

Staff Report
for the
October 2026 Meeting
of the
SLO APCD Hearing Board
In the matter of
Stipulated Order of Abatement
Case 17-01

San Luis Obispo County Air Pollution Control District

October 14, 2026

Introduction

Since 2018, the Hearing Board of the San Luis Obispo County Air Pollution Control District (Hearing Board) has convened annually, typically in October, to receive informational updates on Annual Reports and Workplans (ARWPs) prepared by the California Department of Parks and Recreation (State Parks). In 2019, 2022, 2024, and 2025, the meetings also included public hearings on proposed modifications to the Stipulated Order of Abatement in Case 17-01 (SOA). In addition to these fall meetings, the Hearing Board has occasionally held meetings or hearings at other times of the year.¹

The SOA requires the Air Pollution Control District (APCD) to hold a workshop on the ARWP to receive public comment prior to the Air Pollution Control Officer (APCO) issuing his or her final approval or denial of the ARWP. These public workshops have typically been combined with the Hearing Board's fall meetings. Thus, the annual fall Hearing Board meetings are dual purpose: They fulfill the SOA's public workshop requirement and provide the Hearing Board with an informational update.

The October 14, 2026, Hearing Board meeting is an informational update and public workshop only—unlike last year's meeting, there is not an application to modify the SOA to consider or any other action items on the agenda. At the meeting, the APCD, State Parks, and the Oceano Dunes Scientific Advisory Group (SAG) will provide updates on progress meeting the SOA's emissions reduction goal, air quality on the Nipomo Mesa, and activities planned in the 2026 ARWP. The public and Hearing Board will have the opportunity to provide comments on the ARWP and SOA process.

At its last meeting (October 15, 2026), the Hearing Board modified the SOA to require that State Parks, APCD, and the SAG "continue to refine the measurement-based metric ('SAG metric') ... and report results annually to the Hearing Board ... Said report shall additionally include data collected by the Northern Foredune Restoration Monitor over the last year."² The updates provided at the October 14th meeting will also address these new requirements.

The remainder of this staff report briefly reviews the background on the SOA, provides information on the SAG Metric and the Northern Foredune Restoration Area monitoring, and provides a general update on trends in air quality downwind of the ODSVRA. Presentations on all of these topics will be given at the October 14, 2026, Hearing Board Meeting.

Background on the SOA

In October of 2017, a previous APCO submitted a petition requesting the Hearing Board find State Parks in violation of rules and regulations related to public nuisance. The petition alleged that dust emissions from the Oceano Dunes State Vehicular Recreation Area (ODSVRA) are the "overwhelming

¹ All materials related to previous Hearing Board meetings in Case 17-01 are available on the APCD website at <https://www.slocleanair.org/who/board/hearing-board/actions.php>.

² Hearing Board of the San Luis Obispo County Air Pollution Control District, "Order to Modify Existing Stipulated Order Of Abatement," Case 17-01, filed October 16, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2025%20Fourth%20Amendment%20to%20Stipulated%20Order%20of%20Abatement%2017-01_FILED%2010-16-2025.pdf.

contributor to PM₁₀ health standard exceedances measured [downwind] on the Nipomo Mesa.” The petition requested an abatement order requiring State Parks to refrain from violating nuisance regulations and District Rule 1001, which is related to dust emissions from the park.³ The APCO proposed an abatement order which called for immediately prohibiting camping and vehicular access from large areas of the park until dust control measures providing equivalent emission reductions were installed.⁴

The hearing on the petition was continued numerous times and spanned several meetings; ultimately the parties agreed to a *stipulated* order of abatement, which the Hearing Board approved at a meeting in April 2018. In agreeing to a stipulated order, State Parks explicitly denied the allegations in the petition, and the Hearing Board did not make any findings related to the allegations. The APCD agreed to the stipulated order to quickly achieve meaningful dust mitigation measures while avoiding potentially protracted litigation.

Among other things, the original SOA required “Initial Particulate Matter Reduction Actions” including fencing-off and installing vegetation and temporary dust controls on more than 80 acres of the off-roading area. It required State Parks to develop a “Particulate Matter Reduction Plan” (PMRP) designed achieve state and federal PM₁₀ standards and to reduce PM₁₀ emissions on high wind days by 50%. The SOA further required State Parks to develop an “Annual Report and Work Plan” (ARWP) each year, proposing the actions to be taken toward achieving the goals of the PMRP. The SOA also established the SAG and procedures for APCO-approval of the PMRP and ARWPs.⁵

Since 2018, the SOA has been amended a number of times. Amendments have addressed procedural ambiguities, refined the goals and timelines of the SOA in response to new data and better understanding of the scientific issues, and responded to direction from the Hearing Board. As currently amended, the SOA requires State Parks to reduce emissions from the ODSVRA to the same level as before vehicular disturbance. It also has the goal of “eliminat[ing] emissions in excess of naturally occurring emissions from the ODSVRA that contribute to downwind violations of the state and federal PM₁₀ air quality standards.”⁶ Both the current and pre-disturbance emissions are determined with modeling, since measuring actual emissions from the Park—now or in the past—is not possible.

As amended, the SOA sets an October 2028 deadline for achieving these goals. Specifically, it states, “By October 16, 2028, in consultation with the SAG and CARB, the Respondent shall obtain Hearing Board approval that the approved excess emissions goal has been met.”⁶ Thus, it is the Hearing

³ Larry Allen, Air Pollution Control Officer, “Petition for Order of Abatement,” Case 17-01, October 4, 2017. Available online at <https://web.archive.org/web/20221012170648/https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Hearing%20Board%20Petition-Final.pdf>.

⁴ Larry Allen, Air Pollution Control Officer, “Proposed Order of Abatement,” Case 17-01. Available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/APCD%20Draft%20Abatement%20Order%282%29.pdf>.

⁵ Hearing Board of the San Luis Obispo County Air Pollution Control District, “Stipulated Order Of Abatement,” Case 17-01, filed May 4, 2018. Available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Filed%20%26%20Approved%20SOA%20Case%2017-01%20Apr-30-18.pdf>.

