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## **Weather Mitigation Research and Development Policy Authorization Act of 2007 (Introduced in Senate)**

S 1807 IS

110th CONGRESS

1st Session

**S. 1807**

To establish the Weather Mitigation Advisory and Research Board, and for other purposes.

**IN THE SENATE OF THE UNITED STATES**

**July 17, 2007**

Mrs. HUTCHISON 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 establish the Weather Mitigation Advisory and Research Board, and for other purposes.

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

### **SECTION 1. SHORT TITLE.**

This Act may be cited as the `Weather Mitigation Research and Development Policy Authorization Act of 2007'.

### **SEC. 2. PURPOSE.**

It is the purpose of this Act to develop and implement a comprehensive and coordinated national weather mitigation policy and a national cooperative Federal and State program of weather mitigation research and development.

### **SEC. 3. FINDINGS.**

Congress finds the following:

(1) According to a 2003 report by the National Research Council, `people in drought- and hail-prone areas willingly spend significant resources on weather mitigation programs, and in 2001 there were at least 66 operational programs being conducted in 10 States across the United States. At the same time, less than a handful of weather mitigation

research programs are underway worldwide, and related research in the United States has dropped to less than \$500,000 per year from a high of \$20,000,000 in the late 1970s.' The NRC report entitled 'Critical Issues in Weather Modification Research' also states that 'a coordinated national program of weather modification research is needed'. Such a program is supported by States that need a scientific means of evaluating current programs and increasing their effectiveness through applied research.

(2) Droughts in the United States result in an average economic loss between \$6,000,000,000 and \$8,000,000,000 annually, while severe hail producing storms result in up to \$2,300,000,000 damage to crops and over \$2,000,000,000 in property loss annually. Snowpack, rain enhancement, and hail suppression weather mitigation projects help reduce these losses, and additional research in these areas will make existing programs even more effective and permit them to better quantify their impacts. Recent droughts in the Western United States have produced low lake levels at Lake Powell and Lake Mead and have led the Seven Colorado River Basin States to create cooperative agreements. A separate cooperative agreement is in place for wintertime snowfall enhancement programs in the States of Utah, Colorado, and Wyoming to pursue water augmentation to benefit the entire Colorado River System.

(3) Past and recent evaluations of the potential for snowpack augmentation by cloud seeding in the Colorado River Basin indicate a significant yield in runoff can be attained through properly designed projects. A 2006 evaluation by the Bureau of Reclamation of the Department of the Interior indicates the potential for 800,000 additional acre-feet of water.

(4) The impacts of possible climate change and the human impact on weather are not well understood. Weather mitigation research could provide data on what, if any, impact pollution may have on the precipitation processes in cloud systems. Research into inadvertent and planned weather mitigation may increase our understanding and

knowledge of any potential impacts.

(5) The recent Weather Damage Modification Program conducted by the Bureau of Reclamation employed a successful model for combining local, State, and Federal resources in providing a means for scientific evaluation of operational cloud-seeding projects (rainfall and snowfall enhancement and hail suppression) in North Dakota, Oklahoma, Texas, Colorado, Utah, Nevada, and California.

## **SEC. 4. DEFINITIONS.**

In this Act:

(1) BOARD- The term `Board' means the Weather Mitigation Advisory and Research Board established under section 5(a).

(2) EXECUTIVE DIRECTOR- The term `Executive Director' means the Executive Director of the Board appointed under section 5(d).

(3) RESEARCH AND DEVELOPMENT- The term `research and development' means theoretical analysis, exploration, experimentation, and the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes.

## **SEC. 5. WEATHER MITIGATION ADVISORY AND RESEARCH BOARD ESTABLISHED.**

(a) Establishment- There is established in the National Science Foundation the Weather Mitigation Advisory and Research Board to establish and coordinate the national research and

development program on weather mitigation described in section 6.

(b) Membership-

(1) COMPOSITION- The Board shall consist of 11 members appointed by the Director of the National Science Foundation as follows:

(A) At least 2 members shall be representatives of States that are currently supporting operational weather mitigation programs.

