NCUAQMD
2025 Annual Network Plan and Assessment for Ambient Air Monitoring

July 1, 2025

North Coast Unified
Air Quality Management District
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Contents

Definition of Terms

AAC	Atmospheric Analysis and Consulting
AAQS	Ambient Air Quality Standard
AQI	Air Quality Index
AQS	Air Quality System
BAAQMD	Bay Area Air Quality Management District
CA	California
CARB	California Air Resources Board
E-BAM	Environment (proof) Beta-Attenuation Monitor
FEM	Federal Equivalency Method
FRM	Federal Reference Method
IMPROVE	Interagency Monitoring of Protected Visual Environments
IRA	Inflation Reduction Act (2022 Grant under sections 103/105 of the Clean Air Act)
MSA	Micropolitian Statistical Area
NAAQS	National Ambient Air Quality Standards
NOAA	National Oceanographic and Atmospheric Administration
NCUAQMD	North Coast Unified Air Quality Management District
NSN	National Sovereign Nation
POC	Parameter Occurrence Code
PQAO	Primary Quality Assurance Organization
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Station
SOP	Standard Operating Procedure
SPM	Special Purpose Monitor
TRS	Total Reduced Sulfur
USFS	United States Forest Service

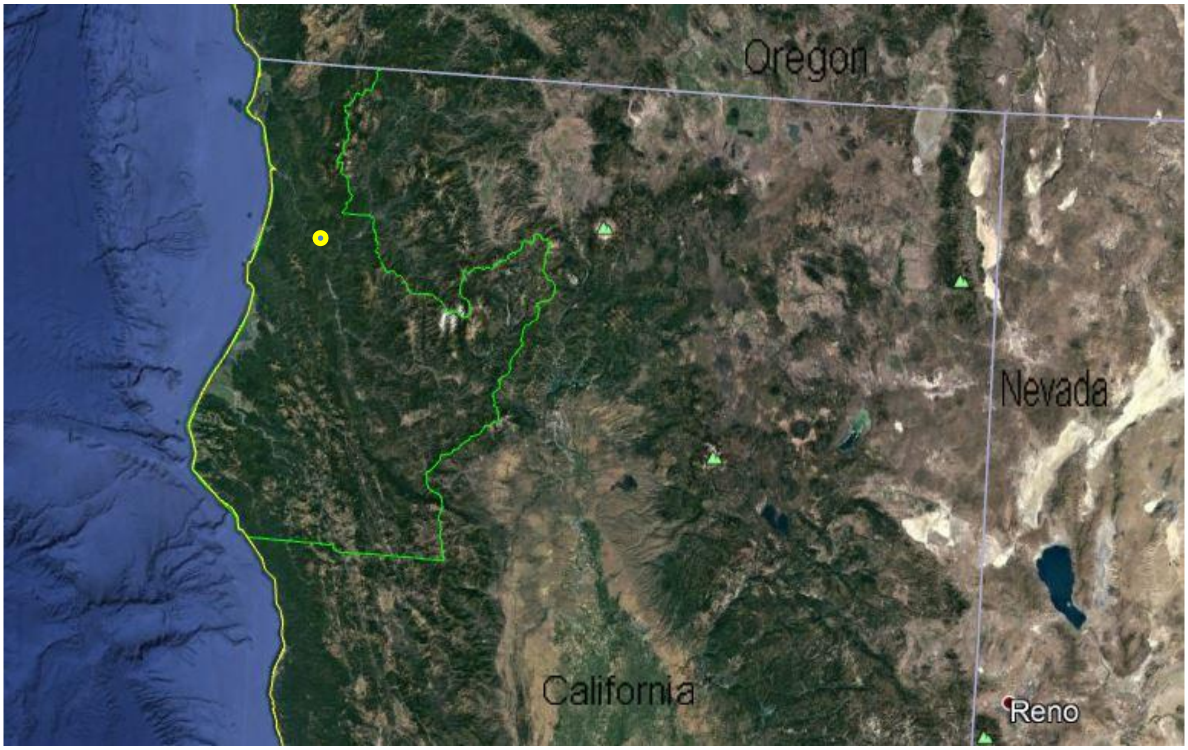
Executive Summary

Annual review of governmental air monitoring networks is required by Title 40 Code of Federal Regulations Part 58.10 (40 CFR 58.10). The North Coast Unified Air Quality Management District's ("NCUAQMD") *2025 Annual Network Plan and Assessment for Ambient Air Monitoring* is an examination of the NCUAQMD's network of ambient air pollution monitoring stations. This report meets the requirements for an annual network plan as listed in 40 CFR 58.10, but is also a 5-Year Air Monitoring Network Assessment, which occurs every five (5) years with additional information and analysis included. Since ambient monitoring objectives, regulatory requirements, and demographics change over time, air agencies need to reevaluate and potentially reconfigure their monitoring networks to best meet the needs of these changes. This assessment reviews the adequacy of the air monitoring network and helps to determine how the network might overall be improved.

One of the keys to managing successful emissions reduction strategies is having a reliable monitoring network to inform decisions. The NCUAQMD works to optimize its monitoring network to best monitor air quality in its jurisdiction to inform planning strategy decisions.

The NCUAQMD is located within the North Coast Air Basin in California. Responsibility for air monitoring in the North Coast Air Basin is divided among three air districts: Mendocino County Air Quality Management District, Northern Sonoma County Air Pollution Control District, and North Coast Unified Air Quality Management District. All three of these air districts belong to the California Air Resources Board (CARB) Primary Quality Assurance Agency (PQAO). Further information about all the other Districts in the air basin can be found in the CARB Annual Network Plan.

NCUAQMD is in the northwestern portion of the North Coast Air Basin, covering a territory of 7,753 square miles. It has jurisdiction over three counties: Humboldt, Del Norte, and Trinity. The NCUAQMD is bordered on the west by the Pacific Ocean and extends from the Oregon border south approximately 140 miles to the Mendocino County line. This area includes widely varied terrain, from coastal wetlands to rugged mountains. Diurnal offshore wind patterns are common. During summer months, north to northwest winds dominate, whereas in the winter more winds tend to come from the south. Inversions are common because of the complex topography of the area coupled with its coastal location. These inversions occur year-round, but most frequently during the cooler months from late fall to early spring. The NCUAQMD office is in Eureka, the county seat of Humboldt County. Eureka is 284 miles north of San Francisco and 466 miles south of Portland, Oregon.



The pollutant of greatest concern for the jurisdiction is Particulate Matter (PM). Del Norte and Trinity Counties are classified as Attainment for PM_{10} for the California State 24-hour PM_{10} standard under the Ambient Air Quality Standard (AAQS), while Humboldt County is classified as Nonattainment for that standard. Based on studies and emission inventories, PM emissions in the District appear to be primarily from transportation, woodstoves, open burning, permitted sources, and wildfire events. The NCUAQMD continues to strive toward reaching the California AAQS for PM_{10}. Humboldt County has met attainment requirements for the most recent years of 2023 and 2024. If the trend continues, it may allow the NCUAQMD to apply for District wide attainment.

There are two major (Title V) stationary sources of emissions in the jurisdiction, which are both located in Humboldt County near Eureka: Humboldt Sawmill Company (Scotia) and the PG&E Humboldt Bay Generating Station (Eureka). The NCUAQMD operates three stationary air monitoring stations, one in each of the counties within the jurisdiction. NCUAQMD also deploys portable particulate matter monitors (E-BAM) to monitor both prescribed and wildfires.

The 2025 Annual Network Plan and Assessment for Plan for Ambient Air Monitoring was made available for a 30-day public comment period. All comments received were forwarded to the United States Environmental Protection Agency (EPA) concurrent with submittal of the plan. Written comments were submitted to the North Coast Unified Air Quality Management District, Attn: Comments on Annual Network Monitoring Plan, 707 L Street, Eureka, California, 95501. Changes suggested in the comments may be addressed in subsequent plan updates. This report may be viewed on the NCUAQMD website (www.ncuaqmd.org), and hard copies are available for review at the NCUAQMD office. Written comments were submitted to the North Coast Unified Air Quality Management District, Attn: Comments on Annual Network Monitoring Plan, 707 L Street, Eureka, California, 95501.

Network Design

The NCUAQMD operated three monitoring sites in 2024. The following maps on the follow pages show the locations of the monitoring sites. The tables below list the pollutants measured at each site.

Table 1. List of State and Local Air Monitoring Stations (Instruments)

Site Name	AQS Site #	Pollutants Monitored
Jacobs	060231004	PM_{10}, $PM_{2.5}$

Table 2. List of Special Purpose Monitoring Stations (Instruments)

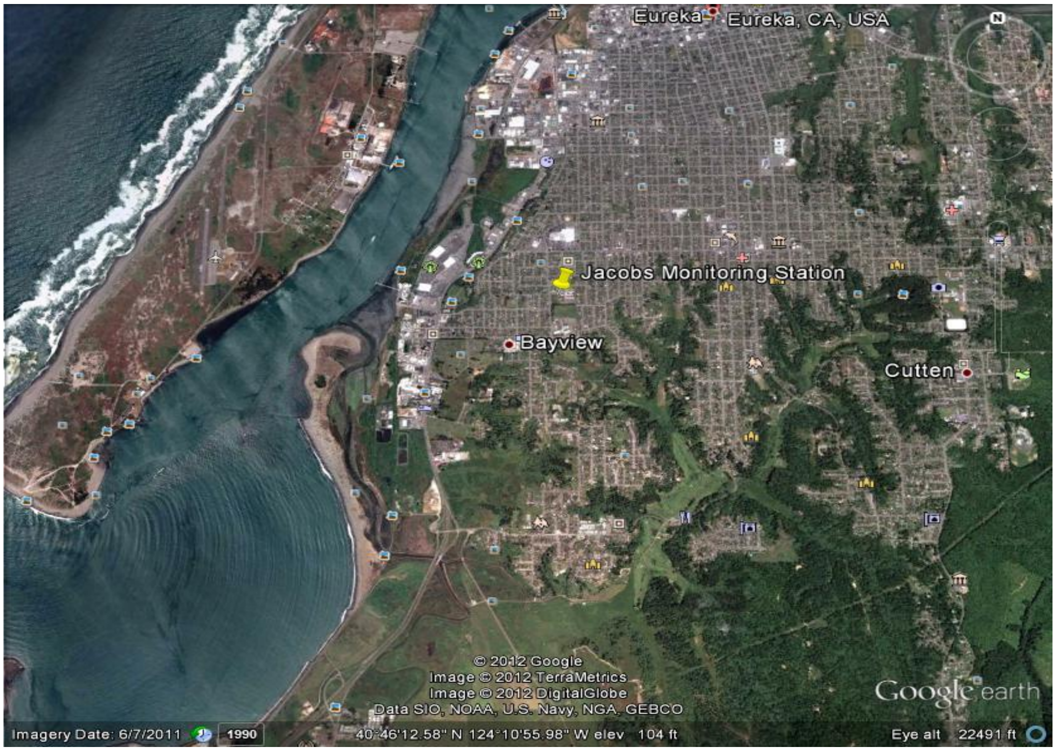
Site Name	AQS Site #	Pollutants Monitored
Jacobs	060231004	O3, NO_2, CO, SO_2

Table 3. List of Other Monitors (Instruments)

Site Name	AQS Site #	Pollutants Monitored
Crescent City	060150007	$PM_{2.5}$
Weaverville	061050002	$PM_{2.5}$

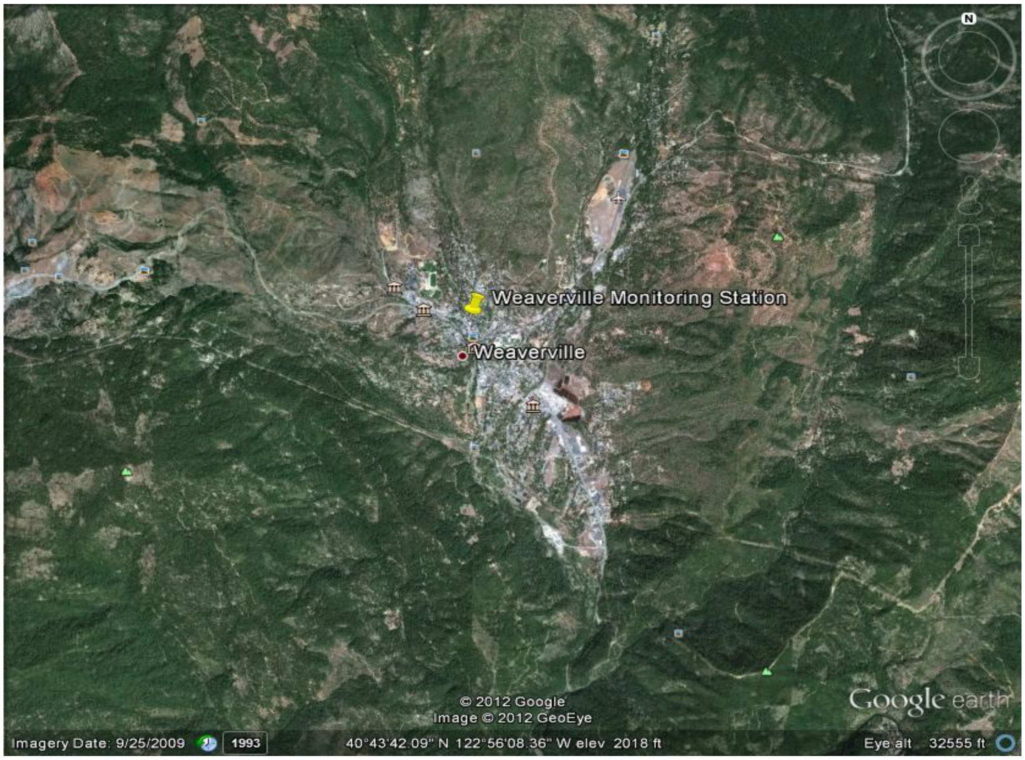
Monitoring Station Locations

<u>Jacobs Monitoring Station</u> (717 South Ave, Eureka, Humboldt County)



Crescent City Monitoring Station (994 G Street, Crescent City, Del Norte County)

Weaverville Monitoring Station (11 Court Street, Weaverville, Trinity County)



Minimum Monitoring Requirements

This network meets the minimum monitoring requirements for all criteria pollutants (Tables 3-9).

