Air Quality Impacts of ODSVRA Dust Control Projects

June 17, 2022

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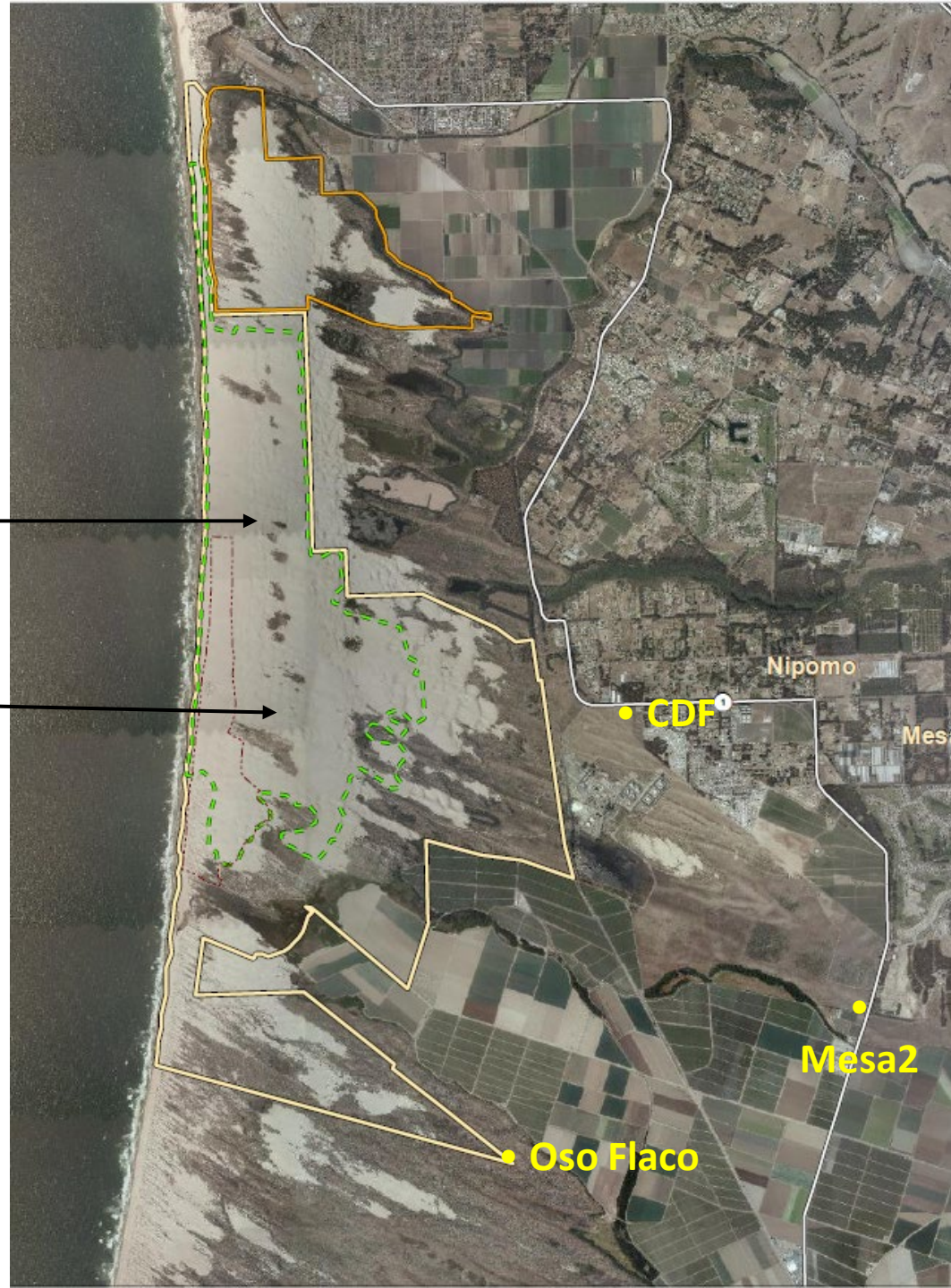
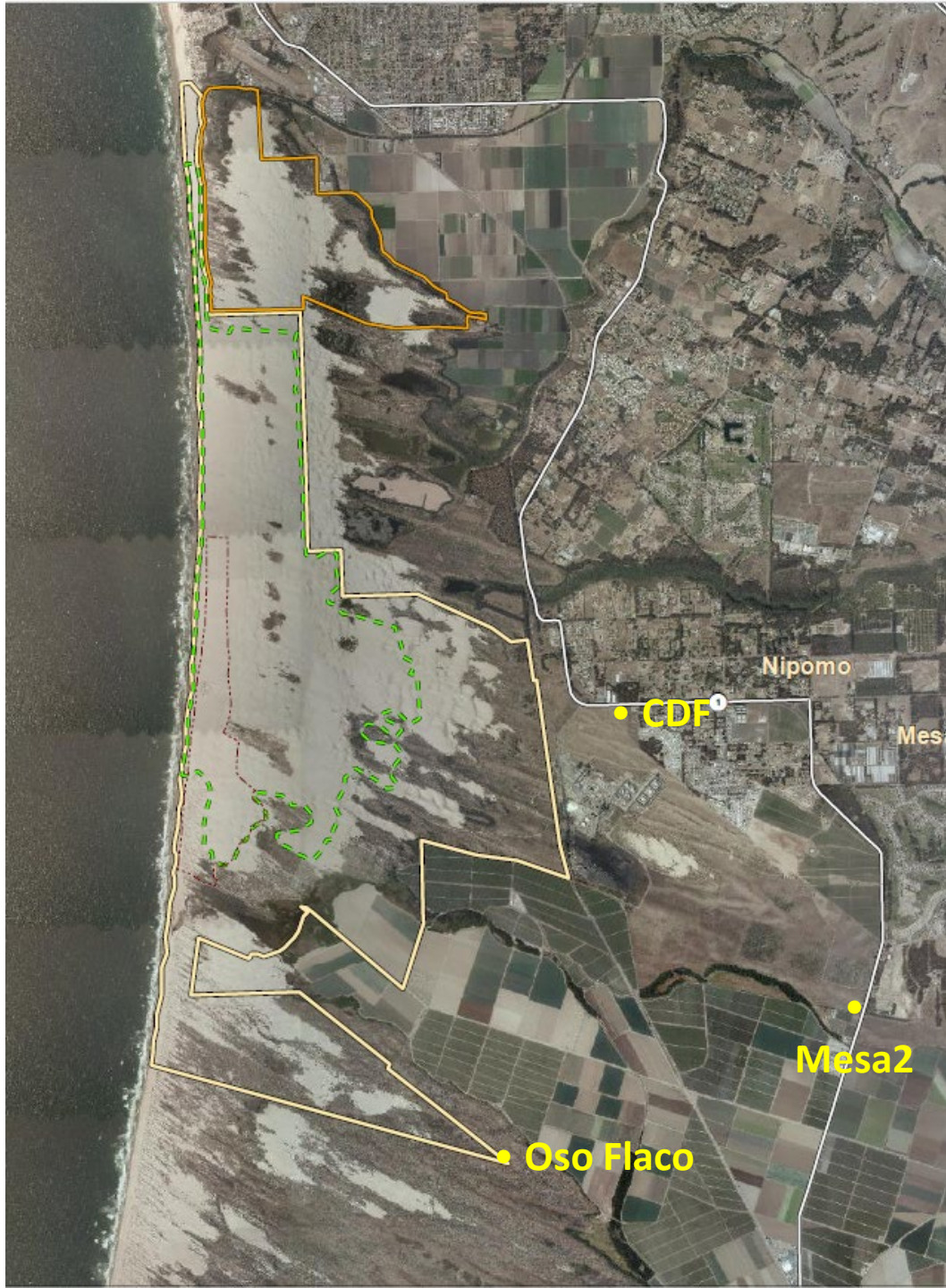
ODSVRA
(yellow)

