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REPT. 110–605
Part 1

GLOBAL CHANGE RESEARCH AND DATA MANAGEMENT ACT OF 2007

APRIL 24, 2008.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. GORDON of Tennessee, from the Committee on Science and Technology, submitted the following

R E P O R T

[To accompany H.R. 906]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 906) to promote and coordinate global change research, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

69–006

I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Global Change Research and Data Management Act of 2007".

TITLE I—GLOBAL CHANGE RESEARCH

SEC. 101. FINDINGS AND PURPOSE.

(a) FINDINGS.—The Congress makes the following findings:

(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that are significantly altering the Earth habitat.

(2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant alterations of world climate patterns. Over the next century, these changes could adversely affect world agricultural and marine production, coastal habitability, biological diversity, human health, global social and political stability, and global economic activity.

(3) Developments in interdisciplinary Earth sciences, global observing systems, and satellite and computing technologies make possible significant scientific understanding of global changes and their effects, and have resulted in the significant expansion of environmental data and information.

(4) Development of effective policies to prevent, mitigate, and adapt to global change will rely on improvement in scientific understanding of global environmental processes and on development of information that is of use to decisionmakers at the local, regional, and national levels.

(5) Although the United States Global Change Research Program has made significant contributions to understanding Earth's climate and the anthropogenic influences on Earth's climate and its ecosystems, the Program now needs to produce more information to meet the expressed needs of decisionmakers.

(6) Predictions of future climate conditions for specific regions have considerable uncertainty and are unlikely to be confirmed in a time period necessary to inform decisions on land, water, and resource management. However, improved understanding of global change should be used to assist decisionmakers in the development of policies to ensure that ecological, social, and economic systems are resilient under a variety of plausible climate futures.

(7) In order to most effectively meet the needs of decisionmakers, both the research agenda of the United States Global Change Research Program and its implementation must be informed by continuous feedback from documented users of information generated by the Program.

(b) PURPOSE.—The purpose of this title is to provide for the continuation and coordination of a comprehensive and integrated United States observation, research, and outreach program which will assist the Nation and the world to understand, assess, predict, and respond to the effects of human-induced and natural processes of global change.

SEC. 102. DEFINITIONS.

For purposes of this title—

(1) the term "global change" means human-induced or natural changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of the Earth to sustain life;

(2) the term "global change research" means study, monitoring, assessment, prediction, and information management activities to describe and understand—

(A) the interactive physical, chemical, and biological processes that regulate the total Earth system;

(B) the unique environment that the Earth provides for life;

(C) changes that are occurring in the Earth system; and

(D) the manner in which such system, environment, and changes are influenced by human actions;

(3) the term "interagency committee" means the interagency committee established under section 103;

(4) the term "Plan" means the National Global Change Research and Assessment Plan developed under section 105;

(5) the term "Program" means the United States Global Change Research Program established under section 104; and

(6) the term "regional climate change" means the natural or human-induced changes manifested in the local or regional environment (including alterations in weather patterns, land productivity, water resources, sea level rise, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of a specific region to support current or future social and economic activity or natural ecosystems.

SEC. 103. INTERAGENCY COOPERATION AND COORDINATION.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency committee to ensure cooperation and coordination of all Federal research activities pertaining to processes of global change for the purpose of increasing the overall effectiveness and productivity of Federal global change research efforts. The interagency committee shall include representatives of both agencies conducting global change research and agencies with authority over resources likely to be affected by global change.

(b) FUNCTIONS OF THE INTERAGENCY COMMITTEE.—The interagency committee shall—

(1) serve as the forum for developing the Plan and for overseeing its implementation;

(2) serve as the forum for developing the vulnerability assessment under section 107;

(3) ensure cooperation among Federal agencies with respect to global change research activities;

(4) work with academic, State, industry, and other groups conducting global change research, to provide for periodic public and peer review of the Program;

(5) cooperate with the Secretary of State in—

(A) providing representation at international meetings and conferences on global change research in which the United States participates; and

(B) coordinating the Federal activities of the United States with programs of other nations and with international global change research activities;

(6) work with appropriate Federal, State, regional, and local authorities to ensure that the Program is designed to produce information needed to develop policies to reduce the vulnerability of the United States and other regions to global change;

(7) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities; and

(8) identify additional decisionmaking groups that may use information generated through the Program.

SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM.

(a) ESTABLISHMENT.—The President shall establish an interagency United States Global Change Research Program to improve understanding of global change, to respond to the information needs of communities and decisionmakers, and to provide periodic assessments of the vulnerability of the United States and other regions to global and regional climate change. The Program shall be implemented in accordance with the Plan.

(b) LEAD AGENCY.—The lead agency for the United States Global Change Research Program shall be the Office of Science and Technology Policy.

(c) INTERAGENCY PROGRAM ACTIVITIES.—The Director of the Office of Science and Technology Policy, in consultation with the interagency committee, shall identify activities included in the Plan that involve participation by 2 or more agencies in the Program, and that do not fall within the current fiscal year budget allocations of those participating agencies, to fulfill the requirements of this Act. The Director of the Office of Science and Technology Policy shall allocate funds to the agencies to conduct the identified interagency activities. Such activities may include—

(1) development of scenarios for climate, land-cover change, population growth, and socioeconomic development;

(2) calibration and testing of alternative regional and global climate models;

(3) identification of economic sectors and regional climatic zones; and

(4) convening regional workshops to facilitate information exchange and involvement of regional, State, and local decisionmakers, non-Federal experts, and other stakeholder groups in the activities of the Program.

(d) WORKSHOPS.—The Director shall ensure that at least one workshop is held per year in each region identified by the Plan under section 105(b)(11) to facilitate infor-

mation exchange and outreach to regional, State, and local stakeholders as required by this Act.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Office of Science and Technology Policy for carrying out this section $10,000,000 for each of the fiscal years 2008 through 2013.

SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH AND ASSESSMENT PLAN.

(a) IN GENERAL.—The President shall develop a National Global Change Research and Assessment Plan for implementation of the Program. The Plan shall contain recommendations for global change research and assessment. The President shall submit an outline for the development of the Plan to the Congress within 1 year after the date of enactment of this Act, and shall submit a completed Plan to the Congress within 3 years after the date of enactment of this Act. Revised Plans shall be submitted to the Congress at least once every 5 years thereafter. In the development of each Plan, the President shall conduct a formal assessment process under this section to determine the needs of appropriate Federal, State, regional, and local authorities and other interested parties regarding the types of information needed by them in developing policies to reduce society's vulnerability to global change and shall utilize these assessments, including the reviews by the National Academy of Sciences and the National Governors Association under subsections (e) and (f), in developing the Plan.

(b) CONTENTS OF THE PLAN.—The Plan shall—

(1) establish, for the 10-year period beginning in the year the Plan is submitted, the goals and priorities for Federal global change research which most effectively advance scientific understanding of global change and provide information of use to Federal, State, regional, and local authorities in the development of policies relating to global change;

(2) describe specific activities, including efforts to determine user information needs, research activities, data collection, database development, and data analysis requirements, development of regional scenarios, assessment of model predictability, assessment of climate change impacts, participation in international research efforts, and information management, required to achieve such goals and priorities;

(3) identify relevant programs and activities of the Federal agencies that contribute to the Program directly and indirectly;

(4) set forth the role of each Federal agency in implementing the Plan;

(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies, the National Research Council, or other entities;

(6) make recommendations for the coordination of the global change research and assessment activities of the United States with such activities of other nations and international organizations, including—

(A) a description of the extent and nature of international cooperative activities;

(B) bilateral and multilateral efforts to provide worldwide access to scientific data and information; and

(C) improving participation by developing nations in international global change research and environmental data collection;

(7) detail budget requirements for Federal global change research and assessment activities to be conducted under the Plan;

(8) catalog the type of information identified by appropriate Federal, State, regional, and local decisionmakers needed to develop policies to reduce society's vulnerability to global change and indicate how the planned research will meet these decisionmakers' information needs;

(9) identify the observing systems currently employed in collecting data relevant to global and regional climate change research and prioritize additional observation systems that may be needed to ensure adequate data collection and monitoring of global change;

(10) describe specific activities designed to facilitate outreach and data and information exchange with regional, State, and local governments and other user communities; and

(11) identify and describe regions of the United States that are likely to experience similar impacts of global change or are likely to share similar vulnerabilities to global change.

(c) RESEARCH ELEMENTS.—The Plan shall include at a minimum the following research elements:

(1) Global measurements, establishing worldwide to regional scale observations prioritized to understand global change and to meet the information needs of decisionmakers on all relevant spatial and time scales.

(2) Information on economic, demographic, and technological trends that contribute to changes in the Earth system and that influence society's vulnerability to global and regional climate change.

(3) Development of indicators and baseline databases to document global change, including changes in species distribution and behavior, extent of glaciations, and changes in sea level.

(4) Studies of historical changes in the Earth system, using evidence from the geological and fossil record.

(5) Assessments of predictability using quantitative models of the Earth system to simulate global and regional environmental processes and trends.

(6) Focused research initiatives to understand the nature of and interaction among physical, chemical, biological, land use, and social processes related to global and regional climate change.

(7) Focused research initiatives to determine and then meet the information needs of appropriate Federal, State, and regional decisionmakers.

(d) INFORMATION MANAGEMENT.—The Plan shall incorporate, to the extent practicable, the recommendations relating to data acquisition, management, integration, and archiving made by the interagency climate and other global change data management working group established under section 203.

(e) NATIONAL ACADEMY OF SCIENCES EVALUATION.—The President shall enter into an agreement with the National Academy of Sciences under which the Academy shall—

(1) evaluate the scientific content of the Plan; and

(2) recommend priorities for future global and regional climate change research and assessment.

(f) NATIONAL GOVERNORS ASSOCIATION EVALUATION.—The President shall enter into an agreement with the National Governors Association Center for Best Practices under which that Center shall—

(1) evaluate the utility to State, local, and regional decisionmakers of each Plan and of the anticipated and actual information outputs of the Program for development of State, local, and regional policies to reduce vulnerability to global change; and

(2) recommend priorities for future global and regional climate change research and assessment.

(g) PUBLIC PARTICIPATION.—In developing the Plan, the President shall consult with representatives of academic, State, industry, and environmental groups. Not later than 90 days before the President submits the Plan, or any revision thereof, to the Congress, a summary of the proposed Plan shall be published in the Federal Register for a public comment period of not less than 60 days.

SEC. 106. BUDGET COORDINATION.

(a) IN GENERAL.—The President shall provide general guidance to each Federal agency participating in the Program with respect to the preparation of requests for appropriations for activities related to the Program.

(b) CONSIDERATION IN PRESIDENT'S BUDGET.—The President shall submit, at the time of his annual budget request to Congress, a description of those items in each agency's annual budget which are elements of the Program.

SEC. 107. VULNERABILITY ASSESSMENT.

(a) REQUIREMENT.—Within 1 year after the date of enactment of this Act, and at least once every 5 years thereafter, the President shall submit to the Congress an assessment which—

(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

(2) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years;

(3) based on indicators and baselines developed under section 105(c)(3), as well as other measurements, analyzes changes to the natural environment, land and water resources, and biological diversity in—

(A) major geographic regions of the United States; and

(B) other continents;

(4) analyzes the effects of global change, including the changes described in paragraph (3), on food and fiber production, energy production and use, transportation, human health and welfare, water availability and coastal infrastructure, and human social and economic systems, including providing information about the differential impacts on specific geographic regions within the United States, on people of different income levels within those regions, and for rural and urban areas within those regions; and

(5) summarizes the vulnerability of different geographic regions of the world to global change and analyzes the implications of global change for the United

States, including international assistance, population displacement, food and resource availability, and national security.

(b) USE OF RELATED REPORTS.—To the extent appropriate, the assessment produced pursuant to this section may coordinate with, consider, incorporate, or otherwise make use of related reports, assessments, or information produced by the United States Global Change Research Program, regional, State, and local entities, and international organizations, including the World Meteorological Organization and the Intergovernmental Panel on Climate Change.

SEC. 108. POLICY ASSESSMENT.

Not later than 1 year after the date of enactment of this Act, and at least once every 4 years thereafter, the President shall enter into a joint agreement with the National Academy of Public Administration and the National Academy of Sciences under which the Academies shall—

(1) document current policy options being implemented by Federal, State, and local governments to mitigate or adapt to the effects of global and regional climate change;

(2) evaluate the realized and anticipated effectiveness of those current policy options in meeting mitigation and adaptation goals;

(3) identify and evaluate a range of additional policy options and infrastructure for mitigating or adapting to the effects of global and regional climate change;

(4) analyze the adoption rates of policies and technologies available to reduce the vulnerability of society to global change with an evaluation of the market and policy obstacles to their adoption in the United States; and

(5) evaluate the distribution of economic costs and benefits of these policy options across different United States economic sectors.

SEC. 109. ANNUAL REPORT.

Each year at the time of submission to the Congress of the President's budget request, the President shall submit to the Congress a report on the activities conducted pursuant to this title, including—

(1) a description of the activities of the Program during the past fiscal year;

(2) a description of the activities planned in the next fiscal year toward achieving the goals of the Plan; and

(3) a description of the groups or categories of State, local, and regional decisionmakers identified as potential users of the information generated through the Program and a description of the activities used to facilitate consultations with and outreach to these groups, coordinated through the work of the interagency committee.

SEC. 110. RELATION TO OTHER AUTHORITIES.

The President shall—

(1) ensure that relevant research, assessment, and outreach activities of the National Climate Program, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global and regional climate change research and assessment efforts; and

(2) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities through programs authorized in the National Climate Program Act (15 U.S.C. 2901 et seq.).

SEC. 111. REPEAL.

The Global Change Research Act of 1990 (15 U.S.C. 2921 et seq.) is repealed.

SEC. 112. GLOBAL CHANGE RESEARCH INFORMATION.

The President shall establish or designate a Global Change Research Information Exchange to make scientific research and other information produced through or utilized by the Program which would be useful in preventing, mitigating, or adapting to the effects of global change accessible through electronic means.

SEC. 113. ICE SHEET STUDY AND REPORT.

(a) STUDY.—

(1) REQUIREMENT.—The Director of the National Science Foundation and the Administrator of National Oceanic and Atmospheric Administration shall enter into an arrangement with the National Academy of Sciences to complete a study of the current status of ice sheet melt, as caused by climate change, with implications for global sea level rise.

(2) CONTENTS.—The study shall take into consideration—

(A) the past research completed related to ice sheet melt as reviewed by Working Group I of the Intergovernmental Panel on Climate Change;

(B) additional research completed since the fall of 2005 that was not included in the Working Group I report due to time constraints; and

(C) the need for an accurate assessment of changes in ice sheet spreading, changes in ice sheet flow, self-lubrication, the corresponding effect on ice sheets, and current modeling capabilities.

(3) REPORT.—Not later than 18 months after the date of enactment of this Act, the National Academy of Sciences shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the key findings of the study conducted under subsection (a), along with recommendations for additional research related to ice sheet melt and corresponding sea level rise.

SEC. 114. HURRICANE FREQUENCY AND INTENSITY STUDY AND REPORT.

(a) STUDY.—

(1) REQUIREMENT.—The Administrator of the National Oceanic and Atmospheric Administration and the Director of the National Science Foundation shall enter into an arrangement with the National Academy of Sciences to complete a study of the current state of the science on the potential impacts of climate change on patterns of hurricane and typhoon development, including storm intensity, track, and frequency, and the implications for hurricane-prone and typhoon-prone coastal regions.

(2) CONTENTS.—The study shall take into consideration—

(A) the past research completed related to hurricane and typhoon development, track, and intensity as reviewed by Working Groups I and II of the Intergovernmental Panel on Climate Change;

(B) additional research completed since the fall of 2005 that was not included in the Working Group I and II reports due to time constraints;

(C) the need for accurate assessment of potential changes in hurricane and typhoon intensity, track, and frequency and of the current modeling and forecasting capabilities and the need for improvements in forecasting of these parameters; and

(D) the need for additional research and monitoring to improve forecasting of hurricanes and typhoons and to understand the relationship between climate change and hurricane and typhoon development.

(3) REPORT.—Not later than 18 months after the date of enactment of this Act, the National Academy of Sciences shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the key findings of the study conducted under subsection (a).

TITLE II—CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT

SEC. 201. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Federal agencies have a primary mission to manage and archive climate and other global change data obtained through their research, development, or operational activities.

(2) Maintenance of climate and global change data records is essential to present and future studies of the Earth's atmosphere, biogeochemical cycles, and climate.

(3) Federal capabilities for the management and archiving of these data have not kept pace with advances in satellite and other observational technologies that have vastly expanded the type and amount of information that can be collected.

(4) Proposals and plans for expansion of global observing networks should include plans for the management of data to be collected and budgets reflecting the cost of support for management and archiving of data.

(b) PURPOSES.—The purposes of this title are to establish climate and other global change data management and archiving as Federal agency missions, and to establish Federal policies for managing and archiving climate and other global change data.

SEC. 202. DEFINITIONS.

For purposes of this title—

(1) the term ''metadata'' means information describing the content, quality, condition, and other characteristics of climate and other global change data,

compiled, to the maximum extent possible, consistent with the requirements of the "Content Standard for Digital Geospatial Metadata" (FGDC–STD–001–1998) issued by the Federal Geographic Data Committee, or any successor standard approved by the working group; and

(2) the term "working group" means the interagency climate and other global change data management working group established under section 203.

SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT WORKING GROUP.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency climate and other global change data management working group to make recommendations for coordinating Federal climate and other global change data management and archiving activities.

(b) MEMBERSHIP.—The working group shall include the Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, the Secretary of Energy, the Secretary of Defense, the Director of the National Science Foundation, the Director of the United States Geological Survey, the Archivist of the United States, the Administrator of the Environmental Protection Agency, the Secretary of the Smithsonian Institution, or their designees, and representatives of any other Federal agencies the President considers appropriate.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, the working group shall transmit a report to the Congress containing the elements described in subsection (d). Not later than 4 years after the initial report under this subsection, and at least once every 4 years thereafter, the working group shall transmit reports updating the previous report. In preparing reports under this subsection, the working group shall consult with expected users of the data collected and archived by the Program.

(d) CONTENTS.—The reports and updates required under subsection (c) shall—

(1) include recommendations for the establishment, maintenance, and accessibility of a catalog identifying all available climate and other global change data sets;

(2) identify climate and other global change data collections in danger of being lost and recommend actions to prevent such loss;

(3) identify gaps in climate and other global change data and recommend actions to fill those gaps;

(4) identify effective and compatible procedures for climate and other global change data collection, management, and retention and make recommendations for ensuring their use by Federal agencies and other appropriate entities;

(5) develop and propose a coordinated strategy for funding and allocating responsibilities among Federal agencies for climate and other global change data collection, management, and retention;

(6) make recommendations for ensuring that particular attention is paid to the collection, management, and archiving of metadata;

(7) make recommendations for ensuring a unified and coordinated Federal capital investment strategy with respect to climate and other global change data collection, management, and archiving;

(8) evaluate the data record from each observing system and make recommendations to ensure that delivered data are free from time-dependent biases and random errors before they are transferred to long-term archives; and

(9) evaluate optimal design of observation system components to ensure a cost-effective, adequate set of observations detecting and tracking global change.

TITLE III—INTERNATIONAL COOPERATION IN GLOBAL CHANGE RESEARCH

SEC. 301. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Pooling of international resources and scientific capabilities will be essential to a successful international global change program.

(2) While international scientific planning is already underway, there is currently no comprehensive intergovernmental mechanism for planning, coordinating, or implementing research to understand global change and to mitigate possible adverse effects.

(3) An international global change research program will be important in building future consensus on methods for reducing global environmental degradation.

(4) The United States, as a world leader in environmental and Earth sciences, should help provide leadership in developing and implementing an international global change research program.

(b) PURPOSES.—The purposes of this title are to—

(1) promote international, intergovernmental cooperation on global change research;

(2) involve scientists and policymakers from developing nations in such cooperative global change research programs; and

(3) promote international efforts to provide technical and other assistance to developing nations which will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

SEC. 302. INTERNATIONAL DISCUSSIONS.

(a) GLOBAL CHANGE RESEARCH.—The President shall direct the Secretary of State to initiate discussions with other nations leading toward international protocols and other agreements to coordinate global change research activities. Such discussions should include the following issues:

(1) Allocation of costs in global change research programs, especially with respect to major capital projects.

(2) Coordination of global change research plans with those developed by international organizations such as the International Council on Scientific Unions, the World Meteorological Organization, and the United Nations Environment Program.

(3) Establishment of global change research centers and training programs for scientists, especially those from developing nations.

(4) Development of innovative methods for management of international global change research, including the use of new or existing intergovernmental organizations for the coordination or funding of global change research.

(5) Establishment of international offices to disseminate information useful in identifying, preventing, mitigating, or adapting to the possible effects of global change.

(b) ENERGY RESEARCH.—The President shall direct the Secretary of State (in cooperation with the Secretary of Energy, the Secretary of Commerce, the United States Trade Representative, and other appropriate Federal agents) to initiate discussions with other nations leading toward an international research protocol for cooperation on the development of energy technologies which have minimally adverse effects on the environment. Such discussions should include the following issues:

(1) Creation of an international cooperative program to fund research related to energy efficiency and conservation, solar and other renewable energy sources, and passively safe and diversion-resistant nuclear reactors.

(2) Creation of an international cooperative program to develop low-cost energy technologies which are appropriate to the environmental, economic, and social needs of developing nations.

(3) Exchange of information concerning environmentally safe energy technologies and practices, including those described in paragraphs (1) and (2).

II. PURPOSE OF THE BILL

The purpose of H.R. 906 is to promote and coordinate interagency global change research including the reorientation of the U.S. Global Change Research Program (USGCRP), increase the overall effectiveness and productivity of Federal global change research efforts, produce policy relevant information, and facilitate greater exchange of that information with regional, State, and local governments and other non-federal user groups and with the international community.

III. BACKGROUND AND NEED FOR THE LEGISLATION

The nation's first Climate Program preceded the USGCRP and was established by the National Climate Program Act (P.L. 95–367) in 1978. The Climate Program was intended to conduct climate research, provide climate information, and support policy decisions to ''assist the Nation and the world to understand and respond to natural and human-induced climate processes and their implications'' (P.L. 95–367, § 3). It was established as an inter-

agency program coordinated through a National Climate Program Office within the National Oceanic and Atmospheric Administration (NOAA). By the mid-1980s Congress began to consider expanding the Climate Program. At the time, the Program was thought to be producing high quality science, but it was not providing information that would lead to policy responses to threats from climate change.

In 1987, White House Science Advisor William Graham formed the Committee on Earth Sciences within the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET). The purpose of this Committee was to "increase the overall effectiveness and productivity of Federal R & D efforts directed toward an understanding of the Earth as a global system" (CES 1987).

After several years of work, Congress passed, and President Bush signed, The U.S. Global Change Research Act of 1990 (P.L. 101–606), which established the U.S. Global Change Research Program we have today. The Program is aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, and promoting discussions toward international protocols in global change research.

The law codified the interagency structure put in place by the Reagan Administration and defined the agencies that would participate in the Program. The law also requires the development of a series of 10-year plans for the conduct of research on global change by the federal government to "advance scientific understanding of global change and provide usable information on which to base policy decisions related to global change;" an evaluation of the Plan by the National Research Council; the coordination of agency budgets for global change research; and a report to Congress every four years on the consequences of climate change.

While research plans have been produced periodically by the Program and reviewed by the National Research Council as required by the law, the production of periodic assessments based upon the findings of the Program and the effects of global change on natural systems and sectors of the economy has been lacking. There has been only one comprehensive report published since the beginning of the Program satisfying this requirement of the law—the National Assessment on Climate Change published in 2001.

The current Administration continues a number of initiatives previously conducted under the Global Change Research Act. The Climate Change Science Program (CCSP) is charged with integrating science on global change produced by federal agencies. The Program is producing a series of twenty one synthesis and assessment products on a range of subjects (http://www.climatescience.gov/). The Administration also has a Climate Change Research Initiative (CCRI) and the Climate Change Technology Program (CCTP), with NOAA and DOE designated as the lead agencies, respectively. The role of the CCRI is to reduce the significant remaining uncertainties associated with understanding human-induced climate change and facilitate full use of scientific information in policy and decision making on possible response strategies for adaptation and mitigation. The role of the CCTP is to focus Federal research and development efforts on the identification and development of technologies to reduce and avoid green-

house gas emissions, capture and sequester emissions, and increase energy efficiency.