Ozone

Table 4. Minimum Monitoring Requirements for Ozone Sites

Micropolitan Statistical Area (MSA)	County	Pop. In Year 2020	4th highest 8-hour max. (ppb) (2022-2024)	2024 3-year design value (ppb)	SLAMS Ozone Sites Required	Active SLAMS Ozone Sites	Active Ozone SPMs	Sites Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	Jacobs 0.047	Jacobs 0.043	0	0	1	0
Crescent City	Del Norte	27,743	-	-	0	0	0	0
none	Trinity	16,112	-	-	0	0	0	0

The NCUAQMD is not required to have Ozone monitors by either a State Implementation Plan (SIP) or Criteria Pollutant Maintenance Plan. The NCUAQMD monitors Ozone as an estimation of population exposure levels. The NCUAQMD has never had an exceedance of Ozone and has been below the standard since operation of the monitor.

$PM_{2.5}$

Table 5. Minimum Monitoring Requirements for SLAMS $PM_{2.5}$. Sites

Micropolitan Statistical Area	County	Pop. In Year 2020	Annual Design Value (ug/m^3) (2022-2024)	Daily Design Value (ug/m^3) (2022-2024)	FRM Sites Required	SLAMS Sites Active	SPM Sites Active	Sites Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	Jacobs 6.8	Jacobs 18	0	1	0	0
Crescent City	Del Norte	27,743	-	-	0	0	1	0
none	Trinity	16,112	-	-	0	0	1	0

Table 6. Minimum Monitoring Requirements for Continuous $PM_{2.5}$ Sites

Micropolitan Statistical Area	County	Pop. In Year 2020	SLAMS FEM Sites required	SLAMS Sites Active	SPM Sites Active
Eureka, Arcata, Fortuna	Humboldt	136,463	0	0	0
Crescent City	Del Norte	27,743	0	0	1
none	Trinity	16,112	0	0	1

Table 7. Collocation of continuous $PM_{2.5}$ monitors

Method Code	# Primary Monitors	POC designations	Required NCUAQMD operated collocated monitors	Active NCUAQMD operated collocated FRM monitors	Active Collocated FEM Monitors
143	1	1,2	0	1	0

The NCUAQMD is not required to have $PM_{2.5}$ monitors as they are not required by either by a State Implementation Plan (SIP) or Criteria Pollutant Maintenance Plan. Although there has never been an exceedance of the standard at any of the sites, the NCUAQMD has no required FRM $PM_{2.5}$ sites so it is not necessary to identify the maximum concentration $PM_{2.5}$ site.

Collocation is the responsibility of the Primary Quality Assurance Organization (PQAO). The NCUAQMD works with the CARB PQAO to assist wherever possible. The NCUAQMD currently operates a collocation of a Thermo 2000i to Thermo 2000i (method 143/143). This collocation began in December of 2023 in response to CARB's 2021 shuttering of the only PQAO collocation of method 143 within the PQAO. When NCUAQMD discovered that CARB PQAO method 143 data was no longer recommended for data certification in the AQS system due to this cessation, NCUAQMD organized to begin the current collocation. Method 143 is an FRM method, so it does not generate continuous data, however, of all the $PM_{2.5}$ samplers used in California, it is this method which exhibits the lowest coefficient of variation (CV)

The NCUAQMD monitors $PM_{2.5}$ in Humboldt County to estimate population exposure throughout the year and prioritizes providing good quality AQI information to the EPA AirNow website (EPA AirNow Fire & Smoke Map) during wildfire events.

PM$_{10}$

Table 8. Minimum Monitoring Requirements for PM10 Sites

Micropolitan Statistical Area	County	Population in Year 2020	Max Concentration (2022-2024) (ug/m^3)	SLAMS Sites Required	SLAMS Sites Active	SPM Sites Active	Sites Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	Jacobs 76	1	1	0	0
Crescent City	Del Norte	27,743	-	0	0	0	0
none	Trinity	16,112	-	0	0	0	0

The NCUAQMD is classified a Nonattainment for PM$_{10}$ for the California State 24-hour PM$_{10}$ standard under the AAQS for Humboldt County. PM$_{10}$ is monitored continuously at Jacobs Station in Eureka, Humboldt County. This frequency meets the requirements of 40 CFR 58.12. Jacobs is the only, and thus the maximum, PM$_{10}$ site in the District. The Jacobs Station is the only, and thus the maximum, PM$_{10}$ site in Humboldt County in the NCUAQMD. The NCUAQMD continues to only have rare exceedances of PM$_{10}$. The NCUAQMD is not required to have additional PM$_{10}$ monitors as they are not required by either a SIP or a Maintenance Plan.

NO$_2$

Table 9. Minimum Monitoring Requirements for NO$_2$ Monitors

Micropolitan Statistical Area	County	Population in Year 2020	Annual Design Value (ppb) (2022-2024)	SLAMS Monitors Required	Active SLAMS Monitors	Active SPM Monitors	Monitors Needed
Eureka-Arcata, Fortuna	Humboldt	136,463	Jacobs 14	0	1	0	0
Crescent City	Del Norte	27,743	-	0	0	0	0
none	Trinity	16,112	-	0	0	0	0

The NCUAQMD is not required to have NO$_2$ monitors as they are not required by either SIP or Maintenance Plan. The NCUAQMD monitored NO$_2$ in Humboldt County 2006-2024 to examine population exposure. EPA shutdown approval for that monitor was received in the EPA response to the 2024 NCUAQMD Annual Network Plan. Based on population, near-road NO$_2$ monitors are not required within NCUAQMD boundaries. The NCUAQMD never had an exceedance of NO$_2$ and had been well below the standard throughout monitor operation.

SO_2

Table 10. Minimum Monitoring Requirements for SO_2 Monitors

Micro-politan Statistical Area	County	Pop. in Year 2020	Annual Design Value (ppb) (2022-2024)	Max 24 hour (ppb) (2022-2024)	Max 1 hour (ppb) (2022-2024)	SLAMS Monitors Required	Active SLAMS Monitors	Active SPM Monitors	Monitors Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	Jacobs 0.44	Jacobs 1.3	Jacobs 1.5	0	0	1	0
Crescent City	Del Norte	27,743	-	-	-	0	0	0	0
none	Trinity	16,112	-	-	-	0	0	0	0

The NCUAQMD has never had an exceedance of SO_2 and has been well below the standard since operation of the monitor. The NCUAQMD is not required to have SO_2 monitors as they are not required by either a SIP or Maintenance Plan. The NCUAQMD monitored SO_2 2006-2024 in Humboldt County to examine population exposure. EPA shutdown approval was received in the EPA response to the 2024 NCUAQMD Annual Network Plan.

CO

Table 11. Minimum Monitoring Requirements for CO Monitors

Micro-politan Statistical Area	County	Pop. in Year 2020	8-hour Design Value (ppm) (2021-2023)	1 hour. Design Value (ppm) (2021-2023)	SLAMS Monitors Required	Col-located Monitors Required	Active SLAMS Monitors	Active SPM Monitors	Monitors Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	Jacobs 0.6	Jacobs 0.7	0	0	1	0	0
Crescent City	Del Norte	27,743	-	-	0	0	0	0	0
none	Trinity	16,112	-	-	0	0	0	0	0

The NCUAQMD has never had an exceedance of CO and has been well below the standard since operation of the monitor. The NCUAQMD is not required to have CO monitors as they are not required by either a SIP or Maintenance Plan. The NCUAQMD monitored for CO 2006-2023, shutting the CO instrument down due to unrecoverable failure in April 2023. EPA shutdown approval was received in the EPA response to the 2024 NCUAQMD Annual Network Plan.

Lead (Pb)

Table 12. Minimum Monitoring Requirements for Pb

Micropolitan Statistical Area	County	Pop. In Year 2020	Annual Design Value	Monitors Required	Active Monitors	Monitors Needed
Eureka, Arcata, Fortuna	Humboldt	136,463	-	0	0	0
Crescent City	Del Norte	27,743	-	0	0	0
none	Trinity	16,112	-	0	0	0

The NCUAQMD is not required to monitor Lead (Pb). Lead monitors are not required by either a SIP or Maintenance Plan.

Quality Control

The NCUAQMD is a member of the CARB Primary Quality Assurance Organization (PQAO), and all ambient air monitoring meets CARB Quality Control and Quality Assurance requirements. CARB audit records and site information for the NCUAQMD can be found on the CARB website or obtained by contacting the NCUAQMD.

The NCUAQMD's $PM_{2.5}$ FRM filters are analyzed by the Bay Area Air Quality Management District (BAAQMD). The BAAQMD Laboratory meets federal requirements for Quality Control and Quality Assurance. Information regarding the laboratory can be found on the BAAQMD website.

Automated zero, precision, and span audits of NCUAQMD gaseous analyzers are carried out with a Thermo 146i Multigas Calibrator. The Multigas Calibrator titrates zero air and a multigas blend which is certified according to the 2012 EPA Traceability Protocol. Onsite comparisons of the NCUAQMD zero air generator are performed by the CARB on a biannual basis. The Zero Air audit is performed in accordance with the CARB Zero Air Source Audit Program. Detailed information is available on the Air Resources Board website.

NCUAQMD analyzer precision and zero audits are carried out every third day, and spans are run once per week. The 146i calibrator used is certified by the CARB Standards lab. CARB calibration staff calibrate station gaseous instruments biannually with an independent instrument, and CARB audit staff audit yearly with a separate independent instrument. Particulate instruments are flow audited monthly by NCUAQMD staff, and independently audited by CARB staff every six months. Particulate instruments undergo flow calibrations yearly by CARB calibration staff. Information regarding CARB methods are available on the California Air Resources Board website.

Collocation

The NCUAQMD is a member of the CARB Primary Quality Assurance Organization (PQAO) and relies on the PQAO network to satisfy all collocation requirements (CFR 58 App A 3.2.5). The NCUAQMD works with the CARB PQAO to assist with collocation wherever possible. The NCUAQMD currently operates a $PM_{2.5}$ FRM Thermo 2000i to Thermo 2000i collocation. This collocation began in December of 2023 and supports the CARB PQAO collocation Network.

Recent or Proposed Modifications to Network

The NCUAQMD's decision to remove the NO_2, CO, and SO_2 criteria gas monitoring in 2024 is consistent with CARB's recommendation and findings in ARB's 2022 TSA Report which indicated that the monitoring network generally exceeded the regulatory monitoring requirements and was too large for current resources. EPA approval for these shut down is attached to this document. (Attachment A). The NCUAQMD reported the data from these instruments to the Federal Air Quality Database (AQS) as Special Purpose Monitor (SPM) for 18 years. The shutdown request was based on 40CFR Part 58.14 (1), where data collected supports a less than a 10% chance that either the Jacobs CO monitor, the Jacobs SO_2 , or the Jacobs NO_2 monitor would exceed 80% of the NAAQS over the next three (3) years.

CARB has encouraged the NCUAQMD to focus on Particulate Matter as the criteria pollutant of highest concern and to continue Ozone monitoring. As indicated previously, the NCUAQMD is classified as nonattainment for PM_{10} for the California State 24-hour PM_{10} standard for Humboldt County, but is in attainment of the $PM_{2.5}$ standard. Although Ozone continues to be monitored in Humboldt County, but as noted above, the NCUAQMD has only had one exceedance of Ozone Standard, which occurred during a wildfire event. Ozone levels have generally been well below the standard throughout monitor operation.

Southern Humboldt could benefit from a $PM_{2.5}$ monitor as PM typically affects the region because of the prevalent use of woodstoves, prescribed fire activity, and frequent wildfire events. A continuous $PM_{2.5}$ device is also necessary to provide good quality information AQI information for this affected region during wildfire events for the EPA AirNow website (EPA AirNow Fire & Smoke Map). The NCUAQMD continues to seek funding for a particulate-only monitoring station (similar to the Crescent City and Weaverville stations) for this area in the southern part of the jurisdiction.

The NCUAQMD recently received funding from the Inflation Reduction Act Section 60105, to establish a Particulate Matter only station at the NCUAQMD's office in Eureka. This station will use real-time instruments to monitor for PM_{10} and $PM_{2.5}$, thus providing faster dissemination of public health information to the people of Eureka. A project to better determine the boundaries of the Humboldt Bay Air Basin was also funded by the IRA grant. This project will utilize NCUAQMD owned E-BAMs in arrays near understood basin perimeters.

In April of 2025, CARB proposed a change to the function of the PQAO. Previously, a major mission of the CARB PQAO included, "common calibration facilities and standards". In the memo, "*U.S. EPA 2023 Ozone Technical Assistance Document Implementation for CARB's Air Quality Surveillance Branch and Changes to District Calibration Services*" dated February 28, 2025, CARB suggested that common calibration instruments need no longer be used, but instead, each District should calibrate their own instruments with their own equipment. This is a foundational change to the purpose of a PQAO and transfers a substantial monetary cost from CARB to the Local Districts. NCUAQMD requests EPA guidance on both the technical and financial ramifications of this proposed change.

Review of Changes to $PM_{2.5}$ Monitoring Network

Should a required $PM_{2.5}$ monitor need to be moved, the annual network plan inspection/comment process would be used to review any such changes. Any change to the NCUAQMD's $PM_{2.5}$ network is reviewed by EPA Region 9. In December of 2024, the NCUAQMD began running an FRM collocation of method 143 at Jacobs Monitoring Station.

The NCUAQMD recently received funding from the Inflation Reduction Act Section 60105, to establish a Particulate Matter only station at the NCUAQMD's office in Eureka. This station will use real-time instruments to monitor for PM_{10} and $PM_{2.5}$, thus providing faster dissemination of public health information to the people of Eureka. A project to better determine the boundaries of the Humboldt Bay Air Basin was also funded by the IRA grant. This project will utilize NCUAQMD-owned E-BAMs in arrays near understood basin perimeters.

Data Submission Requirements

Data and Precision/Accuracy reports are to be submitted to CARB no later than 60 days after the quarter of record. The CARB uploads NCUAQMD data to the National Air Quality System (AQS) no later than 90 days after the quarter of record. CARB typically submits the annual data certification no later than May 1st of each year.

Data Availability

NCUAQMD's air quality data is available in the AQS database and the Air Quality and Meteorological Information System (AQMIS) database. It can also be obtained directly from the NCUAQMD. The NCUAQMD should be contacted directly to request data if access through the public databases is problematic.

Detailed Site Information

Site Name: Jacobs

The Jacobs site was established in December of 2006 and is located on the west side of the City of Eureka.

