

**Testimony of
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Agency
~ on behalf of Coastal States Organization**

**Before the
Subcommittee on Fisheries and Wildlife and Oceans
Committee on Natural Resources
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**Hearing on Planning for a Changing Climate and its Impacts on Wildlife and
Oceans: State and Federal Efforts and Needs.**

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Chairwoman Bordallo, Ranking Member Brown, and distinguished members of the Subcommittee; thank you for the opportunity to appear before you today to offer testimony regarding needs of the states and territories to successfully respond and adapt to the existing and future impacts of climate change along the nation's coasts.

My name is Anthony Brunello and I serve as the Deputy Secretary for Climate Change and Energy for the California Resources Agency. I am here today on behalf of the Coastal States Organization (CSO), which represents the interests of the Governors from thirty-five coastal states and territories and commonwealths. Over the past year, CSO's Climate Change Work Group developed a report targeting the key research, information, and policy needs designed to foster improved adaptation policies. This was a collaborative process with twenty-six states represented and led to a climate change policy later adopted by all thirty-five coastal states. During my testimony today, I will provide comments reflective of this CSO policy as well as specific observations from climate adaptation efforts in California.

CLIMATE IMPACTS TO COASTAL REGIONS

As committee members may know, the Coastal States Organization just released a "Call for Action" to identify three critical steps necessary at the federal level for ocean and coastal management. One of the three issues identified was the need for the federal government to assist coastal states in efforts to adapt to climate change. The nation's coastal states, territories, and commonwealths will be the hardest hit by climate change impacts from sea level rise, temperature change and precipitation shifts over the next century. These findings were detailed in both the Bush Administration's National Science and Technology Council (NSTC) report released last month and the U.N. International Panel on Climate Change (IPCC) Fourth Assessment Report. Coastal and Great Lakes areas are especially vulnerable to accelerated sea level rise, shoreline erosion, increased storm frequency and intensity, changes in rainfall, and related

flooding. Expected impacts will vary regionally, but leading scientists tell us that many of these events are likely to be experienced in the coming decades - regardless of existing and proposed reductions in Green House Gas (GHG) emissions. In California, absent successful intervention, one meter of sea level rise is being projected over the next century. This would result in flooding of more than 100 square miles of the San Francisco Bay Area including critical infrastructure such as the Oakland and San Francisco Airports and would inundate portions of the Sacramento-San Joaquin River Delta area. “The Delta” is California’s main artery for the State Water Project that provides water to more than 25 million residents (Figure 1 shows areas that could be flooded in the Bay Area with a one meter rise in sea level).

Islands and territories are especially vulnerable to sea level rise and extreme storm events. In fact, the IPCC found that sea-level rise is expected to impact island states in particular by exacerbating inundation, storm surge, erosion and other coastal hazards, in addition to threatening vital infrastructure, settlements and facilities that support the livelihood of island communities. Islands infrastructure is predominantly located on the coast, including nearly all international airports, roads and capital cities. In the Caribbean and Pacific islands, more than 50 percent of the population lives within a mile of the shoreline. And as Chairwoman Bordallo knows in her home of Guam, sea level rise is a growing concern with all development there being within 11 miles of the shoreline.

Climate change will also significantly impact coral reefs, fisheries and other marine-based resources, while adversely affecting human health, agriculture, and tourism, especially as it pertains to small island communities. Other impacts include changes in the chemical and physical characteristics of marine systems, saltwater intrusion into groundwater aquifers and coastal rivers, increase in harmful algal blooms, spread of invasive species, habitat loss, species migrations, and changes in population dynamics among marine and coastal species.

DEVELOPING A COMPREHENSIVE CLIMATE ADAPTATION STRATEGY

Most coastal states are not prepared to address predicted climate change impacts. States and federal entities could assist in the development of sector-specific climate adaptation strategies (i.e., water, oceans, infrastructure, habitat, agriculture, health, etc.) and comprehensive cross-sector strategies that would aim to reduce vulnerability to climate change. In developing climate adaptation strategies in California, there are three components needed to reduce vulnerability to future climate impacts including: (1) expanding the understanding of climate impacts to California; (2) developing a comprehensive cross-sector state climate adaptation strategy; and (3) implementing the climate adaptation strategy.

