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Th3

Prepared March 17, 2021 for March 18, 2021 Hearing

To: Commissioners and Interested Persons

From: Susan Craig, Central Coast District Manager
Kevin Kahn, Central Coast District Supervisor

Subject: Additional hearing materials for Th3
CDP Number 4-82-300 Review (Oceano Dunes)

This package includes additional materials related to the above-referenced hearing item as follows:

State Parks correspondence received March 17, 2021

March 16, 2021

Steve Padilla, Chair
California Coastal Commission
1725 Front Street, Suite 300
Santa Cruz, CA 95060
831-427-4863

Jack Ainsworth, Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Chair Padilla and Mr. Ainsworth:

Re: Oceano Dunes State Vehicular Recreation Area
Coastal Development Permit 4-82-300 Review

This letter responds to the California Coastal Commission ("Coastal Commission") Staff Recommendation dated February 16, 2021 ("Staff Report") regarding the Coastal Commission's review of Coastal Development Permit 4-82-300 ("CDP") for Oceano Dunes State Vehicular Recreation Area ("Oceano Dunes"). The California Department of Parks and Recreation ("DPR") requests that the Coastal Commission reject or, alternatively, take no action on the staff recommendations, recognizing the current Public Works Plan ("PWP") public process that both DPR and the Coastal Commission agreed was the best path forward in determining future operations and development at Oceano Dunes.

DPR appreciates the Coastal Commission staff report's recognition of the valuable coastal recreation opportunities and resources at Oceano Dunes and Pismo State Beach. Combined, park visitors enjoy 5,000 acres with many diverse recreational opportunities such as motorized recreation, camping, playing on the beach, fishing, hiking, nature walks, horseback riding, kite surfing, paddling, and bird watching. Since motorized activity is allowed on the beach and dunes at Pismo State Beach and Oceano Dunes, those accessing the water for surfing, kiteboarding, fishing, and paddling can park their vehicles and easily unload gear near the water's edge. This motorized access also provides a welcome opportunity for our differently abled visitors to travel to and enjoy the shoreline and dunes.

DPR deeply appreciates and shares the mission of the Coastal Commission to protect and enhance California's coast and oceans for present and future generations. DPR and the Coastal Commission have a shared mission at Oceano Dunes, and that mission is twofold: to protect the coastal resources of the park for future generations,

and to ensure that all Californians have equal access to the park and its diverse recreational opportunities.

DPR's legal mandate is articulated in its mission, "to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation". The Coastal Commission shares our statewide commitment to providing access for all and a vision for the protection and stewardship of the State's natural resources for both current and future generations. The Coastal Commission also shares a commitment to public engagement and a belief that the best policies for our shared resources are created through public processes.

The Draft Public Works Plan

The Coastal Commission and DPR agreed on the idea of a PWP as a viable option to examine future operations and management of Oceano Dunes holistically. As discussed, the PWP is a long-range land use management plan for compliance with the California Coastal Act ("Coastal Act") that is reviewed and approved by the Coastal Commission. DPR's development of a PWP includes a robust public engagement process and would ultimately result in a new overarching management plan, setting a new path for Oceano Dunes and Pismo State Beach. The PWP is intended to bring about necessary reforms to protect the resources and manage a unique form of coastal recreation with a nearly 100-year history at Oceano Dunes.

The PWP process has included robust public engagement from local residents, environmental and conservation organizations, off-highway vehicle ("OHV") recreation enthusiasts, recreation industry groups, local and national organizations, state and federal agencies, and thousands of individuals. This process reflects the substantial public interest and complicated regulatory framework that comes from the operation of a State Vehicular Recreation Area ("SVRA") within the coastal zone.

Input received prior to and during the PWP planning process reflects various reasons for pursuing a PWP. DPR held multiple listening sessions and planning meetings to gather input on the public works plan. DPR committed to addressing the diverse range of issues and moved forward with the jointly supported path of pursuing a public works plan with the goal of finding common ground for resolving longstanding issues. Unfortunately, the initial goal of presenting a draft PWP for Commission and public input was understandably delayed from its original release date of September 2020 due to the global COVID-19 pandemic on top of the worst wildfire season in California's history. Despite these setbacks, DPR committed to releasing the draft PWP by the end of the calendar year. The draft PWP and EIR was released on December 31, 2020.

The draft PWP intends to balance complex interests and issues in a transparent, accessible and scientifically informed public process that convenes divergent points of view to craft an optimal set of solutions. The draft PWP is currently in the public comment stage. After public comment closes on March 18, 2021, DPR will review and

respond to comments and refine the draft PWP before finalization and implementation.

Biodiversity Management Plan

DPR is currently implementing the recommendations prepared by California Department of Fish and Wildlife ("CDFW") in the Biodiversity Management Plan ("BDMP") developed in the fall of 2020. CDFW, the state trustee agency for fish and wildlife of the state and DPR, the state trustee agency for the natural resources within the state park system, worked together to inform a set of CDFW recommendations regarding biological resource management efforts at Oceano Dunes. The resulting BDMP recommendations include short-term actions and long-term management efforts, including regular agency consultation and collaboration, scientific studies, restoration projects, or more formal agreements such as a Natural Communities Conservation Plan ("NCCP").

The BDMP describes the unique biological diversity of the Oceano Dunes District, management goals and objectives to conserve this biodiversity, and the recommendations to achieve these goals. It also provides guidance on the process and procedures for short and long-term management actions. Planning and management will address potential impacts of park uses on vegetation and plant communities, sensitive and protected habitat areas, and wildlife species. The BDMP addresses some of the most complex issues at Oceano Dunes including: Arroyo Grande Creek crossing management, endangered shorebird nesting plans, assessment of nighttime vehicle activity, and establishment of an NCCP. An NCCP considers the populations (both plants and wildlife and the habitats they rely on) as a whole and would better accommodate additional management actions through coordinated, regionally focused efforts. The NCCP is a landscape level permit that DPR and CDFW have jointly endeavored to complete within five years, or sooner if feasible.

July 2019 Coastal Commission Conditions

On July 11, 2019, the Coastal Commission held a public hearing in San Luis Obispo County to review the CDP. At the hearing, the Coastal Commission acknowledged the public planning efforts DPR had begun via the PWP planning process. The Coastal Commission voted to require DPR to address a number of conditions in the draft PWP and required DPR to update the Coastal Commission at quarterly meetings over the next year.

The draft PWP addresses all the conditions raised by the Coastal Commission. DPR has additionally taken action on some of the items immediately through operational adjustments and implementation of the BDMP recommendations from CDFW. The conditions and actions to address them are articulated below:

1. Predator Management Plan. Increase Predator Management.

DPR Action: All trash receptacles at Oceano Dunes are now enclosed. Draft PWP proposes added measures.

DPR has replaced all trash receptacles in Oceano Dunes. Currently, every trash receptacle is enclosed, including all dumpsters. The draft PWP proposes added measures through the development of an enclosed dumpster collection area and utilizing enclosed dumpsters to deter wildlife and predators.

DPR conducts year-round predator monitoring to include surveys, trapping, and annual reporting. DPR has committed to developing an NCCP which will provide adaptive solutions for predator management.

2. Vehicular Enforcement Plan. Increase Operational Enforcement.

DPR Action: Robust recruitment and safety enhancement tools. Draft PWP proposes added measures.
State Park Peace Officers patrol Oceano Dunes and enforce the California Vehicle Code, the Penal Code and other laws and regulations. DPR implemented a robust recruitment program targeted at increasing law enforcement recruitment and retention statewide. As a result of this effort, DPR will have its largest cadet class graduating this year. DPR intends to assign new cadets to Oceano Dunes, increasing enforcement officers by a substantial percentage.

Oceano Dunes staff have developed an inventory tool, the Oceano Dunes Incident Map, to help identify accident hot spots and determine the most appropriate public safety measures. Oceano Dunes staff also reviewed all current OHV concession agreements to ensure they contained proper safety protocols and that those protocols are enforced.

The draft PWP proposes the following: construction of a new observation tower at the Grand and Pier Avenue entrances to provide additional oversight and enforcement and decrease response times; upgrade entrance stations at Grand and Pier avenues with modern facilities that can apply new technology to help manage visitor use and better track visitor numbers, including vehicle counts; increase staff hours at the entrance stations; and install additional regulatory signage at entrance stations and throughout the parks.

3. Fencing Augmentation and Enhancement Plan. Add Fencing. Install additional fencing in specific areas to better protect coastal resources.

DPR Action: Increased monitoring, additional fencing installed. Draft PWP proposes continued monitoring and fencing efforts.
Oceano Dunes has an extensive fencing program of over 35 miles throughout the park. DPR has increased monitoring, inspection and maintenance of these fencelines to quickly identify and remedy fence maintenance issues.

DPR has installed additional fencing to protect areas like the 48-acre foredune installed in December 2019 and intends to install additional fencing as we implement dust mitigation measures.

4. Public Outreach Plan. Enhance Public Outreach.

DPR Action: Implemented three separate public outreach efforts, implemented permanent public outreach and engagement plan. Draft PWP proposes continued innovative and adaptive outreach and engagement efforts.
DPR implemented three separate public outreach efforts: one each for the PWP, dust mitigation efforts, and the Habitat Conservation Plan with the United States Fish and Wildlife Service. In addition, District staff recently implemented a permanent public outreach and community engagement plan.

The draft PWP commits to continuing innovative efforts for long-term community outreach and engagement using strategies and lessons learned from successful community engagement efforts at Los Angeles State Historic Park and the Proposition 68 Statewide Park Program. The PWP recommends the creation and development of a long-term community engagement program, which is already underway. DPR's community engagement goal is to make connections and build relationships with community members, organizations, and institutions. Engaging local individuals and organizations to improve park operations and visitor experiences and build relationships is key to establishing a community outreach program.

5. Monitoring Program. Eliminate the Technical Review Team (TRT) and Implement Annual Reports.

DPR Action: Draft PWP proposes eliminating the TRT and implementing annual reports.
The draft PWP recommends adopting this condition by replacing the TRT with an annual reporting program processed through the Coastal Commission Executive Director's review and approval.

6. Special Events Protocol. Require a separate CDP for all special events that could result in adverse impacts to coastal resources.

DPR Action: Draft PWP analyzes and limits areas for special events.
The draft PWP identifies the most appropriate areas in the Oceano Dunes District for special events and adopt those areas as appropriate to limit activities to specific locations where management of events and mitigation of potential impacts are feasible.

Oceano Dunes requires CEQA review of larger special events and special events shall not exceed use limits.

7. Nighttime Vehicular Use. Prohibit vehicular and OHV activity during nighttime hours (i.e., from one-hour after sunset and to one-hour before sunrise).

DPR Action: Implement BDMP recommendations regarding nighttime vehicular use.
The BDMP addresses nighttime riding and proposes to design and conduct a joint study by DPR and CDFW to gather site specific information and foster adaptive management concerning the impacts of night riding on natural resources and species. This joint study will facilitate the integration of DPR information and data and inform the development of the NCCP. Specifically, a peer reviewed, multi-year academic study will be completed. To ensure a true study control, night riding will be prohibited south of Post 4.5 during the duration of at least half of the study.

8. Arroyo Grande Creek Crossing Plan. Prohibit Arroyo Grande Creek Crossing. Prohibit vehicular crossings of Arroyo Grande Creek when it flows.

DPR Action: Implemented BDMP recommendation to close creek crossings when depth reaches 12-inches and prepare a feasibility study for mobile stream crossing structure.
DPR implemented the BDMP recommendations regarding the Arroyo Grande Creek Crossing which includes closing the stream crossing to all vehicles (with an exception for health and safety purposes) when a 12-inch depth-criteria is reached. DPR also will implement a feasibility study for a mobile stream crossing structure as soon as possible to further reduce potential vehicle impacts.

9. Updated Interim Use Limits. Reduce interim vehicular and OHV daily use limits as follows: (a) 1,806 street-legal vehicles per day;(b) 700 camping units per night; and (c) 1,204 OHVs per day.

DPR Action: Draft PWP proposes reduced interim use limits.
DPR has proposed stricter interim use limits than those proposed by the Coastal Commission as follows: 1,000 street-legal vehicles per day; 500 camping units per night; and 1,000 OHVs per day. DPR has committed to an updated, peer reviewed carrying capacity study.

10. No Interim Use Limit Exceptions. Eliminate the four exceptions that allow unlimited vehicular and OHV use on Memorial Day, Fourth of July, Labor Day, and Thanksgiving weekends.

DPR Action: DPR eliminated exceptions to use limits in 2004.

11. Entrance Study. Evaluate Entrance Modifications.

DPR Action: Draft PWP evaluates entrance modifications.
The PWP proposes entrance modifications to maximize access for people and vehicles. Including construction of a new, year-round entrance in the southern portion of the park. Also includes redesign of the current entrances with the replacement of the two existing kiosks with new structures, that will include technological upgrades. Also included is ADA accessible parking, restrooms and walkways into the park and the construction of a new, year-round entrance in the southern portion of the park.

12. Permanent Southern Exclosure. Make the roughly 300-acre seasonal endangered species exclosure area permanent.

DPR Action: Implemented enhanced shorebird protection measures recommended in BDMP.
DPR has committed to developing an NCCP in collaboration with CDFW, to be completed within 5 years and it sets a framework for resource protections for the next 25 years. DPR has also committed to dramatically increase plover and tern nest exclosure buffers from 100ft radius to 150 meter radius for western snowy plovers and an increase from 330ft radius to 300 meter radius for least terns, as outlined in the BDMP. Additionally, DPR will close the shoreline habitat in front of the 48-acre foredune to the public when nests are present.

13. Authorize Dust Control Areas. Allow for Future Closures for Required Dust Control.

DPR Action: Draft PWP incorporates future dust control measures.
The draft PWP defers to the 5-year dust plan and thereby allows future closures, fencing and vegetation related development consistent with CDP 3-12-050 as amended.

14. Indemnification for DPR/Liability for Costs and Attorneys' Fees.

This condition must be addressed through the PWP approval process.

15. Special Condition Conflicts.

This condition must be addressed through the PWP approval process.

DPR took the direction seriously from the Coastal Commission to address all of the above issues. DPR field and executive staff dedicated countless hours to assuring that the draft PWP, BDMP, and operational plans considered and addressed each of the Coastal Commission's conditions. As noted earlier, the draft PWP is still in the public comment period through March 18, 2021.

February 16, 2021 Coastal Commission Staff Report
DPR recognizes the work that goes into developing the detailed Coastal Commission staff reports provided to the Commission for the myriad of issues before this body. We deeply appreciate the time dedicated by staff to prepare these reports. DPR recognizes that the solutions that apply in one coastal community or ecosystem rarely apply, cookie-cutter style, to another.

DPR's positions on the complex issues at Oceano Dunes differ from those presented in the February 16, 2021 Coastal Commission staff report (staff report). Still, it is always our hope that we work together to fulfill DPR and the Coastal Commission's shared mission – to strike a balance between access and preservation.

The staff report suggests that both the draft PWP and the nearly 100-year OHV recreational access to Oceano Dunes is inconsistent with the Coastal Act, the City of Grover Beach, and San Luis Obispo County Local Coastal Programs (LCPs). We respectfully disagree. As described in more detail in the attached DPR analysis of the staff report (Attachment 1) and in the draft PWP, OHV recreational access is managed consistent with the LCPs and the Coastal Act.

The draft PWP contains a detailed step-by-step analysis of consistency with the Coastal Act and each LCP (see Chapter 4 of the Draft PWP), including an introduction and a thorough and detailed analysis of all specific Coastal Act issues addressed. Furthermore, Chapter 5 of the Draft PWP explains, in detail, how the implementation of the PWP would work, and how DPR anticipates working with the Coastal Commission during implementation of the PWP. The PWP planning team spent significant time on this consistency analysis and carefully crafted the policies and projects in the Draft PWP in a manner that would be consistent with the Coastal Act – and all other applicable laws and regulations, including the federal and state Endangered Species Acts.

DPR is managing OHV recreation at Oceano Dunes in compliance with the Coastal Act and the LCPs. When the Coastal Commission approved the 1982 CDP and subsequent amendments and the LCPs, the Coastal Commission considered the California Coastal Act's mandate to protect the Parks' significant public access and recreational uses while protecting sensitive coastal resources. The Coastal Commission has repeatedly determined DPR's management of the Park in balancing active recreation and resource protection is consistent with applicable Coastal Act policies. For example, in 2001, the Coastal Commission approved, by a vote of 11-1, Amendment 5 to the 1982 CDP, which included interim use limits of vehicles, including OHV recreation vehicles, at 4,300 per day and overnight camping at 1,000 campsites per night, even though the Coastal Commission in that same amendment stated that the entire park of Oceano Dunes was Environmentally Sensitive Habitat Area ("ESHA").

The staff report recommends both immediate and longer-term conditions as amendments to the CDP. The most controversial of these proposals being the 5-year phase-out of OHV recreational access to Oceano Dunes. The staff report provides no evidentiary analysis of the impacts of the proposed changes, or any mitigation measures to offset the impacts of the proposed major operational and public access changes that would result if adopted.

DPR believes adopting any amendment to the CDP, while an agreed-upon public process addressing these same issues is well underway, would sidestep years of effort in a preemptive manner that favors a pre-determined and exclusionary outcome. A policy process that is not accessible to all has a poor chance of resulting in a lasting solution. It has an even smaller chance of providing access for all or building a constituency for future conservation actions along the coast.

A more detailed response to each proposed condition is provided in the Attachment.

Conclusion
DPR has over 150 years of experience in balancing the complex issues of public access and resource protection. We dedicate ourselves to solving the complexities of resources protection, public access and recreation. We have demonstrated significant progress in all of those areas and we believe the draft PWP process offers the best way forward for continued community engagement, transparency and adaptive management.

Oceano Dunes is the only coastal beach in the State Park system that is open to vehicles. The 1,000 campsites in the park represent nearly a sixth of all the coastal campsites in the system and 59%[1] of the lower-cost coastal accommodations available in San Luis Obispo County. The beach campsites proposed for reduction are a significant portion of the low-cost overnight lodging options for the coast. The draft PWP proposes a plan to mitigate some of this loss however, the staff report does not.

The majority of Oceano Dunes visitors come from the Central Valley and Los Angeles County, which also tend to be underserved in terms of parks and recreation facilities. Affordable overnight lodgings along the central coast are scarce. The staff report's

[1] *Explore the Coast, An Assessment of Lower-Cost Coastal Accommodations*; Coastal Conservancy, page 13, Figure C.

proposed amendments to the CDP would result in a significant loss of access to Oceano Dunes for many families and communities.

Resource protections at Oceano Dunes are currently stronger than ever. Between the draft PWP, the Biodiversity Management Plan, the Habitat Conservation Plan, the Dust Management Plan, improved status of endangered species, and other operational improvements such as trash management and increased patrols, we have already made significant strides toward a more protected and sustainable environment at Oceano Dunes. The changes we have made and those we are proposing have so far been compatible with OHV use.

For this reason, the Commission need not and should not make substantial operational changes via amendments to the CDP while the PWP process is underway. The Commission, via approval of coastal development permits, has approved park operations, including OHV operations, for 40 years. There have always been competing interests, and it has always been the work of DPR and the Commission to find the balance among these interests that bests serves everyone. The draft PWP process will continue our tradition of using transparent, public processes to develop solutions that work for everyone and are informed by the best and latest science.

We sincerely hope the Coastal Commission will partner with us in a publicly engaged process of shaping, vetting and improving the PWP for the benefit of all Californians and the extraordinary resources that are the Oceano Dunes. Thank you for your consideration of this request. If you have any questions, please do not hesitate to contact me at (916) 653-8380.

Sincerely,

ARMANDO QUINTERO
Director

ATTACHMENT:

CSP Response to the Coastal Commission February 16, 2021 Staff Report

CC:
California Coastal Commissioners
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Dayna Bochco
Donne Brownsey
Linda Escalante
Carole Groom
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Gavin Newsom, *Governor*
Armando Quintero, *Director*

Prepared March 16, 2021 for March 18, 2021 Coastal Commission Hearing

California Coastal Commission
1725 Front Street, Suite 300
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831-427-4863

Subject: **Oceano Dunes SVRA Coastal Development Permit 4-82-300 Review**
Attachment: CSP Response to the Coastal Commission February 16, 2021 Staff Report

To: California Coastal Chair Stephen Padilla and Executive Director Jack Ainsworth

From: Armando Quintero, Director, California State Parks

Contents

Introduction

The California Department of Parks and Recreation (CSP, State Parks) has reviewed the February 16, 2021 California Coastal Commission Staff Report (Coastal Commission Staff Report or February Report) prepared for the March 18, 2021 hearing on the Oceano Dunes Coastal Development Permit 4-82-300 (CDP) review.

We appreciate the Coastal Commission Staff Report's recognition of the valuable coastal recreation opportunities and resources State Parks' manage at Oceano Dunes State Vehicular Recreation Area (SVRA) and Pismo State Beach. Combined, park visitors enjoy 5,000 acres with many diverse recreational opportunities such as motorized recreation, camping, playing on the beach, fishing, hiking, nature walks, horseback riding, kite surfing, paddling, and bird watching. Since motorized activity is allowed on the beach and dunes at Pismo State Beach and Oceano Dunes SVRA, those accessing the water for surfing, kiteboarding, fishing, and paddling can park their vehicle and easily unload gear near the water's edge. This motorized access also provides a welcome opportunity for visitors with mobility limitations to travel to and along the shoreline.

Oceano Dunes SVRA and Pismo State Beach (since jointly managed, referred to as ("the Park") serve between 1.5 and 2.1 million visitors per year and account for a large proportion of coastal camping opportunities in the State Park System. The previous use-limit of 1,000 campsites available at Oceano Dunes SVRA represent a significant part of the approximately 6,200 total coastal campsites in the entire State Park System and represent 59% of lower-cost coastal accommodations found within San Luis Obispo County (State Coastal Conservancy, 2019)[1]. At $10 a night, the SVRA provides some of the only affordable coastal accommodations for many families. In addition, camping opportunities at Oceano Dunes SVRA are unique in that this is the only coastal unit in the State Park System where visitors can camp directly on the beach.

Of the 3,600 acres of State Park land encompassing Oceano Dunes SVRA, only 1,350 acres of Oceano Dunes SVRA are open to camping and off-highway vehicle (OHV) recreation. During the nesting season for endangered shorebirds, another 300 acres are closed off from activities seasonally. State Parks manages OHV access on less than half of the SVRA property as visitors may only recreate in unvegetated areas and away from sensitive natural and cultural resources. State Parks' management of OHV

[1] *Explore the Coast, An Assessment of Lower-Cost Coastal Accommodations*; Coastal Conservancy, page 13, Figure C.

recreation has allowed the development of successful resource protection programs while providing balanced recreational opportunities.

Executive Summary

When the Coastal Commission approved the CDP and subsequent amendments and the San Luis Obispo County Local Coastal Program (SLO LCP), the Coastal Commission considered the California Coastal Act's (Coastal Act) mandate to protect the Parks' significant public access and recreational uses and preserve sensitive coastal resources. The Coastal Commission has repeatedly determined that State Parks' management of the Park in balancing active recreation and resource protection are consistent with applicable Coastal Act policies. This balance was embedded in the SLO LCP's detailed policy framework for the Park and further reiterated by the Coastal Commission in the condition compliance and annual reviews conducted for the CDP for almost four decades.

The February Report states that OHV recreation is not allowed in the Park because the Coastal Commission has determined that the entire SVRA is environmentally sensitive habitat area (ESHA). This position not only conflicts with the explicit Park-specific policy language of the SLO LCP, but it also seeks to retract without adequate basis the Coastal Commission's prior approvals and findings of consistency with the Coastal Act. It does not recognize the balance that was struck through the underlying CDP and codified in the certified SLO LCP, resulting in specific SLO LCP policy directives and, instead seeks to eliminate coastal public access and recreation that millions of visitors have enjoyed for over a century--predating both State Parks management of Oceano Dunes SVRA and the Coastal Act.

The SLO LCP's emphasis and direction for preserving the Park's historic and ongoing active recreational opportunities in conjunction with protecting sensitive resources within the dunes is supported by the SLO LCP's certified land use designations and the Park-specific policies developed to ensure a continued balance for the Park's unique recreational and natural resources. The SLO LCP designates the SVRA riding area as Recreation, identifying the State Beach and SVRA as a major visitor attraction in the Coastal Zone and provides for a wide variety of passive and active recreation opportunities "including clamming, driving on the beach, and recreational vehicle use within the dunes." The SLO LCP designates large swaths of the Park as Open Space to achieve the balance in the underlying CDP. It also identifies areas as important buffer zones to protect the vegetated back dunes and other sensitive natural resource areas where only passive recreational activities are permitted. The SLO LCP land use designations coincide with the Park-specific SLO LCP policy requirements relative to limiting OHV recreation to previously disturbed, non-vegetated dune areas and allowing

only resource-dependent passive recreational uses in areas designated as Open Space.

Based on the Coastal Commission's prior site-specific analysis and determinations identifying and designating Park areas for specific uses based on historic levels of disturbance, the Coastal Commission repeatedly chose to recognize State Parks' authority and management to balance public recreation, coastal access, and sensitive resource protection policy mandates. Such balancing, now referred to as conflict resolution, is provided for in Coastal Act Section 30007.5. The Coastal Commission's decisions to approve the CDP and LCPs ensured that the Park's program of recreational uses and resource protection measures is the most protective of significant coastal resources.

The PWP is consistent with the San Luis Obispo County and the City of Grover Beach's Local Coastal Plans

The February Report states that the draft PWP is not consistent with the Coastal Act, SLO LCP, or the City of Grover Beach Local Coastal Plan (GB LCP) (collectively the LCP's). However, the February Report does not explicitly state the nature of the inconsistency.

The draft PWP contains a detailed step by step analysis of the consistency of the Draft PWP with the Coastal Act and each LCP (see Chapter 4 of the Draft PWP), including an introduction and a step by step, thorough and detailed analysis of all specific Coastal Act issues, addressed (Please see: Public Access and Recreation – pages 4-4 to 4-45; Environmentally Sensitive Habitat Area and special-status species – pages 4-45 to 4-77; marine resources: water quality – pages 4-77 to 4-93; agricultural resources – pages 4-93 to 4-100; archeological and paleontological resources – pages 4-100 to 4-109; coastal visual resources -pages 4-109 to 4-123; coastal hazards – pages 4-123 to 4-138; and air quality, energy conservation and promotion of public transit -pages 4-138-4-143).

Furthermore, Chapter 5 of the Draft PWP explains how the PWP implementation would work and how State Parks anticipates working with the Coastal Commission during its implementation. The PWP planning team spent significant time on this consistency analysis. The policies and projects in the Draft PWP are crafted in a manner that is consistent with the Coastal Act – and all other applicable laws and regulations, including the federal and state Endangered Species Acts.

Action on PWP

On page 3 of the February Report, it is stated that one of the purposes of the March 18, 2021 hearing is to "provide feedback to State Parks on its PWP," but that "because it is a draft and State Parks' CEQA process is not yet complete, the Commission cannot take final action on the PWP at this meeting." Instead, the February Report recommends an amendment to the CDP to make fundamental changes to the Park's operation, including phasing out OHV recreation, short of completing the PWP process as previously determined.

If the Coastal Commission were to act on the recommended amendments to the CDP, including the phase out OHV recreation, or make other substantial changes to State Parks' operation and management of the Park, this would curtail the public process of the PWP, which in not in the best interest of the public.

Draft PWP Addresses the Coastal Commission's Proposed Conditions

On page 8 of the February Report, Coastal Commission staff states that in July 2019, the Coastal Commission provided 15 specific requirements to be addressed in the PWP. Coastal Commission staff also directed CSP to "explore" transitioning away from OHV recreation. The February Report states that the PWP does not include the Coastal Commission's requested changes to address these ongoing issues, such as the July 2019 recommendations.

CSP has addressed the Coastal Commission's proposed conditions in the Draft PWP. CSP found that some of the items could immediately be implemented through management actions. These conditions and how they are being addressed, are discussed in detail in Section Coastal Commission Conditions and Concerns below. For example, issues relating to bird exclosures and predator management are addressed as part of a comprehensive species management program that keeps the Park in compliance with the Draft Habitat Conservation Plan (HCP) and the United States Fish and Wildlife Service's (USFWS), regulatory authority over the Federal Endangered Species Act. Similarly, issues associated with state wildlife mandates are addressed by the California Department of Fish and Wildlife (CDFW), who per Coastal Act Section 30401, have the authority to set the standards for regulatory oversight of these mandates. Subsequently, State Parks and CDFW included the Oceano Dunes Biodiversity Management Plan, a set of CDFW recommendations for both long and short-term implementation of planning, study, and compliance with these mandates. In another example, CSP addressed trash management through ongoing changes (see new trash containers in the video presented at the March 18, 2021 meeting) and proposed a long-term solution to this item (see Volume 1, Section 3.4.6 on page 3-63 of the Draft PWP).

CSP thoroughly explored the concept of phasing out OHV recreation as requested– and found it inconsistent with legal mandates under the Public Resources Code and CSP's mission to provide public access and recreation as codified in the Oceano Dunes SVRA General Plan. CSP included the Coastal Commission's request to analyze a "no OHV alternative" in the PWP EIR but found this would significantly impact recreation and public access opportunities. The analysis found there are feasible alternatives to eliminating OHV use that will enhance resource protection, preservation and benefit public health without the need to eliminate historic public access and use.

The recommendations in the February Report would remove public coastal access and severely diminish the visitor experience at Oceano Dunes SVRA. Furthermore, recommendations may duplicate the authority of other agencies, such as the USFWS, CDFW, the San Luis Obispo Air Pollution Control Board (APCD), and the Regional Water Quality Control Board (RWQCB). CSP has been working with these agencies for years to manage resources under these agencies' jurisdictions by preparing specific plans and programs per the respective authorities. Deviating from this long-standing and cooperative interagency course could result in detrimental effects on shorebird conservation efforts and ongoing coastal restoration efforts. It would remove direct beach access for millions of Californians and may cause Oceano Dunes to be out of compliance with existing and future federal and state regulations or with regulations issued by other agencies. These proposed actions and recommendations are in direct conflict with Coastal Act sections providing direction on such interrelated state agency authorities and jurisdictions (Coastal Act, Chapter 5, Sections 30400-30420).

The following response provides detailed information regarding the proposed recommendations identified in the February Report.

The February Report proposes significant changes to land use and park management which were not fully discussed with or requested by CSP. Several years ago, CSP set out to prepare a public works plan pursuant to Public Resources Code Section 30605. Discussions between Coastal Commission and CSP staff suggested this as a public process that would result in a new overarching management plan to hopefully address and settle some of the longstanding contentious issues associated with the nearly forty-year history of the CDP. CSP through this PWP process has engaged local residents, environmental and conservation organizations, OHV recreation enthusiasts, recreation industry groups, local and national organizations, federal and state agencies, and thousands of individuals. This process reflects the substantial public interest and complicated regulatory framework for the operation of an SVRA within the Coastal Zone.

Input received before, and during the PWP planning process reflects the various reasons for pursuing a PWP. CSP held a listening session on November 30, 2017, to gather input on the concept of a public works plan to address long-standing operational and development issues. Upon hearing the diverse range of issues and a general hope for building consensus on a new plan for the Park, CSP moved forward with the jointly supported path of pursuing a public works plan with the goal of finding common ground. Therefore, in May 2018, CSP held scoping meetings to begin the PWP process. Showing commitment to this path, CSP has spent countless hours, staff resources, and money to prepare the PWP. Confirming our commitment to the process, CSP met regularly with Coastal Commission staff and, after the July 2019 Commission hearing and direction, provided regular updates to the Coastal Commission on the PWP. In Fall 2020, CSP committed to releasing a draft PWP for public review by the end of the calendar year. The draft PWP and EIR were released on December 31, 2020.

The February Report recommendations, if adopted, circumvent the PWP process by implementing directives prior to completion of a public process. CSP strongly believes that the PWP addresses all management issues previously brought forth by the Coastal Commission members and staff. CSP has honored its commitment of diligently working on a balanced PWP.

Compliance with the California Environmental Quality Act

The February Report appears to not provide analysis of the impacts of the proposed changes nor any mitigation measures to offset the impacts of the proposed major operational and public access changes that would result from several of the staff recommendations, including the phasing out OHV recreation in the Park. Section 13096 of the Coastal Commission's administrative regulations require Coastal Commission approval of coastal development permit applications and coastal development permit amendments, supported by a finding showing the application, as modified by any conditions of approval, to be consistent with any applicable California Environmental Quality Act (CEQA) provisions. The recommendations in the February Report have been submitted by the Coastal Commission staff as amendments to the CDP. Therefore, the February Report should have also provided a CEQA evaluation to analyze the impacts, propose mitigation to reduce significant impacts, and additional evidence to support findings that the changes would not adversely affect any physical resources. These do not appear to have been provided.

In fact, eliminating OHV recreation and consolidating camping into a smaller part of the beach, as proposed in the February Report, could result in potentially significant impacts to recreational opportunities, including the removal of an affordable recreation

option and numerous lower-cost coastal accommodation options. The February Report also does not analyze potential effects on any other resource topics.

Section 13096 of the Coastal Commission's administrative regulations and Section 21080.5(d)(2)(A) of CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment. The draft PWP/EIR and HCP provide feasible alternatives and feasible mitigation measures that would substantially lessen any significant adverse impact that the activity may have on the environment.

Coastal Commission Staff-Recommended CDP Special Conditions

Five-Year Transition to Phase Out OHV Uses from Oceano Dunes SVRA

The 2001 Coastal Commission Amended Action Report for Amendment 5 to the CDP (page 21) states,

"Balancing the legislatively mandated recreational requirements of the off-highway vehicle enthusiast with the numerous other Federal and State mandates is a challenging task. Overall, it is important to evaluate CSP's proposal for maximum consistency with the resource protection policies of the Coastal Act, while acknowledging the Oceano Dunes SVRA's enabling legislation."

Per the July 2020 Legal Memo jointly issued from CSP and Coastal Commission Legal Staff:

> In 1982, the Legislature enacted the Off-Highway Motor Vehicle Act. (Chapter 994, Statutes of 1982.) In 2003, the Legislature passed the Off-Highway Motor Vehicle Recreation Act of 2003 ("OHV Act"), Public Resources Code § 5090.01 et seq. Original versions of the OHV Act commencing with the 1982 OHV Act contained references to specific state vehicular recreation areas, such as Pismo Dunes State Vehicular Recreation Area ("Pismo Beach SVRA"), which is now Oceano Dunes SVRA. The current OHV Act, commencing with the OHV Act as amended in 1991, deleted references to specific units in favor of more general language relating to regulation of OHVs[2]. In 2017, the OHV Act was amended to

[2] Chapter 994, Statutes of 1982, enacted the first OHV Act. In the 1982 OHV act, Pismo Dunes was listed as lands included in the SVRA and Trail system along with other units that had been established to that point in time. PRC 5090.40 "The system consists of the following lands: (a) Carnegie, Clay Pit,

eliminate the program's decadal sunset provision, add soil conservation standards, increase protections for natural, cultural, and archeological resources, and require CSP to prepare and implement wildlife habitat protection plans for lands in, or proposed to be included in, state vehicular recreation areas. The bill also added new provisions related to monitoring and adaptive management. (Public Resources Code § 5090.35.)

The February Report's recommendation to phase out off-highway vehicle use at Oceano Dunes SVRA would drastically change the intent and use of the Park as established by the Legislature, the 1975 General Plan for the SVRA, and subsequent actions by State Parks and Recreation Commission in designating the use of this State Park unit. It would require a change in the classification of the SVRA.

As noted earlier, the February Report appears to provide no analysis of the impacts of this substantial proposed change, or any mitigation measures to offset the impacts if this was adopted. The majority of Oceano Dunes visitors come from the Central Valley and Los Angeles County which also tend to be underserved in terms of parks and recreation facilities. Affordable overnight lodgings along the central coast are scarce. The February Report's proposed amendments to the CDP would result in a significant loss of access to Oceano Dunes for many families and communities.

Elimination of the Pier Avenue Entrance

CSP agrees that improvements to the entrances of the parks can be made to reduce impacts on the resources and community and enhance visitor access and operations. As requested by the Coastal Commission, feasible alternatives are included in the PWP, such as modifications to both the Pier and Grand entrance stations to maximize pedestrian and vehicle access, enhance monitoring and control of vehicle entries, and reduce sand tracking out of the parks. Additionally, the PWP recommended working with CDFW to identify and construct a new, year-round entrance in the Park's southern

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Hollister Hills, Hungry Valley, Pismo Dunes, and Ocotillo Wells State Vehicular Recreation Areas. In 1991, Chapter 701 Statutes of 1991, the foregoing section was repealed and replaced with a new, more generic, Public Resources Code 5090.40 (a) which read: "The system consists of areas and trails established primarily to provide facilities and opportunities for the purposes of operating off-highway motor vehicles, as defined in Section 38006 of the Vehicle Code".

property. All these alternatives would help disperse use and reduce impacts at the northern end of the property.

The February Report asserts that "the Commission has never analyzed or authorized permanent use of these entrances, as is required by the base CDP" (February Report page 7). In the CDP, it was required that CSP finalize Oceano Dunes SVRA's access and staging area. In 1991, CSP circulated and finalized the Access Corridor Project EIR, which determined that the existing access via Pier and Grand Avenues and staging area near Post 2 is the environmentally preferred alternative[3]. Coastal Commission staff submitted comment letters on the 1990 Notice of Preparation for the EIR (Letter dated December 26, 1990) (California Coastal Commission, 1990) and the August 1991 Draft EIR (California Coastal Commission, 1991). The Final EIR addressed all the substantive issues brought up in the Coastal Commission's comment letter.

Because the Access Corridor Project was completed in 1991, the three-year limitation was met within three years from the date the SLO Local Coastal Plan (LCP) was certified. No construction was necessary because the access and staging areas were already in use and became permanent. Access issues were reviewed again in the 2006 Condor Environmental Alternative Access Study, which determined and reaffirmed that the Grand and Pier Avenue entrances are the environmentally superior access points (Zilke, 2007)[4]. The current SVRA access and circulation pattern is consistent with the findings of both studies.

Regarding the Grand Avenue entrance, the Coastal Commission approved a 1999 amendment to the GB LCP with modifications that deleted outdated language to the temporary nature of the Grand Avenue entrance and included new text that clearly identified the entrance as permanent and something to be maintained. By approving the amendment to the GB LCP, the Coastal Commission did finalize the Grand Avenue entrance. Additionally, The Oceano Community Plan acknowledges the Pier Avenue entrance as a primary entrance, acknowledges CSP's substantial investment in Pier Avenue for the purpose, and recognizes the development and land use opportunities associated with maintaining the entrance.

[3] In 1992, the Off-Highway Motor Vehicle Recreation Commission certified the EIR and adopted the project as an amendment to the Oceano Dunes SVRA General Development Plan and Resource Management Plan. In 1994, the California State Park and Recreation Commission also considered and adopted the amendment to the unit General Development Plan contained in the Access Corridor Project.
[4] In 2007, CSP submitted a letter to Chair Kruger outlining that the 1991 Alternative Access Study, associated EIR, and the formal Adoption of those conclusions by the Parks and Recreation Commission, made the accesses and staging areas permanent (Attachment A).

The Coastal Commission's certification of the 1999 GB LCP Amendment and the 2001 Oceano Specific Plan SLO LCP Amendment reflect the many years of study and decision-making resulting in the permanent establishment of the two existing entrances.

Per the Coastal Commission's direction, CSP evaluated entrance modifications in the draft PWP. The draft PWP identifies and preliminarily evaluates two potential alternative southern access locations as identified in the SLO LCP: one near Oso Flaco Lake and one at the Phillips 66 site. These recommendations are longer-term options that would require a general plan amendment for Oceano Dunes SVRA and additional permitting. Until they are a viable option and implemented, the entrances at Grand and Pier Avenues would need to remain to provide access to the Parks. As recommended in the PWP, CSP could close one or both northern entrances to OHV access should a secure and permanent southern entrance become available. However, access will still be required from Grand and Pier Avenues for vehicular day use in Pismo State Beach and allow public and emergency access into the SVRA when conditions allow.

