

WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH

CALIFORNIA OREGON WASHINGTON

Climate Change Action Coordination Team

Work Plan Released May 2010

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Table of Contents

1	Overview	3
1.1	Scope of Work.....	3
1.2	Key Deliverables and Outcomes	4
2	Task/Subtask Descriptions	5
2.1	SLR and Storminess Estimates	5
2.2	Physical Impacts Assessment.....	5
2.3	Ecosystem and Natural Resource Shoreline Impact Assessment.....	6
2.4	Adaptation Strategies	7
2.5	Coastal Climate Change Adaptation ‘Guidebook’ (Key Deliverable).....	7
2.6	Information Needs.....	8
2.7	Coordination with other Actions in the WCGA	8
	Other Notes and Issues.....	11



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Work Plan

1 Overview

In September 2006, the Governors of Oregon, Washington and California signed the West Coast Governors' Agreement on Ocean Health. Under this agreement, the three states, by working together and consulting with federal agency leads and stakeholders, developed a bold set of actions to improve the health of our ocean and coastal resources. On July 29, 2008, the three states released a final Action Plan that outlines many activities on a range of issues.

This work plan document is intended to organize and communicate key objectives and planned tasks related to the activities of the Climate Change Action Coordination Team (ACT) of the West Coast Governors' Agreement on Ocean Health (WCGA).

1.1 Scope of Work

Develop a west coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next several decades and work to develop recommended actions to mitigate and adapt to the impacts of climate change and related coastal hazards. Specifically, the Climate Change ACT will seek to:

- Engage with academia, nongovernmental entities, local, state and federal government agencies, tribal governments, and the private sector to ensure that impacts to the West Coast under various likely climate change scenarios are modeled.
- Promote the use a consistent frame of reference for predicting and responding to shorelines changes from storm surge events and sea level rise (SLR). Liaison with the Sediment Management ACT to ensure climate change impacts, manifested in sediment dynamics, are addressed properly.
- Promote and facilitate the alignment of methodologies and tools to improve information exchanges across the region.

(Source: West Coast Governors' Agreement on Ocean Health, Final Action Plan)



The WCGA Action Plan directs this group’s focus on the shoreline impacts from climate change. Public comments suggested the Climate Change ACT broaden its perspective in two key areas: ocean acidification and sediments. The Scope of Work has been revised to better connect with the Sediment Management ACT. The Plan also recognizes that other potential climate change impacts will affect the health of coastal resources in the West. The expectation is that a number of these other impacts, such as potential connections to hypoxia and changes to upwelling along the West Coast, will be further addressed through Priority Area 6: Expand Ocean and Coastal Information, Research and Monitoring. It is also anticipated that ocean acidification and its impacts will be addressed by Priority Area 6 and the Executive Committee of the WCGA has agreed that this needs to be a priority addressed and supported through existing external working groups and through additional research. In addition, the Plan recognizes that the impacts of climate change “will affect every priority in this agreement” and expect that each action will incorporate climate change and its impacts into their considerations.

1.2 Key Deliverables and Outcomes

The primary objective of the Climate Change ACT is to create a framework and access to information that helps local governments wisely plan for the shoreline impacts resulting from climate change over the next several decades. The products from this ACT should assist state agencies in their various roles managing coastal lands, with an emphasis on those activities involving local land use and infrastructure planners as well as resource managers. In addition, this group will provide recommendations to facilitate continuing coordination among the states and federal agencies by identifying the common regional issues and solutions. Specifically, the Climate Change ACT seeks to provide access to tools and information that will allow the states to develop strategies necessary to address shoreline change, and for local governments to develop detailed vulnerability assessments.



2 Task/Subtask Descriptions

NOTE: Many of these tasks will require the identification and securing of funds and/or staff resources to accomplish (see Table 1, page 10). The formation of targeted groups of experts may be warranted to execute specific tasks, but those determinations have not yet been made.

2.1 SLR and Storminess Estimates

- 2.1.1 Develop a consensus of estimates and uncertainties of SLR and changes in storminess (including overall atmospheric and oceanic processes) along the west coast of the United States for the years 2030, 2050, and 2100. Through the relationships and partnerships fostered by the WCGA, the three states, with some support from NOAA, USGS and the Army Corps of Engineers, have funded the NAS to conduct this Sea Level Rise Assessment Report that will begin in early 2010. The study will establish regional estimates with ranges and uncertainties covering:
- a. Global inputs to SLR
 - b. El Niño/Southern Oscillation, Pacific Decadal Oscillation, other oceanic conditions
 - c. Storm frequency and intensity/storm surge
 - d. Local factors effecting relative SLR such as seasonal tidal changes, winds and currents, vertical land movement (VLM) and other local atmospheric effects or extreme weather events.
- 2.1.2 Bring together west coast scientists in a workshop, or series of sub-regional workshops, to develop a consensus process to share current knowledge and to promote idea sharing related to generating estimates listed in 2.1.1. Although such workshops will be part of the NAS study, the Climate Change ACT may recommend additional workshops to achieve these objectives.
- 2.1.3 Assess climate/weather models that capture extreme events and what these models can reveal about impacts to shoreline from SLR and storminess. In this assessment of models, consider whether the further development of regional climate models, or other strategies, would be the most efficient in terms of both cost and resources well still addressing the needs of regional, state and local coastal resource managers.

