Issue At A Glance:

Air Quality in Eastern Coachella Valley

The Eastern Coachella Valley is experiencing poor air quality due to various pollutants. However, there is a lack of real-time data available in the region to residents and policy makers. This brief calls for a more active role by the state government to help support placement and monitoring of air quality data sensors in the region.

SPECIAL EDITION

Many rural regions lack data and monitoring programs for air quality. This puts rural residents at a disadvantage as they cannot rely on regional air districts to protect them against public health hazards. The rural Eastern Coachella Valley (ECV) does not have a publicly available air quality monitoring program and, therefore, real-time data are lacking.

Residents experience the negative health effects of poor air quality and are unable to advocate for themselves. This issue brief will describe the problem in ECV, provide background information on air quality data, and recommend an action plan.

Eastern Coachella Valley

The Eastern Coachella Valley is a geographic area within Southern California that includes four rural and unincorporated communities: Thermal, Oasis, Mecca, and North Shore. These areas are home to more than 20,000 residents, who are predominantly Latino/Hispanic families working in agriculture. Many of the residents are low-income.¹





Cities of ECV relative to the Salton Sea

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Causes of Poor Air Quality in Coachella Valley

The elevation of the Coachella Valley (which ECV is a part of) extends from 479 feet in Palm Springs down to -226 feet at the shoreline of the Salton Sea in the community of North Shore. The air quality across the Coachella Valley varies with many potential sources such as heavy agricultural and industrial activity from surrounding areas. The primary causes of decreased air quality include the following: diesel particulate from goods movement, pesticide drift, smoke from burning agricultural residues at dump sites, windstorms and energy plants. The Eastern Coachella Valley consistently falls outside the level of safe air quality standards as determined by the United States Environmental Protection Agency.²

Air Quality Contaminants

There are four air quality contaminants that are monitored by a network of regulator sensors near the Salton Sea, the North Shore, Mecca, Indio, and Palm Springs. Those contaminants are particulate matter (PM)₁₀, PM_{2.5}, hydrogen sulfide (H₂S), and ozone. The levels of these pollutants at ECV often exceed the safety standards.³

PM₁₀: PM₁₀ is a large particle that is generated by erosion and fragmentation of the desert soils and then blown by the valley's heavy winds. Studies indicate that inhalation of particulate matter is associated with exacerbated respiratory conditions such as asthma. Figure 1 indicates that the 2018 PM₁₀ levels in Mecca and Indio exceeded federal and state standards.^{2,3,4,5}

PM_{2.5}: PM_{2.5} is smaller in size than PM₁₀ and is usually emitted from automobile combustion, forest fires and industries. The Salton Sea does not emit PM_{2.5} according to studies conducted by the California Air Resources Board. Figure 2 indicates that the 2018 PM_{2.5} levels in the monitored areas of ECV exceeded state and federal standards.^{2,4,6}

H₂S: The hydrogen sulfide release from the Salton Sea is a unique environmental phenomenon that is only partially understood and known to occur on the north side of the lake during the summer months. Hydrogen sulfide is not part of the Ambient Air Quality Standard routinely measured by the federal or state departments, but it is the best indicator for monitoring the odor associated with the natural cycling that occurs during the summer. The H₂S spikes happen in the summer around the same time that the wind changes direction and blows from the Salton Sea into ECV.^{2,7,8}

Ozone: At the ground level, ozone can act as a harmful component of smog that affects the respiratory system. It is produced when nitrogen oxides combine with volatile organic compounds in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources. In ECV, ozone levels consistently exceed the federal ozone standards. While some ozone is generated in the valley itself, a significant portion comes from coastal and central Los Angeles County areas. Ozone is particularly hazardous in ECV during the late afternoon hours due to peak sunlight and wind direction.^{2,3}



exceed federal and state standards in 2018.

Figure 2: The PM_{2.5} levels in the monitored areas exceed state and federal standards in 2018.

June 2020

Current Issues

There are some regulatory sensors in ECV, but most are reporting data that is not specific to ECV. Most of the data for ECV is summarized into the South Coast Air Quality Management District's (SCAQMD) Air Quality index to give a single value to the entire Coachella Valley. The Air Quality Index does not account for the different air quality conditions that occur in the east and west portions of the valley.²

Residents in ECV have complained of poor air quality for a number of years and have requested more monitoring sites. There are a number of reasons for this request, including the need to learn more about the odors that are making the residents ill.

Focused discussions with residents from some of these rural communities have addressed the lack of timely and adequate data on air quality. For instance, students and staff at Saul Martinez Elementary School in Mecca became ill from aerially borne odors in 2011. They were evacuated, the school closed, and several were taken to the hospital. However, there was no way to detect the source of the odors or the composition.

The key issue is that most air quality regulatory sensor data is not available in real-time for residents of ECV, with the exception of hydrogen sulfide. Ozone is only measured in two locations and reaches hazardous levels in the late afternoon. Selenium is recognized as a public health hazard but is not monitored.

Recommendations

Given the issues at hand, more regulatory sensors should be placed throughout the Eastern Coachella Valley. These sensors should:

- Produce data streams that are publicly available with real-time data similar to the two hydrogen sulfide monitors already located in Mecca and at the Salton Sea
- Be routinely maintained by the SCAQMD or other approved organizations
- Include sensors specifically for detecting environmental air quality hazards from the Salton Sea, industrial pollutants from the Mecca industrial complex, and particulate pollution from the regional agricultural activity that is unique to ECV
- Include additional parameters that are specific to ECV's unique air quality basin. This includes monitoring potential Salton Sea emissions of selenium and hydrogen sulfide along with wind patterns.

Moreover, the low-cost sensors that are currently present must be routinely maintained by SCAQMD in partnership with trained community scientists. Once these recommendations become a reality, residents and policy makers can have accurate, real-time data on air pollutants in ECV to make evidence-based decisions to improve the health of the residents living in this region.

References:

- 1. https://censusreporter.org/profiles/06000US0606590520-coachella-valley-ccd-riverside-county-ca/
- 2. http://www.sph.wiki/EJ/lib/exe/fetch.php?media=pdf_air_white_%20paper.pdf
- 3. https://www.arcgis.com/apps/webappviewer/index.html?id=dd4a15deed8647ed acb14f140ca83d05
- 4. https://ww3.arb.ca.gov/qaweb/mapdemo/map_module.php
- 5. https://ww3.arb.ca.gov/qaweb/site.php?s_arb_code=33033
- 6. https://www.aqmd.gov/docs/default-source/ab-617-ab-134/year-2/community-identification-prioritization/self-rec-form-year-2.pdf?sfvrsn=8
- 7. https://www.sciencedirect.com/science/article/pii/S0048969708007687?via%3 Dihub
- 8. https://saltonseaodor.org/



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