MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Communications and Legislation Committee

April 8, 2008 Board Meeting

7-3

Subject

Express support for (1) S. 1807 (Hutchison, R-Texas), the Weather Mitigation Research and Development Policy Authorization Act of 2007; and (2) H.R. 3445 (Udall, D-Colorado), the Weather Mitigation Research and Technology Transfer Authorization Act of 2007

Description

Authorization is requested to express support for S. 1807 and H.R. 3445, bills which would articulate federal policy on weather modification and authorize funds for a cooperative program of research and development. Passage of these bills would improve the effectiveness of existing weather modification programs, thereby generating additional water for the benefit of the Colorado River System and by extension Metropolitan.

Background

Weather modification (including cloud seeding) projects have been operating in the United States since the 1950s. Currently there are over 74 projects in 23 countries worldwide. Weather modification has been identified by representatives of the Colorado River Basin states (Basin states) as an activity which could potentially increase snowpack and augment the flow of the Colorado River. Entities within the seven Basin states have executed three cooperative agreements to implement weather modification activities to increase precipitation in the Colorado River system watershed. The Colorado River Board of California's Executive Director, as California's representative of the Governor for Colorado River operations, has expressed the CRB's support for these bills (**Attachment 1**). Representatives of the other Basin states have indicated that they will express their support of these bills to their Congressional representatives.

Legislative Analysis

If enacted, S. 1807 (**Attachment 2**) or H.R. 3445 (**Attachment 3**) would develop and implement a coordinated national weather modification policy and a cooperative federal and state program for weather modification research and development. The 10-year program establishes goals and priorities for federal research; provides grants training, and support for scientists; and recommends coordination with weather modification activities of other national and international organizations.

Activities under this legislation include: funding research and development to further the understanding of planned and inadvertent weather modification processes; improving cloud seeding technologies; coordinating with other research activities; developing partnerships; providing scholarships and education; undertaking promotional activities; improving forecasting and decision-making technologies; performing evaluations; and administering grants.

The legislation establishes a grant program similar to previous National Oceanic and Atmospheric Administration and Bureau of Reclamation weather modification programs. It authorizes an appropriation of $10 million per year for ten years at a 50 percent federal cost-share. State agencies, universities, and organizations involved in weather modification are eligible to apply for funds. It allows for cooperative agreements with federal and state agencies, academic institutions, and other public and private organizations and requires annual reports to the President and Congress.

Differences Between the Bills

S. 1807 is a revised version of S. 517 which was not voted upon by the Senate in the 109th Congress. The North American Interstate Weather Modification Council (Council) provided input to S. 1807, which addresses issues raised during deliberations on S. 517. Metropolitan is a member of the Council. H.R. 3445 has not been revised to match the language of S. 1807 and so it remains almost identical to S. 517 as reported from the Senate Committee on Commerce, Science, and Transportation. We expect the differences between the bills to be reconciled through amendment or conference committee.

Importance to the Basin States and Metropolitan

The results cited from both research and operational programs in the Intermountain West (the region between the Rockies, Cascades, and Sierra Nevada mountain ranges) indicate a reasonable expectation that winter weather modification increases of 10 percent in snowpack can be attained through properly designed and operated projects. The Colorado River Basin drought has significantly reduced the amount of water in storage in Lakes Powell and Mead. Several evaluations of the potential for snowpack augmentation by cloud seeding in the Colorado River Basin indicate the potential, conservatively, for the generation of 800,000 acre-feet of additional water in a normal snowpack year. Language in S. 1807 specifically mentions the legislation's benefit to the Colorado River Basin. Also, weather modification has been identified as an adaptive strategy to delay the effects or reduce the severity of climate change. This bill would improve weather modification coordination efforts among federal and state agencies and provide funding for research and technology transfer, which would improve the effectiveness of existing programs and initiatives in the Colorado River Basin.

Policy

By Minute Item 41222, dated January 10, 1995, the Board adopted Colorado River Basin management policy principles.

By Minute Item 42820, dated February 10, 1998, the Board adopted Colorado River resources strategy policy principles.