Under the United Nations Framework Convention on Climate Change (UNFCCC), major industrialized nations, including the U.S., made a voluntary pledge to reduce their greenhouse gas emissions to 1990 levels by the year 2000.

In 1990, total U.S. greenhouse gas emissions were 6,148 teragrams of carbon dioxide equivalents (Tg CO_2 Eq.). By 2000, total U.S. emissions about 14 percent above 1990 levels, or 7,033 Tg CO_2 Eq. U.S. emissions have fluctuated from 2000 through 2006, with several years showing a slight decline from 2000 emissions. U.S. emissions for 2006 were estimated to be 7,054 Tg CO_2 Eq.[1] The voluntary goal set in UNFCCC has proven to be very challenging, and to date, no industrialized nation has achieved it.

The Administration's policy has three basic objectives: slowing the growth of emissions; strengthening science, technology and institutions; and enhancing international cooperation. While the current Administration is meeting its climate change policy objectives and the rate of growth for U.S. emissions has been reduced, U.S. emissions of greenhouse gases have not yet stabilized and continue to grow. There is still much to be done if we are to return to a goal of stopping the growth of greenhouse gas emissions and eventually reversing them.

The requested budget for the major climate change programs in 2007 was estimated by the Congressional Research Service (CRS) to be 4.90 billion dollars. Of this total, the science program request totaled 1.7 billion dollars.[2] The participating agencies include virtually every department in the federal government: NASA, NSF, NOAA, DOE, USDA, DOI, HHS, EPA, the Smithsonian Institution and DOD. The core agencies that have contributed to climate change science are NASA, NOAA, NSF, and DOE.

Absent coordinated federal direction on adapting to climate change impacts, regions and states have taken action on their own to develop integrated plans to serve multiple user communities. Regional plans eliminate duplication for states with similar geographic makeup and help businesses by bringing greater uniformity and predictability to state rules and regulations. For example, Powering the Plains is a regional initiative, involving participants from the Dakotas, Minnesota, Iowa, and Wisconsin, which aims to develop strategies, policies, and demonstration projects for alternative energy sources. The Southwest Climate Change Initiative will allow Arizona and New Mexico to work together to reduce greenhouse gases and address the impacts of climate change in the region. Other such projects include the Northeast Regional Greenhouse Gas Initiative (RGGI), The Clean and Diversified Energy Initiative launched by the Western Governors Association, The West Coast Governors' Global Warming Initiative, and the New England Governors' and Eastern Canadian Premiers' Climate Action Plan. These regional and state programs would greatly benefit from in-

[1] U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2006. Report No. EPA 430–R–08–005; April 15, 2008, Executive Summary p ES–12, Table ES–4. Recent Trends in U.S. Greenhouse Gas Emissions and Sinks by Chapter/IPCC Sector (Tg CO_2 Eq.).

[2] Congressional Research Service (2007). Climate Change: Federal Expenditures; January 22; p. 3; Table 1. RL33817.

formation products generated by a user-driven climate change research program, as established in H.R. 906.

The USGCRP has continued to produce high quality science and advance our knowledge of Earth's climate system. However, the Program has not produced sufficient policy analyses and impact assessments. It has not produced information in formats that are user-friendly to a wide range of individuals and organizations seeking information about climate variability and change and its relationship to concentrations of greenhouse gases in the atmosphere. The information is generally not available in a manner that will be of ready assistance to decision makers at the federal, state, and local level working on the development of adaptation and mitigation strategies.

H.R. 906 directs the Program to develop assessments of vulnerability to climate change and to develop policy assessments that will evaluate alternative strategies for responding, adapting, and mitigating climate change that is projected to occur under different atmospheric concentrations of greenhouse gases.

The components of the core science programs of the USGCRP continue to produce useful scientific information and better, more refined understanding of the climate system. H.R. 906 does not eliminate these programs and activities. However, H.R. 906 shifts the emphasis to the production of information that is needed to develop strategies to cope with current climate change and to mitigate greenhouse gas emissions to reduce the magnitude of future climate impacts. To ensure the Program produces policy-relevant information, H.R. 906 includes a review of the Program by the National Governors Association's Center for Best Practices.

IV. HEARING SUMMARY

On Thursday, May 3, 2007 the Subcommittee on Energy and Environment, Committee on Science and Technology held a hearing on H.R. 906, The Global Climate Change Research and Data and Management Act of 2007 to hear testimony on H.R. 906 from the following witnesses:

- Dr. Philip Mote, Office of Washington State Climatologist and Affiliate Professor at the University of Washington. Dr. Mote is a research scientist at the University of Washington, in the Climate Impacts Group (CIG), and an Affiliate Professor in the Department of Atmospheric Sciences. In addition, Dr. Mote works as a consultant at Northwest Research Associates specializing in the dynamics of the tropical upper troposphere and lower stratosphere.
- Dr. Michael MacCracken, President of the International Association of Meteorology and Atmospheric Sciences of the International Union of Geodesy and Geophysics. Dr. MacCracken is the Chief Scientist for Climate Change Programs with the Climate Institute in Washington DC. He served as the U.S. Global Change Research Program (USGCRP) first Executive from 1993–1997.
- Dr. Jack Fellows, Vice President at the University Center for Atmospheric Research (UCAR). Dr. Fellows is the Vice President for Corporate Affairs at UCAR and the Director of UCAR's Office of Programs (UOP).
- Mr. Franklin Nutter, President of the Reinsurance Association of America and Member of UCAR's Board of Trustees. Mr. Nutter also served on the NCAR Advisory Council and the Weather Coali-

tion, a group of private companies, associations, and universities advocating for the advancement of weather research and applications.

- Ms. Sarah Bittleman, Office of the Governor of Oregon, Theodore R. Kulongoski, on behalf of the Western Governors Association. Ms. Sarah Bittleman is the Director of the Governor of Oregon's Washington D.C. office.
- Dr. James Mahoney, Environmental Consultant. From April 2, 2002 to March 30, 2006 Dr. Mahoney was Assistant Secretary of Commerce for Oceans and Atmosphere, and Deputy Administrator of the National Oceanic and Atmospheric Organization (NOAA). During this period, Dr. Mahoney served as the Director of the U.S. Climate Change Science Program (CCSP).

SUMMARY OF HEARING

Dr. MacCracken spoke to the Program's assessments from his experience as the former Executive Director for the USGCRP. He explained the Program's novelty and success depends upon its ability to not only coordinate the activities of 10 agencies, but also several regions. MacCracken noted that while providing information to Congress to support policy development is certainly important, preparing for and adapting and responding to the impacts of climate change must start locally and regionally.

Dr. Fellows addressed the strengths and weaknesses of the Program. He explained the Program specializes in producing the sound scientific basics for policymaking, acting as a unique interagency mechanism for coordination and planning, and tying research and observational strategies to user needs. The Program has, however, been weakened by political influences and climate politics, and has been overshadowed by other priorities. According to Fellows the legislation is timely and necessary, but could be strengthened by highlighting the Program's priorities and identifying a Program Director and Office.

Dr. Mahoney's testimony focused on Program management. While management is the responsibility of the executive branch, Mahoney explains Congress needs to guide the establishment and fund a management and coordination office. There needs to be a central location, most likely in the Office of Management and Budget (OMB), to solidify the separate parts of the 13 collaborating agencies. He also noted that in developing better user-friendly resources, the Program requires better communication and education strategies, not a de-emphasis on scientific assessments. Finally Mahoney suggests avoiding duplication by coordinating reports and output with the international community.

Mr. Nutter discussed the role of global change for reinsurance, or the insurance of insurance, companies. In 2005, the total global insured catastrophe losses were $83 billion and experts expect these losses to double every ten years. Nutter believes H.R. 906 will provide the necessary information to enhance risk assessment and lead to improved insurance markets.

Dr. Mote began his remarks by highlighting the societal demands for information about climate and what such demands mean locally. The regional and state level focus on climate change described in the legislation is valuable in connecting stakeholder needs. He recommends establishing a national program that trans-

lates high quality, modeling information into local stakeholder needs.

Ms. Bittleman testified on behalf of the Western Governor's Association and expressed the need for comprehensive user-driven information. The legislation would involve the National Governor's Association in evaluating the Program's research Plan from a user perspective. Bittleman explained that decision-makers in government and the private sector need reliable information so they can plan and respond accordingly.

Members' questions focused on the structure and timeline of the Program. Witnesses explained the director for the USGCRP needs to have sufficient authority to make decisions about and make budget decisions over the Program. Witnesses also suggested sequencing the various reports throughout a four or five year period rather than requesting a ten-year Research Plan, an Annual Plan, a Vulnerability Plan and a Policy Plan within the first year.

V. COMMITTEE ACTIONS

SUBCOMMITTEE ACTION

On February 7, 2007, Representative Mark Udall, for himself and Representative Robert Inglis, introduced H.R. 906, The Global Climate Change Research Data and Management Act of 2007.

The Subcommittee on Energy and Environment met to consider H.R. 906 on June 6, 2007 and consider the following amendment to the bill:

A Manager's amendment offered by Mr. Udall made a number of technical and substantive changes to the bill. The amendment adds outreach as an explicit purpose of the U.S. Global Change Science Program. It adds a new definition in Section 102 for regional climate change and makes conforming changes to reflect the new definition throughout the bill. In Section 103, the amendment adds information exchange and outreach with regional, State, and local governments and other user communities as a function of the Interagency Committee. It amends Section 105 to require a single Research and Assessment Plan and changes the deadlines for submission to Congress for the Plan's outline, the Plan, and subsequent revisions to it to one year, 3 years, and every 5 years, respectively and adds a description of outreach activities as a required element of the Plan. In Section 107, the amendment restores the requirement from the original law for making projections of climate change over 25- and 100-year time horizons and adds water availability and coastal infrastructure to the list of effects of global change the Program should assess. It also ties the Assessments required in Sec. 107 to the schedule and contents of the IPCC Working Group Reports to facilitate maximum use of resources used to produce these reports and distribution of the information contained within them. It amends Section 110 to direct the President to utilize the authorities in the 1978 National Climate Program Act as a mechanism to facilitate ongoing information exchange with regional, State, and local governments and other user communities. Finally, it amends Section 203 to establish a 4-year reporting cycle for the Interagency Working Group on Climate Data after the first report is produced. *The amendment was agreed to by voice vote.*

Mr. Inglis moved that the Subcommittee favorably report the bill, H.R. 906, to the Full Committee on Science and Technology. The motion was agreed to by a voice vote.

FULL COMMITTEE ACTION

The Science and Technology Committee met to consider H.R. 906, as well as other legislation, on June 27, 2007 and consider the following amendments to the bill:

1. A manager's amendment offered by Mr. Udall which, in addition to changes of a technical nature, includes a requirement in Section 103 for the Interagency Committee to subdivide the U.S. into regions that are likely to experience similar impacts or to share similar vulnerabilities to global change; changed language in Section 107 to require the Program to summarize the vulnerabilities to climate change for all regions of the world and analyze the implications for the U.S. and its international interests; incorporated language provided by the Administration to ensure that the information used to produce the IPCC reports and other assessments and reports is fully utilized and incorporated into the assessments required under Section 107; strikes Section 303 of the bill and adds a new Section 112 directing the President to designate a Global Change Research Information Exchange too make information accessible through electronic means. *The amendment was agreed to by voice vote.*

2. An amendment offered by Mr. Udall that designates the Office of Science & Technology Policy (OSTP) as the lead agency of the USGCRP, creating a single point of contact responsible for the Program and authorizing $10 million per year for OSTP to perform interagency tasks designated within the Strategic Plan. This will allow for the distribution of specific funds to cover these activities which now are not funded through any of the individual agencies' budgets. *The amendment was agreed to by voice vote.*

3. An amendment offered by Mr. Gingrey that directs the President to commission the National Academy of Sciences and National Academy of Public Administration to do a policy analysis that includes: an evaluation of implemented and proposed policy options for adapting to and mitigating climate change with respect to their costs and benefits, their adoption rates and the barriers to their adoption. *The amendment was agreed to by voice vote.*

4. An amendment offered by Ms. Woolsey that directs the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA) to commission an Ice Sheet Study by the National Academy of Sciences to examine the current status of ice sheet melt related to climate change and its implications for global sea level rise. *The amendment was agreed to by voice vote.*

5. An amendment offered by Ms. Johnson that directs NOAA and NSF to commission a study by the National Academy of Sciences to examine the current state of the science on the potential impacts of climate change on patterns of hurricane and typhoon development, including storm intensity, track and frequency and the implications for hurricane- and typhoon-prone coastal regions. *The amendment was agreed to by voice vote.*

Mr. Hall moved that the Full Committee favorably report the bill, H.R. 906, to the Full Committee on Science and Technology. *The motion was agreed to by a voice vote.*

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL, AS REPORTED

H.R. 906 re-orients the U.S. Global Change Research Program (USGCRP) to produce more policy-relevant information and facilitate greater exchange of that information with regional, State, and local governments and with other non-federal user groups. H.R. 906 directs the President to designate an interagency committee to coordinate all federal research activities in the area of global change and to facilitate the use of that information by agencies with authority over resources likely to be affected by global change. The interagency committee is directed to develop and implement a Research and Assessment Plan to guide and communicate the results of the Program, respectively. The Plan is revised on a 5-year cycle.

Section 104 designates the Office of Science and Technology Policy (OSTP) as the lead agency for the Program and authorizes $10 million per year to fund activities that are included in the Plan, that involve two or more participating agencies, and for which no funding is provided in individual agency budgets. The Director of OSTP is required to conduct at least one workshop in each of the regions of the U.S. identified under the Plan to facilitate information exchange between the federal program and regional, state, and local governments and other interested non-federal parties.

Section 105 requires a review of the Plan for its scientific merit by the National Academy of Sciences. In order to ensure the policy-relevance of information produced through this Program, H.R. 906 includes a review of the Research and Assessment Plan by the Center for Best Practices of the National Governors Association. The Center will convene a group under a contract from the federal government to assess the Plan from the perspective of regional, State, and local governments. The Plan is also subject to a public comment period of at least 60 days.

H.R. 906 continues the current Program activities in climate and global change research, but it emphasizes the need to produce tangible, policy-relevant products that periodically synthesize the information generated by this Program. Section 107 requires the President to submit to Congress an assessment that integrates the scientific findings of the Program, analyzes current trends in global change and projects the trends for 25- and 100-year periods into the future; analyzes changes in the environment and key socio-economic sectors for major geographic regions of the U.S.; and analyzes the implications of the potential impacts of global change in other regions of the world on the U.S. and on U.S. international assistance and other international interests.

In addition, H.R. 906 requires a policy assessment intended to provide information about the range of policy options available to adapt and mitigate climate change. It also includes authorization for several targeted studies by the National Academy of Sciences on two subjects with important implications for the U.S., especially for coastal communities: the potential for significant sea level rise due to ice sheet melting and the potential for increased intensity of hurricanes and typhoons.

H.R. 906 also directs the President to designate an interagency committee to coordinate the collection, management, archiving, and distribution of the many data bases and data sets controlled by various agencies of the federal government. The committee is required to report to Congress on the status of global observing networks, the maintenance of climate and global change data records, and the status of efforts to better coordinate the data collection, archiving and distribution functions of all participating federal agencies.

Finally, H.R. 906 directs the President through the Secretary of State to facilitate U.S. leadership and participation in international global change research efforts and energy research.

VII. SECTION-BY-SECTION ANALYSIS (BY TITLE AND SECTION), AS REPORTED

TITLE I: GLOBAL CHANGE RESEARCH

Section 101: Findings and purpose

The purpose of the bill is to reauthorize and amend the 1990 law authorizing the U.S. Global Change Research Program to provide for a continued Earth and climate observation, research, and outreach program. The bill also authorizes the Program to provide information that will enable us to understand the potential impacts of climate change on both regional and global scales and to provide information that will allow federal, state, and local governments to adapt and respond to the effects of climate change.

Section 102: Definitions

Section 102 defines the following terms for the purposes of this legislation: global change, global change research, regional climate change, interagency committee, Plan, and Program.

Section 103: Interagency cooperation and coordination

Establishes an interagency committee to oversee and coordinate the Program and defines the functions of the interagency committee, including the function of facilitating ongoing information exchange between the Program and regional, State, and local governments and other user communities.

Section 104: United States global climate change research program

Section 104 directs the President to establish an interagency U.S. Global Research Program. The Office of Science and Technology (OSTP) is established as the lead agency for the U.S. Global Change Research Program, and the Director of OSTP is responsible for the distribution of funds to cover interagency activities of the Program that are not funded through any of the individual agencies' budgets. A sum of $10 million dollars is authorized to be appropriated to OSTP for each fiscal year from FY 2008 to FY 2013.

Section 105: National global change research and assessment plan

Section 105 directs the President to develop and deliver to Congress an initial outline of the Plan to guide the interagency activities conducted under the U.S. Global Change Research Program, the completed Plan in three years, and an updated Plan every five years. This section defines the contents of the Plan and the min-

imum research elements of the Plan. It also directs that the Plan incorporate the recommendations of the interagency working group established under Section 203.

The section also requires two evaluations of the Plan, one by the National Academy of Sciences, for the review of the scientific merit of the proposed program, and the other for a review by the Center for Best Practices of the National Governors Association to evaluate the proposed program's utility for meeting the information needs of state, local and regional decision-makers. This section also provides for public review of the Plan including its publication in the Federal Register with a comment period of at least 60 days.

Section 106: Budget coordination

Section 106 requires the President to provide guidance to each Federal agency participating in the Program to identify funds to carry out the Program and to include a request for the activities in his annual budget.

Section 107: Vulnerability assessment

Section 107 requires the President to submit an assessment to Congress one year after enactment and then at intervals of every five years. The section defines the contents of the assessment to include: a summary of the scientific findings of the Program and the uncertainties associated with the findings; analyses of changes to natural systems at regional and continental scales; analyses of the effects of global change on human social and economic systems at regional and continental scales; analyses of regional vulnerabilities to global change; and summary of policies and technologies to reduce the identified vulnerabilities and their rates of adoption.

Section 108: Policy assessment

Section 108 requires the President to enter into an agreement with the National Academy of Public Administration and the National Academy of Sciences to do a policy analysis that includes: an evaluation of implemented and proposed policy options for adapting to and mitigating climate change with respect to their costs and benefits, their adoption rates and the barriers to their adoption the costs and benefits of mitigation and adaptation policy options for addressing climate change. This assessment is due not later than 1 year after the enactment of this legislation and at least once every 4 years thereafter.

Section 109: Annual report

Section 109 requires the President to submit an annual report to Congress with a description of the activities of the Plan during the past fiscal year, a description of the activities planned for the next fiscal year, and a description of the decision makers identified as potential users and the activities used to facilitate consultation with those user groups.

Section 110: Relation to other authorities

Section 110 requires coordination of the activities authorized under this program with those of the National Climate Program.

Section 111: Repeal

This section repeals the *Global Change Research Act of 1990*.

Section 112: Global change research information

Section 112 requires the President to establish or designate a Global Research Information Exchange to make scientific research available to use in preventing, mitigating, or adapting to the effects of global change through electronic means.

Section 113: Ice sheet study and report

Section 113 requires the Director of the National Science Foundation and the Administrator of the National Oceanic and Atmospheric Administration to enter into an agreement with the National Academy of Sciences to complete a study to examine the current status of ice sheet melt in relation to climate change and its implications for global sea level rise. The study shall be completed no later than 18 months after the bill is enacted.

Section 114: Hurricane frequency and intensity study and report

Section 114 requires the Administrator of the National Oceanic and Atmospheric Administration and the Director of the National Science Foundation to enter into an agreement with the National Academy of Sciences to evaluate the current state of the science on the potential impacts of climate change on patterns of hurricane and typhoon development, including storm intensity, track and frequency and the implications for hurricane- and typhoon-prone coastal regions.

TITLE II: CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT

Section 201: Findings and purposes

Section 201 establishes climate and global change data management and archiving as federal agency missions and establishes policies for managing and archiving these data.

Section 202: Definitions

Section 202 defines the following terms for the purposes of this legislation: metadata and working group.

Section 203: Interagency climate and other global change data management working group

Section 203 directs the President to establish an interagency working group to coordinate Federal global change data management and archiving activities. The section also defines the membership in the interagency group and requires the working group to report to Congress with recommendations for the maintenance and archiving of data related to global change.

TITLE III: INTERNATIONAL COOPERATION IN GLOBAL CHANGE RESEARCH

Section 301: Findings and purpose

The purpose of this title is to promote international cooperation on global change research.

Section 302: International discussions

Section 302 directs the President to initiate discussion with other nations on coordination global change research. It also directs the President to initiate discussion with other nations on cooperation of research and development of energy technologies that have minimal adverse effects on the environment.

VIII. COMMITTEE VIEWS

The debate about whether climate change is occurring and about whether human activity has contributed to it is over. As our population, economy, and infrastructure have grown, pressure on the natural resources upon which we depend has increased along with the need for strategies to adapt and mitigate climate change. The impacts of climate change are only exacerbating already sparse resources and deadly natural disasters.

For all of these reasons, it is the Committee's view that the U.S. Global Change Research Program should produce more information that is readily useable by decision makers and resource managers in government and in the private sector. People throughout this country and in the rest of the world need information they can use to develop response, adaptation, and mitigation strategies to make our communities, our businesses, and our nation more resilient and less vulnerable to climate change.

The U.S. Global Change Research Program has produced high quality science and greatly expanded our understanding of Earth's climate system and improved projections of the likely changes in the system we will experience due to increased greenhouse gas concentrations in the atmosphere.

The Committee believes the emphasis of the Program needs to be on producing more information at the regional scale. The Committee recognizes that regional scale models of climate and the data sets to support them are not as fully developed as the global climate models. However, programs such as NOAA's Regional Integrated Sciences and Assessments (RISA) Program produce information at this scale. The Committee believes the Program should be placing greater emphasis on improvement of our understanding of the implications of global climate change on different regions of the country since this is a more realistic scale for development of adaptation and mitigation strategies. The Committee commends the Administration for their efforts to include regionally-based information in several of the twenty one assessment reports[3] they are producing under the USGCRP and for their effort to develop methodologies that will permit further regional analyses to be performed in future reports.

H.R. 906 includes changes to the provisions in P.L. 101–606 that establish the interagency committee that implements the USGCRP. Over the life of this Program, and through different administrations, the structure of the interagency group governing the USGCRP has deviated from the specific structure included in Section 102 of P.L. 101–606. The changes adopted by the Committee

[3] U.S. Climate Change Science Program. Impacts of Climate Change Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I. Synthesis and Assessment Product 4.7, March 2008. 439 pp. and Effects of Climate Change on energy Production and Use in the United States, Synthesis and Assessment Product 4.5, October 2007.

to existing law in Section 103 of H.R. 906 reflect this reality and the Committee's view that the Administration should have the flexibility to select the specific structure for the interagency committee governing this program.

Current law designates a chairperson selected from among the agency representatives that serve on the interagency committee to lead the work of the committee. The leadership of the committee rotates among various agencies under current law. Witnesses appearing before the Committee testified to the need for a designated lead for the Program. The Committee believes the USGCRP needs consistent leadership. The use of the interagency office to guide this Program would also ensure the Program was not viewed as the primary responsibility of the single agency or department that currently is chairing the interagency group, but as a true interagency effort. The Committee believes that the Director of the Office of Science and Technology Policy (OSTP) should take on this role and H.R. 906, Section 104 designates OSTP as the lead agency for the USGCRP. The functions of the OSTP Director included in Section 204 of P.L. 94–282 are consistent with the need for leadership on the scientific and policy issues addressed through the USGCRP. As an interagency office, OSTP is positioned to take a broad view of overall government resources and capabilities that must be brought together to address climate and other global environmental change. The Committee expects the Director of OSTP to work with the OMB to ensure that agency budget allocations are sufficient to meet the Program goals outlined in the Program Plan.