⁶ Hearing Board of the San Luis Obispo County Air Pollution Control District, “Order to Modify Existing Stipulated Order Of Abatement,” Case 17-01, filed October 21, 2024. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Modified%20Stipulated%20Order%20of%20Abatement%2017-01_FILED%2010-21-2024.pdf.

Board that will eventually decide whether State Parks has reduced emissions from the ODSVRA sufficiently.

SAG Metric

Background on the Metric

At its October 2024 meeting, the Hearing Board directed the District to “develop an air quality metric to be used in further compliance of the Stipulated Order of Abatement.”⁷ Over the next year, the SAG led the effort to respond to this direction and developed a measurement-based (as opposed to modeling-based) indicator that could be used in the future to determine whether the ODSVRA was in compliance with the SOA. At its October 2025 hearing, the Hearing Board incorporated the so-called “SAG metric” into the SOA.

Briefly, the SAG metric is essentially the ratio of PM_{10} —measured downwind of the ODSVRA—to wind speed—measured within the ODSVRA near the shore. The metric only considers times when the ODSVRA is likely to be generating dust, thus it only includes data from wind-blown dust events, i.e., days when the wind is blowing from the ocean toward Nipomo Mesa with sufficient strength to generate dust. Furthermore, only daytime data is included, since this is when winds and PM_{10} are highest. The metric is calculated as an annual average from October 1 to September 30. See the October 2025 staff report for a complete description of the methodology.⁸

As dust controls are installed and emissions from the ODSVRA are reduced, the value of the SAG Metric is expected to decrease, since with fewer acres of open sand, the same wind conditions ought to produce less dust. This trend is apparent for CDF and Mesa2 in the Figure 1, below, which is reproduced from the October 2025 staff report. The figure shows the SAG Metric calculated for CDF, Mesa2, and Oso Flaco for 2017 through 2025. There are no mitigations upwind of the Oso Flaco monitoring station, so no downward trend is expected or observed there.

To use the SAG Metric for tracking compliance with the SOA’s excess emissions goal, a threshold value must be selected that delineates compliance from non-compliance. The October 2025 staff report suggested that once the ODSVRA has achieved compliance—as indicated by the modeling—the value of the SAG metric associated with compliant year could be used as the compliance threshold. For example, if the modeling indicated that for a certain year the ODSVRA had met the SOA excess emissions goal, then the value of the SAG metric for that year would become the compliance threshold. Moving forward, as long as the SAG metric remained below that threshold, it could be assumed that the ODSVRA remained in compliance. The October 2025 staff report stated that “the District, SAG, and State Parks believe it is premature to set compliance thresholds based on the SAG Metric at this time.”⁸

⁷ Hearing Board of the San Luis Obispo County Air Pollution Control District, “Minutes of the Air Pollution Control District Hearing Board of the County Of San Luis Obispo, October 15, 2024,” Approved June 25, 2025. Available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/10-15-2024%20Draft%20Mins.pdf>.

⁸ San Luis Obispo County Air Pollution Control District, “Air Pollution Control Officer’s Application to Modify the Terms And Conditions of Stipulated Order of Abatement in Case 17-01,” October 8, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Application%20to%20Modify%202025_Final.pdf.

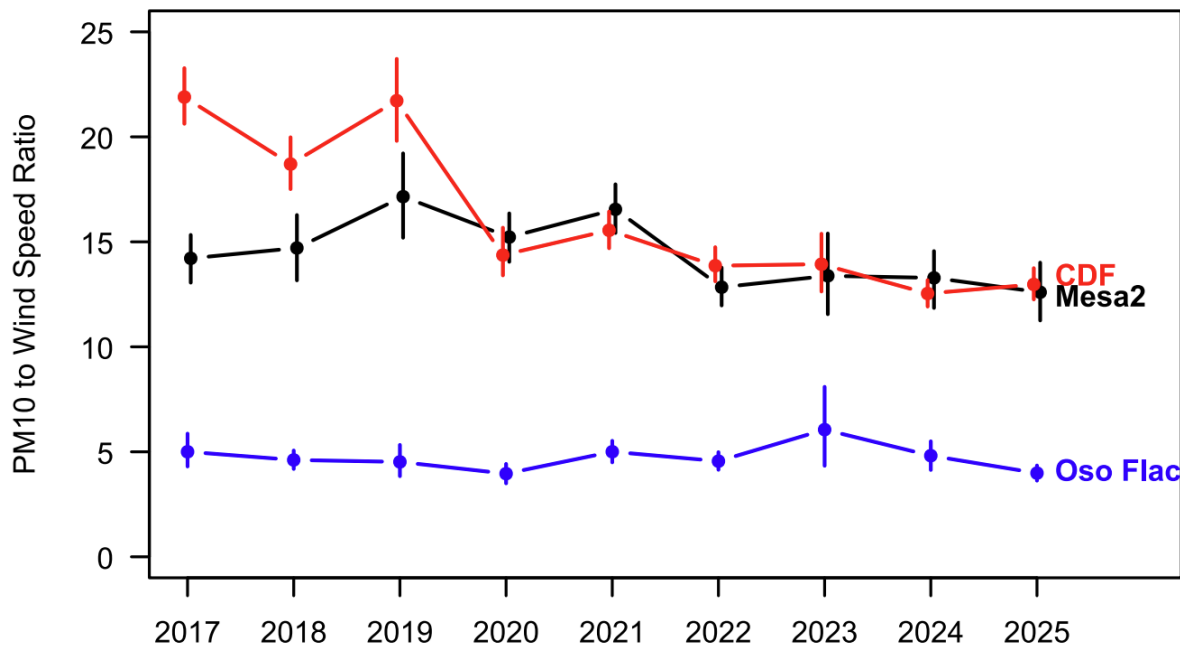


Figure 1: SAG Metric for CDF, Mesa2, and Oso Flaco for 2017-2025. The vertical lines through each point are 95% confidence limits; units are $\mu\text{g}/\text{m}^3$ per m/s. Due to the non-calendar year averaging, "2025" means October 1, 2024, to September 30, 2025, and likewise for earlier years.

