

Consideration of Sea Level Rise in Recent LCP Updates: Newport Beach Case Study

Introduction

In August of 2015, the Coastal Commission unanimously adopted its Sea Level Rise Policy Guidance, which provides recommendations for how to address sea level rise within the context of the Coastal Act. In particular, the document discusses the importance of addressing sea level rise in Local Coastal Programs (LCPs). LCPs are a critical tool for addressing sea level rise because they dictate the types, intensities, and locations of allowable land uses, and therefore provide a framework for implementing proactive adaptation strategies to address sea level rise vulnerabilities. However, many LCPs were certified in the 1980s and 1990s and need updates to reflect changed conditions, new information and knowledge, and new programs and policies, especially those related to climate change and sea level rise.

To that end, the Coastal Commission, in coordination with other state agencies including the State Coastal Conservancy and the Ocean Protection Council, has provided significant grant funding to support LCP updates with a particular emphasis on addressing sea level rise. By the end of 2016, the Coastal Commission awarded 3 rounds of grants totaling approximately \$4.5 million to support the completion of sea level rise vulnerability assessments, adaptation plans, Land Use Plan (LUP) and Implementation Plan (IP) updates, and local adoption and Coastal Commission certification of LCPs. The first round of grants was completed in April of 2016.

Four jurisdictions with grants from the Coastal Commission were chosen as case studies to provide information on how sea level rise adaptation planning and related LCP policy development are carried out on a local scale. The four jurisdictions – Marin County, and the cities of Pacific Grove, Goleta, and Newport Beach, were chosen because they represent a variety of geographic areas as well as different planning approaches. These four case studies provide valuable information and lessons learned on topics such as finding the right level of detail for vulnerability assessments, the utility of including a specific adaptation planning step, and the importance of adaptive LCP policies. More information on these topics can be found in each of the individual case studies.

The schematic below shows a generalized process for how to address sea level rise through an LCP update. As exemplified by the following case studies, there are several ways to approach this process and each of the four example communities took different approaches for development of their Local Coastal Programs.



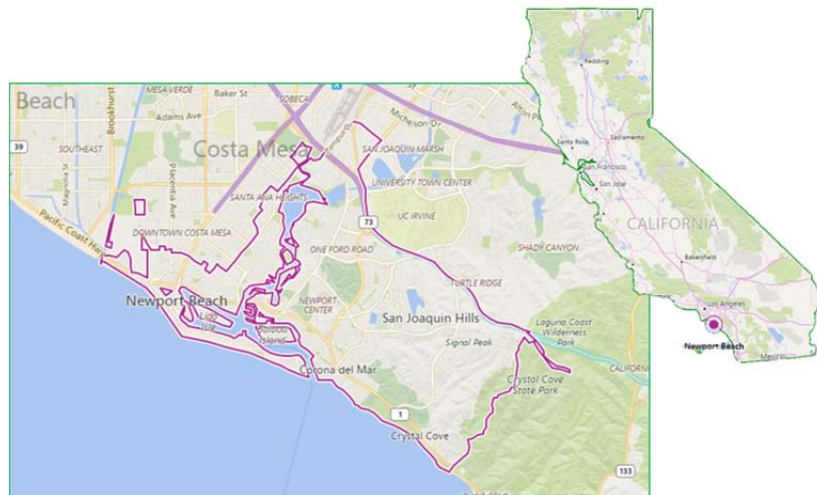
Newport Beach is an example of a jurisdiction that did not have a certified LCP and focused its efforts on completion of the IP using an existing, certified LUP as the standard of review. As shown in the schematic below, the city did not complete a sea level rise vulnerability assessment or adaptation plan; rather, the certified LUP policies were used to develop the content of the IP related to sea level rise. Despite the lack of a city-specific sea level rise vulnerability assessment, the city was able to incorporate sea level rise considerations into the IP using existing resources, such as the Coastal Commission's 2015 Sea Level Rise Policy Guidance and existing regional studies on sea level rise. The IP was approved with modifications by the Coastal Commission on September 8, 2016, and became fully certified on January 13, 2017. To address the lack of a city-specific vulnerability assessment, the IP includes a commitment to conduct a sea level rise vulnerability assessment for the city's entire coastal zone to inform a future LCP update.