Individual agency budgets include funding for programs that are part of the USGCRP. These are often dual purpose programs in that they are activities of the USGCRP and they also are directly related to the mission and statutory obligations of the individual agency. The Committee recognizes that there are a number of activities essential to the USGCRP that are not funded in individual agency budgets. The Committee believes that funds must be available to support activities of the USGCRP that are not funded within individual agency budgets and require the participation of two or more agencies. Witnesses at the hearing identified several activities that fall into this category and the Committee explicitly included several such activities in H.R. 906. As lead agency for the Program, OSTP has been authorized funds that are to be utilized for this purpose. Activities associated with information exchange and outreach functions of the USGCRP are not funded through individual agency budgets, and the Committee believes communication between the USGCRP and non-federal entities is essential to ensure that information produced by the USGCRP is relevant to decision-makers in state and local governments as well as in the private sector.

The Committee included specific direction to hold annual workshops in each of the regions of the country identified in accordance with the Program. The Committee believes the activities of the USGCRP have been too concentrated within the federal government and insufficient opportunities have been provided for dialogue and information exchange with resource managers, planners, and other decision makers at the state and local government level and with the private sector. The ongoing dialogue and exchange of information provided through these workshops will assist federal

agencies participating in the USGCRP to focus the Program to ensure it will serve the information needs of the organizations that are developing, and will continue to develop adaptation and mitigation strategies to reduce society's vulnerability to climate change.

The Committee believes the USGCRP should produce periodic assessments that synthesize the knowledge gained through this program and as a means to convey information about the likely impacts of climate change for key sectors of the U.S. economy, for natural ecosystems, and for communities in different regions of the U.S. In addition to the potential impacts, the Committee believes the USGCRP assessments should include information about vulnerability to climate change to guide the development strategies that will reduce the identified vulnerabilities. Although current law requires assessments to be produced every four years, the Program has produced only one assessment since the law was enacted in 1990. The Committee believes the assessment function is essential. Scientists associated with the USGCRP have produced significant contributions toward the production of four assessments for the Intergovernmental Panel on Climate Change (IPCC).

The Committee does not intend to create a separate, dual process to that of the IPCC for the development of the assessments required under H.R. 906. The Committee believes that much of the information needed to produce the assessments under this Act may be drawn from reports produced for the IPCC and information and reports produced through the USGCRP and other existing programs. The Committee adopted language in Section 107(b) of H.R. 906 to clarify its intention that assessment reports periodically synthesize and organize existing information to identify key trends and findings that decision makers can evaluate and use to guide policy development. Since research is ongoing, periodic updates to highlight new information are also needed. To be of maximum utility to decision makers, the assessments should be concise and the Committee anticipates these documents would be similar to the Summaries for Policymakers produced for the IPCC.

The Committee is aware of the Administration's current efforts to produce twenty one assessment products under the USGCRP on a variety of topics. The Committee anticipates these reports in conjunction with the material from the recent IPCC reports will include the information necessary to meet the first deadline in Section 107 of this legislation.

Section 105 of H.R. 906 requires the Plan for the USGCRP to tie its research to the information needs of the people making decisions about development and resources at all levels of government. It also requires the Plan to identify observing systems needed to ensure adequate monitoring of climate and global change. The Plan also must identify and describe the regions of the U.S. that will become the focus of climate and global change research and assessment at the regional scale. The Committee believes the research of the USGCRP must be guided by a Plan that incorporates user information needs. Furthermore, the Committee believes the research Plan should be evaluated to ensure its scientific merit and to ensure the relevance of USGCRP research to the user community. The Committee believes the National Academy of Sciences' review of past USGCRP research Plans has been an effective means to guide the development of the science undertaken by the Program.

The Committee believes review of the Plan by the National Governors' Association Center for Best Practices would provide a similar guidance to the USGCRP on the potential for the research to deliver the policy relevant information needed to guide development of adaptation and mitigation policies. The Committee anticipates the Center will coordinate with regional governors' associations and appropriate county and state organizations when undertaking their review of the Plan.

The Committee recognizes that climate change policies are being developed and implemented by state and local governments in many areas of the country. There are numerous options under consideration to reduce greenhouse gas emissions and to adapt to changes in resource availability or in climate that are already being experienced in some areas, including policies to address climate impacts or resource constraints that result from local land-use changes. The Committee recognizes that alternative policy choices will impact different groups in society and different sectors of the economy with respect to the costs and benefits of their implementation. H.R. 906 includes a requirement for a periodic policy assessment by the National Academy of Public Administration and the National Academy of Sciences. The Committee believes an assessment comparing the resulting emission reductions and the distribution of costs and benefits of the different policy options being implemented across the U.S. would promote greater dialogue and accelerate development, selection, and implementation of cost-effective policies to address climate and global change. The Committee recognizes that the two Academies are entirely different organizations. The Committee intends this joint study to draw upon the particular analytical strengths of each organization to produce a comprehensive report.

Coastal areas account for much of the fastest population growth and expansion of infrastructure, development, and commerce, and the U.S. has an extensive coastline that is home to 53 percent of the population. Two projected impacts of climate change are of particular concern to these areas: sea level rise and the potential for increased frequency and intensity of hurricanes. Due to the vulnerability of our population and the potential for severe economic disruption in our coastal areas, the Committee believes we would benefit from a review of the most recent science and recommendations for increased attention to refine the projections of the potential impacts due to these phenomena prior to the next comprehensive climate change impact review by the IPCC. Sections 113 and 114 of H.R. 906 require the administration to contract with the National Academy of Sciences to convene a panel of scientists to complete studies of these two phenomena. The Committee believes these studies should be initiated shortly after the bill becomes law.

The many agencies of the federal government gather data and information at many times and geographic scales in the performance of their missions and to meet their statutory obligations. In achieving the goals of the Plan envisioned in this legislation, the data collection, management and archiving issues now facing the agencies will increase in magnitude as policymakers seek answers to questions on regional as well as global levels. The Committee believes federal agencies must coordinate their data and information collection activities to support climate and global change research and

development and the production of national and regional assessments of the potential impacts of changes in climate and other environmental, economic and social conditions. Better coordination will ensure the Nation receives the full benefit of the significant investments made in climate and global change research. The Committee recognizes the Administration has organized such an interagency committee like that outlined in Title II, believes its activity will continue to be of vital importance in the future, and intends this language to give its work a statutory foundation.

The Committee directs that these data and information resources be catalogued and made available to the public. Finally, because studies investigating the Earth's variation over long time scales are fundamental to our understanding of global change, the federal government must ensure it has adequate plans to assure the continuing availability of these resources by providing for proper archiving in the decades to come.

IX. COST ESTIMATE

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is included in Section X of this report pursuant to House rule XIII, clause 3(c)(3).

H.R. 906 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 906 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

H.R. 906—Global Change Research and Data Management Act of 2007

Summary: H.R. 906 would repeal the Global Change Research Act of 1990 and replace it with the text of this legislation, aimed at supporting research on natural and human-induced changes in the global environment and coordinating interagency research programs.

CBO estimates that implementing H.R. 906 would cost $10 million in 2008 and about $50 million over the 2008–2012 period, subject to appropriation of the specified and necessary funds. Enacting the bill would not affect direct spending or revenues.

H.R. 906 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA). Any costs to state and local governments would be incurred voluntarily.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 906 is shown in the following table. The costs of this legislation fall within budget functions 250 (general science, space, and technology) and 800 (general government).

	By fiscal year, in millions of dollars—				
	2008	2009	2010	2011	2012
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
United States Global Change Research Program:					
Authorization Level	10	10	10	10	10
Estimated Outlays	8	10	10	10	10
Reports:					
Estimated Authorization Level	2	1	*	*	*
Estimated Outlays	2	1	*	*	*
Total Changes:					
Estimated Authorization Level	12	11	10	10	10
Estimated Outlays	10	11	10	10	10

* = less than $500,000.

Basis of estimate: For this estimate, CBO assumes that the legislation will be enacted near the start of fiscal year 2008, that the specified and necessary amounts will be appropriated for each fiscal year, and that outlays will follow historical trends for similar activities. CBO estimates that implementing H.R. 906 would cost $10 million in 2008 and about $50 million over the 2008–2012 period.

United States Global Change Research Program

Section 104 would establish an interagency United States Global Change Research Program and authorize the appropriation of $10 million a year over the 2008–2013 period. Under this program, the Office of Science and Technology Policy would work with other federal agencies on climate change programs and workshops. Assuming appropriation of the specified amounts, CBO estimates that implementing this program would cost $8 million in 2008 and $48 million over the 2008–2012 period.

Reports

H.R. 906 would require reports by the National Academy of Sciences within 18 months of enactment on the status of the earth's ice sheets, and on the impact of climate change on the frequency and severity of hurricanes and typhoons. The legislation also would establish an interagency working group to report on the coordination of activities related to the management and archival of federal climate and global change data. Based on the cost of similar studies, CBO estimates that the reports would cost $3 million over the 2008–2012 period.

Intergovernmental and private-sector impact: H.R. 906 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would require the responsible federal entities to consult with state, regional, and local authorities. Any costs to state and local governments would be incurred voluntarily.

Estimate prepared by: Federal Costs: Matthew Pickford. Impact on State, Local, and Tribal Governments: Neil Hood. Impact on the Private Sector: Amy Petz.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

XI. COMPLIANCE WITH PUBLIC LAW 104–4

H.R. 906 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The oversight findings and recommendations of the Committee on Science and Technology are reflected in the body of this report.

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c) of House rule XIII, the goal of H.R. 906 is to advance global change research through interagency cooperation and coordination; by establishing an interagency United States Global Change Research Program, a National Global Change Research Plan, and an interagency climate and other global change data management working group; and through international cooperation in global change research.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 906.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 906 does not establish nor authorize the establishment of any advisory committee.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 906 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. EARMARK IDENTIFICATION

H.R. 906 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9(d), 9(e), or 9(f) of rule XXI.

XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

XIX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

GLOBAL CHANGE RESEARCH ACT OF 1990

AN ACT To require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions toward international protocols in global change research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

[SECTION 1. SHORT TITLE.

[This Act may be cited as the "Global Change Research Act of 1990".

[SEC. 2. DEFINITIONS.

[As used in this Act, the term—

[(1) "Committee" means the Committee on Earth and Environmental Sciences established under section 102;

[(2) "Council" means the Federal Coordinating Council on Science, Engineering, and Technology;

[(3) "global change" means changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, and ecological systems) that may alter the capacity of the Earth to sustain life;

[(4) "global change research" means study, monitoring, assessment, prediction, and information management activities to describe and understand—

[(A) the interactive physical, chemical, and biological processes that regulate the total Earth system;

[(B) the unique environment that the Earth provides for life;

[(C) changes that are occurring in the Earth system; and

[(D) the manner in which such system, environment, and changes are influenced by human actions;

[(5) "Plan" means the National Global Change Research Plan developed under section 104, or any revision thereof; and

[(6) "Program" means the United States Global Change Research Program established under section 103.

[TITLE I—UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM

[SEC. 101. FINDINGS AND PURPOSE.

[(a) FINDINGS.—The Congress makes the following findings:

[(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that may significantly alter the Earth habitat within a few human generations.

[(2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant global warming and thus alter world climate patterns and increase global sea levels. Over the next century, these consequences could adversely affect world agricultural and marine production, coastal habit-

ability, biological diversity, human health, and global economic and social well-being.

[(3) The release of chlorofluorocarbons and other stratospheric ozone-depleting substances is rapidly reducing the ability of the atmosphere to screen out harmful ultraviolet radiation, which could adversely affect human health and ecological systems.

[(4) Development of effective policies to abate, mitigate, and cope with global change will rely on greatly improved scientific understanding of global environmental processes and on our ability to distinguish human-induced from natural global change.

[(5) New developments in interdisciplinary Earth sciences, global observing systems, and computing technology make possible significant advances in the scientific understanding and prediction of these global changes and their effects.

[(6) Although significant Federal global change research efforts are underway, an effective Federal research program will require efficient interagency coordination, and coordination with the research activities of State, private, and international entities.

[(b) PURPOSE.—The purpose of this title is to provide for development and coordination of a comprehensive and integrated United States research program which will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.

[SEC. 102. COMMITTEE ON EARTH AND ENVIRONMENTAL SCIENCES.

[(a) ESTABLISHMENT.—The President, through the Council, shall establish a Committee on Earth and Environmental Sciences. The Committee shall carry out Council functions under section 401 of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6651) relating to global change research, for the purpose of increasing the overall effectiveness and productivity of Federal global change research efforts.

[(b) MEMBERSHIP.—The Committee shall consist of at least one representative from—

[(1) the National Science Foundation;

[(2) the National Aeronautics and Space Administration;

[(3) the National Oceanic and Atmospheric Administration of the Department of Commerce;

[(4) the Environmental Protection Agency;

[(5) the Department of Energy;

[(6) the Department of State;

[(7) the Department of Defense;

[(8) the Department of the Interior;

[(9) the Department of Agriculture;

[(10) the Department of Transportation;

[(11) the Office of Management and Budget;

[(12) the Office of Science and Technology Policy;

[(13) the Council on Environmental Quality;

[(14) the National Institute of Environmental Health Sciences of the National Institutes of Health; and

[(15) such other agencies and departments of the United States as the President or the Chairman of the Council considers appropriate.

Such representatives shall be high ranking officials of their agency or department, wherever possible the head of the portion of that agency or department that is most revelant to the purpose of the title described in section 101(b).

[(c) CHAIRPERSON.—The Chairman of the Council, in consultation with the Committee, biennially shall select one of the Committee members to serve as Chairperson. The Chairperson shall be knowledgeable and experienced with regard to the administration of scientific research programs, and shall be a representative of an agency that contributes substantially, in terms of scientific research capability and budget, to the Program.

[(d) SUPPORT PERSONNEL.—An Executive Secretary shall be appointed by the Chairperson of the Committee, with the approval of the Committee. The Executive Secretary shall be a permanent employee of one of the agencies or departments represented on the Committee, and shall remain in the employ of such agency or department. The Chairman of the Council shall have the authority to make personnel decisions regarding any employees detailed to the Council for purposes of working on business of the Committee pursuant to section 401 of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6651).

[(e) FUNCTIONS RELATIVE TO GLOBAL CHANGE.—The Council, through the Committee, shall be responsible for planning and coordinating the Program. In carrying out this responsibility, the Committee shall—

[(1) serve as the forum for developing the Plan and for overseeing its implementation;

[(2) improve cooperation among Federal agencies and departments with respect to global change research activities;

[(3) provide budgetary advice as specified in section 105;

[(4) work with academic, State, industry, and other groups conducting global change research, to provide for periodic public and peer review of the Program;

[(5) cooperate with the Secretary of State in—

[(A) providing representation at international meetings and conferences on global change research in which the United States participates; and

[(B) coordinating the Federal activities of the United States with programs of other nations and with international global change research activities such as the International Geosphere-Biosphere Program;

[(6) consult with actual and potential users of the results of the Program to ensure that such results are useful in developing national and international policy responses to global change; and

[(7) report at least annually to the President and the Congress, through the Chairman of the Council, on Federal global change research priorities, policies, and programs.

[SEC. 103. UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM.

[The President shall establish an interagency United States Global Change Research Program to improve understanding of global change. The Program shall be implemented by the Plan developed under section 104.

[SEC. 104. NATIONAL GLOBAL CHANGE RESEARCH PLAN.

[(a) IN GENERAL.—The Chairman of the Council, through the Committee, shall develop a National Global Change Research Plan for implementation of the Program. The Plan shall contain recommendations for national global change research. The Chairman of the Council shall submit the Plan to the Congress within one year after the date of enactment of this title, and a revised Plan shall be submitted at least once every three years thereafter.

[(b) CONTENTS OF THE PLAN.—The Plan shall—

[(1) establish, for the 10-year period beginning in the year the Plan is submitted, the goals and priorities for Federal global change research which most effectively advance scientific understanding of global change and provide usable information on which to base policy decisions relating to global change;

[(2) describe specific activities, including research activities, data collection and data analysis requirements, predictive modeling, participation in international research efforts, and information management, required to achieve such goals and priorities;

[(3) identify and address, as appropriate, relevant programs and activities of the Federal agencies and departments represented on the Committee that contribute to the Program;

[(4) set forth the role of each Federal agency and department in implementing the Plan;

[(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies and departments, the National Research Council, or other entities;

[(6) make recommendations for the coordination of the global change research activities of the United States with such activities of other nations and international organizations, including—

[(A) a description of the extent and nature of necessary international cooperation;

[(B) the development by the Committee, in consultation when appropriate with the National Space Council, of proposals for cooperation on major capital projects;

[(C) bilateral and multilateral proposals for improving worldwide access to scientific data and information; and

[(D) methods for improving participation in international global change research by developing nations; and

[(7) estimate, to the extent practicable, Federal funding for global change research activities to be conducted under the Plan.

[(c) RESEARCH ELEMENTS.—The Plan shall provide for, but not be limited to, the following research elements:

[(1) Global measurements, establishing worldwide observations necessary to understand the physical, chemical, and biological processes responsible for changes in the Earth system on all relevant spatial and time scales.

[(2) Documentation of global change, including the development of mechanisms for recording changes that will actually occur in the Earth system over the coming decades.

[(3) Studies of earlier changes in the Earth system, using evidence from the geological and fossil record.

[(4) Predictions, using quantitative models of the Earth system to identify and simulate global environmental processes and trends, and the regional implications of such processes and trends.

[(5) Focused research initiatives to understand the nature of and interaction among physical, chemical, biological, and social processes related to global change.

[(d) INFORMATION MANAGEMENT.—The Plan shall provide recommendations for collaboration within the Federal Government and among nations to—

[(1) establish, develop, and maintain information bases, including necessary management systems which will promote consistent, efficient, and compatible transfer and use of data;

[(2) create globally accessible formats for data collected by various international sources; and

[(3) combine and interpret data from various sources to produce information readily usable by policymakers attempting to formulate effective strategies for preventing, mitigating, and adapting to the effects of global change.

[(e) NATIONAL RESEARCH COUNCIL EVALUATION.—The Chairman of the Council shall enter into an agreement with the National Research Council under which the National Research Council shall—

[(1) evaluate the scientific content of the Plan; and

[(2) provide information and advice obtained from United States and international sources, and recommended priorities for future global change research.

[(f) PUBLIC PARTICIPATION.—In developing the Plan, the Committee shall consult with academic, State, industry, and environmental groups and representatives. Not later than 90 days before the Chairman of the Council submits the Plan, or any revision thereof, to the Congress, a summary of the proposed Plan shall be published in the Federal Register for a public comment period of not less than 60 days.

[SEC. 105. BUDGET COORDINATION.

[(a) COMMITTEE GUIDANCE.—The Committee shall each year provide general guidance to each Federal agency or department participating in the Program with respect to the preparation of requests for appropriations for activities related to the Program.

[(b) SUBMISSION OF REPORTS WITH AGENCY APPROPRIATIONS REQUESTS.—(1) Working in conjunction with the Committee, each Federal agency or department involved in global change research shall include with its annual request for appropriations submitted to the President under section 1108 of title 31, United States Code, a report which—

[(A) identifies each element of the proposed global change research activities of the agency or department;

[(B) specifies whether each element (i) contributes directly to the Program or (ii) contributes indirectly but in important ways to the Program; and

[(C) states the portion of its request for appropriations allocated to each element of the Program.

[(2) Each agency or department that submits a report under paragraph (1) shall submit such report simultaneously to the Committee.

[(c) CONSIDERATION IN PRESIDENT'S BUDGET.—(1) The President shall, in a timely fashion, provide the Committee with an opportunity to review and comment on the budget estimate of each agency and department involved in global change research in the context of the Plan.

[(2) The President shall identify in each annual budget submitted to the Congress under section 1105 of title 31, United States Code, those items in each agency's or department's annual budget which are elements of the Program.

[SEC. 106. SCIENTIFIC ASSESSMENT.

[On a periodic basis (not less frequently than every 4 years), the Council, through the Committee, shall prepare and submit to the President and the Congress an assessment which—

[(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

[(2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and

[(3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years.

[SEC. 107. ANNUAL REPORT.

[(a) GENERAL.—Each year at the time of submission to the Congress of the President's budget, the Chairman of the Council shall submit to the Congress a report on the activities conducted by the Committee pursuant to this title, including—

[(1) a summary of the achievements of the Program during the period covered by the report and of priorities for future global change research;

[(2) an analysis of the progress made toward achieving the goals of the Plan;

[(3) expenditures required by each agency or department for carrying out its portion of the Program, including—

[(A) the amounts spent during the fiscal year most recently ended;

[(B) the amounts expected to be spent during the current fiscal year; and

[(C) the amounts requested for the fiscal year for which the budget is being submitted.

[(b) RECOMMENDATIONS.—The report required by subsection (b) shall include recommendations by the President concerning—

[(1) changes in agency or department roles needed to improve implementation of the Plan; and

[(2) additional legislation which may be required to achieve the purposes of this title.

[SEC. 108. RELATION TO OTHER AUTHORITIES.

[(a) NATIONAL CLIMATE PROGRAM RESEARCH ACTIVITIES.—The President, the Chairman of the Council, and the Secretary of Commerce shall ensure that relevant research activities of the National Climate Program, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global change research efforts.

[(b) AVAILABILITY OF RESEARCH FINDINGS.—The President, the Chairman of the Council, and the heads of the agencies and departments represented on the Committee, shall ensure that the research findings of the Committee, and of Federal agencies and departments, are available to—

[(1) the Environmental Protection Agency for use in the formulation of a coordinated national policy on global climate change pursuant to section 1103 of the Global Climate Protection Act of 1987 (15 U.S.C. 2901 note); and

[(2) all Federal agencies and departments for use in the formulation of coordinated national policies for responding to human-induced and natural processes of global change pursuant to other statutory responsibilities and obligations.

[(c) EFFECT ON FEDERAL RESPONSE ACTIONS.—Nothing in this title shall be construed, interpreted, or applied to preclude or delay the planning or implementation of any Federal action designed, in whole or in part, to address the threats of stratospheric ozone depletion or global climate change.

[TITLE II—INTERNATIONAL COOPERATION IN GLOBAL CHANGE RESEARCH

[SEC. 201. SHORT TITLE.

[This title may be cited as the "International Cooperation in Global Change Research Act of 1990".

[SEC. 202. FINDINGS AND PURPOSES.

[(a) FINDINGS.—The Congress makes the following findings:

[(1) Pooling of international resources and scientific capabilities will be essential to a successful international global change program.

[(2) While international scientific planning is already underway, there is currently no comprehensive intergovernmental mechanism for planning, coordinating, or implementing research to understand global change and to mitigate possible adverse effects.

[(3) An international global change research program will be important in building future consensus on methods for reducing global environmental degradation.

[(4) The United States, as a world leader in environmental and Earth sciences, should help provide leadership in developing and implementing an international global change research program.

[(b) PURPOSES.—The purposes of this title are to—

[(1) promote international, intergovernmental cooperation on global change research;

[(2) involve scientists and policymakers from developing nations in such cooperative global change research programs; and

[(3) promote international efforts to provide technical and other assistance to developing nations which will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

[SEC. 203. INTERNATIONAL DISCUSSIONS.

[(a) GLOBAL CHANGE RESEARCH.—The President should direct the Secretary of State, in cooperation with the Committee, to initiate discussions with other nations leading toward international

protocols and other agreements to coordinate global change research activities. Such discussions should include the following issues:

[(1) Allocation of costs in global change research programs, especially with respect to major capital projects.

[(2) Coordination of global change research plans with those developed by international organizations such as the International Council on Scientific Unions, the World Meteorological Organization, and the United Nations Environment Program.

[(3) Establishment of global change research centers and training programs for scientists, especially those from developing nations.

[(4) Development of innovative methods for management of international global change research, including—

[(A) use of new or existing intergovernmental organizations for the coordination or funding of global change research; and

[(B) creation of a limited foundation for global change research.

[(5) The prompt establishment of international projects to—

[(A) create globally accessible formats for data collected by various international sources; and

[(B) combine and interpret data from various sources to produce information readily usable by policymakers attempting to formulate effective strategies for preventing, mitigating, and adapting to possible adverse effects of global change.

[(6) Establishment of international offices to disseminate information useful in identifying, preventing, mitigating, or adapting to the possible effects of global change.

[(b) ENERGY RESEARCH.—The President should direct the Secretary of State (in cooperation with the Secretary of Energy, the Secretary of Commerce, the United States Trade Representative, and other appropriate members of the Committee) to initiate discussions with other nations leading toward an international research protocol for cooperation on the development of energy technologies which have minimally adverse effects on the environment. Such discussions should include, but not be limited to, the following issues:

[(1) Creation of an international cooperative program to fund research related to energy efficiency, solar and other renewable energy sources, and passively safe and diversion-resistant nuclear reactors.

