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110TH CONGRESS
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S. 2307

[Report No. 110-341]

To amend the Global Change Research Act of 1990, and for other purposes.

IN THE SENATE OF THE UNITED STATES

NOVEMBER 5, 2007

Mr. KERRY (for himself, Ms. SNOWE, Ms. KLOBUCHAR, and Mr. NELSON of Florida) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

MAY 22, 2008

Reported by Mr. INOUE, with amendments

[Omit the part struck through and insert the part printed in *italic*]

A BILL

To amend the Global Change Research Act of 1990, and
for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Global Change Re-
5 search Improvement Act of 2007”.

1 SEC. 2. TABLE OF CONTENTS.

2 The table of contents for this Act is as follows:

TITLE I—AMENDMENT OF THE GLOBAL CHANGE RESEARCH ACT
OF 1990

- Sec. 101. Amendment of Global Change Research Act of 1990.
- Sec. 102. Changes to findings and purpose.
- Sec. 103. Changes in definitions.
- Sec. 104. Change in committee name and structure.
- Sec. 105. Change in National Global Change Research Plan.
- Sec. 106. Integrated Program Office.
- Sec. 107. Budget coordination.
- Sec. 108. Research grants.
- Sec. 109. Evaluation of information.
- Sec. 110. Repeal of obsolete provision.
- ~~Sec. 111. Ice sheet study and report.~~
- ~~Sec. 112. Hurricane frequency and intensity study and report.~~
- Sec. 111. Reporting.*
- Sec. 112. Independent review of GCRP products.*
- Sec. 113. Scientific communications.
- Sec. 114. Aging workforce issues program.
- Sec. 115. Authorization of appropriations.

TITLE H—NATIONAL CLIMATE SERVICE

- ~~Sec. 201. Amendment of National Climate Program Act.~~

TITLE II—NATIONAL CLIMATE SERVICE

- Sec. 201. Amendment of National Climate Program Act.*
- Sec. 202. Short title; table of contents.*
- Sec. 203. Findings.*
- Sec. 204. Purpose.*
- Sec. 205. Definitions.*
- Sec. 206. National Climate Service.*
- Sec. 207. Reauthorization.*

TITLE III—TECHNOLOGY ASSESSMENT

- Sec. 301. National Science and Technology Assessment Service.

TITLE IV—CLIMATE CHANGE TECHNOLOGY

- Sec. 401. NIST greenhouse gas functions.
- Sec. 402. Development of new measurement technologies.
- Sec. 403. Enhanced environmental measurements and standards.
- Sec. 404. Technology development and diffusion.
- Sec. 405. Authorization of appropriations.

TITLE V—ABRUPT CLIMATE CHANGE

- Sec. 501. Abrupt climate change research program.
- Sec. 502. Purposes of program.
- Sec. 503. Abrupt climate change defined.
- Sec. 504. Authorization of appropriations.

1 **TITLE I—AMENDMENT OF THE**
2 **GLOBAL CHANGE RESEARCH**
3 **ACT OF 1990**

4 **SEC. 101. AMENDMENT OF GLOBAL CHANGE RESEARCH**
5 **ACT OF 1990.**

6 Except as otherwise expressly provided, whenever in
7 this title an amendment or repeal is expressed in terms
8 of an amendment to, or repeal of, a section or other provi-
9 sion, the reference shall be considered to be made to a
10 section or other provision of the Global Change Research
11 Act of 1990 (15 U.S.C. 2921 et seq.).

12 **SEC. 102. CHANGES TO FINDINGS AND PURPOSE.**

13 Section 101 (15 U.S.C. 2931) is amended to read as
14 follows:

15 **“SEC. 101. FINDINGS AND PURPOSE.**

16 “(a) **FINDINGS.**—The Congress makes the following
17 findings:

18 “(1) According to the 4th Assessment Report of
19 the Intergovernmental Panel on Climate Change,
20 most of the observed increase in global average tem-
21 peratures since the mid-20th century is very likely
22 due to the observed increase in anthropogenic green-
23 house gas concentrations.

24 “(2) Human-induced changes, in conjunction
25 with natural fluctuations, may lead to significant al-

1 terations of world climate patterns. Over this cen-
2 tury, these changes could adversely affect world ag-
3 ricultural and marine production, coastal habit-
4 ability, biological diversity, human health, global so-
5 cial and political stability, and global economic activ-
6 ity.

7 “(3) Developments in interdisciplinary Earth
8 sciences, global observing systems, and satellite and
9 computing technologies make possible significant sci-
10 entific understanding and prediction of global
11 changes and their effects, and have resulted in the
12 significant expansion of environmental data and in-
13 formation.

14 “(4) Development and strengthening of effec-
15 tive policies to mitigate and adapt to global change
16 will rely on improvement in scientific understanding
17 of global environmental and societal processes and
18 on development of information that is of use to deci-
19 sionmakers at the local, regional, and national levels.

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

1 “(6) Although the United States Global Change
2 Research Program has made significant contribu-
3 tions to understanding Earth’s climate and the an-
4 thropogenic influences on Earth’s climate and its
5 ecosystems, the Program also needs to produce in-
6 formation that better meets the expressed needs of
7 decisionmakers.

8 “(7) Better predictions of future climate condi-
9 tions at the regional level are desirable to inform de-
10 cisions, including those related to land, water, and
11 resource management.

12 “(8) Improved understanding of global change
13 is needed to identify risks and vulnerabilities under
14 plausible climate futures to assist decisionmakers in
15 the development of policies to help ensure that eco-
16 logical, social, and economic systems are resilient.

17 “(9) In order to more effectively meet the needs
18 of decisionmakers and the public, the research agen-
19 da of the United States Global Change Research
20 Program and its implementation and products
21 should be informed by continuous feedback from
22 users of information generated by the Program.

23 “(b) PURPOSE.—The purpose of this title is to pro-
24 vide for the continuation and coordination of a comprehen-
25 sive and integrated United States observation, research,

1 assessment, and outreach program which will assist the
 2 Nation and the world to better understand, assess, predict,
 3 mitigate, and adapt to the effects of human-induced and
 4 natural processes of global change.”.

5 **SEC. 103. CHANGES IN DEFINITIONS.**

6 Section 2 (15 U.S.C. 2921) is amended—

7 (1) by redesignating paragraphs (1) through
 8 (6) as paragraphs (2) through (7), respectively;

9 (2) by inserting before paragraph (2), as redesi-
 10 gnated, the following:

11 “(1) ‘climate change’ means any change in cli-
 12 mate over time, whether due to natural variability or
 13 as a result of human activity;”;

14 (3) by striking “Earth and Environmental
 15 Sciences” in paragraph (2), as redesignated and in-
 16 serting “Global Change Research”; ~~and~~

17 (4) by striking “*Federal Coordinating Council*
 18 *on Science, Engineering, and Technology;*” in para-
 19 *graph (3), as redesignated, and inserting “National*
 20 *Science and Technology Council established by Execu-*
 21 *utive Order 12881, November 23, 1993;”;* and

22 ~~(4)~~ (5) by striking paragraph (4), as redesi-
 23 gnated, and inserting the following:

24 “(4) ‘global change’ means human-induced or
 25 natural changes in the global environment (including

1 climate change and other phenomena affecting land
2 productivity, oceans and coastal areas, freshwater
3 resources, atmospheric chemistry, biodiversity, and
4 ecological systems) that may alter the capacity of
5 Earth to sustain life;”.

6 **SEC. 104. CHANGE IN COMMITTEE NAME AND STRUCTURE.**

7 Section 102 (15 U.S.C. 2932) is amended—

8 (1) by striking “**EARTH AND ENVIRON-**
9 **MENTAL SCIENCES.**” in the section heading and
10 inserting “**GLOBAL CHANGE RESEARCH.**”;

11 (2) by striking “Earth and Environmental
12 Sciences.” in subsection (a) and inserting “Global
13 Change Research.”;

14 (3) by redesignating paragraphs (14) and (15)
15 of subsection (b) as paragraphs (15) and (16), re-
16 spectively, and inserting after paragraph (13) the
17 following:

18 “(14) the National Institute of Standards and
19 Technology of the Department of Commerce;”;

20 (4) by striking the last sentence of subsection
21 (b) and inserting “The representatives shall be the
22 Deputy Secretary or the Deputy Secretary’s des-
23 ignee (or, in the case of an agency other than a de-
24 partment, the deputy head of that agency or the
25 deputy’s designee).”;

1 (5) by striking subsection (d) and inserting the
2 following:

3 “(d) SUBCOMMITTEES AND WORKING GROUPS.—The
4 Committee may establish such additional subcommittees
5 and working groups to carry out its work as it sees fit.”;
6 and

7 (6) by striking “and” after the semicolon in
8 subsection (e)(6); and

9 (7) by redesignating paragraph (7) of sub-
10 section (e) as paragraph (8) and inserting after
11 paragraph (6) the following:

12 “(7) work with appropriate Federal, State, re-
13 gional, and local authorities to ensure that the Pro-
14 gram is designed to produce information needed to
15 develop policies to reduce the impacts of global
16 change; and”.