The Coastal Commission's Other Recommended Operational Changes

Restricted Use Areas

The February Report recommends including a condition to the CDP that states, *"All fenced restoration, habitat enclosure, cultural resource, and other protected areas shall be off-limits to all forms of access…"*

Oceano Dunes SVRA has an ongoing robust program to manage public access within the park. These programs include rules and regulations for public access consistent with applicable sections of the Public Resources Code. These programs and controls include a robust native plant restoration program that annually restores 12-15 acres of dune with locally collected native plants; an active program to install and maintain fencing to protect sensitive natural areas and culturally sensitive areas; and robust scientific programs to assess wildlife habitat consistent with Public Resources Code Section 5090.35.

Plover and Tern Habitat Restrictions Incl. Seasonal vs. Permanent Exclosures, Seasonal and Other Restrictions.

The February Report includes a condition to the CDP to make seasonal exclosures permanent along with other restrictions. This request was also in the July 2019 Coastal Commission Staff Report and addressed in the draft PWP and the collaboration between CSP and CDFW in developing the Biodiversity Management Plan (BDMP). Recommendations from these documents include:

- Commits to developing a Natural Communities Conservation Plan in collaboration with CDFW, to be completed within five years, and it sets a framework for resource protections for the next 50 years;
- Increase western snowy plover and California least tern nest exclosures buffers, from 100-foot radius to 150-meter radius for plovers and an increase from 300-foot radius to 300-meter radius for terns, as outlined in the plan; and
- Closes roughly two-thirds of the shoreline to all public access and recreation during the nesting season

The PWP reflects the protections that are covered by the Habitat Conservation Plan and the Biodiversity Management Plan.

Further detail regarding CSP's shorebird protection program is discussed in the "Plover and Tern Habitat Conditions" section of this document.

Allow Dune Restoration and protection of ESHA to address coastal resource degradation such as permanent dust control purposes.

The February Report acknowledges the extensive efforts CSP has undertaken since 2013 to mitigate the dust downwind of Oceano Dunes SVRA. CSP has, to date, planted more than 230 acres of vegetation within the SVRA, and most is within approximately 1,000 acres designated for OHV recreation. The draft PWP proposes to allow future dune restoration projects and protection of ESHA. Furthermore, it is believed that there is now more dune vegetation than existed naturally, as documented by comparing the current coverage with aerial imagery of the dunes from the 1930s -- a time that preceded dune OHV recreation. These efforts are leading to improvements in air quality as noted by both the San Luis Obispo Air Pollution Control District and the Scientific Advisory Group (SAG).

Prohibit Nighttime Vehicular Use/ Riding

Nightime riding at Oceano Dunes SVRA was studied in 1997 and again in 2005 at the Scientific Subcommittee's request and direction[5]. The report was provided to both the Technical Review Team (TRT) and the Scientific Subcommittee. The Scientific Subcommittee, which included a Coastal Commission biologist, reviewed the study in

[5] Mad River Biologists. Tech. *Oceano Dunes State Vehicular Recreation Area Nighttime Riding Study: Final Report*. Arcata, CA: State of California, 2005.

2006. At that time, neither body recommended additional study or actions specific to nighttime vehicular use.

As a designated campground on the beach, campers need vehicular access for ingress/egress, convenience, public safety, and emergency purposes. It is common for visitors to arrive at the campground in the evening, after driving for several hours to reach the campground. Especially for visitors with daytime commitments such as work, arriving before sunset may not be feasible. While many state parks do limit day-use hours of operation, all California state park campgrounds allow visitors to arrive after sunset and exit the campground after dark if needed. Additionally, given the size of the Oceano Dunes SVRA camping area, and the fact that it is located on the sand, many visitors also must drive from their campsite to use the restrooms and other facilities.

The February Report does not differentiate between OHV recreational nighttime riding, and ingress/egress, facilities, and convenience needs of the visitors of the campground.

The issue of nighttime riding is addressed in the PWP through the BDMP, which recommends an update to the 1997 and 2005 Nighttime Riding Study[6]. The recommendation is to implement a new joint study with CDFW that will be peer-reviewed and evaluate the potential impacts of nighttime riding on wildlife activities through a controlled study. CSP has committed to applying the study results by requiring operational changes to address impacts, if necessary.

Prohibiting Arroyo Grande Creek Crossings

Oceano Dunes District has procedures in place to ensure wildlife protection in Arroyo Grande Creek. Currently, District environmental scientists monitor the creek and lagoon seasonally and provide an annual fisheries report to the USFWS that includes updates on the presence of federal and state-listed species, like the tidewater goby. The upper creek and lagoon are closed to vehicle use year-round to protect sensitive aquatic habitat. Pedestrians and equestrians are prohibited in the creek and lagoon during the western snowy plover and California least tern breeding season.

The environmental management plans currently in development include the HCP, Wildlife Habitat Protection Plans (WHPP), Storm Water Management Plan (SWMP), and the BDMP that addresses Arroyo Grande creek crossings. CSP has implemented the BDMP recommendation to close creek crossings (with an exception for health and

[6] Burton, Robert K, and Michael J Kutilek. Tech. *Nocturnal Habits of Western Snowy Plovers at Oceano Dunes State Vehicular Recreation Area*. San Jose, CA: State of California, 1997.

Mad River Biologists. Tech. *Oceano Dunes State Vehicular Recreation Area Nighttime Riding Study: Final Report*. Arcata, CA: State of California, 2005.

safety purposes) when a 12-inch flow depth-criteria is reached. CSP also will implement a feasibility study for a mobile stream crossing structure as soon as possible to further reduce potential vehicle impacts.

Establishing Use Limits for Campsites, Street-legal Vehicles, and OHV Vehicles.

The draft PWP addresses the Coastal Commission's concern, responding to the request to reduce the day-use and camping limits. In the July 2019 Coastal Commission Staff Report, the suggested interim use limits were:

> Interim OHV, street-legal vehicle, and camping daily use limits shall be reduced an amount proportionate to acreage that has been removed from vehicular/OHV use (e.g., due to dust control requirements, other exclosures, etc.), including as future areas are taken offline. As of July 11, 2019, 1,048 acres are authorized for OHV and camping use, and interim use limits are as follows: (a) 1,806 street-legal vehicles per day; 700 camping units per night; and (c) 1,204 OHVs per day. A street-legal vehicle that also stays overnight counts as both a street-legal vehicle and as a camping unit." Coastal Commission (California Coastal Commission, 2019, p. 10)

It should be noted that this Coastal Commission staff statement identifies higher intensity of use than the interim limits recommended in the PWP. CSP evaluated the figures further, taking into consideration busy holiday and summer weekends, and proposed further reduction in the Draft PWP that included implementing year-round interim use limits of:

- 500 camping vehicles and sites,
- 1,000 street-legal vehicles, and
- 1,000 OHVs per day.

Also, the February Report identifies these use limits as "at any one time" while CSP considers these "day" use limits. It is a CSP standard practice to only allow the total of the use limits per day. Once the use limit has been reached, CSP does not allow vehicles to enter the park regardless if others have exited.

Understanding the need to evaluate further carrying capacity and intensity of use, both Coastal Commission staff and CSP agree that the reduction in use limits would be "interim" until an updated carrying capacity study is completed. The draft PWP proposes the above use limits until another study is conducted to determine the appropriate permanent beach camping and day-use limits for OHVs and street-legal vehicles. CSP is committed to conducting an updated peer-reviewed carrying capacity study.

Additional discussion on carrying capacity, enforcement, and intensity of use is in the Public Access and Recreation section of this letter. The draft PWP is the appropriate mechanism for CSP to explore and analyze future vehicle use limits. Reducing vehicle use limits directly impacts coastal access and low-cost coastal accommodations. Permanent use limit reductions should be carefully considered and analyzed through public planning processes.

Allowable Grading and Fencing.

CSP has an ongoing fence management program that includes the maintenance and regular replacement of over 35 miles of fencing at the Parks. Maintenance includes erecting fencing, replacing damaged fencing, and moving sand away from fence lines or towards fence lines as needed using heavy equipment. State Parks routinely contracts for assistance from the California Conservation Corps staff for fence repair.

The Draft PWP recommended enhancing the fencing program to:

- Identify methods (e.g., video monitoring or in-person surveillance) to increase fence monitoring to protect coastal resources such as vegetated dunes and the South Oso Flaco Lake area.
- Continue regular inspections and maintenance of installed fencing to identify repair and replacement needs.
- Use heavy equipment to move sand to maintain existing fencing's operational efficiency, including the seasonal snowy plover exclosure.
- Identify strategies to improve air quality, including dune stabilization, installation of wind fencing, and ongoing studies with monitoring, data collection, and analysis.

The draft PWP and HCP are the appropriate mechanisms to analyze heavy equipment use and fencing programs. These items should be carefully considered and analyzed through environmental planning processes.

Trash/Recycling Operations

CSP covered all trash cans with lids for immediate resolution and installed new enclosed dumpsters. The draft PWP also proposes a fully developed and enclosed trash collection facility.

CSP currently has several programs and practices to manage predators, including predator monitoring and trash management programs. Predator management is referenced in the annual nesting season report submitted to Coastal Commission,

USFWS, and CDFW and is integral to the HCP conservation program. A Draft HCP was released and is currently going through the public review process.

The District's Stormwater Management Plan, completed in February 2019, includes a trash assessment that established a baseline for each camping and parking area. Trash reduction measures and Best Management Practices (BMPs) were identified for waste storage areas that focus on sediment control, erosion control, pollution prevention, and good housekeeping. The District has also been implementing the BMPs to ensure continuous progress towards meeting the desired trash load baselines identified in the SWMP. These BMPs cover all waste containers, secure them during high wind events, clean any trash on the ground, and avoid overfilling waste containers.

The District is also subject to the amendments regarding refuse disposal adopted by the State Water Resources Control Board (SWRCB) in April 2015 for the SWRCB's Water Quality Control Plan for California's Ocean Waters. The Draft PWP will expand on these predator control measures by codifying current BMPs and incorporating measures identified in the SWMP, HCP, and the parks' Wildlife Habitat Protection Plan (WHPP).

CSP has already implemented this proposed condition and will continue implementing and improving the Oceano Dunes Predator Management Program and Trash Control Programs. CSP will continue to provide annual Predator Management Reports to the Coastal Commission Executive Director.

Require Special Events CDP Authorization.

The District does not permit special events that can harm coastal resources. District staff follow the Department's special event policies, address city and county concerns, and comply with all state and federal regulations for resource protection, including established vehicle limits for the Park and conducting environmental analysis as required by CEQA. Also, District resource staff identify the most appropriate areas in the parks for special events and adapt these areas to limit activities to specific locations where management of events and mitigation of potential impacts are feasible.

CSP's authority to establish a process for permitting special events is found in Title 14, California Code of Regulations, Section 4301 (j). As suggested in the February Report, CSP's review already includes evaluating potential coastal resource impacts resulting from the activities, and appropriate management measures are identified and implemented. As a standard practice, Oceano Dunes District staff solicit Coastal Commission staff feedback during planning efforts on larger special events, including the events referenced in the February Report. Therefore, this condition is unnecessary.

Access and Outreach Implementation

The Oceano Dunes District continues to provide 2,800 hours of educational programming each year, including a wide variety of interpretive programs for students and youth. District-wide educational programming reached approximately 108,000 visitors in 2019. The District has a team of interpreters, seasonal staff, and volunteers that run a visitor center and manage educational and community outreach programs. The distance-learning program, Parks Online Resources for Teachers and Students (known as PORTS), has been implemented to deliver live virtual field trips using an approved curriculum to school children who cannot travel to the parks. Short video presentations about the District and its resources are also available on social media websites like YouTube.

Draft PWP Section 2.2: Environmental Justice discusses CSP's programs and efforts to address environmental justice issues. CSP worked to implement meaningful engagement and participation in the process with underserved and underrepresented communities in the local regions of southern San Luis Obispo and northern Santa Barbara counties. These efforts align with departmental goals, objectives, and programs to ensure increased access, remove social, economic, and cultural barriers to our parks, and enhance lower-cost accommodation opportunities.

Although COVID-19 restrictions delayed the implementation of initial in-person outreach engagement actions, the Draft PWP documents CSP's commitment to implementing a permanent Community Engagement Program at Oceano Dunes District. This program meets CSP's department-wide goals addresses the Coastal Act's Environmental Justice policies. The Draft PWP included the following recommendations:

- Continue the PWP, HCP, and SOA public outreach efforts while establishing the permanent program to increase understanding of the beach and dune areas' appropriate use by lower-income populations, youth, and tribal parties.
- Improve existing education facilities and provide bus access to the Oso Flaco Day Use Area to create new opportunities for school groups and visitors to participate in a wide variety of interpretation, educational, and recreational programs.
- Install interpretive facilities, such as educational panels, kiosks, audio tours, and multi-language materials, at park entrance stations, campfire centers, the Monarch Butterfly Grove, and the Oso Flaco Pismo Beach boardwalk.
- Enhance outreach efforts to underserved communities and non-traditional users, including youth, tribal parties, and lower-income residents, using technology and social media.

- Engage with partners, such as existing and potential businesses and nonprofits and community-based and statewide organizations, for input and assistance to increase access to quality interpretative programs for under-represented groups.

CSP recognizes that we have consistently received significant numbers of comments and regular input from both the Oceano beachfront and Nipomo Mesa communities during the PWP planning process. We also know that the conventional techniques for gathering community input during our planning process have fallen short in our attempts to reach more fully the more underserved and underrepresented populations in neighboring Oceano and surrounding communities. Therefore, this is the purpose of proposing a permanent Community Engagement Program for Oceano Dunes District that aims to engage with and receive direct input from these community members. These programs require time and effort to build relationships with these communities to directly hear what recreational activities and visitor services would best suit their needs. This program will follow the successful model community engagement programs that have been established in other state parks, such as Los Angeles State Historic Park.

Environmental justice concerns, such as the ones raised by Coastal Commission staff, are extremely complex and include multiple factors, many outside of the purview of State Parks. The Draft PWP clearly states CSP's intention to develop a dedicated community engagement and outreach program as a long-term management tool to allow CSP to work with all communities, governmental jurisdictions, and non-governmental organizations to engage them in the environmental justice conversation. We commit to finding workable solutions that we can support and responsibly address.

Monitoring, Report, and Review.

Since its inception, the Technical Review Team (TRT) met annually to review the program's status and other CDP requirements and provide a report to the Coastal Commission. The last report was presented in January 2019. By mutual agreement, both the Coastal Commission and CSP felt that the TRT had met its obligations and should be disbanded. Understanding that a review process may benefit both departments, the Draft PWP recommended replacing the TRT with an annual reporting program processed through the Coastal Commission's Executive Director's review and approval. State Parks continues to provide annual reports to Coastal Commission staff in addition to those prepared for other agencies, including USFWS, CDFW, SLO APCD, and reports required by the PRC (e.g., annual Habitat Monitoring System Report) or prepared as part of SVRA management. CSP will continue to provide these agency reports to Coastal Commission staff for their review, and CSP is open to a process that involves regular coordination between staff. This review process should focus on collaboration and not be regulatory or be subject to the Coastal Commission or the Coastal Commission Executive Officer's approval.

Plover and Tern Habitat Conditions

CSP is the single most important land manager supporting recovery of the Western Snowy Plover (WSP) in California. In any given year, 60 of our 128 coastal units provide plover habitat (breeding or wintering), and as many as 30 provide nesting habitat. Over 1/3 of the designated critical habitat in the state occurs in State Park Units. CSP works closely with the USFWS, CDFW, and many others to support a wide range of efforts aimed at WSP recovery. All this work is aimed squarely at the survival and recovery of the species. We all share the goal of recovering this species.

Oceano Dunes SVRA has implemented an extremely successful program to manage nesting for the federally threatened WSP and the state and federally listed endangered California least tern. Oceano Dunes SVRA is demonstrably one of the most important breeding sites for the WSP in California. It contains the second largest population of WSPs on the entire pacific coast. The WSP conservation program at Oceano Dunes SVRA is the largest and most significant across the state park system. In fact, over the last 18 years, the minimum number of western snowy plover breeding adults has increased over 560% from 32 in 2002, to 214 in 2019. State Parks annually spends roughly two million dollars on the program at Oceano Dunes, funded via the Off-Highway Vehicle trust fund.

State Parks will implement habitat protections for WSP and least tern as outlined in the BDMP and the draft HCP, under USFWS's and CDFW's authority and jurisdiction, respectively. State Parks has developed management strategies for listed species at Oceano Dunes SVRA and is actively working on a Draft HCP. Coastal Commission staff have reviewed the Draft HCP and submitted comment letters on the Draft EIR and Draft Environmental Assessment. The concerns raised by the regulatory agencies in the letters attached to the February Report are appropriately handled through the draft HCP public process.

The BDMP recommends management measures focused on the protection of sensitive species and their associated habitats. For example, the buffer between plover nest exclosures will be dramatically increased from a 100-foot radius to a 150-meter radius for plovers and from a 330-foot radius to a 300-meter radius for terns. The BDMP also recommends closing nearly two-thirds of the shoreline to all coastal access and recreation during the nesting season. CSP has committed to implementing these measures beginning at the next nesting season.

The February Report states:

> The Commission's staff ecologists believe that making the exclosure permanent and expanding protective fencing to other primary tern and plover breeding locations will improve habitat function" (Coastal Commission Staff Report page 88).

CSP has a robust program to manage nesting habitat for snowy plover and least tern and has collected substantial monitoring data over the last 20 years to substantiate the successful use of seasonal exclosures.

The February Report also mischaracterizes an option in the draft HCP regarding a potential reduction in the 300 acres that are seasonally closed to OHV recreation. The potential reduction is identified as an option in the Draft HCP -- which is currently in the public review process. The Draft HCP states the reduction will only occur if stringent biological and operational issues are satisfied to demonstrate that the park meets its recovery breeding targets.

The February Report states, "in 2018, State Parks documented one tern and 36 plover deaths, with eight of them crushed and killed by OHVs" and "In 2019, three terns and 26 plovers were killed, with several of these individuals found amidst tire tracks" (Coastal Commission Staff Report page 85). These figures include bird fatalities known to have been caused by predation or death by other natural causes. By not explicitly stating that these cited mortalities are caused by multiple sources, including natural conditions (e.g., predators and natural causes), the February Report gives the impression that more injury from public recreational activities occurs.

Additionally, the February Report refers to:

> [a] large number of plovers found in areas outside of the exclosure, including the very large number of nests, 66 in 2018, found outside, but adjacent to the exclosure" (Coastal Commission Staff Report page 88*).*

The nests discussed were initiated west of the main seasonal exclosure on a portion of the shoreline closed to public access during the nesting season. Exclosure fencing is installed in February when the beach is in a winter profile. By the peak of nesting, the beach can build many hundreds of feet from natural processes, and often nests are initiated in this newly built beach area. This statement in the February Report gives the impression that the seasonal exclosure is insufficient to protect nests and that these nests are vulnerable to public activity. However, these nests are protected from the public, and their relation to the fenced seasonal exclosure reflects seasonal changes in beach profiles through natural processes.

CSP articulates all plover and least tern nesting management protocols (including seasonal exclosures, individual nest protections, and decisions to close areas to public activity) with CDFW and the USFWS through an annual Nesting Season Management Plan or an HCP and NCCP, once those processes are final. CSP agreed to implement the recommendations in the BDMP to address interim steps and study areas until an NCCP is approved. All management of snowy plover and least tern will be conducted consistent with the appropriate wildlife agencies' recommendations and as specifically outlined in the relevant documents (Nesting Season Management Plan, BDMP, and Draft HCP).

Arroyo Grande Creek Crossings

CSP included the Arroyo Grande Creek crossing as part of its Draft HCP, currently under review by USFWS. The BDMP also includes recommendations for additional measures and further study to provide additional protection to aquatic resources from the creek crossing.

CSP has consulted extensively with regulatory agencies such as NOAA Fisheries, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife on fisheries management and monitoring. CSP is in regular contact with regulatory agencies and has provided background information that state and federal wildlife agencies have reviewed regarding tidewater goby and steelhead.

The February Report's recommendation would effectively cut off access to public lands within Oceano Dunes SVRA for 3-7 months out of the year. Furthermore, this recommendation does not offer additional protection to aquatic species or water quality than current management as informed by the BDMP and adaptive management measures articulated in the HCP.

The February Report states that the:

> Commission's staff ecologists have documented that the geomorphological changes to the creek from such crossings, even at depths less than 12 inches, are also extremely damaging to this ESHA habitat, and a flow trigger does not prevent this degradation" (Coastal Commission Staff Report page 90).

However, the report does not cite evidence that vehicle crossing, as currently implemented under BDMP recommendations, has had adverse effects on steelhead or tidewater goby. CSP has been working with NOAA Fisheries and the USFW through the HCP planning process and has developed specific and focused management measures

to eliminate or minimize impacts to listed species, including tidewater goby and steelhead trout.

Additionally, State Parks collaborated with CDFW on the recent BDMP that includes further recommendations to manage creek crossing better and study potential impacts from this crossing. As noted in the February Report (page 92), CDFW identified concerns with the Arroyo Grande Creek crossing. Still, instead of closing access, the BDMP identified feasible mitigation measures, such as when the water flow reaches a level of 12 inches or is unsafe for vehicles to cross. The PWP and BDMP also suggest exploring a seasonal creek crossing that can be installed to minimize impacts to listed species further.

The February Report identifies concern over:

> Any disturbance that causes rapid lagoon breaching may have the effect of flushing tidewater goby from the lower reaches of the creek into the ocean and causing their demise. California red-legged frogs are also present around Arroyo Grande Lagoon and Creek during this time period, and others, and the frogs themselves, as well as their egg sacs, may also be harmed by a precipitous breaching event" (Coastal Commission Staff Report page 91).

There is no evidence that the vehicle activity has caused a rapid creek breach. CSP has protocols to protect California red-legged frog and tidewater goby, which are outlined in the draft HCP.

The February Report was in error when stating:

> As noted earlier, the County actually owns a roughly 5-acre property that is located at the normal rivermouth area, and some of the crossings may thus be taking place on County property, and not State Parks property." (Coastal Commission Staff Report Page 89, footnote 91).

State Parks owns all beach areas near Arroyo Grande Creek, and there is no County land where the public can drive.

The February Report also discusses "alleged" illegal crossings of the Arroyo Grande Creek, resulting in significant habitat disruption. CSP staff monitor creek crossings and restrict Arroyo Grande Creek crossing through a posted Superintendent's Order, which can be enforced and cited by State Park Peace Officers. It is not a memorandum but a posted order with the full force of law behind it (CCR, Title 14, § 4301(i)).

CSP has developed management measures that provide maximum protection to tidewater goby and steelhead trout associated with vehicle crossings at Arroyo Grande

Creek. These programs have been thoroughly vetted through the responsible wildlife agencies (USFWS, NOAA Fisheries, CDFW), and CSP has provided all interested agencies with copies of reports and studies documenting the conclusions that impacts from this creek crossing are effectively managed. The TRT and Scientific Subcommittee received annual fisheries studies documenting tidewater goby and steelhead conditions in Arroyo Grande Creek. They did not recommend additional measures in their 18-year tenure other than recommending CSP complete the HCP to cover any potential residual impacts under the federal Environmental Species Act.

Air Quality and Public Health

On page 107, the February Report states:

> The Coastal Act states that air quality protection programs are the principal responsibility of local air pollution control districts [APCD in this case] and CARB, and requires the Commission to ensure that new development is consistent with these entities' air pollution control programs and requirements per Coastal Act Sections 30414 and 30253(c).

In this context, the air quality issues are handled through the San Luis Obispo Air Pollution Control District and through the CDP applications, CSP has submitted for the PMRP (CDP 3-12-050 As Amended) and is not relevant to this discussion on the CDP.

CSP appreciates the Coastal Commission's concerns about air quality at this location. The following information describes the measures and studies related to air quality and particulate matter reduction measures at Oceano Dunes SVRA.

Stipulated Order of Abatement

CSP agreed to implement numerous dust control measures under the Stipulated Order of Abatement (SOA) with the SLO APCD. These efforts focus on specific surface treatments in select areas to address dust control needs. Some of those efforts may use native dune vegetation, while others involve surface stabilizers, wind fencing, or other treatments. This suite of projects is informed by monitoring and scientific analysis. Other measures include closing sections of the open riding area to motorized recreation and camping, installing track-out devices at the entrances at Grand and Pier avenues to reduce track-out of sand onto paved, public roadways, and preparing a Particulate Matter Reduction Plan (PMRP).

Oceano Dunes District's Scientific Advisory Group (SAG), San Luis Obispo (SLO) Air Pollution Control District (APCD), and State Parks agree that the original requirements of the Stipulated Order of Abatement (SOA) are imperfect and need to be updated. This

information was confirmed in the public statements made by the APCD Air Pollution Control Officer. Also, SAG recognizes the limitations of the current SOA requirement, and is in the process of working with CSP to update those requirements. With the recent work that has been done, the SAG and the University of Nevada's Desert Research Institute (DRI) propose that the SOA requirements may potentially change. A change in the SOA requirements would influence the total acreage of the SVRA that may need to be converted to dust mitigation.

CSP is also working with SAG, DRI, and California Air Resources Board (CARB) to explore the secondary effects of dust control projects using a computation fluid dynamics model (Attachment B) (California State Parks, 2020). The SAG believes that these secondary effects may be significant toward reaching the goals of the SOA.

While dust control issues are discussed in the February Report, any development associated with those efforts under the Coastal Act must be reviewed under CDP 3-12-050. State Parks works with the SLO APCD to determine appropriate dust treatments in compliance with the SOA.

It is important to note that the SLO APVD has jurisdiction over air quality issues and has adopted specific regulations related to dust that comes from the dunes within Oceano Dunes SVRA. Neither the SAG nor SLO APCD has advocated for a closure of Oceano Dunes SVRA to vehicular activity. Instead, both have sought a balanced approach that achieves dust control objectives while facilitating continued OHV access and camping at Oceano Dunes SVRA.

Particulate Matter Reduction Plan

The APCD approved the June 2019 *Draft Particulate Matter Reduction Plan* that directs dust mitigation efforts over the next four years -- until 2023. State Parks partners with the APCD and CARB to comply with the SOA.

The PRMP is discussed in PWP Volume 2, Section Dust Control Management and Maintenance. Due to the in-process and dynamic nature of the PRMP, the PWP does not attempt to duplicate its conditions, treatments, or mitigation measures. Instead, the PWP requires compliance with the PRMP and relies on this plan for specific recommendations, actions, and standards.

Air Quality Corrections

The SLO APCD has statutory authority over air quality issues in this area and has not requested a cessation of OHV activity. Furthermore, the SLO APCD is working

collaboratively with CSP to achieve air quality improvements along with sustained OHV recreational opportunities.

The February Report does not discuss the noticeable improvements in PM-10 concentrations both measured and modeled at the California Department of Forestry (CDF) air monitor located downwind of Oceano Dunes SVRA in the range of a 45% reduction (Attachment C, DRI Increments in Progress) (Gillies, Furtak-Cole, Mejia, & Etyemezian, 2021), Attachment D: A very-high resolution (20m) measurement-based dust emissions and dispersion modeling approach for the Oceano Dunes, California) (Glick, Gillies, Mejia, & Etyemezian, 2019), Attachment E: March 12, 2021 Letter from CGS to State Parks). The February Report refers to the state and federal exceedances of PM-10 when there has not been a federal PM-10 exceedance since 2014. CARB has stated the State PM-10 standard is more of a goal and is regularly exceeded in many parts of the state, most notably in California's Central Valley.

Per the requirements of the SOA, CSP is working with DRI to quantify the effects of off-highway vehicle (OHV) operations and emissions at the SVRA. DRI is in the process of completing a report that synthesizes seven years of PI-SWERL (dust emission) data at the SVRA.

The February Report states:

> if focused on the foredunes (which is where such permanent changes have been focused thus far), would effectively near eliminate camping as an option at the Park in the area where it is currently allowed, south of Post 2 (page 100).

This statement is not correct. Many of the projects are in the foredune zone, but not necessarily within the camping area. State Parks is currently working with the SAG, the APCD, and DRI to reduce emissions at the Mesa 2 monitoring station. These projects are not on the beach but are further back in the more heavily traveled dunes areas.

On page 95, the Coastal Commission Staff Report states:

> dust emissions associated with operations at the Park have resulted, and continue to result, in air quality problems inland of the Park, including leading to exceedances of state and federal ambient air quality standards for particulate matter equal to or less than 10 and 2.5 microns in size.

CSP has not exceeded PM-10 since 2014. According to DRI (see Attachment C DRI Increments of Progress), the PM-10 emissions at the CDF monitoring station have improved by 45%, and mass emissions have reduced by 22% once the projects are installed in 2021.

On page 96, the Coastal Commission Staff Report states:

> Two APCD studies have concluded that OHV activity is a major contributing factor to the high particulate matter levels recorded inland of the Park, including on the Nipomo Mesa and further inland locations, and that the primary emissions causes are direct as well as indirect impacts associated with OHV use.

CSP is currently working with the APCD, CARB, DRI, and Scripps Institute of Oceanography (Scripps) to better understand the different components of PM-10 concentrations downwind of Oceano Dunes SVRA. The SAG hypothesis is that most of PM-10 is made up of dust from the dunes. The Scripps report found dust to be a fraction of the PM-10 with (water and other) components of the PM-10. Particulate matter from the combustion of off-highway vehicles' engines has not been proven to be a significant portion of the current studies.

A correction is needed about the SAG on page 98 of the February Report:

> The SOA also included the formation of a Scientific Advisory Group (SAG) to provide advice to APCD on all technical air quality matters and recommendations related to the SOA and to achieving Rule 1001 compliance.

The SAG advises Parks on matters related to air quality at Oceano Dunes SVRA. The SAG is an independent group of international experts whose primary function is to review and guide the science around dust control and dust mitigation efforts at the SVRA.

On page 99, the February Report states:

> …even more recent SAG/APCD air quality modeling has suggested that roughly 800 acres, or more than half of the pre-dust control OHV/camping area, may need to be permanently retired from OHV/camping use and revegetated to meet APCD Rule 1001 requirements for dust abatement for air quality and public health reasons. In any case, whether it is a total of 500 acres or 800 acres or something in between, it appears clear that significant additional permanent dust control mitigation is going to be required by APCD to meet air quality and public health requirements.

The statement mischaracterizes the SAG's current work to examine the SOA standards based on updated modeling and new information related to secondary effects dust control projects. The SAG and CARB believe that the secondary results of dust mitigation projects are likely to be significant. State Parks is currently working with the

SAG and DRI to explore the secondary effects and how that may influence the SOA's goals (see Attachment B: the proposal Secondary Effects of Dust Control Projects).

On page 100, the February Report states:

> Thus, while State Parks has already removed over 150 acres of dune ESHA from the riding and camping area by that CDP, and has commenced vegetative restoration of these areas, significantly more such area may be required to be retired by the APCD to abate the acute public health problems according to APCD modeling to date. In fact, modelling suggests that some 800 acres may have to be permanently retired and restored to result in the needed changes to address the dust, air quality, and public health issues associated with vehicular/OHV activities at the site.

It is incorrect to state this is an APCD model. It is a DRI model that the SAG had adopted as per the SOA. Also, the 800-acre number may be high. More information will be revealed in the Secondary Effects of Dust Control Projects study.

Page 100 of the February Report incorrectly states the number of acres for dust mitigation projects. State Parks installed over 230 acres of dust mitigation projects, with over 190 acres inside the riding area.

On page 103, the February Report states:

> The science points to the need to abate the dust by allowing the dunes to be restored, and restoring the dunes can only occur when they are not constantly being demolished by vehicular/OHV use.

The APCD, with statutory authority over air quality issues in this area, has not advocated for a cessation of OHV activity. Additionally, the SAG states:

> from an air quality perspective the work of the SAG thus far indicates that there is a workable approach to achieving the targets set by the SOA while retaining some level of off-highway vehicular activity at the ODSVRA. We would like to make sure that these scientifically informed findings, which are reflected in multiple Parks reports in response to the SOA, are appropriately considered within broader debates about management of the ODSVRA. (Nickling, 2021)

In paragraph 1 of page 102, the February Report states:

> … State Parks and APCD have targeted their dust abatement efforts at restoring the dune landform by ceasing riding activity and planting native dune vegetation, especially in the foredune areas (nearest the beach and ocean) that have been

> identified as being the most emissive and the highest source of dust,116 and which correspond with the most frequently used OHV riding areas.

CSP has been working with the SAG and DRI to target more emissive areas based on the emission monitoring calculated in the model. The projects are at various parts of the dune complex and are not all focused on the beach. Refer to the dust mitigation project map for more detail.

Rather these efforts focus on specific surface treatments in select areas to address dust control needs. Some of those efforts may use native dune vegetation, while others involve surface stabilizers, wind fencing, or other treatments. This suite of projects is informed by monitoring and scientific analysis.

In paragraph 3 of page 103, the February Report states:

> … SAG has found dune revegetation efforts to be a critical component to dust mitigation. And the proposed dust mitigations – retiring certain areas from vehicular, OHV and camping use and permanently restoring them to vegetated dunes – is both needed and working to reduce downwind dust emissions.

The dunes are naturally sandy and were never fully vegetated, as per 1930s aerial imagery. In some cases, CSP restores native dunes vegetation to areas where it would have been in the past, as per the aerial imagery. In other instances, CSP uses native dune vegetation to reduce sand movement on the dunes.

On page 86, the February Report states citing Attachment 9:

> When foredunes and back dunes are impacted such that the vegetation is removed, the dunes revert to active moving dunes that often overtake and bury wetlands and other areas of sensitive dune habitat. This has happened in the area of street legal vehicle and OHV use at Oceano Dunes where wind erosion has resulted in blowouts larger than would naturally occur and masses of unstable sand now dominate the landscape.

As stated above, CSP has significantly increased dune vegetation since the baseline 1930's condition with an estimated 200 acres of vegetated dune habitat between Arroyo Grande Creek and Oso Flaco Lake. There is more vegetation in this area currently than in the 1930s. The assumption that the dune field's natural condition would have more vegetation absent OHV activity is not supported by documentation. The earliest known photos of the area show substantially less vegetation and more active open sand sheets than currently exist.

Community Outreach and Environmental Justice

CSP fully recognizes the overarching environmental, social, and public health issues that feed environmental justice issues as articulated in the February Staff Report. This issue is especially true for the traditionally underserved and underrepresented populations in the nearby communities of Oceano, Nipomo, Santa Maria, and Guadalupe.

The February Report focuses on the singular and unique off-highway recreational activities at Oceano Dunes SVRA while providing no recognition or substantive analysis of inherent and existing social, political, and natural/environmental conditions also in play in developing environmental justice issues in these communities.

CSP is committed to applying environmental justice to its planning efforts to serve all Californians equally. State Parks also manages about one-third of California's coastline and recognizes the importance of the CCC's policy in providing equitable access to coastal resources. PWP development has followed the CCC's Statement of Environmental Principles and State Parks' guidance regarding environmental justice when planning and developing the PWP's goals, principles, programs, and projects.

Tribal Issues - Background

CSP has an active and ongoing historic preservation program and has coordinated with the State Historic Preservation Officer (SHPO) formally since 1982. In addition to compliance with provisions of CEQA to protect, avoid and/or mitigate any impacts to historical, archaeological, or tribal cultural resources, as a state agency, CSP also must comply with PRC Section 5024 and 5024.5. These mandates require state agencies to hold an inventory of such resources and formulate policies to implement all prudent and feasible measures to protect and maintain all state-owned historical resources.

One of our cultural resource management program elements is regular Native American consultation with identified tribes and groups as determined by the California Native American Heritage Commission. Cultural resource preservation is a core element of the Department's mission. CSP has undertaken consultation for decades and has had a formal Native American Consultation Policy since 2006, years before the 2014 passage of Assembly Bill-52, which required state agencies to include Native American consultation and recognize tribal cultural resources during CEQA review and actions (PRC § 5097.94, 21073, 21074, 21080 to 21083 et al.).

Native American Consultation during the PWP has occurred with several identified tribes and groups. The Northern Chumash and Yak Tityu Tityu Northern Chumash being two of those who have requested and undertook formal consultation. The Tribes

have concerns about the protection of known archaeological sites within the Parks and what they consider to be “sacred natural places” associated with their peoples and culture. For the record, the Native American Heritage Commission has confirmed that there are no formally recorded tribal cultural resource sacred sites listed currently for the Park property. This finding is not unusual as the Department often receives input during consultation on areas that Native American tribes see as culturally significant regardless of formal documentation as such.

However, without any formal determination of qualification of such tribal cultural resources within Oceano Dunes SVRA lands as defined in Assembly Bill 52 (AB-52) (PRC §21074), no assessment of significant adverse change can be made. Additionally, the February Report misstates claims of known Native American tribal remains within the current SVRA riding areas, which is not accurate.

CSP recognizes these comments received from Tribes during consultation and will continue to consult on these and other issues to protect known and potential tribal cultural resources.

This approach is consistent with AB-52 and department directives to undertake consultation, consider all input and attempt, when prudent and feasible, measures to address such potential impacts with agreed-upon mitigation measures. PRC Section 21084.3 et al. also directs that if mitigation measures are not otherwise identified and agreed upon, that the agency can consider a range of other treatment, recognition, and management measures to avoid or minimize potential impacts.

There are no provisions in CEQA PRC §5024.5, AB-52, or the Coastal Commission’s Native American Consultation Policy that require an agency to implement all requests or input received during the consultation. The statement (Coastal Commission Staff Report page 5) that “what the tribes want is *what* the law actually *requires*” is incorrect in its assessment of environmental mandate requirements of implementing Tribal Consultation recommendations.

A detailed LCP consistency analysis relative to applicable cultural resource LCP policies is included in Draft PWP Section 4.6 Archaeological and Paleontological Resources.

Applicable Coastal Act and LCP Consistency

Standard of Review

The February Report presents a complex policy consistency analysis for the Parks’ existing OHV recreation, acknowledging that the analysis is “rather circular – cross-referencing other LCP policies, which cross-reference the CDP’s conditions, which

themselves cross-reference the LCP"(page 73 of the February Report). The "circular" analysis provided by Coastal Commission staff creates confusion relative to the appropriate standard of review for the Coastal Commission's action and interjects bias-based broad interpretations under Coastal Act policies when the legal standard of review is the LCPs. This is an important point because the Coastal Commission, in approving the original CDP for the Park (and each CDP amendment), considered the need to protect the unique and significant public access and recreational uses offered, including OHV recreation with the need to protect sensitive coastal resources. The Coastal Commission struck a careful balance between active recreation and resource protection, finding the Park's uses consistent with applicable Coastal Act policies. This balance was then embedded in the SLO LCP's detailed policy framework once certified by the Coastal Commission and further reiterated by the Coastal Commission in every condition compliance and annual review conducted for the CDP for almost four decades.

The SLO LCP and the Coastal Act's on public access and recreation policies are the standard of review for all Coastal Commission decisions affecting OHV recreation within the areas of Oceano Dunes SVRA at issue (except those uses located in tidelands, submerged lands, and lands that are subject to the public trust), and the SLO LCP explicitly and specifically acknowledges vehicle use in designated areas as permitted and perpetual. Coastal Commission staff's new interpretation that OHV recreation is not allowed in areas the SLO LCP specifically designates for such use because the entire SVRA is ESHA not only conflicts with the explicit policy language of the SLO LCP but seeks to essentially retract the Coastal Commission's prior approval and findings of consistency, ignoring the balance that was struck through the CDP and subsequently codified in the LCPs with specific policies to manage and preserve the Park's recreational uses and protect sensitive coastal resources as required by state and federal law.

Coastal Commission staff's conclusion regarding policy inconsistency is based on two primary premises: 1) the development and management authorizations included in the CDP, and therefore the Park-specific policies and standards contained in the SLO LCP were interim and temporary, and therefore cannot be interpreted to allow for or govern continued OHV activities within the Park, and 2) even if the SLO LCP does specifically provide for continued OHV recreation in the Park, Oceano Dunes SVRA is ESHA, OHV recreation is not a resource-dependent use; therefore the existing OHV recreation is prohibited under the Coastal Act and must be phased out.

As noted, this more contemporary staff interpretation is not consistent with the several decades of Coastal Commission actions and findings acknowledging OHV recreation as an ongoing and legislatively mandated recreational activity, subject to appropriate

management measures to ensure the protection of coastal resources. Coastal Commission staff's assertion regarding the interim and temporary nature of the CDP also does not comport with the precise terms of the CDP, nor does it agree with the clear policy discussion and directives of the SLO LCP.

