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NATIONAL SECURITY AGENCY
CENTRAL SECURITY SERVICE
FORT GEORGE G. MEADE, MARYLAND 20755-6000

FOIA Case: 101215A
7 July 2017

JOHN GREENEWALD
[REDACTED]
[REDACTED]

Dear Mr. Greenewald:

This responds to your Freedom of Information Act (FOIA) request of 28 March 2017 for Intellipedia pages on "WEATHER MODIFICATION and/or PROJECT CIRRUS and/or PROJECT STORMFURY and/or CLOUD SEEDING and/or OPERATION POPEYE and/or PROJECT CUMULUS." As stated in our previous letter, dated 3 April 2017, your request was assigned Case Number 101215. A copy of your request is enclosed. For purposes of this request and based on the information you provided in your letter, you are considered an "all other" requester. As such, you are allowed 2 hours of search and the duplication of 100 pages at no cost. There are no assessable fees for this request. Your request has been processed under the FOIA.

For your information, NSA provides a service of common concern for the Intelligence Community (IC) by serving as the executive agent for Intelink. As such, NSA provides technical services that enable users to access and share information with peers and stakeholders across the IC and DoD. Intellipedia pages are living documents that may be originated by any user organization, and any user organization may contribute to or edit pages after their origination. Intellipedia pages should not be considered the final, coordinated position of the IC on any particular subject. The views and opinions of authors do not necessarily state or reflect those of the U.S. Government.

We conducted a search of all three levels of Intellipedia for the requested topics, and located three documents that are responsive to your request. Two of these documents are enclosed. Certain information, however, has been deleted from the enclosures.

This Agency is authorized by statute to protect certain information concerning its activities (in this case, internal URLs) as well as the names of its employees. Such information is exempt from disclosure pursuant to the third exemption of the FOIA, which provides for the withholding of information specifically protected from disclosure by statute. The specific statute

applicable in this case is Section 6, Public Law 86-36 (50 U.S. Code 3605). We have determined that such information exists in this record, and we have excised it accordingly.

In addition, personal information regarding individuals has been deleted from the enclosures in accordance with 5 U.S.C. 552 (b)(6). This exemption protects from disclosure information that would constitute a clearly unwarranted invasion of personal privacy. In balancing the public interest for the information you request against the privacy interests involved, we have determined that the privacy interests sufficiently satisfy the requirements for the application of the (b)(6) exemption.

Since these deletions may be construed as a partial denial of your request, you are hereby advised of this Agency's appeal procedures. You may appeal this decision. If you decide to appeal, you should do so in the manner outlined below.

- The appeal must be sent via U.S. postal mail, fax, or electronic delivery (e-mail) and addressed to:

NSA/CSS FOIA/PA Appeal Authority (P132)
National Security Agency
9800 Savage Road STE 6932
Fort George G. Meade, MD 20755-6932

The facsimile number is (443)479-3612.

The appropriate email address to submit an appeal is FOIARSC@nsa.gov.

- It must be postmarked no later than 90 calendar days of the date of this letter.
- Please include the case number provided above.
- Please describe with sufficient detail why you believe the denial of requested information was unwarranted.
- NSA will endeavor to respond within 20 working days of receiving your appeal, absent any unusual circumstances.
- Appeals received after 90 days will not be addressed.

You may also contact our FOIA Public Liaison at foialo@nsa.gov for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Rd- OGIS
College Park, MD 20740
ogis@nara.gov
(877) 684-6448
(202) 741-5770
Fax (202) 741-5769

The final responsive document was previously requested in your case number 84180. As explained in our response letter to that case, dated 8 September 2016, that document was referred to another agency for their direct response to you.

Sincerely,

A handwritten signature in dark ink, appearing to read "Paul H." followed by a stylized flourish.

for
JOHN R. CHAPMAN
Chief, FOIA/PA Office
NSA Initial Denial Authority

Encls:
a/s

From: donotreply@nsa.gov
Sent: Tuesday, March 28, 2017 4:08 PM
To: donotreply@nsa.gov
Subject: FOIA Request (Web form submission)

Title: Mr.

Full Name: John Greenewald

email: john@greenewald.com

Company: The Black Vault

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Postal City: [REDACTED]

Postal State-prov: [REDACTED]

Zip Code: [REDACTED]

Country: United States of America

Home Phone: [REDACTED]

Work Phone: [REDACTED]

Records Requested: To whom it may concern,

This is a non-commercial request made under the provisions of the Freedom of Information Act 5 U.S.C. S 552. My FOIA requester status as a "representative of the news media" however due to your agency's denial of this status, I hereby submit this request as an "All other" requester.

I prefer electronic delivery of the requested material either via email to john@greenewald.com, FAX 1-818-659-7688 or via CD-ROM or DVD via postal mail. Please contact me should this FOIA request should incur a charge.