[(2) Creation of an international cooperative program to develop low cost energy technologies which are appropriate to the environmental, economic, and social needs of developing nations.

[(3) Exchange of information concerning environmentally safe energy technologies and practices, including those described in paragraphs (1) and (2).

[SEC. 204. GLOBAL CHANGE RESEARCH INFORMATION OFFICE.

[Not more than 180 days after the date of enactment of this Act, the President shall, in consultation with the Committee and all relevant Federal agencies, establish an Office of Global Change Research Information. The purpose of the Office shall be to dissemi-

nate to foreign governments, businesses, and institutions, as well as the citizens of foreign countries, scientific research information available in the United States which would be useful in preventing, mitigating, or adapting to the effects of global change. Such information shall include, but need not be limited to, results of scientific research and development on technologies useful for—

[(1) reducing energy consumption through conservation and energy efficiency;

[(2) promoting the use of solar and renewable energy sources which reduce the amount of greenhouse gases released into the atmosphere;

[(3) developing replacements for chlorofluorocarbons, halons, and other ozone-depleting substances which exhibit a significantly reduced potential for depleting stratospheric ozone;

[(4) promoting the conservation of forest resources which help reduce the amount of carbon dioxide in the atmosphere;

[(5) assisting developing countries in ecological pest management practices and in the proper use of agricultural, and industrial chemicals; and

[(6) promoting recycling and source reduction of pollutants in order to reduce the volume of waste which must be disposed of, thus decreasing energy use and greenhouse gas emissions.

[TITLE III—GROWTH DECISION AID

[SEC. 301. STUDY AND DECISION AID.

[(a) The Secretary of Commerce shall conduct a study of the implications and potential consequences of growth and development on urban, suburban, and rural communities. Based upon the findings of the study, the Secretary shall produce a decision aid to assist State and local authorities in planning and managing urban, suburban, and rural growth and development while preserving community character.

[(b) The Secretary of Commerce shall consult with other appropriate Federal departments and agencies as necessary in carrying out this section.

[(c) The Secretary of Commerce shall submit to the Congress a report containing the decision aid produced under subsection (a) no later than January 30, 1992. The Secretary shall notify appropriate State and local authorities that such decision aid is available on request.]

XX. COMMITTEE RECOMMENDATIONS

On June 13, 2007, the Committee on Science and Technology favorably reported H.R. 906, as amended, by a voice vote and recommended its enactment.

XXI. PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 906, THE GLOBAL CHANGE RESEARCH AND DATA MANAGEMENT ACT OF 2007

WEDNESDAY, JUNE 6, 2007

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to call, at 9:44 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Nick Lampson [Chairman of the Subcommittee] presiding.

Chairman LAMPSON. Good morning. The Subcommittee on Energy and Environment will come to order. Pursuant to notice, the Subcommittee on Energy and Environment meets to consider the following measures: H.R. 906, the Global Change Research and Data Management Act of 2007; H.R. 2304, the Advanced Geothermal Energy Research and Development Act of 2007; and H.R. 2313, the Marine Renewable Energy Research and Development Act of 2007.

We will now proceed with the markup beginning with opening statements, and I will begin.

Today the Subcommittee will consider three bills: H.R. 906, the Global Change Research and Data Management Act; H.R. 2304, the Advanced Geothermal Energy Research and Development Act; and H.R. 2313, the Marine Renewable Energy Research and Development Act of 2007.

First, we will take up H.R. 906, the Global Change Research and Data Management Act of 2007, which will re-orient the current interagency climate research program to produce information that supports efforts of resource managers, businesses and individuals to understand and reduce our vulnerability to extreme weather events and climate change.

The U.S. Global Change Research Program has been in existence in some form since the late 1970s. This important program has vastly expanded our knowledge of Earth's land, water and atmospheric systems. However, fires, droughts, hurricanes and other natural events have highlighted our increasing vulnerability to extreme weather and climate changes. With better planning and implementation adaptation strategies, these costs can be reduced.

Next, we will consider two pieces of legislation to expand our country's renewable energy portfolio in the areas of geothermal and ocean power. These resources are both potentially vast in size and have potential to provide clean power at competitive rates but they require support to advance to the stage of commercial viability.

H.R. 2304, the Advanced Geothermal Energy Research and Development Act of 2007, would reinvigorate geothermal research and development in this country. It would provide support and guid-

ance for researchers to develop technologies capable of tapping into the vast quantities of thermal energy that is stored in the Earth's crust.

H.R. 2313, the Marine Renewable Energy Research and Development Act of 2007, would support renewable energy development by exploiting the energy of ocean tides and currents. Today this promising industry is at roughly the same development stage that wind was back 20 years ago. With the support provided by this bill, this industry is posed to grow into a significant contributor of clean electricity to our nation's power grid.

In short, these bills are about addressing overlooked opportunities in our collective efforts to create good American jobs, diversify our energy supply, increase our security and reduce the environmental impact of energy production. All three pieces of legislation are important to our environment and our economy. Therefore, I urge their passage and I look forward to getting them to the House Floor.

[The prepared statement of Chairman Lampson follows:]

PREPARED STATEMENT OF CHAIRMAN NICK LAMPSON

Today, the Subcommittee we will consider three bills, H.R. 906, the Global Change Research and Data Management Act; H.R. 2304, the Advanced Geothermal Energy Research and Development Act; and H.R. 2313, the Marine Renewable Energy Research and Development Act.

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All three pieces of legislation are important to our environment and our economy. Therefore, I urge their passage, and look forward to getting them to the House Floor.

Chairman LAMPSON. At this time I will recognize Mr. Inglis to present his opening remarks.

Mr. INGLIS. Thank you, Mr. Chairman, and thank you for holding this markup.

I am happy to be a co-sponsor of Mr. Udall's bill, the Global Change Research and Data Management Act. For a number of years, the U.S. Global Research Program has coordinated a successful interagency research program on global environmental change and implications of a changing climate for society. H.R. 906 continues support for this research and makes that research user-friendly for federal, State and local decision-makers who are tasked with the job of creating policies that address the challenges associated with climate change.

We also have an opportunity to address the development of clean, renewable energy sources in today's markup of H.R. 2304, the Advanced Geothermal Energy Research and Development Act, and H.R. 2313, the Marine Renewable Energy Research and Development Act. Geothermal and marine-related energy should be sources of energy for us and I am looking forward to promoting research that will make these alternatives commercially feasible. I hope we can build on what we have already learned and that experienced scientists in that program have already achieved and move forward to even greater use of these sources of energy.

And Mr. Chairman, I hope that by the time that we have concluded opening statements, that more Members will appear from the Republican conference that is still underway, and when they do, I suppose we will have a quorum for votes on these bills.

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Thank you for holding this markup, Mr. Chairman.

I'm happy to be a co-sponsor of Mr. Udall's bill, the Global Change Research and Data Management Act. For many years, the United States Global Research Program has coordinated a successful interagency research program on global environment change and implications of a changing climate for society. H.R. 906 continues support for this research, and makes that research "user-friendly" for federal, State, and local decision-makers who are tasked with the job of creating policies that address the challenges associated with climate change.

We also have an opportunity to address the development of clean, renewable energy sources in today's markup of H.R. 2304, the Advanced Geothermal Energy Research and Development Act, and H.R. 2313, the Marine Renewable Energy Research and Development Act. Geothermal and marine-related energy should be sources of energy for us, and I'm looking forward to promoting research that will make these alternatives commercially affordable. I hope that we can build on what we've already learned and that experienced scientists and other professionals are included so that duplication does not occur.

Thank you again, Mr. Chairman, and I look forward to working with you to advance this legislation.

Chairman LAMPSON. We will be ready for the votes when they come in. We may get a little ahead of them.

Without objection, Members may place statements in the record at this point.

We will now consider H.R. 906, the Global Change Research and Data Management Act of 2007, and I will yield Mr. Udall five minutes to describe this bill.

Mr. UDALL. Thank you, Mr. Chairman, and thank you for bringing the bill up for markup today.

In February, Representative Inglis and I introduced H.R. 906, the Global Change Research and Data Management Act of 2007. The debate about whether climate change is occurring and about whether human activity has contributed to it is over. As our popu-

lation, economy and infrastructure have grown, we have put more pressure on the natural resources we all depend upon. The fires, droughts, severe storms and other natural events that we experience every year exact a tremendous toll on our society. We must reduce the human and economic costs of these events by making our communities more resilient and less vulnerable to their impacts.

For all these reasons, we need the U.S. Global Change Research Program to produce more information that is readily available to decision-makers and resource managers in government and in the private sector.

People throughout this country and in the rest of the world need information they can use to develop response, adaptation and mitigation strategies to make our communities, our business and our nation more resilient and less vulnerable to the changes that are inevitable.

The USGCRP has significantly advanced our scientific knowledge of Earth's atmosphere and climate and has provided us with a wealth of new data and information about the functioning of our planet. We need to continue to expand this knowledge. However, we need to increase the output of information to decision-makers that will assist them in developing adaptation and response strategies to the effects of global change.

I believe that we must move to reduce greenhouse gas emissions if we are to avoid future increases in surface temperature that will trigger severe impacts that we cannot overcome with adaptation strategies. However, and I think this is an important point, Mr. Chairman, this bill does not regulate greenhouse gas emission levels or mandate any specific policy approach for addressing climate change.

We will need economic and technical information as well as information about system responses and climate responses to different concentrations of greenhouse gases in the atmosphere to design cost-effective policies to achieve emission reductions and avoid dangerous impacts of future climate change.

The USGCRP should be the vehicle for providing this information. H.R. 906 will improve the outreach and information exchange aspects of the program and make the information that it provides much more useful.

Again, I want to thank my good friend from South Carolina, Representative Inglis, for working with me on H.R. 906, and I ask our colleagues to support this important legislation.

[The prepared statement of Mr. Udall follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARK UDALL

Thank you, Chairman Lampson, for bringing this bill up for markup today.

This February, I, along with Representative Bob Inglis, introduced H.R. 906, the Global Change Research and Data Management Act of 2007.

The debate about whether climate change is occurring and about whether human activity has contributed to it is over. As our population, economy, and infrastructure have grown, we have put more pressure on the natural resources we all depend upon.

The fires, droughts, severe storms and other natural events that we experience every year exact a tremendous toll on our society.

We must reduce the human and economic costs of these events by making our communities more resilient and less vulnerable to their impacts.

For all of these reasons, we need the U.S. Global Change Research Program to produce more information that is readily usable by decision makers and resource managers in government and in the private sector.

People throughout this country and in the rest of the world need information they can use to develop response, adaptation, and mitigation strategies to make our communities, our businesses, and our nation more resilient and less vulnerable to the changes that are inevitable.

The USGCRP has significantly advanced our scientific knowledge of Earth's atmosphere and climate and has provided us with a wealth of new data and information about the functioning of our planet. We need to continue to expand this knowledge.

However, we need to increase the output of information to decision-makers that will assist them in developing adaptation and response strategies to the effects of global change.

I believe that we must move to reduce greenhouse gas emissions if we are to avoid future increases in surface temperature that will trigger severe impacts that we cannot overcome with adaptation strategies.

However, this bill does not regulate greenhouse gas emission levels or mandate any specific policy approach for addressing climate change.

We will need economic and technical information as well as information about system responses and climate responses to different concentrations of greenhouse gases in the atmosphere to design cost effective policies to achieve emission reductions and avoid dangerous impacts of future climate change.

The USGCRP should be the vehicle for providing this information. H.R. 906 will improve the outreach and information exchange aspects of this Program and make the information that it provides more useful.

Again, I thank my colleague, Rep. Inglis for working with me on H.R. 906. I ask our colleagues to support this important legislation.

Chairman LAMPSON. Thank you, Mr. Udall.

I recognize Mr. Inglis to present any remarks on the bill.

Mr. INGLIS. As I said, Mr. Chairman, in my opening statement, I am very happy to be a co-sponsor of Mr. Udall's bill. I think it will help to prepare local governments, State governments for the impacts of global climate change and the coordination makes sense. We gather information and it makes sense to make that available in a user-friendly kind of way. So I am pleased with the bill and hope that we are going to have a quorum here soon to pass it.

Chairman LAMPSON. We are working on that quorum. Does anyone wish to be recognized to speak on this? Ms. Biggert is recognized for five minutes.

Ms. BIGGERT. Mr. Chairman, I am concerned, you know, that this meeting is being held at 9:30 when the Republicans have a caucus, you know, so we have to leave to come here and I think that I don't ever remember that having happened. I think it is important for us to have the opportunity to speak on this, so I would make a point of order that a quorum is not present.

Chairman LAMPSON. Your point of order is noticed. We can suspend and wait until we have a discussion, if that is what you desire.

Ms. BIGGERT. It is not what I so desire. I think that is what is proper under our rules.

Chairman LAMPSON. A quorum is assumed to be present unless someone objects, and with your objection we will suspend.

Ms. BIGGERT. I ask unanimous consent to withdraw my motion. I just wanted to make the point that the timing is such that I would hope that that wouldn't happen again.

Chairman LAMPSON. Any objection? Seeing none, thank you, we will proceed. Okay. And we have a quorum at this point in time.

I ask unanimous consent that the bill is considered as read and open to amendment at any point and that Members proceed with the amendments in order of the roster. Without objection, it is so ordered.

Mr. UDALL. Mr. Chairman, I have an amendment at the desk.

Chairman LAMPSON. The first amendment on the roster is an amendment in the nature of a substitute offered by the gentleman from Colorado. I ask unanimous consent that the amendment in the nature of a substitute be treated as original text for the purposes of amendment under the five-minute rule. Without objection, so ordered.

Mr. Udall, the Clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to H.R. 906 offered by Mr. Udall of Colorado and Mr. Inglis of South Carolina.

Chairman LAMPSON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman from Colorado for five minutes to explain the substitute amendment.

Mr. UDALL. Thank you, Mr. Chairman, and this amendment in the nature of a substitute incorporates a series of changes to the legislation that were suggested by witnesses at our hearing, outside groups and individuals who provided comments. Again I want to thank my very good friend from South Carolina, Mr. Inglis, for working with me, a fully working partnership here to develop and incorporate these changes.

The comments that I reference address several broad themes. First was the need for the program to provide more geographically refined information to assist decision-makers at the regional, State and local levels that will be designing and implementing adaptation and mitigation strategies to cope with not only current but future climate change. To address this, we added a definition of regional climate change that incorporates changes that are not strictly climate-related but also changes because of population increases, changes in land use and development patterns. Throughout this substitute we have included specific references to global and regional climate change information, both in the planning and the execution of the program.

Secondly, a number of witnesses at our hearing told us that we were asking for too much too soon. The original bill had a strategic plan, a vulnerability assessment and a policy assessment all due within one year of enactment. The substitute changes the time line for these products. In the first year we are now asking that the Administration produce an outline describing the steps that they will take for strategic plan development. Then the new strategic plan will be due three years after the bill is enacted and then the plan will undergo revision every five years. We have retained the original timeline for delivery of the vulnerability assessment, and that is because we all believe that the required information for the assessment is contained in the Working Group I and Working Group II reports issued within the last few months by the IPCC, the Intergovernmental Panel on Climate Change, and while we would like to see as much of this information as possible tailored to help us understand the changes we will face here in the United States, we believe the U.S.-relevant content of these reports can be high-

lighted and repackaged within a year's time to fulfill the requirement of this section. We have extended the cycle for future assessments by one year to every five years.

The original, referencing back to the law in the 1990s, contains several provisions to indicate that the activities of the USGCRP should be coordinated with the activities that the United States was participating in internationally. We retained those provisions and added a new one in Section 107 to emphasize the importance of making maximum use of the information gathered. The IPCC has produced four substantial reports since the first one was released in 1990. During that same time period the U.S. Global Change Research Program has produced just one assessment. The IPCC process has benefited a great deal from the involvement of U.S. scientists and U.S. investments in climate research and we should be benefiting here at home as well. Better coordination of these two efforts and more involvement with regionally-based groups would achieve that goal. We have not yet changed the timeline for the production of the policy assessment required in Section 108 of the bill and we will do that during the Full Committee markup. A Member of the Committee has expressed an interest in working on that section of the bill, and I believe that we will come to agreement shortly on text to replace that section.

We are also awaiting some information from the Administration on climate-related reports to see if we can further accommodate their concerns about too onerous reporting burden for the program.

And finally, we heard from witnesses and outside groups that this program needs to foster more interaction between decision-makers at regional, State and local levels and other non-governmental organizations and businesses that may be impacted by changes occurring both at the regional and the global levels. We have added language to expand the outreach and information exchange purposes and tasks associated with this program.

Now, the USGCRP should not just produce a series of reports. It should continue to expand our knowledge of the Earth's climate system. The program should facilitate an ongoing exchange of information that will support the development, implementation and evolution of adaptation and mitigation strategies to maintain the viability of natural and human-managed systems. We still have some other items to address prior to marking this up in the Full Committee. I look forward to further productive discussions that will yield an even better bill, and again I want to thank my colleague, Mr. Inglis, for his support and the friendship and partnership on this important legislation.

[The prepared statement of Mr. Udall follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARK UDALL

Mr. Chairman, I have an amendment at the desk.

The amendment in the nature of a substitute to H.R. 906 incorporates a series of changes to the legislation that were suggested by witnesses at our hearing, outside groups, and individuals who provided comments on the bill. I want to thank Rep. Inglis for working with me to develop and incorporate these changes.

We received many constrictive comments and suggestions on H.R. 906. In general, the comments addressed several broad themes.

First was the need for the Program to provide more geographically refined information to assist decision-makers at the regional, State, and local levels that will be

designing and implementing adaptation and mitigation strategies to cope with current and future climate change.

To address this, we have added a definition of regional climate change that incorporates changes that are not strictly climate-related, but also changes because of population increases, changes in land use, and development patterns. Throughout the Substitute we have included specific references to global and regional climate change information both in the planning and execution of the program.

Second, a number of witnesses at our hearing told us that we were asking for too much too soon. The original bill had a Strategic Plan, a Vulnerability Assessment, and a Policy Assessment all due within one year of enactment.

The Substitute changes the time line for these products. In the first year, we are now asking that the Administration produce an outline describing the steps that they will take to produce a Strategic Plan for research and assessment. The new Strategic Plan will be due three years after the bill is enacted. Then, the Plan will undergo revision every five years.

We have retained the original timeline of H.R. 906 for delivery of the Vulnerability Assessment. This is because we believe the required information for this assessment is contained in the Working Group I and Working Group II reports issued within the last few months by the Intergovernmental Panel on Climate Change.

While we would like to see as much of this information as possible tailored to help us understand the changes we will face here in the U.S., we believe the U.S.-relevant content of these reports can be highlighted and repackaged within a year's time to fulfill the requirement of this section. We have extended the cycle for producing further assessments by one year to every five years.

The original law contained several provisions to indicate the activities of the U.S. Global Change Research Program should be coordinated with the activities the U.S. was participating in internationally. We have retained these provisions and added a new one in Section 107 to emphasize the importance of making maximum use of the information gathered anal synthesized in efforts such as the production of IPCC documents.

The IPCC has produced four substantial reports since the first one was released in 1990. During that same time period, the U.S. Global Change Research Program. has produced one assessment. The IPCC process has benefited a great deal from the involvement of U.S. scientists and U.S. investments in climate research. We should be benefiting here at home as well. Better coordination of these two efforts and more involvement with regionally-based groups would achieve that goal.

We have not yet changed the time line for the production of the Policy Assessment required in Section 108 of the bill. We will do that during the Full Committee markup. A Member of the Committee has expressed an interest in working on that Section of the bill and I believe we will come to agreement shortly on text to replace that section.

We are also awaiting some information from the Administration on climate-related reports to see if we can further accommodate their concerns about too onerous a reporting burden for the Program.

Finally, we heard from witnesses and outside groups that this Program needs to foster more interaction between decision-makers at regional, State, and local levels and other non-governmental organizations and businesses that may be impacted by changes occurring at the regional and global scales. We have added language to expand the outreach and information exchange purposes and tasks associated with this Program.

The U.S. Global Change Research Program should not just produce a series of Reports. It should continue to expand our knowledge of the Earth's climate system. The Program should facilitate an ongoing exchange of information that will support the development, implementation, and evolution of adaptation and mitigation strategies to maintain the viability of our natural and human-managed systems.

We still have some other items to address prior to marking up this bill in the Full Committee. I look forward to further productive discussions that will yield a better bill.

Once again, I thank my colleague and co-sponsor, Mr. Inglis for working with me on this legislation. I urge support for the amendment and for H.R. 906.

Chairman LAMPSON. Thank you, Mr. Udall. Is there further discussion on the amendment?

Mr. INGLIS. I might just add, Mr. Chairman, that this shows that hearings really do matter because what happened here is witnesses testified, we heard some information from them, and as a result the bill was improved. So I thank the gentleman for making these

improvements. I am happy to co-sponsor the manager's amendment as well.

Chairman LAMPSON. Anyone else wish to be recognized?

Are there any amendments to the amendment in the nature of a substitute? If not, the vote occurs on the amendment in the nature of a substitute. All in favor, say aye. Those opposed, say no. The ayes have it and the amendment is agreed to, and I would note that we do have a quorum present for that vote. Pursuant to Rule 2T, further proceedings on this matter are postponed until after further notice from the Chair.

Are there any other amendments? Hearing none, the vote is on the bill, H.R. 906, the Global Change Research and Data Management Act of 2007, as amended. All those in favor, say aye. Those opposed, no. The ayes have it.

I recognize Mr. Inglis for a motion.

Mr. INGLIS. Mr. Chairman, I move that the Subcommittee report H.R. 906 as amended to the Full Committee. Furthermore, I move that the staff be instructed to prepare the Subcommittee legislative report and make necessary technical and conforming changes to the bill as amended in accordance with the recommendations of the Subcommittee.

Chairman LAMPSON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Those opposed, say no. The ayes have it, and the bill is favorably reported.

Without objection the motion to reconsider is laid upon the table. Subcommittee Members may submit additional or Minority views on the measure.

I want to thank the Members for their attendance, and this concludes our Subcommittee markup. We are adjourned.

[Whereupon, at 10:25 a.m., the Subcommittee was adjourned.]

Appendix:

H.R. 906, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER

I

110TH CONGRESS
1ST SESSION

H. R. 906

To promote and coordinate global change research, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 7, 2007

Mr. UDALL of Colorado (for himself and Mr. INGLIS of South Carolina) introduced the following bill; which was referred to the Committee on Science and Technology, and in addition to the Committee on Foreign Affairs, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To promote and coordinate global change research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Global Change Research and Data Management Act of 2007".

TITLE I—GLOBAL CHANGE RESEARCH

SEC. 101. FINDINGS AND PURPOSE.

(a) FINDINGS.—The Congress makes the following findings:

(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that are significantly altering the Earth habitat.

(2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant alterations of world climate patterns. Over the next century, these changes could adversely effect world agricultural and marine production, coastal habitability, biological diversity, human health, global social and political stability, and global economic activity.

(3) Developments in interdisciplinary Earth sciences, global observing systems, and satellite and computing technologies make possible significant scientific understanding of global changes and their effects, and have resulted in the significant expansion of environmental data and information.

(4) Development of effective policies to prevent, mitigate, and adapt to global change will rely on im-

provement in scientific understanding of global environmental processes and on development of information that is of use to decisionmakers at the local, regional, and national levels.

(5) Although the United States Global Change Research Program has made significant contributions to understanding Earth's climate and the anthropogenic influences on Earth's climate and its ecosystems, that Program has not produced sufficient information to meet the expressed needs of decisionmakers.

(6) Predictions of future climate conditions for specific regions have considerable uncertainty and are unlikely to be confirmed in a time period necessary to inform decisions on land, water, and resource management. However, improved understanding of global change should be used to assist decisionmakers in the development of policies to ensure that ecological, social, and economic systems are resilient under a variety of plausible climate futures.

(7) In order to most effectively meet the needs of decisionmakers, both the research agenda of the United States Global Change Research Program and its implementation must be informed by continuous

feedback from documented users of information generated by the Program.

