

107TH CONGRESS  
1ST SESSION

# S. 1716

To speed national action to address global climate change, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

NOVEMBER 15, 2001

Mr. KERRY (for himself, Mr. STEVENS, Mr. HOLLINGS, Mr. INOUE, and Mr. AKAKA) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

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## A BILL

To speed national action to address global climate change,  
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 Climate Change  
5 Act of 2001”.

6 **SEC. 2. TABLE OF CONTENTS.**

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

- Sec. 1. Short Title.
- Sec. 2. Table of Contents.
- Sec. 3. Findings.
- Sec. 4. Greenhouse gases defined.

## TITLE I—CLIMATE CHANGE SCIENCE AND TECHNOLOGY POLICY

## Subtitle A—Office of Climate Change Action

- Sec. 101. Establishment of Office of Climate Change Action.
- Sec. 102. Climate change action task force.
- Sec. 103. Climate change action strategy.
- Sec. 104. Reports.

## Subtitle B—Policy Development Activities and Organizations

- Sec. 151. Elevate global climate change in the Office of Science and Technology Policy.
- Sec. 152. Establishment of Associate Director for global climate change.
- Sec. 153. National Science and Technology Assessment Service.

## TITLE II—GREENHOUSE GAS MEASURING AND REPORTING

- Sec. 201. National greenhouse gas measurement, verification, and reporting system.
- Sec. 202. Atmospheric monitoring and reporting on trends.

## TITLE III—CLIMATE CHANGE SCIENCE AND INFORMATION

## Subtitle A—Amendments to the Global Change Research Act of 1990

- Sec. 301. Amendment of Global Change Research Act of 1990.
- Sec. 302. Changes in definitions.
- Sec. 303. Change in committee name.
- Sec. 304. Change in national global change research plan.
- Sec. 305. Integrated Program Office.
- Sec. 306. Changes in reference to national climate change program.

## Subtitle B—National Climate Services and Monitoring

- Sec. 351. Amendment of National Climate Program Act.
- Sec. 352. Change in short title of Act.
- Sec. 353. Changes in findings.
- Sec. 354. Change in purpose.
- Sec. 355. “Program” changed to “Service”.
- Sec. 356. Tools for regional planning.
- Sec. 357. Authorization of appropriations.
- Sec. 358. National Climate Service Plan.
- Sec. 359. International Pacific research and cooperation.

## TITLE IV—CLIMATE CHANGE TECHNOLOGY

- Sec. 401. NIST greenhouse gas functions.
- Sec. 402. Measurement and verification technologies.
- Sec. 403. Enhanced environmental measurements and standards.
- Sec. 404. Technology development and diffusion.
- Sec. 405. Transfer of greenhouse gas reduction technology.

## TITLE V—CLIMATE ADAPTATION AND HAZARDS PREVENTION

## Subtitle A—Assessment and Adaptation

- Sec. 501. Regional climate assessment and adaptation.
- Sec. 502. Coastal vulnerability and adaptation.

## Subtitle B—Pilot Programs; Grants

- Sec. 551. Forecasting projects.
- Sec. 552. Database establishment.
- Sec. 553. Definitions.

Sec. 554. Authorization of appropriations.

TITLE VI—OCEAN AND COASTAL OBSERVING SYSTEM

Sec. 601. Ocean and coastal observing system.

Sec. 602. Authorization of appropriations.

1 **SEC. 3. FINDINGS.**

2 The Congress finds the following:

3 (1) The natural greenhouse effect is real and is  
4 an essential component of the planet's climate proc-  
5 ess, but some greenhouse gases are increasing in the  
6 atmosphere because of human activities and increas-  
7 ingly trapping more heat.

8 (2) The global-average surface temperature has  
9 increased over the 20th century by 0.4 to 0.8 de-  
10 grees Celsius and the average temperature increase  
11 in the Northern Hemisphere over the 20th century  
12 is likely to have been the largest of any century dur-  
13 ing the past 1,000 years.

14 (3) From 1948 to 1998 the mean temperature  
15 of the world ocean increased with substantial  
16 changes in heat in the 300-to-1,000 meter layers of  
17 each ocean and in depths greater than 1,000 meters  
18 in the North Atlantic.

19 (4) Other observed changes are consistent with  
20 this warming, including widespread retreat of moun-  
21 tain glaciers in non-polar regions, decrease in snow  
22 cover and ice extent, and a rise of between 10–20  
23 centimeters of global-average sea level.

1           (5) There is new and stronger evidence that the  
2 warming observed over the last 50 years is attrib-  
3 utable to human activities.

4           (6) Direct atmospheric measurements made  
5 over the past 40-plus years, coupled with  
6 paleoclimatic measurements from ice cores, have  
7 documented the steady growth in the atmospheric  
8 abundance of carbon dioxide.

9           (7) The predominant cause of this increase in  
10 carbon dioxide is the combustion of fossil fuels and  
11 the burning of forests. Further, methane abundance  
12 has doubled over the Industrial Era. Other heat-  
13 trapping gases are also increasing as a result of  
14 human activities.

15           (8) Emissions of greenhouse gases and aerosols  
16 due to human activities continue to alter the atmos-  
17 phere in ways that are expected to affect the cli-  
18 mate.

19           (9) Scenarios of future human activities indi-  
20 cate continued changes in atmospheric composition  
21 throughout the 21st century. Projected rates of  
22 warming would be much larger than the observed  
23 20th-century changes and would very likely be with-  
24 out precedent during at least the last 10,000 years.

1           (10) The oceans are key to regulating climate  
2           and atmospheric concentrations of greenhouse gases,  
3           and to understanding global change processes. Yet,  
4           at present we lack an observing system to monitor  
5           marine and coastal waters that cover nearly three  
6           quarters of the Earth's surface. Such a system not  
7           only would improve knowledge of global change, but  
8           also contribute to ensuring national security, man-  
9           aging marine resources reducing ocean pollution, im-  
10          proving shipping and other marine operations, and  
11          mitigating natural hazards.

12          (11) A greenhouse-gas warming could be re-  
13          versed only very slowly because of the centuries-long  
14          rate of removal of many greenhouse gases from the  
15          atmosphere and because of the slow response of the  
16          oceans to thermal changes.

17          (12) Stabilization of greenhouse gases in the at-  
18          mosphere will require a no net greenhouse gas emis-  
19          sion strategy in conjunction with specific innovative  
20          mitigation technologies and flexible compliance  
21          mechanisms.

22          (13) Substantial and coordinated progress must  
23          be made in both the public and private sectors to de-  
24          velop and deploy uniform measurement and  
25          verification standards and innovative technologies

1 and practices that will meet the goal of stabilizing  
2 greenhouse gas concentrations in the atmosphere at  
3 levels that would prevent dangerous human inter-  
4 ference in the climate system.

5 (14) Federal, state and local governments will  
6 need assistance in planning for or adapting to un-  
7 avoidable coastal and land use changes associated  
8 with global climate change. Coastal zone manage-  
9 ment and innovative technologies such as remote  
10 sensing, geographic information systems and sat-  
11 ellite-based positioning information, when integrated  
12 with regional climate assessments, could provide de-  
13 cision makers with essential hazards prevention and  
14 long-term planning capabilities.

15 **SEC. 4. GREENHOUSE GASES DEFINED.**

16 (a) IN GENERAL.—In this Act, the term “greenhouse  
17 gas” means—

- 18 (1) carbon dioxide (CO<sub>2</sub>);
- 19 (2) methane (CH<sub>4</sub>);
- 20 (3) nitrous oxide (N<sub>2</sub>O);
- 21 (4) hydrofluorocarbons (HFCs);
- 22 (5) perfluorocarbons (PFCs); or
- 23 (6) sulphur hexafluoride (SF<sub>6</sub>).