Pre-SOA Riding Area
(green dashes)



PM_{10} Downwind of the Oceano Dunes

- Usual sources
  - Background (aerosols, traffic, sea salt)
  - Wildfire smoke (2020, 2017)
  - Regional Dust (2020, 2019)
- Wind-blown dust (saltation derived)
  - Influenced by:
    - ODSVRA Dust Control Projects
    - Winds



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ODSVRA Dust Controls

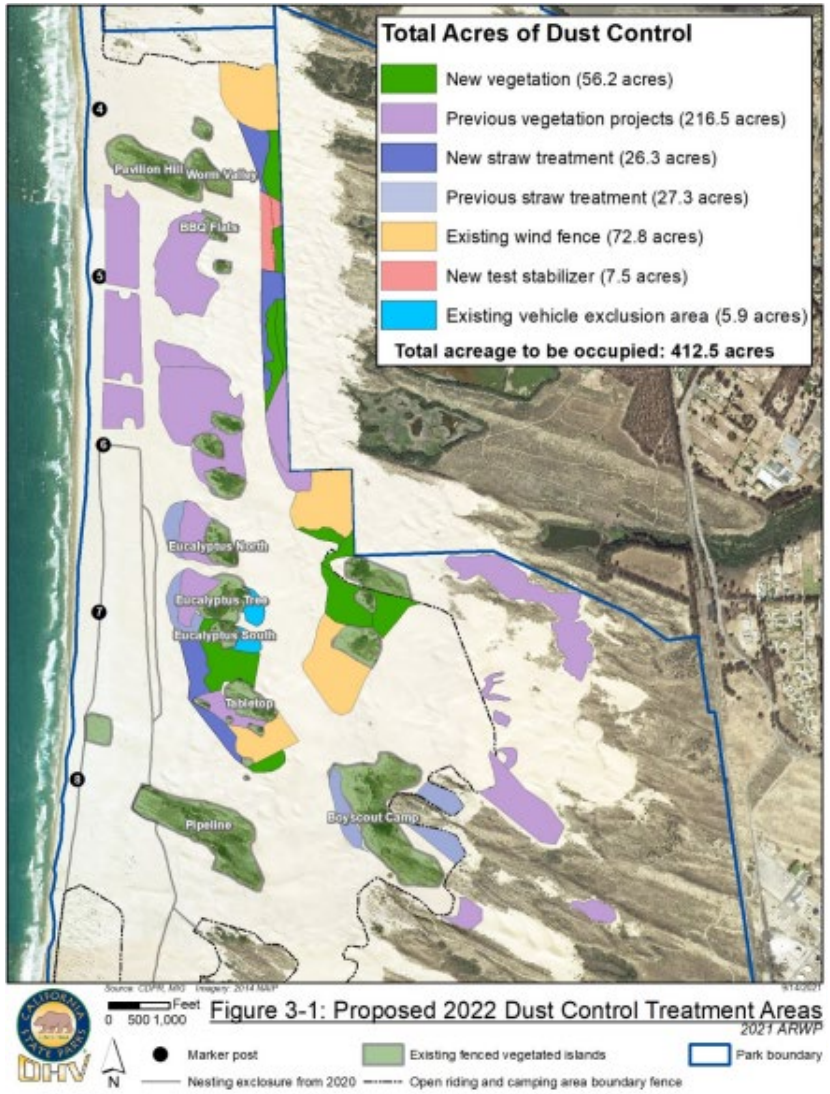


Figure 3-1: Proposed 2022 Dust Control Treatment Areas
2021 ARWP

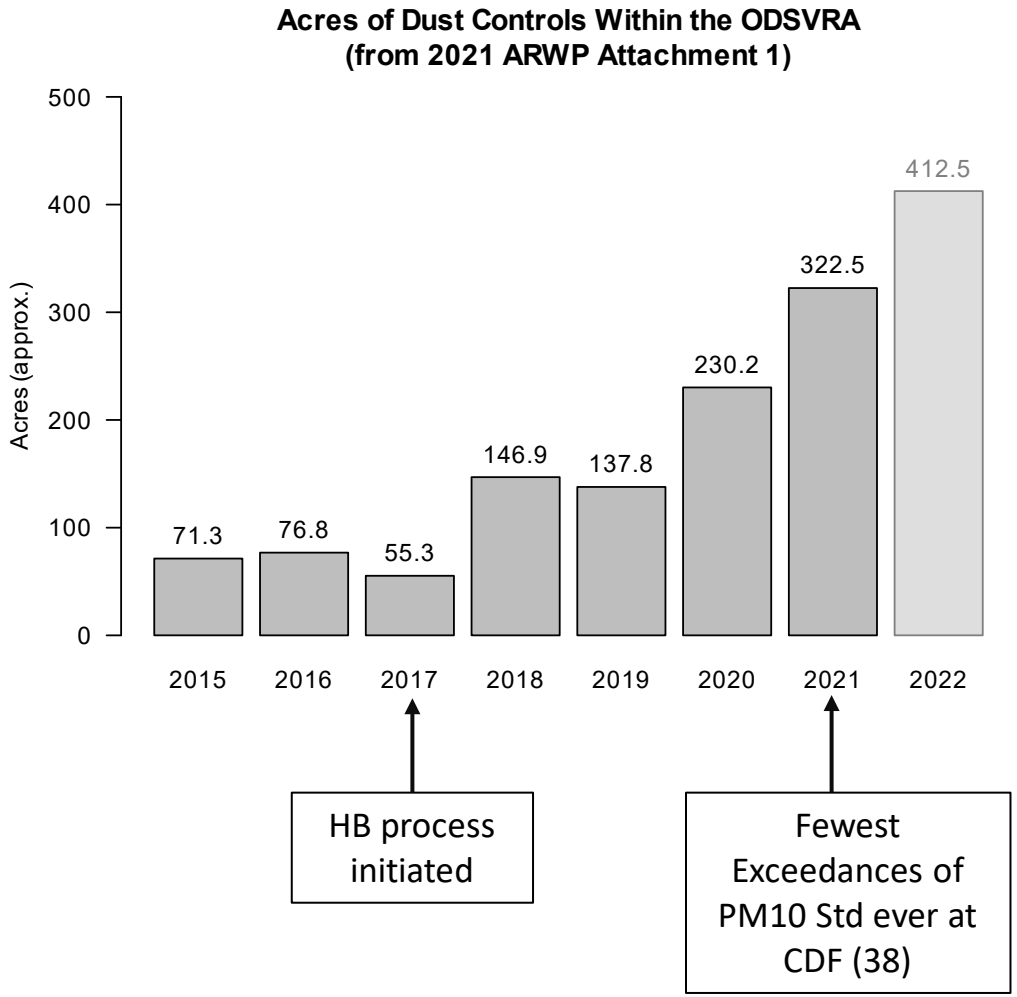


Exhibit 1: APCD Analysis – 2021

"Difference-in-differences" analysis to control for meteorology

- Comparing 2021 to pre-SOA (2017):
  - Dust controls increased from 55.3 to 322.5 acres
  - At CDF, wind event day PM_{10} levels decreased 33.5%.
  - Median 24-hour wind day PM_{10} in 2021:
    - Observed: 52 µg/m^3
    - Predicted: 77 µg/m^3
  - Parks/DRI Model predicts 38.8% improvement over this period