2026 Update

As noted above, a year ago the SOA was amended to require annual reporting of the SAG Metric to the Hearing Board. The APCD, State Parks, and the SAG intended to calculate the SAG Metric for the October 1, 2025, to September 30, 2026, period and present an updated Figure 1, including the additional year of data. Unfortunately, there was an equipment failure at the near-shore wind sensor (the "S1 tower"), and wind data from February 5 through June 2, 2026, are unreliable. These wind data are needed to calculate the SAG Metric; without them, the metric cannot be assessed. Furthermore, the period of data loss coincides with the time of year when wind-blown dust events are most frequent. Therefore, simply ignoring the missing data and calculating the metric for the rest of the year would not be representative and is not recommended.

Following this unfortunate failure, the contractor running the S1 tower has implemented more frequent QA/QC checks to ensure that any future failures are detected early and corrected quickly, minimizing data loss. We anticipate being able to update the SAG Metric next year.

Northern Foredune Restoration Area Monitor

The October 2025 SOA amendment also required reporting of data collected by the particulate monitor in the Northern Foredune Restoration Area (NFRA). At the time the amendment was made, the Hearing Board did not provide an explicit rationale for adding the requirement. However, it is assumed to be in response to claims by off-road advocates that the elevated PM_{10} measured on the Nipomo Mesa comes not from the ODSVRA but rather from an offshore source. Of the many PM_{10}

monitors within the ODSVRA, the NFRA monitor is closest to the shore, approximately 100 meters from the mean high tide line. If the ocean were the dominant source of PM₁₀ measured inland, then the NFRA monitor would be expected to measure high levels of PM₁₀, comparable to the levels observed at CDF and Mesa2. If, on other hand, the PM₁₀ is generated inland, i.e., between the NFRA monitor and CDF and Mesa2, then the NFRA monitor is anticipated to measure low levels of PM₁₀ compared to inland monitors.

The NFRA monitor is run by Desert Research Institute under contract with State Parks, and they have prepared the required report, “Report of Findings for the Northern Foredune Restoration Monitoring (NFRA) Station – May to September 2025,” which is included under separate cover. The data from the NFRA monitor are also discussed in the 2026 Annual Report and Work Plan (pp 2-18 to 2-22). The ARWP discussion concludes that the dataset “argues against the conjecture that high PM₁₀ concentrations downwind of the ODSVRA can be attributed to oceanic sources.”⁹

Air Quality Trends

The District operates several PM₁₀ monitoring stations downwind of the ODSVRA and uses the data collected at these sites to assess the impacts of dust mitigations on air quality. Several air quality metrics are tracked, including the annual number of exceedances of the state PM₁₀ standard and of local Rule 1001, annual averages, the number of hours over 300 µg/m³, and the District’s Difference-in-Differences metric. These metrics are reported in the District’s Annual Air Quality Reports, and they are regularly presented to the District Board and the Hearing Board. All show trends of marked overall improvement in air quality as dust controls are implemented under the SOA.

The most recent Annual Air Quality Report presents trends through 2025. The section discussing air quality downwind of the ODSVRA is reproduced below.¹⁰ Trends for 2026 year-to-date will be presented at the October 14, 2026, meeting.

Introduction

Windblown dust from the ODSVRA continues to impact air quality in southern San Luis Obispo County. For two decades, the APCD has been engaged with the California Department of Parks and Recreation (State Parks) in an effort to resolve the issue and improve the region’s air quality; these actions are chronicled on the APCD website.¹¹ Since daily monitoring began at CDF in 2010, the annual number of exceedances of the California PM₁₀ standard has varied from many as 97 (in 2017)

⁹ California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, “Oceano Dunes State Vehicular Recreation Area Dust Control Program: Provisional Final 2026 Annual Report and Work Plan,” September 23, 2026. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2026ARWP_Provisional_Final_20260923_reduced.pdf.

¹⁰ San Luis Obispo County Air Pollution Control District, “Annual Air Quality Reports for 2025,” May 2026. The section reproduced here is Appendix A; the full report is available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/%28B-4%29%20Annual%20Air%20Quality%20Report%202025.pdf>

¹¹ San Luis Obispo County Air Pollution Control District, “Oceano Dunes Particulate Emissions Reduction Efforts,” <https://www.slocleanair.org/air-quality/oceano-dunes-efforts.php>.

to as few as 14 (in 2024), with most related to ODSVRA dust. Over this period, State Parks has scaled up its dust mitigation program, with the total area of dust controls growing from 1 to 740.1 acres.¹²

It would be overly simplistic to attribute year-to-year changes in downwind PM₁₀ levels solely to changes in ODSVRA dust mitigations. This is because downwind PM₁₀ concentrations are influenced not only by the mitigations, but also by non-ODSVRA sources including wildfire smoke and dust transported from the San Joaquin Valley (SJV). Most importantly, variations in meteorology, especially the strength and frequency of onshore wind events, are the dominant influence. It is the wind that drives dust emissions, so, all else being equal, windier years are expected to be dustier and to have more PM₁₀ exceedances than less windy years.

To quantify the effectiveness of these dust controls, recent Annual Air Quality Reports¹³ have analyzed trends in particulate matter on the Nipomo Mesa. The 2017 Annual Air Quality Report proposed a “Difference-in-Differences” approach to disentangling the potential effects of the mitigations from meteorology and other factors. In brief, this method looks at the ratio of PM₁₀ concentrations between CDF and Oso Flaco on wind event days and then asks whether that ratio changes from one year to the next. Comparing to Oso Flaco implicitly controls for inter-annual variations in meteorology and impacts from non-ODSVRA sources. This is because CDF and Oso Flaco should experience the same trends in meteorology, and they should be similarly influenced by wildfires and regional particulate matter events. However, the mitigation measures are upwind of CDF but not Oso Flaco, so changes in the mitigations should only affect dust levels at CDF.