24 (b) OTHER GASES.—In addition to the gases listed  
25 in subsection (a), the term “greenhouse gas” includes any

1 other gas determined by the Secretary of Commerce, after  
 2 consultation with the National Office of Climate Change  
 3 Action and the Environmental Protection Agency, after  
 4 notice and an opportunity for a public hearing to con-  
 5 tribute substantially to climate change phenomena associ-  
 6 ated with global warming attributable to greenhouse  
 7 gases.

8 **TITLE I—CLIMATE CHANGE**  
 9 **SCIENCE AND TECHNOLOGY**  
 10 **POLICY**

11 **Subtitle A—Office of Climate**  
 12 **Change Action**

13 **SEC. 101. ESTABLISHMENT OF OFFICE OF CLIMATE**  
 14 **CHANGE ACTION.**

15 (a) IN GENERAL.—There is established a National  
 16 Office of Climate Change Action within the Office of  
 17 Science and Technology Policy to coordinate—

18 (1) the development of a United States climate  
 19 change action strategy; and

20 (2) the development, integration, and planning  
 21 of long-range research and development budgets for  
 22 climate change action in consultation with the Office  
 23 of Management and Budget.

24 (b) DUTIES.—The Office established by subsection

25 (a) is responsible for—

1           (1) establishing policies, objectives, and prior-  
2           ities for the national climate change action strategy;

3           (2) consulting with the President in creating  
4           the interagency task force under section 102;

5           (3) advising the President and the Congress, in  
6           coordination with the Office of Management and  
7           Budget, of substantial changes in the organization,  
8           management, budgeting, and personnel allocations of  
9           Federal agencies involved in climate change activities  
10          necessary to achieve the goals of the climate change  
11          action strategy.

12          (c) DIRECTOR.—The Associate Director for Global  
13          Climate Change in the Office of Science and Technology  
14          Policy shall serve as the Director of the Office of Climate  
15          Change Action.

16          **SEC. 102. CLIMATE CHANGE ACTION TASK FORCE.**

17          The President, after consultation with the Federal  
18          Coordinating Council for Science, Engineering, and Tech-  
19          nology established by section 401 of the National Science  
20          and Technology Policy, Organization, and Priorities Act  
21          of 1976 (42 U.S.C. 6651), shall create an interagency cli-  
22          mate change action task force, which shall be chaired by  
23          the Secretary of Commerce, to serve as the primary mech-  
24          anism for development and implementation of a climate  
25          change action strategy under section 103.

1 **SEC. 103. CLIMATE CHANGE ACTION STRATEGY.**

2 The task force established under section 102 shall de-  
3 velop a national strategy for—

4 (1) establishing and implementing emission re-  
5 duction standards and specific mitigation approaches  
6 that will substantially reduce United States green-  
7 house gas emissions and stabilize atmospheric green-  
8 house gas concentrations in order to prevent dan-  
9 gerous anthropogenic interference with the climate  
10 system;

11 (2) doubling the current investment in research  
12 and development of energy efficiency and emissions  
13 reductions technologies by the United States public  
14 and private sectors aimed at transforming the  
15 United States economy into a no-net greenhouse gas  
16 emissions economy;

17 (3) ensuring long-term investment of adequate  
18 resources to high priority climate research and infra-  
19 structure needs, including observation and modeling  
20 systems needed to provide reliable global-mean and  
21 regional predictions and evaluate adaption strate-  
22 gies;

23 (4) promoting the transfer and exportation of  
24 innovative United States greenhouse gas emissions  
25 reduction or sequestration technologies to enable

1 other nations to reduce their emissions of green-  
2 house gases;

3 (5) identifying national risks and vulnerabilities  
4 associated with the effects of climate change or cli-  
5 mate variability and designing an appropriate adap-  
6 tation and disaster response capability; and

7 (6) recommending legislative or administrative  
8 actions necessary to implement the strategy.

9 **SEC. 104. REPORTS.**

10 (a) STRATEGY.—The President shall transmit to the  
11 Congress not later than 18 months after the date of enact-  
12 ment of this Act a report containing the climate change  
13 action strategy developed under this subtitle. The Presi-  
14 dent shall transmit a revised report on the strategy bienni-  
15 ally thereafter.

16 (b) PROGRESS REPORTS.—The President shall trans-  
17 mit to the Congress not later than 1 year after the date  
18 of enactment of this Act, and annually thereafter, a report  
19 on—

20 (1) the progress that has been made in devel-  
21 oping and implementing the climate change action  
22 strategy required under this subtitle, including data  
23 on greenhouse gas emissions reductions and tech-  
24 nology innovation achievements;

1           (2) whether, and the extent to which, Federal  
2           agency policies or discretionary programs are con-  
3           tributing effectively to the long-term goal of sta-  
4           bilization of atmospheric greenhouse gas emissions;

5           (3) whether, and the extent to which, Federal  
6           research and development activities are consistent  
7           with the strategy; and

8           (4) recommendations to ensure effective Fed-  
9           eral implementation of the strategy.

10          (c) REVIEW.—The Science and Technology Assess-  
11          ment Service established under section 154 shall review  
12          the report submitted to the Congress under subsections  
13          (a) and (b), and provide technical advice to the Congress  
14          on the adequacy of Federal agency efforts to provide tech-  
15          nologies that will stabilize atmospheric greenhouse gases.

## 16           **Subtitle B—Policy Development** 17           **Activities and Organizations**

### 18          **SEC. 151. ELEVATE GLOBAL CLIMATE CHANGE IN THE OF-** 19                           **FICE OF SCIENCE AND TECHNOLOGY POLICY.**

20          Section 101(b) of the National Science and Tech-  
21          nology Policy, Organization, and Priorities Act of 1976  
22          (42 U.S.C. 6601(b)) is amended—

23           (1) by redesignating paragraphs (7) through  
24           (13) as paragraphs (8) through (14), respectively;  
25           and

1           (2) by inserting after paragraph (6) the fol-  
2           lowing:

3           “(6) improving efforts to understand, assess,  
4           predict, mitigate, and respond to global climate  
5           change;”.

6 **SEC. 152. ESTABLISHMENT OF ASSOCIATE DIRECTOR FOR**  
7           **GLOBAL CLIMATE CHANGE.**

8           Section 203 of the National Science and Technology  
9           Policy, Organization, and Priorities Act of 1976 (42  
10          U.S.C. 6612) is amended—

11          (1) by striking “four” in the second sentence  
12          and insert “five”;

13          (2) by striking “title.” in the second sentence  
14          and inserting “title, one of whom shall be respon-  
15          sible for global climate change.”; and

16          (3) by striking “prescribe.” and inserting “pre-  
17          scribe, except that the Associate Director for global  
18          climate change shall coordinate the development, in-  
19          tegration, and planning of long-range research and  
20          development budgets for climate change action in  
21          consultation with the Office of Management and  
22          Budget.

1 **SEC. 153. NATIONAL SCIENCE AND TECHNOLOGY ASSESS-**  
2 **MENT SERVICE.**

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

6 **“TITLE VII—NATIONAL SCIENCE**  
7 **AND TECHNOLOGY ASSESS-**  
8 **MENT SERVICE**

9 **“SEC. 701. ESTABLISHMENT.**

10 “There is hereby created a Science and Technology  
11 Assessment Service (hereinafter referred to as the ‘Serv-  
12 ice’), which shall be within and responsible to the legisla-  
13 tive branch of the Government.

14 **“SEC. 702. COMPOSITION.**

15 “The Service shall consist of a Science and Tech-  
16 nology Board (hereinafter referred to as the ‘Board’)  
17 which shall formulate and promulgate the policies of the  
18 Service, and a Director who shall carry out such policies  
19 and administer the operations of the Service.

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

21 “The Service shall coordinate and develop informa-  
22 tion for Congress relating to the uses and application of  
23 technology to address current national science and tech-  
24 nology policy issues. In developing such technical assess-  
25 ments for Congress, the Service shall utilize, to the extent

1 practicable, experts selected in coordination with the Na-  
2 tional Research Council.