Percent of wind event day PM_{10} levels vs pre-SOA (2017)

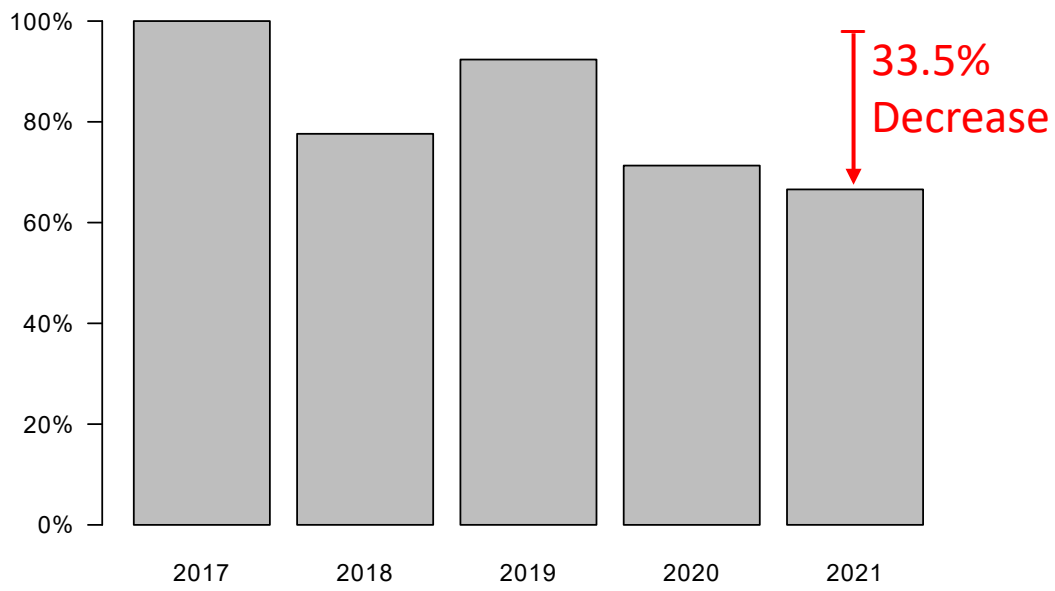


Exhibit 1: APCD Analysis – 2021

Annual Hours > 300 µg/m³

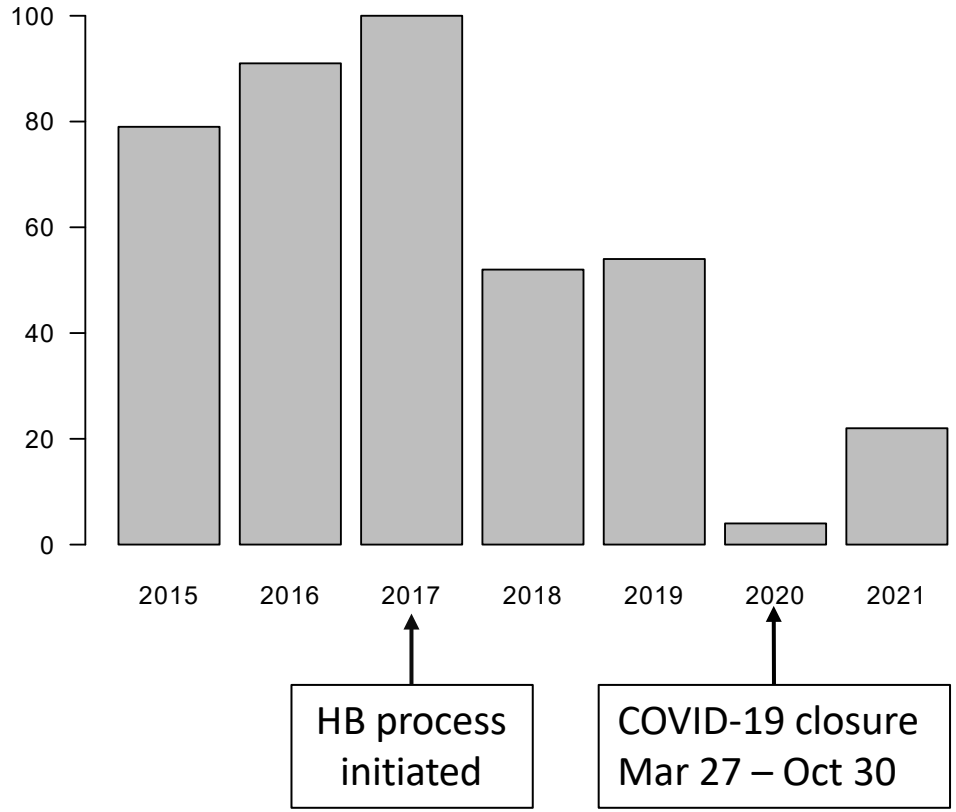
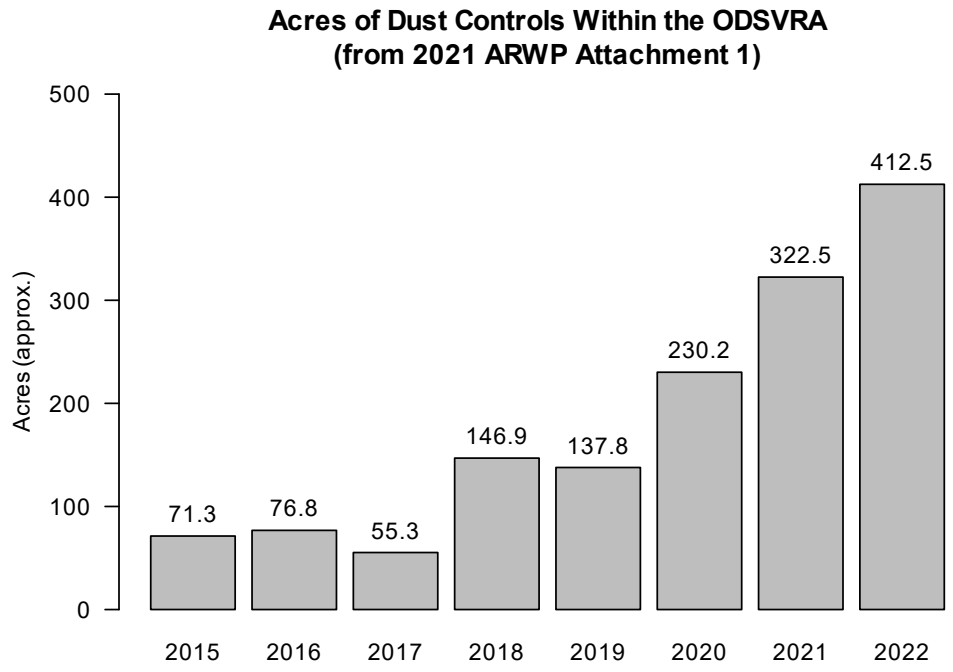