Coastal Commission staff's interpretation that the CDP and SLO LCP identified "interim and temporary allowable uses" is not correct. As discussed in more detail in the Planning Processes and Permitting section of this letter, the Coastal Commission's CDP and subsequent amendments authorized new development in the form of management measures identified by State Parks as necessary to manage the recreational uses of the Park. While several of the management measures involved ongoing planning efforts and acknowledged that adjustments in management measures could be necessary based on further studies (which were completed and approved (see discussion of entrance and carrying capacity studies in the Elimination of the Pier Avenue Entrance and Public Access and Recreation sections of this letter, respectively), there is not a single reference in the CDP to changing the underlying uses of the Park. Nor would we expect there to be such terms given that the recreational uses existing at that time were well established before Coastal Act and not subject to CDP requirements. The interim nature of the CDP authorization applied to the management measures triggering the need for the permit in the first place, meaning those proposed changes meeting the definition of development under the Coastal Act (i.e. the entrance improvements, fencing, habitat restoration, use limits, etc.) The CDP's special conditions reinforce this fact, wherein Special Condition 2 limits the Commission's ability to address Park management concerns via the annual review process to instituting "an alternative approach to resource management, or set of management measures". The CDP includes no provision for changing the basic uses of the Park and no ability for the Commission to revoke the permit, but provides for a collaborative approach to addressing recreational and resource needs on an ongoing basis as reflected in the last Coastal Commission action on Amendment 5 to the CDP in 2001:

> Balancing the legislatively mandated recreational requirements of the off-highway vehicle enthusiast with the numerous other Federal and State mandates is a challenging task. Overall, it is important to evaluate State Parks' proposal for maximum consistency with the resource protection policies of the Coastal Act, while acknowledging the Oceano Dunes SVRA's enabling legislation…
>
> Overall, adaptive management appears to be very appropriate in this particular regulatory situation. Rather than only establishing a specific limit of users within the park, adaptive management leaves open the possibility for subsequent changes to data collection, program evaluation, and management reaction as new information is discovered over the long-term. Although interim vehicle limits

> should be established as a baseline for future analysis, any changes in use limitations would follow from this on-going systematic monitoring and management approach. More generally, Commission participation in an on-going adaptive management approach will allow for better balancing between the Public Access, Recreation, and Environmentally Sensitive Habitat Policies of the Coastal Act over time rather than through more limited permit decisions. Finally, adaptive management through something like a TRT more appropriately recognizes that the recreational uses of the Oceano Dunes SVRA are established by state legislation, and that the management challenge is how to balance this legislatively sanctioned activity with on-going and dynamic environmental management concerns.

It is worth noting here that the PWP proposes a new adaptive management program to continue the task of balancing the Park's existing public access and recreational uses with resource protection and management laid out by the Coastal Commission, CSP, and SLO County in the underlying CDP and SLO LCP, and we hope to have an opportunity to review this element of the PWP with Coastal Commission members and staff at a future hearing on the PWP.

LCP Consistency Review

Concerning the SLO LCP, the February Report includes quotes from the LCP's narrative, implying that the serious issues and concerns with OHV use in the Park identified in that narrative still plague us today. However, it must be noted that the SLO LCP narrative reflects conditions in the Park existing at that time, nearly 40 years ago. It predates the implementation of the management measures proposed and required under the CDP, as amended, and the many additional management measures voluntarily implemented by CSP over the years. The SLO LCP narrative speaks to "uncontrolled access to beach and dunes," "unrestricted vehicle use," and disturbance to sensitive vegetation, including Dune Lakes and Oso Flaco Lake. These issues have been addressed, with significant portions of the park being closed to OHV use and subject to habitat restoration, and numerous management measures implemented to ensure coastal public access and recreation are maximized in conjunction with sensitive resource protection. The Commission's actions on the CDP and subsequent condition compliance and annual reviews confirm this.

As noted, many management measures enumerated in the CDP were incorporated into the SLO LCP upon certification by the Commission. As with the CDP, the SLO LCP does not dictate "interim and temporary allowable uses" at the Park. Rather, it addresses the need for resource protection and potential adjustments in management measures based on additional studies (subsequently completed and approved by SLO

County, as discussed in the LCP Consistency Review Section). The SLO LCP clearly states:

> Certain factors must be recognized in development of the two state park units [i.e., Oceano Dunes SVRA and Pismo State Beach]. These are: 1. The Nipomo dune-wetland complex is a unique, but fragile ecosystem. 2. Historical use of the dunes has included surf fishing, clamming, and walking along the beach. These uses should not be precluded by other uses of the beach and dunes. 3. Recreation vehicle use is the dominant recreational element and will continue within the two park units, consistent with availability of staffing and facilities of the State Department of Parks and Recreation. 4. Continued use of the dunes by off-road vehicles has led to environmental degradation of this habitat and has eliminated historical daytime uses. … The critical decisions on the extent and intensity of recreational use is dependent on the ability to minimize the impacts of off-road vehicle use.

Here the SLO LCP sets out to balance recreational uses and resource protection as has the Commission, not to redesign or re-designate the Park as recommended by Coastal Commission staff.

> **Area Plan Policy 4: General Development Plan Revisions.** The General Development Plan (GDP) shall be revised in accordance with the Local Coastal Plan. The plan should identify a variety of recreational opportunities with use areas separated where possible to minimize conflicts. Passive recreational uses and nature study uses should be provided for in the sensitive vegetated areas restricted from OHV use. Approval of the GDP for inclusion into the County's LCP, or approval of a coastal development permit for a development within either Pismo Beach State Park or the Pismo Dunes State Vehicular Recreation Area, shall be subject to a finding that the State Department of Parks and Recreation is making a commitment for sufficient manpower to ensure resource protection, ordinance enforcement and access control in conformance with the conditions of Coastal Development Permit No. 4-82-[300]. Should the terms and conditions of the coastal permit not be enforced or accomplished or should they not be sufficient to regulate the use in a manner consistent with the protection of resources, public health and safety and community values, then under the county's police powers, the imposition of an interim moratorium on [OHV] use may be necessary to protect resources while long-range planning, development of facilities and requisition of equipment and manpower is completed.

The February Report cites Area Plan Policy 4 and suggests it seeks to resolve the underlying use, intensity of use, and the potential for prohibiting OHV use under the

SLO LCP if the CDP is insufficient to protect resources, public health, and safety, and community values. However, Area Plan Policy 4 does not speak to a need to address the underlying use (i.e., OHV), but a need to identify a variety of recreational opportunities with use areas separated where possible to minimize conflicts. More specifically, Area Plan Policy 4 provides for establishing passive recreational uses in the sensitive vegetated areas restricted from OHV, thus providing for use separate from the designated OHV area. There is no LCP discussion and policy directive to prohibit OHV use as suggested by the February Report. The policy speaks only to a County-initiated *"interim moratorium"* on the established and continuing OHV use, and only if necessary to protect resources "while long-range planning, development of facilities and requisition of equipment and manpower is completed*."*

> **Area Plan Policy 7: Alternative Camping Areas.** Alternative camping areas subject to the numerical limitations of Coastal Development Permit No. 4-82-[300] may be appropriate in the dunes area and beach. These are dependent upon assurance that scattered sites will still allow for adequate environmental protection throughout the dunes.
>
> Back dunes camping areas shall be identified at locations outside of the buffers. Adequate sanitary facilities shall be provided. These back dunes camping areas shall be for tent camping or camping from four-wheel drive vehicles that can gain access to them. With provision of adequate improved facilities, heavier units (which would have a greater environmental impact when accessing the dunes) should make use of the designated staging area. For major events such as hill climbs and competitions, state parks may authorize special access from the Oso Flaco causeway where it can ensure that adequate habitat protection exists.
>
> Beach camping in conformance with the numerical limitations of Coastal Development Permit No.4-82-[300] shall be permitted where it can be established that: a) administration of the entire park unit would not be adversely affected, b) control of total users can be maintained within acceptable carrying enforcement/ capacity. The General Development Plan must identify area(s) for beach camping which would minimize conflicts with other users of the sandy beach. (It is estimated each campsite can accommodate from five to eight persons). Consistent with the provisions of Coastal Development Permit No. 4-82-[300], this limit can be adjusted either upward or downward based on monitoring of the impacts of this use.
>
> In addition, to the camping facilities for ORV users, the GDP must identify overnight and day use areas for non-ORV users, including hikers, horseback riding, etc.

> Peak ORV use on the six major weekends must be closely monitored to evaluate the impacts. Monitoring data shall be reviewed jointly by State Department of Parks and Recreation, the county, Department of Fish and Game and the Coastal Commission on an annual basis. Long-term reduction of the peak use may be necessary to ensure adequate resource protection.

Area Plan Policy 7 provides a specific set of development standards to address new and expanded alternative camping areas within the dunes for tents and vehicles, avoiding established buffers, providing sanitary facilities, adjusting use limits, and providing additional, not replacement recreational opportunities. The policy does not state or imply the uses described are interim and temporary but describes requirements for continued and expanded uses.

> **Area Plan Policy 8: Habitat Protection.** Natural buffer areas for sensitive habitat areas shall be identified and fenced, consistent with the provisions of Coastal Development Permit No. 4-82-30A and the stabilized dune areas. Habitat enhancement programs shall be undertaken for the following areas including programs such as stabilization of the dunes with appropriate native vegetation to protect encroachment on wetlands and surrounding agricultural land. (LCP)
>
> a. Dune Lakes
>
> b. Coreopsis Hill
>
> c. Oso Flaco Lake
>
> d. Little Oso Flaco Lake
>
> Fences or other appropriate techniques shall be maintained where needed to preclude vehicular access in such areas as the Dune Lakes, Oso Flaco Lake, and natural areas in the eastern portion of the park and lease area. (SLO County LCP)

Despite the language of Area Plan Policy 8, the February Report suggests that the policy provides:

> an even more protective policy than the base CDP as it applies to sensitive habitat areas under the LCP, requiring that they be identified and put off-limits to these high-intensity vehicular uses" thus requiring "that portion of the Park…to be put off-limits to vehicle/OHV.

This interpretation of Policy 8 dismisses the plain language included in the policy itself, the balance of the LCP, and the specific conditions of the CDP. This policy's intent is clear: fence and protect natural buffer areas as identified in the CDP (determined by description and figures) and restore and protect the areas containing Dune Lakes, Coreopsis Hill, Oso Flaco Lake, and Little Oso Flaco Lake. This policy requires nothing more and, under the interpretation in the February Report, would conflict with other Park-specific policies providing for OHV use in unvegetated dune areas.

> **Area Plan Policy 9. ORV Use Area.** ORV use shall be permitted only in identified unfenced vehicular use areas. These areas are identified in Figure 4. No recreational ORV use will be allowed in the designated natural areas. These buffer areas reflect areas required for habitat protection and generally recognize the established lease agreement with Union Oil for the areas adjacent to the eastern portion of the park. ORV is prohibited in all vegetated areas.
>
> ORV use of the county held portion (generally lying between the sandy beach and Dune Lakes) shall be limited to the Sand Highway west to the sandy beach. This will minimize conflicts with the Dune Lake Properties to the east and the State Department of Parks and Recreation Dune Preserve to the north. The map of ORV use areas indicates a buffer area along these critical interface areas.

In its interpretation of Area Plan Policy 9, The February Report turns back to its LCP narrative citations, summarized without current context as explained previously, to the incorrect assumption that the CDP and LCP authorized only interim and temporary uses. Coastal Commission staff presume that in preparation of the LCP, the County intended to phase out OHV use. However, Policy 9 and Figure 4 are not best understood as part of the LCP narrative, reflecting conditions and concerns existing 40 years, as suggested by Coastal Commission staff. Rather, Policy 9 and Figure 4 are best understood in context with the companion policies and provisions of the certified LCP, meant to address the concerns cited in the narrative, which reflect the actions of the Commission on the underlying CDP. In this regard, Coastal Commission staff's analysis fails to review applicable LCP policies in the full context of the LCP, including its complete policy text and land use and zoning designations. The authorizations included in the CDP clearly allow for OHV use within designated areas at the Park.

As noted, despite the February Report's suggestion that the LCP identifies interim and temporary OHV uses only, the County's LCP identifies OHV use as the "dominant recreational element" of the Park and one which "will continue within the two park units…". The LCP's emphasis on preserving active recreational uses within the Park is undeniably supported by the LCP's land use designation maps illustrating those Park areas that have been designated as Recreation. It identifies the State Beach and SVRA

as the major visitor attraction in the coastal zone and providing for a wide variety of passive and active recreation opportunities including clamming, driving on the beach and recreational vehicle use within the dunes. The LCP's land use designation maps also illustrate those Park areas designated as Open Space, identifying areas as important buffer zones to protect the vegetated back dunes and dune lakes. Only passive recreational activities that are consistent with the protection of the sensitive habitat are permitted. The County's Recreation and Open Space land use designations for the Park largely reflect historical patterns of OHV use and directly reflect the Park-specific CDP and LCP policy requirements. These are relative to restricting OHV use to non-vegetated dune areas and allowing only for resource-dependent passive recreational uses in vegetated dune areas designated as Open Space.

In addition to the LCP's land use designation maps, the SLO LCP South County Area Plan contains Figure 4 (San Luis Obispo County, 1988, pp. 8-11), which guides in implementing the specific policy directives related to limiting OHV uses to unfenced and unvegetated dune areas and maintaining natural buffer areas for the protection of surrounding sensitive habitat areas. Figure 4 identifies the entirety of the La Grande Tract as a buffer area, where OHV would typically be prohibited, which does not accurately reflect SLO LCP policies that specifically acknowledge and provide ongoing OHV use of the property. However, Figure 4 must be reconciled with actual conditions on the ground, the land use designation maps contained in the SLO LCP, prior Commission findings for certification of the SLO LCP and approval of the CDP, and the specific LCP policy directives the map is intended to support.

Figure 4 was first included in the 1981 draft LCP and accompanied by text proposing that the Park be closed to recreation and camping until CSP designed and funded a plan making Oso Flaco Lake the primary camping area and access point for the Park. The Coastal Commission eventually rejected the draft LCP in part because it found the plan conflicted with the intent of the Coastal Act to "maximize public access and recreational opportunities for all the people" and that Oso Flaco Lake was too environmentally sensitive for the suggested uses. In 1982, prior to approving the County's revised LCP, the Coastal Commission approved the CDP, including OHV recreation and camping within the La Grande Tract and other areas identified as buffers in Figure 4. When the County LCP was certified in 1984, it was revised to include policies to reflect the approved CDP conditions, which specifically acknowledge and provide ongoing OHV use of the La Grande property. Under the terms of the CDP, OHV use of the La Grande Tract was limited by perimeter fencing to be installed along the Sand Highway (or along the ridge just eastward of the Sand Highway), and fencing installed a minimum of 100 ft. from the vegetated areas except along Sand Highway where the fence would encroach into the Sand Highway travel corridor.

The February Report suggests that because Figure 4 illustrates the La Grande Tract as a buffer area, the County intended to phase out OHV. Here again, however, this conclusion ignores the policy's explicit language and the CDP conditions upon which it is based, which articulate OHV as an allowable use in this Park area. Figure 4 was not refined to reflect the Commission's approved CDP conditions nor the Commission's final decisions on the SLO LCP. Figure 4 erroneously shows County ownership as extending to the shoreline. It incorrectly shows the entire property as buffer and includes Oso Flaco Lake as a staging area, clearly in conflict with the Commission's decisions. Add to this the fact that SLO County designated the entire La Grande Tract as Recreation, allowing for active recreational uses, and signed on to a 25-year operating agreement with CSP just one year after the Land Use Plan was certified. It is hard to imagine SLO County intended to phase out OHV as Coastal Commission staff suggests. If SLO County viewed OHV use within the La Grande Tract as interim and temporary, intending to phase it out, it is more likely the County would have designated the entirety of the La Grande Tract as Open Space. As with other Park areas specifically identified for resource protection and only passive recreation, it is unlikely SLO County would have signed on to a 25-year operating agreement as described.

> **Area Plan Policy 10. Administration of County Holdings.** The county-owned land south of the dune preserve shall be administered through a memorandum of understanding between the county and the State Department of Parks and Recreation. Management of the facility has been assigned to the State. This shall be reexamined periodically to establish the most appropriate management capability. (LCP)

Coastal Commission staff interpret Area Plan Policy 10's provision for reexamining management capability of the La Grande Tract periodically as reaffirming the interim status of OHV use of the property. This suggests that "different conclusions about La Grande's use could, and would, be ascertained in the future." However, as discussed above, the record does not support the Coastal Commission staff's position. The County has designated the La Grande Tract for active recreation, undeniably allows for OHV use on the property, and the SLO LCP identifies OHV use as the dominant recreational element of the Park. This use is expected to continue as is provided for by the SLO LCP's park-specific policies.

Environmentally Sensitive Habitat Areas

As explained in the draft PWP, the SLO LCP's SRA combining designation maps are only the first step in determining the potential presence and extent of ESHA within a project area and identifying appropriate uses based on those determinations. The SLO LCP directs that the location of development near sensitive resource areas is to be

determined by the actual location of the resource, rather than the boundaries as shown on the SLO LCP SRA combining designation maps considering the general health of habitat on the project site; assessing the level of habitat fragmentation; the level and duration of development/uses in and around the project site; describing the health and species composition of the habitat; and examining the level of connectivity of habitat the project site to other nearby locations. In the case of dune ESHA, a clear distinction is made in the SLO LCP between bare sand areas historically disturbed by Park uses versus naturally vegetated and/or disturbed dune habitat. This is consistent with the Commission's findings for approving CDP 4-82-300 and subsequent amendments, acknowledging and providing for ongoing Park uses in historically disturbed dune areas while mandating protection of adjacent sensitive habitat areas.

The February Report claims that the SLO LCP does not allow for such site-specific determinations in designating ESHA and defining allowable uses, indicating that "there is nothing in the LCP that establishes a process for mapped ESHA to be determined not to be ESHA… As such, the LCP's ESHA maps are determinative as to what constitutes ESHA under the LCP." Coastal Commission Staff's position here is not supported by the facts and conflicts with the Commission's common Statewide practice of basing ESHA determinations on site-specific evaluations instead of broad SLO LCP mapping resources, including for Commission decisions involving the SLO County's certified LCP.

The process for site-specific ESHA evaluations under the SLO LCP, and the ability for the Commission to render an ESHA determination different from what is illustrated on the SLO LCP maps, is laid out in detail in the Commission's approval of a subdivision project on appeal A-3-SL0-03-117:

> As described previously, the LCP generally uses a map based system to identify areas where new development needs to be closely reviewed for conformance with the LCP provisions protecting ESHA and uses "combining designations" as geographic overlays that identify particular resources or constraints that need to be considered during the development review process... It should be noted that the issue of reconciling outdated LCP maps with actual resource conditions was detailed in the Commission's review of the Periodic Review of the San Luis Obispo County LCP adopted by the Commission in July 2001. The County has recently responded to the Commission's concern in their most recent Periodic Review Implementation LCP amendment submittal to the Commission (SLO-MAJ-1-03). In that submittal, which the Commission certified on February 20,2004 and that is now in effect, the County incorporated the Commission's suggested modification that more specifically and directly references the rules of interpretation for resolving questions regarding projects which may be appealed to the Coastal Commission based on the location of development within a

> Sensitive Resource Area. As stated by the Commission's findings on page 37 of SLO-MAJ-1-03 (Phase I Periodic Review Implementation) the purpose of this modification was to clarify that "the location of development in relationship to sensitive resource areas must be determined in accordance with the actual location of the resource, rather than a depiction on a map". (California Coastal Commission, 2005, pp. 20-21).

In this appeal case, the Commission approved the project even though Coastal Commission Staff determined the project improvements to be located within a much larger ESHA area (in this case, indigenous Monterey pine forest). Thus, it was located almost entirely within an ESHA. The Commission's decision was based on the site-specific conditions of the site that reflected past disturbances, noting that previously developed areas and existing roads within the ESHA "are not themselves ESHA."

State Parks acknowledges that the Coastal Commission has in the past considered the entire dune system ESHA. Still, it has repeatedly determined that OHV use is consistent with the Coastal Act and SLO LCP to implement appropriate measures to ensure the use is limited to previous and historically disturbed areas. This measure minimizes impacts to the sensitive vegetated dune habitats as identified under the SLO LCP's park-specific policies and accompanying site-specific habitat determinations. As indicated by the Commission's decision approving CDP Amendment 3:

> The Commission finds that while the proposed amendment would result in the opening of additional dune areas to OHV entry and use, the additional areas are those which do not contain sensitive vegetation or wetland habitats and their accessibility to vehicles use will not result in damage to such habitats.
>
> The areas opened by the fence relocations are areas which are historically unvegetated open sand, or are areas which have been damaged so extensively by past vehicle entry that revegetation is unlikely. The new fence alignment is intended to protect existing vegetated areas without restricting large areas of open sand suitable for OHV recreation. The Commission finds that the proposed amendment is consistent with PRC 30240 of the Coastal Act, the San Luis Obispo County certified LUP and the expressed intent of Coastal Permit 4-82-300.

As further explained in the Commission's decision approved CDP Amendment 5:

> Oceano Dunes SVRA itself is divided into different regions based upon allowable activities and include areas set aside strictly for resource protection, street legal vehicle use, and a combination of street legal/off-highway vehicle use (see Exhibit 3). The separation and delineation of these specific areas was developed

> through the past cooperative efforts of the Coastal Commission and County of San Luis Obispo Board of Supervisors, the California Department of Fish & Game (DFG) and the California Department of Parks & Recreation (CSP).
>
> Vehicles have been driven on the beach at Oceano for at least 70 years (as of 2001). Prior to the 1980s, vehicles were operated on the entire 16 miles of beach from Pismo Beach to the north to Mussel Rock in Santa Barbara County to the south. Now, street-legal vehicles are allowed on approximately five miles of the beach from Grand Avenue to the southern boundary of the Oceano Dunes SVRA and OHVs are restricted to about three miles of the beach, from a point one mile south of Pier Avenue (Milepost 2) to just south of Milepost 8, and on the dunes inland about two miles. The most southern and eastern portions of the Oceano Dunes SVRA are closed to vehicle use.
>
> On June 17, 1982, prior to certification of San Luis Obispo County's Local Coastal Program, the South Central Regional Coastal Commission approved coastal development permit 4-82-300 to allow State Parks to construct protective fencing around sensitive habitats and place two kiosks for access control. This permit, including four subsequent amendments, addressed the number of users to be allowed in Oceano Dunes SVRA (Special Conditions 3B, 3D, and 6).

Here again, the Coastal Commission acknowledged the historical uses of the Park, the analysis and balancing that went into designating areas within the Park based on allowable activities (including street-legal vehicle use), the combined use of street legal and OHV use, and identified sensitive resources. It is worth noting that the Coastal Commission cited the underlying CDP and its conditions in the correct context of addressing the “number of users to be allowed in the Oceano Dunes SVRA” for resource protection purposes, not the types of uses allowed.

In the case of dune ESHA, a clear distinction is also made in the SLO LCP between dune areas historically disturbed by Park uses (and therefore void of vegetation) versus naturally vegetated and/or restored dune habitat, consistent with the Coastal Commission’s findings for approving the CDP and subsequent amendments and annual reviews, acknowledging, and providing for ongoing Park uses in historically disturbed dune areas while mandating protection of adjacent sensitive habitat areas. As detailed previously, the SLO LCP designates most of the designated OHV use area as Recreation and specifically identifies portions of the Park for OHV use:

> Recreation
> Most of the lands designated in the Recreation land use category are located in the dunes and wetlands adjacent to the coast. The ocean, beaches and dunes are the principal tourist attractions of the South County. (LCP)

> The coastal dunes are proposed by the State Department of Parks and Recreation for an expansion of the Pismo State Park and State Vehicular Recreation Area. These two contiguous state park units encompass over 2,000 acres of beaches, wetlands, and sand dunes. Combined, the state beach and vehicular recreation areas are the major visitor attraction within the coastal zone with over three million visitors per year according to the State Department of Parks and Recreation. Providing a wide variety of recreation opportunities, the parks are famous for clamming and driving on the beach and recreational vehicle use within the Dunes. Existing facilities include a golf course and two developed campgrounds. A major staging area must be developed to serve as the primary access to the dunes for off road vehicle users. Alternate camping areas, habitat buffers, and identified off-highway vehicle use areas must be addressed in revisions to the General Development Plan for this state park unit. Detailed standards by which the General Development Plan will be measured are found in the Planning Area Standards chapter. (LCP)

The relevant Planning Area standards are cited and addressed in the Planning Processes and Permitting section of this letter, and as addressed in that section, provide clear direction as to the location and Park management measures that allow for ongoing OHV use within the areas designated for that specific purpose. The SLO LCP's reference to a General Development Plan revision is necessary if or when future development or uses are proposed beyond what the General Plan already envisions for the Park. In summary, the Planning Area standards provide for:

- Area Plan Policy 4 - Identifying a variety of recreational opportunities with use areas separated where possible to minimize conflicts, and establishing passive recreational uses in the sensitive vegetated areas restricted from OHV, thus providing for use separation from the designated OHV area.
- Area Plan Policy 7 – providing for alternative camping areas for tents and vehicles, avoiding established buffers, provision of sanitary facilities, adjusting use limits and providing additional, not replacement, recreational opportunities.
- Area Plan Policy 8 - Fencing and protecting natural buffer areas as identified in the CDP (which are identified by description and figures), and restoring and protecting the areas containing Dune Lakes, Coreopsis Hill, Oso Flaco Lake and Little Oso Flaco Lake.
- Area Plan Policy 9 - Limiting OHV use to identified unfenced vehicular use areas and prohibiting recreational OHV in the designated natural areas as identified in the LCP, and limiting OHV use of the La Grande Tract to Sand Highway west to the sandy beach to minimize conflicts with the Dune Lake Properties to the east and the State Department of Parks and Recreation Dune Preserve to the north.

In addition, the LCP includes Policy 37 in its Coastal Plan Policies, which states:

> Policy 37: Recreational Off-Road Vehicle Use of Nipomo Dunes
> Within designated dune habitats, recreational off-road vehicle traffic shall only be allowed in areas identified appropriate for this use. Detailed recommendations concerning protection of the dune habitat within Pismo State Beach and Pismo Vehicular Recreation area are found in the chapter regarding Recreation and Visitor-Serving Facilities [this policy shall be implemented as a standard].

The February Report dismisses the allowance of OHV use within designated dune habitats provided in Policy 37, summarily concluding that the policy allowance must only apply to "other areas in the Nipomo Dunes complex (that includes but occupies a much greater area than the Park) that might be dune but not ESHA, and not the Park." The interpretation in this regard is not correct. The SLO LCP and its regulatory policies address only land areas located within the County's Coastal Zone, not beyond. The policy itself supports OHV use in designated dune habitats, consistent with the conditions of the underlying CDP and SLO LCP Planning Area standards, which collectively provide clear and concise direction as to the management measures that allow for ongoing OHV use within the dune areas designated for that specific purpose.

Balancing Recreation and Sensitive Resource Protection - Conflict Resolution

Throughout the February Report, staff cites the Coastal Commission's previous ESHA determination for the Park and the County's Sensitive Resource Area combining designation maps, declaring that the entire designated OHV riding area is ESHA. Therefore, it opines, OHV is prohibited throughout the Park. This analysis does not reconcile with the record that a Commission-approved CDP and Commission-certified LCP designated OHV riding area prohibits OHV use. Although the CDP and SLO LCP (including underlying land use designation maps, site-specific improvement maps, and specific conditions and policy directives) allow for OHV in designated areas, Coastal Commission staff insist the use is prohibited due to the ESHA designation, and there is no means of concluding otherwise.

Without justification, this ignores the Coastal Commission's prior actions and findings, concluding that the Park's OHV use is permitted within the designated OHV area, regardless of any ESHA designation. The Coastal Commission previously acted to carefully balance public access, active recreation, and resource protection, defining specific use areas based on site-specific habitat delineations, collaboratively identifying appropriate management measures, and finding all the Park's uses consistent with applicable Coastal Act and LCP policies. The Coastal Commission's repeated decisions

to balance these important coastal policy mandates, allowing for impacts to ESHA which may otherwise not be allowed to preserve and maximize public access and recreation, was not the first or last time such a decision would be made. These types of balancing decisions, in current terms, are now referred to as conflict resolution.

For example, in 2017, the Coastal Commission approved a new campground facility at Fort Ord Dunes State Park. This non-resource-dependent project included RV sites, tent sites, walk-in sites, and other development impacting ESHA to balance the need to maximize public access and lower-cost recreational opportunities, including priority visitor-serving facilities. For that project, the campground and roads were expected to impact 17 acres of dunes, and the project overall proposed to impact 50 acres of dunes as part of the construction. The Coastal Commission Staff Report explained the conflict-resolution findings as follows:

> Fundamentally, although portions of the proposed project might be considered interpretive (e.g., interpretive pathways etc.) and potentially allowable in ESHA, the proposed campground overall is not a resource-dependent use and it is not allowed in ESHA under the Coastal Act. In addition, the campground would occupy 17 acres of dunes once complete, and it would result in indirect impacts to surrounding dune ESHA from increased activity in the area. These ESHA inconsistencies would normally require that the project be denied. However, denial would mean that other Coastal Act objectives related to public recreational access would not be realized, as compelled by the Coastal Act's public access policies. In other words, the project presents a conflict between Coastal Act policies that protect ESHA and those that seek to achieve maximum public recreational access, including lower-cost facilities on oceanfront land suitable for recreational uses. In this type of case, the Coastal Act provides that this conflict be resolved in the way that is, on balance, the most protective of significant coastal resources. Staff believes that approval in this case would be the most protective of the various resources at issue in this proposed project, provided that inconsistencies are resolved to the maximum extent feasible to maximize the project's public recreational access benefits and to minimize/mitigate for impacts to ESHA and other coastal resources. (California Coastal Commission, 7-2017, p. 2)

Similarly, the Commission made conflict resolution findings to approve the Lawson's Landing project, where the Commission allowed ESHA impacts for approval of a 75-acre low-cost oceanfront campground, including RV sites, located in the Tomales Dunes complex. The Commission approved the project in 2011 with subsequent permit amendments, most recently in 2020. Because most of the site constituted ESHA, and because the Commission approved non-resource dependent recreational and visitor-

serving camping-related development in ESHA, the Commission's 2011 approval was based on the Coastal Act's conflict resolution provisions.

The situation at Oceano Dunes SVRA is no different in terms of the need to maximize public access while minimizing impacts to ESHA, except that, as explained above, this conflict resolution decision has already been made. It is embedded in the Commission-approved CDP and Commission-certified LCP. While there may be reasons to revisit the Park's management measures as provided for in the CDP and LCP at this time, there is no cause to revisit the Commission's prior decisions ensuring that the Park continues to be managed in a manner that maximizes public access and recreation with resource protection.

In addition, unlike the two examples cited here, the SLO LCP is unique in that it explicitly allows for OHV use in the dunes, ESHA or not. In doing so, the SLO LCP reflects the Commission's past efforts and determinations to designate the less sensitive and unvegetated portions of the dunes for OHV use while designating specific identified natural resources areas (i.e., Oceano Lagoon, Dune Lakes, and Oso Flaco Lakes) and naturally and restored vegetated dune areas for resource-dependent and passive-use recreational uses.

ESHA and the Phillips 66 project (mistakenly called Phillips 66 Improvement Project in Coastal Commission Staff Report)

The February Report states that in 2017 a CPD application was denied by the County because the proposed 20-acre extension of a rail spur from the existing developed footprint would have impacted ESHA as determined by the Commission's staff ecologist. The report goes on to state that the PWP "would lead to a similar conclusion, because the new intensive development is not allowed in ESHA under the LCP and would eliminate ESHA under its footprint." The report also states that the PWP project would "fragment ESHA, that there is no opportunity for a buffer from such development, and that the project would "raise the same types of concern about uses and intensity of use as are currently raised by the Park." These assertions are not supported by data and analysis but are merely based on statements. The Draft PWP and associated EIR are clear in that there are many unknowns about the Phillips 66 property and that it could not be developed until remediated.

Many of the more intensive uses would likely be in the developed footprint and thus would not lead to further "fragmentation of ESHA." Should the project move forward, any design would have to be based on detailed on-the-ground studies, which would aim to direct development towards an already disturbed site, inventory the site for sensitive resources, and look for opportunities for restoration. Thus by "pre-empting" any future development of the site with a statement that "all is ESHA," it would mean nothing can

ever happen at the site, preventing prospective investors from considering the site for any alternative use. Thus, it is likely condemning it to long-term industrial use, undoubtedly not the most desirable use of Coastal Zone property. Arguably, use by CSP, an agency with a dual mission of "resource protection and recreation," could be considered a better use.

Finally, the February Report suggests that the Commission-approved CDP lacks "clarity regarding what it explicitly does and does not authorize, including not being responsive to today's changing coastal resource planning landscape." CSP disagrees and submits that the CDP is crystal clear in the intent to balance coastal public access, recreation, and resource protection policy mandates, and thereby imposed a series of specific conditions, subsequently incorporated into the County LCP, to ensure that balance was to be maintained well into the future. There has been no change in the Coastal Act or LCP policy framework governing the Park. All the issues identified by Staff, sensitive habitats, special status species, and community compatibility have been addressed in prior Commission decisions on the CDP and LCP spanning several decades. The claim that "science has clarified the significant adverse impacts of these uses and intensities of uses," is unsupported given that the extent of the Park's sensitive habitat and ability to support the special status species of concern has only increased, significantly, under Parks' management as an SVRA.

The February Report also suggests that the dunes would be "vegetated" and "dust generation would cease" if OHV activity in the dunes were eliminated. Strong prevailing winds off the Pacific Ocean create the dune system that currently exists – and has historically existed. Prevailing winds create the patterns seen in the dunes on aerial photographs. This is a natural phenomenon, and healthy dunes migrate and continuously create and recreate crest and shapes as the wind shifts, both daily and seasonally. The statement that dunes would be vegetated if left alone represents a vast misunderstanding of natural dune processes. Vegetated cover in the SVRA is currently greater than historically, as District staff has undertaken tremendous efforts to plant vegetation to "stabilize" problem areas in response to the stipulated abatement order. If OHV were eliminated, and effort related to the stipulated abatement order ceased, and CSP ceased to plant vegetation and maintain existing plantings, native vegetated cover of the dunes would likely decrease, rather than increase. If vegetated cover extended on its own, it would likely be in the form of invasive species such as European beach grass and other non-native species, thus decreasing habitat availability for native sensitive plants and wildlife species that depend on a more "open" native dune habitat.

40 Acre Riding Trail Project

The February Report requires clarification of the proposed 40 acres project. CSP is not proposing to convert 40 acres of vegetated dunes into riding areas. Rather, CSP is proposing to create a maximum two-mile-long trail (impacting no more than five acres) through an area previously open to OHV riding but was ultimately restored in 2009 to reduce the potential for open sand sheets impacting Oso Flaco Lake. This project is a controlled access through vegetation that CSP installed but in an area that can sustain a limited trail system while protecting nearby habitat areas. This would impact up to 5 acres of dune scrub vegetation that CSP installed in 2008 to stabilize an area to sustain single track trail development once the vegetation had become established.

Public Access and Recreation

As noted in the February Report, Coastal Act Sections 30210 through 30224 specifically protect public access and recreational opportunities to and along the shoreline and offshore waters for public recreational access purposes, particularly free and low-cost opportunities. And, indeed, the Coastal Act and LCP require that recreational opportunities not only be provided and protected but that such opportunities be maximized consistent with the need to protect sensitive resources. As such, given the unique and significant low-cost recreational uses the Park currently provides in both passive and active recreational forms and the Staff's recommendation to fundamentally change the Park, it is concerning that the report includes no informed analysis or an honest discussion of the substantial impact to the Park's public access and recreational resources that would result from the Commission's adoption of the report's recommendations. Eliminating historic OHV use from the only location along the California coastline allowing for such use in conjunction with the loss of 1000 coastal camping units will impact millions of coastal recreationists, many from inland communities who have not the fortune or means to live along and enjoy the coast daily. The February Report recommendation raises pivotal consistency issues with public access and recreation policies of the Coastal Act and the LCPs.

Recreational Vehicle Low-Cost Visitor Accommodations

In evaluating the park's recreational offerings, the February Report notes that, although there are people who camp in tents, most of the camping at Oceano Dunes is via RVs, camping trailers, campers, and similar equipment. The February Report concludes that RV and similar types of camping do not qualify as a lower-cost accommodation due to the cost of entry into the equipment used and, in some cases, may even qualify as higher-cost. The report states that that most of the beach camping at Oceano Dunes is not lower cost due to the cost of entry into the equipment used. This analysis relies on

outdated and incomplete data from 2011 regarding costs associated with purchasing and renting RV camping equipment and cites the conclusion from the Coastal Commission's 2014 Public Workshop on Lower Cost Visitor Serving Accommodations that RV campgrounds are not typically considered a lower cost.

When analyzing this issue, its important to understand how RVs are owned and used and the benefit RV uses and facilities provided to coastal recreationists especially, where the average cost of a hotel room on the coast far exceeds the means of many. The February Report focuses on the costs of purchasing, owning, and renting an RV, but makes no mention that RVs can support many different types of users in many ways. Many RVs are shared amongst family members and friends, extending camping opportunities well beyond a single owner. RVs are often used as a "base camp," supporting larger families or groups of recreationists otherwise camping in tents. Furthermore, RVs provide a unique opportunity for differently abled recreationists to access and enjoy locations they may otherwise never experience. RVs come in all different sizes and with a wide range of amenities, allowing for a broad spectrum of owner and user opportunities.

In this case, RV camping at Oceano Dunes SVRA functions as a low-cost visitor accommodation and provides for a range of users. The SVRA cannot be compared to a typical RV campground, as it gives a much more unique coastal camping experience allowing for a range of camping options at a very low cost. Moreover, the Commission has routinely considered the use of RVs as a lower-cost visitor accommodation through various LCP and permit actions. For example, the LCPs for the City of Carlsbad and the City of Newport Beach, among others certified by the Commission, explicitly list RVs and RV parks as a type of lower-cost overnight accommodation and require mitigation for their loss or removal.

Further, in several recent coastal development permit actions, the Commission has approved campgrounds with a mix of RV camping and tent camping, noting that the campground provided lower-cost accommodations and/or provided access and accommodations for a range of users (see A-2-MAR-08-028-A2 (Nov. 2017) (California Coastal Commission, 11-2017) and -A3 (Lawson's Landing) (California Coastal Commission, 10-2020); CDP 2-20-0018 (Dillon Beach Resort, LLC) (California Coastal Commission, 2-2021), and CDP 3-14-1613 (Fort Ord State Park) (California Coastal Commission, 7-2017).In the case of the Commission's action on the Sunshine Enterprise application (CDP 5-18-0872) (California Coastal Commission, 12-2019), the Commission acknowledged RV use as a low-cost accommodation, finding that "Hostels, RV parks, and campgrounds tend to be inherently lower-cost, and are the type of facilities that a mitigation fee for the loss of existing lower-cost overnight accommodations or the failure to provide new lower-cost facilities would support." Thus,

as demonstrated by the Commission's own prior local coastal plan certifications and permit findings, the loss of beach camping recommended by the February Report, including RV, would significantly impact low-cost recreation and overnight accommodations. Protecting Oceano Dunes SVRA' unique beach camping resources, alternatively, serves to maximize public access and lower-cost overnight accommodations and provides for a range of user groups in a unique beachfront location with high demand, consistent with SLO LCP and Coastal Act requirements.

The Commission has determined in prior decisions on projects that would reduce or eliminate existing or potential future opportunities for low-cost recreational resources and overnight accommodations that such loss results in "a barrier to access for those with limited income, and contributes to increased coastal inequality." The February Report's recommendation to eliminate 1000 low-cost units from the State Park's system is put forth with no consideration of these impacts.

The PWP planning process's important outcomes include learning what barriers exist to coastal recreation in the Park and more clearly understand the most valued recreation opportunities provided by the Park. For example, CSP found that more than 46 percent of the 2018 Visitor Survey respondents reside between 101-200 miles from the Park. Many live in California's Central Valley. In an article published by the Associated Press in 2012, the Fresno area ranked as the second most impoverished area in the nation (Associated Press, 2012). During the PWP-specific user survey conducted in 2018, respondents identified motorized recreation, beach camping, and beach play as their top three activities while visiting Pismo State Beach or Oceano Dunes SVRA, Besides vehicle recreation, the ability to camp on the beach and dunes at Oceano Dunes SVRA is a significant recreational attraction, offering a very low-cost camping and recreation opportunity for many who might otherwise not be able to visit and stay overnight on the coast.