The Oso Flaco station was installed in mid-2015, so this analysis is only possible for 2016 and later years. The year 2017 is used as the baseline to compare other years against because it had the least amount of mitigation and thus is the best approximation of a fully unmitigated baseline.

For this analysis, a wind event day is defined as any day when the hourly wind speed at 15:00 at the S1 Tower within the ODSVRA exceeds 9.445 m/s and the hourly wind direction at 13:00 at CDF is between 289.5 and 360 degrees. Any day that was obviously influenced by wildfire smoke or SJV dust transport was excluded from the analysis. While there have been many days of wildfire smoke and SJV dust over the years, only two—October 11, 2021, and July 6, 2020—also met the criteria for being wind event days and were excluded from the analysis. See the 2017 Annual Air Quality Report further description of the methodology.¹⁴

The difference-in-differences methodology has been used in subsequent Annual Air Quality Reports and presentations to the Hearing Board. Here, the methodology is applied to data from 2025. The methodology is also applied to Mesa2 to assess the response of PM₁₀ levels at that site to the mitigations.

¹² State of California, Department of Parks and Recreation, Provisional Final 2025 Annual Report and Work Plan, September 26, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2025ARWP_ProvFinal_20250926_reduced.pdf.

¹³ San Luis Obispo County Air Pollution Control District, Annual Air Quality Reports for 2015-2025, all available at <https://www.slocleanair.org/library/air-quality-reports.php>.

¹⁴ San Luis Obispo County Air Pollution Control District, Annual Air Quality Reports for 2017, November 2018. Available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2017aqrt-FINAL2.pdf>.

Results

The results for 2025 along with earlier years are summarized in Table A1, below. Applying the methodology to the 2025 data yields a statistically significant 36.4% improvement in event-day PM₁₀ at CDF compared to the baseline year of 2017 (95% CI: 23.6 to 47.1%; p-value: 5.4E-6). In concrete terms, the median wind event day PM₁₀ concentration at CDF was 50 µg/m³ in 2025; this analysis predicts it would have been 78 µg/m³ if these mitigation projects had not been implemented.

For Mesa2, the methodology yields a 15.0% improvement in event-day PM₁₀ since 2017 (95% CI: 0.0 to 27.9%; p-value: 0.055). In concrete terms, the median wind event day PM₁₀ concentration at this site was 44 µg/m³ in 2025, and the analysis predicts it would have been 52 µg/m³ without the mitigations.

Table A1: Summary of Change in Event-Day PM₁₀ Ratio at CDF & Mesa2

Table 1: Difference-in-differences results, 2016 – 2025						
Year	Total Dust Mitigation Extent (acres)	Number of Wind Events	Change, vs 2017 baseline, in Event-Day PM ₁₀ Ratio			
			CDF vs Oso Flaco		Mesa2 vs Oso Flaco	
			Percent Change	95% Confidence Interval	Percent Change	95% Confidence Interval
2025	740.1	55	- 36.4%	-23.6% to -47.1%	- 15.0%	0.0% to -27.9%
2024	740.1	43	- 39.0%	-21.9% to -52.4%	- 10.4%	+10.7% to -27.4%
2023	740.1	55	- 38.1%	-24.9% to -48.9%	- 22.2%	-6.8% to -35.0%
2022	740.1	74	- 31.6%	-18.5% to -42.6%	- 13.8%	+1.4% to -26.7%
2021	322.5	55	- 33.5%	-16.1% to -47.3%	- 7.0%	+11.8% to -22.6%
2020	230.2	42	- 28.4%	-13.9% to -40.4%	+ 4.6%	+25.4% to -12.9%
2019	137.8	33	- 7.6%	+23.2% to -30.7%	+ 14.9%	+41.4% to -6.7%
2018	146.9	50	- 22.4%	-7.4% to -34.9%	- 2.3%	+14.3% to -16.4%
2017	55.3	37	0%	n. d.	0%	n. d.
2016	76.8	48	- 12.7%	+16.8% to -38.4%	- 4.2%	+17.8% to -22.0%

n.d. = not defined (as this is the baseline year.)

Discussion

As in previous years, the analysis confirms that dust controls at the ODSVRA are reducing downwind PM₁₀. Wind event day PM₁₀ is estimated to have been reduced by 35.4% at CDF and by 15.0% at Mesa2. The analysis still estimates larger improvements in PM₁₀ at CDF than at Mesa2; this is expected since the dust mitigations are focused more upwind of CDF than the Mesa2. Despite this, actual concentrations at CDF remain higher than Mesa2, as CDF's baseline PM₁₀ level was higher than Mesa2's.

The 36.4% improvement for 2025 is smaller than the estimated improvement in 2023 (38.1%) or 2024 (39.0%). Higher dust levels at CDF are also indicated by other air quality metrics tracked by the APCD, including annual hours over 300 µg/m³ (Figure A1), annual Rule 1001 violations (Figure A3), the annual number of exceedances of the California PM₁₀ Standard (Figure 10), and annual PM₁₀ averages (Figure 12), each of which were higher in 2025 than in 2023 or 2024 but still lower than in 2022 and all earlier years.

This result can also be compared with other analyses that seek to control or “normalize” for differences in meteorology from year to year. One such analysis is the Total PM₁₀ to Total Wind Power Density (TPM₁₀:TWPDP) ratio, a metric developed by Desert Research Institute (DRI) and now reported annually in State Parks’ ARWPs. Like the difference-in-differences methodology, it aims to control interannual changes in meteorology, albeit by a completely different method. Figure A4, provided by DRI and the ODSVRA Scientific Advisory Group, shows the results through 2025. For CDF, the TPM₁₀:TWPDP ratio for 2025 is about the same as 2024 but higher than 2023, suggesting that since 2023 there has been slightly larger PM₁₀ impacts at CDF, even after controlling for differences in meteorology.

