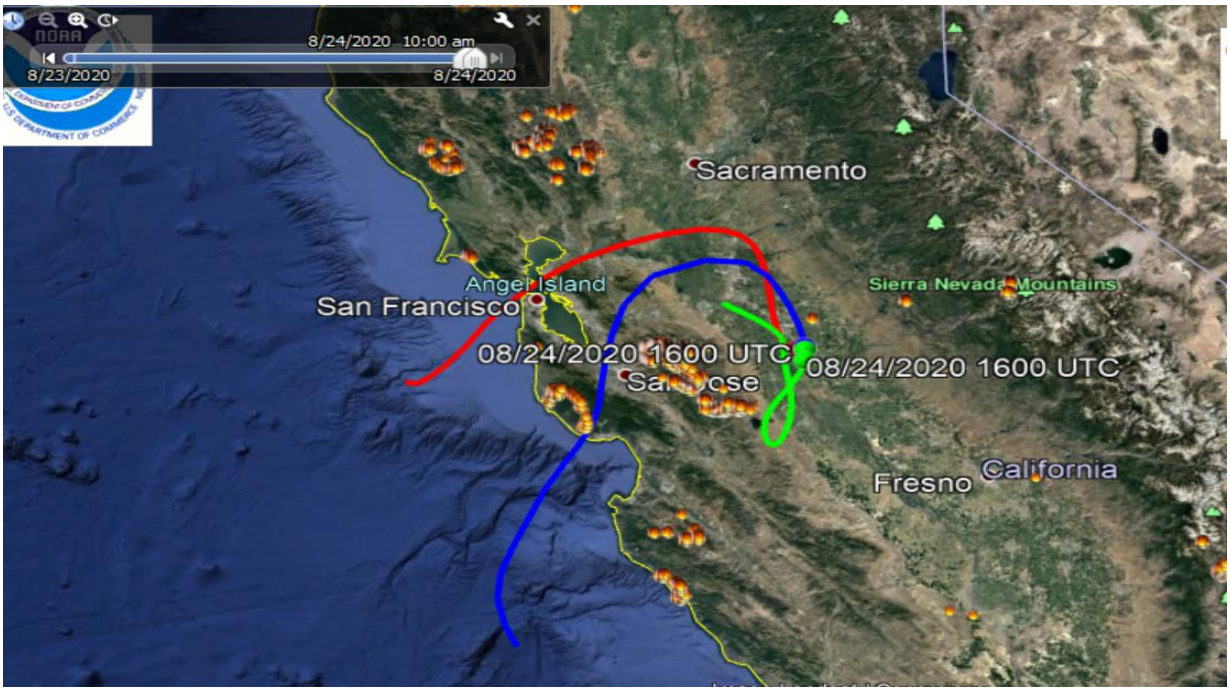
In Figure E-10, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Turlock at the 50, 500, and 1,000 meter height levels around 12:00 PM PST, where a peak concentration of 148 µg/m^3 was recorded. West-northwest winds on August 21 and 22, 2020, transported smoke from the Woodward fire and LNU and SCU Complexes toward the Turlock area.

Figure E-10: Backward Trajectory (24-hour) for August 22, 2020, showing location of air mass arriving in Turlock at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 12:00 PM



In Figure E-11, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Turlock at the 50, 500, and 1,000 meter height levels around 11:00 AM PST, where a peak concentration of 140 µg/m^3 was recorded. West-northwest winds on August 23 and 24, 2020, transported smoke from the Woodward fire and CZU and SCU Complexes toward the Turlock area.

Figure E-11: Backward Trajectory (24-hour) for August 24, 2020, showing location of air mass arriving in Turlock at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 AM

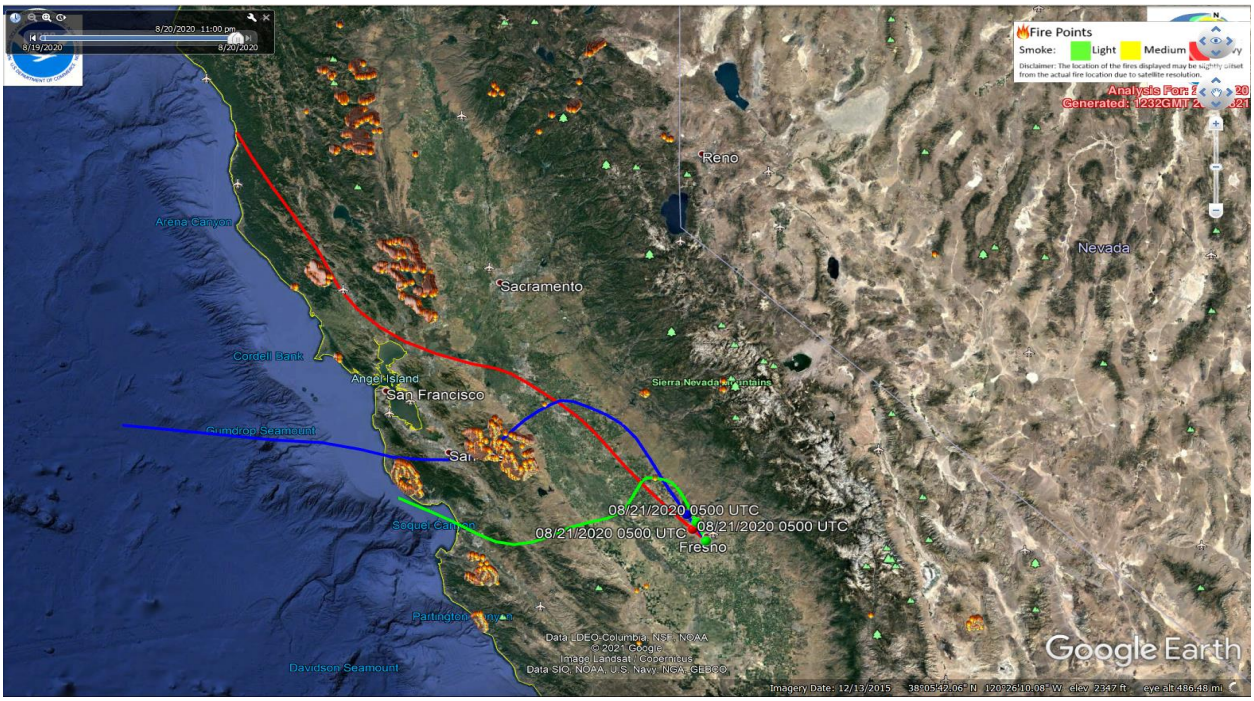


E.4 Fresno-Foundry Backward Trajectories

The following trajectory analysis depicts emissions transported to the Fresno-Foundry air monitoring site for August 20 -24, 2020. The modeling and observations show that the smoke originated at the Woodward fire and LNU, SCU, and CZU Complexes west-northwest of Fresno-Foundry. The model trajectory analysis takes the air parcel east-southeast toward the Fresno-Foundry area, leading to the elevated PM2.5 concentrations reported at the Fresno-Foundry air monitoring station.

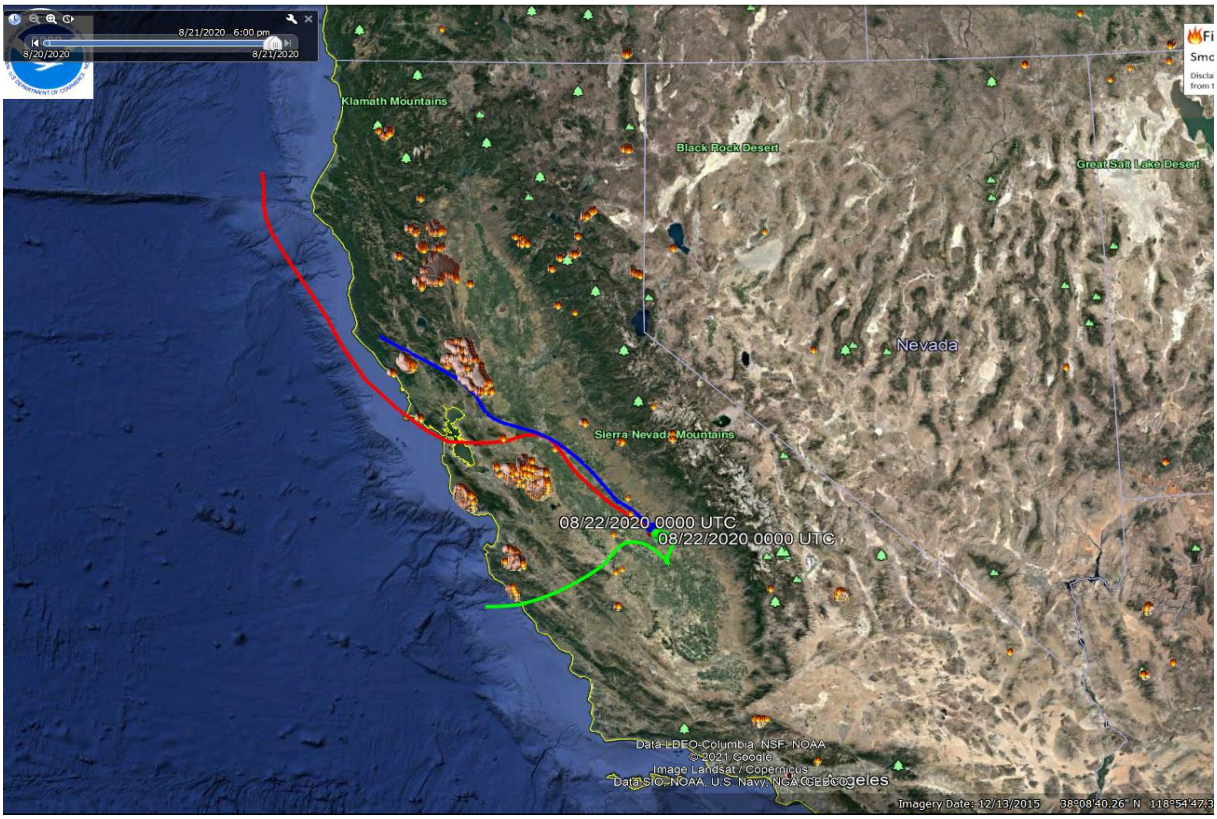
In Figure E-12, backward trajectory analysis for August 20, 2020, shows the origination location of air mass arriving at Fresno-Foundry at the 50, 500, and 1,000 meter height levels around 11:00 PM PST, where a peak concentration of 185 µg/m^3 was recorded. West-northwest winds on August 20, 2020, transported smoke from the CZU, LNU and SCU Complexes toward the Fresno-Foundry area.

Figure E-12: Backward Trajectory (24-hour) for August 20, 2020, showing location of air mass arriving in Fresno-Foundry at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 PM



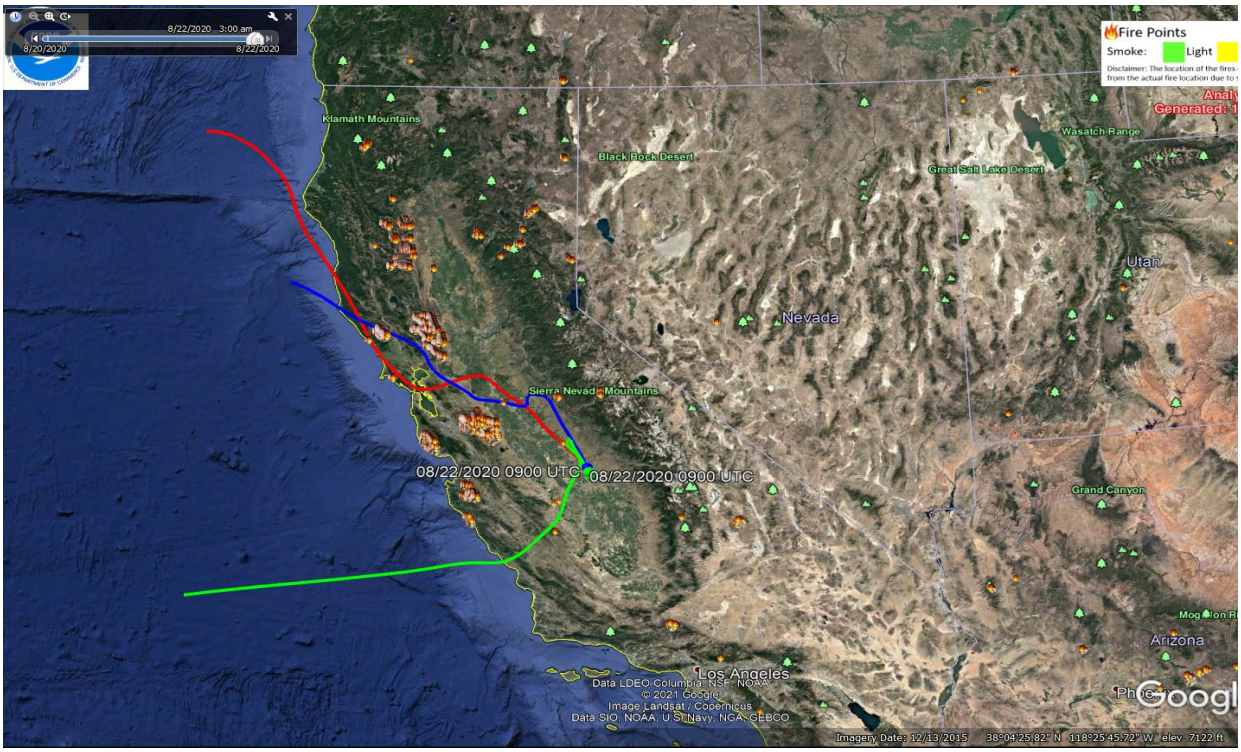
In Figure E-13, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Fresno-Foundry at the 50, 500, and 1,000 meter height levels around 11:00 PM PST, where a peak concentration of 173 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Fresno-Foundry on this day. West-northwest winds on August 20 and 21, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Fresno-Foundry area.

Figure E-13: Backward Trajectory (36-hour) for August 21, 2020, showing location of air mass arriving in Fresno-Foundry at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 PM



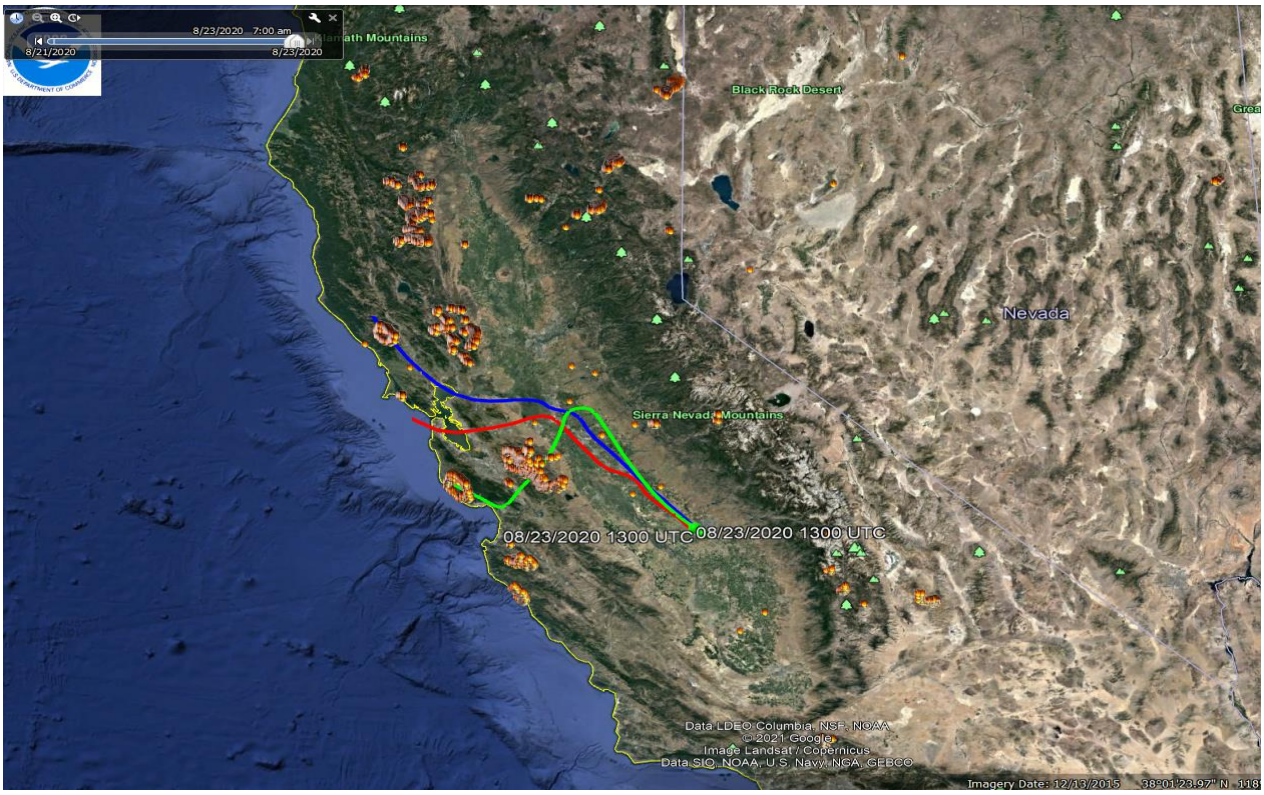
In Figure E-14, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Fresno-Foundry at the 50, 500, and 1,000 meter height levels around 2:00 AM PST, where a peak concentration of 180 µg/m^3 was recorded. A backward trajectory of 48 hours was used to capture the origin of the smoke that impacted Fresno-Foundry on this day. West-northwest winds on August 20, 21 and 22, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Fresno-Foundry area.

Figure E-14: Backward Trajectory (48-hour) for August 22, 2020, showing location of air mass arriving in Fresno-Foundry at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 2:00 AM.



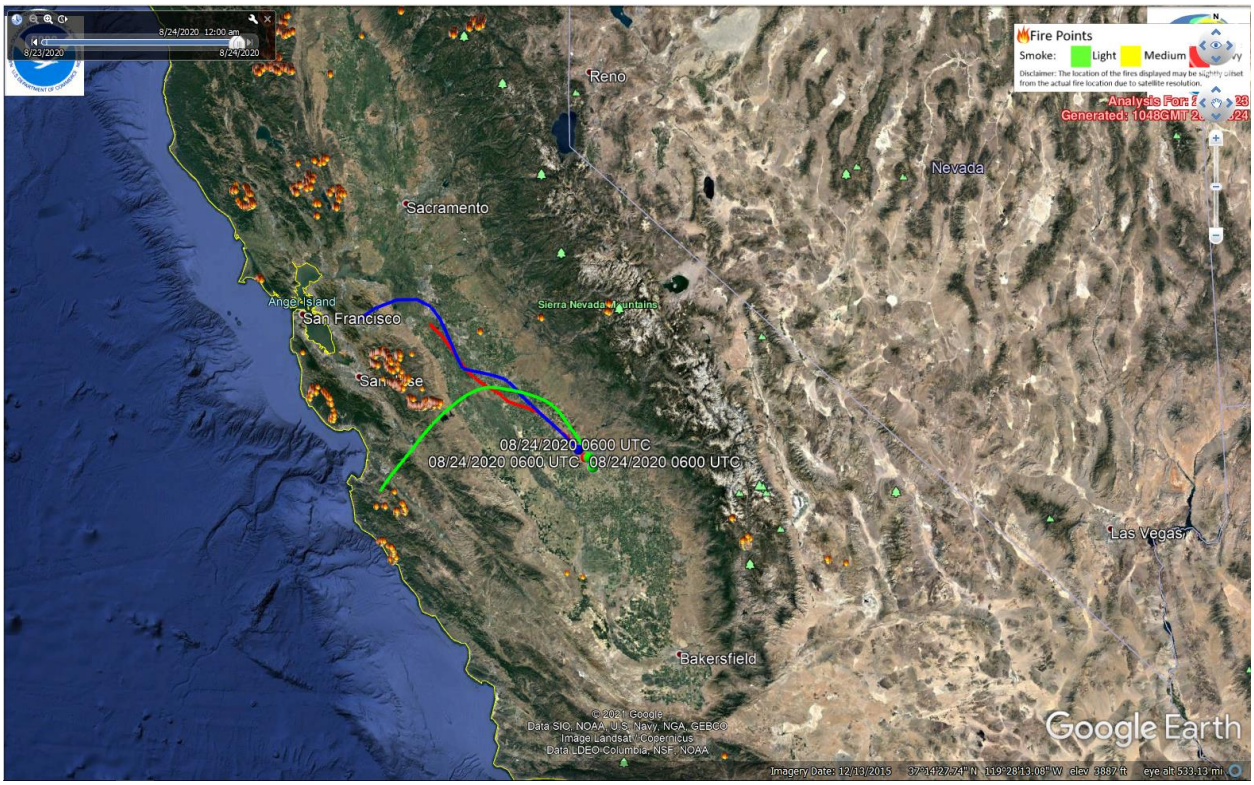
In Figure E-15, backward trajectory analysis for August 23, 2020, shows the origination location of air mass arriving at Fresno-Foundry at the 50, 500, and 1,000 meter height levels around 7:00 AM PST, where a peak concentration of 135 µg/m^3 was recorded. West-northwest winds on August 22 and 23, 2020, transported smoke from the Woodward Fire, LNU and SCU Complexes toward the Fresno-Foundry area.

Figure E-15: Backward Trajectory (24-hour) for August 23, 2020, showing location of air mass arriving in Fresno-Foundry at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 7:00 AM.



In Figure E-16, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Fresno-Foundry at the 50, 500, and 1,000 meter height levels around 12:00 AM PST, where a peak concentration of 123 µg/m^3 was recorded. Northwest winds on August 23, 2020, transported smoke from the SCU Complex toward the Fresno-Foundry area.

Figure E-16: Backward Trajectory (24-hour) for August 24, 2020, showing location of air mass arriving in Fresno-Foundry at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 12:00 AM.

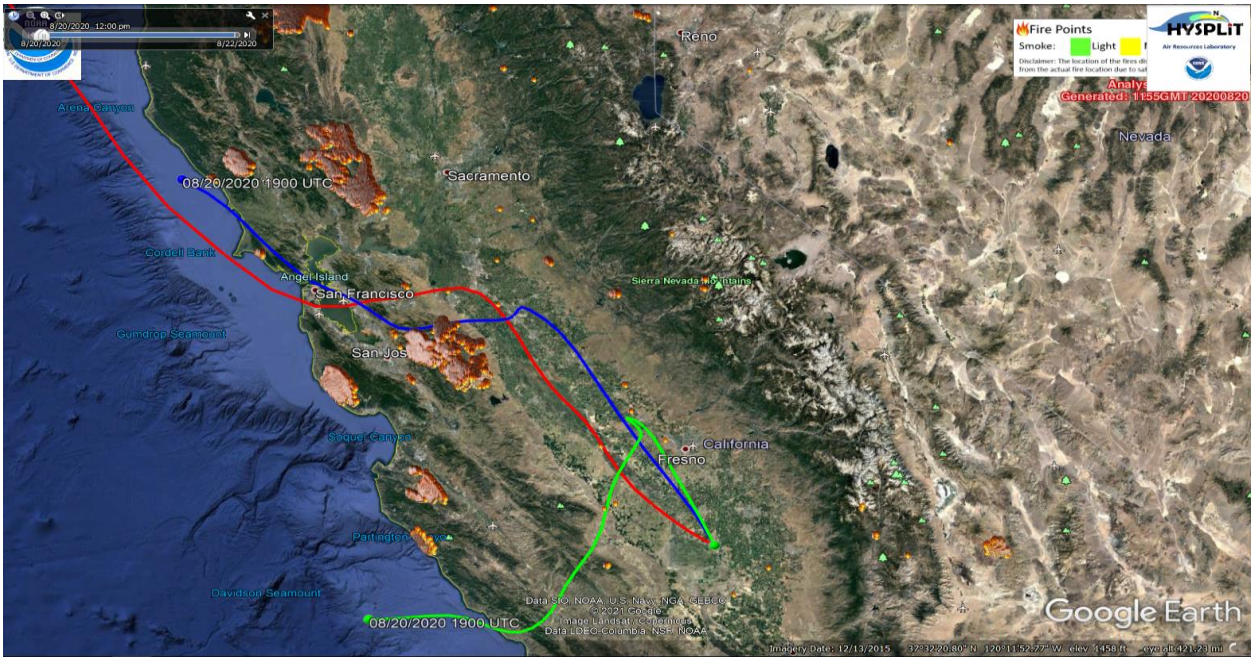


E.5 Corcoran Backward Trajectories

The following trajectory analysis depicts emissions transported to the Corcoran air monitoring site for August 21 -24, 2020. The modeling and observations show that the smoke originated at the Carmel, River, Woodward Fires and LNU, SCU, and CZU Complexes northwest of Corcoran. The model trajectory analysis takes the air parcel southeast toward the Corcoran area, leading to the elevated PM2.5 concentrations reported at the Corcoran air monitoring station.

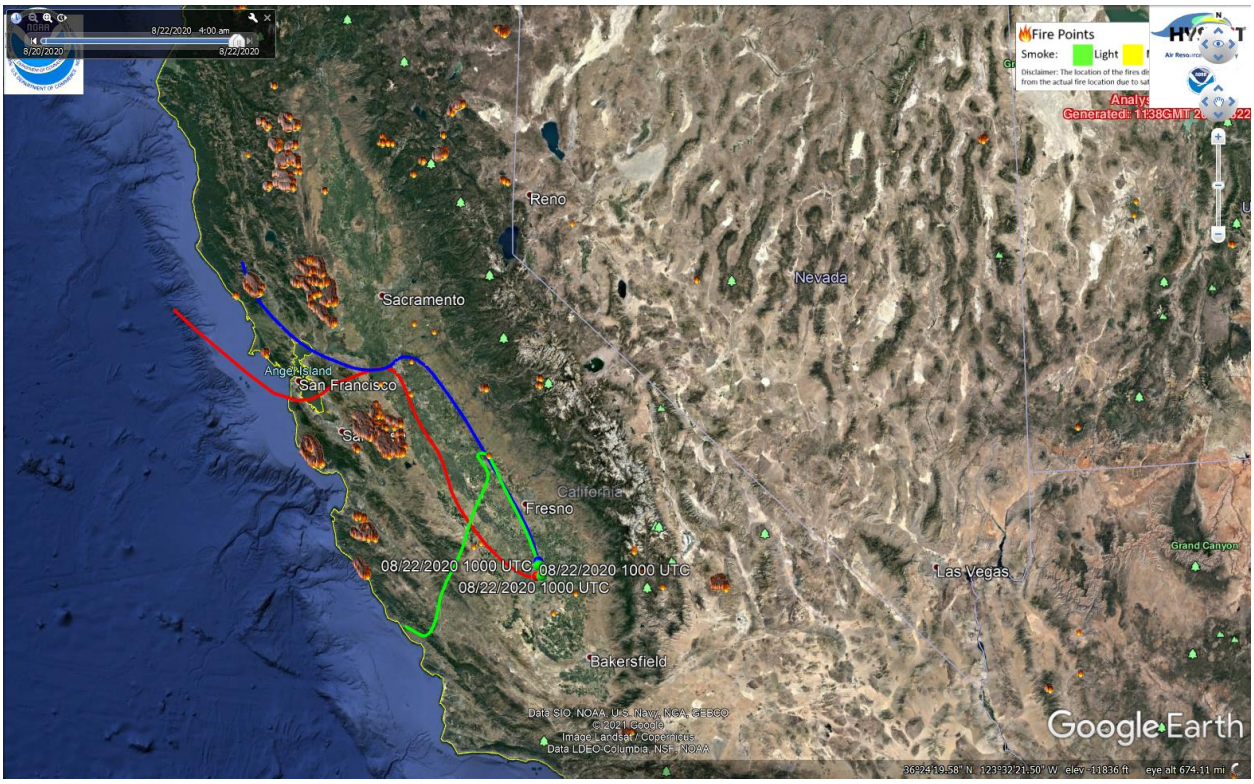
In Figure E-17, backward trajectory analysis for August 21, 2020, shows the origination location of air mass arriving at Corcoran at the 50, 500, and 1,000 meter height levels around 11:00 PM PST, where a peak concentration of 165 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Corcoran on this day. Northwest winds on August 20 and 21, 2020, transported smoke from the Woodward fire, LNU and SCU Complexes toward the Corcoran area.

Figure E-17: Backward Trajectory (36-hour) for August 21, 2020, showing location of air mass arriving in Corcoran at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 PM



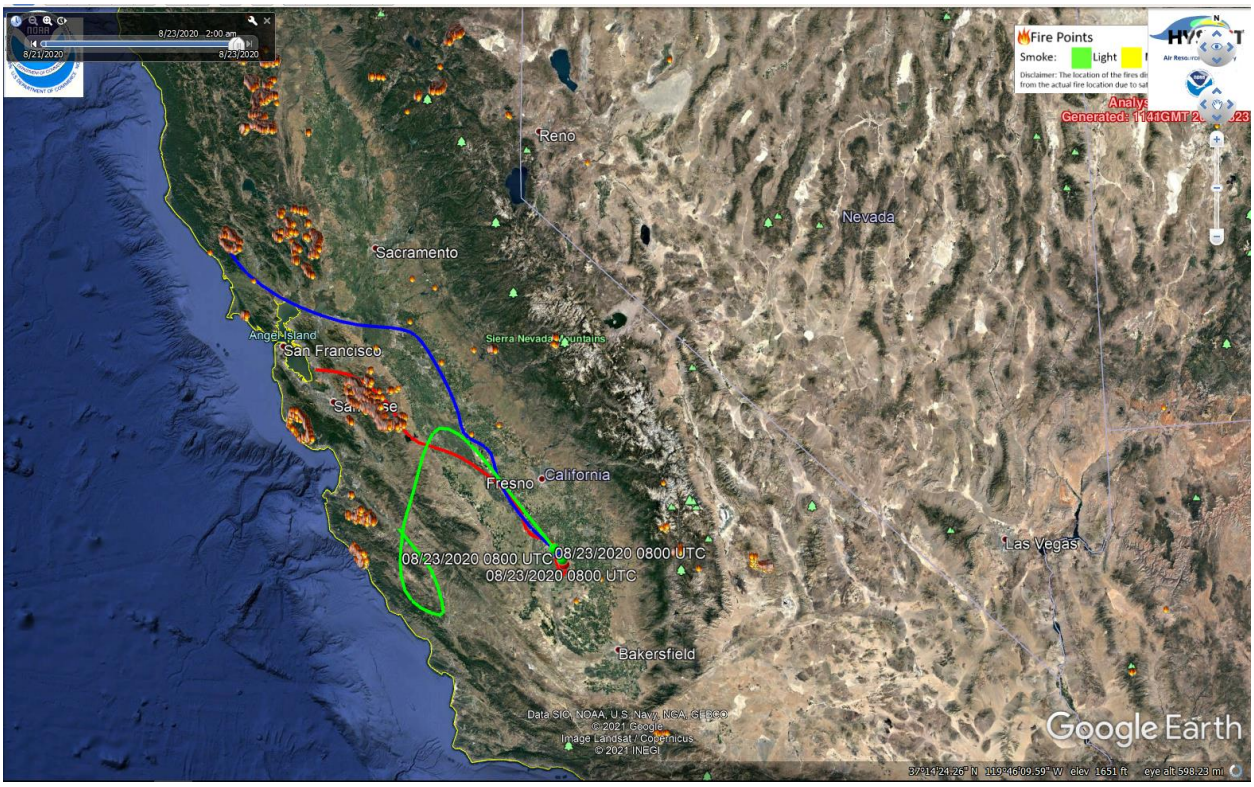
In Figure E-18, backward trajectory analysis for August 22, 2020, shows the origination location of air mass arriving at Corcoran at the 50, 500, and 1,000 meter height levels around 06:00 AM PST, where a peak concentration of 234 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Corcoran on this day. Northwest winds on August 21 and 22, 2020, transported smoke from the Woodward fire, LNU and SCU Complexes toward the Corcoran area.

Figure E-18: Backward Trajectory (36-hour) for August 22, 2020, showing location of air mass arriving in Corcoran at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 6:00 AM



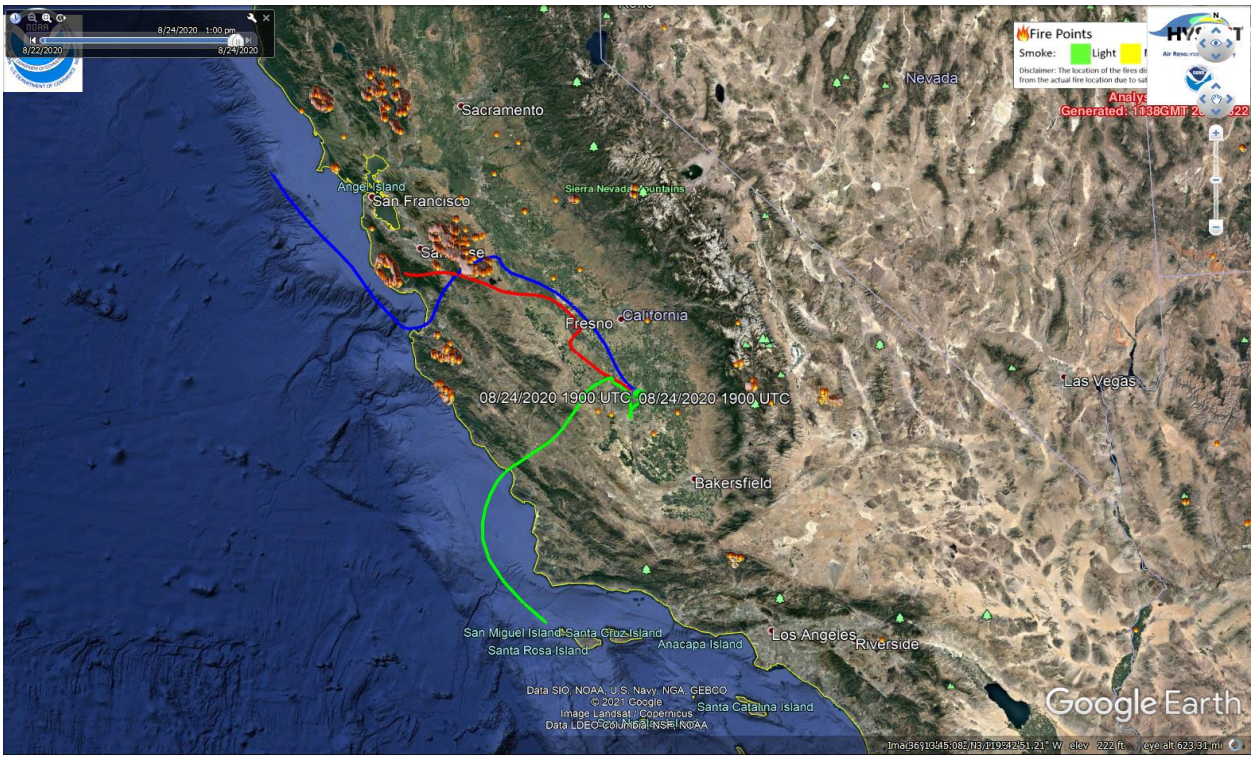
In Figure E-19, backward trajectory analysis for August 23, 2020, shows the origination location of air mass arriving at Corcoran at the 50, 500, and 1,000 meter height levels around 12:00 AM PST, where a peak concentration of 133 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Corcoran on this day. Northwest winds on August 21, 22, and 23 2020, transported smoke from the LNU and SCU Complexes toward the Corcoran area.

Figure E-19: Backward Trajectory (36-hour) for August 23, 2020, showing location of air mass arriving in Corcoran at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 12:00 AM



In Figure E-20, backward trajectory analysis for August 24, 2020, shows the origination location of air mass arriving at Corcoran at the 50, 500, and 1,000 meter height levels around 11:00 AM PST, where a peak concentration of 123 µg/m^3 was recorded. A backward trajectory of 36 hours was used to capture the origin of the smoke that impacted Corcoran on this day. Northwest winds on August 23 and 24 2020, transported smoke from the Carmel, River Fires, and CZU and SCU Complexes toward the Corcoran area.

