



Insights into dust emission from multiple years of studies at the Oceano Dunes in California

Vicken Etyemezian (1), John Gillies (1), George Nikolich (1), and Ronnie Glick (2)

(1) Desert Research Institute, Division of Atmospheric Sciences, United States (vic@dri.edu), (2) California Department of Parks and Recreation, Oceano Dunes District, United States

The active Oceano Dunes on the Central Coast of California in San Luis Obispo County formed approximately 12,000 to 15,000 years ago. Earlier dune building episodes extend back in time even further, perhaps as early as 750,000 years ago. A large portion of the dunes (about 500 ha) serves as the setting for a State Park where the public is allowed to ride recreational vehicles such as off-road motorcycles and all-terrain vehicles (ATV). Frontal systems during spring and portions of summer result in consistent west-northwesterly winds that move sand and emit dust, dust that is transported downwind to residential and commercial areas of the Nipomo Mesa. Complaints from impacted residents and concerns from the regulatory agency for air quality have prompted a long-term effort to understand and reduce dust emissions from the Oceano Dunes. A focus of the work has been to determine the portion of air quality degradation in excess of what would occur naturally as a consequence of allowing recreational vehicles to use the dunes. Studies have included multiple field measurements of wind erosion potential with the PI-SWERL instrument, field measurements of ambient wind and dust particle concentrations, modeling studies, and implementation of water-free dust control techniques. With emphasis on the spatial emissions patterns estimated from PI-SWERL testing over several years, an overview of what has been learned to date is presented.