By Minute Item 44813, dated March 12, 2002, the Board adopted global climate change and water resources planning policy principles.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is not defined as a project under CEQA because it involves continuing administrative activities, such as general policy and procedure making (Section 15378(b)(2) of the State CEQA Guidelines). In addition, where it can be seen with certainty that there is no possibility that the proposed action in question may have a significant effect on the environment, the proposed action is not subject to CEQA (Section 15061(b)(3) of the State CEQA Guidelines).

The CEQA determination is: Determine that the proposed action is not subject to CEQA pursuant to Sections 15378(b)(2) and 15061(b)(3) of the State CEQA Guidelines.

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and express support for S. 1807 and H.R. 3445.
Fiscal Impact: None
Business Analysis: These bills are a step in promoting and funding coordinated federal and state weather modification programs that would strengthen Metropolitan's water stewardship image and improve operations of weather modification programs in the Colorado River Basin.

Option #2

Take no action.

Fiscal Impact: None

Business Analysis: Non-support of these bills would not strengthen Metropolitan's water stewardship image regarding the Colorado River and miss an opportunity to promote and fund coordinated federal and state weather modification programs which could improve operations in the Colorado River Basin.

Staff Recommendation

Option #1

3/17/2008
Linda Waade *Date*
Deputy General Manager, External Affairs

3/19/2008
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Colorado River Board Letters

Attachment 2 – S. 1807

Attachment 3 – H.R. 3445

BLA #5994

STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

COLORADO RIVER BOARD OF CALIFORNIA
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1068
(818) 500-1625
(818) 543-4685 FAX

December 12, 2007

The Honorable Barbara Boxer
Committee on Commerce, Science and Transportation
U.S. Senate
112 Hart Senate Office Building
Washington, DC 20510

Dear Senator Boxer:

As one of your constituents, I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for S. 1807, *The Weather Mitigation Research and Development Policy Authorization Act of 2007* and respectfully request that you cosponsor S. 1807. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

As recommended by a 2003 National Research Council report entitled *Critical Issues in Weather Modification Research*, a federally-sponsored weather modification research program is needed and is supported by states that need a scientific means of evaluating current programs, as well as increasing their effectiveness through applied research. Droughts in the United States result in an average economic loss of $6 to 8 billion per year, while severe hail producing storms result in up to $2.3 billion in damage to crops and over $2 billion in property loss annually. Rain enhancement and hail suppression weather modification projects help mitigate these losses. Additional research in these areas is needed to make existing programs more effective and permit them to better quantify that effectiveness.

Recent droughts 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 cooperative agreement among the seven Colorado River Basin states is in place for wintertime cloud seeding in the states of Colorado, Utah, and Wyoming to pursue water augmentation to the benefit of the entire Colorado River System. Evaluations of the potential for snowpack augmentation by cloud seeding in the Colorado River Basin indicate that a significant yield in runoff can be attained through properly designed projects. A 2006 U.S. Bureau of Reclamation (USBR) evaluation indicates the potential for generating up to 800,000 additional acre-feet of water in an average year if the states were to implement new programs and designate new areas for cloud seeding.

Weather modification operations and regulation currently reside within state and local governments and it is the Board's belief that the federal role should be that of assistance with applied research and practical technology transfer programs. The recent USBR Weather Damage

Modification Program (WDMP) implemented a successful model for combining local, state, and federal resources in providing a means for scientific evaluation of operational rainfall, snowfall enhancement, and hail suppression projects in California, Colorado, Nevada, North Dakota, Oklahoma, Texas, and Utah. The Board supports this cooperative federal-state research model.

In correspondence to the Secretary of the Interior, the seven Colorado River Basin states recommended implementation of an expanded weather modification program as part of a package of actions to prepare for and respond to shortage conditions. Covering about one-twelfth the area of the coterminous United States and including parts of seven states and Mexico, the river basin is a major source of water supply for urban and agricultural areas throughout the arid Southwest. The Colorado River has historically provided about half of the imported water used in Southern California.

