

Calendar No. 752

110TH CONGRESS <i>2d Session</i>	{	SENATE	{	REPORT 110-341
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GLOBAL CHANGE RESEARCH IMPROVEMENT ACT OF 2007

REPO RT

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION

ON

S. 2307



MAY 22, 2008.—Ordered to be printed

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

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GLOBAL CHANGE RESEARCH IMPROVEMENT ACT OF 2007

MAY 22, 2008.—Ordered to be printed

Mr. INOUYE, from the Committee on Commerce, Science, and Transportation, submitted the following

R E P O R T

[To accompany S. 2307]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 2307) to amend the Global Change Research Act of 1990, and for other purposes, having considered the same, reports favorably thereon with amendments and recommends that the bill (as amended) do pass.

PURPOSE OF THE BILL

The purpose of S. 2307, the Global Change Research Improvement Act of 2007, is to improve the basic research and products the Federal government develops to address climate change and its impacts and to increase the relevance of the Global Change Research Program (GCRP) to State, local, and non-governmental decision makers. The legislation also would establish a new National Climate Service within the National Oceanic and Atmospheric Administration (NOAA); reinstate a Science and Technology Assessment Service within the legislative branch; authorize the National Institute of Standards and Technology (NIST) to provide improved technologies for measuring and reducing greenhouse gas emissions; establish a scientific research program on abrupt climate change; and authorize appropriations for fiscal years (FY) 2009 through 2013.

BACKGROUND AND NEEDS

Our current understanding of climate change stems largely from focused scientific research programs that began in the late 1970s. In 1978, the National Climate Program Act coordinated the U.S. government's participation in climate research conducted under international auspices. International research efforts coalesced in

1988 with the establishment of the Intergovernmental Panel on Climate Change (IPCC). This international body regularly assesses the worldwide state of knowledge on climate change and issued its Fourth Assessment Report over the course of 2007. Following the creation of the IPCC, Congress enacted the Global Change Research Act of 1990 (GCRA) developed by the Senate Committee on Commerce, Science, and Transportation to strengthen and coordinate U.S. research efforts through the establishment of a U.S. GCRP.

The GCRA provides for the development and coordination of a comprehensive and integrated U.S. research program and regular scientific assessments to assist decision makers in understanding, assessing, predicting, and responding to impacts linked to climate change. The Climate Change Science Program (CCSP) is the Bush Administration's restructuring of the research program mandated under the Act. While NOAA is currently the GCRP's lead agency, several other agencies participate in the program, including the National Science Foundation (NSF), the Departments of Energy, Agriculture, Transportation, and State, the Department of Interior's U.S. Geological Survey, and the National Institutes of Health. The National Aeronautics and Space Administration (NASA) is the largest participating agency, by budget, in the program.

Resource managers require accurate, relevant, timely, and user-friendly data on climate change in order to plan for the potential impacts of climate change on natural resources. In this regard, the existing Federal program has been criticized on a number of fronts. The program has not produced a comprehensive, integrated national assessment of the projected impacts of climate change on key U.S. resources and infrastructure, as Congress directed in the GCRA, since 2000. The program has yet to produce information that meets the expressed needs of decision makers at the local, State, and regional levels. Improving scientific understanding on local and regional scales is necessary to develop and strengthen policies to mitigate and adapt to climate change. Yet significant decreases in funding for Federal climate science began in FY 2005, from a high of nearly \$2 billion in FY 2004 to \$1.54 billion requested in FY 2008. NASA's climate research budget suffered the largest cuts. However, the President's FY 2009 proposed budget would see funding for climate science increase to more than \$2 billion for the first time since 2003. This increase is due to boosts in funding for the American Competitiveness Initiative to NSF and the Department of Energy Office of Science, as well as budget restructuring in NASA to increase spending for Earth sciences, especially satellite programs.

The National Research Council (NRC) has conducted regular reviews of the Federal government's climate change research efforts. In September, 2007, an NRC panel completed a review of the CCSP and identified a number of key concerns — primarily that efforts to understand the impact of such changes on society and to analyze mitigation and adaptation strategies remain relatively immature. The panel also determined that the CCSP has made inadequate progress in supporting decision making and risk analyses, assessing impacts on human well being and vulnerabilities, studying regional impacts, and communicating with a wider group of stakeholders. The panel also cited concerns with the removal of Earth

observing climate sensors from NASA and NOAA satellites under the National Polar-orbiting Operational Environmental Satellite System.

Regardless of which method policy makers choose to address the effect climate change has on the Earth, scientists and experts must develop standards, measurements, and calibration technologies to enable accurate monitoring and verification. Sound science is needed to provide a foundation for public policy. Measurement technologies allow operators and auditors to determine if climate change technologies are indeed functioning in the way that they are intended, and whether goals are being met. NIST plays a critical role in developing such standards and measurement technologies. NIST provides products and services that enable researchers to accurately monitor physical and chemical events, absorption and emission of greenhouse gases, atmospheric conditions, and other parameters critical to understanding the complex systems of our environment. It also played a critical role in developing the standards, measurements, and calibration technologies that enable scientists to measure the distribution of chemical species, chemical data, and reference measurements relevant to environmental processes and decision making regarding human health and environmental safety.

SUMMARY OF PROVISIONS

S. 2307 would provide five titles to improve the basic research and information that the Federal government develops on climate change and its impacts and would reinstate the Science and Technology Assessment Service.

Title I of S. 2307 would amend, strengthen, and reauthorize the GCRA. It would refocus the GCRP's emphasis on providing information and products that are relevant to State, local and non-governmental decision makers. It would require a ten-year strategic plan for the GCRP, which would include a detailed plan for climate change research, assessment, information management, public participation, outreach, and budget. It also would direct the President to submit to Congress, no less frequently than every four years, a single, integrated, comprehensive assessment of the impacts of climate change on the natural environment, agriculture, energy production and use, land and water resources, and other critical resources. The bill also would provide for an independent review of the processes for creating the national assessments and strategic plans to determine the extent to which scientific findings and communications are subjected to non-scientific policy considerations.

Title II of S. 2307 would amend the National Climate Program Act to establish a new National Climate Service within NOAA to address the need for a permanent mechanism for dissemination of the data and information generated by the GCRA. At present, NOAA's Climate Program Office utilizes eight Regional Integrated Science and Assessment program offices across the country to disseminate information at the regional level. However, these university-based centers are not permanent but rather funded through a grant program. The National Climate Service would provide regular climate change information and predictions to decision makers, resource managers, and other stakeholders.

Title III would reinstate a Science and Technology Assessment Service, modeled on the Office of Technology Assessment, within the legislative branch. With increased attention to climate change and other scientific and technical developments, Congress should have access to unbiased scientific and technical expertise.

Title IV would authorize NIST to develop relevant standards, measurements, and calibration technologies to enable accurate measuring, monitoring, and verification of greenhouse gas emissions, environmental processes, and climate change technologies.

Finally, title V would require the Secretary of Commerce to establish a program of scientific research on abrupt climate change in the Office of Oceanic and Atmospheric Research of NOAA.

LEGISLATIVE HISTORY

Senator Kerry, Chairman of the Science, Technology, and Innovation Subcommittee, introduced S. 2307 on November 5, 2007, with Senator Snowe as an original cosponsor. Senators Klobuchar and Nelson (FL) subsequently signed on as cosponsors. The bill was referred to the Committee on Commerce, Science, and Transportation. The Committee held a hearing November 14, 2007, on improving the Federal climate change research and information program. The science advisor to the President testified before the Committee, in addition to a diverse group of scientists, nongovernmental organizations, and other interested stakeholders.

