HUMBOLDT BAY SEA LEVEL RISE ADAPTATION PLANNING PROJECT

Adaption Planning Working Group

Meeting

October 30, 2013

AGENDA

- 1. Introductions/Announcements: All [10]
- 2. HB SLR AP Project Web Page Review: Aldaron [10]
- 3. CCC SLR Guidance Document:
 Hilary Papendick and Melissa Kraemer [30-40]
- 4. Climate Ready and LCP Grant Program Proposals: Joel, Hilary, John, Lisa and Larry [15]
- 5. Public/Stakeholder meeting, November 12: Dan, Hank, Jeff, and Aldaron [15]
- 6. Vulnerability assessment update: Jeff [15]
- 7. Risk assessment update: Aldaron [15]

Introductions and Agency Updates/Announcements



The <u>Local Government Commission</u> and the State of California are organizing the first California Adaptation Forum in the state capital for next summer. This two-day forum will build off a successful National Adaptation Forum held in Colorado in 2013. The attendance of many California leaders there underscored the need for a California-focused event, which will be held every other year to complement the biennial national conference.

Climate change is having, and will have, more widespread impacts on California's economy and environment. California's unique and valuable natural treasures – hundreds of miles of coastline, high-value forestry and agricultural resources, snowmelt-fed fresh water supply, vast snow and water-fueled recreational opportunities as well as other natural wonders – are especially at risk.



To respond to climate change, the State enacted the California Global Warming Solutions Act of 2006 (Assembly Bill 32 - Núñez). The Act caps California's greenhouse gas emissions at 1990 levels by 2020.

Adopting this ambitious goal put California at the forefront of global action. Achieving this goal will require significant collaboration and support from all public entities and private stakeholders representing all sectors of California's diverse economy.

In addition to reducing California's greenhouse gas emissions, there are steps that must be taken to protect against climate change impacts that are already occurring. Taking steps now to prepare for and adapt to climate change will protect public health and safety, our economy and our future.

Climate Adaptation Advocate



"It's time for courage, it's time for creativity and it's time for boldness to tackle climate change."

- California Governor Edmund G. Brown

Sponsorship Opportunities

We are looking for Conference Sponsors – agencies, organizations, foundations and companies – that are leading the way supporting climate change adaptation efforts across the country. These high-profile sponsorship opportunities offer many ways to interact with conference participants and underscore your commitment to safeguarding the state from climate impacts and creating national models.

For more information about becoming a Conference Sponsor please download our <u>Sponsorship</u> Brochure.





Hosted by the Local Government Commission in partnership with the State of California

HBSLRAP Web Page

http://humboldtbay.org/humboldt-bay-sealevel-rise-adaptation-planning-project



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Harbor, Recreation & Conservation District

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Humboldt Bay Sea Level Rise Adaptation Planning Project

Sea Level Rise

The increase in global temperature has raised sea level by 7 to 8 inches over the past century. On Humboldt Bay, sea level rise is greater because we live in a seismically active area and the ground has been dropping in elevation. Consequently, sea level in the Bay may have increased by more than 18 inches over the past century. The National Research Council has projected that sea level may rise by as much as 55 to 65 inches in California by 2100. Communities around Humboldt Bay will need to prepare for the effects of sea-level rise, which could severely impact critical infrastructure such as our wastewater treatment plants, Highway 101 corridor, our port, and residential communities, businesses, and coastal agricultural lands.



Humboldt Bay Sea Level Rise Adaptation Planning Project

The State Coastal Conservancy is funding a multi-phased sea-level rise project on Humboldt Bay. The first phase completed in January 2013 was the *Humboldt Bay Shoreline Inventory*, *Mapping and Sea Level Rise Vulnerability Project* and the second phase currently underway is the *Humboldt Bay Sea Level Rise Adaptation Planning Project*. The Coastal Ecosystems Institute of Northern California is the project sponsor for the second phase. There are two components of the second phase: inundation modeling and mapping that Northern Hydrology and Engineering is preparing, and adaptation planning that the Humboldt Bay Harbor, Recreation and Conservation District along with Humboldt County Public Works are implementing as co-lead agencies. Trinity Associates is the adaptation planner for the Adaptation Planning Working Group that the District and County have convened.