Passage of S. 1807 in the 110th Congress is key to the establishment of a comprehensive and coordinated national weather mitigation policy and to the funding of weather mitigation research. This legislation has the support of the Family Farm Alliance, the Western States Water Council, the Weather Modification Association, the North American Weather Modification Council, and a myriad of local interests including: ground water management districts, water conservation districts, water and sanitation districts, agricultural interests, and municipal and county governments.

This Board respectfully requests that a member of your staff contact Ms. Jamie Moore of Senator Hutchison's staff to add your name as a cosponsor to S. 1807, and help move this important legislation forward in the 110th Congress. Please do not hesitate to contact me at (818) 500-1625 should you have any questions.

Thank you in advance for your consideration of this request.

Sincerely,

Gerald R. Zimmerman
Executive Director

cc: Senator Kay Bailey Hutchison
284 Russell Senate Building
Washington, DC 20510

Mr. Dennis Strong, Director, Utah Division of Water Resources
Mr. Scott Balcomb, State of Colorado
Mr. Jay D. Bingham, Chairman, Colorado River Commission of Nevada
Mr. John R. D'Antonio Jr., State Engineer and Secretary, New Mexico Interstate Stream Commission
Mr. Herbert R. Guenther, Director, Arizona Department of Water Resources
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Mr. Lester A. Snow, Director, California Department of Water Resources

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ARNOLD SCHWARZENEGGER, Governor

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December 12, 2007

The Honorable Kay Bailey Hutchison
Committee on Commerce, Science and Transportation
U.S. Senate
284 Russell Senate Office Building
Washington, DC 20510

Dear Senator Hutchison:

I am writing to express the support of the Colorado River Board of California (Board) for S. 1807, *The Weather Mitigation Research and Development Policy Authorization Act of 2007*, which you have introduced. The Colorado River Board of California is the California State agency charged with protecting California's rights and interests in the resources provided by the Colorado River and representing California in discussions and negotiations regarding the Colorado River and its management.

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Sincerely,

Gerald R. Zimmerman
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cc: Mr. Dennis Strong, Director, Utah Division of Water Resources
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Mr. John R. D'Antonio Jr., State Engineer and Secretary, New Mexico Interstate Stream Commission
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STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor
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December 12, 2007

The Honorable Mark Udall
Committee on Science and Technology
U.S. House of Representatives
100 Cannon House Office Building
Washington, DC 20515

Dear Representative Udall:

I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007*, which you have introduced. The Colorado River Board of California is the California State agency charged with protecting California's rights and interests in the resources provided by the Colorado River and representing California in discussions and negotiations regarding the Colorado River and its management.

As recommended by a 2003 National Research Council report entitled *Critical Issues in Weather Modification Research*, a federally-sponsored weather modification research program is needed and is supported by states that need a scientific means of evaluating current programs, as well as increasing their effectiveness through applied research. Droughts in the United States result in an average economic loss of $6 to 8 billion per year, while severe hail producing storms result in up to $2.3 billion in damage to crops and over $2 billion in property loss annually. Rain enhancement and hail suppression weather modification projects help mitigate these losses. Additional research in these areas is needed to make existing programs more effective and permit them to better quantify that effectiveness.

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In correspondence to the Secretary of the Interior, the seven Colorado River Basin states recommended implementation of an expanded weather modification program as part of a package of actions to prepare for and respond to shortage conditions. Covering about one-twelfth the area of the coterminous United States and including parts of seven states and Mexico, the river basin is a major source of water supply for urban and agricultural areas throughout the arid Southwest. The Colorado River has historically provided about half of the imported water used in Southern California. Passage of H.R. 3445 in the 110th Congress is key to the establishment of a comprehensive and coordinated national weather mitigation policy and to the funding of weather mitigation research.