The foundation for any adaptation strategy is to understand what areas and sectors are most vulnerable to future climate impacts and what can be done to reduce the risk, if possible, of these impacts. Understanding climate change impacts requires downscaling large global climate models and their results to a more state-friendly format. The IPCC and NSTC reports mentioned provide a good starting point for understanding the national and regional impacts, but a similar state-oriented effort is needed. Although California is

committed to this work through the California Energy Commission (CEC), coastal management agencies, the California Ocean Protection Council, and other sister agencies need more technical and financial assistance from the federal government. A clear federal strategy is needed for intergovernmental coordination with coastal states and local governments to assist us on coastal adaptation to climate change. A key component to this federal strategy for coastal adaptation should be a new, stronger focus on interagency cooperation between NOAA, state coastal management programs, regional efforts (i.e., West Coast Governors Agreement), and state floodplain managers. This will include assistance with mapping, modeling, and determination of the socio-economic impacts of climate change.

The first key component of adaptation is building the understanding of climate impacts. Thus, coastal states need clear idea, with maps and other tools, to identify what is at risk. It will be critical to become more familiar with the concepts of “vulnerability” and “risk management.” Vulnerability is the potential for a system to be harmed by climate change, considering the impacts of climate change on the systems as well as its capacity to adapt. Risk management is a tool to manage uncertainty related to climate change impacts through risk assessment, strategies development to manage it, and mitigation of risk. Both concepts are more common in industry than government and require new resource intensive tools based on probabilities and expert opinion rather than historical records. Both will be necessary since, to quote Yogi Berra, “*The future ain't what it used to be.*”

The second key component for successful adaptation is developing the strategy. This is the most challenging component since it requires:

- Linking climate change vulnerability analysis to policy and financial investment actions that can reduce these risks; and
- Building political support to implement adaptation strategies.

Because climate change impacts are multi-dimensional, strategies must be comprehensive and cut across sectors. For example, coastal communities such as Los Angeles will benefit from a cross-sector analysis as they may face increased sea level, reduced water supply, and increased health risk from rising temperatures.

The final and most important component of a climate adaptation strategy is to implement the strategy. This is obvious, but important to emphasize since the majority of adaptation discussions focus on improving the science of climate change, which is necessary, but doesn't fund nor promote actions to reduce known climate risks already identified. Many climate change adaptation strategies will simply be enhancing existing efforts, such as building higher and stronger flood control levies. However others sectors may require a complete restructuring of funding and planning efforts, such as funding habitat for endangered species that research shows no hope of surviving future climate change impacts.

CALIFORNIA'S ADAPTATION EFFORTS

California is already seeing significant climate change impacts now through shifting precipitation patterns and sea level rise. Sea level in the Bay Area has increased 7 inches over the last century, fires are increasing in severity and duration, and snow pack is melting earlier each year. In the future, California is expecting to see even higher sea level, more rain, less snow, and a shift and possible reduction in habitat and species diversity unlike any seen in the past.

California is now developing a statewide climate adaptation strategy in coordination with its aggressive GHG mitigation policies. State commitments in the 2006 Global Warming Solutions Act (to reduce the state's GHG emissions 20 percent below its 1990 levels by 2020 and an 80 percent reduction by 2050) along with the Low Carbon Fuel and Renewable Portfolio Standards will help reduce the long-term climate impacts to California. However, these efforts and the world's mitigation efforts will slow, but not stop, climate impacts to California over the next century; therefore, adaptation to expected future impacts must occur as a parallel track to mitigation. This is why California, through the leadership of California Resources Agency Secretary Mike Chrisman, is planning its first coordinated climate change adaptation strategy effort that will be completed in 2009.

To develop California's climate adaptation strategy, early efforts are focused on understanding where California is most vulnerable to climate change. The California Energy Commission (CEC), in partnership with numerous government, academic, industry, and NGO partners, has spent millions of dollars over the last five years on building new climate change scenarios for California and funding in-depth studies of impacts to energy, forestry, water, biodiversity, and other sectors. The California Ocean Protection Council and state coastal management agencies (California Coastal Commission and the San Francisco Bay Conservation and Development Commission) are working on targeted analyses of coastal impacts. These studies will be complete this year, and will be used to develop the state's climate adaptation strategy and to better inform policy-makers and the general public.