Existing Conditions

The first phase of the project inventoried and mapped the Bay's 102 miles of shoreline and found that 75% of the shoreline is artificial. This is an important finding as artificial shoreline structures such as earthen dikes must be maintained if the lands behind them are to be protected. The Bay's artificial shoreline is predominately (67%) made of two types of structures: earthen dikes (53%) and railroad grade (14%). If these structures are breached or overtopped during King Tides, storm surges, El Nino conditions, or from sea level rise, thousands of acres of former tidelands that are vulnerable would be flooded by the tides.

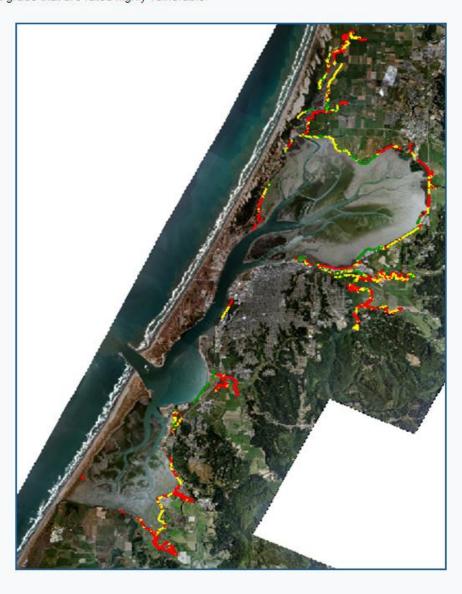


Artificial (red) vs. Natural (green)

Dike (yellow) and Railroad (red)

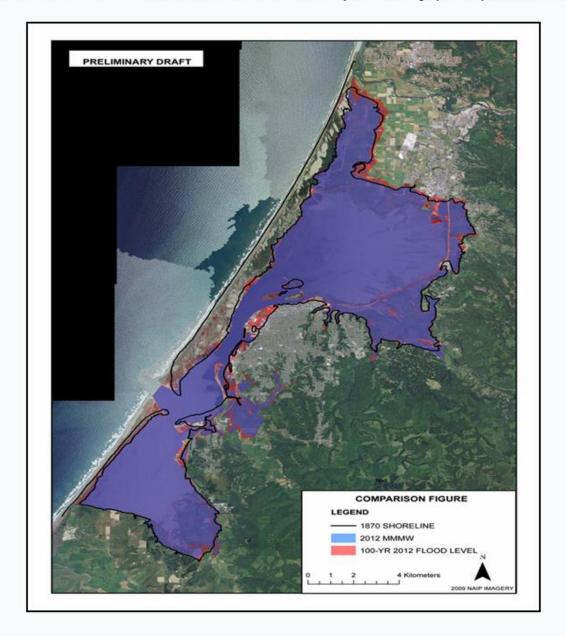
Vulnerability Assessment

To assess shoreline vulnerability, this project has selected a baseline elevation of the mean monthly maximum high tide elevation (7.74 feet) as measured at the North Spit tide gage. Shoreline vulnerability was rated based on a combination of shoreline cover (exposed, vegetated, and fortified) and elevation in relation to the baseline elevation of 7.74 feet. The inventory of the Bay's shoreline found that currently there area 21 miles of dikes and 5 miles of railroad grade that are rated highly vulnerable.



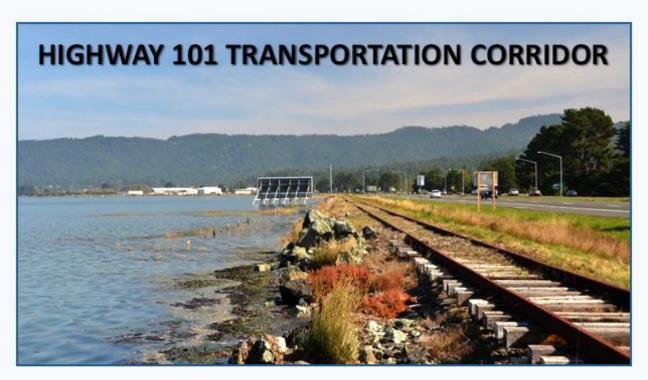
Vulnerability Rating: High (red), Moderate (yellow), and Low (green)

During the second phase of this project, an inundation model has been developed to map the areas that are vulnerable to flooding at the baseline tide elevation if shoreline structures are breached or overtopped. It is not surprising that the area that is vulnerable to flooding is nearly the same area of former tidelands that were diked and drained over a century ago. Models are also being created to map the areas that would be flooded with 1, 2, 3 and 6 feet of sea level rise. These models will also indicate the areas subject to flooding by a 100 year flood event.



