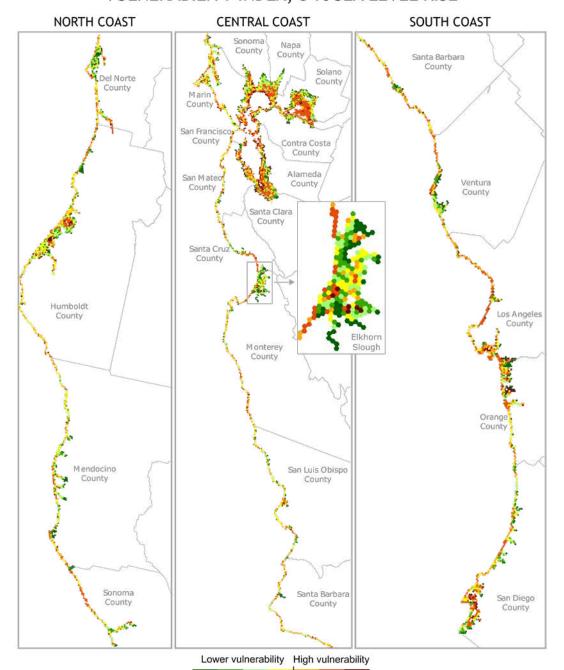
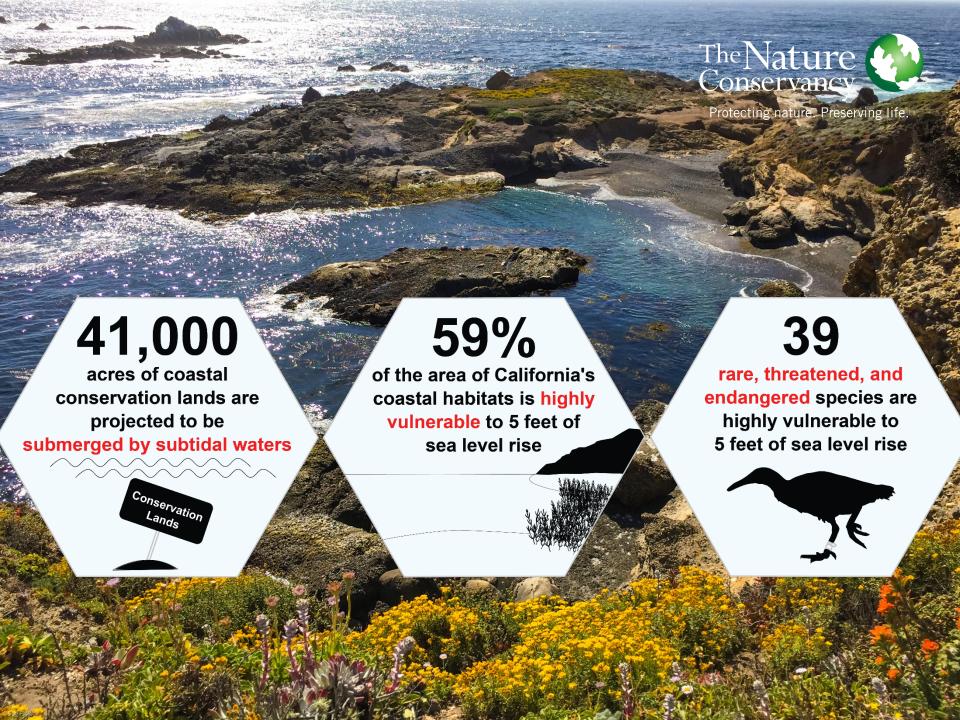
Coastal Resilience: Nature's Role Sarah Newkirk, Senior Coastal Project Director The Nature Conservancy in California



