

Dunes as nature-based solutions to enhance resilience of California's beaches to climate change

A California Climate Action Seed Grant funded project

Project Summary:

California's sandy beaches are iconic, highly valued spaces that provide many co-benefits to coastal communities, economies and ecosystems. Recently, the impacts of El Niño events and winter storms on beaches across the state have amplified concerns about the vulnerability of our beaches to climate change and emphasized the need for adaptation strategies.

Coastal dunes can enhance the resilience of adjoining beaches to climate change impacts. This project will enhance understanding of, and provide actionable information for, the use of coastal dunes as Nature Based Solutions (NbS) for enhancing the resilience of sandy beaches in California to climate-change impacts such as flooding, erosion, and loss of specialized habitats and biodiversity.



Morro Bay dunes. Photo credit: Nick Sadrpour

As a collaborative project of the California Dune Science Network, the research team will:

- 1. Create a state-wide inventory and vulnerability assessment of coastal dunes in California informed by historical imagery and a recent physically-based coupled model.**
- 2. Assess responses of restored coastal dunes using modeling and observations from pilot sites that state agencies have invested in with our team and collaborating partners.**
- 3. Compile existing data and extend monitoring beyond the 5 years required by permits to assess performance of selected dune projects across a range of scales/types.**
- 4. Develop state-wide guidance for monitoring, implementation, maintenance, and performance assessment of protective dunes using collaborator workshops, outcomes, and lessons from dozens of existing projects statewide.**

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Collaborators: Beach Erosion Authority for Clean Oceans and Nourishment (BEACON), California Coastal Commission, California Ocean Protection Council (OPC), City of Santa Monica, Climate Science Alliance, Coastal Ecosystems Institute of Northern California (CEINC), Guadalupe-Nipomo Dunes Center, Morro Bay National Estuary Program (MBNEP), Point Blue Conservation Science, Southern California Coastal Wetland Research Project, Tijuana River National Estuarine Research Reserve, UCLA, UCSB, UCSD/Scripps Institution of Oceanography, USC Sea Grant, U.S. Fish and Wildlife Service, U.S. Geological Survey (USGS) Pacific Coastal & Marine Science Center (PCMSC)

For more information, see the California Dune Science Network website: www.resilientcoastlines.com
UC Climate Research Award announcement: [Climate-Action-Seed-and-Matching-Grants_2023.pdf](#)
(uckeepresearching.org)