



Photo: Mike Baird

Sea Level Rise & California King Tides

Marina IACC June 2012

Presentation Outline

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- Sea level rise adaptation in California
- Impacts to marinas
- King Tides Initiative
- Discussion

Sea Level Rise Adaptation in California

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- OPC Interim Sea Level Rise Guidance (2010)
 - ▣ Establishes SLR projections for state agencies

OPC Sea Level Rise Projections:

2030: 7 inches

2050: 14 inches

2100: 40 - 55 inches

- Uncertainty based future greenhouse gas emissions and ice-sheet melt

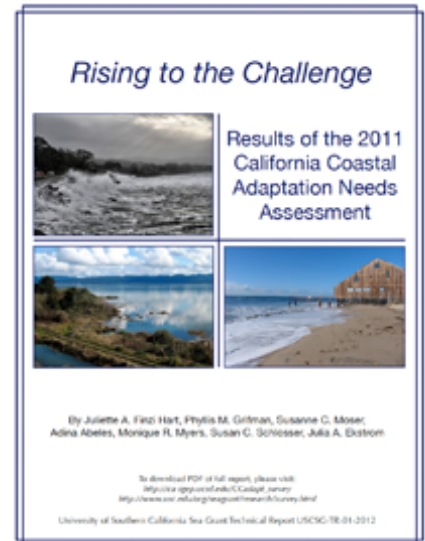


Sea Level Rise Adaptation in California

- National Academy of Sciences California Sea Level Rise Study (Late June 2012)
- Updated CA Adaptation Strategy (Dec 2012)
- State agency SLR guidance (on going)
 - BCDC, Cal Trans, State Lands Commission, Coastal Conservancy, etc.
- California Coastal Adaptation Needs Assessment (released May 2012)

Coastal Adaptation Needs Assessment

- Adaptation is a high priority
- Majority accept reality of climate change & are concerned about impacts
- 93% of respondents taking action
- Respondents are quite knowledgeable about impacts
- **In early stages of planning and implementation**
- **Info must be easily accessible**
- **Greatest barriers are lack of staff capacity and resources**



Coastal Commission & Sea Level Rise

- Permit modifications and LCP policies
 - ▣ Incorporate SLR adaptations on a case-by-case basis

- SLR Guidance for Commission staff and local governments
 - ▣ Draft guidance by fall 2012

Sea Level Rise Impacts to Marinas

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- Inundation of low-lying areas
- Increased storm surge, flooding, and related property damage
- Loss of public access
- Decrease in need for dredging



Photo: Lisa Cox



Photo: Aaron McLendon



Photo: Frank Quirarte

Wharves

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- Can experience more uplift from waves → increase in storm damage



High waves hit Pacifica Pier, Frank Quirarte

Cargo Facilities & Docks

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- ❑ Ships will be higher than docks → decrease in efficiency of cargo facilities
- ❑ Tidal prism will increase → greater scour of all foundations



Alameda, Coast Guard Facilities



Long Beach Port, Javier de Jaureguiberry

Seawalls & Other Engineered Structures

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- More regular exposure to wave energy → increased storm damage
- Exposure to deeper water → greater foundation scour



Santa Barbara, Claire Fackler



Capitola, Ocean Solutions

Channels

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- Channels will be deeper → decreased need for dredging

