

Quantifying Salton Sea's Harmful PM During High Winds Events

The Salton Sea (SS), located in Southern California, 40 miles from Mexicali, Mexico, is a man-made lake once considered an oasis for the wealthy. Agricultural run-offs from Imperial Valley farms and waste drainage from Mexicali have been pouring into the Salton Sea for decades polluting the water with carcinogenic chemicals that are increasing oxygen and salinity levels, making the ecosystem uninhabitable for fish and wildlife. Water transfers, on-farm efficiency, evaporation, and the climate crisis are causing Salton Sea water levels to recede at an alarming rate, exposing playa latent with harmful particulate matter (PM). During the Imperial and Coachella Valley high wind seasons, PM from the surrounding arid mountains, sand dunes, and exposed SS playa can blow into the neighboring communities, exposing the residents to harmful PM. In an effort to reduce the neighboring communities' exposure to harmful PM, local water and power distributors Imperial Irrigation District (IID) launched the Salton Sea Air Quality Mitigation Program (SSAQMP) to provide a comprehensive, science-based, adaptive approach to address air quality mitigation requirements, including continuous monitoring and quantification of particulate matter (PM-2.5/PM-Coarse) and implementation of innovative dust mitigation strategies. The SSAQMP is funded through the Quantification Settlement Agreement Joint Powers Authority with members including IID, San Diego County Water Authority, Coachella Valley Water District and California Department of Fish and Wildlife. The SSAQMP established six (6) Air Quality Monitoring Stations located around the SS, each equipped with one (1) Thermo-Fisher Scientific TEOM 1405-D (TEOM) for continuous PM monitoring and one (1) meteorological tower with microwave network connectivity. During forecasted wind speeds (>20-mph), eight (8) BGI PQ200s (PQ200) are deployed for a 24-hour sample run. This study analyzes the correlated TEOM data (centric to high wind event days) and PQ200 data in comparison with TEOM data during "clear" (≤5-mph) days to determine the concentration levels of PM created during high wind events. Also, incorporation of wind rose diagrams, created using wind speed/direction data collected at meteorological towers, aid in understanding varying PM concentrations relative to their deployment site properties. The results of this study provide an essential tool for understanding the amount of exposure that neighboring communities are experiencing during high wind events and how IID's implemented mitigation efforts will look moving forward.

Speaker Bio

Sergio A. Valenzuela is an Air Quality Monitoring Technician with SCS Engineers, currently managing the field requirements for the Imperial Irrigation District's (IID) Salton Sea Air Quality Monitoring Program (SSAQMP). An Imperial Valley native, Mr. Valenzuela has been personally involved with the nuanced issues concerning the Salton Sea and its surrounding regions through various aspects. His collective experience from agriculture, multiple community air monitoring projects, and state programs have culminated in a very unique perspective on air quality issues throughout the Imperial and Coachella Valleys in Southern California.