Jacobs	
AQS ID	060231004
Latitude /Longitude (degrees)	40.776608 N 124.179494 W
Location	Alice Birney Elementary School
Address	717 South Ave, Eureka
County	Humboldt
Dist. to road (meters)	50
Traffic count (AADT)	2,299 (June 2023, Utah Street between Gibson Ave. and Highland Ave.)
Representative statistical area name	Eureka, Arcata, Fortuna
Groundcover	grass
PEP audit?	Information maintained by EPA
NPAP audit?	Information maintained by EPA
PM10 Flow audits	Performed every 2 weeks by NCUAQMD, Performed biannually by CARB
PM2.5 Flow audits	Performed monthly by NCUAQMD, Performed biannually by CARB
Gaseous audits	Following the requirement in QA Volume II, performance audits are performed annually by CARB
Date of 2024 CARB annual performance evaluation for ozone instruments	May 14, 2024
Dates of two semi-annual PM10 flow CARB audits occurring in 2024	May 14,2024 November 18, 2024
Dates of two semi-annual CARB PM2.5 flow audits, occurring in 2024	May 14, 2024 November 18, 2024
Gaseous One-point control checks	Performed a minimum of once 14 days
Gaseous instrument calibrations	Performed bi-annually
Representative Area	Humboldt County Micropolitan Statistical Area, Eureka-Arcata-Fortuna, suburban

Pollutant	O3	NO2	CO	SO2	PM2.5	PM2.5	PM10
Primary/QA Collocated/Other	N/A	N/A	N/A	N/A	Primary	Collocated	Primary
Parameter Code	44201	42602	42101	42401	88101	88101	81102
POC	1	1	1	1	1	2	1
Basic Monitoring Objective	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	Research Support	NAAQS comparison
Site Type	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population Exposure	Population exposure
Monitor Type	SPM	SPM	SPM	SPM	SLAMS	SLAMS	SLAMS
Network affiliations	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spatial scale	Neighbor-hood	Neighbor-hood	Neighbor-hood	Neighbor-hood	Neighbor-hood	Neighbor-hood	Neighbor-hood
Sampling method	Photometric EQOA-0880-047	Chemiluminescence RFNA-1289-074	Gas Filter correlation RFCA-0981-054	Pulsed Florescence EQSA-0486-060	Low Volume RFPS-0498-143	Low-Volume RFPS-0498-143	EQPM-0798-122
Instrument manufacturer and model	Thermo 49i	Thermo 42i	Thermo 48i	Thermo 43i	Thermo 2000i	Thermo 2000i	Met One BAM-1020
FRM/FEM/ARM	FEM	FRM	FRM	FEM	FRM	FRM	FEM
Collecting Agency	NCUAQMD	NCUAQMD	NCUAQMD	NCUAQMD	NCUAQMD	NCUAQMD	NCUAQMD
Analytical Lab	N/A	N/A	N/A	N/A	BAAQMD	BAAQMD	N/A
Reporting Agency	CARB	CARB	CARB	CARB	CARB	CARB	CARB
Start date	Dec 15, 2006	Dec 15, 2006	Dec 15, 2006	Dec 15, 2006	Dec 25, 2006	Dec 2, 2023	Jan 1, 2014
Required Sampling Frequency	N/A	N/A	N/A	N/A	1:6	1:12	1:6
Current Sampling Frequency	continuous	continuous	continuous	continuous	1:3	1:12	continuous
Sampling season	Year round	Year round	Year round	Year round	Year round	Year Round	Year round
Probe height (meters)	4.5	4.5	4.5	4.5	4.3	4.3	5
Distance of low-volume PM instrument from other PM instruments are >1 meter?	N/A	N/A	N/A	N/A	yes	yes	N/A
Distance from supporting structure (meters)	2	2	2	2	1.8	1.8	2.4

Pollutant	O3	NO2	CO	SO2	PM2.5	PM2.5	PM10
Distance from obstructions on roof (meters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance from obstructions not on roof (meters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Height of obstructions not on roof (meters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance from trees (meters)	29	29	29	29	28	28	31
Distance to furnace or incinerator flue (meters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360	360	360	360
Probe material	Teflon	Teflon	Teflon	Teflon	N/A	N/A	N/A
Residence time (seconds)	8.5	12.2	8.5	14.6	N/A	N/A	N/A
Operation meets requirements of appendices B, C, D and E where applicable	yes	yes	yes	yes	yes	yes	yes
Will there be changes within the next 18 months?	yes	yes	yes	yes	no	no	no
With regard only to CFR 58.30, is data suitable for comparison against the annual PM2.5 NAAQS?	N/A	N/A	N/A	N/A	yes	yes	N/A
Does instrument meet EPA Min. Data Assess. Requirements for PM2.5 instruments (CFR 40, part 58, Appendix A) or an alternative?	N/A	N/A	N/A	N/A	yes	yes	N/A

Site Name: Weaverville

The Weaverville site was established in 1995. It is located in downtown Weaverville near HWY 299.

Weaverville Site	
AQS ID	061050002
Latitude/Longitude (degrees)	40.734767 N 122.941172 W
Location	Trinity County Courthouse
Address	11 Court Street, Weaverville
County	Trinity
Dist. to road	28 meters to highway 299
Traffic count	9,600 AADT for HWY 299 at Washington Street (2022)
Groundcover	Paved
PEP audit	Information maintained by EPA
NPAP audit	Information maintained by EPA
$PM_{2.5}$ Flow audits	Performed biweekly by NCUAQMD, Performed biannually by CARB
Date of annual performance evaluation (2024 CARB flow audit)	May 13,2024
2024 semi-annual $PM_{2.5}$ flow audits by CARB	May 13, 2024 Nov 18,2024
Representative Area	Rural, no MSA in Trinity County
Pollutant	**$PM_{2.5}$**
Primary/QA Collocated/ Other	Primary
Parameter Code	88502
POC	1
Basic monitor objective	Air Pollution Data
Site Type	Population exposure
Monitor Type	Other
Spatial scale	Neighborhood
Network Affiliation	N/A
Sampling method	EQPM-0798-122
Instrument manufacturer and model	Met One BAM-1020
FRM/FEM/ARM	Non-FEM
Collecting Agency	NCUAQMD
Analytical Lab	N/A
Reporting Agency	CARB
Start date	March 2015

Pollutant	$PM_{2.5}$
Required Sampling Frequency	N/A
Current Sampling Frequency	continuous
Sampling season	Year round
Probe height (meters)	8
Distance from supporting structure (meters)	2.4
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof	N/A
Distance from trees (meters)	15
Distance to furnace or incinerator flue	N/A
Distance between collocated monitors	N/A
Unrestricted airflow (degrees)	360
Probe material	N/A
Residence time	N/A
Operation meets requirements of appendices B, C, D, and E, where applicable	yes
Will there be changes within the next 18 months?	no
I With regard only to CFR 58.30. is data suitable for comparison against the annual $PM_{2.5}$ NAAQS?	no
Does instrument meet EPA Minimum Data Assessment Requirements for $PM_{2.5}$ instruments (CFR 40, part 58, Appendix A) or an approved alternative?	yes

Site Name: Crescent City

The Crescent City site was established in 1998. It is currently located at Crescent Elk Middle School.

Crescent City	
AQS ID	060150007
Latitude/ Longitude (degrees)	41.755925 N 124.203614 W
Location	Crescent Elk Middle School
Address	994 G Street
County	Del Norte
Dist. to road	64 meters to 9th Street
Traffic count	9,500 AADT ON L STREET AT 9TH STREET (2022)
Groundcover	Paved/grass
PEP audit	Information maintained by EPA
NPAP audit	Information maintained by EPA
Flow audit	bimonthly by NCUAQMD
Date of 2024 annual performance evaluation (CARB audit)	none
Date of semi-annual flow audit occurring in 2024 (CARB flow audit)	none
Representative Area	Del Norte County, Micropolitan Statistical Area, Crescent City Urban
Pollutant	**$PM_{2.5}$**
Primary/QA Collocated/Other	Other
Parameter Code	88502
POC	1
Basic Monitoring Objectives	NAAQS comparison
Site Type	Population exposure
Monitor Type	Other
Network Affiliation	N/A
Spatial scale	Neighborhood
Sampling method	EQPM-0798-122
Instrument manufacturer and model	Met One BAM-1020
FRM/FEM/ARM	Non-FEM
Collecting Agency	NCUAQMD
Analytical Lab	N/A
Reporting Agency	CARB
Start date	May 2019
Current Sampling Frequency	Continuous
Required Sampling Frequency	N/A
Sampling season	Year round

Pollutant	$PM_{2.5}$
Probe height	7
Distance from supporting structure	2
Distance from obstructions on roof	N/A
Distance from obstructions not on roof	N/A
Height of obstruction not on roof (meters)	N/A
Distance from trees	93 meters
Distance to furnace or incinerator flue	49 meters
Height of stack	4 meters
Fuel burned	Diesel, intermittent, as determined by building needs
Distance between collocated monitors	N/A
Unrestricted airflow(degrees)	360
Probe material	N/A
Residence time	N/A
Operation meets requirements of appendices B, C, D, and E, where applicable	yes
Will there be changes within the next 18 months?	no
With regard only to CFR 58.30. is data suitable for comparison against the annual $PM_{2.5}$ NAAQS?	no
Does instrument meet EPA Minimum Data Assessment Requirements for $PM_{2.5}$ instruments (CFR 40, part 58, Appendix A) or an approved alternative?	yes

Monitoring Objectives

The monitoring objectives of the NCUAQMD match those found in the Code of Federal Regulations (CFR), part 58, appendix D: 1) to determine the highest concentrations expected to occur in the area covered by the network, 2) to determine representative concentrations in areas of high population density, 3) to determine the impact on ambient pollution levels of significant sources or source categories, 4) to determine background concentration levels, 5) to determine extent of regional pollution transport among populated area, and in support of secondary standards, and 6) to determine welfare-related impacts in more rural and remote areas, such as visibility impairment and effects on vegetation. These objectives are met to the greatest extent allowed by the size and funding of the NCUAQMD. The NCUAQMD prioritizes monitoring goals in the order listed above.

The NCUAQMD's area of responsibility (Humboldt, Del Norte, and Trinity County) which make up the northern portion of the North Coast Air Basin, located in the northwestern portion of California. The complex topography of the terrain necessitates the deployment of multiple particulate monitors in the case of wildfire events. The NCUAQMD operates three permanent monitoring stations, one in each county. In 2024, there was one full station monitoring six criteria pollutants, and two particulate only stations, which are all neighborhood scale monitoring sites. The NCUAQMD has no background stations, however there are several sites run by other agencies within the jurisdiction, which can provide background information. In 2026-2030, the NCUAQMD plans to utilize IRA grant funds to implement real-time $PM_{2.5}$ monitoring at a downtown Eureka location, install a new Ozone calibrator in the existing uptown Eureka station, and perform a preliminary evaluation of the Humboldt Bay Air Basin boundary.

There are two important atmospheric monitoring stations located in the NCUAQMD jurisdiction. The National Oceanic and Atmospheric Administration (NOAA) operates a site in Trinidad (Humboldt County) which measures surface ozone, stratified ozone, and collects samples for halocarbon analysis. The second station belongs to the Advanced Global Atmospheric Gases Experiment (AGAGE) which is also location in Trinidad. The AGAGE is supported by over twenty agencies and measures the halogenated gases regulated under the Montreal Protocol on Substances that deplete the ozone layer, and the major non-CO_2 greenhouse gases. Ozone information collected here informs the NCUAQMD's background O_3 concentration determination.

The determination of regional pollution transport among populated areas and monitoring in support of secondary standards is beyond current funding constraints of the NCUAQMD. However, NOAA operates a surface Ozone instrument in Weaverville, Trinity County to study ozone transport. This information is not expected to have ramifications on ozone attainment for the area, but will generate useful data which inland PQAO members may wish to utilize and may be used as a baseline for any future developments in the area.

There are two Interagency Monitoring of Protected Visual Environments (IMPROVE) sites within the NCUAQMD. One is located near Trinity Lake in Trinity County (Trinity National Forest), and the other in Redwood National Park in Del Norte County. Both sites perform $PM_{2.5}$ speciation and are used for background and speciation information. Detailed reports are available at airquality.ucdavis.edu/.

Additionally, there are three local tribal Governments (Hoopa Valley Tribe NSN, Yurok Tribe NSN, and Blue Lake Rancheria NSN) that operate monitoring equipment within the NCUAQMD jurisdiction. Particulate matter sites are located in Hoopa Valley (Humboldt County), Weitchpec

(Humboldt County), Klamath Glen (Del Norte County), and Blue Lake (Humboldt County). Data from tribal sources could be utilized by the District only when documented quality assurance and quality control activities meet the NCUAQMD's PQAO requirements. Most commonly, the particulate sites in Klamath Glen and Weitchpec are utilized to assess air quality conditions during wildfire and prescribed burning events.

Smoke monitoring is a primary responsibility of the NCUAQMD, as it is located in a region extremely susceptible to wildfire events of significant duration. The NCUAQMD owns four E-BAMs and caches two additional E-BAMs which belong to the California Air Resources Board's Prescribed Fire Monitoring Program. These units are deployed on an as needed basis during wildfire and prescribed fire events. The objectives of the units are: 1) to determine the highest concentrations expected to occur in the area covered by the network, 2) to determine representative concentrations in areas of high population density, and 3) to determine the effectiveness of the Smoke Management Plan used in Prescribed Burn events.

Monitoring Efficiency

The primary users of the monitoring data are NCUAQMD staff, State and Federal database users, the Health Departments of Humboldt, Trinity, and Del Norte Counties, Tribal Health Departments, Schools, and the United States Forest Service. Additionally, the data is used by private citizens for personal health management and travel planning.

Monitoring data becomes particularly important to Health Departments during wildfire events. District data has been used to substantiate health-related Federal Declarations of Emergency in both Humboldt and Trinity Counties. Humboldt County was the first County in California to issue a Declaration of Emergency based on Air Quality.

The NCUAQMD compares its monitoring data to the Federal Ambient Air Quality Standards, and the California State Ambient Air Quality Standards, (AAQS), to determine compliance with ambient air health standards. Current State and Federal standards are listed in the following table.

Table of Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	9.0 µg/m³	15.0 µg/m³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m³)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m³)		9 ppm (10 mg/m³)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m³)	Gas Phase Chemiluminescence	100 ppb (188 µg/m³)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)		53 ppb (100 µg/m³)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m³)	Ultraviolet Fluorescence	75 ppb (196 µg/m³)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m³	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m³ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m³		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

See footnotes on next page ...