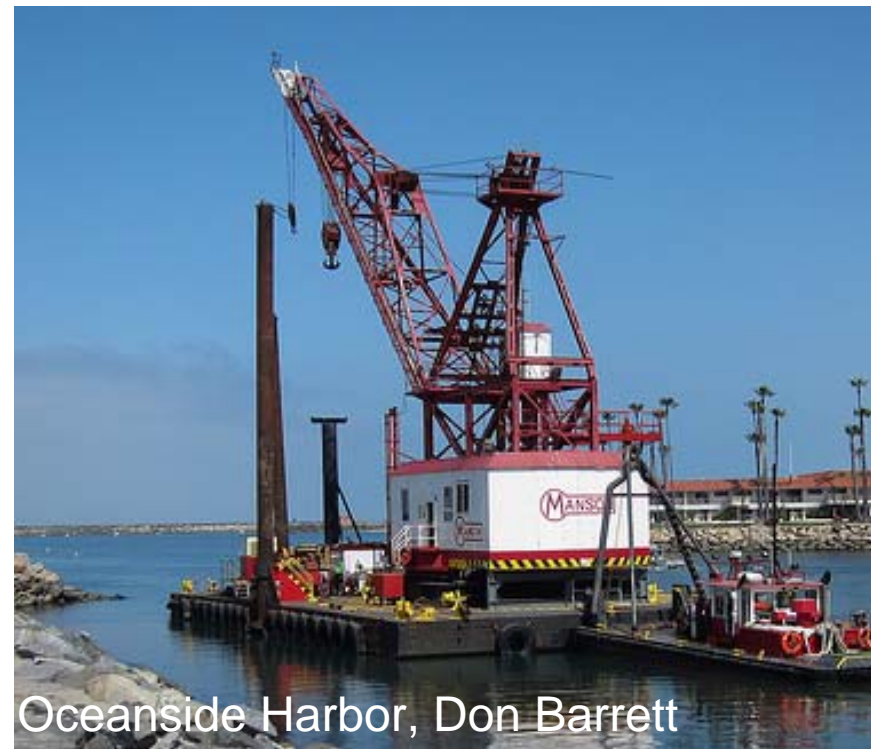
Marina del Rey Harbor Navigation Channel Dredging Project

March 2012 to September 2012

This maintenance dredging project will improve navigational safety for First Responders, recreational vessels and others by dredging up to 1,000,000 cubic yards of material from the entrance channel at Marina del Rey Harbor. Clean material will be placed in the near shore at Dockweiler and Redondo Beaches. Additional clean material will also be placed on the beach at Redondo. The remainder of the material will be placed at the Port of Long Beach. Work will be performed 24 hours per day, 7 days a week. This project is managed by the United States Army Corps of Engineers. For additional information or questions visit <http://www.spl.usace.army.mil/marinadelrey.html> or call this number (213) 479-8696 or (213) 452-3921.



Marina Del Rey, US Army Corps of Engineers



Oceanside Harbor, Don Barrett

Breakwaters and Jetties

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- Less freeboard → increased storm damage