A 2026 publication by DRI¹⁵ presents yet another methodology to quantify changes in downwind PM₁₀ that are attributable to the ODSVRA dust controls, and it too suggests that PM₁₀ impacts were higher at CDF in 2025 than last year, even after correcting for differences in meteorology. The authors developed a machine learning model to predict PM₁₀ levels downwind of the ODSVRA based on local meteorological inputs like wind speed and direction, relative humidity, precipitation, and boundary layer height. The model was trained on data collected before significant dust mitigations were deployed (2011-2017) and then used to predict concentrations in the subsequent period of increasing mitigations (2018-2025). The difference between the predicted and observed PM₁₀ levels in this subsequent period is taken to be an indicator of the improvement in air quality that is attributable to the mitigations. As shown in Figure A5, the method estimates about a 30% improvement in PM₁₀ at CDF for 2025, which is less than the approximately 34% improvement estimated for 2024.

There were more wind event days in 2025 than 2024 (Table A1), so it is not surprising that the number of hours over 300 µg/m³ (Figure A1), the number of exceedances of the California PM₁₀ Standard (Figure 10), and the annual PM₁₀ average (Figure 12) all increased in 2025. This is because the footprint of the mitigations has remained unchanged, and these metrics do not account for differences in “windiness” from one year to the next. But increased windiness may not be the whole story, since all of the metrics that do account for windiness—namely the difference-in-differences analysis, the TPM₁₀:TWPDP density metric, the new DRI methodology, and (to a lesser extent) Rule 1001—all indicate slightly larger PM₁₀ impacts at CDF in 2025. This may be due to a natural factor that influences PM₁₀ which is not well controlled by any of the metrics. For example, if the wind direction in 2025 was shifted from earlier years, this could have increased PM₁₀ impacts, but it would not be accounted for in the metrics.

It is also possible that the 740 acres of dust mitigations at the ODSVRA were somewhat less effective in 2025 than in 2024. Specifically, degradation of vegetation projects in some areas might explain the recent uptick in PM₁₀. Typically, the first step in establishing a new restoration plot is to cover the area in a bed of straw. Sterile grain may also be planted. These measures are intended to help native plants establish themselves, but they also suppress dust generation. As a restoration project (or a permanent vehicle closure area) matures and plant density increases, it is expected to become

¹⁵ Mejia JF, Henao JJ, Gillies JA, Furtak-Cole E, “Seasonal Dynamics of Fugitive Dust Emissions from the Oceano Dunes: Linking Wind Regimes, PM10 Exceedances, and Intervention Effectiveness.” *Atmospheric Environment*. April 6, 2026: 122008. Available online at <https://doi.org/10.1016/j.atmosenv.2026.122008>.

more effective as a dust mitigation. In last year's Annual Air Quality Report, this evolution was cited as the likely reason for the year-over-year incremental improvement in PM₁₀ at CDF since 2022, even as the total extent of the mitigation projects remained constant at 740.1 acres.

While the majority vegetation projects have been successful in terms of plant survival and density, portions of some project areas have not matured as intended and may now be becoming emissive again as their initial straw layer and sterile grain cover has decayed or as they have been inundated with sand. This issue was identified in the approved Final Annual Report and Work Plan (ARWP) for 2025, and State Parks has increased their already-ongoing efforts to refresh restoration areas with supplemental planting and seeding activities. For the July 2025 to July 2026 planning cycle, State Parks has committed to 42.5 acres of supplemental plantings.¹²

In contrast to CDF, for Mesa2 the difference-in-differences analysis shows incremental improvement, with the estimated decrease in PM₁₀ relative to the baseline jumping from 10.4% in 2024 to 15.0% in 2025. This is mirrored in the trends in annual hours over 300 µg/m³ (Figure A2) and the annual number of exceedances of the California PM₁₀ Standard (Figure 10), both of which achieved their lowest numbers yet observed. DRI's TPM₁₀:TWPD metric also finds that 2025 improved incrementally over 2024 (Figure A4), while their newest method shows a slight deterioration. It is possible that the reason most metrics show improvement for Mesa2 in 2025, while for CDF they show the opposite, could be the spatial distribution of restoration projects, with more areas of degraded vegetation upwind of CDF than upwind of Mesa2. This explanation is speculative; no analysis of the location of degraded vegetation vis-à-vis the monitoring locations has been conducted.