Exhibit 1: APCD Analysis – 2022 So Far

2022: 90 more acres completed May 10



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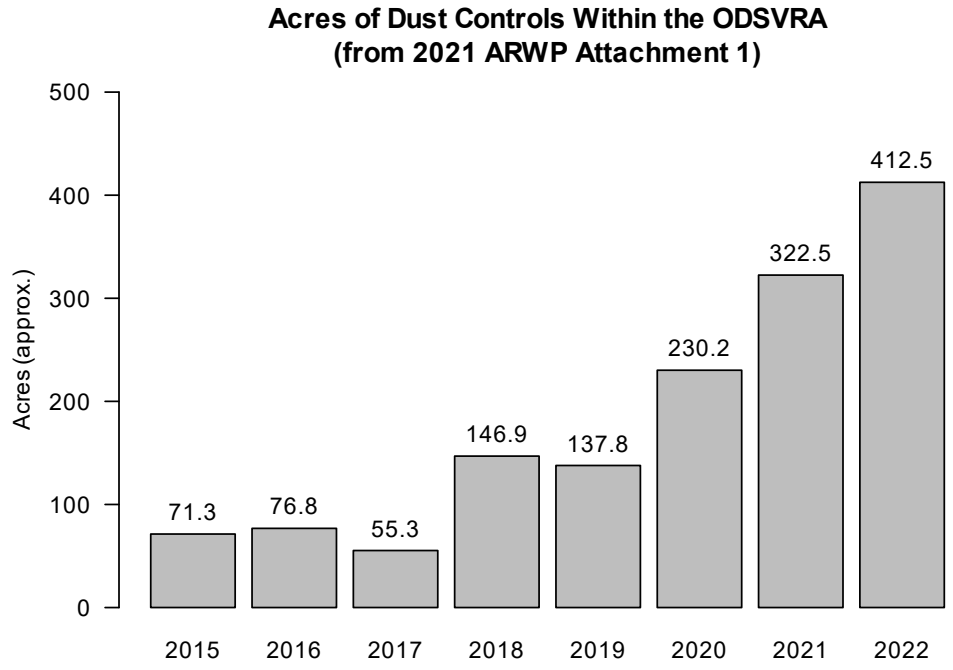
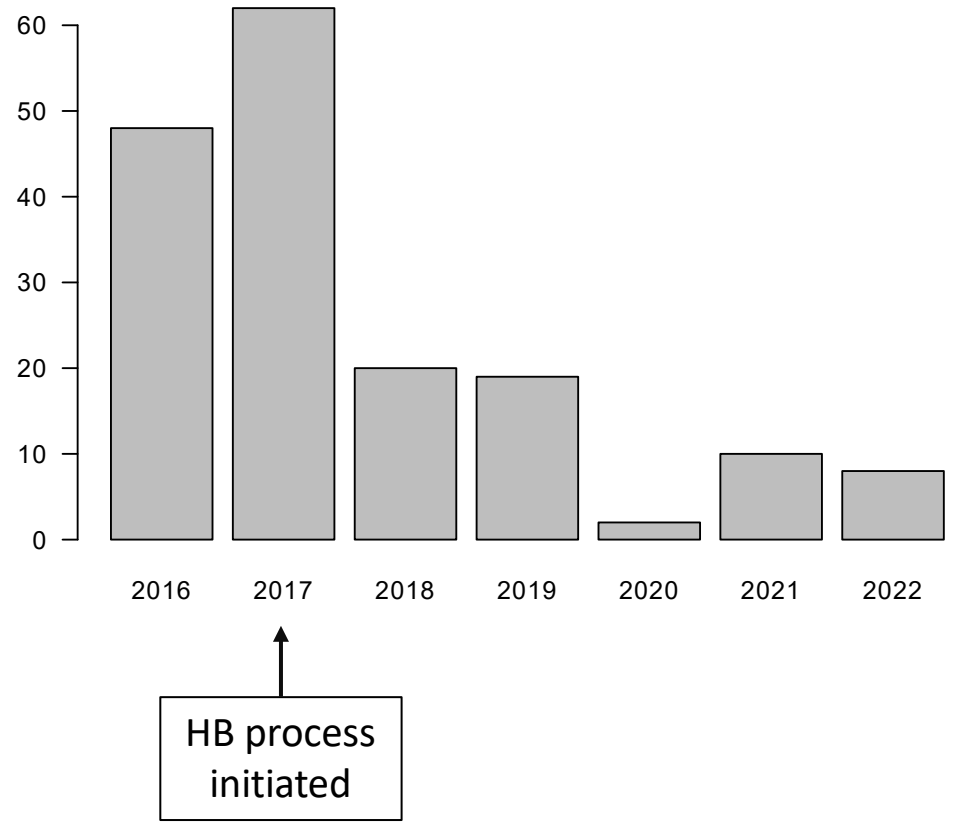