Figure 1. Newport Beach sea level rise planning as of February 2017. Green indicates the steps described herein.

Background

The City of Newport Beach lies in a relatively heavily developed portion of Orange County. With a community of over 75,000 residents, the city covers a 25.4 square mile area, including 2.5 square miles of bay and harbor waters. The city has over 30 miles of bay and ocean waterfront stretching from



the northern border at the Santa Ana River mouth to Crystal Cove State Park in the south. The coastal zone covers 63 percent of the city's total land area.

The development of Newport Bay Harbor was authorized in 1934 and carried out by the Army Corps of Engineers. Islands within Newport Bay were created using dredged sediments within the estuary and are now built out with bulkheaded residential lots and small piers. Newport Beach's coastal zone is incredibly rich in coastal resources, including the Upper Newport Bay Ecological Reserve, which is home to sensitive biological resources including sand dunes, coastal bluffs, and riparian areas. The city has extensive visitor-serving uses that provide vital recreational areas and infrastructure, like trails, parks, beaches, and commercial areas, walkable shopping districts and visitor accommodations



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for the millions of visitors to the city each year. Many areas of the city are subject to coastal hazards, including development protected by bulkheads, low-lying areas subject to flooding, and bluffs susceptible to erosion.

The city's Land Use Plan (LUP) was first certified on May 18, 1982. It was comprehensively updated in 2005, and the most recent update was effectively certified on October 8, 2009. In 2012, the city began formulating the

Implementation Plan (IP), and following three years of public involvement, hearings, and extensive deliberation by the City Planning Commission, Harbor Commission and City Council, the city submitted the IP for Coastal Commission consideration. On September 8, 2016, the Coastal Commission approved the IP with modifications, and on November 22, 2016, the Newport Beach City Council approved the Implementation Plan as modified by the Coastal Commission. Following a check off by the Coastal Commission Executive Director, the LCP became certified by the CCC on January 13, 2017, transferring permit review authority to the city.

Existing LUP and Sea Level Rise

The City of Newport's certified Land Use Plan (2009) includes both background information on sea level rise (Section 2.5.8) and various policies that address or relate to the subject of sea level rise. The background information section acknowledges the physical hazards associated with sea level rise, including erosion, flooding, and saltwater intrusion, and describes potential associated impacts to coastal resources and development



within the city. These impacts include a reduction in beach width due to erosion, increased bluff retreat rates, inundation of coastal wetlands, and increased salinity of bays and aquifers. The background section also notes that sea levels have increased 4-10 inches over the last century. It does not, however, include a discussion of more recent studies on future sea level rise such as the National Research Council's 2012 report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present and Future* (NRC 2012), which is now considered to be the best available science on sea level rise in California. While NRC

2012 describes a likely acceleration in sea level rise rates and projects sea level rise of up to 66 inches by 2100, the background section of the LUP instead contemplates the continuation of the observed rate of sea level rise from tide gauge records in Los Angeles and San Diego. It states that projections of accelerating sea level rise *“are too poorly constrained to engender policy changes and development of appropriate mitigation strategies. However, sea level rise would lead to the permanent inundation of low-lying areas, with potentially significant changes in land use, so it is not too soon to develop longer-term strategies that can be implemented to cope with these changes.”* Therefore, the LUP background section conveys an intent to address sea level rise through broad, long term strategies.

Policies in the LUP address several issues related to sea level rise. First, several policies in section 2.8 require new development to avoid hazardous areas and assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices. Permit applications for new coastal development must provide a wave uprush and impact report that, among other things, includes projections of sea level rise over a 75-year time period. Section 4.4 of the LUP includes policies regarding the calculation of setbacks, providing for the setback to be increased where necessary to ensure safety and stability of the development, and section 8.2 includes a policy to site and design new structures to avoid the need for a shoreline or bluff protective device for a 75-year economic life.