As noted, it appears that the February Report's alternative camping proposal attempts to offset the significant impacts to public access and recreation resulting from the proposal to eliminate beach camping and OHV use from the south portion of the Park. However, CSP conducted an analysis of camping opportunities as defined by the report's recommendation to eliminate existing beach camping opportunities and replace them with street-legal vehicle camping between Grand and Pier Avenue. A hypothetical campground in this area was created using Geographic information system (GIS) software that included single unit and group campsites. Camping area sizes were based on typical developed campsites but slightly larger to accommodate circulation needs and the beach's topographical conditions (see Attachment F: Camping Grand to Pier Campsites Rendition). Based on this analysis, the recommended camping area might support approximately 104 single sites and 14 group sites accommodating an average

of 5 vehicles. However, because the recommended beach camping area is narrower than the existing OHV camping area and would also be susceptible to the effects of high tide and Sea Level Rise, it is more likely that only 80 sites could be accommodated. Also, not considered are the significant impacts of recreation opportunities, both in the form of camping and in the form of vehicle access to the dunes south of the proposed camping area, eliminating access for visitors who are unable to hike significant distances to enjoy a special dune experience unique along the California Coast.

Finally, The February Report's recommendation to eliminate OHV uses at the Park, while at the same time mandating various facility and habitat improvement projects, does not acknowledge the realities of California's budgeting process and staff resources of CSP. The Legislature must approve CSP's annual budget through the Budget Act. At present, Oceano Dunes SVRA is fortunate in that it receives an annual operating budget of approximately $10-12 million dollars, and Pismo SB is allocated roughly $2.5 million. The February Report's recommendation to eliminate OHV use would simultaneously eliminate the current operating budget of Oceano Dunes SVRA, with no replacement funds identified. This will significantly reduce funding necessary to maintain existing recreation infrastructure, maintain existing facilities, continue habitat restoration, management, and monitoring efforts, and develop new recreation opportunities on Oceano Dunes SVRA property.

The allowable uses of the OHV Trust Funds are articulated in Vehicle Code §38225. If OHV recreation at Oceano Dunes is eliminated, the OHV Trust Funds can no longer be used to manage and operate Oceano Dunes. Without other sources of funding identified to replace them, the now robust Resource Management Program efforts would be severely curtailed. The feasibility of implementing any of the February Report's recommended park and restoration improvements, including the proposed beach camping alternative, is uncertain at best.

Motorized and Non-Motorized Use Conflicts

The February Report claims:

> …in 2020 was an eye-opener for many in the community. Without such more intensive uses, the Park still saw significant general beach use fronting both Grover Beach and Oceano, where such uses did not have to dodge vehicles." (Coastal Commission Staff Report page 169).

No evidence has been provided to support these claims. Regarding attendance, CSP recognized a massive reduction in public visitation to the park and beaches during late March 2020 and October 2020, periods when the park was closed to public vehicle coastal access.

As a point of comparison, Day Use visitation during the Memorial Day weekend period, May 25th, 2019, was 4,237 persons to Pismo State Beach and Oceano Dunes SVRA. During the COVID-19 period, when coastal vehicle access was temporarily prohibited, Day Use pedestrian visitation on May 24th, 2020 was 2,846 persons. Monthly attendance in May 2020 was 11,457 persons as compared to monthly attendance in May 2019 of 41,302. An overall monthly visitor reduction of approximately 72 percent of our coastal visitors, a significant decrease to normal park attendance and far from "significant beach use".

Parks Carrying Capacity

The February Report asserts that the carrying capacity has yet to be resolved under the base CDP. CSP agrees with the Coastal Commission staff that the question is "what amount of use can be accommodated at the Park consistent with required coastal resource protection" (page 134) but not on whether vehicular/OHV activities should be allowed. Additionally, their assertion that the current use limits are "actually based on anecdotal observations of the level of uses that had been occurring" (page 134) is not accurate. As required by the CDP, CSP did complete a carrying capacity study in 1998, a joint exercise between CSP, Coastal Commission, and SLO County. The study arrived at the current capacity limits. The February Report also states:

> "both the original CDP and the amendment that authorized the current interim vehicle use limits set these numbers based on historic use patterns represented by State Parks rather than rigorous scientific rationale" (Coastal Commission Staff Report page 135).

CSP disagrees with this statement as 40 years of monitored use data and a 1998 carrying capacity, coupled with successful conservation programs, such as consistent increases in listed species recovery and dune restoration figures, demonstrate scientific rationale.

As the February Report discusses, ultimately, the Coastal Commission decided adaptive management would be the appropriate tool in managing the Park by establishing the TRT.

> [The] "primary function of the TRT is to "develop recommendations to the Superintendent of the Oceano Dunes SVRA regarding…adjustments to day and overnight use limits…" and, as part of its ongoing research and monitoring efforts" (Coastal Commission Staff Report page 135),

The CSP participated in the TRT for over 17 years, annually reporting to the Coastal Commission. The TRT did "continually monitoring vehicle use numbers and their

corresponding impacts on Park coastal resources" as there were no significant impacts on the coastal resources identified, there could be no "evidence-based change" to support "scientifically based limits to be adopted through amendment of the CDP." (Coastal Commission Staff Report page 135).

The Coastal Commission opted to defer the decisions to the TRT. However, Coastal Commission staff ceased their participation in the TRT from 2008 to 2015 and again from 2016 - 2019. The draft PWP proposes interim use limits and an updated, peer-reviewed carrying capacity study which would be used to inform permanent use-limits.

Enforcement of Use Limits

Oceano Dunes District staff comply with the current use limits outlined in the CDP. Those limits include about 2,500 street-legal vehicles, 1,700 OHVs, and 1,000 campsites. Staff use counters at the entry kiosks to count vehicles as they enter the parks. Independence Day and Memorial Day weekends are typically the only days when vehicle use limits are reached. Once capacity is reached, additional vehicles are prohibited from entry. As of January 1, 2020, beach camping was reduced to 500 vehicles according to the recommended treatments in San Luis Obispo APCD's Stipulated Order.

A concern identified in the February Report is "how to accurately count and enforce said use limits...of OHVs to 1,720 "at any given time." (Coastal Commission Staff Report page 136). All vehicles are counted when entering the parks to ensure that the use limits are not exceeded. At this time, CSP cannot track the numbers of vehicles exiting the park, so only the maximum allowed vehicles are allowed per day. So, if 1,720 OHV's are allowed, CSP would only allow up to 1,720 OHV' in the park for the entire all day. In the future, with improved technology and updated entrance stations, CSP could replace the daily entrance numbers with a system to track numbers of vehicles exiting the park, providing "real-time" numbers. Under the current management, there can never be more than the allowed OHV, camping units, or day-use vehicles in the park at any one time throughout the day, regardless of the number of vehicles that leave the park throughout the day. It is important to note that camping vehicles and their associated OHV's are tracked with separate passes and are accounted for within the operational limits established for the park. It is also true that the entrance kiosks close at night, but users can still access and leave the park through the Pier Avenue entrance. The ability to enter and exit a campground is necessary as these are lodging accommodations. We cannot lock visitors in any campground overnight. Nor do we restrict arrivals to daylight hours only as this would be unfeasible for individuals and families who are not able to arrive in daylight hours due to work or other commitments. CSP's current technology allows us to count the number of vehicles (axles that cross

the entrance) to better determine the number of vehicles accessing the park when the entrance stations are closed. CSP has developed methods to account for vehicles entering the Park after hours to incorporate this information into our tracking of daily use numbers.

Additionally, when the entrance station closes at sunset, officers are still patrolling the parks to ensure rules are followed, including speed and monitoring visitor use numbers. While the system is not perfect, it has been reliably used to track visitor use numbers for many decades and has been reviewed by the TRT throughout its 18-year term. CSP stands by its methods to monitor, track, and enforce use limits and has a proven record of accomplishment of successfully managing use in the Park.

The implication is that CSP is not enforcing access, speed limits, disturbance of listed species, destruction of protected resources, etc. All laws, regulations, and posted orders in the park units are strictly enforced and cited by State Park Peace Officers. CSP staff are not allowing inappropriate activities to occur. CSP is upholding its duties to enforce the law at Pismo SB and Oceano Dunes SVRA.

To assist in developing appropriate public safety measures, CSP analyzes incident records from Oceano Dunes SVRA. An inventory tool, the Oceano Dunes Incident Map, was designed to help identify accident hot spots to determine the most appropriate public safety measures. CSP continues to evolve the process of monitoring and reporting incidents. CSP staff also reviewed all current OHV concession agreements to ensure they contained appropriate safety protocols and that those protocols are being enforced.

Additional measures proposed in the draft PWP to ensure accurate visitor and vehicle counts include the following:

- Construct a lifeguard observation tower and new restrooms at the existing restroom facility at the Grand Avenue entrance to provide additional oversight and enforcement and decrease response times.
- Increase staffing hours at the entrance stations and implement various methods (e.g., traffic sensors) to ensure accurate vehicle counts.
- Install additional regulatory signage at entrance stations and throughout the parks. Replace the entrance stations at Grand and Pier avenues with modern facilities that can apply new technology to help manage visitor use and track visitor numbers.

Intensity of Use

Any reduction of vehicle use limits could directly impact coastal access and the availability of low-cost coastal accommodations. Proposed reductions from current conditions should be carefully considered through a rigorous planning process and analyzed during associated environmental review. The draft PWP process and associated Environmental Impact Report are the appropriate CSP mechanism to explore and analyze future vehicle use limits. It takes a holistic look at park operations to balance public access with the numerous regulatory constraints associated with the park. Put another way, and there is no value to evaluating use numbers independent of the other significant competing issues and regulations.

The use limits in the current CDP and Amendments have evolved over the years, always in response to CSP and the Commission's collaborative efforts to balance policy mandates requiring that maximum public access and coastal recreation be provided in conjunction with sensitive resource protection. The use limits have been based on careful consideration of public recreational demand, identification of Park areas suitable for various recreational uses, identification of sensitive Park areas in need of protection, and compliance with other applicable laws and regulations such as the Federal and State Endangered Species Acts. State Parks has complied with the CDP use limits over the permit's lifetime and has not requested amendments to the CDP vehicle use limits.

Since the park was established, the OHV industry has trended from larger OHV's (Water Pumper Buggies, jeeps, etc.) to smaller single rider bikes (dirt bikes, ATVs) to more powerful multi-user (ROV's). With each new generation of OHV, the physical impacts on the landscape may change. Visitor use numbers that were established during an era of old-style dune buggies may not meet the realities of an age with ATVs and ROV's. For example, ATVs have a lighter impact on the land and do not require as much space to operate. ROV's are more powerful, but there are fewer on the beach because they can carry multiple passengers.

Similarly, new regulations for endangered species protection and air quality may cause visitor use patterns and intensity in certain areas of the park. As proposed in the PWP, an updated carrying capacity study is an excellent way to examine environmental constraints and changes in the OHV industry to determine a scientifically sound method to manage public OHV activity with new and emerging regulatory restrictions. This can also be combined with new technologies to monitor "real-time" vehicle numbers can help establish a reasonable carrying capacity that is compatible with the landscape, reflects environmental and regulatory constraints, and protects public safety.

In response to the Coastal Commission's concerns and stated in their July 2019 conditions memo, CSP evaluated the current use limits through the PWP and

recommended a temporary reduction in use limits until an updated, peer-reviewed carrying capacity study can be completed. The draft PWP also provides an adaptive management program to manage the Park's uses as environmental conditions and habitat needs change over time to ensure a proper balance between resource management, recreational use, and visitor experience is maintained for the Park. CSP is willing to temporarily reduce use limits until another carrying capacity study can be completed to ensure the parks' sensitive resources' ongoing protection.

The temporary reductions proposed in the draft PWP include 1,000 street-legal vehicles, 500 overnight camping spots on the beach, and 1,000 OHVs. These numbers represent a significant reduction from use numbers typically occurring over busy holiday weekends and peak periods.

The February Report alleges that the PWP is proposed to increase OHV use. This is not accurate as discussed in the preceding paragraphs, a temporary reduction in use limits is proposed in the PWP. The PWP merely seeks to accommodate existing uses better, spread them more evenly over accessible areas of the park appropriate for recreation, and provide additional access to alleviate crowding at existing entrances. There is nothing in the PWP that states OHV use (numbers or intensity) would be expanded. The February Report interprets the implementation of the 40-acre riding trail as "expanding" OHV use. However, this project has been in the planning stage for many years. The trail's installation would represent a second phase of a project that started several years ago with revegetating the area to protect water quality in Oso Flaco Lake.

This project is not new. It has been included in the Draft HCP for endangered species permitting and is included in the PWP for consistency and to address non-Endangered Species Covered-related issues and environmental review. The draft PWP does not expand the existing riding area or camping on the beach not currently open to camping. It includes significant improvements to non-OHV recreation facilities, such as the boardwalk, entrances and lifeguard tower projects, campground improvement projects, and Butterfly Grove Public Access Project. Like the development project containing OHV serving elements, the non-OHV public access elements do not seek to "increase use" of the Park by themselves but rather serve existing uses better. Should the new boardwalk or other public access project attract a significant number of unique visitors from adjacent neighborhoods or visitors from outside the area, they would be allowed to use the Park, but increasing the numbers is not a goal.

Planning Processes and Permitting

CSP has attempted to work with Coastal Commission staff for years in addressing CDP-related issues. CSP has been diligent in studying and addressing legitimate concerns raised by the Coastal Commission and Coastal Commission staff since the earliest

negotiations that predate the 1982 permit. CSP has implemented substantial ground-level management, including restoration, endangered species monitoring, fencing, trash control, enforcement, and public education. CSP has studied numerous issues surrounding the Park, including access, staging areas, carrying capacity, fisheries, and countless other large and small efforts.

CSP stands by the substantial work it has taken to develop the PWP and feels it is a well-researched, balanced approach to Park management, based on current data and best available science – followed by a thorough analysis of impacts that would result from PWP implementation. CSP believes that the Oceano Dunes SVRA can continue operating with the modifications proposed in the draft PWP and consistent with all applicable laws, including the Coastal Act.

Vested Rights

The February Report asserts that the use of street-legal vehicles and OHVs at the Park are not vested rights. CSP respectfully disagrees. First, the February Report identifies the Coastal Act process that a party can claim it has a vested right to continue a development activity without the need for a CDP if they can prove that they had already legally commenced that development activity before the commencement of CDP requirements (see Coastal Act Section 30608).

On page 129, the February Report states:

> The criteria for establishing such a vested right for an ongoing activity is to be able to conclusively show that (1) the activity in question has been occurring regularly since prior to February 1, 1973 (for within 1,000 feet of the ocean) and prior to January 1, 1977 (throughout the coastal zone); (2) that the applicant had all necessary authorizations to do so as of those time frames; and (3) that the applicant has made a substantial investment and incurred substantial liabilities in reasonable reliance on a good faith belief that they would be able to continue these activities.

The February Report asserts that CSP did not acquire the property until 1974. It was preceded by the 1972 Coastal Initiative and did not qualify for vested rights. However, the vehicular and OHV activity property had already been established before both the 1973 and 1976 preceding CDP permitting requirements, being managed by local jurisdictions.

Vehicular and OHV activities were so popular on the property that it was recommended as the first State Vehicle Recreation Area, purchased by the State in 1974 and approved by the California State Legislature. This meets criteria #1 under the authority of CSP per PRC 30401. The General Development Plan was approved by the California State Park and Recreation Commission in 1975, identifying the intent for the long-term management of the vehicular/OHV activities on the property.

Vehicular and OHV use was further codified in the Coastal Commission Application 36-17 (General Plan for Pismo State Beach) and CDP 4-82-300 (1982). Moreover, the County's LCP includes specific standards intended to allow this recreational activity to continue in a manner that preserves surrounding sensitive dune habitats, thereby meeting criteria #2.

Finally, the State's act of purchasing the property was the initial investment made in good faith belief that CSP would continue the vehicular and OHV activity. There have been major capital outlay projects and operational costs associated with providing and managing the vehicular/OHV activities, thereby meeting criteria #3.

The February Report asserts that since State Parks has never submitted an application and instead "availed itself to the CDP process" (page 128, last paragraph), we have waived our right to claim that vested rights for vehicular and OHV activities exist. However, CSP has worked with Coastal Commission since the SVRA's inception with the understanding that the property's legislative intent and legal classification as an SVRA was well established and accepted. Thus, justifying the use of public resources invested in property development and operation into the future.

Furthermore, the Coastal Commission staff do clarify that the burden of proof is on an applicant to prove these things, which CSP can do and would look forward to working with the Coastal Commission staff on establishing vested rights for vehicular/OHV activities at Oceano Dunes SVRA as identified as an option in the Coastal Commission Staff Report.

Also, the February Report asserts that the CDP and subsequent amendments have been a temporary or interim accommodation for OHV recreation. This suggestion is not supported by the written record and actions controlled or taken by the Coastal Commission over the last few decades.

The February Report argues that the Commission's approval of State Parks' General Development Plan in 1975 was:

> ...explicitly for a conceptual framework for Park management, and was not a coastal permit permanently authorizing any particular type of development, much less the types of development State Parks points to (page 127, last paragraph).

CSP understands that any "actual development contemplated under the plan" (page 127, last paragraph) would require separate permit applications. The draft PWP intends to bring development projects to the Coastal Commission for review and approval to be implemented. All the proposed development projects within the draft PWP are consistent with the General Plan, except two, the Oso Flaco (future) development project and the Southern Entrance/Phillip 66 project, which clearly state that amendments to both the General Plan and LCPs would be necessary.

In the original CDP and subsequent amendments, there has been no language which implies OHV recreation, beach camping, and OHV use are considered "temporary" or "interim" as identified by this February Report. In fact, in all iterations of this permit, specific language is included which speaks to the planned long-term use, and recreational activities located at Oceano Dunes SVRA, evidenced by the consistent language Coastal Commission staff have included over the decades such as:

> "…until either a permanent staging area is operational or this permit and the County's LUP is amended to accommodate possible necessary minor adjustments in the operation of these conditions…" (Item 2 of CDP 4-82-300).

The terms "temporary" and "interim" occur throughout the February Report and purport an overarching premise that off-highway motor vehicle recreation at Pismo Dunes State Vehicular Recreation Area (later the name was changed to Oceano Dunes SVRA) was only "temporarily" approved as an activity at the park. Some other "future plan" of another recreation experience was being considered. CSP respectfully disagrees with this assertion for the reasons stated throughout this document.

Reclassification of Park

The February Report implies that adjusting the allowable use at the SVRA would not require a significant investment in resources to reclassify the park. The report even suggests that a reclassification would not be necessary. While it is possible to reclassify a State Park unit, the reclassification of Oceano Dunes SVRA to a State Recreation Area (SRA) or other appropriate classification is a lengthy process that would require the approval of the State Park and Recreation Commission and possibly the Off-Highway Motor Vehicle Recreation Commission, revision of State Parks' regulations classifying Oceano Dunes as an SVRA, a change in funding source, and a new joint

general plan. These tasks would take considerable staff time, public input, environmental review, and money to complete.

SVRAs, and their operations, including natural resource protection activities in the SVRA, and staffing are funded through the OHV Trust Fund, not the State Park and Recreation Fund (SPRF). Reclassifying an SVRA to an SRA would also change its funding source. In fiscal year 2019/2020, Oceano Dunes District spent approximately 12 million dollars on OHV and SVRA-related park operations, maintenance, education, public safety, and resource management programs. Nearly one-third of this money was used for resource protection and air quality management. Since the shorebirds nest on the beach and not in the dunes, removing OHVs from the Park would not change the amount of money and staff resources needed to manage the resources at their current levels.

Finally, CSP would need to prepare a new joint general plan or two separate plans following a reclassification from an SVRA to an SRA or State Beach. General Plans take several years to complete, depending on their complexity and areas of controversy and can cost hundreds of thousands to millions of dollars to complete.

Violations

The February Report discusses, in length, multiple alleged violations (some referenced by case file numbers) of various permit conditions. The report refers to “a series of allegations” (Coastal Commission Staff Report Page 139*)* such as exceedance of allowed vehicular use limits, vehicles in vegetated dune areas, inappropriately augmented ramps and movement of signs limiting vehicular use in areas. The report recognizes that many are anecdotal observations without any supporting documentation and admits that the Commission staff have not taken any formal enforcement actions, in part due to jurisdiction of other regulatory agencies such as the USFWS and CDFW. CSP has coordinated with Coastal Commission staff on numerous operational issues and inquiries from the public, and are concerned that the report discusses such “allegations" without providing basic information about the allegation and providing an opportunity for CSP to respond. To bring these alleged violations up in a public staff report is troubling since it gives the reader the impression that CSP has been negligent in operating the SVRA. Any allegations and violations should be coordinated with CSP, just like the recent (and only violations) Violation Files Nos. V-3-98-004 and V-3-10-042 resulted in Consent Executive Director Cease and Desist Order (EDCDO) ED-20-CD-01. As discussed in the February Report (page 141), the Coastal Commission and CSP reached an agreement to provide interim authorization for beneficial plover and tern management measures which CSP continues to honor.

PWP Planning Process Corrections

On page 141, footnote 155, the Coastal Commission Staff Report states:

> For example, in February 2019, State Parks released for public comment a list of potential identified projects that could be undertaken as part of the PWP. One of the projects was a new additional campground and OHV staging, riding, and entrance at Oso Flaco Lake. This project not only presented what appeared to be serious LCP inconsistencies related to agricultural conversion and ESHA degradation, at a minimum, but instead of circumscribing Park uses and activities in ways that resolve the problems identified, it appeared to increase OHV use and related coastal resource impacts associated with the same.

CSP presented a range of potential project concepts for public review and input in February 2019. The planning team then dramatically revised the Oso Flaco Improvement Project based on public and Coastal Commission input to the project proposed in the draft PWP to no longer include OHV staging, riding, and entrance to the back dunes. These latter activities are proposed in the Phillips 66/ Southern Entrance project.

On page 149, the Coastal Commission Staff Report states:

> And finally, at the Commission's July 2019 CDP review, the Commission recommended a series of very specific management measures that were to be addressed by the PWP, most of which directly affect operations (see Exhibit 11). Unfortunately, the draft PWP does not meet these goals and objectives, nor does it truly address the Commission's requirements.

Volume 2, Section 2.3.1, Coastal Commission Conditions and Concerns, directly addresses the July 2019 CDP requirements that affect operations that fall under Coastal Act purview. CSP also addressed these requirements in detail at the February 2020 Coastal Commission meeting during the PWP update report.

DEIR chapter 23, section 2.2 *Alternative 2: No OHV Use Alternative* analyzes the Coastal Commission's recommendation to phase out OHV recreation over five years. In summary, the DEIR rejected this alternative as it would:

- have a significant adverse impact on recreation, removing visitors and campers from having recreational access to the coast and this popular park
- State Parks does not have the authority to phase out OHV activity in the SVRA on its own (§ 5019.50 and 5090.24)

- not be feasible. Oceano Dunes SVRA receives an annual operating budget of approximately 12 million dollars, and Pismo SB is allocated 2.5 million. If the SVRA were reclassified as a State Beach or State Park, it would be reasonable to assume that the operating budget would be reduced accordingly. Funding for the resource programs would be eliminated until an alternative funding source can be identified and appropriated by the Legislature.

- conflict with State Park's responsibility of managing state parkland in a manner consistent with governing laws (PRC § 5008, § 5090.2(b), § 5090.35(a)) while promoting accessible recreation.

- would have a significant and negative impact on existing recreation opportunities at the SVRA. Nearly 1.4 million people visit Oceano Dunes SVRA for day use and camping. Visitors also use OHV-vehicles to access non-motorized activities on the beach to unload equipment, such as surf fishing, kiteboarding, and kayaking. Many visitors also depend on motorized vehicles to access the coast because of mobility issues.

Agricultural Land Conversion Proposed for the Oso Flaco Improvement Project

The February Report goes into detail about Coastal Commission Staff's interpretation of "ag land conversion." The following excerpt from Section 5.2 on page 5-1 of the Draft PWP EIR (Volume 3) explains State Parks' position on ag land designations in detail:

> The Park does not contain any agricultural or forestry lands with the exception of the Oso Flaco area. The Oso Flaco Improvement Project site consists primarily of agricultural fields (i.e., row crops) (see Figure 3-3 in PWP Chapter 3, "The Plan"). According to the San Luis Obispo County Important Farmland map, published by the California Division of Land Resource Protection (DOC 2016), approximately 116 acres of land within the Oso Flaco Improvement Project site is designated as Prime Farmland[7]. However, this is inaccurate as the site is owned in fee title by State Parks, is not under agricultural preserve, and should not have been designated by the County. State Parks has owned this land for decades and has been leasing the site in the interim to be used by a private entity for agriculture until such time that the site can be used as Park land. Under the current PWP, and specifically because of implementation of the Oso Flaco Initial and Future Site Improvement Projects, the site will be developed to provide high-priority public access and recreational use consistent with the Park General Plan. Portions of the site would also be restored to natural habitat, including a riparian

[7] Prime Farmland is defined by the DOC as land that has the best combination of physical and chemical features able to sustain long-term agricultural production and sustained high yield crops.

> buffer along the Oso Flaco Creek. Land designated as Prime Farmland is located adjacent to the south and southeast of the Oso Flaco Improvement Project site. However, these lands would not be affected by PWP implementation.

The following excerpt from Section 5.3.1 explains why this issue is not further discussed in the EIR:

> Convert Important Farmland to Nonagricultural Uses—As noted in Section 5.2, "Environmental Setting," above, the Park does not contain any agricultural lands with the exception of the Oso Flaco area. Approximately 116 acres of land within the Oso Flaco Improvement Project site is designated as Prime Farmland. However, State Parks has owned this land for decades and has been leasing the site in the interim to be used by a private entity for agriculture until such time that the site can be used as Park land. The Oso Flaco Improvement Project site is not under an agricultural preserve program. The proposed site restoration and transition to high-priority public access and recreational use and restored as natural habitat consistent with the Park General Plan would not result in loss of Important Farmland acreage. Therefore, implementation of the PWP and site-specific projects would have no impacts related to the direct conversion of Important Farmland. This issue is not discussed further in this draft EIR.

While CSP recognizes this is a different interpretation of the issue than that exhibited by Commission staff, CSP has carefully considered this issue and taken it into full consideration before the publication of the Draft PWP.

Economic Impacts

Oceano Dunes District conducted two economic impact studies, the first in 2010 and the second prepared by SMG in 2016. The purpose of both studies was to identify the economic benefit of the Oceano Dunes SVRA and to provide Parks-related information to serve our visitors better. Both studies provided CSP valuable information about our visitors, where they travel from, and their recreational interests when they visit the park.

Neither of these efforts studied alternate forms of recreation and therefore should not assess such economic impacts. Additionally, the study does not look at an economical replacement scenario suggested by Dr. King in his assessment, which included Exhibit 13 of the Coastal Commission Staff Report.

Associate Professor Patel's comments are also appreciated; however, one would argue that the economic assertions made, given the (park closure due to the) COVID-19 pandemic, are premature and do not represent sustained economic trends to be used for planning. A detailed analysis is outlined below.

Detailed observations regarding Exhibit 13 of the Coastal Commission Staff Report - Economic analysis conducted by Dr. King of San Francisco State University

CSP reviewed the economic analysis by Dr. King included with the February Report and made the following observations:

- CSP could not find documentation relating to the professional critique of the 2016 SMG report, which we believe was prepared in 2019 by Dr. Patel at Cal Poly, referenced in multiple pages of the February Report. We cannot assess the validity of the critique that indicates that the 2016 SMG analysis was fundamentally flawed. Given the reference to Dr. Patel's critique, the Coastal Commission staff should include this critique in the exhibits to be reviewed in context by the public.
- The 2016 SMG report makes no explicit statement that if OHV uses were banned, a majority or all the estimated economic benefits would be lost. The February Report indicates that opponents of their staff recommendation have made this argument, which we can neither confirm nor deny. CSP has not made this argument.
- The arithmetic error in the SMG analysis, noted on page 14 of the February Report, cannot be assessed without access to the background data used to inform the study. SMG would be the appropriate party to address this critique.
- The February Report notes on page 14 that the SMG analysis asks the wrong questions, limiting its value as a tool for decision-makers. This is a subjective statement, and all studies could receive the same critique. As noted in the SMG report, the report's goal is to "determine the economic impact of visitors to the Oceano Dunes District of State Parks on the local San Luis Obispo County." This is a valid question to ask. While other potentially valuable questions could be asked, as noted by Dr. King, such as the costs and benefits of different recreational offerings at the Oceano Dunes District as well as non-market value benefits, this was not the question that SMG was asked to answer when the study was commissioned.
- The February Report notes on page 15 that Dr. King believes that Oceano Dunes District would provide a similar amount of regional economic benefits in the absence of OHV uses. This is conjecture and not supported with meaningful primary data (granted, Dr. King also acknowledges a study should be structured to collect this data). Further, Dr. King notes in his review (page 180/628 of Exhibit 13), "Given the scarcity of OHV activities in California and especially on the coast, I anticipate that the non-market value will be quite significant." Further, Dr. King notes (page 189/628 of Exhibit 13) that "In my opinion, the loss of OHV

recreation is significant and should be mitigated somehow." The February Report does not include these important considerations noted by Dr. King.

- The February Report notes on page 15 that when the Park was closed to OHV use in 2020 (due to the Covid-19 pandemic), the Park saw significant beach use. As discussed earlier, the data does not support this statement.
- The February Report notes on page 164 that the SMG report has "study errors" per Dr. Patel's review. Without seeing Dr. Patel's review, we can neither confirm nor deny these statements. One can disagree with the study question(s) being asked, but this is different from the underlying study being in "error."
- The February Report notes on page 164 that they engaged Dr. King to "best understand its conclusions regarding the effect of the Park to the local economy, and, ideally, to understand better how a change in the range of activities offered at the Park might affect its contribution to that economy." It is important to note that the second objective of Dr. King's review was not the SMG study's purpose.
- The February Report notes on page 165 that Dr. King believes the SMG study did not follow the Institutional Review Board sampling methods and that the sampling methodology was not clearly explained. Many surveys of this type do not go through Institutional Review Board approval (especially when they are not contracted through a university). Not taking this action should not be considered a "fatal flaw," especially if SMG followed industry best practices. Further, a lack of detail on the sampling methodology does not invalidate the survey results. For both issues, SMG would be the appropriate entity to respond.
- As noted earlier, the February Report, based on reviews of the SMG study by Dr. Patel and Dr. King, claims that the wrong question is being asked. The February Report page 165 states that the SMG report "calculates the Park's economic impact as its economic benefit." It is not clear where this statement is made in the SMG report (based on our review). Further, this framing is caught in semantics to some degree. It could be argued that economic impacts are one valid decision-making input, and economic benefits are another valid decision-making input. There are numerous valid critiques to both forms of analysis and how they are used in public policy discourse. The statement that the SMG report has "fundamental flaws" because it is focused on economic impacts rather than economic benefits is a matter of opinion, and as a point of subjective disagreement, this statement should be scrutinized.
- The February Report notes on page 165 that the SMG analysis "assumes that if OHV use were discontinued, then the Park would generate zero economic benefit." In our review of the SMG report, we cannot find any narrative that justifies this statement. For example, page 166 of the Coastal Commission Staff Report states, "…it is not accurate or fair to suggest that there would be no

economic value to the Park if there were no OHV uses." This conclusion is not made in the SMG report.

- The February Report notes on page 167 that "The Commission believes that OHV use can be eliminated without significant economic hardship to the region, including as evidenced by Dr. King's analysis." Dr. King's review does not provide any hard analysis or data to back up this conclusion beyond comparing expenditure patterns across different activity types. Per Dr. King's review, further study would be needed to validate this statement.
- The February Report notes on page 167 that "Furthermore, Dr. Patel provided an updated analysis in early 2021. In that analysis, he found, based on empirical data from transient occupancy taxes (TOT) and employment numbers, that the loss of OHV use in 2020 (due to Covid-19 restrictions) didn't materially lead to any economic loss in the Oceano/five cities area." Based on our initial assessment of the study Dr. Patel does not provide the enough information required to validate the strong conclusions made in the report.
- The February Report notes on page 169 that "reports from local governments (as well as Dr. Patel's assessment above) indicate that economic activity did not precipitously decline, and increased in certain areas, including significant TOT, notwithstanding the Park was closed to vehicles and OHV for much of the year. In other words, this time allowed for real-life experiments of sorts that portends what a Park without OHV can result in for the local community." While this may be a "real-life experiment of sorts," there could be many explanatory or instrumental variables that could further contextualize the outcomes beyond OHV use restriction. Further, reference to significant TOT revenues fails to account for the likelihood that many OHV users are overnight campers, which are not subject to TOT's.
- The February Report notes on page 169 that

  > In short, while State Parks' economic study has been cited as evidence of OHV's positive economic impact on the local community and thus used as justification to retain it, there are numerous flaws with its methods and findings. Perhaps most notable is that it does not compare the economic benefit that a Park with different recreational offerings would provide, including with respect to enhanced day-use beach-going and overnight camping use."

  As noted previously, just because the SMG study may not ask and answer the specific questions that the Coastal Commission believes to be more useful, this is not grounds for saying the study has "fatal flaws." That is a matter of subjective opinion or policy perspective, and such statements misconstrue the stated purpose of the SMG report.

In summary, CSP objects to and questions the assertions regarding the economic analyses contained in the February Report.

Summary

The Draft PWP addresses the conditions the Coastal Commission and Coastal Commission requested State Parks to consider. Furthermore, for the reasons stated above, OHV recreation is consistent with the Coastal Act and the SLO LCP. DPR has over 150 years of experience in balancing the complex issues of public access and resource protection. We dedicate ourselves to solving the complexities of resources protection, public access and recreation. We have demonstrated significant progress in all those areas and we believe the draft PWP process offers the best way forward for continued community engagement, transparency, and adaptive management.

Oceano Dunes is the only coastal beach in the State Park system that is open to vehicles. The 1,000 campsites in the park represent nearly a sixth of all the coastal campsites in the system and 59%[1] of the lower-cost coastal accommodations available in San Luis Obispo County. These beach campsites proposed for reduction are a significant portion of the low-cost overnight lodging options for the coast. The draft PWP proposes a plan to mitigate some of this loss however the staff report does not.

The majority of Oceano Dunes visitors come from the Central Valley and Los Angeles County which also tend to be underserved in terms of parks and recreation facilities. Affordable overnight lodgings along the central coast are scarce. The loss of access to Oceano Dunes would be a great blow to these families and communities.

Resource protections at Oceano Dunes are currently stronger than ever. Between the draft PWP, the Biodiversity Management Plan, the Habitat Conservation Plan, the Dust Management Plan, improved status of endangered species, and other operational improvements such as trash management and increased patrols, we have already made significant strides toward a more protected and sustainable environment at the park. The changes we have made and those we are proposing have so far been compatible with OHV use.

For this reason, the Commission need not and should not make substantial operational changes via amendments to the CDP while the PWP process is underway. The Commission has approved park operations, including OHV operations, for 40 years. There have always been competing interests, and it has always been the work of Parks and the Commission to find the balance among these interests that bests serve

[1] *Explore the Coast, An Assessment of Lower-Cost Coastal Accommodations*; Coastal Conservancy, page 13, Figure C.

everyone. The draft PWP process will continue our tradition of using transparent, public processes to develop solutions that work for everyone and are informed by the best and latest science.

Thank you for the opportunity for DPR to respond to the February Report. DPR reserves any and all rights it may have in law and equity to support its positions on the matters contained herein. We look forward to continue working with the Coastal Commission on these important matters.

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List of Attachments

Attachment A: 2007 State Parks Letter to Coastal Commission Renewal of Coastal Development Permit Amendment 4-82-300-A5.

Attachment B: April 2020 “Evaluating Secondary Effects of Dust Controls on Emissions and Air Quality using Computational Fluid Dynamic Modeling”

Attachment C: “DRI Increments in Progress to Achieve SOA Goals”

Attachment D: ” A very-high resolution (20m) measurement-based dust emissions and dispersion modeling approach for the Oceano Dunes, California”

Attachment E: March 12, 2021 Letter from the CGS to State Parks

Attachment F: State Parks Camping Grand to Pier Campsites Rendition

List of Acronyms

Acronym	Name
ATV	All-Terrain Vehicle
BMPs	Best Management Practices
BDMP	Biodiversity Management Plan
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDF	California Department of Forestry
CSP or State Parks	California Department of Parks and Recreation
GB LCP	City of Grover Beach Local Coastal Plan
CDP	Coastal Development Permit
DRI	Desert Research Institute
ESHA	Environmental Sensitive Habitat Area
HCP	Habitat Conservation Plan
LCP	Local Coastal Plan
the Park	Oceano Dunes SVRA and Pismo State Beach
OHMVR	Off-highway Motor Vehicle Recreation
OHV	Off-Highway Vehicle
PRC	Public Resources Code
ROV	Recreation Off-Highway Vehicle
County	San Luis Obispo County

Acronym	Name
SLO APCD	San Luis Obispo County Air Pollution Control District's
SRA	State Recreation Area
SVRA	State Vehicular Recreation Area
SWMP	Storm Water Management Plan
TOT	Tax Occupancy Status
TRT	Technical Review Team
USFWS	United States Fish and Wildlife Service
WHPP	Wildlife Habitat Protection Plans

Attachment A

State of California • The Resources Agency
Arnold Schwarzenegger, *Governor*

DEPARTMENT OF PARKS AND RECREATION
Ruth Coleman, *Director*
Oceano Dunes State Vehicular Recreation Area
340 James Way, Suite 270
Pismo Beach, California 93449
(805) 773-7170

May 14, 2007

Mr. Patrick Kruer, Chairman
California Coastal Commission
Central Coast District Office
725 Front Street, Suite 300
Santa Cruz, California 95060

Subject: **Renewal of Coastal Development Permit Amendment 4-82-300-A5**

Dear Chairman Kruer,

Thank you for your letter of April 9, 2007, in which you raised concerns regarding the subject Coastal Development Permit (CDP). I want to state at the outset that I have yet to formally receive a copy of the letter; I only have a copy provided to me by San Luis Obispo (SLO) County staff that was made public at the SLO County Board of Supervisors hearing on April 17, 2007 regarding the La Grande Tract acquisition proposal.

The items of concern expressed in your letter were substantively addressed in the February 13, 2007, transmittal to you from California Department of Parks and Recreation (DPR) Director Ruth Coleman regarding the then pending annual review of Oceano Dunes State Vehicular Recreation Area (SVRA) CDP compliance. While trying not to be duplicative, I do find it necessary to reemphasize DPR's previously stated positions on certain concerns you have raised.

I understand the California Coastal Commission's (CCC) concern about the low fledge rate of the western snowy plover (WSP) in 2006, but must again emphasize the fledge rate be viewed in both regional and long term contexts. Although the WSP chick fledge rate in 2006, was low, 7.4%, compared to previous years, similar results were seen in other areas within this United States Fish and Wildlife Service (USFWS) designated Recovery Unit. The Oceano Dunes SVRA fledge rate is likely the result of predation. Chick mortality occurred throughout the protected areas of the park, including the non-riding area. Despite approximately two million visitors in 2006, there was no evidence of any mortality being the result of recreational activities.

It is important to note that Oceano Dunes SVRA has exceeded the USFWS WSP Draft Recovery Plan target of one fledged chick per adult male in three of the past five years, with an additional year significantly close to the draft target goal. Avian specialists evaluate overall effectiveness of the management program at Oceano Dunes SVRA, as well as other areas, by considering data over an extended period of time, such as five year periods, and then considering any single year's results in context.

In contrast with the fledge rate, other WSP breeding numbers at Oceano Dunes SVRA remained high in 2006. Monitors recorded 107 breeding birds and117 nests producing 230 chicks, which is above the five year average. The nest hatch rate, commonly used by many sites throughout the state as the sole success criteria, was 74% at Oceano Dunes SVRA. This hatch rate was considerably higher then all other sites in San Luis Obispo County: Guadalupe-Nipomo Dunes National Wildlife Area, 42%; San Simeon, 64%; Villa Creek, 37%; Morro Strand, 26%; Montana de Oro Sandspit, 52%. Although none of the above sites report fledge rates, based upon the reported hatch rates, one might speculate that fledge rates at those sites may have been similarly lower than that reported at Oceano Dunes SVRA.

