

Findings from the 2012 NRC West Coast Sea Level Rise Report

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This talk will review findings recently released in a National Research Council (NRC) report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. The report summarizes the IPCC (2007) findings on global sea-level change and published research results on the processes that contribute to sea-level change in the region and also presents the NRC Committee's analysis of relevant data and model results. For the California coast south of Cape Mendocino, the NRC Committee projection is that sea level will rise 4 to 30 cm by 2030 relative to 2000, 12 to 61 cm by 2050, and 42 to 167 cm by 2100. For the Washington, Oregon, and California coasts north of Cape Mendocino, the NRC Committee projection is between -4 cm (sea-level fall) and +23 cm by 2030, -3 cm and +48 cm by 2050, and 10 to 143 cm by 2100. Major sources of uncertainty in the regional projections are related to assumptions about future ice losses and a constant rate of vertical land motion over the projection period. Most of the damage along the California, Oregon, and Washington coasts is caused by storms—particularly the confluence of large waves, storm surges, and high astronomical tides during a strong El Niño. To date, there is a lack of consensus among climate model simulations about whether the number and severity of storms will change in the northeast Pacific.

Keywords: Sea Level Rise

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Delta Conservancy Climate Change Policy

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The Sacramento-San Joaquin Delta could undergo many changes due to climate change and sea-level rise in the decades ahead. The potential affects to this region include an increased risk of levee failure, loss of agricultural land and productivity, loss of wetlands, reduced water quality, contamination of groundwater supplies, more water dedicated to meeting water quality standards, biodiversity shifts, increased vulnerability to invasive species, and changes to State Water Project and Central Valley Project operations. As a primary state agency to implement ecosystem restoration in the Delta, the Delta Conservancy seeks to understand and addresses potential climate change impacts, and developed a climate change policy to assist in determining what could increase the Delta's resiliency to the effects of climate change. The Delta Conservancy believes the regional economic and environmental health are linked to the Delta's vulnerability to potential climate change impacts listed above, and that strengthening the Delta region's economy will help the Delta adapt to potential future conditions resulting from climate change. To further this goal, the Delta Conservancy identified in its climate change policy a suite of carbon management and adaptation strategies, as well as guidelines on assessing risk from sea-level rise.

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Sea-Level Rise and Coastal Inundation during the Near-Term

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What does projected sea-level rise mean for coastal inundation now and in the next few decades? The majority of California's open coast is physically protected from inundation (but not necessarily from erosion) by sea cliffs or dune backed beaches; vulnerability to inundation is a localized condition. Although many planning scenarios focus on the large end-of-century projections of global mean SLR, mid-century projections are only in the ballpark of one foot; near-term effects will be experienced as inundation during winter storm events, especially events occurring during stronger El Niño conditions when sea levels can be higher than average. During these events, storm surge and high tides can temporarily increase sea levels to amounts not otherwise expected until the century's end, as was experienced during the

1982–83 El Niño when some of the Central Coast's worst historical erosion damage was observed. Coastal inundation can stem from multiple sources: seawater (storm surge, storm events during high tides), riverine (overbank flow from freshwater drainages), or local stormwater system overflows. This latter condition was observed during 2010 atmospheric river storm events in Southern California, when high-intensity precipitation overwhelmed local stormwater drainage systems and caused urban flooding. Tools for responding to inundation during winter storms events include improved research observations of offshore meteorological and wave conditions, and improved observations and forecasting for extreme precipitation events, such as atmospheric rivers.

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San Francisco Bay Area Sustainable Communities Strategy

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In the decades ahead, predicted acceleration of sea-level rise from global climate change threatens over 330 square miles of low-lying shoreline property and over \$60 billion worth of public and private development around San Francisco Bay. To deal with this challenge, the San Francisco Bay Conservation and Development Commission recently adopted new regulations that require sea level rise to be addressed when planning shoreline projects. At the same time, the Metropolitan Transportation Commission and the Association of Bay Area Governments are formulating a Sustainable Communities Strategy, which is aimed at reducing driving—the region’s largest source of greenhouse gas emissions—by encouraging local governments to plan more compact, mixed-use development near transit corridors within the urbanized core of the region. However, much of the existing development and many transportation corridors are in low-lying areas around the bay that are vulnerable to sea-level rise, and living and working near highways exposes the public to higher levels of air pollutants. To meet these challenges in a manner that will advance economic prosperity in the Bay Area, these three regional agencies, along with the Bay Area Air Quality Management District, are working together under the overview of a Joint Policy Committee to formulate a comprehensive regional strategy that will advance the economy, increase social equity, and protect environmental quality by integrating greenhouse gas mitigation and climate change adaptation into the region’s Sustainability Communities Strategy.

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Implications of Sea Level Rise and Climate Change for the Coastal and Interior Waters of California: Panel Discussion

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The National Research Council's report, "Sea Level Rise in California, Oregon, and Washington," is soon to be released in June 2012. The report evaluates each of the major contributors to global and local sea level rise and gives the associated range of values for the western U.S. for 2030, 2050, and 2100. This special session is convened to present and discuss the report's findings on sea level rise and climate change that affect the coastal and interior waters of California, as interpreted by well-known, local climate experts of California. The session's chair, John Andrew (DWR), convened the speakers, who will evaluate and present what is known about (a) climate-induced increases in storm frequency and magnitude; (b) related changes to regional and local sea level rise estimations; and (c) the efficacy of coastal habitats and coastal restoration (e.g. watershed restoration) in increasing the resilience of communities and ecosystems along the West Coast of California. Amber Mace (UC Davis) will moderate the panel, and begin with Daniel Cayan (Scripps Institution of Oceanography), a member of the NRC committee, who will briefly describe the report findings. The discussion will then move from science to planning and policy, with three speakers discussing implications for California's Coast (Jeanine Jones, DWR), San Francisco Bay (Will Travis, Bay Area Joint Policy Committee), and Sacramento–San Joaquin Delta (Kristal Davis–Fadtke, Delta Conservancy). (If time permits, an additional speaker from the Ocean Protection Council or State Coastal Conservancy may provide update of the state's coastal adaptation strategy.) Panelists will further the discussion by asking "what's next?" Amber Mace will close the panel discussion, summarizing the speaker's main points and giving her interpretations of the general direction of public policy-making regarding to sea level rise and climate change at local and national levels. John Andrew will provide the session's epilogue, thanking all speakers, and bringing audience awareness to recent humanitarian efforts in the face of global climate change by introducing the trailer for the conference's featured documentary, "Someplace With a Mountain."

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