Other policies provide for comprehensive studies of long-term shoreline change with sea level rise, along with monitoring of beach widths and elevations to establish thresholds for when backshore development may be exposed to flooding or damage from storm waves. The LUP also contains a number of policies regarding the use, siting, and design of protective devices that aim to minimize impacts to coastal resources and shoreline processes, and requires a waiver of future shoreline protection as a condition of approval for new development projects. Together, these and other relevant LUP policies provided the basis for specific regulatory measures necessary to carry out the LUP and address sea level rise in the IP.

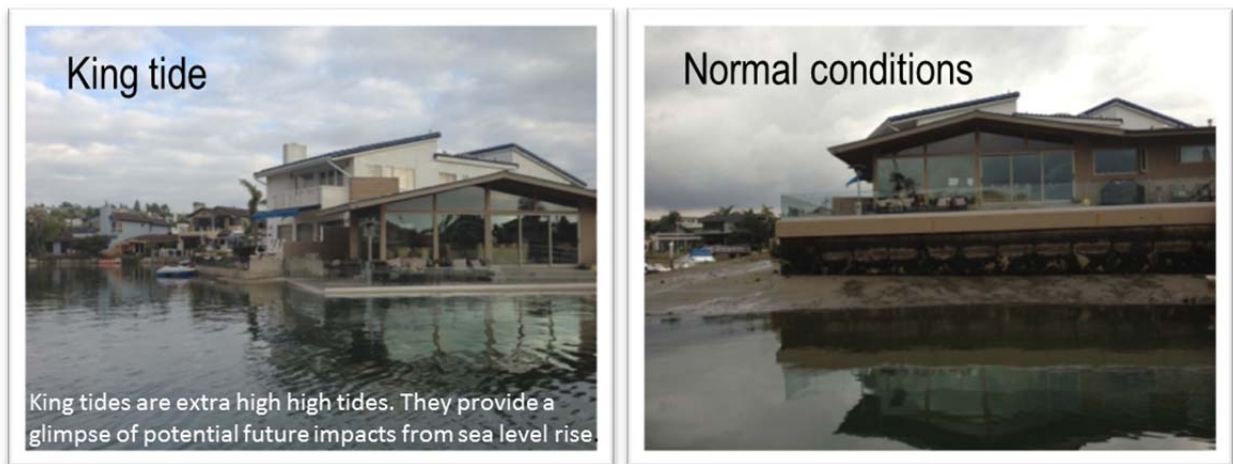


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IP Development Process

The city's recent efforts to complete its Implementation Plan and fully certify its LCP began in 2012. The work generally fell into two phases, with the first phase involving the formation of a General Plan/Local Coastal Program Implementation Committee to provide oversight and direction to city staff and the preparation of the Administrative Draft Implementation Plan. Phase II involved community outreach, continued coordination with Coastal Commission staff, local public hearings, and submittal of the Implementation Plan to the California Coastal Commission. The second phase was partially funded by an LCP Local Assistance Grant from the Coastal Commission ([LCP-14-10](#)).

The Coastal Commission broadly encourages the use of sea level rise vulnerability assessments to inform LCP development, and this process is discussed in detail in the Coastal Commission's 2015 Sea Level Rise Policy Guidance document. Many coastal jurisdictions currently undertaking projects to develop or update LCPs perform various technical studies, including a sea level rise vulnerability assessment, prior to beginning policy development. Such studies can provide geographically explicit information needed to develop, for instance, hazard overlays that depict the areas that might be impacted by hazards related to sea level rise and required actions to be carried out through policies and ordinances in the LCP. However, because Newport's recent effort was focused on certification of the LCP, the city did not perform a vulnerability assessment and used only the existing LUP as the standard of review for the regulations in the IP. Despite this lack of information, the policies of the certified LUP provided the basis that was needed for development standards and requirements in the IP that promote sea level rise resiliency. This subject was an area of extensive coordination between city and Coastal Commission staff during the pre-and post-submittal development of the IP.



Photos by: Danny Sullivan (<http://dannysullivan.com/king-tides-hit-newport-beach-3232>)

Adopted IP and Sea Level Rise

The Implementation Plan was developed using the certified policies of the 2009 LUP as the standard of review. The following bullet points summarize some of the key sections in the approved IP that carry out the LUP policies related to sea level rise. While these sections address a wide variety of subjects beyond just sea level rise, the intention of the summary below is to describe the key ways the IP promotes adaptation to sea level rise, minimizes coastal hazards, and maximizes protection of coastal resources.

