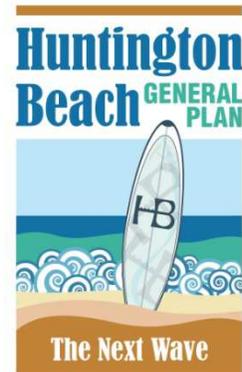


Sea Level Rise Task Force Memorandum

February 12, 2014



Overview

This memorandum summarizes the project team's understanding of sea-level rise (SLR) guidance in the State of California and identified SLR vulnerabilities in the City of Huntington Beach (City). This memorandum is being provided to SLR Task Force members in advance of the first meeting to facilitate a discussion of the study's approach. Task Force input is encouraged to assist the project team in identifying areas of known and suspected SLR vulnerability. Information presented in this memorandum will be elaborated upon in the SLR vulnerability assessment report.

Sea Level Rise Guidance

A myriad of planning and policy level guidance on SLR has been released by international, federal and state entities. These guidance documents were generally informed by research and publications generated from the scientific community. The most applicable guidance to the City of Huntington Beach is the *Draft Sea-Level Rise Policy Guidance* recently released by the California Coastal Commission (CCC) in October 2013. The document provides step-by-step guidance on how to address SLR in new and updated Local Coastal Programs (LCPs) and Coastal Development Permits (CDPs) consistent with the California Coastal Act¹. Steps provided in the guidance are as follows:

1. Determine a range of SLR projections relevant to the LCP planning area or segment.
2. Identify potential physical SLR impacts in the LCP planning area/segment.
3. Assess potential risks from SLR to coastal resources and development in the LCP planning area/segment.
4. Identify adaptation measures and LCP policy options.
5. Develop or update the LCP and certify with California Coastal Commission.
6. Monitor and re-evaluate implementation of the LCP and specific measures as needed.

Given the scope of the General Plan update, the SLR vulnerability assessment would consist of Steps 1 through 4. This memo summarizes known information about Steps 1 through 3. Subsequent analysis to be completed following the task force meeting will provide additional information regarding Steps 1 through 3 that will support development of General Plan policies

¹ Although the City of Huntington Beach is not updating its LCP at this time, the City is using this SLR guidance to inform the General Plan update. The LCP will be updated following completion of the General Plan Update.

and a stand-alone Coastal Resiliency Plan (Step 4). This information will be used by the City to update the LCP.

Step 1: Sea Level Rise Projections

The CCC guidance recommends use of the best available science for Step 1 (developing a range of SLR projections for the assessment). At the time of the CCC guidance Public Review Draft, this was a study completed by the National Research Council for the U.S. West Coast (California, Oregon, and Washington) in 2012. The NRC study predicts a 0.5-foot increase in relative SLR by 2030, and a 3.1-foot increase by 2100 (Table 1 and Figure 2) in the Los Angeles region, relative to 2000 levels.

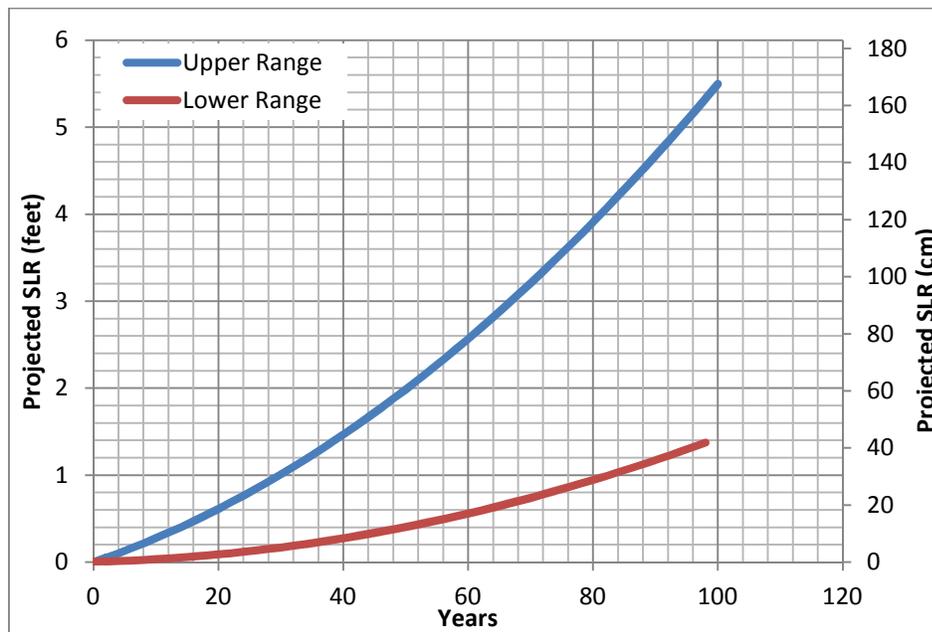
Note that the confidence in the projections, indicated by the uncertainty values, increases with the projection year as does the difference between the low and high projections.