I respectfully request a copy of the Intellipedia entry (from all three Wikis that make up the Intellipedia) for the following entry(s) (Or whatever similar topic may pertain if it is slightly worded differently):

WEATHER MODIFICATION

and/or

PROJECT CIRBUS

and/or

PROJECT STORMFURY

and/or

CLOUD SEEDING

and/or

OPERATION POPEYE

and/or

PROJECT CUMULUS

Thank you so much for your time, and I am very much looking forward to your response.

Sincerely,

John Greenewald, Jr.

[REDACTED]
[REDACTED]
[REDACTED]

(U) Cloud seeding

UNCLASSIFIED

From Intellipedia

You have new messages (last change).

Cloud seeding, a form of intentional weather modification or climate engineering, is the attempt to change the amount or type of precipitation that falls from clouds, by dispersing substances into the air that serve as cloud condensation or ice nuclei, which alter the microphysical processes within the cloud. The usual intent is to increase precipitation (rain or snow), but hail and fog suppression are also widely practiced in airports.

The most common chemicals used for cloud seeding include silver iodide and dry ice (solid carbon dioxide). Liquid propane, which expands into a gas, has also been used. This can produce ice crystals at higher temperatures than silver iodide. The use of hygroscopic materials, such as salt, is becoming more popular^[*citation needed*] after promising research.^[1]

Seeding of clouds requires that they contain supercooled liquid water—that is, liquid water colder than zero degrees Celsius. Introduction of a substance such as silver iodide, which has a crystalline structure similar to that of ice, will induce freezing nucleation.

Dry ice or propane expansion cools the air to such an extent that ice crystals can nucleate spontaneously from the vapor phase. Unlike seeding with silver iodide, this spontaneous nucleation does not require any existing droplets or particles because it produces extremely high vapor supersaturations near the seeding substance. However, the existing droplets are needed for the ice crystals to grow into large enough particles to precipitate out.

In mid-latitude clouds, the usual seeding strategy has been based on the fact that the equilibrium vapor pressure is lower over ice than over water. The formation of ice particles in supercooled clouds allows those particles to grow at the expense of liquid droplets. If sufficient growth takes place, the particles become heavy enough to fall as precipitation from clouds that otherwise would produce no precipitation. This process is known as "static" seeding.

Seeding of warm-season or tropical cumulonimbus (convective) clouds seeks to exploit the latent heat released by freezing. This strategy of "dynamic" seeding assumes that the additional latent heat adds buoyancy, strengthens updrafts, ensures more low-level convergence, and ultimately causes rapid growth of properly selected clouds.

Cloud seeding chemicals may be dispersed by aircraft (as in the second figure) or by dispersion devices located on the ground (generators, as in first figure, or canisters fired from anti-aircraft guns or rockets). For release by aircraft, silver iodide flares are ignited and dispersed as an aircraft flies through the inflow of a cloud. When released by devices on the ground, the fine particles are carried downwind and upwards by air currents after release.

File:Cloud Seeding.svg

Cloud seeding can be done by ground generators, plane, or rocket.

File:Cloudseedingimagerevised

This image explaining cloud seeding shows the chemical either silver iodine or dry ice being dumped onto the cloud which then becomes a rain shower. The process shown in the upper right is what is happening in the cloud and the process of condensation to the introduced chemicals.

Sources for image:

<http://www.fletcherboland.com/photos/mountains/11.php>

An electronic mechanism was tested in 2010, when infrared laser pulses were directed to the air above Berlin by researchers from the University of Geneva.^[2] The experimenters posited that the pulses would encourage atmospheric sulfur dioxide and nitrogen dioxide to form particles that would then act as seeds.^[2]

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Effectiveness

Referring to the 1903, 1915, 1919 and 1944 and 1947 and weather modification experiments, the Australian Federation of Meteorology discounted "rain making." By the 1950s the CSIRO Division of Radiophysics switched to investigating the physics of clouds and had hoped by 1957 to better understand these processes. By the 1960s the dreams of weather making had faded only to be re-ignited post-corporatisation of the Snowy Mountains Scheme in order to achieve "above target" water. This would provide enhanced energy generation and profits to the public agencies who are the principal owners. Cloud seeding has been shown to be effective in altering cloud structure and size and in converting supercooled liquid water to ice particles. The amount of precipitation due to seeding is difficult to quantify.