DPR appreciates the recommendations of the CCC mandated Scientific Sub-Committee (SSC) as it considers improvement measures on a seasonal basis for its WSP and California least tern (CLT) management programs, with the understanding that such measures are subject to review and concurrence by the California Department of Fish and Game (DFG) and the USFWS. Since 2001, the SSC recommendations have largely been followed; however, where conflicts may exist with DPR's responsibility to carry out mandated purposes for Oceano Dunes SVRA, management decisions have been carried out consistent with such purposes.

To illustrate the above point, DPR has thoroughly considered the continued SSC recommendation to implement a study evaluating the potential benefits to nesting habitat of year-round closures of current seasonal nesting areas to recreational vehicles. However, experimental closures will not be performed on the remaining open public access areas within Oceano Dunes SVRA. Currently 2100 acres of the 3600 acre park are permanently closed under the CDP permit for resource protection purposes; in addition, more than 350 acres are closed seasonally due to the extensive WSP/CLT management program. As an alternative to overly restrictive additional year-round closures, DPR has emphasized habitat enhancement efforts in the North and South Oso Flaco areas of the park. As habitat work continues, nesting success improvement in these areas has been noted. Further, until the USFWS WSP Draft Recovery Plan, the USFWS 4(d) rule revision efforts, and relevant components of the regional Habitat Conservation Plan are all finalized, it is premature to conduct activities that will further displace permitted day use and camping activities without having

exhausted potential resource management opportunities within non-vehicular areas of the park.

Although DPR is not proposing to implement the year-round closure study proposed by the SSC, a beach wrack manipulation study has been initiated. This study will determine if direct management of beach wrack and distribution of materials such as wood chips and driftwood in the seasonally closed areas may be an effective source of habitat improvement compared to an untreated beach, such as at Oso Flaco, and as compared to the open recreational beach found in the camping and riding areas to the north. Findings from this study should help determine if habitat improvements initiated each year in the seasonally closed areas are effective.

Regarding the status of the existing SVRA entrances and staging area, it is DPR's position that the "interim" status of these areas was resolved in the 1991-1994 time period through compliance with CCC mandated steps. These steps, which included the 1991 Pismo Dunes SVRA Access Corridor Project and amending the General Development Plan and Resource Management Plan for Pismo State Beach and Pismo Dunes SVRA, are described in greater detail below. No further action from CDPR is required with regard to CDP 4-82-300 A4 Condition 1 "Staging Area Location."

The Pismo Dunes SVRA Access Corridor Project, which addressed the interim nature of the existing access and staging areas and considered alternatives to those sites, concluded in August 1991 with the preparation and presentation of a draft environmental impact report (DEIR) for the project. The project report concluded that the Grand and Pier Avenue entrances were the "Environmentally Preferred" alternative, together with the staging area that remains in use today. The location currently used for staging purposes is described in Condition 1A as the interim OHV staging area on or adjacent to the beach south of the designated mile post two. Current operation of this area is consistent with Condition 1A; non-street legal off-highway vehicles are brought to the staging area on trailers and are prohibited north of the mile post two.

Condition 1B listed the interim staging area as one of the alternatives to be evaluated. As a result of the August 1991 DEIR, the Pier and Grand Avenue ramps and the interim staging area were recommended as the "Environmentally Preferred" alternative and adopted by DPR as the permanent location for access and staging for what is now Oceano Dunes SVRA. Conclusions reached in the study satisfied the requirements of Condition 1B for selection and adoption of the permanent site.

According to the record, James Johnson, then Area Manager for the CCC, provided comments to the above document with DPR notation. Additionally, SLO County commented as noted in the final EIR submitted on October 29, 1991. On January 24, 1992, the California Off-Highway Motor Vehicle Recreation Commission approved the Access Corridor Project as an amendment to the unit General Development Plan and

Resource Management Plan. Further, on February 16, 1994, at its meeting in San Luis Obispo, the California State Park and Recreation Commission considered and adopted the recommendations contained in the Access Corridor Project, which included Pier and Grand Avenues as the access points for an amendment to the unit General Development Plan.

No challenges arose to the above project study, the environmental review process, the findings or the recommendation that the interim staging area and access points become permanent, or the adoption of the study as an amendment to the unit General Development Plan. Once this study was adopted as an amendment to the unit General Development Plan, the interim nature of the access points and staging area was effectively resolved by making the areas permanent.

Condition 1B does not contain a requirement that the CDP be amended to reflect the selection of the interim access and staging areas as permanent. The only requirement in Condition 1B for review and modification of the CDP was in the event that construction and operation of a permanent staging area could not be accomplished within the time limits established in the condition. Because the Access Corridor Project was completed in 1991, within three years from the date the Local Coastal Plan (LCP) was certified, the three year limitation was met. No construction was necessary because the interim areas were already in use and simply became permanent. Thus, no CDP review or modification was required.

DPR has reviewed the LCP and the South County Coastal Area Plan referenced by the LCP. While the LCP indicates that the site at Oso Flaco Lake is to be the primary access and staging area site, the South County Coastal Area Plan establishes that the primary access point shall be as indicated in the CDP (Standard 5, Access Control, page 46). Thus, it appears that the LCP as implemented through the standards of the South County Coastal Area Plan, both adopted in 1988, by reference to Condition 1 of the CDP, establishes the current staging and access areas as the primary controlled access points. Therefore no amendment is required to implement the permanent establishment of the staging and access areas. Certainly, the issue had not been raised until the February 2007 CCC staff report and it had been nearly sixteen years since the interim nature of the subject locations was effectively resolved.

In conjunction with addressing the access and staging areas, your letter also suggests preparation of a report and supporting maps comparing the location of existing fencing to the location of dune habitat fencing established by DPR's CDP 4-82-300 and 4-82-3300-A4, identifying current routes for equestrian access pursuant to CDP 4-82-300-A4, and describing the status of the dune restoration program required by Special Condition 2 of CDP 4-82-300.

In our on-going effort to ensure resource protection in the park, Oceano Dunes SVRA has been working closely with the California Geologic Survey (CGS) on a comparative map analysis, with the intent of overlaying maps of the park as close to 1982 as possible, in order to compare vegetation coverage. As part of ongoing work with CGS, Oceano Dunes SVRA is developing a strategy for vegetation management and stabilization for the long-term sustainability of the vegetated areas within the park. Results of the above work will be shared with CCC staff and the public.

In addition, Oceano Dunes SVRA has implemented the fencing and restoration plans approved by the CDP and subsequent amendments. The islands are part of a dynamic, changing environment, which requires continual adjustment of fencing to provide protection for these areas. Adjustments may be made to accommodate resource protection, law enforcement/public safety response, fixed facilities, and maintenance considerations. Since the initiation of the original CDP, evidence exists that vegetated portions of the park have expanded in certain areas, especially where the expansion is the direct result of restoration projects that have been completed.
Regarding the HCP, I can certainly appreciate your interest in the status and timeline for that process and can assure you that work is ongoing and progress is being made between DPR, USFWS and DFG. As noted in the staff report, DPR is anticipating release of the public draft HCP in 2007 or early 2008. The HCP will be released in conjunction with a DEIR/Environmental Impact Statement (EIS) at which time members of the public and agencies of interest will have 90 days to review and comment on both documents.

While the HCP is a document solely moved forward by DPR, the EIR/EIS is prepared jointly with DPR as lead agency for CEQA purposes, and the USFWS acting in lead capacity for NEPA requirements. Key issues to be addressed in both documents, including a range of alternatives, are being developed in compliance with governing statutes and regulations, including USFWS incidental take issuance criteria. Part of the process of developing these documents requires DPR and USFWS to take into account comments duly received. In addition to the mandatory “No Project” alternative, DPR will consider a reasonable range of alternatives that would further reduce take of a covered species or reduce other significant impacts identified in the draft EIR/EIS.

DPR appreciates the points highlighted in your letter and the suggestions provided. However, we believe that a permit amendment application is not necessary at this time. Since this issue has been addressed in compliance with the existing CDP, no permit amendment is required to establish a permanent location for the recreational vehicle access and staging areas. In addition DPR is in compliance with fencing and restoration requirements of the CDP, therefore a CDP amendment application addressing this issue is not necessary. Finally, DPR does not propose that the Technical Review Team approach of park management review should be modified to oversee and evaluate HCP implementation, as this is the role of the USFWS and

CDFG. Consideration will be given to future potential CDP amendment proposals that may address changed management conditions resulting from finalization of the HCP related processes.

In closing, DPR appreciates the CCC's continued interest in protecting coastal resources at Oceano Dunes SVRA while also providing significant public recreational access for many of the citizens of California. DPR is always willing to address common concerns that may need to be identified and discussed. Please feel free to call me at (805) 773-7170 if you have further questions.

Sincerely,

Andrew Zilke
District Superintendent

cc: San Luis County Board of Supervisors
Michael Chrisman, Secretary of Resources Agency
Ruth Coleman, Director
Daphne Greene, Deputy Director
Phil Jenkins, Chief

Attachment B

Evaluating Secondary Effects of Dust Controls on Emissions and Air Quality using Computational Fluid Dynamic Modeling

The secondary effects on emissions and air quality from the foredune restoration project are expected to be significant based on scientific arguments made by the Science Advisory Group, but quantification of the added benefits to air quality needs to be carried out.

The current mass emission/dispersion modeling being undertaken to estimate the effect of implementing dust controls to lower mass emissions and improve air quality is not sufficiently sophisticated to take into account the changes in flow that will result from changes in the surface as the foredune develops.

We suggest that DRI undertake a measurement and modeling effort within the framework and budget of our current contract with Parks to develop a Computational Fluid Dynamics model that can be used to evaluate how the evolving foredune will modulate the boundary-layer flow (wind speed, direction, and surface shear velocity) over the foredune area, in the lee of the foredune area, and in synergy with the re-vegetation areas that lies east of the foredune restoration area.

The methodological approach will be to use the open-source finite volume toolbox openFOAM as the basis for developing the flow model. Dr. Eden Furtak-Cole has extensive experience with this software having previously used it to model flow in urban street canyons in Hong Kong and other applications as well. He will be the principle developer of the model working with others in the DRI team who bring expertise in modeling (J. Mejia) and wind erosion and dust emissions (J. Gillies, V. Etyemezian). The goal will be to use the model to evaluate how the flow is changed by the developing foredune and subsequently use this information to inform CALMET in terms of wind speed, wind direction, and surface shear over and in the lee of the foredune. The changes in flow will subsequently affect the mass emissions (reduce wind shear by an established fractional reduction for the affected grid cells), and provide a more realistic wind field for the particles that are being dispersed by the wind.

To develop the modeling inputs will also require some measurements be made in the field in the established foredune areas of the Park to parameterize boundary conditions (e.g., vertical wind speed profiles, horizontal flow gradients in the lee of select dunes). We will also need access to the Digital Elevation Maps (DEMs) from Arizona State University's UAV photogrammetric program to (digitally) construct the topography of the evolving foredune as well as a DEM of the mature foredune that has been used as a model for the fully-evolved foredune that is being restored.

Benefits that can arise from this work are: 1) a means to provide more realistic estimates of the aerodynamic roughness lengths (z_0) for different areas of the ODSVRA. This parameter plays a critical role in CALMET in the estimation of wind shear (which drives dust emissions), and at present its representation in CALMET remains simplistic; 2) better estimates of shear velocity based on topographic position on the dunes and in their lee, which will also provide better estimates of emissions.

We envision that this model could be developed in the next 8 months and refined with incorporation of the field-measurement based parameterizations by summer 2021.

Attachment C

Increments of Progress

J. Gillies, E. Furtak-Cole, J. Mejia, V. Etyemezian,
Desert Research Institute
January 5, 2021

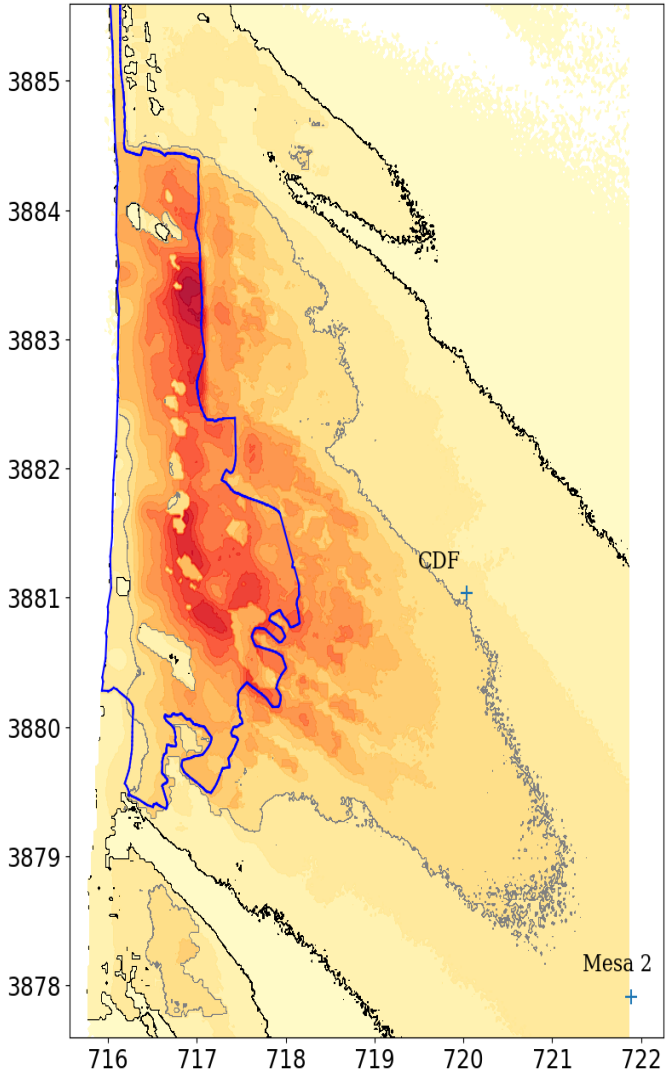
Increments of Progress Demonstrating Progress to Achieving SOA Goals

Reduce PM_{10} mass emissions (mg m^{-2} s^{-1}) by 50%

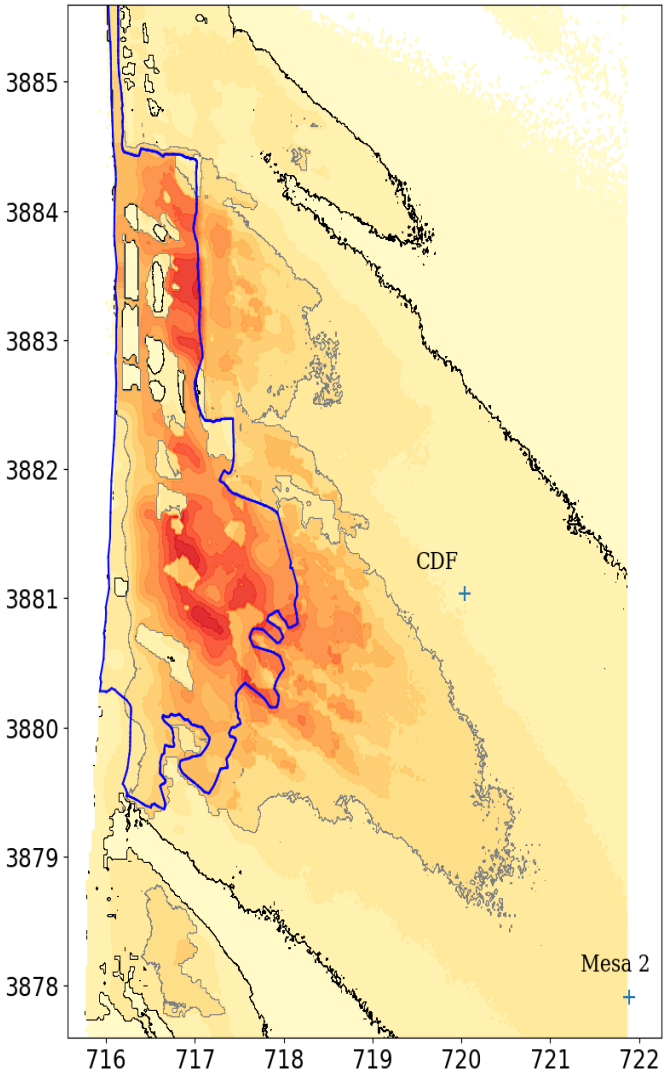
Reduce PM_{10} levels across the area downwind of the ODSVRA and exceedances of the Federal and State 24-hour mean PM_{10} standards

Beginning in 2014, 28 acres of dust controls were implemented, and the acreage has increased to 223 acres in 2020.

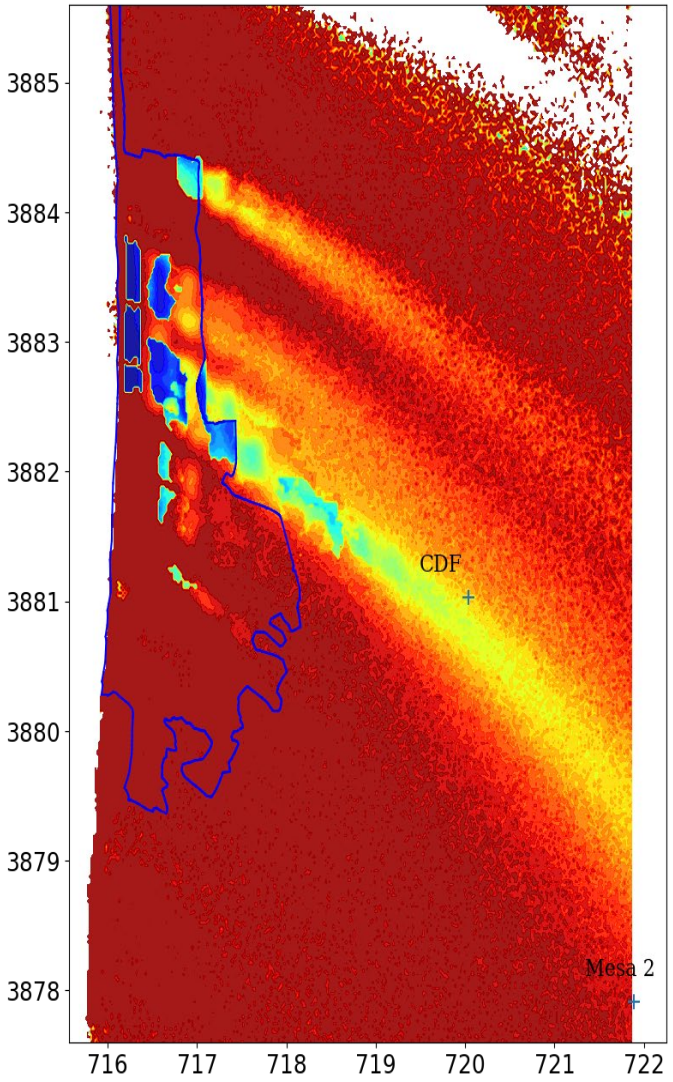
According to emission and dispersion modeling undertaken by DRI, the 223 acres reduces PM_{10} measured at the CDF monitoring station



2013 No controls



2020 Controls



PM_{10} percent change between 2013 and 2020

Do air quality and meteorological data corroborate the model results?

Can incremental progress in improved air quality be demonstrated from 2013 to 2020 from the dust control actions?

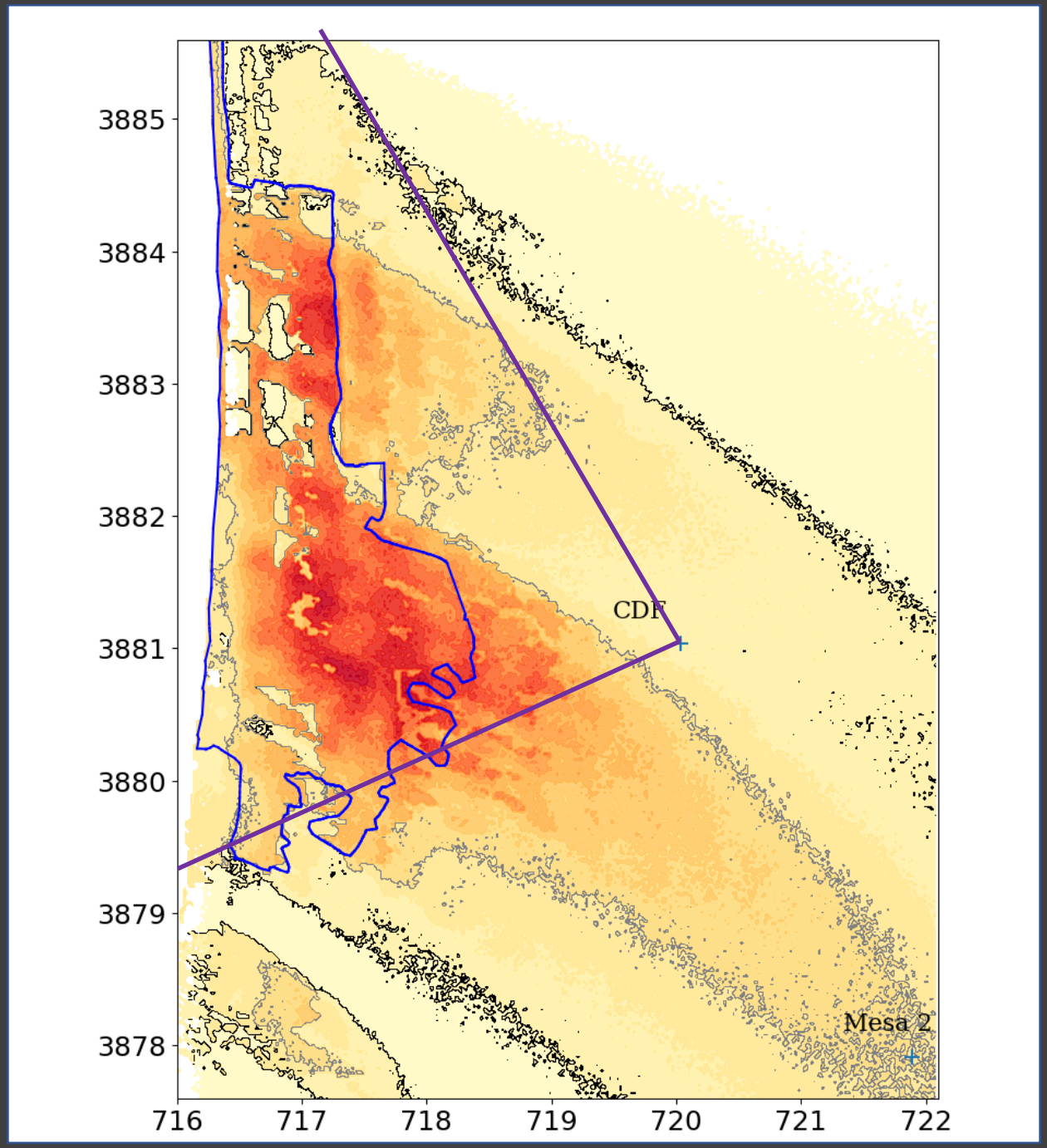
Available data:

Hourly mean PM_{10} from CDF and Mesa2

Hourly meteorological data (hourly mean wind speed and wind direction) from CDF, Mesa2, and S1 tower (within the ODSVRA)

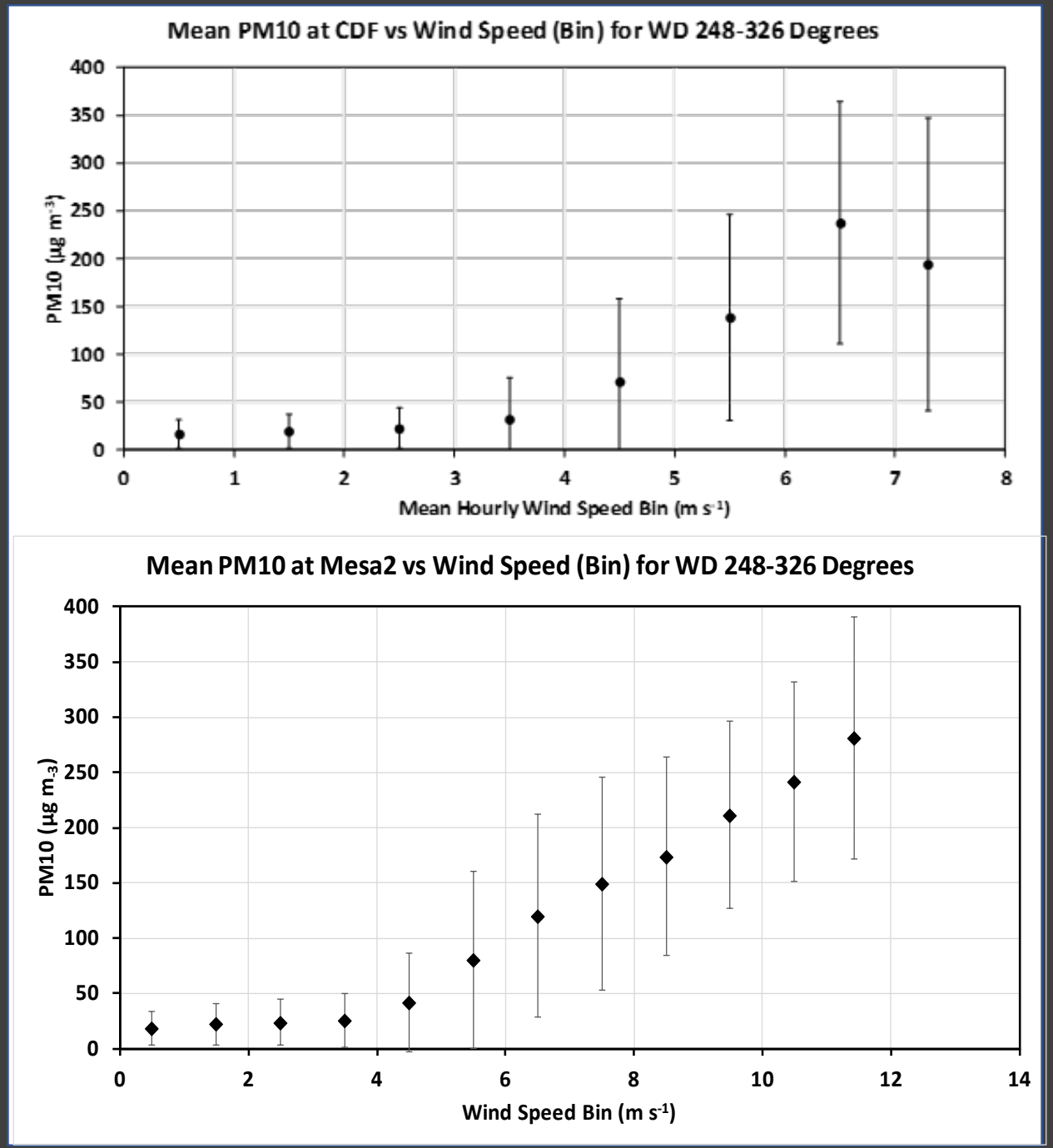
Methods

- Assumptions:
- 1) Winds from 248° to 326 ° are used to ensure, conservatively, that the air flow that reaches CDF and Mesa2 has most likely travelled from the ODSVRA



Methods

- Assumptions:
- 2) A wind speed filter is applied based on screening for the conditions where it is most likely that the PM_{10} reaching CDF and Mesa2 is due to the generation of dust by the saltation process within the ODSVRA.
- CDF and Mesa2: ≥4.5 m/s; S1 ≥8 m/s



Methods

- Assumptions:
- 3) Eliminate hourly wind speed and the corresponding PM_{10} data for that hour if there has been a precipitation event from one to three days prior to the measurement

Analysis

- Calculate Wind Power Density (WPD) for each (filtered) hour

WPD = air density (kg/m^3) x wind speed^3 (m/s)=$Watts/m^2$

Analysis

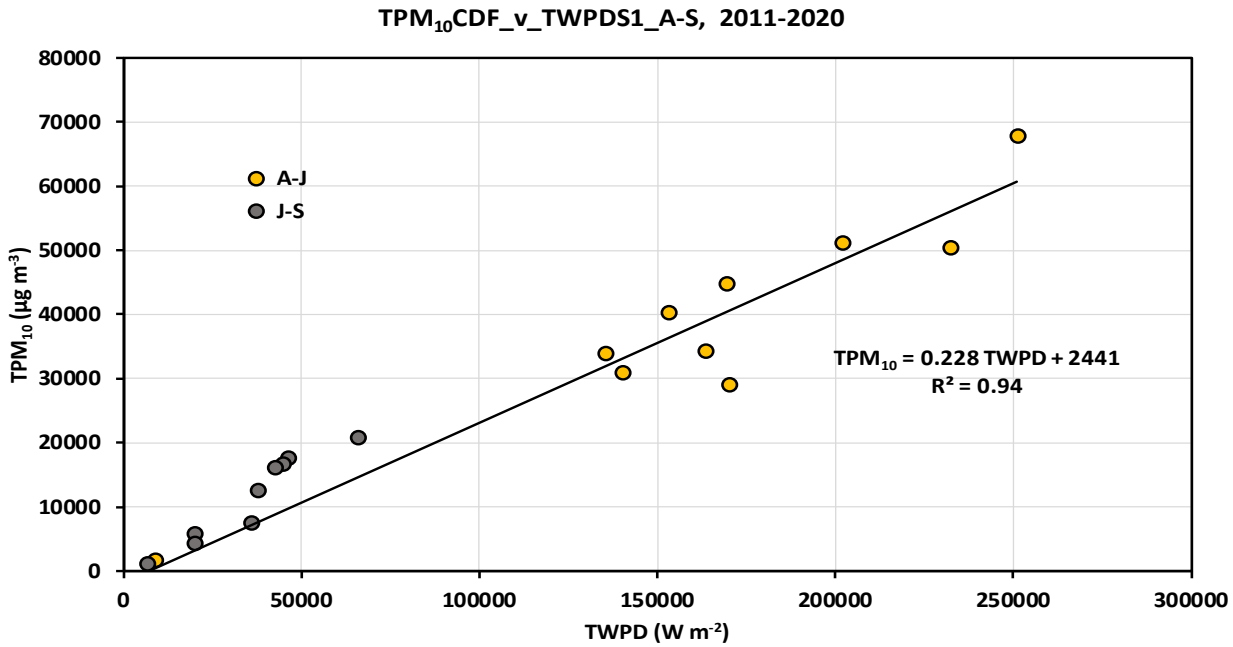
Calculate the sum of hourly WPD for the periods of interest (April-June and July-September [filters applied])

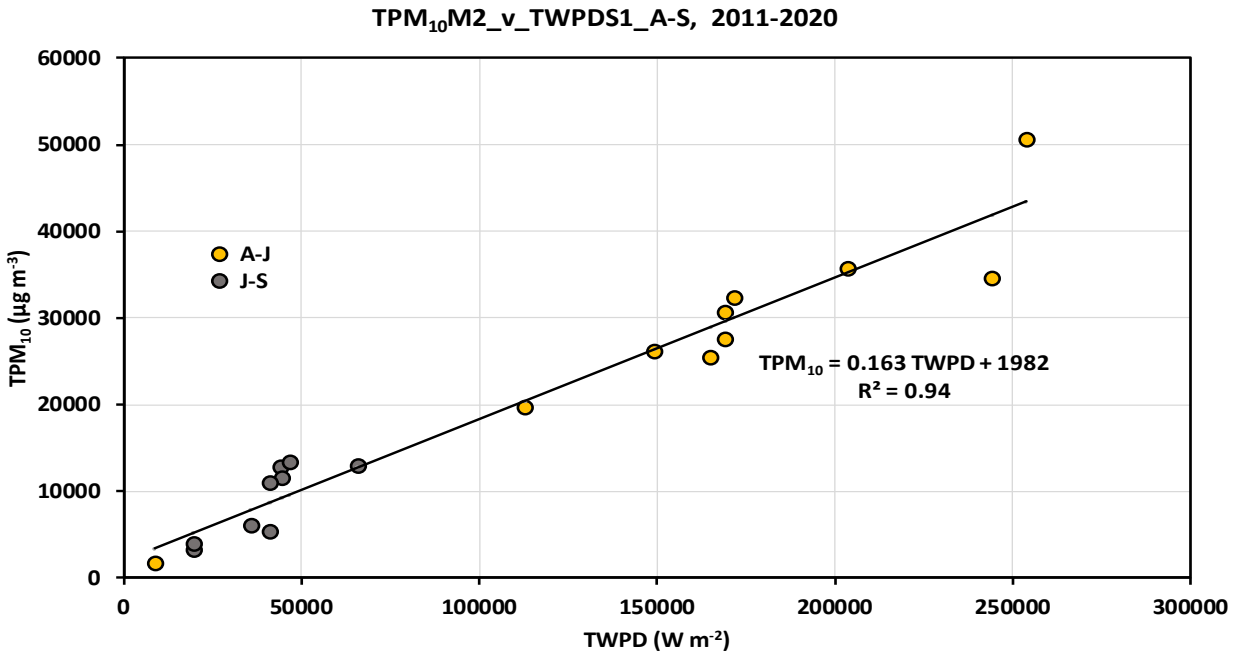
Calculate the sum of PM_{10} hourly concentration for the matching hours in the same periods of interest

$$Total\ WPD = \sum_{End\ Hour}^{Begin\ Hour} Hourly\ WPD$$

$$Total\ PM_{10} = \sum_{End\ Hour}^{Begin\ Hour} Hourly\ PM_{10}$$

Results


TPM10CDF_v_TWPDS1_A-S, 2011-2020
TPM10 (µg m-3)
TWPD (W m-2)
A-J
J-S
TPM10 = 0.228 TWPD + 2441
R² = 0.94
0
10000
20000
30000
40000
50000
60000
70000
80000
0
50000
100000
150000
200000
250000
300000


TPM10M2_v_TWPDS1_A-S, 2011-2020
TPM10 (µg m-3)
TWPD (W m-2)
A-J
J-S
TPM10 = 0.163 TWPD + 1982
R² = 0.94
0
10000
20000
30000
40000
50000
60000
0
50000
100000
150000
200000
250000
300000

Results

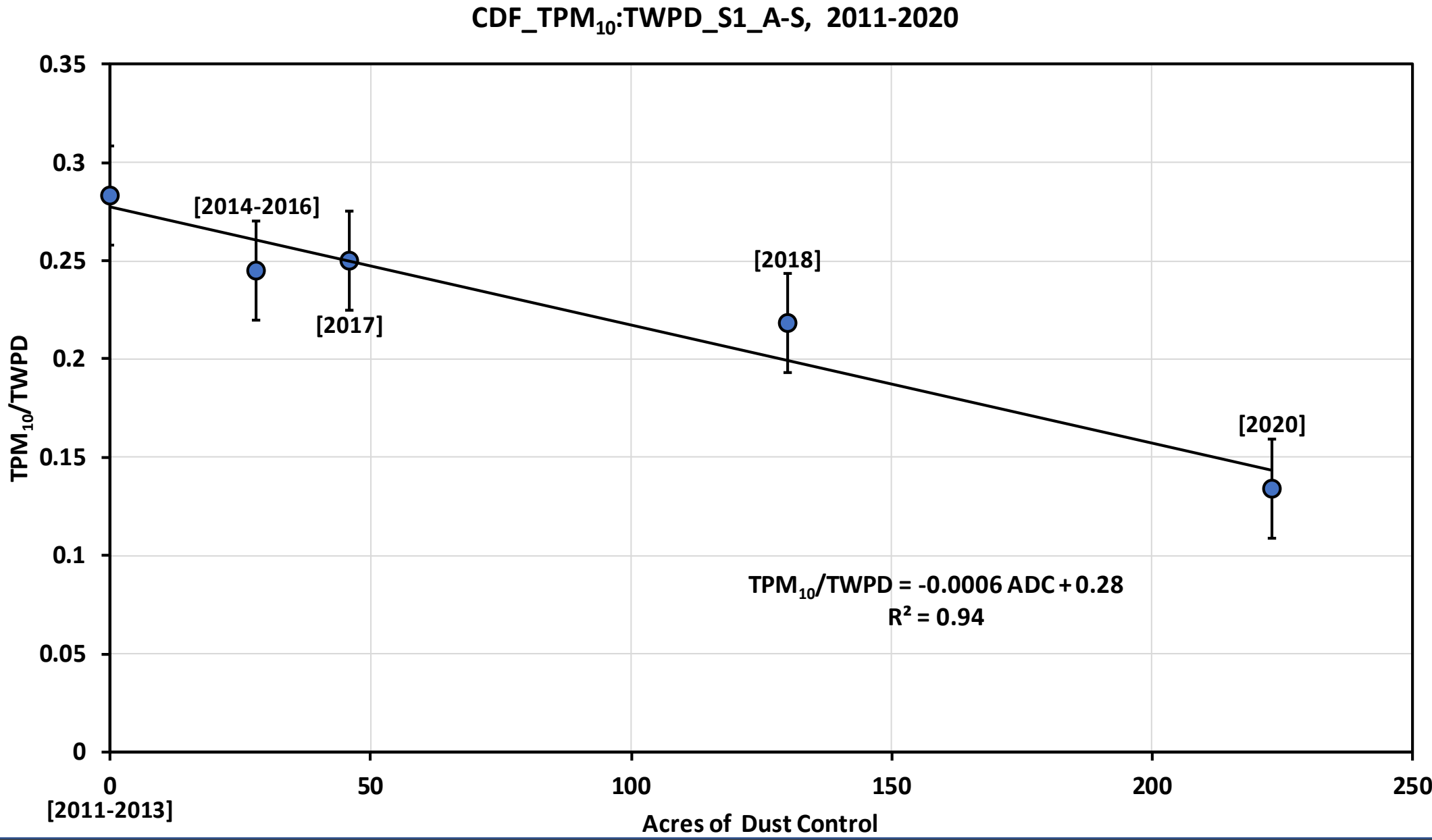
Because of the strength of the relation between TPM_{10} and TWPD, their ratio can serve as a metric to evaluate how the dust emission system is changed by landscape changes.