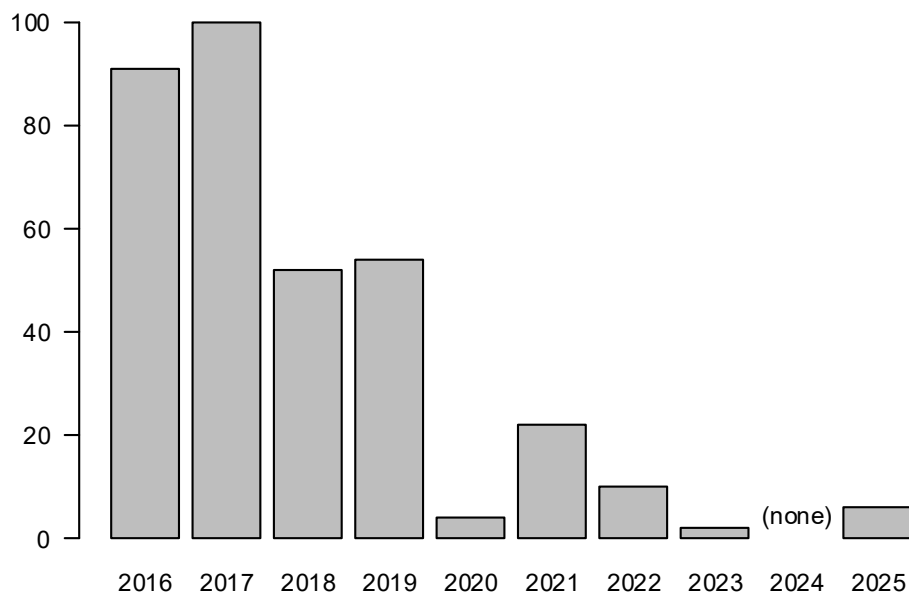


Figure A1: Annual Hours at CDF Greater than 300 µg/m³

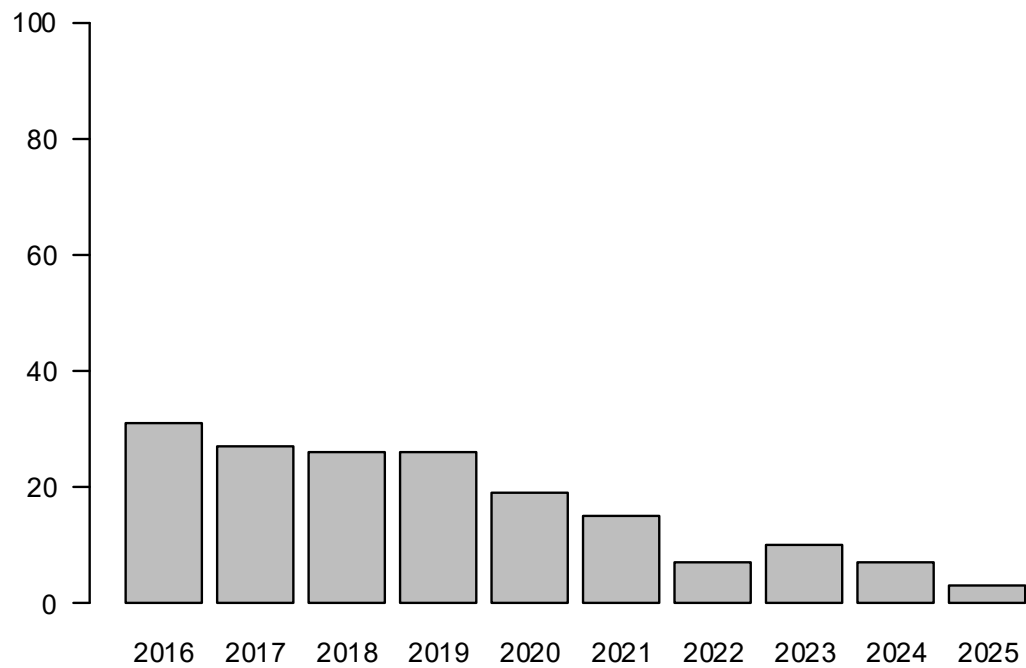


Figure A2: Annual Hours at Mesa2 Greater than 300 µg/m³

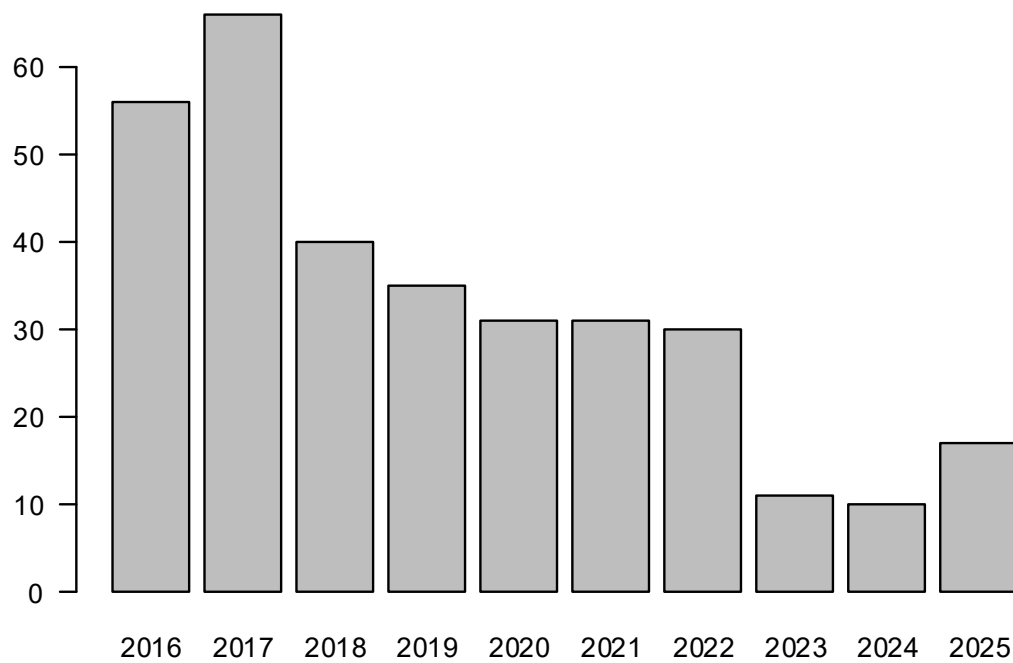


Figure A3: Annual Violations of District Rule 1001

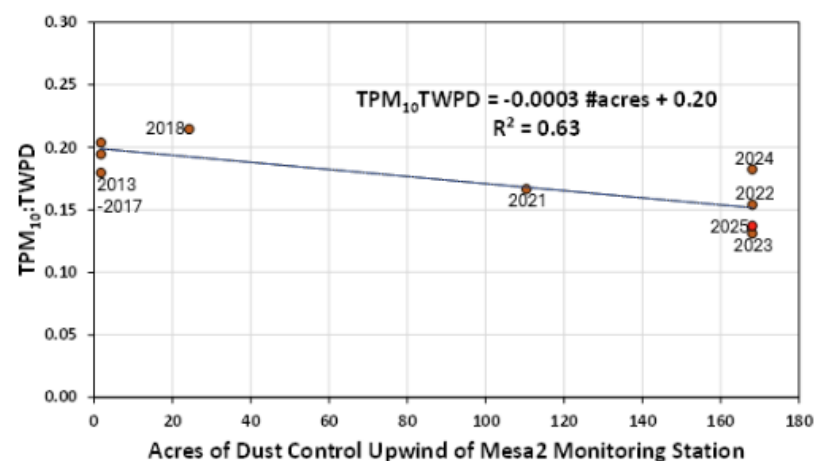
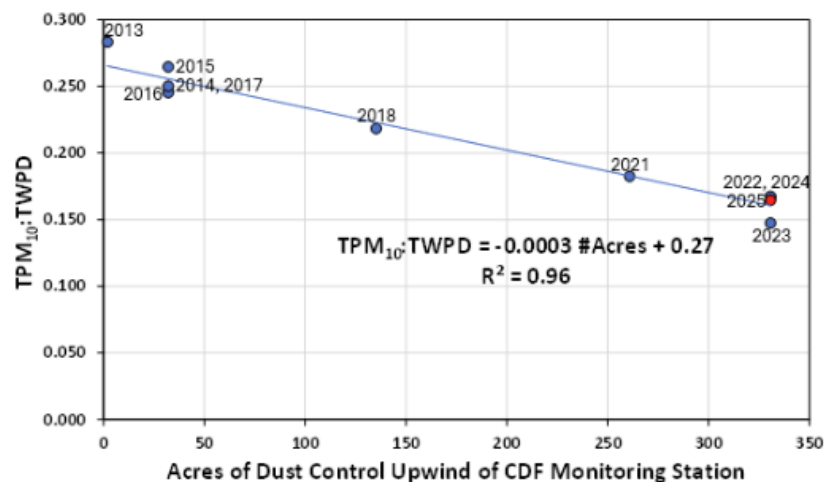