Figure E-20: Backward Trajectory (36-hour) for August 24, 2020, showing location of air mass arriving in Corcoran at 50 (red), 500 (blue), and 1,000 (green) meter height levels around 11:00 AM



Appendix F

Supporting surface observations

Appendix F: Supporting surface observations [^]

Stockton:

Weather Conditions for SCK

Tabular Observations from 08/19/2020 23:55 PDT to 08/20/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Gust mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	82.4	5.8		W	Smoke	10	
0:55	80.6	8.1		NW	Smoke	10	6000
1:55	75.2	4.6		NNE	Smoke	10	6000
2:55	71.6	4.6		N	Smoke	10	
4:55	69.8	4.6		NNE	Smoke	10	
5:55	68	5.8		NNE	Smoke	7	
6:55	66.2	5.8		N	Haze, Smoke	2.5	
7:55	71.6	4.6		NNW	Haze, Smoke	2.5	
8:55	77	0		N	Haze, Smoke	2.5	2000
9:55	80.6	4.6		NW	Haze, Smoke	2	2000
10:55	84.2	5.8		WNW	Haze, Smoke	1.5	2000
11:55	86	11.5		WNW	Haze, Smoke	2	2200
12:55	87.8	9.2		WNW	Haze, Smoke	1.75	2700
13:55	91.4	8.1		N	Haze, Smoke	1.5	2600
14:55	95	6.9		N	Haze, Smoke	1.25	1900
15:55	96.8	9.2		NW	Haze, Smoke	1.5	2100
16:55	93.2	17.3		WNW	Haze, Smoke	5	3500
17:55	93.2	15		WNW	Haze, Smoke	4	
18:55	89.6	12.7		NW	Smoke	10	
19:55	84.2	10.4		W	Smoke	9	11000
20:55	78.8	8.1		WNW	Haze, Smoke	6	
21:55	75.2	8.1		W	Haze, Smoke	5	
22:55	73.4	6.9		W	Haze, Smoke	5	

[^]All Surface Observations from Meso West: https://mesowest.utah.edu/

Weather Conditions for SCK

Tabular Observations from 08/20/2020 23:55 PDT to 08/21/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	69.8	5.8	NW	Haze, Smoke	5	
0:55	69.8	3.5	N	Haze, Smoke	5	
1:55	68	4.6	NNW	Haze, Smoke	5	
2:55	69.8	0	N	Haze, Smoke	5	
4:55	66.2	0	N	Smoke	10	4800
5:55	64.4	0	N	Smoke	10	
6:55	62.6	3.5	ENE	Smoke	8	4500
7:55	66.2	3.5	N	Smoke	7	3700
8:55	71.6	0	N	Haze, Smoke	4	3700
9:55	75.2	0	N	Haze, Smoke	3	3600
10:55	78.8	6.9	WNW	Haze, Smoke	2.5	3000
11:55	82.4	4.6	WNW	Haze, Smoke	2.5	3300
12:55	87.8	9.2	NW	Haze, Smoke	2	3300
13:55	89.6	4.6	NW	Haze, Smoke	1.75	2800
14:55	91.4	9.2	NW	Haze, Smoke	1.5	2100
15:55	91.4	6.9	NW	Haze, Smoke	2	2800
16:55	91.4	8.1	NW	Haze, Smoke	1.75	2400
17:55	91.4	5.8	NNW	Haze, Smoke	2	2400
18:55	89.6	15	WNW	Smoke	7	
19:55	86	8.1	NW	Smoke	10	10000
20:55	82.4	9.2	W	Smoke	10	9000
21:55	80.6	9.2	W	Smoke	10	9000
22:55	77	0	N	Smoke	9	

Weather Conditions for SCK

Tabular Observations from 08/21/2020 23:55 PDT to 08/22/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	73.4	5.8	NNW	Smoke	9	
0:55	73.4	3.5	NNE	Smoke	9	
1:55	69.8	0	N	Smoke	10	
2:55	69.8	0	N	Smoke	10	
4:55	68	0	N	Smoke	10	
5:55	66.2	0	N	Smoke	8	
6:55	66.2	3.5	N	Smoke	7	
7:55	69.8	0	N	Haze, Smoke	7	3000
8:55	69.8	0	N	Haze, Smoke	4	
9:55	75.2	0	N	Haze, Smoke	4	
10:55	80.6	3.5	SW	Haze, Smoke	4	
11:55	84.2	9.2	WNW	Haze, Smoke	6	
12:55	87.8	4.6	N	Haze, Smoke	6	0
13:55	91.4	4.6	NW	Haze, Smoke	5	
14:55	95	6.9	W	Haze, Smoke	5	
15:55	96.8	4.6	NW	Haze, Smoke	5	
16:55	96.8	3.5	NW	Haze, Smoke	5	
17:55	98.6	0	N	Haze, Smoke	5	
18:55	96.1	8.1	WNW	Haze, Smoke	5	
19:55	89.6	5.8	W	Haze, Smoke	4	
20:55	87.8	10.4	W	Smoke	8	
21:55	80.1	3.5	W	Haze, Smoke	6	
22:55	80.6	8.1	NW	Haze, Smoke	6	

Weather Conditions for SCK

Tabular Observations from 08/22/2020 23:55 PDT to 08/23/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	78.8	8.1	NW	Smoke	7	
0:55	75.2	5.8	NNW	Smoke	8	
1:55	71.6	4.6	ESE	Smoke	7	
2:55	71.6	0	N	Haze, Smoke	6	
4:55	69.8	0	N	Smoke	7	
5:55	71.6	3.5	NW	Smoke	7	
6:55	71.6	5.8	W	Smoke	8	
7:55	69.8	3.5	WSW	Haze, Smoke	10	
8:55	78.8	4.6	NNW	Haze, Smoke	10	
9:55	82.4	6.9	N	Haze, Smoke	10	
10:55	89.6	4.6	N	Haze, Smoke	7	
11:55	91.4	4.6	N	Haze, Smoke	7	
12:55	93.2	3.5	NNW	Haze, Smoke	2.5	
13:55	95	6.9	NW	Haze, Smoke	2	
14:55	96.8	5.8	NW	Haze, Smoke	2	
15:55	95	10.4	NW	Haze, Smoke	1.75	
16:55	95	8.1	NW	Haze, Smoke	1.25	3400
17:55	91.4	9.2	NW	Haze, Smoke	3.5	3400
18:55	89.6	10.4	NW	Haze, Smoke	5	
19:55	87.8	10.4	NW	Smoke	7	
20:55	84.2	8.1	N	Haze, Smoke	6	
21:55	84.2	8.1	W	Haze, Smoke	6	
22:55	80.6	10.4	NNW	Haze, Smoke	3	

Weather Conditions for SCK

Tabular Observations from 08/23/2020 23:55 PDT to 08/24/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Gust mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	80.6	0		N	Haze, Smoke	3	
0:55	75.2	5.8		E	Haze, Smoke	5	
1:55	77	11.5		N	Haze, Smoke	5	
2:55	75.2	5.8		NW	Haze, Smoke	5	
4:55	71.6	0		N	Haze, Smoke	5	
5:55	71.6	4.6		NNE	Haze, Smoke	4	
6:55	71.6	0		N	Haze, Smoke	2.5	2700
7:55	71.6	4.6		WSW	Haze, Smoke	3	2800
8:55	77	5.8		WSW	Haze, Smoke	2.5	
9:55	80.6	5.8		WNW	Haze, Smoke	2	
10:55	82.4	4.6		W	Haze, Smoke	1.75	
11:55	87.8	5.8		WNW	Haze, Smoke	2	
12:55	91.4	0		N	Haze, Smoke	1.75	
13:55	93.2	5.8		W	Haze, Smoke	1.75	
14:55	95	4.6		WNW	Haze, Smoke	1.75	
15:55	96.8	8.1		NW	Haze, Smoke	1.75	
16:55	95	10.4		NW	Haze, Smoke	2	
17:55	91.4	11.5		NW	Smoke	8	
18:55	89.6	13.8		NW	Smoke	10	4500
19:55	86	15		NW	Smoke	10	
20:55	84.2	12.7	21.9	NW	Smoke	10	
22:55	82.4	9.2		WNW	Smoke	10	

Modesto:

Weather Conditions for KMOD

Tabular Observations from 08/17/2020 23:55 PDT to 08/18/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	87.8	10.4	NNW	Clear	10	
0:55	87.8	12.7	NNW	Clear	10	
1:55	87.8	11.5	NNW	Clear	10	
2:55	84.2	10.4	NNW	Clear	10	
3:55	84.2	10.4	NW	Clear	10	
4:55	82.4	10.4	NW	Clear	10	
5:55	82.4	8.1	NW	Clear	10	
6:55	82.4	5.8	NW	Clear	10	
7:55	84.2	8.1	NNW	Clear	8	
8:55	87.8	9.2	NW	Clear	9	
9:55	89.6	11.5	NW	Clear	9	
10:55	93.2	8.1	NNW	Clear	10	
11:55	96.8	9.2	NNW	Clear	10	
12:55	100.4	12.7	NW	Clear	10	
13:55	102.2	11.5	WNW	Clear	10	
14:55	105.8	12.7	NW	Clear	10	
15:55	102.2	15	NNW	Mostly Clear	9	
16:55	104	15	NNW	Partly Cloudy	10	
17:55	102.2	11.5	NNW	Mostly Cloudy	10	9500
18:55	98.6	8.1	NW	Overcast	10	9500
19:55	95	6.9	NNW	Partly Cloudy	10	
20:55	93.2	6.9	NNW	Mostly Clear	10	
21:55	91.4	9.2	NW	Partly Cloudy	10	
22:55	93.2	11.5	WNW	Partly Cloudy	10	

Weather Conditions for KMOD

Tabular Observations from 08/18/2020 23:55 PDT to 08/19/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	89.6	8.1	NNW	Clear	10	
0:55	86	4.6	NNE	Clear	10	
1:55	84.2	8.1	NNW	Clear	10	
2:55	82.4	5.8	NNW	Overcast	10	4100
3:55	82.4	6.9	NNW	Partly Cloudy	10	
4:55	80.6	5.8	N	Clear	10	
5:55	80.6	4.6	N	Clear	10	
6:55	78.8	3.5	NNE	Clear	10	
7:55	78.8	0	N	Mostly Cloudy	10	4900
8:55	80.6	4.6	NNE	Overcast	10	5500
9:55	82.4	3.5	NNE	Overcast	10	5000
10:55	87.8	3.5	N	Mostly Clear	10	
11:55	93.2	5.8	NNW	Clear	8	
12:55	98.6	10.4	NW	Smoke	5	
13:55	96.8	8.1	NW	Smoke	7	
14:55	98.6	11.5	NNW	Smoke	7	
15:55	98.6	10.4	NW	Smoke	8	
16:55	100.4	11.5	NW	Smoke	9	
17:55	98.6	12.7	NW	Smoke	10	
18:55	96.8	12.7	NW	Smoke	8	
19:55	93.2	13.8	NW	Overcast	10	10000
20:55	89.6	11.5	WNW	Partly Cloudy	10	
21:55	91.4	16.1	WNW	Clear	10	
22:55	89.6	12.7	WNW	Overcast	10	6500

Weather Conditions for KMOD

Tabular Observations from 08/19/2020 23:55 PDT to 08/20/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	87.8	6.9	N	Overcast	10	6500
0:55	82.4	5.8	N	Overcast	10	6000
1:55	80.6	4.6	N	Overcast	10	6000
2:55	78.8	6.9	N	Overcast	10	6000
3:55	77	6.9	N	Mostly Clear	10	
4:55	75.2	9.2	N	Clear	10	
5:55	75.2	9.2	N	Haze	6	
6:55	73.4	3.5	WNW	Haze	1.5	
7:55	73.4	5.8	NNW	Haze	1.5	
8:55	77	9.2	NNW	Haze, Smoke	3	
9:55	80.6	9.2	NNW	Haze, Smoke	2.5	
10:55	82.4	8.1	N	Haze, Smoke	2	
11:55	84.2	9.2	NW	Haze, Smoke	1.75	
12:55	87.8	9.2	NNW	Haze, Smoke	1.5	
13:55	89.6	12.7	NNW	Haze, Smoke	1	
14:55	89.6	8.1	NNW	Haze, Smoke	1	
15:55	89.6	6.9	N	Haze, Smoke	1.5	
16:55	91.4	5.8	NNW	Haze, Smoke	1.5	
17:55	89.6	10.4	NNW	Haze, Smoke	1.5	7000
18:55	87.8	11.5	NNW	Haze, Smoke	4	6000
19:55	84.2	9.2	NNW	Haze	5	6500
20:55	82.4	10.4	NNW	Haze	6	7000
21:55	80.6	8.1	NNW	Haze	5	6500
22:55	77	6.9	NNW	Haze	5	7000

Weather Conditions for KMOD

Tabular Observations from 08/20/2020 23:55 PDT to 08/21/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	75.2	3.5	NNE	Haze	5	
0:55	73.4	3.5	N	Haze	4	5500
1:55	73.4	6.9	N	Haze	5	
2:55	73.4	5.8	N	Haze	6	4300
3:55	71.6	5.8	N	Overcast	10	4600
4:55	71.6	4.6	N	Overcast	10	4400
5:55	69.8	3.5	N	Mostly Cloudy	9	4100
6:55	68	4.6	N	Mostly Cloudy	7	4500
7:55	69.8	5.8	N	Haze, Smoke	3	4700
8:55	69.8	8.1	N	Haze, Smoke	5	
9:55	71.6	9.2	N	Haze, Smoke	3	4000
10:55	73.4	5.8	N	Haze, Smoke	3	
11:55	77	6.9	N	Haze, Smoke	2.5	
12:55	80.6	11.5	NW	Haze, Smoke	1.75	
13:55	84.2	10.4	NW	Haze, Smoke	2	
14:55	87.8	10.4	NW	Haze, Smoke	1.75	
15:55	89.6	11.5	NW	Haze, Smoke	1.75	
16:55	89.6	9.2	NW	Haze, Smoke	1.75	
17:55	87.8	5.8	N	Haze, Smoke	1.75	
18:55	86	4.6	N	Haze, Smoke	1.75	
19:55	84.2	4.6	N	Haze, Smoke	2.5	9000
20:55	82.4	6.9	NNW	Haze	3	8500
21:55	80.6	4.6	NNW	Haze	3.5	
22:55	78.8	5.8	N	Haze	5	

Weather Conditions for KMOD

Tabular Observations from 08/21/2020 23:55 PDT to 08/22/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	75.2	0	N	Haze	6	
0:55	73.4	0	N	Clear	7	
1:55	69.8	0	N	Clear	7	
2:55	68	0	N	Clear	7	
3:55	68	0	N	Haze	4	
4:55	71.6	0	N	Clear	7	
5:55	68	0	N	Haze	6	
6:55	69.8	0	N	Haze	3	
7:55	69.8	4.6	N	Haze	3	
8:55	73.4	5.8	N	Haze	3	
9:55	77	6.9	NW	Haze	3.5	
10:55	80.6	4.6	NW	Haze	3	
11:55	82.4	5.8	NNW	Haze	2.5	
12:55	86	4.6	N	Haze	2.5	
13:55	89.6	5.8	NW	Haze	2.5	
14:55	89.6	4.6	W	Haze	2.5	
15:55	89.6	5.8	WNW	Haze	3.5	
16:55	87.8	0	N	Haze	3.5	
17:55	87.8	0	N	Haze	3	
18:55	84.2	0	N	Haze	3	
19:55	84.2	3.5	W	Haze	3	7500
20:55	82.4	3.5	W	Haze	3.5	7000
21:55	84.2	6.9	NW	Haze	6	6500
22:55	80.6	6.9	NW	Overcast	10	6500

Weather Conditions for KMOD

Tabular Observations from 08/22/2020 23:55 PDT to 08/23/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	80.6	5.8	NNW	Partly Cloudy	10	
0:55	77	0	N	Clear	8	
1:55	75.2	3.5	N	Haze	6	
2:55	75.2	3.5	N	Haze	6	
3:55	71.6	0	N	Haze	6	
4:55	71.6	0	N	Haze	6	
5:55	69.8	0	N	Haze	6	
6:55	66.2	0	N	Haze	4	
7:55	73.4	0	N	Haze	5	
8:55	77	4.6	NNW	Clear	7	
9:55	82.4	0	N	Clear	9	
10:55	86	4.6	NNW	Clear	7	
11:55	89.6	4.6	NW	Clear	7	
12:55	91.4	3.5	W	Haze	4	
13:55	93.2	6.9	NW	Haze	5	
14:55	93.2	9.2	NNW	Haze	5	
15:55	93.2	9.2	NW	Haze	2.5	
16:55	93.2	9.2	NNW	Haze	2	
17:55	91.4	5.8	N	Haze	2	
18:55	91.4	8.1	N	Haze	1.75	4600
19:55	87.8	10.4	NNW	Haze	3	4600
20:55	84.2	9.2	NNW	Haze	5	6000
21:55	82.4	8.1	NW	Haze	5	
22:55	80.6	8.1	NNE	Haze	2.5	4300

Weather Conditions for KMOD

Tabular Observations from 08/23/2020 23:55 PDT to 08/24/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	78.8	4.6	NNE	Haze	3	4800
22:55	80.6	8.1	NNW	Smoke	10	
21:55	82.4	11.5	NW	Smoke	10	
20:55	84.2	10.4	NNW	Smoke	10	
19:55	86	11.5	NNW	Smoke	9	
18:55	89.6	12.7	NNW	Haze, Smoke	2	
17:55	93.2	12.7	NNW	Haze, Smoke	1.75	
16:55	93.2	12.7	NW	Haze, Smoke	1.75	
15:55	93.2	10.4	NNW	Haze, Smoke	2	
14:55	93.2	5.8	N	Haze, Smoke	1.75	
13:55	93.2	4.6	NW	Haze, Smoke	1.75	
12:55	89.6	3.5	NW	Haze, Smoke	1.5	
11:55	87.8	3.5	NNW	Haze, Smoke	1.5	
10:55	82.4	4.6	NW	Haze, Smoke	1.5	
9:55	78.8	0	N	Haze, Smoke	1.75	
8:55	75.2	3.5	SW	Haze, Smoke	2	
7:55	75.2	0	N	Haze, Smoke	2	
6:55	73.4	0	N	Haze	3	
5:55	73.4	4.6	NW	Haze	4	
4:55	73.4	5.8	NW	Haze	4	
3:55	73.4	5.8	NW	Haze	5	
2:55	75.2	4.6	NW	Haze	4	
1:55	78.8	6.9	NNE	Haze	5	
0:55	78.8	5.8	NNW	Haze	5	

Fresno:

Weather Conditions for KFAT

Tabular Observations from 08/17/2020 23:55 PDT to 08/18/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	89.6	6.9	WNW	Clear	10	
0:55	87.8	5.8	W	Clear	10	
1:55	86	6.9	NW	Clear	10	
2:55	84.2	5.8	NW	Clear	10	
3:55	84.2	5.8	NW	Clear	10	
4:55	82.4	0	N	Clear	10	
5:55	82.4	4.6	W	Clear	10	
6:55	80.6	0	N	Clear	9	
7:55	82.4	0	N	Clear	8	
8:55	87.8	9.2	SE	Clear	9	
9:55	91.4	13.8	ESE	Clear	8	
10:55	93.2	11.5	SE	Mostly Clear	9	
11:55	95	6.9	S	Clear	8	
12:55	96.8	5.8	ESE	Clear	8	
13:55	100.4	8.1	S	Mostly Clear	8	
14:55	102.2	3.5	S	Partly Cloudy	9	
15:55	105.8			Mostly Cloudy	9	9500
16:55	105.8	10.4	WNW	Mostly Clear	10	
17:55	104	12.7	WNW	Mostly Clear	10	
18:55	102.2	10.4	WNW	Mostly Clear	10	
19:55	100.4	9.2	WNW	Mostly Clear	10	
20:55	96.8	8.1	NW	Clear	10	
21:55	95	10.4	WNW	Smoke	7	
22:55	93.2	15	WNW	Mostly Clear	9	

Weather Conditions for KFAT

Tabular Observations from 08/18/2020 23:55 PDT to 08/19/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	91.4	9.2	NW	Partly Cloudy	10	
0:55	91.4	10.4	WNW	Mostly Cloudy	10	11000
1:55	91.4	10.4	NW	Partly Cloudy	10	
2:55	89.6	5.8	ENE	Clear	10	
3:55	87.8	8.1	WNW	Clear	10	
4:55	87.8	5.8	ENE	Clear	10	
5:55	84.2	8.1	NW	Clear	10	
6:55	82.4	3.5	WNW	Clear	10	
7:55	84.2	5.8	NNW	Clear	10	
8:55	87.8	4.6	NNW	Clear	10	
9:55	89.6	3.5	SW	Clear	10	
10:55	93.2	4.6	SE	Clear	8	
11:55	96.8	3.5	SW	Clear	9	
12:55	100.4	8.1	NW	Clear	9	
13:55	100.4	8.1	WNW	Mostly Clear	8	
14:55	100.4	13.8	NW	Haze, Smoke	6	
15:55	100.4	15	WNW	Haze, Smoke	3.5	
16:55	98.6	15	NNW	Haze, Smoke	3.5	
17:55	95	15	NW	Haze, Smoke	5	
18:55	91.4	10.4	WNW	Haze, Smoke	5	11000
19:55	89.6	8.1	WNW	Smoke	7	
20:55	87.8	8.1	W	Partly Cloudy	8	
21:55	87.8	4.6	NW	Mostly Clear	7	
22:55	86	4.6	NNW	Mostly Clear	10	

Weather Conditions for KFAT

Tabular Observations from 08/19/2020 23:55 PDT to 08/20/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	82.4	4.6	NW	Partly Cloudy	9	
0:55	82.4	3.5	NW	Mostly Clear	9	
1:55	80.6	0	N	Clear	10	
2:55	80.6	0	N	Clear	9	
3:55	75.2	5.8	SE	Clear	9	
4:55	75.2	0	N	Clear	9	
5:55	75.2	0	N	Clear	8	
6:55	75.2	0	N	Smoke	6	
7:55	75.2	0	N	Haze, Smoke	6	
8:55	80.6	3.5	ESE	Haze, Smoke	4	
9:55	84.2	5.8	SSE	Haze, Smoke	3	
10:55	87.8	8.1	SE	Haze, Smoke	4	
11:55	89.6	0	N	Haze, Smoke	5	
12:55	91.4	6.9	WNW	Haze, Smoke	5	
13:55	93.2	9.2	NW	Haze, Smoke	5	
14:55	96.8	8.1	NW	Haze, Smoke	6	
15:55	98.6	5.8	W	Haze, Smoke	6	4000
16:55	100.4	9.2	NNW	Haze, Smoke	6	3500
17:55	96.8	13.8	WNW	Smoke	3	3000
18:55	93.2	11.5	NW	Smoke	3	2800
19:55	89.6	10.4	NW	Smoke	3	4800
20:55	87.8	10.4	NW	Smoke	3	5000
21:55	84.2	6.9	WNW	Smoke	3	4800
22:55	82.4	5.8	NW	Smoke	2	4500

Weather Conditions for KFAT

Tabular Observations from 08/20/2020 23:55 PDT to 08/21/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	78.8	5.8	NNW	Smoke	2	4300
0:55	77	6.9	WNW	Smoke	2	4300
1:55	75.2	4.6	WNW	Smoke	2	4100
2:55	73.4	4.6	NNW	Smoke	2.5	4300
3:55	73.4	3.5	W	Smoke	2.5	3500
4:55	71.6	4.6	N	Smoke	2	3600
5:55	69.8	3.5	NNW	Smoke	2.5	3500
6:55	71.6	0	N	Smoke	1.5	3600
7:55	73.4	3.5	WNW	Smoke	2	3300
8:55	77	0	N	Smoke	1.5	2700
9:55	82.4	0	N	Smoke	1.5	3200
10:55	86	4.6	S	Smoke	2	3200
11:55	89.6	5.8	S	Smoke	2	3200
12:55	93.2	6.9	SE	Smoke	2	3200
13:55	96.8	6.9	SW	Smoke	2	3200
14:55	98.6	0	N	Smoke	2	2900
15:55	96.8	11.5	NW	Smoke	2	3000
16:55	95	12.7	WNW	Smoke	2	2800
17:55	93.2	15	WNW	Smoke	2	2700
18:55	89.6	12.7	WNW	Smoke	2	2700
19:55	87.8	10.4	NW	Smoke	1.5	2900
20:55	84.2	10.4	NW	Smoke	2	2900
21:55	82.4	9.2	WNW	Smoke	2.5	3500
22:55	80.6	6.9	WNW	Smoke	2.5	3500

Weather Conditions for KFAT

Observations Prior to: 08/22/2020 23:00 PDT

Tabular Observations from 08/21/2020 23:55 PDT to 08/22/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	80.6	5.8	WNW	Smoke	2.5	3700
0:55	78.8	3.5	NW	Smoke	2	4000
1:55	77	0	N	Smoke	2.5	3800
2:55	75.2	0	N	Smoke	2.5	3800
3:55	75.2	4.6	NE	Smoke	2.5	3800
4:55	73.4	4.6	S	Smoke	2.5	4200
5:55	73.4	0	N	Smoke	2	4300
6:55	71.6	3.5	E	Smoke	1	3000
7:55	73.4	4.6	E	Smoke	1	3000
8:55	75.2	4.6	ESE	Smoke	1	3000
9:55	80.6	3.5	SSE	Smoke	1	2700
10:55	82.4	4.6	ESE	Smoke	1	2500
11:55	86	5.8	S	Smoke	1.25	2500
12:55	89.6	4.6	SW	Smoke	1.25	2600
13:55	93.2	3.5	SSE	Smoke	1	2400
14:55	93.2	3.5	WSW	Smoke	1.25	2200
15:55	95	3.5	W	Smoke	1.25	2500
16:55	96.8	0	N	Smoke	1	2500
17:55	98.6	6.9	WNW	Smoke	1.25	2200
18:55	93.2	10.4	NW	Smoke	1.5	3000
19:55	89.6	8.1	NW	Smoke	3	4600
20:55	87.8	8.1	NW	Smoke	3	2200
21:55	84.2	6.9	WNW	Smoke	2.5	2200
22:55	82.4	4.6	W	Smoke	3	2200

Weather Conditions for KFAT

Tabular Observations from 08/22/2020 23:55 PDT to 08/23/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	82.4	3.5	NW	Smoke	3	4600
0:55	80.6	3.5	N	Smoke	3	4600
1:55	78.8	0	N	Smoke	3	4800
2:55	78.8	0	N	Smoke	3	5000
3:55	78.8	3.5	WNW	Smoke	2.5	5000
4:55	75.2	5.8	SE	Smoke	2.5	5500
5:55	75.2	3.5	SSW	Smoke	2.5	4400
6:55	75.2	0	N	Smoke	1.25	2400
7:55	75.2	0	N	Smoke	1.25	2000
8:55	77	0	N	Smoke	1.25	1600
9:55	82.4	0	N	Smoke	1.5	1600
10:55	86	3.5	SSE	Smoke	2	1500
11:55	89.6	3.5	ESE	Smoke	2.5	1500
12:55	89.6	4.6	SE	Smoke	2	1500
13:55	91.4	0	N	Smoke	2	1900
14:55	93.2	0	N	Smoke	2.5	2100
15:55	95	3.5	NW	Smoke	2.5	2100
16:55	95	6.9	NNW	Smoke	2.5	2500
17:55	95	9.2	NNW	Smoke	2.5	3100
18:55	93.2	8.1	NW	Smoke	1.75	
19:55	91.4	6.9	NW	Smoke	3	4300
20:55	89.6	8.1	W	Smoke	3	4100
21:55	87.8	6.9	WNW	Smoke	2.5	4500
22:55	84.2	9.2	WNW	Haze, Smoke	4	4800

Weather Conditions for KFAT

Tabular Observations from 08/23/2020 23:55PDT to 08/24/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	84.2	5.8	NNW	Haze, Smoke	4	4300
0:55	82.4	5.8	NNW	Haze, Smoke	3	4100
1:55	80.6	6.9	WNW	Haze, Smoke	3	3500
2:55	80.6	3.5	NNW	Haze, Smoke	3	3500
3:55	78.8	4.6	NE	Haze, Smoke	3.5	3700
4:55	78.8	0	N	Haze, Smoke	3	4000
5:55	78.8	0	N	Haze, Smoke	3	3500
6:55	75.2	4.6	W	Haze, Smoke	2	3000
7:55	77	5.8	NW	Haze, Smoke	1.75	2600
8:55	78.8	5.8	NNW	Haze, Smoke	2	3500
9:55	80.6	0	N	Haze, Smoke	2	3500
10:55	86	0	N	Haze, Smoke	2	3100
11:55	89.6	0	N	Haze, Smoke	2	3200
12:55	93.2	0	N	Haze, Smoke	2	3100
13:55	96.8	5.8	W	Haze, Smoke	2	3300
14:55	98.6	5.8	NW	Haze, Smoke	1.75	2400
15:55	100.4	5.8	W	Haze, Smoke	2	
16:55	100.4	5.8	NW	Haze, Smoke	2.5	
17:55	100.4	4.6	NNW	Haze, Smoke	3	
18:55	98.6	8.1	NW	Haze, Smoke	2.5	
19:55	95	10.4	NW	Haze, Smoke	3	
20:55	91.4	11.5	NW	Haze, Smoke	3.5	
21:55	87.8	15	NW	Haze, Smoke	3	2400
22:55	84.2	12.7	NW	Haze, Smoke	2.5	

Hanford:

Weather Conditions for KHJO

Tabular Observations from 08/18/2020 23:55 PDT to 08/19/2020 22:55 PDT:

Time (PDT)	2.0m Temperature ° F	10.0m Wind Speed mph	10.0m Wind Direction	Weather conditions	Visibility miles	Ceiling feet
23:55	91.4	10.4	NW	Mostly Cloudy	10	11000
0:55	89.6	11.5	NNW	Mostly Cloudy	10	11000
1:55	87.8	4.6	NNW	Mostly Cloudy	10	11000
2:55	82.4	4.6	N	Partly Cloudy	10	
3:55	87.8	13.8	NW	Partly Cloudy	10	
4:55	87.8	8.1	N	Mostly Clear	10	
5:55	82.4	3.5	N	Mostly Clear	10	
6:55	84.2	8.1	WNW	Clear	10	
7:55	84.2	9.2	NW	Clear	10	
8:55				Clear		
9:55	89.6	11.5	NW	Mostly Cloudy	7	2400
10:55	91.4	9.2	NW	Clear	7	
11:55	95	8.1	NNW	Haze	6	
12:55	96.8	8.1	NNW	Haze	6	
13:55	100.4	13.8	NW	Haze	4	
14:55	100.4	15	NW	Haze	3	1300
15:55	100.4	17.3	NW	Haze	3	1400
16:55	96.8	20.7	NW	Haze	2.5	1000
17:55	95	16.1	NW	Haze	4	
18:55	93.2	13.8	NW	Haze	4	4700
19:55	87.8	4.6	N	Haze	6	4900
20:55	86	5.8	N	Overcast	7	5500
21:55	86	4.6	NNW	Overcast	7	3400
22:55	84.2	5.8	NNW	Mostly Clear	7	

Weather Conditions for KHJO

Tabular Observations from 08/19/2020 23:55 PDT to 08/20/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	84.2	8.1	NW	Haze	6	
0:55	78.8	0	N	Mostly Cloudy	7	8000
1:55	73.4	0	N	Haze	5	7500
2:55	71.6	0	N	Haze	6	7500
3:55	75.2	5.8	NNW	Overcast	8	8000
4:55	69.8	3.5	S	Mostly Cloudy	8	8500
5:55	68	0	N	Overcast	7	8000
6:55	66.2	3.5	W	Haze	6	3500
7:55	75.2	8.1	NW	Overcast	7	3600
8:55	77	8.1	NNW	Haze	4	3500
9:55	78.8	5.8	NW	Haze	5	
10:55	82.4	0	N	Haze	6	
11:55	87.8	6.9	NW	Haze	6	
12:55	87.8	9.2	WNW	Haze	5	
13:55	89.6	10.4	WNW	Haze	4	
14:55	91.4	6.9	NNW	Haze	4	
15:55	93.2	9.2	NNW	Haze	6	
16:55	95	8.1	NNW	Haze	5	5000
17:55	93.2	8.1	NW	Haze	2	2000
18:55	91.4	9.2	NW	Haze	1.75	1900
19:55	87.8	8.1	NW	Haze	4	3000
20:55	84.2	5.8	NNW	Haze	4	3500
21:55	80.6	5.8	NW	Haze	3.5	
22:55	78.8	8.1	NW	Haze	3	2300

Weather Conditions for KHJO

Tabular Observations from 08/20/2020 23:55 PDT to 08/21/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	77	6.9	NNW	Haze	2.5	3300
0:55	75.2	10.4	NW	Haze	2.5	3400
1:55	75.2	6.9	NNW	Haze	2.5	3200
2:55	71.6	4.6	NW	Haze	3	3100
3:55	71.6	5.8	NNW	Haze	3	3200
4:55	69.8	6.9	NNW	Haze	4	3100
5:55	69.8	4.6	NNW	Haze	4	3000
6:55	69.8	3.5	N	Haze	4	2700
7:55	71.6	5.8	NNW	Haze	0.25	2200
8:55	75.2	6.9	NW	Haze	2.5	1900
9:55	80.6	4.6	NNW	Haze	2	2100
10:55	84.2	3.5	W	Haze	2	1900
11:55	89.6	5.8	ENE	Haze	1.5	1800
12:55	91.4	3.5	W	Haze	2	1900
13:55	93.2	5.8	NNW	Haze	2.5	1900
14:55	95	0	N	Haze	2.5	1900
15:55	98.6	5.8	N	Haze	2.5	2000
16:55	96.8	11.5	NW	Haze	1.5	2000
17:55	93.2	15	NW	Haze	1.75	1600
18:55	87.8	12.7	NW	Haze	1.75	2000
19:55	84.2	8.1	WNW	Haze	2	1900
20:55	82.4	9.2	WNW	Haze	2.5	2500
21:55	80.6	9.2	NW	Haze	2.5	2700
22:55	80.6	6.9	NW	Haze	2	1500

Weather Conditions for KHJO

Tabular Observations from 08/21/2020 23:55 PDT to 08/22/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	75.2	3.5	NNW	Haze	2	2000
0:55	75.2	4.6	NW	Haze	2	1800
1:55	71.6	0	N	Haze	2	2600
2:55	71.6	4.6	SW	Haze	1.75	2800
3:55	69.8	3.5	SSE	Mist	1.75	2200
4:55	69.8	4.6	W	Haze	1.75	2600
5:55	66.2	0	N	Mist	1.5	1200
6:55	66.2	0	N	Mist	0.75	1200
7:55	69.8	0	N	Haze	0.75	1200
8:55	75.2	3.5	WSW	Haze	1	1200
9:55	80.6	4.6	W	Haze	2	1600
10:55	84.2	4.6	NNW	Haze	2	1100
11:55	87.8	5.8	NNW	Haze	4	1000
12:55	89.6	5.8	W	Haze	1.75	1400
13:55	93.2	5.8	NNW	Haze	2.5	1400
14:55	95	6.9	NW	Haze	2	1800
15:55	96.8	5.8	NNW	Haze	2	1500
16:55	96.8	0	N	Haze	3	1400
17:55	93.2	3.5	NNE	Haze	3	1600
18:55	89.6	4.6	NW	Haze	2	2800
19:55	89.6	6.9	WNW	Haze	3	2700
20:55	86	6.9	WNW	Haze	2.5	2900
21:55	84.2	5.8	NW	Haze	2.5	2400
22:55	82.4	5.8	WNW	Haze	2.5	3200

Weather Conditions for KHJO

Tabular Observations from 08/22/2020 23:55 PDT to 08/23/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	78.8	4.6	NW	Haze	2.5	3000
0:55	75.2	4.6	N	Haze	2.5	2100
1:55	73.4	3.5	N	Haze	2.5	2800
2:55	69.8	0	N	Mist	1.75	2400
3:55	69.8	0	N	Mist	2	1600
4:55	69.8	3.5	SSW	Mist	1.75	2100
5:55	69.8	0	N	Mist	2	1600
6:55	69.8	3.5	NNE	Mist	1	1400
7:55	71.6	0	N	Mist	1.25	1000
8:55	75.2	0	N	Haze	1.25	900
9:55	80.6	0	N	Haze	1.25	800
10:55	82.4	0	N	Haze	1.25	1000
11:55	86	3.5	ESE	Haze	1.5	1000
12:55	89.6	0	N	Haze	2	900
13:55	91.4	4.6	SE	Haze	2.5	1200
14:55	93.2	0	N	Haze	2.5	1100
15:55	93.2	3.5	ENE	Haze	3	1200
16:55	93.2	5.8	N	Haze	3.5	1300
17:55	91.4	3.5	N	Haze	4	1300
18:55	87.8	0	N	Haze	4	1300
19:55	84.2	3.5	W	Haze	5	2500
20:55	87.8	6.9	WNW	Haze	5	2700
21:55	86	0	N	Haze	4	2700
22:55	84.2	4.6	WNW	Haze	4	2500

Weather Conditions for KHJO

Tabular Observations from 08/23/2020 23:55 PDT to 08/24/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility	Ceiling
(PDT)	° F	mph			miles	feet
23:55	82.4	0	N	Haze	4	2100
0:55	80.6	4.6	NNW	Haze	4	2400
1:55	80.6	5.8	N	Haze	3.5	2800
2:55	77	4.6	NNE	Haze	3	3200
3:55	73.4	0	N	Haze	3	2300
4:55	71.6	3.5	SSW	Mist	3	2200
5:55	69.8	0	N	Mist	3	2400
6:55	73.4	3.5	WNW	Haze	2	2200
7:55	78.8	3.5	NW	Haze	2	1900
8:55	80.6	6.9	WNW	Haze	2.5	1500
9:55	84.2	0	N	Haze	2.5	1600
10:55	87.8	0	N	Haze	2	1600
11:55	91.4	4.6	NNW	Haze	1.75	1700
12:55	93.2	4.6	NE	Haze	1.75	1500
13:55	96.8	4.6	WNW	Haze	1.75	1500
14:55	98.6			Haze	1.75	1600
15:55	98.6	4.6	NW	Haze	2.5	1500
16:55	100.4	4.6	NE	Haze	1.75	1400
17:55	98.6	3.5	NE	Haze	2.5	1600
18:55	91.4	0	N	Haze	3	1100
19:55	86	0	N	Haze	4	1600
20:55	91.4	9.2	WNW	Haze	3.5	1700
21:55	87.8	8.1	WNW	Haze	3	2200
22:55	84.2	12.7	WNW	Haze	3	2300

Bakersfield:

Weather Conditions for KBFL

Tabular Observations from 08/19/2020 23:55 PDT to 08/20/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility
(PDT)	° F	mph			miles
23:55	86	4.6	E	Haze	6
0:55	84.2	5.8	ESE	Clear	7
1:55	84.2	3.5	ENE	Clear	9
2:55	80.6	3.5	SSE	Clear	9
3:55	82.4	4.6	ESE	Clear	9
4:55	80.6	0	N	Clear	9
5:55	77	0	N	Clear	9
6:55	78.8	0	N	Clear	7
7:55	80.6	0	N	Clear	7
8:55	84.2	0	N	Clear	7
9:55	87.8	8.1	NW	Clear	10
10:55	89.6	8.1	NW	Clear	9
11:55	91.4	6.9	NW	Haze	3.5
12:55	93.2	8.1	WNW	Haze	2.5
13:55	96.8	9.2	NW	Haze	2
14:55	96.8	9.2	NW	Smoke	2
15:55	96.8	11.5	NNW	Smoke	2
16:55	95	10.4	NW	Smoke	3
17:55	93.2	9.2	NW	Smoke	3
18:55	91.4	4.6	WNW	Smoke	3
19:55	89.6	3.5	NNW	Smoke	4
20:55	87.8	3.5	N	Smoke	4
21:55	87.8	4.6	NNW	Smoke	6
22:55	82.4	0	N	Smoke	5

Weather Conditions for KBFL

Tabular Observations from 08/20/2020 23:55 PDT to 08/21/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility
(PDT)	° F	mph			miles
23:55	82.4	0	N	Smoke	4
0:55	80.6	3.5	S	Smoke	4
1:55	78.8	0	N	Smoke	4
2:55	75.2	3.5	S	Smoke	4
3:55	75.2	0	N	Smoke	3
4:55	75.2	0	N	Smoke	3
5:55	73.4	3.5	SSE	Smoke	3.5
6:55	73.4	3.5	ESE	Smoke	2
7:55	75.2	0	N	Smoke	2
8:55	77	3.5	S	Smoke	1.75
9:55	80.6	3.5	S	Smoke	2.5
10:55	82.4	5.8	W	Smoke	3.5
11:55	87.8	6.9	W	Smoke	4
12:55	89.6	4.6	SW	Smoke	2.5
13:55	93.2	4.6	SW	Smoke	3
14:55	95	6.9	S	Smoke	3
15:55	96.8	3.5	WNW	Smoke	2
16:55	96.8	5.8	W	Smoke	2
17:55	96.8	3.5	W	Smoke	2.5
18:55	95	4.6	W	Smoke	2.5
19:55	89.6	4.6	NNW	Smoke	2.5
20:55	87.8	11.5	WNW	Smoke	3
21:55	84.2	4.6	NW	Smoke	2.5
22:55	82.4	6.9	WNW	Smoke	2.5

Weather Conditions for KBFL

Tabular Observations from 08/21/2020 23:55 PDT to 08/22/2020 22:55 PDT:

Time	2.0m Temperature	10.0m Wind Speed	10.0m Wind Direction	Weather conditions	Visibility
(PDT)	° F	mph			miles
23:55	80.6	6.9	WNW	Smoke	2
0:55	78.8	0	N	Smoke	2
1:55	78.8	3.5	SE	Smoke	1.75
2:55	78.8	4.6	ESE	Smoke	2
3:55	78.8	5.8	ESE	Smoke	1.75
4:55	78.8	4.6	ESE	Smoke	1.75
5:55	78.8	3.5	ESE	Smoke	1.75
6:55	78.8	0	N	Smoke	1.25
7:55	80.6	0	N	Smoke	1.25
8:55	82.4	3.5	S	Smoke	1.25
9:55	84.2	4.6	SW	Smoke	1.5
10:55	86	4.6	WSW	Smoke	1.75
11:55	89.6	5.8	WNW	Smoke	1.5
12:55	91.4	3.5	WNW	Smoke	1.75
13:55	93.2	8.1	NW	Smoke	1.75
14:55	96.8	5.8	W	Smoke	1.75
15:55	98.6	9.2	W	Smoke	2.5
16:55	98.6	9.2	NW	Smoke	3
17:55	96.8	9.2	WNW	Smoke	3
18:55	93.2	8.1	NW	Smoke	2
19:55	89.6	8.1	NNW	Smoke	3
20:55	87.8	5.8	N	Smoke	3
21:55	87.8	0	N	Smoke	3
22:55	82.4	0	N	Smoke	3

Appendix G

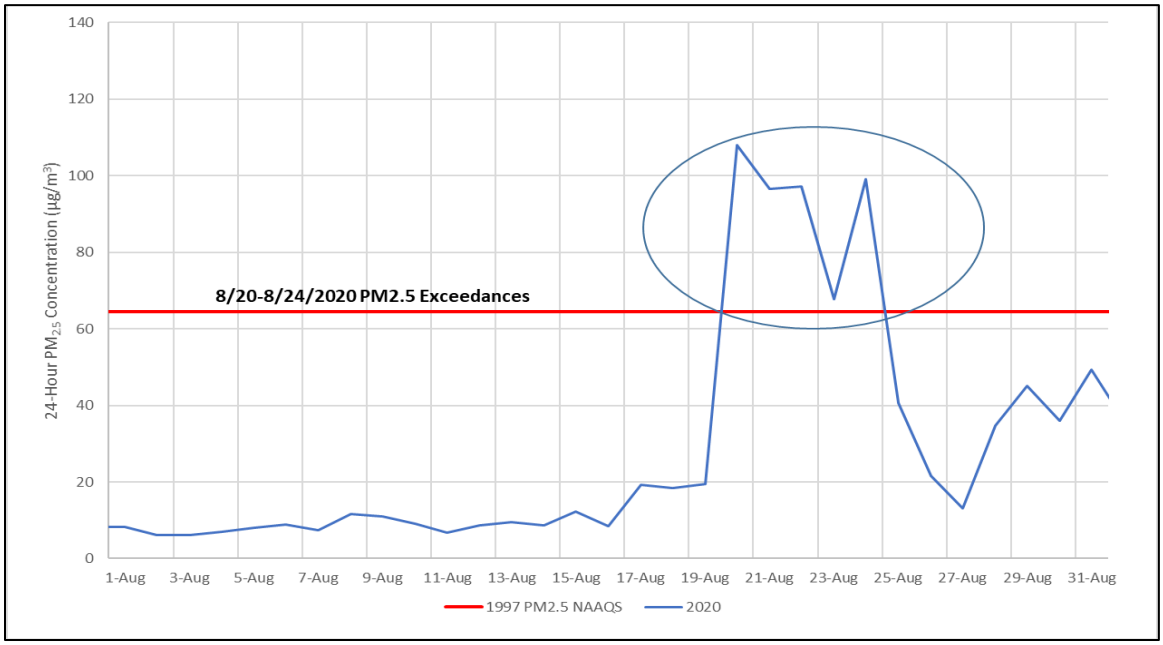
24-hour PM2.5 Concentration Trends
Turlock, Stockton-Hazelton, Manteca, Fresno-Foundry, and Corcoran

Appendix G: 24-hour PM2.5 Concentration Trends for Turlock, Stockton-Hazelton, Manteca, Fresno-Foundry, and Corcoran

Turlock:

At Turlock the highest pre-event 24-hour average $PM_{2.5}$ concentration for August was 19.5 µg/m^3 on August 19th. There was a steady increase in $PM_{2.5}$ concentrations beginning on August 17th when the fires began, and peaking on August 20th with a $PM_{2.5}$ value of 108 µg/m^3. Wildfire smoke caused for concentrations to remain above the standard from August 20-24. As conditions began to clear and smoke dispersed concentrations quickly decreased by 58 µg/m^3 between August 24th and 25th.