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

4 “Science and technology assessment activities under-  
5 taken by the Service may be initiated upon the request  
6 of—

7 “(1) the Chairman of any standing, special, or  
8 select committee of either House of the Congress, or  
9 of any joint committee of the Congress, acting for  
10 himself or at the request of the ranking minority  
11 member or a majority of the committee members;

12 “(2) the Board; or

13 “(3) the Director.

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

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

23 **“SEC. 706. AUTHORITY.**

24 “The Service shall have the authority, within the lim-  
25 its of available appropriations, to do all things necessary

1 to carry out the provisions of this section, including, but  
2 without being limited to, the authority to—

3           “(1) make full use of competent personnel and  
4 organizations outside the Office, public or private,  
5 and form special ad hoc task forces or make other  
6 arrangements when appropriate;

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

16           “(3) accept and utilize the services of voluntary  
17 and uncompensated personnel necessary for the con-  
18 duct of the work of the Service and provide trans-  
19 portation and subsistence as authorized by section  
20 5703 of title 5, United States Code, for persons  
21 serving without compensation; and

22           “(4) prescribe such rules and regulations as it  
23 deems necessary governing the operation and organi-  
24 zation of the Service.

1 **“SEC. 707. BOARD.**

2 “(a) IN GENERAL.—The Board shall consist of 13  
3 members as follows—

4 “(1) 6 Members of the Senate, appointed by the  
5 President pro tempore of the Senate, 3 from the ma-  
6 jority party and 3 from the minority party;

7 “(2) 6 Members of the House of Representa-  
8 tives appointed by the Speaker of the House of Rep-  
9 resentatives, 3 from the majority party and 3 from  
10 the minority party; and

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

13 **“SEC. 708. REPORT TO CONGRESS.**

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

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

21 “There are authorized to be appropriated to the Serv-  
22 ice such sums as are necessary to fulfill the requirements  
23 of this title.”.

1       **TITLE II—GREENHOUSE GAS**  
2       **MEASURING AND REPORTING**

3       **SEC. 201. NATIONAL GREENHOUSE GAS MEASUREMENT,**  
4               **VERIFICATION, AND REPORTING SYSTEM.**

5           (a) EMISSIONS MEASUREMENT AND VERIFICATION  
6       SYSTEM.—The Director of the National Institute of  
7       Standards and Technology shall, within 1 year after the  
8       date of enactment of this Act, design and develop a com-  
9       prehensive national measurement and verification system  
10      for greenhouse gas emissions in order to establish a con-  
11      sistent and technically accurate record of greenhouse gas  
12      emissions, reductions, and atmospheric concentrations for  
13      measurement of progress in emissions reduction and fu-  
14      ture trading in greenhouse gas credits.

15          (b) SYSTEM REQUIREMENTS.—The system developed  
16      by the Director shall—

17           (1) provide a method for establishing an accu-  
18      rate baseline, using standard units, for national or  
19      international measurement and accounting of the  
20      United States’s greenhouse gas emissions and reduc-  
21      tions;

22           (2) build on, or coordinate with, existing moni-  
23      toring, measurement, and reporting systems applica-  
24      ble to greenhouse gases under Federal environ-  
25      mental or other laws;

1           (3) ensure coverage of greenhouse gases regu-  
2           lated under the Clean Air Act (42 U.S.C. 7401 et  
3           seq.) and greenhouse gas sources accounting for at  
4           least 75 percent of United States greenhouse gas  
5           emissions;

6           (4) utilize techniques and methods that will  
7           minimize measurement and reporting costs of cov-  
8           ered entities;

9           (5) utilize advanced technologies, including sat-  
10          ellite and laser technology, that will allow for field  
11          measurement and verification;

12          (6) allow for measurement of reductions from  
13          energy efficiency or environmentally appropriate car-  
14          bon reduction projects;

15          (7) set uniform protocols and standards that  
16          can be used in State or international reporting and  
17          measurement systems, including those established by  
18          the Intergovernmental Panel on Climate Change;

19          (8) support the emissions reporting system es-  
20          tablished under subsection (c);

21          (9) provide for use and training of third-party  
22          verification entities; and

23          (10) provide a forum for public dissemination of  
24          measurement and reporting techniques and methods,  
25          including distribution on the world wide web.

1 (c) MANDATORY GREENHOUSE GAS REPORTING SYS-  
2 TEM.—

3 (1) IN GENERAL.—No later than 2 years after  
4 the date of enactment of this Act, the Climate  
5 Change Task Force, acting through the Secretary of  
6 Commerce, shall initiate a mandatory greenhouse  
7 gas emissions reporting system for the industrial,  
8 energy-producing, and transportation sectors of the  
9 economy utilizing the measurement and verification  
10 system developed under subsection (a) and (b). The  
11 Secretary shall ensure that the system is designed to  
12 maximize completeness, transparency, and accuracy  
13 and to minimize measurement-and-reporting costs  
14 for covered entities.

15 (2) COVERED ENTITIES.—The reporting system  
16 shall measure, track, and disclose direct and indirect  
17 emissions from entities operating in the industrial,  
18 energy-producing, and transportation sectors of the  
19 United States economy. This shall include facilities  
20 or entities—

21 (A) with significant direct greenhouse gas  
22 emissions;

23 (B) with manufacturing or other processes  
24 that are significant consumers of energy, par-  
25 ticularly energy derived from fossil fuel sources;

1           (C) that sell or market products or services  
2           that consume significant amounts of energy,  
3           particularly energy derived from fossil fuel  
4           sources; or

5           (D) involved in land use activities that re-  
6           lease significant greenhouse gases.

7           (d) REPORTING EMISSIONS.—

8           (1) NOTIFICATION REQUIREMENT.—Within 12  
9           months after the reporting system is developed, all  
10          covered entities shall be notified of the existence of  
11          the system, and the procedures for measuring,  
12          verifying, and submitting greenhouse gas emissions  
13          information to the Secretary.

14          (2) REQUIRED INFORMATION.—Each covered  
15          entity shall be required to report direct and indirect  
16          emissions on an entity-wide and facility-by-facility  
17          basis.

18          (3) FIRST REPORTING DATE.—Each covered en-  
19          tity notified under paragraph (1) to begin reporting  
20          under the reporting system shall be required to  
21          begin reporting not less than 4 years after the date  
22          of enactment of this Act.

23          (4) VOLUNTARY REPORTING.—Any entity may  
24          voluntarily report greenhouse gas emissions informa-

1           tion into the reporting system, and such information  
2           shall be included in the reporting system.

3           (e) PENALTY FOR FAILURE TO REPORT.—If any per-  
4           son required to report under this section fails to transmit  
5           the report at the time and in the manner required by the  
6           Task Force, the Secretary shall issue an administrative  
7           order assessing a penalty of not more than \$25,000 per  
8           day. Each day on which the failure to report continues,  
9           excepting Saturdays, Sundays, and holidays, constitutes a  
10          separate violation of the reporting requirement. The max-  
11          imum penalty the Secretary may assess against any per-  
12          son for any multiple day violation of a single failure to  
13          report may not exceed \$200,000.

14          (f) PUBLIC INFORMATION.—The Secretary shall  
15          make greenhouse gas emissions information contained in  
16          the reporting system publicly available, including through  
17          access on the world wide web, except in a case in which  
18          publishing information would reveal a trade secret or dis-  
19          close information vital to national security. Emissions in-  
20          formation reported by individual facilities shall be made  
21          available through a link with the Toxic Release Inventory  
22          public access system established under section 821 of the  
23          Act entitled “An Act to amend the Clear Air Act to pro-  
24          vide for attainment and maintenance of health protective  
25          purposes”, (42 U.S.C. 7651k nt.).

