

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

Strike all after the enacting clause and insert the following:

1 SECTION 1. SHORT TITLE.

2 This Act may be cited as the “Global Change Re-
3 search and Data Management Act of 2007”.

4 TITLE I—GLOBAL CHANGE
5 RESEARCH

6 SEC. 101. FINDINGS AND PURPOSE.

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

9 (1) Industrial, agricultural, and other human
10 activities, coupled with an expanding world popu-
11 lation, are contributing to processes of global change
12 that are significantly altering the Earth habitat.

13 (2) Such human-induced changes, in conjunc-
14 tion with natural fluctuations, may lead to signifi-
15 cant alterations of world climate patterns. Over the
16 next century, these changes could adversely affect
17 world agricultural and marine production, coastal

1 habitability, biological diversity, human health, glob-
2 al social and political stability, and global economic
3 activity.

4 (3) Developments in interdisciplinary Earth
5 sciences, global observing systems, and satellite and
6 computing technologies make possible significant sci-
7 entific understanding of global changes and their ef-
8 fects, and have resulted in the significant expansion
9 of environmental data and information.

10 (4) Development of effective policies to prevent,
11 mitigate, and adapt to global change will rely on im-
12 provement in scientific understanding of global envi-
13 ronmental processes and on development of informa-
14 tion that is of use to decisionmakers at the local, re-
15 gional, and national levels.

16 (5) Although the United States Global Change
17 Research Program has made significant contribu-
18 tions to understanding Earth's climate and the an-
19 thropogenic influences on Earth's climate and its
20 ecosystems, the Program now needs to produce more
21 information to meet the expressed needs of decision-
22 makers.

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

1 essary to inform decisions on land, water, and re-
2 source management. However, improved under-
3 standing of global change should be used to assist
4 decisionmakers in the development of policies to en-
5 sure that ecological, social, and economic systems
6 are resilient under a variety of plausible climate fu-
7 tures.

8 (7) In order to most effectively meet the needs
9 of decisionmakers, both the research agenda of the
10 United States Global Change Research Program and
11 its implementation must be informed by continuous
12 feedback from documented users of information gen-
13 erated by the Program.

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

21 **SEC. 102. DEFINITIONS.**

22 For purposes of this title—

23 (1) the term “global change” means human-in-
24 duced or natural changes in the global environment
25 (including alterations in climate, land productivity,

1 oceans or other water resources, atmospheric chem-
2 istry, biodiversity, and ecological systems) that may
3 alter the capacity of the Earth to sustain life;

4 (2) the term “global change research” means
5 study, monitoring, assessment, prediction, and infor-
6 mation management activities to describe and under-
7 stand—

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

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

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

15 (D) the manner in which such system, en-
16 vironment, and changes are influenced by
17 human actions;

18 (3) the term “interagency committee” means
19 the interagency committee established under section
20 103;

21 (4) the term “Plan” means the National Global
22 Change Research and Assessment Plan developed
23 under section 105;

1 (5) the term “Program” means the United
2 States Global Change Research Program established
3 under section 104; and

4 (6) the term “regional climate change” means
5 the natural or human-induced changes manifested in
6 the local or regional environment (including alter-
7 ations in weather patterns, land productivity, water
8 resources, sea level rise, atmospheric chemistry, bio-
9 diversity, and ecological systems) that may alter the
10 capacity of a specific region to support current or
11 future social and economic activity or natural eco-
12 systems.

13 **SEC. 103. INTERAGENCY COOPERATION AND COORDINA-**
14 **TION.**

15 (a) ESTABLISHMENT.—The President shall establish
16 or designate an interagency committee to ensure coopera-
17 tion and coordination of all Federal research activities per-
18 taining to processes of global change for the purpose of
19 increasing the overall effectiveness and productivity of
20 Federal global change research efforts. The interagency
21 committee shall include representatives of both agencies
22 conducting global change research and agencies with au-
23 thority over resources likely to be affected by global
24 change.

1 (b) FUNCTIONS OF THE INTERAGENCY COM-
2 MITTEE.—The interagency committee shall—

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

5 (2) serve as the forum for developing the vul-
6 nerability assessment under section 107;

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

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

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

14 (A) providing representation at inter-
15 national meetings and conferences on global
16 change research in which the United States
17 participates; and

18 (B) coordinating the Federal activities of
19 the United States with programs of other na-
20 tions and with international global change re-
21 search activities;

22 (6) work with appropriate Federal, State, re-
23 gional, and local authorities to ensure that the Pro-
24 gram is designed to produce information needed to

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

3 (7) facilitate ongoing dialog and information ex-
4 change with regional, State, and local governments
5 and other user communities; and

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

9 **SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH**
10 **PROGRAM.**

11 The President shall establish an interagency United
12 States Global Change Research Program to improve un-
13 derstanding of global change, to respond to the informa-
14 tion needs of communities and decisionmakers, and to pro-
15 vide periodic assessments of the vulnerability of the United
16 States and other regions to global and regional climate
17 change. The Program shall be implemented in accordance
18 with the Plan.