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STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

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December 12, 2007

The Honorable Lynn Woolsey
Committee on Science and Technology
U.S. House of Representatives
2263 Rayburn House Office Building
Washington, DC 20515

Dear Representative Woolsey:

I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007* and respectfully request that you cosponsor H.R. 3445. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

As recommended by a 2003 National Research Council report entitled *Critical Issues in Weather Modification Research*, a federally-sponsored weather modification research program is needed and is supported by states that need a scientific means of evaluating current programs, as well as increasing their effectiveness through applied research. Droughts in the United States result in an average economic loss of $6 to 8 billion per year, while severe hail producing storms result in up to $2.3 billion in damage to crops and over $2 billion in property loss annually. Rain enhancement and hail suppression weather modification projects help mitigate these losses. Additional research in these areas is needed to make existing programs more effective and permit them to better quantify that effectiveness.

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In correspondence to the Secretary of the Interior, the seven Colorado River Basin states recommended implementation of an expanded weather modification program as part of a package of actions to prepare for and respond to shortage conditions. Covering about one-twelfth the area of the coterminous United States and including parts of seven states and Mexico, the river basin is a major source of water supply for urban and agricultural areas throughout the arid Southwest. The Colorado River has historically provided about half of the imported water used in Southern California.

Passage of H.R. 3445 in the 110th Congress is key to the establishment of a comprehensive and coordinated national weather mitigation policy and to the funding of weather mitigation research. This legislation has the support of the Family Farm Alliance, the Western States Water Council, the Weather Modification Association, the North American Weather Modification Council, and a myriad of local interests including: ground water management districts, water conservation districts, water and sanitation districts, agricultural interests, and municipal and county governments.

This Board respectfully requests that a member of your staff contact Ms. Wendy Adams of Representative Mark Udall's staff to add your name as a cosponsor to H.R. 3445 and help move this important legislation forward in the 110th Congress. Please do not hesitate to contact me at (818) 500-1625 should you have any questions.

Thank you in advance for your consideration of this request.

Sincerely,

Gerald R. Zimmerman
Executive Director

cc: Representative Mark Udall, 100 Cannon House Office Building, Washington, DC 20515

Mr. Dennis Strong, Director, Utah Division of Water Resources
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STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

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770 FAIRMONT AVENUE, SUITE 100
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December 12, 2007

The Honorable Dana Rohrabacher
Committee on Science and Technology
U.S. House of Representatives
2300 Rayburn House Office Building
Washington, DC 20515

Dear Representative Rohrabacher:

I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007* and respectfully request that you cosponsor H.R. 3445. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

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This Board respectfully requests that a member of your staff contact Ms. Wendy Adams of Representative Mark Udall's staff to add your name as a cosponsor to H.R. 3445 and help move this important legislation forward in the 110th Congress. Please do not hesitate to contact me at (818) 500-1625 should you have any questions.

Thank you in advance for your consideration of this request.

Sincerely,

Gerald R. Zimmerman
Executive Director

cc: Representative Mark Udall, 100 Cannon House Office Building, Washington, DC 20515

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December 12, 2007

The Honorable Jerry McNerney
Committee on Science and Technology
U.S. House of Representatives
312 Cannon House Office Building
Washington, DC 20515

Dear Representative McNerney:

I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007* and respectfully request that you cosponsor H.R. 3445. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

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Executive Director

cc: Representative Mark Udall, 100 Cannon House Office Building, Washington, DC 20515

Mr. Dennis Strong, Director, Utah Division of Water Resources
Mr. Scott Balcomb, State of Colorado
Mr. Jay D. Bingham, Chairman, Colorado River Commission of Nevada
Mr. John R. D'Antonio Jr., State Engineer and Secretary, New Mexico Interstate Stream Commission
Mr. Herbert R. Guenther, Director, Arizona Department of Water Resources
Ms. Jennifer Gimbel, Director, Colorado Water Conservation Board
Ms. Patricia Mulroy, General Manager, Southern Nevada Water Authority
Mr. Patrick T. Tyrrell, State Engineer, Wyoming State Engineer's Office
Mr. Don A. Ostler, Executive Secretary/Director, Upper Colorado River Commission
Mr. Bart Fisher, Chairman, Colorado River Board of California
Mr. Jeffrey Kightlinger, General Manager, The Metropolitan Water District of Southern California
Mr. Lester A. Snow, Director, California Department of Water Resources