1 **SEC. 202. ATMOSPHERIC MONITORING AND REPORTING ON**  
2 **TRENDS.**

3 (a) **ATMOSPHERIC MONITORING AND VERIFICATION**  
4 **PROGRAM.**—The Secretary of Commerce, in coordination  
5 with relevant Federal agencies, shall, as part of the Na-  
6 tional Climate Service, establish an atmospheric moni-  
7 toring and verification program utilizing aircraft, satellite,  
8 ground sensors, and modeling capabilities to monitor,  
9 measure, and verify atmospheric greenhouse gas levels,  
10 dates, and emissions. Where feasible, the program shall  
11 measure emissions from identified sources participating in  
12 the reporting system for verification purposes. The pro-  
13 gram shall use measurements and standards that are con-  
14 sistent with those utilized in the greenhouse gas measure-  
15 ment and reporting system established under subsection  
16 (a).

17 (b) **ANNUAL REPORT.**—The Secretary of Commerce  
18 shall issue an annual report that identifies greenhouse  
19 emissions and trends on a local, regional, and national  
20 level. The report shall also identify emissions or reductions  
21 attributable to individual or multiple sources covered by  
22 the greenhouse gas measurement and reporting system es-  
23 tablished under section 201.

1     **TITLE III—CLIMATE CHANGE**  
2     **SCIENCE AND INFORMATION**  
3     **Subtitle A—Amendments to the**  
4     **Global Change Research Act of**  
5     **1990**

6     **SEC. 301. AMENDMENT OF GLOBAL CHANGE RESEARCH**  
7             **ACT OF 1990.**

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

14    **SEC. 302. CHANGES IN DEFINITIONS.**

15         Paragraph (1) of section 2 (15 U.S.C. 2921) is  
16    amended by striking “Earth and” inserting “Climate  
17    and”.

18    **SEC. 303. CHANGE IN COMMITTEE NAME.**

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

20             (1) by striking “EARTH AND” in the section  
21    heading and inserting “CLIMATE AND”; and

22             (2) by striking “Earth and” in subsection (a)  
23    and inserting “Climate and”.

1 **SEC. 304. CHANGE IN NATIONAL GLOBAL CHANGE RE-**  
2 **SEARCH PLAN.**

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

4 (1) by adding at the end of subsection (c) the  
5 following:

6 “(6) Methods for integrating information to  
7 provide predictive tools for planning and decision  
8 making by governments, communities and the pri-  
9 vate sector.”;

10 (2) by inserting “local, State, and Federal” be-  
11 fore “policy makers” in subsection (d)(3);

12 (3) by striking “and” in subsection (d)(2);

13 (4) by striking “change.” in subsection (d)(3)  
14 and inserting “change; and”;

15 (5) by adding at the end of subsection (d) the  
16 following:

17 “(4) establish a common assessment and mod-  
18 eling framework that may be used in both research  
19 and operations to predict and assess the vulner-  
20 ability of natural and managed ecosystems and of  
21 human society in the context of other environmental  
22 and social changes.”; and

23 (6) by adding at the end the following:

24 “(g) STRATEGIC PLAN; REVISED IMPLEMENTATION  
25 PLAN.—The Chairman of the Council, through the Com-  
26 mittee, shall develop a strategic plan for the United States

1 Global Climate Change Research Program for the 10-year  
2 period beginning in 2002 and submit the plan to the Con-  
3 gress within 180 days after the date of enactment of the  
4 Global Climate Change Act of 2001. The Chairman,  
5 through the Committee, shall also submit a revised imple-  
6 mentation plan under subsection (a).”.

7 **SEC. 305. INTEGRATED PROGRAM OFFICE.**

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

9 (1) by redesignating subsections (a), (b), and  
10 (c) as subsections (b), (c), and (d), respectively; and

11 (2) inserting before subsection (b), as redesign-  
12 nated, the following:

13 “(a) INTEGRATED PROGRAM OFFICE.—

14 “(1) ESTABLISHMENT.—There is established in  
15 the Office of Science and Technology Policy an inte-  
16 grated program office for the global change research  
17 program.

18 “(2) ORGANIZATION.—The integrated program  
19 office established under paragraph (1) shall be head-  
20 ed by the associate director for climate change and  
21 shall include a representative from each Federal  
22 agency participating in the global change research  
23 program.

24 “(3) FUNCTION.—The integrated program of-  
25 fice shall—

1           “(A) manage, working in conjunction with  
2 the Committee, interagency coordination and  
3 program integration of global change research  
4 activities and budget requests;

5           “(B) ensure that the activities and pro-  
6 grams of each Federal agency or department  
7 participating in the program address the goals  
8 and objectives identified in the strategic re-  
9 search plan and interagency implementation  
10 plans;

11           “(C) ensure program and budget rec-  
12 ommendations of the Committee are commu-  
13 nicated to the President and are integrated into  
14 the climate change action strategy;

15           “(D) review, solicit, and identify, and allo-  
16 cate funds for, partnership projects that ad-  
17 dress critical research objectives or operational  
18 goals of the program, including projects that  
19 would fill research gaps identified by the pro-  
20 gram, and for which project resources are  
21 shared among at least 2 agencies participating  
22 in the program; and

23           “(E) review and approve, in conjunction  
24 with the Committee, all annual appropriations

1 requests from Federal agencies or departments  
2 participating in the program.

3 “(4) CLEARANCE REQUIRED.—Notwithstanding  
4 any other provision of law to the contrary, no Fed-  
5 eral agency or department participating in the pro-  
6 gram may submit its annual appropriations request  
7 for program-related activities to the President with-  
8 out the approval of the Integrated Program Office.

9 “(5) GRANT AUTHORITY.—The Integrated Pro-  
10 gram Office may authorize 1 or more of the depart-  
11 ments or agencies participating in the program to  
12 enter into contracts and make grants, using funds  
13 appropriated for use by the Office of Science and  
14 Technology Policy for the purpose of carrying out  
15 the responsibilities of that Office.

16 “(6) FUNDING.—For fiscal year 2002, and each  
17 fiscal year thereafter, not less than \$13,000,000  
18 shall be made available to the Integrated Program  
19 Office from amounts appropriated to or for the use  
20 of the Office of Science and Technology Policy.”;

21 (3) by striking “Committee.” in paragraph (2)  
22 of subsection (c), as redesignated, and inserting  
23 “Committee and the Integrated Program Office.”;  
24 and

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

4   **SEC. 306. CHANGES IN REFERENCE TO NATIONAL CLIMATE**  
5                           **PROGRAM.**

6           Section 108 (15 U.S.C. 2938) is amended—

7           (1) by striking “PROGRAM” in the heading for  
8           subsection (a) and inserting “SERVICE”; and

9           (2) by striking “Program, established by the  
10          National Climate Program Act (15 U.S.C. 2901 et  
11          seq.),” and inserting “ Service, established by the  
12          National Climate Service Act (15 U.S.C. 2901 et  
13          seq.),”.

14                   **Subtitle B—National Climate**  
15                   **Services and Monitoring**

16   **SEC. 351. AMENDMENT OF NATIONAL CLIMATE PROGRAM**  
17                           **ACT.**

18          Except as otherwise expressly provided, whenever in  
19          this subtitle an amendment or repeal is expressed in terms  
20          of an amendment to, or repeal of, a section or other provi-  
21          sion, the reference shall be considered to be made to a  
22          section or other provision of the National Climate Pro-  
23          gram Act (15 U.S.C. 2901 et seq.).

1 **SEC. 352. CHANGE IN SHORT TITLE OF ACT.**

2 (a) IN GENERAL.—Section 1 of the National Climate  
3 Program Act (15 U.S.C. 2901 nt) is amended by striking  
4 “Program” and inserting “Service”.

5 (b) REFERENCES TO ACT BY FORMER SHORT  
6 TITLE.—Except when inappropriate, any reference in any  
7 law, Executive order, or other document—

8 (1) to the National Climate Program Act shall  
9 include a reference to the National Climate Service  
10 Act; and

11 (2) to the National Climate Service Act shall in-  
12 clude a reference to the provisions of law formerly  
13 known as the National Climate Program Act.