19 **SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH AND AS-**
20 **SESSMENT PLAN.**

21 (a) IN GENERAL.—The President shall develop a Na-
22 tional Global Change Research and Assessment Plan for
23 implementation of the Program. The Plan shall contain
24 recommendations for global change research and assess-
25 ment. The President shall submit an outline for the devel-

1 opment of the Plan to the Congress within 1 year after
2 the date of enactment of this Act, and shall submit a com-
3 pleted Plan to the Congress within 3 years after the date
4 of enactment of this Act. Revised Plans shall be submitted
5 to the Congress at least once every 5 years thereafter. In
6 the development of each Plan, the President shall conduct
7 a formal assessment process under this section to deter-
8 mine the needs of appropriate Federal, State, regional,
9 and local authorities and other interested parties regard-
10 ing the types of information needed by them in developing
11 policies to reduce society's vulnerability to global change
12 and shall utilize these assessments, including the reviews
13 by the National Academy of Sciences and the National
14 Governors Association under subsections (e) and (f), in
15 developing the Plan.

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

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

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

1 ties, data collection, database development, and data
2 analysis requirements, development of regional sce-
3 narios, assessment of model predictability, assess-
4 ment of climate change impacts, participation in
5 international research efforts, and information man-
6 agement, required to achieve such goals and prior-
7 ities;

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

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

13 (5) consider and utilize, as appropriate, reports
14 and studies conducted by Federal agencies, the Na-
15 tional Research Council, or other entities;

16 (6) make recommendations for the coordination
17 of the global change research and assessment activi-
18 ties of the United States with such activities of other
19 nations and international organizations, including—

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

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

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

4 (7) detail budget requirements for Federal glob-
5 al change research and assessment activities to be
6 conducted under the Plan;

7 (8) catalog the type of information identified by
8 appropriate Federal, State, regional, and local deci-
9 sionmakers needed to develop policies to reduce soci-
10 ety's vulnerability to global change and indicate how
11 the planned research will meet these decisionmakers'
12 information needs;

13 (9) identify the observing systems currently em-
14 ployed in collecting data relevant to global and re-
15 gional climate change research and prioritize addi-
16 tional observation systems that may be needed to en-
17 sure adequate data collection and monitoring of
18 global change; and

19 (10) describe specific activities designed to fa-
20 cilitate outreach and data and information exchange
21 with regional, State, and local governments and
22 other user communities.

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

1 (1) Global measurements, establishing world-
2 wide to regional scale observations prioritized to un-
3 derstand global change and to meet the information
4 needs of decisionmakers on all relevant spatial and
5 time scales.

6 (2) Information on economic, demographic, and
7 technological trends that contribute to changes in
8 the Earth system and that influence society's vulner-
9 ability to global and regional climate change.

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

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

17 (5) Assessments of predictability using quan-
18 titative models of the Earth system to simulate glob-
19 al and regional environmental processes and trends.

20 (6) Focused research initiatives to understand
21 the nature of and interaction among physical, chem-
22 ical, biological, land use, and social processes related
23 to global and regional climate change.

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

4 (d) INFORMATION MANAGEMENT.—The Plan shall
5 incorporate, to the extent practicable, the recommenda-
6 tions relating to data acquisition, management, integra-
7 tion, and archiving made by the interagency climate and
8 other global change data management working group es-
9 tablished under section 203.

10 (e) NATIONAL ACADEMY OF SCIENCES EVALUA-
11 TION.—The President shall enter into an agreement with
12 the National Academy of Sciences under which the Acad-
13 emy shall—

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

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

18 (f) NATIONAL GOVERNORS ASSOCIATION EVALUA-
19 TION.—The President shall enter into an agreement with
20 the National Governors Association Center for Best Prac-
21 tices under which that Center shall—

22 (1) evaluate the utility to State, local, and re-
23 gional decisionmakers of each Plan and of the antici-
24 pated and actual information outputs of the Pro-

1 gram for development of State, local, and regional
2 policies to reduce vulnerability to global change; and
3 (2) recommend priorities for future global and
4 regional climate change research and assessment.

