



“Particulate Nitrate Modeling in the San Joaquin Valley”

CARB Research Seminar for Contract # 15-301

William Vance, Ph.D.

CARB Staff & Research Contract Manager

June 21, 2019

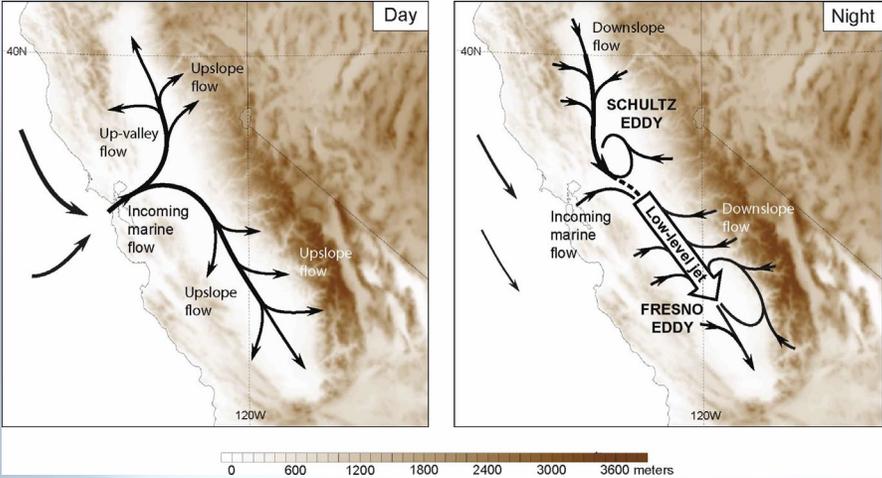
Announcements

- ◆ Additional information about the speaker as well as slides and other materials can be found at this link: <https://ww3.arb.ca.gov/research/seminars/kleeman4/kleeman.htm>
- ◆ For those of you online, questions for the speaker can be sent to CoastalRm@calepa.ca.gov For our in-person audience: “housekeeping” items.

General Overview



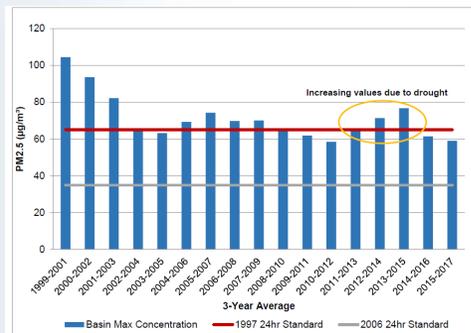
San Joaquin Valley APCD 2016



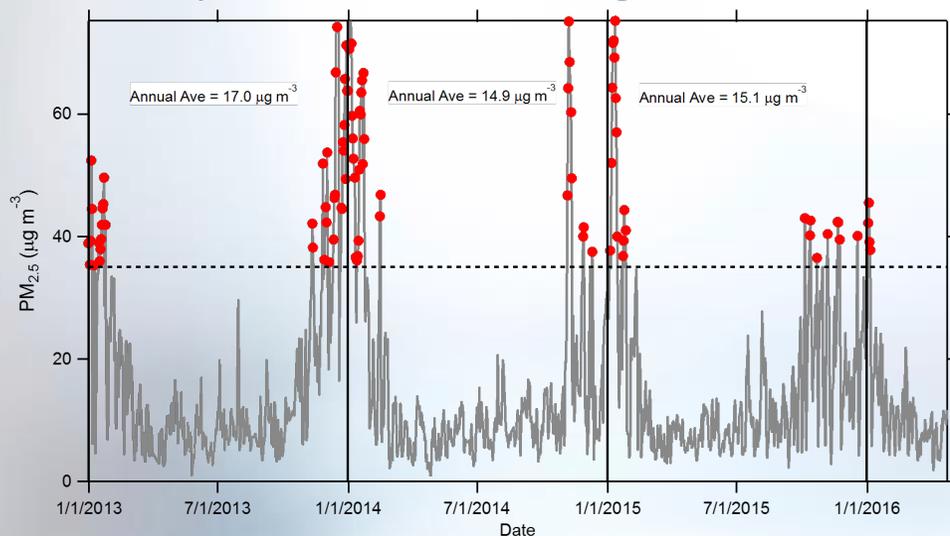
J.-W. Bao et al., 2008

- ◆ The unique topographical and meteorological conditions in the San Joaquin Valley (SJV) present a challenge to regulatory efforts to comply with particulate matter standards, esp. particles less than 2.5 microns (PM_{2.5}).
- ◆ The SJV is an intermountain valley approximately 250 miles long and averaging 80 miles wide. It is bounded on the east, west and south by mountains.
- ◆ Marine air flows into the basin mainly from the San Joaquin River delta; topographic features restrict air movement into and out of the valley.
- ◆ Low mixing heights and stagnant conditions limit the vertical and horizontal transport of pollutants, which allows pollutants to accumulate over time.

PM2.5 Trends



Valley 24-hour PM2.5 Design Value Trend



ARB AQMIS, Site: Fresno-Garland
PM_{2.5} concentration measurements from
Fresno-Garland site. Dashed line is 24-Hour
PM_{2.5} Standard.

- ◆ Wintertime particulate matter (PM) air pollution in the SJV often exceeds the US Environmental Protection Agency (EPA) 24-hour standard for PM_{2.5} (35 mg m⁻³).
- ◆ Submicron PM is primarily composed of organic aerosol (OA) and ammonium nitrate (AN), with each contributing about equally.
- ◆ This project evaluated emission inventories, meteorological conditions, and regional chemical regimes to determine pathways to improving nitrate predictions in the SJV.
- ◆ Regulatory efforts to comply with particulate matter standards in the SJV require improvements in our knowledge of the factors controlling the particle formation, transport (horizontally and vertically) and precursor sources.

Today's Speaker — Dr. Michael Kleeman

- ◆ Dr. Kleeman is a Professor of Civil and Environmental Engineering at the University of California at Davis.
- ◆ He received his Ph.D. from the California Institute of Technology in 1998 (thesis advisor Glen Cass).
- ◆ His research spans a wide range of subjects in atmospheric science from ozone production from agricultural sources to interactions between climate-energy-air quality to characterization & source apportionment of atmospheric ultrafine particles.
- ◆ For more information, visit:
<https://faculty.engineering.ucdavis.edu/kleeman/>.