14 **SEC. 353. CHANGES IN FINDINGS.**

15 Section 2 (15 U.S.C. 2901) is amended—

16 (1) by striking “Weather and climate change  
17 affect” in paragraph (1) and inserting “Weather, cli-  
18 mate change, and long-term weather fluctuations af-  
19 fect public safety, environmental security, human  
20 health,”;

21 (2) by striking “climate” in paragraph (2) and  
22 inserting “climate, including seasonal and decadal  
23 fluctuations,”;

24 (3) by striking “changes.” in paragraph (5) and  
25 inserting “changes and providing free exchange of  
26 meteorological data.”; and

1 (4) by adding at the end the following:

2 “(7) The present rate of advance in research  
3 and development is inadequate and new develop-  
4 ments must be incorporated rapidly into services for  
5 the benefit of the public.

6 “(8) The United States lacks adequate infra-  
7 structure and research to meet national climate  
8 monitoring and prediction needs.”.

9 **SEC. 354. CHANGE IN PURPOSE.**

10 Section 3 (15 U.S.C. 2902) is amended by striking  
11 “program” and inserting “service”.

12 **SEC. 355. “PROGRAM” CHANGED TO “SERVICE”.**

13 (a) DEFINITION.—Section 4 (15 U.S.C. 2903) is  
14 amended by striking paragraph (3) and inserting the fol-  
15 lowing:

16 “(3) The term “Service” means the National  
17 Climate Service.”.

18 (b) PROGRAM IN DEPARTMENT OF COMMERCE.—In  
19 section 5 (15 U.S.C. 2904) insert “in the Department of  
20 Commerce” after “Program”.

21 (c) CONFORMING AMENDMENTS.—The Act is  
22 amended—

23 (1) by striking “ Program” each place it ap-  
24 pears in sections 5(b)(2), 5(b)(3), 5(c)(2)(B),  
25 5(c)(4), 5(d), 5(d)(1), 5(d)(10) (as section 5(d) is

1 amended by section 355 of this Act), 5(e)(1),  
2 5(e)(2)(A), 5(f)(1), 5(f)(2), 5(g), 7(a), 7(b), 7(c),  
3 8(a), and 9 and inserting “Service”;

4 (2) by striking “program” each place it appears  
5 in sections 5(e)(2)(A) and 5(c)(3) and inserting  
6 “Service”;

7 (3) by striking “programs,” in section  
8 5(d)(10)(A) (as section 5(d) is amended by section  
9 355 of this Act) and inserting “Service”;

10 (4) by striking “PROGRAM” and inserting  
11 “SERVICE” in the headings for subsections (c), (d),  
12 and (e) of section 5; and

13 (5) by striking “**PROGRAM**” in the heading  
14 for section 5 and inserting “**SERVICE**”.

15 **SEC. 356. TOOLS FOR REGIONAL PLANNING.**

16 Section 5(d) (15 U.S.C. 2904(d)) is amended—

17 (1) by redesignating paragraphs (4) through  
18 (9) as paragraphs (5) through (10), respectively;

19 (2) by inserting after paragraph (3) the fol-  
20 lowing:

21 “(4) methods for improving modeling and pre-  
22 dictive capabilities and developing assessment meth-  
23 ods to guide national, regional, and local planning  
24 and decision-making on land use, water hazards, and  
25 related issues;”

1           (3) by inserting “sharing,” after “collection,” in  
2 paragraph (5), as redesignated;

3           (4) by striking “experimental” each place it ap-  
4 pears in paragraph (9), as redesignated;

5           (5) by striking “preliminary” in paragraph  
6 (10), as redesignated;

7           (6) by striking “this Act,” the first place it ap-  
8 pears in paragraph (10), as redesignated, and insert-  
9 ing “the Global Climate Change Act of 2001,”; and

10           (7) by striking “this Act,” the second place it  
11 appears in paragraph (10), as redesignated, and in-  
12 serting “that Act,”.

13 **SEC. 357. AUTHORIZATION OF APPROPRIATIONS.**

14 Section 9 (15 U.S.C. 2908) is amended—

15           (1) by striking “1979,” and inserting “2002,”;

16           (2) by striking “1980,” and inserting “2003,”;

17           (3) by striking “1981,” and inserting “2004,”;

18 and

19           (4) by striking “\$25,500,000” and inserting  
20 “\$75,500,000”.

21 **SEC. 358. NATIONAL CLIMATE SERVICE PLAN.**

22 The Act (15 U.S.C. 2901 et seq.) is amended by in-  
23 serting after section 5 the following:

1 **“SEC. 6. NATIONAL CLIMATE SERVICE PLAN.**

2 “Within one year after the date of enactment of the  
3 Global Climate Change Act of 2001, the Secretary of Com-  
4 merce shall submit to the Senate Committee on Com-  
5 merce, Science, and Transportation and the House  
6 Science Committee a plan of action for the National Cli-  
7 mate Service. The plan shall set forth recommendations  
8 and funding estimates for—

9 “(1) a national center for operational climate  
10 monitoring and predicting with the functional capac-  
11 ity to monitor and adjust observing systems as nec-  
12 essary to reduce bias;

13 “(2) the design, deployment, and operation of  
14 an adequate national climate observing system that  
15 builds upon existing environmental monitoring sys-  
16 tems and closes gaps in coverage by existing sys-  
17 tems;

18 “(3) the establishment of a national coordinated  
19 modeling strategy, including a national climate mod-  
20 eling center to provide a dedicated capability for cli-  
21 mate modeling and a regular schedule of projections  
22 on a long and short term time schedules and at a  
23 range of spatial scales;

24 “(4) improvements in modeling and assessment  
25 capabilities needed to integrate information to pre-  
26 dict regional and local climate changes and impacts;

1           “(5) in coordination with the private sector, im-  
2           proving the capacity to assess the impacts of pre-  
3           dicted and projected climate changes and variations;

4           “(6) a program for long term stewardship,  
5           quality control, development of relevant climate  
6           products, and efficient access to all relevant climate  
7           data, products, and critical model simulations; and

8           “(7) mechanisms to coordinate among Federal  
9           agencies, State and local government entities and  
10          the academic community to ensure timely and full  
11          sharing and dissemination of climate information  
12          and services, both domestically and internationally.”.

13 **SEC. 359. INTERNATIONAL PACIFIC RESEARCH AND CO-**  
14 **OPERATION.**

15          The Secretary of Commerce, in cooperation with the  
16          Administrator of the National Aeronautics and Space Ad-  
17          ministration, shall conduct international research in the  
18          Pacific region that will increase understanding of the na-  
19          ture and predictability of climate variability in the Asia-  
20          Pacific sector, including regional aspects of global environ-  
21          mental change. Such research activities shall be conducted  
22          in cooperation with other nations of the region. There are  
23          authorized to be appropriated for the purposes of this sec-  
24          tion \$1,500,000 to the National Oceanic and Atmospheric

1 Administration and \$1,500,000 to the National Aero-  
2 nautics and Space Administration.

3 **TITLE IV—CLIMATE CHANGE**  
4 **TECHNOLOGY**

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

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

8 (1) striking “and” after the semicolon in para-  
9 graph (21);

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

12 (3) by inserting after paragraph (21) the fol-  
13 lowing:

14 “(22) perform research to develop enhanced  
15 measurements, calibrations, standards, and tech-  
16 nologies which will enable the reduced production in  
17 the United States of greenhouse gases associated  
18 with global warming, including carbon dioxide, meth-  
19 ane, nitrous oxide, ozone, perfluorocarbons, hydro-  
20 fluorocarbons, and sulphur hexafluoride; and”.

