

Pacoima Sensor Library Project

Community Monitoring with Air Sensors

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February 26, 2025

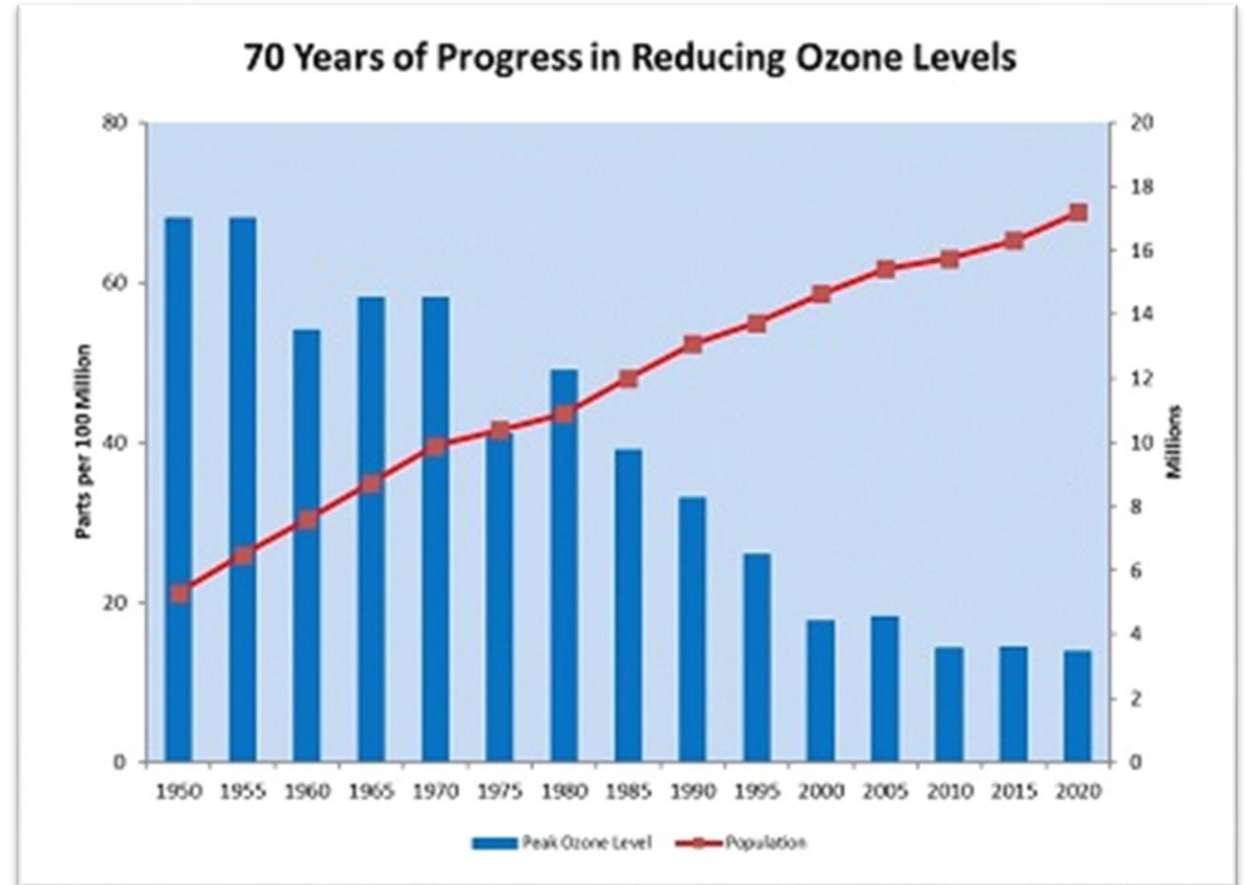
AGENDA



1. Overview of South Coast AQMD
2. Air Monitoring Stations
3. Air Quality Sensors
4. Sensor Library Grant
5. Viewing Sensor Data

SOUTH COAST AQMD

South Coast AQMD is the regulatory agency responsible for improving air quality for large areas of Los Angeles, Orange, Riverside and San Bernardino counties