17 **SEC. 105. CHANGE IN NATIONAL GLOBAL CHANGE RE-**
18 **SEARCH PLAN.**

19 Section 104 (15 U.S.C. 2934) is amended—

20 (1) by striking the section heading and insert-
21 ing the following:

22 **“SEC. 104. NATIONAL GLOBAL CHANGE RESEARCH AND AS-**
23 **SESSMENT PLAN.” ;**

24 (2) by redesignating subsections (a) through (f)
25 as subsections (b) through (g), respectively, and in-

1 serting before subsection (b), as redesignated, the
2 following:

3 “(a) STRATEGIC PLAN; REVISED IMPLEMENTATION
4 PLAN.—The Chairman of the Council, through the Com-
5 mittee, shall develop a strategic plan for the United States
6 Global Climate Change Research Program for the 10-year
7 period beginning in 2008 and submit the plan to the Con-
8 gress within 1 year after the date of enactment of the
9 Global Change Research Improvement Act of 2007. The
10 strategic plan shall include a detailed plan for research,
11 assessment, information management, public participa-
12 tion, outreach, and ~~budget.~~ *budget and shall be updated*
13 *at least once every 5 years.”;*

14 (3) by inserting “and Assessment” after “Re-
15 search” in subsection (b), as redesignated;

16 (4) by striking “research.” in subsection (b), as
17 redesignated, and inserting “research and assess-
18 ment.”;

19 (5) by striking “this title,” in subsection (b), as
20 redesignated, and inserting “the Global Change Re-
21 search Improvement Act of 2007,”;

22 (6) by inserting “short-term and long-term” be-
23 fore “goals” in paragraph (1) of subsection (c), as
24 redesignated;

1 (7) by striking “usable information on which to
2 base policy decisions related to” in paragraph (1) of
3 subsection (c), as redesignated, and inserting “infor-
4 mation relevant and readily usable by local, State,
5 and Federal decisionmakers, as well as other end-
6 users, for the formulation of effective decisions and
7 strategies for measuring, predicting, mitigating, and
8 adapting to”;

9 (8) by inserting “development of regional sce-
10 narios, assessment of model predictability, assess-
11 ment of climate change impacts,” after “predictive
12 modeling,” in paragraph (2) of subsection (c), as re-
13 designated;

14 (9) by striking “priorities;” in paragraph (2) of
15 subsection (c), as redesignated, and inserting “prior-
16 ities and propose measures to address gaps and
17 growing needs for these activities;”

18 (10) by striking paragraphs (6) and (7) of sub-
19 section (c), as redesignated, and inserting the fol-
20 lowing:

21 “(6) make recommendations for the coordina-
22 tion of the global change research and assessment
23 activities of the United States with such activities of
24 other Nations and international organizations, in-
25 cluding—

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

3 “(B) bilateral and multilateral efforts to
4 provide worldwide access to scientific data and
5 information, and proposals to improve such ac-
6 cess and build capacity for its use; and

7 “(C) improving participation by developing
8 Nations in international global change research
9 and environmental data collection;

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

13 “(8) include a process for identifying informa-
14 tion needed by appropriate Federal, State, regional,
15 and local decisionmakers to develop policies to plan
16 for and address projected impacts of global change;

17 “(9) identify and sustain the observing systems
18 currently employed in collecting data relevant to
19 global and regional climate change research and
20 prioritize additional observation systems that may be
21 needed to ensure adequate data collection and moni-
22 toring of global change;

23 “(10) identify existing capabilities and gaps in
24 national, regional, and local climate prediction and
25 scenario-based modeling capabilities for forecasting

1 and projecting climate impacts at local and regional
2 levels, and propose measures to address such gaps;

3 “(11) describe specific activities designed to fa-
4 cilitate outreach and data and information exchange
5 with regional, State, and local governments and
6 other user communities;

7 “(12) identify and describe ecosystems and geo-
8 graphic regions of the United States that are likely
9 to experience similar impacts of global change or are
10 likely to share similar vulnerabilities to global
11 change; and

12 “(13) include such additional matter as the
13 Committee deems appropriate.”;

14 (11) by striking paragraphs (1) and (2) of sub-
15 section (d), as redesignated, and inserting the fol-
16 lowing:

17 “(1) Global and regional research and measure-
18 ments to understand the nature of and interaction
19 among physical, chemical, biological, land use, and
20 social processes responsible for changes in the Earth
21 system on all relevant spatial and time scales.

22 “(2) Development of indicators, baseline data-
23 bases, and ongoing monitoring to document global
24 change, including changes in species distribution and
25 behavior, changes in oceanic and atmospheric chem-

1 istry, extent of ice sheets, glaciers, and snow cover,
2 shifts in water distribution and abundance, and
3 changes in sea level.”;

4 (12) by adding at the end of subsection (d), as
5 redesignated, the following:

6 “(6) *Address emerging priorities for climate*
7 *change science, such as ice sheet melt and movement,*
8 *the relationship between climate change and hurri-*
9 *cane and typhoon development, including intensity,*
10 *track, and frequency, decreasing water levels in the*
11 *Great Lakes, and droughts in the western and south-*
12 *eastern United States.*

13 “~~(6)~~ (7) Methods for integrating information to
14 provide predictive and other tools for planning and
15 decisionmaking by governments, communities and
16 the private sector.”;

17 (13) by striking “and” in paragraph (2) of sub-
18 section (e), as redesignated;

19 (14) by striking paragraph (3) of subsection
20 (e), as redesignated, and inserting the following:

21 “(3) combine and interpret data from various
22 sources to produce information readily usable by
23 local, State, and Federal policymakers, and other
24 end-users, attempting to formulate effective deci-

1 sions and strategies for mitigating and adapting to
 2 the effects of global change; and”;

3 (15) by adding at the end of subsection (e), as
 4 redesignated, the following:

5 “(4) establish a common assessment and mod-
 6 eling framework that may be used in both research
 7 and operations to project, predict, and assess the
 8 vulnerability of natural and managed ecosystems
 9 and of human society in the context of other envi-
 10 ronmental and social changes.”; and

11 ~~(16) by striking “change research.” in para-~~
 12 ~~graph (2) of subsection (f), as redesignated, and in-~~
 13 ~~serting “and regional climate research and assess-~~
 14 ~~ment.”.~~

15 (16) by striking subsection (f), as redesignated,
 16 and inserting the following:

17 “(f) NATIONAL RESEARCH COUNCIL EVALUATION.—

18 “(1) REVIEW OF STRATEGIC PLAN.—The Chair-
 19 man of the Council shall enter into an agreement
 20 with the National Research Council under which the
 21 National Research Council shall—

22 “(A) evaluate the scientific content of the
 23 Plan;

24 “(B) provide information and advice obtained
 25 from United States and international sources,

1 *and recommended priorities for future global and*
 2 *regional climate research and assessment; and*

3 “(C) *address such other studies on emerging*
 4 *priorities as the Chairman determines to be war-*
 5 *ranted.*”

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

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

14 “(B) *identify domestic and international*
 15 *regulatory mechanisms and regulatory gaps for*
 16 *controlling the deployment of such technologies*
 17 *and provide recommendations for addressing*
 18 *such regulatory gaps.”.*

19 **SEC. 106. INTEGRATED PROGRAM OFFICE.**

20 Section 105 (15 U.S.C. 2935) is amended—

21 (1) by redesignating subsections (a), (b), and
 22 (c) as subsections (b), (c), and (d), respectively; and

23 (2) by inserting before subsection (b), as reded-
 24 ignated, the following:

25 “~~(a) INTEGRATED PROGRAM OFFICE.—~~

1 “(1) ESTABLISHMENT.—There is established in
2 the Office of Science and Technology Policy an Inte-
3 grated Program Office for the Program.

4 “(2) ORGANIZATION.—The Integrated Program
5 Office established under paragraph (1) shall be
6 headed by the associate director with responsibility
7 for climate change science and technology and shall
8 include, to the maximum extent feasible, a rep-
9 resentative from each Federal agency participating
10 in the Program.