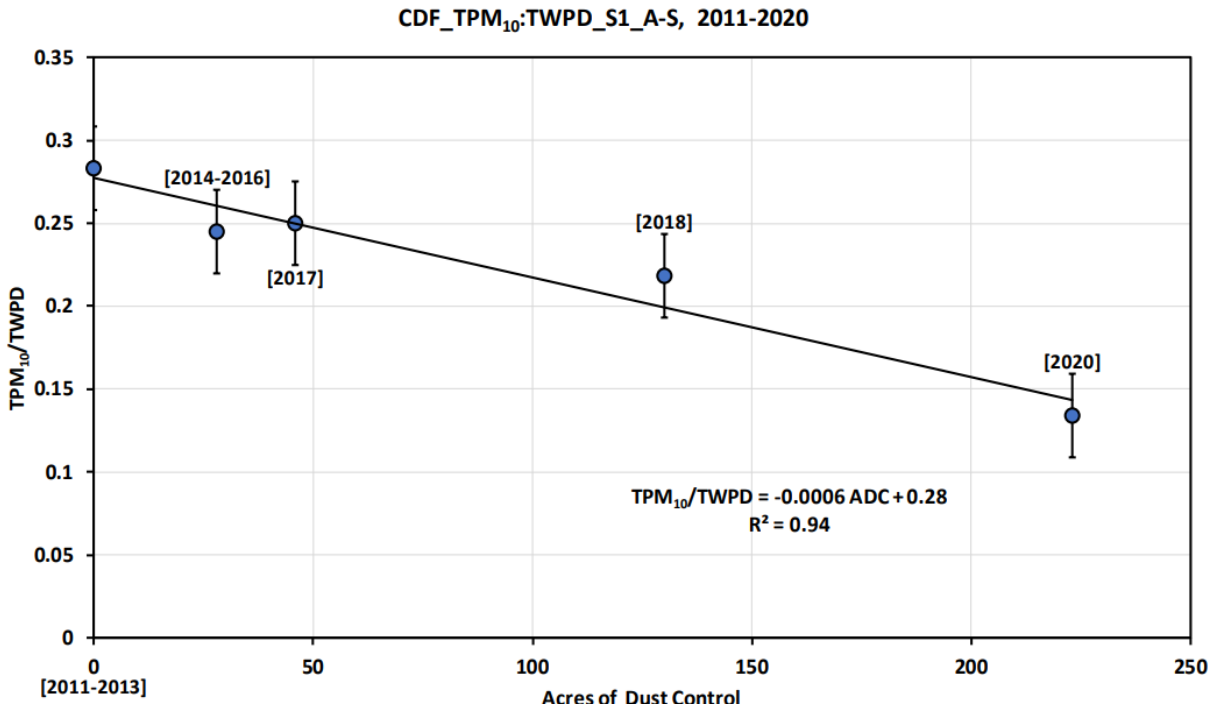
Hours > 300 ug/m^3, Jan 1 – May 31



Desert Research Institute: Wind Power Density

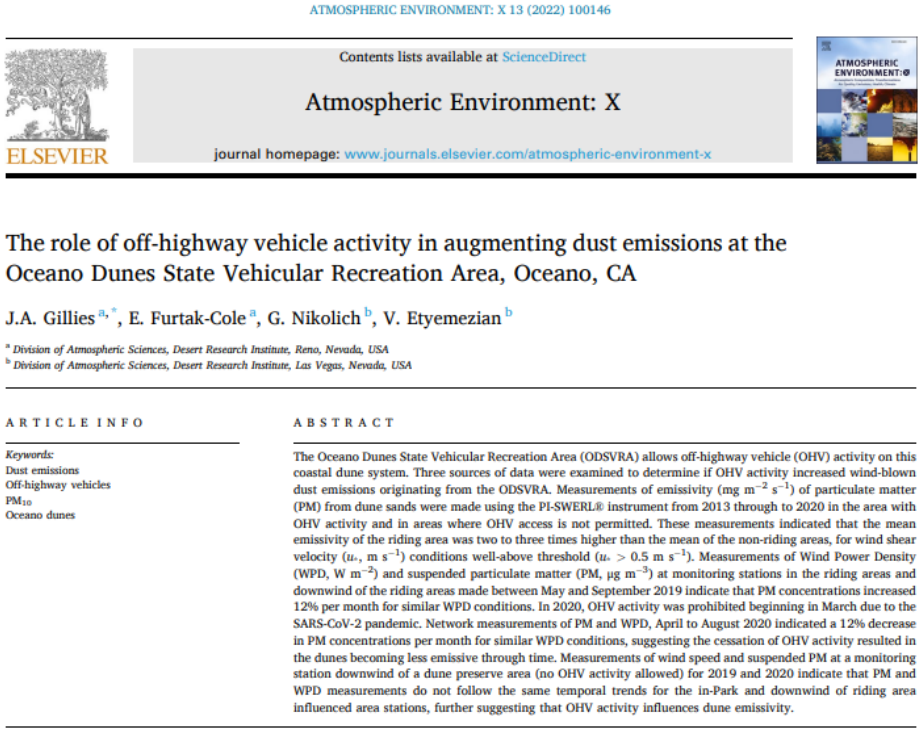
2021 ARWP Attachment 10

- Track changes in relationship between:
  - PM_{10} at CDF
  - Wind power density (~ wind speed^3)
- Filter data to hours with high winds from the dunes
- Sum of PM_{10} vs Sum WPD



Desert Research Institute: Wind Power Density

See also *Atmospheric Environment: X* paper



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The role of off-highway vehicle activity in augmenting dust emissions at the Oceano Dunes State Vehicular Recreation Area, Oceano, CA

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ABSTRACT

The Oceano Dunes State Vehicular Recreation Area (ODSVRA) allows off-highway vehicle (OHV) activity on this coastal dune system. Three sources of data were examined to determine if OHV activity increased wind-blown dust emissions originating from the ODSVRA. Measurements of emissivity (mg m^{-2} s^{-1}) of particulate matter (PM) from dune sands were made using the PI-SWERL® instrument from 2013 through to 2020 in the area with OHV activity and in areas where OHV access is not permitted. These measurements indicated that the mean emissivity of the riding area was two to three times higher than the mean of the non-riding areas, for wind shear velocity (u_*, m s^{-1}) conditions well-above threshold ($u_* > 0.5$ m s^{-1}). Measurements of Wind Power Density (WPD, W m^{-2}) and suspended particulate matter (PM, μg m^{-3}) at monitoring stations in the riding areas and downwind of the riding areas made between May and September 2019 indicate that