21 **SEC. 402. MEASUREMENT AND VERIFICATION TECH-**  
22 **NOLOGIES.**

23 The Secretary of Commerce shall initiate a program  
24 to develop, with technical assistance from appropriate  
25 Federal agencies, innovative standards and measurement

1 technologies (including technologies for use in the system  
2 established under section 201(a) to measure carbon  
3 changes due to changes in land use cover) to calculate—

4 (1) greenhouse gas emissions and reductions  
5 from agriculture, forestry, and other land use prac-  
6 tices;

7 (2) non-carbon dioxide greenhouse gas emis-  
8 sions from transportation;

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

11 (4) any other greenhouse gas emissions or re-  
12 ductions for which no accurate or reliable measure-  
13 ment technology exists.

14 **SEC. 403. ENHANCED ENVIRONMENTAL MEASUREMENTS**  
15 **AND STANDARDS.**

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

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

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

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

22 **“(a) IN GENERAL.—**The Director shall establish  
23 within the Institute a program to perform and support re-  
24 search on global climate change standards and processes,  
25 with the goal of providing scientific and technical knowl-

1 edge applicable to the reduction of greenhouse gases (as  
2 defined in section 4 of the Global Climate Change Act of  
3 2001).

4 “(b) RESEARCH PROGRAM.—

5 “(1) IN GENERAL.—The Director is authorized  
6 to conduct, directly or through contracts or grants,  
7 a global climate change standards and processes re-  
8 search program.

9 “(2) RESEARCH PROJECTS.—The specific con-  
10 tents and priorities of the research program shall be  
11 determined in consultation with appropriate Federal  
12 agencies, including the Environmental Protection  
13 Agency, the National Oceanic and Atmospheric Ad-  
14 ministration, the National Aeronautics and Space  
15 Administration, and the National Science Founda-  
16 tion. The program generally shall include basic and  
17 applied research—

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

22 “(B) to assist in establishing of a baseline  
23 reference point for future trading in greenhouse  
24 gases and the measurement of progress in emis-  
25 sions reduction;

1           “(C) that will be exchanged internationally  
2           as scientific or technical information which has  
3           the stated purpose of developing mutually rec-  
4           ognized measurements, standards, and proce-  
5           dures for reducing greenhouse gases; and

6           “(D) to assist in developing improved in-  
7           dustrial processes designed to reduce or elimi-  
8           nated greenhouse gases.

9           “(c) NATIONAL MEASUREMENT LABORATORIES.—

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

18           “(2) MATERIAL, PROCESS, AND BUILDING RE-  
19           SEARCH.—The National Measurement Laboratories  
20           shall conduct research under this subsection that  
21           includes—

22           “(A) material and manufacturing processes  
23           which are designed for energy efficiency and re-  
24           duced greenhouse gas emissions into the envi-  
25           ronment;

1           “(B) developing environmentally-friendly,  
2           ‘green’ chemical processes to be used by indus-  
3           try; and

4           “(C) enhancing building performance with  
5           a focus in developing standards or tools which  
6           will help incorporate low or no-emission tech-  
7           nologies into building designs.

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

18          “(d) NATIONAL VOLUNTARY LABORATORY ACCREDI-  
19          TATION PROGRAM.—The Director shall utilize the Na-  
20          tional Voluntary Laboratory Accreditation Program under  
21          this section to establish a program to include specific cali-  
22          bration or test standards and related methods and proto-  
23          cols assembled to satisfy the unique needs for accredita-  
24          tion in measuring the production of greenhouse gases. In  
25          carrying out this subsection the Director may cooperate

1 with other departments and agencies of the Federal Gov-  
2 ernment, State and local governments, and private organi-  
3 zations.”.

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

5 (a) **ADVANCED TECHNOLOGY PROGRAM COMPETI-**  
6 **TIONS.**—The Director of the National Institute of Stand-  
7 ards and Technology, through the Advanced Technology  
8 Program, may hold a portion of the Institute’s competi-  
9 tions in thematic areas, selected after consultation with  
10 industry, academics, and other Federal Agencies, designed  
11 to develop and commercialize enabling technologies to ad-  
12 dress global climate change by significantly reducing  
13 greenhouse gas emissions and concentrations in the at-  
14 mosphere.

15 (b) **MANUFACTURING EXTENSION PARTNERSHIP**  
16 **PROGRAM FOR “GREEN” MANUFACTURING.**—The Direc-  
17 tor of the National Institute of Standards and Technology,  
18 through the Manufacturing Extension Partnership Pro-  
19 gram, may develop a program to support the implementa-  
20 tion of new “green” manufacturing technologies and tech-  
21 niques by the more than 380,000 small manufacturers,  
22 with particular emphasis on improving the energy effi-  
23 ciency of electric motors.

1 **SEC. 405. TRANSFER OF GREENHOUSE GAS REDUCTION**  
2 **TECHNOLOGY .**

3 (a) ESTABLISHMENT.—The Secretary of Commerce  
4 shall establish a technology transfer program for emissions  
5 reduction and energy efficiency technologies. In selecting  
6 technologies for promotion through this program, the Sec-  
7 retary shall consult with the Department of Energy, the  
8 Agency for International Development, the Environmental  
9 Protection Agency, and other appropriate Federal agen-  
10 cies.

11 (b) FOCUS AREAS.—The program shall—

12 (1) promote the transfer of United States emis-  
13 sions reduction technologies to developing countries  
14 and countries in transition that are likely to have  
15 greenhouse gas emissions increases over the next 20  
16 years;

17 (2) promote the transfer of United States emis-  
18 sions reduction technologies to clean development  
19 and technology transfer programs established under  
20 the Framework Convention on Climate Change and  
21 other international agreements;

22 (3) identify technology, policy, and market op-  
23 portunities for transfer and development of such  
24 technologies; and

1           (4) make recommendations to other appropriate  
2       Federal agencies to improve Federal participation in  
3       the program.

4       (c) **ADVISORY COMMITTEE.**—The Secretary shall es-  
5       tablish an advisory committee composed of representatives  
6       of industry, academics, and other interested groups to pro-  
7       vide advice on the development, deployment, and export  
8       of greenhouse gas reduction technologies.

9       **TITLE V—CLIMATE ADAPTATION**  
10       **AND HAZARDS PREVENTION**  
11       **Subtitle A—Assessment and**  
12       **Adaptation**

13       **SEC. 501. REGIONAL CLIMATE ASSESSMENT AND ADAPTA-**  
14       **TION.**

15       (a) **IN GENERAL.**—The President shall establish  
16       within the Department of Commerce a National Climate  
17       Vulnerability and Adaptation Program for regional im-  
18       pacts related to increasing concentrations of greenhouse  
19       gases in the atmosphere and climate variability.

20       (b) **COORDINATION.**—In designing such program the  
21       Secretary shall consult with the Climate Change Task  
22       Force to ensure involvement of, and coordination with, ap-  
23       propriate Federal, State, and local government entities.

24       (c) **REGIONAL VULNERABILITY ASSESSMENTS.**—The  
25       program shall—

1           (1) evaluate, based on predictions developed  
2           under this Act, the National Climate Service Act (15  
3           U.S.C. 2901 et seq.), and the global climate mod-  
4           eling community, regional vulnerability to phe-  
5           nomena associated with climate change and climate  
6           variability, including—

7                   (A) increases in severe weather events;

8                   (B) sea level rise and shifts in the  
9                   hydrological cycle;

10                  (C) natural hazards, including tsunami,  
11                  drought, flood and fire; and

12                  (D) alteration of ecological communities at  
13                  the ecosystem or watershed level; and

14           (2) build upon predictions and other informa-  
15           tion developed in the National Assessments prepared  
16           under the Global Change Research Act of 1990 (15  
17           U.S.C. 2921 et seq.).