On December 4, 2007, the Committee considered a manager's amendment to this bill in an open executive session. The Committee, by voice vote, ordered S. 2307 to be reported favorably, as amended. Provisions similar to those included in this bill were passed by the Senate in 2002 and 2003 as part of the Energy Policy Act but were rejected by the House. Staff assigned to this legislation are Ann Zulkosky, Democratic Professional Staff, Kris Sarri, Democratic Senior Professional Staff, Floy DesChamps, Republican Senior Advisor, Todd Bertson, Republican Senior Counsel, and Mike Conathan, Republican Professional Staff.

ESTIMATED COSTS

In compliance with subsection (a)(3) of paragraph 11 of rule XXVI of the Standing Rules of the Senate, the Committee states that, in its opinion, it is necessary to dispense with the requirements of paragraphs (1) and (2) of that subsection in order to expedite the business of the Senate.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported:

NUMBER OF PERSONS COVERED

The reported bill would not authorize any new regulations and therefore will not subject any individuals or businesses to new regulations. The bill would have little, if any, regulatory impact.

ECONOMIC IMPACT

The bill, as reported, is not expected to have a significant impact on the nation's economy.

PRIVACY

The reported bill would not have any adverse impact on the personal privacy of individuals.

PAPERWORK

The reported bill would not increase paperwork requirements for the private sector. The bill would require several reports from the Federal government. The legislation also would establish a competitive grant program for priority climate change research areas as identified by the Committee on Global Change Research. Applicants to this grant program would have to file documents to apply for this program.

CONGRESSIONALLY DIRECTED SPENDING

In compliance with paragraph 4(b) of rule XLIV of the Standing Rules of the Senate, the committee provides that the bill as reported contains no congressionally directed spending items.

SECTION-BY-SECTION ANALYSIS

Section 1. Short Title.

This section would provide that the legislation may be cited as the "Global Change Research Improvement Act of 2007."

Section 2. Table of Contents.

This section would provide the table of contents for the five titles of the Act.

TITLE I — AMENDMENT OF THE GLOBAL CHANGE RESEARCH ACT OF
1990*Section 101. Amendment of Global Change Research Act of 1990.*

This section would specify that changes in this title are in reference to the GCRA (15 U.S.C. 2921 et seq.) except as otherwise expressly provided.

Section 102. Changes to findings and purpose.

This section would update and expand the findings and purpose to reflect new data, studies, and assessments since the enactment of the GCRA, including the Fourth Assessment Report of the IPCC. It also would emphasize the need to provide information and products that are of relevance to local, State, and regional resource managers and decision makers.

Section 103. Changes in definitions.

This section would add a definition for "climate change" based on usage by the IPCC, and update the definitions of "Committee," "Council," and "global change."

Section 104. Change in committee name and structure.

This section would update and change the name of the Committee carrying out the Act from the Committee on Earth and Environmental Sciences to the Committee on Global Change Research. It would add NIST of the Department of Commerce to the list of Committee members and allow the Committee to establish subcommittees and working groups, as necessary. It also would require the Committee to work with appropriate Federal, State, regional, and local authorities to ensure that the GCRP is designed to produce information needed to develop policies to reduce the impacts of global change.

Section 105. Change in National Global Change Research Plan.

This section would amend and expand the existing national Global Change Research Plan that provides for the implementation of the GCRP. The Chairman of the Council, through the Committee on Global Change Research, would develop and submit a 10-year plan for the GCRP within 1 year after the date of enactment of this Act. The revised implementation plan would include new strategic elements such as short and long term goals and priorities for climate change research, assessments, information management, public participation, outreach, and budget. The strategic elements also would focus on the information needs of Federal, State, regional, and local decision makers to measure, predict, mitigate, and adapt to global change; require the development of regional scenarios and assessments of model predictability; identify capabilities and address gaps for climate forecasting and prediction, as well as for observing systems currently used to collect relevant data; describe activities to facilitate outreach and data and information exchange with end users; and identify and describe ecosystems and geographic regions nationwide that are likely to experience similar global change impacts or vulnerabilities.

This section would add new research elements to the plan to better understand the nature of and interaction among physical, chemical, biological, land use, and social processes responsible for changes in the Earth system; to develop indicators and baseline databases, and conduct ongoing monitoring to document global change; to address emerging research priorities for climate change science; and, to develop methods for integrating information for planning and decision making by end users.

This section would add new information management elements to the plan to provide recommendations for data products that are useful to end users attempting to formulate decisions and strategies for mitigating and adapting to global change, and for establishing a common assessment and modeling framework to be used for both research and operations.

This section also would expand the NRC's evaluation of the research elements of the plan to address both global and regional climate research and assessment. Finally, this section would require an additional study to examine coastal and ocean carbon sequestration technologies and identify regulatory gaps while producing recommendations to address those gaps.

The entire plan would be updated at least once every five years and resubmitted to the Congress after each revision.

Section 106. Integrated Program Office.

This section would require the President to establish a Global Change Research Coordination Office to support the work of the GCRP. In conjunction with the Committee, the office would manage interagency coordination and program integration; ensure that the activities and programs of each Federal agency participating in the GCRP addresses the goals and objectives identified in the strategic and implementation plans; ensure that program and budget recommendations of the Committee are communicated to the President; coordinate partnership projects with GCRP goals; review and provide recommendations on all annual appropriations requests; provide technical and administrative support to the Committee; serve as the point of contact for technical and programmatic information on Federal climate change activities for all interested groups; and conduct public outreach.

The Director of the Office of Science and Technology Policy (OSTP) would report to Congress within 90 days after the date of enactment on the amount of funding and the adequacy of funding mechanisms of the Global Change Research Coordination Office.

Section 107. Budget coordination.

This section would require the President to provide the Committee on Global Change Research and the Global Change Research Coordination Office the opportunity to review and comment on the budget estimate of each agency involved in the GCRP's strategic and implementation plan. It also would require the President to submit an integrated budget plan, at the time of the annual budget request to Congress, and a description of those items in each agency's annual budget that are elements of the GCRP.

Section 108. Research grants.

This section would require the Committee on Global Change Research to develop a list of priority research areas on climate change that are not being adequately addressed by Federal agencies. The Director of OSTP would then transmit the list to NSF for funding through the Science and Technology Policy Institute. The research grants would be authorized for FY 2008 and each fiscal year thereafter to NSF at not less than \$30,000,000.

Section 109. Evaluation of information.

This section would require the President to submit a single, integrated, comprehensive assessment to Congress on the information being developed in this title no less than every 4 years.

Section 110. Repeal of obsolete provision.

This section would repeal an obsolete provision.

Section 111. Reporting.

This section would require a report to Congress from NOAA, in consultation with NASA and the U.S. Air Force, describing the strategy for restoring the decommissioned and scaled down climate sensors scheduled for the National Polar-orbiting Operational Environmental Satellite System and the Geostationary Operational Environmental Satellites—R Series.

Section 112. Independent review of GCRP products.

This section would direct NSF to contract with the National Academy of Public Administration to review the process of the GCRP and the National Climate Service to determine the extent to which scientific findings and communications were subjected to non-scientific policy considerations. The results and recommendations of the review would be submitted to Congress. NSF would be authorized to be appropriated \$1,000,000 for each of fiscal years 2009 through 2013 to carry out this section.

Section 113. Scientific communications.

This section would require the President to establish guidelines and implement a plan requiring NOAA, NASA, NSF, the Environmental Protection Agency, and other Federal agencies with scientific research programs to adopt policies that ensure the integrity of scientific communications.

Section 114. Aging workforce issues program.

This section would direct the Administrator of NOAA to implement a program to address aging workforce issues in climate science, global change, and other focuses of NOAA research.