PM concentrations increased 12% per month for similar WPD conditions. In 2020, OHV activity was prohibited beginning in March due to the SARS-CoV-2 pandemic. Network measurements of PM and WPD, April to August 2020 indicated a 12% decrease in PM concentrations per month for similar WPD conditions, suggesting the cessation of OHV activity resulted in the dunes becoming less emissive through time. Measurements of wind speed and suspended PM at a monitoring station downwind of a dune preserve area (no OHV activity allowed) for 2019 and 2020 indicate that PM and WPD measurements do not follow the same temporal trends for the in-Park and downwind of riding area influenced area stations, further suggesting that OHV activity influences dune emissivity.

Highlights:

- Analyzes impact of 2020 COVID-19 riding ban using PI-SWERL and WPD data
- Riding areas 2 to 3 times more emissive than non-riding
- Typically, riding area emissivity increases during Spring and Summer
- In 2020, it decreased
  - 46% overall decrease over 5 months

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Conclusion

- For pre-SOA (2017) through 2021
  - Wind-event-day PM_{10} at CDF has improved by 33.5% due to mitigations
  - Aligns well with model prediction of 36.8%
  - Corroborated by
    - Trends in hours > 300 $\mu g/m^3$,
    - Trends in exceedances of District Rule 1001,
    - Trends in exceedances of the California PM_{10} standard,
    - DRI's Wind Power Density analysis.
- 2022 so far
  - Windiest winter/spring along the coast since 1976
  - Fewer hours > 300 $\mu g/m^3$ this year than last
- 2020's temporary off-roading ban resulted in significantly less dust production