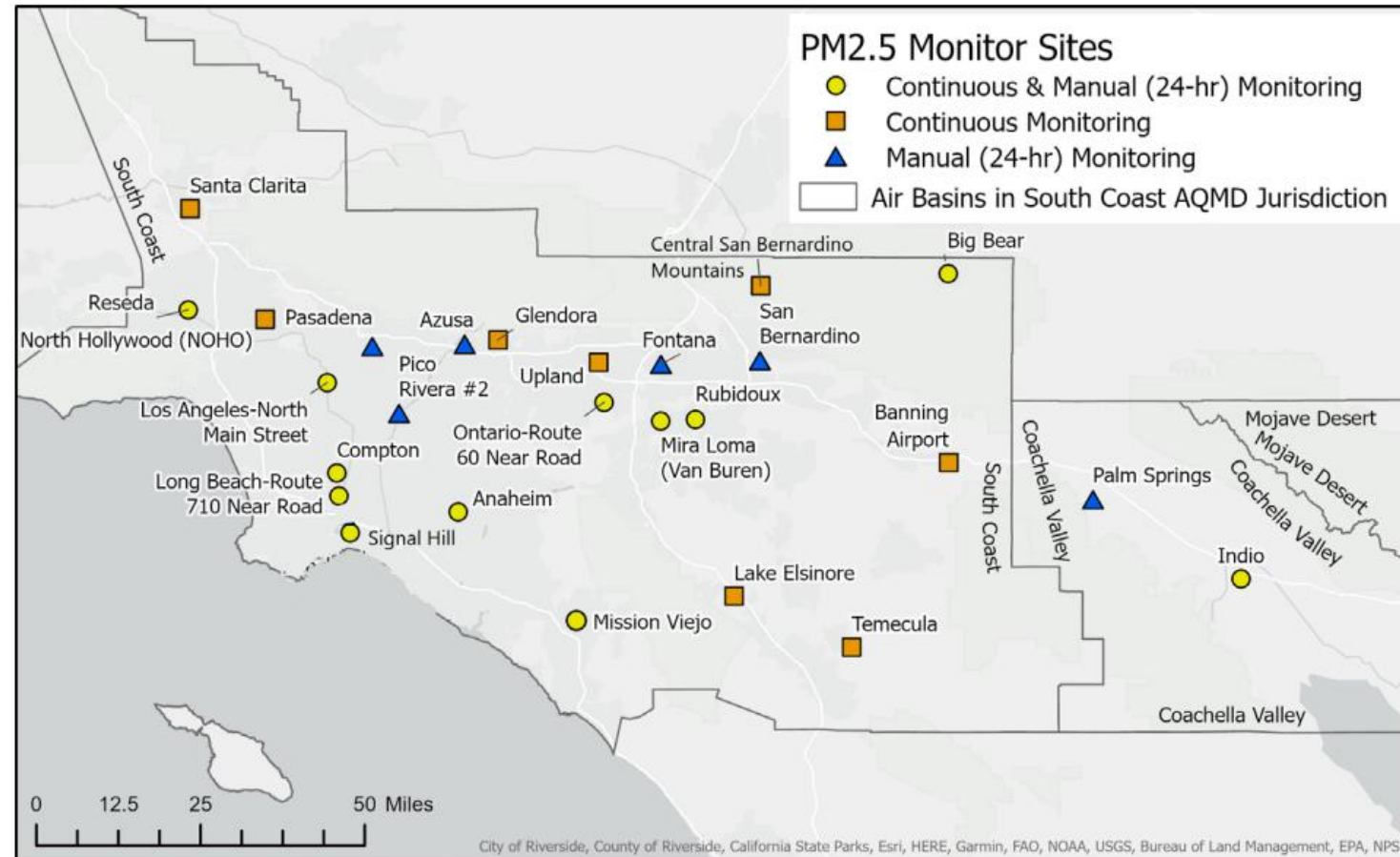


<https://www.aqmd.gov/nav/about>

AIR MONITORING STATIONS

South Coast AQMD operates over 35 permanent air monitoring stations (AMS) across the South Coast Air Basin

Map of Air Monitoring Stations



Part of the AMS in Riverside, CA

<https://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan>

WHAT ARE AIR SENSORS?

- Consumer grade air quality devices started gaining traction in the 2010s
- Much smaller and lower cost than government reference instruments
- Easily deployed at people's homes
- Data quality varies between devices



Image credits: Polidori A., Papapostolou V., Collier-Oxandale A., Hafner H., and Blakey T. (2021) Community in Action: A Comprehensive Guidebook on Air Quality Sensors.