11 “(3) FUNCTION.—The Integrated Program Of-
12 fice shall—

13 “(a) *GLOBAL CHANGE RESEARCH COORDINATION OF-*
14 *FICE.*—

15 “(1) *IN GENERAL.*—*The President shall establish*
16 *a Global Change Research Coordination Office. The*
17 *Office shall have a director, who shall be a senior sci-*
18 *entist or other qualified professional with research ex-*
19 *pertise in climate change science, as well as experi-*
20 *ence in policymaking, planning, or resource manage-*
21 *ment, and a fulltime staff. The Office shall—*

22 “(A) manage, in conjunction with the
23 Committee, interagency coordination and pro-
24 gram integration of global change research ac-
25 tivities and budget requests;

1 “(B) ensure that the activities and pro-
2 grams of each Federal agency or department
3 participating in the Program address the goals
4 and objectives identified in the strategic re-
5 search plan and interagency implementation
6 plans;

7 “(C) ensure program and budget rec-
8 ommendations of the Committee are commu-
9 nicated to the President and are integrated into
10 the strategic and implementation plans for the
11 Program;

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

20 “(E) review and provide recommendations,
21 in conjunction with the Committee, on all an-
22 nual appropriations requests from Federal
23 agencies or departments participating in the
24 ~~Program.~~” *Program;*

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

3 “(G) serve as a point of contact on Federal
4 climate change activities for government organi-
5 zations, academia, industry, professional soci-
6 eties, State climate change programs, interested
7 citizen groups, and others to exchange technical
8 and programmatic information; and

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

12 “(2) FUNDING.—The Office may be funded
13 through interagency funding in accordance with sec-
14 tion 631 of The Treasury and General Government
15 Appropriations Act, 2003 (Pub. L. 108–7; 117 Stat.
16 471).

17 “(3) REPORT.—Within 90 days after the date of
18 enactment of the Global Change Research Improve-
19 ment Act of 2007, the Director of the Office of Science
20 and Technology Policy shall report to the Senate
21 Committee on Commerce, Science, and Transpor-
22 tation and the House of Representatives Committee
23 on Science and Technology on the funding of the Of-
24 fice. The report shall include—

1 “(A) the amount of funding required to ade-
2 quately fund the Office; and

3 “(B) the adequacy of existing mechanisms
4 to fund the Office.”; and

5 ~~(3) by striking “Committee.” in paragraph (2)~~
6 ~~of subsection (c), as redesignated, and inserting~~
7 ~~“Committee and the Integrated Program Office.”;~~
8 and

9 (4) by inserting “and the Integrated Program
10 Office” after “Committee” in paragraph (1) of sub-
11 section (d), as redesignated.

12 (3) by striking “Committee.” in paragraph (2)
13 of subsection (c), as redesignated, and inserting
14 “Committee and the Global Change Research Coordi-
15 nation Office.”.

16 **SEC. 107. BUDGET COORDINATION.**

17 Section 105 (15 U.S.C. 2935), as amended by section
18 106, is further amended by striking subsection (d), as re-
19 designated, and inserting the following:

20 “(d) CONSIDERATION IN PRESIDENT’S BUDGET.—

21 “(1) IN GENERAL.—Before each annual budget
22 submitted to the Congress under section 1105 of
23 title 31, United States Code, the President shall, in
24 a timely fashion, provide an opportunity to the Com-
25 mittee and the ~~Integrated Program Office~~ *Global*

1 *Change Research Coordination Office* to review and
2 comment on the budget estimate of each agency and
3 department involved in global change research in the
4 context of the Plan. *The Committee and the Global*
5 *Change Research Coordination Office shall transmit a*
6 *report containing the results of their reviews to the*
7 *Senate Committee on Commerce, Science, and Trans-*
8 *portation and the House of Representatives Com-*
9 *mittee on Science and Technology no later than the*
10 *date on which the President submits the annual budg-*
11 *et to the Congress under section 1105 of title 31,*
12 *United States Code.*

13 “(2) PROGRAM ITEMS.—The President shall
14 submit, at the time of the annual budget request to
15 Congress, an integrated budget plan that would con-
16 solidate and highlight Program priorities and include
17 a description of those items in each agency’s annual
18 budget which are elements of the Program.”.

19 **SEC. 108. RESEARCH GRANTS.**

20 Section 105 (15 U.S.C. 2935), as amended by sec-
21 tions 106 and 107, is further amended—

22 (1) by redesignating subsections (b), (e), (d),
23 and (e) as subsections (e), (d), (e), and (f), sub-
24 sections (b), (c), and (d) as subsections (c), (d), and
25 (e), respectively; and

1 (2) by inserting after subsection (a) the fol-
2 lowing:

3 “(b) RESEARCH GRANTS.—

4 “(1) COMMITTEE TO DEVELOP LIST OF PRI-
5 ORITY RESEARCH AREAS.—The Committee shall de-
6 velop a list of priority areas for research and devel-
7 opment on climate change that are not being ade-
8 quately addressed by Federal agencies. *In the list,*
9 *the Committee shall identify the appropriate agency*
10 *to lead the such areas of research funded under para-*
11 *graph (3)(A).*

12 “(2) DIRECTOR OF OSTP TO TRANSMIT LIST TO
13 NSF.—The Director of the Office of Science and
14 Technology Policy shall transmit the list to the Na-
15 tional Science Foundation.

16 “(3) FUNDING THROUGH NSF.—

17 “(A) BUDGET REQUEST.—The National
18 Science Foundation shall include, as part of the
19 annual request for appropriations for the
20 Science and Technology Policy Institute, a re-
21 quest for appropriations to fund research in the
22 priority areas on the list developed under para-
23 graph (1).

24 “(B) AUTHORIZATION.—For fiscal year
25 2008 and each fiscal year thereafter, there are

1 authorized to be appropriated to the National
2 Science Foundation not less than \$30,000,000,
3 to be made available through the Science and
4 Technology Policy Institute, for research in
5 those priority areas.”.

6 **SEC. 109. EVALUATION OF INFORMATION.**

7 Section 106 (15 U.S.C. 2936) is amended—

8 (1) by striking “**SCIENTIFIC**” in the section
9 heading;

10 (2) by striking “On a periodic basis (not less
11 frequently than every 4 years), the Council, through
12 the Committee, shall prepare and submit to the
13 President and the Congress an assessment” and in-
14 serting “On a periodic basis (not less frequently
15 than every 4 years), the President shall submit to
16 Congress a single, integrated, comprehensive assess-
17 ment”;

18 (3) by striking “and” after the semicolon in
19 paragraph (2); and

20 (4) by striking “years.” in paragraph (3) and
21 inserting “years; and”; and

22 (5) by adding at the end the following:

23 “(4) evaluates the information being developed
24 under this title, considering in particular its useful-
25 ness to local, State, and national decisionmakers, as

1 well as to other stakeholders such as the private sec-
 2 tor, after providing a meaningful opportunity for the
 3 consideration of the views of such stakeholders on
 4 the effectiveness of the Program and the usefulness
 5 of the information.”.

6 **SEC. 110. REPEAL OF OBSOLETE PROVISION.**

7 ~~Section 108 (15 U.S.C. 2938) is amended by striking~~
 8 ~~subsection (e).~~

9 *Section 108(c) (15 U.S.C. 2938(c)) is amended by*
 10 *striking “stratospheric ozone depletion or”.*

11 **SEC. 111. ICE SHEET STUDY AND REPORT.**

12 (a) ~~STUDY.—~~

13 (1) ~~REQUIREMENT.—~~The Director of the Na-
 14 tional Science Foundation and the Administrator of
 15 National Oceanic and Atmospheric Administration
 16 shall enter into an arrangement with the National
 17 Academy of Sciences to complete a study of the cur-
 18 rent status of ice sheet melt and movement, as
 19 caused by climate change, with implications for glob-
 20 al sea level rise.

21 (2) ~~CONTENTS.—~~The study shall take into con-
 22 sideration—

23 (A) the past research completed related to
 24 ice sheet melt as reviewed by Working Group I

1 of the Intergovernmental Panel on Climate
2 Change;

3 (B) additional research published since the
4 fall of 2005 that was not included in the Work-
5 ing Group I report due to time constraints; and

6 (C) the need for an accurate assessment of
7 changes in ice sheet spreading, changes in ice
8 sheet flow, self-lubrication, the corresponding
9 effect on ice sheets, and current modeling capa-
10 bilities.

11 (3) REPORT.—Not later than 18 months after
12 the date of enactment of this Act, the National
13 Academy of Sciences shall transmit to the Com-
14 mittee on Science and Technology of the House of
15 Representatives and the Committee on Commerce,
16 Science, and Transportation of the Senate a report
17 on the key findings of the study conducted under
18 subsection (a), along with recommendations for addi-
19 tional research related to ice sheet melt and cor-
20 responding sea level rise.

21 **SEC. 112. HURRICANE FREQUENCY AND INTENSITY STUDY**

22 **AND REPORT.**

23 (a) STUDY.—

24 (1) REQUIREMENT.—The Administrator of the
25 National Oceanic and Atmospheric Administration

1 and the Director of the National Science Foundation
2 shall enter into an arrangement with the National
3 Academy of Sciences to complete a study of the cur-
4 rent state of the science on the potential impacts of
5 climate change on patterns of tropical cyclone (hur-
6 ricane and typhoon) development, including storm
7 intensity, track, and frequency, overall destructive
8 power, precipitation amount and intensity, runoff
9 and flooding, and the implications for hurricane-
10 prone and typhoon-prone coastal regions.