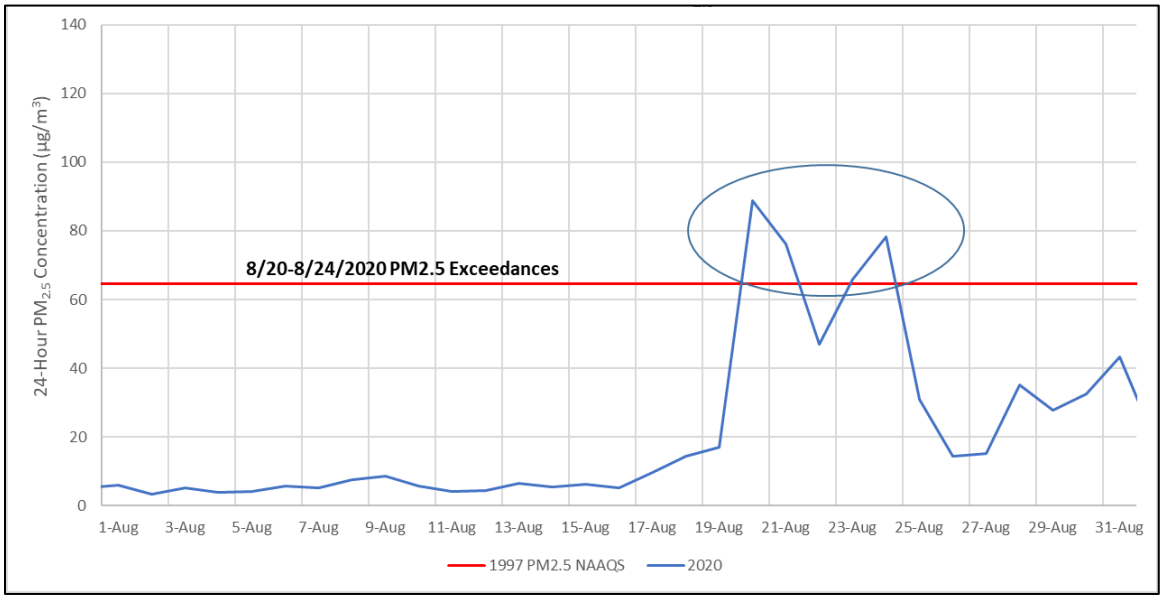
Figure G-1: 24-hour PM2.5 Concentration Trend for Turlock – August 1-31, 2020



Stockton-Hazelton:

At Stockton-Hazelton the highest 24-hour average $PM_{2.5}$ concentration in days leading up to the event was measured at 16.9 µg/m^3 on August 19th. There was a jump in $PM_{2.5}$ concentrations beginning on August 17th when the fires began, and peaking on August 20th with a $PM_{2.5}$ value of 88 µg/m^3. Wildfire smoke caused for concentrations to average above the standard on August 20th, 21st, 23rd, and 24th. As conditions began to clear and smoke dispersed concentrations quickly decreased by 47 µg/m^3 between August 24th and 25th.

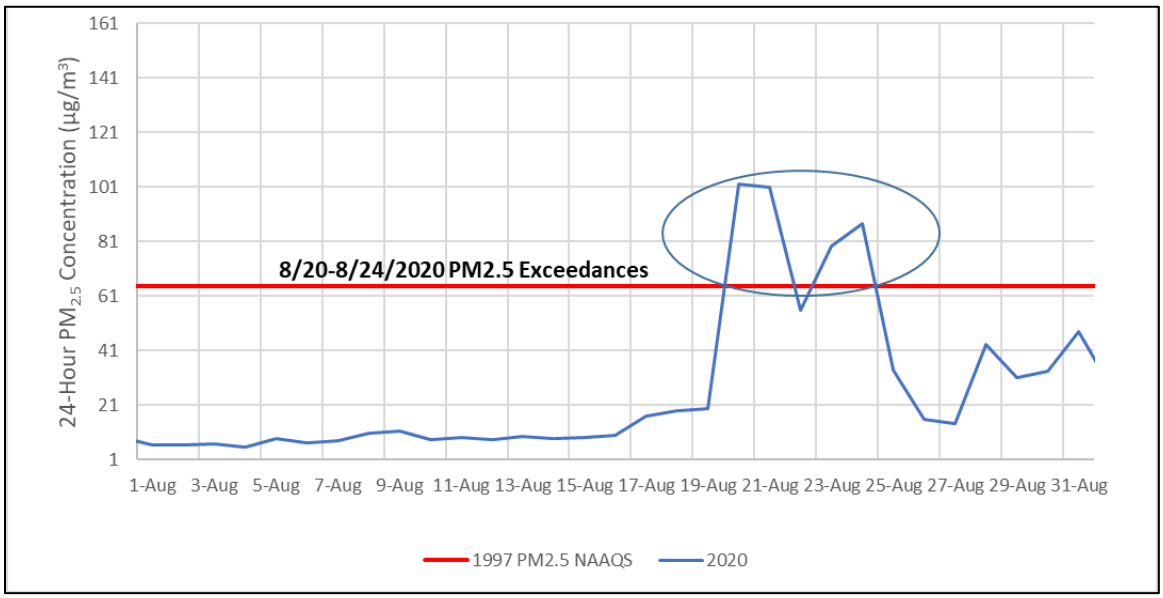
Figure G-2: 24-hour PM2.5 Concentration Trend for Stockton-Hazelton – August 1-31, 2020



Manteca:

At Manteca the 24-hour average $PM_{2.5}$ concentration for August remains below the NAAQS standard for the first 19 days of the month, with the highest concentration for pre-event days being 19.7 µg/m^3 on August 19th. $PM_{2.5}$ values quickly rose in on August 20th and remained elevated through the 24th, with a slight decrease in concentration on the 22nd. As conditions began to clear and smoke dispersed concentrations quickly decreased by 54 µg/m^3 between August 24th and 25th.

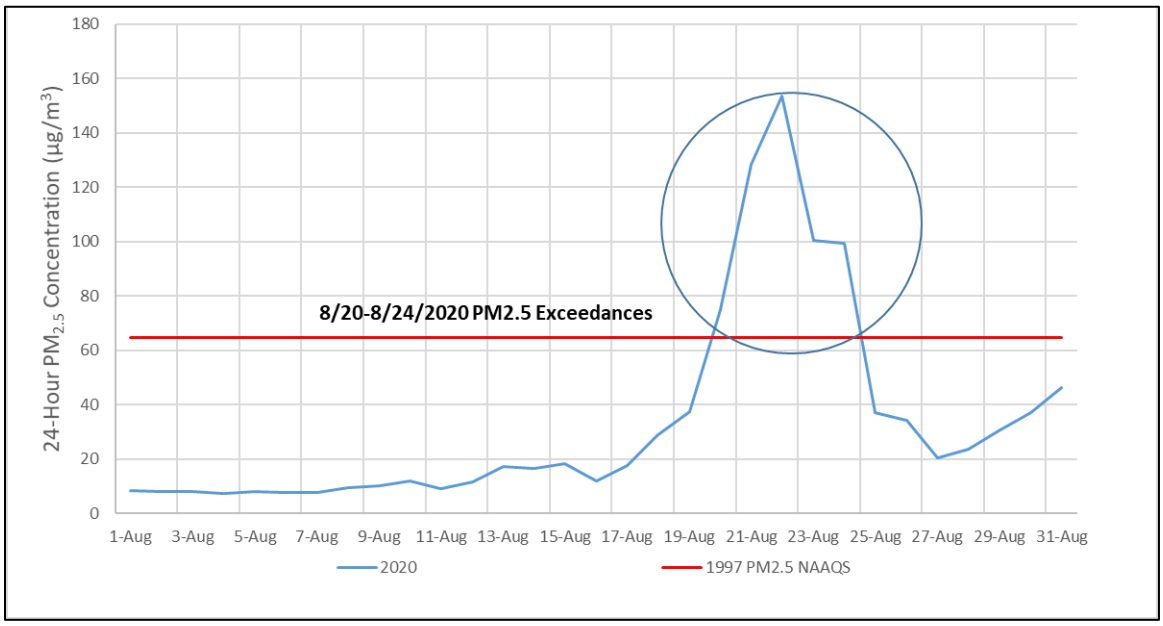
Figure G-3: 24-hour PM2.5 Concentration Trend for Manteca – August 1-31, 2020



Fresno-Foundry:

At Fresno-Foundry the highest 24-hour average $PM_{2.5}$ concentration in August pre-event days was measured 17.8 µg/m^3 on August 17th. There is a steady increase in $PM_{2.5}$ concentrations beginning on August 13th, and peaking on August 22nd with a $PM_{2.5}$ value of 153 µg/m^3. Wildfire smoke caused for concentrations to remain above the standard from August 20-24. As conditions began to clear and smoke dispersed concentrations quickly decreased by 62 µg/m^3 between August 24th and 25th.

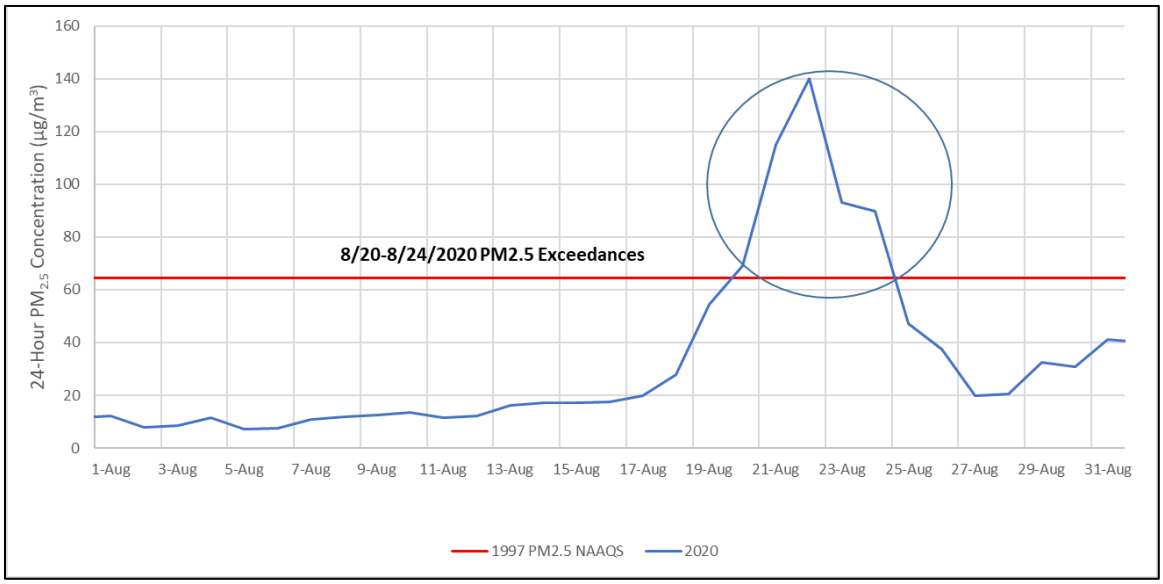
Figure G-4: 24-hour PM2.5 Concentration Trend for Fresno-Foundry – August 1-31, 2020



Corcoran:

At Corcoran the highest pre-event day 24-hour average $PM_{2.5}$ concentration was 54.5 µg/m^3 on August 19th. There is a steady increase in $PM_{2.5}$ concentrations beginning on August 13th, and peaking on August 22nd with a $PM_{2.5}$ value of 140 µg/m^3. From August 20-24 wildfire smoke caused for concentrations to remain above the standard. As conditions began to clear and smoke dispersed concentrations quickly decreased by 43 µg/m^3 between August 24th and 25th.

Figure G-5: 24-hour PM2.5 Concentration Trend for Corcoran – August 1-31, 2020

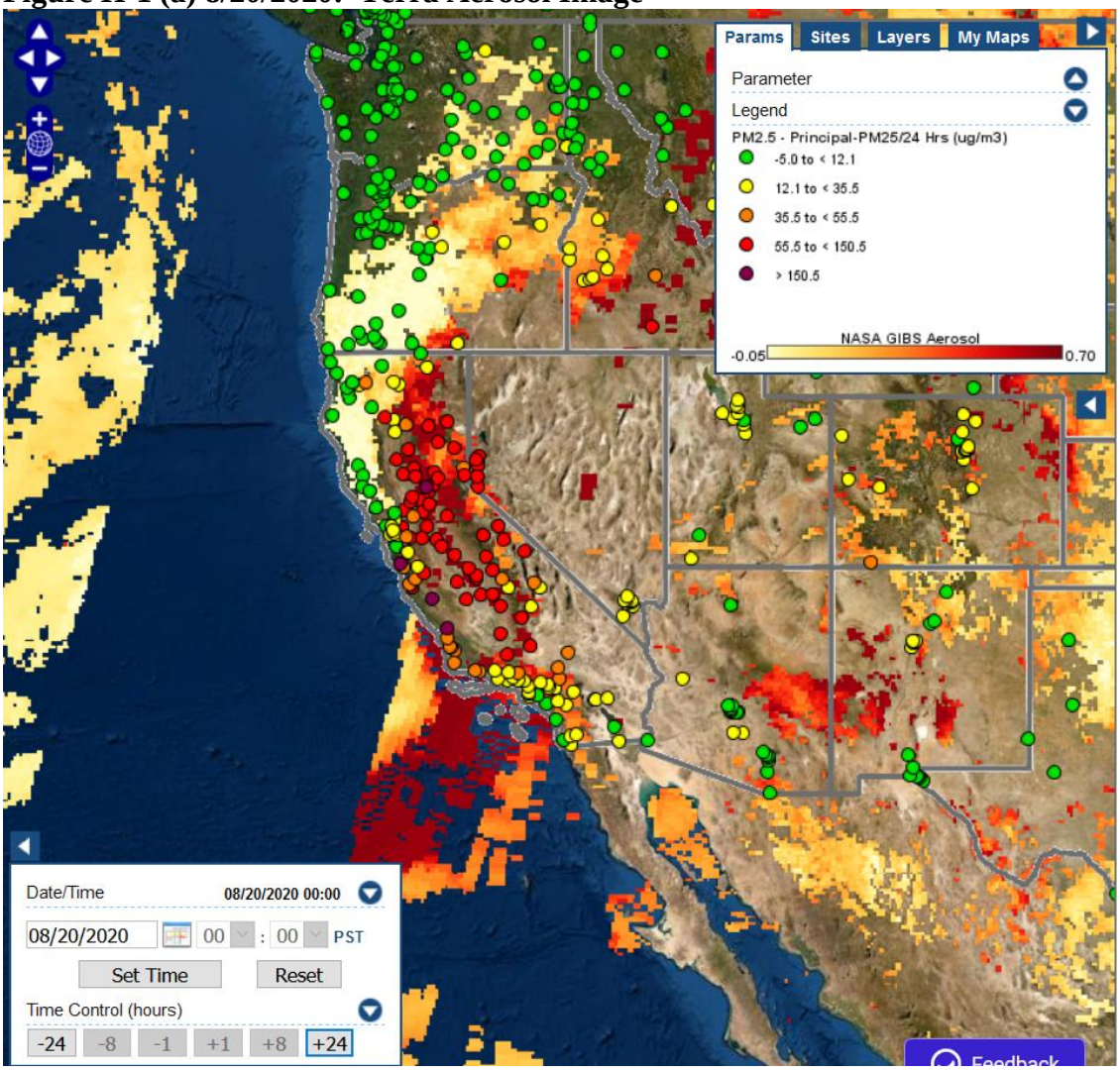


Appendix H

Aqua and Terra Aerosol Images

AIRNOW Tech Navigator[37] website was used to compile the Terra Aerosol Image overlaid on the AQI coded PM2.5 24-hour concentrations shown below. For a more detailed information of the MODIS Aerosol products that are illustrated in the images below, refer to NASA's Atmosphere Discipline Team Imager Products website.[38] Figures H-1 through Figure H-5 shows the 24-hour PM2.5 concentrations (AQI colored coded) overlaid on either the Terra (a) or Aqua (b) Aerosol Images. The darker the color the more aerosol detected by the satellite. Through the demonstration period of August 20 through August 24, 2020, the San Joaquin Valley experienced poor air quality and high concentrations of aerosols.

Figure H-1 (a) 8/20/2020: Terra Aerosol Image



[37] AIRNOW Tech Navigator Website: https://www.airnowtech.org/navigator/index.cfm#
[38] NASA: Atmosphere Discipline Team Imager Products Website: https://atmosphere-imager.gsfc.nasa.gov/products/aerosol

Figure H-1 (b) 8/20/2020: Aqua Aerosol Image

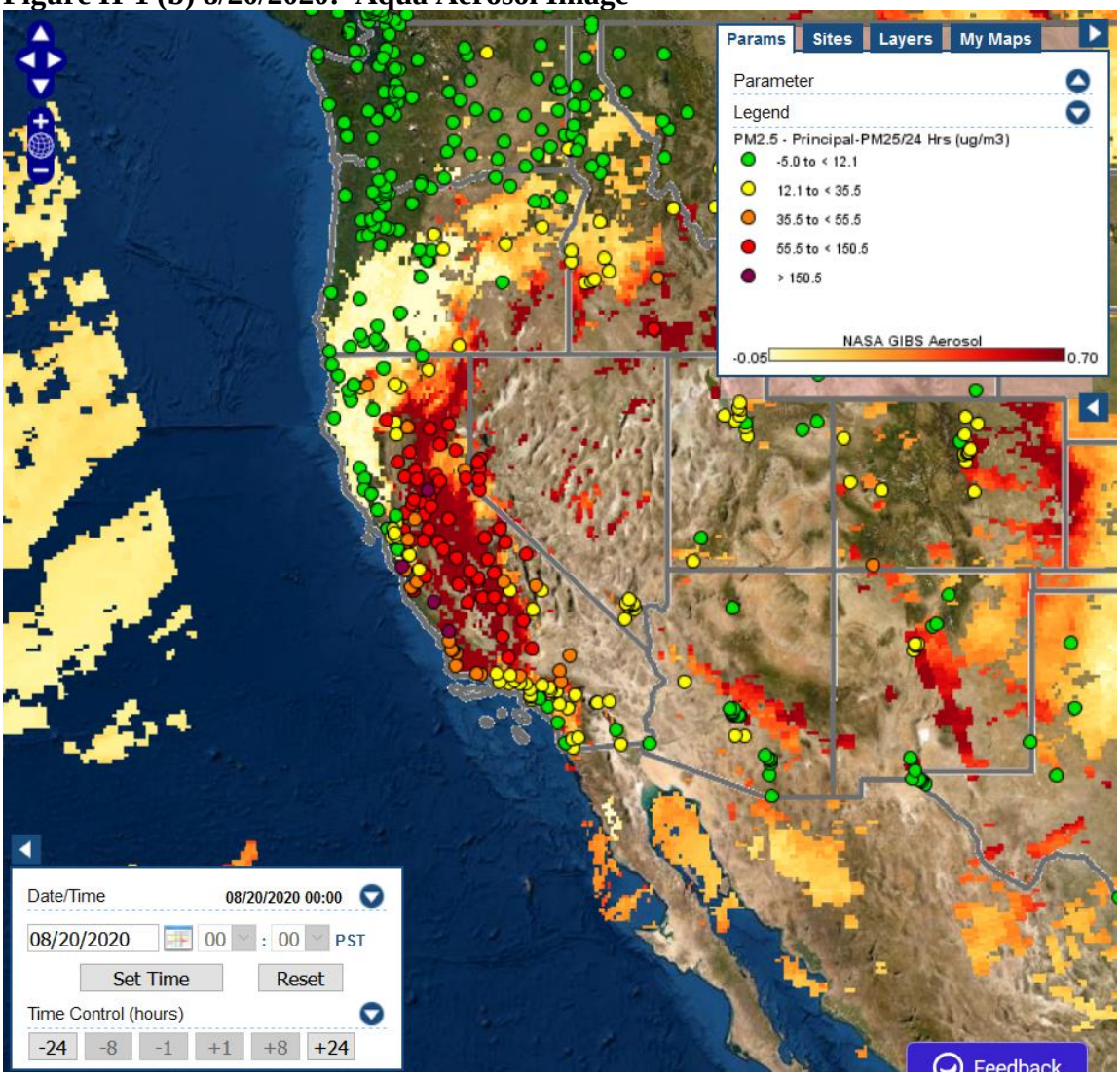


Figure H-2 (a) 8/21/2020: Terra Aerosol Image

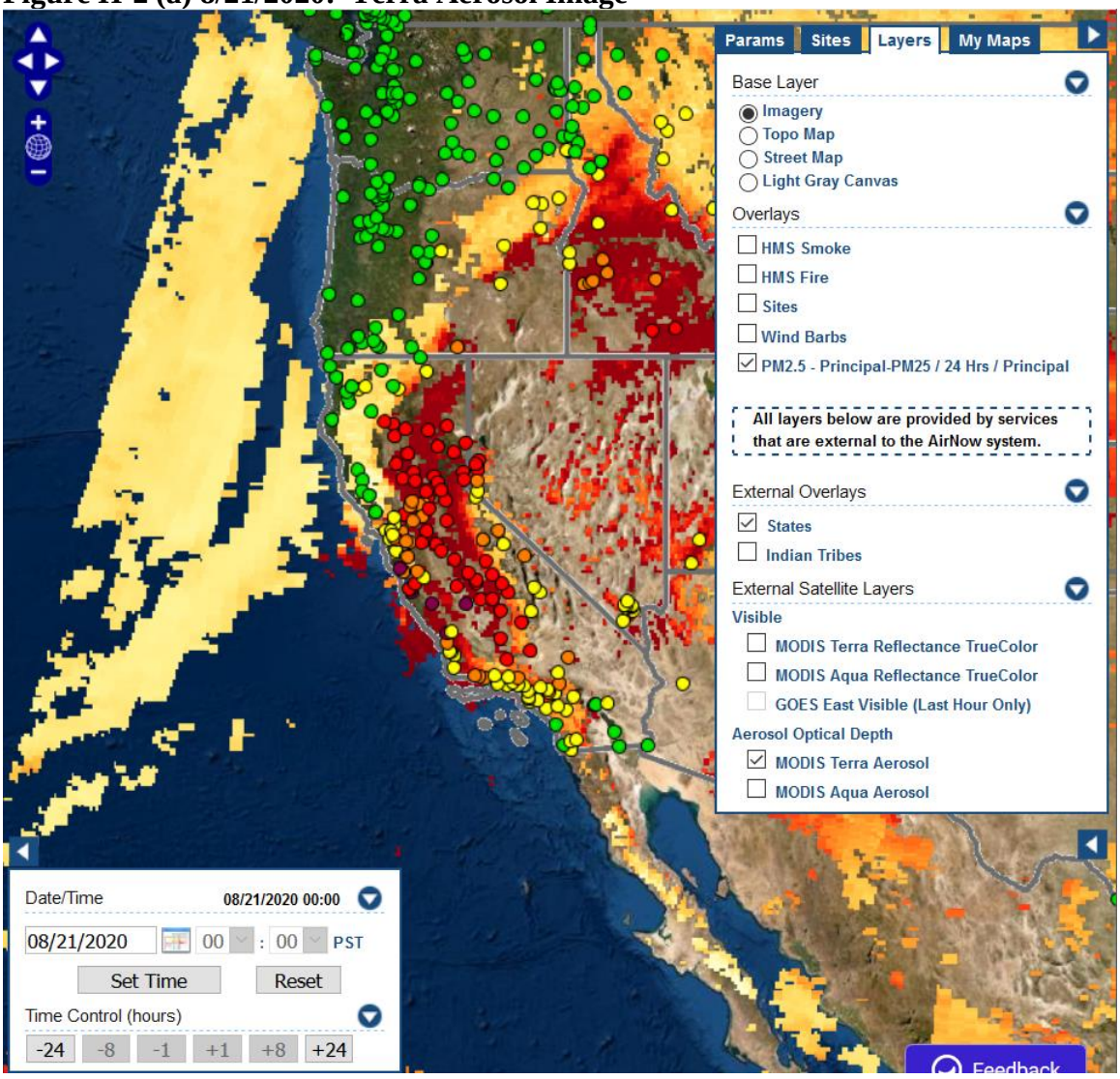


Figure H-2 (b) 8/21/2020: Aqua Aerosol Image

No Aqua image is available for 8/21/2020.