SENSORS VS. REGULATORY-GRADE MONITORS

Regulatory-Grade Monitors

- Expensive (\$20,000 - \$40,000)
- Requires supporting equipment and regular checks by a team of experts
- Used for government regulation
- High quality QA/QC'd data

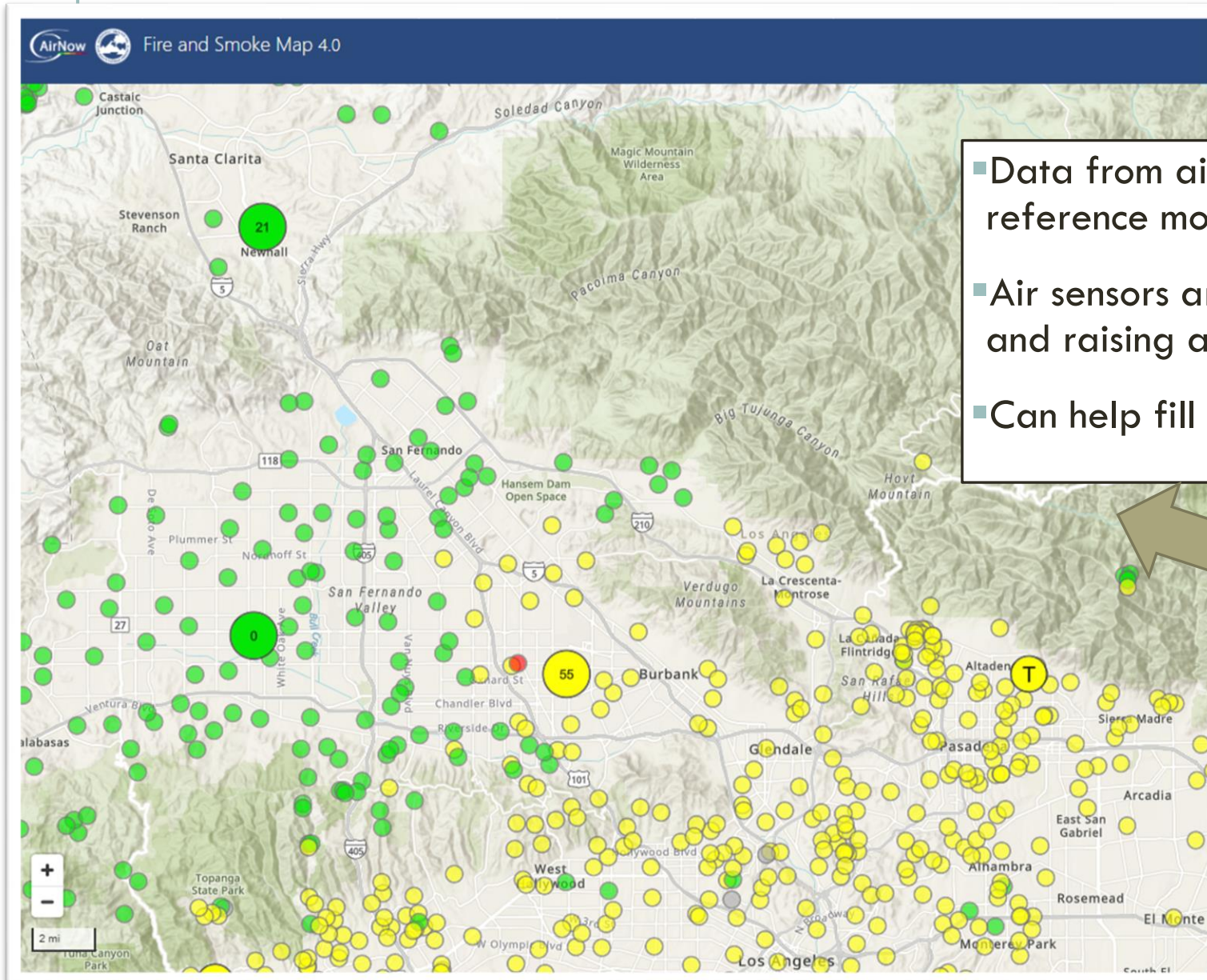


Sensors

- Relatively inexpensive (\$100 - \$7000)
- Easier to use out of the box without expertise
- Used for personal and community monitoring
- Data quality not fit for regulatory purposes



WHY USE SENSORS?



