Implications of Sea Level Rise on North Humboldt Bay

By: Victoria Blakeney, Wade Bonney, Nicholas Chang, Leah Healy, Elmer Llamas, Sophie Scully, and Rebecca Urbanczyk
What Will Sea Level Rise Mean for Humboldt Bay?

• HSU Department of Environmental Science and Management, Senior Planning Practicum Spring 2011

• Sea Level Rise
  – Pacific Institute predicts 1.4 meter rise by 2100
  – Rise + Increased Storm Surges + High Tides
Overview

• A Conceptual Model of Sea Level Rise for North Humboldt Bay

• Selected Issues of Concern
  – Transportation
  – Businesses and Homes
  – Agricultural Land
  – Wetlands
  – Threatened and Endangered Species

• Overall Responses

• Conclusion
Conceptual Model of Implications of Sea Level Rise

Characterizing the Problem

- Shoreline conditions
- Information needs
- Gradual or abrupt rise
- First impacts
- Subduction, subsidence, sedimentation

(NASA)
Direct Effects

• Higher water levels
• Flooded land
• Flooded infrastructure

(Placer.ca.gov)
Indirect Effects

- Economic
- Social/Cultural
- Ecological

(University of Missouri)

(Sdakotabirds.com)
Additional Challenges

- Remoteness
- Regulatory Challenges (local, state, federal)

(co.humboldt.ca.us)  (ca.gov)  (epa.gov)
Responses

• Planning responses
• Political Processes
• Funding
• Public education

(virtualguidebooks.com)

(arcataeye.com)
Planning Responses

Mitigate
(San Francisco Bay Planning and Urban Research Association)

Accommodate
(EPA)

Retreat
(EPA)

Chow, 2008

Flickr, 2009
Inundation Zone by 2100

Source: Pacific Institute, 2009

Source: CA Dept. of Fish and Game
Transportation

• Local, regional, interstate transit
• Transportation of food and other goods
• Disaster preparedness
Transportation

• City and County Roads

• Airport
Businesses and Homes
Jacobs Ave. Working Group

• Weak levee from 1930’s; FEMA remapping flood zones
• Collaborative, voluntary proactive group including most Jacobs Ave. business owners
• Reclamation only works if all landowners participate
Agricultural Land

- 90% of wetlands lost since late 1800s
- Current uses: cut-flower, silage and hay production, row crops, and livestock grazing
- Choices for the future
  - Maintain/raise height of existing levees
  - Sell land
  - Conservation
  - Aquaculture
Wetlands

- **Wetland types may shift or be lost**
  - Depth sensitive vegetation
  - Salinity increases
  - Species composition changes

- **Retreat**
  - Inland migration
  - Reestablish in higher elevations
  - Water source conversion

- **Expand**
  - Convert adjacent landscape
Threatened and Endangered Species

• 7 local species
• Already struggling
• Current regulations are designed to protect current habitat; not flexible for changes in habitat or creating new habitat
• Habitat change will affect many other species, some of which could become endangered
Overall Responses

• Political Decision-Making Responses
  – Modification of existing institutions and legal framework
    • Adaptive options for management plans (NEPA, CEQA)
    • Flexibility in laws (ESA, CWA)
  – Interagency and cross-boundary coordination

• Local Planning Responses
  – Reclamation districts
  – Purchasing buffer land
Conclusions

• Planning responses
• Funding
• Public education

• Continued research
• Opportunities
• Early start