Figure H-3 (a) 8/22/2020: Terra Aerosol Image

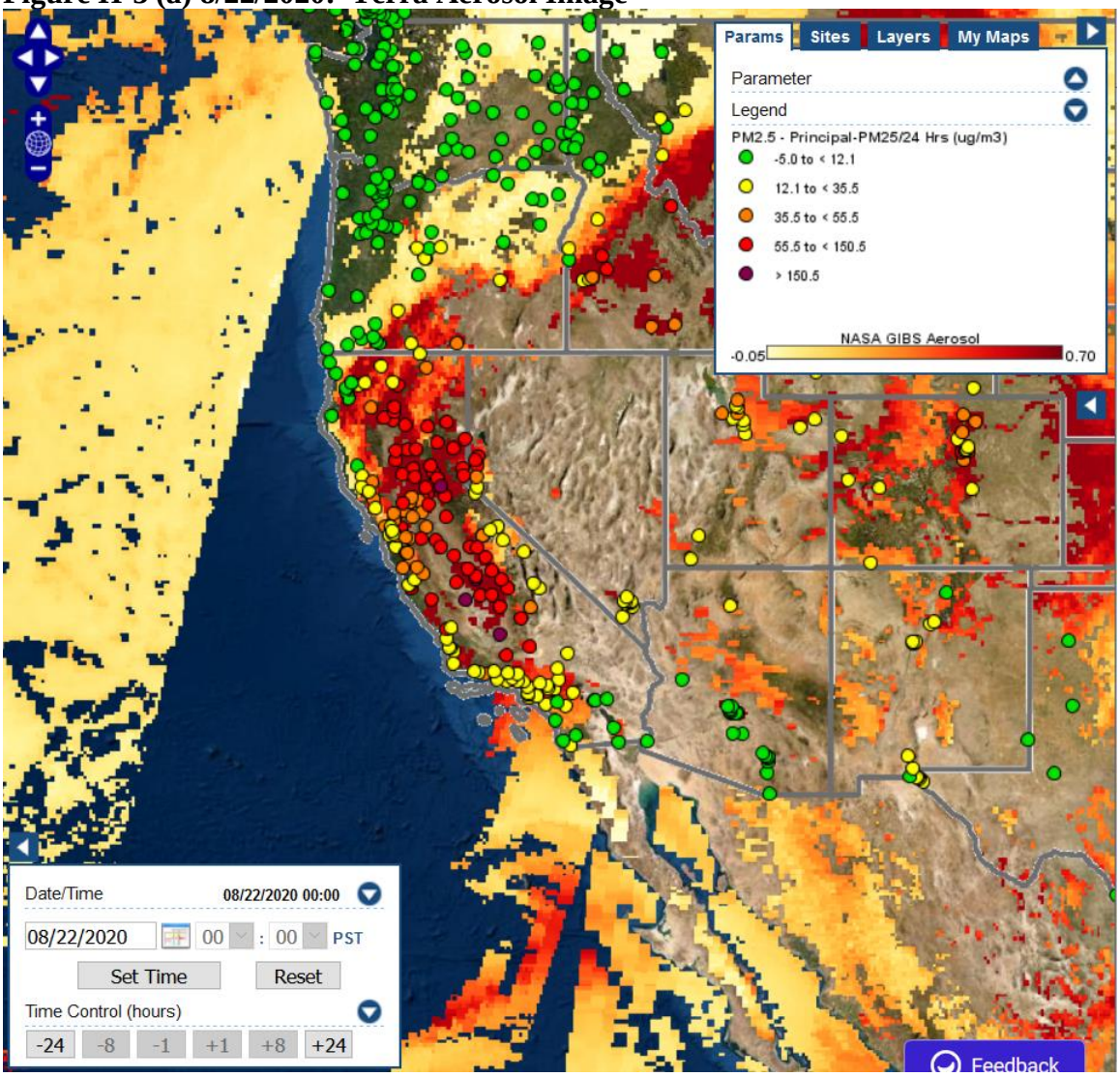


Figure H-3 (b) 8/22/2020: Aqua Aerosol Image

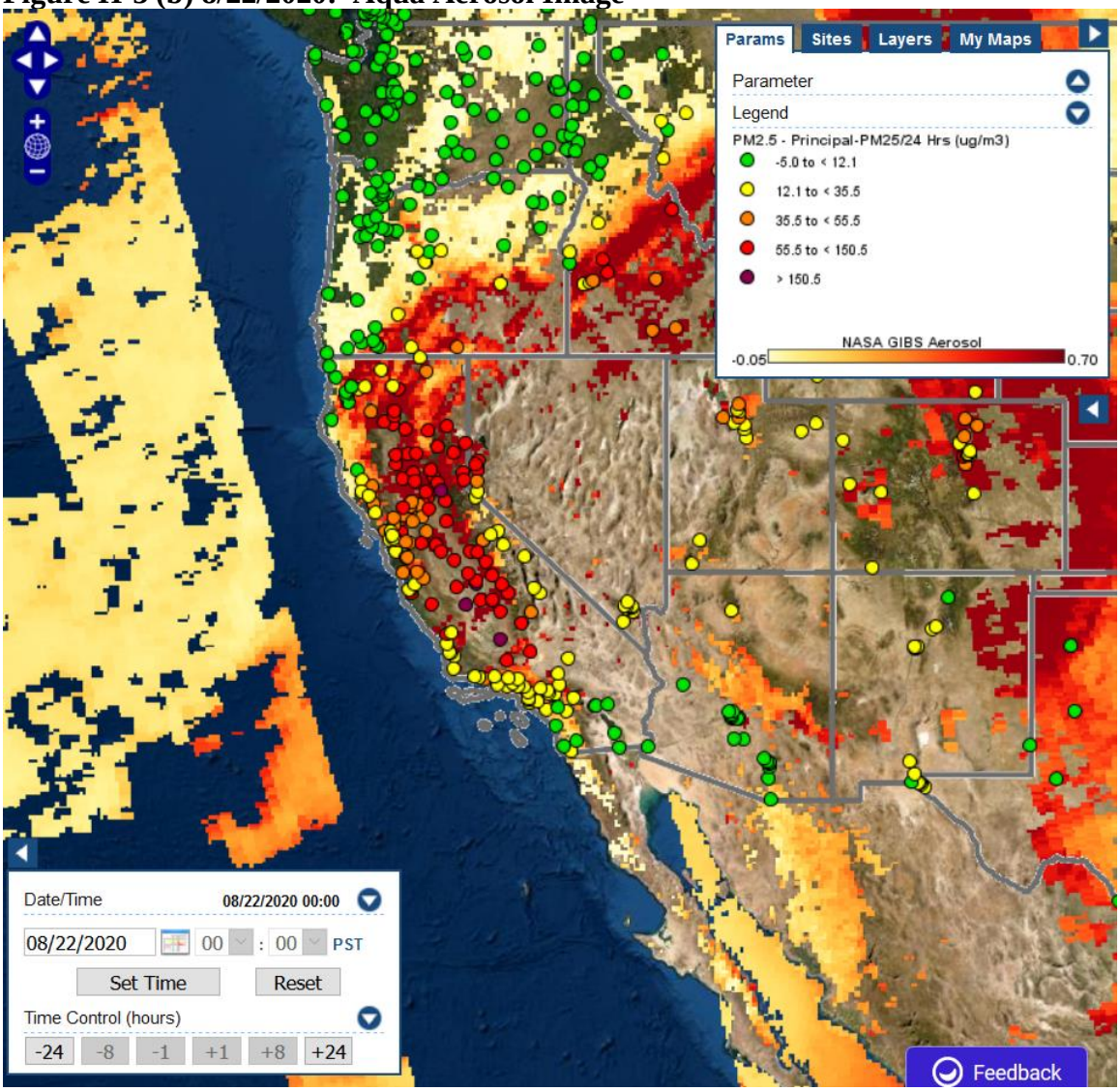


Figure H-4 (a) 08/23/2020: Terra Aerosol Image

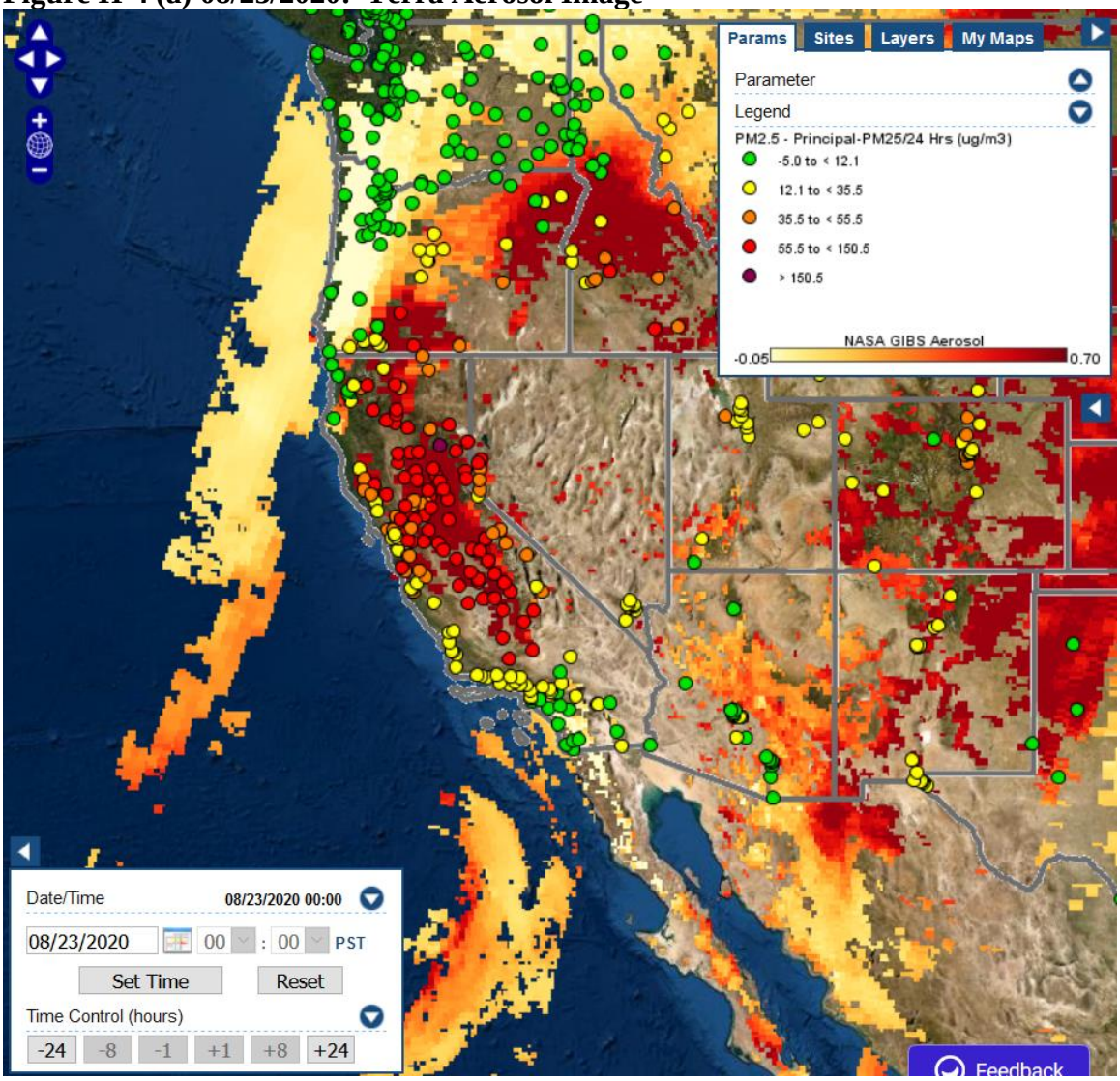


Figure H-4 (b) 08/23/2020: Aqua Aerosol Image

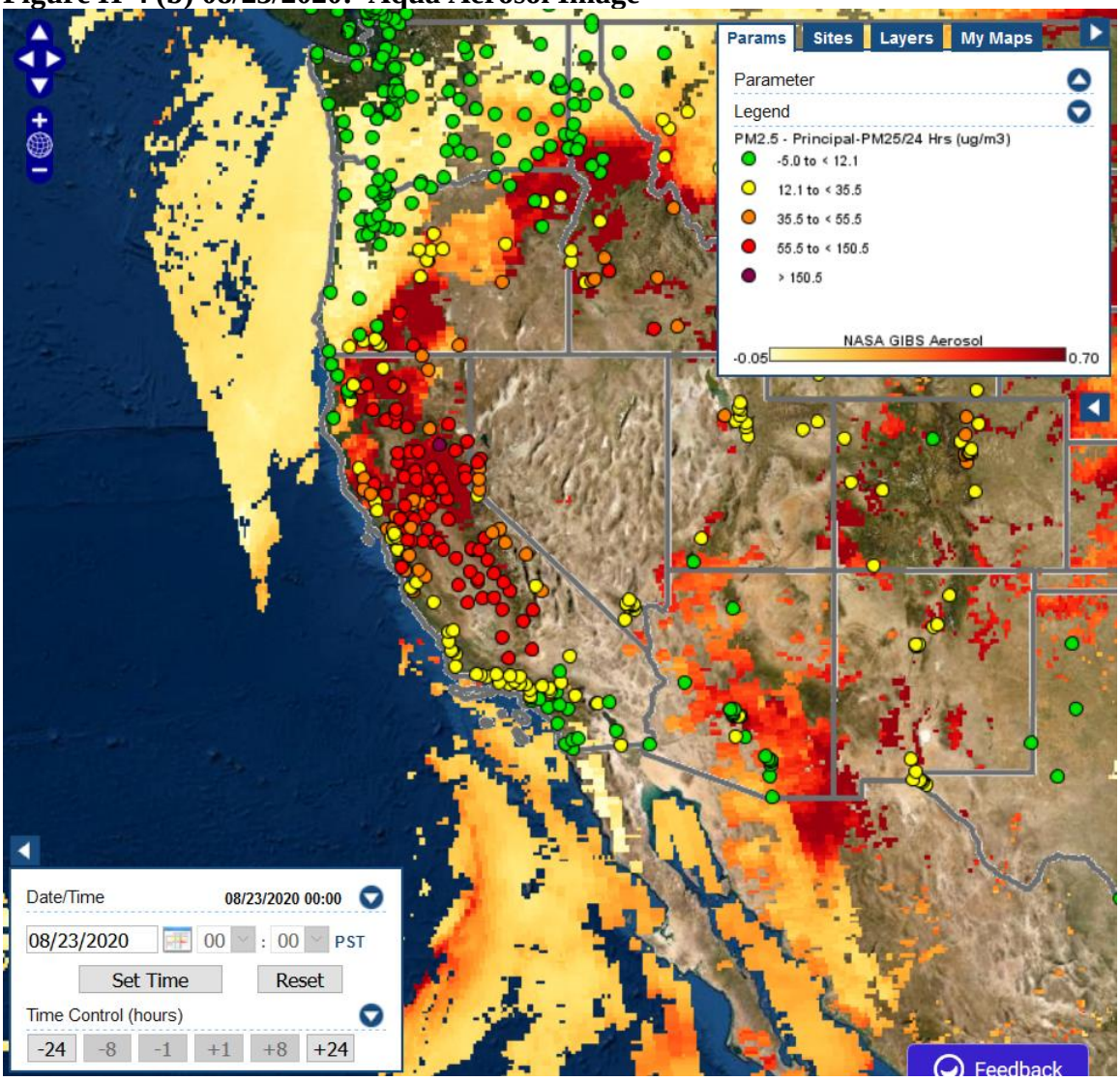


Figure H-5 (a) 08/24/2020: Terra Aerosol Image

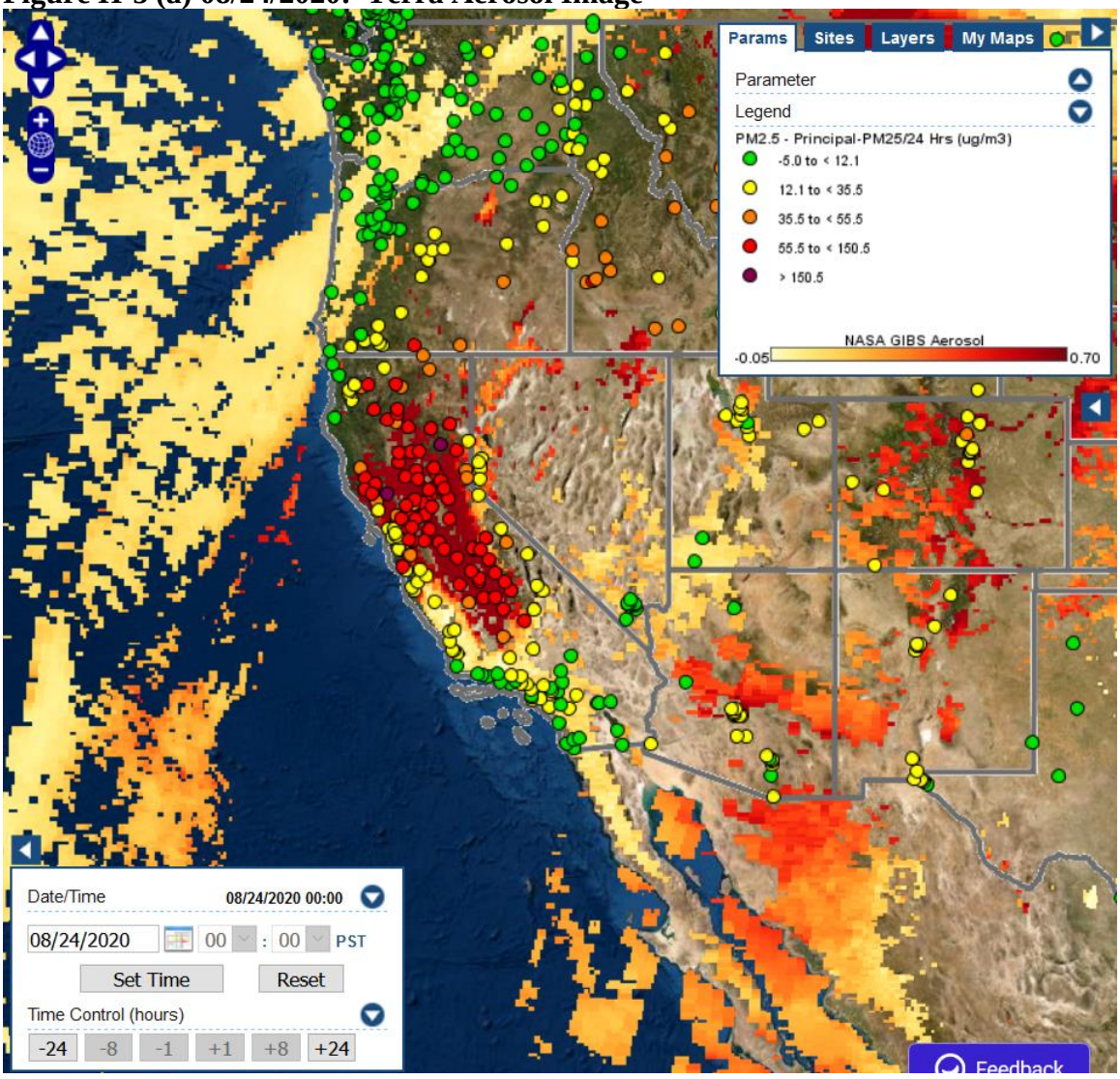
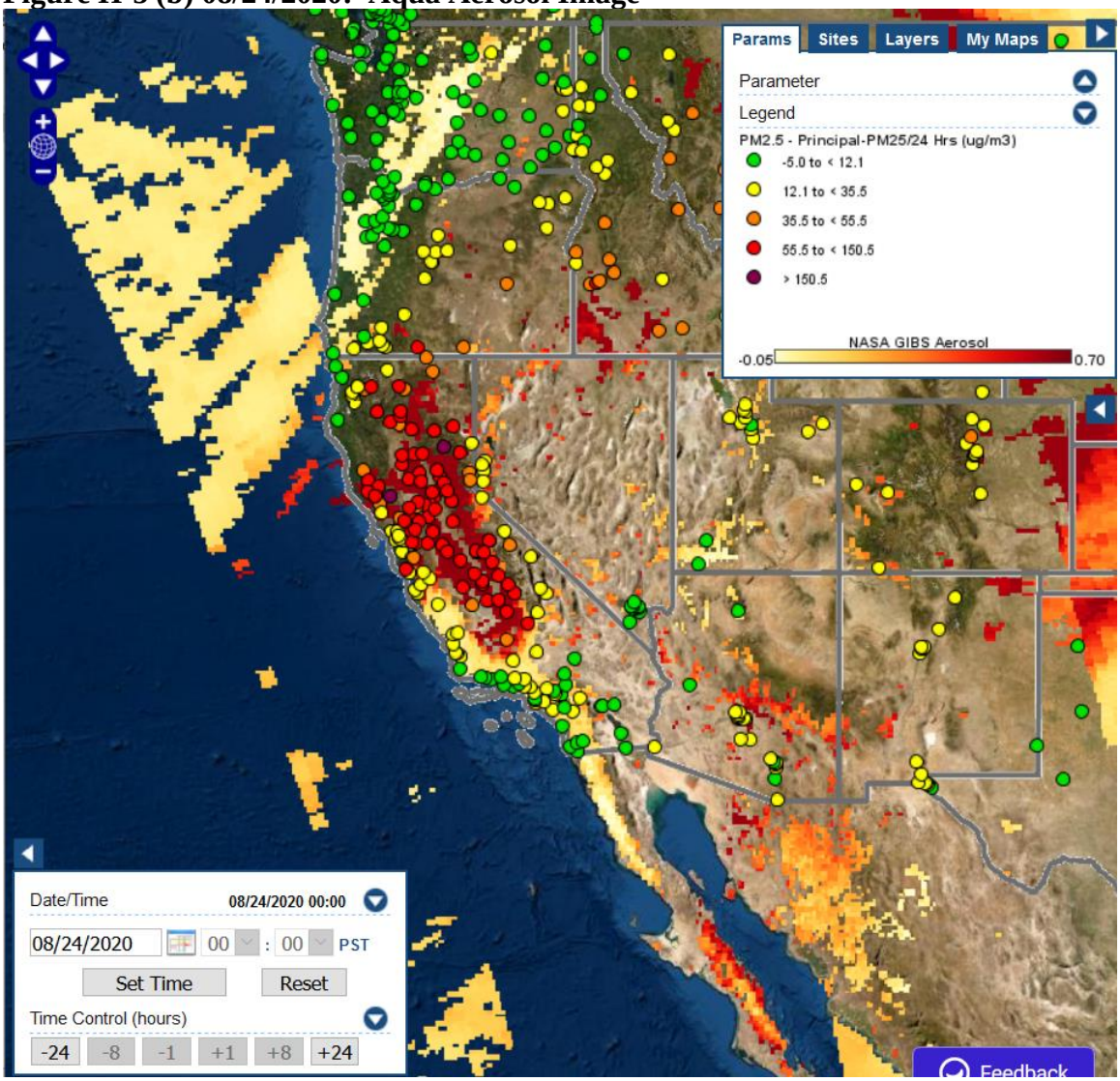


Figure H-5 (b) 08/24/2020: Aqua Aerosol Image

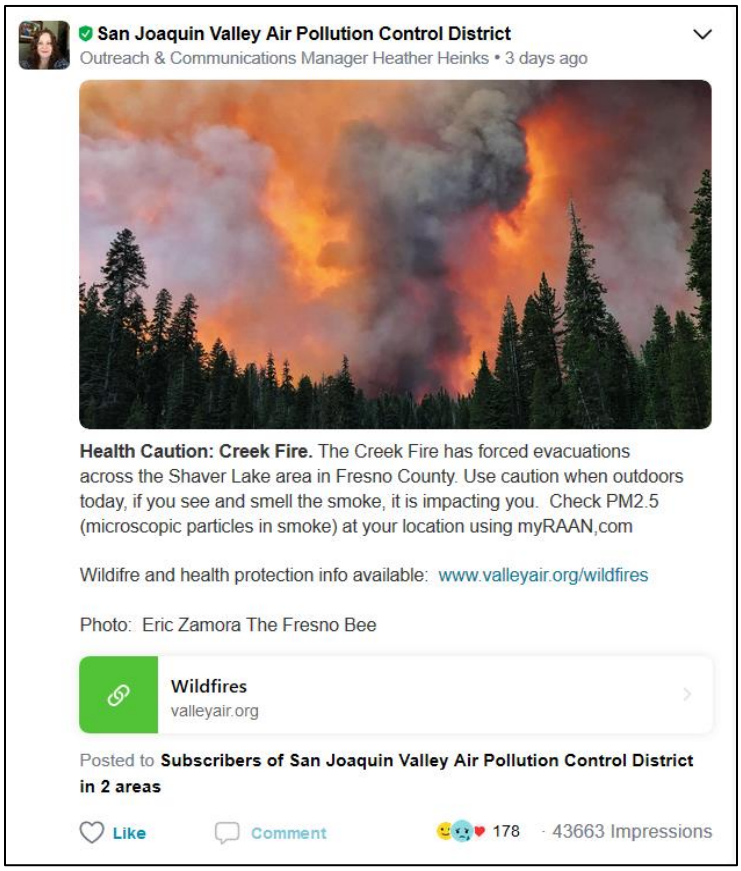


Appendix I

Media and Social Media Reports

District Social Media Posts and Air Quality Tools

Example NextDoor Post



Facebook Post during Event

Twitter Post during Event

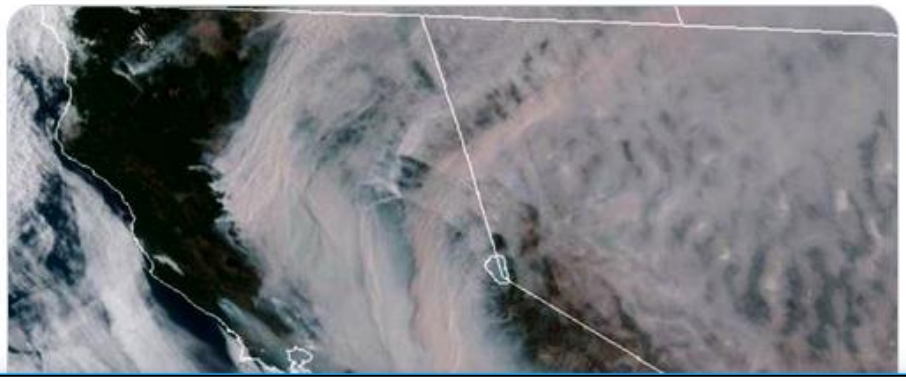
Valley Air District @ValleyAir · Aug 21, 2020

Very unhealthy air quality is expected to persist through the weekend Valley-wide. Protect yourself from PM (particulate matter) exposure by remaining indoors with air filtration if possible. Health caution details: ow.ly/BBXH50B5Wad.

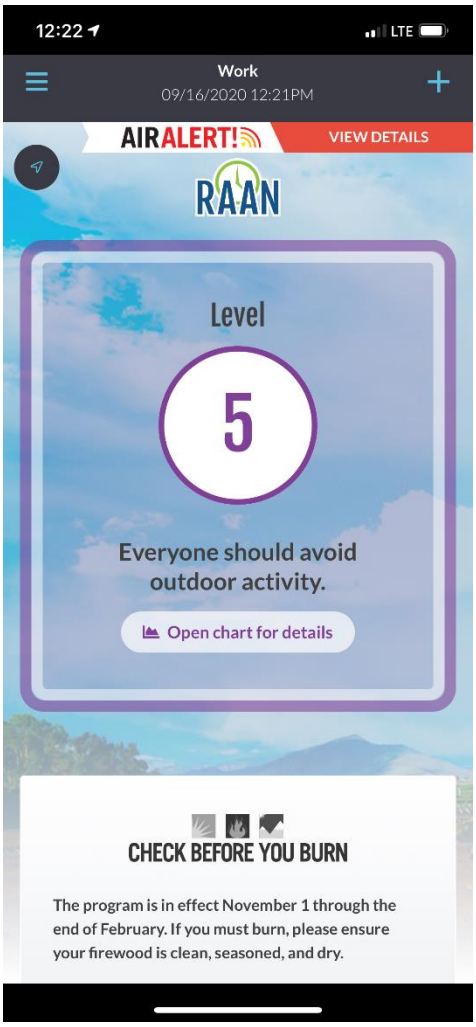
2 6

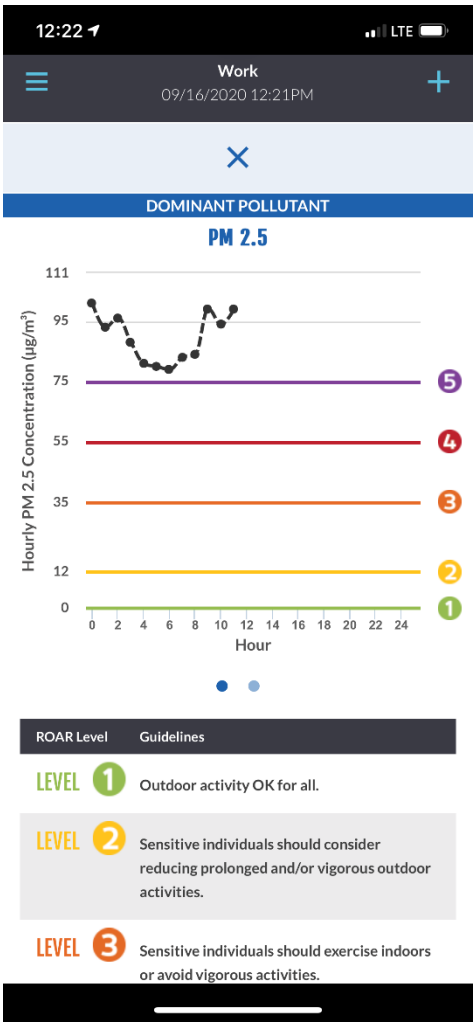
Valley Air District @ValleyAir · Aug 21, 2020

El Distrito advierte a los residentes del Valle de los crecientes impactos a la salud debido a los continuos incendios forestales. Vea advertencia: ow.ly/xtIU50B5O3q



Example of District Air Quality Tools





Daily Electronic Newspaper Clippings from around the Valley 8/18/2020:

Wildfire smoke hangs over Tracy as heat wave continues
Press staff report Tracy Press, Monday, August 17, 2020

A smoky haze from grass fires burning out of control in the hills near Patterson hangs over Tracy as the region swelters in a triple-digit heat wave that has triggered widespread rolling blackouts and air-quality warnings. A group of four fires designated by Cal Fire as the Canyon Zone Fire is burning in Del Puerto Canyon northwest of Patterson, about 21 miles southeast of the intersection of 11th Street and Tracy Boulevard. The fire burned through Sunday night, and brown smoke had crept over Tracy by Monday afternoon, giving the sun a red-orange hue. As of 4:14 p.m., Cal Fire estimated that 1,851 acres had burned and the fires were still entirely uncontrolled. The Stanislaus County Sheriff's Office has issued mandatory evacuation orders for people who live on Del Puerto Canyon Road from Frank Raines Park to Mines Road. Another group of grass fires near Mount Diablo State Park on Deer Valley and Marsh Creek roads, dubbed the Deer Zone Fires, has consumed 1,161 acres since Sunday and is also burning out of control. Those fires were sparked by lightning. People across Tracy reported ash falling in their neighborhoods Monday afternoon. The San Joaquin Valley Air Pollution Control District cautioned valley residents to stay out of the smoky air caused by those wildfires and other fires farther south near Turlock, Fresno County and Los Angeles.

The air district warned that microscopic particles in the smoke can trigger asthma, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Young children, older adults, and anyone with existing respiratory conditions, including COVID-19, are especially at risk from this type of air pollution. Anyone who can smell smoke or see falling ash should consider the air unhealthy. The best response is to move indoors to a filtered, air-conditioned environment and keep windows closed. The air district emphasized that cloth and paper masks used to reduce the transmission of COVID-19 via respiratory droplets are not sufficient to filter out the microscopic particles that make up smoke.

At the same time, an extreme heat wave has brought triple-digit temperatures and warnings of rolling blackouts. A statewide flex alert calling for everyone to conserve electricity was issued Sunday and continues through Wednesday. Temperatures are expected to peak over 100 degrees each day, driving electricity demand higher in the late afternoon and early evening, just as the sun sinks and solar power generation becomes less efficient. In response, people are asked to turn off unnecessary lights; use major appliances in the morning or later at night; and, health permitting, keep thermostats at 78 degrees or higher between 3 and 10 p.m.

Flex alerts are issued by the California Independent System Operator, which oversees the state's bulk electrical power system, transmission lines and electricity market. The goal is to prevent rolling blackouts and other emergency measures. Pacific Gas & Electric Co. notified customers by a recorded voice message that rolling blackouts were possible in the area through Wednesday at the discretion of Cal ISO. The blackouts could last up to two hours until the demand on the power grid stabilizes. A similar alert was issued Friday, followed by a Stage 3 Electrical Emergency, the first declared since the 2001 energy crisis. Accuweather forecasts Tracy's high

temperatures to remain in the triple digits through Wednesday, cooling into the high 90son Thursday but immediately rebounding to triple-digit heat Friday through Monday.

Air district issues health caution in response to wildfires
The Bakersfield Californian, Monday, August 17, 2020

The San Joaquin Valley Air Pollution Control District has issued a health caution as a result of the various wildfires that are impacting the air quality throughout the Central Valley. The Canyon Fire in Stanislaus County near Turlock, the Hills Fire in Fresno County and the Lake Fire in Los Angeles County are producing smoke that is infiltrating eight valley counties, including Kern County.

Air pollution officials caution residents to reduce exposure to the particulate matter emissions by remaining indoors in affected areas. “Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed,” the air pollution control district said in a news release. “The common cloth and paper masks individuals are wearing due to COVID-19 concerns may not protect them from wildfire smoke.” Air monitoring stations are designed to detect microscopic particulate matter 2.5 particles that exist in smoke. However, larger particles, such as ash, may not be detected, according to the district. “If you smell smoke or see falling ash in your immediate vicinity, consider air quality 'unhealthy' even if RAAN displays lower levels of pollution,” the news release said. Residents can use the district’s Real-time Air Advisory Network to track air quality by visiting myRAAN.com or check the district’s wildfire page at www.valleyair.org/wildfires for information about any current and recently past wildfires affecting the Valley.

High temperatures slow work, trigger special precautions for outdoor laborers
By John Cox The Bakersfield Californian, Monday, August 17, 2020

High temperatures are making tough jobs harder for people working outdoors in Kern County, and recently high humidity and poor air quality aren't helping. Probably the biggest impact the ongoing heat wave has had locally is shortened work hours for some crews. The workday starts and ends earlier, which can lower productivity and reduce paycheck totals. "The guys don't necessarily want to go home" when temperatures rise to the upper 90 degrees, said pistachio orchard professional Josh Newfield, owner of Newfield Ag Management. "A lot of time they do want the hours. They want the work."

OILFIELD HEAT

A similar situation faces oilfield workers who have recently been placed on reduced schedules because of the heat, Bakersfield oilman Chad Hathaway said. In his case, the reduced availability of electrical power during the heat wave presents an additional problem. "It's causing a lot of us havoc and forcing a lot of us to shut down and start up and putting everyone at risk of an accident that is out of our control," Hathaway said by email Monday. Construction being another activity sensitive to high temperatures, contractors working on the Centennial Corridor transportation project have requested and received the city of Bakersfield's permission to work late at night in order to avoid the worst of the heat. The good news is that these scheduling

adjustments haven't slowed work on the corridor, city Project Manager Luis Topete said. Recent humidity has complicated matters—California Farmworker Foundation Executive Director Hernan Hernandez called it "suffocating at times." But high moisture content in the hot air does not triggers pecial workplace precautions the way high temperatures do.

REQUIRED PRECAUTIONS

Cal-OSHA has been working with employers to remind workers of preventative steps that must be taken to minimize the chance of heat illness, which can be fatal. As temperatures near 95 degrees, laborers unaccustomed to working in such conditions must be observed by a supervisor or other designee for their first 14 days on the job. Communication is another emphasis: To avoid accidents, workers and their supervisors must stay in close contact throughout the workday. Employees must be reminded of their right to cool-down breaks and the need to drink extra water. During the COVID-19 pandemic, Cal-OSHA says it's also important that employers provide adequate shade while ensuring workers maintain a safe distance from each other, including through the use of staggered breaks, increased shaded areas "or both." Additionally, the agency said employers need to conduct extra disinfecting procedures at restroom facilities and water sources.

MASKS OUTSIDE?

The necessity of wearing a mask can make outdoors work harder, Cal-OSHA warns." Employers should be aware that wearing face coverings can make it more difficult to breathe and harder for a worker to cool off, so additional breaks may be needed to prevent overheating," an agency spokesman said by email. "Workers should have face coverings at all times, but they should be removed in outdoor high heat conditions to help prevent overheating as long as physical distancing can be maintained." The agency added that high humidity limits the body’s ability to cool through evaporation, increasing the risk of heat illness. It also said that while poor air quality doesn’t directly increase the risk of heat illness," it can increase cardiovascular risks and put additional strain on the body’s cardiovascular system, which may also be stressed in high heat conditions. "Pete Belluomini, vice president of farming operations at Lehr Bros. Inc., said he's grateful his crews recently finished up the potato harvest and are therefore less busy now than before. Workers are now cleaning up fields in preparation for the next season, which is mercifully less work during this time of year, he said. Lately crews are starting their days at 5:30 a.m., which he said is pretty standard for this time of year. Although some workers would rather work longer hours, he said employees get dismissed when it gets too hot. "When you're getting in the 90s and you're starting to flirt with 100, it's time to shut it down," he said.

Smoke from wildfires prompts Central Valley air pollution district to issue health caution By Vongni Yang Visalia Times-Delta, Monday, Aug. 17, 2020

The San Joaquin Valley Air Pollution Control District issued a health caution on Monday because of smoke caused by wildfires across the state. Smoke from the Canyon Fire (Stanislaus County), the Hills Fire (Fresno County) and Lake Fire(Los Angeles County) is infiltrating into the San Joaquin Valley, affecting the air quality. Smoke from the growing River Fire in Salinas could also push its way inland if winds shift. Air pollution officials caution residents to reduce

exposure to the particulate matter emissions by remaining indoors in affected areas. Affected counties include San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and parts of Kern counties. Pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke, pollution officials said. Residents should move indoors, to a filtered, air-conditioned environment with windows closed if they are experiencing poor air quality due to smoke from the wildfires.

Residents can track air quality by visiting this website. If you smell smoke or see falling ash in your immediate vicinity, consider air quality to be "unhealthy." The health caution will remain in place until the fires are extinguished.

Modesto battles wildfires, record-setting heat wave. Why we won't see any relief soon
By Kevin Valine Modesto Bee, Monday, Aug. 17, 2020

If you thought Sunday was a scorcher, you were right. Modesto's daytime high of 109 and nighttime low of 80 both set records for the hottest August 16 since the Modesto Irrigation District started keeping records in 1939.And we won't see any relief soon from a prolonged heat wave that has baked California and much of the West Coast. The National Weather Service in Sacramento predicts Monday's high will be 108 degrees, and Tuesday will be hotter by about a couple of degrees. Wednesday should hit 104, which is when the excessive heat warning the NWS issued Friday is expected to end. The conditions are causing other problems in Stanislaus County, with lightning the likely cause of a fire in Del Puerto Canyon, and possible rolling blackouts this evening affecting the area's PG&E customers, including much of the city of Newman. NWS meteorologist Scott Rowe said Thursday should be 100 degrees, but Modesto will start heating up again over the weekend, with temperatures in the low 100s.

Rowe said a massive upper level ridge of high pressure parked over the Southwest is the culprit for heat wave. "We get them every summer," he said. "But this one is stronger and more persistent." The previous daytime high for August 16 was 104 in 1992 and the previous nighttime low for the same date was 75 set last year. The MID records temperatures in downtown. Lightning storms in Bay Area The excessive heat also has brought thunderstorms and lightening to the Bay Area and other parts of California as well as wildfires. Those fires include four burning in Del Puerto Canyon, northwest of Patterson. Cal Fire reports that what it is calling the Canyon Zone wildfires had burned 1,851 acres as of about noon Monday with 0% containment. The fires started Sunday. The fires have brought smoke to Modesto and elsewhere in the San Joaquin Valley.

The San Joaquin Valley Air Pollution Control District has issued a health caution because of the smoke. "Air pollution officials caution Valley residents to reduce exposure to the particulate matter emissions by remaining indoors in affected areas," according to a news release. The district said the masks and other face coverings residents are wearing because of the new coronavirus may not protect them from the effects of wildfire smoke. The district reported that Valley residents are seeing and feeling the effects of the smoke from the Canyon Zone fires, the Hills fire in Fresno County and the Lake fire in Los Angeles County. The Hills fire had burned more than 950 acres and Lake fire more than 18,500 acres as of Monday, according to Cal Fire. Cal Fire spokeswoman Pam Temmerm and said the lightning storm that came through the Bay Area over the weekend could have caused the Del Puerto Canyon fires. "It may have reached (the canyon)," she said. "It's certainly a possibility given the weather." But she said it's too soon to know the fires' cause with any certainty. Temmerm and said she is not aware of any injuries, and it's too soon to report on any property damage.

Daily Electronic Newspaper Clippings from around the Valley 8/19/2020:

Windy conditions spread fire in Del Puerto Canyon, bring ash and smoke to Modesto area
By Patty Guerra Modesto Bee and Merced Sun-star, Wed., Aug., 19, 2020

Fires burning in the hills west of Modesto continued to grow overnight, but firefighters have built some containment lines that are holding, authorities said Wednesday. Hot, windy conditions are making the fire harder to control and spreading ash and smoke for miles. The Del Puerto Canyon fire is burning near Patterson in western Stanislaus County. The fire is part of what Cal Fire is calling the SCU Lightning Complex, more than a dozen wildfires that have burned 85,000 acres with 5% containment as of Wednesday morning. The Del Puerto Canyon fire is part of Canyon Zone fires, which have consumed 25,000 acres. Two first-responder injuries have been reported, and Stanislaus County Sheriff Jeff Dirkse said in a Facebook post Tuesday night that two structures have burned. Heavy winds pushed the fire overnight, Cal Fire said in a news release issued Wednesday morning.

The recent heat wave, with higher nighttime temperatures than normal for this time of year, also has made it harder for crews to make much headway. "Westerly onshore winds are forecasted to increase today, and while temperatures will be a few degrees cooler with slightly higher humidity, those changes will be negated by the stronger onshore flow," the news release said. Those winds also have blown smoke and ash in to the Northern San Joaquin Valley, where air officials issued a health alert and people reported seeing ash falling as far east as Empire.

Residents in the area have been evacuated, and those in the Diablo Grande community have been advised to leave as well. On Wednesday, Stanislaus County Sheriff's deputies plan to try to escort some ranchers into the evacuated area to check on their livestock, Dirkse said in his post Tuesday. In all, 578 firefighters are battling the blaze, according to Cal Fire. On Wednesday, "crews will continue to scout for safe access points in order to construct direct and indirect fire line, mitigate the ongoing structure threat and provide continued recon for any new fire starts."

Wildfire smoke chokes Bay Area, with air quality 'very poor for the foreseeable future'
By Kate Galbraith San Francisco Chronicle, Wednesday, August 19, 2020

Smoke from wildfires raging around the region covered much of the Bay Area on Wednesday, creating unhealthy air conditions and triggering several alerts. "The air quality will be very poor for the foreseeable future given rapid spread of fires and stagnant air mass," the Bay Area arm of the National Weather Service tweeted on Wednesday morning around 7:40 a.m. Air district authorities issued a Spare the Air alert through Wednesday, banning wood burning, and an air quality advisory through Thursday. The smell of smoke hovered over many areas including San Francisco, with a National Weather Service worker even reporting ash downtown. "The smoke is everywhere now," said Kristina Chu, acting communications manager for the Bay Area Air Quality Management District, on Wednesday morning In particular, she said the SCU Lightning Complex fire raging in the eastern Bay Area was generating huge amounts of smoke. "The SCU Lightning Complex fire is still not even remotely contained," she said. "That's causing the biggest amount of smoke in the Bay area, covering five counties."

As of Wednesday morning, the wildfire consisted of 20 separate blazes in rugged terrain in Santa Clara, Alameda, Contra Costa, San Joaquin and Stanislaus counties, according to a Cal Fire incident report. It had burned 85,000 acres and was 5% contained. As of 6 a.m., the highest (worst) reading in the Bay Area for fine particles were in Pleasanton., Redwood City and Gilroy, where air quality was rated unhealthy. (Data from air monitors is available only after a few hours' lag.) Air in San Francisco was rated moderate, but had been worsening and was on the verge of being rated "unhealthy for sensitive groups" — a rating that already applied to East Oakland. The air quality advisory means that anyone with pre-existing respiratory issues should limit all outdoor activity.

If you smell smoke, "go inside, close windows and doors and make sure they're sealed," Chu said. If indoor temperatures are too high for those sheltering in place, Chu said, "We recommend checking your local and county offices for a cooling center around you so you can be healthy and safe." Chu also emphasized that only certain kinds of masks will protect wearers from fine particles called PM2.5. "Everybody right now is under a mask order for COVID," she said. "However, any mask that is not an N95 or higher will not do anything to protect you from PM2.5 particles from wildfire smoke."

People can still wear their coronavirus protection masks outdoors, but if they don't have N95 masks, "We recommend staying inside to avoid wildfire smoke," she said. Chu said the cooler weather expected on Thursday could help improve air quality by bringing in cleaner air from the ocean and creating better conditions for fire containment. "We hope as temperatures come down a little bit in our inland pockets around the region, and as onshore winds start to pick up, that those combinations will help with fire containment around the Bay Area," she said.

Smoke blankets the Lodi area as wildfires burn throughout state
By K. Cathey Lodi News-Sentinel, Wednesday, Aug. 19, 2020

Lodians on Wednesday woke to pale reddish sunlight attempting to shine through a smoke-blanketed sky, and a fine dusting of ash coating surfaces throughout the city. The city -- and most of San Joaquin County -- is surrounded by some of the dozens of wildfires burning throughout the state, including the SCU Lightning Complex burning in San Joaquin and four other counties, which had grown to 85,000 acres in just under 24 hours since it began on Tuesday, and the fast-growing LNU Lightning Complex in Solano, Napa, Sonoma and Yolo counties. Air quality was poor in Lodi on Wednesday morning, according to AccuWeather, a private weather forecasting firm.

Winds from the northwest have been blowing smoke from the LNU Complex into the Lodi area, said Randy Adkins, a senior meteorologist with AccuWeather. While the wind is expected to shift so that it is coming first from the west, then from the southwest, any relief will likely be short-lived. The SCU complex and several other fires are raging southwest of Lodi. "It does look like you will be dealing with smoke for the next couple of days at the very least," Adkins said. The air quality might improve just a little before the winds shift completely, but by Friday, the wind will most likely be bringing smoke from those fires to the southwest into the area, he said. While the San Joaquin Valley Air Pollution Control District's Real-time Air Advisory Network showed OK air quality for Lodi, Heather Heinks, the district's outreach and communications

manager, warned that the monitors only pick up small particulate pollution, not ash or heavier particles. "The see and smell test should always prevail over what you see on a monitor," she said. The entire Lodi area is under a health caution due to the wildfire smoke despite the RAAN readings, she said.