Risk Assessment

Sea level rise's primary impact on Humboldt Bay will be flooding and secondarily salt water intrusion. The maximum high tides of the year are called King Tides and the average is 8.78 feet at the North Spit tide gage. But in a few years, King Tides have reached as high as 9.5 feet, which is nearly 2 feet of sea level rise, and dikes were overtopped or breached. Much of our communities' critical infrastructure is at risk from tidal flooding because they were constructed on vulnerable former tidelands: For example, Highway 101, Eureka's and Arcata's wastewater treatment plants, and miles of water-gas-electrical transmission lines are located behind earthen dikes or railroad grade on former tidelands. There are also public facilities, businesses, residential communities, and agricultural areas that are at risk from tidal flooding if the shoreline is breached or overtopped or by sea level rise. We must plan for a future of rising tides while the ground is subsiding and sea level is rising if we are to protect the communities on Humboldt Bay



Adaptation Planning

The Humboldt Bay Harbor, Recreation and Conservation District and Humboldt County Public Works together have formed the Adaptation Planning Working Group whose members include staff from the Planning and Public Works Departments for Humboldt County and the Cities of Eureka and Arcata, Coastal Ecosystems Institute of Northern California, State Coastal Conservancy, Coastal Commission's North Coast District office, Wiyot Tribe, Humboldt Bay National Wildlife Refuge, Department of Fish and Wildlife, US Fish and Wildlife Service, Bureau of Land Management, and National Resources Conservation Service. The goal of the project is to support informed decision-making and encourage a unified, consistent regional adaptation strategy to address impacts associated with sea level rise in the Humboldt Bay region. Sea level rise adaptation planning begins with understanding existing conditions, assessing what areas are vulnerable and what assets are at risk, and developing Bay-wide unified adaptation strategies to deal with flooding.



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Project Informational Documents

- Humboldt Bay Shoreline Inventory, Mapping and Sea Level Rise Vulnerability Assessment Report
- Addendum Humboldt Bay Shoreline Inventory, Mapping and Sea Level Rise Vulnerability Assessment Report
- · Existing conditions (TBA)
- 100 year flood inundation maps (TBA)

Current News and Information

PRESS RELEASE - "Forecast: Rising Tides on Humboldt Bay" - October 25, 2013

The Humboldt Bay Harbor, Recreation, and Conservation District and Humboldt County Public Works Department invite the public to an informational meeting on planning for the potential effects of sea level rise around Humboldt Bay. The meeting will be held on Tuesday, November 12, from 6 to 8 p.m. at the Humboldt Bay Aquatic Center, room 203, 921 Waterfront Drive, Eureka.

The Humboldt Bay sea level rise adaptation planning project was initiated in 2010 with funding from the State Coastal Conservancy. The first phase of the project was to inventory, map and assess the vulnerability of the shoreline, a project that was completed in 2012. The second phase of the project, is sponsored by the Coastal Ecosystems Institute of Northern California, involves modeling and mapping present and future flood risk around the bay, and developing adaptation strategies for potential sea level rise impacts. The goals of the project are to support informed decision-making and encourage a unified, consistent regional adaptation approach among the jurisdictions around the bay. This meeting will provide an update on the shoreline assessment, inundation modeling and planning efforts currently in progress.

Presentations will address current shoreline conditions, locally observed rates of sea level rise, and the compounding effect of land subsidence.

The results of an analysis to identify areas around Humboldt Bay vulnerable to flooding under current conditions will be presented. Ongoing work to assess the flooding risks due to sea level rise will be described as well as development of adaptation strategies.

This meeting provides an opportunity for the public to learn about the sea level rise project and ask questions of the sea level rise adaptation planning team.