2.2 Physical Impacts Assessment

Outline a strategy for developing an improved understanding of the physical impacts on coastal environments. Identify existing information and methodologies related to the characterization of physical impacts, including a gap analysis and a qualitative



assessment of the level of uncertainty in these methodologies. Potential applications to the coasts of California, Oregon, and Washington will be examined.

2.2.1 Natural Shorelines

- a. Identify the physical forcing mechanisms associated with climate change (e.g., SLR, increased storm activity, increased wave height, sediment budget and composition changes) that will impact coastal environments.
- b. Develop a shoreline classification system for a west coast-wide physical impacts assessment of shoreline change.
- c. Identify and catalogue potential impacts of the different physical forcing mechanisms (2.2.1.a) to different shoreline types identified in the classification system (2.2.1.b).
- d. Identify possible assessment methods and predictive models that could forecast the impact of the physical forcing mechanisms associated with climate change on specific coastal regions.

2.2.2 Modified Shorelines

- a. Develop a classification system for modified shorelines.
- b. Identify and catalogue how various modified shorelines might be impacted by the physical forcing mechanisms identified in 2.2.1.a.

2.3 Ecosystem and Natural Resource Shoreline Impact Assessment

Describe the observed and anticipated ecological and ecosystem effects of SLR, storminess, and extreme events on coastal habitats.

2.3.1 Characterize how near-shore habitat will be impacted (ecosystem and biological changes) by the physical changes to the coast and extreme events accompanying the projected changes in climate

- a. Partner with Department of Interior (US Geological Survey and US Fish and Wildlife Service) to sponsor a conference for coastal natural resource managers, highlighting the “state of the science” presentations from ecological, climate, and policy experts. [Completed January 2009].
- b. Query subject matter experts to identify key ecosystems/habitats impacted by climate change and sea level rise.
- c. Identify models of SLR, impacts on marshes and other natural shorelines (e.g., “SLAMM” - Sea Level Affecting Marshes Model) to aid land management agencies.
- d. Conduct a literature review of shoreline change impacts to natural resources and make reference list available to resource managers.



- e. Survey west coast resource managers to catalogue observed habitat changes and areas/issues of highest concern.
- 2.3.2 Further understand the role of coastal ecosystems and habitat restoration as adaptation tools for community and resource managers planning for the impacts of SLR and increased storminess. Identify opportunities for communities to enhance their resilience through strategic habitat conservation.
- a. Identify habitat types for protection, restoration and/or enhancement – highlighting the benefits provided to local communities. Develop criteria for choosing habitat types and methodologies based on characteristics such as potential for loss of the habitat type, ability of species and habitat to migrate, long-term viability of the habitat, buffering capacity for local built communities, etc.
 - b. Highlight priorities and “Best Management Practices” for managers.
 - c. Use coast-wide habitat map called for in the WCGA Action Plan and SLR predictions to create a “triage” methodology to identify “hotspots” of threatened habitats.
 - d. Provide methodologies for identifying local/regional goals for adding resilience to wetlands and other “buffering” habitats (e.g. 10,000 acres of intact, highly functioning wetlands are recommended to provide the necessary “ecosystem services” to Blank County).

2.4 Adaptation Strategies

Identify and catalogue emerging state-of-the-art mitigation and adaptation strategies for impacts identified in Tasks 2.2 and 2.3, considering both physically modified/engineered and ecosystem/natural habitat based approaches.

- 2.4.1 Partner with the Climate Impacts Group (CIG) at the University of Washington and other relevant organizations to develop a database repository of actual coastal adaptation methods and case studies.
- 2.4.2 Assess and communicate economic drivers and tradeoffs of natural versus engineered mitigation and adaptation strategies including their limitations.

2.5 Coastal Climate Change Adaptation ‘Guidebook’ (Key Deliverable)

Provide coastal land/resource managers throughout the West Coast with one comprehensive resource for planning for climate change adaptation.

- 2.5.1 Create a Guidebook, that encompasses the information outlined in the above tasks and any other deemed relevant by the ACT as key in helping ensure that coastal resource managers have the information and tools needed for addressing shoreline change due to climate change.



- 2.5.2 Identify best ways to provide the tools and information to coastal land and resources managers through training, on line delivery (e.g. NOAA Climate Portal), or other mechanisms. Work with partners to develop and provide these resources.
- 2.5.3 Identify funding for local governments to conduct detailed vulnerability assessments and implement adaptation strategies per the Guidebook and identify pilots for implementing assessments and adaptation strategies in representative communities along the West Coast.

2.6 Information Needs

Ensure information and recommendations address the issues most relevant to land/resource managers - additional and ongoing information gathering will be essential.