"If you can, at all costs, stay inside during this time," Heinks said. Employers should be following state guidelines for working in smoke if any of their employees need to work outdoors, she added. Heinks urged local residents to check and, if needed, change the air filters in their homes. "Check the one in your car, too," she said. She also urged residents to check on their neighbors and loved ones, especially the elderly and anyone with health problems. Adkins seconded the recommendation to stay indoors. If possible, he said, close your windows and run air conditioning. Air conditioners are likely to bring a little smoke inside, he said, but it's better than opening the windows and people need to stay cool during the heat wave.

Another thing to keep in mind is that the cloth masks most area residents are wearing to prevent the spread of COVID-19 cannot filter out small particulate pollution, Heinks said. Residents should not assume that their pandemic masks will offer any protection against the smoke outdoors, unless they are specifically rated for pollution use. The Cal Fire website briefly went down on Wednesday morning due to the number of people attempting to access it. It briefly came back up around 10:20 a.m. before going down again around 11:30 a.m. Cal Fire has issued a Red Flag Warning for the Central Valley through Thursday evening, meaning high temperatures, low humidity and winds are raising the risk of fire danger.

The high pressure system that has brought a sweltering heat wave to the Lodi area is also trapping the smoke in the Valley, Heinks said. As of Wednesday morning, the largest group of fires on Cal Fire's incidents page was the SCU Lightning Complex, with at least 20 blazes burning 85,000 acres in Santa Clara, Alameda, Contra Costa, San Joaquin and Stanislaus counties. The fires were 5% contained. "Some of the terrain has little to no fire history with decadent fuels conducive to extreme fire growth," Cal Fire reported on its website. "Overnight, crews saw critical rates of spread and medium range spotting. Increasing west winds tested containment lines in all zones and had crews actively engaged in structure protection." Western San Joaquin County residents were not being asked to evacuate on Wednesday morning, but residents in portions of the other four counties were under mandatory evacuation orders or warnings. An evacuation center had been set up at the Santa Clara County Sheriff's Office in San Jose.

The LNU Lightning Complex in Napa, Sonoma, Yolo and Solano counties is at zero containment with more than 46,000 acres burned as of Wednesday morning, according to Cal Fire. The Ulatis Community Center was serving as an evacuation center, with the Solano County Fairgrounds in Vallejo temporarily housing large animals, and the county animal shelter making room for displaced small pets. Part of the city of Vacaville was under mandatory evacuation orders as one of the LNU Complex fires raced toward it from the northwest. "The fire came so fast in the Pleasants Valley Road area that several families barely escaped, and one was trapped for hours in a field before they could find an opening to get out," the Sacramento Bee reported on Wednesday morning.

Additional nearby wildfires include the Salt Fire near Salt Spring Reservoir just east of Jackson, which is 10% contained as of Wednesday morning after burning 1,500 acres; the CZU Lightning Complex in Santa Cruz and San Mateo counties, which has burned 10,000 acres and is uncontained; and the Dolan, River and Carmel fires in Monterey County. The River Fire, the largest of the three, is 7% contained after burning more than 10,000 acres on Wednesday morning. While the fires are destructive and bad for the air, they are likely to have one small benefit.

"It likely will prevent temperatures from getting as hot as they otherwise would," Adkins said. Whenever the air fills with particulate matter, whether smoke, dust or something else, it tends to slightly lower the temperature closer to the ground, he said. That said, the wildfires are dangerous, and anyone thinking of going to see them up close should think twice, Adkins said. He has seen videos of people trying to approach the fires and drive through them for the thrill of it. Getting that close to a massive fire puts anyone in the car in danger, he said, especially since it's easier to get turned around or lost in thick smoke. It also endangers the first responders who then need to rescue the lost car and get its passengers to safety. For air quality information, visit www.valleyair.org. For updates from Cal Fire, visit www.fire.ca.gov.

Wildfire smoke hangs over Tracy as heat wave continues
Press staff report Tracy Press, Tuesday, August 18, 2020

Update: On Tuesday morning, Cal Fire grouped together 20 separate fires started by lightning strikes across the area covered by the Santa Clara Unit as the SCU Lightning Complex Incident. They include the Canyon Zone fires in the hills near Patterson in Stanislaus County; the Calaveras Zone fires in Alameda, Santa Clara and Stanislaus counties; and the Deer Zone fires near Mount Diablo State Park and Round Valley Regional Preserve in Contra Costa County.

As of 8 a.m., all the fires together had consumed 25,000 acres, and Cal Fire has not yet established any containment lines. The fires are burning through areas of steep, inaccessible terrain, and firefighters must contend with triple-digit daytime temperatures and fast-moving flames. Cal Fire has not given a time frame for full containment of the fires. A smoky haze from grass fires burning out of control in the hills near Patterson hangs over Tracy as the region swelters in a triple-digit heat wave that has triggered widespread rolling blackouts and air-quality warnings.

A group of four fires designated by Cal Fire as the Canyon Zone Fire is burning in Del Puerto Canyon northwest of Patterson, about 21 miles southeast of the intersection of 11th Street and Tracy Boulevard. The fire burned through Sunday night, and brown smoke had crept over Tracy by Monday afternoon, giving the sun a red-orange hue. As of 4:14 p.m., Cal Fire estimated that 1,851 acres had burned and the fires were still entirely uncontrolled.

The Stanislaus County Sheriff's Office has issued mandatory evacuation orders for people who live on Del Puerto Canyon Road from Frank Raines Park to Mines Road. Another group of grass fires near Mount Diablo State Park on Deer Valley and Marsh Creek roads, dubbed the Deer Zone Fires, has consumed 1,161 acres since Sunday and is also burning out of control. Those

fires were sparked by lightning. People across Tracy reported ash falling in their neighborhoods Monday afternoon.

The San Joaquin Valley Air Pollution Control District cautioned valley residents to stay out of the smoky air caused by those wildfires and other fires farther south near Turlock, Fresno County and Los Angeles. The air district warned that microscopic particles in the smoke can trigger asthma, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Young children, older adults, and anyone with existing respiratory conditions, including COVID-19, are especially at risk from this type of air pollution. Anyone who can smell smoke or see falling ash should consider the air unhealthy. The best response is to move indoors to a filtered, air-conditioned environment and keep windows closed.

The air district emphasized that cloth and paper masks used to reduce the transmission of COVID-19 via respiratory droplets are not sufficient to filter out the microscopic particles that make up smoke. At the same time, an extreme heat wave has brought triple-digit temperatures and warnings of rolling blackouts. A statewide flex alert calling for everyone to conserve electricity was issued Sunday and continues through Wednesday.

Temperatures are expected to peak over 100 degrees each day, driving electricity demand higher in the late afternoon and early evening, just as the sun sinks and solar power generation becomes less efficient. In response, people are asked to turn off unnecessary lights; use major appliances in the morning or later at night; and, health permitting, keep thermostats at 78 degrees or higher between 3 and 10 p.m. Flex alerts are issued by the California Independent System Operator, which oversees the state's bulk electrical power system, transmission lines and electricity market.

The goal is to prevent rolling blackouts and other emergency measures. Pacific Gas & Electric Co. notified customers by a recorded voice message that rolling blackouts were possible in the area through Wednesday at the discretion of Cal ISO. The blackouts could last up to two hours until the demand on the power grid stabilizes. A similar alert was issued Friday, followed by a Stage 3 Electrical Emergency, the first declared since the 2001 energy crisis. Accuweather forecasts Tracy's high temperatures to remain in the triple digits through Wednesday, cooling into the high 90s on Thursday but immediately rebounding to triple-digit heat Friday through Monday.

Lightning fires continue to prompt evacuations in multiple counties northwest of Patterson by: Kay Recede KTXL Fox40 News, Tues., Aug. 18, 2020

STANISLAUS COUNTY, Calif. (KTXL) — Fire crews continue to battle the SCU Lightning Complex, a collection of at least 20 fires that have affected at least five counties in the region northwest of Patterson. By Tuesday afternoon, at least 25,000 acres had burned. The sky above Patterson was still very hazy, making it hard to breathe and see in the area. Hotspots still lingered throughout Del Puerto Canyon after a fire sparked 4 a.m. Sunday, affecting San Joaquin and Stanislaus counties.

"I feel sorry for the people that are out there. I hear they're being evacuated now. It's terrible," Newman resident Susan Wells told FOX40. The fires have prompted evacuation orders for Frank Raines Park to Mines Road, Del Puerto Canyon Road 1 mile to Mines Road, Welch Creek Road, Marsh Creek Road round valley to Morgan Territory, all of Morgan Territory and March Creek mobile home park. Kilkare and Mill Creek roads are under warnings.

In Stanislaus County, families said they've come to expect this reality almost every summer. "Every year we have fires; this isn't the first fire up in this area," Wells said. But dealing with each and every fire and the evacuations that come with it they said is always surreal. "I feel bad for all the families that have to evacuate and stuff. That's terrible," said Patterson resident Aaron Hernandez. Cal Fire spokesman Jake Miller told FOX40 over the phone that the steep hills and the current heat advisory impacting California are posing a challenge to fire crews. "Just makes it very difficult for crews to work out there just because of the heat and it's also very conducive to fire behavior," Miller explained. Miller said firefighters train and are prepared for these conditions and are working to get the upper hand. "Getting the crews a lot of fluid and making sure that they're rested overnight," Miller said.

As the haze and smoke continue to make its way into neighborhoods, the San Joaquin Valley Air Pollution Control District advises families to remain inside, especially as temperatures continue to rise above 100 degrees. "Miserable. It makes it totally miserable," Wells said. There was an evacuation center that was set up but a Stanislaus County official told FOX40 that no one used it Monday night. The official said that if there are families who may need shelter, the county will reopen a site.

Note: The following clip in Spanish mentions the Health Caution the Air District issued yesterday due to wildfire smoke impacting the Valley.

Emiten alerta por mala calidad del aire en el Valle Central debido a múltiples focos de incendios Al menos 15 focos de incendios se registran durante esta jornada en California, cuya contención se ha visto dificultada por las altas temperaturas que sacuden al estado. Univision.com, Monday, Aug. 17, 2020

FRESNO, California.- A raíz de los diferentes incendios que azotan el estado, el Distrito de Calidad del Aire del Valle de San Joaquín emitió una advertencia de salud para los residentes del área, la cual se mantendrá vigente hasta que los siniestros sean controlados. Por el momento son seis los focos de incendios que están afectando la calidad del aire del Valle del San Joaquín, pero al menos 15 en todo el estado. En el condado de Los Ángeles, el incendio Lake ha consumido más de 18 mil acres y su contención es del 31%, mientras que por el noroeste llega el humo proveniente del incendio Dee Zone, entre los condados de Contra Costa y Stockton. Un incendio que lleva más de dos días es el incendio forestal Hills, al sur de Coalinga, en el condado de Fresno, el cual ha consumido casi 1,000 acres y los bomberos reportan un 18% de contención de las llamas. Canyon Fire, ubicado en el condado de Stanislaus cerca de Turlock, también está causando problemas en la calidad del aire. Y es que las partículas contaminantes se infiltran y concentran en la cuenca del Valle de San Joaquín, que incluye los condados de Stanislaus, Merced, San Joaquín, Madera, Fresno, Kings, Tulare y la porción del valle del condado de Kern.

La contaminación por estas partículas puede desencadenar ataques de asma, agravar la bronquitis crónica y aumentar el riesgo de ataque cardíaco y accidente cerebrovascular. Las autoridades explican que las estaciones de monitoreo suelen detectar partículas microscópicas de PM 2.5 que existen en el humo . Sin embargo, es posible que otras partículas más grandes, como las cenizas, no sean detectadas. "Si huele humo o ve cenizas que caen en sus inmediaciones, considere la calidad del aire como "insalubre" (nivel 4 de RAAN o superior) incluso si el nivel de contaminación de RAAN (Red de asesoramiento de aire en tiempo real) es menor. Los funcionarios del Distrito de la Calidad del Aire del Valle de San Joaquín advierten que cualquiera que experimente una mala calidad del aire debido al humo de los incendios forestales debe trasladarse al interior, a un ambiente con aire acondicionado y filtrado con las ventanas cerradas. A las 3pm de este lunes, la concentración de ozono en el aire alcanza los 103 ppb, muy cerca del nivel 5. Los niveles de PM 2.5 se mantienen en un nivel moderado, sin embaargo puede que las cenizas no sean detectadas como material microscópico contaminante. Mientras los incendios no sean controlados, se mantiene vigente la advertencia de salud. Por su parte, el Servicio de Metereología de Hanford reiteró temperaturas máximas de hasta 113ºF en algunas zonas del Valle Central para toda esta semana.

Daily Electronic Newspaper Clippings from around the Valley 8/20/2020:

Wildfires Turn Valley and All of California Into a Sci-Fi Landscape
By Bill McEwen GV Wire, Thursday, Aug. 20, 2020

As crews battle 367 wildfires in heatwave-baked California, the satellite view from above shows a state enveloped in smoke. On the ground, firefighters are doing their best to contain the blazes — many of them ignited by nearly 11,000 lightning strikes during a 72-hour period. Strong winds are spreading some of the fires, as well as the smoke that is darkening skies, dropping soot, and making the sun look like something from a sci-fi movie.

Bay Area Air Is Some of the Worst in the World

As bad as the air is in Fresno, it's worse in parts of the Bay Area, which customarily enjoys clear air scoured by ocean breezes. With wildfires burning north, east, and south of San Francisco, the air quality index there on Wednesday among the worst in the world, KQED reported. To compare the Bay Area's air quality to that in the Valley today, click on this link. Because of the wildfires, the Valley Air District has issued a health caution. And, district officials are advising residents to reduce exposure to particulate matter emissions by staying indoors. "PM pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke," the district said in a news release. "Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed." District officials also advise that common cloth and paper masks people are wearing because of COVID-19 "may not protect them from wildfire smoke." A wildfire in Del Puerto Canyon near Patterson in the North Valley is contributing to Fresno area smoke. That fire grew to 137,495 acres overnight — or about 215 square miles — Cal Fire said Thursday morning.

Breathing in Smoke Raises COVID-19 Risk

Dr. Madhavi Dandu, professor of medicine at UCSF, told KQED that breathing smoky air could make people more susceptible to COVID-19. "Air pollution and all type of particulate matter, but especially the particulate 2.5 that we see in fires, can really impact both lung health as well as just general immune health," Dandu said. "One of the things that it does is destroy these little hairs that we call cilia that are in the lungs, which are ways to protect the lungs. They basically wipe off the germs, or spread off the germs, so that they don't eventually get into the bloodstream."

Tracking Valley Air Quality

The air district's Real-time Air Advisory Network tracks air quality throughout the Valley, myRAAN.com. In addition, anyone can follow air quality conditions by downloading the free "Valley Air" app on a mobile device.

Heatwave, Rabid Bats, COVID, Smoky Air, Flex Alert. What's Next for Fresno?
By Bill McEwen GV Wire, Wednesday, Aug. 19, 2020

Today defines what it means to be Fresno Strong. Public health officials are telling folks not to touch dead bats because they could be rabid. The heatwave continues, electricity conservation is a must, the air is smoky, and there's a rabid bat warning amid the coronavirus pandemic.

Wednesday's high temperature is expected to be 107 degrees, and an Excessive Heat Warning remains in effect. Though the state — thanks to conservation efforts by residents — avoided rolling electricity blackouts on Monday and Tuesday, there's a Flex Alert today from 2 p.m. to 9 p.m. Because of wildfires, the Valley Air District has issued a Health Caution and is advising residents to remain indoors. Meanwhile, Fresno is one of 42 counties on California's COVID-19 watch list. And, that means children and parents are having to navigate the first days of distance learning and the usual family dynamics that can be challenging in so-called "normal times." So, where do we begin?

Report but Don't Touch Dead Bats

This heatwave isn't just straining the electricity grid and causing wildfires. It's deadly for bats. Don't be surprised if you find one on the ground near your house or somewhere else. "These bats can be potential carriers of rabies," said the Fresno County Department of Public Health in a news release. "Rabies is a very serious disease and is almost always fatal if not treated before symptoms appear." The department reports that a rabid bat was found in central Fresno recently and six bats last year tested positive for rabies. Make sure dogs and cats are vaccinated. If you come across a dead bat in the city of Fresno, call the Central California SPCA, (559) 233-7722. Residents in unincorporated county areas should call Fresno Humane Animal Services, (559) 600-PETS. For more information on rabies, call (559) 600-3332 or visit www.fcdph.org/PETS.

Wildfires Filling Valley With Smoke

Multiple wildfires are bringing smoke into the San Joaquin Valley and making breathing difficult. People "with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible to the health effects from this form of pollution," the Valley Air District said in a news release. "Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed." The three fires cited by air officials as being responsible for the health: the Lake Fire in Southern California, the Canyon Zone Fire in Stanislaus and San Joaquin counties, and the Hills Fire nine miles south of Coalinga near Highway 33. The Hills Fire has burned 1,500 acres and is 35% contained. Cal Fire reports that 462 personnel are battling the blaze in steep terrain. Containment is expected by Aug. 27. These are a few of the many wildfires underway in California. On Tuesday, Gov. Gavin Newsom declared an emergency, easing the way to secure federal grants and also out-of-state firefighting help.

Rolling Blackouts Averted, but Conservation Still Needed

After warning Tuesday that as many as 2 million homes and businesses might be subject to rotating blackouts, the California Independent System Operator canceled its emergency declaration Tuesday night. “That’s a wrap. You did it, California consumers,” California ISO tweeted, adding: “Thank you for keeping the electricity flowing.” Wednesday morning, the managers of the state’s electricity grid, said that today’s Flex Alert would move up an hour. During a Flex Alert, residents are asked to do whatever they can to save power.

How to See If Your House Might Go Dark

You can follow the state’s electricity supply, current demand, and expected peak demand in real-time at this link. In addition, PG&E customers can look up their address to determine if their household will be affected by a rolling blackout. Visit www.pge.com/rotatingoutages to check your address.

This face mask can also help you with wildfire smoke, experts say. If you can find one
By Summer Lin Fresno Bee and Merced Sun-Star, Thursday, August 20, 2020

People have been wearing masks to curb the spread of COVID-19, but as wildfires burn in California, resulting in elevated levels of pollution, you also may need a mask to protect yourself from smoke. Cloth face coverings and medical masks have been recommended by the Centers for Disease Control and Prevention to slow the spread of the virus, but they aren’t effective in filtering out smoke, ABC7 News reported. It’s best to wear N95 masks, which filter out 95 percent of hazardous matter, but they’ve been in short supply during the pandemic, according to SFGate.

The N95 masks with an exhalation valve, which reduces moisture in the mask and makes it easier to breathe, isn’t the best to wear to stop COVID transmission because it allows air to leave the mask, according to ABC7 News. If someone happens to be asymptomatic, the virus could still leave the mask and infect others. A way to solve this is to block the valve with tape or wear another cloth mask over the N95 mask, SFGate reported. Wildfire smoke can make you more prone to lung illnesses, including COVID-19, because it irritates the lungs, affects the immune system, and causes inflammation, according to the CDC. “Unfortunately, wildfires continue to burn throughout the Bay Area and we expect several days of smoky conditions,” said Jack Broadbent, executive officer of the Bay Area Air Quality Management District. “As respiratory health is top of mind for all of us during the pandemic, it’s crucial that residents take steps to avoid exposure to unhealthy air.”

The CDC recommends limiting time spent outdoors, using a portable air cleaner, air conditioners, heat pumps, fans, and window shades inside, and avoiding creating more pollution by frying food, vacuuming, sweeping or using gas appliances. People more at risk of wildfire smoke effects include: children under 18 years old, pregnant women, adults aged 65 and older, people with health conditions including asthma, diabetes, and lung disease, people of lower socioeconomic status, those who are immunocompromised or taking drugs suppressing the immune system, and outdoor workers.

Multiple wildfires bring toxic smoke to Fresno area. Here is who's at risk
By Jim Guy Fresno Bee, Thursday, August 20, 2020

Multiple wildfires burning throughout California are sending billowing clouds of toxic smoke into the central San Joaquin Valley, prompting a warning to residents from the air pollution control district. Blazes near the region are reported in the Coalinga area, and near Lebec and Turlock. The National Weather Service forecasts that the air quality will not improve until the fires are extinguished. The health caution was issued to residents in Fresno, Merced, Madera, Kings and Tulare counties. The residents were warned to reduce exposure to particulate matter by remaining indoors as much as possible. The air warning will remain in place until the fires are extinguished.

Pollution can trigger asthma attacks, aggravate chronic bronchitis and increase the risk of heart attack and stroke. Those with respiratory conditions, including COVID-19, young children and the elderly are especially vulnerable to the effects of the pollution. Common cloth and paper masks may not be effective against the smoke. For more information, go to www.valleyair.org.

How do you keep wildfire smoke out of your house and car? Tips to keep air pollution away
By Michael McGough Fresno Bee and Merced Sun-Star, Thursday, August 20, 2020
Hundreds of wildfires across California are creating poor air quality conditions throughout most of the state. If you can smell smoke or it makes your eyes sting, you should limit your outdoor time as much as possible because it can be harmful to your respiratory health. If you're in your home and still can smell smoke, you may want to take some preventive steps to prevent even more of that smokey air from getting in. Amid wildfire smoke, "if you are advised to stay indoors, take steps to keep indoor air as clean as possible," the U.S. Environmental Protection Agency advises. How exactly do you do that? Here's some advice compiled from the EPA, the American Lung Association, Sacramento region's Spare the Air and other organizations, including the Bay Area Air Quality Management District.

▪ Keep your home's doors and windows closed.
▪ Run your home air conditioner, but use the "recirculate" setting. Make sure the air conditioner filter is clean. If the filter is dirty or old, you should replace it.
▪ Use an air purifier, but make sure it is one that does not produce ozone.
▪ Check your home's walls, windows and doors for potential openings. Repair or replace any doors or windows with major air leak issues; use caulk on walls or weather-proofing tape or sealants on window to cover up smaller openings. Older homes may be more susceptible to these types of problems, while newer homes are generally built a little bit tighter.
▪ A ceiling fan won't change the quality of the air within your home; it just recirculates it. But if you are choosing to use a ceiling fan in an effort to keep cool rather than air conditioning because you have concerns about your AC system's filtration, be sure to clean the fan, especially if you don't use it frequently, to rid it of any dust particles that may have built up.
▪ While driving, also use your air conditioner's recirculate setting. Do not roll down the windows.
▪ Close air conditioning vents in your vehicle while driving through a particularly smokey area.

Live updates: Fires near Patterson roar to 137,000 acres; evacuation orders expanded
By Patty Guerra Fresno Bee, Merced Sun-Star and other papers, Thursday, August 20, 2020

The series of fires that includes the blaze burning in Del Puerto Canyon near Patterson exploded overnight to 137,495 acres, Cal Fire said in a news release Thursday morning. That's roughly 215 square miles burning in fires believed to be caused by lightning starting on Sunday night. "Crews were once again engaged in structure defense throughout the night," the release said. "Damage assessment is ongoing."

High temperatures and low humidity have made fighting the fire, which is burning some areas of steep terrain that have never had fire before so the overgrowth is feeding the fire, Cal Fire said. "Fire perimeter and control efforts have been hampered by extreme fire behavior and accessibility issues," the news release said. "Crews will continue to scout for safe access points and build direct and indirect fire line where possible." On Wednesday, at least five people were injured in the fire and had to be rescued, authorities said. Smoke and ash in the air for miles around led to a health warning from the San Joaquin Valley Air Pollution Control District. According to the district's air monitors, air quality in cities as far away as Modesto, Turlock and Merced remained poor at 9:45 a.m.

Thursday, though it was down from its peak about 8 a.m. Stanislaus County Sheriff Jeff Dirkse said that the department's helicopter was able to fly from the canyon to Frank Raines Park to assess the damage on Wednesday, and found that more than half the buildings, which he described as either houses, hunting shacks or outbuildings, did not have noticeable damage. He said the helicopter would be back Thursday when deputies could do a more complete search of the canyon. On Friday, they planned to assess damage west of Newman. They could not get to that area on Wednesday because of the fire.

Thursday update: Merced's air quality remains at unhealthy levels from wildfires
By Shawn Jansen Merced Sun-Star, Wednesday, August 19, 2020

The San Joaquin Valley Air Pollution Control District is advising Merced residents to stay inside, as the air quality has reached unhealthy levels due smoke accumulating from wildfires in the state. The fine particle matter measurement in Merced reached Level 5 — the highest level of air pollution — for the second consecutive day on Thursday, said district spokesperson Heather Heinks. Merced climbed to Level 5 at 7 a.m. and has remained at that unhealthy level through noon.

"The smoke impact is definitely more widespread today," Heinks said. "The last three hours (from 8:30 a.m. to 11:30 a.m.) we're seeing significant particle matter pollution in Merced. Today is a day to be cautious and stay inside if you can." Heinks also recommends changing the air filters in your home and car to make sure they are working properly so they keep the smoke out. Heinks say people with respiratory conditions, including those suffering from COVID-19, should stay away from air pollution as much as possible. Those who are required to work outside should check with their employer, Heinks says. "If you can see it and smell it, the air is having an impact on you," Heinks said. The Canyon Fire, located near Turlock, the Hills Fire, which is

located in Fresno County and the Lake Fire located in Los Angeles are all contributing to the smoke that has settled in the San Joaquin Valley.

According to experts, particle matter pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Heinks says the poor air quality will continue for the next couple days. “We do expect it to linger the next couple days as long as the fires are raging,” Heinks said. “Prepare to hunker down inside for the next couple days.” Information on air quality due to wildfires can be found at www.valleyair.org/wildfires.

Air quality hits danger zone in Bay Area as thick smoke, ash blanket the region
By Susanne Rust and Rong-Gong Lin II, Los Angeles Times Merced Sun-Star, Thursday, August 20, 2020

SAN FRANCISCO -Massive fires ringing the San Francisco Bay Area are continuing to create dangerous air quality.In many neighborhoods, a layer of ash has covered the ground, distributed by gusty winds and adding to the pollution that is clouding much of the area. The American Lung Association warned that excessive heat, wildfire smoke and COVID-19 posed risks to those most vulnerable to respiratory problems. "The combination of uncontained wildfires and extreme heat has created conditions that put even healthy individuals at risk," said Dr. Afif El-Hasan, an association spokesman. "The ongoing COVID-19 pandemic only makes these potential effects more serious."

Intense smoke and heat can trigger coughing and wheezing, worsen lung function and lead to bronchitis or even death, he said. "The best thing you can do is to avoid outdoor air," San Francisco Mayor London Breed said. The poor air quality will likely continue until the fires are mostly contained, officials said. A status report Wednesday from the California Department of Forestry and Fire Protection on the fires that make up the LNU Lightning Complex suggests conditions may not improve until Sept. 1. Officials noted that although most cloth masks, including bandannas, help protect against the spread of COVID-19, they do not protect against particulate matter from the smoke.

The Air Quality Index is the yardstick the Environmental Protection Agency uses for reporting air quality. Levels ranging from 151 to 200 are considered unhealthy; from 201 to 300, very unhealthy; and 301 and above, hazardous. "Smoke can irritate the eyes and airways, causing coughing, a dry, scratchy throat and irritated sinuses," the Bay Area Air Quality Management District said. "Elevated particulate matter in the air can trigger wheezing in those who suffer from asthma, emphysema" and other chronic respiratory ailments. Here are some tips and warnings from the Bay Area Air Quality Management District on dealing with the bad air:

– Staying indoors, where the air quality is better, with windows and doors closed is the best way to protect your health. During high-heat and heavy-smoke events, keep indoor air cool or visit a cooling center.
– Set air conditioning units and car vent systems to recirculate to help prevent outside air from moving inside.
– Avoid adding additional air pollution. Curtail activities such as wood burning, lawn mowing, leaf blowing, driving, barbecuing, or other dust-producing activities.

– Bandannas and typical surgical masks do nothing to protect against wildfire smoke particles.
– If individuals desire a mask, only N-95 or N-100 respirator masks should be worn. But there's no clear evidence that N-95 respirator use by the general public is beneficial to an individual's health during wildfire smoke air quality events. Further, officials warn that, when dealing with heavy smoke from fires, taking a mask on and off can cause fine particulate matter to build up in the mask, which the wearer will breathe when it is put back on the face. In addition, those who wear a mask to protect from fire smoke can have a false sense of security that leads to overexertion.
– Do not save and reuse N-95 masks.
– When dealing with heavy-smoke events, N-95s may be dangerous for some people with lung or heart conditions.
– Certified N-95s are not available for children. Children should not wear these masks – they do not fit properly and can impede breathing.

California slammed by wildfires, heat, unhealthy smoky air
By Daisy Nguyen and Seth Borenstein, Associated Press Merced Sun-Star, Wednesday, August 19, 2020

SAN FRANCISCO - Northern Californians were confronted with multiple threats as wildfires, unhealthy smoky air, extreme heat, the looming possibility of power outages and an ongoing pandemic forced many to weigh the risks of staying indoors or going outside. Ash sprinkled the ground and smoke from several wildfires cast an eerie glow over much of the San Francisco Bay Area on Wednesday, creating unhealthy air quality and heightening concerns about people most prone to respiratory illnesses.

As ozone pollution reached unhealthy levels in some places, the region's air district and public health officials urged people to stay inside with windows and doors shut until the smoke subsided. There was no relief in sight: the forecast for Thursday called for some of the worst air in the world, with the air quality index doubling in the densely populated parts of the Bay Area. The region's air district extended a “Spare the Air” alert through Sunday, which makes it illegal to burn wood. Smoke can irritate the eyes and airways, causing coughing, a dry scratchy throat and irritated sinuses.

Elevated particulate matter in the air can trigger wheezing in those who suffer from asthma, emphysema or COPD. “I'm feeling lightheaded and I'm a healthy 30-year old. Imagine what it's like if you're an older person or have asthma,” said Kyle Laurentine of San Mateo. “I worry, especially in the COVID-19 era, that we're in a state of respiratory vulnerability.” But with a statewide call to conserve energy to avert another rolling power outage, people sweltering in a prolonged heat wave and surrounded by smoke must choose between cranking their fans and air conditioners or shutting them down to conserve energy. “These disasters need solutions that are in direct conflict with each other," said Jennifer K. Balch, a fire scientist at the University of Colorado. “COVID-19 is forcing us outside to reduce transmission risk while extreme wildfire smoke is forcing us back inside where the air is better. We’re running out of options to cope, under the weight of compound disasters.”

If it gets too hot indoors, Erin DeMerritt with the Bay Area Air Quality Management District suggested visiting cooling centers where they are available or any indoor space with filtered air while following mask-wearing and social distancing protocols. “It’s also important to note that bandannas and masks used to protect yourself from the coronavirus do nothing to protect against smoke from wildfires,” she added.

The Bay Area has seen unhealthy levels of air pollution the last four consecutive years from smoke blowing from huge wildfires that devastated wine country in 2017 and the town of Paradise in 2018 and caused widespread evacuations in Sonoma County last year. Wednesday's poor air quality came on quickly as the Bay Area was socked in by exploding wildfires to the north, south and east. Scientists said over the decades climate change's warmer, drier weather is making much more of California burn.

Exposure to wildfire smoke can lead to real health problems, including asthma and heart attacks, said Colorado State University atmospheric scientist Jeff Pierce, who has worked with epidemiologists on the health effects of wildfires. “Very unhealthy” air quality forecasts usually double hospitalizations for asthma but it may be different this year with people afraid to go to the hospital because of the coronavirus, he said.

Smoke can even penetrate homes, making it hard for vulnerable people, including those sick from coronavirus, to escape, Pierce said. Scientists said a top health concern with smoke are the fine particles that get deep into the lungs. “I consider wildfire smoke kind of like tobacco smoke without the nicotine,” said Dr. John Balmes, a professor of pulmonary medicine at University of California, San Francisco and environmental health at University of California, Berkeley.

Recent studies from China and Europe suggest such particles can increase the risk of progression for patients who have milder conoravirus cases to more severe symptoms, he said. The particles can damage the lung lining, triggering the body’s natural immune system to overreact with inflammation to fight off a non-existent infection. In that way it makes the injury worse, he said. Other immune system responses can also cause more problems than the smoke itself, something that can happen in coronavirus situations, he said.

The coronavirus was on Fae Gershenson's mind when she opened her 70-acre ranch to people fleeing a lightning-sparked wildfire north of Santa Cruz Tuesday evening. She had the space for evacuees' tents, stalls for their farm animals and an outdoor composting toilet to allow for physical distancing. But when a family arrived with a 95-year-old grandmother, Gershenson said she was worried about the smoke's effect on older people and invited the woman into her house. “We talked about how to keep each other safe; everyone's conscious about wearing masks,” Gershenson said. She said wildfires have threatened her property in the Santa Cruz mountains a few times before, and with a neighbor helping manage her children's distance learning, she has the ability to help evacuees. “I have no idea how people can do it right now,” she said. “I don't think it's going to be normal for quite some time.”

Lightning blitz keeps wildfires raging across California
By Janie Har and Martha Mendoza, Associated Press Merced Sun-Star and Modesto Bee, Thursday, August 20, 2020

SANTA CRUZ, Calif. - More than two dozen major fires were scorching California on Thursday, largely the result of an unprecedented lightning siege that dropped nearly 11,000 strikes over several days. “This is definitely a historic lightning event,” said Daniel Berlant, an assistant deputy director with the state Department of Forestry and Fire Protection. “The last time we had a lightning siege that was even comparable was in 2008.” The fires have destroyed 175 structures, including homes, and are threatening 50,000 more, he said; 33 civilians and firefighters have been injured. Most of the activity is in Northern California, where fires have chewed through nearly 500 square miles (1,250 square kilometers) of brushland, rural areas, canyon country and dense forest surrounding San Francisco. Fires also burned in the Sierra Nevada and Southern California wild lands.

With so many burning at once, firefighters say they're unable to tap resources such as extra personnel and equipment. In Marin County, just north of San Francisco where a small fire is burning near the Pacific Ocean, county fire chief Jason Weber said they are waiting for assistance from Montana to arrive this weekend. He said that in his 25 years in fire service, “we’ve never seen this level of draw-down" with heavy competition within the state and in the western U.S. for equipment and people. Berlant said the state has requested 375 engines from out of state, with some already in the state and others scheduled to arrive soon.

About 26,000 people in Santa Cruz County were under orders to evacuate, sheriff’s department chief deputy Chris Clark said Thursday. Another 1,000 people in neighboring San Mateo County were also under evacuation orders as the so-called CZU August Lightning complex fire grew overnight to 62 square miles (160 square kilometers). Officials said the fire had the potential to grow significantly in the next 24 hours and one of the tools they have— given stretched resources— was for people to leave their homes when told. But some people refused when officers went door-to-door Wednesday night, said Cal Fire Chief Mark Brunton. “With the resources that we are lacking, we ask you to help us to help us to do our jobs and to keep the public safe," he said. Kevin Stover, 42, was struggling with indecision early Thursday morning when a mandatory evacuation order was issued for the rugged and small town of Felton outside the beach city of Santa Cruz.

“I don’t want to leave,” said Stover, a camera operator and rigger now driving for Door Dash and Lyft because of the pandemic. His car, loaded with important papers, his father’s urn and some arrowheads that meant a lot to him, had a flat tire. He had put a plug in the tire and patched it with gaff tape. “I’m trying to figure out if I should cut these original oil paintings out of the frame to salvage them,” he said. In addition to about two dozen major blazes, small fires kept erupting, though most were quickly stopped.

In central California, a pilot on a water dropping mission in western Fresno County died Wednesday morning when his helicopter crashed. The pilot was working with Fillmore-based Guardian Helicopters, which had a contract with the state fire agency to provide emergency services, said Zoe Keliher, an investigator with the National Transportation Safety Board. A

Pacific Gas & Electric utility worker died at a fire in the Vacaville area between San Francisco and Sacramento but circumstances were not clear. The worker was found in a vehicle and CPR was performed but he was pronounced dead at a hospital, said a California Department of Forestry and Fire Protection statement. He had been clearing poles and lines to make the area safe for firefighters, Cal Fire said. The state recorded nearly 11,000 strikes in 72 hours, Gov. Gavin Newsom said Wednesday.

Two fires in Sonoma County prompted evacuation orders for 8,000 residents near the Russian River Wednesday and residents of Healdsburg, which has a population of about 12,000, were warned late Wednesday night to be ready to flee. Ash and smoke filled much of the air in San Francisco from another cluster of fires — known as the LNU Lightning Complex — in Sonoma and other counties north of San Francisco that destroyed more than 100 buildings, including some homes, and threatened 25,000 others in five counties. “Fires are making runs in multiple directions and impacting multiple communities.

A critically dry air mass is moving over the area bringing strong winds," a Cal Fire statement said Wednesday night. Travis Air Force Base ordered non-mission essential personnel to evacuate, officials said. Residents in nearby Vacaville, a city of about 100,000, were roused before dawn Wednesday by orders to flee. In eastern San Francisco Bay, a cluster of 20 separate lightning-sparked fires called the SCU Lightning Complex threatened about 6,200 buildings in five counties. California State Parks announced full or partial closures of more than two dozen parks, including Big Basin Redwoods in the Santa Cruz Mountains, where the park headquarters and other facilities were damaged. The park featuring magnificent towering stands of ancient coast redwoods dates to 1902 and is the state’s oldest. Some firefighters were working 72-hour shifts instead of the usual 24 hours.

In Southern California, firefighters worked in high heat to increase containment of fires in mountains north and east of Los Angeles. A huge fire also burned in the remote Mojave National Preserve.

2,500-acre fire near Big Sur is 0% contained, leading to Highway 1 and parks closures
By Cassandra Garibay Merced Sun-Star, Thursday, August 20, 2020

The Dolan Fire near Big Sur held at 2,500 acres and was 0% contained as of Thursday morning, according to the Los Padres National Forest Service. Highway 1 remained closed from Ragged Point in San Luis Obispo County to Pfeiffer Burns State Park in Monterey County, according to CalTrans. The area east of Dolan Canyon was evacuated Wednesday, and many state parks in and near Big Sur were closed. According to the California Department of Parks and Recreation, the following parks are closed for camping, hiking and day use:

- John Little State Natural Reserve,
- Limekiln State Park,
- Julia Pfeiffer Burns State Park,
- Pfeiffer Big Sur State Park,
- Andrew Molera State Park,
- Point Sur State Historic Park,

- Garrapata State Park, and
- Point Lobos State Natural Reserve.

Officials believe the Dolan Fire was started intentionally around 8 p.m. Tuesday in John Little State Nature Reserve south of Slates Hot Springs. The Monterey County Sheriff's Office arrested 30-year-old Fresno resident Ivan Geronimo Gomez on suspicion of arson of forest lands, according to a Sheriff's Office Facebook post on Wednesday. The Los Padres National Forest Service tweeted that smoke inversion prevented firefighters from using air resources Wednesday. The fire was burning through steep terrain and had lots of fuel, but little wind, according to the national forest service.