- Data from air sensors are not as accurate as data from reference monitors
- Air sensors are a good tool for community engagement and raising awareness
- Can help fill in the gaps between air monitoring stations

Map from EPA Fire and Smoke Map

Shows Air Sensor data in small circles and Reference Instrument data in large circles

<https://fire.airnow.gov/>

SENSOR LIBRARY GRANT



Air sensors undergoing calibration for the Pacoima community monitoring project

- South Coast AQMD was awarded an EPA grant to empower community-based air quality monitoring through the Sensor Library Program
- Six Aeroqual AQY-R air sensors purchased for Pacoima community with grant funds

AEROQUAL AQY-R



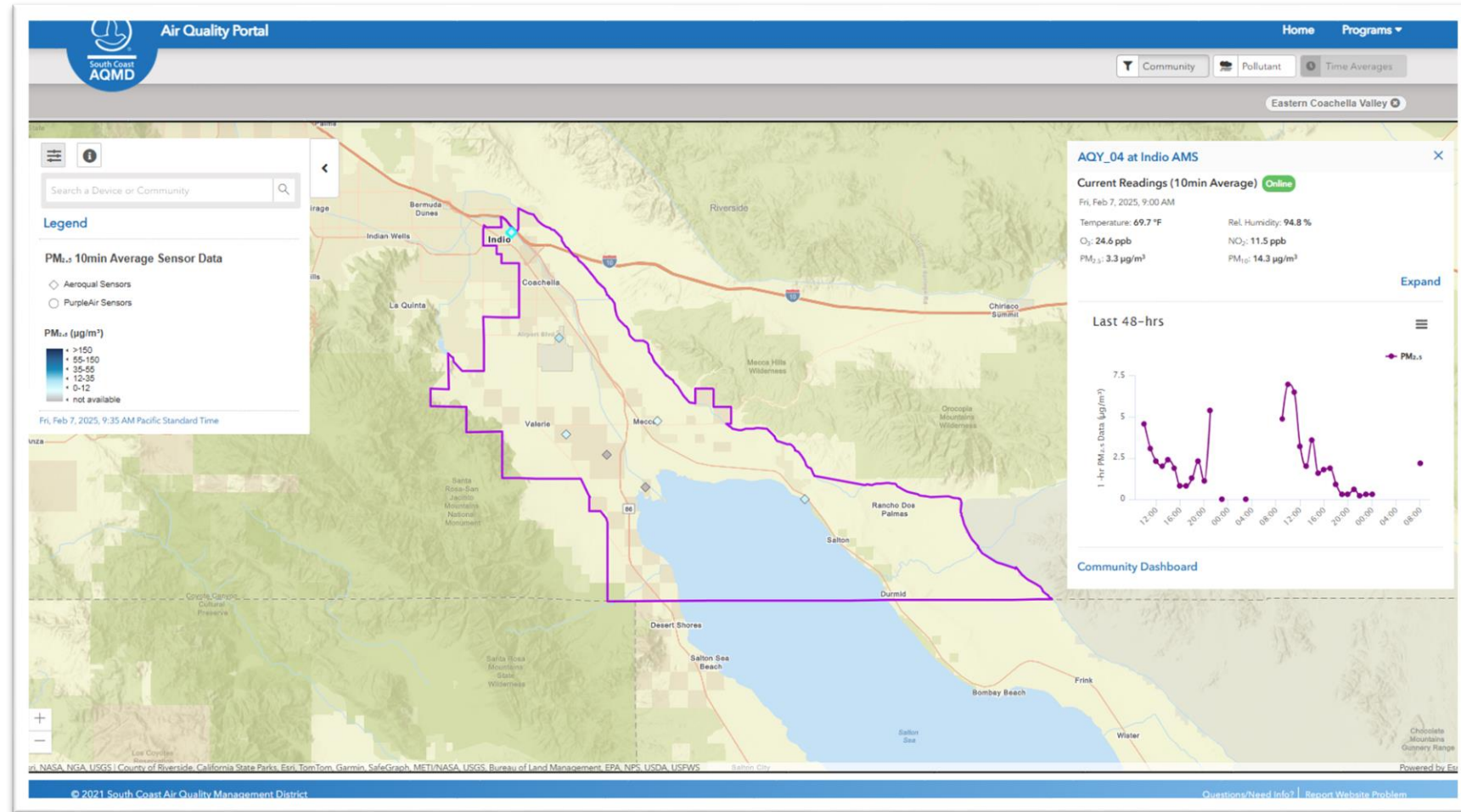
- Streams data to the cloud when configured to Wi-Fi
- Requires access to outdoor power outlet
- Each device measures:
 - Particulate Matter ($PM_{2.5} + PM_{10}$)
 - Ozone
 - NO_2
 - Temperature
 - Relative Humidity