Section 115. Authorization of appropriations.

This section would authorize annual appropriations of such sums as may be necessary for FY 2009 through FY 2013. Of the amounts appropriated for each fiscal year, \$4,000,000 would be available to the Global Change Research Coordination Office through OSTP for the tasks outlined in section 106, and such sums as may be necessary for NOAA, NSF, and NASA, and, to the extent that funds remain available, for other Federal agencies participating in the GCRP for the purposes of carrying out this Act.

TITLE II — NATIONAL CLIMATE SERVICE

Section 201. Amendment of National Climate Program Act.

This section would specify that changes in this title are in reference to the National Climate Program Act (15 U.S.C. 2901 et seq.).

Section 202. Short Title; Table of Contents.

This section would provide that the legislation may be cited as the “National Climate Service Act of 2007” and the table of contents for this title.

Section 203. Findings.

This section would provide that climate change and related hazards affect many elements vital to national security and human welfare; current progress in research and development is inadequate; the United States lacks sufficient tools for adapting to and mitigating the impacts of climate change; climate change information needs to be widely disseminated; and international cooperation is essential.

Section 204. Purpose.

This section would state that the purpose of the Act is to establish a National Climate Service that will advance the national interest and associated international concerns in understanding, forecasting, responding, adapting to, and mitigating the impacts of natural and human-induced climate change and variability.

Section 205. Definitions.

This section would define: (1) “Administrator”, (2) “Advisory Council”, (3) “Climate Change”, (4) “Director”, (5) “Global Change Research Program”, and (6) “Service”. It would clarify the definition of Secretary.

Section 206. National Climate Service.

This section would establish a National Climate Service (NCS) within NOAA that would include a national center and a network of regional and local facilities for operational climate monitoring and prediction. The NCS would produce and deliver authoritative, timely, and usable information about climate change, climate variability, trends, and impacts on local, State, regional, national, and global scales. This section would also require that the Secretary of Commerce submit to Congress a plan of action for the NCS. The NCS would utilize appropriate research from GCRP activities. This section would require the Administrator of NOAA to appoint a director of the NCS to manage the organization and execute the functions and actions of the NCS. This section also would establish a National Climate Service Advisory Council with a diverse membership from relevant Federal, State, and local government, universities, and non-governmental and private sectors to advise the Director of the Service on key priorities for climate-related issues that require the attention of the NCS.

Contract and Grant Authority. This section would provide that functions vested in any Federal officer or agency by this Act or under the GCRP may be exercised through the facilities and personnel of the agency involved or, to the extent provided or approved in advance in appropriation Acts, by other persons or entities under contracts or grant arrangements entered into by such officer or agency.

Annual Report. This section would require the Secretary of Commerce to prepare and submit to the President and authorizing committees of Congress a report on the activities conducted pursuant to this Act during the preceding fiscal year.

Section 207. Reauthorization.

Authorization of Appropriations. This section would authorize \$300,000,000 for FY 2009; \$350,000,000 for FY 2010; \$400,000,000 for FY 2011; \$450,000,000 for FY 2012; and, \$500,000,000 for FY 2013 to the Secretary of Commerce for the purposes of carrying out this title.

TITLE III — TECHNOLOGY ASSESSMENT

Section 301. National Science and Technology Assessment Service.

This section would specify that changes are in reference to the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6601 et seq.).

Establishment. This section would reinstate a Science and Technology Assessment Service (STAS) which would be within and responsible to the legislative branch of government.

Composition. This section would provide the structure of the STAS including a Science and Technology Board to formulate and promulgate the policies of the STAS, and a Director to carry out such policies and administer the operations of the Service.

Functions and Duties. This section would establish the STAS's functions, including coordinating and developing information for Congress relating to the uses and application of technology to address current national science and technology policy issues. This section also would direct the service to coordinate with the National Research Council.

Initiation of Activities. This section would describe who would initiate assessment activities undertaken by the STAS, including the Chairman of any standing, special, or select committee of Congress, the Science and Technology Board, or the Director of the STAS.

Administration and Support. This section would provide that the Director of the STAS be appointed by the Board and would serve for a term of 6 years. The Director would contract for administrative support from the Library of Congress.

Authority. This section would provide to the STAS the authority to carry out the provisions of this section.

Board. This section would describe the Board structure, including 13 members, of which the Director would be a nonvoting member, along with six from the Senate and six from the House of Representatives, divided equally between the majority and minority parties.

Report to Congress. This section would require the STAS to submit an annual report to Congress that would include an evaluation of technology assessment techniques and the identification of technological areas and programs requiring future analysis.

Authorization of Appropriations. This section would authorize such sums as may be necessary to the STAS to fulfill the requirements of this title.

TITLE IV — CLIMATE CHANGE TECHNOLOGY

Section 401. NIST greenhouse gas functions.

This section would amend the National Institute of Standards and Technology Act (15 U.S.C. 272(c)) to authorize NIST to perform research to develop enhanced measurements, calibrations, standards, and technologies to reduce production of greenhouse gases associated with global warming.

Section 402. Development of new measurement technologies.

This section would direct the Secretary of Commerce to initiate a program to develop innovative standards and measurement technologies to calculate greenhouse gas emissions and reductions.

Section 403. Enhanced environmental measurements and standards.

This section would amend the National Institute of Standards and Technology Act (15 U.S.C. 271 et seq.) by requiring the Director to establish a program to perform and support research on global climate change standards and processes, with the goal of providing scientific and technical knowledge applicable to the reduction of greenhouse gases associated with global warming, including carbon dioxide, methane, nitrous oxide, ozone, perfluorocarbons, hydro fluorocarbons, and sulfur hexafluoride. This section would direct the Director of NIST to utilize the National Measurement Laboratories at NIST to improve the accuracy of measurements and control of industrial chemical processes to reduce or eliminate greenhouse gases. The Director would also utilize the National Voluntary Laboratory Accreditation Program to establish a program to address the unique needs for accreditation in measuring the production of greenhouse gases.

Section 404. Technology development and diffusion.

This section would provide for the Director of NIST, through the Hollings Manufacturing Extension Partnership Program, to develop a program to support the implementation of new “green” manufacturing technologies and techniques.

Section 405. Authorization of appropriations.

This section would authorize \$15,000,000 for each of fiscal years 2009 through 2013 to the Director of the NIST for carrying out the purposes of this title.

TITLE V — ABRUPT CLIMATE CHANGE

Section 501. Abrupt climate change research program.

This section would require the Secretary of Commerce to establish a program of scientific research on abrupt climate change in the Office of Oceanic and Atmospheric Research of NOAA.

Section 502. Purposes of program.

This section would outline the purposes of the program, which would develop a global array of terrestrial and oceanographic indicators of paleoclimate to sufficiently identify and describe past instances of abrupt climate change; improve the understanding of thresholds and nonlinearities in geophysical systems related to the mechanisms of abrupt climate change; incorporate such mechanisms into advanced geophysical models of climate change; and test the output of such models against an improved global array of records of past abrupt climate change.

Section 503. Abrupt climate change defined.

This section would define “abrupt climate change” as a change in the climate that occurs so rapidly or unexpectedly that human or natural systems have difficulty adapting to the climate as changed.

Section 504. Authorization of appropriations.

This section would authorize to be appropriated to the Department of Commerce for each of fiscal years 2009 through 2013, to remain available until expended, such sums as necessary, not to exceed \$10,000,000, to carry out the research program in this title.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, 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 material is printed in italic, existing law in which no change is proposed is shown in roman):

GLOBAL CHANGE RESEARCH ACT OF 1990

SEC. 2. DEFINITIONS.