(b) PURPOSE.—The purpose of this title is to provide for the continuation and coordination of a comprehensive and integrated United States observation and research program which will assist the Nation and the world to understand, assess, predict, and respond to the effects of human-induced and natural processes of global change.

SEC. 102. DEFINITIONS.

For purposes of this title—

(1) the term ''global change'' means human-induced or natural changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of the Earth to sustain life;

(2) the term ''global change research'' means study, monitoring, assessment, prediction, and information management activities to describe and understand—

(A) the interactive physical, chemical, and biological processes that regulate the total Earth system;

(B) the unique environment that the Earth provides for life;

(C) changes that are occurring in the Earth system; and

(D) the manner in which such system, environment, and changes are influenced by human actions;

(3) the term ''interagency committee'' means the interagency committee established under section 103;

(4) the term ''Plan'' means the National Global Change Research Plan developed under section 105; and

(5) the term ''Program'' means the United States Global Change Research Program established under section 104.

SEC. 103. INTERAGENCY COOPERATION AND COORDINATION.

(a) ESTABLISHMENT.—The President shall establish an interagency committee to ensure cooperation and coordination of all Federal research activities pertaining to processes of global change for the purpose of increasing the overall effectiveness and productivity of Federal global change research efforts. The interagency committee shall include representatives of both agencies conducting global change research and agencies with authority over resources likely to be affected by global change.

(b) FUNCTIONS OF THE INTERAGENCY COMMITTEE.—The interagency committee shall—

(1) serve as the forum for developing the Plan and for overseeing its implementation;

(2) serve as the forum for developing the vulnerability assessment under section 107;

(3) ensure cooperation among Federal agencies with respect to global change research activities;

(4) work with academic, State, industry, and other groups conducting global change research, to provide for periodic public and peer review of the Program;

(5) cooperate with the Secretary of State in—

(A) providing representation at international meetings and conferences on global change research in which the United States participates; and

(B) coordinating the Federal activities of the United States with programs of other nations and with international global change research activities;

(6) work with appropriate Federal, State, regional, and local authorities to ensure that the Program is designed to produce information needed to develop policies to reduce the vulnerability of the

United States and other regions to global change; and

(7) identify additional decisionmaking groups that may use information generated through the Program.

SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM.

The President shall establish an interagency United States Global Change Research Program to improve understanding of global change, to respond to the information needs of communities and decisionmakers, and to provide periodic assessments of the vulnerability of the United States and other regions to global change. The Program shall be implemented in accordance with the Plan.

SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH PLAN.

(a) IN GENERAL.—The President shall develop a National Global Change Research Plan for implementation of the Program. The Plan shall contain recommendations for global change research. The President shall submit the Plan to the Congress within 1 year after the date of enactment of this Act, and shall submit a revised Plan at least once every 4 years thereafter. In the development of each Plan, the President shall conduct a formal assessment process to determine the needs of appropriate Federal, State, regional, and local authorities and other interested

parties regarding the types of information needed by them in developing policies to reduce society's vulnerability to global change and shall utilize these assessments in developing the Plan.

(b) CONTENTS OF THE PLAN.—The Plan shall—

(1) establish, for the 10-year period beginning in the year the Plan is submitted, the goals and priorities for Federal global change research which most effectively advance scientific understanding of global change and provide information of use to Federal, State, regional, and local authorities in the development of policies relating to global change;

(2) describe specific activities, including efforts to determine user information needs, research activities, data collection and data analysis requirements, assessment of model predictability, participation in international research efforts, and information management, required to achieve such goals and priorities;

(3) identify relevant programs and activities of the Federal agencies that contribute to the Program directly and indirectly;

(4) set forth the role of each Federal agency in implementing the Plan;

(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies, the National Research Council, or other entities;

(6) make recommendations for the coordination of the global change research activities of the United States with such activities of other nations and international organizations, including—

(A) a description of the extent and nature of international cooperative activities;

(B) bilateral and multilateral efforts to provide worldwide access to scientific data and information; and

(C) improving participation by developing nations in international global change research and environmental data collection;

(7) detail budget requirements for Federal global change research activities to be conducted under the Plan;

(8) catalog the type of information identified by appropriate Federal, State, regional, and local decisionmakers needed to develop policies to reduce society's vulnerability to global change and indicate how the planned research will meet these decisionmakers' information needs; and

(9) identify the observing systems currently employed in collecting data relevant to global change research and prioritize additional observation systems that may be needed to ensure adequate data collection and monitoring of global change.

(c) RESEARCH ELEMENTS.—The Plan shall include at a minimum the following research elements:

(1) Global measurements, establishing worldwide to regional scale observations prioritized to understand global change and to meet the information needs of decisionmakers on all relevant spatial and time scales.

(2) Information on economic and demographic trends that contribute to changes in the Earth system and that influence society's vulnerability to global change.

(3) Development of indicators and baseline databases to document global change, including changes in species distribution and behavior, extent of glaciations, and changes in sea level.

(4) Studies of historical changes in the Earth system, using evidence from the geological and fossil record.

(5) Assessments of predictability using quantitative models of the Earth system to simulate global and regional environmental processes and trends.

(6) Focused research initiatives to understand the nature of and interaction among physical, chemical, biological, and social processes related to global change.

(7) Focused research initiatives to determine and then meet the information needs of appropriate Federal, State, and regional decisionmakers.

(d) INFORMATION MANAGEMENT.—The Plan shall incorporate, to the extent practicable, the recommendations relating to data acquisition, management, and archiving made by the interagency climate and other global change data management working group established under section 203.

(e) NATIONAL ACADEMY OF SCIENCES EVALUATION.—The President shall enter into an agreement with the National Academy of Sciences under which the Academy shall—

(1) evaluate the scientific content of the Plan; and

(2) recommend priorities for future global change research.

(f) NATIONAL GOVERNORS ASSOCIATION EVALUATION.—The President shall seek to enter into an agreement with the National Governors Association Center for Best Practices under which that Center shall—

(1) evaluate the utility to State, local, and regional decisionmakers of each Plan and of the anticipated and actual information outputs of the Program for development of policies to reduce vulnerability to global change; and

(2) recommend priorities for future global change research.

(g) PUBLIC PARTICIPATION.—In developing the Plan, the President shall consult with academic, State, industry, and environmental groups and representatives. Not later than 90 days before the President submits the Plan, or any revision thereof, to the Congress, a summary of the proposed Plan shall be published in the Federal Register for a public comment period of not less than 60 days.

SEC. 106. BUDGET COORDINATION.

(a) IN GENERAL.—The President shall provide general guidance to each Federal agency participating in the Program with respect to the preparation of requests for appropriations for activities related to the Program.

(b) CONSIDERATION IN PRESIDENT'S BUDGET.—The President shall submit, at the time of his annual budget request to Congress, a description of those items in each agency's annual budget which are elements of the Program.

SEC. 107. VULNERABILITY ASSESSMENT.

Within 1 year after the date of enactment of this Act, and at least once every 4 years thereafter, the President shall submit to the Congress an assessment which—

(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

(2) based on indicators and baselines developed under section 105(c)(3), as well as other measurements, analyzes changes to the natural environment, land and water resources, and biological diversity in—

(A) major geographic regions of the United States; and

(B) other continents;

(3) analyzes the effects of global change, including the changes described in paragraph (2), on agriculture, energy production and use, transportation, human health and welfare, and human social and economic systems, including providing information

about the differential impacts on specific geographic regions within the United States, on people of different income levels within those regions, and for rural and urban areas within those regions;

(4) analyzes the vulnerability of different geographic regions of the world to global change, including analyses of the implications of global change for international assistance, population displacement, and national security; and

(5) analyzes the adoption rates of policies and technologies available to reduce the vulnerability of society to global change with an evaluation of the market and policy barriers suppressing their adoption in the United States.

SEC. 108. POLICY ASSESSMENT.

Not later than 1 year after the date of enactment of this Act, and at least once every 3 years thereafter, the President shall submit to the Congress a policy assessment which—

(1) documents current policy options being utilized by Federal, State, and local governments to mitigate or adapt to the effects of global change;

(2) evaluates the realized and anticipated effectiveness of those current policy options in addressing global change; and

(3) identifies and evaluates additional policy options for mitigating or adapting to the effects of global change.

SEC. 109. ANNUAL REPORT.

Each year at the time of submission to the Congress of the President's budget request, the President shall submit to the Congress a report on the activities conducted pursuant to this title, including—

(1) a summary of the achievements of the Program during the period covered by the report;

(2) an analysis of the progress made toward achieving the goals of the Plan; and

(3) a list of the State, local, and regional decisionmakers identified as potential users of the information generated through the Program and a description of the consultations with this community coordinated through the work of the interagency committee.

SEC. 110. RELATION TO OTHER AUTHORITIES.

The President shall ensure that relevant research activities of the National Climate Program, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global change research efforts.

SEC. 111. REPEAL.

The Global Change Research Act of 1990 (15 U.S.C. 2921 et seq.) is repealed.

TITLE II—CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT

SEC. 201. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Federal agencies have a primary mission to manage and archive climate and other global change data obtained through their research, development, or operational activities.

(2) Maintenance of climate and global change data records is essential to present and future studies of the Earth's atmosphere, biogeochemical cycles, and climate.

(3) Federal capabilities for the management and archiving of these data have not kept pace with advances in satellite and other observational technologies that have vastly expanded the type and amount of information that can be collected.

(4) Proposals and plans for expansion of global observing networks should include plans for the management of data to be collected and budgets re-

flecting the cost of support for management and archiving of data.

(b) PURPOSES.—The purposes of this title are to establish climate and other global change data management and archiving as Federal agency missions, and to establish Federal policies for managing and archiving climate and other global change data.

SEC. 202. DEFINITIONS.

For purposes of this title—

(1) the term ''metadata'' means information describing the content, quality, condition, and other characteristics of climate and other global change data, compiled, to the maximum extent possible, consistent with the requirements of the ''Content Standard for Digital Geospatial Metadata'' (FGDC–STD–001–1998) issued by the Federal Geographic Data Committee, or any successor standard approved by the working group; and

(2) the term ''working group'' means the interagency climate and other global change data management working group established under section 203.

SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT WORKING GROUP.

(a) ESTABLISHMENT.—The President shall establish an interagency climate and other global change data management working group to make recommendations for coordinating Federal climate and other global change data management and archiving activities.

(b) MEMBERSHIP.—The working group shall include the Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, the Secretary of Energy, the Secretary of Defense, the Director of the National Science Foundation, the Director of the United States Geological Survey, the Archivist of the United States, the Administrator of the Environmental Protection Agency, the Secretary of the Smithsonian Institution, or their designees, and representatives of any other Federal agencies the President considers appropriate.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, the working group shall transmit a report to the Congress containing the elements described in subsection (d). Not later than 3 years after the initial report under this subsection, and not later than once every 4 years subsequent to that, the working group shall transmit reports updating the previous report. In preparing re-

ports under this subsection, the working group shall consult with expected users of the data collected and archived by the Program.

(d) CONTENTS.—The reports and updates required under subsection (c) shall—

(1) include recommendations for the establishment, maintenance, and accessibility of a catalog identifying all available climate and other global change data sets;

(2) identify climate and other global change data collections in danger of being lost and recommend actions to prevent such loss;

(3) identify gaps in climate and other global change data and recommend actions to fill those gaps;

(4) identify effective and compatible procedures for climate and other global change data collection, management, and retention and make recommendations for ensuring their use by Federal agencies and other appropriate entities;

(5) develop and propose a coordinated strategy for funding and allocating responsibilities among Federal agencies for climate and other global change data collection, management, and retention;

(6) make recommendations for ensuring that particular attention is paid to the collection, management, and archiving of metadata;

(7) make recommendations for ensuring a unified and coordinated Federal capital investment strategy with respect to climate and other global change data collection, management, and archiving;

(8) evaluate the data record from each observing system and make recommendations to ensure that delivered data are free from time-dependent biases and random errors before they are transferred to long-term archives; and

(9) evaluate optimal design of observation system components to ensure a cost-effective, adequate set of observations detecting and tracking global change.

TITLE III—INTERNATIONAL CO-OPERATION IN GLOBAL CHANGE RESEARCH

SEC. 301. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Pooling of international resources and scientific capabilities will be essential to a successful international global change program.

(2) While international scientific planning is already underway, there is currently no comprehensive intergovernmental mechanism for planning, coordinating, or implementing research to understand global change and to mitigate possible adverse effects.

(3) An international global change research program will be important in building future consensus on methods for reducing global environmental degradation.

(4) The United States, as a world leader in environmental and Earth sciences, should help provide leadership in developing and implementing an international global change research program.

(b) PURPOSES.—The purposes of this title are to—

(1) promote international, intergovernmental cooperation on global change research;

(2) involve scientists and policymakers from developing nations in such cooperative global change research programs; and

(3) promote international efforts to provide technical and other assistance to developing nations which will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

SEC. 302. INTERNATIONAL DISCUSSIONS.

(a) GLOBAL CHANGE RESEARCH.—The President shall direct the Secretary of State to initiate discussions with other nations leading toward international protocols and other agreements to coordinate global change research activities. Such discussions should include the following issues:

(1) Allocation of costs in global change research programs, especially with respect to major capital projects.

(2) Coordination of global change research plans with those developed by international organizations such as the International Council on Scientific Unions, the World Meteorological Organization, and the United Nations Environment Program.

(3) Establishment of global change research centers and training programs for scientists, especially those from developing nations.

(4) Development of innovative methods for management of international global change research, including the use of new or existing intergovernmental organizations for the coordination or funding of global change research.

(5) Establishment of international offices to disseminate information useful in identifying, pre-

venting, mitigating, or adapting to the possible effects of global change.

(b) ENERGY RESEARCH.—The President shall direct the Secretary of State (in cooperation with the Secretary of Energy, the Secretary of Commerce, the United States Trade Representative, and other appropriate Federal agents) to initiate discussions with other nations leading toward an international research protocol for cooperation on the development of energy technologies which have minimally adverse effects on the environment. Such discussions should include the following issues:

(1) Creation of an international cooperative program to fund research related to energy efficiency and conservation, solar and other renewable energy sources, and passively safe and diversion-resistant nuclear reactors.

(2) Creation of an international cooperative program to develop low-cost energy technologies which are appropriate to the environmental, economic, and social needs of developing nations.

(3) Exchange of information concerning environmentally safe energy technologies and practices, including those described in paragraphs (1) and (2).

SEC. 303. GLOBAL CHANGE RESEARCH INFORMATION OFFICE.

The President shall establish an Office of Global Change Research Information to disseminate to foreign governments, businesses, and institutions, as well as the citizens of foreign countries, scientific research and other information available in the United States which would be useful in preventing, mitigating, or adapting to the effects of global change.

○

SECTION-BY-SECTION ANALYSIS OF H.R. 906,
GLOBAL CLIMATE CHANGE RESEARCH DATA AND
MANAGEMENT ACT OF 2007

Purpose: To promote and coordinate global change research, and for other purposes.

Title I: Global Change Research

Section 101: Findings and Purpose

The purpose of the bill is to reauthorize and amend the 1990 law authorizing the U.S. Global Change Research Program to provide for a continued Earth and climate observation and research program. The bill also authorizes the program to provide information that will enable us to understand the potential impacts of climate change or both regional and global scales and to provide information that will allow Federal, State, and local governments to adapt and respond to the effects of global change.

Section 102: Definitions

Section 102 defines the following terms for the purposes of this legislation: global change, global change research, interagency committee, plan, and program.

Section 103: Interagency Cooperation and Coordination

Establishes an interagency committee to oversee and coordinate the program and define the functions of the interagency committee.

Section 104: United States Global Climate Change Research Program

Section 104 directs the President to establish an interagency U.S. Global Research Program.

Section 105: National Global Change Research Plan

Section 105 directs the President to develop an initial Plan to guide the interagency activities conducted under the U.S. Global Change Research Program and to update the Plan every four years. This section also defines the contents of the plan and the minimum research elements of the plan. This section also provides for two evaluations of the plan, one by the National Academy of Sciences, for the review of the scientific merit of the program plan. The other, for a review by the Center for Best Practices of the National Governors Association for a review of the plan's utility for meeting the information needs of State, local and regional decision-makers. This section also provides for public review of the plan including its publication in the *Federal Register* with a comment period of at least 60 days.

Section 106: Budget Coordination

Section 106 requires the President to provide guidance to each federal agency participating in the program to identify funds to carry out the program and to include a request for the activities of this program in his annual budget.

Section 107: Vulnerability Assessment

Section 107 requires the President to submit an assessment to Congress one year after enactment and then at intervals of every four years. The section defines the contents of the assessment to include: a summary of the findings of the Program and the uncertainty associated with the findings; analyses of changes to natural systems at regional and continental scales; analyses of the effects of global change on human social and economic systems at regional and continental scales; analyses of regional vulnerabilities to global change; and analyses of policies and technologies to reduce the identified vulnerabilities and their rates of adoption.

Section 108: Policy Assessment

Section 108 requires the President to submit periodic Policy Assessments to Congress evaluating current policy options being utilized by Federal, State, and local governments to mitigate or adapt to the effects of global change.

Section 109: Annual Report

Section 109 requires the President to submit an annual report to Congress with a summary of the achievements of the Program, an analysis of the progress made towards achieving its goals, and a list of potential users of the information created by the Program.

Section 110: Relation to Other Authorities

Section 110 requires coordination of the activities authorized under this program with those of the National Climate Program. This section also repeals the *Global Change Research Act of 1990.*

Title II: Climate and Other Global Change Data Management

Section 201: Findings and Purposes

Section 201 establishes climate and global change data management and archiving as federal agency missions and establishes policies for managing and archiving these data.

Section 202: Definitions

Section 202 defines the following terms for the purposes of this legislation: metadata and working group.

Section 203: Interagency Climate and Other Global Change Data Management Working Group

Section 203 directs the President to establish and interagency working group to coordinate federal global change data management and archiving activities. The section also defines the membership in the interagency group and requires the working group to report to Congress with recommendations for the maintenance and archiving of data related to global change.

Title III: International Cooperation in Global Change Research

Section 301: Findings and Purpose

The purpose of this title is to promote international cooperation on global change research.

Section 302: International Discussions

Section 302 directs the President to initiate discussion with other nations on coordination of global change research. It also directs the President to initiate discussion with other nations on cooperation of research and development of energy technologies that have minimal adverse effects on the environment.

Section 303: Global Change Research Information Office

Section 303 directs the President to establish an Office of Global Change Research Information to disseminate foreign governments, businesses, and institutions information which would be useful in preventing, mitigating, or adapting the effects of global change.

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
SUBCOMMITTEE MARKUP
June 6, 2007

H.R. 906 – *the Global Change Research and Data Management Act of 2007*

AMENDMENT ROSTER

No.	Sponsor	Description	Results
1	Mr. Udall and Mr. Inglis	Amendment in the nature of a substitute making numerous substantive and technical changes to the bill.	Agreed to by voice vote.

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 906 OFFERED BY MR. UDALL OF COLORADO AND MR. INGLIS OF SOUTH CAROLINA

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Global Change Research and Data Management Act of 2007".

TITLE I—GLOBAL CHANGE RESEARCH

SEC. 101. FINDINGS AND PURPOSE.

(a) FINDINGS.—The Congress makes the following findings:

(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that are significantly altering the Earth habitat.

(2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant alterations of world climate patterns. Over the next century, these changes could adversely affect world agricultural and marine production, coastal

habitability, biological diversity, human health, global social and political stability, and global economic activity.

(3) Developments in interdisciplinary Earth sciences, global observing systems, and satellite and computing technologies make possible significant scientific understanding of global changes and their effects, and have resulted in the significant expansion of environmental data and information.

(4) Development of effective policies to prevent, mitigate, and adapt to global change will rely on improvement in scientific understanding of global environmental processes and on development of information that is of use to decisionmakers at the local, regional, and national levels.

(5) Although the United States Global Change Research Program has made significant contributions to understanding Earth's climate and the anthropogenic influences on Earth's climate and its ecosystems, the Program now needs to produce more information to meet the expressed needs of decisionmakers.

(6) Predictions of future climate conditions for specific regions have considerable uncertainty and are unlikely to be confirmed in a time period nec-

essary to inform decisions on land, water, and resource management. However, improved understanding of global change should be used to assist decisionmakers in the development of policies to ensure that ecological, social, and economic systems are resilient under a variety of plausible climate futures.

(7) In order to most effectively meet the needs of decisionmakers, both the research agenda of the United States Global Change Research Program and its implementation must be informed by continuous feedback from documented users of information generated by the Program.

(b) PURPOSE.—The purpose of this title is to provide for the continuation and coordination of a comprehensive and integrated United States observation, research, and outreach program which will assist the Nation and the world to understand, assess, predict, and respond to the effects of human-induced and natural processes of global change.

SEC. 102. DEFINITIONS.

For purposes of this title—

(1) the term ''global change'' means human-induced or natural changes in the global environment (including alterations in climate, land productivity,

oceans or other water resources, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of the Earth to sustain life;

(2) the term "global change research" means study, monitoring, assessment, prediction, and information management activities to describe and understand—

(A) the interactive physical, chemical, and biological processes that regulate the total Earth system;

(B) the unique environment that the Earth provides for life;

(C) changes that are occurring in the Earth system; and

(D) the manner in which such system, environment, and changes are influenced by human actions;

(3) the term "interagency committee" means the interagency committee established under section 103;

(4) the term "Plan" means the National Global Change Research and Assessment Plan developed under section 105;

(5) the term "Program" means the United States Global Change Research Program established under section 104; and

(6) the term "regional climate change" means the natural or human-induced changes manifested in the local or regional environment (including alterations in weather patterns, land productivity, water resources, sea level rise, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of a specific region to support current or future social and economic activity or natural ecosystems.

SEC. 103. INTERAGENCY COOPERATION AND COORDINATION.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency committee to ensure cooperation and coordination of all Federal research activities pertaining to processes of global change for the purpose of increasing the overall effectiveness and productivity of Federal global change research efforts. The interagency committee shall include representatives of both agencies conducting global change research and agencies with authority over resources likely to be affected by global change.

(b) FUNCTIONS OF THE INTERAGENCY COMMITTEE.—The interagency committee shall—

(1) serve as the forum for developing the Plan and for overseeing its implementation;

(2) serve as the forum for developing the vulnerability assessment under section 107;

(3) ensure cooperation among Federal agencies with respect to global change research activities;

(4) work with academic, State, industry, and other groups conducting global change research, to provide for periodic public and peer review of the Program;

(5) cooperate with the Secretary of State in—

(A) providing representation at international meetings and conferences on global change research in which the United States participates; and

(B) coordinating the Federal activities of the United States with programs of other nations and with international global change research activities;

(6) work with appropriate Federal, State, regional, and local authorities to ensure that the Program is designed to produce information needed to

develop policies to reduce the vulnerability of the United States and other regions to global change;

(7) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities; and

(8) identify additional decisionmaking groups that may use information generated through the Program.

SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM.

The President shall establish an interagency United States Global Change Research Program to improve understanding of global change, to respond to the information needs of communities and decisionmakers, and to provide periodic assessments of the vulnerability of the United States and other regions to global and regional climate change. The Program shall be implemented in accordance with the Plan.

SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH AND ASSESSMENT PLAN.

(a) IN GENERAL.—The President shall develop a National Global Change Research and Assessment Plan for implementation of the Program. The Plan shall contain recommendations for global change research and assessment. The President shall submit an outline for the devel-

opment of the Plan to the Congress within 1 year after the date of enactment of this Act, and shall submit a completed Plan to the Congress within 3 years after the date of enactment of this Act. Revised Plans shall be submitted to the Congress at least once every 5 years thereafter. In the development of each Plan, the President shall conduct a formal assessment process under this section to determine the needs of appropriate Federal, State, regional, and local authorities and other interested parties regarding the types of information needed by them in developing policies to reduce society's vulnerability to global change and shall utilize these assessments, including the reviews by the National Academy of Sciences and the National Governors Association under subsections (e) and (f), in developing the Plan.

