

The final Sea Level Rise Adaptation Strategy Report is being coordinated with the California Coastal Commission. Therefore, the results presented below are considered preliminary and could be subject to change.

Background

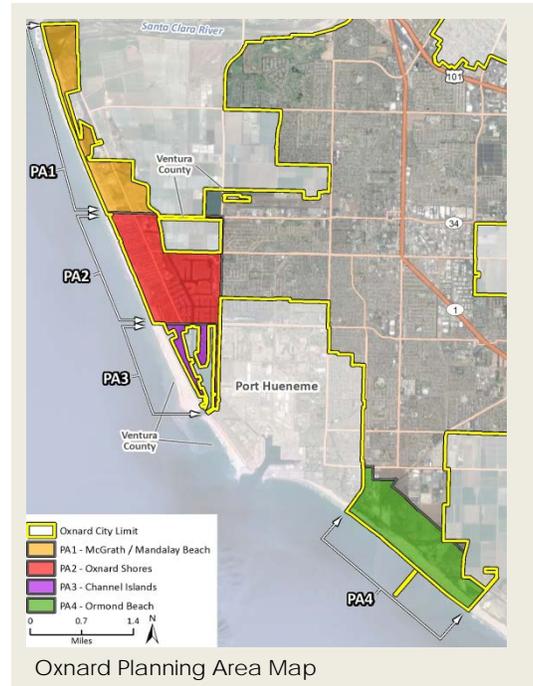
The California Coastal Act requires local governments to prepare and implement Local Coastal Plans (LCPs) to protect natural and man-made coastal resources and maximize public access to the shoreline. Climate change makes that effort more challenging, as climbing temperatures increase sea level rise (SLR) and threaten coastal resources and communities. The City of Oxnard adopted its LCP in 1982, and while it has been amended since then, it has not yet undergone a comprehensive update. The adaptation strategies considered in the Sea Level Rise Adaptation Strategy Report are Green Protect, Hard Protect, Accommodation, and Managed Retreat. The *Adaptation Report* was prepared to inform the Local Coastal Program (LCP) Update process and City coastal permitting, SLR adaptation planning, and related regulatory processes.

About the Assessment

Coastal areas of Oxnard were divided into four planning areas: McGrath-Mandalay (Planning Area 1), Oxnard Shores (Planning Area 2), Channel Islands Harbor (Planning Area 3), and Ormond Beach (Planning Area 4). Adaptation strategies were considered for each planning area.

Cost-benefit Analysis

This study included a cost-benefit analysis of the adaptation strategies to allow comparison. The aim of the economic analysis was to provide a common metric against which the trade-offs between the costs and benefits of each adaptation strategy may be evaluated. The analysis accounts for the physical changes, economic benefits, and damages associated with each adaptation strategy, including the vulnerability of beaches and coastal property. Coastal hazards included coastal flooding and erosion anticipated during a 100-year storm event and the exposure of property to monthly tidal flooding exacerbated by high SLR scenarios at three planning horizons: 2030, 2060, and 2100 (8.0, 25.3, and 58.1 inches of SLR, respectively). The cost-benefit analysis evaluates the level of benefits that come from beach recreation against the costs of expected property losses and damages and the costs of implementing the adaptation strategy itself. A cost-benefit analysis is a useful tool to compare adaptation strategies, however, there are limitations. The cost-benefit analysis did not include the value of ecological resources, public access points, and visual impacts. Therefore, a cost-benefit analysis should be considered as one tool planners and policy makers can use to shape their decisions.



Adaptation Strategies

-  **Green Protect** involves “natural infrastructure” such as stable sand dunes and coastal wetlands. Wetlands and sand dunes absorb and deflect wave energy.
-  **Hard Protect** involves the construction of seawalls, dikes, flood gates, groins, revetments, etc. Although a prevalent strategy, can cause negative impacts to beaches, views, and public access.
-  **Accommodation** involves methods to modify existing developments or design new developments. These can include elevating structures and other engineering retrofits.
-  **Managed Retreat** assumes structures would be relocated or replaced and moved beyond the highest coastal hazard zone after development has been impacted by coastal hazards.

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Results

Overall Net Benefits of each Adaptation Strategy by Planning Area (2017 dollars)

Planning Area	Planning Horizon		
	By 2030	By 2060	By 2100
1 Mandalay McGrath	 Managed Retreat \$45.5 million	 Managed Retreat \$107.6 million	 Managed Retreat \$179.5 million
2 Oxnard Shores	 Managed Retreat -\$13.2 million	 Managed Retreat -\$65.1 million	 Managed Retreat -\$66.3 million
	 Green Protect \$32.0 million	 Green Protect \$69.2 million	 Green Protect \$120.1 million
	 Hard Protect -\$13.2 million	 Hard Protect \$26.0 million	 Hard Protect \$26.0 million
	 Accommodation Not evaluated	 Accommodation Not evaluated	 Accommodation Not evaluated
3 Channel Islands Harbor	 Managed Retreat \$2.0 million	 Managed Retreat -\$7.9 million	 Managed Retreat -\$11.0 million
	 Green Protect -\$0.4 million	 Green Protect \$800 million	 Green Protect -\$12.0 million
	 Hard Protect \$2.0 million	 Hard Protect -\$7.9 million	 Hard Protect -\$11.9 million
	 Accommodation Not evaluated	 Accommodation Not evaluated	 Accommodation Not evaluated

Note: Planning Area 4 is undergoing a separate SLR adaptation planning process as part of the Ormond Beach Restoration & Access Plan. In light of Oxnard's support for and participation in this process, an analysis for Planning Area 4 is not provided.

Conclusions

- In terms of overall benefits, the analysis determined that Green Protect had greater economic benefits for Planning Area 2 & Planning Area 3 compared to Hard Protect.
- Coastal armoring is expected to lead to a reduction in sandy beach width and thus reduces beach access, attendance and the accompanying economic value, in addition to the unquantified losses in habitat and visual amenities provided by this resource.
- Accommodation strategies for specific areas such as Channel Islands Harbor and waterway communities will still need to be evaluated by comparing engineering-specific designs and options.

Next Steps

The next step is to use the information provided in the *Adaptation Report* and the previous *Vulnerability Report* to draft SLR LCP polices that: (1) support the community's vision for the future; (2) address the specific coastal hazard risks; (3) are consistent with the California Coastal Act, (4) generally follow the policy directions in the Coastal Commission's SLR Policy Guidance (2015); and (5) reduce impacts from hazard events compared to not having taken any adaptations.