The Dolan Fire has contributed to smoky skies throughout San Luis Obispo County — and the worst air quality in the nation in parts of the county, according to air quality monitoring company IQ Air. The River Fire and Carmel Fire in south Monterey County have also been a factor in the dangerous increase in particulate matter in San Luis Obispo County. The River Fire began Sunday and had grown to 33,653 acres as of Thursday morning, Cal Fire reported. The wildfire near Salinas had destroyed six structures, damaged two and continued to threaten 2,500 more as of Thursday morning, according to the agency.

The River fire was 7% contained and burning in all directions Thursday morning. Full containment is expected by Aug. 30, according to Cal Fire. As of Thursday, four firefighter have had minor injuries as a result of that fire, according to Cal Fire. The Carmel Fire near Carmel had grown to 4,385 acres as of Thursday morning and remained 0% contained, Cal Fire said. Three structures were destroyed and 311 were threatened as of Thursday.

Wildfires continue to make California's air quality unhealthy, including Sacramento
By Michael McGough Sacramento Bee, Thursday, August 20, 2020

The skies are darkened by haze, and you may have woken up to ash on your car for a second straight day. How unhealthy might Thursday's air conditions be in Northern California? Smoke from ongoing wildfires, especially the two major lightning complexes raging in the North Bay and the Santa Cruz area, continues to seriously impact air quality across the state, including the capital region. Conditions in many parts of the state are bad enough to pose a hazard to those spending any significant stretch of time outdoors, or anyone who may be allowing outside air into their home.

The air quality index Thursday morning ranged from "unhealthy" to "very unhealthy" levels across wide swaths of the greater Sacramento area, according to the nationwide monitor at AirNow.gov and local readings from SpareTheAir.com. There's significant particulate matter (PM 2.5) pollution across a vast majority of California, those monitors show. A general rule of thumb: If you can smell wildfire smoke or it stings your eyes or throat, any significant time spent in those conditions can be hazardous to your health. If you're outside, head indoors; if you're inside your home and you can still smell it, you should take measures from air conditioning improvements to sealing up window cracks, to smoke-proof your home.

In terms of actual measurable pollution levels, Thursday's worst readings are predictably in the immediate vicinity of the two 120,000-plus-acre fires currently burning in the North Bay and South Bay areas. The SCU Lightning Complex burning in the Santa Cruz mountains has surged AQI levels past 300, into "hazardous" territory for roughly the northern half of Santa Cruz County, according to AirNow. And the LNU Lightning Complex, which since early Wednesday has rolled into the areas just east into Solano County from Napa, pumped the AQI up to around 285 in the Vacaville area shortly before 8:30 a.m., according to a Spare the Air alert.

Air quality maps also show AQI levels from 101 to 150 (orange shading, denoting "unhealthy for sensitive groups") and 151 to 200 (red, meaning unhealthy for the general population) blanketing essentially the entire Sacramento region. The south and east parts of Sacramento County, including all of Elk Grove, Galt, Sloughhouse, Rancho Murieta and parts of Folsom, are in red; the rest of the county is in orange. In Yolo County, the Davis area was in orange territory as of 10 a.m. Thursday, and most of the county from Esparto to its west border with Napa is in red, unhealthy territory.

The southwest corner of Yolo, in and around Winters, has "very unhealthy" AQI readings between 201 and 300 that are marked light purple on the maps. A solid chunk of the foothills and all of the Lake Tahoe area are in the red, too: the entirety of Amador, Calaveras and Alpine counties, plus most of El Dorado County and the east half of Placer County had unhealthy air conditions Thursday morning, according to AirNow.

Heat, smoky air fill Modesto, but for how long? MID, TID hit record for power demand
By John Holland Modesto Bee, Wednesday, August 19, 2020

One of the worst hot spells in years continued Wednesday, with Modesto-area temperatures expected to top 100 for a seventh straight day.

The heat combined with wildfire smoke to make breathing hard for people with respiratory conditions. But everyone might want to just stay inside if possible to avoid heat stress and related ills. The National Weather Service forecast a high of 104 in Modesto on Wednesday. The heat peaked at 102 to 109 over the previous six days, according to the Modesto Irrigation District. The threat extends over the Central Valley and adjacent foothills, which have seen a sudden burst of fires, including one in the hills west of Patterson. "The entire population could be impacted by long-duration extreme heat with little to no relief overnight," said a Wednesday morning advisory from the Sacramento office of the Weather Service.

The weather service's extreme heat warning was set to expire Wednesday night at 9 p.m. The San Joaquin Valley Air Pollution Control District extended its Air Quality Alert, which it issued on Monday. The weather service also issued Wednesday a Red Flag Warning for the low humidity and high winds, which will continue to hamper firefighters. That will remain in effect until Thursday at 9 a.m. A dozen cooling centers await around Stanislaus County for people who don't have their own air conditioning. They do not include Vintage Faire Mall, which had been on an initial list and is mostly closed by the pandemic. The heat wave caused record electricity demand in both MID and the Turlock Irrigation District. Both reported no major outages so far this week but urged customers to conserve. A brief dip into the upper 90s

The forecast calls for Modesto highs of 97 on Thursday and Friday, followed by three days at 100 and 99 on Tuesday. Also of concern is the lack of nighttime cooling that usually happens during Modesto-area summers. The city got down to only 80 early Wednesday and 82 a day earlier, MID reported. Heat-stressed people and livestock usually benefit from overnight breezes from the Sacramento-San Joaquin Delta. The good news: Overnight lows around 70 are forecast over the next few days, including a brisk 67 as Friday dawns.

MID and TID prepared for demand

MID had record demand of 702 megawatts Monday, followed by 695 on Tuesday, spokeswoman Melissa Williams said by email. The district got through it by activating a program where some customers agree beforehand to have their AC switched off temporarily. Some commercial and industrial users also cut demand. "Despite the heat and record peak, we experienced only a few heat-related power outages Monday," Williams said. Wednesday's smoke layer was expected to tamp down the demand to about 690 megawatts, she said. TID's electricity demand hit a record 692 megawatts Monday, spokesman Brandon McMillan said by email. It dipped to 690 on Tuesday and was forecast at 680 on Wednesday. TID reported no major outages, but McMillan advised that the heat can cause localized stresses on the lines. "The district has procured enough energy resources to meet the increased demand throughout the heat wave," he said. "However, we appreciate our customers' conservation efforts to help reduce the strain on the system."

Update for customers of PG&E

Some people in Stanislaus County get power from Pacific Gas & Electric Co., which also serves Tuolumne and other mountain counties.

The utility said California avoided rotating outages for a third straight day on Tuesday. It credited conservation efforts and urged customers to keep it up. Among the tips:

- Run the AC in the morning, when electricity supplies are not stressed, then keep the thermostat at 78 degrees when at home during the rest of the day, health permitting. Turn it up to 85 or turn it off when not at home.
- Use a ceiling fan to help spread the cooled air. Turn off fans and lights when you leave the room.
- Cover windows with shades and awnings.
- Avoid using the oven in favor of the stove top, microwave or outdoor grill.
- Don't open the fridge too often. The average family does it 33 times a day.
- Run dishwashers and laundry machines early in the day or late at night.
- Check on elderly or frail people at risk from the heat.
- Drink plenty of water, even when you are not thirsty.
- Take a cool shower or bath and wear lightweight, loose, light-colored clothing.
- Stay out of direct sunlight.
- Avoid alcohol and caffeine.

Wildfires prompt poor air quality, health caution
By Sabra Stafford Turlock Journal, Tuesday, Aug 18, 2020

Multiple wildfires burning in and around the Central Valley, including one in Del Puerto Canyon in Patterson, are creating some unhealthy air conditions for Valley residents. As a result, the San Joaquin Valley Air Pollution Control District is issuing a health caution, which will remain in place until the fires are extinguished. Air pollution officials caution Valley residents to reduce exposure to the particulate matter emissions by remaining indoors. PM pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Individuals with heart or lung disease should follow their doctors' advice for dealing with episodes of PM exposure.

Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible to the health effects from this form of pollution. Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed. The common cloth and paper masks individuals are wearing due to COVID-19 concerns may not protect them from wildfire smoke.

The fire in Del Puerto Canyon is part of the SCU Lightning Complex fire being fought and monitored by Cal Fire. It includes 20 fires in three zones - Deer, Calaveras and Canyon - and has burned an estimated 25,000 acres, most of which is in the Canyon Zone. It is 0 percent contained as of Tuesday afternoon. "Overnight, crews worked hard to improve and strengthen existing control lines while aggressively attacking fires where accessible," Cal Fire wrote in the incident update. "Challenges for firefighters include dangerous rate of spread, medium range spotting and inaccessible terrain combined with triple digit temperatures." A mandatory evacuation order has been issued for residents on Del Puerto Canyon Road from Frank Raines Park (Stanislaus County) west to Mines Road (Santa Clara County) due to increased fire activity on the Canyon Fire.

'Extreme behavior': Residents flee California fire as blaze storms into Vacaville
Staff Reports The Stockton Record, Wednesday, Aug. 19, 2020

VACAVILLE – Vacaville residents awoke in the darkness Wednesday morning to frantic evacuation orders as an uncontrolled wildfire burned into the western edge of the city and destroyed at least 50 structures. In Solano County, a rural area southeast of Vacaville, some residents fled for the first time ever. "I've lived here for 30 years, never had to evacuate before," resident Tim Lukehart said. "There's been fires of course, but not like this one." Travis Air Force Base has ordered immediate evacuations for non-mission essential personnel; mission essential personnel should contact their chain of command for duty status, the base said in a statement Wednesday evening.

Vacaville, a city of about 100,000 is located between San Francisco and Sacramento. The blaze moved quickly Monday night in the sweltering temperature. The air had an orange, smoke-filled hue for miles, with ash covering vehicles. Homes were burned down on both sides of Pleasant Valley Road, the street where Lukehart lives with his wife Sarah. Wooden fences were still in

flames, and one family was chasing their cattle through a field as they tried to bring the animals home to safety as the grass smoldered.

A rescue effort to save about 125 horses failed as owners could not get trailers to the area or access by foot. The LNU Lightening Complex fire is the second-largest burning in California Wednesday, according to the California Department of Forestry and Fire Protection. As of 8 a.m. Wednesday, it had burned 46,225 acres and firefighters had zero containment. The fire began Tuesday at 9:20 p.m. and is now burning in both Sonoma and Napa counties, Cal Fire said. The state is currently battling multiple fires as the August heatwave is taking its toll on California. The LNU lightning complex fire stretches across parts of three counties and the fire threatens more structures, according to officials. At about 5 p.m., a portion of Interstate 80 was shut down by the California Highway Patrol because of wildfires.

Governor declares state of emergency

Gov. Gavin Newsom said firefighters are battling 367 known wildfires across California, including 23 that are considered major fires. Of those 367 fires, "the prospect of that number going up is very real," he said at a press conference Wednesday. California Department of Forestry and Fire Protection spokeswoman Lynnette Round told Reuters that "in the last 72 hours we've experienced an historic lightning siege with 10,849 strikes causing more than 367 new fires." Newsom declared a statewide emergency Tuesday, saying the blazes were "exacerbated by the effects of the historic West Coast heat wave and sustained high winds." Television footage showed some homes in flames and thick ash dropping in a rural area near Interstate 80 as the fire appeared to head toward more densely populated areas. In all, the fires have burned more than 71 square miles of land in Napa and Sonoma counties.

No evacuations in Winters

As of 11 a.m. Wednesday, evacuation orders had not been issued within the city limits, according to Mayor Wade Cowan. The unincorporated town has about 7,200 residents and is just over 16 miles north of Vacaville. The city's public safety facility, the combined police and fire departments, opened in the morning to assist residents, but no one has needed shelter in the city at this point, he said.

"The evacuation order that is mandatory is to the west of us," he said. "The last I heard from our fire chief, they are currently doing some back fires to try to make a better buffer between the city and the fire lines." The fire moved quickly Monday night, forcing residents to flee their homes before the sunrise. Sarah Lukehart said she left at about 2 a.m. Tuesday, and her husband a few hours later. "I left at 5 a.m., and there was fire on three sides of me," Tim Lukehart said Wednesday afternoon. "A neighbor came down a few hours later and said our house was OK. But who knows now."

Fire departments from the cities of Oakland, Hayward, Berkeley, and Fairfield and the counties of Contra Costa and Alameda sent crews to battle the blaze. Local residents set up areas for people to gather and watered down fields in the path of the fire. Due to the fire, the San Joaquin

Valley Air Pollution Control District has issued a health caution because of the hazy conditions caused by smoke from the wildfires burning throughout California.

Officials are asking Valley residents to reduce their exposure to particulate matter by remaining indoors. Particulate matter can trigger asthma attacks, aggravate chronic bronchitis and increase the risk of heart attack and stroke. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible. Common cloth and paper masks being worn because of COVID-19 concerns may not provide protection from wildfire smoke. It has become a waiting game for many involved to see what, if any, of their property survives. Farm owner John Pierson, had decided not to evacuate, stating that his property is surrounded by green grass and he has stored plenty of water for the livestock.

Rachel Hawkins, her family and pets, which includes a dog and cat, evacuated early on Tuesday. She spent the next several hours parked in her car in an orchard, hoping she had a home to return to. "The fires was moving fast Monday night, but seems to have slowed down a bit," Hawkins said. "All you can do is hope." This is a developing story and will be updated throughout the day.

Smoke from California wildfires impacting San Joaquin Valley air quality
By Genette Brookshire The Stockton Record, Wednesday, Aug. 19, 2020

The San Joaquin Valley Air Pollution Control District has issued a health caution because of the hazy conditions caused by smoke from the wildfires burning throughout California. Officials are asking Valley residents to reduce their exposure to particulate matter by remaining indoors. Particulate matter can trigger asthma attacks, aggravate chronic bronchitis and increase the risk of heart attack and stroke.

Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible. Common cloth and paper masks being worn because of COVID-19 concerns may not provide protection from wildfire smoke.

• If you see or smell smoke in your immediate area, stay indoors, if possible, with windows and doors closed and use air conditioning to recirculate air to avoid drawing outside air inside. Also, in your vehicle, use the "recirculating" air function.
• Those with heart or lung disease, older adults, pregnant women and children should avoid prolonged or heavy exertion outside. Outdoor activities should be moved or rescheduled for when the air quality improves. If that's not possible, at least take several breaks during the outdoor activity.
• Ensure family members with heart disease or lung problems such as asthma, bronchitis or emphysema are following their doctor's advice about medicine and their respiratory management plan. Seek help if symptoms worsen.

For people who have not been previously diagnosed with a chronic lung or heart disease, health officials note that smoke can "unmask" or produce symptoms of those conditions such as chest pain or tightness, shortness of breath or fatigue. If they appear, contact a doctor. It also is advised to keep airways moist by drinking lots of water. You also can breathe through a warm, wet

washcloth to help relieve dryness. Residents can track air quality at myRAAN.com and find out which fires are affecting the air at www.valleyair.org/wildfires.

Sunny, stagnant and smoky conditions continue By Elaina Rusk KERO ABC 23, Thurs., Aug. 20, 2020

BAKERSFIELD, Calif. — If you were outside Wednesday, you know that the Valley was covered in a thick layer of smoke. As the high pressure responsible for our heat the last two weeks starts to shift south into Arizona today, that will allow more of a westerly flow for Kern County. Unfortunately that shift in wind direction will also push more smoke from the complex fires near the Bay Area into the valley, leading to more dense smoke filling into Kern County. The 5-15 mile per hour winds are enough to push the smoke in, but not enough to push it out, so it remains trapped here in the south valley and mountains and will continue to get worse the next few afternoons. So air quality is unhealthy for everyone and we have an Air Quality Alert in effect through Tuesday next week.

Everyone should avoid exposure to this particle pollution and remain inside in the air conditioning as much as possible. As a result of that shifting high pressure and westerly ocean wind today, we should "cool down" a few degrees from yesterday's 104 to today's expected 101 in Bakersfield. That's obviously still hot and above average, but not near daily heat records. As a result of that downward shift in temperatures, our Excessive Heat Warning was allowed to expire early here in the south valley, after being in effect for a week.

The Excessive Heat Warning for the Kern Desert was extended through tomorrow as they are expecting afternoon highs of 105 and hotter the next two afternoons. The Kern River Valley finally gets a break from the triple digits, with a forecast in the 90s this afternoon. The low 90s are expected again today in Tehachapi and Frazier Park. We're staying sunny, stagnant, hot and dry for the next several afternoons, then we'll start dragging more tropical moisture into the region Sunday, leading to a renewed thunderstorm threat for Kern County through Tuesday. So it will feel more humid with the continuation of the heat and haze with a chance that thunderstorms could lead to heavy localized rain, small hail, dangerous cloud-to-ground lightning and gusty winds. The long range forecast keeps Bakersfield hovering around that 100 degree mark through the end of the month.

Back to that bad air quality...

Our partners at the Valley Air District say if you can smell smoke and see ash, that is an indication that you should be treating air quality conditions as RAAN Level 4 or 5 and take the following steps to limit your exposure:
1. Limit your outdoor activities, especially children and people with chronic heart and lung diseases.
2. Remain inside air conditioned buildings. Note: If you do not have an air conditioner, staying inside with the windows closed may be dangerous in extremely hot weather. In these cases, seek alternative shelter.

3. If you have asthma or other lung diseases, make sure you follow your doctor's instructions about taking your medicines and following your asthma management plan. Call your doctor if your symptoms worsen.
4. If you are an older adult, have children, or if you have heart or lung diseases, talk with your doctor about whether you should leave the area.

Please note: Smoke is a mixture of gases and fine (microscopic) particles that can cause health problems. The RAAN monitors are designed to detect these fine particles. Ash pieces, however, are much larger in size and will not be detected. If an area is covered in ash, air quality should be considered a RAAN Level 4 or higher, even if the monitor reflects a lower reading.

'Historic lightning siege:' Thousands flee as hundreds of wildfires blaze across California By Doyle Rice, Scott Linesburgh and Elinor Aspegren USA TODAY, Thurs., Aug. 20, 2020

VACAVILLE, California — Thousands of people are under evacuation orders in regions around the San Francisco Bay Area on Wednesday as wildfires blazed across the state amid a blistering heat wave now in its second week. Smoke blanketed San Francisco, and could be seen from space, per satellites at the National Weather Service. In all, Gov. Gavin Newsom said firefighters are battling 367 known wildfires across California, including 23 that are considered major fires. Of those 367 fires, "the prospect of that number going up is very real," he said at a press conference Wednesday. Newsom blamed "the extraordinary weather we're experiencing and all of these lightning strikes" for the fires. He said the state has recorded nearly 11,000 lightning strikes in 72 hours.

A helicopter fighting the blaze crashed in Coalinga, California Wednesday morning, killing the pilot and sparking a new wildfire, which then merged into the nearby Hills Fire. The blaze burning near Vacaville was dubbed the Hennessey Fire, but there are so many fires burning in the area that firefighters have put them all under one incident – the LNU Lightning Complex – for reporting purposes, Weather.com said. In all, those fires have burned around 72 square miles of land in Napa and Sonoma counties, and are 0% contained. Residents of Vacaville, a city of about 100,000 between San Francisco and Sacramento, awoke in the darkness Wednesday morning to frantic evacuation orders as an uncontrolled wildfire burned into the western edge of the city and destroyed at least 50 structures.

In Solano County, a rural area southeast of Vacaville, some residents fled for the first time ever. "I've lived here for 30 years, never had to evacuate before," resident Tim Lukehart said. "There's been fires of course, but not like this one." The air had an orange, smoke-filled hue for miles, with ash covering vehicles. Homes were burned down on both sides of Pleasant Valley Road, the street where Lukehart lives with his wife Sarah. Wooden fences were still in flames, and one family was chasing their cattle through a field as they tried to bring the animals home to safety as the grass smoldered. A rescue effort to save about 125 horses failed as owners could not get trailers to the area or access by foot. In an alert issued just after 7 p.m.

Wednesday, the Travis Air Force base commander ordered a partial evacuation of "non-mission essential personnel." Wednesday afternoon, the fire jumped Interstate 80, forcing highway officials to close a five-mile freeway section. The LNU Lightning Complex is the second-largest

fire burning in California on Wednesday, according to the California Department of Forestry and Fire Protection. The largest fire burning in California, a blaze made up of 20 separate fires burning near San Jose, has been named the SCU Lightning Complex Fire. The fire ballooned from 54 square miles to burning at least 132 square miles over Tuesday night. It is 5% contained, and threatens more than 1,400 structures, according to the SCU branch of Cal Fire.

Another group of 30 fires in Chico, called the Butte Lightning Complex fires, has consumed 2 square miles with 10% containment, with Cal Fire, and are not expected to impact residents, according to a Cal Fire-Butte County news release. Will Powers, a state fire spokesman, said "throughout the state of California right now, we are stretched thin for crews" because of the fires. "Air resources have been stretched thin throughout the whole state." Much of California is enduring a sweltering late summer heat wave that has broken several record highs in recent days, including a 130-degree reading Sunday in Death Valley, Weather.com said.

The hot, dry conditions are expected to continue at least into the weekend. The extreme heat was being generated by a strong ridge of high pressure over the western U.S., which also produced an onslaught of thunderstorms and lightning that ignited many of the wildfires burning in California. "We have a very large area of high pressure over the area," National Weather Service meteorologist David Sweet said. "It's sitting right over us, and it's not moving." There was "no relief" expected Wednesday from the sweltering heat, the Weather Service said, as temperatures were forecast to again soar above 100 degrees across much of the western U.S. In all, some 37 million people were under excessive heat warnings in the West, mainly in California, Arizona and Nevada.

One of the major consequences of the heat wave over the past several days has been the threat of temporary power outages, also known as rolling blackouts, to conserve electricity usage along the state's power grid. Grid managers again called for voluntary energy conservation during afternoon and evening hours Wednesday to try to avoid having to order utilities to cut power to selected areas, which happened twice last week but has been narrowly avoided since then. In Northern California, police and firefighters went door-to-door before dawn Wednesday in a frantic scramble to warn residents to evacuate as fire encroached on Vacaville. Fire officials said at least 50 structures were destroyed and 50 were damaged and that four people were injured. Television footage showed some homes in flames and thick ash dropping in a rural area near Interstate 80 as the fire appeared to head toward more densely populated areas.

Diane Bustos told KPIX-TV that she and her husband tried to drive out but their vehicle caught on fire and they had to flee on foot. "I got all these flames on me and I lost my shoe, but I made it. God saved me," she said. Due to the Hennessey fire, the San Joaquin Valley Air Pollution Control District has issued a health caution because of the hazy conditions caused by smoke from the wildfires burning throughout California. Officials are asking Valley residents to reduce their exposure to particulate matter by remaining indoors.

Particulate matter can trigger asthma attacks, aggravate chronic bronchitis and increase the risk of heart attack and stroke. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible. Common cloth and paper masks being worn because of COVID-19 concerns may not provide protection from wildfire smoke.

In Napa County, Gail Bickett, 80, loaded up her three dogs in a truck to evacuate as the fire burned behind houses across the road, the San Francisco Chronicle reported. “It’s scary,” she said. “It’s overwhelming.” State Sen. Bill Dodd, who represents the area in the state Legislature, said the fires burning in Napa and Sonoma counties were mostly affecting less populated areas. “I think the people around here, even the people that have structures in harm’s way, understand that they’re in a more rural area and that the people in more densely populated areas have to get the resources first,” he said.

Several fires were also were burning in northern coastline areas and in Southern California. The cluster of wine country fires threaten an area that only last year grappled with another massive blaze that forced 200,000 to flee – a task made more complicated this year because of the pandemic.

No evacuations for Tracy as nearby wildfires fill sky with smoke Press staff report
Tracy Press, Wednesday, Aug. 19, 2020

Fires started by lightning that have been burning since Sunday in Santa Clara, Alameda, Contra Costa, San Joaquin and Stanislaus counties have covered the area in smoke, but they pose no immediate threat to Tracy residents or need for evacuations. Tracy’s local fire department, the South San Joaquin County Fire Authority, put out a statement Wednesday afternoon in response to concern about evacuation orders in neighboring counties.

The Canyon Zone fires south of Tracy, burning in and around Del Puerto Canyon northwest of Patterson, are part of a collection of 20 fires in several counties designated by Cal Fire as the SCU Lightning Complex. The other fires are grouped into the Deer Zone and Calaveras Zone. By Wednesday morning, they had collectively burned 85,000 acres and were only 5% contained. An orange glow in the sky to the south and flames visible Tuesday night, along with heavy clouds of smoke, have put some people in the Tracy area on edge. The fire department confirmed Wednesday that there were no evacuation warnings or orders for the Tracy area or within San Joaquin County, and none were expected. The fire is expected to grow to the south and east over the next 48 hours, and smoke will remain throughout the area. Officials are preplanning for potential impacts and making contingency plans for areas within the South San Joaquin County Fire Authority jurisdiction. However, the fire department does not anticipate any need to evacuate area residents.

Earlier Wednesday, some local residents had received emergency alerts from Alameda County about evacuations in the Livermore area that had a "Tracy, CA" heading, leading to confusion and concern. People in Tracy and other parts of San Joaquin County can sign up for local emergency alert notifications at sjready.org, the website of the San Joaquin County Office of Emergency Services. The notification system provides critical information for emergency situations, such as severe weather, unexpected road closures and evacuations of neighborhoods.

Note: The following clip in Spanish mentions the Health Caution for Stanislaus County due to wildfire smoke impacting the Valley and how residents can protect themselves.

Emiten alerta de calidad del aire por incendios en Stanislaus Telemundo 33, Wednesday, August 19, 2020

El humo de los incendios de Canyon Zone, en el oeste del condado de Stanislaus, está afectando la calidad del aire en el condado, informaron las autoridades este miércoles. El humo de los incendios forestales podría afectar afectar la salud. Los síntomas más comunes son irritación de ojos y garganta, tos y dificultad para respirar. Las personas con problemas de salud, especialmente afecciones cardíacas o respiratorias, deben tener especial cuidado. Sigue estas precauciones para proteger su salud:
• Minimiza las actividades al aire libre
• Quédete adentro con las ventanas y puertas cerradas tanto como sea posible
• No enciendas ventiladores que traigan aire exterior con humo al interior
• Enciende el aire acondicionado o la calefacción solo si no trae humo del exterior
• Considere abandonar el área hasta que mejoren las condiciones del humo si experimenta síntomas relacionados con exposición al humo
• Conoce la calidad actual del aire consultando https://www.valleyair.org/myraan/

Para trabajadores al aire libre:
• Limita el esfuerzo
• Toma descansos frecuentes
• Si la actividad prolongada al aire libre es inevitable, las máscaras adecuadas (por ejemplo, máscaras N95) pueden proteger contra la exposición dañina
• Consulta con su empleador si tiene inquietudes específicas Cuándo buscar atención médica:Comunícate con tu proveedor de atención médica si experimenta los siguientes síntomas que no mejoran después de mudarse al interior o en un entorno de calidad del aire seguro:
• Falta de aliento o dificultad para respirar
• Sibilancias
• Opresión o dolor en el pecho
• Palpitaciones
• Náuseas o fatiga inusual
• Mareos y / o sensación de desmayo

Daily Electronic Newspaper Clippings from around the Valley 8/21/2020:

Growing Northern California fires straining resources as Newsom calls for help
By Dominic Fracassa, Alexei Koseff and Dustin GardinerSan Francisco Chronicle, Friday, August 21, 2020

Friday brought another day of intense firefighting across Northern California, as clusters of lightning-sparked conflagrations continue their deadly march across the region. The fires so far have killed at least four people, displaced thousands —possibly for weeks rather than days — destroyed homes and torched precious redwood forests with little sign of reprieve in sight. The SCU Lightning Complex fire, comprised of some 20 conflagrations in Santa Clara County, Alameda County, Contra Costa County, San Joaquin County and Stanislaus counties became the largest blaze in the state after it exploded to cover just under 230,000 acres as of Friday afternoon. Firefighters have so far placed containment barriers around just 10% of the fire, which is now the seventh largest on record in the state.

The LNU Lightning Complex fire in Napa, Sonoma, Lake, Yolo and Solano counties grew more modestly overnight, standing at just over 219,000 acres Friday afternoon and with 7% containment. Firefighters have still not been able to eke out any containment against the 50,000-acre CZU August Lightning Complex in Santa Cruz and San Mateo counties, which was bearing down menacingly on the already evacuated UC Santa Cruz campus. Law enforcement and fire officials have evacuated 64,600 residents between the two counties. Chris Clark, chief deputy of the Santa Cruz County Sheriff's Office, warned those fleeing the fires that it could be weeks before they can return to their homes due to the unpredictable nature of the blazes. More than 560 fires are burning across California, scorching some 771,000 acres, or just over 1,200 square miles so far, state officials said. They were sparked by a barrage of nearly 12,000 lightning strikes, most of which hit the state last weekend.

More lighting could be on the way in coming days: The National Weather Service said Friday that atmospheric conditions could produce dry lightning between Sunday morning and next Tuesday. With firefighting resources stretched to the breaking point, Gov. Gavin Newsom has called for aide from across the country. Ten states have contributed or pledged assistance to California's firefighting efforts, Newsom said Friday. He has also requested help from Australia and Canada. "Fire conditions have increased in other states, and as a consequence of that, our mutual aid that goes outside of the state of California has also been stretched.

But that mutual aid system nonetheless has been activated," Newsom said. "Those states are also dealing with their own domestic challenges within their states related to the heat wave, and yet they're still offering support. We have more people, but it's not enough. We have more air support, but it's still not enough," he added. The dual crises of the fires and the ongoing COVID-19 pandemic has prompted evacuation centers to take additional precautions. Dozens of evacuees remained huddled Friday morning at a Red Cross shelter at the Sonoma County Fairgrounds. They slept spaced six-feet apart on cots in a large exhibit hall where volunteers brought meals to them. Blue tape on the floor reminded everyone to keep social distancing.

Outside the shelter, the smoke-filled skies felt like déjà vu for Mark Struthers, 47, who lost his Santa Rosa home in the 2017 Tubbs fire. He's been homeless for the last three years, and had been camping along the river in Guerneville before he was evacuated Tuesday. This time, he said, the fires helped him find shelter. "In a weird way, this is kind of a blessing for me," Struthers said. "It feels nice to be here and have a safe, secure place."

He said he's been trying to put his life back together since the Tubbs Fire caused him to start drinking heavily and live on the streets. But rebuilding a home on the property he owns in Santa Rosa seems precarious, Struthers said. "Long-term, do I really want to go that route if another fire sweeps through?" he said. "Now, it's all scorched and everything."

How do you keep wildfire smoke out of your house and car? Here are some tips
By Michael McGough Merced Sun-Star, Friday, August 21, 2020

Hundreds of wildfires across California are creating poor air quality conditions throughout most of the state. And wildfires are burning in Washington and Idaho. If you can smell smoke or it makes your eyes sting, you should limit your outdoor time as much as possible because it can be harmful to your respiratory health. If you're in your home and still can smell smoke, you may want to take some preventive steps to prevent even more of that smokey air from getting in. Amid wildfire smoke, "if you are advised to stay indoors, take steps to keep indoor air as clean as possible," the U.S. Environmental Protection Agency advises. How exactly do you do that?

Here's some advice compiled from the EPA, the American Lung Association, Sacramento region's Spare the Air and other organizations, including the Bay Area Air Quality Management District.

▪Keep your home's doors and windows closed.
▪Run your home air conditioner, but use the "recirculate" setting. Make sure the air conditioner filter is clean. If the filter is dirty or old, you should replace it.
▪Use an air purifier, but make sure it is one that does not produce ozone.
▪Check your home's walls, windows and doors for potential openings. Repair or replace any doors or windows with major air leak issues; use caulk on walls or weather-proofing tape or sealants on window to cover up smaller openings. Older homes may be more susceptible to these types of problems, while newer homes are generally built a little bit tighter.
▪A ceiling fan won't change the quality of the air within your home; it just recirculates it. But if you are choosing to use a ceiling fan in an effort to keep cool rather than air conditioning because you have concerns about your AC system's filtration, be sure to clean the fan, especially if you don't use it frequently, to rid it of any dust particles that may have built up.
▪While driving, also use your air conditioner's recirculate setting. Do notroll down the windows.
▪Close air conditioning vents in your vehicle while driving through a particularly smokey area.

'Stay indoors.' Wildfire smoke, unhealthy air quality won't leave Valley this weekend
By Joshua Tehee Merced Sun-Star and The Fresno Bee, Friday, August 21, 2020

No less than eight of the state's active wildfires are dumping smoke and accompanying particulate matter, including PM2.5, into the Valley air basin –in case you're wondering why the

horizon looks straight out of a Star Wars film (just check Instragram) and the air quality has been asthma-triggeringly bad. Just how unhealthy is our air? Very, says the San Joaquin Valley Air Pollution Control District, which issued another health caution on Friday, urging residents, especially those with respiratory conditions, young children and the elderly, to remain indoors through the weekend.

"Through this week, PM2.5 concentrations have continued to increase, resulting in very unhealthy air quality across the region," the district said. "Anyone experiencing poor air quality due to wildfire smoke should move indoors, to a filtered, air-conditioned environment with windows closed. The common cloth and paper masks individuals are wearing due to COVID-19 concerns may not protect them from wildfire smoke." The health caution will remain in place until the fires are extinguished, and the districts predicts unhealthy air quality to affect the Valley into next week. You can track the air quality in your area online with the District's Real-time Air Advisory Network, though the district says if you can smell smoke and see ash, the air quality conditions are likely Level 4 or Level 5. This is a good indication that you should limit outdoor activity and remain inside (with air conditioning if possible). Those with asthma or other lung diseases, should follow doctor's instructions for medicine and asthma management. Some will want to talk with doctors about whether they should leave the area.

What's different about this August?

In terms of air quality, it's ozone (aka smog) that typically affects the Valley during the summer, and there's been a downward trend in ozone levels over the past few years, according to Heather Heinks, an air district spokesperson. Last year was one of the best ozone seasons on records. What the Valley is experiencing now is reminiscent of the conditions caused by the Camp Firein 2018."Without the wildfires," Heinks said, "it wouldn't be like this."

Fire near Patterson is spreading at 120 feet per minute, Cal Fire says
By Patty Guerra and Kristin LamMerced Sun-Star and The Fresno Bee, Friday, August 21, 2020

The series of fires that includes the blaze burning in Del Puerto Canyon near Patterson exploded overnight to 137,495 acres, Cal Fire said in a news releaseThursday morning.That's roughly 215 square miles burning in fires believed to be caused by lightning starting on Sunday night.The fires are spreading as fast at 120 feet per minute, Cal Fire said in a video update posted on its Twitter feed.

Capt. Stephen Volmer, fire behavioral analyst for Cal Fire, said the fire's "spotting distance" is up to three-quarters of a mile. "We're going to have some of that brush ignite and ... throw fire embers three-quarters of a mile ahead of where the fire (is)," he said. "And when it lands in a receptive fuel bin like the dry grasses and dry brush that's out there, we're going to see new fire." That is hampering control efforts and helping to spread the fire, Volmer said.

The weather is also complicating matters. Generally, the humidity rises at night, allowing firefighters to make progress. "On this incident, there's a little phenomenon that's happening," Volmer said. The humidity has been dropping at night, "and that's allowing the fire to burn all

day and all night long." The dry grasses are contributing to the fast spread. "That's putting the fire moving faster than we can actually engage it safely," he said.

Evacuation center reopens

Two evacuees came to the temporary evacuation center at Creekside Middle School in Patterson around 11 a.m. and left shortly after. Five people staffed the gymnasium, which had social distancing rules posted on the door. Any evacuees are subject to health screenings before entering, said Christopher Losavio, executive director of the local Red Cross chapter. The organization also helped set up hotel rooms for some evacuees Wednesday night, Losavio said in a text, and may do so again Thursday if there is a need. On Wednesday, at least five people were injured in the fire and had to be rescued, authorities said.

Smoky air all the way to Modesto

Smoke and ash in the air for miles around led to a health warning from the San Joaquin Valley Air Pollution Control District. According to the district's air monitors, air quality in cities as far away as Modesto, Turlock and Merced remained poor as of midafternoon Thursday. Stanislaus County Sheriff Jeff Dirkse said that the department's helicopter was able to fly from the canyon to Frank Raines Park to assess the damage on Wednesday, and found that more than half the buildings, which he described as either houses, hunting shacks or outbuildings , did not have noticeable damage. He said the helicopter would be back Thursday when deputies could do a more complete search of the canyon. On Friday, they planned to assess damage west of Newman. They could not get to that area on Wednesday because of the fire.

Evacuation areas change

Cal Fire has expanded the evacuation order to include areas in San Joaquin County. Now under mandatory evacuation order is the area south of West Corral Hollow Road to the Stanislaus County line, west of Interstate 580 to the Alameda County line and east of Alameda County line to I-580 and Stanislaus County.

An evacuation warning has been issued for the area of San Joaquin County north of West Corral Hollow Road to I-580 and east of the Alameda County line to I-580, and the PAR Country Estates neighborhood near Tracy. At 1:30 p.m. Thursday, Cal Fire lifted the mandatory evacuation order for the Diablo Grande community, though the area remains under an evacuation warning.

Update: Moccasin Fire in Tuolumne County continues to spread By Marijke Rowlandand Julian A. Lopez The Fresno Bee, Thursday, August 20, 2020

A vegetation fire that started near Moccasin in Tuolumne County Thursday afternoon has spread rapidly east forcing mandatory evacuations in the area. The fire was first reported shortly before 2 p.m. near Highway 49 and Highway 120 in the southwest corner of the foothills county, west of Groveland. The then five-acre fire closed Highway 49 at the Highway 120 junction, to allow fire crews to access the area. The fire then grew in size quickly, according to alerts from the

Tuolumne County Sheriff's Department Facebook page. By 3:45 p.m. the fire had grown to 300 acres and a forced mandatory evacuation order from Highway 120 at Moccasin through Big Oak Flat, to Merrell Road in Groveland. The evacuation area includes Priest Coulterville Road. The fire is moving east at a "critical rate of speed," according the sheriff's department.

