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**Testimony of
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Before

**The U.S. House of Representatives
Select Committee on Energy Independence and Global Warming**

October 22, 2009

Chairman Markey and distinguished members of the Select Committee, it is my pleasure to be here today to outline some of Maryland's successes in planning for climate change and to discuss with you the importance of developing a strategic national approach to adaptation.

Given our more than 4,000 miles of coastline and documented rate of sea level rise nearly twice that of the global average, Maryland has already begun to strategically plan for the impacts of climate change. In April 2007, Governor Martin O'Malley signed an Executive Order establishing the Maryland Climate Change Commission. Approximately a year after its formation, the Commission released Maryland's Climate Action Planⁱ, setting forth a course of action to stem not only the drivers of climate change but also for how to adapt and respond to the inevitable consequences.

Historic tide-gauge records show that sea levels are rising along Maryland's coast and have increased one-foot within state waters over the last 100 years. We are currently expecting that sea level may rise at least twice as fast as it did during the 20th century, resulting in potentially 2.7 to 3.4 feet of rise by the year 2100. Such a rise will likely cause increased vulnerability to storm events, more frequent and severe coastal flooding, inundation of low-lying lands, submergence of tidal marshes, more shore erosion, salt-water intrusion, and higher water tables. While Maryland's entire coast will be impacted over the course of time, our state's low-lying coastal areas, to as well as those with large amounts of exposed shoreline are most at risk. The Chesapeake Bay is ranked the third most vulnerable region in the nation to the impact of sea level rise.

Confirming this fact is that the impact of sea level rise is already apparent - Maryland is currently losing approximately 580 acres per year to shore erosion; and alarmingly, thirteen Chesapeake Bay islands once mapped on nautical charts have already disappeared beneath the water's surface. In a 2008 report, the National Wildlife Federation estimated that approximately 400,000 acres of land on the Chesapeake's Eastern Shore could gradually be submerged.ⁱⁱ Maryland has thousands of miles of developed waterfront property along its coast, including many historic human settlements such as Smith Island. These coastal areas contain billions of dollars worth of public and private investments that will be adversely impacted by sea level rise and the intensification of coastal storm events.

A key component of Maryland's Climate Action Plan is the Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change. Phase I of this Strategy sets forth the state's vision for protecting Maryland's future economic well-being, environmental heritage and public safety from the already inevitable impacts of climate change-induced sea level rise and coastal storms. The Strategy recommends a suite of 18 specific legislative, policy, and planning actions aimed at the reduction of impact to existing built environments & future growth and development; financial and economic impact avoidance; the protection of human health, safety and welfare; and the protection and restoration of the State's forests, wetlands and beaches as they inherently protect us from the impacts of climate change.

Implementation of the Adaptation Strategy is well underway. In 2008 Maryland passed two pieces of key legislation called for in the Strategy: The Living Shoreline Protection Act and amendments to the Chesapeake and Coastal Bays Critical Area Act. Both will reduce Maryland's vulnerability over time and protect natural resources from the impacts of sea level rise by restoring natural shoreline buffers such as grasses and wetlands and limiting new growth in vulnerable areas.

The work of the Maryland Commission on Climate Change drew national accolades for its focus on adaptation. The U.S. Climate Change Science Program, Synthesis and Assessment Product 4.1, *Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region*ⁱⁱⁱ, states that "Maryland has taken a proactive step towards addressing a growing a problem by committing to implementation of its sea level rise response strategy and increasing awareness and consideration of sea level rise issues in both public and governmental arenas."

Aside from sea level rise and coastal storms, Maryland is equally concerned about the likely consequences of a changing climate to the state's agriculture industry, forestry resources, fisheries resources, freshwater supply, aquatic and terrestrial ecosystems, and human health. For example, many marine living resources will likely experience changes in species composition and abundance with warming. Fisheries managers will need to adapt management to account for shifts in productivity, variability and predictability of fish populations due to climate change.

In terms of water quality, a changing climate will have multiple and complex effects on the Chesapeake Bay as well as on Maryland's coastal bays and the nearshore ocean environment. Maryland and the other Bay states are taking aggressive action to accelerate Bay restoration efforts yet are concerned that rising sea levels and changes in precipitation patterns may make restoration more difficult to achieve. The Chesapeake Bay Program's Scientific and Technical Advisory Committee report, *Climate Change and the Chesapeake Bay*^{iv} and the Executive Order 13508, Draft Section 202(d) Report, *Chesapeake Bay Watershed Climate Change Impacts*^v, both address this concern and collectively recommend the need for action on planning for adaptation at the regional, state and national level.