11 (2) CONTENTS.—The study shall take into con-
12 sideration—

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

18 (B) additional research completed since the
19 fall of 2005 that was not included in the Work-
20 ing Group I and II reports due to time con-
21 straints;

22 (C) the need for accurate assessment of
23 potential changes in hurricane and typhoon in-
24 tensity, track, and frequency and of the current
25 modeling and forecasting capabilities and the

1 need for improvements in forecasting of these
2 parameters; and

3 ~~(D)~~ the need for additional research, real-
4 time observation, and monitoring to improve
5 forecasting of hurricanes and typhoons and to
6 understand the relationship between climate
7 change and hurricane and typhoon develop-
8 ment.

9 ~~(3)~~ REPORT.—Not later than 18 months after
10 the date of enactment of this Act, the National
11 Academy of Sciences shall transmit to the Com-
12 mittee on Science and Technology of the House of
13 Representatives and the Committee on Commerce,
14 Science, and Transportation of the Senate a report
15 on the key findings of the study conducted under
16 subsection (a).

17 **SEC. 111. REPORTING.**

18 *Within 30 days after the date of enactment of this Act,*
19 *the Administrator of the National Oceanic and Atmospheric*
20 *Administration, in consultation with the Administrator of*
21 *the National Aeronautics and Space Administration and*
22 *the Secretary of the Air Force, shall transmit to the Senate*
23 *Committee on Commerce, Science, and Transportation and*
24 *the House of Representatives Committee on Science and*
25 *Technology a report describing the strategy to restore the*

1 *decommissioned and scaled down climate sensors scheduled*
2 *for the National Polar-orbiting Operational Environmental*
3 *Satellite System and the Geostationary Operational Envi-*
4 *ronmental Satellites-R Series, include a budget and sched-*
5 *ule.*

6 **SEC. 112. INDEPENDENT REVIEW OF GCRP PRODUCTS.**

7 (a) *NSF CONTRACT AUTHORITY.*—*Within 6 months*
8 *after the date of enactment of this Act, the National Science*
9 *Foundation shall execute a contract with the National*
10 *Academy of Public Administration to conduct the reviews*
11 *required by subsections (b) and (c) and such additional re-*
12 *views as the National Academy of Public Administration*
13 *deems warranted.*

14 (b) *IMPLEMENTATION OF ACT.*—*Within 2 years after*
15 *the date of enactment of this Act, the National Academy*
16 *of Public Administration shall—*

17 (1) *conduct an independent review of the imple-*
18 *mentation of the Global Change Research Act of 1990*
19 *and the National Climate Service, and the extent to*
20 *which scientific communications and findings are in-*
21 *appropriately subjected to non-scientific policy con-*
22 *siderations, including a review of the process used by*
23 *participating agencies to contribute information to*
24 *the Global Change Research Program and the Na-*
25 *tional Climate Service and for clearing testimony and*

1 *other communications to the Congress regarding the*
2 *Global Change Research Program and the National*
3 *Climate Service; and*

4 *(2) report the results of the review, together with*
5 *any recommendations the National Academy of Pub-*
6 *lic Administration deems appropriate, to the Senate*
7 *Committee on Commerce, Science, and Transpor-*
8 *tation and the House of Representatives Committee*
9 *on Science and Technology.*

10 *(c) GLOBAL CHANGE RESEARCH PROGRAM PROD-*
11 *UCTS.—Within 180 days after the date on which each stra-*
12 *tegic plan required by section 104 and within 180 days*
13 *after the date on which each national assessment required*
14 *by section 106 has been submitted to the Congress, the Na-*
15 *tional Academy of Public Administration shall—*

16 *(1) conduct an independent review of the process*
17 *undertaken by the Global Change Research Program*
18 *in developing the strategic plan and the national as-*
19 *sessments that evaluates the extent to which scientific*
20 *communications and findings were inappropriately*
21 *subjected to nonscientific policy consideration (includ-*
22 *ing an assessment of whether findings included, or*
23 *proposed for inclusion, in the reports were modified*
24 *or not included due to nonscientific policy consider-*
25 *ations); and*

1 (2) *report the results of the review, together with*
2 *any recommendations the National Academy of Pub-*
3 *lic Administration deems appropriate, to the Senate*
4 *Committee on Commerce, Science, and Transpor-*
5 *tation and the House of Representatives Committee*
6 *on Science and Technology.*

7 (d) *PUBLIC PARTICIPATION.*—*In conducting the re-*
8 *views, the National Academy of Public Administration*
9 *shall provide notice and opportunity for public discussion*
10 *and comment on any process evaluated under this section.*

11 (e) *CONFIDENTIALITY.*—*Notwithstanding any other*
12 *provision of law to the contrary, the National Academy of*
13 *Public Administration shall maintain as confidential, and*
14 *refuse to disclose publicly, the identity of any individual*
15 *interviewed as part of a review conducted under this sec-*
16 *tion.*

17 (f) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
18 *authorized to be appropriated to the National Science*
19 *Foundation \$1,000,000 for each of fiscal years 2009 through*
20 *2013 to carry out this section.*

21 **SEC. 113. SCIENTIFIC COMMUNICATIONS.**

22 The President shall establish guidelines and imple-
23 ment a plan that requires the National Oceanic and At-
24 mospheric Administration, the National Aeronautics and
25 Space Administration, the Environmental Protection

1 Agency, the National Science Foundation, and other Fed-
 2 eral agencies with scientific research programs to adopt
 3 policies that ensure the integrity of scientific communica-
 4 tions. ~~Such policies shall include provisions that ensure~~
 5 ~~that final text and communications are approved by the~~
 6 ~~scientist or scientists who authored the report or commu-~~
 7 ~~nication, and that enable scientists to disseminate research~~
 8 ~~results and freely communicate with the Congress, the~~
 9 ~~media, and colleagues in a timely fashion. Such policies~~
 10 *shall include provisions regarding the approval of final text*
 11 *and communications, and enable scientists to disseminate*
 12 *research results and freely communicate with the Congress,*
 13 *the media, and colleagues in a timely fashion.*

14 **SEC. 114. AGING WORKFORCE ISSUES PROGRAM.**

15 The Administrator of the National Oceanic and At-
 16 mospheric Administration shall implement a program to
 17 address aging work force issues in climate science, global
 18 change, and other focuses of NOAA research that—

19 (1) documents technical and management experi-
 20 ences before senior employees leave the Adminis-
 21 tration, including—

22 (A) documenting lessons learned;

23 (B) briefing organizations;

24 (C) providing opportunities for archiving
 25 lessons in a database; and

1 (D) providing opportunities for near-term
2 retirees to transition out early from their pri-
3 mary assignment in order to document their ca-
4 reer lessons learned and brief new employees
5 prior to their separation from the Administra-
6 tion;

7 (2) provides incentives for retirees to return
8 and teach new employees about their career lessons
9 and experiences; and

10 (3) provides for the development of an award to
11 recognize and reward outstanding senior employees
12 for their contributions to knowledge sharing.

13 **SEC. 115. AUTHORIZATION OF APPROPRIATIONS.**

14 There are authorized to be appropriated for the pur-
15 poses of carrying out this Act such sums as may be nec-
16 essary for fiscal years ~~2008 through 2012~~. *2009 through*
17 *2013*. Of the amounts appropriated for that fiscal year pe-
18 riod—

19 (1) \$4,000,000 shall be made available to *the*
20 *Global Change Research Coordination Office through*
21 the Office of Science and Technology Policy for each
22 of such fiscal years; and

23 (2) such sums as may be necessary shall be
24 made available to—

1 (A) the National Oceanic and Atmospheric
2 Administration for each of such fiscal years;

3 (B) the National Science Foundation for
4 each of such fiscal years;

5 (C) the National Aeronautics and Space
6 Administration for each of such fiscal years;
7 and

8 (D) other Federal agencies participating in
9 the Program, to the extent funds remain avail-
10 able after the application of paragraph (1) and
11 subparagraphs (A), (B), and (C) of this para-
12 graph, for each of such fiscal years.

13 **TITLE II—NATIONAL CLIMATE**
14 **SERVICE**

15 **SEC. 201. AMENDMENT OF NATIONAL CLIMATE PROGRAM**
16 **ACT.**

17 The National Climate Program Act (15 U.S.C. 2901
18 et seq.) is amended to read as follows:

19 **“SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

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

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

“Sec. 1. Short title; table of contents.

“Sec. 2. Findings.

“Sec. 3. Purpose.

“Sec. 4. National Climate Service.

“Sec. 5. Contract and grant authority.

“Sec. 6: Annual report.

“Sec. 7: Definitions.

“Sec. 8: Authorization of appropriations.