Figure A4: $TPM_{10}/TWPD$ Ratio for CDF (top) and Mesa2 (bottom).
Courtesy of Desert Research Institute / Oceano Dunes Scientific Advisory Group.

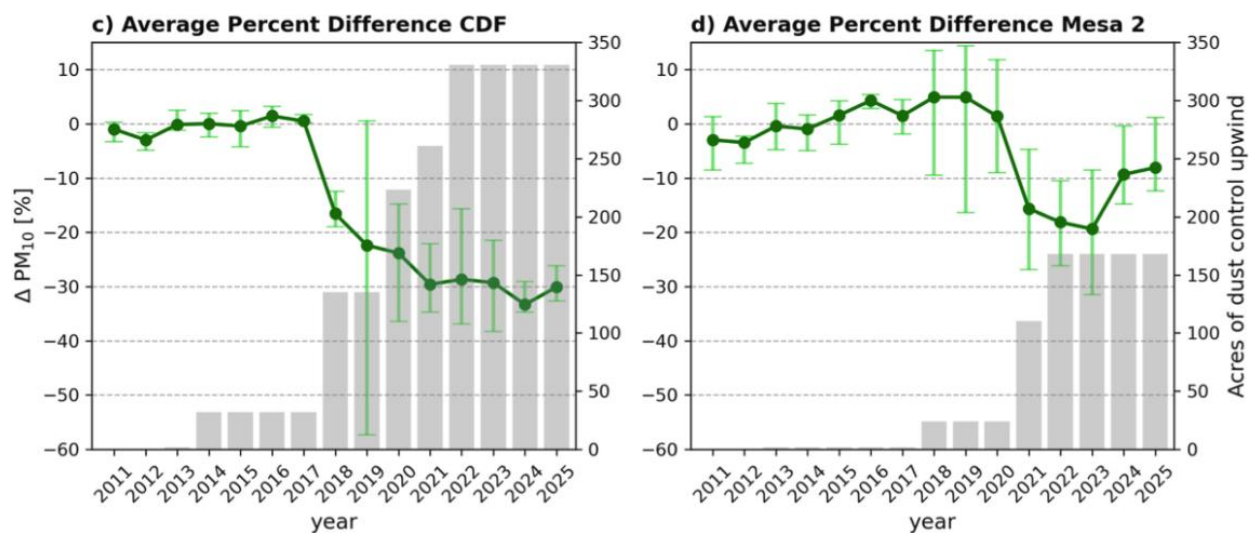


Figure A5: Percent difference between the observed and predicted concentrations at CDF (left) and Mesa 2 (right). Reproduced from Reference 15.

Conclusions

Overall, the difference-in-difference analysis and other metrics indicate that the 740 acres of dust controls in the ODSVRA continue to be effective in reducing PM₁₀ levels downwind at CDF and Mesa2. Since 2017, wind event day PM₁₀ has been reduced by 36.4% at CDF and 15.0% at Mesa2.

Compared to the previous two years, in 2025 CDF saw a somewhat higher annual average, more exceedances of the California PM₁₀ standard and Rule 1001, and more hours over 300 µg/m³. These increases are partially explained by 2025 having more wind events than 2024; however, the difference-in-differences analysis and both DRI metrics also found somewhat larger PM₁₀ impacts, even after adjusting for this increased windiness. The reason for this is unknown, but it may indicate a small deterioration in the effectiveness of the dust controls, possibly resulting from the degradation of revegetation areas in some areas of the ODSVRA. The need to refresh certain vegetation projects was already identified in the 2025 ARWP, and State Parks has committed to 42.5 acres of supplemental plantings in 2025-2026 to address the issue.

For Mesa2, most metrics—including the difference-in-difference analysis—show lower PM₁₀ impacts in 2025 than 2024. The contrast between CDF and Mesa2 could be due to how areas of degraded vegetation are arranged within the park, with more such areas being upwind of CDF, but this is speculative and would require a detailed analysis of vegetation coverage to confirm.

In addition to the APCD's difference-in-difference analysis, DRI has developed two additional metrics to assess dust mitigation effectiveness. All three attempt to disentangle the effects of meteorology on PM₁₀ from the effects of the dust controls. Despite using different approaches to do this, the three yield qualitatively similar results. DRI's latest publication¹⁵ states that "Dust-abatement strategies implemented since 2018 have demonstrably reduced PM₁₀ concentrations and regulatory exceedances. Meteorologically normalized counterfactuals indicate [PM₁₀] reductions of up to 35% at CDF and 20% at Mesa 2, preventing possibly ten federal and more than 170 exceedances of the California state standard." These estimated reductions are very similar to the those estimated by the difference-in-differences and reported in Table A1, and they indicate that State Parks' dust mitigation program has been a success.