[15 U.S.C. 2921]

As used in this Act, the term—

(1) “climate change” means any change in climate over time, whether due to natural variability or as a result of human activity;

[(1)] (2) “Committee” means the Committee on [Earth and Environmental Sciences] *Global Change Research* established under section 102;

[(2)] (3) “Council” means the [Federal Coordinating Council on Science, Engineering, and Technology;] *National Science and Technology Council established by Executive Order 12881, November 23, 1993*;

[(3)] (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” means human-induced or natural changes in the global environment (including climate change and other phenomena affecting land productivity, oceans and coastal areas, freshwater resources, atmospheric chemistry, biodiversity, and ecological systems) that may alter the capacity of Earth to sustain life;

[(4)] (5) “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)] (6) “Plan” means the National Global Change Research Plan developed under section 104, or any revision thereof; and

[(6)] (7) “Program” means the United States Global Change Research Program established under section 103.

[SEC. 101. FINDINGS AND PURPOSE.]

[15 U.S.C. 2931]

[(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 habitability, 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. 101. FINDINGS AND PURPOSE.**(a) FINDINGS.—**The Congress makes the following findings:

(1) According to the 4th Assessment Report of the Intergovernmental Panel on Climate Change, most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.

(2) Human-induced changes, in conjunction with natural fluctuations, may lead to significant alterations of world climate patterns. Over this 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 and pre-

diction of global changes and their effects, and have resulted in the significant expansion of environmental data and information.

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

(5) *Although significant Federal global change research efforts are underway, an effective Federal program will require improvements in interagency coordination, coordination with the activities of local, regional, State, private, and international entities, and increased levels of Federal resources.*

(6) *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 also needs to produce information that better meets the expressed needs of decisionmakers.*

(7) *Better predictions of future climate conditions at the regional level are desirable to inform decisions, including those related to land, water, and resource management.*

(8) *Improved understanding of global change is needed to identify risks and vulnerabilities under plausible climate futures to assist decisionmakers in the development of policies to help ensure that ecological, social, and economic systems are resilient.*

(9) *In order to more effectively meet the needs of decisionmakers and the public, the research agenda of the United States Global Change Research Program and its implementation and products should be informed by continuous feedback from 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, assessment, and outreach program which will assist the Nation and the world to better understand, assess, predict, mitigate, and adapt to the effects of human-induced and natural processes of global change.*

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

[15 U.S.C. 2932]

SEC. 102. COMMITTEE ON GLOBAL CHANGE RESEARCH.

(a) ESTABLISHMENT.—The President, through the Council, shall establish a Committee on [Earth and Environmental Sciences.] *Global Change Research.* 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 Standards and Technology of the Department of Commerce;*

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

[(15)] (16) 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 relevant to the purpose of the title described in section 101(b).] *The representatives shall be the Deputy Secretary or the Deputy Secretary's designee (or, in the case of an agency other than a department, the deputy head of that agency or the deputy's designee).*

(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).]

(d) *SUBCOMMITTEES AND WORKING GROUPS.—The Committee may establish such additional subcommittees and working groups to carry out its work as it sees fit.*

(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) *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 impacts of global change; and*
- [(7)]** (8) 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. 104. NATIONAL GLOBAL CHANGE RESEARCH PLAN.]

[15 U.S.C. 2934]

SEC. 104. NATIONAL GLOBAL CHANGE RESEARCH AND ASSESSMENT PLAN.

(a) STRATEGIC PLAN; REVISED IMPLEMENTATION PLAN.—The Chairman of the Council, through the Committee, shall develop a strategic plan for the United States Global Climate Change Research Program for the 10-year period beginning in 2008 and submit the plan to the Congress within 1 year after the date of enactment of the Global Change Research Improvement Act of 2007. The strategic plan shall include a detailed plan for research, assessment, information management, public participation, outreach, and budget and shall be updated at least once every 5 years.

[(a)] (b) IN GENERAL.—The Chairman of the Council, through the Committee, shall develop a National Global Change Research and Assessment Plan for implementation of the Program. The Plan shall contain recommendations for national global change **[research.]** *research and assessment.* The Chairman of the Council shall submit the Plan to the Congress within one year after the date of enactment of **[this title,]** *the Global Change Research Improvement Act of 2007*, and a revised Plan shall be submitted at least once every three years thereafter.

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

*(1) establish, for the 10-year period beginning in the year the Plan is submitted, the *short-term and long-term* 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]** *information relevant and readily usable by local, State, and Federal decisionmakers, as well as other end-users,**

for the formulation of effective decisions and strategies for measuring, predicting, mitigating, and adapting to global change;

(2) describe specific activities, including research activities, data collection and data analysis requirements, predictive modeling, *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;** *priorities and propose measures to address gaps and growing needs for these activities;*

(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.]

(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 proposals to improve such access and build capacity for its use; 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) include a process for identifying information needed by appropriate Federal, State, regional, and local decisionmakers

to develop policies to plan for and address projected impacts of global change;

(9) identify and sustain 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) identify existing capabilities and gaps in national, regional, and local climate prediction and scenario-based modeling capabilities for forecasting and projecting climate impacts at local and regional levels, and propose measures to address such gaps;

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

(12) identify and describe ecosystems and geographic 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; and

(13) include such additional matter as the Committee deems appropriate.

[(c)] (d) 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.]

(1) Global and regional research and measurements to understand the nature of and interaction among physical, chemical, biological, land use, and social processes responsible for changes in the Earth system on all relevant spatial and time scales.

(2) Development of indicators, baseline databases, and ongoing monitoring to document global change, including changes in species distribution and behavior, changes in oceanic and atmospheric chemistry, extent of ice sheets, glaciers, and snow cover, shifts in water distribution and abundance, and changes in sea level.

(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.

(6) Address emerging priorities for climate change science, such as ice sheet melt and movement, the relationship between climate change and hurricane and typhoon development, including intensity, track, and frequency, decreasing water levels

in the Great Lakes, and droughts in the western and southeastern United States.

(7) Methods for integrating information to provide predictive and other tools for planning and decisionmaking by governments, communities and the private sector.

[(d)] (e) 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.]

(3) combine and interpret data from various sources to produce information readily usable by local, State, and Federal policymakers, and other end-users, attempting to formulate effective decisions and strategies for mitigating and adapting to the effects of global change; and

(4) establish a common assessment and modeling framework that may be used in both research and operations to project, predict, and assess the vulnerability of natural and managed ecosystems and of human society in the context of other environmental and social changes.

[(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) NATIONAL RESEARCH COUNCIL EVALUATION.]—

(1) REVIEW OF STRATEGIC PLAN.—The Chairman of the Council shall enter into an agreement with the National Research Council under which the National Research Council shall—

(A) evaluate the scientific content of the Plan;

(B) provide information and advice obtained from United States and international sources, and recommended priorities for future global and regional climate research and assessment; and

(C) address such other studies on emerging priorities as the Chairman determines to be warranted.

(2) ADDITIONAL NATIONAL RESEARCH COUNCIL STUDIES.—The Secretary shall execute an agreement with the National Research Council—

(A) to examine existing research, potential risks (including adverse impacts to the marine environment), and the effectiveness of ocean iron fertilization or other coastal and ocean carbon sequestration technologies; and

(B) identify domestic and international regulatory mechanisms and regulatory gaps for controlling the deployment of such technologies and provide recommendations for addressing such regulatory gaps.

[(f)] (g) 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.