A key challenge is in discerning how much precipitation would have occurred had clouds not been seeded. Overall, there is general expectation that winter cloud seeding over mountains will produce snow, expressed by professional organizations.^{[3][4][5][6]} There is statistical evidence for seasonal precipitation increases of about 10% with winter seeding.^[7]

The US government, through its National Center for Atmospheric Research, has analyzed seeded and unseeded clouds to understand the differences between them, and has conducted seeding research in other countries.
[citation needed]

Clouds were seeded during the 2008 Summer Olympics in Beijing using rockets,^[8] so that there would be no rain during the opening and closing ceremonies.^[9] although others dispute their claims of success.^[10]

A 2010 Israel University study revealed that the common practice of cloud seeding with materials such as silver

iodide and frozen carbon dioxide may not be as effective as it had been hoped.^[11] A 2011 study suggest that airplanes may produce ice particles by freezing cloud droplets that cool as they flow around the tips of propellers, over wings or over jet aircraft, and thereby unintentionally seed clouds. This could have potentially serious consequences for particular hail stone formation.^[12]

Impact on environment and health

With an NFPA 704 rating of Blue 2, silver iodide can cause temporary incapacitation or possible residual injury to humans and mammals with intense or continued but not chronic exposure. However, there have been several detailed ecological studies that showed negligible environmental and health impacts.^{[13][14][15]} The toxicity of silver and silver compounds (from silver iodide) was shown to be of low order in some studies. These findings likely result from the minute amounts of silver generated by cloud seeding, which are 100 times less than industry emissions into the atmosphere in many parts of the world, or individual exposure from tooth fillings.^[16]

Accumulations in the soil, vegetation, and surface runoff have not been large enough to measure above natural background.^[17] A 1995 environmental assessment in the Sierra Nevada of California^[18] and a 2004 independent panel of experts (an overview only is presented in the executive summary of the research) in Australia confirmed these earlier findings.

Cloud seeding over Kosciuszko National Park - a Biosphere Reserve - is problematic in that several rapid changes of environmental legislation were made to enable the "trial." Environmentalists are concerned about the uptake of elemental silver in a highly sensitive environment affecting the pygmy possum amongst other species as well as recent high level algal blooms in once pristine glacial lakes. The ABC program Earthbeat on July 14, 2004 heard that not every cloud has a silver lining where concerns for the health of the pygmy possums was raised. Research 50 years ago and analysis by the former Snowy Mountains Authority led to the cessation of the cloud seeding program in the 1950s with non-definitive results. Formerly, cloud seeding was rejected in Australia on environmental grounds because of concerns about the protected species, the pygmy possum (<http://www.colongwilderness.org.au/RedIndex/NSW/Jagu99.htm>) . Since silver iodide and not elemental silver is the cloud seeding material, the claims of negative environmental impact are disputed by peer-reviewed research as summarized by the international weather modification association .

History

Vincent Schaefer (1906–1993) discovered the principle of cloud seeding in July 1946 through a series of serendipitous events. Following ideas generated between himself and Nobel laureate Irving Langmuir while climbing Mt. Washington in New Hampshire, Schaefer, Langmuir's research associate, created a way of experimenting with supercooled clouds using a deep freeze unit of potential agents to stimulate ice crystal growth, *i.e.*, salt, talcum powder, soils, dust and various chemical agents with minor effect. Then one hot and humid July 14, 1946, he wanted to try a few experiments at General Electric's Schenectady Research Lab.

File:Cessna 210 Hagelflieger
Detail.jpg

Cessna 210 with cloud seeding
equipment

He was dismayed to find that the deep freezer was not cold enough to produce a "cloud" using breath air. He decided to move the process along by adding a chunk of dry ice just to lower the temperature of his experimental chamber. To his astonishment, as soon as he breathed into the deep freezer, a bluish haze was noted, followed by an eye-popping display of millions of microscopic ice crystals, reflecting the strong light rays from the lamp illuminating a cross-section of the chamber. He instantly realized that he had discovered a

way to change supercooled water into ice crystals. The experiment was easily replicated and he explored the temperature gradient to establish the -40°C ^[19] limit for liquid water.

Within the month, Schaefer's colleague, the noted atmospheric scientist Dr. Bernard Vonnegut (brother of novelist Kurt Vonnegut) is credited with discovering another method for "seeding" supercooled cloud water. Vonnegut accomplished his discovery at the desk, looking up information in a basic chemistry text and then tinkering with silver and iodide chemicals to produce silver iodide. Together with Professor Henry Chessin, SUNY Albany, a crystallographer, he co-authored a publication in Science Magazine^[20] and received a patent in 1975.^[21] Both methods were adopted for use in cloud seeding during 1946 while working for the General Electric Corporation in the state of New York.