Power has been shut off from Moccasin through Big Oak Flat to Merrell Road in Groveland as well. The sheriff's department said evacuation centers are being set up at the Mariposa Fairgrounds, 5007 Fairgrounds Road in Mariposa, and the Manzanita Building at the Mother Lode Fairgrounds, 220 Southgate Drive in Sonora. Officials from Tuolumne County Animal Control (209-694-2730) and Team ELITE (which stands for Evacuation of Livestock in Tuolumne Emergencies, 209-782-0616) will be on standby to assist with animals. The state's firefighting forces have been stretched thin as dozens of wildfires, many sparked by lightning from the recent heat wave, have broken out across California. Due to the fire, the sheriff's department said its dispatch center will not be taking any non-emergency calls. For non-emergencies contact the sheriff's office at 209-533-6505or 209-533-5833.The Bee will have more on this fire and the evacuation order as it becomes available.

At least 5 people killed in Northern California wildfires
By Janie Har and Martha Mendoza, Associated Press The Fresno Bee, Thursday, August 20, 2020

SANTA CRUZ, Calif. Dozens of wildfires raging throughout Northern California have now claimed at least five lives and threaten tens of thousands of homes, authorities said Thursday. The death of a resident in Solano County, in the northeastern San Francisco Bay Area, was reported Thursday by Sheriff Thomas A. Ferrara, although he didn't have any additional details. In addition, three civilians had died in Napa County since the fires began, said Daniel Berlant, a Cal Fire assistant deputy director. In all, more than 30 civilians and firefighters have been injured. It wasn't immediately clear whether the Solano and Napa county fatalities included a Pacific Gas & Electric utility worker who was found dead Wednesday in a vehicle in the Vacaville area between San Francisco and Sacramento.

A pilot on a water-dropping mission in central California also died Wednesday when his helicopter crashed. Gov. Gavin Newsom addressed the wildfires, calling them clear evidence of climate change, in a last-minute video recorded for the Democratic National Convention from a forest near Watsonville after he visited an evacuation center. "If you are in denial about climate change, come to California," he said. "I confess this is not where I expected to be speaking here tonight," he said into what appeared to be a cellphone camera. Newsom had recorded an earlier, more lighthearted video, to be delivered in the convention's prime-time hours but decided it didn't bring the right tone amid his state's disasters, said Dan Newman, one of his political advisers.

More than two dozen major fires were scorching California and taxing the state's firefighting capacity, sparked by an unprecedented lightning siege that dropped nearly 11,000 strikes over several days. The fires have destroyed 175 structures, including homes, and are threatening 50,000 more, said Daniel Berlant, an assistant deputy director with the state Department of

Forestry and Fire Protection. In all, 33 civilians and firefighters have been injured. At least two people were missing.

Smoke and ash billowing from the fires has fouled the air throughout the scenic central coast and San Francisco. Most of the activity is in Northern California, where fires have chewed through about 500 square miles (1,250 square kilometers) of brushland, rural areas, canyon country and dense forest surrounding San Francisco. More than 10,000 firefighters are on the front lines, but fire officials in charge of each of the major fire complexes say they are strapped for resources. Some firefighters were working 72-hour shifts instead of the usual 24 hours. The state has requested 375 engines and crew from other states. “That’s going to allow our firefighters that have have been on the front line since this weekend to have an opportunity to take some rest," Berlant said.

More firefighters were sent to battle a complex of fires in Santa Cruz and San Mateo counties but “it’s still not enough,” said the incident commander, Cal Fire Assistant Chief Billy See. “We’re still drastically short for a fire of this size.” he said at an evening news conference. Fire officials said the flames were being driven by bone-dry timber and brush and erratic winds. They pleaded with residents to be ready to evacuate when ordered because they place firefighters in danger when crews have to protect those staying behind.

“Today we saw a growth of approximately 700 to 1,000 acres an hour in heavy timber," See said. “That’s a dangerous rate of spread for our firefighters and for all those residents out there. "Cal Fire spokesman Dan Olson said there are concerns that some people are trying to organize through social media to create volunteer brigades and fight the fire themselves. “The dangers out there to their own lives outweigh anything they can accomplish,” he said. “They’re putting their lives in jeopardy.” In Marin County, just north of San Francisco, where a smaller fire is burning near the Pacific Ocean, county fire chief Jason Weber said he is waiting for assistance from Montana to arrive this weekend. He said in his 25 years in fire service, “we’ve never seen this level of draw-down” from cooperating agencies, as there is heavy competition in the western United States for equipment and people.

In the coastal mountain regions south of San Francisco, where 48,000 people were under orders to evacuate, a fire complex had burned 75 square miles (194 square kilometers). Officials warned it has the potential to grow significantly in the next day. At least 50 buildings, including homes, had burned and nearly 21,000 structures were threatened, fire officials said. Given depleted resources, one of the best tools firefighters have for public safety is to get people out of harm's way. But some people refused when officers went door-to-door Wednesday night, Cal Fire Chief Mark Brunton said.

Kevin Stover, 42, was struggling with indecision early Thursday when a mandatory evacuation order was issued for the rugged and small town of Felton outside the beach city of Santa Cruz. “I don’t want to leave,” said Stover, a camera operator and rigger now driving for Door Dash and Lyft because of the pandemic. His car, loaded with important papers, his father’s urn and some arrowheads that meant a lot to him, had a flat tire. “I’m trying to figure out if I should cut these original oil paintings out of the frame to salvage them,” he said.

The unusually large size and number of simultaneous fires, other fires throughout the West and the loss of inmate firefighting crews because inmates were released from prisons to prevent the spread of coronavirus, have created the perfect storm for firefighting. “Our agency is taxed to the limit,” said Incident Commander Mike Smith at the fire near Santa Cruz. Officials there are awaiting help from other states, but they are having to look further afield than usual, meaning it will take days for crews to arrive, he said. The U.S. Forest Service can't help because they are busy fighting fires on federal lands.

In Monterey County along the coast, about 9,000 people have been evacuated for a fire that's now 52 square miles (136 square kilometers).Two fires in Sonoma County prompted evacuation orders for 8,000 residents near the Russian River Wednesday. Residents of Healdsburg, with a population of about 12,000, were warned Wednesday night to be ready to flee. Fires in that region destroyed more than 100 buildings, including some homes, and threatened 25,000 people across five counties.

Tim Edwards, president of the union representing 7,000 Cal Fire firefighters, said lawmakers need to allocate more money at a time when firefighters are working 40 to 50 days at a time without real relief. California State Parks announced full or partial closures of more than two dozen parks, including Big Basin Redwoods in the Santa Cruz Mountains, where the park headquarters and other facilities were damaged. The park featuring towering stands of ancient coast redwoods dates to 1902 and is the state’s oldest.

California Fires Claim 5 Lives, Threaten Thousands of Homes
AP News GV Wire, Friday, August 21, 2020

SANTA CRUZ —Sky-darkening wildfires that took at least five lives and forced thousands of people from their homes blazed throughout California on Friday as firefighting resources strained under the vastness of the infernos authorities were trying to control. Three major complexes encompassing dozens of fires chewed through a combined 770 square miles of forests, canyons, and rural areas north, east, and south of San Francisco Bay.

Thousands of acres were ablaze elsewhere in the state. Three major complexes encompassing dozens of fires chewed through a combined 770 square miles of forests, canyons, and rural areas north, east, and south of San Francisco Bay. Thousands of acres were ablaze elsewhere in the state. Tens of thousands of homes were threatened by flames that drove through dense and bone-dry trees and brush. Many of the fires were sparked by lightning strikes from brief thunderstorms this week as a high-pressure area over the West brought a dangerous mix of triple-digit weather and monsoonal moisture pulled from the south.

Some fires doubled in size within 24 hours, fire officials said. And while some evacuations were lifted in the small city of Vacaville, between San Francisco and Sacramento, other areas expanded their evacuation areas. The University of California, Santa Cruz, was evacuated and a new fire burning near Yosemite National Park also prompted evacuations. Santa Cruz itself, a coastal city of 65,000, wasn’t affected but Mayor Justin Cummings urged residents Thursday evening to be prepared to evacuate by gassing up their vehicles and packing important documents, medicines, and other belongings. “Prepare early so that you are ready to go at a

moment's notice," Cummings said. Although temperatures were predicted to ease slightly on Friday, they were also expected to be hot enough so that firefighters will not be able to count on cool evening weather aiding them. Erratic winds also could drive the fires unpredictably in multiple directions, state fire officials said.

More Than 64,000 People Ordered to Evacuate in Santa Cruz, San Mateo Counties

"There's so much heat in these fires that they create their own wind ... and they may blow in any direction, and very erratically," said Daniel Berlant, an assistant deputy director with the state Department of Forestry and Fire Protection, known as Cal Fire. Winds gusting to 20 mph over ridge tops could challenge the overnight firefighting efforts in Santa Cruz and San Mateo counties, said the incident commander, Cal Fire Assistant Chief Billy See. "This country likes to burn at night, more so than during the day, and that's because of the wind patterns," he said. More than 64,000 people were ordered evacuated in those counties. The ferocity of the fires was astonishing so early in the fire season, which historically has seen the largest and deadliest blazes when gusty, dry winds blow in the fall. But the death toll already had reached at least five since the majority of blazes started less than a week ago. Berlant said three civilians died in Napa County and one died in neighboring Solano County since the fires began. He didn't have details but Solano County Sheriff Thomas A. Ferrara reported the death of a male resident there. It wasn't immediately clear whether the fatalities included a Pacific Gas & Electric utility worker who was found dead Wednesday in a vehicle in the Vacaville area. Also, in central California, a pilot on a water-dropping mission in western Fresno County died Wednesday morning when his helicopter crashed.

At Least 175 Buildings Destroyed and Tens of Thousands Threatened

At least two other people were missing and more than 30 civilians and firefighters have been injured, authorities said. Tim and Anne Roberts had gone to the beach with their two children on Monday to avoid the smoke at their home in Boulder Creek in Santa Cruz County. They packed a change of clothes, their children's school supplies, and their passports —just in case. Smoke and ash billowing from the fires also fouled the air throughout California's scenic central coast and in San Francisco. The fires have destroyed at least 175 buildings, including homes, and threatened tens of thousands more.

Tim and Anne Roberts had gone to the beach with their two children on Monday to avoid the smoke at their home in Boulder Creek in Santa Cruz County. They packed a change of clothes, their children's school supplies and their passports —just in case. They learned Wednesday that their house had burned. Birth certificates, legal documents, and family heirlooms are gone. But in photos of the ruins, they were surprised by how many redwoods, oaks and fruit trees were still standing. "It's a strange sort of comfort," Tim Roberts said. The good news for Brookdale resident Larissa Eisenstein Thursday afternoon was that her five chickens, Kelly and The Nuggets, had been safely relocated into a stranger's yard in a safer, neighboring community. The chicken evacuation came a day after Eisenstein, a Silicon Valley tech worker, had been forced to leave them behind during an overnight evacuation. She fled with her cats Mochi and Mini, driving from one hotel to the next only to find they were full before landing in a safe place where they could get some rest.

Some 3,000 Firefighters Had Arrived in the Past 24 Hours

The bad news Thursday was that the fire was burning down her wooded street as she adjusted to the idea that her worldly possessions may now be limited to photos of her parents, some jewelry she had grabbed, and fresh tomatoes from her garden. "After I got the cats, I realized there was very little important to me, and the priority is to try to remember how lovely things can be," she said. "I've had a wonderful garden this year." More than 10,000 firefighters were on the front lines. Some 3,000 firefighters had arrived in the past 24 hours, along with hundreds of fire engines from neighboring states, and National Guard troops that were staffing hand crews and flying helicopters, Berlant said. Some C-130 military aircraft also had been outfitted as air tankers, Berlant said. More firefighters were sent to battle the complex of fires in Santa Cruz and San Mateo counties but "it's still not enough," See said. "We're still drastically short for a fire of this size," he said. Cal Fire spokesman Dan Olson said there are concerns that some people are trying to organize through social media to create volunteer brigades and fight the fire themselves. "The dangers out there to their own lives outweigh anything they can accomplish," he said. "They're putting their lives in jeopardy." In a last-minute video recorded for the Democratic National Convention, Gov. Gavin Newsom said "if you are in denial about climate change, come to California."

California Looks to Battle Mega Wildfires with Fire
By Jane Braxton Little, Scientific American GV Wire, Thursday, August 20, 2020

As flames once again rage across the state, officials embrace a counterintuitive firefighting approach Kyburz, Calif.—Near the top of a 7,000-foot ridge in California's Sierra Nevada, crews wielding gasoline-dripping torches began igniting piles of small logs and branches on an unusually cold morning late last September. Ignoring snow flurries and light rain, they trudged from one pile to another, nursing the flames that licked into pine needles and twigs on the surrounding ground and monitoring small trees that flared up like bonfires. The fire starters worked their way down the mountain north of Caples Creek over the next week, their blazes efficiently controlled with the help of "lanes" that had been cleared of forest debris.

They supervised flames racing across meadows that, remarkably, had not burned since at least 1916. Crews paid particular attention to the largest Jeffrey and ponderosa pines, some of them 300 years old. These trees had been protected in advance by volunteers, who had removed shrubs and raked fuels away from trunks that were more than 30 inches in diameter. By the time the flames were out, the Caples Ecological Restoration Project had burned 3,435 acres in the mountainous watershed of Eldorado National Forest, 70 miles east of Sacramento—part of an area that provides the primary water supply for more than 110,000 people. It was the largest intentional fire ever set in the Sierra Nevada and one of the largest on federal land in the state.

The effort marks a milestone in California's pivot away from a century of suppressing fire at all costs and toward working with it instead—using controlled flames to restore ecosystems that evolved to burn in frequent, mostly low-intensity blazes. Suppression has left forests throughout the West unnaturally crowded with small trees and shrubs—ready tinder for larger, far more damaging conflagrations. California's forests are even more vulnerable because more than 147 million drought-weakened tree shave died statewide since 2010, leaving them primed to burn.

Because of these and other factors, such as poor management practices and warmer temperatures from climate change, the extent of fires that escape even the most aggressive suppression has increased fivefold over the past five decades. Scientists say tangled masses of ultra dry fuel represent a fire hazard of unprecedented size and intensity if left alone. Blazes this year, including the Lake Fire in the mountains north of Los Angeles and the L.N.U. Lightning Complex west of Sacramento, have already burned 30 percent more than the acreage flames blackened across California last year, stretching firefighting crews thin and prompting Governor Gavin Newsom to declare a state of emergency.

U.S. Forest Service officials had been planning the Caples prescribed burnfor five years—nervously hoping the forest would not go up in flames sparked by lightning or a careless camper before they could implement their meticulously designed, scientific burn strategy. “This is all about reintroducing fire back into the landscape: restoring that vital natural ecosystem process, which will ultimately slow the spread of wildfire,” says Jeff Marsolais, Eldorado’s forest supervisor.

Planned and Unplanned

In 2011 Eldorado forest officials identified the steep, granite-strewn slopes of the Caples Creek area as a priority for restoration efforts that would gradually reintroduce fire and restore the meadows dotting the pine and fir forests. Funded by a $477,000 Sierra Nevada Conservancy grant, the plan scientists developed involves 8,800 acres of prescribed burning over 15 years to reduce the heavy load of flammable low-lying vegetation. Along with preventing huge and uncontrollable wildfires, they aim to reestablish forests healthy enough to allow small fires to burn unimpeded.

The path of the Caples prescribed burn was designed to promote a mixture of species in a mosaic, with large openings between tree stands where fire could occasionally burn undergrowth without damaging large trees. “We wanted to reintroduce fire where it would bring the greatest benefits and inflict the least harm,” says Forest Service ecologist Becky Estes, who designed the monitoring plots in the Caples burn. Not everything in the project went as envisioned. Unexpected high winds roared through the area 10 days into the carefully calculated plan, blowing the intentional fire out of the 1,080-acre designated zone and into forests that had not been prepared for burning.

Eldorado forest officials brought in suppression crews, halting the escaped fire after it burned through 2,355 acres. Such glitches are part of the learning process as forest managers try bringing fire back to the Sierra Nevada after 100 years of fighting it off, says Tony Scardina, deputy forester of national forests in California. “We understand that when we’re managing fire, whether it’s a wildland or a planned fire, there’s always risk,” he says. But Scardina is undaunted. “We remain committed to bringing those ecosystems back to a resilient state in a planned, careful and controlled manner,” he says. “And we are committed to applying what we learned from this situation to continuously improve our prescribed fire program.”

Checking In

Scardina and others had to wait for winter snows to melt—and for Forest Service officials to come up with COVID-19 pandemic protocols that made it safe for a group of scientists to inspect the burned area to see what was growing come spring. Nine months after the fire, the trail along Caples Creek climbs through gray granite boulders and purple lupines blooming among charred logs. Blackened tree trunks rise out of thick grass carpets, and the sun filters through a canopy of conifer needles, half of them green, half of them scorched rust-red.

Helen Payne, a botanist in Estes's ecological field-monitoring crew, is on her hands and knees just off the trail on a hot July morning, examining a spindly cedar tree with black burn streaks on its trunk. Behind her, fire-felled pines the size of utility poles are toppled against trees that are still standing but weakened by fire, likely to fall in the next big storm. The ground is littered with dry needles sprinkled across the ashes of last year's burn. Payne is taking inventory of every detail within an area about the size of a home swimming pool: the presence of seedlings, flowering plants and fungi, as well as the size and number of trees and whether they are healthy, scorched or fire-killed. This plot is one of 105 that Estes established before the burn to monitor its effects on as much of the vegetation as possible—every five years for the foreseeable future.

Payne points to a tiny seedling, its trunk no thicker than darning thread but somehow supporting the fragile fronds of new life. "We found two," she says, clearly excited by the speed of rejuvenation. Data collected at 46 monitoring plots in a November assessment have provided information about the immediate effects of the fire. Despite intense burning in some places and an extra 2,355 acres catching fire, the experiment generally produced healthier forests, says Scott Dailey, one of the Forest Service ecologists who conducted the assessment. Before the burn, eight-inch-diameter saplings were nearly triple the density scientists believe a resilient forest should harbor. These small trees ignite easily, providing a ladder for fire to climb into the tops of large ones.

The part of the blaze that got away actually cut their number to a more sustainable density—and the intentional fire did not reduce them as much as officials would have liked, Dailey says. The prescribed burn did not kill any trees greater than 30 inches in diameter, but these centuries-old survivors did not fare so well in the escaped wildfire. Among the plots he surveyed in that area, Dailey found nearly 25 percent fewer large trees after the fire. The prescribed burn effectively reduced the ground litter under trees, where wildfires generally start, knocking the average litter depth down from around two inches to less than half an inch. The wildfire was even more effective: nearly two and a half inches of duff were reduced to around one third of an inch.

Overall, the combined Caples planned burn and inadvertent wildfire produced forests much closer to natural conditions, Dailey says. Still, there was some damage: The bulldozers brought in to control the escaped flames left scars on the forest floor. And trees were haphazardly strewn about some areas, because firefighters had to fell them to suppress the blaze.One of the lessons Caples taught managers is the crucial role of meteorology, Marsolais says. No one predicted the winds that blew the fire beyond the planned area. "Our forecasting has only so much capability. We're focusing now on how good predictions can be," he says. The burn also made clear that many forests in the Sierra Nevada are simply too crowded for fire to return without the extraordinary effort that went into preparing the Caples area. "You can't just put fire back on the landscape," Marsolais says.

Small but Important Step

The Caples prescribed burn is an important first step—but a small one—in a long march toward restoring forest resilience, says Malcolm North, a U.S. Forest Service scientist at the Pacific Southwest Research Station. He studies Sierra Nevada forests but was not involved in the Caples burn. To return forests to their original state (in which they survive and benefit from natural fire), he says crews would have to burn 500,000 acres a year on the five million acres the Forest Service manages in the Sierra Nevada. The agency's "fuels reduction" goal for this year is 230,000 acres, including just 60,000 acres of prescribed burning. For the rest, chain saws and other mechanical equipment will be used to thin trees. "Whatever we can do to change the pace and scale of prescribed burning, that's the 99.9 percent priority," North says. Forest resilience has implications for most of California's residents.

The effects of unhealthy forests have proliferated, particularly following the devastating wildfires of 2018. Homeowners' insurance rates doubled and tripled for those lucky enough to get policies at all. Too many people have experienced the terror of wildfires bearing down on them, forcing last-minute evacuations and taking dozens of lives. Most pervasive, however, are the effects of the smoke that smothers cities, small towns and rural areas alike, increasing the risk of asthma and other respiratory problems.

Public acceptance of smoke is one of the greatest challenges facing the drive to return natural fire to the Sierra Nevada's forests. Prescribed burns do emit smoke—but the smoke from wildfires carries far more toxic ingredients from burned homes and vehicles, Marsolais says. Craig Thomas, former executive director of Sierra Forest Legacy, a nonprofit conservation group, calls smoke a trade-off. He has engaged air resource officials through a multiparty collaboration to improve coordination between the management of fire and public health.

Because California's Sierra Nevada forests have a natural propensity to ignite, whether as wildfires or controlled burns, Thomas says, "we either work with fire, or it eats our lunch." Eldorado forest officials will continue to study the effects of the Caples burn as they prepare for the next prescribed fire, likely in an adjacent area in 2021. Restoring forest health and ecosystem values at a meaningful scale is a long-term process, Marsolais says. "We cannot let up," he adds. "Uncontrolled wildfire is knocking on the doors of these communities."

Residents advised to stay indoors due to poor air quality
By Erick Torres, Patterson IrrigatorTracy Press, Thursday, Aug. 20, 2020

Air quality in Patterson has been rated as "very unhealthy" with an air quality index rating (AQI) of 209 by the AirNow resource tool that uses data from the California Air Resources Board. The AQI rating runs from 0-500. The higher the AQI value, the greater level of air pollution, and the greater the health concern. AQI ratings are divided into six categories with each category corresponding to a different level of health concern. Each level is assigned a color. A 209 AQI rating puts the health alert at the second to the highest purple category labeled "very unhealthy," meaning that the risk of health effects is increased for everyone in the area.

Weather conditions are expected to persist through Saturday, so residents in the area will continue to see smoke impacts from regional fires. Residents are suggested to limit strenuous outdoor activities and consider moving physical activities indoors or rescheduling them. People with heart or lung disease, older adults, children and teens should avoid physical activities outdoors. Health risks can include stinging eyes, irritated respiratory system, headaches, and aggravated chronic heart disease due to compromised air quality. Residents should remain indoors as much as possible and use air conditioning and an air filter to aid with the poor air quality.

A Perfect Storm for Fire
By Katie Evans, Press Banner Staff Reporter Tracy Press, Thursday, Aug. 20, 2020

If you were rudely awakened this past Saturday night, August 15th, you weren't alone. A heat wave reaching above 100 degree temperatures have caused many valley residents to open doors and windows at night throughout this week, with hopes for a cool breeze. However, residents got more than they expected at 3 a.m., when huge gusts of wind and a brilliant lightning storm swept across Santa Cruz County. Some folks slept through, others watched from bed, a few saddled up their pup for an impromptu dog walk, and others, like 17-year-old Scotts Valley resident Jackson Damhorst, captured the stunning and fearsome event with their lens.Regardless of how you experienced it, our community is still fighting the storm's effects.

Lightning strikes, hot temperatures, and winds proved a perfect recipe for fires throughout the County, like the 120-acre Warrenella Fire in Davenport and the 118-acre fire near Waddell Beach. Several smaller fires burned in our valleys, like one in Zayante, off Eagle Tree Lane. Robert Gray, the Felton Fire Protection District Chief, had a moment to discuss fire conditions in San Lorenzo. "There's so many smaller fires at this point, that it's difficult to sum up exact numbers, sizes, locations, and states of containment. I can tell you, about 80 to 90% of fires are currently under 10 acres and caused by [lightning] ground strikes... We've sent resources to all different areas, mostly assisting neighboring agencies with fires, fallen trees, and downed power lines." Gray shared the unique difficulties in putting out San Lorenzo Valley fires, "Almost all of our fires are on steep terrain, in difficult to access areas.

The fires [still burning in SLV] are in remote areas that makes finding and fighting them difficult...You can see the smoke, but how do you get there?" While the terrain distinct to San Lorenzo makes firefighters' tasks quite arduous, Gray gives this advice to ease their burden, "The biggest thing the community can do is be prepared. We get so many calls are from those that aren't. They find themselves in situations that they could've been prepared for. Know your limitations. Figure out a plan for self-sufficiency if you lose power. What are you going to do with medical supplies that require refrigeration? Do you have flashlights, batteries, canned goods? A way to contact loved ones?" Gray adds, "We're always there to assist in a jam, but if people take the initiative, we can go to more dangerous situations that utilize our specialized training." Gray and I then discussed protocol for those aforementioned dangerous situations. "First you need to recognize the situation.

If you see or smell smoke, you don't necessarily need to call 911 right away. With wind shifts, smoke can roll in almost like a fog bank, which is frightening for community members.

However, you should only call if a defined column of smoke or flames are in sight." The Fire Chief touched on another vital resource to keep yourself informed on the current state of fires. "Code Red is an emergency alert system to pass vital information from us to the community. If wires are blocking a road, we can pinpoint where we want the alert to go, maybe it's a 1/2-mile radius or certain streets. Code Red gives information to community that's specific to their needs." However, you must enroll online to receive alerts and, according to Gray, many community members have yet to do so. You can easily enroll for the lifesaving alert service by logging onto https://scr911.org/ and clicking on the Code Red link. Even if your current living situation is safely away from fire, you can still be at risk from inhalation of smoke. Richard Stedman, the Air Pollution Control Officer of the Monterey Bay Air Resources District shared these helpful guide lines:

·When the concentration of smoke has reached orange, red, purple, or maroon levels of the [Air Quality Index] residents should limit their activity by staying indoors with the doors and windows closed to avoid breathing smoke. You may want to check with your health care provider to make sure it's not necessary for you to leave the area to where wildfire smoke is diminished or not present.

·Use common sense. If it looks smoky outside, it's not a good time to exercise or work outside and it's not a good time for your children to play outdoors.

·Help lower inside particle levels inside your home. When smoke levels are high, avoid using anything that burns, such as wood fireplaces, gas logs, gas stoves –even candles. Don't vacuum as that stirs up particles already inside your home. And don't smoke. That puts even more pollution in your lungs, and in the lungs of people around you.

·We are asking residents to avoid adding more pollution to the air by limiting activities such as wood burning, driving, lawn mowing, and leaf blowing. Also, drive your car only if absolutely necessary and combine trips, when possible, to reduce pollution. With these tips you can stay safe and healthy during wildfire season. Please help ease the strain on our first responders by staying prepared, informed, and aware. If you haven't yet joined the Code Red alert service, does so at https://scr911.org/.Visit https://gispub.epa.gov/airnow/for an updated and interactive air quality map.If you'd like to help out the Felton Fire Protection District, they're now looking for volunteers at https://feltonfire.com/joinus/.

Wildfire smoke blankets Central Valley with no end in sight
By Quinn Wilson Bakersfield Californian, Friday, Aug. 21, 2020

The sun —apparently —also rises over Bakersfield and much of the Central Valley, despite the dense wildfire smoke clouding much of the sky. The seemingly perpetual twilight state was sparked by a weather system Wednesday that caused smoke from a cluster of Northern California wildfires to drift across the valley, according to Heather Heinks, the San Joaquin Valley Air Pollution Control District's outreach and communications manager. "People need to plan on hunkering down for a few days," Heinks said Thursday. "If the heat hasn't already driven you inside, the air quality certainly will." Heinks explained that the current conditions are hazardous for anybody, whether they have a preexisting respiratory condition or are perfectly

healthy. She even said the air quality can "exacerbate" any symptoms or illness related to COVID-19."Healthy people would even feel the effects (of the air quality) after prolonged exposure with symptoms like having a scratchy throat, tightness in the chest and a headache the next day," Heinks said. The cloth masks typically used to prevent the spread of COVID-19, she said, are not very effective in protecting yourself from poor air quality. While she said N95 masks would be more effective to protect against the air issues, no formal recommendations have been made due to their limited availability.

Lt. Joel Swanson, public information officer for the Kern County Sheriff's Office, said that the KCSO's ongoing academy has suspended all of its outdoor activity due to the air conditions. He explained the Sheriff's Office is "doing what they can" to make sure recruits meet the state's fitness standards. "Our academy is held at a former airport hangar, so we can do some activities in our airport hangar," Swanson said. "The temperatures are also affecting that; it's a very hot building." Swanson said the KCSO's air division has not been impacted by reduced visibility. However, the Federal Aviation Administration advises all flights be grounded when visibility is 3 miles or less.

As of Thursday afternoon, the visibility at Meadows Field Airport was at 5 miles, according to Jeff Barlow, senior meteorologist at the National Weather Service in Hanford. The Kern County Public Health Services Department recommends residents stay indoors when possible, limit outdoor activity, and close windows and doors. "These actions are particularly important for our more vulnerable residents that include children, pregnant women, older adults and those with existing lung or heart conditions," said Michelle Corson, spokeswoman for the health department. Barlow said there is currently no outlook as to when the smoke will subside and that it will likely "slosh around the valley for a while." "Fire repression is obviously key and the weather drives these fires," Barlow said. "There aren't much but some light winds so (the smoke) really isn't moving anywhere and is just drifting to the east into Nevada and up into Idaho."

Andrew Freeborn, public information officer for the Kern County Fire Department, explained that Kern County sits between "a few" significant wildfires happening from all directions. He said to the south there's the Holzer Fire and the Lake Fire, to the east is the Dome Fire and then in central and Northern California, there are 200,000 to 300,000 acres of land burning. "We've got so much in the state going on right now. Amongst this heat wave, we had a barrage of thousands of lightning strikes around the state that caused a lot of (the fires)," Freeborn said. "We need to be making sure we're not inadvertently starting any other fires." With elevated pollution levels noted in the Tehachapi, Rosamond and Mojave areas, the Eastern Kern Air Pollution Control District on Thursday urged children, older adults and anyone with heart and lung problems to avoid outdoor activity if they can smell or see smoke. Smoke from several fires, including from the Lake Fire in Lake Hughes in the unincorporated area of Los Angeles, is impacting several communities, the Eastern Kern air district noted in a news release. One unintentionally positive impact the smoke has had on the Central Valley is that temperatures have managed to stay down from the lack of direct sunlight, according to Barlow. "The smoke acts the same way as clouds would and it's like an overcast day so we went ahead and canceled the heat warning," Barlow said Thursday.

As the state has been on the brink of a potential energy crisis since last Friday, Katie Allen, marketing and communications manager for Pacific Gas and Electric, said PG&E has not had to enact any rotating blackouts throughout its service area since this weekend. As of Thursday afternoon, the California Independent System Operator did not call for a "Flex Alert" for the first time since Sunday. Heinks explained that even though the valley air district may only be calling for a "moderate" air quality day, its monitors are only tracking fine particulate matter and not the larger bits of ash that have been seen falling from the wildfires. "The see-and-smell rule prevails over monitors; treat it like a level 4 (air quality day), or worse," Heinks said. She said residents can check current air quality conditions online at www.valleyair.org/myraan/and can also check out a variety of resources regarding the current wildfires at valleyair.org/wildfires/.

GET bus offering free rides Friday due to poor air quality in the region
The Bakersfield Californian, Thursday, Aug. 20, 2020

Golden Empire Transit District will provide FREE rides Friday because of poor air quality currently in the southern San Joaquin Valley. According to a GET news release, the local Air Quality Index is over 150, which is considered unhealthy and potentially hazardous to the general population. High temperatures and smoke caused by statewide forest fires have caused the spike in poor air quality this week locally. "GET is committed to the environment and exceptional customer service," said CEO Karen King. "(Friday) we invite you to leave your cars parked and ride GET for free, all day, to avoid additional air pollution and to protect your health."

Daily Electronic Newspaper Clippings from around the Valley 8/24/2020:

Massive wildfires scorch California, but humidity helps keep feared lightning at bay for now
By Ryan W. Miller USA Today, Monday, August 24, 2020

Massive wildfires ignited by lightning continued to rage Monday on all sides of the San Francisco Bay area, and much of Northern California was under a red flag warning as high winds with lightning threatened to spark even more flames. Three vast blazes are scorching Northern California, and more than 650 wildfires, most sparked by lightning, have burned across the state in the last week. However, firefighters received some help Monday from the weather as humidity rose and the lightning was kept at bay overnight. "Mother Nature's helped us quite a bit," said Billy See, the California Department of Forestry and Fire Protection (Cal Fire) incident commander for a complex of fires burning south of San Francisco. At least seven people have died from the fires, including the first victim of the CZU Lightning Complex fire in the Santa Cruz Mountains, south of San Francisco, who was found dead Sunday. Nearly a quarter-million people are under evacuation orders and warnings as weather forecasts signaled the looming threat of more lightning with hot temperatures and unpredictable winds.

Here's what we know on Monday:

LNU Lightning Complex, SCU Lightning Complex, CZU Lightning Complex burning area around San Francisco On all sides of the San Francisco Bay Area, three of the largest fires in California are burning: the LNU Lightning Complex to the north has burned 350,030 acres and was 22% contained; the SCU Lightning Complex to the southeast has burned 347,196 acres and was 10% contained; and the CZU Lightning Complex to the south has burned 78,000 and was 13% contained. A lightning complex is a group of fires started by lightning strikes.

California fires: This is how a lightning storm can start a wildfire

According to Cal Fire, the LNU Lightning Complex in California's wine country is expected to grow. "Fires continue to make runs in multiple directions, impacting multiple communities," Cal Fire said. With more than 1,000 structures destroyed or damaged, and at least four fatalities confirmed since the fire started burning last Monday, the LNU Lightning Complex has been the most deadly and destructive in Northern California. The Santa Rosa Press Democrat reported that the fire gained less than 3,000 acres over night and the expected lightning storms did not materialize. "That's a pretty substantial victory last night, considering all things," Cal Fire spokesman Jay Tracy told the newspaper. The SCU Lightning Complex in the Santa Clara area "merged into two major fires and are broken into three zones," Cal Fire says. With both the LNU and SCU complexes burning more than 500 square miles, the fires have become two of the three largest fires in state history. In the CZU Lightning Complex, the body of a 70-year-old man was discovered Sunday in a remote area called Last Chance.

Approximately 77,000 people have been evacuated from the area of CZU complex, and more than 200 buildings have been destroyed, Cal Fire says. "This is one of the darkest periods we've been in with this fire," Santa Cruz Sheriff's Department Chief Deputy Chris Clark said. Across

California, more than 12,000 lighting strikes have been recorded since Aug. 15, igniting hundreds of blazes. More than 14,000 firefighters, 2,400 engines and 95 aircraft are combating the fires. Other large fires included the Butte/Tehama/Glenn Lightning Complex west of Red Bluff and the River Fire south of Salinas, both of which had burned nearly 50,000 acres each. According to the Los Angeles Times, wildfires have burned more than 1.2 million acres of land in California since last month. In all of 2019, which was a slow year for fires, only 259,000 acres, the Times reported. In Southern California, several fires are burning around the Los Angeles area, including an 11-day-old blaze that held steady at just under 50 square miles.

Forecast calls for more dry thunderstorms that could ignite even more blazes

Most of Northern California remains under red flag warnings, indicating "critical fire weather conditions," as more dry thunderstorms threaten the state. The dry storms could bring more lightning strikes as well as gusty winds that could spread any fire started by the strike. The red flag warnings were in effect through Monday night. Mark Brunton, a battalion chief for Cal Fire, said firefighters are prepared for more flames, but he's not sure what to expect. "There's a lot of potential for things to really go crazy out there," he said.

Reports of 'sickening' looting of fire victims, including a firefighter

As tens of thousands have been forced from their homes, looters have taken advantage of the situation, local authorities have warned. In one case, a looter burglarized a California firefighter's marked vehicle, Santa Cruz County Sheriff Jim Hart said Sunday. Brunton called the incident "sickening" and said the firefighter's wallet was stolen and his bank account was "drained" while he was at work directing firefighting crews in the area. Hart said his department has made eight arrests related to looting so far. Some of the looters have been from outside the area, he said. Others are neighbors. Looters have taken personal possessions inside homes and guns, for example. Hart added a story he heard about a group trying to take an outdoor heating system. "I have no empathy, I have no patience for somebody who is going to come into our community and steal from people who have been who have been evacuated and victimized and traumatized," Hart said.

Air quality worsens in north, central California

With so many fires burning throughout the state, unhealthy air full of smoke continues to blanket the areas around the blazes and south in Central California. The National Weather Service issued air quality alerts throughout much of the Bay Area and central California "until fires are extinguished." "Because of the number of fires we have in California, the smoke is just a lot more than normal," said Dan Kottlowski, a senior meteorologist at AccuWeather. "As long as the fires are burning, you're going to keep seeing smoke in these areas." Kottlowski said much of the smoke gets caught in Sacramento and San Joaquin Valleys, and the air flow often remains stagnant during this time of year. Warm weather can also create temperature inversions that trap the particulate matter in the lower atmosphere, worsening air quality over time, Kottlowski added. The weather service's office for the San Joaquin Valley in Hanford warned residents to "stay indoors if possible" and to avoid prolonged outdoor activity. Smoke was forecast to move north Monday, the office said. Air quality index maps showed levels of fine particulate matter, or

PM 2.5, in the air in parts of northern and central California as among the worst levels in the world.

"Exposure to particle pollution can cause serious health problems, aggravate lung disease, cause asthma attacks and acute bronchitis, and increase risk of respiratory infection," the weather service says.

How to stay safe from wildfire smoke

Wildfire smoke can irritate your eyes, nose, throat and lungs, make it hard to breathe and make you cough or wheeze, according to the Centers for Disease Control and Prevention, To reduce exposure to smoke, the CDC recommends choosing a room that can be closed off to outside air. Place a portable air cleaner or filter in the room if possible, the CDC says, and wear a respirator to filter out smoke. While most cloth or surgical masks will help prevent the spread of the new coronavirus, they don't keep people safe from harmful particles in smoke. A mask designed to filter fine particulate matter, like an N-95, is best, though supplies are scarce because of the pandemic. Kottlowski said the more layers, the better, if you don't have access to a respirator. Some face coverings allow you to put an additional filter in to protect you from smoke particles, he said. An air conditioning unit with high efficiency filters can capture fine particles from smoke, and setting the system to recirculate mode can prevent outside air from coming in. Also, avoid burning candles and frying or broiling meat, the CDC says.