- 2.6.1 Identify key baseline data needed by coastal resource managers to plan for coastal inundation– such as shoreline maps and collection of topographic and bathymetric merged data (e.g., LIDAR); coastal vertical uplift and subsidence and work with the Seafloor Mapping ACT to identify potential sources for the bathymetric and topographic data and the resources needed to create accurate shoreline maps. This will include a synthesis of the information and data needs identified in recent meetings and studies for West Coast states and an estimation – based on frequency, resolution and technology needed – of the time and cost associated with filling these existing data and information gaps.
- 2.6.2 Create a scientific research agenda that identifies key questions related to predicting and assessing coastal change, and the monitoring data, modeling, and research needed to answer those key questions (e.g. SLR-driven changes to sediment budgets and ecosystem evolution).
- 2.6.3 In consultation with coastal resource managers, undertake a gap analysis of social science information needed for implementation of adaptation strategies, including the data for economic tradeoff analyses.

2.7 Coordination with other Actions in the WCGA

The Climate Change ACT is charged with an overarching Action within the WCGA Action Plan given the impacts of climate change on all the actions. This ACT needs to ensure the integration of the work and work products around climate change with the other actions.

- 2.7.1 Connection to other Actions within the WCGA Action Plan – As an overarching action, the Climate Change ACT needs to connect with most of the other ACTs and actions and insure that any applicable information and products developed through this work plan is both useful to and used by the other ACTs. In



particular, the work under the habitat section of the WCGA Action Plan could benefit from the work proposed on ecosystem and natural habitat shoreline impacts, the need for shoreline mapping needs to connect to the Seafloor Mapping ACT and the need for a scientific research agenda for climate change impacts and coastal change should be done in conjunction with the Research ACT. To that end, the Climate Change ACT would propose a meeting or series of meetings sponsored by the WCGA to allow the ACTs to work together on these connections.

- 2.7.2 Closer coordination with the Sediment Management Action Coordination Team - The new liaison member will ensure climate change impacts, manifested in changes to sediment dynamics, are coordinated between the ACTs to avoid duplication, improve communication and ensure coordinate so both work plan products are consistent and well informed, particularly actions related to beach nourishment and regional sediment management.



Table 1: Climate Change ACT Deliverables, Resource Needs and Schedule

Subtask	Deliverable	Budget Need	¹ Additional Staff Need	Estimated Completion Dates
2.1	NAS study on West Coast SLR and Storminess Estimates	² \$600K (already funded)	No	April 2011
2.2	Physical Impacts Assessment: Natural	TBD	Yes	June 2010
	Physical Impacts Assessment: Modified	TBD	Yes	September 2010
2.3	Summary of Potential Ecosystem Impacts	³ \$200K	Yes	September 2010
2.4	Adaptation Strategies Database	⁴ \$100K	No	December 2010
2.5	Coastal Adaptation Guidebook	⁵ \$250K	Yes	June 2011
	Implementation of Adaptation Strategies	⁶ 2,000K	Yes	TBD
2.6	Identify User Information Needs	⁷ 75K	Yes	September 2010
	Monitoring and Research Gaps	⁸ TBD	TBD	TBD
2.7	Integration with other ACTs	\$15K	Yes	January 2011

1-This could signify either the creation of an expert sub-group or additional staff time not currently available within the ACT from one of the partners.

2- Funding for the study has been identified from the three states plus contributions from NOAA, U.S.G.S., and the Army Corps of Engineers.

3-Funding for student intern or other identified party to compile reports, facilitate data gathering and data partnerships, other resources (GIS, website management, and document production) will also be needed.

4-Potential cost share with UW CIG to ensure deployment of database with relevant information.

5-Design, printing, distribution of Guidebook, including outreach.

6-Figures here could vary widely depending on scope of assistance to local governments. The working group will work to develop the criteria for determining the number and scope of pilot applications. This will include appropriate criteria for determining the best representative communities to be able to transfer the implementation lessons learned and to ensure geographic distribution.

7-Funds would support literature search and questionnaire surveys.

8-Could include significant funds for additional LIDAR surveys, other mapping, vertical elevations and deformation rate determination, other coastal/oceanic/atmospheric modeling and related data analysis.



Other Notes and Issues

The below issues are currently not identified as specific Climate Change ACT tasks but have been identified as either possible additional topics for consideration or issues of particular note concerning the execution of the overall mission of the ACT.

1. Examining where watershed delivery of sediment will make a difference in sediment budgets both within estuaries and littoral cells.
2. Analyzing new or altered legal applications of the public trust doctrine in light of sea level rise and changing shorelines.
3. Compiling sample laws and ordinances that allow and/or promote adaptation policies at the state or local level.
4. Designing and recommending knowledge transfer areas – connecting scientists with end users on an ongoing basis. Identify issues other ACTs should be aware of from our work (Goal: promote synergies, avoid conflicting information/recommendations).
5. Identifying barriers to action and motivators needed for action as identified through social science studies (e.g. Oregon Sea Grant study) to maximize use of risk and vulnerability information.
6. Examining creation of an online decision tree to aid resource managers in determining how and when these adaptation strategies can best be used, based on the information in the Guidebook on adaptation strategies, tools and information.