1 **“SEC. 2. FINDINGS.**

2 “The Congress finds the following:

3 “(1) Weather, climate change, and climate vari-
4 ability affect public safety, environmental services
5 and security, human health, agriculture, energy use,
6 water resources, and other factors vital to national
7 security and human welfare.

8 “(2) The present rate of advance of national ef-
9 forts in research and development and the applica-
10 tion of such advances is inadequate to meet the chal-
11 lenges posed by observed and projected rates of cli-
12 mate change and climate variability and the increas-
13 ing demand for information to guide planning and
14 response across all sectors.

15 “(3) The United States lacks adequate re-
16 search, infrastructure, and coordinated outreach and
17 communication mechanisms to meet national climate
18 monitoring, prediction, and decision support needs
19 for adapting to and mitigating the impacts of cli-
20 mate change and climate variability.

21 “(4) Information regarding climate change and
22 climate variability is not being fully disseminated or
23 used, and Federal efforts have given insufficient at-
24 tention to assessing and applying this information.

1 “(5) Climate change and climate variability
2 occur on a global basis making international co-
3 operation essential for the purpose of sharing the
4 benefits and costs of a global effort to understand
5 and communicate these changes.

6 **“SEC. 3. PURPOSE.**

7 “It is the purpose of this Act to establish a National
8 Climate Service that will advance the national interest and
9 associated international concerns in understanding, fore-
10 casting, responding, adapting to, and mitigating the im-
11 pacts of natural and human-induced climate change and
12 climate variability.

13 **“SEC. 4. NATIONAL CLIMATE SERVICE.**

14 “(a) ESTABLISHMENT.—The Secretary shall estab-
15 lish within the National Oceanic and Atmospheric Admin-
16 istration a National Climate Service not later than a year
17 after the date of the enactment of the Global Change Re-
18 search Improvement Act of 2007. The Service shall in-
19 clude a national center and a network of regional and local
20 facilities for operational climate monitoring and pre-
21 diction.

22 “(1) IN GENERAL.—The Service shall produce
23 and deliver authoritative, timely and usable informa-
24 tion about climate change, climate variability,

1 trends, and impacts on local, State, regional, na-
2 tional, and global scales.

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

5 “(A) provide comprehensive and authoritative
6 information about the state of the climate and its ef-
7 fects, through observations, monitoring, data, infor-
8 mation, and products that accurately reflect climate
9 trends and conditions;

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

13 “(C) utilize appropriate research from the
14 United States Global Change Research Program ac-
15 tivities and conduct focused research, as needed, to
16 enhance understanding, information and predictions
17 of the current and future state of the climate and
18 its impacts that is relevant to policy, planning, and
19 decision making;

20 “(D) utilize assessments from the Global
21 Change Research Program activities and conduct fo-
22 cused assessments as needed to enhance under-
23 standing of the impacts of climate change and eli-
24 mate variability;

1 ~~“(E) assess and strengthen delivery mecha-~~
2 ~~nisms for providing climate information to end~~
3 ~~users;~~

4 ~~“(F) communicate climate data, conditions, pre-~~
5 ~~dictions, projections, indicators, and risks on an on-~~
6 ~~going basis to decision- and policy- makers, the pri-~~
7 ~~vate sector, and to the public;~~

8 ~~“(G) coordinate and collaborate on climate~~
9 ~~change, climate variability, and impacts activities~~
10 ~~with municipal, state, regional, national and inter-~~
11 ~~national agencies and organizations, as appropriate;~~
12 ~~and~~

13 ~~“(H) support the Department of State and~~
14 ~~international agencies and organizations, as well as~~
15 ~~domestic agencies and organizations, involved in as-~~
16 ~~sessing and responding to climate change and cli-~~
17 ~~mate variability.~~

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

1 “(1) provide for the interpretation and commu-
2 nication of climate data, conditions, predictions, pro-
3 jections, and risks on an on-going basis to decision
4 and policy makers at the local, regional, and na-
5 tional levels;

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

9 “(3) support infrastructure and ability to ar-
10 chive and quality ensure climate data, and make fed-
11 erally-funded model simulations and other relevant
12 climate information available from the Global
13 Change Research Program activities and other
14 sources (and related data from paleoclimate studies).

15 “(4) include a program for long-term steward-
16 ship, quality control, development of relevant climate
17 products, and efficient access to all relevant climate
18 data, products, and model simulations;

19 “(5) establish a national coordinated modeling
20 strategy, including a national climate modeling cen-
21 ter to provide a dedicated capability for modeling
22 and forecasting, scenarios and planning resources,
23 and a regular schedule of projections on long- and
24 short-term time horizons over a range of scales, in-
25 cluding regional scales;

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

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

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

12 “(B) timely and full sharing, dissemination
13 and use of climate information and services in
14 risk preparedness, planning, decision making,
15 and early warning and natural resources man-
16 agement, both domestically and internationally;

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

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

24 “(10) support competitive research programs
25 that will improve elements of the Service described

1 in this Act through the Climate Program Office
2 within the Service headquarter function.

3 “(e) COORDINATION WITH THE USGCRP.—The
4 Service shall utilize appropriate research from Global
5 Change Research Program activities to enhance under-
6 standing, information and predictions of the current and
7 future state of the climate and its impacts that is relevant
8 to policy and decisions. The Service shall provide appro-
9 priate information about the current and future state of
10 the climate and its impacts that are useful for research
11 purposes to relevant Global Change Research Program ac-
12 tivities. The Director of the Service will serve as a liaison
13 to the Global Change Research Program and a member
14 of the Global Change Research Program should serve on
15 the Advisory Council.

16 “(d) DIRECTOR.—The Administrator shall appoint a
17 director of the Service, who shall oversee all processes as-
18 sociated with managing the organization and executing the
19 functions and actions described in this Title. The Director
20 will serve as a liaison to the Global Change Research Pro-
21 gram to ensure the transition of research into services and
22 to provide services to meet the needs of research.

23 “(e) NATIONAL CLIMATE SERVICE ADVISORY COUN-
24 CIL.—The Administrator shall, in consultation with the
25 majority and minority leaders of the Senate Committee

1 on Commerce, Science, and Transportation and the House
2 of Representatives Committee on Science and Technology,
3 and the National Academy of Sciences, appoint the mem-
4 bership of a National Climate Service Advisory Council,
5 with members serving 4-year terms and include a diverse
6 membership from appropriate Federal, State and local
7 government, universities, non-government and private sec-
8 tors who use climate information and cover a range of sec-
9 tors, such as water, drought, fisheries, coasts, agriculture,
10 health, natural resources, transportation, and insurance.
11 The Council shall advise the Director of the Service of key
12 priorities in climate-related issues that require the atten-
13 tion of the Service. The Council shall be responsible for
14 ensuring coordination across regional and national con-
15 cerns and the assessment of evolving information needs.

16 **“SEC. 5. CONTRACT AND GRANT AUTHORITY.**

17 “Functions vested in any Federal officer or agency
18 by this Act or under the Program may be exercised
19 through the facilities and personnel of the agency involved
20 or, to the extent provided or approved in advance in appro-
21 priation Acts, by other persons or entities under contracts
22 or grant arrangements entered into by such officer or
23 agency.

1 **“SEC. 6. ANNUAL REPORT.**

2 “The Secretary shall prepare and submit to the
3 President and the authorizing committees of the Congress,
4 not later than March 31 of each year, a report on the
5 activities conducted pursuant to this Act during the pre-
6 ceding fiscal year, including—

7 “(1) a summary of the achievements of the Na-
8 tional Climate Service during the previous fiscal
9 year; and

10 “(2) an analysis of the progress made toward
11 achieving the goals and objectives of the Service.

12 **“SEC. 7. DEFINITIONS.**

13 “In this Act:

14 “(1) ADMINISTRATOR.—The term ‘Adminis-
15 trator’ means the Administrator of the National
16 Oceanic and Atmospheric Administration.

17 “(2) ADVISORY COUNCIL.—The term ‘Advisory
18 Council’ refers to the Climate Services Advisory
19 Council.

20 “(3) CLIMATE CHANGE.—The term ‘climate
21 change’ means any change in climate over time,
22 whether due to natural variability or as a result of
23 human activity.

24 “(4) CLIMATE VARIABILITY.—The term ‘climate
25 variability’ means variations in the mean state and
26 other statistics of the climate on all temporal and

1 spatial scales beyond that of individual weather
2 events.

3 “(5) DIRECTOR.—The term ‘Director’ means
4 the Director of the National Oceanic and Atmos-
5 pheric Administration’s National Climate Service.

6 “(6) GLOBAL CHANGE RESEARCH PROGRAM.—
7 The term ‘Global Change Research Program’ means
8 the United States Global Change Research Program
9 established under section 103 of the Global Change
10 Research Act of 1990 (15 U.S.C. 2933).

11 “(7) SECRETARY.—The term ‘Secretary’ means
12 the Secretary of Commerce.