STATE OF CALIFORNIA - THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

COLORADO RIVER BOARD OF CALIFORNIA
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1068
(818) 500-1625
(818) 543-4685 FAX

December 12, 2007

The Honorable Laura Richardson
Committee on Science and Technology
U.S. House of Representatives
2233 Rayburn House Office Building
Washington, DC 20515

Dear Representative Richardson:

I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007* and respectfully request that you cosponsor H.R. 3445. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

As recommended by a 2003 National Research Council report entitled *Critical Issues in Weather Modification Research*, a federally-sponsored weather modification research program is needed and is supported by states that need a scientific means of evaluating current programs, as well as increasing their effectiveness through applied research. Droughts in the United States result in an average economic loss of $6 to 8 billion per year, while severe hail producing storms result in up to $2.3 billion in damage to crops and over $2 billion in property loss annually. Rain enhancement and hail suppression weather modification projects help mitigate these losses. Additional research in these areas is needed to make existing programs more effective and permit them to better quantify that effectiveness.

Recent droughts 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 cooperative agreement among the seven Colorado River Basin states is in place for wintertime cloud seeding in the states of Colorado, Utah, and Wyoming to pursue water augmentation to the benefit of the entire Colorado River System. Evaluations of the potential for snowpack augmentation by cloud seeding in the Colorado River Basin indicate that a significant yield in runoff can be attained through properly designed projects. A 2006 U.S. Bureau of Reclamation (USBR) evaluation indicates the potential for generating up to 800,000 additional acre-feet of water in an average year if the states were to implement new programs and designate new areas for cloud seeding.

Weather modification operations and regulation currently reside within state and local governments and it is the Board's belief that the federal role should be that of assistance with applied research and practical technology transfer programs. The recent USBR Weather Damage Modification Program (WDMP) implemented a successful model for combining local, state, and federal resources in providing a means for scientific evaluation of operational rainfall, snowfall enhancement, and hail suppression projects in California, Colorado, Nevada, North Dakota, Oklahoma, Texas, and Utah. The Board supports this cooperative federal-state research model.

In correspondence to the Secretary of the Interior, the seven Colorado River Basin states recommended implementation of an expanded weather modification program as part of a package of actions to prepare for and respond to shortage conditions. Covering about one-twelfth the area of the coterminous United States and including parts of seven states and Mexico, the river basin is a major source of water supply for urban and agricultural areas throughout the arid Southwest. The Colorado River has historically provided about half of the imported water used in Southern California.

Passage of H.R. 3445 in the 110th Congress is key to the establishment of a comprehensive and coordinated national weather mitigation policy and to the funding of weather mitigation research. This legislation has the support of the Family Farm Alliance, the Western States Water Council, the Weather Modification Association, the North American Weather Modification Council, and a myriad of local interests including: ground water management districts, water conservation districts, water and sanitation districts, agricultural interests, and municipal and county governments.

This Board respectfully requests that a member of your staff contact Ms. Wendy Adams of Representative Mark Udall's staff to add your name as a cosponsor to H.R. 3445 and help move this important legislation forward in the 110th Congress. Please do not hesitate to contact me at (818) 500-1625 should you have any questions.

Thank you in advance for your consideration of this request.

Sincerely,

Gerald R. Zimmerman
Executive Director

cc: Representative Mark Udall, 100 Cannon House Office Building, Washington, DC 20515

Mr. Dennis Strong, Director, Utah Division of Water Resources
Mr. Scott Balcomb, State of Colorado
Mr. Jay D. Bingham, Chairman, Colorado River Commission of Nevada
Mr. John R. D'Antonio Jr., State Engineer and Secretary, New Mexico Interstate Stream Commission
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STATE OF CALIFORNIA - THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

COLORADO RIVER BOARD OF CALIFORNIA
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1068
(818) 500-1625
(818) 543-4685 FAX

December 12, 2007

The Honorable Brian Bilbray
Committee on Science and Technology
U.S. House of Representatives
227 Cannon House Office Building
Washington, DC 20515