[15 U.S.C. 2935]

(a) GLOBAL CHANGE RESEARCH COORDINATION OFFICE.—

(1) IN GENERAL.—The President shall establish a Global Change Research Coordination Office. The Office shall have a director, who shall be a senior scientist or other qualified professional with research expertise in climate change science, as well as experience in policymaking, planning, or resource management, and a fulltime staff. The Office shall—

(A) manage, in conjunction with the Committee, interagency coordination and program integration of global change research activities and budget requests;

(B) ensure that the activities and programs of each Federal agency or department participating in the Program address the goals and objectives identified in the strategic research plan and interagency implementation plans;

(C) ensure program and budget recommendations of the Committee are communicated to the President and are integrated into the strategic and implementation plans for the Program;

(D) review, solicit, identify, and arrange funding for partnership projects that address critical research objectives or operational goals of the Program, including projects that would fill research gaps identified by the Program, and for which project resources are shared among at least 2 agencies participating in the Program;

(E) review and provide recommendations, in conjunction with the Committee, on all annual appropriations requests from Federal agencies or departments participating in the Program;

(F) provide technical and administrative support to the Committee;

(G) serve as a point of contact on Federal climate change activities for government organizations, academia, industry, professional societies, State climate change programs, interested citizen groups, and others to exchange technical and programmatic information; and

(H) conduct public outreach, including dissemination of findings and recommendations of the Committee, as appropriate.

(2) FUNDING.—The Office may be funded through interagency funding in accordance with section 631 of The Treasury and

General Government Appropriations Act, 2003 (Pub. L. 108-7; 117 Stat. 471).

(3) *REPORT.*—Within 90 days after the date of enactment of the Global Change Research Improvement Act of 2007, the Director of the Office of Science and Technology Policy shall report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology on the funding of the Office. The report shall include—

- (A) the amount of funding required to adequately fund the Office; and
- (B) the adequacy of existing mechanisms to fund the Office.

(b) *RESEARCH GRANTS.*—

(1) *COMMITTEE TO DEVELOP LIST OF PRIORITY RESEARCH AREAS.*—The Committee shall develop a list of priority areas for research and development on climate change that are not being adequately addressed by Federal agencies. In the list, the Committee shall identify the appropriate agency to lead the such areas of research funded under paragraph (3)(A).

(2) *DIRECTOR OF OSTP TO TRANSMIT LIST TO NSF.*—The Director of the Office of Science and Technology Policy shall transmit the list to the National Science Foundation.

(3) *FUNDING THROUGH NSF.*—

(A) *BUDGET REQUEST.*—The National Science Foundation shall include, as part of the annual request for appropriations for the Science and Technology Policy Institute, a request for appropriations to fund research in the priority areas on the list developed under paragraph (1).

(B) *AUTHORIZATION.*—For fiscal year 2008 and each fiscal year thereafter, there are authorized to be appropriated to the National Science Foundation not less than \$30,000,000, to be made available through the Science and Technology Policy Institute, for research in those priority areas.

[(a)] (c) *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)] (d) *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 [Com-

mittee.] *Committee and the Global Change Research Coordination Office.*

[(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.]

(e) CONSIDERATION IN PRESIDENT'S BUDGET.—

(1) *IN GENERAL.—Before each annual budget submitted to the Congress under section 1105 of title 31, United States Code, the President shall, in a timely fashion, provide an opportunity to the Committee and the Global Change Research Coordination Office to review and comment on the budget estimate of each agency and department involved in global change research in the context of the Plan. The Committee and the Global Change Research Coordination Office shall transmit a report containing the results of their reviews to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology no later than the date on which the President submits the annual budget to the Congress under section 1105 of title 31, United States Code.*

(2) *PROGRAM ITEMS.—The President shall submit, at the time of the annual budget request to Congress, an integrated budget plan that would consolidate and highlight Program priorities and include a description of those items in each agency's annual budget which are elements of the Program.*

SEC. 6. [SCIENTIFIC] ASSESSMENT.

[15 U.S.C. 2936]

[(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] *On a periodic basis (not less frequently than every 4 years), the President shall submit to Congress a single, integrated, comprehensive 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.] years; and

(4) evaluates the information being developed under this title, considering in particular its usefulness to local, State, and national decisionmakers, as well as to other stakeholders such as the private sector, after providing a meaningful opportunity for the consideration of the views of such stakeholders on the effectiveness of the Program and the usefulness of the information.

SEC. 8. RELATION TO OTHER AUTHORITIES.

[15 U.S.C. 2938]

(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.

NATIONAL CLIMATE PROGRAM ACT**[SECTION 1. SHORT TITLE.]**

[This Act may be cited as the “National Climate Program Act”.]

[SEC. 2. FINDINGS.]

[15 U.S.C. 2901]

[The Congress finds and declares the following:

[(1) Weather and climate change affect food production, energy use, land use, water resources and other factors vital to national security and human welfare.

[(2) An ability to anticipate natural and man-induced changes in climate would contribute to the soundness of policy decisions in the public and private sectors.

[(3) Significant improvements in the ability to forecast climate on an intermediate and long-term basis are possible.

[(4) Information regarding climate is not being fully disseminated or used, and Federal efforts have given insufficient attention to assessing and applying this information.

[(5) Climate fluctuation and change occur on a global basis, and deficiencies exist in the system for monitoring global climate changes. International cooperation for the purpose of sharing the benefits and costs of a global effort to understand climate is essential.

[(6) The United States lacks a well-defined and coordinated program in climate-related research, monitoring, assessment of effects, and information utilization.]

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) **SHORT TITLE.**—This Act may be cited as the “National Climate Service Act of 2007”.

(b) **TABLE OF CONTENTS.**—The table of contents for this Act is as follows:

- Sec. 1. Short title; table of contents.
- Sec. 2. Findings.
- Sec. 3. Purpose.
- Sec. 4. Definitions.
- Sec. 5. National Climate Program.
- Sec. 6. National Climate Service.
- Sec. 7. Contract and grant authority.
- Sec. 8. Annual report.
- Sec. 9. Authorization of appropriations.”.

SEC. 2. FINDINGS.

The Congress finds the following:

(1) Climate change and related hazards affect public safety, environmental services and security, human health, agriculture, energy use, water resources, wildlife and other natural resources, and other factors vital to national security and human welfare.

(2) The present rate of advance of national efforts in research and development and the application of such advances is inadequate to meet the challenges posed by observed and projected rates of climate change and the increasing demand for information to guide planning and response across all sectors.

(3) The United States lacks adequate research, infrastructure, and coordinated outreach and communication mechanisms to meet national climate monitoring, prediction, and decision support needs for adapting to and mitigating the impacts of climate change.

(4) Information regarding climate change is not being fully disseminated or used, and Federal efforts have given insufficient attention to assessing and applying this information.

(5) Climate change occurs on a global basis making international cooperation essential for the purpose of sharing the benefits and costs of a global effort to understand and communicate these changes.

SEC. 3. PURPOSE.

[15 U.S.C. 2902]

It is the purpose of the Congress in this Act to establish a national climate program that will assist the Nation and the world to understand and respond to natural and man-induced climate processes and their [implications.] implications and to establish a National Climate Service that will advance the national interest and associated international concerns in understanding, forecasting, responding, adapting to, and mitigating the impacts of natural and human-induced climate change and climate variability.

SEC. 4. DEFINITIONS.

[15 U.S.C. 2903]

[As used in this Act, unless the context otherwise requires:] In this Act:

(1) The term “Board” means the Climate Program Policy Board.

[(2) The term “Office” means the National Climate Program Office.]