(b) CONTENTS OF THE PLAN.—The Plan shall—

(1) establish, for the 10-year period beginning in the year the Plan is submitted, the goals and priorities for Federal global change research which most effectively advance scientific understanding of global change and provide information of use to Federal, State, regional, and local authorities in the development of policies relating to global change;

(2) describe specific activities, including efforts to determine user information needs, research activi-

ties, data collection, database development, and data analysis requirements, development of regional scenarios, assessment of model predictability, assessment of climate change impacts, participation in international research efforts, and information management, required to achieve such goals and priorities;

(3) identify relevant programs and activities of the Federal agencies that contribute to the Program directly and indirectly;

(4) set forth the role of each Federal agency in implementing the Plan;

(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies, the National Research Council, or other entities;

(6) make recommendations for the coordination of the global change research and assessment activities of the United States with such activities of other nations and international organizations, including—

(A) a description of the extent and nature of international cooperative activities;

(B) bilateral and multilateral efforts to provide worldwide access to scientific data and information; and

(C) improving participation by developing nations in international global change research and environmental data collection;

(7) detail budget requirements for Federal global change research and assessment activities to be conducted under the Plan;

(8) catalog the type of information identified by appropriate Federal, State, regional, and local decisionmakers needed to develop policies to reduce society's vulnerability to global change and indicate how the planned research will meet these decisionmakers' information needs;

(9) identify the observing systems currently employed in collecting data relevant to global and regional climate change research and prioritize additional observation systems that may be needed to ensure adequate data collection and monitoring of global change; and

(10) describe specific activities designed to facilitate outreach and data and information exchange with regional, State, and local governments and other user communities.

(c) RESEARCH ELEMENTS.—The Plan shall include at a minimum the following research elements:

(1) Global measurements, establishing worldwide to regional scale observations prioritized to understand global change and to meet the information needs of decisionmakers on all relevant spatial and time scales.

(2) Information on economic, demographic, and technological trends that contribute to changes in the Earth system and that influence society's vulnerability to global and regional climate change.

(3) Development of indicators and baseline databases to document global change, including changes in species distribution and behavior, extent of glaciations, and changes in sea level.

(4) Studies of historical changes in the Earth system, using evidence from the geological and fossil record.

(5) Assessments of predictability using quantitative models of the Earth system to simulate global and regional environmental processes and trends.

(6) Focused research initiatives to understand the nature of and interaction among physical, chemical, biological, land use, and social processes related to global and regional climate change.

(7) Focused research initiatives to determine and then meet the information needs of appropriate Federal, State, and regional decisionmakers.

(d) INFORMATION MANAGEMENT.—The Plan shall incorporate, to the extent practicable, the recommendations relating to data acquisition, management, integration, and archiving made by the interagency climate and other global change data management working group established under section 203.

(e) NATIONAL ACADEMY OF SCIENCES EVALUATION.—The President shall enter into an agreement with the National Academy of Sciences under which the Academy shall—

(1) evaluate the scientific content of the Plan; and

(2) recommend priorities for future global and regional climate change research and assessment.

(f) NATIONAL GOVERNORS ASSOCIATION EVALUATION.—The President shall enter into an agreement with the National Governors Association Center for Best Practices under which that Center shall—

(1) evaluate the utility to State, local, and regional decisionmakers of each Plan and of the anticipated and actual information outputs of the Pro-

gram for development of State, local, and regional policies to reduce vulnerability to global change; and

(2) recommend priorities for future global and regional climate change research and assessment.

(g) PUBLIC PARTICIPATION.—In developing the Plan, the President shall consult with representatives of academic, State, industry, and environmental groups. Not later than 90 days before the President submits the Plan, or any revision thereof, to the Congress, a summary of the proposed Plan shall be published in the Federal Register for a public comment period of not less than 60 days.

SEC. 106. BUDGET COORDINATION.

(a) IN GENERAL.—The President shall provide general guidance to each Federal agency participating in the Program with respect to the preparation of requests for appropriations for activities related to the Program.

(b) CONSIDERATION IN PRESIDENT'S BUDGET.—The President shall submit, at the time of his annual budget request to Congress, a description of those items in each agency's annual budget which are elements of the Program.

SEC. 107. VULNERABILITY ASSESSMENT.

(a) REQUIREMENT.—Within 1 year after the date of enactment of this Act, and at least once every 5 years

thereafter, the President shall submit to the Congress an assessment which—

(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

(2) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years;

(3) based on indicators and baselines developed under section 105(c)(3), as well as other measurements, analyzes changes to the natural environment, land and water resources, and biological diversity in—

(A) major geographic regions of the United States; and

(B) other continents;

(4) analyzes the effects of global change, including the changes described in paragraph (3), on food and fiber production, energy production and use, transportation, human health and welfare, water availability and coastal infrastructure, and human social and economic systems, including providing information about the differential impacts on specific geographic regions within the United States, on people of different income levels within those regions,

and for rural and urban areas within those regions; and

(5) analyzes the vulnerability of different geographic regions of the world to global change, including analyses of the implications of global change for international assistance, population displacement, and national security.

(b) COORDINATION.—To the extent appropriate, the information produced in accordance with this section shall be coordinated with the production of similar reports and information produced by the United States Global Change Research Program for incorporation into reports of international organizations, including the World Meteorological Organization and the Intergovernmental Panel on Climate Change.

SEC. 108. POLICY ASSESSMENT.

Not later than 1 year after the date of enactment of this Act, and at least once every 3 years thereafter, the President shall submit to the Congress a policy assessment which—

(1) documents current policy options being utilized by Federal, State, and local governments to mitigate or adapt to the effects of global change;

(2) evaluates the realized and anticipated effectiveness of those current policy options in addressing global change; and

(3) identifies and evaluates additional policy options for mitigating or adapting to the effects of global change.

SEC. 109. ANNUAL REPORT.

Each year at the time of submission to the Congress of the President's budget request, the President shall submit to the Congress a report on the activities conducted pursuant to this title, including—

(1) a summary of the achievements of the Program during the period covered by the report;

(2) an analysis of the progress made toward achieving the goals of the Plan; and

(3) a list of the State, local, and regional decisionmakers identified as potential users of the information generated through the Program and a description of the consultations with this community coordinated through the work of the interagency committee.

SEC. 110. RELATION TO OTHER AUTHORITIES.

The President shall—

(1) ensure that relevant research, assessment, and outreach activities of the National Climate Pro-

gram, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global and regional climate change research and assessment efforts; and

(2) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities through programs authorized in the National Climate Program Act (15 U.S.C. 2901 et seq.).

SEC. 111. REPEAL.

The Global Change Research Act of 1990 (15 U.S.C. 2921 et seq.) is repealed.

TITLE II—CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT

SEC. 201. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Federal agencies have a primary mission to manage and archive climate and other global change data obtained through their research, development, or operational activities.

(2) Maintenance of climate and global change data records is essential to present and future stud-

ies of the Earth's atmosphere, biogeochemical cycles, and climate.

(3) Federal capabilities for the management and archiving of these data have not kept pace with advances in satellite and other observational technologies that have vastly expanded the type and amount of information that can be collected.

(4) Proposals and plans for expansion of global observing networks should include plans for the management of data to be collected and budgets reflecting the cost of support for management and archiving of data.

(b) PURPOSES.—The purposes of this title are to establish climate and other global change data management and archiving as Federal agency missions, and to establish Federal policies for managing and archiving climate and other global change data.

SEC. 202. DEFINITIONS.

For purposes of this title—

(1) the term ''metadata'' means information describing the content, quality, condition, and other characteristics of climate and other global change data, compiled, to the maximum extent possible, consistent with the requirements of the ''Content Standard for Digital Geospatial Metadata'' (FGDC–STD–

001–1998) issued by the Federal Geographic Data Committee, or any successor standard approved by the working group; and

(2) the term ''working group'' means the interagency climate and other global change data management working group established under section 203.

SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT WORKING GROUP.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency climate and other global change data management working group to make recommendations for coordinating Federal climate and other global change data management and archiving activities.

(b) MEMBERSHIP.—The working group shall include the Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, the Secretary of Energy, the Secretary of Defense, the Director of the National Science Foundation, the Director of the United States Geological Survey, the Archivist of the United States, the Administrator of the Environmental Protection Agency, the Secretary of the Smithsonian Institution, or their des-

ignees, and representatives of any other Federal agencies the President considers appropriate.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, the working group shall transmit a report to the Congress containing the elements described in subsection (d). Not later than 4 years after the initial report under this subsection, and at least once every 4 years thereafter, the working group shall transmit reports updating the previous report. In preparing reports under this subsection, the working group shall consult with expected users of the data collected and archived by the Program.

(d) CONTENTS.—The reports and updates required under subsection (c) shall—

(1) include recommendations for the establishment, maintenance, and accessibility of a catalog identifying all available climate and other global change data sets;

(2) identify climate and other global change data collections in danger of being lost and recommend actions to prevent such loss;

(3) identify gaps in climate and other global change data and recommend actions to fill those gaps;

(4) identify effective and compatible procedures for climate and other global change data collection, management, and retention and make recommendations for ensuring their use by Federal agencies and other appropriate entities;

(5) develop and propose a coordinated strategy for funding and allocating responsibilities among Federal agencies for climate and other global change data collection, management, and retention;

(6) make recommendations for ensuring that particular attention is paid to the collection, management, and archiving of metadata;

(7) make recommendations for ensuring a unified and coordinated Federal capital investment strategy with respect to climate and other global change data collection, management, and archiving;

(8) evaluate the data record from each observing system and make recommendations to ensure that delivered data are free from time-dependent biases and random errors before they are transferred to long-term archives; and

(9) evaluate optimal design of observation system components to ensure a cost-effective, adequate set of observations detecting and tracking global change.

TITLE III—INTERNATIONAL CO-OPERATION IN GLOBAL CHANGE RESEARCH

SEC. 301. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Pooling of international resources and scientific capabilities will be essential to a successful international global change program.

(2) While international scientific planning is already underway, there is currently no comprehensive intergovernmental mechanism for planning, coordinating, or implementing research to understand global change and to mitigate possible adverse effects.

(3) An international global change research program will be important in building future consensus on methods for reducing global environmental degradation.

(4) The United States, as a world leader in environmental and Earth sciences, should help provide leadership in developing and implementing an international global change research program.

(b) PURPOSES.—The purposes of this title are to—

(1) promote international, intergovernmental cooperation on global change research;

(2) involve scientists and policymakers from developing nations in such cooperative global change research programs; and

(3) promote international efforts to provide technical and other assistance to developing nations which will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

SEC. 302. INTERNATIONAL DISCUSSIONS.

(a) GLOBAL CHANGE RESEARCH.—The President shall direct the Secretary of State to initiate discussions with other nations leading toward international protocols and other agreements to coordinate global change research activities. Such discussions should include the following issues:

(1) Allocation of costs in global change research programs, especially with respect to major capital projects.

(2) Coordination of global change research plans with those developed by international organizations such as the International Council on Scientific Unions, the World Meteorological Organization, and the United Nations Environment Program.

(3) Establishment of global change research centers and training programs for scientists, especially those from developing nations.

(4) Development of innovative methods for management of international global change research, including the use of new or existing intergovernmental organizations for the coordination or funding of global change research.

(5) Establishment of international offices to disseminate information useful in identifying, preventing, mitigating, or adapting to the possible effects of global change.

(b) ENERGY RESEARCH.—The President shall direct the Secretary of State (in cooperation with the Secretary of Energy, the Secretary of Commerce, the United States Trade Representative, and other appropriate Federal agents) to initiate discussions with other nations leading toward an international research protocol for cooperation on the development of energy technologies which have minimally adverse effects on the environment. Such discussions should include the following issues:

(1) Creation of an international cooperative program to fund research related to energy efficiency and conservation, solar and other renewable

energy sources, and passively safe and diversion-resistant nuclear reactors.

(2) Creation of an international cooperative program to develop low-cost energy technologies which are appropriate to the environmental, economic, and social needs of developing nations.

(3) Exchange of information concerning environmentally safe energy technologies and practices, including those described in paragraphs (1) and (2).

SEC. 303. GLOBAL CHANGE RESEARCH INFORMATION OFFICE.

The President shall establish an Office of Global Change Research Information to disseminate to foreign governments, businesses, and institutions, as well as the citizens of foreign countries, scientific research and other information available in the United States which would be useful in preventing, mitigating, or adapting to the effects of global change.

XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 906, THE GLOBAL CHANGE RESEARCH AND DATA MANAGEMENT ACT OF 2007

WEDNESDAY, JUNE 27, 2007

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Committee met, pursuant to call, at 10:08 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. The Committee will come to order.

Pursuant to notice, the Committee on Science and Technology meets to consider the following measures: H.R. 906, the Global Change Research and Data Management Act of 2007; H.R. 1933, the Department of Energy Carbon Capture and Storage Research, Development, and Demonstration Act of 2007; H.R. 2773, the Biofuels Research and Development Enhancement Act; and H.R. 2774, the Solar Energy Research and Investment Act of 2007.

I know that we have a lot of other markups going on today, so we are going to try to proceed, but I would like to make a couple of announcements at first. Now, some of the Members have been interested in the trip we are going to be taking, the fact-finding trip we are taking to Greenland the weekend of July the 19th. We should know today about—we have a plane, but we still have concern about in-country travel, because we can't use our plane there, because of the lengths of the runway. We should know more about that today, so we will know the size and the number of folks that we can take.

Also, you have received a letter through your office, but I will remind you, in case you didn't know, that there is going to be a climate change meeting of the UN Framework Convention on Climate Change, the parent body that oversees the Kyoto Protocol. It will be held in Bali from December the 3rd to the 14th. There will be important areas of discussion. It will include carbon sequestration, reforestation, avoiding deforestation, and carbon trading. There will be about 10,000 international delegates there. We will not, or as Members, we will not be a credentialed participant, but we will be able to interact with those folks that are there. We will not be taking a Science Committee group as a whole, but we do have some slots, I think, that will be made available to us, for individuals that would like to go. But again, when you put 10,000 people there, it is going to be crowded, and so, you need to let us know soon.

And finally, I think that we should all say happy birthday to Margaret today. We congratulate her on surviving one more, and hope there will be more to come.

Mr. LAMPSON. And happy anniversary to you and your wife, Mr. Chairman.

Chairman GORDON. Thank you for reminding me. By the way, from 7:00 to 9:00 will be a good time to call votes, because I am not going to be here tonight.

With concern about global climate change, the high gas and electricity prices, and our growing reliance on unstable energy supplying nations, energy has come to the forefront of our constituents' awareness, and has been placed at the top of the Congressional to-do list. Here, on the Science and Technology Committee, we have responded with an aggressive energy agenda. With the addition of four bills, that we are going to mark up today, this committee will contribute an even dozen pieces of bipartisan legislation that made a vital contribution to the national strategy to put U.S. and the world on track to a more sustainable future.

First, we will consider H.R. 906. Mr. Udall and Mr. Inglis, the Ranking Member of the Energy and Environment Subcommittee and co-sponsor of the bill, have worked together to produce this legislation. H.R. 906 re-orients the U.S. Global Change Research Program to produce more policy relevant climate information for regional, State, and local governments, and other groups.

We will then take up H.R. 1933, by Representative Udall, which sets out the next steps in DOE's carbon mitigation strategies. In addition to ongoing research in carbon management, the bill authorizes DOE to conduct demonstrations on large scale Carbon Capture and Storage technologies, through partnerships with industrial, academic, and government entities. Because we will continue to use our abundant resources of coal to meet our energy needs for the foreseeable future, it is critical that we demonstrate an integrated system of capture, transportation, and storage of carbon dioxide, at a scale that encourages industry to start making technological choices.

Next, the Committee will take up a bill by the Chairman of the Energy and Environment Subcommittee, Representative Nick Lampson. H.R. 2773, the Biofuels Research and Development Enhancement Act, will better coordinate and compile information from federal biofuels research programs, and focus biofuels research on infrastructure needs and efficiency of biorefinery technologies. H.R. 2773 also provides for the in depth study of several challenges facing broader of biofuels, and increases the funding levels of biofuels research.

Finally, we will consider H.R. 2774, the Solar Energy Research and Advancement Act of 2007, introduced by Congresswoman Giffords. This bill creates an R&D program on energy storage technology for concentrating solar plants, which allows for the use of solar energy, even when the sun isn't shining. It also asks DOE to conduct studies on how to best integrate concentrating solar plants within the grid, and ways to reduce water uses in these plants. In addition, it creates a workforce training program for solar installation and maintenance, which is critical to making solar power a real energy option across the Nation.

For each of these bills, the Energy and Environment Subcommittee held legislative hearings, had markups, where we heard valuable witness testimony, and facilitated good Member discussions on the barriers and possible pathways to these programs. And as you know, we are not alone in this effort. The Energy and

Commerce Committee is marking up a series of bills today, at this very moment, and my friend, Congressman Hall, as well as a few of the folks in the Majority, are on both committees, so we are monitoring that, and if you see a dust cloud here at some point, we will be moving to the other committee to make those votes, but I am sure we will be left in good hands here, and we will continue with this markup.

In conclusion, I want to urge my colleagues to support these bills. I know that the Committee's pace has been very aggressive, and it has been difficult at times for all of us. However, I believe the products that have resulted from this process demonstrate the value of this committee, and its bipartisan work reflects the entire membership.

The bottom line is that we are going to have an energy bill in July. The Science Committee is going to, in a bipartisan way, make a major, major contribution with that. There are going to be several other committees that will have bills. We are going to get a reference from most of those, sequential, which we will also put our mark on. Every bill that has come out of this committee has been bipartisan, all but one. We will see what happens today, but so far, all but one has been unanimous, and so, I think everyone on this committee can go home, and claim a great deal of credit for what I think will be not an enormously comprehensive, but a good bill, a step forward, that will pass by a large margin on the House Floor in July.

So now, I recognize Mr. Hall to present his opening remarks.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

With concerns about global climate change, high gas and electricity prices, and our growing reliance on unstable energy-supplying nations, energy has come to the forefront of our constituents' awareness and has been placed at the top of the Congressional "To-Do" list.

Here on the Science and Technology Committee we have responded with an aggressive energy agenda.

With the addition of the four bills we are marking up today, this committee will contribute an even dozen pieces of legislation that make a vital contribution to the national strategy to put the U.S., and the world, on track to a more sustainable future.

First we will consider H.R. 906. Mr. Udall and Mr. Inglis, the Ranking Member of the Energy and Environment Subcommittee and co-sponsor of the bill, have worked together to produce this legislation.

H.R. 906 re-orients the U.S. Global Change Research Program to produce more policy-relevant climate information for regional, State, and local governments and other user groups.

We will then take up H.R. 1933 by Rep. Udall, which sets out the next steps in DOE's carbon mitigation strategies. In addition to ongoing research in carbon management, the bill authorizes DOE to conduct demonstrations of large-scale carbon capture and storage technologies through partnerships with industrial, academic and government entities.

Because we will continue to use our abundant resources of coal to meet our energy needs for the foreseeable future, it is critical that we demonstrate an integrated system of capture, transportation, and storage of carbon dioxide at a scale that encourages industry to start making technology choices.

Next, the Committee will take up a bill by the Chairman of the Energy & Environment Subcommittee, Rep. Nick Lampson. H.R. 2773, the Biofuels Research and Development Enhancement Act, will better coordinate and compile information from federal biofuels research programs and focus biofuels research on infrastructure needs and efficiency of biorefinery technologies.

H.R. 2773 also provides for the in-depth study of several challenges facing broader use of biofuels and increases the funding levels for biofuels research.

Finally, we will consider H.R. 2774, the Solar Energy Research and Advancement Act of 2007, introduced by Congresswoman Giffords. This bill creates an R&D program on energy storage technology for concentrating solar power plants, which allows for the use of solar energy even when the sun isn't shining.

It also asks DOE to conduct studies on how to best integrate concentrating solar plants with the grid, and ways to reduce water usage in these plants. In addition, it creates a workforce training program for solar installation and maintenance, which is critical to making solar power a real energy option across the country.

For each of these bills the Energy and Environment Subcommittee held legislative hearings and markups where we heard valuable witness testimony and facilitated good Member discussions on the barriers and possible pathways for these programs.

And, as you all may know, we are not alone in this effort today. The Energy and Commerce Committee is also marking up a series of energy bills and I, along with Ranking Member Hall and a few others, may have to excuse myself for votes in that committee.

In conclusion, I urge my colleagues to support these four bills. I know the Committee's pace has been very aggressive and that has been difficult at times for all of us. However, I believe the products that have resulted from this process demonstrate the value of this committee and its work and it reflects well on the entire membership.

I want to thank all the Members for their cooperation and participation.

Mr. HALL. Thank you, Mr. Chairman, and I will try not to take the full length of time, and make one statement. I will be glad, as I am sure you will and others, when this month passes.

I understand that you and your fellow Chairmen and other Members have been working, I guess, under the usual pressure of this first year, to get and report bills out of the Committee, and sometimes, I fear that when we rush things through, we don't get the best end-product we could have, if we had more time to fully vet the language, but I guess we will be working that as we go.

You have done a good job of working with us, and I thank you for that. While I think improvements in the bill before us today are going to occur through amendments to be offered, I think they could be improved further, and I hope we will have other opportunities to do this, as the bill moves to the Floor. It is also my hope and understanding that, going forward, there will be more of an effort to have both sides working together, as we craft legislation to come before this committee. We will have more time. I think this would improve not only the quality of work we produce, but also, the bipartisan way in which they are handled.

With that said, I support and believe it is important to our country's energy future to keep all options on the table, and we strive to do that with the three energy bills before us. One of our greatest challenges as a Nation is energy self-sufficiency. We need to break our dependence on foreign sources of energy from countries we don't trust and who don't trust us. To do that, we need to be honest and practical about what needs to be done to get to that point.

Solar and biofuels are an important source of domestic energy, but they are also limited in their scope. It is important that we continue to research and develop the resources we know exist domestically, and currently provide reliable, affordable, and clean sources of energy. I look forward to working with the Committee and working with you, Mr. Chairman, in the months ahead, to address this reality, so that Americans can enjoy more energy choices at a lower cost.

I yield back.

[The statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you Mr. Chairman. In the interest of time, I will keep my statement brief and say that I will be glad when this month is over. I understand that you and your fellow Chairmen have been working under pressure from the Speaker to report bills out of committee, but I fear that sometimes when things are rushed through, we don't get the best end-products we could have if we had more time to fully vet the language. While I think there are improvements in the bills before us today with the Subcommittee markup last week and the amendments to be offered today, I think that they could still be improved upon, and I hope that we'll have other opportunities to do so. It is also my hope and understanding that going forward, there will be more of an effort to have both sides working together as we craft legislation to come before the Committee. I think this would improve not only the quality of work we produce, but also the bipartisan way in which they are handled.

With that said, I support what we're doing here today. It's important to our country's energy future to keep all options on table, and we continue to do that with the three energy bills before us.

With that I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Chairman, or rather, thank you, Mr. Hall.

Let me also say that you may not know, but I met privately and personally with the Republican, both the staff from the Members, as well as the Committee staff the other day, to talk about how we can, you know, do what I think is a good job even better. There were compliments in some areas of the consultation. There were suggestions for improvement in the others. I have asked for them to put together models of how they see things done, and good ways that we have done it, and if we haven't done it as well as we would like, so those kind of models, we are going to continue to work together.

I am a new Chairman, there is a lot of new staff, and we are going to get this thing better and better, as we go along, because I truly believe that more consultation gets us a bipartisan bill, a consensus bill, and we are all going to be better off.

So, does anyone else wish to be recognized?

All right. Then I ask unanimous consent that the bill is considered as read and open to amendment at any point, and that the Members proceed with the amendments in the order on the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by the gentleman from Colorado, Mr. Udall. Are you ready to proceed with your amendment?

Mr. UDALL. Mr. Chairman, I am. If I might, can I make a statement on the bill itself?

Chairman GORDON. And you have an amendment at the desk?

Mr. UDALL. Mr. Chairman, I have a bill at the desk, and if I might, I would like to make a statement on the bill itself.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Mr. Udall of Colorado.

Chairman GORDON. Okay. All right. Excuse me, Mr. Udall, I guess my gavel got in front of your request to make a statement. Let me recognize, once again, you for a statement, and anyone else that would like to.

Mr. UDALL. Thank you, Chairman Gordon, for bringing the bill up today, and if I could, I would like to just briefly describe it. I

introduced H.R. 906, the Global Change Research and Data Management Act of 2007, with my colleague from South Carolina, Mr. Inglis, earlier this year.