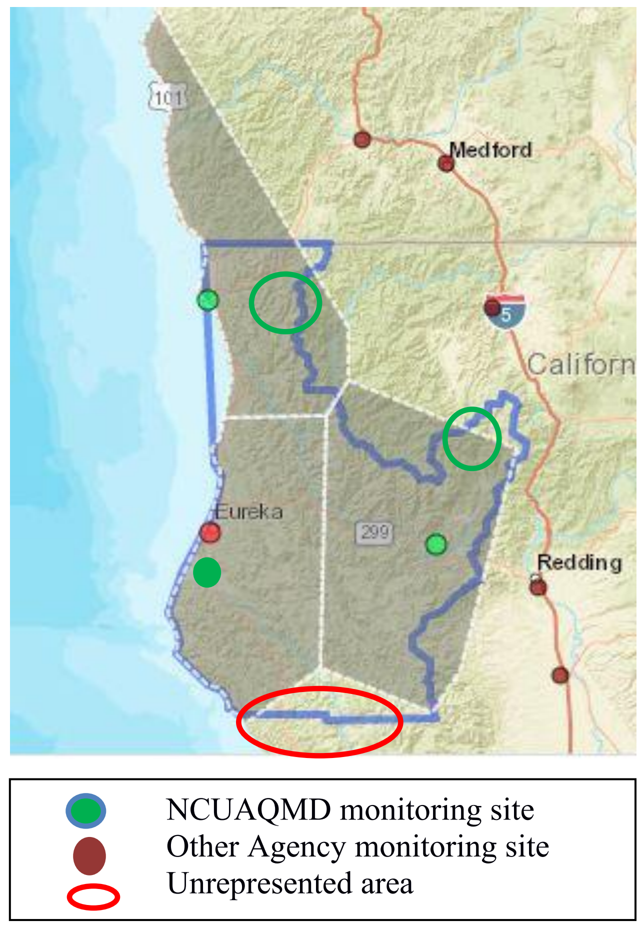
Notable Changes since Last Assessment

In December of 2024, the NCUAQMD shut down the SO_2, NO_2, and CO instruments. After 19 years of continuous operation, the instruments had reached the end of their useful lifetime, and after nearly twenty years of data demonstrated each gas concentrations to be well below its Ambient Air Quality Standard.

This 5 Year Assessment, covering the period from 2020 to 2024, including the COVID-19 pandemic. The NCUAQMD monitoring continued to operate all monitoring instruments throughout the pandemic, and achieved a high level of completeness for each year.

Geographical Distribution

Geographic assessment tools found on the Ambient Air Monitoring Assessment Tools website were used to investigate monitoring distribution within the NCUAQMD jurisdiction. The shaded gray areas represent the region best represented by each monitor.



There are three distinct areas of the NCUAQMD which lack monitoring coverage. The first two are in the northeast portions of the jurisdiction. They are small, rural, and largely unpopulated areas. Because of the areas' remoteness, and due to the existing roads being more accessible to the East of the area, it is considered likely that residents of these areas largely glean their ambient air quality information from the Siskiyou County Health Department, or the Oregon Department of Environmental Quality.

The third area which lacks coverage resides in a populated area of Southern Humboldt. The city of Garberville is the largest population center in that area which is 50 miles south of the nearest PM monitoring station, and not well represented by that data. This area is frequently impacted by smoke from wood heating, wildfires, and prescribed fires.

Trends

Population

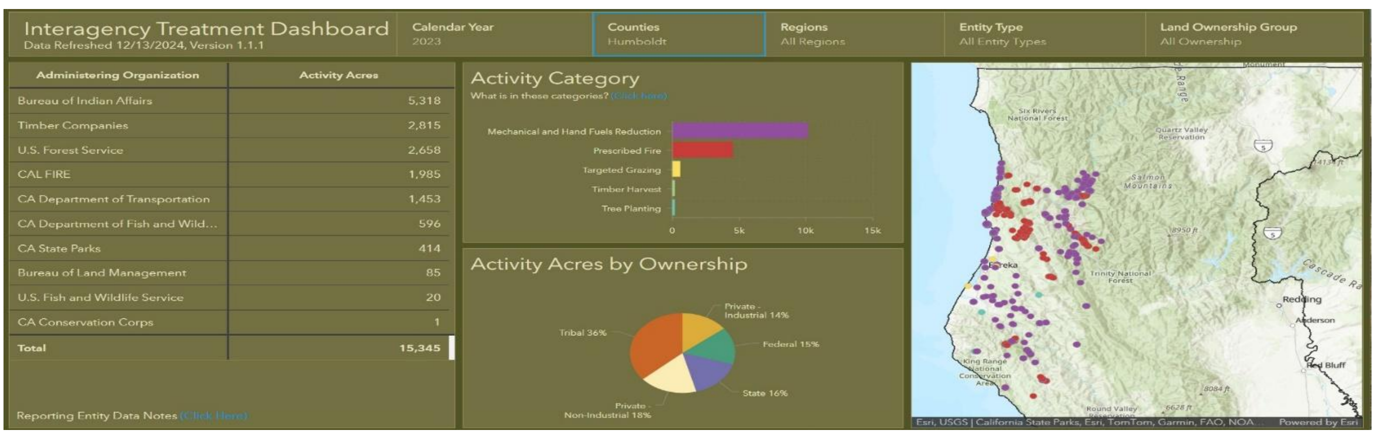
The 2020 US Census indicated small changes in population for Humboldt and Del Norte Counties since the 2010 Census. The Del Norte County population decreased by 3%, the and the Humboldt County population grew by 1%. Trinity County is estimated to have experienced a larger change between 2010 and 2020, growing by 17%. Upon review, the population thresholds do not require increases in monitoring levels. No area within the NCUAQMD meets the population thresholds requiring Air Quality Forecasts to be disseminated.

Demographic groups considered more susceptible to poor air quality include the elderly, the poor, and the less educated. Within the NCUAQMD jurisdiction, the elderly are estimated to comprise 19% to 25% of the population as compared to the California average of 15%. Population data also shows that within the NCUAQMD jurisdiction there is a 4% higher percentage of people living in poverty (16%) as opposed to the national average of 12%. Additionally, the median household income within the jurisdiction is over $34,000 lower than the California median income, and $16,000 lower than the national median income. Two of the three counties within the jurisdiction have a lower percentage of college graduates than the nation at large. Only 18% of the Trinity County population and 21% of the Del Norte County population have college degrees, as opposed to 36% nationally.

Prescribed Burning

The federal government has expanded efforts to reduce wildfire risk across the western United States. California's strategic plan includes the USFS target of deploying 150,000 acres of beneficial fire, with an overall one-million acre goal for the state. Prescribed burning has increased over the last five years, and with this goal, it is expected to continue to increase. Much of this increase might be expected to occur in the NCUAQMD, as over 900,000 acres of the Shasta-Trinity and Six Rivers National Forests are designated as priority prescribed burn landscapes.

Figure 1: CA Wildfire Landscape Resilience Interagency Treatment Dashboard



Air Monitoring Station Trends

Jacobs Air Monitoring Station

Jacobs is the only gaseous monitoring station within the NCUAQMD jurisdiction. The Jacobs station was established in 2006, monitoring for PM_{10}, $PM_{2.5}$, Ozone, Carbon Monoxide, Sulfur Dioxide, and Nitrogen Dioxide. As indicated previously, the NCUAQMD's decision to remove the NO_2, CO, and SO_2 criteria gas monitoring in 2024 was essentially based on 40CFR Part 58.14 (1) as the trend for the data collected for almost twenty years has always been extremely low in comparison to the NAAQS, where data collected indicated a less than a 10% chance that either NO_2, CO, SO_2, including Ozone, would exceed 80% of the NAAQS over the next three (3) years.

Weaverville Air Monitoring Station

The Weaverville Courthouse site is the only NCUAQMD fixed monitoring site in Trinity County, and was chosen because it is in the most populous area in this county. It was initially established in 1994 to measure PM_{10}, but in 2008, NCUAQMD began additionally monitoring $PM_{2.5}$ at this location. In 2013, Trinity County was redesignated as being in attainment for PM_{10}, and the PM_{10} instrument was shut down, but $PM_{2.5}$ continues to be measured. Both Special Purpose and Non-FEM $PM_{2.5}$ instruments have been used at this location.

Year	Instrument
2008-2011	Non-FEM BAM-1020
2011-2013	Special Purpose Grimm 180
2015-Present	Non-FEM BAM-1020

The Weaverville station also hosts an ozone instrument that is owned by NOAA, and is used to collect data for transport studies. While the ozone data meets stringent Department of Commerce QAQC requirements, it does not meet the QAQC checks required by AQS and the PQAO, hence the data is not part of the AQS record.

The Weaverville station is used to establish regulatory compliance, complete emission reduction evaluations, and to perform accountability and performance measurements. The station is needed for geographical representation and is an important station for smoke monitoring during wildfire events.

Crescent City Air Monitoring Station

The Crescent City site is the only NCUAQMD fixed monitoring site in Del Norte County, and was chosen because it is in the most populous area in this county. It was initially established in 1994 to measure PM_{10}, but in 2008, NCUAQMD began additionally monitoring $PM_{2.5}$ at this location. In 2013, Del Norte County was redesignated as being in attainment for PM_{10}, and the PM_{10} instrument was shut down, but $PM_{2.5}$ continues to be measured.

The Crescent City Station has been located in three different places, all within the city limits. Each move was precipitated by logistical access requirements.

Year	Station Location	Pollutants Measured
1994-1998	9th and H Street Annex (Del Norte County offices)	PM_{10}
1998-2014	880 Northcrest Drive (Health Dept.)	PM_{10}
2016-Present	994 G Street Crescent Elk School	$PM_{2.5}$

The Crescent City station represents conditions in a large part of the northwestern portion of the North Coast Air Basin. The PM monitor is needed for geographical representation. It is used to establish regulatory compliance, evaluate emission reductions, track trends, assess the effects of air pollution control programs, and monitor wildfire smoke.

Portable Air Monitoring

The District operates six portable PM2.5 E-BAM units. These units are used primarily for smoke monitoring, from wildfires and prescribed burns. They are also used to investigate air quality complaints. Data from the units has been used for air quality model evaluation, public reporting of the AQI, air quality impacts of an emission source, Public Service Announcement determinations and to establish welfare-related impacts in rural and remote areas. In the future, it is anticipated that portable Monitors will be used to better determine the Humboldt Bay Air Basin boundary and impacts to communities.

Pollutant Trends

Pollutant Trend - Particulate Matter (PM_{10})

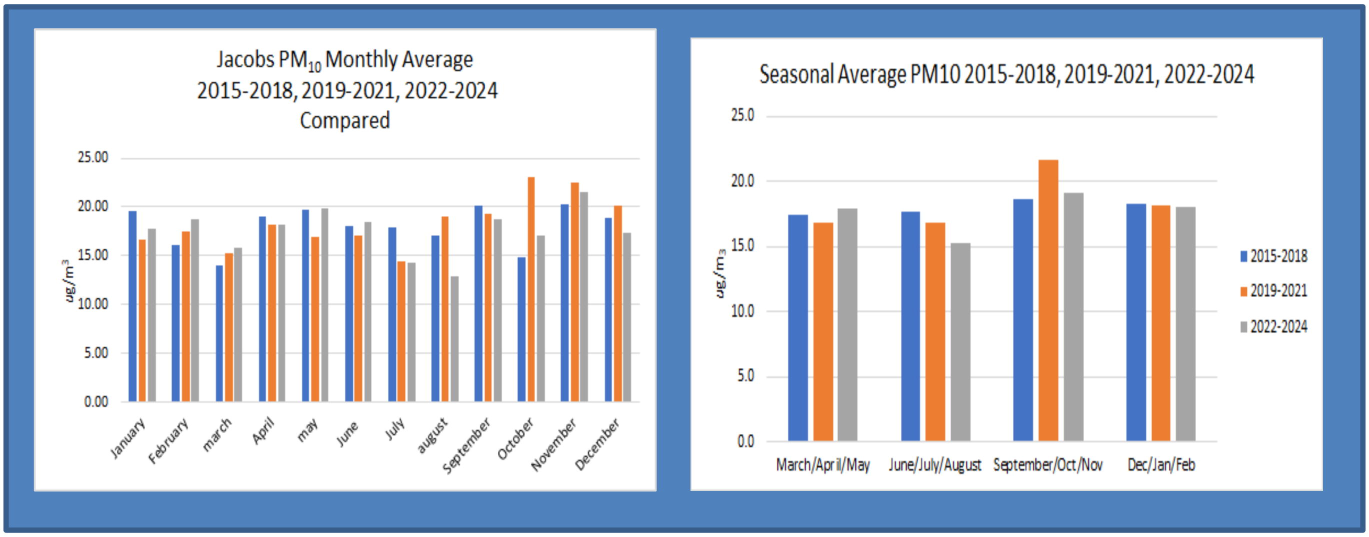
For the NCUAQMD, Del Norte and Trinity Counties was classified as attainment for the California AAQS and monitoring for PM_{10} no longer occurs in those counties. Humboldt County is still classified as non-attainment for PM_{10} by California AAQ where PM_{10} monitoring still occurs at the Jacob Station in the City of Eureka.

Since the last network assessment, the California PM_{10} AAQS was exceeded 21 times between 2020 and 2024, however fourteen (14) of these exceedances were attributed to wildfire events. Of the seven (7) remaining exceedances, four (4) are suspected to be from woodstove burning, two (2) are suspected to be from prescribed burning, and one (1) suspected to be attributable to fireworks.

Likely Cause	Number of Exceedances
Household wood heating methods	4
Wildfire	14
Prescribed Burn	2
Fireworks	1

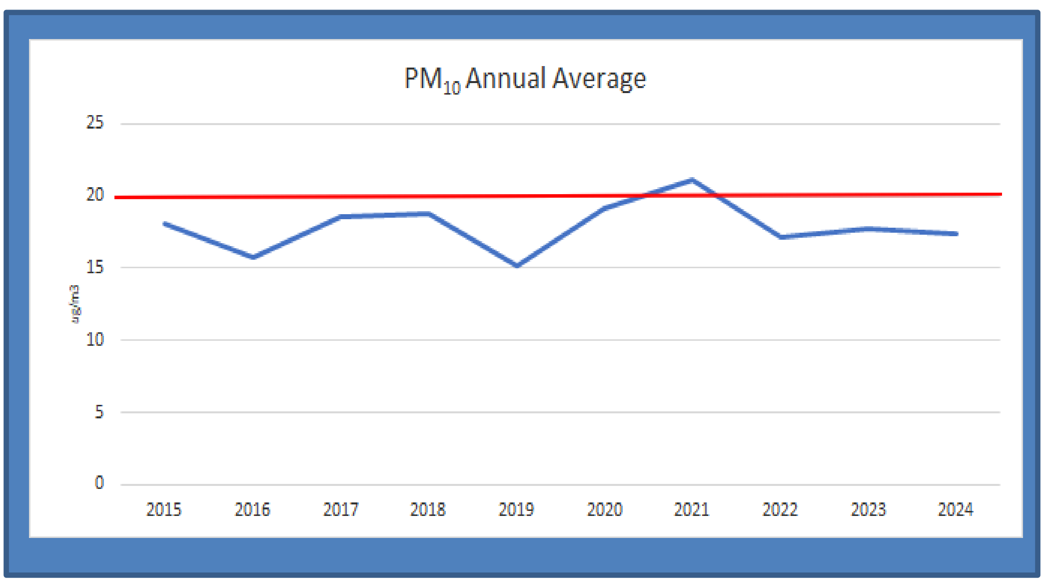
PM_{10} data indicates generally higher levels of PM_{10} in the Eureka area during the fall and winter, shown by seasonal peaks in the graphs below. Particulate levels appear to be primarily impacted by wood heating devices in winter and backyard burns in spring and fall.