The bullets below also represent many of the subjects of coordination between the city and Coastal Commission staff. Since the city had not performed a sea level rise vulnerability assessment to inform the IP, it was particularly important to Coastal Commission staff to work with city staff to develop language for the IP that carried out the certified sea level rise-related policies of the LUP to the maximum extent possible. While Coastal Commission staff recognize that not all planning efforts will be able to include a sea level rise vulnerability assessment, it is still critical to address sea level rise using the best available information in order to carry out the hazard minimization and resource protection policies of the Coastal Act and certified LUP, as well as lay the foundation for additional future work on the LCP.

As described below, Coastal Commission staff worked with city staff to add detail from the best available science and resources to Appendix A—a new element of the IP created to address sea level rise. The appendix was revised to specify the various elements that should be included in site-specific analyses of sea level rise, and the IP was revised elsewhere to ensure the Appendix was cross referenced in the sections of the IP that included requirements for such analyses. Coastal Commission staff also worked with the city on standards for waterfront development and development in shoreline hazardous areas to promote sea level rise resiliency. These subjects are described further in the bullet points below.

- **Appendix A: Sea Level Rise** – This appendix provides background information on sea level rise and references the current best available science on sea level rise projections, NRC 2012. It provides a step-by-step process, consistent with the Coastal Commission’s 2015 Sea Level Rise Policy Guidance, describing how sea level rise should be considered in the preparation and review of CDP applications. These steps include detail on 1) selecting sea level rise projections; 2) performing site-specific analysis, considering sea level rise, wave uprush, geologic stability, erosion, flooding, and other impacts; 3) analyzing impacts to coastal resources; 4) analyzing adaptation strategies and project alternatives to minimize hazards and impacts to resources; and 5) implementing those alternatives or adaptation strategies through conditions of approval. Several sections of the IP cross reference the methodology in Appendix A, including but not limited to Wave Uprush and Wave Impacts (see Section 21.30.015.C.3), and Geologic Stability (see Section 21.30.015.C.4).
- **Finished flood elevation** – Section 21.30.015(D)(3) includes development standards for waterfront development. It generally requires that the minimum top

of slab/finished floor elevation comply with those established in the Flood Insurance Rate Maps (FIRMs), but provides for the elevation to be increased to account for sea level rise when recommended by a site-specific Coastal Hazards Report. This concept is repeated in Section 21.30.060 (Height Limits and Exceptions).

- **Waterfront development resiliency standards** – Along with the provision for an increase in finish floor elevation for new structures, Section 21.30.015(D) provides additional standards for waterfront development to promote sea level rise resiliency, including: to minimize, and where feasible, avoid shoreline hazards identified in, for example, coastal hazards and/or geologic stability reports described in Section 21.30.015(E); to require the property owner/applicant to acknowledge any hazards present at the site, assume the risk of injury and damage from such hazards, and unconditionally waive any claim of damage or liability against the decision authority from such hazards; to remove nonconforming structures particularly when located on State tidelands or beaches available to the public; and to bring new development and/or replacement structures into conformity with current standards for setbacks from the shoreline, bluff and/or bulkhead.
- **Coastal hazards reports** – Section 21.30.015(E) addresses development in hazardous shoreline areas, including areas identified as hazardous in the most current Local Hazard Mitigation Plan, areas identified in Appendix A as potentially impacted by sea level rise, and shoreline areas that are reasonably expected to be impacted by sea level rise based on best available science over the lifetime of the new development. In addition to cross referencing the detailed methodology set forth in Appendix A for conducting an analysis of sea level rise, the section provides a detailed list of various elements required in these studies, including analysis of erosion, slope stability, and storm waves, all as influenced by sea level rise over a 75-year period. It also requires that the report include identification of necessary mitigation measures to address increased erosion and flooding due to sea level rise, such as waterproofing, flood shields, watertight doors, moveable floodwalls, partitions, water-resistive sealant devices, sandbagging and other similar flood-proofing techniques.
- **Geologic stability reports** – In addition to coastal hazards reports, Section 21.30.015(E) requires that development proposed in shoreline areas of known or potential geologic or seismic hazards include a Geologic Stability Report that uses the methodology described in Appendix A. This includes accounting for sea level rise in long-term (75-year) coastal bluff retreat projections.
- **Designing for adaptive capacity** – One of the standards for development proposed on coastal bluffs, canyons, and shoreline areas (Section 21.30.030) states that design techniques include designing structures to include sea level rise adaptation measures for an identified sea level rise scenario (as described in Appendix A) as well as allow for the implementation of planned adaptation measures that could be needed under other sea level rise scenarios in the future.