(1) ADMINISTRATOR.—*The term “Administrator” means the Administrator of the National Oceanic and Atmospheric Administration.*

(2) ADVISORY COUNCIL.—*The term “Advisory Council” refers to the Climate Services Advisory Council.*

(3) CLIMATE CHANGE.—*The term “climate change” means any change in climate over time, whether due to natural variability or as a result of human activity.*

(4) DIRECTOR.—*The term “Director” means the Director of the National Oceanic and Atmospheric Administration’s National Climate Service.*

(5) GLOBAL CHANGE RESEARCH PROGRAM.—*The term “Global Change Research Program” means the United States Global Change Research Program established under section 103 of the Global Change Research Act of 1990 (15 U.S.C. 2933).*

[(3)] (6) PROGRAM.—*The term “Program” means the National Climate Program.*

[(4)] (7) SECRETARY.—*The term “Secretary” means the Secretary of [Commerce.] Commerce, acting through the Administrator of the National Oceanic and Atmospheric Administration.*

(8) SERVICE.—*The term “Service” means the National Oceanic and Atmospheric Administration’s National Climate Service.*

* * * * *

[SEC. 7. ANNUAL REPORT.

[15 U.S.C. 2906]

[The Secretary shall prepare and submit to the President and the authorizing committees of the Congress, not later than March 31 of each year, a report on the activities conducted pursuant to this Act during the preceding fiscal year, including—

[(a) a summary of the achievements of the Program during the previous fiscal year;

[(b) an analysis of the progress made toward achieving the goals and objectives of the Program;

[(c) a copy of the 5-year plan and any changes made in such plan;

[(d) a summary of the multiagency budget request for the Program of subsection 5(g); and

[(e) any recommendations for additional legislation which may be required to assist in achieving the purposes of the Act.

[SEC. 8. CONTRACT AND GRANT AUTHORITY; RECORDS AND AUDITS.

[15 U.S.C. 2907]

[(a) Functions vested in any Federal officer or agency by this Act or under the Program may be exercised through the facilities and personnel of the agency involved or, to the extent provided or approved in advance in appropriation Acts, by other persons or entities under contracts or grant arrangements entered into by such officer or agency.

[(b)(1) Each person or entity to which Federal funds are made available under a contract or grant arrangement as authorized by

this Act shall keep such records as the Director of the Office shall prescribe, including records which fully disclose the amount and disposition by such person or entity of such funds, the total cost of the activities for which such funds were so made available, the amount of that portion of such cost supplied from other sources, and such other records as will facilitate an effective audit.

[(2) The Director of the Office and the Comptroller General of the United States, or any of their duly authorized representatives, shall, until the expiration of 3 years after the completion of the activities (referred to in paragraph (1)) of any person or entity pursuant to any contract or grant arrangement referred to in subsection (a), have access for the purpose of audit and examination to any books, documents, papers, and records of such person or entity which, in the judgment of the Director or the Comptroller General, may be related or pertinent to such contract or grant arrangement.]

SEC. 6. NATIONAL CLIMATE SERVICE.

(a) ESTABLISHMENT.—

(1) IN GENERAL.—The Secretary shall establish within the National Oceanic and Atmospheric Administration a National Climate Service not later than a year after the date of the enactment of the Global Change Research Improvement Act of 2007. The Service shall include a national center and a network of regional and local facilities for operational climate monitoring and prediction.

(2) DUTIES.—The Service shall produce and deliver authoritative, timely and usable information about climate change, climate variability, trends, and impacts on local, State, regional, national, and global scales.

(3) SPECIFIC SERVICES.—The Service, at a minimum, shall—

(A) provide comprehensive and authoritative information about the state of the climate and its effects, through observations, monitoring, data, information, and products that accurately reflect climate trends and conditions;

(B) provide predictions and projections on the future state of the climate in support of adaptation, preparedness, attribution, and mitigation;

(C) utilize appropriate research from the United States Global Change Research Program activities and conduct focused research, as needed, to enhance understanding, information and predictions of the current and future state of the climate and its impacts that is relevant to policy, planning, and decision making;

(D) utilize assessments from the Global Change Research Program activities and conduct focused assessments as needed to enhance understanding of the impacts of climate change and climate variability;

(E) assess and strengthen delivery mechanisms for providing climate information to end users;

(F) communicate climate data, conditions, predictions, projections, indicators, and risks on an ongoing basis to decision- and policy-makers, the private sector, and to the public;

(G) coordinate and collaborate on climate change, climate variability, and impacts activities with municipal, state, re-

gional, national and international agencies and organizations, as appropriate;

(H) support the Department of State and international agencies and organizations, as well as domestic agencies and organizations, involved in assessing and responding to climate change and climate variability;

(I) establish an atmospheric monitoring and verification program utilizing aircraft, satellite, ground sensors, ocean and coastal observing systems, and modeling capabilities to monitor, measure, and verify greenhouse gas levels, dates, and emissions throughout the global oceans and atmosphere; and

(J) issue an annual report that identifies greenhouse emission and trends on a local, regional, and national level and identifies emissions or reductions attributable to individual or multiple sources covered by the program established under subparagraph (I).

(b) ACTION PLAN.—Within 1 year after the date of enactment of the Global Change Research Improvement Act of 2007, the Secretary shall submit to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology a plan of action for the National Climate Service. The plan, at a minimum, shall—

(1) provide for the interpretation and communication of climate data, conditions, predictions, projections, and risks on an on-going basis to decision and policy makers at the local, regional, and national levels;

(2) design, deploy, and operate an adequate national climate observing system that closes gaps in existing coverage;

(3) support infrastructure and ability to archive and quality ensure climate data, and make federally-funded model simulations and other relevant climate information available from the Global Change Research Program activities and other sources (and related data from paleoclimate studies).

(4) include a program for long-term stewardship, quality control, development of relevant climate products, and efficient access to all relevant climate data, products, and model simulations;

(5) establish—

(A) a national coordinated computing strategy, including establishing a new, or supplementing support for existing, national climate computing capability to provide dedicated computing capacity for modeling and forecasting, scenarios, and planning resources, and a regular schedule of projections on long- and short-term time horizons over a range of scales, including regional scales; and

(B) a mechanism to allow access to such capacity by the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, and National Science Foundation sponsored researchers;

(6) improve integrated modeling, assessment, and predictive capabilities needed to document and predict climate changes and impacts, and to guide national, regional, and local planning and decision making;

(7) provide a system of regular consultation and coordination with Federal agencies, States, Indian tribes, non-governmental organizations, the private sector and the academic community to ensure—

(A) that the information requirements of these groups are well incorporated; and

(B) timely and full sharing, dissemination and use of climate information and services in risk preparedness, planning, decision making, and early warning and natural resources management, both domestically and internationally;

(8) develop standards, evaluation criteria and performance objectives to ensure that the Service meets the evolving information needs of the public, policy makers and decision makers in the face of a changing climate;

(9) develop funding estimates to implement the plan; and

(10) support competitive research programs that will improve elements of the Service described in this Act through the Climate Program Office within the Service headquarter function.

(c) COORDINATION WITH THE USGCRP.—The Service shall utilize appropriate research from Global Change Research Program activities to enhance understanding, information and predictions of the current and future state of the climate and its impacts that is relevant to policy and decisions. The Service shall provide appropriate information about the current and future state of the climate and its impacts that are useful for research purposes to relevant Global Change Research Program activities. The Director of the Service will serve as a liaison to the Global Change Research Program and a member of the Global Change Research Program should serve on the Advisory Council.

(d) DIRECTOR.—The Administrator shall appoint a director of the Service, who shall oversee all processes associated with managing the organization and executing the functions and actions described in this Act. The Director will serve as a liaison to the Global Change Research Program to ensure the transition of research into services and to provide services to meet the needs of research.