Contact / Additional Info

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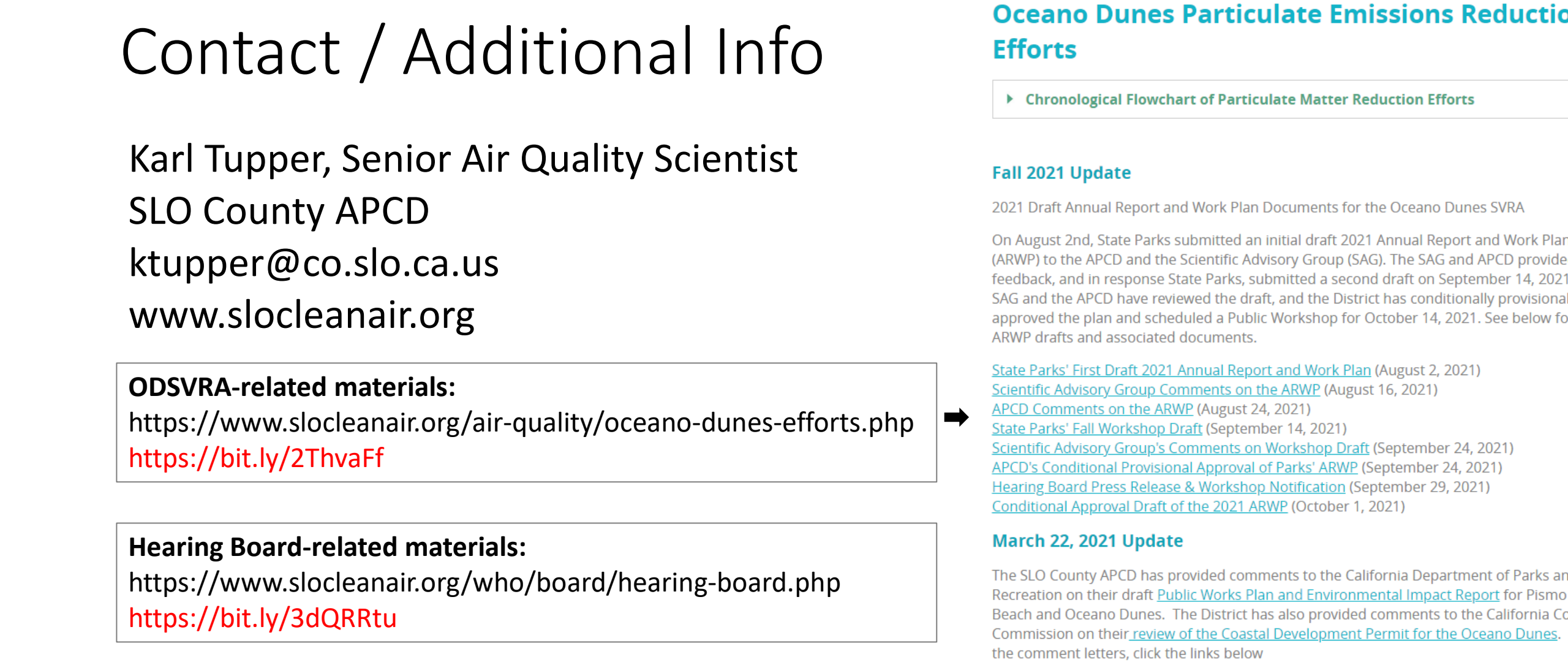
ODSVRA-related materials:
https://www.slocleanair.org/air-quality/oceano-dunes-efforts.php
https://bit.ly/2ThvaFf

Hearing Board-related materials:
https://www.slocleanair.org/who/board/hearing-board.php
https://bit.ly/3dQRRtu



Oceano Dunes Particulate Emissions Reductio Efforts

▸ Chronological Flowchart of Particulate Matter Reduction Efforts

Fall 2021 Update

2021 Draft Annual Report and Work Plan Documents for the Oceano Dunes SVRA

On August 2nd, State Parks submitted an initial draft 2021 Annual Report and Work Plan (ARWP) to the APCD and the Scientific Advisory Group (SAG). The SAG and APCD provide feedback, and in response State Parks, submitted a second draft on September 14, 2021 SAG and the APCD have reviewed the draft, and the District has conditionally provisional approved the plan and scheduled a Public Workshop for October 14, 2021. See below fo ARWP drafts and associated documents.

State Parks' First Draft 2021 Annual Report and Work Plan (August 2, 2021)
Scientific Advisory Group Comments on the ARWP (August 16, 2021)
APCD Comments on the ARWP (August 24, 2021)
State Parks' Fall Workshop Draft (September 14, 2021)
Scientific Advisory Group's Comments on Workshop Draft (September 24, 2021)
APCD's Conditional Provisional Approval of Parks' ARWP (September 24, 2021)
Hearing Board Press Release & Workshop Notification (September 29, 2021)
Conditional Approval Draft of the 2021 ARWP (October 1, 2021)

March 22, 2021 Update

The SLO County APCD has provided comments to the California Department of Parks an Recreation on their draft Public Works Plan and Environmental Impact Report for Pismo Beach and Oceano Dunes. The District has also provided comments to the California Co Commission on their review of the Coastal Development Permit for the Oceano Dunes. the comment letters, click the links below