Dear Representative Bilbray:

I would like to take this opportunity to bring to your attention recent activities in the field of weather modification. I am writing to express the support of the Colorado River Board of California (Board) for H.R. 3445, *The Weather Mitigation Research and Technology Transfer Authorization Act of 2007* and respectfully request that you cosponsor H.R. 3445. In the United States over $15 million is spent each year on weather modification operations that include snowpack augmentation, rainfall augmentation, and hail suppression. This bill would develop and implement a coordinated national weather mitigation policy and a cooperative Federal and State program of weather mitigation research and development.

As recommended by a 2003 National Research Council report entitled *Critical Issues in Weather Modification Research*, a federally-sponsored weather modification research program is needed and is supported by states that need a scientific means of evaluating current programs, as well as increasing their effectiveness through applied research. Droughts in the United States result in an average economic loss of $6 to 8 billion per year, while severe hail producing storms result in up to $2.3 billion in damage to crops and over $2 billion in property loss annually. Rain enhancement and hail suppression weather modification projects help mitigate these losses. Additional research in these areas is needed to make existing programs more effective and permit them to better quantify that effectiveness.

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Weather modification operations and regulation currently reside within state and local governments and it is the Board's belief that the federal role should be that of assistance with applied research and practical technology transfer programs. The recent USBR Weather Damage Modification Program (WDMP) implemented a successful model for combining local, state, and federal resources in providing a means for scientific evaluation of operational rainfall, snowfall enhancement, and hail suppression projects in California, Colorado, Nevada, North Dakota, Oklahoma, Texas, and Utah. The Board supports this cooperative federal-state research model.

In correspondence to the Secretary of the Interior, the seven Colorado River Basin states recommended implementation of an expanded weather modification program as part of a package of actions to prepare for and respond to shortage conditions. Covering about one-twelfth the area of the coterminous United States and including parts of seven states and Mexico, the river basin is a major source of water supply for urban and agricultural areas throughout the arid Southwest. The Colorado River has historically provided about half of the imported water used in Southern California.

Passage of H.R. 3445 in the 110th Congress is key to the establishment of a comprehensive and coordinated national weather mitigation policy and to the funding of weather mitigation research. This legislation has the support of the Family Farm Alliance, the Western States Water Council, the Weather Modification Association, the North American Weather Modification Council, and a myriad of local interests including: ground water management districts, water conservation districts, water and sanitation districts, agricultural interests, and municipal and county governments.

This Board respectfully requests that a member of your staff contact Ms. Wendy Adams of Representative Mark Udall's staff to add your name as a cosponsor to H.R. 3445 and help move this important legislation forward in the 110th Congress. Please do not hesitate to contact me at (818) 500-1625 should you have any questions.

Thank you in advance for your consideration of this request.

Sincerely,

Gerald R. Zimmerman
Executive Director

cc: Representative Mark Udall, 100 Cannon House Office Building, Washington, DC 20515

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Mr. Jeffrey Kightlinger, General Manager, The Metropolitan Water District of Southern California
Mr. Lester A. Snow, Director, California Department of Water Resources

II

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 mitiga-

tion 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 pro-

ducing 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 under-

stood. 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 in-

formation, 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 re-

search 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 (e).

(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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I

110TH CONGRESS
1ST SESSION

H. R. 3445

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

IN THE HOUSE OF REPRESENTATIVES

AUGUST 3, 2007

Mr. UDALL of Colorado introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To establish the Weather Mitigation Operations 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 Technology Transfer Authorization Act of 2007".

SEC. 2. PURPOSE.

It is the purpose of this Act to develop and implement a comprehensive and coordinated national weather mitiga-

tion policy and a national cooperative Federal and State program of weather mitigation research and development.

SEC. 3. DEFINITIONS.

In this Act:

(1) BOARD.—The term "Board" means the Weather Mitigation Advisory and Research Board.

(2) EXECUTIVE DIRECTOR.—The term "Executive Director" means the Executive Director of the Weather Mitigation Advisory and Research Board.