Figure 2. Average PM_{10} in Eureka (by month and by season)



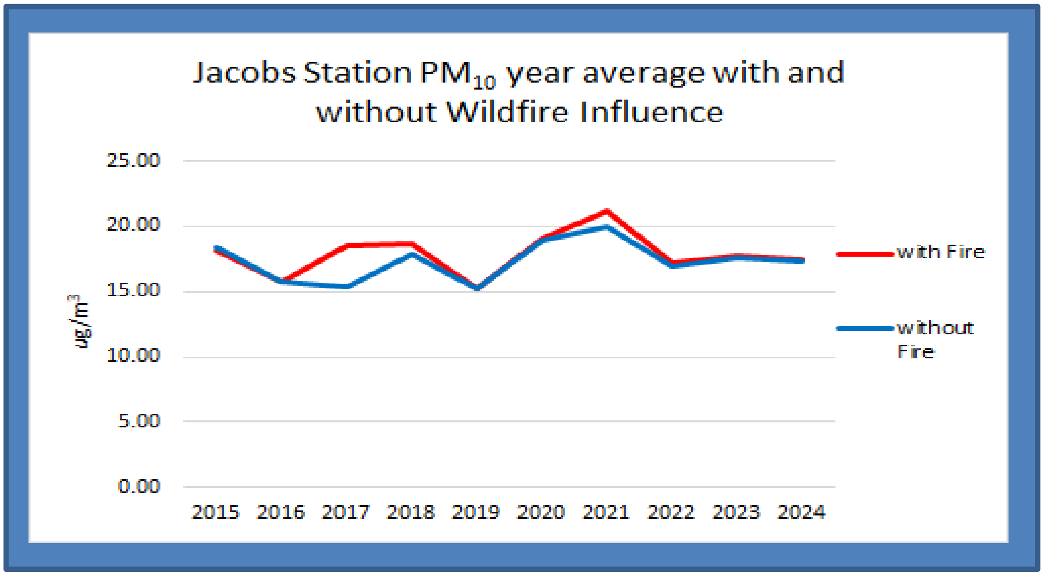
The average level of PM_{10} in Eureka has changed little since the last network plan assessment. There is large deviation between the individual years. This is likely a combined effect of wildfire events, social changes during the pandemic (i.e. wood stove use and driving habits), and prescribed burning events.

Figure 3: PM_{10} Annual Average in Eureka (by year)



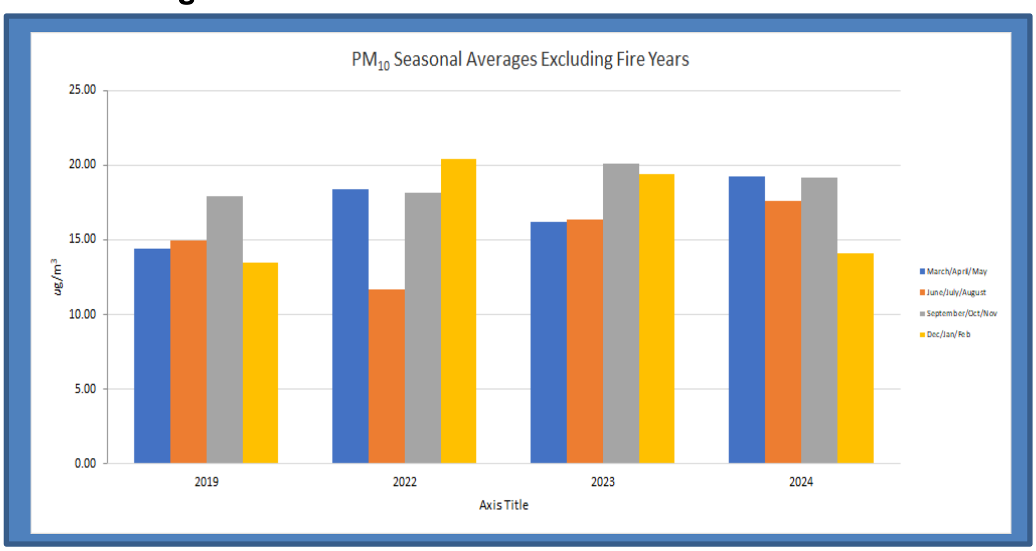
While wildfire smoke has influenced PM_{10} levels in Eureka over the last ten years, it is not the major influence. Although wildfire has prominently affected the arithmetic mean during years with major wildfire events, the overall PM_{10} trend is the same with or without wildfire.

Figure 4: Wildfire influence on PM_{10} in Eureka



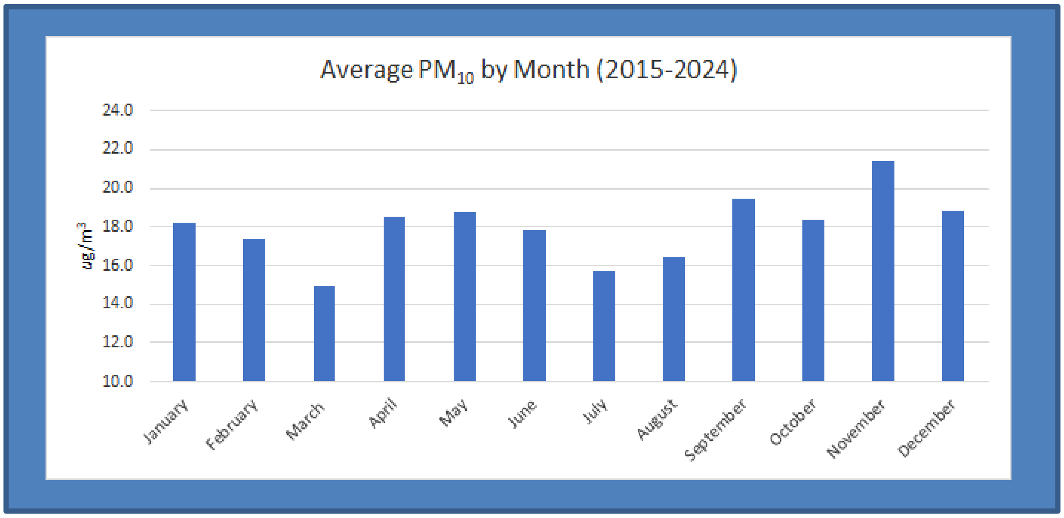
It appears that seasonal burning, such as wood stove home heating in fall and winter, and backyard slash burning in spring may be significant contributors to PM_{10} in Eureka.

Figure 5: Seasonal influence on PM_{10} in Eureka



Seasonal peaks are visible both during the colder winter months and during the spring backyard burning season.

Figure 6: Monthly PM_{10} average in Eureka



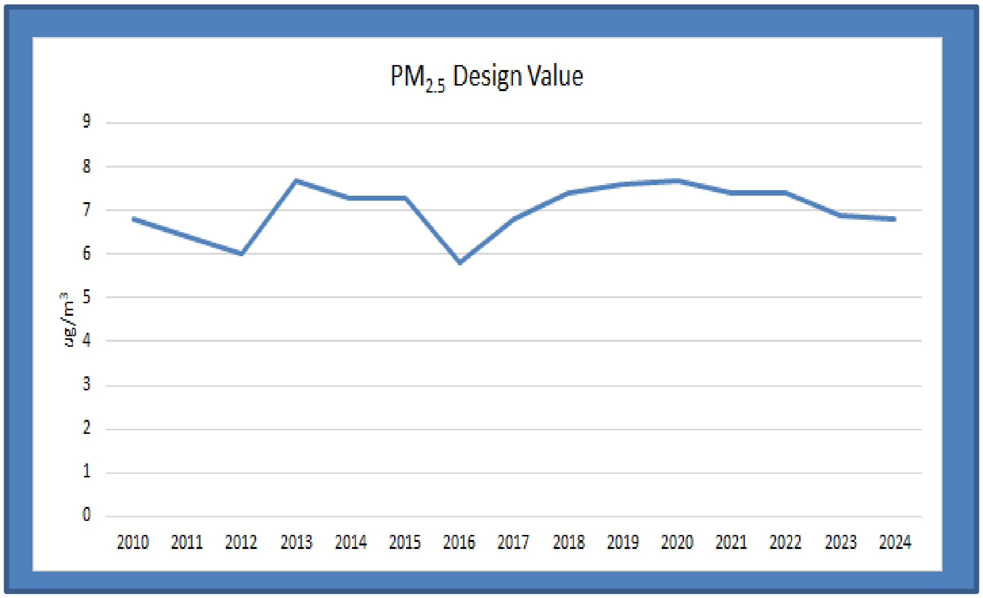
<u>Pollutant Trend – Particulate Matter ($PM_{2.5}$)</u>

The NCUAQMD is classified as being in attainment for $PM_{2.5}$ in all counties accordance with the California AAQS. Between 2020 and 2024, the California AAQS $PM_{2.5}$ 24-hr standard has only been exceeded three (3) times. Since the last network assessment, all conclusive determinations of the causes of elevated $PM_{2.5}$ levels have been due to burning activities: wood stoves, illegal burns, wildfires, prescribed fires, or structure fires.

Likely Causes	Number of Exceedances
Household wood heating methods	1
Wildfire	2

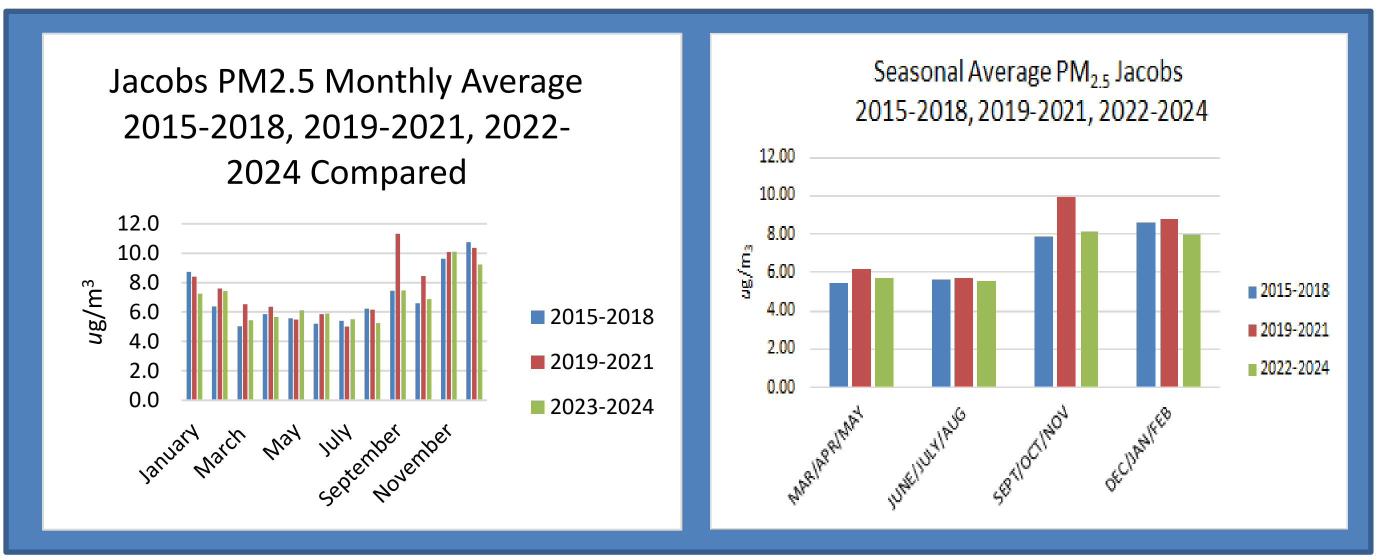
In Humboldt County, the Jacobs Station in the City of Eureka utilizes an FRM instrument for $PM_{2.5}$ monitoring. $PM_{2.5}$ levels in Eureka have fluctuated slightly over the last fifteen years, hovering around 7 *u*g/m^3 and appear to be trending downward since a high in 2020. During the COVID-19 pandemic years (2020-2022), it appears this period was a bit unusual, perhaps due to the increased amount of time people spent at home. It is hypothesized that more residents may have been able to utilize their woodburning heat sources, as they generally spent more time at home due to workplace, school and business shutdowns. This pandemic activity may have caused a short-term elevation in the Eureka $PM_{2.5}$ level which has since dissipated.

Figure 7: Eureka Station - $PM_{2.5}$ Design Value



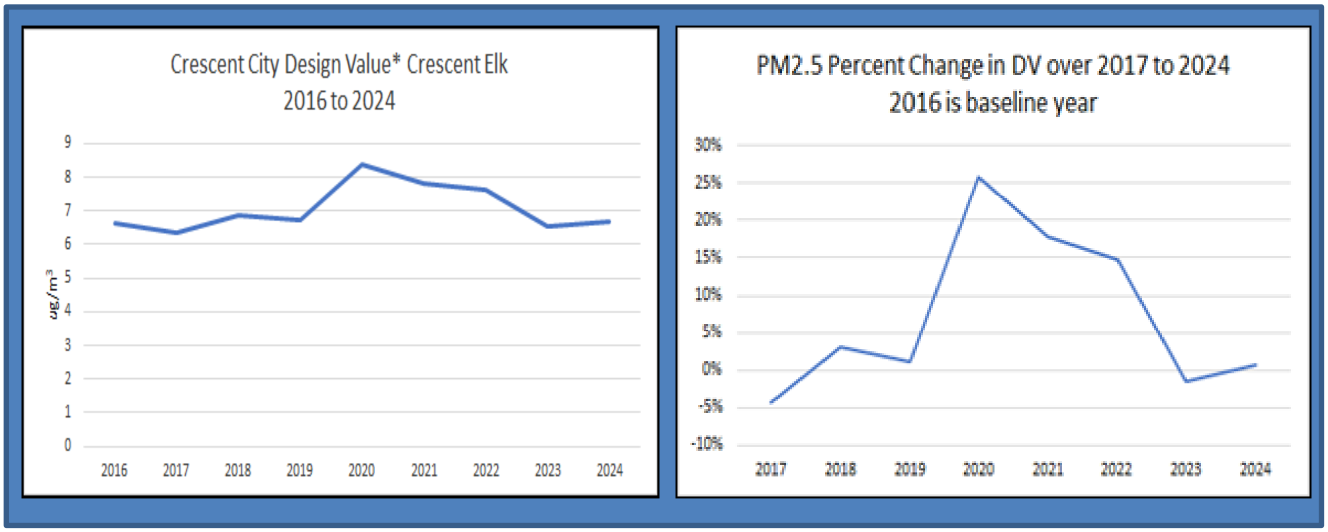
In Eureka, PM generally is found at higher levels during the colder winter months, when more households are likely to be using wood burning appliances. There was a wildfire affecting PM levels in Eureka in September and October of 2020, which attributed to the spike in PM at that time.