Photo: rdongses



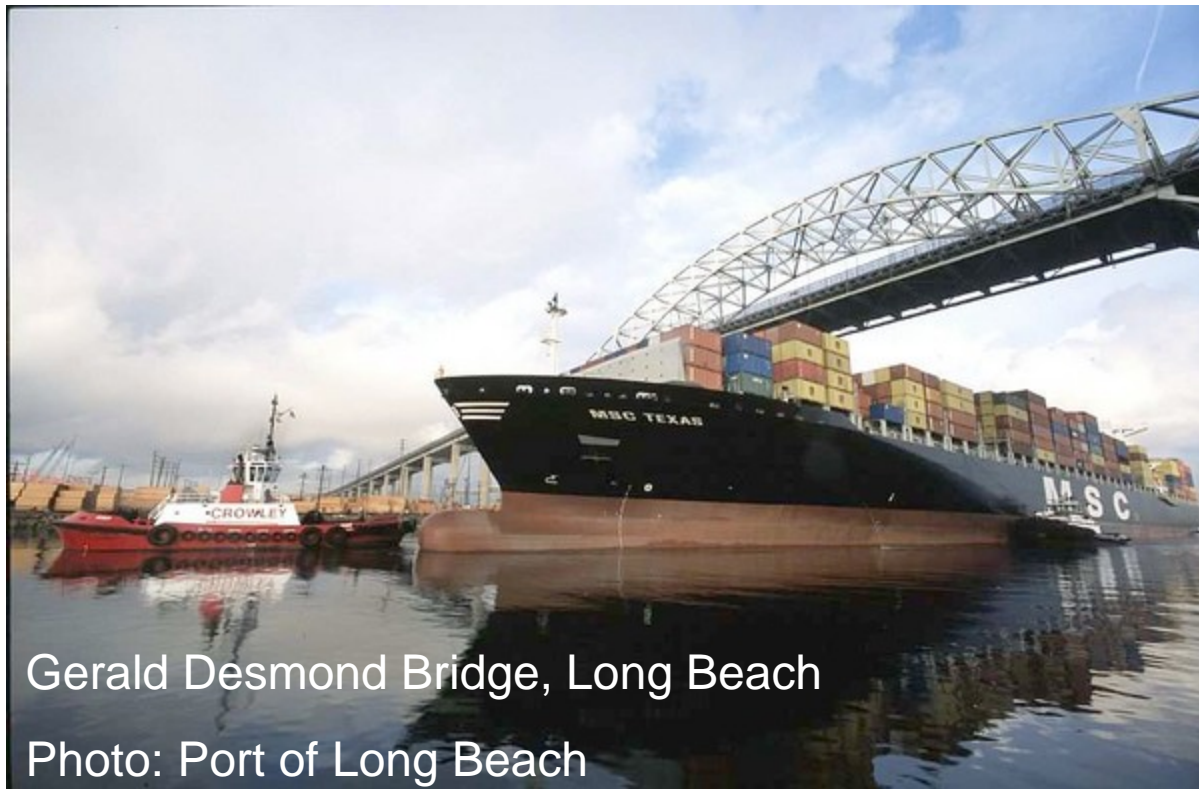
Photo: Samantha Decker

Santa Cruz breakwater

Bridges

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- Decrease in vertical clearance under bridges → will need to increase height of bridges or only allow boat traffic at low tide



Gerald Desmond Bridge, Long Beach

Photo: Port of Long Beach

Beaches

- Loss of beach area → reduced boating and public access



Mother's Beach, Marina Del Rey, Photo: Aaron McLendon

Other Sea Level Rise Impacts

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Wetlands

- Inundation and inland migration
- Greater scour and removal of sediment

Groundwater

- Increased salt water intrusion to coastal aquifers

Coastal Bluffs

- Increased bluff retreat
- Greater scour and undercutting

California King Tides Initiative

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- Document and chronicle vulnerable areas of California coastline
- Raise awareness about sea level rise and coastal hazards
- Garner support for sea level rise policy and local adaptation efforts



Michael Fox, Capitola

California King Tides Initiative

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- Began as pilot in SF Bay in 2010, quickly expanded to statewide effort
- Run through a collaborative partnership of state and federal agencies and non-profit organizations



Photo: Mike Baird

CA King Tide Organizing Partners

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Making San Francisco Bay Better



2011-2012 Accomplishments

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- Over 500 photos on Flickr from 28 cities spanning CA coast
- Social media campaign: Facebook, Twitter, etc.
- New partners: Thank You Ocean, Sierra Club of California, Friends of Five Creeks, Surfrider Foundation, and Surfpulse.
- Showcased photos at ~10 events
- State and national media coverage, stories by [Energy & Environment's ClimateWire](#), and [NPR's KQED](#)


Engaging New Audiences

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Talking about king tides at the
Academy of Sciences Night Life

Nerd Nite SF
It's like the Discovery Channel . . . with beer!



TAYLOR NAIRN
Strange Waters: King Tides + Sea Level Rise, Rollin' up to a Coast Near You

BRENDAN MAURO
LEGO® and Grown-Ups: Instructions Not Included



Photo: Mike Schweizer

PLEASE HELP US
SAVE OUR ERODING
CLIFFS - USE PATIO WALK.
THANK YOU!

CAUTION



Photo: Brian Flores



Photo: Heidi Nutters



Photo: Yanna B



Photo: Frank Quirarte

Get Involved!

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- Take photos and post them online
- Spread the word!
- Upcoming King Tides
 - ▣ Nov 13th -15th
 - ▣ Dec 12th – 14th
 - ▣ Jan 9th – 11th
 - ▣ Feb 7th – 9th



Photo:Sirgious

<http://californiakingtides.org/>

<http://www.flickr.com/groups/cakingtides/>

Questions?

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Photo: Yanna B

Thank You



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