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Testimony

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House of Representatives

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# CLIMATE CHANGE ADAPTATION

## Strategic Federal Planning Could Help Officials Make More Informed Decisions

Statement of John B. Stephenson, Director  
Natural Resources and Environment



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October 22, 2009

Mr. Chairman and Members of the Committee:

I am pleased to be here today to discuss our report to this committee on climate change adaptation and the role strategic federal planning could play in government decision making. Changes in the climate attributable to increased concentrations of greenhouse gases may have significant impacts in the United States and internationally.<sup>1</sup> For example, climate change could threaten coastal areas with rising sea levels. In recent years, climate change adaptation—adjustments to natural or human systems in response to actual or expected climate change—has begun to receive more attention because the greenhouse gases already in the atmosphere are expected to continue altering the climate system into the future, regardless of efforts to control emissions. According to a recent report by the National Research Council (NRC), however, individuals and institutions whose futures will be affected by climate change are unprepared both conceptually and practically for meeting the challenges and opportunities it presents. In this context, adapting to climate change requires making policy and management decisions that cut across traditional economic sectors, jurisdictional boundaries, and levels of government. My testimony is based on our October 2009 report,<sup>2</sup> which is being publicly released today, and addresses three issues: (1) what actions federal, state, local, and international authorities are taking to adapt to a changing climate; (2) the challenges that federal, state, and local officials face in their efforts to adapt; and (3) the actions that Congress and federal agencies could take to help address these challenges. We also provide information about our prior work on similarly complex, interdisciplinary issues.

We employed a variety of methods to assess these issues. To determine the actions federal, state, local, and international authorities are taking to adapt to a changing climate, we obtained summaries of adaptation-related efforts from a broad range of federal agencies and visited four sites where government officials are taking actions to adapt. The four sites were New

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<sup>1</sup>Major greenhouse gases include carbon dioxide (CO<sub>2</sub>); methane (CH<sub>4</sub>); nitrous oxide (N<sub>2</sub>O); and such synthetic gases as hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF<sub>6</sub>).

<sup>2</sup>GAO, *Climate Change Adaptation: Strategic Federal Planning Could Help Government Officials Make More Informed Decisions*, [GAO-10-113](#) (Washington, D.C.: Oct. 7, 2009).

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York City; King County, Washington; the state of Maryland; and the United Kingdom, focusing on London and Hampshire County. We gathered information during and after site visits through observation of adaptation efforts, interviews with officials and stakeholders, and a review of documents provided by these officials. To describe challenges that federal, state, and local officials face in their efforts to adapt and the actions that Congress and federal agencies could take to help address these challenges, we developed a Web-based questionnaire, and sent it to 274 federal, state, and local officials knowledgeable about adaptation.<sup>3</sup> Within the questionnaire, we organized questions about challenges and actions into groups related to the following: (1) awareness among governmental officials and the public about climate change impacts and setting priorities with respect to available adaptation strategies; (2) sufficiency of information to help officials understand climate change impacts at a scale that enables them to respond; and (3) the structure and operation of the federal government including whether roles and responsibilities were clear across different levels of government.

We conducted our review from September 2008 to October 2009 in accordance with generally accepted government auditing standards. A more detailed description of our scope and methodology is available in appendix I of our report.

Mr. Chairman, the following summarizes the findings on each of the issues discussed in our report:

- *Federal, state, local, and international efforts to adapt to climate change:* Although there is no coordinated national approach to adaptation, several federal agencies report that they have begun to take action with current and planned adaptation activities. These activities are largely ad hoc and fall into categories such as information for decision making, federal land and natural resource management, and governmentwide adaptation strategies, among others. For example, the National Oceanic and Atmospheric Administration's (NOAA) Regional Integrated Sciences and Assessments program supports climate change research to meet the needs of decision makers and policy planners at the national, regional, and local levels. In addition, several federal agencies have reported beginning to consider measures that would strengthen the resilience of natural resources in the face of climate change. For example, on September 14,

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<sup>3</sup>For our questionnaire, 187 of 274 officials responded for a response rate of approximately 68 percent. Not all officials responded to every question.

