Identifying Impacts to Shoreline Habitats: A Call to Action

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Climate Change Action Coordination Team

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From the West Coast Governors' Agreement on Ocean Health Action Plan, May 2008:

Therefore, the West Coast states will focus initial efforts, in collaboration with the federal government, on a West Coastwide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next several decades, and work together to develop actions to mitigate and adapt to the impacts of climate change and related coastal hazards.

What will the physical changes to our coasts be?

What will get wet?

Identifying Physical Changes to Natural Shorelines

- Develop a common classification system for the shorelines of the west coast
- Identify the physical forcing mechanisms associated with climate change
- Identify the resulting potential impacts of different physical forcing mechanisms on different coastal environments

Coastal Geomorphic Systems

- Rocky Coasts and Headlands
  (e.g., plunging sea cliffs)
- Deposition Coasts
  (e.g., barrier beaches, spits, beaches, dunes)
- Erosion Coasts
  (e.g., bluffs, marine terraces, sea cliffs)
- Estuaries and Lagoons
  (e.g., barrier estuaries, closed lagoons and marshes)

Physical Forcing Mechanisms

- Sea Level Rise
- Increased Storm Activity
- Increased Wave Height
- Changes in Seasonal Stream flows
- Changes in Seasonal Precipitation Patterns
- Changes in long-term Precipitation Patterns
- Changes in dominant wind pattern
- Changes in sediment composition and budget

The West Coast Governors' Agreement on Ocean Health
Climate Change Action Team
NEEDS YOUR INPUT!

"Preparing for the Effects of Climate Change" is one of two "Overarching Actions" identified in the Action Plan as "the impacts of climate change will affect every priority in this agreement and many of the specific action items."

Background

The three West Coast states are focusing initial efforts, in collaboration with the Federal government, on a coast-wide assessment of shoreline changes and ***anticipated impacts to coastal areas and communities due to climate change over the next several decades***, and working together to develop actions to mitigate and adapt to such changes.

We need your input to gather information on the full range of potential impacts to ***biological*** and ***ecological*** communities, as well as built human communities. This preliminary assessment of coast-wide (ex. migratory species) and localized ecological impacts (changes to function and specific habitats) will be included as a qualitative addition to the Team's work plan and used to inform recommendations to local, state and federal coastal resource managers and other users.

Exercise I (Ecological Impacts of Climate Change) - SEE ATTACHED TABLE:

As you participate in the Concurrent Sessions, please give thought to identifying potential impacts to the habitats associated with coastal environments. Identify up to three specific impacts to/vulnerabilities of the habitats associated with these shoreline types. List these bullets in order of importance or priority.

Exercise I. Ecological Impacts of Climate Change

Anticipated Changes to Coastal Dynamics	Resulting Physical Impacts
1. Changes in Beach Dynamics	- Erosion - Accretion - Over-washing - Migration
2. Changes in Bluff Dynamics	- Erosion - Landslides
3. Changes in Channel Dynamics	- Migration - Avulsion
4. Changes in Tidal Dynamics	- Tidal Prism - Mixing - Circulation - Amplification
5. Changes in Fresh/ Salt Water Interface	- Inundation of low-lying shorelines - Saltwater Intrusion - Soil Saturation - Episodic (Coastal and Watershed) - Flooding and Associated Storm Damage

Climate Change Impacts Table

Anticipated Changes to Coastal Dynamics	Resulting Physical Impacts	Resulting Ecological/Biological Impacts
1. Changes in Beach (Dunes, Barriers) Dynamics	a. Erosion b. Accretion c. Overwashing d. Migration	1ai. 1aii. 1aiii. 1bi. Etc… **Your Input Here !**
2. Changes in Bluff Dynamics	a. Erosion b. Landslides	
3. Changes in Channel Dynamics	a. Migration b. Avulsion	
4. Changes in Tidal Dynamics	a. Tidal Prism b. Mixing c. Circulation d. Amplification	
1. Changes in Fresh/Salt Water Interface Dynamics in Estuariesand Lagoons	a. Inundation of low-lying shorelines b. Saltwater Intrusion c. Soil Saturation d. Episodic (Coastal and Watershed) Flooding and Associated Storm Damage	
6. Changes in Open Ocean Dynamics	6a. Acidification 6b. Temperature	

Example

a. Changes in Beach (Dunes, Barriers) Dynamics	1. Erosion 2. Accretion 3. Overwashing 4. Migration *Added:* 5. *Coastal Squeeze (inundation)*	***Example of Localized Impact:*** *i. Nesting & breeding habitat loss for endangered snowy plover (Attributed to Physical Impacts a,b,c,d, & added "e".)* *ii. Changes in snowy plover dispersal patterns range-wide (fewer locations available for breeding and over-wintering). (a, b, c, d, "e")* *iii. Inundation/loss of important snowy plover habitats: Mission Beach (San Diego Area) causing little habitat to squeezed against development; Monterrey Bay inundation causing habitat to squeeze against agricultural fields (Pajaro watershed). Beaches are already bordered by bluffs, creating additional habitat squeeze. (a, b, c, d, "e")*

Exercise II: Habitat as Adaption

- List examples of West Coast ecosystems that are known to have buffered the impacts of climate change, violent storms, etc. (Examples from other regions are welcome if they are suitable surrogates for west coast geographic types.)
- What three specific actions could be taken to increase the West Coast's natural resilience to the changes outlined in Exercise I (see table)? Please list in order of priority.
  i.
  ii.
  iii.

The West Coast Governors' Agreement on Ocean Health's Climate Change Action Coordination Team NEEDS YOUR INPUT!

- Exercise 1: Ecological Impacts of Climate Change
- Exercise 2: Habitat as Adaptation

WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH

WASHINGTON OREGON CALIFORNIA

Thank You for your Input!

Comments will also be accepted at the following website until March 14, 2009:
http://www.fws.gov/pacific/Climatechange/meetings/Coastal.html

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