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

12 **SEC. 106. BUDGET COORDINATION.**

13 (a) IN GENERAL.—The President shall provide gen-
14 eral guidance to each Federal agency participating in the
15 Program with respect to the preparation of requests for
16 appropriations for activities related to the Program.

17 (b) CONSIDERATION IN PRESIDENT’S BUDGET.—The
18 President shall submit, at the time of his annual budget
19 request to Congress, a description of those items in each
20 agency’s annual budget which are elements of the Pro-
21 gram.

22 **SEC. 107. VULNERABILITY ASSESSMENT.**

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

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

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

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

9 (3) based on indicators and baselines developed
10 under section 105(c)(3), as well as other measure-
11 ments, analyzes changes to the natural environment,
12 land and water resources, and biological diversity
13 in—

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

16 (B) other continents;

17 (4) analyzes the effects of global change, includ-
18 ing the changes described in paragraph (3), on food
19 and fiber production, energy production and use,
20 transportation, human health and welfare, water
21 availability and coastal infrastructure, and human
22 social and economic systems, including providing in-
23 formation about the differential impacts on specific
24 geographic regions within the United States, on peo-
25 ple of different income levels within those regions,

1 and for rural and urban areas within those regions;
2 and

3 (5) analyzes the vulnerability of different geo-
4 graphic regions of the world to global change, in-
5 cluding analyses of the implications of global change
6 for international assistance, population displacement,
7 and national security.

8 (b) COORDINATION.—To the extent appropriate, the
9 information produced in accordance with this section shall
10 be coordinated with the production of similar reports and
11 information produced by the United States Global Change
12 Research Program for incorporation into reports of inter-
13 national organizations, including the World Meteorological
14 Organization and the Intergovernmental Panel on Climate
15 Change.

16 **SEC. 108. POLICY ASSESSMENT.**

17 Not later than 1 year after the date of enactment
18 of this Act, and at least once every 3 years thereafter,
19 the President shall submit to the Congress a policy assess-
20 ment which—

21 (1) documents current policy options being uti-
22 lized by Federal, State, and local governments to
23 mitigate or adapt to the effects of global change;

1 (2) evaluates the realized and anticipated effec-
2 tiveness of those current policy options in addressing
3 global change; and

4 (3) identifies and evaluates additional policy op-
5 tions for mitigating or adapting to the effects of
6 global change.

7 **SEC. 109. ANNUAL REPORT.**

8 Each year at the time of submission to the Congress
9 of the President's budget request, the President shall sub-
10 mit to the Congress a report on the activities conducted
11 pursuant to this title, including—

12 (1) a summary of the achievements of the Pro-
13 gram during the period covered by the report;

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

16 (3) a list of the State, local, and regional deci-
17 sionmakers identified as potential users of the infor-
18 mation generated through the Program and a de-
19 scription of the consultations with this community
20 coordinated through the work of the interagency
21 committee.

22 **SEC. 110. RELATION TO OTHER AUTHORITIES.**

23 The President shall—

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

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

5 (2) facilitate ongoing dialog and information ex-
6 change with regional, State, and local governments
7 and other user communities through programs au-
8 thorized in the National Climate Program Act (15
9 U.S.C. 2901 et seq.).

10 **SEC. 111. REPEAL.**

11 The Global Change Research Act of 1990 (15 U.S.C.
12 2921 et seq.) is repealed.

13 **TITLE II—CLIMATE AND OTHER**
14 **GLOBAL CHANGE DATA MAN-**
15 **AGEMENT**

16 **SEC. 201. FINDINGS AND PURPOSES.**

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

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

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

1 ies of the Earth’s atmosphere, biogeochemical cycles,
2 and climate.

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

8 (4) Proposals and plans for expansion of global
9 observing networks should include plans for the
10 management of data to be collected and budgets re-
11 flecting the cost of support for management and
12 archiving of data.

13 (b) PURPOSES.—The purposes of this title are to es-
14 tablish climate and other global change data management
15 and archiving as Federal agency missions, and to establish
16 Federal policies for managing and archiving climate and
17 other global change data.

18 **SEC. 202. DEFINITIONS.**

19 For purposes of this title—

20 (1) the term “metadata” means information de-
21 scribing the content, quality, condition, and other
22 characteristics of climate and other global change
23 data, compiled, to the maximum extent possible, con-
24 sistent with the requirements of the “Content Stand-
25 ard for Digital Geospatial Metadata” (FGDC–STD–

1 001–1998) issued by the Federal Geographic Data
2 Committee, or any successor standard approved by
3 the working group; and

4 (2) the term “working group” means the inter-
5 agency climate and other global change data man-
6 agement working group established under section
7 203.