Update 8:25 a.m.: CalTrans closes Highway 120/49; Weather break for SCU crews?
By Brian ClarkModesto Bee, Mon., Aug. 24, 2020

Update, 8:25 a.m.: Caltrans closes roads around Moc Fire Highway 120/49 is closed in the area of the Moc Fire, the state Department of Transportation said in a post on Twitter Monday morning. The road is closed from Chinese Camp in Tuolumne County east to SR-120/Priest Grade and south to SR-49/Penon Blanco Road in Mariposa County. Drivers are advised to seek alternate routes. There is no estimated time of reopening, Caltrans said. Update, 7:45 a.m.: Crews at SCU Lightning Complex could get break Unlike Sunday, More moderate weather conditions this afternoon – more humidity and cooler temperatures – could give those fighting the SCU Lightning Complex, which includes the Canyon Zone Fire in and around Stanislaus County's Del Puerto Canyon, the break they need. The fire grew overnight a little, to 347,196 acres, and CalFire was able to assess more of the damage as containment remained at 10%.

The agency announced Monday morning that 12 structures had been destroyed and 12 "minor structures" also were destroyed. More than 20,000 structures remained threatened. Three first responders and two civilians have suffered injuries. There is still no estimate on when the fire, which encompasses seven counties, including Merced, will be under control. Diablo Grande Parkway and the Diablo Grande community remain under an evacuation warning. There was no immediate update Monday morning on the Moc Fire in Tuolumne and Mariposa counties with the exception that containment had gone from 10% to 12%.

Air quality off to a poor start on Monday

Unlike Sunday, when some Stanislaus County residents were greeted with a somewhat blue sky in the morning, Monday has gotten off to a bad start in terms of air quality. The air quality index at 6 a.m. was at 164, in the unhealthful range as fires to the east and west of Modesto continued to burn.

On Sunday, through at least late morning, the AQI was in the 80s, in the moderate range. The National Weather Service on Thursday issued an Air Quality Alert, that remains in place until crews can get hold of the fires burning in Stanislaus County and elsewhere (the SCU Lightning Complex) and in Tuolumne and Mariposa counties (the Moc Fire). There are other fires throughout Northern California and in the hills east of Fresno. Temperatures in the mid to high 90s are expected through Friday in the Modesto area. We should have an update on the fires shortly.

Update, 7:40 p.m.: SCU Lightning fire grows; overnight conditions a concern In updates Sunday night on various fires, here is the latest: The SCU Lightning Complex grew to 343,965 acres throughout the day. The LNU Lightning Complex in Sonoma and surrounding counties has grown to 347,630 acres. Crews are especially worried about the hot, dry and windy conditions facing them into Sunday night and Monday morning. The Red Flag warning has now been extended to 5 p.m. Monday. CalFire also updated its evacuation warnings to include four spots in Merced County:

- North of Hwy 152 to I-5 to the Santa Clara County Line and Stanislaus County Line
- West of the I-5 excluding the community of Santa Nella
- East of Santa Clara County Line and Stanislaus County Line to the Delta-Mendota
- South of the Stanislaus County Line to Hwy 152

Meanwhile, the Turlock Fire Department announced they have firefighters at the LNU Lightning Complex, the North Complex in Plumas and the BTU Lightning Complex just south of Chico. In a set of numbers released by CalFire on Sunday:

- Since Aug. 15, there have more more than 12,000 lightning strikes.
- There have been 615 new wildefires.
- More than 14,000 firefighters are covering 2,400 fire engines, 284 dozers, 327 fire crews, 321 water tenders and 95 aircraft.
- There have been about 60 out of state engines.
- Two dozen wildfires have consumed more than 1.1 million acres.

Update, 5:15 p.m.: CalFire talks at Sunday afternoon press conference With more adverse weather expected from Sunday night into Monday, officials with CalFire and partner agencies urged residents within the SCU Lightning Complex fires to take evacuation warnings and orders seriously. “We are hyper-focused with CalFire Team 6 on that structure defense component and evacuations,” Jake Hess, the chief assigned to the Santa Clara Unit, said at a news conference in Alameda County on Sunday afternoon. “So, please, please, look at those evacuation orders or warnings and listen to those. We put those out there for a reason.” Officials said 1,323 personnel are fighting the SCU Lightning Complex, which now involves San Benito and Merced counties in addition to Stanislaus, San Joaquin, Alameda, Contra Costa and Santa Clara. Speaking on areas of particular concern, a CalFire chief spoke about the southern piece of the Canyon Fire in and around Del Puerto Canyon. “The fire continues to push down into the (Henry W. Coe) State

Park through wilderness area, and that continues to give us a little challenge," he said. "We've created a number of different contingency lines on both sides of the fire and those contingency lines are usually done with bulldozers that are creating lines the fire can't burn through." Those bulldozed lines are augmented with an attack from tankers that lay down retardant lines. Hess referred to the SCU Lightning Complex battle as a marathon. Getting the fire controlled and extinguished is just the first part. Then will come the "fire suppression repair piece," he said.

The CalFire Santa Clara Unit will be living with this incident for years, he predicted. Returning to the more immediate future, Hess said the potential lightning to come Sunday night and Monday "has us very white-knuckled right now" and CalFire turning to partner agencies for resources. Twenty-plus lightning strikes began the fires that merged into the SCU Complex, he said, calling it an "unprecedented event that immediately overwhelmed our resources" and has crews battling 22 fires spread out over the counties.

Update, 6:50 a.m.: Modesto's air quality already unhealthy as crews battle SCU, Moc fires By Deke Farrow Fresno Bee, Monday, August 24, 2020

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Those bulldozed lines are augmented with an attack from tankers that lay down retardant lines. Hess referred to the SCU Lightning Complex battle as a marathon. Getting the fire controlled and extinguished is just the first part. Then will come the "fire suppression repair piece," he said. The CalFire Santa Clara Unit will be living with this incident for years, he predicted. Returning to the more immediate future, Hess said the potential lightning to come Sunday night and Monday "has us very white-knuckled right now" and CalFire turning to partner agencies for resources. Twenty-plus lightning strikes began the fires that merged into the SCU Complex, he said, calling it an "unprecedented event that immediately overwhelmed our resources" and has crews battling 22 fires spread out over the counties.

Update, 2:30 p.m.: SCU Lightning Complex just 10 percent contained Crews fighting the SCU Lightning Complex fires faced the threats of wind gusts and dry lightning Sunday and into

Monday as they worked to improve containment beyond the 10% it's been for the past few days. The complex, which includes the Canyon Fire in and around Del Puerto Canyon west of Patterson, had burned 339,968 acres as of the latest update from CalFire on Sunday. Overnight Saturday, poor humidity and southwest winds "tested containment lines on the north edge of the Calaveras and Canyon zones," CalFire reported Sunday morning.

A Red Flag warning, signaling the possibility of warm winds and dry lightning, began Sunday at 5 a.m. and was expected to last through Monday afternoon at 5. The period of greatest concern was Sunday evening through Monday morning, CalFire reported. The weather service's Sacramento office posted on its Facebook page a gif of a weather prediction model that shows scattered thunderstorms with little to no rainfall are expected to move across Northern California from Sunday evening into Monday. "Even if the storms miss the complex, gusty outflow winds from nearby cells will be of concern for fire growth and firefighter safety," according to a CalFire incident update Sunday. As the agency reported injuries to two firefighters and two civilians, it said "aerial assets" arrived Sunday to assist in perimeter updates and operational decisions on the complex. There is no prediction on when the fires will be fully contained, CalFire reported. Diablo Grande Parkway and the Diablo Grande community remained under an evacuation warning.

While there are five known structures that have been destroyed, 20,265 remain threatened. The SCU Lightning Complex started Aug. 16 with multiple fires. They merged into two major fires and are broken into three zones: Canyon, Calaveras and Deer. The complex is burning in Santa Clara, Alameda, Contra Costa, San Joaquin and Stanislaus counties. Saturday night, it became the second largest fire by acreage in state history dating back to 1932, but was surpassed overnight by the LNU Lightning Complex in Sonoma and Napa counties, among others. The LNU is now at 341,243 acres. The largest is the Mendocino Complex, which burned 459,123 acres in July of 2018. Moc Fire containment doubles Containment of the Moc Fire, burning in parts of Tuolumne and Mariposa counties, has gone from 5% to 10%, CalFire reported Sunday morning. It remains at 2,800 acres. No structures have been lost or damaged, but 1,500 remain threatened. CalFire's update said the fire is active in the Jackass Creek drainage, very rugged terrain and a difficult area for fire personnel to access.

Early Sunday afternoon on its Facebook page, the CalFire Tuolumne Calaveras United posted that the fire poses a significant threat to the Priest Coulterville Road area. It also said it is working with local utility providers to restore power where it does not threaten firefighter safety. The Tuolumne County Sheriff's Department, on its Facebook page, wrote that additional resources had arrived or were to arrive Sunday. Because of hot and dry weather conditions, along with possible lightning over the next two days, evacuated areas remain threatened. There are evacuation areas set up at the Mother Lode and Mariposa fairgrounds. Air quality warnings issued Because of fires burning across Northern California, air quality continues to be unhealthy for much of the interior, the National Weather Service is reporting. It urges residents to limit outdoor activities and check on sensitive groups. A post on the weather service's Facebook page links to AirNow to check air quality by ZIP code or city. Shortly before noon, AirNow said air quality in Modesto was well within the "moderate" range, but the forecast was for "unhealthy." The San Joaquin Valley Air Pollution Control District has a valleywide air quality alert in effect

because of the wildfires. It warns that particulate matter pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke.

Big California wildfires burn on as death toll reaches 7
By Martha Mendoza and John Antczak, Associated Press Bakersfield Californian, Monday, Aug. 24, 2020

SCOTTS VALLEY, Calif. (AP) — Firefighters battling three massive wildfires in Northern California got a break from the weather early Monday as humidity rose and there was no return of the onslaught of lightning strikes that ignited the infernos a week earlier. The region surrounding San Francisco Bay remained under extreme fire danger until late afternoon amid the possibility of of lightning and gusty winds, but fire commanders said the weather had aided their efforts so far. “Mother Nature's helped us quite a bit," said Billy See, the California Department of Forestry and Fire Protection incident commander for a complex of fires burning south of San Francisco. The three big fires around the Bay Area and many others burning across the state have put nearly 250,000 people under evacuation orders and warnings and authorities renewed warnings for anxious homeowners to stay away from the evacuation zones.

Six people who returned to a restricted area south of San Francisco to check on their properties were surprised by fire and had to be rescued, the San Mateo County Sheriff's Office said. The death toll from the fires reached 7 over the weekend after authorities battling a big fire in the Santa Cruz Mountains south of San Francisco announced the discovery of the body of a 70-year-old man in a remote area called Last Chance. He had been reported missing and police had to use a helicopter to reach the area of about 40 off-the-grid homes at the end of a windy, steep dirt road north of the city of Santa Cruz. The area was under an evacuation order and Santa Cruz County Sheriff’s Office Chief Deputy Chris Clark said the discovery of the man's body was a reminder of how important it was for residents to evacuate from fire danger zones. “This is one of the darkest periods we’ve been in with this fire,” he said. California over the last week has been hit by 650 wildfires across the state, many sparked by more than 12,000 lighting strikes recorded since Aug. 15. There are 14,000 firefighters, 2,400 engines and 95 aircraft battling the fires.

The Santa Cruz fire is one of three “complexes,” or groups of fires, burning on all sides of the San Francisco Bay Area. All were started by lightning. Fire crew made slow progress battling the blazes over the weekend, which included a break in the unseasonably warm weather and little wind. But the National Weather Service issued a “red flag” warning through Monday afternoon for the drought-stricken area, meaning extremely dangerous fire conditions exist, including high temperatures, low humidity, lightning and wind gusts up to 65 mph (105 kph) that officials said “may result in dangerous and unpredictable fire behavior.”

A fire in wine country north of San Francisco and another southeast of the city have within a week have grown to be two of the three largest fires in state history, with both burning more than 500 square miles (1,295 square kilometers). The wine country fire has been the most deadly and destructive blaze, accounting for five deaths and 845 destroyed homes and other buildings. Three of the victims were in a home that was under an evacuation order. Officials surveying maps at command centers are astonished by the sheer size of the fires, said Cal Fire spokesman Brice Bennett. “You could overlay half of one of these fires and it covers the entire city of San

Francisco," Bennett said Sunday. In Southern California, an 11-day-old blaze held steady at just under 50 square miles (106 square kilometers) near Lake Hughes in the northern Los Angeles County mountains. Rough terrain, hot weather and the potential for thunderstorms with lightning strikes challenged firefighters on Sunday.

Authorities said their firefighting effort in Santa Cruz was hindered by people who refused to evacuate and those who were using the chaos to loot. Santa Cruz County Sheriff Jim Hart said 100 officers were patrolling and anyone not authorized to be in an evacuation zone would be arrested. "What we're hearing from the community is that there's a lot of looting going on," Hart said. He and county District Attorney Jeff Rosell expressed anger at what Rosell called the "absolutely soulless" criminals victimizing people already victimized by the fire. Among them was a fire commander who was robbed when he left his fire vehicle to help direct operations. Someone entered the vehicle and stole personal items, including a wallet and "drained his bank account," said Chief Mark Brunton, a battalion chief for the California Department of Forestry and Fire Protection. "I can't imagine a bigger lowlife," Hart said.

Holly Hansen, who fled the wine country fire, was among evacuees from the community of Angwin allowed Sunday to return home for one hour to retrieve belongings. She and her three dogs waited five hours in her SUV for their turn. Among the items she took with her were photos of her pets. "It's horrible when you have to think about what to take," she said. "I think it's a very raw human base emotion to have fear of fire and losing everything. It's frightening."

Northern California firefighters dig in ahead of high winds By Martha Mendoza and Frank Baker, Associated Press Bakersfield Californian, Sunday, Aug. 23, 2020

SCOTTS VALLEY, Calif. (AP) — Three massive wildfires chewed through parched Northern California landscape Sunday as firefighters raced to dig breaks and make other preparations ahead of a frightening weather system. That system was packing high winds and more of the lightning that sparked the huge blazes and scores of other fires around the state, putting nearly a quarter-million people under evacuation orders and warnings. At the CZU Lightning Complex fire in the Santa Cruz Mountains, south of San Francisco, authorities said their effort was hindered by people who refused to heed evacuation orders and those who were using the chaos to steal. Santa Cruz County Sheriff Jim Hart said 100 officers were patrolling and anyone not authorized to be in an evacuation zone would be arrested. "What we're hearing from the community is that there's a lot of looting going on," Hart said. He said eight people have been arrested or cited and "there's going to be more." He and county District Attorney Jeff Rosell expressed anger at what Rosell called the "absolutely soulless" people who seek to victimize those already victimized by the fire.

Among the victims was a fire commander who was robbed while helping coordinate efforts on Saturday. Someone entered the commander's fire vehicle and stole personal items, including a wallet and "drained his bank account," said Chief Mark Brunton, a battalion chief for the California Department of Forestry and Fire Protection (Cal Fire). "I can't imagine a bigger low-life," Hart said, promising to catch him and vowing "the DA is going to hammer him." The Santa Cruz fire is one of the "complexes," or groups of fires, burning on all sides of the San Francisco Bay Area. They were started by lightning strikes that were among 12,000 registered in the state

in the past week. The National Weather Service issued a “red flag” warning through Monday afternoon for the drought-stricken area, meaning extreme fire conditions including high temperatures, low humidity and wind gusts up to 65 mph (105 kph) that “may result in dangerous and unpredictable fire behavior.” In nearly a week, firefighters have gotten no more than the 17% containment for the LNU Lightning Complex fire in wine country north of San Francisco. It’s been the most destructive blaze, accounting for five deaths and 845 destroyed homes and other buildings. It and a fire burning southeast of the Bay Area are among the five largest fires in state history, with both burning more than 500 square miles (1,295 square kilometers).

In Southern California, an 11-day-old blaze held steady at just under 50 square miles (106 square kilometers) near Lake Hughes in northern Los Angeles County mountains. Rough terrain, hot weather and the potential for thunderstorms with lightning strikes challenged firefighters. Holly Hansen, an evacuee from the LNU fire, was among evacuees from the community of Angwin being allowed to back their homes for one hour to retrieve belongings. She and her three dogs waited five hours in her SUV for their turn. “It’s horrible, I lived in Sonoma during the (2017) Tubbs Fire, so this is time No. 2 for me. It’s horrible when you have to think about what to take," she said. “I think it’s a very raw human base emotion to have fear of fire and losing everything. It's frightening.”

Meantime, firefighters were frantically preparing for thunderstorms that will bring high winds and “dry” lightning, a term used when such storms have little or no rain. Brunton said while he’s confident firefighters did the most with the time they had to prepare, he’s not sure what to expect. “There's a lot of potential for things to really go crazy out there,” he said. Since Aug. 15, more than 500 fires of varying sizes have burned throughout California, scorching 1.2 million acres, or 1,875 square miles (4,856 square kilometers). Of those, about two dozen major fires were attracting much of the state’s resources. Most of the damage was caused by the three complex fires. They have burned 1,175 square miles (3.043 square kilometers), destroyed almost 1,000 homes and other structures and killed five people, three of whom who were found in a home in an area under an evacuation order. Other casualties included ancient redwood trees at California’s oldest state park, Big Basin Redwoods, plus the park’s headquarters and campgrounds.

Smoke from the fires made the region’s air quality dangerous, forcing millions to stay inside. Officials surveying maps at command centers are astonished by the sheer size of the fires, Cal Fire spokesman Brice Bennett said. “You could overlay half of one of these fires and it covers the entire city of San Francisco,” Bennett said Sunday. Responding to the emergency, President Donald Trump on Saturday issued a major disaster declaration to provide federal assistance. Gov. Gavin Newsom said in a statement that the declaration will also help people in counties affected by the fires with crisis counseling, housing and other social services. Fire officials, meanwhile, have struggled to get enough resources to fight the biggest fires because so many blazes are burning around the state. The wine country fire has only 1,700 firefighters on scene. By comparison, the state had 5,000 firefighters assigned to the Mendocino Complex Fire in 2018, the largest fire in state history. “All of our resources remain stretched to capacity that we have not seen in recent history,” said Shana Jones, the chief for Cal Fire’s Sonoma-Lake-Napa unit.

Relief from smoky skies and bad air may be on its way. Here's what experts predict
By Robert Rodriguez Fresno Bee, Sunday, August 23, 2020

A storm front from the Pacific Northwest is expected to arrive next weekend, bringing some relief from the central San Joaquin Valley's smoky skies, suffocating air quality and triple-digit heat. National Weather Service meteorologist David Spector said that while the storm isn't expected to bring rain, it will provide the region with a strong westerly flow of cooler air. Those winds could push out the stagnant, smoky air that has settled into the area from wildfires raging north of the central Valley. The incoming storm that could arrive Sunday also is expected to knock temperatures down a few degrees to seasonal average highs in the mid-90s and lows in the mid-60s. High heat and smoky air has made for poor air quality in the region. The San Joaquin Valley Air Pollution Control District issued an air quality alert on Saturday and Sunday. Sunday's air quality was rated as very unhealthy in Fresno, Kings and Tulare counties. Madera County's air quality was rated as unhealthy. Air pollution control officials recommend people stay indoors, saying the particle pollution can cause serious health problems, including aggravating lung disease, and increase the risk of respiratory infections. For the latest on air quality information visit the air pollution control district's website at www.valleyair.org.

'Good idea to leave,' Castle Fire grows, sheriff recommends evacuation at Camp Nelson
By Joshua Yeager Visalia Times Delta, Sunday, August 23, 2020

Tulare County Sheriff Mike Boudreaux issued a voluntary evacuation notice Sunday afternoon as the Castle Fire grew dramatically in size Sunday, scorching some 4,000 acres in Sequoia National Forest. Deputies are in the area going cabin to cabin to warn people "that the fire is growing and it would be a good idea to leave," spokesperson Ashley Ritchie said in a news release. Heavy smoke particles, in particular, pose a health risk to the elderly and those with pre-existing conditions. The sheriff and Valley air pollution officials urge everyone to stay inside as particle pollution skyrockets above safe levels. Lightning sparked the Castle Fire in Sequoia National Forest Wednesday morning. On Sunday, the fire jumped the Little Kern River, increasing tenfold in size from about 400 acres on Saturday. The fire is 0% contained, according to the United States Forest Service. Six 20-person hand crews were dispatched to the fire on Thursday, but the firefighters were unable to stop the spread of the flames because of the challenging terrain, wind patterns and harsh conditions. The fire is now spreading further into the remote Golden Trout Wilderness, away from Camp Nelson and Ponderosa to the northeast. No giant sequoia trees are currently threatened by the wildfire, officials said Saturday. Now that the fire has exploded in size, it's unclear how far the flames are from the world's most famous trees. "This fire is burning in extremely rough, inaccessible terrain," said Alicia Embrey, Sequoia National Forest spokeswoman.

Lots of fires, limited resources

Firefighters are making the best of limited resources to keep the flames at bay, she said. Officials are concerned by continuing hot and dry conditions, as well as thunderstorms forecast across the mountains this weekend. The challenging weather sparked Cal Fire to issue a red flag fire warning across much of the state Saturday. "What this means, is that any lightning that comes through, based on the fact that we have so many resources that are affected throughout

California, it's going to likely result in additional fires," said Chief Sana Jones, an incident commander for Cal Fire. "We do have a plan in order to immediate attack those fires, but it's going to take some work." An Incident Management Team has been ordered for the Castle Fire and is expected to arrive over the next few days. That process may be sped up after Sunday's quick spread.

Emergency closures of Golden Trout Wilderness trails and trailheads are pending. Those with Wilderness permits are asked to view closure information online. Forest personnel are reaching out to known wilderness permit holders to warn them about the fires. Aircrews battling the Castle Fire spotted a second fire on Friday, where Pistol Creek and Shotgun Creek converge, deep in the Tulare County wilderness. The second blaze is located within the burn scar of the 2017 Lion Fire and grew to 200 acres. It will remain unstaffed until resources become available to put it out. "With most fire personnel assigned to other fires throughout California, the forest is prioritizing firefighting resources to protect life first, then property and infrastructure," Embrey said.

Air quality unhealthy this weekend; people encouraged to stay inside
The Porterville Recorder, Friday, August 21, 2020

The San Joaquin Valley Air Pollution District reissued a health caution on Friday, stating it will remain in place until all of the state's wildfires are extinguished. There have been eight wildfires across the state that have been dumping smoke and accompanying particular matter, including PM2.5 into the Valley. The district stated PM2.5 concentrations continued to increase throughout the week, leading to unhealth air quality in the Valley. The District stated it anticipates unhealthy air quality to affect the Valley through the weekend and encouraged residents to stay indoors. The District stated the following fires are producing smoke that's infiltrating the Valley: The SCU Lightning Complex Fire, located in multiple Northern California counties, including Stanislaus and San Joaquin Counties; the Hills Fire, located in Fresno County west of Avenal near Highway 33; the CZU August Lightning Complex Fire, located in various locations across San Mateo and Santa Cruz Counties; and the Lake Fire located in Los Angeles County southeast of Lebec.

The District stated counties impacted are San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and Kern. Air pollution officials caution Valley residents to reduce exposure to the particulate matter emissions by remaining indoors in these affected areas. PM pollution can trigger asthma attacks, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Individuals with heart or lung disease should follow their doctors' advice for dealing with episodes of PM exposure. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible to the health effects from this form of pollution. Anyone experiencing poor air quality due to wildfire smoke should move indoors to a filtered, air-conditioned environment with windows closed. The district stated face coverings people wear may not protect them from wildfire smoke. Residents can use the District's Real-time Air Advisory Network (RAAN) to track air quality at any Valley location by visiting myRAAN.com. District air monitoring stations are designed to detect microscopic PM2.5 particles that exist in smoke. However, larger particles, such as ash, may not be detected. Those smell smoke or see falling ash in their immediate vicinity should consider air quality "unhealthy"

(RAAN Level 4 or higher) even if RAAN displays a lower level of pollution. The public can also check the District's wildfire page at www.valleyair.org/wildfires for information about any current and recently past wildfires affecting the Valley.
In addition, anyone can follow air quality conditions by downloading the free "Valley Air" app on their mobile device. For more information, visit www.valleyair.org or call a District office in Fresno (559-230-6000), Modesto (209-557-6400) or Bakersfield (661-392-5500).

Smoke from California wildfires impacting San Joaquin Valley air quality
By Genette Brookshire Stockton Record, Friday, Aug. 21, 2020

The San Joaquin Valley Air Pollution Control District has issued a health caution because of the hazy conditions caused by smoke from the wildfires burning throughout California. Officials are asking Valley residents to reduce their exposure to particulate matter by remaining indoors. Particulate matter can trigger asthma attacks, aggravate chronic bronchitis and increase the risk of heart attack and stroke. Those with existing respiratory conditions, including COVID-19, young children and the elderly, are especially susceptible. Common cloth and paper masks being worn because of COVID-19 concerns may not provide protection from wildfire smoke.

• If you see or smell smoke in your immediate area, stay indoors, if possible, with windows and doors closed and use air conditioning to recirculate air to avoid drawing outside air inside. Also, in your vehicle, use the "recirculating" air function.

• Those with heart or lung disease, older adults, pregnant women and children should avoid prolonged or heavy exertion outside. Outdoor activities should be moved or rescheduled for when the air quality improves. If that's not possible, at least take several breaks during the outdoor activity.

• Ensure family members with heart disease or lung problems such as asthma, bronchitis or emphysema are following their doctor's advice about medicine and their respiratory management plan. Seek help if symptoms worsen. For people who have not been previously diagnosed with a chronic lung or heart disease, health officials note that smoke can "unmask" or produce symptoms of those conditions such as chest pain or tightness, shortness of breath or fatigue.

If they appear, contact a doctor. It also is advised to keep airways moist by drinking lots of water. You also can breathe through a warm, wet washcloth to help relieve dryness. Residents can track air quality at myRAAN.com and find out which fires are affecting the air at www.valleyair.org/wildfires.

Wildfires Impacting Air Quality Across State
By CR Staff Clovis Roundup, Friday, August 21, 2020

With numerous wildfires burning, the air quality has been greatly impacted throughout California. The San Joaquin Valley Air District has issued a health caution for valley residents that will remain in effect till wildfires are contained. District health officials are expecting the air quality to worsen throughout the weekend and is warning people to stay indoors, avoid being

outside for long periods of time especially those who have underlying respiratory or health conditions. Below are current wildfires: SCU Lightning Complex Fire, located in multiple northern counties, including Stanislaus and San Joaquin Counties; the Hills Fire, located in Fresno County west of Avenal near Highway 33. CZU August Lightning Complex Fire, located in various locations across San Mateo and Santa Cruz Counties. Lake Fire located in Los Angeles County southeast of Lebec are producing smoke that is infiltrating into the San Joaquin Valley which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare Counties, and the valley portion of Kern county. To find more information ongoing wildfires, visit www.valleyair.org/wildfires. For more information about air quality, visit www.valleyair.org or call a District office in Fresno (559-230-6000), Modesto (209-557-6400) or Bakersfield (661-392-5500).

Scotts Valley, SLV communities evacuated as fires burn out of control
Press Banner in the Tracy Press, Friday, Aug. 21, 2020

Cal Fire has ordered evacuations around Santa Cruz County

- Bonny Doon south of Ice Cream Grade, and Pine Flat Road South
- All areas of Ben Lomond
- South of Bear Creek Road to Felton, including Ben Lomond
- Scott Valley west of Highway 17
- Campus of University of California, Santa Cruz
- All areas adjacent to Bonny Doon and the San Lorenzo Valley should be prepared to evacuate

Wildfires burning out of control in southern San Mateo County and northern Santa Cruz County have scorched 50,000 acres, forcing evacuations in the communities of Scotts Valley, Ben Lomond and Felton. The fires, named the CZU August Lightning Complex by Cal Fire, were sparked by lightning on Sunday morning have destroyed 50 structures and forced the evacuation of 64,000 people in the flames' path. A Cal Fire spokesman said the fires had "significant behavior through the night," especially on the eastern edge of the fire zone, affecting areas near Boulder Creek and Ben Lomond. They continued to burn with no containment as of Friday morning. There were 1,026 firefighters on the line fighting the fire with 82 fire engines, 30 water tenders, 10 helicopters and 30 bulldozers assigned to 20 crews. Officials said multiple fires had merged during the night and continued to burn due to low humidity, inaccessible terrain and limited resources.

Firefighting air tankers from throughout the state are flying suppression missions as conditions allow, but heavy smoke is hampering flight operations. Santa Cruz County Sheriff's Chief Deputy Chris Clark said Friday morning that the evacuation of the 12,000 residents of Scotts Valley west of Highway 17 was nearly complete. Once everyone has been evacuated, 93 officers and deputies will spread out on roving patrols throughout the valley, including Scotts Valley, to keep homes secure against potential looting or vandalism. Clark said it might be weeks before people can return to their homes, depending on what the fire does.

Residents who might have left pets or other animals in an evacuation area can call the county animal control, 831-471-1182, to see whether the sheriff's department can arrange for a rescue of

their animals. For the latest evacuation orders, evacuation warnings and road closures, visit the Cal Fire San Mateo-Santa Cruz Unit Twitter page. Smoke from the wildfires is also impacting the wider area. The Monterey Bay Air Resources District issued a wildfire air quality advisory stating the air quality had reached "hazardous" — the highest level on the scale — at many monitoring stations throughout Santa Cruz, Monterey and San Benito counties. Everyone should take precautions to limit exposure to smoke and spend as little time outdoors as possible. Smoke is a mixture of gases and fine particles created when wood and other organic material burn.

Microscopic particles in the smoke can trigger asthma, aggravate chronic bronchitis, and increase the risk of heart attack and stroke. Young children, older adults, and people of all ages with existing respiratory conditions, including COVID-19, are especially at risk from this type of air pollution. People are urged to remain indoors in a room with filtered air and to reduce their activity levels until the air clears. More air quality information, including the status of the wildfire smoke, can be found at mbard.org.

California fires claim 6 lives, threaten thousands of homes
Written by Janie Har and Martha Mendoza, Associated Press The Business Journal, Friday, Aug. 21, 2020

(AP) — Sky-darkening wildfires that took at least six lives and forced tens of thousands of people from their homes blazed throughout California on Friday as firefighting resources strained under the vastness of the infernos authorities were trying to control. Three major complexes encompassing dozens of fires chewed through a combined 780 square miles (2,020 square kilometers) of forests, canyons and rural areas flanking San Francisco on three sides. Statewide, nearly 12,000 firefighters are battling blazes that have scorched more than 1,200 square miles (3,120 square kilometers) in California, said Daniel Berlant, assistant deputy director for the state Department of Forestry and Fire Protection, known as Cal Fire.

Crews from Oregon, Idaho and Arizona have arrived to relieve local firefighters, he said, with engines on their way from as far away as Maryland and New Jersey. Tens of thousands of homes were threatened by flames that drove through dense and bone-dry trees and brush. Many of the fires were sparked by lightning strikes from brief thunderstorms — nearly 12,000 since last weekend — as a high-pressure area over the West brought a dangerous mix of triple-digit weather and monsoonal moisture pulled from the south. Some fires doubled in size within 24 hours, fire officials said. And while some evacuations were lifted in the small city of Vacaville, between San Francisco and Sacramento, other areas expanded their evacuation areas. The University of California, Santa Cruz, was evacuated, and a new fire burning near Yosemite National Park also prompted evacuations.

Santa Cruz itself, a coastal city of 65,000, wasn't affected. But Mayor Justin Cummings urged residents Thursday evening to be prepared to evacuate by gassing up their vehicles and packing important documents, medicines and other belongings. "Prepare early so that you are ready to go at a moment's notice," Cummings said. More than 64,000 people have been ordered to evacuate in San Mateo and Santa Cruz counties, which make up part of Silicon Valley and hug the coast south of San Francisco. With firefighting resources tight, homes in remote, hard-to-get-to places burned unattended. Cal Fire Chief Mark Brunton pleaded with evacuees to quit battling fires on

their own, saying that just causes more problems for professionals. “We had last night three separate rescues that pulled our vital, very few resources away,” he said. An anxious Rachel Stratman, 35, and her husband, Quentin Lareau, 40, waited for word Friday about their home in the Forest Springs community of Boulder Creek after evacuating earlier this week. She knows one house has burned but has received conflicting information about the rest of the neighborhood. “It’s so hard to wait and not know,” she said. “I’m still torn if I want people to be going back to the area and videotaping. I know they cause the firefighters distraction, but that’s the only way we know.” The couple are in a San Jose hotel with medication she needs after undergoing a transplant surgery last month. She collected her mother’s ashes and some clothes while her husband closed windows and readied the home before they evacuated Tuesday. “I kept looking at things and kept thinking I should grab this or that, but I just told myself I needed to leave. I didn’t bring any official documents and I didn’t bring my house deed or car title. No passport,” she said. The ferocity of the fires was astonishing so early in the fire season, which historically has seen the largest and deadliest blazes when gusty, dry winds blow in the fall. But the death toll already had reached at least six since the majority of blazes started less than a week ago, with four deaths claimed by fires burning in wine country north of San Francisco.

The bodies of three people were found in a home that burned in Napa, Henry Wofford, spokesman for the Napa County Sheriff’s Office, told the San Francisco Chronicle. In Solano County Sheriff Thomas A. Ferrara reported the death of a male resident there. Separately, a Pacific Gas & Electric utility worker was found dead Wednesday in a vehicle in the Vacaville area Wednesday. In central California, a pilot on a water-dropping mission in western Fresno County died Wednesday morning when his helicopter crashed. At least two other people were missing and more than 30 civilians and firefighters have been injured, authorities said. Smoke and ash billowing from the fires also fouled the air throughout California’s scenic central coast and in San Francisco. The fires have destroyed at least 175 buildings. Tim and Anne Roberts had gone to the beach with their two children on Monday to avoid the smoke at their home in Boulder Creek in Santa Cruz County. They packed a change of clothes, their children’s school supplies and their passports — just in case. They learned Wednesday that their house had burned. Birth certificates, legal documents and family heirlooms are gone. But in photos of the ruins, they were surprised by how many redwoods, oaks and fruit trees were still standing. “It’s a strange sort of comfort,” Tim Roberts said.

The good news for Brookdale resident Larissa Eisenstein Thursday afternoon was that her five chickens, Kelly and The Nuggets, had been safely relocated into a stranger’s yard in a safer, neighboring community. The chicken evacuation came a day after Eisenstein, a Silicon Valley tech worker, had been forced to leave them behind during an overnight evacuation. She fled with her cats Mochi and Mini, driving from one hotel to the next only to find they were full before landing in a safe place where they could get some rest. The bad news Thursday was that the fire was burning down her wooded street as she adjusted to the idea that her worldly possessions may now be limited to photos of her parents, some jewelry she had grabbed, and fresh tomatoes from her garden. “After I got the cats, I realized there was very little important to me, and the priority is to try to remember how lovely things can be,” she said. “I’ve had a wonderful garden this year.”

Although temperatures were predicted to ease slightly on Friday, they were also expected to be hot enough so that firefighters will not be able to count on cool evening weather aiding them. Erratic winds also could drive the fires unpredictably in multiple directions, state fire officials said. Winds gusting to 20 mph (32 kph) over ridge tops could challenge overnight firefighting efforts in Santa Cruz and San Mateo counties, said the incident commander, Cal Fire Assistant Chief Billy See. More firefighters were sent to battle the complex of fires, but "it's still not enough," See said. "We're still drastically short for a fire of this size," he said. State reminds farmers to protect outdoor workers from poor air quality

By John Cox Bakersfield Californian, Friday, Aug. 21, 2020

On top of limitations imposed by COVID-19 and the heat wave, local ag companies and their workers are now having to deal with extraordinarily poor air quality that has the potential to shut down outdoor work amid the ongoing grape and almond harvests. Cal/OSHA, in a news release shared by the state Department of Food and Agriculture, on Friday reminded California employers they must make sure their workers are protected from airborne particulate matter caused by wildfires across the state.

"If employers cannot move operations indoors where air is adequately filtered and they do not have access to respiratory protection, they may need to halt operations until the outdoor air quality improves," Cal/OSHA Chief Doug Parker said in the release. Wildfire smoke carries dangerous chemicals and gases but the biggest concern is fine particular matter known as PM2.5. These tiny specks can inhibit lung function and worsen conditions such as asthma and heart problems. They can also aggravate COVID-19. Cal/OSHA noted that when the local air quality says PM2.5 reaches 151 or higher — it was forecast to be 153 Friday, according to the San Joaquin Valley Air Pollution Control District — then employers of outdoor workers must share information and instruction about available protective measures. It said employers must also make workplace modifications "if feasible," such as bringing workers inside where air is filtered. Otherwise, Cal/OSHA stated, they must either reduce employees' exposure to dirty air or provide masks approved by the U.S. National Institute for Occupational Safety and Health as meeting N95, N99, N100, R95, P95, P99 or P100 filtration standards.

Kern Ag Commissioner Glenn Fankhauser said by email he was unaware of any local operations that have had to close down because of the recently poor air quality. He noted the state has provided the county with N95 masks specifically for distribution to farmworkers having to work in the smoky air and that growers can give their crews N95 masks if they have them. On Friday, the Grower-Shipper Association of Central California noted there is some limited crossover between wildfire and COVID-19 face-mask practices but that some ag employers will need to provide N95 masks to workers. It said in a news release that it's making sure its members are aware of the state's regulatory requirements on days of low air quality. "Workplace safety has remained at the forefront throughout the pandemic, but farmers and farming companies know they must also prioritize exposure mitigation measures in place to help protect employees from wildfire smoke," the association wrote. It pointed out that 2020 has presented growers with challenges that seem like the most difficult they have ever faced. "We are a resilient industry with dedicated farmers and farm employees," the GSA stated. "But 2020 is testing everyone's

resolve and we must lean on each other and protect each other during these unprecedented times."

Wildfire evacuation order, warnings issued for areas south of Tracy
Tracy Press, Thursday, Aug 20, 2020

A fire evacuation order related to the SCU Lightning Complex was issued at noon Thursday for an area on the other side of Interstate 580 at Tracy's extreme southern edge. Other nearby areas are under evacuation warnings. Immediate evacuation is required in the red area in the map below, which is south of West Corral Hollow Road to the Stanislaus County line and west of I-580 to the Alameda County line. The Cal Fire incidents page shows that the SCU Lightning Complex Fire extends north to Lone Tree Creek, about 5 miles southwest of Tracy Golf and Country Club. Homes in the area around the golf course are not under an evacuation order, but are under an evacuation warning, shown in yellow on the map. An evacuation warning (yellow) is also in effect in the area north of West Corral Hollow Road and east of the Alameda County line to I-580. For a visual overview of evacuation orders and warnings related to the SCU Lightning Complex fires, refer to this map. Note that the "Tracy triangle" is just north of the evacuation area.