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2009, the Department of the Interior issued an order designed to address the impacts of climate change on the nation's water, land, and other natural and cultural resources.<sup>4</sup> While no single entity is coordinating climate change adaptation efforts across the federal government, several federal entities are beginning to develop governmentwide strategies to adapt to climate change. For example, the President's Council on Environmental Quality (CEQ) is leading a new initiative to coordinate the federal response to climate change in conjunction with the Office of Science and Technology Policy, NOAA, and other agencies. Similarly, the U.S. Global Change Research Program, which coordinates and integrates federal research on climate change, has developed a series of "building blocks" that outline options for future climate change work, including science to inform adaptation.

While many government authorities have not yet begun to adapt to climate change, some at the state and local levels are beginning to plan for and respond to climate change impacts. We visited three U. S. sites—New York City; King County, Washington; and the state of Maryland—where government officials are taking such steps. Our analysis of these sites suggests three major factors have led these governments to act. First, natural disasters such as floods, heat waves, droughts, or hurricanes raised public awareness of the costs of potential climate change impacts. Second, leaders in all three sites used legislation, executive orders, local ordinances, or action plans to focus attention and resources on climate change adaptation. Finally, each of the governments had access to relevant site-specific information to provide a basis for planning and management efforts. This site-specific information arose from partnerships that decision makers at all three sites formed with local universities and other government and nongovernment entities. Limited adaptation efforts are also taking root in other countries around the world. As in the case of the state and local efforts we describe, some of these adaptation efforts have been triggered by the recognition that current weather extremes and seasonal changes will become more frequent in the future. Our review of climate change adaptation efforts in the United Kingdom describes how different levels of government work together to ensure that climate change considerations are incorporated into decision making.

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<sup>4</sup>Secretarial Order No. 3289 (Sept. 14, 2009).

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- *Government officials face numerous challenges when considering adaptation efforts:* The challenges faced by federal, state, and local officials in their efforts to adapt fall into the following three categories, based on our analysis of questionnaire results, site visits, and available studies:
    - First, available attention and resources are focused on more immediate needs, making it difficult for adaptation efforts to compete for limited funds. For example, about 71 percent (128 of 180) of the officials who responded to our questionnaire rated “non-adaptation activities are higher priorities” as very or extremely challenging when considering climate change adaptation efforts.
    - Second, insufficient site-specific data, such as local projections of expected changes, make it hard to predict the impacts of climate change, and thus hard for officials to justify the current costs of adaptation efforts for potentially less certain future benefits. For example, King County officials said they are not sure how to translate climate change information into effects on salmon recovery efforts.
    - Third, adaptation efforts are constrained by a lack of clear roles and responsibilities among federal, state, and local agencies. Of particular note, about 70 percent (124 of 178) of the respondents rated the “lack of clear roles and responsibilities for addressing adaptation across all levels of government” as very or extremely challenging. Interestingly, local and state respondents rate this as a greater challenge than did federal respondents. About 80 percent (48 of 60) of local officials and about 67 percent (31 of 46) of state officials who responded to the question rated the issue as either very or extremely challenging, compared with about 61 percent (42 of 69) of the responding federal officials.<sup>5</sup>
  
  - *Federal efforts could help government officials make decisions about adaptation:* Potential federal actions for addressing challenges to adaptation efforts fall into the following three areas, based on our analysis of questionnaire results, site visits, and available studies:
    - First, training and education efforts could increase awareness among government officials and the public about the impacts of climate change and available adaptation strategies. A variety of programs are

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<sup>5</sup>Differences by level of government (federal, state, and local) that are reported are for illustrative purposes and may not be statistically different. We present selected examples where the difference between federal, state, or local responses is greater than 15 percent and the difference presents useful context for the overall results. There were other differences by level of government that are not presented in our report.