Constant ratio through time: no change in dust emission system

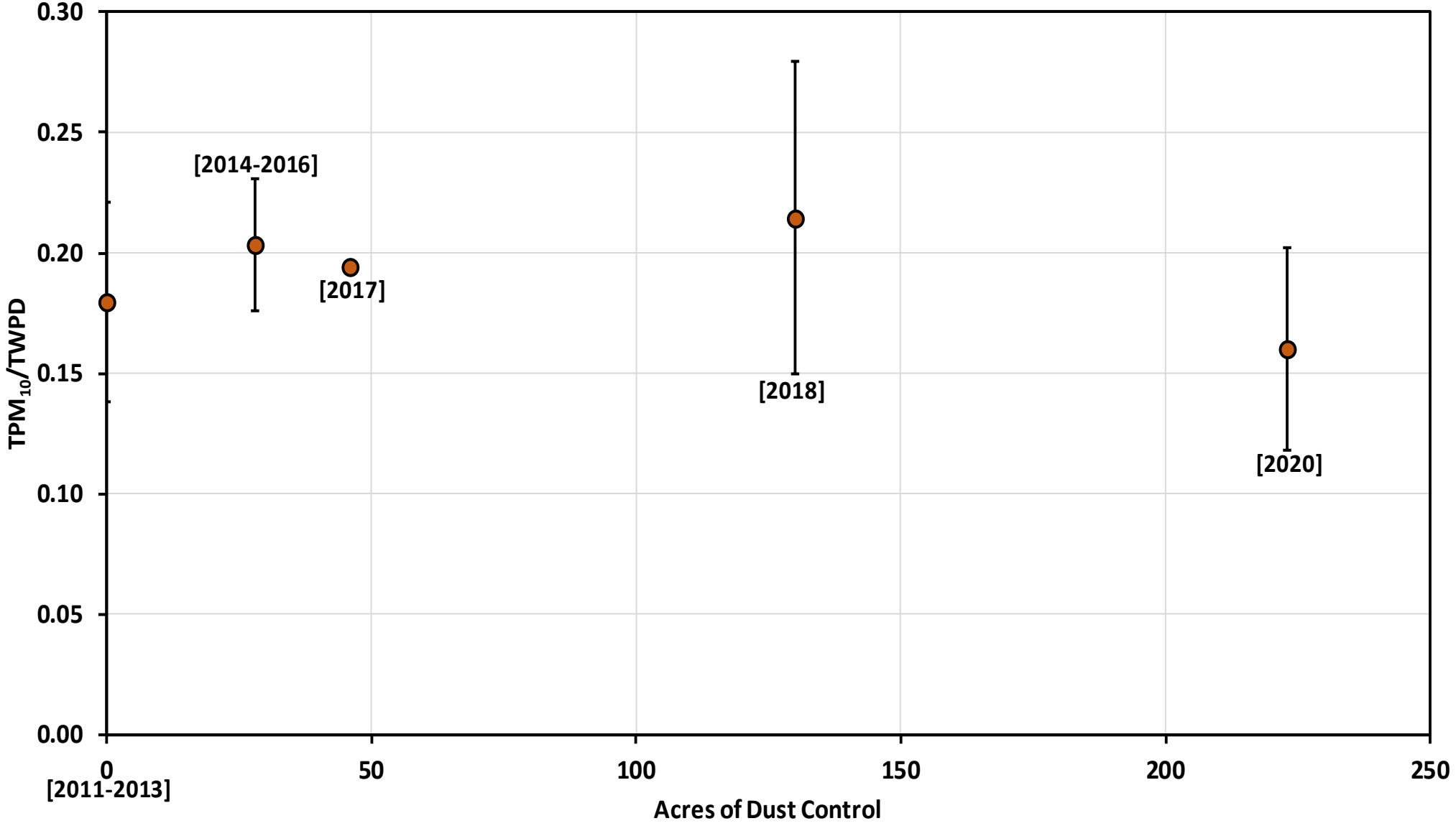
Changing ratio through time: change in dust emission system through time

Why change?: 1) reduction in area emitting, or 2) change in surface emissivity

Results


CDF_TPM10:TWPD_S1_A-S, 2011-2020
TPM10/TWPD
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
[2014-2016]
[2017]
[2018]
[2020]
TPM10/TWPD = -0.0006 ADC + 0.28
R² = 0.94
0
[2011-2013]
50
100
150
200
250
Acres of Dust Control

Results


M2_TPM10:TWPD_S1_A-S, 2011-2020
TPM10/TWPD
0.30
0.25
0.20
0.15
0.10
0.05
0.00
[2014-2016]
[2017]
[2018]
[2020]
0
[2011-2013]
50
100
150
200
250
Acres of Dust Control

Summary

- DRI's emission/dispersion modeling suggests PM_{10} at CDF is reduced by 42% due to controls in place in 2020 (i.e., 223 acres)
- Sequential decline in TPM_{10}:TWPD ratio for CDF/S1 tower from 2011-2013 to 2020 indicate that with increased area of dust controls the production of PM_{10} has decreased through time
- Reduction in 2020 is 48% for equivalent WPD since 2011-2013 (no controls in place)
- (Possible) Decline in TPM_{10}:TWPD ratio for Mesa2/S1 tower between 2011-2013 and 2020 indicates dust controls have reduced the production of PM_{10} by 11% for equivalent WPD since 2011-2013 (no controls in place), model results suggest 7% decrease

Attachment D

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A very-high resolution (20m) measurement-based dust emissions and dispersion modeling approach for the Oceano Dunes, California

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ABSTRACT

This study shows the results from very high-resolution (20 m) dust emissions and transport simulations for the Oceano Dunes State Vehicular Recreation Area (ODSVRA), a coastal sand dune complex located in San Luis Obispo County, California. Field data from an enhanced observation period carried out in May–July 2013 helped estimate the emissions and flow conditions over the dune field. Emissions are based on a comprehensive emissions grid developed from in-situ measurements using the Portable In-Situ Wind ERosion Lab (PI-SWERL). PI-SWERL estimates the potential for a soil surface to produce PM_{10} dust emissions for a range of wind speeds. This approach provided a well-determined PM_{10} emissions field as a function of time and space. Wind and turbulence fields were estimated using the CALMET diagnostic meteorological model constrained with surface stations, upper air soundings, buoys, and the North American Reanalysis data. Hourly, three-dimensional wind flow and instability objective analysis fields were developed at 20 m resolution in order to consider the complex flow over realistic dune morphology, land use/land cover and terrain characteristics over and around the Oceano Dunes. The dust dispersion simulations were performed using a computationally efficient and vectorized Lagrangian Stochastic Particle Dispersion Model driven by the CALMET output and the PI-SWERL time-space variable emissions. The dispersion model is based on the Langevin formulation and includes the turbulent diffusion and stochastic particle motion (of millions of particles) in the inertial sub-range, and assuming particles as discrete units neglecting deposition. The model estimates diffusion of particles from an initial particle releases that scale according to the PI-SWERL time-variable emissions estimates. Results were then tested at two independent-downwind locations, with positive correlations for flow conditions ($R^2 = 0.89$) and similar receptor PM_{10} concentrations ($R^2 = 0.85$). Evaluations against those observations during mean flow conditions as well as for elevated dust events suggest that the model framework can capture the spatial and temporal characteristics of mean day-to-day and diurnal PM_{10} variability. In this study we describe the details of the model framework and its performance as well as its implementation to locate the dust sources that have the strongest impact in the receptor sites and to evaluate the impact of different dust reduction strategies used at the ODSVRA to mitigate PM_{10} at downwind receptors.

1. Introduction

Emissions of dust due to high winds blowing across susceptible surfaces are a major source of airborne particulate matter pollution in arid and semi-arid environments (Hassan et al., 2016; Shahsavani et al., 2012; Tsiouri et al., 2014). Fugitive emissions are not limited, however, to arid and semi-arid environments as wind-driven particle emissions from natural surfaces (Huang et al., 2019) and stockpiles of industrial material also occur even in more humid environments (e.g., Sanderson et al., 2014).

To understand source and receptor relationships for fugitive dust emissions on a regional scale requires models that can effectively account for the strength of the emissions, the wind field, and the dispersion of the particles. Regional-scale models that have been developed to quantify fugitive dust emissions include those described by Ono et al. (2011) and Shaw et al. (2008). Models such as that described by Ono et al. (2011) are limited by their specificity to the area they were designed for (i.e., Owens Lake, California), or source materials (e.g., Sanderson et al., 2014), or they cannot account for topographic complexity because of their coarse resolution.

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Available online 21 September 2019

We present here a very-high resolution model system for predicting the effect of particle emissions (μg m^{-2} s^{-1}) from fugitive dust sources on regional air quality (μg m^{-3}) based on: a) *in situ* measurements of erodibility (i.e., threshold wind speed for emissions) and erosivity (i.e., emission as a function of wind shear), combined with b) a highly-resolved wind field model for complex terrain, and c) a Lagrangian Particle Dispersion model to track emissions through time and across space from source to receptor. We demonstrate the utility of this model system to predict downwind concentrations of suspended particles and its capability to identify source areas through knowledge of their relative contribution of particles at key receptor sites, which can guide remediation strategies.

The Oceano Dunes in San Luis Obispo County, California is a known source of fugitive dust emissions (Gillies et al., 2017; Huang et al., 2019) that degrades regional air quality below US Federal and State of California 24-h mean standards for particulate matter ≤10 μm aerodynamic diameter (PM_{10}, 150 μg m^{-3} and 50 μg m^{-3}, respectively). It is used as an ideal test-bed for demonstrating model performance and utility for identifying target areas for potential remediation activities.

The Oceano Dunes are a quaternary age coastal dune complex (Orme and Tchakerian, 1986) in California (Fig. 1), which contain the Oceano Dunes State Vehicular Recreation Area (ODSVRA) California State Park consisting of ~500 ha of dune environment that allows off-road recreational vehicle activity as well as ~280 ha of dune preserve that does not allow vehicle access. Under conditions of elevated wind speed, typically > 8 m s^{-1} with a dominant westerly component as measured 10 m above ground level (AGL), the threshold for sand transport is exceeded and once this occurs it is accompanied by dust emissions (Gillies and Etyemezian, 2014; Gillies et al., 2017; Huang et al., 2019). For periods of wind erosion within the dune system that last for ≥6 h, air quality measurements made by the San Luis Obispo County Air Pollution Control District downwind of the eastern boundary of the park have been observed to exceed the 24 h mean standard for PM_{10} for both US EPA and California State air quality regulations. As part of an on-going effort to reduce PM_{10} dust emissions that contribute to the violation of the standards and that are associated with the saltating sand in the dune areas, control measures are being evaluated (e.g., Gillies and Lancaster, 2013; Gillies et al., 2017).

To be able to evaluate how dust control measures may affect the downwind concentrations of PM_{10} and to identify key source areas within the park to target for potential remediation requires an emission/dispersion model that effectively accounts for the complex topography of the dune system and spatial variability in emission strength across the park domain and realistically disperses the emitted particles through time and across space. To achieve this objective we developed a model that integrates a highly resolved emissions grid based on *in situ* measurements of emission strength using the PI-SWERL® instrument (Etyemezian et al., 2007, 2014), generates a time and space resolved wind field using CALMET (Scire et al., 2000a), and uses a Lagrangian Stochastic Particle Dispersion Models (LSPDM) to disperse particles. The LSPDM used in this study is based on Bellasio et al. (2017) that has been modified to optimize its performance in the physical setting of this coastal dune environment. We neglected both wet and dry deposition and used a different turbulent formulation in the stochastic component of the model.

Pollutant transport and dispersion modeling is a subject that has garnered a large amount of research activity to develop models that effectively, efficiently, and realistically characterize meteorology and predict pollutant concentrations (gases and aerosols) at receptor sites. They are important tools used in environmental impact and regulatory studies (Hegarty et al., 2013; Lin et al., 2012; Stein et al., 2015; Mayaud et al., 2017; Foroutan et al., 2017; Vellingiri et al., 2016). Much of the research has focused on large-scale global or regional (~100–1000 km) dispersion models. At local scales (~10 m–~10 km) orographic and geographical features create additional challenges when local topography is complex and land surface characteristics change at a scale that is smaller than any available dataset or observation network. Dispersion models require three dimensional (for stationary modeling) or four dimensional wind field data (for non-stationary), which are considered difficult to analyze or simulate because of dependence on multiple factors, including surface properties such as topography, surface roughness, and flow instability. However, detailed wind information and emissions that adequately resolve local scale features are difficult to obtain. The CALifornia METeorological model (CALMET; Scire et al., 2000a) can be used to generate cost-effective three-dimensional wind fields; it is a common tool for US EPA regulatory studies. CALMET has been implemented to develop consistent wind fields from regional (Yim et al., 2007; Wang et al., 2008; Calastrini et al., 2012) to local scales (Kovalets et al., 2013; Schlager et al., 2017) for use in applied meteorological and air pollution transport studies.

This research study makes direct use of field measurements of dust emission and avoids making parameterizations of dust emissions that require assumptions for: the grain size distribution, soil constituents, and emissivity. Therefore, our work constitutes a step forward as it reduces the uncertainty when modeling dust transport and impacts, a desirable aspect in fugitive dust modeling highlighted in Huang et al. (2019).

The key goal of this work was to develop realistic, yet very fine-scale, emissions, wind, and dispersion fields for particulate matter (PM) using *in situ* observations of wind speed and direction patterns, and PM emissivity (μg m^{-2} s^{-1}) collected during a field campaign within the ODSVRA in 2013 (Gillies and Etyemezian, 2014; Etyemezian and Gillies, 2016). We developed a modeling framework that combines CALMET, driven with suitable and spatially-resolved meteorological measurements at sufficient density, combined with measured emission relationships and an LSPDM to allow the quantitative simulation of the concentration of PM_{10} dust downwind of the dunes and provide an accounting of where the sources of PM_{10} are that affect receptors of interest. The developed model framework offers the opportunity to explore the emission and dispersion of PM_{10} for other years at the ODSVRA and also other geographic areas where an emission grid is subsequently established.

In this work, we implement CALMET using an unprecedented grid size (20 m) to help resolve the detailed flow over and around the dune field, together with the larger scale kinematical and channeling effects of the terrain and slope flows. We develop an LSPDM formulation that uses meteorology based on CALMET output and time-space variable emission relationships derived from *in situ* measurements of emission flux using the PI-SWERL instrument (Etyemezian et al., 2007, 2014).

Dust emissions from the dune field are variable in space and time and the intensity of those emissions is related to regional and localized flow regimes that influence local shear stress acting on the surface and the surface conditions (Etyemezian et al., 2015; Etyemezian and Gillies, 2016). For dust emission source attribution, we run the LSPDM model in a forward mode and use a tagging procedure to “fingerprint” the origin of each particle with their source location, date, and emission rate information. The results of the model framework, configured to describe the spatio-temporal variability of the 2013 dust season – significant dust outbreaks typically occur between March and the beginning of June, but can continue to occur with some frequency through October in some years (e.g., SLOAPCD, 2013, 2016) –, are compared with independent downstream meteorology and PM_{10} concentration observations to evaluate the performance of the model chain in the quantitative estimation of the Oceano Dune dust contribution near ground level locations downwind of the ODSVRA.

To our knowledge, this represents the first time that a complete model implementation from in-situ source strength measurements to resultant concentrations at a receptor has been implemented at the local/regional scale for windblown fugitive dust emissions. The model framework can be used to inform where mitigation strategies could be placed to reduce dust emissions and potentially improve downwind air quality. Such a model framework can also be used to evaluate dust

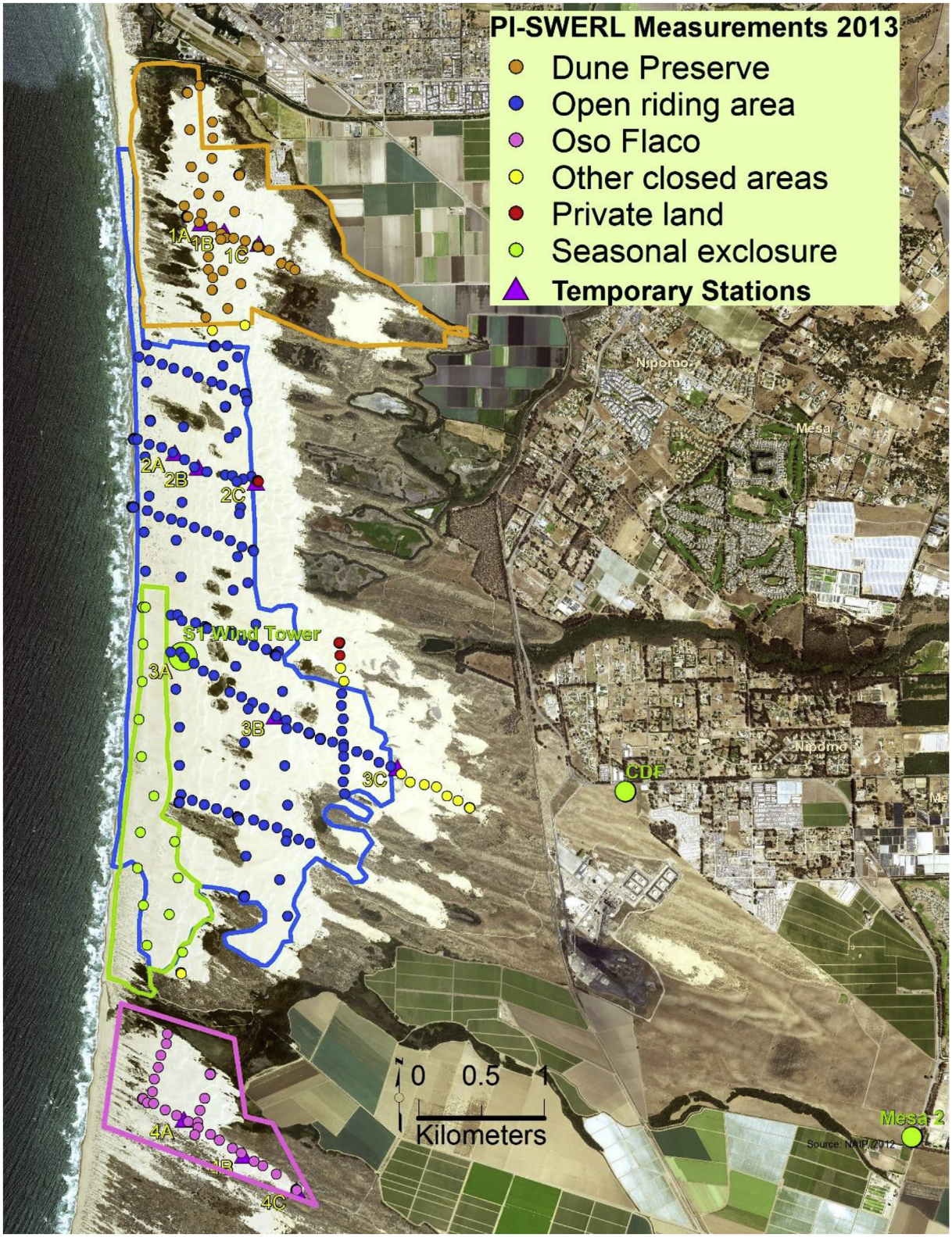

Fig. 1. Location of ODSVRA temporary monitoring stations in 2013, CDF and Mesa 2 air quality monitoring sites, and PI-SWERL measurements used to develop the emissions grid.

control strategies and estimate their effectiveness to improve downwind air quality on a regional scale or with respect to specific receptor sites. Hence, we run the LSPDM to create forward trajectories for multiple emission scenarios based on different dust control measures to assess their effectiveness under the same meteorology fields.

In this paper we: 1) provide the complete dataset used to estimate emissions (Supplemental Material), 2) provide details of the model framework development (Section 2), and 3) evaluate the model performance using independent meteorology and downstream PM_{10} dust concentration data (Section 3). We further show the impact of a

realistic and idealized dust control strategy and assess the impact in reducing concentration of PM_{10} in the impact region (Section 4). Finally, the conclusions are provided together with a summary of the characteristics, limitations and benefits of the model framework (Section 5). Remarks on potential future atmospheric environment applications and operational and research opportunities are also provided.

2. Methods and model development

2.1. 2013 enhanced meteorological observation period within the ODSVRA

In 2013, a temporary network of instrumented towers was set up within the ODSVRA (Fig. 1). The network operated between May and July. The monitoring network consisted of three instrumented towers on each of four transects oriented to 292°, the direction most associated with sand transport and dust emission events. At each tower, data on wind speed and direction (at 3 m and in four locations at 10 m AGL) were obtained to characterize the local conditions and regional air flow patterns. In addition, measurement of air temperature and relative humidity (RH) at a height of approximately 2 m AGL were acquired. The locations (latitude and longitude), distances along the transects to monitoring positions from the shoreline and their elevation above sea level are listed in Table 1. The data used herein encompass the time period from May 10, 2013 through July 20, 2013.

Transect 1 lies within the northern section of the Dune Preserve, to the east of the fore-dune complex dominated by non-native plant species. The three measurement positions span a distance of approximately 1185 m. The westernmost and origin position was approximately 700 m from the shoreline (Fig. 1). Transect 2, Position A is approximately 409 m from the shoreline. Transect 3 is approximately 1760 m south of Transect 2, and Transect 4 is approximately 3600 m south of Transect 3, and lies within the southern area of ODSVRA, south of Oso Flaco Lake (Fig. 1).

2.2. Downwind ODSVRA PM_{10} monitoring sites

Measurements of hourly mean PM_{10} downwind of the ODSVRA are available from US EPA regulated monitors operated by the San Luis Obispo Co. Air Pollution Control District, San Luis Obispo, CA. These quality-assured and quality-controlled data are available from the California Air Resources Board (CARB), Sacramento, CA website (https://www.arb.ca.gov). Two sites, CDF Arroyo Grande (35.04676° N, 120.58777° W, elevation 35 m; hereafter CDF) and Nipomo-Guadalupe Rd. (35.02079° N, 120.56389° W, elevation 42 m; hereafter Mesa 2) operate Beta Attenuation Monitors (BAMs) to measure and record mean hourly PM_{10} measured 3 m AGL, which provide data to allow for comparison of model-estimated PM_{10} concentrations and local mean hourly wind speed and direction measured at 10 m AGL.

Table 1
The positional data for the meteorological measurement stations.

Transect ID	Latitude	Longitude	Distance from shore [m]	Elevation [mASL]
T1A	35.088257	−120.6235	700	17.95
T1B	35.087615	−120.6216	893	29.05
T1C	35.086687	−120.6186	1185	21.15
T2A	35.071805	−120.6263	409	13.09
T2B	35.088257	−120.6235	628	19.04
T2C	35.069508	−120.6193	1101	32.35
T3A	35.056977	−120.6261	500	19.64
T3B	35.052712	−120.6181	1365	34.31
T3C	35.048821	−120.6076	2420	24.31
T4A	35.023906	−120.6269	859	18.6
T4B	35.021225	−120.6218	1411	37.28
T4C	35.018632	−120.6173	1913	37.08

2.3. Site-specific emission factors

An important factor in the overall understanding of dust emissions from the Oceano Dunes is the characterization of the variability of the erodibility (i.e., threshold shear velocity, u_{*_t} m s^{-1}) and magnitude and variability of the surface emissivity (F μg m^{-2} s^{-1}) for PM_{10} across the spatial domain. The PI-SWERL (Etyemezian et al., 2007, 2014; Sweeney et al., 2008, 2011) was adopted as the tool for providing data on erodibility and emissivity of the surfaces within the ODSVRA, in both riding and non-riding areas.

Briefly, the PI-SWERL consists of a cylindrical chamber (0.30 m diameter) that is open on one end. A test plate, with a central region that is open and is equal in diameter to the inside of the PI-SWERL chamber and a thin metal lip that extends 0.04 m below the bottom, is gently inserted into the sand test surface (see inset in Fig. 2). The function of the test plate is to keep the PI-SWERL from tipping or moving during testing, to keep the sand underneath the open portion of the PI-SWERL contained within the test region, and to provide a seal between the PI-SWERL and the test surface. The PI-SWERL is placed onto the test plate so that the open bottom of the PI-SWERL is aligned with the open section of the test plate.

Within the PI-SWERL, an annular blade is suspended from the top cylinder approximately 0.05 m above the test surface and connected to a motor at the top of the cylindrical chamber. When the motor spins, a shearing stress (τ, N m^{-2}) is created on the test surface (Etyemezian et al., 2014) by the rotation of the annular blade. Clean air is injected into the cylinder at a flow rate of 100 L per minute (lpm), it mixes with the dusty air inside and is exhausted out of a port at the top of the chamber. Another small port at the top of the chamber is connected to a dust monitor (DustTrak 8520, TSI, Inc.) so that the concentrations of PM within the chamber are measured once per second. The dust monitor is equipped with a size cut device so that it measures PM_{10}.

For the testing carried out at the ODSVRA the PI-SWERL was operated with a set sequence of target RPM values (2000, 3000, and 3500, nicknamed a “Hybrid 3500” test). For the Hybrid 3500 test, 60 s of clean air flush are followed by a linear “ramping” increase of the blade rotation from 0 RPM to 2000 RPM over the course of 60 s. The rotation rate of 2000 RPM is held constant for 90 s corresponding to the first constant RPM “step”, followed by a ramping increase to 3000 RPM over 60 s. The second step at 3000 RPM is held for 90 s, followed by a 60 s ramp to 3500 RPM. Following this, power to the blade is cut and the cylindrical chamber is flushed with clean air for 90 s. Coordination of motor speed, air flow control, and data collection and logging from the DustTrak and other instruments is automated. The instrument also collects GPS coordinates and uses four optical gate devices (OGD, Etyemezian et al., 2017) to monitor the initiation of sand movement near the surface.

A total of 360 measurements using two PI-SWERL instruments were completed between August 26, 2013 and September 5, 2013. As much as possible, testing was conducted along a transect line, running nominally east-west or north-south. Each testing day was started at the beginning of a chosen transect by running a collocated test with two PI-SWERL units placed within 5 m of each other (See example in Fig. 2). The PI-SWERL units were then moved a nominal distance of a meter or so and another collocation test was completed. This procedure was completed one more time so that each PI-SWERL completed three replicate measurements and the two PI-SWERLs were collocated for the span of these replicate measurements. This sequence of “collocation” steps was conducted at the beginning and end of each measurement day and after every six non-collocation tests.

Following initial collocation, for nominally east-west transects, one PI-SWERL was moved approximately 100 m in the direction of the transect, while the other unit was moved 200 m from the original point of collocation. One test was completed before the units were subsequently moved 200 m each so that one PI-SWERL was at 300 m from the original point of collocation and the other was 400 m from that same

Fig. 2. Collocation of two PI-SWERL units. Inset shows the test plate that the PI-SWERL was placed upon.

point. This "leapfrog" measurement position pattern was continued until either the end of a transect was reached or each PI-SWERL had completed six tests since the last point of collocation. In the latter case, both PI-SWERLs were moved to the next point along the transect, where they underwent the collocation procedure (and also provided useable measurements for that location).

Fig. 1 displays the locations where valid PI-SWERL measurements were completed. In all, eight east-west transects were completed with four corresponding to the instrumented meteorological transects numbered "1"-"4" (Fig. 1). Additional transects were conducted between "1" and "2", between "2" and "3", and between "3" and "4". Several north-south transects were also completed to improve spatial coverage of the measurements. For this direction, the PI-SWERLs were spaced 300 m apart rather than 100 m owing to the much longer transect lengths. In general, it was more difficult to maintain a straight line of travel along the north-south direction because of topographic relief. At the western edge, the north-south transect started in an area that excluded off-road vehicle riding to protect an endangered bird species breeding area (i.e., the Snowy Plover exclosure) in the south and finished at the northern boundary of the riding area. Two transects ran from the riding area into the Dune Preserve in the north. Three additional north-south transects were completed between towers "3b" and "3c", and in the Oso Flaco area (Fig. 1).

Of the 360 tests, there were seven tests (five for unit #2 and two for unit #3) where the last step in the Hybrid 3500 program resulted in the DustTrak upper limit (150 mg m^{-3}) being exceeded. The data from the 3500 RPM interval were considered invalid for those tests. The effect of those invalid data is likely negligible in terms of impacting overall data quality.

Each RPM step corresponds to constant shear stress τ values (or u_*, as $\tau = \rho_{air} u_*^2$ where ρ_{air} is air density, kg m^{-3}). The RPM is converted to a u_* value using the relationship from Etyemezian et al. (2014):

$$u_* = C_1 \alpha^4 RPM^{C_2/\alpha} \quad (1)$$

where C_1 is a constant (=0.000683), C_2 is a constant (=0.832), and α, which has a value between 0.8 and 1 that varies with the surface roughness, and which was assumed equal to unity based on the surface roughness designation of smooth sand.

Dust emissions at each of the three steps where RPM is held constant are calculated by averaging the 1-s dust concentrations over the duration of the step and using

$$E_i = \frac{\left(C_{DT,i} \times \frac{F_i}{60 \times 1000}\right)}{A_{eff}} \quad (2)$$

where E_i is the PM_{10} dust emissions in units of mg m^{-2} s^{-1} at the ith step, $C_{DT,i}$ is the average DustTrak PM_{10} in mg m^{-3}, F_i is the clean air flow rate in (and out of) the PI-SWERL chamber in liters per minute, and A_{eff} is the PI-SWERL effective area in m^2 (0.035 m^2 as recommended by Etyemezian et al., 2014).

The RPM that corresponded to the threshold of sand particle movement and dust emissions (i.e., u_{*t}) was estimated using a semi-automated algorithm that identifies systematic changes in the electronic signals from the near-ground optical gate devices (OGS 1 and OGS 2) within the PI-SWERLs as RPM steadily increases to reach the first set-point of 2000. Ultimately, the data analyst reviews the findings of the algorithm in every case to ensure that it has adequately identified the threshold.

2.4. Meteorological model

Gridded flow conditions were developed using the CALMET version 5.8.5. CALMET is a diagnostic meteorological model developed and maintained by US EPA; the model generates mass-consistent wind fields and estimates hourly wind and temperature fields on a three-dimensional grid extending from the surface to the mid-troposphere. First, the model interpolates the observations, then, it considers the kinematical effects of terrain, slope flows and blocking effects, and further adjusts wind fields using a zero divergence constraint to meet the mass consistency requirement. For coastal applications, CALMET also considers whether the wind flow occurs over water or land, and considers special interpolation regions that accounts for the sea breeze by considering: [..] *an inverse distance squared interpolation, but the distance are defined as the difference between the distances of the grid point to the coastline and the station to the coastline if the station and the grid point are in the same side of the coastline and the sum if they are on the opposite sides. With this method, the actual distance between the grid point and the station is not important, only their relative distance from the coastline* (Scire et al., 2000a).

Energy balance is applied to heat fluxes, u_*, Monin-Obukhov length, and convective velocity scale. Scire et al. (2000a) discuss the theoretical and technical details of CALMET. CALMET is a cost-effective, computationally efficient model but is limited in the representation of dynamical processes such as non-linear flow interactions, flow splitting, and explicit turbulence processes (Wang et al., 2008).

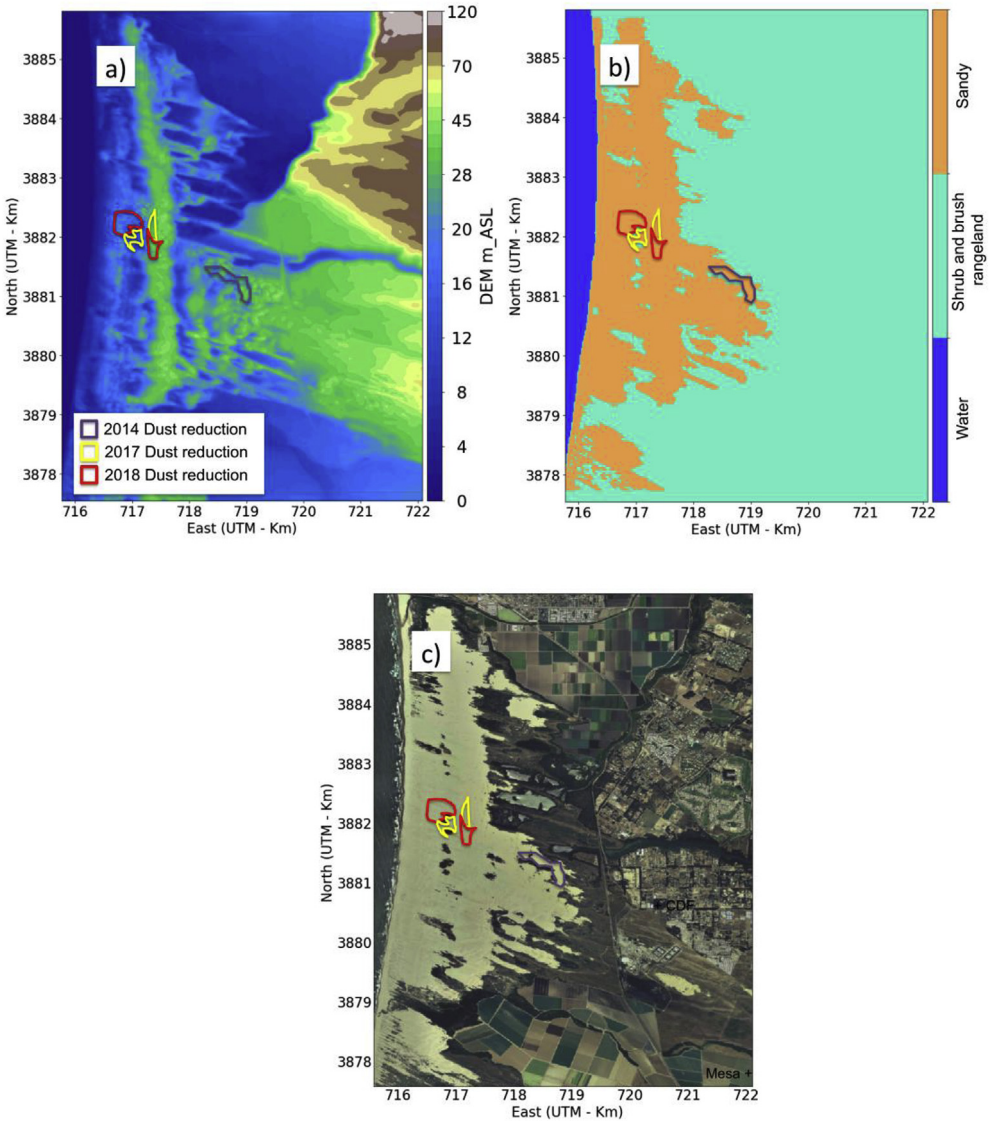

Fig. 3. (a) 20 m digital elevation model, (b) land cover information implemented in CALMET, (c) aerial image shown for reference. Polygons in each panel indicate the dust treatment areas implemented in time. Coordinates based on the WGS-84 region and Datum NAS-C.

The CALMET model analyzes 3D wind fields based on meteorological observations, terrain elevations, and land-use information. For our purposes the model domain was configured using very fine horizontal and vertical resolutions. Terrain-following vertical coordinates were determined from 10 to 200 m above the surface at 10 m vertical increments, and every 50 m from 200 m up to the model top at 2.5 km above ground. CALMET domain includes 20 m grid sizes with 415 × 447 grid points in the x and y direction, respectively (Fig. 3). Stationary data for bottom boundary conditions were aggregated from 5 m to 20 m grid size and include the terrain elevations and land use categories (water, sand, shrub and brush rangeland). We tested the model sensitivity to different grid aggregation sizes from 5 m to 100 m. This test was necessary to guarantee that the dune topographic structures and associated flow relaxation were captured, while balancing the computing resources necessary for the integration. We found that 20 m was an adequate grid size and a parsimonious trade off. Though urban developments are included in the model domain, they were not considered as most urban grid points lay downstream and near the eastern border of the model domain. Default geophysical parameters were implemented as a function of the land use categories, such as the albedo, surface roughness length, Bowen ratio, soil heat flux, and vegetation leaf area index (Table 2).

The meteorological model assimilates meteorological data from the temporary observation network consisting of 13 surface station sites (Fig. 1). Good quality data for all the observation sites were available from 15th May to 20th July 2013, which is the base period of the integration of the model framework. All the results presented in this study are based on the outlined integration period, unless otherwise described. Hourly surface observations of 10 m AGL wind direction and speed, 2 m AGL temperature and relative humidity were provided to the model. Vertical soundings were included and provided wind direction and speed, temperature, pressure, and height. In order to provide improved upper level data for upstream conditions, we retrieved 3-hourly North American Regional Reanalysis (NARR; Mesinger et al., 2006) soundings over the nearest offshore grid point (35.058° N, 120.833° W; 18 km offshore), and at the Vandenberg NWS sounding site (34.73° N, 120.58 ° W; 35 km to the south of the domain), which only provides daily information at 12 UTC. A buoy site (NOAA-NDBC-46011, Santa Maria; 34.956° N, 121.019° W; 33 km offshore) was located outside the integration domain but provided offshore and upwind surface wind speed, pressure, air and sea surface temperature data. No precipitation was assimilated during the integration period; hence wet deposition was assumed to be negligible in this study.

A two-day integration period during an extreme wind case was used

Table 2
Surface layer geophysical parameters used in CALMET.

Category ID	z_0 (m)	Albedo (0–1)	Bowen Ratio	Soil Heat Flux Parameter	Leaf Area Index
Shrub and Brush rangeland	0.05	0.25	1	0.15	0.5
Water	0.001	0.1	0	1	0
Sandy Area other than the flat beach (> 100 m from waterline)	0.00026*	0.3	1	0.15	0.05

* Estimated from S1 tower meteorological data (see Section 3.2 for details and Fig. 1 for location of S1 tower).

to further test CALMET sensitivity to different parameters, as highlighted by Wang et al. (2008), and the inclusion (or not) of the buoy, soundings, and different combinations of the ODSVRA network sites. From these tests (not shown), we concluded that the buoy and the NARR soundings were crucial to provide realistic offshore and upper-level flow variability, respectively. Additionally, two long term monitoring sites created significant sensitivity in the model output, one over the target area (CDF) and another site over the eastern fringe of the model domain (Mesa 2) (Fig. 1). For completeness and to test for extrapolation potential and the overall confidence in the CALMET output, we also ran a full long term simulation by leaving out the CDF and Mesa 2 observations. For the longer term meteorology and dispersion model components of this study, all surface station, buoy, and upper-air level data were used.

Regarding model parameters selection and sensitivity, we follow Wang et al. (2008) recommendations in the selection of the vertical weights for the upper-level wind interpolation. The inclusion of the kinematical effects of terrain, slope flows and blocking effects were crucial to characterize the flow around the dune field structure and the channeling induced by the higher and more complex terrain in the northwestern border of the integration domain.

2.5. Dispersion model

Lagrangian Particle Dispersion Models (LPDMs) are used widely in the field of atmospheric pollution studies (Stain et al., 2015) because they are easy to implement relative to Eulerian frameworks, and offer cost-effective performance (Hegarty et al., 2013; Bellasio et al., 2017). Lagrangian models track particles assuming the resulting displacement is due to the sum of an advective component by the mean flow (e.g., hourly CALMET model output) and a velocity perturbation component, which is unresolved and typically requires grid-based parameterization or sub-grid explicit solutions. Such velocity perturbations, which represent the turbulent diffusion of the pollutants, are resolved by using mixing properties of the mean wind field and factoring stochastic parameters based on random number generation.

LPDMs are adequate for transport and dispersion of pollutants in the mixed boundary layer for short- and long-range distances (Hegarty et al., 2013; Thomson and Wilson, 2013); they have proved to be very useful for determining and locating source-receptor relationships, while offering the required sensitivity and accuracy necessary for policy relevant decisions (Zhao et al., 2009; Miller et al., 2013). However, for Lagrangian models with turbulent diffusion based on the stochastic behavior of the velocity perturbations (e.g., CALPUFF; Scire et al., 2000b), Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT; Draxler, 1999), the Stochastic Time-Inverted Lagrangian Transport (STILT; Lin et al., 2003), and Flexible Particle (FLEXPART; Stohl et al., 2005)), the irreversibility of turbulent diffusion and deposition (He, 2011; Xu et al., 2016) prevents the accurate estimation of source regions simply using the LPDM in a backward trajectory mode, i.e., integrating trajectory equations backward in time from receptors. The irreversibility problem is less critical for well-mixed surface and planetary boundary layers with isotropic turbulence (Xu et al., 2016). The possibility exists, however, for a violation of mass conservation to occur (Lin et al., 2003). To avoid this limitation, LPDM can be implemented in a forward-time mode with tagging functionality, which allows source-receptor relationships to be identified by incorporating all available statistical information on the emission sources, and atmospheric trajectories for individual particles.

In this study, we implement a computationally efficient LSPDM that simulates dust transport including a stochastic turbulent diffusion component as described in Bellasio et al. (2017). For forward trajectories of particles, we use the Thomson (1987) assumption for separation of the mean and perturbed motion. The net result is a trajectory velocity for each particle that is given by the sum of the grid point mean Eulerian velocity and a velocity perturbation at the sub-grid scale. The model tracks particles forward by considering the advection by the mean wind field derived by interpolating hourly time increments from CALMET (described in Section 2.2; the LSPDM uses input taken directly from CALMET output format), and the sub-grid scale turbulent fluctuations (unresolved by CALMET), which represent the turbulent diffusion of the particles using a constant time step (Lin et al., 2012). We used a dt of 1 s (upper limit using the Wilson and Zhuang (1989) formulation) to accommodate the time scale (T_L) within the well-mixed layer (~100–200 s). Smaller (0.1 s) and larger (5 s) dt values were implemented but the downstream spread at the receptor location were relatively similar, 0.4% and 3.2%, respectively, suggesting that the LSPDM solutions were stable for integration within the simulated domain (Wilson and Zhuang, 1989; for homogeneous turbulence, a time step $dt = 0.1$ TL is recommended) and with minimal numerical diffusion (Eluszkiewicz et al., 2000). The adopted dt preserves tracer gradients even at the sub-grid scale (< 20 m). Within the mixed layer, the turbulent diffusion component is a function of the turbulence conditions derived from CALMET, which follows the Monin-Obukov similarity theory formulation (Scire et al., 2000a). The stochastic process assumes a normally distributed random number generator with mean zero and variance equal to the time step dt (Thomson, 1987), hence reproducing the stochastic nature of turbulence (Thomson and Wilson, 2013).