13 “(8) SERVICE.—The term ‘Service’ means the
14 National Oceanic and Atmospheric Administration’s
15 National Climate Service.

16 **“SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

17 “There are authorized to be appropriated to the Sec-
18 retary to carry out this Act—

19 “(1) \$300,000,000 for fiscal year 2008;

20 “(2) \$350,000,000 for fiscal year 2009;

21 “(3) \$400,000,000 for fiscal year 2010;

22 “(4) \$450,000,000 for fiscal year 2011; and

23 “(5) \$500,000,000 for fiscal year 2012.”.

1 **TITLE II—NATIONAL CLIMATE**
 2 **SERVICE**

3 **SEC. 201. AMENDMENT OF NATIONAL CLIMATE PROGRAM**
 4 **ACT.**

5 *Except as otherwise expressly provided, whenever in*
 6 *this title an amendment or repeal is expressed in terms of*
 7 *an amendment to, or repeal of, a section or other provision,*
 8 *the reference shall be considered to be made to a section or*
 9 *other provision of the National Climate Program Act (15*
 10 *U.S.C. 2901 et seq.).*

11 **SEC. 202. SHORT TITLE; TABLE OF CONTENTS.**

12 *Section 1 of the Act (15 U.S.C. 2901 note) is amended*
 13 *to read as follows:*

14 **“SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

15 **“(a) SHORT TITLE.—***This Act may be cited as the ‘Na-*
 16 *tional Climate Service Act of 2007’.*

17 **“(b) TABLE OF CONTENTS.—***The table of contents for*
 18 *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.”.*

19 **SEC. 203. FINDINGS.**

20 *Section 2 of the Act (15 U.S.C. 2901) is amended to*
 21 *read as follows:*

1 **“SEC. 2. FINDINGS.**

2 *“The Congress finds the following:*

3 *“(1) Climate change and related hazards affect*
4 *public safety, environmental services and security,*
5 *human health, agriculture, energy use, water re-*
6 *sources, wildlife and other natural resources, and*
7 *other factors vital to national security and human*
8 *welfare.*

9 *“(2) The present rate of advance of national ef-*
10 *forts in research and development and the application*
11 *of such advances is inadequate to meet the challenges*
12 *posed by observed and projected rates of climate*
13 *change and the increasing demand for information to*
14 *guide planning and response across all sectors.*

15 *“(3) The United States lacks adequate research,*
16 *infrastructure, and coordinated outreach and commu-*
17 *nication mechanisms to meet national climate moni-*
18 *toring, prediction, and decision support needs for*
19 *adapting to and mitigating the impacts of climate*
20 *change.*

21 *“(4) Information regarding climate change is*
22 *not being fully disseminated or used, and Federal ef-*
23 *forts have given insufficient attention to assessing and*
24 *applying this information.*

25 *“(5) Climate change occurs on a global basis*
26 *making international cooperation essential for the*

1 *purpose of sharing the benefits and costs of a global*
2 *effort to understand and communicate these*
3 *changes.”.*

4 **SEC. 204. PURPOSE.**

5 *Section 3 (15 U.S.C. 2902) is amended by striking*
6 *“implications.” and inserting “implications and to estab-*
7 *lish a National Climate Service that will advance the na-*
8 *tional interest and associated international concerns in un-*
9 *derstanding, forecasting, responding, adapting to, and*
10 *mitigating the impacts of natural and human-induced cli-*
11 *mate change and climate variability.”.*

12 **SEC. 205. DEFINITIONS.**

13 *Section 4 (15 U.S.C. 2903) is amended—*

14 *(1) by striking “As used in this Act, unless the*
15 *context otherwise requires:” and inserting “In this*
16 *Act:”;*

17 *(2) by striking paragraphs (1) and (2) and re-*
18 *designating paragraphs (3) and (4) as paragraphs*
19 *(6) and (7), respectively;*

20 *(3) by inserting before paragraph (6), as redesign-*
21 *ated, the following:*

22 *“(1) ADMINISTRATOR.—The term ‘Adminis-*
23 *trator’ means the Administrator of the National Oce-*
24 *anic and Atmospheric Administration.*

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

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

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

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

16 (4) *by inserting “PROGRAM.—” before “The*
17 *term” in paragraph (6), as redesignated;*

18 (5) *by inserting “SECRETARY.—” before “The*
19 *term” in paragraph (7), as redesignated;*

20 (6) *by striking “Commerce.” in paragraph (7),*
21 *as redesignated, and inserting “Commerce, acting*
22 *through the Administrator of the National Oceanic*
23 *and Atmospheric Administration.”; and*

24 (7) *by adding at the end thereof the following:*

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

4 **SEC. 206. NATIONAL CLIMATE SERVICE.**

5 (a) *IN GENERAL.*—*The Act is amended by striking sec-*
6 *tions 7 and 8 (15 U.S.C. 2906 and 2907, respectively) and*
7 *inserting after section 5 the following:*

8 **“SEC. 6. NATIONAL CLIMATE SERVICE.**

9 “(a) *ESTABLISHMENT.*—

10 “(1) *IN GENERAL.*—*The Secretary shall establish*
11 *within the National Oceanic and Atmospheric Ad-*
12 *ministration a National Climate Service not later*
13 *than a year after the date of the enactment of the*
14 *Global Change Research Improvement Act of 2007.*
15 *The Service shall include a national center and a net-*
16 *work of regional and local facilities for operational*
17 *climate monitoring and prediction.*

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

23 “(3) *SPECIFIC SERVICES.*—*The Service, at a*
24 *minimum, shall—*

1 “(A) provide comprehensive and authoritative
2 information about the state of the climate and its ef-
3 fects, through observations, monitoring, data, infor-
4 mation, and products that accurately reflect climate
5 trends and conditions;

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

9 “(C) utilize appropriate research from the
10 United States Global Change Research Program ac-
11 tivities and conduct focused research, as needed, to en-
12 hance understanding, information and predictions of
13 the current and future state of the climate and its im-
14 pacts that is relevant to policy, planning, and deci-
15 sion making;

16 “(D) utilize assessments from the Global Change
17 Research Program activities and conduct focused as-
18 sessments as needed to enhance understanding of the
19 impacts of climate change and climate variability;

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

22 “(F) communicate climate data, conditions, pre-
23 dictions, projections, indicators, and risks on an on-
24 going basis to decision- and policy- makers, the pri-
25 vate sector, and to the public;

1 “(G) coordinate and collaborate on climate
2 change, climate variability, and impacts activities
3 with municipal, state, regional, national and inter-
4 national agencies and organizations, as appropriate;

5 “(H) support the Department of State and inter-
6 national agencies and organizations, as well as do-
7 mestic agencies and organizations, involved in assess-
8 ing and responding to climate change and climate
9 variability;

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

16 “(J) issue an annual report that identifies green-
17 house emission and trends on a local, regional, and
18 national level and identifies emissions or reductions
19 attributable to individual or multiple sources covered
20 by the program established under subparagraph (I).

21 “(b) ACTION PLAN.—Within 1 year after the date of
22 enactment of the Global Change Research Improvement Act
23 of 2007, the Secretary shall submit to the Senate Committee
24 on Commerce, Science, and Transportation and the House
25 of Representatives Committee on Science and Technology

1 *a plan of action for the National Climate Service. The plan,*
2 *at a minimum, shall—*

3 “(1) *provide for the interpretation and commu-*
4 *nication of climate data, conditions, predictions, pro-*
5 *jections, and risks on an on-going basis to decision*
6 *and policy makers at the local, regional, and national*
7 *levels;*

8 “(2) *design, deploy, and operate an adequate na-*
9 *tional climate observing system that closes gaps in ex-*
10 *isting coverage;*

11 “(3) *support infrastructure and ability to ar-*
12 *chive and quality ensure climate data, and make fed-*
13 *erally-funded model simulations and other relevant*
14 *climate information available from the Global Change*
15 *Research Program activities and other sources (and*
16 *related data from paleoclimate studies).*

17 “(4) *include a program for long-term steward-*
18 *ship, quality control, development of relevant climate*
19 *products, and efficient access to all relevant climate*
20 *data, products, and model simulations;*

21 “(5) *establish—*

22 “(A) *a national coordinated computing*
23 *strategy, including establishing a new, or*
24 *supplementing support for existing, national cli-*
25 *mate computing capability to provide dedicated*

1 *computing capacity for modeling and fore-*
2 *casting, scenarios, and planning resources, and a*
3 *regular schedule of projections on long- and*
4 *short-term time horizons over a range of scales,*
5 *including regional scales; and*

6 *“(B) a mechanism to allow access to such*
7 *capacity by the National Oceanic and Atmos-*
8 *pheric Administration, the National Aeronautics*
9 *and Space Administration, and National*
10 *Science Foundation sponsored researchers;*