Table 1. SLR Projections for Los Angeles Region

Year	Projection (ft)	Uncertainty (ft, +/-)	Low Range (ft)	High Range (ft)
2030	0.5	0.2	0.2	1.0
2050	0.9	0.3	0.4	2.0
2100	3.1	0.8	1.5	5.5

Source: NRC 2012

Figure 1. Projected SLR for the Los Angeles Region



Source: NRC 2012

Step 2: Identify Potential Physical Impacts

The National Oceanic and Atmospheric Administration (NOAA) recently modeled the potential impacts of SLR projections along the California coastline at a planning level of detail to help decision-makers understand existing and potential future vulnerabilities. The NOAA website (<http://csc.noaa.gov/digitalcoast/tools/slrviewer>) allows users to control the amount of SLR (0 to 6 feet) anticipated, and displays areas of potential flooding or inundation. Model results for the study area are shown under a 5-foot SLR scenario during a 5.5 foot high tide in Figure 2. Water depths are shown using a gradient scale; thus, darker blue areas are regions of deeper water.

The NOAA modeling efforts for the City represent a first-order evaluation of vulnerabilities in Huntington Beach. This condition represents a worst case scenario for 2100 based on the current guidance and best available science. One of the model's shortfalls is that it does not account for the hydrologic connectivity of upland areas to the coast, meaning that all areas lower in elevation than the projected water level would be shown to be flooded regardless of whether or not water could access this area over the surface, and/or through an open channel, culvert, or storm drain. This results in over-estimation of flooding in many areas. Our future modeling work will account for these connections.

Step 3: Potential Risks to Resources and Development

Based on the review of existing modeling by NOAA and discussions with the City thus far, the following areas are preliminarily identified as being vulnerable to SLR (see Figure 3):

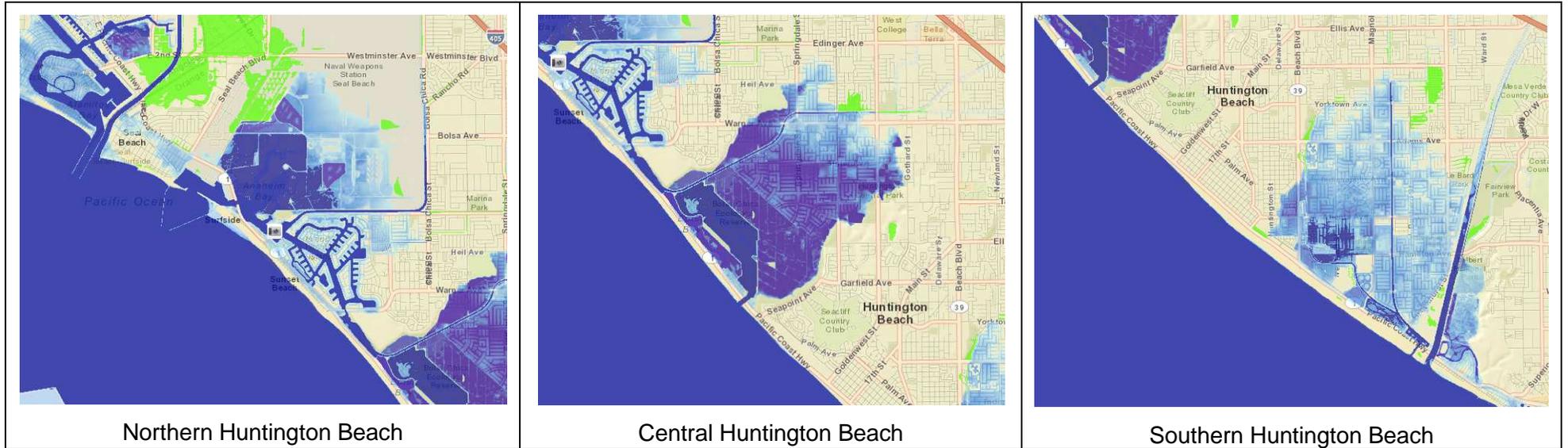
1. Pacific Coast Highway northbound along Huntington Harbour in Sunset Beach near Park Place (see Photo right) and at isolated points to the north;
2. The entire reach of the Sunset Beach shoreline;
3. Huntington Harbour;
4. Huntington Beach Bluffs (to erosion);
5. Pacific Coast Highway along Bolsa Chica, mainly along Outer Bolsa Bay;
6. Pacific Coast Highway along Huntington Beach wetlands, mainly near Magnolia and Brookhurst Streets; and
7. South Huntington Beach along the Huntington Beach and Talbert Flood Control Channels.



January 1, 2014 - "King Tide" at PCH in Sunset Beach

This is considered a working list and input from the Task Force is appreciated.

Figure 2. NOAA Coastal Flooding Model Results (high tide and 5 feet of SLR)



References

California Coastal Commission (CCC). 2013. Draft Sea-Level Rise Policy Guidance. October.

National Research Council (NRC). 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. Washington, DC: The National Academies Press, 2012.

National Oceanic and Atmospheric Association (NOAA). NOAA Sea Level Rise Impact Viewer. <http://csc.noaa.gov/slr/viewer/>

Cal-Adapt – Exploring California Climate Change Research. <http://cal-adapt.org/sealevel/>