Related Links

- Humboldt Baykeeper Sea Level Rise http://www.humboldtbaykeeper.org/climate-change-impacts-sea-level-rise.html
- Humboldt Baykeeper King Tide http://www.flickr.com/groups/humboldtbaykingtides/
- Coastal Commission Sea Level Rise Adaptation Guide http://www.coastal.ca.gov/climate/SLRquidance.html
- California Adaptation Planning Guide http://resources.ca.gov/climate adaptation/local government/adaptation planning guide.html
- Cal-Adapt http://cal-adapt.org/@
- Cal Energy Sea Level Rise Adaptation Planning
 Guide http://calost.org/pdf/announcements/Adapting%20to%20Sea%20Level%20Rise N%20Russell G%20Griggs 2012.pdf

Sample PowerPoint To Video Conversion (final will have narration)



Coastal Commission
Sea Level Rise
Guidance Document
Hilary Papendick
Melissa Kraemer

Climate Ready and LCP Grant Program Proposals

Climate Ready Grant Program: SCC

LCP Grant Programs

- •OPC LCP Grant: July 15, 2013
- CCC LCP Grant: November 22, 2013
- •OPC LCP Grant: March to May, 2014
- •CCC LCP Grant: March to May, 2014

2013 PUBLIC AND STAKEHOLDER MEETING November 12th

HSU Aquatic Center

6:00 to 8:00 p.m.

Public and Stakeholder Weeting

- 1. Advertising
- 2. Intended Audience
- 3. Audience Perceptions and levels of Understanding
- 4. Goals of the Meeting
- 5. What Topics and Information will be Presented
- 6. Who will do the Presentations
- 7. Overall Communications of the Project

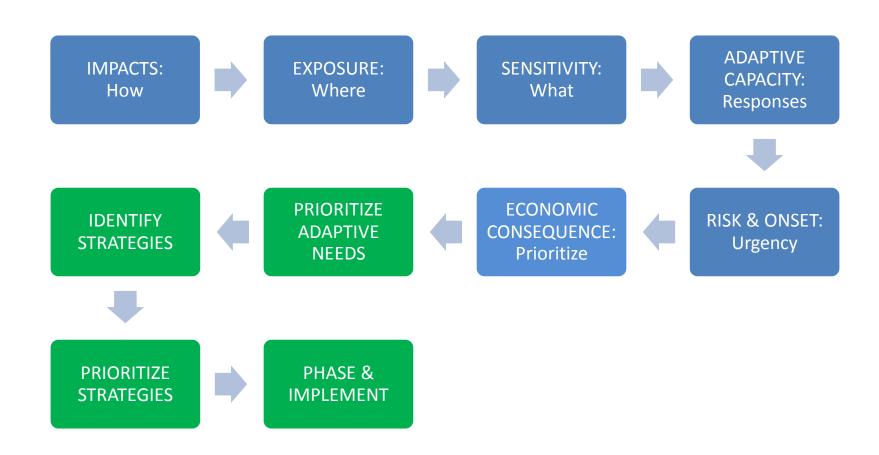
Inundation Mapping Update Jeff Anderson

RISK ASSESSMENT Case Study: King Salmon

Aldaron Laird







1) Impacts:

- Historic and Current: Shoreline Erosion
- Current, King Tides and Near-Term: Flooding
- Near-Term: Saltwater Intrusion

2) Critical Assets:

- HBHRCD: Shoreline Armorment-Jetties, Revetment, Dune Ecosystem, Sea Wall, and Dikes
- > HCSD: Municipal Water Wells and Water Transmission Lines
- HCSD: Wastewater Transmission Lines, and Sewage Lift Station
- PG&E: Power Plant, Industrial Well, Electrical Transmission Line, and Gas Pipelines
- ➤ HCPW: King Salmon Avenue Single Ingress and Egress

3) Other Assets:

- Land Uses: Residential, Retail, Commercial, and Recreation
- Coastal Resources

Meeting Schedule: 2013-2015

2013	2014	2015
2/27	2/26	
4/24	4/30	
(7/15)	6/25	
8/28	8/27	
10/30	10/29	
12/18		1/7

Humboldt Bay Sea Level Rise Adaptation Planning Project Goal

The goal of the project is to support informed decision-making and encourage a unified, consistent regional adaptation strategy to address the hazards associated with sea level rise in the Humboldt Bay region.