18           (d) PREPAREDNESS RECOMMENDATIONS.—The pro-  
19           gram shall submit a report to Congress within 2 years  
20           after the date of enactment of this Act that identifies and  
21           recommends implementation and funding strategies for  
22           short and long-term actions that may be taken at the na-  
23           tional, regional, State, and local level—

24                   (1) to minimize threats to human life and prop-  
25                   erty,

- 1           (2) to improve resilience to hazards,  
2           (3) to minimize economic impacts; and  
3           (4) to reduce threats to critical biological and  
4           ecological processes.

5           (e) INFORMATION AND TECHNOLOGY.—The Sec-  
6           retary shall make available appropriate information and  
7           other technologies and products that will assist national,  
8           regional, State, and local efforts to reduce loss of life and  
9           property, and coordinate dissemination of such tech-  
10          nologies and products.

11          (f) AUTHORIZATION OF APPROPRIATIONS.—There  
12          are authorized to be appropriated to the Secretary of Com-  
13          merce \$4,500,000 to implement the requirements of this  
14          section.

15          **SEC. 502. COASTAL VULNERABILITY AND ADAPTATION.**

16          (a) COASTAL VULNERABILITY.—Within 2 years after  
17          the date of enactment of this Act, the Secretary shall, in  
18          consultation with the appropriate Federal, State, and local  
19          governmental entities, conduct regional assessments of the  
20          vulnerability of coastal areas to hazards associated with  
21          climate change, climate variability, sea level rise, and fluc-  
22          tuation of Great Lakes water levels. The Secretary may  
23          also consult with the governments of Canada and Mexico  
24          as appropriate in developing such regional assessments. In  
25          preparing the regional assessments, the Secretary shall

1 collect and compile current information on climate change,  
2 sea level rise, natural hazards, and coastal erosion and  
3 mapping, and specifically address impacts on Arctic re-  
4 gions and the Central, Western, and South Pacific regions.

5 The regional assessments shall include an evaluation of—

6           (1) social impacts associated with threats to  
7           and potential losses of housing, communities, and in-  
8           frastructure;

9           (2) physical impacts such as coastal erosion,  
10          flooding and loss of estuarine habitat, saltwater in-  
11          trusion of aquifers and saltwater encroachment, and  
12          species migration; and

13          (3) economic impact on local, State, and re-  
14          gional economies, including the impact on abundance  
15          or distribution of economically important living ma-  
16          rine resources.

17          (b) COASTAL ADAPTATION PLAN.—The Secretary  
18 shall, within 3 years after the date of enactment of this  
19 Act, submit to the Congress a national coastal adaptation  
20 plan, composed of individual regional adaptation plans  
21 that recommend targets and strategies to address coastal  
22 impacts associated with climate change, sea level rise, or  
23 climate variability. The plan shall be developed with the  
24 participation of other Federal, State, and local govern-  
25 ment agencies that will be critical in the implementation

1 of the plan at the State and local levels. The regional plans  
2 that will make up the national coastal adaptation plan  
3 shall be based on the information contained in the regional  
4 assessments and shall identify special needs associated  
5 with Arctic areas and the Central, Western, and South  
6 Pacific regions. The Plan shall recommend both short and  
7 long-term adaptation strategies and shall include rec-  
8 ommendations regarding—

9           (1) Federal flood insurance program modifica-  
10        tions;

11           (2) areas that have been identified as high risk  
12        through mapping and assessment;

13           (3) mitigation incentives such as rolling ease-  
14        ments, strategic retreat, State or Federal acquisition  
15        in fee simple or other interest in land, construction  
16        standards, and zoning;

17           (4) land and property owner education;

18           (5) economic planning for small communities  
19        dependent upon affected coastal resources, including  
20        fisheries; and

21           (6) funding requirements and mechanisms.

22        (c) TECHNICAL PLANNING ASSISTANCE.—The Sec-  
23        retary, through the National Ocean Service, shall establish  
24        a coordinated program to provide technical planning as-  
25        sistance and products to coastal States and local govern-

1 ments as they develop and implement adaptation or miti-  
2 gation strategies and plans. Products, information, tools  
3 and technical expertise generated from the development of  
4 the regional assessments and the regional adaptation  
5 plans will be made available to coastal States for the pur-  
6 poses of developing their own State and local plans.

7 (d) COASTAL ADAPTATION GRANTS.—The Secretary  
8 shall provide grants of financial assistance to coastal  
9 States with Federally approved coastal zone management  
10 programs to develop and begin implementing coastal adap-  
11 tation programs if the State provides a Federal-to-state  
12 match of 4 to 1 in the first fiscal year, 2.3 to 1 in the  
13 second fiscal year, 2 to 1 in the third fiscal year, and 1  
14 to 1 thereafter. Distribution of these funds to coastal  
15 states shall be based upon the formula established under  
16 section 306(c) of the Coastal Zone Management Act of  
17 1972 (16 U.S.C. 1455(c)), adjusted in consultation with  
18 the States as necessary to provide assistance to particu-  
19 larly vulnerable coastlines.

20 (e) COASTAL RESPONSE PILOT PROGRAM.—

21 (1) IN GENERAL.—The Secretary shall establish  
22 a 4-year pilot program to provide financial assist-  
23 ance to coastal communities most adversely affected  
24 by the impact of climate change or climate varia-

1 bility that are located in States with Federal-ap-  
2 proved coastal zone management programs.

3 (2) ELIGIBLE PROJECTS.—A project is eligible  
4 for financial assistance under the pilot program if  
5 it—

6 (A) will restore or strengthen coastal re-  
7 sources, facilities, or infrastructure that have  
8 been damaged by such an impact, as deter-  
9 mined by the Secretary;

10 (B) meets the requirements of the Coastal  
11 Zone Management Act (16 U.S.C. 1451 et seq.)  
12 and is consistent with the coastal zone manage-  
13 ment plan of the State in which it is located;  
14 and

15 (C) will not cost more than \$100,000.

16 (3) FUNDING SHARE.—The Federal funding  
17 share of any project under this subsection may not  
18 exceed 75 percent of the total cost of the project. In  
19 this administration of this paragraph—

20 (A) the Secretary may take into account  
21 in-kind contributions and other non-cash sup-  
22 port of any project to determine the Federal  
23 funding share for that project; and

1 (B) the Secretary may waive the require-  
 2 ments of this paragraph for a project in a com-  
 3 munity if—

4 (i) the Secretary determines that the  
 5 project is important; and

6 (ii) the economy and available re-  
 7 sources of the community in which the  
 8 project is to be conducted are insufficient  
 9 to meet the non-Federal share of the  
 10 project's costs.

11 (f) CZMA TERMS.—Any term used in this section  
 12 that is defined in section 304 of the Coastal Zone Manage-  
 13 ment Act of 1972 (16 U.S.C. 1453) has the meaning given  
 14 it by that section.

15 (g) AUTHORIZATION OF APPROPRIATIONS.—There  
 16 are authorized to be appropriated—

17 (1) \$5,00,000 annually for coastal adaptation  
 18 grants under subsection (d); and

19 (2) \$3,000,000 for each of fiscal years 2003  
 20 through 2006 for the pilot program established  
 21 under subsection (e).

## 22 **Subtitle B—Pilot Programs; Grants**

### 23 **SEC. 551. FORECASTING PROJECTS.**

24 (a) IN GENERAL.—The Administrator of the Na-  
 25 tional Aeronautics and Space Administration shall estab-

1 lish, through the National Oceanic and Atmospheric Ad-  
2 ministration's Coastal Services Center, a program of  
3 grants for competitively awarded pilot projects to explore  
4 the integrated use of sources of remote sensing and other  
5 geospatial information to address State, local, regional,  
6 and tribal agency needs to forecast a plan for adaptation  
7 to coastal zone and land use changes that may result as  
8 a consequence of global climate change or climate varia-  
9 bility.