SENSOR DATA ON AQPORTAL

Data from Aeroqual sensors will be displayed on AQPortal data dashboard

Features:

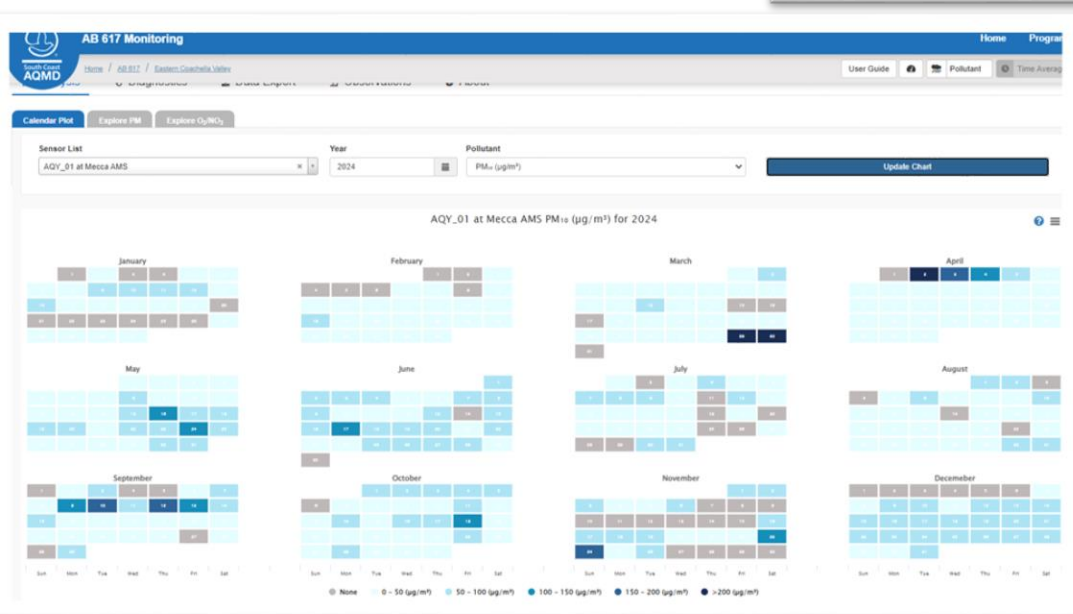
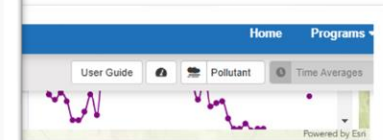
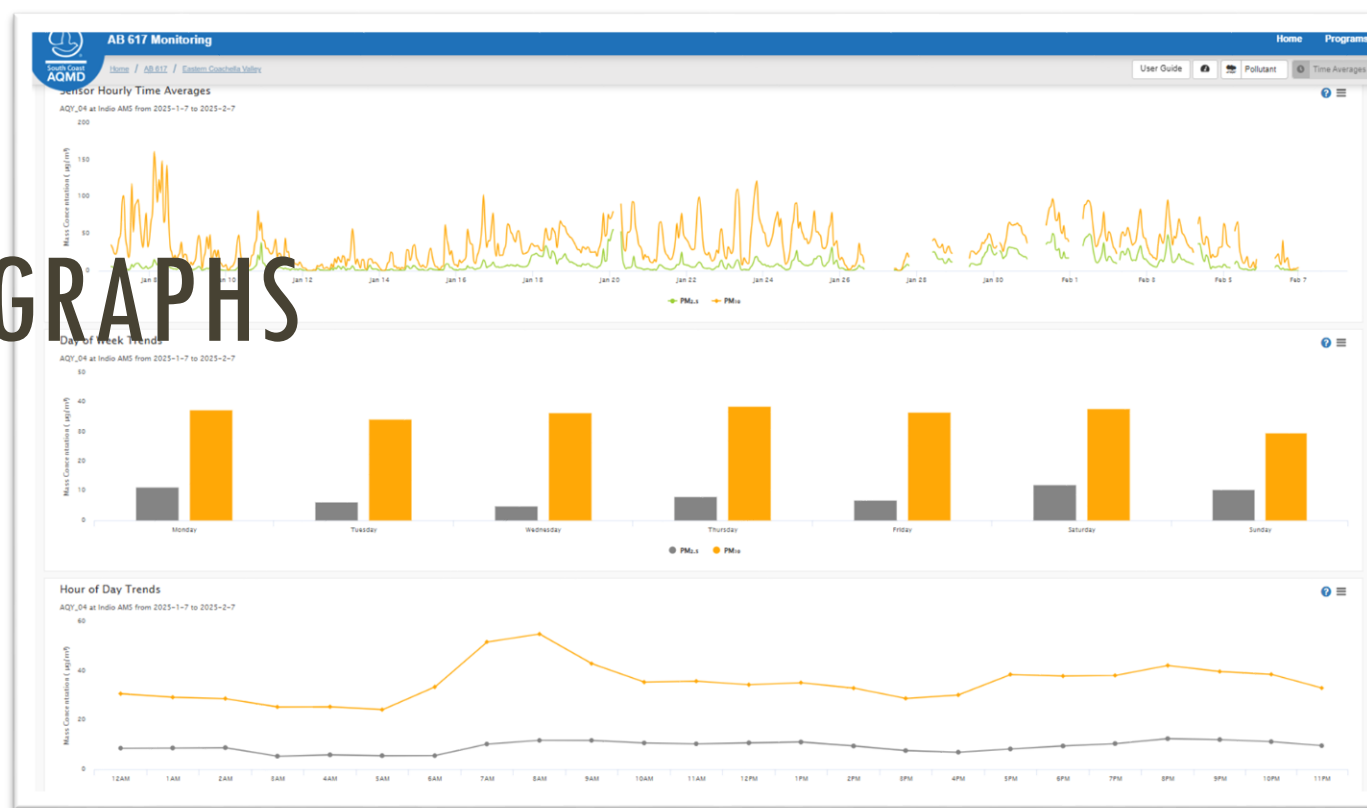
- Current Readings widget
- Time series plots
- Calendar plots
- Data Export tool