Particles are released using the time-space variable dust emission rates described earlier (Section 2.3). Conversion from particle number to mass concentration arising from the emissions is performed at every dt using a linear interpolation function. Particles are initially released in the center of each emitting grid point at different injection rates. A dust injection function was developed using a histogram of 30 equally spaced classes. For example, at every dt, the injection function releases n particles for an emitting grid point falling in the first class of the histogram; $2 \times n$ particles are released for an emitting grid point falling in the second class, and so on, until releasing $30 \times n$ for those in the 30th class. n was fixed as 10 through the integration period, which is large enough to guarantee robust statistics of downwind concentration estimates.

At any time and location, concentration fields are estimated by a counting procedure that relates the number of particles in a volume (e.g., grid point) to the released mass. We estimate hourly PM_{10} downwind concentrations using CALMET 3D grid following Flesch et al. (1995) as:

$$PM_{10}(x, t) = \int_{-\infty}^{t} \int_{-\infty}^{-\infty} S(x_o, t_o) P^f(x, t|x_o, t_o) dx_o dt_o \quad (3)$$

where S is the variable spatial-temporal dust mass emissions or source field and P^f is the probability that a suspended particle originating from

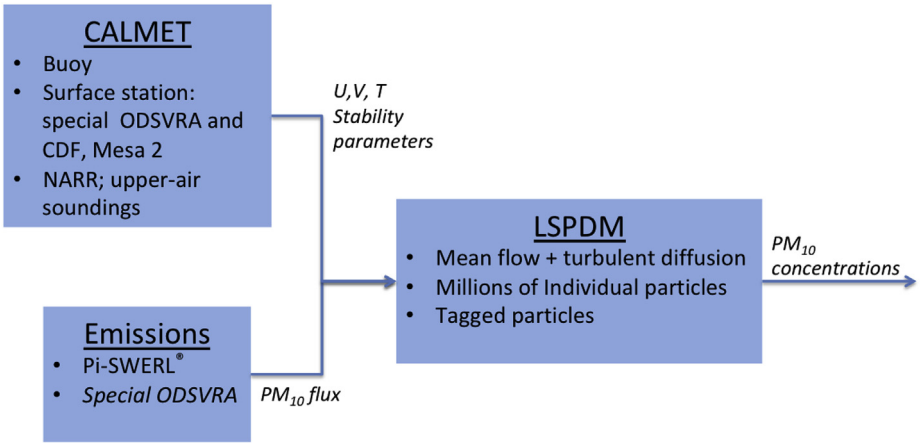

Fig. 4. Schematic of the model framework by model component and input (in-box) and output (labeled arrows) parameters.

$$MBE = \frac{1}{N}\sum_{i=1}^{N}(M_i - O_i), \tag{4}$$

$$MAE = \frac{1}{N}\sum_{i=1}^{N}|M_i - O_i| \tag{5}$$

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(F_i - O_i)^2} \tag{6}$$

$$r = \frac{\sum_{i=1}^{N}(O_i - \bar{O})(F_i - \bar{F})}{\sqrt{\sum_{i=1}^{N}O_i - \bar{O}}\sqrt{\sum_{i=1}^{N}F_i - \bar{F}}} \tag{7}$$

Table 3
The mean PI-SWERL derived 10 m AGL threshold wind speed and PM_{10} emission strength for the three target RPM values.

Area	Threshold wind speed at 10 m AGL (m s^{-1})	Emissions at 2000 RPM (mg PM_{10} · m^{-2} ·s^{-1})	Emissions at 3000 RPM (mg PM_{10} · m^{-2} ·s^{-1})	Emissions at 3500 RPM (mg PM_{10} · m^{-2} ·s^{-1})
Dune Preserve	8.5	0.06	0.41	1.3
Open riding area	9.0	0.22	1.4	2.5
Oso Flaco	10.5	0.01	0.23	0.59
Other closed areas	8.7	0.04	0.32	0.89
Private land	8.7	0.02	0.28	0.77
Seasonal exclosure	9.4	0.02	0.24	0.75

location x_o at t_o is found at location (e.g., grid point) x at time t.

Lagrangian models are reversible in the sense they can be used to locate sources of dust or pollutants. For example, we use the model to identify locations in the Oceano dune field from which fugitive dust particles were released. For Lagrangian models with turbulent diffusion, however, the irreversibility of turbulent diffusion and deposition (He, 2011; Xu et al., 2016) constrains estimations of back trajectories only during the presence of well-mixed atmospheric conditions. To overcome this problem and to accurately detect the source locations, we only execute LPDM model in a forward mode, with active turbulent diffusion and tag each released particle with source information (x_o, t_o). Hence, particle tagging within the LSPDM allows us to efficiently examine how changes to the emission grid, or dust control measures (size and effectiveness) and changing meteorology, can influence downwind concentrations of PM_{10}. This allows us to determine if management objectives of improving air quality have the potential to reach the target of compliance with Federal and State air quality standards. Fig. 4 shows a summary of the model framework presented here including the parameters being passed between models.

2.6. Statistical evaluations

We implemented standard and basic accuracy metrics to evaluate both the flow and the dispersion models' performance, allowing comparison between a sufficiently large number of pairs (N) of the model estimates (M) and the observed (O) hourly values. We included the mean bias error (MBE); mean absolute error (MAE); root-mean-square error (RMSE); and the Pearson correlation coefficient (r), defined as follows:

Note that RMSE penalizes large simulated errors, while MBE and MAE treat errors uniformly. MAE- and MBE-related metrics are more associated with potential imbalances in the model solutions, with MBE indicating directionality of the average error and MAE preventing potential error cancelation as MBE does. An underlying assumption is that the error distribution is unbiased and follows a normal distribution.

3. Results

3.1. Meteorological conditions during the temporary monitoring period

Transect 1, Position A is approximately 700 m from the shoreline (Fig. 1). Wind roses (not shown), based on wind speed and direction measurements made at 3 m AGL for the three positions show the winds reached position A with a dominant westerly component (270°). With increasing distance from the shoreline there is change in the dominant wind direction to the west-north-west (292°). The mean hourly wind

Fig. 5. Spatial distribution of PI-SWERL measured PM_{10} emissions (mg of PM_{10} m^{-2} s^{-1}) at 3000 RPM, which is equivalent to $u_* = 0.53\,m\,s^{-1}$. The blue outline represents the boundary of the riding area highlighted in the text. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

speeds increase from west to east. This is a likely result of compression of the airflow as the lowermost airflow streamlines encounter dune topography (Wiggs et al., 1996).

Transect 2 shows a similar pattern to Transect 1 but at position 2A west-north-west (292°) winds are of equivalent frequency to west winds, unlike at position 1A, and these winds are also of greater magnitude. In the progression from west to east on Transect 2, the frequency of the 292° winds is maintained and the magnitude of the winds along this direction increases.

Transect 3 maintains the same pattern in the wind direction moving west to east as Transect 2, but at position 3A west-north-west (292°) winds are more frequent than west winds and these winds are of greater magnitude. In the progression from west to east on Transect 3, the frequency of the 292° winds is maintained.

Transect 4 lies within the southern area of the ODSVRA, south of Oso Flaco Lake. At all three positions the dominant wind direction is west-north-west (292°), and the highest magnitude mean hourly 3 m AGL wind speeds are associated with this direction. Winds at 3 m AGL from the west (270°) are the second most frequent direction but do not exceed $11\,m\,s^{-1}$. Unlike the three transects to the north of Transect 4, winds from the north-west are more frequent and can reach hourly mean 3 m wind speeds in excess of $11\,m\,s^{-1}$.

Based on the comparisons of wind speed and wind direction data from 3 m to 10 m AGL, measured at the same position for each of the transects, it is clear that the pattern is preserved and independent of height between 3 and 10 m. Therefore, information on the characteristics of wind speed and direction can be obtained with a high degree of confidence using measurements from either height.

3.2. The PI-SWERL derived emissions database

3.2.1. PI-SWERL measured threshold shear velocity (u_{*t})

PI-SWERL provided the opportunity to measure u_{*t} at each location a valid test was made. The RMP identified by the threshold algorithm and checked by visual inspection was converted to u_{*t} ($m\,s^{-1}$) using Eq. (1). These values were converted to 10 m AGL wind speeds through application of the "law of the wall" (Prandtl, 1935) assuming an aerodynamic roughness length (z_0) of 2.6×10^{-4} m, which was estimated from regression of the long record of wind speed at multiple heights at a nearby meteorological station located on the sand sheet well-above the high tide line (S1 in Fig. 1). A summary of u_{*t} by location is given in Table 3. The values in Table 3 are dependent on the assumed value of z_0, but assuming that the true value of z_0 is comparable among all locations of interest within the ODSVRA, the estimated thresholds can be used to identify major differences between locations. Cursory examination suggests that thresholds are lowest in the Dune Preserve and highest in the Oso Flaco area.

3.2.2. Emission factors and database

Fig. 5 shows the distribution of emission factors of PM_{10} dust as measured by PI-SWERL at a blade rotation speed of 3000 RPM. The complete database of emission information, including estimates of u_{*t} and emissions at PI-SWERL blade rotation speeds of 2000 RPM, 3000 RPM, and 3500 RPM is provided as a supplement to this paper.

3.2.3. Interpolation and extrapolation of PI-SWERL emission factors

An interpolation/extrapolation procedure was developed to provide an emission factor versus u_* relationship for every grid cell where there were no PI-SWERL measurements. Measurements made inside a grid cell are used for that cell. Interpolation was done using the five nearest measurements of emissivity for each of the three applied shear stresses (i.e., for the three PI-SWERL RPM steps) with a weighting factor for each datum point set to be $1/r^2$, where r is the distance between the location where the emissivity value is to be calculated (for a specific RPM and the center of the grid cell) and the location where the PI-SWERL data were collected. The interpolated emissivity values for each u_* (for RPM set points) are then used to define $F = au_*^n$ for the grid cell using linear regression of the log-transformed (measured or interpolated) F and u_* values.

The interpolation scheme was modified to account for the following

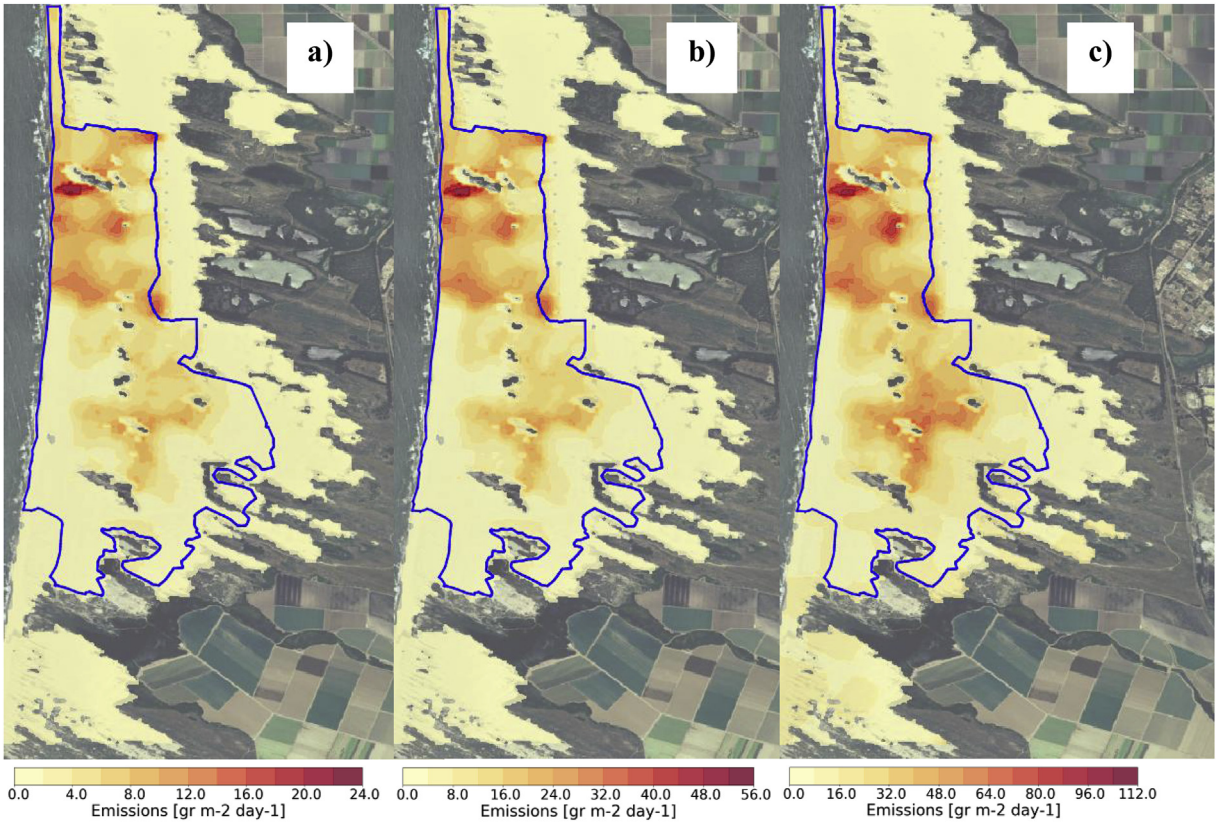

Fig. 6. *Emissions of PM_{10} (gr m^{-2} day^{-1}) across the modeling domain for (a) the entire simulation period, (b) CARB exceedance days (based on a 24-h PM_{10} > 50 μg m^{-3}) and (c) May 22, 2013 US EPA exceedance day (based on a 24-h PM_{10} > 150 μg m^{-3} or* national air-quality standard level*). Exceedance days based on observations at CDF. The blue outline represents the boundary of the riding area highlighted in the text. Note that each panel has a different color table range.* (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

conditions: 1) when grid cells where wholly in the riding area, 2) wholly in non-riding areas, 3) located in areas held in private ownership (non-riding), and 4) located in an area transitioning from riding area to private lands. For riding area only cells, emissivity is calculated with PI-SWERL data only from the riding area. For a non-riding area emissivity is calculated with non-riding area PI-SWERL data. For private land, emissivity is calculated using PI-SWERL data from private lands and non-riding areas within areas designated as Dune Preserve. In a transition zone from riding to private, emissivity is estimated by taking the nearest cell in the riding area and reducing the (measured or interpolated) emissivity by 25% for the first cell adjacent to the riding area, 50% for the next, and 75% for the one after that. Grid cells further than three cell units away from the riding area were treated as private area only cells. Maps of the emissions for a modeled shear velocity used in the PI-SWERL testing for the entire modeling grid and different emissions day periods are shown in Fig. 6. Note that days with high concentrations at CDF correspond with high emissivity days. F is calculated in the model using the u_* derived for that cell by CALMET and the grid-cell specific $F = au_*^n$ relationship, which is derived from least squares regression of the F and u_* data from the PI-SWERL measurements.

3.3. Wind flow sensitivity

Figs. 7 and 8 show scatterplots of wind components and time series of wind speed highlighting that CALMET simulation improves when the meteorological observations at CDF and Mesa 2 are included. Statistical error metrics show the inclusion of CDF and Mesa 2 data are necessary to reach accurate results (Table 4). Systematic errors are evident during strong northwesterly flow episodes (times with both strong positive U and negative V wind components; Figs. 7 and 8), which are more pronounced for the Mesa 2 site. No major outliers are found in the model output. When data are not assimilated at CDF and Mesa 2, the model tends to over-emphasize westerly wind component (onshore) during strong wind times, while under-emphasizing during weak times. All bias, RMSE, MAE, and r metrics suggest that the model results are robust when using all the observations. Also of note is that the simulation of CALMET using all the observations follows closely the diurnal and day-to-day variations; relatively strong wind days share similar pattern, days with strong and dominant westerly wind component tend to also have a northerly wind component, which is likely driven by the coastal orographic forcing (channeling) and the sea breeze. This error patterns tend to be more accentuated over Mesa 2 (Fig. 8) due to error increasing over sparse data regions.

Withholding data from other sites near the shoreline and over the dune field were not as sensitive in CALMET performance (not shown) as the sensitivity shown by withholding CDF and Mesa 2 wind speed and direction data, likely due to the relatively dense station distribution near the shore. Uncertainties are expected from surface station siting and the extent to which the sites adequately represent the wind field in its neighborhood. Additionally, we tested whether the lack of sensitivity near the shoreline was related to the sea breeze option, but no apparent differences where obtained in the outlined error structure. The low sensitivity to the sea breeze option agrees with Wang et al. (2008), who suggested that using the sea-breeze setting did not necessarily yield better results and in some cases results were even worse. Some differences are expected to originate from CALMET divergence minimization procedure as unresolved non-hydrostatic mechanical and convective vertical motions are also expected.

Due to computing limitations, no effort was made to improve-calibrate mixing layer related parameters and other model options in CALMET. No upper-level observations of parameters relevant to mixing

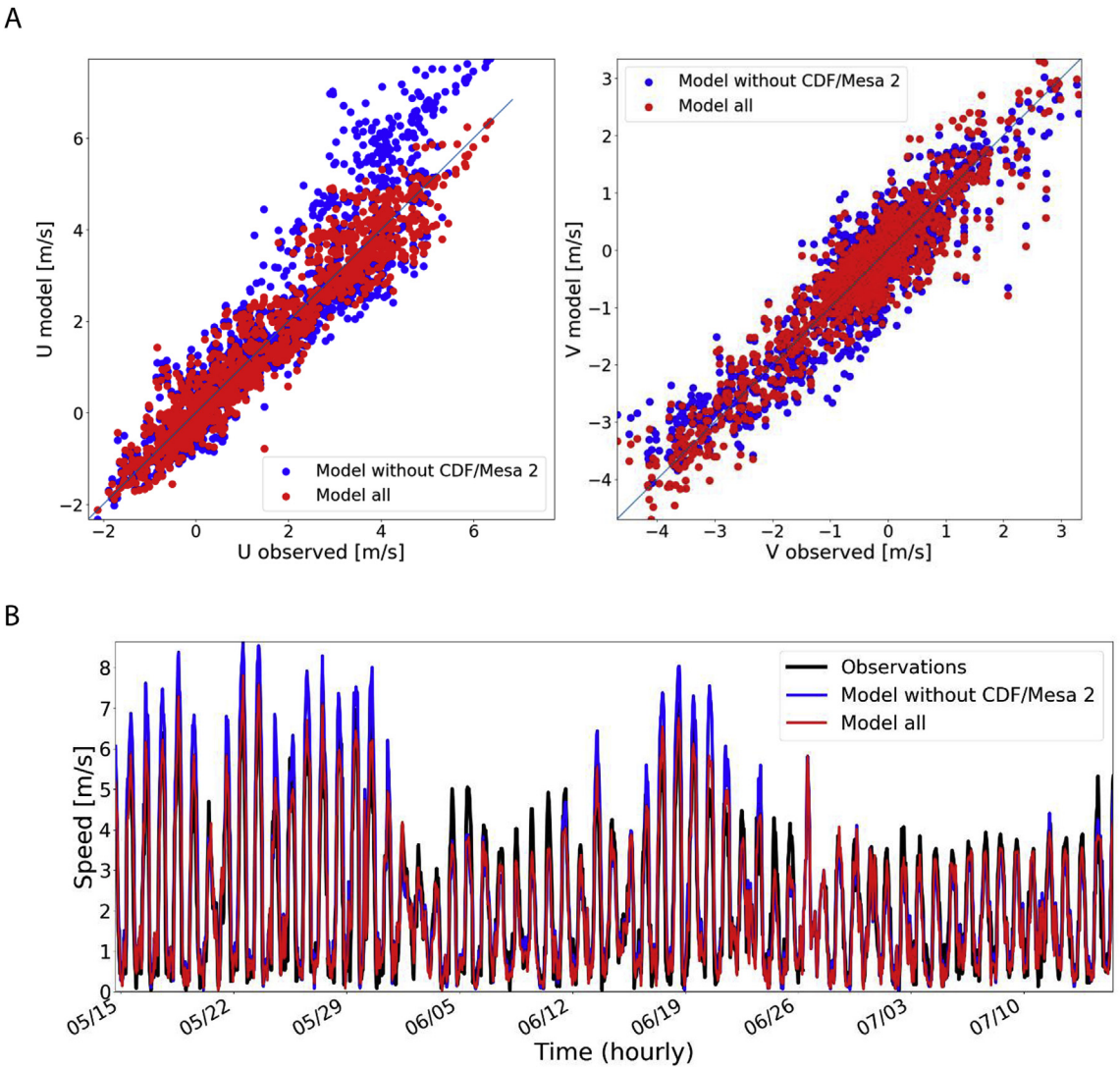

Fig. 7. Modeled CDF hourly wind components (U, V) scatter plots and wind speed time series. Two simulations are shown, with (red) and without (blue) assimilation of observations at CDF and Mesa 2 observations. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

processes were available to evaluate the model output. Although this evaluation approach reflects only the local errors near the surface, this flow dependent bias near the surface, with an even larger bias occurring during relatively strong westerly wind episodes and during the day time, could have an impact in the upper-level onshore flow due to mixing processes.

Fig. 9 shows that the CALMET model using all meteorological station observations performs significantly better in assimilating the mean wind conditions during the daytime with no apparent shift in the diurnal cycle phase of the surface winds, compared to the results when CDF and Mesa 2 sites are not included. The largest differences between the model and the observations are more apparent during the daytime, whereas at night, adding CDF and Mesa 2 is not as critical. Cumulative distribution functions show that the model without CDF and Mesa 2 observations performed more poorly during the extreme wind events (Fig. 10), which seems to coincide with the times during the day when the sea breeze is typically the strongest (i.e., noon to early afternoon, Fig. 9).

Accurate calculation of dispersion is dependent on the wind field model accuracy, which may impact strongly the dust resuspension that is enhanced during high wind days.

To illustrate the impact of the errors in the flow biases near the surface on the potential dust source regions, we compared the observed and modeled wind rose at CDF (Fig. 11). The frequency distribution of wind speed and direction produced by the model, as well as for the observations, suggests that the predominant wind direction during emission events is from the west-northwest (Section 3.1). While observations show greater scatter in the wind direction during weak wind conditions compared to the model, the west-northwesterly dominance during the stronger winds is clearly simulated. However, wind direction bias for winds greater than the observed 80th percentile average 6.6° (± 4.1°, 95% significance level) is observed, which can represent approximately 400 m (along the shore) assuming steady non-turbulent (laminar) flow and that the source region is to the northwest near the shoreline. After assimilating CDF and Mesa 2, the wind direction bias at CDF improved to 1.5° ± 2.3° (95% significance level), which improves the position of origin accuracy to 100 m for source regions near the shore line.

The meteorological evaluation exposed some expected limitations in the CALMET model output, especially near the eastern edge of the domain, where observations were less dense. Such limitations tend to be more pronounced during high wind days and may have significant impacts in modeling the dispersion of the dust emissions. Below, we assess the dispersion model performance using PM_{10} concentration

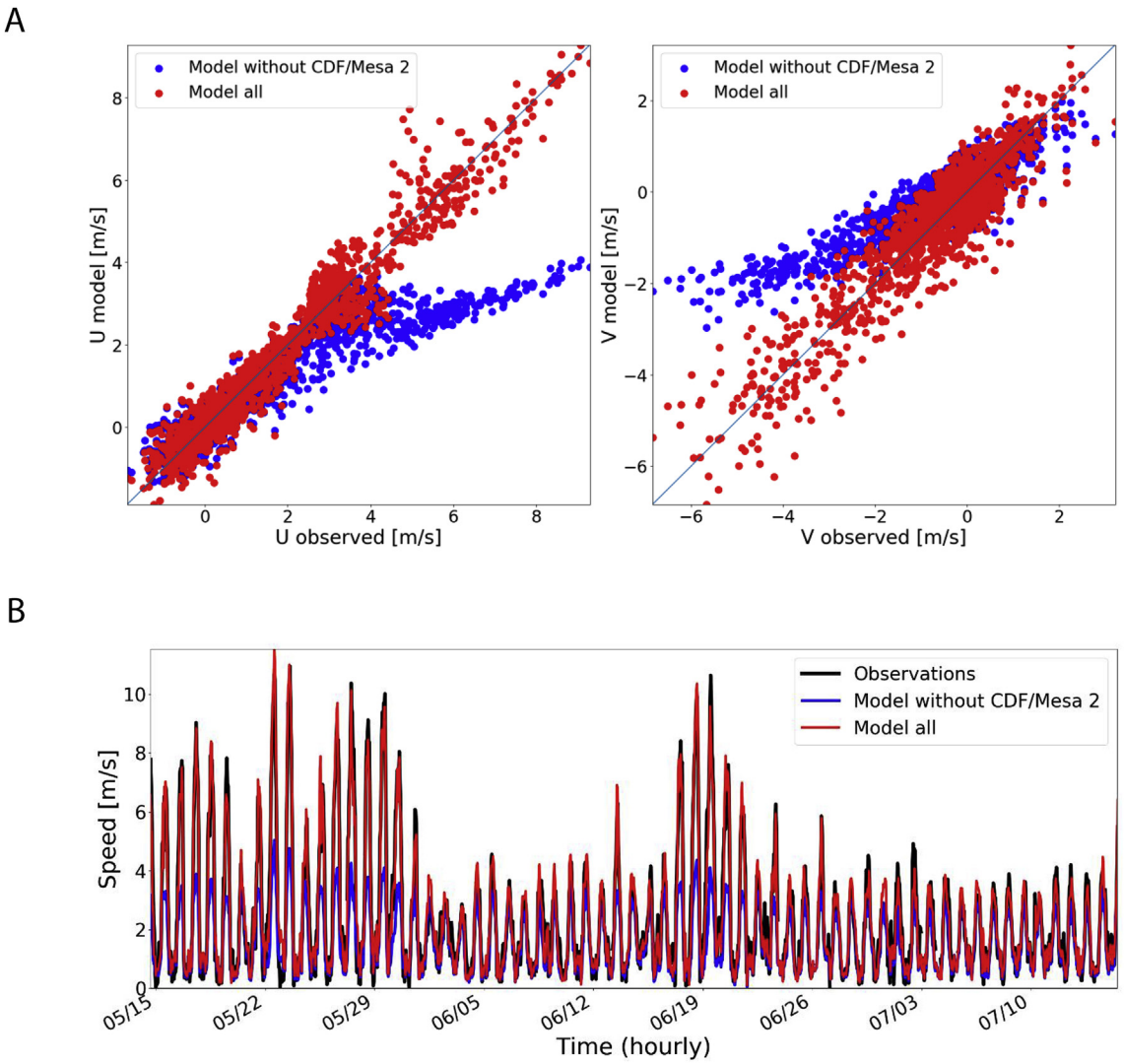

Fig. 8. Same as Fig. 7 but for Mesa 2 site.

Table 4
CALMET wind speed and wind components error metrics performed before and after (inside parentheses) assimilating surface stations from CDF and Mesa 2, using hourly data for May 15th to July 15th, 2013. Mean bias error (MBE), mean absolute error (MSE), and root mean square error (RMSE) are expressed in m s-1, and correlation coefficient (r) is dimensionless.

Error Metric	Speed	U	V
CDF			
MBE	0.19 (−0.01)	0.16 (0.01)	0.06 (0.01)
MAE	0.55 (0.37)	0.61 (0.37)	0.39 (0.33)
RMSE	0.76 (0.49)	0.86 (0.54)	0.51 (0.45)
r	0.93 (0.96)	0.92 (0.96)	0.92 (0.94)
Mesa 2			
MBE	−0.79 (0.02)	−0.55 (0.02)	0.48 (0.01)
MAE	0.90 (0.41)	0.75 (0.37)	0.7 (0.45)
RMSE	1.63 (0.55)	1.26 (0.5)	0.99 (0.58)
r	0.87 (0.97)	0.90 (0.97)	0.88 (0.92)

measurements recorded at the CDF and Mesa 2 sites.

3.4. Dispersion evaluation of PM_{10}

Fig. 12 compares observed and simulated 24-h PM_{10} at CDF showing that the model agrees reasonably well but tends to underestimate observations. Of note is the systematic underestimation of 24-h model-estimated PM_{10} values $< 50\,\mu g\,m^{-3}$, which may be related partly to the influence of other sources contributing to PM_{10} in the observations (e.g., mobile emissions, agriculture, sea salt). We further constrained the analysis by considering only 24-h PM_{10} values during days with both above median values and north-northwesterly airflow, which presumably increases the chance of having hourly PM_{10} transported mostly from the dune field. Fig. 13 shows that under such constraints, pairs of model and observations agree well and tend to follow a linear relationship (at 95% significance level). Not surprisingly, larger values are observed at the CDF site compared to the Mesa 2 site, which is located farther downwind, 3.8 km to the southeast of CDF.

The model was also evaluated in its ability to disperse PM_{10} away from the source region, which we call “dispersiveness”. The dispersiveness metric constitutes a higher order evaluation approach than those shown earlier (Fig. 14). We define dispersiveness as the ratio of the observed concentrations at CDF to the Mesa 2 observation. Moving away from the source region, and under the assumption that there are

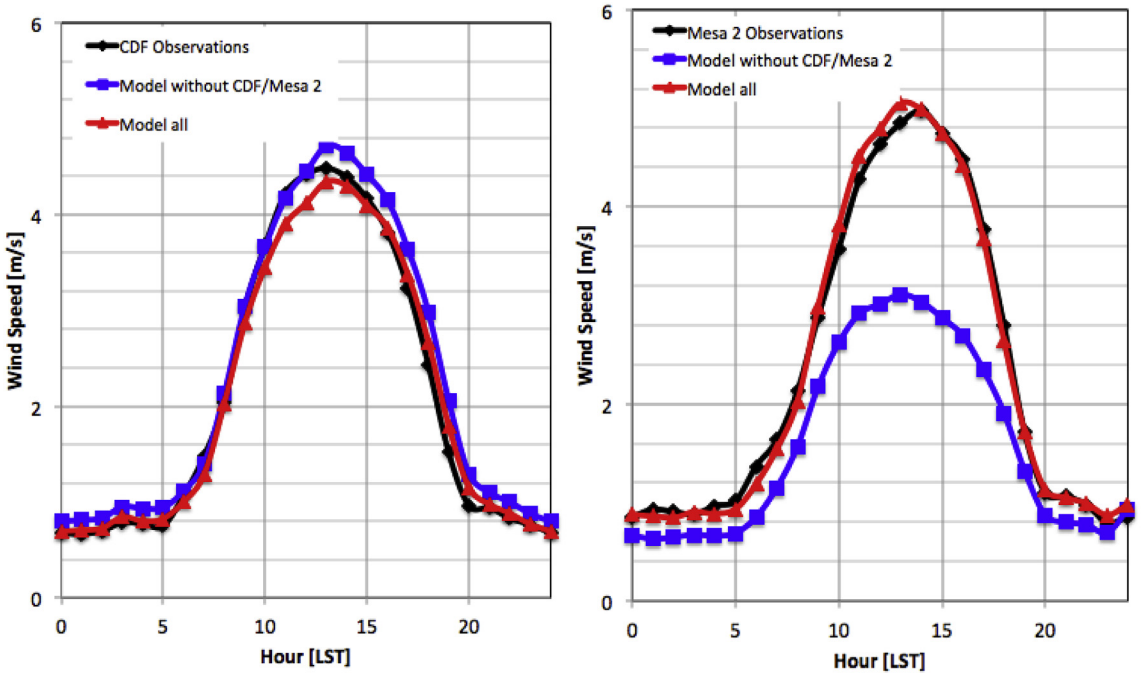

Fig. 9. Wind speed diurnal cycle at (left) CDF and (right) Mesa 2 surface station sites for the period May–July 2013.

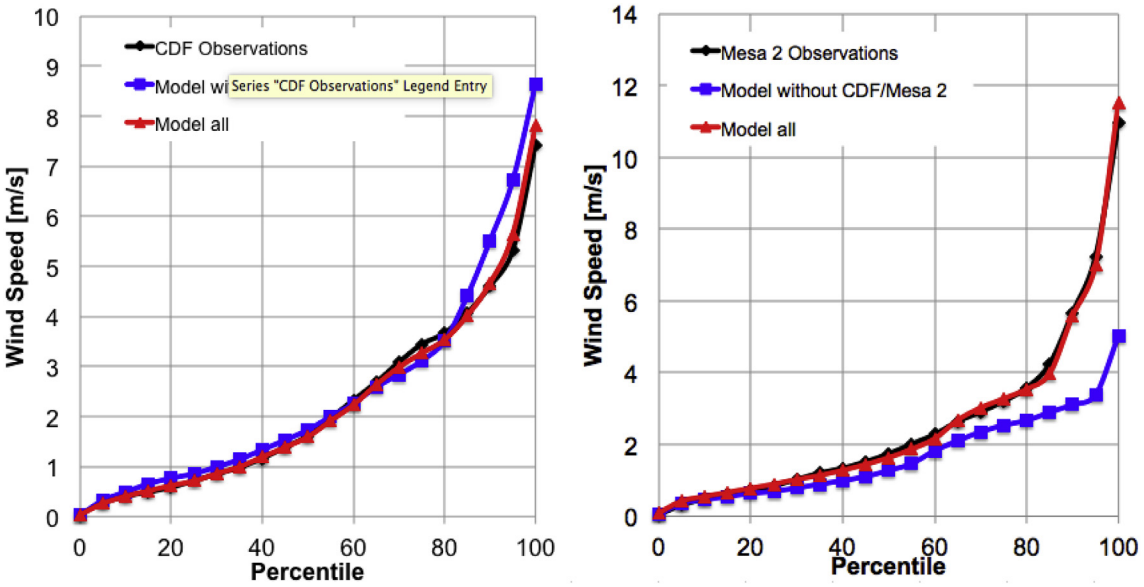

Fig. 10. Hourly wind speed empirical cumulative distribution function at (left) CDF and (right) Mesa 2 surface station sites for May 15th to July 15th, 2013.

no additional PM_{10} sources, or that both sites are exposed to similar background emissions other than dust, chemical transformation or re-suspension of dust particles along the CDF and Mesa 2 trajectories, the concentration of pollutants should decrease due to turbulent dispersion and deposition of particles. The dispersiveness estimates for the observations and the model are shown in Fig. 14. During extreme hourly PM_{10} values (> 90th percentile) at CDF, the model mean dispersiveness between CDF and Mesa 2 sites 1.59 (± 0.76 with 95% significance level) compares well with that based on observations 1.55 (± 0.43 with 95% significance level). When considering the full distribution of the dispersiveness during the extreme episodes, the model distribution also resembles that of the observations.

3.5. Dispersion spatial patterns

Dispersed dust concentration patterns tend to follows the prevailing wind direction, with higher concentration over the source regions (Fig. 15). When averaged over the entire simulation period, the model PM_{10} concentrations are relatively higher for CDF than for Mesa 2, and CDF straddles the 24-h $PM_{10} = 50\,\mu g\,m^{-3}$ contour line. Not surprisingly, higher concentrations are exhibited for days that exceed the State standard (defined as days with observed 24-h PM_{10} exceeding $50\,\mu g\,m^{-3}$).

Fig. 16 shows the dust emission sources affecting CDF. Emissions sources were estimated based on the forward Lagrangian integrations and using the tag information contained in each tracked particle. Results show that the atmospheric dispersion and mixing cause the spread of up to 2 km of the source region affecting CDF, with a relatively

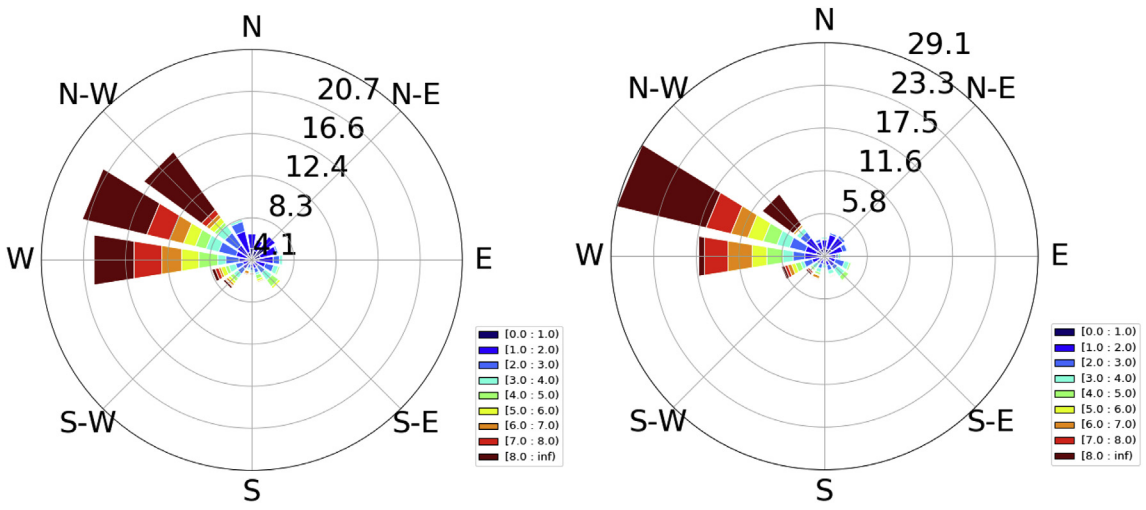

Fig. 11. CDF wind rose plots for (left) hourly observed and (right) model output. Colorbar is in m s^{-1}.

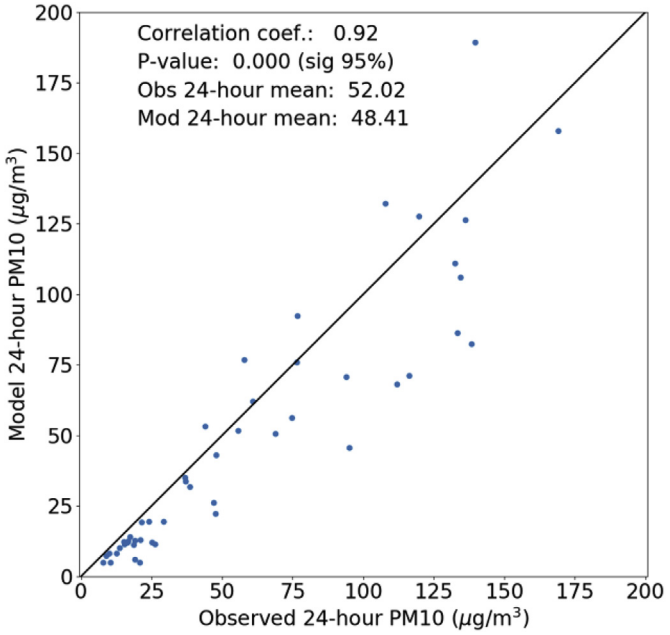

Fig. 12. Scatter plot for observed and model 24-h PM_{10} values at CDF for the period May–July 2013. Only days with complete hourly observation data are considered. Linear correlation coefficients are provided along with their p-value (< 0.025 for 95% significance level).

narrower source region during State PM_{10} 24-h mean exceedance days.

Earlier, we referred to surface wind direction uncertainties leading to a source region error margin on the order of 100 m, implying source location detection errors are within 10%. These results considered all the particles near CDF within a volume constrained by a 20 m height and a radius of 50 m in the horizontal. The selection of the model footprint size around CDF is rather ambiguous: the larger the volume selected around the sink region, the larger the source area; however, too small of a volume (e.g., a radius of 1–10 m in the horizontal) would be methodologically unfair, given the model uncertainties and would reduce the robustness of the results by reducing the number of particles reaching CDF. We examined the sensitivity of the model to the footprint size and results were nearly invariant for radii ranging from 20 m to 60 m (not shown). We emphasize that characterizing the source region with the outlined forward dispersion model does not need to assume that turbulence dispersion is reversible or that the flow is well-mixed, conditions generally assumed by backward Lagrangian integrations in turbulent flow (Lin et al., 2003). Hence, we argue that the source regions identified in Fig. 16 are physically consistent and robust.

4. Dust control strategies

The dispersion model framework and the 2013 meteorology and emission observations described above enable the simulation of the impact of dust emissivity remediation strategies aimed to reduce the Oceano Dunes dust emissions and its dispersion into downwind populated areas. In this section we address the question: What would be the impact of different control strategies on PM_{10} concentrations at CDF? To answer this question, we estimated the effect that treated areas (Fig. 3) have on PM_{10} at CDF and compared the dispersion results against results with no dust treatments in place. The dust reduction treatment areas considered include those which have been implemented between 2014 and 2018. The total area treated by 2018 was 35.5 ha. We used 2013 meteorology and emissions estimated using the 2013 PI-SWERL emission grid. We estimate the effect of control strategies using two conditions: the control measures reduce emissions by 50% or 100%. These values were arbitrarily chosen to represent a highly effective control method such as a complete coverage of the surface by vegetation (i.e., 100%) and a control method that may be less effective such as sand fences spaced > 10 fence heights apart (Gillies et al., 2018).