11 *“(6) improve integrated modeling, assessment,*
12 *and predictive capabilities needed to document and*
13 *predict climate changes and impacts, and to guide*
14 *national, regional, and local planning and decision*
15 *making;*

16 *“(7) provide a system of regular consultation*
17 *and coordination with Federal agencies, States, In-*
18 *dian tribes, non-governmental organizations, the pri-*
19 *vate sector and the academic community to ensure—*

20 *“(A) that the information requirements of*
21 *these groups are well incorporated; and*

22 *“(B) timely and full sharing, dissemination*
23 *and use of climate information and services in*
24 *risk preparedness, planning, decision making,*

1 *and early warning and natural resources man-*
2 *agement, both domestically and internationally;*

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

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

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

14 “(c) *COORDINATION WITH THE USGCRP.—The Serv-*
15 *ice shall utilize appropriate research from Global Change*
16 *Research Program activities to enhance understanding, in-*
17 *formation and predictions of the current and future state*
18 *of the climate and its impacts that is relevant to policy*
19 *and decisions. The Service shall provide appropriate infor-*
20 *mation about the current and future state of the climate*
21 *and its impacts that are useful for research purposes to rel-*
22 *evant Global Change Research Program activities. The Di-*
23 *rector of the Service will serve as a liaison to the Global*
24 *Change Research Program and a member of the Global*

1 *Change Research Program should serve on the Advisory*
2 *Council.*

3 “(d) *DIRECTOR.—The Administrator shall appoint a*
4 *director of the Service, who shall oversee all processes associ-*
5 *ated with managing the organization and executing the*
6 *functions and actions described in this Act. The Director*
7 *will serve as a liaison to the Global Change Research Pro-*
8 *gram to ensure the transition of research into services and*
9 *to provide services to meet the needs of research.*

10 “(e) *NATIONAL CLIMATE SERVICE ADVISORY COUN-*
11 *CIL.—The Administrator shall, in consultation with the*
12 *chairmen and ranking minority party members of the Sen-*
13 *ate Committee on Commerce, Science, and Transportation*
14 *and the House of Representatives Committee on Science and*
15 *Technology, and the National Academy of Sciences, appoint*
16 *the membership of a National Climate Service Advisory*
17 *Council composed of 15 members, with members serving 4-*
18 *year terms and include a diverse membership from appro-*
19 *priate Federal, State and local government, universities,*
20 *non-government and private sectors who use climate infor-*
21 *mation and cover a range of sectors, such as water, drought,*
22 *fisheries, coasts, agriculture, health, natural resources,*
23 *transportation, and insurance. The Council shall advise the*
24 *Director of the Service of key priorities in climate-related*
25 *issues that require the attention of the Service. The Council*

1 *shall be responsible for ensuring coordination across re-*
2 *gional and national concerns and the assessment of evolving*
3 *information needs.*

4 **“SEC. 7. CONTRACT AND GRANT AUTHORITY.**

5 *“Functions vested in any Federal officer or agency by*
6 *this Act or under the Program may be exercised through*
7 *the facilities and personnel of the agency involved or, to*
8 *the extent provided or approved in advance in appropria-*
9 *tion Acts, by other persons or entities under contracts or*
10 *grant arrangements entered into by such officer or agency.*

11 **“SEC. 8. ANNUAL REPORT.**

12 *“The Secretary shall prepare and submit to the Presi-*
13 *dent and the Senate Committee on Commerce, Science, and*
14 *Transportation and the House of Representatives Com-*
15 *mittee on Science and Technology, as part of the annual*
16 *report to meet the requirements of section 102(e)(7) of the*
17 *Global Change Research Act of 1990 (15 U.S.C. 2932(e)(7)),*
18 *a report on the activities conducted pursuant to this Act*
19 *during the preceding fiscal year, including—*

20 *“(1) a summary of the achievements of the Na-*
21 *tional Climate Service during the previous fiscal*
22 *year; and*

23 *“(2) an analysis of the progress made toward*
24 *achieving the goals and objectives of the Service.”.*

1 **(b) SUNSET OF CURRENT PROVISIONS.**—*Section 5 (15*
 2 *U.S.C. 2904) is amended by adding at the end thereof the*
 3 *following:*

4 **“(h) SUNSET.**—*The provisions of this section shall not*
 5 *apply after the date of enactment of the Global Change Re-*
 6 *search Improvement Act of 2007.”.*

7 **SEC. 207. REAUTHORIZATION.**

8 *Section 9 (15 U.S.C. 2908) is amended to read as fol-*
 9 *lows:*

10 **“SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

11 *“There are authorized to be appropriated to the Sec-*
 12 *retary to carry out sections 6, 7, and 8 of this Act—*

13 *“(1) \$300,000,000 for fiscal year 2009;*

14 *“(2) \$350,000,000 for fiscal year 2010;*

15 *“(3) \$400,000,000 for fiscal year 2011;*

16 *“(4) \$450,000,000 for fiscal year 2012; and*

17 *“(5) \$500,000,000 for fiscal year 2013.”.*

18 **TITLE III—TECHNOLOGY**

19 **ASSESSMENT**

20 **SEC. 301. NATIONAL SCIENCE AND TECHNOLOGY ASSESS-**
 21 **MENT SERVICE.**

22 The National Science and Technology Policy, Organi-
 23 zation, and Priorities Act of 1976 (42 U.S.C. 6601 et seq.)
 24 is amended by adding at the end the following:

1 **“TITLE VII—NATIONAL SCIENCE**
2 **AND TECHNOLOGY ASSESS-**
3 **MENT SERVICE**

4 **“SEC. 701. ESTABLISHMENT.**

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

8 **“SEC. 702. COMPOSITION.**

9 “The Service shall consist of a Science and Tech-
10 nology Board which shall formulate and promulgate the
11 policies of the Service, and a Director who shall carry out
12 such policies and administer the operations of the Service.

13 **“SEC. 703. FUNCTIONS AND DUTIES.**

14 “The Service shall coordinate and develop informa-
15 tion for Congress relating to the uses and application of
16 technology to address current national science and tech-
17 nology policy issues. In developing such technical assess-
18 ments for Congress, the Service shall utilize, to the extent
19 practicable, experts selected in coordination with the Na-
20 tional Research Council.

21 **“SEC. 704. INITIATION OF ACTIVITIES.**

22 “Science and technology assessment activities under-
23 taken by the Service may be initiated upon the request
24 of—

1 “(1) the Chairman of any standing, special, or
2 select committee of either House of the Congress, or
3 of any joint committee of the Congress, acting for
4 himself or at the request of the ranking minority
5 member or a majority of the committee members;

6 “(2) the Board; or

7 “(3) the Director.

8 **“SEC. 705. ADMINISTRATION AND SUPPORT.**

9 “The Director of the Science and Technology Assess-
10 ment Service shall be appointed by the Board and shall
11 serve for a term of 6 years unless sooner removed by the
12 Board. The Director shall receive basic pay at the rate
13 provided for level III of the Executive Schedule under sec-
14 tion 5314 of title 5, United States Code. The Director
15 shall contract for administrative support from the Library
16 of Congress.

17 **“SEC. 706. AUTHORITY.**

18 “The Service shall have the authority, within the lim-
19 its of available appropriations, to do all things necessary
20 to carry out the provisions of this section, including, but
21 without being limited to, the authority to—

22 “(1) make full use of competent personnel and
23 organizations outside the Office, public or private,
24 and form special ad hoc task forces or make other
25 arrangements when appropriate;

1 “(2) enter into contracts or other arrangements
2 as may be necessary for the conduct of the work of
3 the Office with any agency or instrumentality of the
4 United States, with any State, territory, or posses-
5 sion or any political subdivision thereof, or with any
6 person, firm, association, corporation, or educational
7 institution, with or without reimbursement, without
8 performance or other bonds, and without regard to
9 section 3709 of the Revised Statutes (41 U.S.C. 51);

10 “(3) accept and utilize the services of voluntary
11 and uncompensated personnel necessary for the con-
12 duct of the work of the Service and provide trans-
13 portation and subsistence as authorized by section
14 5703 of title 5, United States Code, for persons
15 serving without compensation; and

16 “(4) prescribe such rules and regulations as it
17 deems necessary governing the operation and organi-
18 zation of the Service.

19 **“SEC. 707. BOARD.**

20 “The Board shall consist of 13 members as follows—

21 “(1) 6 Members of the Senate, appointed by the
22 President pro tempore of the Senate, 3 from the ma-
23 jority party and 3 from the minority party;

24 “(2) 6 Members of the House of Representa-
25 tives appointed by the Speaker of the House of Rep-

1 representatives, 3 from the majority party and 3 from
2 the minority party; and

3 “(3) the Director, who shall not be a voting
4 member.