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trying to accomplish this goal, such as the Chesapeake Bay National Estuarine Research Reserve (partially funded by NOAA), which provides education and training on climate change to the public and local officials in Maryland.

- Second, actions to provide and interpret site-specific information could help officials understand the impacts of climate change at a scale that would enable them to respond. About 80 percent (147 of 183) of the respondents rated the “development of state and local climate change impact and vulnerability assessments” as very or extremely useful.
- Third, Congress and federal agencies could encourage adaptation by clarifying roles and responsibilities. About 71 percent (129 of 181) of the respondents rated the development of a national adaptation strategy as very or extremely useful. Furthermore, officials we spoke with at our site visits and officials who responded to our questionnaire said that a coordinated federal response would also demonstrate a federal commitment to adaptation.

Our past work on crosscutting issues suggests that governmentwide strategic planning can integrate activities that span a wide array of federal, state, and local entities.<sup>6</sup> As our report and others (such as the National Academy of Sciences and the Intergovernmental Panel on Climate Change) demonstrate, some communities and federal lands are already seeing the effects of climate change, and governments are beginning to respond. However, as our report also illustrates, the federal government’s emerging adaptation activities are carried out in an ad hoc manner and are not well coordinated across federal agencies, let alone state and local governments. Multiple federal agencies, as well as state and local governments, will have to work together to address these challenges and implement new initiatives. Yet, our past work on collaboration among federal agencies suggests that they will face a range of barriers in doing so.<sup>7</sup> Top leadership involvement and clear lines of accountability are critical to overcoming natural resistance to change, marshalling needed resources, and building and maintaining the commitment to new ways of

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<sup>6</sup>GAO, *A Call For Stewardship: Enhancing the Federal Government’s Ability to Address Key Fiscal and Other 21st Century Challenges*, [GAO-08-93SP](#) (Washington, D.C.: Dec. 17, 2007).

<sup>7</sup>GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005), and *Managing for Results: Barriers to Interagency Coordination*, [GAO/GGD-00-106](#) (Washington, D.C.: Mar. 29, 2000).

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doing business. Given the complexity and potential magnitude of climate change and the lead time needed to adapt, preparing for these impacts now may reduce the need for far more costly steps in the decades to come.

Accordingly, our report released today recommends that the appropriate entities within the Executive Office of the President, such as CEQ and the Office of Science and Technology Policy, in consultation with relevant federal agencies, state and local governments, and key congressional committees of jurisdiction, develop a national strategic plan that will guide the nation's efforts to adapt to a changing climate. The plan should, among other things, (1) define federal priorities related to adaptation; (2) clarify roles, responsibilities, and working relationships among federal, state, and local governments; (3) identify mechanisms to increase the capacity of federal, state, and local agencies to incorporate information about current and potential climate change impacts into government decision making; (4) address how resources will be made available to implement the plan; and (5) build on and integrate ongoing federal planning efforts related to adaptation. CEQ generally agreed with the recommendation, noting that leadership and coordination is necessary within the federal government to ensure an effective and appropriate adaptation response and that such coordination would help to catalyze regional, state, and local activities.

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Mr. Chairman, this concludes my statement. I would be pleased to respond to any questions you or other Members of the Committee may have.

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## Contacts and Acknowledgments

For questions about this statement, please contact John B. Stephenson at (202) 512-3841 or [stephensonj@gao.gov](mailto:stephensonj@gao.gov). Individuals who made key contributions to this testimony include Steve Elstein (Assistant Director), Charles Bausell, Keya Chateaufneuf, Cindy Gilbert, Richard Johnson, Benjamin Shouse, Jeanette Soares, Ruth Solomon, and Joseph Thompson. Camille Adebayo, Holly Dye, Mike Jenkins, and Mark Keenan also made important contributions.

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