Table 5 shows a summary of the concentration statistics for the different dust reduction treatments that were in place between 2014 and 2018. Even though 2014 treated areas (Fig. 3) are relatively closer to CDF, they have a marginal effect on concentration reductions at CDF, likely due to their lower emissivity compared to the areas treated in 2017 and 2018. Areas controlled during 2017 and 2018, however, have a more substantial impact in reducing CDF PM_{10} concentrations. After the 2018 area treatment is implemented, and 100% control efficiency is assumed, the mean 24-h PM_{10} reduces to 88.1% relative to the No treatment condition, which reduces the number of 24-h PM_{10} State CARB exceedance events from 20 to 16. These results are encouraging and provide a means to assess treatment effectiveness, both by location and emissivity, in reducing the downwind levels of PM_{10}.

4.1. May 22nd, 2013 dust exceedance day event

Very strong surface winds during May 22nd, 2013 with a strong afternoon peak, were related to one of the largest PM_{10} emission events (Fig. 16). The 24-h mean PM_{10} concentration observed at CDF was 169 μg m^{-3}, which exceeded the US EPA national air-quality standard ($\geq$150 μg m^{-3}). Based on an extreme value frequency analysis using S1

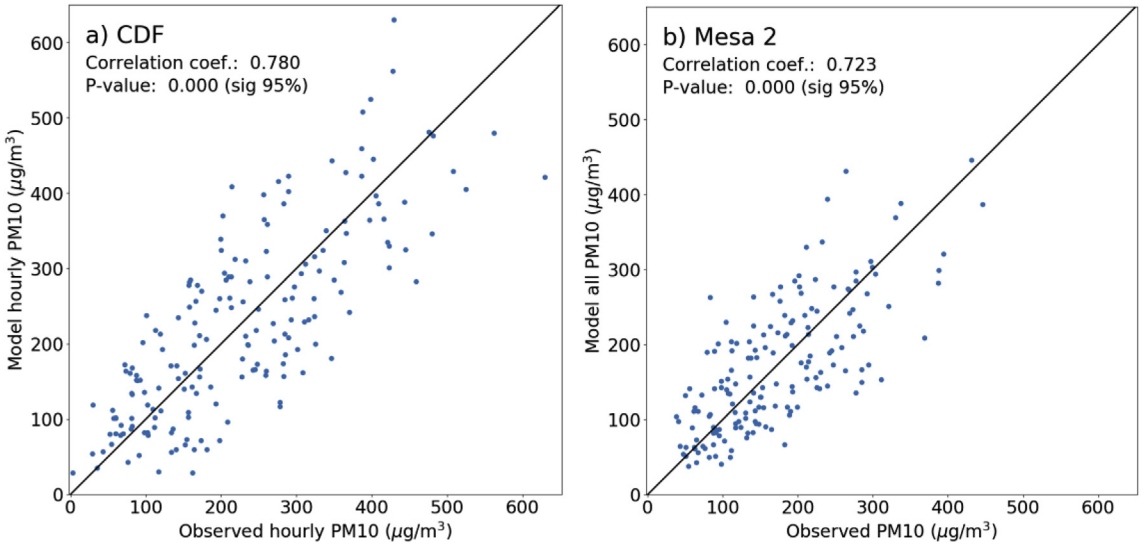

Fig. 13. Scatter plot for observed and model hourly PM_{10} exceeding the observed median for (a) CDF and (b) Mesa 2 sites. Linear correlation coefficients are provided along with their p-value (< 0.025 for 95% significance level).

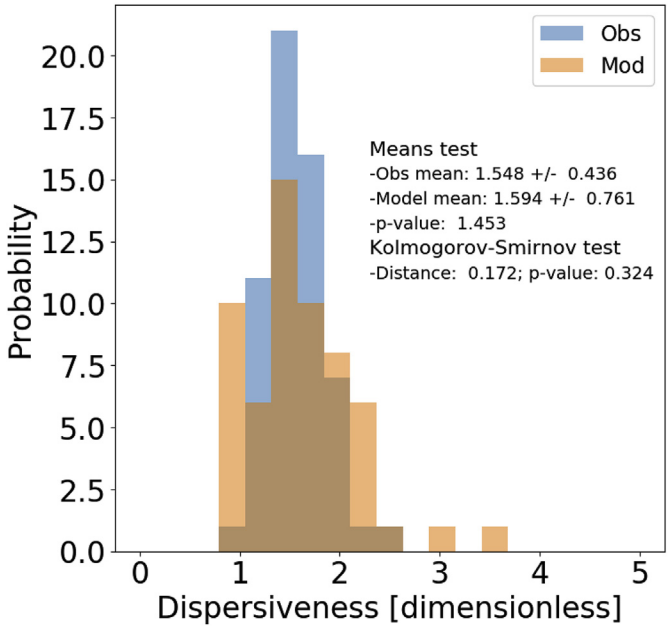

Fig. 14. Model and observed dispersive distribution between CDF and Mesa 2 sites and during hourly PM_{10} exceeding the 90th percentile. See text for details on dispersiveness definition.

data, the surface winds related to this Federal exceedance day is larger than the 99th percentile (per 2010–2017 hourly records; not shown). Table 5 show that the simulated 24-h PM_{10} agrees well with observations but the model slightly underestimated this event predicting a PM_{10} level of 158 $\mu g\, m^{-3}$. It is worth noting that during this event, the model indicates that dust sources are concentrated above regions of high emissivity (Fig. 16). This could help explain why dust treatment effectiveness, for the 100% control effectiveness condition, changed from 158 $\mu g\, m^{-3}$ in the No treatment simulation to 126 $\mu g\, m^{-3}$ after the 2018 treatment area was included, which brought the CDF simulated 24-h PM_{10} level below the Federal air-quality standard level, but still above the State standard. This is not surprising as most treated areas are located upstream and above the source regions (Figs. 3 and 16).

5. Conclusions

In this work, we presented a model framework consisting of a windblown dust emission source strength grid, a meteorological diagnostic gridding system, and a dispersion model, all using unusually fine (~20 m) gridded information. Independent observations of PM_{10} were used to assess the model framework performance to predict mass concentration of PM_{10} at locations downwind of the ODSVRA's eastern border. The model framework proved to be useful to assess the locations of source regions within the modeling domain that contribute significantly to PM_{10} levels at receptor sites used to gauge air quality. The model was also demonstrated to be useful for evaluating the effectiveness of control measures, in terms of their placement and with respect to their measured emissivity, to reduce PM_{10} levels at key receptor sites.

The US-EPA CALMET diagnostic meteorological model proved to be a useful tool for building the gridded meteorology under conditions of significant diurnal and day-to-day temporal variability and the very fine resolution spatial grid (20 m). Overall, CALMET was capable of providing wind fields necessary for dispersion modeling over the Oceano Dunes with its complex terrain and coastal position. Based on experiments made to examine the effects of different datasets on the results, the model showed high sensitivity to upper-air observations from a nearby radiosonde site and soundings from NARR data.

By construction CALMET incorporates the coastal topography and dune morphology to control spatial flow patterns. However, we found that the number of surface monitoring stations was a key factor affecting sensitivity of the wind field results. CALMET proved to be insensitive to the use of the sea-breeze option within the model settings, a circulation process that is very pronounced in the study region. The strength and reach of the relatively strong afternoon sea-breeze were only achieved when observation sites (CDF and Mesa 2 sites) constrained CALMET further inland. To accurately predict dispersion of dust PM, supplementary meteorological data of sufficient spatial coverage will be a critical consideration. Overall, the diagnostic model showed low sensitivity to different model settings aiming to represent flow stability conditions and topographic influence, likely related to the limited physics formulation in the model.

This paper presents a computationally efficient Lagrangian Stochastic Particle Dispersion Model capable of linking directly with CALMET output to simulate the transport of particles emitted from the ground. This is accomplished for mean wind (at hourly time

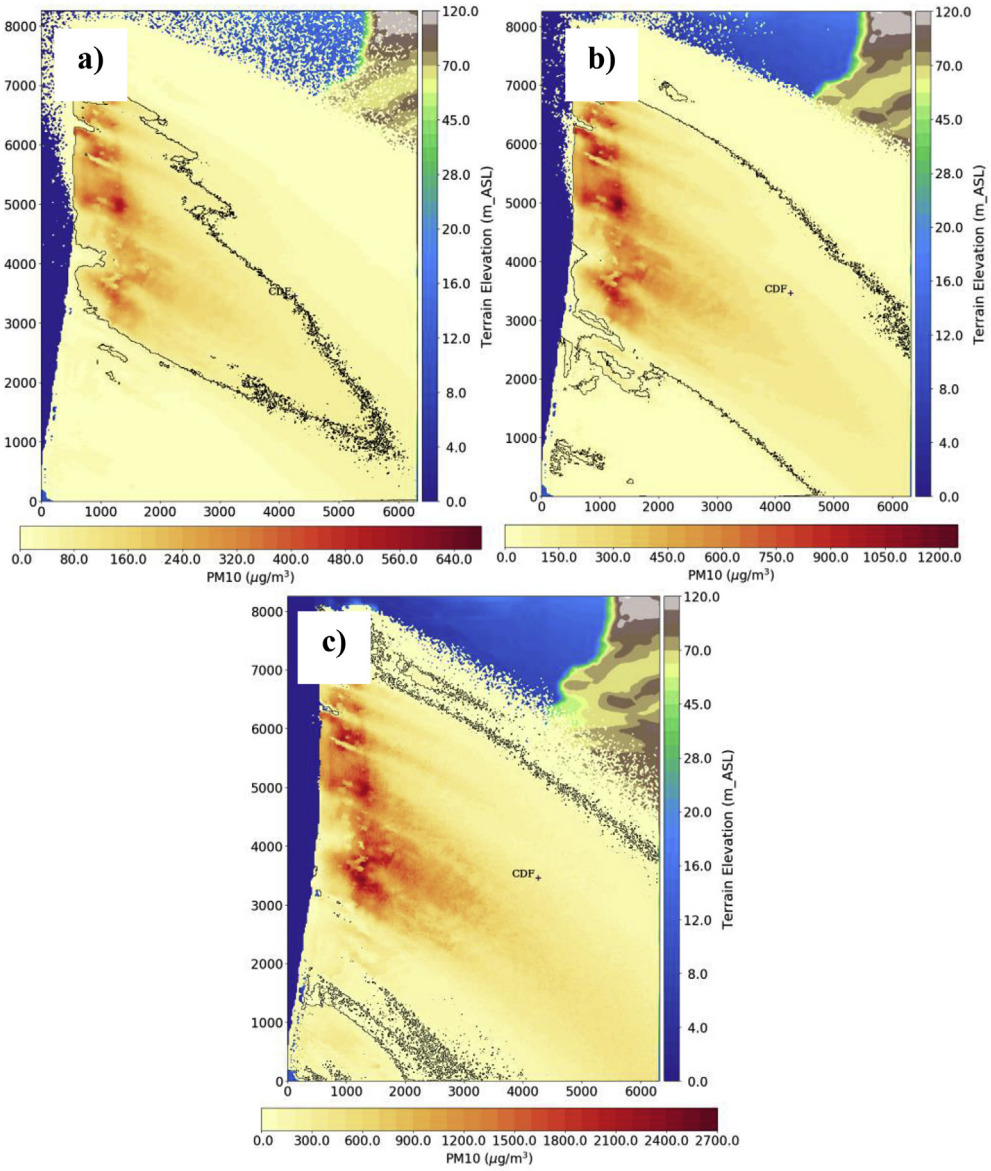

Fig. 15. *Horizontal concentration patterns (average from 10 - 20 m above the ground) for (a) the entire simulation period, (b) CARB exceedance days (based on a 24-h* $PM_{10} > 50\ \mu g\ m^{-3}$*) and (c) May 22, 2013 US EPA exceedance day (based on a 24-h* $PM_{10} > 150\ \mu g\ m^{-3}$ *or* national air-quality standard level*). Exceedance days based on observations at CDF. Note that each panel has a different color table range. Black contour in each panel shows the* $PM_{10} = 50\ \mu g\ m^{-3}$ *isopleth.* (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

increments) speeds, and parameterizes the turbulent diffusion using stochastic random number generators, which vary in intensity with the flow regime and turbulence conditions also derived from CALMET output. The Lagrangian model is integrated forward in time with the number of particles being released scaling as a function of emission strength, resulting in integration of trajectories for a large number of independent dust particles (on the order of 10^8 particles). A kernel method was used to convert dust particle number concentration to PM_{10} concentration.

In general, the present study indicates good agreement between the modeled downwind PM_{10} dust concentrations and observations, but model estimates tend to show a low bias during mean and exceedance events. Dust source regions within the ODSVRA that impact the CDF site were estimated using forward Lagrangian integration and particle tagging information, which reduces the number of assumptions typically necessary when backward dispersion integration is performed for turbulent flow regimes. The dust source area characterization can be used to evaluate how targeted dust reduction treatments for identified areas could affect PM_{10} at specified receptor sites.

The present model framework has proved to serve as a useful and efficient tool to accurately study the impact of dust reduction control strategies on downstream dust dispersion. However, there are various sources of uncertainty, mainly related to the high sensitivity of the CALMET model over data-sparse regions. Non-stationary meteorology models can help overcome these shortcomings but are computationally too expensive to create season-long dust dispersion simulations at scales of the order of tens of meters.

There are two important considerations regarding the technique presented. First, its strength is that it is easily adaptable to other windblown fugitive dust source areas where sufficient field data can be collected to accurately map out the spatial and temporal character of the fugitive emissions. It is directly applicable only to locations where the fugitive dust source is relatively exposed to the atmosphere and the near surface flow is not heavily impacted by non-erodible objects such as buildings, roads, and extensive vegetation. This is an implied assumption when using a tool like the PI-SWERL that relates the

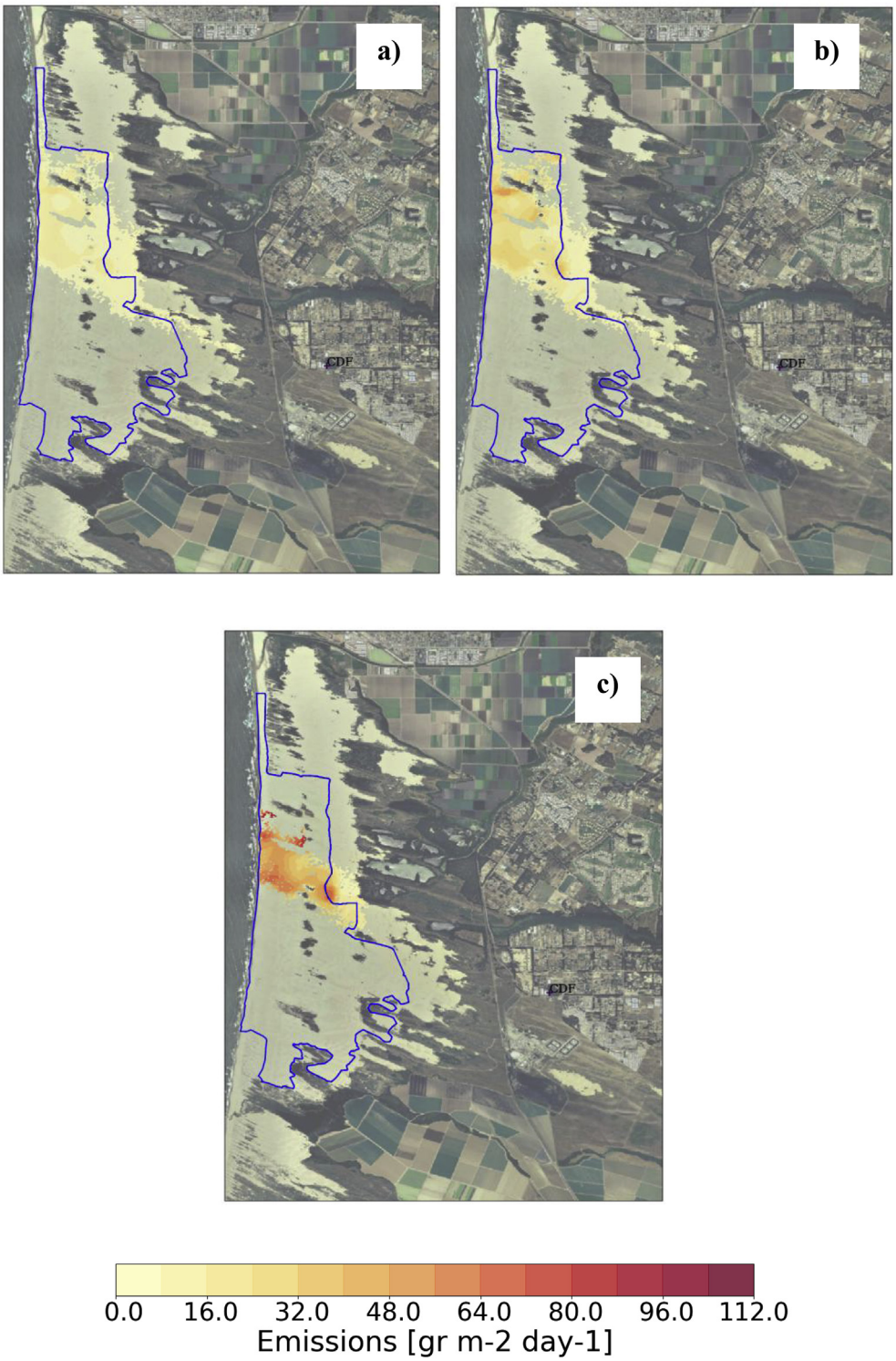

Fig. 16. Emission sources *of* PM_{10} *(gr* m^{-2} day^{-1}*)* affecting CDF *for (a) the entire simulation period, (b) State CARB exceedance days (based on a 24-h* PM_{10} $>$ 50 μg m^{-3}*) and (c) May 22, 2013 US EPA exceedance day (based on a 24-h* PM_{10} $>$ 150 μg m^{-3} *or* national air-quality standard level*). Exceedance days based on observations at CDF with 24-h* PM_{10} *exceeding* 50 μg m^{-3}*. The blue outline represents the boundary of the riding area highlighted in the text.* (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

emissions from the surface to a shear stress aloft. Use of this approach in more complex terrain would require adjustments.

In contrast, techniques that do not rely on measuring emission factors precisely at the source and make use of ambient concentrations as a proxy for emissions are less subject to these types difficulties. These fall broadly into two camps, those that use vertical profiles of ambient concentrations to infer emissions (e.g., Etyemezian et al., 2003; Huang et al., 2019) and those that use ambient concentrations to train a model (e.g., Kinsey et al., 2004; Hassan et al., 2016; Ono et al., 2011). These approaches have their own drawbacks. The former, in principle, provides representative emission factors from some region where the surface and the meteorology are nominally invariant in space. In practice, emission factors so estimated only reflect a narrow cone of influence upwind of the measurement location at some limited distance. The

Table 5
CDF observed and modeled PM_{10} concentrations for different dust reduction treatment areas (Fig. 3) and assuming treatment efficiencies of 50% and 100%. Number of State CARB exceedance cases are based on 24-h PM_{10} exceeding 50 $\mu g\, m^{-3}$. Percentage emissions changes are estimated relative to No treatment emissions.

	Mean 24-h PM_{10} [$\mu g\, m^{-3}$]	Number of State CARB exceedance Events	Mean 24-h PM_{10} exceedance cases [$\mu g\, m^{-3}$]	May 22nd, 2013 24-h mean PM_{10} [$\mu g\, m^{-3}$]
Observations	51	23	99	169
Model (No treatment)	49	20	88	158
Treatment efficiency 50%				
2014	48 (99.4%)	20	88 (99.4%)	157 (98.9%)
2017	47 (97.2%)	20	86 (97.1%)	152 (95.9%)
2018	45 (91.9%)	18	81 (92.2%)	140 (88.7%)
Treatment efficiency 100%				
2014	48 (99.2%)	20	87 (99.2%)	157 (99.4%)
2017	46 (94.7%)	19	83 (93.8%)	145 (91.4%)
2018	42 (85.9%)	18	74 (83.13%)	127 (80.8%)

latter approach, where some number of ambient measurements train a model (e.g., neural network, factor analysis, etc.) cannot hope to unravel the complexities of spatial variations of emissions. The point is that neither of these techniques that relies on ambient concentrations alone is capable of providing specific information on which source area is contributing to the ambient dust levels. In that sense the present technique has a substantial advantage.

A second important consideration is that the density of measurements that are needed to support a specific model accuracy is not known a priori. Some landscapes will express much greater variation in emissions over scales of a few meters than over scales of hundreds of meters or kilometers. In other instances, it may be that only specific surface features are highly wind erodible (e.g., dry lake bed margins) while others are not. This type of information is easy to extract from field measurements where measurements of emissions factors are relatively dense. Conversely, as measurements are collected in the field, these patterns may emerge and inform the sampling protocol.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.atmosenv.2019.116977.

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Attachment E

March 12, 2021

Sarah Miggins
Deputy Director
Off-Highway Motor Vehicle Recreation Division
California Department of Parks and Recreation
1725 23rd Street, Suite 200
Sacramento, CA 95816

Re: Review of Documents Related to the Oceano Dunes State Vehicular Recreation Area and the March 18, 2021 Special Meeting by the California Coastal Commission.

Deputy Director Miggins,

This memorandum from the California Geological Survey (CGS) has been prepared at your request. Its purpose is to provide pertinent geological review of documents regarding the Oceano Dunes State Vehicular Recreation Area (Oceano Dunes SVRA) prepared by the staff of the California Coastal Commission (CCC) for the CCC Special Meeting on March 18, 2021.

The Oceano Dunes SVRA, in south San Luis Obispo (SLO) County, is managed and operated by the California Department of Parks and Recreation (DPR). It consists of approximately 3,500 acres that lie within approximately 18,000 acres of active dunes along the central California coastline, stretching from south SLO County into northern Santa Barbara County. Approximately 1,350 acres of the SVRA is designated for off-highway vehicle (OHV) recreation though dune vegetation planting efforts undertaken by DPR since 2013 have effectively reduced the OHV riding area to approximately 1,100 acres. For seven months of the year, from March 1 to October 1, the size of the OHV riding area is further reduced by approximately 300 acres to protect nesting shorebirds.

The CCC Special Meeting on March 18, 2021 regards a periodic review of the Coastal Development Permit (CDP) issued by the CCC to DPR for DPR's operation and management of the Oceano Dunes SVRA.

The CCC documents issued in advance of the Special Meeting and reviewed by CGS are the February 16, 2021 CCC staff report, "Oceano Dunes Coastal Development Permit 4-82-300 Review" and its accompanying Exhibit 9, "Ecological Significance of Oceano Dunes."

A central issue presented in the reviewed CCC documents is a designation of Environmentally Sensitive Habitat Area (ESHA) under the California Coastal Act. The CCC staff contend ESHA applies to the entirety of the Oceano Dunes SVRA, whether the dunes are vegetated or consist of open sand sheets. Regarding open sand sheets in the dunes, and dune processes in general, in their report and Exhibit 9, CCC staff incorrectly interpret geological processes and dune features in justifying ESHA designation. This review presents examples of that misinterpretation, as well as previous communications with CCC staff which

correctly explain these geological processes and features, but these communications were not cited in the CCC documents.

1977 Inglenook Fen Study

The CCC staff report and Exhibit 9 lean heavily on a 1977 document entitled, "Inglenook Fen, a Study and Plan," prepared by DPR. The 1977 report was an extensive study on a wetland area (the Inglenook Fen) in Mendocino County and adjacent dunes known as the Ten Mile River Dunes. This area is more than 400 miles north-northwest of the Oceano Dunes SVRA.

The stated purpose of the Inglenook Fen study was to examine "threats to the fen ecosystem" consisting of "development within the watershed, with subsequent water reduction, quality degradation, and the destruction of the dune vegetation cover by off-road vehicular use of the dunes adjacent to the fen."

To justify ESHA designation for the entirety of Oceano Dunes, the CCC staff report and Exhibit 9 draw repeated parallels to the Inglenook Fen study. This is problematic because the geological and physiographical settings of the two sites are not the same. This is perhaps best summarized in the second sentence of the preface of the 1977 study: "Inglenook Fen is the only known coastal fen in California."

Additionally, though the 1977 report is lengthy and has many authors, the contributors were not geoscientists. The geology section of the study, which includes descriptions of dune processes and features, was prepared by a botanist and a plant ecologist. This may explain why the discussion of dune processes and noted observations are lacking or inaccurate.

For example, the fundamental aeolian process of dune formation—saltation--is never mentioned in the Inglenook Fen report. In a coastal dune setting, the saltation process begins when prevailing onshore winds push sand, and everything finer than sand, shoreward (CGS, 2019). The sand grains creep and bounce as they are pushed by the wind, forming small ripples. The sand ripples move downwind and as they do, each sand ripple lays down a thin layer of sorted sand as the ripple rolls over the landscape. These layers build on each other, sand ripple by sand ripple, to create the dunes and allow the dunes to migrate downwind (CGS, 2019).

Instead the 1977 Inglenook Fen report states that "the ripple form of dune surfaces reflects an equilibrium condition," and that "dune surfaces slowly build a surface armor of grains too large to be entrained by the highest wind velocities to which they are normally exposed." These statements provide both a demonstration of the dynamic, constant motion of dunes—not equilibrium—and a contradiction: Ripples on a dune surface indicate sand is being deposited in layers as described in the previous paragraph, and the sand is being deposited on top of what was inaccurately observed as a "surface armor of grains."

Yet in their documents, the CCC staff paraphrase this 1977 study to conclude that "OHVs break and churn this protective crust and expose smaller particles that are entrained by prevailing winds, promoting erosion of the dunes." This is noteworthy because in the context of dunes discussed in the 1977 Inglenook Fen study, the word "crust" was not used.

The SLO County Air Pollution Control District (SLOAPCD) has mistakenly characterized the topmost dune layering observed at Oceano Dunes as a "crust" (CGS, 2012). This has led to an easily comprehended but false impression that OHV activity must be breaking this crust, causing fine particles underneath to be released. The inaccurate claim continues to be repeated by members of the public and in local press publications (http://www.santamariasun.com/letters-to-the-editor/19562/oceano-dunes-crust-now-has-time-to-heal/).

In August 2020, one of the authors of the 2021 Coastal staff report and Exhibit 9, Senior Ecologist Dr. Laurie Koteen, had sought a more relevant interpretation of dune surfaces—one specific to Oceano Dunes—by consulting with, among others, dune geomorphologist Dr. Bill Nickling, who is the chair of the Scientific Advisory Group (SAG). The SAG is a team of scientists that investigate dune processes at the SVRA and dust transport. The SAG was formed as part of a 2018 Stipulated Order of Abatement agreement between the SLOAPCD and DPR (SLOAPCD, 2018).

Regarding dune surfaces, Dr. Nickling conveyed to Dr. Koteen via email:

> "As far as I am aware there are no verbal accounts, governmental reports, or citations in the scientific literature describing the development of true crust as described above. At the Oceano Dunes, sand supply is too great and aeolian processes are too active, resulting in the scouring and burying surface sediments, that inhibits the development of crusts."

When I was informed of Dr. Nickling's clarifying email, I sent an email to Dr. Koteen on September 9, 2020 (attached) to supplement his correspondence. I described for Dr. Koteen the process of saltation and the related formation of sand ripples that create the sorted-sand layers that build on each other to form dunes. I also stated that it is "the exposed top layer of dunes that is frequently misinterpreted as a 'crust' by those who are unaware of the internal, layered structure of a sand dune," and, that "dune layers are ephemeral. They form and obliterate several times a day when the wind is up. Topmost layers of dunes are obliterated if the wind shifts or if someone steps onto the dune surface. The layers form again whenever the wind blows forcefully enough to create sand ripples that creep downwind."

But the relevant geological information provided in these August and September 2020 correspondences was not incorporated into the reviewed 2021 CCC staff documents. The 1977 Inglenook Fen document has remained the primary reference CCC staff used to describe and interpret geological processes at Oceano Dunes.

Open Sand Sheets, Dune Vegetation Coverage, and ESHA Designation

The CCC staff report and Exhibit 9 claim ESHA extends throughout the entirety of the Oceano Dunes SVRA. As justification, Exhibit 9 describes sensitive habitats created predominately by dune vegetation under the heading, "Habitats of Oceano Dunes." But for all the discussion presented in the 10-page "Habitats" section, open sand sheets are not described as sensitive habitat. Rather, open sand areas in the dunes, if they are described at all, are seen as

locations where vegetation may grow to create sensitive habitat. This is fundamentally problematic because it implies that open sand sheets in a coastal dune setting should not exist.

Dunes like those along the central coast of California form because of an abundant supply of sand and strong prevailing winds. As noted by Dr. Nickling above, the sand supply and aeolian processes are significant. This keeps dune formation processes active, which inherently creates large, naturally-formed open sand sheets. This is evident in a review of aerial imagery of the central coast dunes from the 1930's (CGS, 2011), a time that predates dune OHV recreation. Recreational use of vehicles equipped with the technology to traverse inland, onto the active dunes, did not grow until 1950's (CGS, 2011), which makes the 1930's aerial imagery a good representation of the dune landscape prior to motorized vehicle recreation in the dunes. A present-day evaluation of the Guadalupe Dunes in northern Santa Barbara County also reveals that open sand sheets have always existed. And as described in the previous section, there is nothing protective or unique regarding the ever-changing surfaces of dunes within open sand sheets.

The CCC staff report and Exhibit 9 extensively describe habitat that is created by dune vegetation, and both documents cite the 1977 Inglenook Fen study as evidence that OHVs driven over dune vegetation will destroy the vegetation. Conceptually, this is obvious. But what is not presented by CCC staff is that DPR has been enormously successful at protecting and increasing dune vegetation coverage to an extent that exceeds the vegetation coverage that existed prior to dune OHV recreation.

A 2011 analysis by CGS has shown that within the Oceano Dunes SVRA boundary, there are 650+ more acres of vegetation covering dune sand in 2010 than there were in 1930's, a time that predates dune OHV recreation, as previously noted (See Figure 8 from CGS, 2011, attached). The analysis also showed that within the north and south bounds of the OHV riding area of the SVRA, dune vegetation coverage has increased by nearly 200 acres. This is mostly due to DPR's plantings of native vegetation east of the OHV riding area and within vegetation islands inside the riding area (CGS, 2011). And since 2013, DPR has planted approximately 230 additional acres of native dune vegetation, mostly within the OHV riding area, as part of its ongoing dust mitigative efforts with the SLOAPCD and the SAG (DPR, 2020).

In total, these planting efforts within the Oceano Dunes SVRA have created far more of the dune habitat—described as ESHA in the CCC staff report and Exhibit 9—than has existed naturally since at least 1930.

Conclusions

In using the 1977 Inglenook Fen study, the CCC staff report and Exhibit 9 inaccurately compare the Oceano Dunes SVRA to a location described as "the only known coastal fen in California" that is more than 400 miles north-northwest of the SVRA. That study inaccurately describes dune processes and features and fails to mention the fundamental geological

process of dune-building—saltation. One of the authors of the CCC staff report and Exhibit 9 received clarifying information regarding geological processes at Oceano Dunes but failed to incorporate this information into the Coastal staff documents. Additionally, open sand sheets, a natural feature at Oceano Dunes and elsewhere in the dunes of the central California coast, are not described as ESHA in the reviewed documents because they are not described at all. Finally, the reviewed CCC documents fail to acknowledge the successful native dune vegetation planting efforts undertaken by DPR. These efforts have created far more ESHA-designated dune habitat than has existed naturally.

Respectfully submitted,

Original signed by:

Will J. Harris, PG 5679, CEG 2222, CHg 750
Senior Engineering Geologist

Concur:

Original signed by:

William R. Short, PG 4576, CEG 1429, CHg 61
Supervising Engineering Geologist

Attachments:

Email text from Will Harris, California Geological Survey, to Dr. Laurie Koteen, CCC Senior Ecologist, September 9, 2020.

Extracted Figure from CGS, 2011: Figure 8 - Comparative Analysis of 1930's and 2010 Aerial Imagery, Oceano Dunes State Vehicular Recreation Area and Vicinity.

References cited:

APCD, 2018. Stipulated Order of Abatement 17-01. San Luis Obispo County Air Pollution Control District Hearing Board, April 30, 2018.

CGS, 2011. In consideration of Draft Rule 1001 proposed by the San Luis Obispo County Air Pollution Control District: An analysis of Wind, Soils, and Open Sand Sheet and Vegetation Acreage in the Active Dunes of the Callender Dune Sheet, San Luis Obispo County, CA. California Geological Survey, November 1, 2011.

CGS, 2012. Overview of Scientific Concerns Regarding Rule 1001 by the San Luis Obispo County Air Pollution Control District. California Geological Survey, July 19, 2012.

CGS, 2019. Review of Stipulated Order of Abatement 17-01 as It Applies to the Development of the Particulate Matter Reduction Plan and Airborne Dust Detected on the Nipomo Mesa, San Luis Obispo County, California. California Geological Survey, September 10, 2019.

DPR, 1977. Inglenook Fen: A Study and Plan. State of California, Resources Agency, Department of Parks and Recreation. Sacramento, California. Barry and Schlinger (Eds.). June 1977.

DPR, 2020. Oceano Dunes SVRA Dust Control Program, 2020 Annual Report and Work Plan, Fourth Draft. California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division. September 30, 2020.

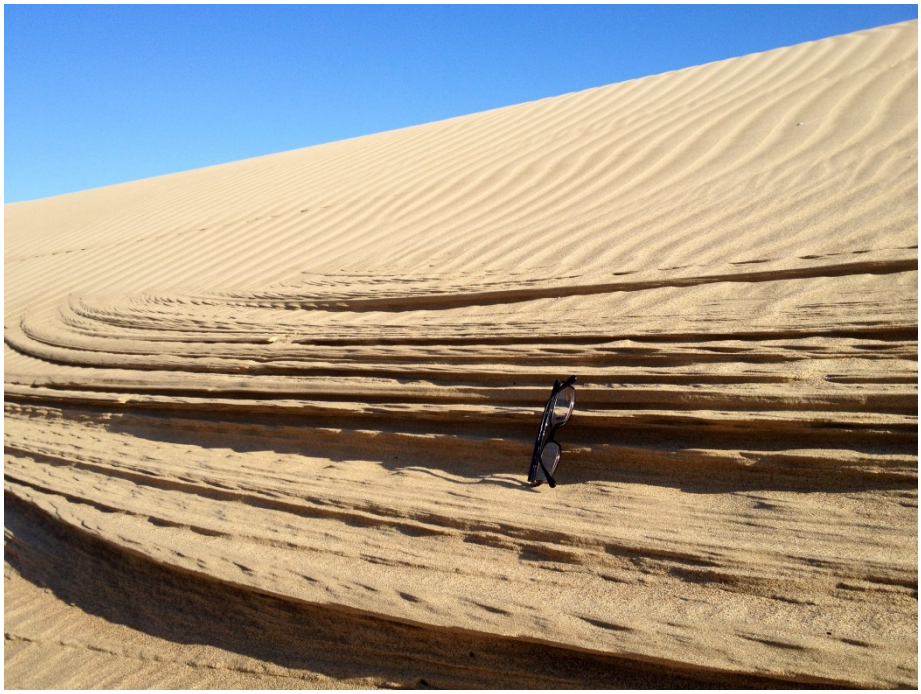
From: Harris, Will@DOC
Sent: Wednesday, September 9, 2020 11:18 AM
To: Koteen, Laurie@Coastal <Laurie.Koteen@coastal.ca.gov>
Cc: William Nickling <wnickling@gmail.com>; Miggins, Sarah@Parks <Sarah.Miggins@parks.ca.gov>; O'Brien, Jon@Parks <Jon.OBrien@parks.ca.gov>; Glick, Ronnie@Parks <Ronnie.Glick@parks.ca.gov>
Subject: dune surfaces and Oceano Dunes SVRA

Dr. Koteen,

In context to a question you asked regarding dune surfaces at the Oceano Dunes SVRA, Dr. Bill Nickling, lead of the Scientific Advisory Group, provided clarifying language to you in recent correspondence. I am appreciative of his response as there have been misinterpretations of dune surfaces that have led to much confusion, and he offers much needed clarity. I would like to build on what Bill has provided with the hope that it will allow the public to recognize a particular aspect of dune morphology for what it is—that is, the layers of sorted sand that comprise dunes.

For the central coast dunes of California, once the wind-driven saltation process begins, sand grains not only bounce along a dune surface, the grains are also pushed by the winds to form small ripples that creep downwind. Each sand ripple works conveyor-like, laying down a thin layer of sorted sand as the ripple rolls over the landscape. These layers build on each other, sand ripple by sand ripple, to create the dunes.

Each sand layer is so well sorted that the layer has a measure of tensional integrity—the sand grains are packed together preserving the layer form. Combined, the sorted sand layers comprise the internal, curviplanar structure of a dune that is observable when a shift in wind erodes the side of a dune, exposing the dune's layered structure, as displayed in the image below, a photograph I took several years ago at Oceano Dunes.



When there are sand ripples, sand is depositing as layers. On the windward side of a dune, the sand ripples are called climbing ripples and cause the dune to build in height, layer by layer. But if there is an interruption in sand supply while the wind is blowing, or if there is a shift in the wind, that may cause localized erosion on the dune surface. The sand ripples will obliterate and the topmost layer of sorted sand will be exposed and eroded.

At Oceano Dunes, it is the exposed top layer of dunes that is frequently misinterpreted as a “crust” by those who are unaware of the internal, layered structure of a sand dune. An exposed top layer of a dune has been further misunderstood by some as something to preserve, a surface akin to desert pavement that takes decades to form.

But dune layers are ephemeral. They form and obliterate several times a day when the wind is up. Topmost layers of dunes are obliterated if the wind shifts or if someone steps onto the dune surface. The layers form again whenever the wind blows forcefully enough to create sand ripples that creep downwind.

As for the firmness of a dune surface, that too regards dune layering. Again on the windward side of a dune, dune layers that form from climbing ripples are more or less stacked on top of each other like sheets in a ream of paper. Standing on the stacked dune layers is like stepping onto a ream of paper that has been placed on the floor of a copy room—it feels nearly as firm and sturdy as the floor itself.

But if the layers are on edge or inclined, like the cross-beds of layers on the lee side of a dune, it will be as if one is stepping onto a ream of paper that has been propped up onto its lengthwise edge: there will be give and it will not feel nearly as firm as the floor. Also, if a dune surface has been disturbed, whether by vehicles, people, or animals, there will also be give, as if the top few pages in the ream of paper have been crumpled. But unlike crumpled paper, the dune surface will smooth out as soon as the wind starts to move the sand.

Thank you for your continued interest in the science of sand dunes and for considering this additional information regarding dune morphology.

Sincerely,

Will Harris
Senior Engineering Geologist
California Geological Survey

Note: Figure below extracted from CGS, 2011

Acreage Results within Oceano Dunes SVRA & Pismo Dune Preserve Boundaries

		Total Acres
	Open Sand Sheet Present in 1930's and 2010 Imagery	2,618
	Vegetation Gain (Open Sand Sheet Present in 1930's Imagery Only)	968
	Vegetation Loss (Open Sand Sheet Present in 2010 Imagery Only)	316

Total Vegetation Gain: 652

Acreage Results for Land Bounded by dashed lines

		Total Acres
	Open Sand Sheet Present in 1930's and 2010 Imagery	1,861
	Vegetation Gain (Open Sand Sheet Present in 1930's Imagery Only)	450
	Vegetation Loss (Open Sand Sheet Present in 2010 Imagery Only)	254

Total Vegetation Gain: 196

CALIFORNIA GEOLOGICAL SURVEY

Oceano Dunes SVRA State Park Boundary

Pismo Dune Preserve

N

0 0.5 1

Miles

Map Scale: 1:32,000

Figure 8

Comparative Analysis of 1930's and 2010 Aerial Imagery
Oceano Dunes State Vehicular Recreation Area and Vicinity

Source: Fairchild, 1930; US Army, 1939; NAIP, 2010, US Department of Agriculture - Farm Service Agency

Attachment F