<https://aqportal.aqmd.gov/>

POLLUTION GRAPHS

CALENDAR PLOTS



The figure displays the data export function, showing a table of pollution data. The table includes columns for Sensor, From Date, To Date, Time Average, and various pollutant concentrations. The table is titled 'Analysis', 'Diagnostics', 'Data Export', 'Observations', and 'About'.

Sensor	From Date	To Date	Time Average	PM _{2.5}	PM ₁₀	O ₃	NO ₂	NO _x	CO	SO ₂	HC	Other
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	0	0	0	0	-999	-999	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	0	0	0	0	-999	-999	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	18.5	14	8.7	18.7	10.3	98.6	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	18.7	13.7	10.2	22.8	10.7	97	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	19.3	13.9	12	28.3	11.5	95	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	20.5	12.9	13.2	28.5	12.2	92.7	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	21.6	11.8	15.3	35.5	12.9	90.6	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	22.6	10.3	18.5	36.6	14.3	85.7	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	22.7	10.1	20.5	40.2	14.7	81.9	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	22.5	11.2	23.2	48.1	16.2	77.4	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	22.2	13.1	24.7	49.3	17.1	72.9	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	13.9	15.4	10.5	10.5	10.5	10.5	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	15.4	10.6	10.6	48.4	17	3.4	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	13.5	18.5	10.5	48.5	17.0	1	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	28	8.8	25.4	51	19.5	67.8	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀
AQY_04 at Indio AMS	2025-1-31	2025-2-7	10 Min	20.4	7.7	27.9	55.8	19.2	65	-999	-999	Insufficient Data for O ₃ , NO ₂ , PM _{2.5} , PM ₁₀

DATA EXPORT FUNCTION

HELPFUL RESOURCES

Sensor Educational Toolkit



THANK YOU



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