Figure 8: Eureka Station - $PM_{2.5}$ Monthly Average



In Del Norte, $PM_{2.5}$ began being monitored in Crescent City in 2016. Since that time, levels have generally been found to be under the NAAQS. No clear trend seems to be evident, but the level appears to have risen during the COVID pandemic years, then returned to the average baseline level.

Figure 9: Crescent City Station - $PM_{2.5}$ Design Values (Non-Regulatory FEM)



When excluding the COVID pandemic years, the change in monthly average for both the 2016-2019 and 2020-2024 years suggests the possibility that wood heating may be generating less particulates than in prior years, and given that prescribed burning is increasing perhaps affecting the monitor more than previously. This might be clarified by the next network assessment.

Figure 10: Crescent City Station - Change in Monthly and Seasonal Averages Average in 2022/2024 as compared to 2016/2018

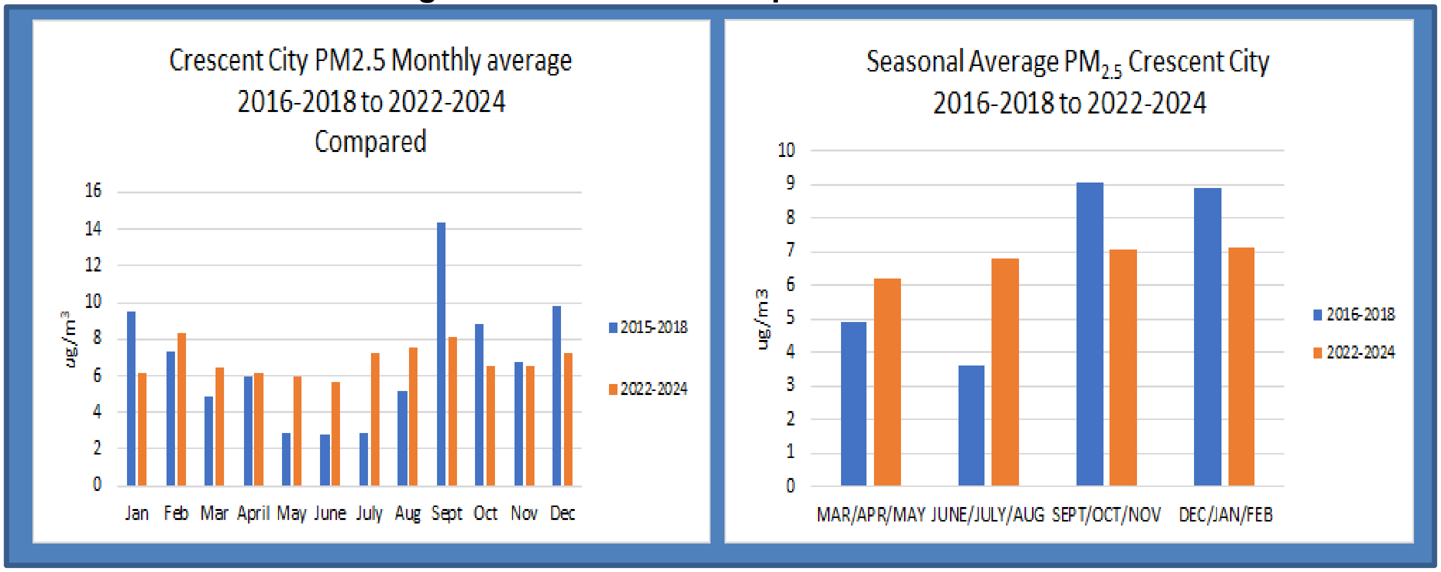
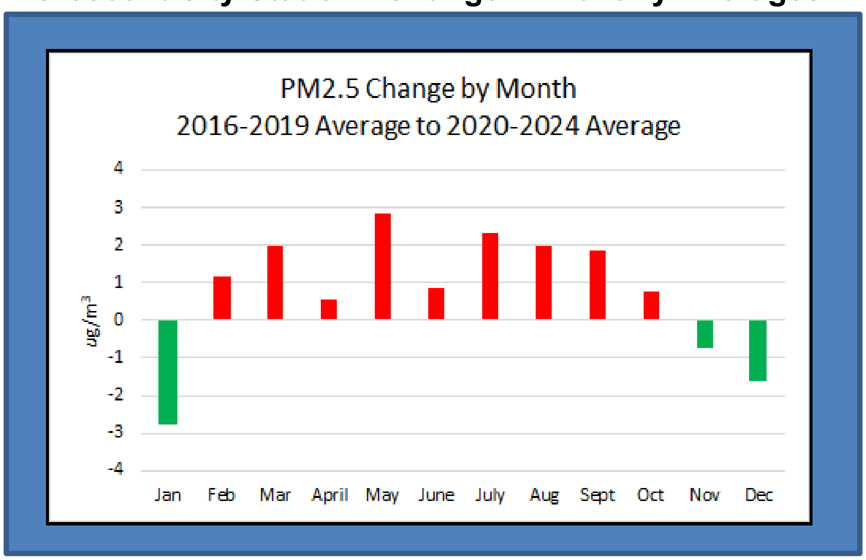
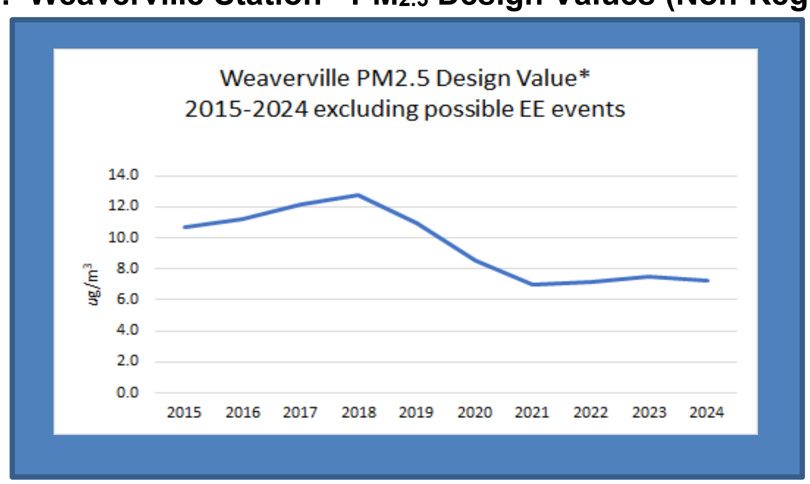


Figure 11: Crescent City Station - Change in Monthly Averages



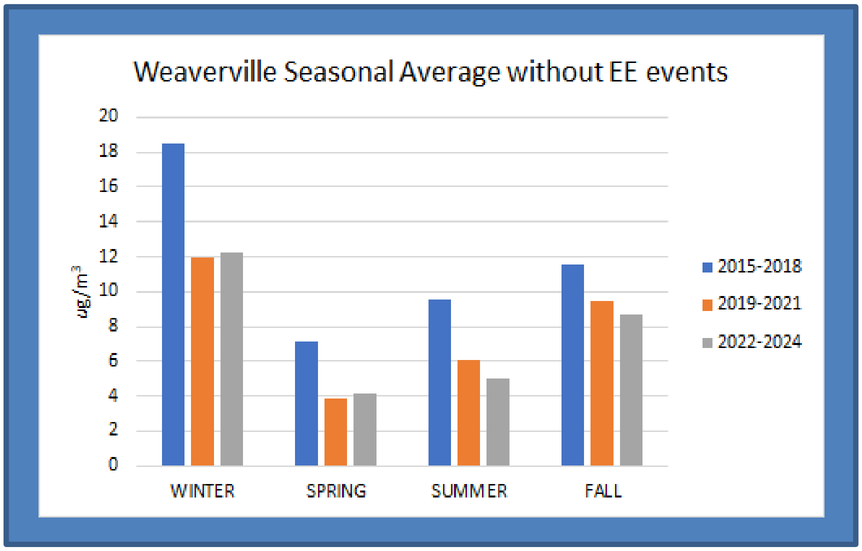
In Trinity County, background $PM_{2.5}$ level at the Weaverville station have been decreasing over the last 10 years.

Figure 12: Weaverville Station - $PM_{2.5}$ Design Values (Non-Regulatory FEM)



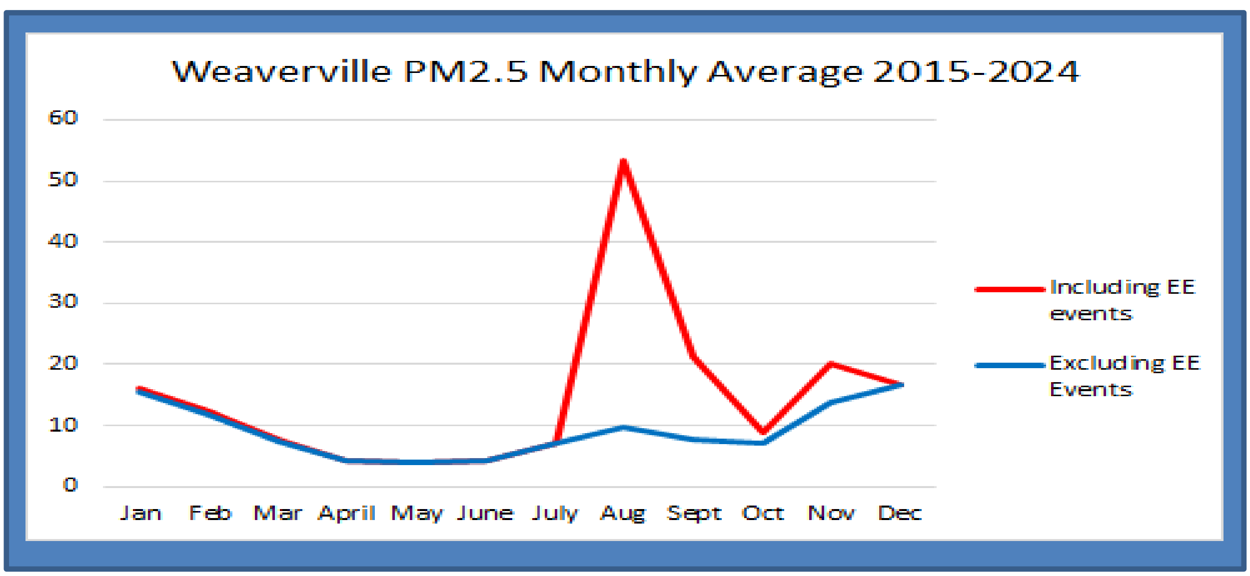
Data indicates generally higher levels of $PM_{2.5}$ in the Weaverville area during the fall and winter that is likely due to increased use of wood heating in the colder months. Trinity County is rural, and many of the homes utilize wood burning stoves for heat. NCUAQMD offers a Wood Stove Reduction Grant Program, and recent grant cycles increased the incentive to almost $6,000. The COVID pandemic years did not appear to influence findings in Trinity County as compared to Humboldt and Del Norte Counties as indicated above, perhaps due to the rural nature of Trinity County.

Figure 13: Weaverville Station - $PM_{2.5}$ Seasonal Averages



Typically, Weaverville is significantly impacted by wildfire events. When evaluating the monthly average both with and without Exceptional Events, evidence of two seasonal peaks (winter and summer) is evident. This supports the assessment that the area's particulate levels are being primarily impacted by wood heating devices and wildfire events.

Figure 14: Weaverville Station - Effect of Exceptional Events on PM2.5 Monthly Average



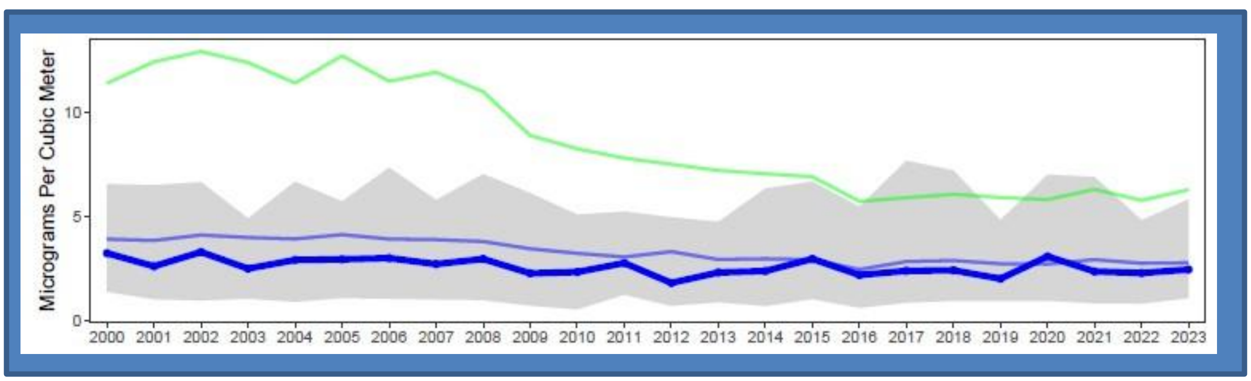
Both the Crescent City and the Weaverville stations utilize BAM-1020 instruments for $PM_{2.5}$ monitoring. The upward bound of the BAM-1020 coefficient of variation (CV) found within the PQAO was 14.3 percent in 2023 (the latest year available), which is above the CFR requirement of 10 percent. The national average CV was also above the CFR requirement. The PQAO is investigating operational improvements for the method. The EPA is aware of the systemic problem, and adopted a new way of calculating the CV in March of 2024 to practically address the issue.