(e) NATIONAL CLIMATE SERVICE ADVISORY COUNCIL.—The Administrator shall, in consultation with the chairmen and ranking minority party members of the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology, and the National Academy of Sciences, appoint the membership of a National Climate Service Advisory Council composed of 15 members, with members serving 4-year terms and include a diverse membership from appropriate Federal, State and local government, universities, non-government and private sectors who use climate information and cover a range of sectors, such as water, drought, fisheries, coasts, agriculture, health, natural resources, transportation, and insurance. The Council shall advise the Director of the Service of key priorities in climate-related issues that require the attention of the Service. The Council shall be responsible for ensuring coordination across regional and national concerns and the assessment of evolving information needs.

SEC. 7. CONTRACT AND GRANT AUTHORITY.

Functions vested in any Federal officer or agency by this Act or under the Program may be exercised through the facilities and personnel of the agency involved or, to the extent provided or approved in advance in appropriation Acts, by other persons or entities under contracts or grant arrangements entered into by such officer or agency.

SEC. 8. ANNUAL REPORT.

The Secretary shall prepare and submit to the President and the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology, as part of the annual report to meet the requirements of section 102(e)(7) of the Global Change Research Act of 1990 (15 U.S.C. 2932(e)(7)), a report on the activities conducted pursuant to this Act during the preceding fiscal year, including—

- (1) a summary of the achievements of the National Climate Service during the previous fiscal year; and*
- (2) an analysis of the progress made toward achieving the goals and objectives of the Service.*

[SEC. 9. AUTHORIZATION OF APPROPRIATIONS.]

[15 U.S.C. 2908]

[In addition to any other funds otherwise authorized to be appropriated for the purpose of conducting climate-related programs, there are authorized to be appropriated to the Secretary, for the purpose of carrying out the provisions of this Act, not to exceed \$50,000,000 for the fiscal year ending September 30, 1979, not to exceed \$65,000,000 for the fiscal year ending September 30, 1980, and not to exceed \$25,500,000 for the fiscal year ending September 30, 1981, of which amount not less than \$2,653,000 shall be made directly available to the National Climate Program Office in the form of a budget item separate from the activities of the National Oceanic and Atmospheric Administration.]

SEC. 9. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary to carry out sections 6, 7, and 8 of this Act—

- (1) \$300,000,000 for fiscal year 2009;*
- (2) \$350,000,000 for fiscal year 2010;*
- (3) \$400,000,000 for fiscal year 2011;*
- (4) \$450,000,000 for fiscal year 2012; and*
- (5) \$500,000,000 for fiscal year 2013.*

**NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
ACT**

SEC. 2. ESTABLISHMENT, FUNCTIONS, AND ACTIVITIES.

[15 U.S.C. 272]

(a) ESTABLISHMENT OF NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.—There is established within the Department of Commerce a science, engineering, technology, and measurement laboratory to be known as the National Institute of Standards and Technology (hereafter in this Act referred to as the “Institute”).

(b) FUNCTIONS OF SECRETARY AND INSTITUTE.—The Secretary of Commerce (hereafter in this Act referred to as the “Secretary”) act-

ing through the Director of the Institute (hereafter in this Act referred to as the "Director") is authorized to take all actions necessary and appropriate to accomplish the purposes of this Act, including the following functions of the Institute—

- (1) to assist industry in the development of technology and procedures needed to improve quality, to modernize manufacturing processes, to ensure product reliability, manufacturability, functionality, and cost-effectiveness, and to facilitate the more rapid commercialization, especially by small- and medium-sized companies throughout the United States, of products based on new scientific discoveries in fields such as automation, electronics, advanced materials, biotechnology, and optical technologies;
- (2) to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods for making measurements consistent with those standards;
- (3) to compare standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal Government and to coordinate the use by Federal agencies of private sector standards, emphasizing where possible the use of standards developed by private, consensus organizations;
- (4) to enter into contracts, including cooperative research and development arrangements, and grants and cooperative agreements, in furtherance of the purposes of this Act;
- (5) to provide United States industry, Government, and educational institutions with a national clearinghouse of current information, techniques, and advice for the achievement of higher quality and productivity based on current domestic and international scientific and technical development;
- (6) to assist industry in the development of measurements, measurement methods, and basic measurement technology;
- (7) to determine, compile, evaluate, and disseminate physical constants and the properties and performance of conventional and advanced materials when they are important to science, engineering, manufacturing, education, commerce, and industry and are not available with sufficient accuracy elsewhere;
- (8) to develop a fundamental basis and methods for testing materials, mechanisms, structures, equipment, and systems, including those used by the Federal Government;
- (9) to assure the compatibility of United States national measurement standards with those of other nations;
- (10) to cooperate with other departments and agencies of the Federal Government, with industry, with State and local governments, with the governments of other nations and international organizations, and with private organizations in establishing standard practices, codes, specifications, and voluntary consensus standards;
- (11) to advise government and industry on scientific and technical problems;
- (12) to invent, develop, and (when appropriate) promote transfer to the private sector of measurement devices to serve special national needs; and

(13) to coordinate Federal, State, and local technical standards activities and conformity assessment activities, with private sector technical standards activities and conformity assessment activities, with the goal of eliminating unnecessary duplication and complexity in the development and promulgation of conformity assessment requirements and measures.

(c) **IMPLEMENTATION ACTIVITIES.**—In carrying out the functions specified in subsection (b), the Secretary, acting through the Director may, among other things—

- (1) construct physical standards;
- (2) test, calibrate, and certify standards and standard measuring apparatus;
- (3) study and improve instruments, measurement methods, and industrial process control and quality assurance techniques;
- (4) cooperate with the States in securing uniformity in weights and measures laws and methods of inspection;
- (5) cooperate with foreign scientific and technical institutions to understand technological developments in other countries better;
- (6) prepare, certify, and sell standard reference materials for use in ensuring the accuracy of chemical analyses and measurements of physical and other properties of materials;
- (7) in furtherance of the purposes of this Act, accept research associates, cash donations, and donated equipment from industry, and also engage with industry in research to develop new basic and generic technologies for traditional and new products and for improved production and manufacturing;
- (8) study and develop fundamental scientific understanding and improved measurement, analysis, synthesis, processing, and fabrication methods for chemical substances and compounds, ferrous and nonferrous metals, and all traditional and advanced materials, including processes of degradation;
- (9) investigate ionizing and nonionizing radiation and radioactive substances, their uses, and ways to protect people structures, and equipment from their harmful effects;
- (10) determine the atomic and molecular structure of matter, through analysis of spectra and other methods, to provide a basis for predicting chemical and physical structures and reactions and for designing new materials and chemical substances, including biologically active macromolecules;
- (11) perform research on electromagnetic waves, including optical waves, and on properties and performance of electrical, electronic, and electromagnetic devices and systems and their essential materials, develop and maintain related standards, and disseminate standard signals through broadcast and other means;
- (12) develop and test standard interfaces, communication protocols, and data structures for computer and related telecommunications systems;
- (13) study computer systems (as that term is defined in section 20(d) of this Act) and their use to control machinery and processes;

(14) perform research to develop standards and test methods to advance the effective use of computers and related systems and to protect the information stored, processed, and transmitted by such systems and to provide advice in support of policies affecting Federal computer and related telecommunications systems;

(15) determine properties of building materials and structural elements, and encourage their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

(16) undertake such research in engineering, pure and applied mathematics, statistics, computer science, materials science, and the physical sciences as may be necessary to carry out and support the functions specified in this section;

(17) compile, evaluate, publish, and otherwise disseminate general, specific and technical data resulting from the performance of the functions specified in this section or from other sources when such data are important to science, engineering, or industry, or to the general public, and are not available elsewhere;

(18) collect, create, analyze, and maintain specimens of scientific value;

(19) operate national user facilities;

(20) evaluate promising inventions and other novel technical concepts submitted by inventors and small companies and work with other Federal agencies, States, and localities to provide appropriate technical assistance and support for those inventions which are found in the evaluation process to have commercial promise;

(21) demonstrate the results of the Institute's activities by exhibits or other methods of technology transfer, including the use of scientific or technical personnel of the Institute for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties; **[and]**

(22) *perform research to develop enhanced measurements, calibrations, standards, and technologies which will enable the reduced production in the United States of greenhouse gases associated with global warming, including carbon dioxide, methane, nitrous oxide, ozone, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride; and*

[(22)] (23) undertake such other activities similar to those specified in this subsection as the Director determines appropriate.