Recognizing the critical need to plan for such impacts as just described, the Maryland Commission on Climate Change has initiated development of Phase II of its Adaptation Strategy. This second phase is focused on addressing the impacts of increasing temperature, changes in precipitation patterns and increased storminess to six issue-based sectors: water resources, agriculture, aquatic and terrestrial ecosystems, forestry, agriculture, human health and transportation and land-use. Adaptation strategies for each sector are to be produced by June 2010.

Over the years, Maryland's coastal adaptation efforts have benefited from a variety of federal funding sources, most notably through the Coastal Zone Management Act (CZMA) as administered by the National Oceanic and Atmospheric Administration (NOAA). Maryland receives approximately \$3 million annually from NOAA to implement these programs and has used approximately \$250,000 of these yearly funds since the year 2000 to fund its sea level rise, coastal hazards and coastal climate change adaptation planning efforts. Thanks to this ongoing federal support, Maryland has a strong Coastal Zone Management and National Estuarine Research Reserve Program, both authorized under the CZMA. CZMA funds have supported climate change-related activities for research and data acquisition, as well as to expand technical, planning, and education activities needed to address key coastal climate change adaptation issues.

Our vulnerability to climate change will ultimately depend upon the magnitude of future impact, as well as how we as a society are able to cope and respond. In Maryland, however, we are continuing to invest, live, and actively manage lands and resources that we know with near certainty will be impacted by climate change. As a result, more and more of Maryland's people, property, public investments and natural resources, including vital fish and wildlife habitat, will soon be at risk.

If states and local governments do not adequately prepare for climate change, we may jeopardize at least a century of land and water conservation success across the country. The billions of dollars of investment in public lands and fish and wildlife habitat by federal and state agencies over the last 100 years is threatened by the anticipated pervasive impacts of climate change. We must protect the integrity of our investment in our nation's natural infrastructure to ensure our security. Federal, state and local governments must move beyond traditional planning and resource management practices and set a course for planning in anticipation of future change.

States are at the front lines of planning for climate change. Despite the absence of a national climate change adaptation program, States like Maryland are already undertaking significant strategic planning efforts. However, the efforts of states across the nation could be improved upon and assisted, by several key actions at the national level.

First, the key role of states, including the valuable research contribution of state academic institutions, in climate change adaptation planning must be clearly established and supported by federal programs.

Next, to facilitate effective coastal adaptation the nation needs a clear national strategy for intergovernmental coordination on adaptation. This strategy should advocate an integrated national approach to natural resource adaptation that reflects meaningful coordination among the state and federal agencies. In the Chesapeake Bay region alone, at least three separate climate change adaptation strategies have been produced in the last year and half – all by different governmental organizations and all calling for enhanced intergovernmental coordination.

And finally, action at the federal level must provide dedicated funding for adaptation. Federal financial support is imperative to protect coastal communities, natural resources and the national interest from the impacts of climate change.

Along these same lines, some of the barriers to strategic coordination of adaptation efforts across federal, state and local governments can be addressed by the following efforts:

- *Reauthorize and strengthen the Coastal Zone Management Act.* Strengthen the CZMA with authorization for climate change related activities; including funding to develop and implement a coastal adaptation plan that recognizes each state's individual needs while building into a proactive national strategy.
- *Support creation of a permanent ocean trust fund.* Revenues from this trust fund could be used by Maryland to address the impacts of climate change, including maintaining healthy, resilient coastal communities and economies; and protecting and restoring coastal ecosystems, habitats, waters, and unique resources. A potential source of revenue could be funds generated by greenhouse gas cap and trade programs.
- *Improve awareness and understanding of the resources available to states and local governments.* A key component of a national climate change adaptation program should be a new and stronger focus on intergovernmental coordination between federal, state and local agencies.
- *Create a better system of observations at the national level - one that is reliably continuous, strategically targeted, and thoroughly integrated.* There is generally insufficient monitoring of Maryland's climate, environmental conditions and resources to characterize their present state and variability. Reliable observations, interpreted with scientific understanding and innovative models, can dramatically reduce uncertainty about the path of climate change in Maryland and its consequences.
- *Help states effectively respond to changes to aquatic and terrestrial ecosystems.* Federal agencies should work closely with coastal states to assess impacts to coastal, marine and migratory fishery habitats and strategically target funds toward projects which will further adaptation. Coastal wetlands and bay islands are vital natural systems in terms of the ecosystem services they provide in the form of clean water, clear air, storm buffers, and flood attenuation. Climate impacts such as drought, catastrophic fires and desiccation of wetlands will all result in releasing carbon currently sequestered in forests and wetlands. Functioning ecosystems sustain fish and wildlife and support associated fishing, hunting and wildlife-dependent recreation with an approximate national value of \$76 billion per year – Maryland's portion of which is a tremendous asset to rural communities throughout the Chesapeake Bay region.
- *Ensure federal adaptation funding for state and private forest lands.* Climate change threatens the ability of the nation's forests - both public and private - to provide clean air and water, carbon sequestration, renewable energy and numerous other ecosystem services. Changes in precipitation, temperature, fire patterns, increased CO₂ concentrations, pest outbreaks and other climate change influences have the potential to transform forest ecosystems. Nearly two-thirds of the nation's forests are held in state and private ownership and will be essential in any wildlife and forest adaptation strategy. Funding adaptation activities on federal forests is essential, but only addresses the needs of a third of the nation's forests.
- *Enhance smart growth programs and policies at the national level.* Action is needed now to protect not only existing human settlements and infrastructure but also to ensure that we avoid future risk by restricting new growth and development in areas we already know are extremely vulnerable. Maryland is working to advocate smart growth practices as a means to accomplish this task and would advocate for the same level of effort at the national level. In the face of climate change, better land-use planning is imperative.

Preparing and planning for the consequences of climate change translates into more green jobs. Maryland's Governor, Martin O'Malley, established a goal of creating at least 100,000 green jobs by 2015. Adapting to climate change is one of the pillars of his Green Jobs Initiative. Numerous green jobs can be created through activities to support climate change adaptation, including marine contractors and landscape architects to design and install living shorelines; foresters to ensure sustainable forest management; biologists to address and remove invasive species, and habitat engineers to restore wetlands.

In conclusion, I want to highlight the need for government to lead by example. Federal, state and local government leadership is imperative if we are to combat and adapt to climate change. Maryland's state government is working to lead by example on the climate front by developing standards to guide the siting and design of state facilities and infrastructure in vulnerable coastal areas; working to reduce our footprint by sequestering carbon; and improving the efficiency of our vehicle fleet.

The issuance of the *Water Resource Policies and Authorities for Incorporating Sea-Level Change Considerations in Civil Works Programs*^{vi} by the U.S. Army Corps of Engineers in July 2009 represents a great instance of leading by example at the federal level. As does the Draft Strategic Plan of the U.S. Fish & Wildlife Service, *Rising to the Challenge, Responding to Accelerating Climate Change*^{vii}. I commend the federal government for such efforts to lead by example which set the stage for states to follow.

Thank you very much for your time in considering my testimony today.

References

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- ⁱ Maryland Commission on Climate Change. 2008. Maryland Climate Action Plan. Maryland Department of Environment. Baltimore, Maryland.
- ⁱⁱ Glick, Patty, et.al.. 2008. Sea-Level Rise and Coastal Habitats in the Chesapeake Bay Region. National Wildlife Federation. Reston, Virginia.
- ⁱⁱⁱ U.S. Climate Change Science Program and the Subcommittee on Global Change Research. 2009. Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region. Synthesis and Assessment Product 4.1.
- ^{iv} Pyke, C., R. Najjar, et al. 2008. Climate Change and the Chesapeake Bay. Chesapeake Bay Program Scientific and Technical Advisory Committee. Annapolis, MD.
- ^v Dept. of Commerce and Dept. of Interior. 2009. September 9, 2009 Draft Report on Chesapeake Bay Watershed Climate Change Impacts: A Draft Report fulfilling Section 202(d) of Executive Order 13508. Washington, D.C.
- ^{vi} Department of the Army, U.S. Army Corps of Engineers. 2009. Water Resource Policies and Authorities for Incorporating Sea-Level Change Considerations in Civil Works Programs. Circular No. 1165-2-211.
- ^{vii} U.S. Fish & Wildlife Service. 2009. September 21, 2009 Draft Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change. Reston, VA.

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To download a copy of Maryland's Climate Action Plan, please visit
<http://www.mde.state.md.us/Air/climatechange/index.asp>.

Additional information on Maryland's climate change adaptation planning efforts can be found at:
<http://www.dnr.state.md.us/dnrnews/infocus/climatechange.html>.