5 **“SEC. 708. REPORT TO CONGRESS.**

6 “The Service shall submit to the Congress an annual
7 report which shall include, but not be limited to, an eval-
8 uation of technology assessment techniques and identifica-
9 tion, insofar as may be feasible, of technological areas and
10 programs requiring future analysis. The annual report
11 shall be submitted not later than March 15 of each year.

12 **“SEC. 709. AUTHORIZATION OF APPROPRIATIONS.**

13 “There are authorized to be appropriated to the Serv-
14 ice such sums as are necessary to fulfill the requirements
15 of this title.”.

16 **TITLE IV—CLIMATE CHANGE**
17 **TECHNOLOGY**

18 **SEC. 401. NIST GREENHOUSE GAS FUNCTIONS.**

19 Section 2(c) of the National Institute of Standards
20 and Technology Act (15 U.S.C. 272(c)) is amended—

21 (1) by striking “and” after the semicolon in
22 paragraph (21);

23 (2) by redesignating paragraph (22) as para-
24 graph (23); and

1 (3) by inserting after paragraph (21) the fol-
2 lowing:

3 “(22) perform research to develop enhanced
4 measurements, calibrations, standards, and tech-
5 nologies which will enable the reduced production in
6 the United States of greenhouse gases associated
7 with global warming, including carbon dioxide, meth-
8 ane, nitrous oxide, ozone, perfluorocarbons,
9 hydrofluorocarbons, and sulfur hexafluoride; and”.

10 **SEC. 402. DEVELOPMENT OF NEW MEASUREMENT TECH-**
11 **NOLOGIES.**

12 The Secretary of Commerce shall initiate a program
13 to develop, with technical assistance from appropriate
14 Federal agencies, innovative standards and measurement
15 technologies (including technologies to measure carbon
16 changes due to changes in land use cover) to calculate—

17 (1) greenhouse gas emissions and reductions
18 from sequestration, agriculture, forestry, and other
19 land use practices;

20 (2) noncarbon dioxide greenhouse gas emissions
21 from transportation;

22 (3) greenhouse gas emissions from facilities or
23 sources using remote sensing technology; and

1 (4) any other greenhouse gas emission or reduc-
2 tions for which no accurate or reliable measurement
3 technology exists.

4 **SEC. 403. ENHANCED ENVIRONMENTAL MEASUREMENTS**
5 **AND STANDARDS.**

6 The National Institute of Standards and Technology
7 Act (15 U.S.C. 271 et seq.) is amended—

8 (1) by redesignating sections 17 through 32 as
9 sections 18 through 33, respectively; and

10 (2) by inserting after section 16 the following:

11 **“SEC. 17. CLIMATE CHANGE STANDARDS AND PROCESSES.**

12 “(a) IN GENERAL.—The Director shall establish
13 within the Institute a program to perform and support re-
14 search on global climate change standards and processes,
15 with the goal of providing scientific and technical knowl-
16 edge applicable to the reduction of greenhouse gases (as
17 defined in section 4 of the Global Climate Change Act of
18 2002).

19 “(b) RESEARCH PROGRAM.—

20 “(1) IN GENERAL.—The Director is authorized
21 to conduct, directly or through contracts or grants,
22 a global climate change standards and processes re-
23 search program.

24 “(2) RESEARCH PROJECTS.—The specific con-
25 tents and priorities of the research program shall be

1 determined in consultation with appropriate Federal
2 agencies, including the Environmental Protection
3 Agency, the National Oceanic and Atmospheric Ad-
4 ministration, and the National Aeronautics and
5 Space Administration. The program generally shall
6 include basic and applied research—

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

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

15 “(C) to develop and provide standards,
16 measurements, measurement tools, and calibra-
17 tions that will enhance and promote remote
18 sensing technologies;

19 “(D) to assist in establishing a baseline
20 reference point for future trading in greenhouse
21 gases and the measurement of progress in emis-
22 sions reduction;

23 “(E) to develop and provide standards,
24 measurements, measurement tools, calibrations,
25 data, models, and other innovative technologies

1 to support the validation and accreditation of a
2 greenhouse gas trading industry;

3 “(F) to assist in developing improved in-
4 dustrial processes designed to reduce or elimi-
5 nate greenhouse gases, including the develop-
6 ment of measurement tools and standards to
7 validate and accredit a carbon offset industry;
8 and

9 “(G) that will be exchanged internationally
10 as scientific or technical information which has
11 the stated purpose of developing mutually rec-
12 ognized measurements, standards, and proce-
13 dures for reducing greenhouse gases.

14 “(c) NATIONAL MEASUREMENT LABORATORIES.—

15 “(1) IN GENERAL.—In carrying out this sec-
16 tion, the Director shall utilize the collective skills of
17 the National Measurement Laboratories of the Na-
18 tional Institute of Standards and Technology to im-
19 prove the accuracy of measurements that will permit
20 better understanding and control of these industrial
21 chemical processes and result in the reduction or
22 elimination of greenhouse gases.

23 “(2) MATERIAL, PROCESS, AND BUILDING RE-
24 SEARCH.—The National Measurement Laboratories

1 shall conduct research under this subsection that in-
2 cludes—

3 “(A) developing material and manufac-
4 turing processes which are designed for energy
5 efficiency and reduced greenhouse gas emissions
6 into the environment;

7 “(B) developing environmentally-friendly,
8 ‘green’ chemical processes to be used by indus-
9 try; and

10 “(C) enhancing building performance with
11 a focus in developing standards or tools which
12 will help incorporate low- or no-emission tech-
13 nologies into building designs.

14 “(3) STANDARDS AND TOOLS.—The National
15 Measurement Laboratories shall develop standards
16 and tools under this subsection that include software
17 to assist designers in selecting alternate building
18 materials, performance data on materials, artificial
19 intelligence-aided design procedures for building sub-
20 systems and ‘smart buildings’, and improved test
21 methods and rating procedures for evaluating the
22 energy performance of residential and commercial
23 appliances and products.

24 “(d) NATIONAL VOLUNTARY LABORATORY ACCREDI-
25 TATION PROGRAM.—The Director shall utilize the Na-

1 tional Voluntary Laboratory Accreditation Program under
2 this section to establish a program to include specific cali-
3 bration or test standards and related methods and proto-
4 cols assembled to satisfy the unique needs for accredita-
5 tion in measuring the production of greenhouse gases. In
6 carrying out this subsection the Director may cooperate
7 with other departments and agencies of the Federal Gov-
8 ernment, State and local governments, and private organi-
9 zations.”.

10 **SEC. 404. TECHNOLOGY DEVELOPMENT AND DIFFUSION.**

11 The Director of the National Institute of Standards
12 and Technology, through the Manufacturing Extension
13 Partnership Program, may develop a program to support
14 the implementation of new “green” manufacturing tech-
15 nologies and techniques by the more than 380,000 small
16 business manufacturers.

17 **SEC. 405. AUTHORIZATION OF APPROPRIATIONS.**

18 There are authorized to be appropriated to the Direc-
19 tor of the National Institute of Standards and Technology
20 to carry out this title and section 17 of the National Insti-
21 tute of Standards and Technology Act as added by section
22 403 of this title, \$15,000,000 for each of fiscal years 2008
23 ~~through 2010.~~ *2009 through 2013.*

1 **TITLE V—ABRUPT CLIMATE**
2 **CHANGE**

3 **SEC. 501. ABRUPT CLIMATE CHANGE RESEARCH PROGRAM.**

4 The Secretary of Commerce shall establish within the
5 Office of Oceanic and Atmospheric Research of the Na-
6 tional Oceanic and Atmospheric Administration, and shall
7 carry out, a program of scientific research on abrupt cli-
8 mate change.

9 **SEC. 502. PURPOSES OF PROGRAM.**

10 The purposes of the program are—

11 (1) to develop a global array of terrestrial and
12 oceanographic indicators of paleoclimate in order to
13 sufficiently identify and describe past instances of
14 abrupt climate change;

15 (2) to improve understanding of thresholds and
16 nonlinearities in geophysical systems related to the
17 mechanisms of abrupt climate change;

18 (3) to incorporate such mechanisms into ad-
19 vanced geophysical models of climate change; and

20 (4) to test the output of such models against an
21 improved global array of records of past abrupt cli-
22 mate changes.

23 **SEC. 503. ABRUPT CLIMATE CHANGE DEFINED.**

24 In this title, the term “abrupt climate change” means
25 a change in the climate that occurs so rapidly or unexpect-

1 edly that human or natural systems have difficulty adapt-
2 ing to the climate as changed.

3 **SEC. 504. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the De-
5 partment of Commerce for each of fiscal years 2009
6 through ~~2014~~, 2013, to remain available until expended,
7 such sums as are necessary, not to exceed \$10,000,000,
8 to carry out the research program required by section 501.

Calendar No. 752

110TH CONGRESS
2^D SESSION

S. 2307

[Report No. 110-341]

A BILL

To amend the Global Change Research Act of
1990, and for other purposes.

MAY 22, 2008

Reported with amendments