

CAPISTRANO BAY DISTRICT
AGENDA REPORT
December 10, 2019

Sea Level Rise

ITEM 7

City Progress with Sea Level Rise Vulnerability Assessment

The City held a progress workshop last week to update stakeholders on their progress with the Sea Level Rise Vulnerability Assessment. This first phase is wrapping up and the City is now beginning work on Phase 2 which will recommend policy changes for inclusion into the Local Coastal Plan (LCP).

The City has not given a completion date for Phase 2 but given that the first phase has taken the better part of 18 months, it is reasonable to expect some kind of draft policy by the end of summer 2020.

A two-page summary from the City is included on the following two pages. For a review of the complete Assessment Report, you can go to the City of Dana Point website and open the Sea Level Rise report: www.danapoint.org You can also shortcut to the report by clicking on the following link: <http://bit.ly/dpsealevelrise> if the link is not interactive then simply type in: **Dana Point Sea Level Rise** in your internet search browser and this should take you to the city's website.

9. Conclusions

This assessment identifies potentially significant impacts to coastal resources in Dana Point for a SLR scenario of 1.6 ft. A resource's vulnerability to SLR is a product of its exposure to coastal hazards (shoreline erosion and flooding), its sensitivity to said hazards (potential damage or loss of function), and its adaptive capacity (ability to restore function or avoid damage). The OPC document suggests there is a 50% probability that SLR will exceed 1.6 ft by 2080. However, the worst-case projections (H++ scenario) indicate this amount of SLR could occur as soon as 2040.

Natural resources and recreational amenities will be among the first resources impacted by SLR due to the effects of coastal squeeze. Throughout Dana Point these resources are constrained from landward migration by development such as residential housing, the LOSSAN railroad corridor, and PCH. "Coastal squeeze" can be defined as the process by which sea level-dependent physical, cultural, or biological areas are pushed landwards with SLR but are prevented from natural landward migration due to a protected or non-erodible structure such as a sea cliff or revetment. The dry beach and intertidal areas of Dana Strand, South Doheny State, and Capistrano Beaches (and resources dependent on these areas) are vulnerable to permanent loss due to coastal squeeze based on CoSMoS shoreline projections for a 1.6-ft rise in sea level.

Continued shoreline erosion, accelerated by SLR, coupled with storm-induced beach erosion has the potential to cause permanent damage to development along Capistrano Beach. With a 1.6-ft rise in sea level, over half of the parcels along Beach Road could be subject to seasonal erosion impacts, which could be problematic for structures on shallow foundations without shoreline protection. The newer structures supported on pile foundations would be less sensitive to seasonal erosion but could be subject to wave uplift forces under this scenario during an extreme coastal storm event. A 3.3-ft rise in sea level represents a significant threshold at which the everyday shoreline is at or landward of the existing development at 135 parcels indicating that 1) there is little or no dry beach remaining in front of these parcels and 2) the existing structures would be subject to regular and more intense wave action given the higher water levels of this scenario. Shoreline projections for higher SLR scenarios indicate the daily shoreline position would be landward of existing development along all of Capistrano Beach. Long-term shoreline erosion not only threatens structures, it also has the potential to eliminate the dry sandy beach areas valued by the community.

The vulnerability to some of these assets can be mitigated through adaptation measures implemented on regional, local, or site-specific scales. The adaptation measures will need to involve coordination with stakeholder groups and agencies to balance the costs, benefits, and trade-offs of these measures. Improving our understanding of the potential effects of SLR on local coastal processes through a regular monitoring program will provide valuable information that can be used to encourage responsible development within these hazard zones. This monitoring data will also inform the design and implementation of adaptation strategies aimed at reducing the adverse impacts of SLR on coastal resources.

A living shoreline approach that mimics rocky intertidal habitat, potentially in combination with restored or enhanced reef structures, could provide multiple ecological benefits for intertidal areas while reducing wave energy and erosion along the shoreline. The design of these features could also be fine-tuned to

provide additional benefits such as sediment retention or potentially improved surfing conditions, and applications could vary to mimic the different nearshore rocky intertidal habitat types along Dana Point.

Beach nourishment is a logical approach to offset the impacts from a retreating shoreline. A regular beach nourishment program would help mitigate the adverse effects of coastal squeeze on natural and man-made resources in Dana Point. However, beach nourishment, considered a “soft protection” strategy, is temporary by design and requires a regular program of re-nourishment to maintain an adequate supply of sediment to a littoral zone. Such a program requires significant financial resources that are often difficult for a single city or entity to support.

One opportunity for implementing an effective and sustainable beach nourishment program would be to engage stakeholders such as OCTA, Caltrans, the City of San Clemente, and California State Parks whose assets would also benefit from a consistent nourishment program. SANDAG may also be a potential partner in a beach nourishment program given the City is within the same littoral cell (Oceanside) as many San Diego communities. Partnering with SANDAG on future beach nourishment projects conducted in the San Diego region could prove a cost-effective option to supplement a local program.

There is considerable uncertainty around the timing of SLR, how future coastal processes may be affected, and what adaptation approaches will be applied in the future. For this reason, SLR hazard planning efforts should not rely on a single projection or scenario. Future SLR hazards for planning purposes should instead correspond to acceptable levels of risk based on the predicted lifespan, exposure, and vulnerability of specific coastal uses and resources. The most effective way for the City to address the vulnerabilities described in this report while accounting for the inherent uncertainties in SLR hazard planning is to implement policies and programs that are flexible and can be adapted in response to SLR, future beach conditions, and future development. Regular updates to the vulnerability assessment, potentially at 10 year intervals, would provide an opportunity to update the findings in this study with the best available science on sea level rise projections and coastal hazards. The updated assessment should also evaluate the effectiveness of the policies, programs and projects implemented by the City and other entities to mitigate the adverse effects of sea level rise.