ABSTRACT

Flooding and erosion caused by rising sea levels and powerful storms threaten property throughout coastal California. To protect against these climate-change related threats, landowners will certainly take action, and the default industry standard response has been to try to “hold the line” against the encroaching sea by constructing seawalls, dikes, levees and other forms of coastal armoring. While armoring may in some cases provide acceptable short term protection, armoring also tends to accelerate shoreline erosion, exacerbating hazards to people and leading to the eventual loss of critical wildlife habitat and public beaches.

Natural Shoreline Infrastructure can be as effective as armoring, while having the added benefits of preserving coastal habitat and public access. Recognizing this, California agencies have mandated that decision-makers prioritize its use in planning and investment decisions. Yet, planners have encountered many stumbling blocks as they have tried to incorporate these approaches into coastal resilience plans. Major obstacles include: a lack of a common definition and shared terminology; lack of expertise; lack of precedent; and the absence of siting guidance and technical design standards.

Here, we set out to enable planners to adopt Natural Shoreline Infrastructure by filling in the missing information. With the input of dozens of coastal managers who served on our Technical Advisory Committee, we developed a definition and collected a list of case studies where Natural Shoreline Infrastructure has already been successfully deployed in California. Drawing from these and other projects, we collected into one place the first detailed technical guidance for implementation, including siting criteria and design thresholds. These criteria inform decisions about where and when to use six types of Natural Shoreline Infrastructure (e.g. sand dunes, seagrass beds). Using Monterey Bay and Ventura County projects as examples, we demonstrate how to use the technical guidance in tandem with spatial data to match a particular shoreline environment with appropriate Natural Shoreline Infrastructure options, creating “blueprints” for action.
The information in this report is intended to facilitate the use of Natural Shoreline Infrastructure along California’s coast, improving the resilience of communities and habitats in the face of climate change.

HIGHLIGHTS

- Coastal planners have faced many stumbling blocks when attempting to incorporate Natural Shoreline Infrastructure strategies into climate-change adaptation plans, and have instead often implemented short-term solutions like coastal armoring, and will continue to do so until significant hurdles to implementing other strategies can be overcome.

- Two major hurdles for planners are a lack of precedent and a dearth of technical guidance applicable to California’s varied environmental settings. To begin to address the first, we’ve collected five detailed case studies where planners have already successfully implemented different types of Natural Shoreline Infrastructure.

- To address the second hurdle to implementation we provide detailed technical guidance information to direct planners in evaluating and deciding where, when, and how to use six types of Natural Shoreline Infrastructure (e.g. sand dunes, seagrass beds), for optimal results.

- Using Monterey Bay and Ventura County as examples, we demonstrate how to use this guidance in tandem with local spatial data to match a particular shoreline environment with appropriate Natural Shoreline Infrastructure options, creating “blueprints” for action.

- Going forward, state agencies and NGOs should support demonstration projects that include testing and monitoring, so that the community of practitioners may continue to improve upon Natural Shoreline Infrastructure approaches and so they can be applied on larger scales, to enhance resilience to climate-change related hazards and maintain public access to healthy shorelines long into the future.

ACCESS

For access to the full report, please email Susan.wilhelm@energy.ca.gov

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