(B) At least 2 members shall be a representative of the National Center for Atmospheric Research of the National Science Foundation.

(C) At least 1 member shall be a representative of National Aeronautics and Space Administration.

(D) At least 1 member shall be a representative of the American Meteorological Society.

(E) At least 1 member shall be a representative of the American Society of Civil Engineers.

(F) At least 1 member shall be a representative of the National Academy of Sciences.

(G) At least 1 member shall be a representative of the National Oceanic and Atmospheric Administration of the Department of Commerce.

(H) At least 1 member shall be a representative of the Department of Agriculture.

(I) At least 1 member shall be a representative of institutions of higher education or

research institutes with experience in the field.

(2) TENURE- A member of the Board shall serve at the pleasure of the Director of the National Science Foundation.

(3) VACANCIES- Any vacancy on the Board shall be filled in the same manner as the original appointment.

(c) Chair and Vice Chair- The Board shall select a Chair and Vice Chair from among its members.

(d) Staff- The Chair of the Board may appoint and terminate an executive director and such other additional personnel as may be necessary to enable the Board to perform its duties. The employment of an executive director shall be subject to confirmation by the Board.

(e) Advisory Committees- The Board may establish advisory committees to advise the Board and to make recommendations to the Board concerning legislation, policies, administration, research, and other matters.

(f) Initial Meeting- Not later than 30 days after the date on which all members of the Board have been appointed, the Board shall hold its first meeting.

(g) Meetings- The Board shall meet at the call of the Chair.

(h) Quorum- A majority of the members of the Board shall constitute a quorum, but a lesser number of members may hold hearings.

(i) Powers of the Board-

(1) STUDIES, INVESTIGATIONS, AND HEARINGS- The Board may conduct studies, obtain

information, and hold hearings necessary to carry out the purposes of this Act.

(2) COOPERATION WITH OTHER AGENCIES- The Board may cooperate with public or private agencies to promote the purposes of this Act.

(3) COOPERATIVE AGREEMENTS- The Board may enter into cooperative agreements with the head of any department or agency of the United States, an appropriate official of any State or political subdivision of a State, or an appropriate official of any private or public agency or organization to conduct research and development pertaining to weather mitigation.

(4) CONDUCTING AND CONTRACTING FOR RESEARCH AND DEVELOPMENT- The Executive Director, with the approval of the Board, may conduct or contract for research and development activities in accordance with section 6.

## **SEC. 6. NATIONAL RESEARCH AND DEVELOPMENT PROGRAM ON WEATHER MITIGATION.**

(a) Implementation Plan- Not later than 180 days after the date of the enactment of this Act, the Executive Director shall develop and submit to Congress a plan for the establishment and coordination of the national research and development program required by section 5(a). Such plan shall--

(1) for the 10-year period beginning in the year it is submitted, establish the goals and priorities for Federal research that most effectively advance scientific understanding of weather mitigation;

(2) describe specific activities required to achieve such goals and priorities, including funding of competitive research grants, training and support for scientists, and

participation in international research efforts;

(3) identify and address, as appropriate, relevant programs and activities of the Federal agencies and departments that would contribute to the program;

(4) consider and use, as appropriate, reports and studies conducted by Federal agencies and departments, weather modification organizations, and other expert scientific bodies, including the National Research Council report entitled `Critical Issues in Weather Modification Research';

(5) make recommendations for the coordination of program activities with weather mitigation activities of other national and international organizations; and

(6) estimate Federal funding for research activities to be conducted under the program.

(b) Program Activities- The national research and development program required by section 5(a) may include the following activities related to weather mitigation:

(1) Interdisciplinary research and development and coordination of research and development and activities to improve understanding of processes relating to planned and inadvertent weather mitigation, including the following:

(A) Research related to cloud and precipitation physics.

(B) Cloud dynamics and cloud modeling.

(C) Improving cloud seeding-related technologies.

(D) Severe weather and storm research.