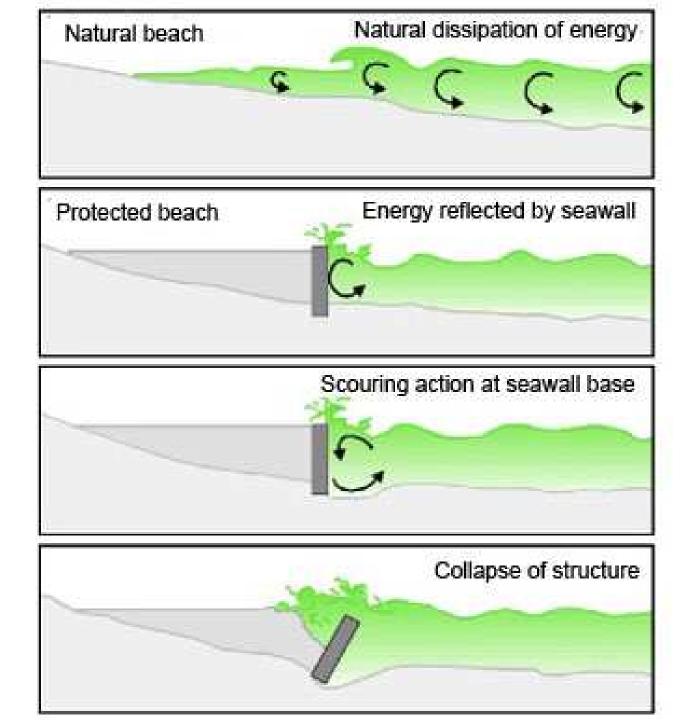
VULNERABILITY INDEX, 5 ft SEA LEVEL RISE











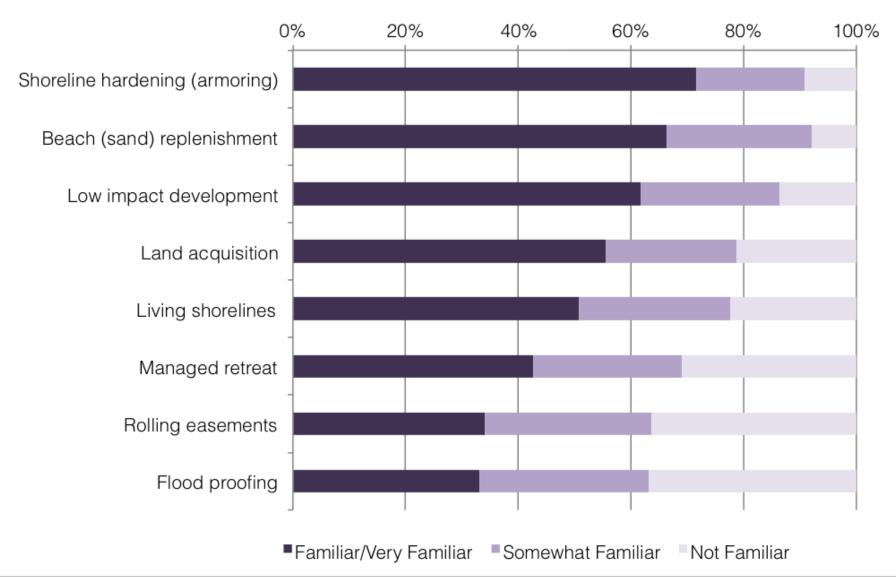




Adaptation Options: The Familiarity Gap

From: Hart et al., Rising to the Challenge (2011)









90 SCIENCE PUBLICATIONS

making the case for nature-based solutions that reduce risk Influencing business practices in TECHNOLOGY, ENERGY, INSURANCE, and HUMANITARIAN sectors