8 **SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL**
9 **CHANGE DATA MANAGEMENT WORKING**
10 **GROUP.**

11 (a) ESTABLISHMENT.—The President shall establish
12 or designate an interagency climate and other global
13 change data management working group to make rec-
14 ommendations for coordinating Federal climate and other
15 global change data management and archiving activities.

16 (b) MEMBERSHIP.—The working group shall include
17 the Administrator of the National Aeronautics and Space
18 Administration, the Administrator of the National Oceanic
19 and Atmospheric Administration, the Secretary of Energy,
20 the Secretary of Defense, the Director of the National
21 Science Foundation, the Director of the United States Ge-
22 ological Survey, the Archivist of the United States, the
23 Administrator of the Environmental Protection Agency,
24 the Secretary of the Smithsonian Institution, or their des-

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

3 (c) REPORTS.—Not later than 1 year after the date
4 of enactment of this Act, the working group shall transmit
5 a report to the Congress containing the elements described
6 in subsection (d). Not later than 4 years after the initial
7 report under this subsection, and at least once every 4
8 years thereafter, the working group shall transmit reports
9 updating the previous report. In preparing reports under
10 this subsection, the working group shall consult with ex-
11 pected users of the data collected and archived by the Pro-
12 gram.

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

15 (1) include recommendations for the establish-
16 ment, maintenance, and accessibility of a catalog
17 identifying all available climate and other global
18 change data sets;

19 (2) identify climate and other global change
20 data collections in danger of being lost and rec-
21 ommend actions to prevent such loss;

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

1 (4) identify effective and compatible procedures
2 for climate and other global change data collection,
3 management, and retention and make recommenda-
4 tions for ensuring their use by Federal agencies and
5 other appropriate entities;

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

10 (6) make recommendations for ensuring that
11 particular attention is paid to the collection, man-
12 agement, and archiving of metadata;

13 (7) make recommendations for ensuring a uni-
14 fied and coordinated Federal capital investment
15 strategy with respect to climate and other global
16 change data collection, management, and archiving;

17 (8) evaluate the data record from each observ-
18 ing system and make recommendations to ensure
19 that delivered data are free from time-dependent bi-
20 ases and random errors before they are transferred
21 to long-term archives; and

22 (9) evaluate optimal design of observation sys-
23 tem components to ensure a cost-effective, adequate
24 set of observations detecting and tracking global
25 change.

1 **TITLE III—INTERNATIONAL CO-**
2 **OPERATION IN GLOBAL**
3 **CHANGE RESEARCH**

4 **SEC. 301. FINDINGS AND PURPOSES.**

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

7 (1) Pooling of international resources and sci-
8 entific capabilities will be essential to a successful
9 international global change program.

10 (2) While international scientific planning is al-
11 ready underway, there is currently no comprehensive
12 intergovernmental mechanism for planning, coordi-
13 nating, or implementing research to understand
14 global change and to mitigate possible adverse ef-
15 fects.

16 (3) An international global change research
17 program will be important in building future con-
18 sensus on methods for reducing global environmental
19 degradation.

20 (4) The United States, as a world leader in en-
21 vironmental and Earth sciences, should help provide
22 leadership in developing and implementing an inter-
23 national global change research program.

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

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

3 (2) involve scientists and policymakers from de-
4 veloping nations in such cooperative global change
5 research programs; and

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

11 **SEC. 302. INTERNATIONAL DISCUSSIONS.**

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

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

21 (2) Coordination of global change research
22 plans with those developed by international organiza-
23 tions such as the International Council on Scientific
24 Unions, the World Meteorological Organization, and
25 the United Nations Environment Program.

1 (3) Establishment of global change research
2 centers and training programs for scientists, espe-
3 cially those from developing nations.

4 (4) Development of innovative methods for
5 management of international global change research,
6 including the use of new or existing intergovern-
7 mental organizations for the coordination or funding
8 of global change research.

9 (5) Establishment of international offices to
10 disseminate information useful in identifying, pre-
11 venting, mitigating, or adapting to the possible ef-
12 fects of global change.

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

22 (1) Creation of an international cooperative
23 program to fund research related to energy effi-
24 ciency and conservation, solar and other renewable

1 energy sources, and passively safe and diversion-re-
2 sistant nuclear reactors.

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

7 (3) Exchange of information concerning envi-
8 ronmentally safe energy technologies and practices,
9 including those described in paragraphs (1) and (2).

10 **SEC. 303. GLOBAL CHANGE RESEARCH INFORMATION OF-**
11 **FICE.**

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