The NCUAQMD does not speciate $PM_{2.5}$ samples due to the prohibitive cost. However, there are two Interagency Monitoring of Protected Visual Environments (IMPROVE) speciation sites within the jurisdiction. These include Redwood National Park (REDW1) in Humboldt County along the coast and the Trinity National Forest (TRIN1). The data collected by the IMPROVE project can be leveraged by NCUAQMD to provide insight into particulate matter composition and trends. Because IMPROVE sites are chosen to track visibility in protected areas, they are generally found in remote areas and may serve as background sites for more industrial and populated sights in the same air basin.

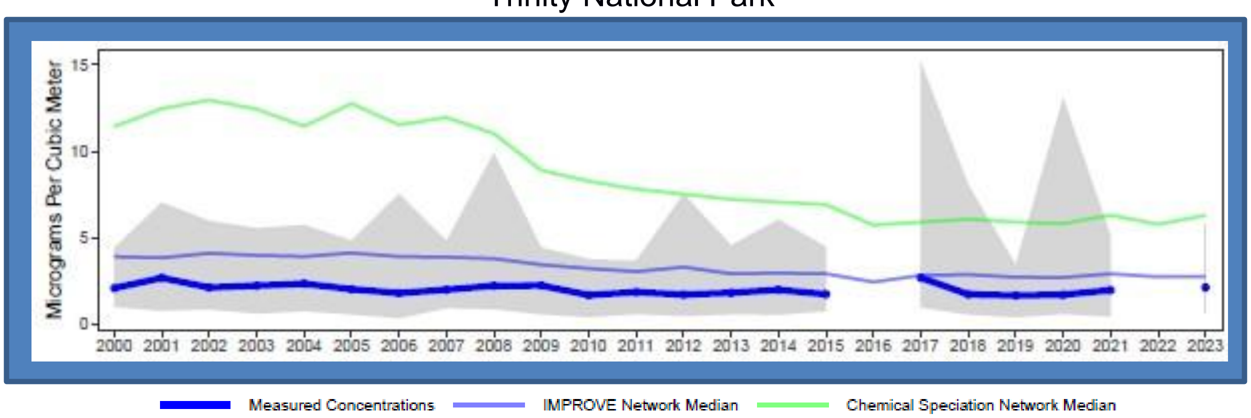
Long term trends at both Redwood National Park and Trinity National Park reflect a fairly stable level of $PM_{2.5}$. Levels also reflect a lower level of particulate matter than found at average IMPROVE sites.

Figure 15: Comparison of IMPROVE long-term PM2.5 Trends

Redwood National Park



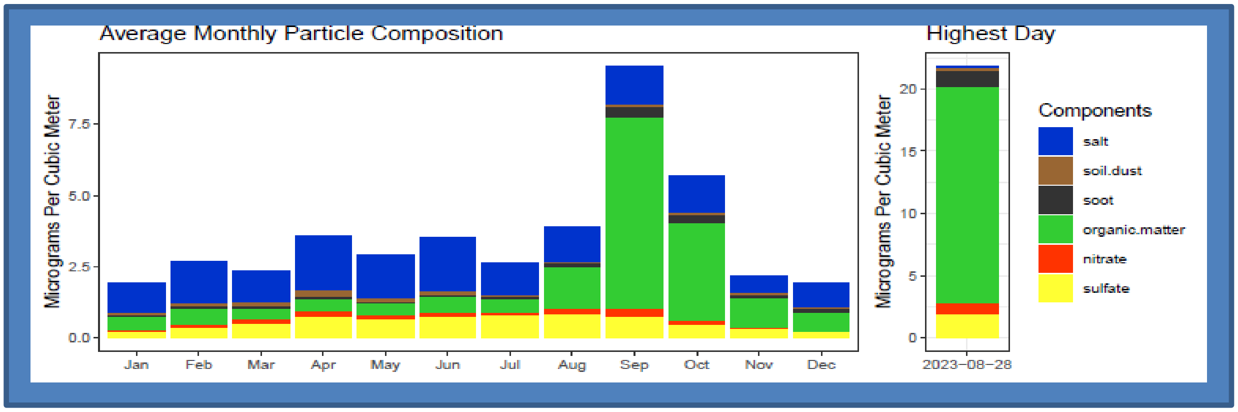
Trinity National Park



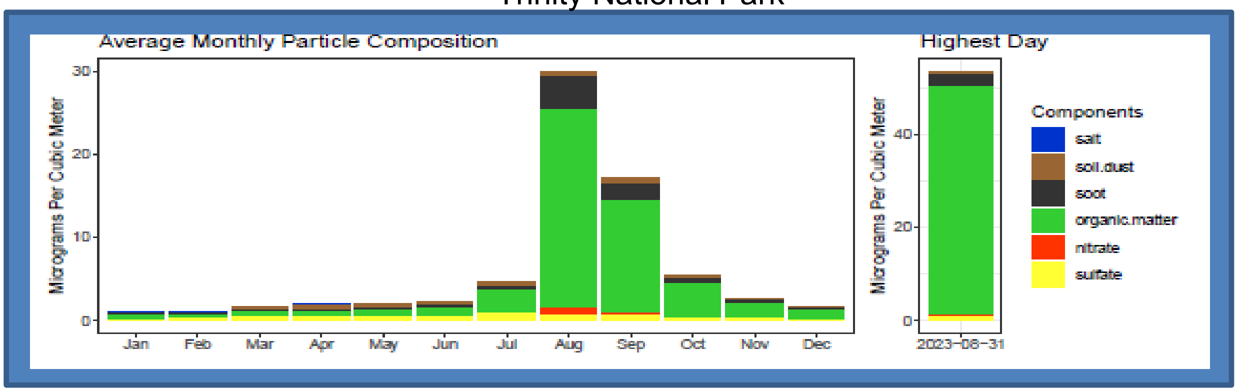
A substantial difference in the composition of $PM_{2.5}$ collected at those sites is evident. Reports from the latest available data year are below (2023)

Figure 16: Comparison of IMPROVE PM2.5 Composition

Redwood National Park



Trinity National Park

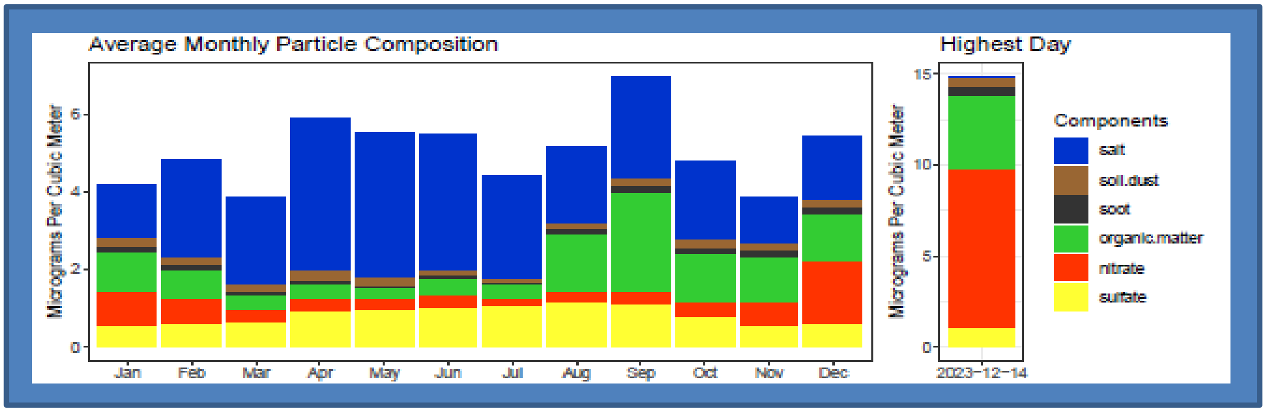


Components	Calculation	Natural Sources	Anthropogenic Sources
Salt	$1.8 \cdot Chloride$	Ocean spray, dry lakebeds	Chemical manufacturing, lake consumption
Soil Dust	$2.2 \cdot Al + 2.49 \cdot Si + 1.63 \cdot Ca$ $+ 2.42 \cdot Fe + 1.94 \cdot Ti$	Soil resuspension, dust storms long-range transport	Construction, agriculture, deforestation, unpaved roads
Soot	$Elemental\ Carbon$	Wildfires	Motor vehicles, wood burning, smoking
Organic Matter	$1.4 \cdot Organic\ Carbon$	Plants, animals, wildfires	Motor vehicles, cooking oils, household cleaners
Nitrate	$1.29 \cdot Nitrate$	Plants, animals	Fertilizer, stock yards, chemical manufacturing
Sulfate	$4.125 \cdot Sulfur$	Volcanism	Coal-fired power plants, chemical manufacturing

At the Redwood National Park, sea salt appears to compose about half of the particulate matter during most of the year. This composition does not appear to be unusual, as it is also found to the south in Marin County at Point Reyes National Seashore (PORE1).

Figure 17: Comparison of PM2.5 Composition for Sea Salt

Comparison - Marin County Point Reyes National Seashore

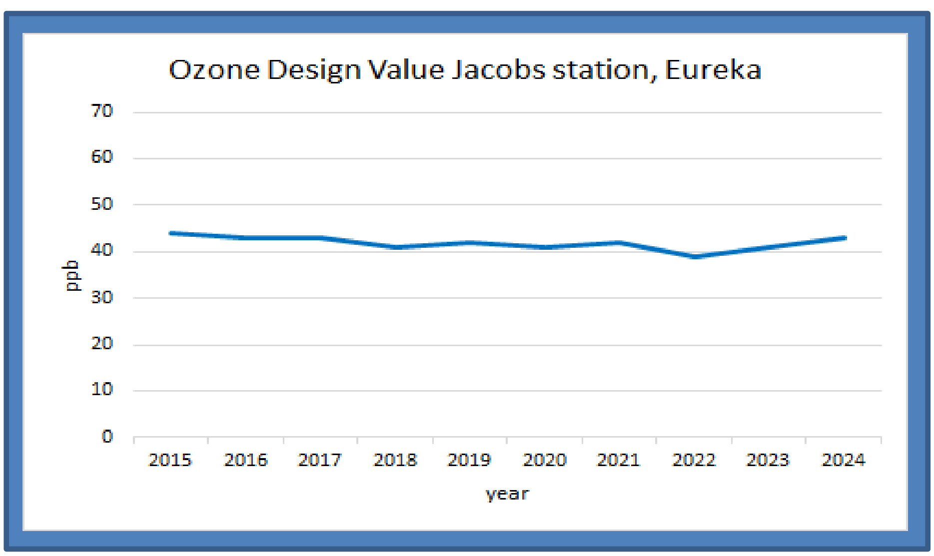


Similar to findings further south along the coast in Monterey, this speciation data points to sea salt being an important component of particulate matter in the coastal zone of the North Coast Air Basin. When particulate matter exceedances occur in the coastal zone, the possible impact of sea salt should be considered. Sea salt from ocean wave action is naturally occurring which is not possible to mitigate with any air quality planning action.

<u>Pollutant Trend - Ozone</u>

In Humboldt County at the Jacobs Station in Eureka, the NCUAQMD utilizes the Thermo 49i-to monitor Ozone. All Ozone exceedances recorded at the Jacobs station can be directly attributed to wildfire events. The NCUAQMD is classified as in attainment for Ozone by California AAQSs.

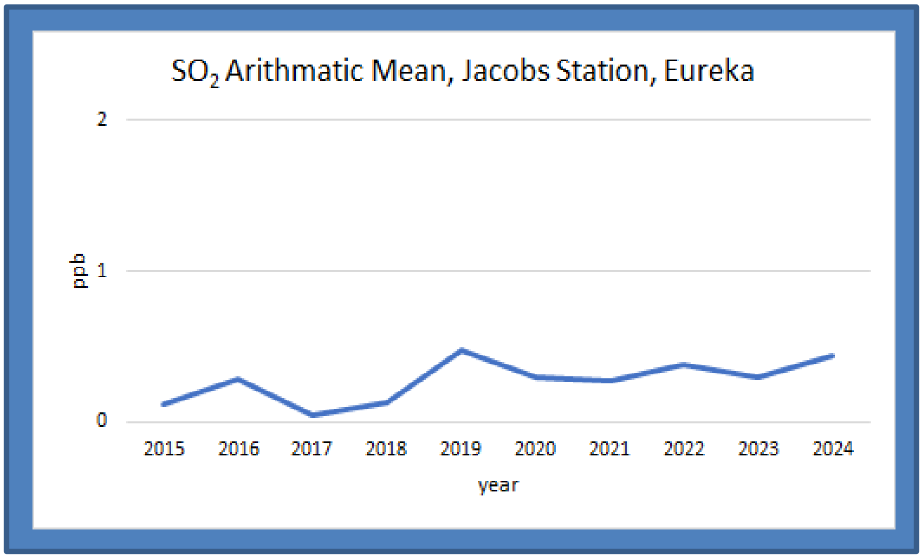
Figure 18: Eureka Station – Ozone Design Value



Sulfur Dioxide (SO_2)

In Humboldt County at the Jacobs Station in Eureka, there never had an exceedance of SO_2. The NCUAQMD is classified as attainment for SO_2 by California AAQS. After collecting data for almost twenty years, the instrument was shut down in 2024 due to extremely low in comparison to the NAAQS, where data collected continued to indicate a less than a 10% chance that the SO_2 readings would exceed 80% of the NAAQS over the next three (3) years.

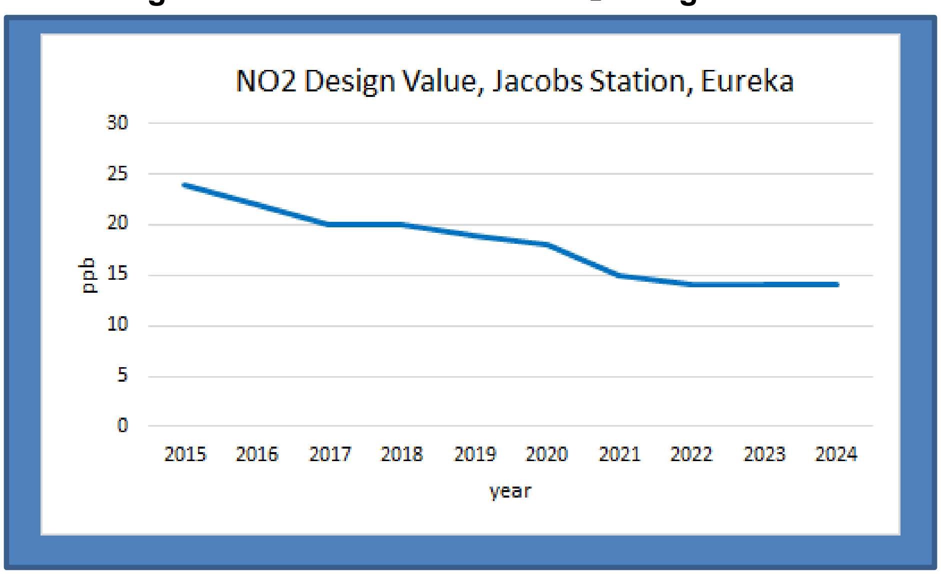
Figure 19: Eureka Station - SO_2 Design Value



Nitrogen Dioxide (NO_2)

In Humboldt County at the Jacobs Station in Eureka, there has never had an exceedance of NO_2. The NCUAQMD is classified as attainment for NO_2 by California AAQS. After collecting data for almost twenty years, the instrument was shut down in 2024 due to extremely low in comparison to the NAAQS, where data collected continued to indicate a less than a 10% chance that the NO_2 readings would exceed 80% of the NAAQS over the next three (3) years.