(d) Management costs. In carrying out the extramural funding programs of the Institute, including the programs established under sections 25, 26, and 28 of this Act, the Secretary may retain reasonable amounts of any funds appropriated pursuant to authorizations for these programs in order to pay for the Institute's management of these programs.

SEC. 17. CLIMATE CHANGE STANDARDS AND PROCESSES.

(a) **IN GENERAL.**—The Director shall establish within the Institute a program to perform and support research on global climate change standards and processes, with the goal of providing scientific and technical knowledge applicable to the reduction of greenhouse gases (as defined in section 4 of the Global Climate Change Act of 2002).

(b) **RESEARCH PROGRAM.**—

(1) **IN GENERAL.**—The Director is authorized to conduct, directly or through contracts or grants, a global climate change standards and processes research program.

(2) **RESEARCH PROJECTS.**—The specific contents and priorities of the research program shall be determined in consultation with appropriate Federal agencies, including the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration. The program generally shall include basic and applied research—

(A) to develop and provide the enhanced measurements, calibrations, data, models, and reference material standards which will enable the monitoring of greenhouse gases;

(B) to develop and provide standards, measurements, and innovative technologies for reducing greenhouse gas emissions in existing industries;

(C) to develop and provide standards, measurements, measurement tools, and calibrations that will enhance and promote remote sensing technologies;

(D) to assist in establishing a baseline reference point for future trading in greenhouse gases and the measurement of progress in emissions reduction;

(E) to develop and provide standards, measurements, measurement tools, calibrations, data, models, and other innovative technologies to support the validation and accreditation of a greenhouse gas trading industry;

(F) to assist in developing improved industrial processes designed to reduce or eliminate greenhouse gases, including the development of measurement tools and standards to validate and accredit a carbon offset industry; and

(G) that will be exchanged internationally as scientific or technical information which has the stated purpose of developing mutually recognized measurements, standards, and procedures for reducing greenhouse gases.

(c) **NATIONAL MEASUREMENT LABORATORIES.**—

(1) **IN GENERAL.**—In carrying out this section, the Director shall utilize the collective skills of the National Measurement Laboratories of the National Institute of Standards and Technology to improve the accuracy of measurements that will permit better understanding and control of these industrial chemical processes and result in the reduction or elimination of greenhouse gases.

(2) **MATERIAL, PROCESS, AND BUILDING RESEARCH.**—The National Measurement Laboratories shall conduct research under this subsection that includes—

(A) developing material and manufacturing processes which are designed for energy efficiency and reduced greenhouse gas emissions into the environment;

(B) developing environmentally-friendly, 'green' chemical processes to be used by industry; and

(C) enhancing building performance with a focus in developing standards or tools which will help incorporate low- or no-emission technologies into building designs.

(3) STANDARDS AND TOOLS.—*The National Measurement Laboratories shall develop standards and tools under this subsection that include software to assist designers in selecting alternate building materials, performance data on materials, artificial intelligence-aided design procedures for building subsystems and 'smart buildings', and improved test methods and rating procedures for evaluating the energy performance of residential and commercial appliances and products.*

(d) NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM.—*The Director shall utilize the National Voluntary Laboratory Accreditation Program under this section to establish a program to include specific calibration or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in measuring the production of greenhouse gases. In carrying out this subsection the Director may cooperate with other departments and agencies of the Federal Government, State and local governments, and private organizations.*

[Sections 17 through 32 (not shown) redesignated as sections 18 through 33, respectively.]

NATIONAL SCIENCE AND TECHNOLOGY POLICY, ORGANIZATION, AND PRIORITIES ACT OF 1976

[42 U.S.C. 6601 et seq.]

* * * * *

TITLE VII—NATIONAL SCIENCE AND TECHNOLOGY ASSESSMENT SERVICE

SEC. 701. ESTABLISHMENT.

There is hereby created a Science and Technology Assessment Service which shall be within and responsible to the legislative branch of the Government.

SEC. 702. COMPOSITION.

The Service shall consist of a Science and Technology Board which shall formulate and promulgate the policies of the Service, and a Director who shall carry out such policies and administer the operations of the Service.

SEC. 703. FUNCTIONS AND DUTIES.

The Service shall coordinate and develop information for Congress relating to the uses and application of technology to address current national science and technology policy issues. In developing such technical assessments for Congress, the Service shall utilize, to the extent practicable, experts selected in coordination with the National Research Council.

SEC. 704. INITIATION OF ACTIVITIES.

Science and technology assessment activities undertaken by the Service may be initiated upon the request of—

- (1) *the Chairman of any standing, special, or select committee of either House of the Congress, or of any joint committee of the Congress, acting for himself or at the request of the ranking minority member or a majority of the committee members;*
- (2) *the Board; or*
- (3) *the Director.*

SEC. 705. ADMINISTRATION AND SUPPORT.

The Director of the Science and Technology Assessment Service shall be appointed by the Board and shall serve for a term of 6 years unless sooner removed by the Board. The Director shall receive basic pay at the rate provided for level III of the Executive Schedule under section 5314 of title 5, United States Code. The Director shall contract for administrative support from the Library of Congress.

SEC. 706. AUTHORITY.

The Service shall have the authority, within the limits of available appropriations, to do all things necessary to carry out the provisions of this section, including, but without being limited to, the authority to—

- (1) *make full use of competent personnel and organizations outside the Office, public or private, and form special ad hoc task forces or make other arrangements when appropriate;*
- (2) *enter into contracts or other arrangements as may be necessary for the conduct of the work of the Office with any agency or instrumentality of the United States, with any State, territory, or possession or any political subdivision thereof, or with any person, firm, association, corporation, or educational institution, with or without reimbursement, without performance or other bonds, and without regard to section 3709 of the Revised Statutes (41 U.S.C. 51);*
- (3) *accept and utilize the services of voluntary and uncompensated personnel necessary for the conduct of the work of the Service and provide transportation and subsistence as authorized by section 5703 of title 5, United States Code, for persons serving without compensation; and*
- (4) *prescribe such rules and regulations as it deems necessary governing the operation and organization of the Service.*

SEC. 707. BOARD.

The Board shall consist of 13 members as follows—

- (1) *6 Members of the Senate, appointed by the President pro tempore of the Senate, 3 from the majority party and 3 from the minority party;*
- (2) *6 Members of the House of Representatives appointed by the Speaker of the House of Representatives, 3 from the majority party and 3 from the minority party; and*
- (3) *the Director, who shall not be a voting member.*

SEC. 708. REPORT TO CONGRESS.

The Service shall submit to the Congress an annual report which shall include, but not be limited to, an evaluation of technology assessment techniques and identification, insofar as may be feasible,

of technological areas and programs requiring future analysis. The annual report shall be submitted not later than March 15 of each year.

SEC. 709. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Service such sums as are necessary to fulfill the requirements of this title.