The strategy efforts are already under way with different agencies and departments responsible for identifying policy options available to reduce California's vulnerability to future climate change. Groups focused on oceans and coastal resources, water, biodiversity, working lands, public health, infrastructure, and energy will identify the most vulnerable areas in each sector and recommend policy for the state's adaptation to future climate impacts. To ensure California is coordinating with other state, national, and international efforts, the state will develop an "adaptation leaders" group to link with other climate change adaptation efforts, and provide varied public and private sector perspectives.

Finally, California is working to implement certain adaptation strategies now that have been identified as necessary in the short term. Some examples include the following:

- For the *ocean and coastal resources sector*, California is developing coastal management planning guidance to deal with sea level rise through its coastal management agencies and the California Ocean Protection Council, departments

such as the California Coastal Conservancy are changing funding guidelines to ensure preservation of terrestrial and aquatic species in coastal areas, and California chairs the Coastal States Organization which is working to ensure climate change adaptation is a priority for state and federal partners.

- For the *water* sector, the state Department of Water Resources is currently updating its State Water Plan that will guide water expenditures and planning for the next century and has climate change as a major planning priority.
- Concerning *biodiversity conservation*, the California Department of Fish and Game has identified climate change as a key threat in its core planning document, the State Wildlife Action Plan, and is now working to address how the land it manages and the species residing on those lands will be impacted. All of California's land management agencies are considering how to adjust planning and expenditures based on updated climate science. This is significant since California has nearly five hundred million dollars to spend per year over the next five years on habitat conservation and restoration in the state.

California's response to climate change is not a simple choice between mitigating GHG emissions and adapting to the impacts of climate change. Adaptation and mitigation are necessary and complementary strategies for combating climate change. California's adaptation strategy effort will provide the state's best current thinking in determining the portfolio of solutions that will best minimize potential risks and maximize potential benefits to the state and its coastal areas.

MOVING TO ACTION

Reducing the United States' vulnerability to climate change impacts should be a national priority that receives the same attention as efforts to mitigate GHG emissions. The science is clear: coastal states can expect significant climate change impacts in many sectors and locations. Now is the time for state and federal policy-makers to begin to take action.

Because the nation's coastal zone faces a number of challenges in adapting to the effects of climate change, coastal states must be full and equal partners in any national response. Close coordination between the federal government and coastal states in research, development of adaptive strategies, sharing of information, and education will be necessary to successfully meet these complex challenges. Given the physical and socioeconomic diversity of the nation's coastlines, individual states are best suited to determine which adaptive mechanisms will work best in their area. Therefore, state authority and sovereignty should be strongly maintained in a national strategy to adapt to climate change.

In California, the focus on understanding climate impacts and developing and implementing comprehensive cross-sector climate adaptation strategies is a useful framework for addressing climate adaptation efforts. The same approach could be

replicated in other states across the country, as is currently happening in Florida, Washington, Oregon, and Maine, to reduce the nation's collective future vulnerability.

The Coastal States Organization would support federal efforts to:

- *Develop a national coastal adaptation strategy to ensure intergovernmental coordination on coastal adaptation to climate change; to clearly define the roles of various agencies; and to identify the mechanisms by which federal programs will coordinate with state partners on coastal adaptation issues. This should be an important component in future strategies regarding the re-authorization of the federal Coastal Zone Management Act;*
- *Fund new climate change research, coordinate existing climate change research, and promote the outreach of this research to the states and territories;*
- *Assist with on-the-ground mapping and modeling efforts that will be critical in addressing these impacts **before** they occur; and,*
- *Recognize the critical role of coastal states in adapting to climate change.*

CONCLUSION

Thank you Chairwoman Bordallo and distinguished members of the Subcommittee for the opportunity to appear before you today to offer testimony on how the nation can collectively reduce the vulnerability of coastal areas to future climate impacts. California is pleased to serve as a resource to the Subcommittee for future adaptation planning efforts.