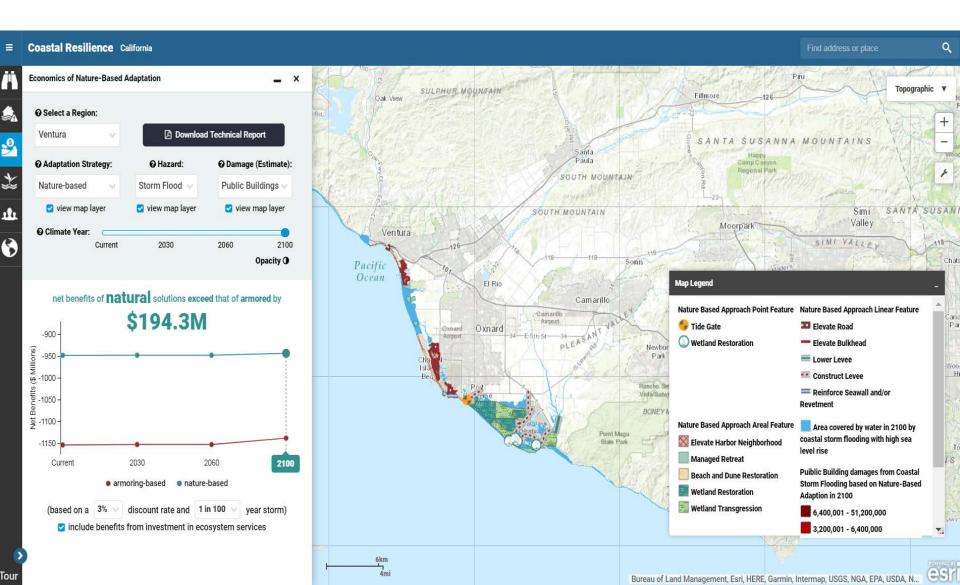
IDENTIFY SOLUTIONS





Economics of nature-based adaptation, California

http://maps.coastalresilience.org/California/



- Lack of technical standards to guide implementation and evaluation;
- Low levels of cross-jurisdiction coordination among local, state, and federal entities;
- Insufficient funding for localized data collection, strategic planning, and regional coordination; and
- Lack of public familiarity with nature-based strategies, leading to a lack of political support.

"[How can we] gauge the effectiveness of nature-based strategies when there are no technical standards"?

"We're asking public works people to make these decisions, and they like to build things that work, so they know how to design a seawall and the life expectancy. They don't know how to do managed retreat and beach nourishment and know [those approaches] will have the same level of certainty that needs to happen to make the mayor and everyone else happy.... We don't have the expertise for these [nature--based] strategies."