(E) Research related to potential adverse affects of weather mitigation.

(2) Coordination with relevant organizations that engage in weather mitigation research.

(3) Development through partnerships among Federal agencies, State agencies with weather modification experience, and academic institutions of new technologies and approaches for weather mitigation.

(4) Establishing scholarships and educational opportunities that encourage an interdisciplinary approach to weather mitigation.

(5) Promotional activities in accordance with subsection (c).

(6) Administering the grant program described in subsection (d).

(c) Promotion of Research and Development- In order to assist in expanding the theoretical and practical knowledge of weather mitigation, the Board shall promote and fund research and development, studies, and investigations with respect to--

(1) improved forecast and decision-making technologies for weather mitigation operations, including tailored computer workstations and software and new observation systems with remote sensors; and

(2) assessments and evaluations of the efficacy of weather mitigation.

(d) Grant Program for Research and Development-

(1) IN GENERAL- The Board may establish a grant program for the award of grants to eligible entities for research and development projects that pertain to weather mitigation. To the extent practicable, the grant program shall be modeled after both the

Atmospheric Modification Program implemented by the National Oceanic and Atmospheric Administration in 1980, and the Weather Damage Modification Program implemented by the Bureau of Reclamation of the Department of the Interior in 2002.

(2) AMOUNT- The Board may not award a grant under this subsection in an amount that-

(A) is greater than \$500,000; or

(B) is less than \$50,000.

(3) FEDERAL SHARE- The Board may not award a grant under this subsection for a project if the Federal share of such project would be greater than 50 percent of the project cost, which may include in-kind services furnished by the participating State.

(4) ELIGIBLE ENTITIES- For purposes of this subsection, an eligible entity is a State agency, institution of higher education, or nonprofit organization that has--

(A) an established background and expertise in the field of weather mitigation; and

(B) experience with working with and coordinating with State agencies.

(5) USE OF FUNDS- A recipient of a grant under this subsection may only use the grant for a research and development project that--

(A) pertains to weather mitigation; and

(B) was in operation on the day before the date the grant was awarded.

## **SEC. 7. ANNUAL REPORT ON ACTIVITIES.**

(a) In General- Not later than January 31, and annually thereafter, the Executive Director shall prepare and submit to the President and Congress an annual report on the activities conducted pursuant to this Act during the preceding calendar year, including the following:

- (1) A summary of the achievements of Federal weather mitigation research, including Federally supported external research, during the preceding fiscal year.
- (2) An analysis of the progress made toward achieving the goals and objectives of the plan developed under section 6(a), including the identification of trends.
- (3) A copy or summary of the plan required by section 6(a) and any changes made to the plan.
- (4) A summary of agency budgets for weather mitigation activities for the preceding fiscal year.
- (5) Recommendations, if any, regarding additional action or legislation that may be required to assist in achieving the purposes of this Act.
- (6) A description of the relationship between research conducted on weather mitigation and research conducted pursuant to the Global Change Research Act of 1990 (15 U.S.C. 2921 et seq.), as well as research on weather forecasting and prediction.
- (7) A description of any potential adverse consequences on life, property, or water resource availability from weather mitigation efforts, and any suggested means of mitigating or reducing such consequences if such efforts are undertaken.

(b) First Report- The first report required by subsection (a) shall be submitted on January 31 in the second calendar year following the date of the enactment of this Act.

## **SEC. 8. COOPERATION WITH WEATHER MITIGATION ADVISORY AND RESEARCH BOARD.**

The head of any department or agency of the United States and the head of any other public or private agency or institution that receives research funds from the United States shall, to the extent practicable, cooperate with the Board for purposes of carrying out this Act.

## **SEC. 9. FUNDING.**

(a) Authorization of Appropriations- There are authorized to be appropriated to the Board for the purposes of carrying out this Act \$10,000,000 for each of the fiscal years 2008 through 2017. Amounts appropriated pursuant to this subsection shall remain available until expended.

(b) Gifts- The Board may accept, use, and dispose of gifts or donations of services or property.

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