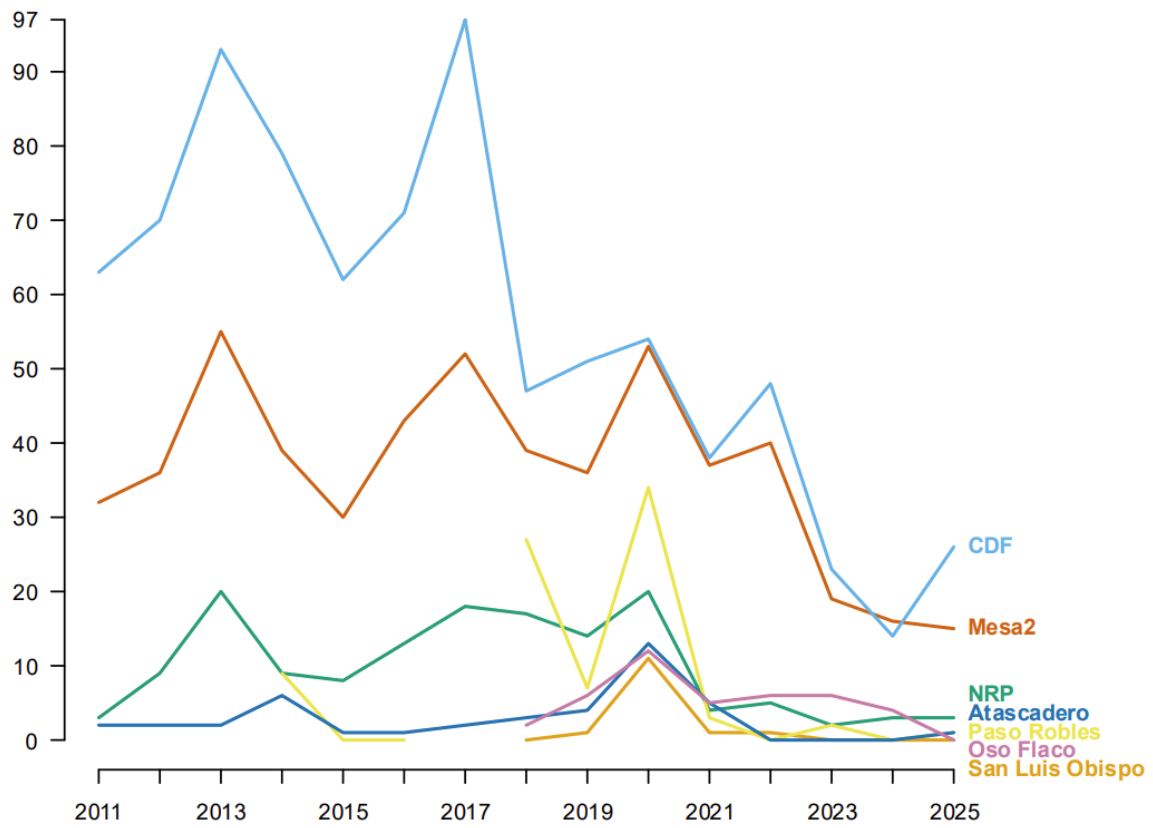


Figure 10: Exceedances of the California 24-hour PM₁₀ Standard, 2011-2025

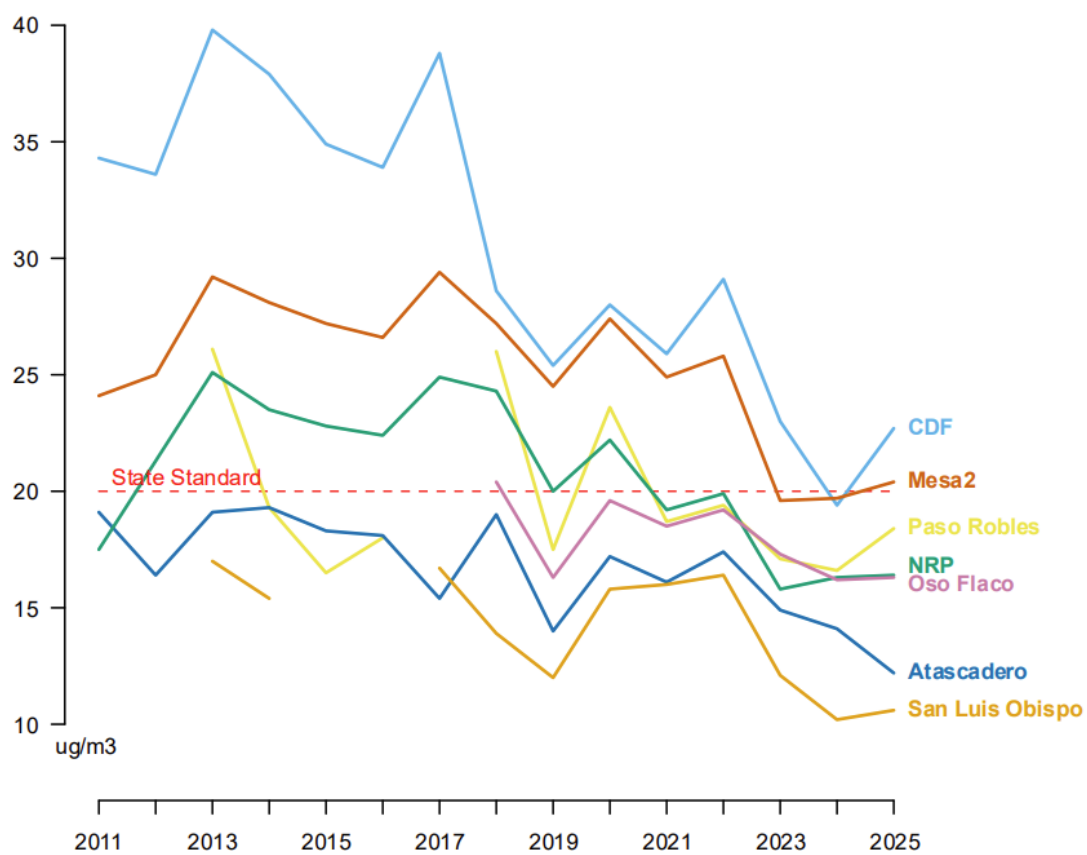


Figure 12: PM₁₀ Annual Averages, 2011–2025