Case Studies of Natural Shoreline Infrastructure in Coastal California

A COMPONENT OF IDENTIFICATION OF NATURAL INFRASTRUCTURE OPTIONS FOR ADAPTING TO SEA LEVEL RISE



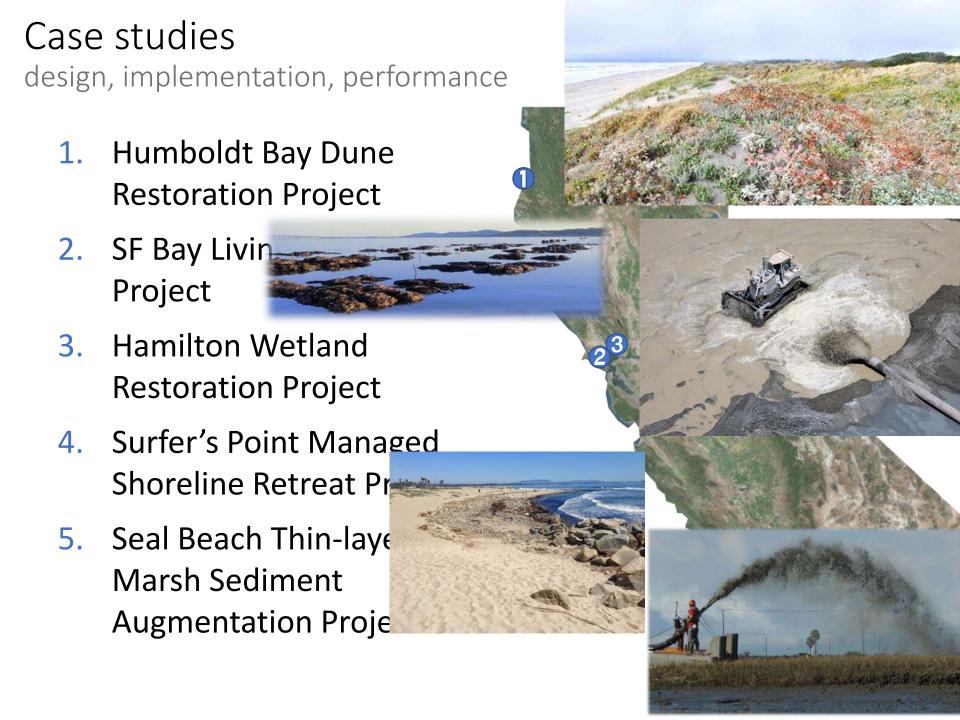








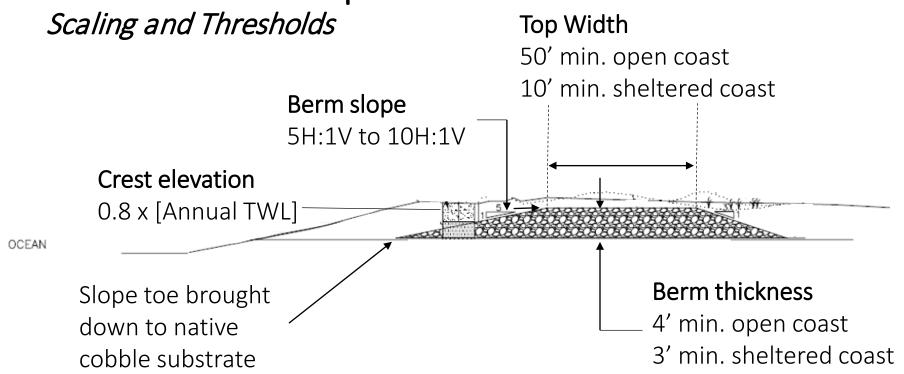




Engineering Guidelines



Cobble Berm Example: Surfer's Point



Based off of cobble berm design at Surfer's Point Managed Retreat

Annual TWLs based off of values calculated in *Relating Future Coastal Conditions to Existing FEMA Flood Hazard Maps: Technical Methods Manual* (ESA, 2016) using
Stockdon and Modified TAW methods.

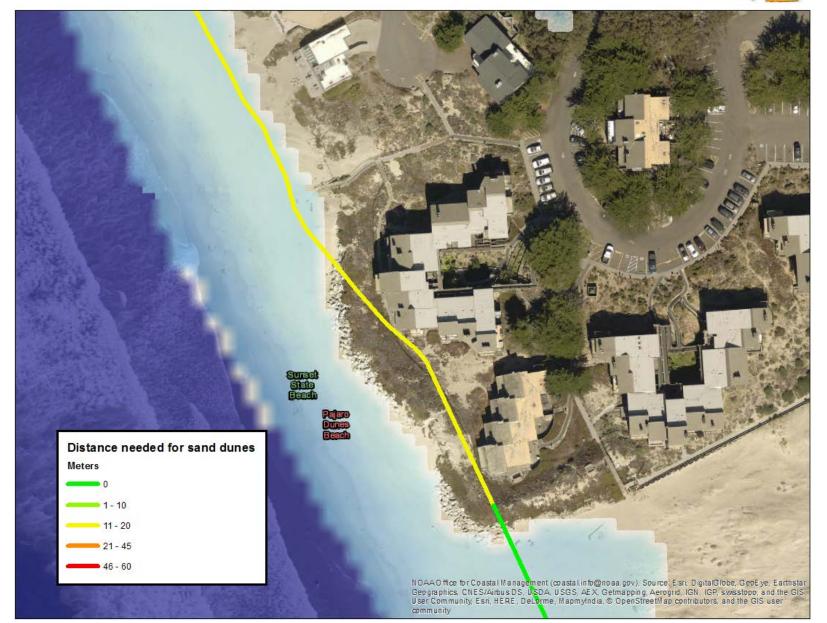
Sand Dune Suitability





Sand Dune Suitability





The coast belongs to everybody.

—PETER DOUGLASS, EXECUTIVE DIRECTOR, CALIFORNIA COASTAL COMMISSION, 1985-2011