Climate change is occurring. Its impacts are already being felt across the country, from Alaska's melting tundra to more intensive droughts across the West. Although we are still debating how to address this challenge at the federal level, we will have to confront climate change soon, and with some mix of mitigation and adaptation. The increase in extreme weather events along will have a large human and economic cost.

H.R. 906 will set us in the right direction, by expanding and improving the U.S. Global Change Research Program to provide more user-driven research and information. We will need economic and technical information, as well as information about system responses, and climate responses to different concentrations of greenhouse gases in the atmosphere, to design cost-effective policies to achieve reductions, and avoid dangerous impacts of future climate change.

The program should be the vehicle providing us information. H.R. 906 will improve the outreach and information exchange aspects of this program, and make the information that it provides more useful. This program has contributed significantly to our knowledge about climate change in our planet's environment since its formation in 1990, but we now need to expand this information, and tailor it to the needs of decision-makers confronted with management and mitigation challenges.

I should add that I believe that we must cut our carbon dioxide emissions as a part of our response to climate change. However, H.R. 906 deals with a research program. The legislation does not create a cap and trade program or any other regulations.

And Mr. Chairman, before closing, I would truly like to thank the staff on both sides of the aisle for their hard work on this legislation. We are lucky to have such an excellent staff on the Science and Technology Committee. And again, I want to thank my colleague, Representative Inglis, for working with me on H.R. 906, and I would ask our colleagues to support this important legislation.

I yield back.

[The prepared statement of Mr. Udall follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARK UDALL

Thank you, Chairman Gordon, for bringing this bill up for markup today.

I introduced H.R. 906, the Global Change Research and Data Management Act of 2007, with my colleague from South Carolina, Mr. Inglis, earlier this year.

Climate change is occurring—its impacts are already being felt across the country, from Alaska's melting tundra to more intense droughts across the West.

Although we are still debating how to address this challenge at the federal level, we will have to confront climate change soon and with some mix of mitigation and adaptation. The increase in extreme weather events alone will have a very large human and economic cost.

H.R. 906 will set us in the right direction by expanding and improving the U.S. Global Change Research Program to provide more user-driven research and information.

We will need economic and technical information as well as information about system responses and climate responses to different concentrations of greenhouse gases in the atmosphere to design cost effective policies to achieve reductions and avoid dangerous impacts of future climate change.

The program should be the vehicle for providing this information. H.R. 906 will improve the outreach and information exchange aspects of this program and make the information that it provides more useful.

The program has contributed significantly to our knowledge about climate change and our planet's environment since its formation in 1990—but we now need to expand this information and tailor it to the needs of decision-makers confronted with management and mitigation challenges.

I should add that I believe that we must cut our carbon dioxide emissions as part of our response to climate change.

However, H.R. 906 deals with a research program—the legislation does not create a cap and trade program or any other regulations.

Before closing, I'd like to thank the staff on both sides for their hard work on this legislation. We are lucky to have such an excellent staff on the Science and Technology Committee.

Again, I thank my colleague, Rep. Inglis for working with me on H.R. 906. I ask our colleagues to support this important legislation.

Chairman GORDON. Thank you, Mr. Udall. I recognize Mr. Hall to present any opening remarks.

Mr. HALL. Mr. Chairman, I will be very brief. Mr. Udall laid it out very well. This bill reorients the U.S. Interagency Climate Change Science Program to make it a little more responsive to the needs of State and local resource managers, and I am also pleased that the Committee held a hearing on the bill, and took the time to consult with both sides of the aisle on it.

And I think with that, I yield back my time.

Chairman GORDON. Does anyone else wish to be recognized? If not, I ask unanimous consent that the bill is considered as read and open to amendment at any point, and that the Members proceed with the amendments in the order on the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment, offered by the gentleman from Colorado, Mr. Udall. Are you ready to proceed with your amendment?

Mr. UDALL. Mr. Chairman, I am, and I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Mr. Udall of Colorado, amendment #067.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain the amendment.

Mr. UDALL. Thank you, Mr. Chairman. The manager's amendment incorporates a series of additional changes to the legislation. Again, I want to thank my good friend, Representative Inglis, for working with me to develop and incorporate these changes.

There are a few minor changes to refine several provisions in the bill, and in addition to those changes, there are three more significant changes or additions to the bill. I would like to briefly touch on those three changes.

First, we have added a requirement for the Interagency Committee to subdivide the U.S. into regions that are likely to experience similar impacts, or share similar vulnerabilities to global change. We made this addition to facilitate the implementation of a requirement for regional workshops with outside stakeholders contained in the amendment that will be offered in a few minutes. It is also necessary to define these regions, if we are to develop

more refined projections of climate change impacts, and design adaptation and mitigation strategies tailored to regional conditions.

We also refined the language requiring the program to assess the vulnerabilities to climate change for all regions of the world. The IPCC process provides a good basis for that. We are directing the program to utilize that information to analyze the implications for the United States. Changes in other parts of the world will impact us indirectly, and we need to understand what those indirect impacts are likely to be.

We also consulted with the Administration. They had some concerns that the language we adopted in the Subcommittee did not achieve our goal of ensuring maximum use of the information produced by the Global Change Research Program, as incorporated into IPCC reports. We have incorporated language that the Administration provided, to accommodate their concerns, and to ensure that the information used to produce the reports and other assessments is fully utilized and incorporated into the assessments required under this Act.

And finally, we amended Section 303 of the original bill, and moved it into Title I. Section 303 was part of the original 1990 law. It required the Administration to establish an information office to facilitate the distribution of the program's information domestically and internationally. The program does maintain a website, so we decided to modernize Section 303 to reflect the new reality of electronic communication. The new Section 112 requires the establishment or designation of a Global Change Research Information Exchange that will make information from the program and other sources available through electronic means.

Again, I want to thank my colleague, Mr. Inglis, for working with me on this amendment and the legislation, and I would urge adoption of the amendment.

Chairman GORDON. Is there further discussion of the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Aye. Those opposed, no. The ayes have it. The amendment is agreed to.

The second amendment on the roster is offered also by the gentleman from Colorado, Mr. Udall. Are you ready to proceed with your amendment?

Mr. UDALL. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Mr. Udall of Colorado, amendment #066.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain the amendment.

Mr. UDALL. Thank you, Mr. Chairman.

One of the most consistent comments we have received during the hearing and throughout the written comments was the need for a strong advocate in the Administration with corresponding budget authority.

After the hearing, I should say at the hearing on H.R. 906, we heard testimony from multiple witnesses explaining the need for a lead agency of the U.S. Global Climate Research Program.

Dr. Mahoney, former Director of the Climate Change Science Program, stated that to be successful, a program like this must have a reasonably funded management and coordination office with a sense of permanence to it.

During questioning, Dr. Jack Fellows, Vice President at the University Center for Atmospheric Research, explained: "I do think there is an argument to be made for the U.S. Global Change Research Program to be close enough to political power to make the kind of decisions and tradeoffs that you would across an agency, and to have some level of budget authority that can help to encourage or provide incentives for people to make investments in the highest priority areas of the program."

I have worked with my colleague and cosponsor, Mr. Inglis, to craft a solution to this longstanding problem in the U.S. Global Change Research Program. The amendment may not go as far as some would advocate, but we believe it does address the shortcoming of the program our witnesses and others identified.

The amendment designates the Office of Science and Technology Policy as the lead agency of the U.S. Global Climate Change Program, and a single point of contact responsible for the program, the Director of OSTP. OSTP has a long history of involvement with the USGCRP, and its designation as a lead agency is consistent with its purposes, as defined in the National Science and Technology Policy Organization and Priorities Act of 1976. That was the law that created OSTP.

The amendment also authorizes OSTP to perform interagency tasks. The Director of OSTP, in consultation with the Interagency Committee for the program, is required to identify activities included in the strategic plan that involve the participation of two or more agencies, and that are required by the Act. The identified activities are those that do not have budget allocations within the individual agencies. The Director then has the authority to allocate funding to get these tasks done. The funds could be used for activities such as development of scenarios needed to make projections of climate change and its impacts, calibrating and testing alternative models, identification and definition of economic sectors and regional climatic zones, and convening regional workshops to facilitate outreach with regional, State, and local governments, and other non-federal stakeholders.

We have heard from many of the outside groups about the value of regular forums for exchange of information. The amendment requires the Director to ensure that at least one workshop will be held in each region annually—to facilitate the exchange of information between the program and other organizations—and individuals with an interest in climate change.

The amendment authorizes $10 million per year for these activities, and again, I want to thank Mr. Inglis for working with me on this amendment, and I urge my colleagues to support this amendment, and yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Udall. Mr. Inglis, you are here just in time, if you would like to make a comment on your amendment.

Mr. INGLIS. Thank you, Mr. Chairman. I am happy to be a co-sponsor of Mr. Udall's bill, the Global Climate Change Research and Data Management Act.

For many years, the United States Global Research Program has coordinated a successful interagency research program on global environmental change and implications of a changing climate for society. H.R. 906 continues support for this research, and makes the research user-friendly for federal, State, and local decision-makers who are tasked with the job of creating policies that address the challenges associated with climate change.

I urge my colleagues to support this bill, and I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Inglis, for your help on this amendment and the bill in general. Is there any further discussion on the amendment?

If no, the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

The third amendment on the roster is offered by the gentleman from Georgia, Dr. Gingrey. Are you ready to proceed with your amendment?

Mr. GINGREY. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Mr. Gingrey of Georgia, amendment #037.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes.

Mr. GINGREY. Mr. Chairman, thank you. During the hearings, of course, we heard from a number of expert witnesses, and the question always, in my mind, and in the mind of many other Members of the Committee, and I think on both sides of the aisle, is not so much a question of the science in regard to climate change, but the action that we take as decision-makers in regard to adaptation and/or mitigation.

And in this bill, which I think H.R. 906, and I commend Mr. Udall and Mr. Inglis for bringing it forward, an excellent piece of legislation, but Section 108 calls for the Administration to report to, on a timely basis, to the Congress, an initial report, I think within one year after passage of the bill, and then, every three years thereafter.

My amendment basically would assign this responsibility, it would have the Administration, whatever Administration that might be, to contract with the National Academy of Public Administration, and the National Academy of Sciences, for them to submit those reports, so that we get information that in no way, shape, or form would be biased in regard to not just what we should do and recommend to our global partners, but also, our State and local communities, in regard to what policies are being used in the way of adaptation and mitigation, how are they working, and what is the cost-benefit analysis of that, as we get down to making these tough decisions.

So, I understand, Mr. Chairman, that the amendment has been favorably looked upon by Mr. Udall and by you, Mr. Chairman, and

I am pleased with that, so I would again, offer that amendment to the Committee, and ask for its approval.

[The prepared statement of Mr. Gingrey follows:]

PREPARED STATEMENT OF REPRESENTATIVE PHIL GINGREY

Mr. Chairman, I thank you for the opportunity to offer this amendment, and I thank Mr. Udall and Mr. Inglis for working with me on it and agreeing to accept it. My amendment changes section 108, the policy assessment. My amendment directs a neutral party, rather than the Administration, to:

- assess current policies being implemented by Federal, State, and local governments to mitigate or adapt to the effects of global and regional climate change;
- evaluate effectiveness of those policies;
- identify and evaluate a range of additional policy options and infrastructure for mitigating or adapting to the effects of global and regional climate change; and
- evaluate the distribution of economic costs and benefits of these policy options across different United States economic sectors.

This study will be performed jointly by the National Academy of Sciences and the National Academy of Public Administration, both highly respected organizations.

Mr. Chairman, I believe this study will get exactly the type of information we all seek—what are the options for adapting to and mitigating climate change, what will those get us, and what will they cost.

I yield back the balance of my time.

Chairman GORDON. Thank you, Dr. Gingrey. It is a good amendment. Clearly, we should not be making recommendations that we don't know the full impact or the cost, and I think this amendment will help us to be able to obtain that information.

Does anyone wish——

Mr. UDALL. Mr. Chairman, I would move to strike the last word.

Chairman GORDON. The gentleman is recognized for five minutes.

Mr. UDALL. Just briefly, I want to thank Mr. Gingrey for offering this important amendment, and my friend from Georgia asked a great question at the third IPCC hearing. Now that we know that climate change is happening, what do we do about it? What is the best way to reduce the impacts of climate change, while also preserving the American way of life? We must find solutions that reduce emissions, but also protect jobs.

And my friend from Georgia, clearly, your amendment will help us figure out which strategies make the most sense moving forward, and I think it improves the legislation. Thank you for being engaged, and I am proud to support your amendment.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Aye. Those opposed, no. The ayes have it. The amendment is agreed to.

The fourth amendment on the roster is offered by the gentlelady from California, Ms. Woolsey.

Ms. WOOLSEY. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Ms. Woolsey of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentlelady is recognized for five minutes to explain her amendment.

Ms. WOOLSEY. Mr. Chairman, my amendment commissions a study to examine how climate change is causing the melting of the ice sheet, and how that melting will affect sea level rise.

On February 2, 2007, Mr. Chairman, the Intergovernmental Panel on Climate Change, the IPCC, released its report detailing the current state of scientific knowledge on climate change. A week later, this committee held a hearing to investigate this report and the findings of the IPCC Working Group I, and at that hearing, we learned that Working Group I had greatly underestimated their projections of sea level rise, because the data that was available to them at the time did not include some of the greatest threats to sea level rise, the ice sheets of Greenland and Antarctica.

Therefore, Mr. Chairman, many scientists now argue that on the current warming trend, we really could completely melt the Greenland ice shelf, adding seven meters to sea level, while the eventual disintegration of the West Antarctic ice sheet remains controversial. So, this melting, if it happened, would add another seven meters to the sea level. These are frightening statistics.

We have to know more about them, and that is why my amendment directs the National Science Foundation to enter into an arrangement with NOAA and NAS to complete a study, and we then can be more accurate in what we are determining our needs will be. And the IPCC report, when it includes Greenland and Antarctica, could make the difference between whether we are looking at two feet or 40 feet predicted based on global warming.

[The prepared statement of Ms. Woolsey follows:]

PREPARED STATEMENT OF REPRESENTATIVE LYNN WOOLSEY

Mr. Chairman, my amendment commissions a study to examine how climate change is causing the melting of the ice sheet and how that melting will effect sea level rise.

On February 2, the Intergovernmental Panel on Climate Change (IPCC) released its report detailing the current state of scientific knowledge on climate change. A week later, this committee held a hearing to investigate this report and the findings of the IPCC Working Group I.

At that hearing, we learned that Working Group I had to greatly underestimate their projections of sea level rise because the data that was available to them at the time did not include some of the greatest threats to sea level rise, the ice sheets of Greenland and Antarctica.

The IPCC report did project a sea level rise of less than two ft. by 2100 but, because of uncertainty in the scientific literature, it excluded the rapidly melting ice sheets in Greenland and West Antarctica. Since the completion of the report much new research has been published illustrating the possible impacts of climate change on the ice sheets. It turns out that the Greenland ice sheet is melting more rapidly than anyone could have predicted and so the effect of sea level rise will be much greater than predicted if we do not act quickly to reduce the build up of greenhouse gases.

In fact, many scientists now argue that on the current warming trend will completely melt the Greenland ice shelf, adding seven meters to sea level. While the eventual disintegration of the West Antarctic ice sheet remains controversial, its melting would add another seven meters to the sea level.

These are frightening statistics that require answers before the next IPCC report, which may not be published until six years from now.

That's why my amendment directs the National Science Foundation (NSF) to enter into an arrangement with the National Academy of Sciences (NAS) and National Oceanic and Atmospheric Administration (NOAA) to complete a study of the current status of ice sheet melt, as caused by climate change, with implications for

global sea level rise. This amendment will help to address this research deficit and help to bring clarity to the issue of future sea level rise.

Mr. Chairman, there is a big difference between the conservative estimate of two feet included in the IPCC report that excludes Greenland and Antarctica and the over 40 feet predicted more recently in other reports. We need to have sound science to know the threat we are facing, especially in coastal districts like mine.

I urge the adoption of this amendment and yield back the balance of my time.

Chairman GORDON. I thank the gentlelady. This is a good amendment, particularly with someone who represents a coastal constituency.

Ms. WOOLSEY. We don't want to get washed away.

Chairman GORDON. I understand your concern.

Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

The fifth amendment on the roster is offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 906, offered by Ms. Eddie Bernice Johnson of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentlelady is recognized for five minutes to explain her amendment.

Ms. JOHNSON. Thank you, Mr. Chairman. The amendment will add critical information that scientists will need to better understand the formation, track, and intensity of hurricanes, as well as the implications and potential impact due to climate change.

As we know, this nation, especially the Gulf Coast, has suffered immense damage due to past hurricanes. This year's hurricane season is predicted to be intense as well. Our nation requires comprehensive and improved hurricane research on frequency and intensity, and on the relationship between climate change and hurricane development.

We need to adequately utilize the expertise of our nation's scientists through our National Academies. Investing in this research study enables us to better plan, and mitigate these disastrous impacts. My amendment directs the NOAA Administrator and the National Science Foundation Director to work with the National Academy of Sciences to complete a study of the current data on the impacts of climate change on hurricane formation, its track, and frequency.

The study should take into consideration the information gained by the Intergovernmental Panel on Climate Change, as well as additional information that has amassed since the fall of 2005. Our country remains extremely vulnerable to severe damage and loss of life from natural disasters, and since 2001, hurricane damage has cost our nation an average of $35.1 billion in economic loss per year. In the past two years, hurricanes have resulted in over 1,450 innocent lives lost.

This study will provide information on scientific findings relating to rapid storm intensity change, relationships among storm size,

motion, and intensity, the internal dynamics of hurricanes, and the manner in which they interact with the environment.

Mr. Chairman, detrimental climate change will only increase the need for a report of this nature. It is imperative for Congress to have access to status reports on scientific findings, and to shape responsible policies relative to climate change.

And thank you for allowing me to offer this amendment and I urge my colleagues to accept it, and I yield back the balance of my time.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman.

This amendment will add critical information scientists will need to better understand the formation, track, and intensity of hurricanes, as well as the implications and potential impacts due to climate change.

As we know, this nation, especially the Gulf region, has suffered immense damage due to past hurricanes; this year's hurricane season is predicted to be intense as well.

Our nation requires comprehensive and improved hurricane research on frequency and intensity, and on the relationship between climate change and hurricane development.

We need to adequately utilize the expertise of our nation's scientists through the National Academies.

Investing in this research study enables us to better plan and mitigate these disastrous impacts.

My amendment directs the NOAA Administrator and NSF Director to work with the National Academy of Sciences to complete a study of the current data on the impacts of climate change on hurricane formation, track and frequency.

The study should take into consideration the information gained by the Intergovernmental Panel on Climate Change as well as additional information that has amassed since the fall of 2005.

Our country remains extremely vulnerable to severe damage and loss of life from natural disasters.

Since 2001, hurricane damage has cost our nation an average of $35.1 billion in economic losses per year. In the past two years, hurricanes have resulted in over 1,450 innocent lives lost.

The study will provide information on scientific findings relating to rapid storm intensity change, relationships among storm size, motion and intensity, the internal dynamics of hurricanes and the manner in which they interact with the environment.

Mr. Chairman, detrimental climate change will only increase the need for a report of this nature. It is imperative for Congress to have access to status reports on scientific findings to shape responsible policies relative to climate change.

Thank you allowing me to offer this amendment. I urge my colleagues to accept it and yield back the balance of my time.

Chairman GORDON. Thank you, Ms. Johnson.

Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

Ms. JOHNSON. Thank you.

Chairman GORDON. Are there other amendments? If no, the vote is on the bill, H.R. 906, as amended. All those in favor will say aye. Aye. Opposed, no. In the opinion of the Chair, the ayes have it.

I recognize Mr. Hall for a motion.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 906, as amended, with the House, with the recommendation that the bill, as amended, do pass. Furthermore, I move that the staff be instructed to prepare the legislative report, and make necessary technical and conforming changes, and that

the Chairman take all necessary steps to bring the bill before the House for consideration.

I yield back.

Chairman GORDON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Aye. Opposed, no. The ayes have it. The bill is reported favorably.

Without objection, the motion to reconsider is laid upon the table. The Members will have two subsequent calendar days in which to submit supplemental, Minority, or additional views on the measure, ending Monday, July the 2nd, at 9:00 a.m. I move, pursuant to Clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 906, the Global Change Research Data Management Act of 2007, as amendment. Without objection, so ordered.

I thank all of you, the hard core that are still here. We had a good day. Four more bills of a dozen that will go into a good Energy Bill next month, and again, a bipartisan, everybody go home and take credit. Thank you.

[Whereupon, at 1:10 p.m., the Committee was adjourned.]

Appendix:

H.R. 906 AS REPORTED, AMENDMENT ROSTER

H.R. 906, AS AMENDED BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

June 6, 2007

SECTION 1. SHORT TITLE.

This Act may be cited as the "Global Change Research and Data Management Act of 2007".

TITLE I—GLOBAL CHANGE RESEARCH

SEC. 101. FINDINGS AND PURPOSE.

(a) FINDINGS.—The Congress makes the following findings:

(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that are significantly altering the Earth habitat.

(2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant alterations of world climate patterns. Over the next century, these changes could adversely affect world agricultural and marine production, coastal habitability, biological diversity, human health, global social and political stability, and global economic activity.

(3) Developments in interdisciplinary Earth sciences, global observing systems, and satellite and computing technologies make possible significant scientific understanding of global changes and their effects, and have resulted in the significant expansion of environmental data and information.

(4) Development of effective policies to prevent, mitigate, and adapt to global change will rely on improvement in scientific understanding of global environmental processes and on development of information that is of use to decisionmakers at the local, regional, and national levels.

(5) Although the United States Global Change Research Program has made significant contributions to understanding Earth's climate and the anthropogenic influences on Earth's climate and its ecosystems, the Program now needs to produce more information to meet the expressed needs of decisionmakers.

(6) Predictions of future climate conditions for specific regions have considerable uncertainty and are unlikely to be confirmed in a time period necessary to inform decisions on land, water, and resource management. However, improved understanding of global change should be used to assist

decisionmakers in the development of policies to ensure that ecological, social, and economic systems are resilient under a variety of plausible climate futures.

(7) In order to most effectively meet the needs of decisionmakers, both the research agenda of the United States Global Change Research Program and its implementation must be informed by continuous feedback from documented users of information generated by the Program.

(b) PURPOSE.—The purpose of this title is to provide for the continuation and coordination of a comprehensive and integrated United States observation, research, and outreach program which will assist the Nation and the world to understand, assess, predict, and respond to the effects of human-induced and natural processes of global change.

SEC. 102. DEFINITIONS.

For purposes of this title—

(1) the term ''global change'' means human-induced or natural changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of the Earth to sustain life;

(2) the term ''global change research'' means study, monitoring, assessment, prediction, and information management activities to describe and understand—

(A) the interactive physical, chemical, and biological processes that regulate the total Earth system;

(B) the unique environment that the Earth provides for life;

(C) changes that are occurring in the Earth system; and

(D) the manner in which such system, environment, and changes are influenced by human actions;

(3) the term ''interagency committee'' means the interagency committee established under section 103;

(4) the term ''Plan'' means the National Global Change Research and Assessment Plan developed under section 105;

(5) the term ''Program'' means the United States Global Change Research Program established under section 104; and

(6) the term ''regional climate change'' means the natural or human-induced changes manifested in

the local or regional environment (including alterations in weather patterns, land productivity, water resources, sea level rise, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of a specific region to support current or future social and economic activity or natural ecosystems.

SEC. 103. INTERAGENCY COOPERATION AND COORDINATION.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency committee to ensure cooperation and coordination of all Federal research activities pertaining to processes of global change for the purpose of increasing the overall effectiveness and productivity of Federal global change research efforts. The interagency committee shall include representatives of both agencies conducting global change research and agencies with authority over resources likely to be affected by global change.

(b) FUNCTIONS OF THE INTERAGENCY COMMITTEE.—The interagency committee shall—

(1) serve as the forum for developing the Plan and for overseeing its implementation;

(2) serve as the forum for developing the vulnerability assessment under section 107;

(3) ensure cooperation among Federal agencies with respect to global change research activities;

(4) work with academic, State, industry, and other groups conducting global change research, to provide for periodic public and peer review of the Program;

(5) cooperate with the Secretary of State in—

(A) providing representation at international meetings and conferences on global change research in which the United States participates; and

(B) coordinating the Federal activities of the United States with programs of other nations and with international global change research activities;

(6) work with appropriate Federal, State, regional, and local authorities to ensure that the Program is designed to produce information needed to develop policies to reduce the vulnerability of the United States and other regions to global change;

(7) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities; and

(8) identify additional decisionmaking groups that may use information generated through the Program.

SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH PROGRAM.

The President shall establish an interagency United States Global Change Research Program to improve understanding of global change, to respond to the information needs of communities and decisionmakers, and to provide periodic assessments of the vulnerability of the United States and other regions to global and regional climate change. The Program shall be implemented in accordance with the Plan.

SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH AND ASSESSMENT PLAN.

(a) IN GENERAL.—The President shall develop a National Global Change Research and Assessment Plan for implementation of the Program. The Plan shall contain recommendations for global change research and assessment. The President shall submit an outline for the development of the Plan to the Congress within 1 year after the date of enactment of this Act, and shall submit a completed Plan to the Congress within 3 years after the date of enactment of this Act. Revised Plans shall be submitted to the Congress at least once every 5 years thereafter. In

the development of each Plan, the President shall conduct a formal assessment process under this section to determine the needs of appropriate Federal, State, regional, and local authorities and other interested parties regarding the types of information needed by them in developing policies to reduce society's vulnerability to global change and shall utilize these assessments, including the reviews by the National Academy of Sciences and the National Governors Association under subsections (e) and (f), in developing the Plan.

(b) CONTENTS OF THE PLAN.—The Plan shall—

(1) establish, for the 10-year period beginning in the year the Plan is submitted, the goals and priorities for Federal global change research which most effectively advance scientific understanding of global change and provide information of use to Federal, State, regional, and local authorities in the development of policies relating to global change;

(2) describe specific activities, including efforts to determine user information needs, research activities, data collection, database development, and data analysis requirements, development of regional scenarios, assessment of model predictability, assessment of climate change impacts, participation in international research efforts, and information man-

agement, required to achieve such goals and priorities;

(3) identify relevant programs and activities of the Federal agencies that contribute to the Program directly and indirectly;

(4) set forth the role of each Federal agency in implementing the Plan;

(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies, the National Research Council, or other entities;

(6) make recommendations for the coordination of the global change research and assessment activities of the United States with such activities of other nations and international organizations, including—

(A) a description of the extent and nature of international cooperative activities;

(B) bilateral and multilateral efforts to provide worldwide access to scientific data and information; and

(C) improving participation by developing nations in international global change research and environmental data collection;

(7) detail budget requirements for Federal global change research and assessment activities to be conducted under the Plan;

(8) catalog the type of information identified by appropriate Federal, State, regional, and local decisionmakers needed to develop policies to reduce society's vulnerability to global change and indicate how the planned research will meet these decisionmakers' information needs;

(9) identify the observing systems currently employed in collecting data relevant to global and regional climate change research and prioritize additional observation systems that may be needed to ensure adequate data collection and monitoring of global change; and

(10) describe specific activities designed to facilitate outreach and data and information exchange with regional, State, and local governments and other user communities.

(c) RESEARCH ELEMENTS.—The Plan shall include at a minimum the following research elements:

(1) Global measurements, establishing worldwide to regional scale observations prioritized to understand global change and to meet the information needs of decisionmakers on all relevant spatial and time scales.

(2) Information on economic, demographic, and technological trends that contribute to changes in

the Earth system and that influence society's vulnerability to global and regional climate change.

(3) Development of indicators and baseline databases to document global change, including changes in species distribution and behavior, extent of glaciations, and changes in sea level.

(4) Studies of historical changes in the Earth system, using evidence from the geological and fossil record.

(5) Assessments of predictability using quantitative models of the Earth system to simulate global and regional environmental processes and trends.

(6) Focused research initiatives to understand the nature of and interaction among physical, chemical, biological, land use, and social processes related to global and regional climate change.

(7) Focused research initiatives to determine and then meet the information needs of appropriate Federal, State, and regional decisionmakers.

(d) INFORMATION MANAGEMENT.—The Plan shall incorporate, to the extent practicable, the recommendations relating to data acquisition, management, integration, and archiving made by the interagency climate and other global change data management working group established under section 203.

(e) NATIONAL ACADEMY OF SCIENCES EVALUATION.—The President shall enter into an agreement with the National Academy of Sciences under which the Academy shall—

(1) evaluate the scientific content of the Plan; and

(2) recommend priorities for future global and regional climate change research and assessment.

(f) NATIONAL GOVERNORS ASSOCIATION EVALUATION.—The President shall enter into an agreement with the National Governors Association Center for Best Practices under which that Center shall—

(1) evaluate the utility to State, local, and regional decisionmakers of each Plan and of the anticipated and actual information outputs of the Program for development of State, local, and regional policies to reduce vulnerability to global change; and

(2) recommend priorities for future global and regional climate change research and assessment.

(g) PUBLIC PARTICIPATION.—In developing the Plan, the President shall consult with representatives of academic, State, industry, and environmental groups. Not later than 90 days before the President submits the Plan, or any revision thereof, to the Congress, a summary of

the proposed Plan shall be published in the Federal Register for a public comment period of not less than 60 days.

SEC. 106. BUDGET COORDINATION.

(a) IN GENERAL.—The President shall provide general guidance to each Federal agency participating in the Program with respect to the preparation of requests for appropriations for activities related to the Program.

(b) CONSIDERATION IN PRESIDENT'S BUDGET.—The President shall submit, at the time of his annual budget request to Congress, a description of those items in each agency's annual budget which are elements of the Program.

SEC. 107. VULNERABILITY ASSESSMENT.

(a) REQUIREMENT.—Within 1 year after the date of enactment of this Act, and at least once every 5 years thereafter, the President shall submit to the Congress an assessment which—

(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

(2) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years;

(3) based on indicators and baselines developed under section 105(c)(3), as well as other measure-

ments, analyzes changes to the natural environment, land and water resources, and biological diversity in—

(A) major geographic regions of the United States; and

(B) other continents;

(4) analyzes the effects of global change, including the changes described in paragraph (3), on food and fiber production, energy production and use, transportation, human health and welfare, water availability and coastal infrastructure, and human social and economic systems, including providing information about the differential impacts on specific geographic regions within the United States, on people of different income levels within those regions, and for rural and urban areas within those regions; and

(5) analyzes the vulnerability of different geographic regions of the world to global change, including analyses of the implications of global change for international assistance, population displacement, and national security.

(b) COORDINATION.—To the extent appropriate, the information produced in accordance with this section shall be coordinated with the production of similar reports and

information produced by the United States Global Change Research Program for incorporation into reports of international organizations, including the World Meteorological Organization and the Intergovernmental Panel on Climate Change.

SEC. 108. POLICY ASSESSMENT.

Not later than 1 year after the date of enactment of this Act, and at least once every 3 years thereafter, the President shall submit to the Congress a policy assessment which—

(1) documents current policy options being utilized by Federal, State, and local governments to mitigate or adapt to the effects of global change;

(2) evaluates the realized and anticipated effectiveness of those current policy options in addressing global change; and

(3) identifies and evaluates additional policy options for mitigating or adapting to the effects of global change.

SEC. 109. ANNUAL REPORT.

Each year at the time of submission to the Congress of the President's budget request, the President shall submit to the Congress a report on the activities conducted pursuant to this title, including—

(1) a summary of the achievements of the Program during the period covered by the report;

(2) an analysis of the progress made toward achieving the goals of the Plan; and

(3) a list of the State, local, and regional decisionmakers identified as potential users of the information generated through the Program and a description of the consultations with this community coordinated through the work of the interagency committee.

SEC. 110. RELATION TO OTHER AUTHORITIES.

The President shall—

(1) ensure that relevant research, assessment, and outreach activities of the National Climate Program, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global and regional climate change research and assessment efforts; and

(2) facilitate ongoing dialog and information exchange with regional, State, and local governments and other user communities through programs authorized in the National Climate Program Act (15 U.S.C. 2901 et seq.).

SEC. 111. REPEAL.

The Global Change Research Act of 1990 (15 U.S.C. 2921 et seq.) is repealed.

TITLE II—CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT

SEC. 201. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Federal agencies have a primary mission to manage and archive climate and other global change data obtained through their research, development, or operational activities.

(2) Maintenance of climate and global change data records is essential to present and future studies of the Earth's atmosphere, biogeochemical cycles, and climate.

(3) Federal capabilities for the management and archiving of these data have not kept pace with advances in satellite and other observational technologies that have vastly expanded the type and amount of information that can be collected.

(4) Proposals and plans for expansion of global observing networks should include plans for the management of data to be collected and budgets re-

flecting the cost of support for management and archiving of data.

(b) PURPOSES.—The purposes of this title are to establish climate and other global change data management and archiving as Federal agency missions, and to establish Federal policies for managing and archiving climate and other global change data.

SEC. 202. DEFINITIONS.

For purposes of this title—

(1) the term ''metadata'' means information describing the content, quality, condition, and other characteristics of climate and other global change data, compiled, to the maximum extent possible, consistent with the requirements of the ''Content Standard for Digital Geospatial Metadata'' (FGDC–STD–001–1998) issued by the Federal Geographic Data Committee, or any successor standard approved by the working group; and

(2) the term ''working group'' means the interagency climate and other global change data management working group established under section 203.

SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL CHANGE DATA MANAGEMENT WORKING GROUP.

(a) ESTABLISHMENT.—The President shall establish or designate an interagency climate and other global change data management working group to make recommendations for coordinating Federal climate and other global change data management and archiving activities.

(b) MEMBERSHIP.—The working group shall include the Administrator of the National Aeronautics and Space Administration, the Administrator of the National Oceanic and Atmospheric Administration, the Secretary of Energy, the Secretary of Defense, the Director of the National Science Foundation, the Director of the United States Geological Survey, the Archivist of the United States, the Administrator of the Environmental Protection Agency, the Secretary of the Smithsonian Institution, or their designees, and representatives of any other Federal agencies the President considers appropriate.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, the working group shall transmit a report to the Congress containing the elements described in subsection (d). Not later than 4 years after the initial report under this subsection, and at least once every 4 years thereafter, the working group shall transmit reports updating the previous report. In preparing reports under

this subsection, the working group shall consult with expected users of the data collected and archived by the Program.

(d) CONTENTS.—The reports and updates required under subsection (c) shall—

(1) include recommendations for the establishment, maintenance, and accessibility of a catalog identifying all available climate and other global change data sets;

(2) identify climate and other global change data collections in danger of being lost and recommend actions to prevent such loss;

(3) identify gaps in climate and other global change data and recommend actions to fill those gaps;

(4) identify effective and compatible procedures for climate and other global change data collection, management, and retention and make recommendations for ensuring their use by Federal agencies and other appropriate entities;

(5) develop and propose a coordinated strategy for funding and allocating responsibilities among Federal agencies for climate and other global change data collection, management, and retention;

(6) make recommendations for ensuring that particular attention is paid to the collection, management, and archiving of metadata;

(7) make recommendations for ensuring a unified and coordinated Federal capital investment strategy with respect to climate and other global change data collection, management, and archiving;

(8) evaluate the data record from each observing system and make recommendations to ensure that delivered data are free from time-dependent biases and random errors before they are transferred to long-term archives; and

(9) evaluate optimal design of observation system components to ensure a cost-effective, adequate set of observations detecting and tracking global change.

TITLE III—INTERNATIONAL COOPERATION IN GLOBAL CHANGE RESEARCH

SEC. 301. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress makes the following findings:

(1) Pooling of international resources and scientific capabilities will be essential to a successful international global change program.

(2) While international scientific planning is already underway, there is currently no comprehensive intergovernmental mechanism for planning, coordinating, or implementing research to understand global change and to mitigate possible adverse effects.

(3) An international global change research program will be important in building future consensus on methods for reducing global environmental degradation.

(4) The United States, as a world leader in environmental and Earth sciences, should help provide leadership in developing and implementing an international global change research program.

(b) PURPOSES.—The purposes of this title are to—

(1) promote international, intergovernmental cooperation on global change research;

(2) involve scientists and policymakers from developing nations in such cooperative global change research programs; and

(3) promote international efforts to provide technical and other assistance to developing nations which will facilitate improvements in their domestic standard of living while minimizing damage to the global or regional environment.

SEC. 302. INTERNATIONAL DISCUSSIONS.

(a) GLOBAL CHANGE RESEARCH.—The President shall direct the Secretary of State to initiate discussions with other nations leading toward international protocols and other agreements to coordinate global change research activities. Such discussions should include the following issues:

(1) Allocation of costs in global change research programs, especially with respect to major capital projects.

(2) Coordination of global change research plans with those developed by international organizations such as the International Council on Scientific Unions, the World Meteorological Organization, and the United Nations Environment Program.

(3) Establishment of global change research centers and training programs for scientists, especially those from developing nations.

(4) Development of innovative methods for management of international global change research, including the use of new or existing intergovernmental organizations for the coordination or funding of global change research.

(5) Establishment of international offices to disseminate information useful in identifying, pre-

venting, mitigating, or adapting to the possible effects of global change.

(b) ENERGY RESEARCH.—The President shall direct the Secretary of State (in cooperation with the Secretary of Energy, the Secretary of Commerce, the United States Trade Representative, and other appropriate Federal agents) to initiate discussions with other nations leading toward an international research protocol for cooperation on the development of energy technologies which have minimally adverse effects on the environment. Such discussions should include the following issues:

(1) Creation of an international cooperative program to fund research related to energy efficiency and conservation, solar and other renewable energy sources, and passively safe and diversion-resistant nuclear reactors.

(2) Creation of an international cooperative program to develop low-cost energy technologies which are appropriate to the environmental, economic, and social needs of developing nations.

(3) Exchange of information concerning environmentally safe energy technologies and practices, including those described in paragraphs (1) and (2).

SEC. 303. GLOBAL CHANGE RESEARCH INFORMATION OFFICE.

The President shall establish an Office of Global Change Research Information to disseminate to foreign governments, businesses, and institutions, as well as the citizens of foreign countries, scientific research and other information available in the United States which would be useful in preventing, mitigating, or adapting to the effects of global change.

COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
JUNE 27, 2007

AMENDMENT ROSTER

H.R. 906, Global Change Research and Data Management Act of 2007

No.	Sponsor	Description	Results
1	Mr. Udall	Manager's amendment makes minor/technical changes to the bill.	Agreed to by voice vote.
2	Mr. Udall	Amends section 104 by designating the Office of Science and Technology Policy (OSTP) as the lead agency for the US Global Climate Research Program.	Agreed to by voice vote.
3	Mr. Gingrey	Amends section 108 by commissioning a National Academy of Sciences/National Academy of Public Administration study of the costs and benefits of different climate change mitigation and adaptation strategies.	Agreed to by voice vote.
4	Ms. Woolsey	Adds a new section to Title I authorizing an Ice Sheet Study by the National Academy of Sciences in coordination with NSF and NOAA.	Agreed to by voice vote.
5	Ms. Johnson	Adds a new section to Title I authorizing a Hurricane Frequency and Intensity Study and Report by the National Academy of Sciences in coordination with NSF and NOAA.	Agreed to by voice vote.

AMENDMENT TO H.R. 906

OFFERED BY MR. UDALL OF COLORADO

Page 10, line 12, strike "and".

Page 10, line 16, strike the period and insert "; and".

Page 10, after line 16, insert the following new paragraph:

(11) identify and describe regions of the United States that are likely to experience similar impacts of global change or are likely to share similar vulnerabilities to global change.

Page 14, lines 18 through 22, amend paragraph (5) to read as follows:

(5) summarizes the vulnerability of different geographic regions of the world to global change and analyzes the implications of global change for the United States, including international assistance, population displacement, food and resource availability, and national security.

Page 14, line 23, through page 15, line 5, amend subsection (b) to read as follows:

(b) USE OF RELATED REPORTS.—To the extent appropriate, the assessment produced pursuant to this section may coordinate with, consider, incorporate, or otherwise make use of related reports, assessments, or information produced by the United States Global Change Research Program, regional, State, and local entities, and international organizations, including the World Meteorological Organization and the Intergovernmental Panel on Climate Change.

Page 16, lines 1 through 4, amend paragraphs (1) and (2) to read as follows:

(1) a description of the activities of the Program during the past fiscal year;

(2) a description of the activities planned in the next fiscal year toward achieving the goals of the Plan; and

Page 16, line 5, strike "list of the" and insert "description of the groups or categories of".

Page 16, line 8, strike "consultations with this community" and insert "activities used to facilitate consultations with and outreach to these groups,".

Page 17, after line 3, insert the following new section:

SEC. 112. GLOBAL CHANGE RESEARCH INFORMATION.

The President shall establish or designate a Global Change Research Information Exchange to make scientific research and other information produced through or utilized by the Program which would be useful in preventing, mitigating, or adapting to the effects of global change accessible through electronic means.

Page 25, lines 1 through 9, strike section 303.

AMENDMENT TO H.R. 906

OFFERED BY MR. UDALL OF COLORADO

Page 7, line 6, insert "(a) ESTABLISHMENT.—" before "The President shall".

Page 7, after line 13, insert the following new subsections:

(b) LEAD AGENCY.—The lead agency for the United States Global Change Research Program shall be the Office of Science and Technology Policy.

(c) INTERAGENCY PROGRAM ACTIVITIES.—The Director of the Office of Science and Technology Policy, in consultation with the interagency committee, shall identify activities included in the Plan that involve participation by 2 or more agencies in the Program, and that do not fall within the current fiscal year budget allocations of those participating agencies, to fulfill the requirements of this Act. The Director of the Office of Science and Technology Policy shall allocate funds to the agencies to conduct the identified interagency activities. Such activities may include—

(1) development of scenarios for climate, land-cover change, population growth, and socioeconomic development;

(2) calibration and testing of alternative regional and global climate models;

(3) identification of economic sectors and regional climatic zones;

(4) convening regional workshops to facilitate information exchange and involvement of regional, State, and local decisionmakers, non-Federal experts, and other stakeholder groups in the activities of the Program.

(d) WORKSHOPS.—The Director shall ensure that at least one workshop is held per year in each region identified by the Plan under section 105(b)(11) to facilitate information exchange and outreach to regional, State, and local stakeholders as required by this Act.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Office of Science and Technology Policy for carrying out this section $10,000,000 for each of the fiscal years 2008 through 2013.

AMENDMENT TO H.R. 906

OFFERED BY MR. GINGREY OF GEORGIA

Page 15, lines 6 through 19, amend section 108 to read as follows:

SEC. 108. POLICY ASSESSMENT.

Not later than 1 year after the date of enactment of this Act, and at least once every 4 years thereafter, the President shall enter into a joint agreement with the National Academy of Public Administration and the National Academy of Sciences under which the Academies shall—

(1) document current policy options being implemented by Federal, State, and local governments to mitigate or adapt to the effects of global and regional climate change;

(2) evaluate the realized and anticipated effectiveness of those current policy options in meeting mitigation and adaptation goals;

(3) identify and evaluate a range of additional policy options and infrastructure for mitigating or adapting to the effects of global and regional climate change;

(4) analyze the adoption rates of policies and technologies available to reduce the vulnerability of society to global change with an evaluation of the market and policy obstacles to their adoption in the United States; and

(5) evaluate the distribution of economic costs and benefits of these policy options across different United States economic sectors.

AMENDMENT TO H.R. 906

OFFERED BY MS. WOOLSEY OF CALIFORNIA

Page 17, after line 3, insert the following new section:

SEC. 112. ICE SHEET STUDY AND REPORT.

(a) STUDY.—

(1) REQUIREMENT.—The Director of the National Science Foundation and the Administrator of National Oceanic and Atmospheric Administration shall enter into an arrangement with the National Academy of Sciences to complete a study of the current status of ice sheet melt, as caused by climate change, with implications for global sea level rise.

(2) CONTENTS.—The study shall take into consideration—

(A) the past research completed related to ice sheet melt as reviewed by Working Group I of the Intergovernmental Panel on Climate Change;

(B) additional research completed since the fall of 2005 that was not included in the Working Group I report due to time constraints; and

(C) the need for an accurate assessment of changes in ice sheet spreading, changes in ice sheet flow, self-lubrication, the corresponding effect on ice sheets, and current modeling capabilities.

(3) REPORT.—Not later than 18 months after the date of enactment of this Act, the National Academy of Sciences shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the key findings of the study conducted under subsection (a), along with recommendations for additional research related to ice sheet melt and corresponding sea level rise.

AMENDMENT TO H.R. 906

OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

Page 17, after line 3, insert the following new section:

SEC. 112. HURRICANE FREQUENCY AND INTENSITY STUDY AND REPORT.

(a) STUDY.—

(1) REQUIREMENT.—The Administrator of the National Oceanic and Atmospheric Administration and the Director of the National Science Foundation shall enter into an arrangement with the National Academy of Sciences to complete a study of the current state of the science on the potential impacts of climate change on patterns of hurricane and typhoon development, including storm intensity, track, and frequency, and the implications for hurricane-prone and typhoon-prone coastal regions.

(2) CONTENTS.—The study shall take into consideration—

(A) the past research completed related to hurricane and typhoon development, track, and intensity as reviewed by Working Groups I and

II of the Intergovernmental Panel on Climate Change;

(B) additional research completed since the fall of 2005 that was not included in the Working Group I and II reports due to time constraints;

(C) the need for accurate assessment of potential changes in hurricane and typhoon intensity, track, and frequency and of the current modeling and forecasting capabilities and the need for improvements in forecasting of these parameters; and

(D) the need for additional research and monitoring to improve forecasting of hurricanes and typhoons and to understand the relationship between climate change and hurricane and typhoon development.

(3) REPORT.—Not later than 18 months after the date of enactment of this Act, the National Academy of Sciences shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the key findings of the study conducted under subsection (a).

ONE HUNDRED TENTH CONGRESS

CONGRESS OF THE UNITED STATES

COMMITTEE ON FOREIGN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515

TELEPHONE: (202) 225-5021
HTTP://WWW.FOREIGNAFFAIRS.HOUSE.GOV/

April 23, 2008

The Honorable Bart Gordon
Chairman
Committee on Science and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

I am writing to you regarding H.R. 906, the Global Change Research and Data Management Act of 2008. This legislation was initially referred to both the Committee on Science and Technology and the Committee on Foreign Affairs.

H.R. 906 has been marked up by the Committee on Science and Technology. Based on the discussions that the staff of our two committees have had regarding this legislation and in the interest of permitting your Committee to proceed expeditiously to floor consideration of this important legislation, I am willing to waive further consideration of this bill. I do so with the understanding that by waiving consideration of the bill, the Committee on Foreign Affairs does not waive any future jurisdictional claim over the subject matters contained in the bill which fall within its Rule X jurisdiction.

Further, I request your support for the appointment of Foreign Affairs Committee conferees during any House-Senate conference convened on this legislation. I also ask that a copy of this letter and your response be placed in the committee report for H.R. 906 and in the *Congressional Record* during consideration of this bill.

I look forward to working with you as we move this important measure through the legislative process.

Sincerely,

Howard L. Berman

HOWARD L. BERMAN
Chairman

cc: The Honorable Ileana Ros-Lehtinen, Ranking Member
The Honorable John Sullivan, Parliamentarian

BART GORDON, TENNESSEE
CHAIRMAN

RALPH M. HALL, TEXAS
RANKING MEMBER

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April 23, 2008

The Honorable Howard L. Berman
Chairman
Committee on Foreign Affairs
U.S. House of Representatives
2170 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Berman:

Thank you for your willingness to allow for floor consideration of H.R. 906, the Global Change Research and Data Management Act of 2008, to proceed.

I appreciate your willingness to waive your Committee's right to further consideration of H.R. 906, even though your Committee shares jurisdiction over the bill and has received an additional referral. Of course, this waiver does not prejudice any further jurisdictional claims by your Committee over this legislation or similar language. Furthermore, I agree to support your request for appointment of conferees from the Committee on Foreign Affairs if a conference is held on this matter.

As is customary, I will insert our two letters in the legislative report on H.R. 906 and in the Congressional Record as part of the consideration of H.R. 906 on the House floor. Thank you for the cooperative spirit in which you have worked regarding this matter and others between our respective committees.

Sincerely,

Bart Gordon

BART GORDON
Chairman

cc: The Honorable Ralph M. Hall, Ranking Member
The Honorable John Sullivan, Parliamentarian

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