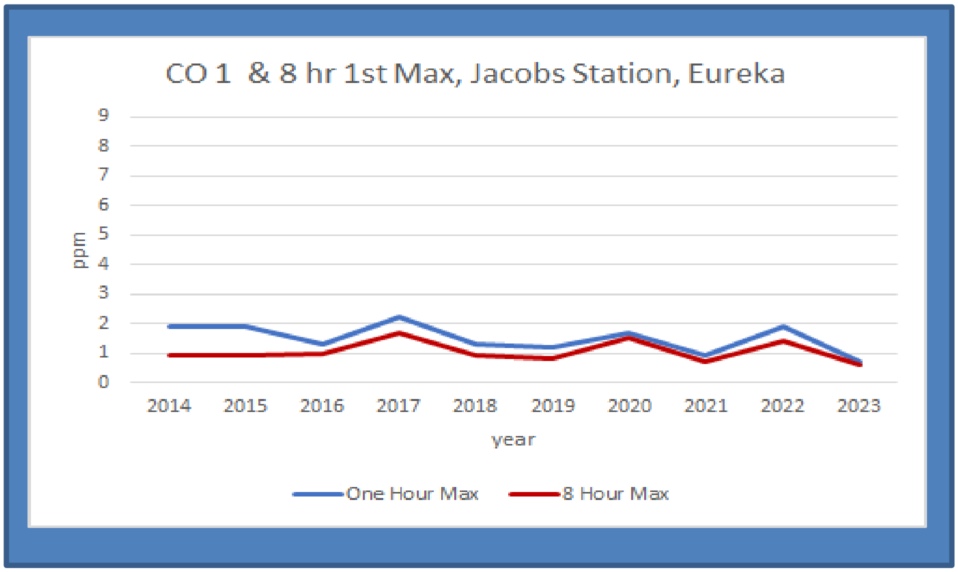
Figure 20: Eureka Station - NO_2 Design Value



Carbon Monoxide (CO)

In Humboldt County at the Jacobs Station in Eureka, there has never had an exceedance of Carbon Monoxide. The NCUAQMD is classified as attainment for CO by California AAQS. After collecting data for almost twenty years, the instrument was shut down in 2024 due to extremely low in comparison to the NAAQS, where data collected continued to indicate a less than a 10% chance that the CO readings would exceed 80% of the NAAQS over the next three (3) years.

Figure 21: Eureka Station - CO Design Value



Network Assessment Summary

All current NCUAQMD stations are required due to geographical need, and these stations are recommended to continue at their current levels. As indicated, one additional particulate monitoring site is recommended in Southern Humboldt County. Monitoring objectives have been met to the greatest extent allowed by the size and funding of the NCUAQMD.

The stations are in proximity to the highest human populations, and the highest significant pollutant concentrations in the area are expected to be discovered at the stations.

Station	AQS number	Pollutant	Year start	Expected NAAQS exceed-ances	Micropol itian Area Served	Design value change 2015-2019/ 2020-2024	Assigned Value to NCUAQMD Network	Plan
Jacobs	060231 004	ozone	2006	none	Eureka-Arcata-Fortuna	+1 ppb	Critical-primary SLAMS Humboldt County	keep
Jacobs	060231 004	carbon monoxide	2006	none	Eureka-Arcata-Fortuna	1 hr.: -0.3 ppm 8 hr.: 0 ppm	Critical- primary SLAMS Humboldt County	Closed Decem ber 2024
Jacobs	060231 004	sulfur dioxide	2006	none	Eureka-Arcata-Fortuna	0 ppb	Credible-primary SLAMS Humboldt County	Closed Decem ber 2024
Jacobs	060231 004	Nitrogen dioxide	2006	none	Eureka-Arcata-Fortuna	-6 ppb	Critical- primary SLAMS Humboldt County	Closed Decem ber 2024
Jacobs	060231 004	PM_{10}	2006	4	Eureka-Arcata-Fortuna	+1.6 ug/m^3	Critical- primary SLAMS Humboldt County	keep
Jacobs	060231 004	$PM_{2.5}$	2006	none	Eureka-Arcata-Fortuna	+0.26 ug/m^3	Critical- primary SLAMS Humboldt County	keep
Weaverville	061050 002	$PM_{2.5}$	2011	none	n/a	-2.6 ug/m^3	Critical-SLAMS, Only Trinity County station	keep
Crescent City	060150 006	$PM_{2.5}$	2014	none	Crescent City	0.8 ug/m^3	Critical-SLAMS, Only Del Norte County station	keep

The wildfire season in California is becoming longer and prescribed burning is increasing. In 2008, the NCUAQMD developed one of the first wildfire monitoring plans in California, which focused on the wide dissemination of AQI information. The NCUAQMD plans to extend its wildfire monitoring plan to include plans for prescribed burn monitoring.

The NCUAQMD continues to strive towards reaching the California AAQS for PM_{10}. With the continued reduction trend of PM_{10} emissions in the county, and an active wood stove change out grant program, it is possible that Humboldt County may reach this attainment goal before the next Network Assessment.

The NCUAQMD together with Northern Sonoma County Air Pollution Control District and Mendocino County Air Quality Management District oversees the North Coast Air Basin. This air basin is determined by political boundaries. In general, CARB designates attainment areas by air basin for pollutants with a regional impact and by county for pollutants with a more local impact. However, when areas within an air basin or county display distinctly different air quality deriving from sources and conditions not affecting the entire air basin or county, CARB designates a smaller area. In 2013, two Counties (Del Norte and Trinity) were split off from NCUAQMD for attainment designation purposes (PM_{10}), and in 2024 a smaller area inside of Mendocino County AQMD (Willits area) was split off for an attainment designation ($PM_{2.5}$). The Humboldt Bay Area has distinct metrological and pollution sources from Humboldt County at large. Because of this, the NCUAQMD Planning Division recognizes Humboldt County air quality may be better represented by perhaps dividing Humboldt County air by topography and meteorology. A boundary line was suggested as early as 1984, and this preliminary line will be used as a starting place for further investigation. The NCUAQMD is looking to define a Humboldt Bay Air Basin within Humboldt County, and has recently received EPA IRA grant funding to study the PM impacts around the Humboldt Bay Area Air Basin.

Attachment A

EPA Approval to end CO, SO_2, NO_2 Monitoring in Eureka

REGION 9

SAN FRANCISCO, CA 94105

October 29, 2024

Brian Wilson
Air Pollution Control Officer
North Coast Unified Air Quality Management District
707 L Street
Eureka, California 99501

Dear Air Pollution Control Officer Wilson:

Thank you for your submission of the North Coast Unified Air Quality Management District (NCUAQMD) *2024 Annual Network Plan for Ambient Air Monitoring* on July 1, 2024. We have reviewed the submitted document based on the requirements set forth in 40 CFR Part 58. Based on the information provided in the plan, the U.S. Environmental Protection Agency (EPA) approves all portions of the network plan except those specifically identified below. With this plan approval, we also formally approve the following system modification: the discontinuation of the Jacobs Eureka (AQS ID: 06-073-1010) CO, NO_2, and SO_2 SLAMS monitoring. More information about this approval is included in Enclosure B.

Please note that we cannot approve portions of the annual network plan for which the information in the plan is insufficient to judge whether the requirement has been met, or for which the information provided does not meet the requirements as specified in 40 CFR 58.10 and the associated appendices. EPA Region 9 also cannot approve portions of the plan for which the EPA Administrator has not delegated approval authority to the regional offices. Enclosure A (*A. Annual Monitoring Network Plan Checklist*) is the checklist EPA used to review your plan for items that are required to be included in the annual network plan along with our assessment of whether the plan submitted by your agency addresses those requirements. Items highlighted in yellow are those EPA Region 9 is not acting on, as we either lack the authority to approve the specific item, or we have determined that a requirement is either not met or information in the plan is insufficient to judge whether the requirement has been met. Items highlighted in green in Enclosure A require attention in order to improve next year's plan. All comments conveyed via this letter and enclosures should be addressed prior to submittal of next year's annual monitoring network plan to EPA.

Additionally, EPA supports state and local government partners in advancing environmental justice efforts while ensuring compliance with applicable civil rights laws. To this end, we see an opportunity for all monitoring organizations to address and advance environmental justice in their annual network plans. Through the development and implementation of annual network plans, activities to advance environmental justice could include identifying monitoring sites in or near communities with environmental justice concerns, describing how environmental justice is considered in network design, considering environmental justice factors in siting, relocating, or discontinuing air monitors, and engaging with specific communities when plans are out for public comment. EPA encourages monitoring organizations to continue considering these issues throughout the year, and to convey yearly updates to the public and EPA on these important areas through the annual network plan process. EPA's EJSCREEN mapping and screening tool, including the environmental justice indexes and demographic indicators, may be useful in support of these efforts.[1] We also encourage you to provide us with any suggestions or requests that could further advance environmental justice in your ambient air monitoring programs.

If you have any questions regarding this letter or the enclosures, please feel free to contact me at
(415) 972-3134 or Katy Green at (415) 972-3897.

Sincerely,

Digitally signed by Vallano, Dena
Date: 2024.10.29 10:34:44 -07'00'

Dena Vallano, Manager
Monitoring and Analysis Section

Enclosures:

A. Annual Monitoring Network Plan Checklist
B. Approval of Discontinuation of Jacobs CO, NO_2, and SO_2 SLAMS monitoring

cc (via email): Wendy Caruso, NCUAQMD
Randy Dickau, NCUAQMD
Jin Xu, California Air Resources Board
(CARB) Kathleen Gill, CARB
Manisha Singh,
CARB Michael
Miguel, CARB
Michael Werst,

CARB Sylvia
Vanderspek, CARB
Alicia Kindred,
CARB Melissa
Niederreiter, CARB
Meg Smith, CARB

Vallano,

[1] U.S. EPA. 2022. EJScreen: Environmental Justice Screening and Mapping Tool, Version 2.0, https://www.epa.gov/ejscreen.

B. Approval of Discontinuation of Jacobs CO, NO_2, and SO_2 SLAMS monitoring

Per 40 CFR 58.14, monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors. On July 3, 2024, North Coast Unified Air Quality Management District (NCUAQMD) sent a letter to EPA with a request to discontinue CO, NO_2, and SO_2 State/Local Air Monitoring Station (SLAMS) monitors at the Jacobs site (Air Quality System (AQS) Site ID: 06-023-1004). While the July 3, 2024 letter notes that the District considers these monitors to be Special Purpose Monitors (SPMs), not SLAMS, the EPA has reviewed this discontinuation as SLAMS to align with previous Annual Network Plans (2015-2021) and Five-Year Network Assessments (2015 and 2020) submitted by NCUAQMD. EPA has reviewed NCUAQMD's request and data associated with these monitors and concluded that the criteria contained in 40 CFR 58.14(c)(1) are met as described below; EPA therefore approves discontinuation of the CO, NO_2, and SO_2 SLAMS monitors at the Jacobs site.

The Jacobs CO monitoring site was in attainment of the 1971 1-hour CO and 8-hour CO National Ambient Air Monitoring Standards (NAAQS) based on the five most recent design values (design value years 2019-2023, encompassing data years 2017-2023). EPA has determined that, based on the design values from 2019-2023, there was less than a 10 percent probability of exceeding 80 percent of the NAAQS during the next three years at this site. This monitor is not specifically required by an attainment or maintenance plan. This site is not needed to fulfill 40 CFR 58 Appendix D requirements for near-road CO monitoring and is not required by the EPA Regional Administrator. Therefore, the closure of this monitoring site will not prevent NCUAQMD from meeting 40 CFR 58 Appendix D requirements.

The Jacobs NO_2 monitoring site was in attainment of the 1971 annual NO_2 NAAQS and the 2010 1-hour NO_2 NAAQS based on the five most recent design values (design value years 2019-2023; encompassing data years 2017-2023). EPA has determined that, based on the design values from 2019-2023, there was less than a 10 percent probability of exceeding 80 percent of the NAAQS during the next three years at this site. Preliminary 2024 data are consistent with the historical trend and continues to show low concentrations. This monitor is not specifically required by an attainment or maintenance plan. This site is not needed to fulfill 40 CFR 58 Appendix D requirements for near-road NO_2 monitoring and is not required by the EPA Regional Administrator. This site is also not being used to meet the area-wide requirement for a monitor located in an area of expected highest concentration. Therefore, the closure of this monitoring site will not prevent NCUAQMD from meeting 40 CFR 58 Appendix D requirements.

The Jacobs SO_2 monitoring site was in attainment of the 2010 1-hour SO_2 NAAQS based on the five most recent design values (design value years 2019-2023; encompassing data years 2017-2023). EPA has determined that, based on the design values from 2019-2023, there was less than a 10 percent probability of exceeding 80 percent of the NAAQS during the next three years at this site. Preliminary 2024 data are consistent with the historical trend and continues to show low concentrations. This monitor is not specifically required by an attainment or maintenance plan. This site is not needed to fulfill 40 CFR 58 Appendix D requirements for monitoring based on the population weighted emissions index, and it is not required by the EPA Regional Administrator. This site is also not required to satisfy the 2015 SO_2 Data Requirements Rules (DRR) (80 FR 51052). Therefore, the closure of this monitoring site will not prevent NCUAQMD from meeting 40 CFR 58 Appendix D requirements.

Based on these analyses, EPA approves NCUAQMD's discontinuation of the Jacobs CO, NO_2, and SO_2 SLAMS monitors. Please include this enclosure and the relevant monitor and site information in next year's annual monitoring network plan.