10 (b) PREFERRED PROJECTS.—In awarding grants  
11 under this section, the Center shall give preference to  
12 projects that—

13 (1) focus on areas that are most sensitive to the  
14 consequences of global climate change or climate  
15 variability;

16 (2) make use of existing public or commercial  
17 data sets;

18 (3) integrate multiple sources of geospatial in-  
19 formation, such as geographic information system  
20 data, satellite-provided positioning data, and re-  
21 motely sensed data, in innovative ways;

22 (4) offer diverse, innovative approaches that  
23 may serve as models for establishing a future coordi-  
24 nated framework for planning strategies for adapta-

1 tion to coastal zone and land use changes related to  
2 global climate change or climate variability;

3 (5) include funds or in-kind contributions from  
4 non-Federal sources;

5 (6) involve the participation of commercial enti-  
6 ties that process raw or lightly processed data, often  
7 merging that data with other geospatial information,  
8 to create data products that have significant value  
9 added to the original data; and

10 (7) taken together demonstrate as diverse a set  
11 of public sector applications as possible.

12 (c) OPPORTUNITIES.—In carrying out this section,  
13 the Center shall seek opportunities to assist—

14 (1) in the development of commercial applica-  
15 tions potentially available from the remote sensing  
16 industry; and

17 (2) State, local, regional, and tribal agencies in  
18 applying remote sensing and other geospatial infor-  
19 mation technologies for management and adaptation  
20 to coastal and land use consequences of global cli-  
21 mate change or climate variability.

22 (d) DURATION.—Assistance for a pilot project under  
23 subsection (a) shall be provided for a period of not more  
24 than 3 years.

1 (e) RESPONSIBILITIES OF GRANTEES.—Within 180  
2 days after completion of a grant project, each recipient  
3 of a grant under subsection (a) shall transmit a report  
4 to the Center on the results of the pilot project and con-  
5 duct at least one workshop for potential users to dissemi-  
6 nate the lessons learned from the pilot project as widely  
7 as feasible.

8 (f) REGULATIONS.—The Center shall issue regula-  
9 tions establishing application, selection, and implementa-  
10 tion procedures for pilot projects, and guidelines for re-  
11 ports and workshops required by this section.

12 **SEC. 552. DATABASE ESTABLISHMENT.**

13 The Center shall establish and maintain an elec-  
14 tronic, Internet-accessible database of the results of each  
15 pilot project completed under section 551.

16 **SEC. 553. DEFINITIONS.**

17 In this subtitle:

18 (1) CENTER.—The term “Center” means the  
19 Coastal Services Center of the National Oceanic and  
20 Atmospheric Administration.

21 (2) GEOSPATIAL INFORMATION.—The term  
22 “geospatial information” means knowledge of the  
23 nature and distribution of physical and cultural fea-  
24 tures on the landscape based on analysis of data

1 from airborne or spaceborne platforms or other  
2 types and sources of data.

3 **SEC. 554. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Ad-  
5 ministrator to carry out the provisions of this subtitle—

6 (1) \$15,000,000 for fiscal year 2002;

7 (2) \$17,500,000 for fiscal year 2003;

8 (3) \$20,000,000 for fiscal year 2004;

9 (4) \$22,500,000 for fiscal year 2005; and

10 (5) \$25,000,000 for fiscal year 2006.

11 **TITLE VI—OCEAN AND COASTAL**  
12 **OBSERVING SYSTEM**

13 **SEC. 601. OCEAN AND COASTAL OBSERVING SYSTEM.**

14 (a) ESTABLISHMENT.—The President, through the  
15 National Ocean Research Leadership Council, established  
16 by section 7902(a) of title 10, United States Code, shall  
17 establish and maintain an integrated ocean and coastal ob-  
18 serving system that provides for long-term, continuous,  
19 and real-time observations of the oceans and coasts for  
20 the purposes of—

21 (1) understanding, assessing and responding to  
22 human-induced and natural processes of global  
23 change;

24 (2) improving weather forecasts and public  
25 warnings;

1           (3) strengthening national security and military  
2 preparedness;

3           (4) enhancing the safety and efficiency of ma-  
4 rine operations;

5           (5) supporting efforts to restore the health of  
6 and manage coastal and marine ecosystems and liv-  
7 ing resources;

8           (6) monitoring and evaluating the effectiveness  
9 of ocean and coastal environmental policies;

10          (7) reducing and mitigating ocean and coastal  
11 pollution; and

12          (8) providing information that contributes to  
13 public awareness of the state and importance of the  
14 oceans.

15          (b) COUNCIL FUNCTIONS.—In addition to its respon-  
16 sibilities under section 7902(a) of such title, the Council  
17 shall be responsible for planning and coordinating the ob-  
18 serving system and in carrying out this responsibility  
19 shall—

20           (1) develop and submit to the Congress, within  
21 6 months after the date of enactment of this Act, a  
22 plan for implementing a national ocean and coastal  
23 observing system that—

1 (A) uses an end-to end engineering and de-  
2 velopment approach to develop a system design  
3 and schedule for operational implementation;

4 (B) determines how current and planned  
5 observing activities can be integrated in a cost-  
6 effective manner;

7 (C) provides for regional and concept dem-  
8 onstration projects;

9 (D) describes the role and estimated budg-  
10 et of each Federal agency in implementing the  
11 plan;

12 (E) contributes, to the extent practicable,  
13 to the National Global Change Research Plan  
14 under section 104 of the Global Change Re-  
15 search Act of 1990 (15 U.S.C. 2934); and

16 (F) makes recommendations for coordina-  
17 tion of ocean observing activities of the United  
18 States with those of other nations and inter-  
19 national organizations;

20 (2) serve as the mechanism for coordinating  
21 Federal ocean observing requirements and activities;

22 (3) work with academic, State, industry and  
23 other actual and potential users of the observing sys-  
24 tem to make effective use of existing capabilities and  
25 incorporate new technologies;

1           (4) approve standards and protocols for the ad-  
2           ministration of the system, including—

3                   (A) a common set of measurements to be  
4                   collected and distributed routinely and by uni-  
5                   form methods;

6                   (B) standards for quality control and as-  
7                   sessment of data;

8                   (C) design, testing and employment of  
9                   forecast models for ocean conditions;

10                  (D) data management, including data  
11                  transfer protocols and archiving; and

12                  (E) designation of coastal ocean observing  
13                  regions; and

14           (5) in consultation with the Secretary of State,  
15           provide representation at international meetings on  
16           ocean observing programs and coordinate relevant  
17           Federal activities with those of other nations.

18           (c) SYSTEM ELEMENTS.—The integrated ocean and  
19           coastal observing system shall include the following ele-  
20           ments:

21                   (1) A nationally coordinated network of regional  
22                   coastal ocean observing systems that measure and  
23                   disseminate a common set of ocean observations and  
24                   related products in a uniform manner and according

1 to sound scientific practice, but that are adapted to  
2 local and regional needs.

3 (2) Ocean sensors for climate observations, in-  
4 cluding the Arctic Ocean and sub-polar seas.

5 (3) Coastal, relocatable, and cabled sea floor  
6 observatories.

7 (4) Broad bandwidth communications that are  
8 capable of transmitting high volumes of data from  
9 open ocean locations at low cost and in real time.

10 (5) Ocean data management and assimilation  
11 systems that ensure full use of new sources of data  
12 from space-borne and in situ sensors.

13 (6) Focused research programs.

14 (7) Technology development program to develop  
15 new observing technologies and techniques, including  
16 data management and dissemination.

17 (8) Public outreach and education.

18 **SEC. 602. AUTHORIZATION OF APPROPRIATIONS.**

19 For development and implementation of an inte-  
20 grated ocean and coastal observation system under this  
21 title, including financial assistance to regional coastal  
22 ocean observing systems, there are authorized to be appro-  
23 priated \$135,000,000 in fiscal year 2002, \$235,000,000  
24 in fiscal year 2003, \$315,000,000 in fiscal year 2004,

- 1 \$390,000,000 in fiscal year 2005, and \$445,000,000 in
- 2 fiscal year 2006.

○