(3) RESEARCH AND DEVELOPMENT.—The term "research and development" means theoretical analysis, exploration, experimentation, and the extension of investigative findings and theories of 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.

(4) WEATHER MITIGATION.—The term "weather mitigation" means changing or controlling, or attempting to change or control, by artificial methods the natural development of atmospheric cloud forms or precipitation forms which occur in the troposphere. Examples include rain enhancement, snowpack augmentation, and hail suppression.

SEC. 4. WEATHER MITIGATION ADVISORY AND RESEARCH BOARD ESTABLISHED.

(a) IN GENERAL.—There is established in the Department of Commerce the Weather Mitigation Advisory and Research Board.

(b) MEMBERSHIP.—

(1) IN GENERAL.—The Board shall consist of 11 members appointed by the Secretary of Commerce, of whom—

(A) at least 1 shall be a representative of the American Meteorological Society;

(B) at least 1 shall be a representative of the American Society of Civil Engineers;

(C) at least 1 shall be a representative of the National Academy of Sciences;

(D) at least 1 shall be a representative of the National Center for Atmospheric Research of the National Science Foundation;

(E) at least 2 shall be representatives of the National Oceanic and Atmospheric Administration of the Department of Commerce;

(F) at least 1 shall be a representative of institutions of higher education or research institutes; and

(G) at least 1 shall be a representative of a State that is currently supporting operational weather mitigation projects.

(2) TENURE.—A member of the Board serves at the pleasure of the Secretary of Commerce.

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

(b) 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.

(c) 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.

(d) MEETINGS.—The Board shall meet at the call of the Chair.

(e) QUORUM.—A majority of the members of the Board shall constitute a quorum, but a lesser number of members may hold hearings.

(f) CHAIR AND VICE CHAIR.—The Board shall select a Chair and Vice Chair from among its members.

SEC. 5. DUTIES OF THE BOARD.

(a) 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 decisionmaking 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, both purposeful (including cloud-seeding operations) and inadvertent (including downwind effects and anthropogenic effects).

(b) FINANCIAL ASSISTANCE.—Unless the use of the money is restricted or subject to any limitations provided by law, the Board shall use amounts in the Weather Mitigation Research and Development Fund—

(1) to pay its expenses in the administration of this Act; and

(2) to provide for research and development with respect to weather mitigation by grants to, or contracts or cooperative arrangements with, public or private agencies.

(c) REPORT.—The Board shall submit to the Secretary of Commerce biennially a report on its findings and research results.

SEC. 6. POWERS OF THE BOARD.

(a) STUDIES, INVESTIGATIONS, AND HEARINGS.—The Board may make any studies or investigations, obtain any information, and hold any hearings necessary or proper to administer or enforce this Act or any rules or orders issued under this Act.

(b) PERSONNEL.—The Board may employ, as provided for in appropriations Acts, an Executive Director and other support staff necessary to perform duties and functions under this Act.

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

(d) 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 for conducting weather mitigation activities or cloud-seeding operations.

(e) CONDUCT AND CONTRACTS FOR RESEARCH AND DEVELOPMENT.—The Executive Director, with the approval of the Board, may conduct and may contract for research and development activities relating to the purpose described in section 2.

SEC. 7. COOPERATION WITH THE WEATHER MITIGATION OPERATIONS AND RESEARCH BOARD.

The heads of the departments and agencies of the United States and the heads of any other public or private agencies and institutions that receive research funds from the United States shall, to the extent possible, give full support and cooperation to the Board and to initiate independent research and development programs that address weather mitigations.

SEC. 8. FUNDING.

(a) IN GENERAL.—There is established within the Treasury of the United States the Weather Mitigation Research and Development Fund, which shall consist of amounts appropriated pursuant to subsection (b) or received by the Board under subsection (c).

(b) 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 fiscal years 2006 through 2015. Any sums appropriated under this subsection shall remain available, without fiscal year limitation, until expended.

(c) GIFTS.—The Board may accept, use, and dispose of gifts or donations of services or property.

○