- Protective devices** – Several sections of the IP address protective structures, and certain standards serve the purpose of reducing the impacts of protective devices on coastal resources considering the effects of sea level rise. Section 21.30.030 (Natural Landform and Shoreline Protection) includes a prohibition on construction of protective devices except to protect coastal-dependent uses or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply; and existing development that is not subject to a recorded waiver of future protection and threatened by hazards. In these cases, the protective device must be located on private land, not State tidelands. It also includes standards for approvable bulkheads for waterfront development, including allowing for realignment as far landward as possible and requiring a waiver of rights to future activities that would result in the encroachment seaward of the approved footprint.



Photo by: Danny Sullivan (<http://dannysullivan.com/king-tides-hit-newport-beach-3232>)

- Waiver of Future Protection** – The standards for development in shoreline hazardous areas in Section 21.30.015(E) require as a condition of approval of new development, a waiver of any potential right to future protection to address situations in the future in which development is threatened by, among other things, hazards associated with sea level rise. It also requires removal and relocation of development if a government agency determines that the development is hazardous or a threat to the public.
- Bluff setbacks** – Section 21.28.040 (Bluff B Overlay District) and Section 21.30.030 (Natural Landform and Shoreline Protection) provide for setbacks to be increased based on the results of a Coastal Hazards and Geologic Stability Reports as described Section 21.30.015 (C) (Development in Hazardous Areas), which includes an analysis of an increase in future erosion rates due to sea level rise.
- Limits on subdivisions** – Section 21.30.025 requires that proposed subdivisions be designed to avoid current hazardous areas, as well as areas that may become hazardous due to future changes such as sea level rise, and will not be approved unless the new or reconfigured parcels can be safe from geologic and other hazards for a minimum of 75 years, and unless shoreline protective devices are prohibited to protect development on the resultant parcels.

- **Determination of Public Access/Recreation Impacts** – Section 21.30A.050 provides standards for the location and configuration of public access, and states that public access improvements shall be designed to, among other things, account for long-term projections in sea level rise and coastal bluff erosion rates according to the methodology set forth in Appendix A: Sea Level Rise.

Next steps

Appendix A of the IP includes additional information about the city's plans for future analysis of sea level rise. As mentioned above, the city and Coastal Commission staff worked together to develop this section and explain what future steps the city will take to address sea level rise in greater detail. As a result of this coordination, Appendix A states that the city will conduct a full sea level rise vulnerability assessment for the city's entire coastal zone as part of a future LCP update. It will use the current best available science on projections of sea level rise, along with the information gained from analysis of wave-run up and flooding potential for individual development projects, and will develop additional adaptation measures to be implemented through the LCP. The city will also coordinate with local and regional partners to share information and adaptation planning ideas related to sea level rise.

Appendix A also describes how the city will re-examine the best available science periodically in conjunction with the release of new information on sea level rise. The city will consider relevant science that is current, peer-reviewed, and widely accepted among the scientific community, such as the newly developed FloodRISE project from UC Irvine. [FloodRISE](#) is an academic project to model future flood extents in Newport Harbor under different sea level rise scenarios using fine-scale, ground-truthed data on the elevations of existing bulkheads, small concrete barriers, streets, and other features. By carrying out the requirements set forth in the certified LUP and approved IP using emerging, best available sea level rise science, the city will continue to promote sea level rise resiliency in a manner that reflects developing science and maximizes resource protection while minimizing coastal hazard impacts.

This product was funded with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program of the Fish and Wildlife Service, U.S. Department of the Interior