Schaefer's altered a cloud's heat budget, Vonnegut's altered formative crystal structure – an ingenious property related to a good match in lattice constant between the two types of crystal. (The crystallography of ice later played a role in Kurt Vonnegut's novel *Cat's Cradle*.) The first attempt to modify natural clouds in the field through "cloud seeding" began during a flight that began in upstate New York on 13 November 1946. Schaefer was able to cause snow to fall near Mount Greylock in western Massachusetts, after he dumped six pounds of dry ice into the target cloud from a plane after a 60-mile easterly chase from the Schenectady County Airport.^[22]

Dry ice and silver iodide agents are effective in changing the physical chemistry of supercooled clouds, thus useful in augmentation of winter snowfall over mountains and under certain conditions, and lightning and hail suppression. While not a new technique, hygroscopic seeding for enhancement of rainfall in warm clouds is enjoying a revival, based on some positive indications from research in South Africa, Mexico, and elsewhere. The hygroscopic material most commonly used is salt. It is postulated that hygroscopic seeding causes the droplet size spectrum in clouds to become more maritime (bigger drops) and less continental, stimulating rainfall through coalescence. From March 1967 until July 1972, the U.S. military's Operation Popeye cloud-seeded silver iodide to extend the monsoon season over North Vietnam, specifically the Ho Chi Minh Trail. The operation resulted in the targeted areas seeing an extension of the monsoon period an average of 30 to 45 days.^[23] The 54th Weather Reconnaissance Squadron carried out the operation to "make mud, not war".^[24]

One private organization which offered, during the 1970s, to conduct weather modification (cloud seeding from the ground using silver iodide flares) was *Irving P. Krick and Associates* of Palm Springs, California. They were contracted by the Oklahoma State University in 1972 to conduct such a seeding project to increase warm cloud rainfall in the Lake Carl Blackwell watershed. That lake was, at that time (1972–73), the primary water supply for Stillwater, Oklahoma and was dangerously low. The project did not operate for a long enough time to show statistically any change from natural variations. However, at the same time, seeding operations have been ongoing in California since 1948.

An attempt by the United States military to modify hurricanes in the Atlantic basin using cloud seeding in the 1960s was called Project Stormfury. Only a few hurricanes were tested with cloud seeding because of the strict rules that were set by the scientists of the project. It was unclear whether the project was successful; hurricanes appeared to change in structure slightly, but only temporarily. The fear that cloud seeding could potentially change the course or power of hurricanes and negatively affect people in the storm's path stopped the project.

Two federal agencies have supported various weather modification research projects, which began in the early 1960s: The United States Bureau of Reclamation (Reclamation; Department of the Interior) and the National Oceanic and Atmospheric Administration (NOAA; Department of Commerce). Reclamation sponsored several cloud seeding research projects under the umbrella of Project Skywater from 1964 to 1988, and NOAA conducted the Atmospheric Modification Program from 1979 to 1993. The sponsored projects were carried out

in several states and two countries (Thailand and Morocco), studying both winter and summer cloud seeding. More recently, Reclamation sponsored a small cooperative research program with six Western states called the Weather Damage Modification Program,^[25] from 2002–2006.

Funding for research in the United States has declined in the last two decades. The Bureau of Reclamation sponsored a six-state research program from 2002–2006, however, called the "Weather Damage Modification Program".^[26] A 2003 study^[27] by the United States National Academy of Sciences urges a national research program to clear up remaining questions about weather modification's efficacy and practice.

In Australia, CSIRO conducted major trials between 1947 and the early 1960s:

- 1947 – 1952: CSIRO scientists dropped dry ice into the tops of cumulus clouds. The method worked reliably with clouds that were very cold, producing rain that would not have otherwise fallen.
- 1953 – 1956: CSIRO carried out similar trials in South Australia, Queensland and other States. Experiments used both ground-based and airborne silver iodide generators.
- Late 1950s and early 1960s: Cloud seeding in the Snowy Mountains, on the Cape York Peninsula in Queensland, in the New England district of New South Wales, and in the Warragamba catchment area west of Sydney.

Only the trial conducted in the Snowy Mountains produced statistically significant rainfall increases over the entire experiment.

Thailand started a rain-making project in the late 1950s. The first principle was to scatter sea salt to catch the humidity in the air and dry ice to condense the humidity to form clouds.^[28] The project took about ten years of experiments and refinement. The first field operations began in 1969 above Khao Yai National Park. Since then rain-making has been successfully applied throughout Thailand and neighbouring countries.^[29] On 12 October 2005 the European Patent Office granted to King Bhumibol Adulyadej the patent EP 1 491 088 *Weather modification by royal rainmaking technology*.

An Austrian study^[30] to use silver iodine seeding for hail prevention ran during 1981–2000, and the technique is still actively deployed there.^[31]

Modern uses

Asia

The largest cloud seeding system in the world is that of the People's Republic of China, which believes that it increases the amount of rain over several increasingly arid regions, including its capital city, Beijing, by firing silver iodide rockets into the sky where rain is desired. There is even political strife caused by neighboring regions which accuse each other of "stealing rain" using cloud seeding. About 24 countries currently practice weather modification operationally^[citation needed]. China used cloud seeding in Beijing just before the 2008 Olympic Games in order to clear the air of pollution, but there are disputes regarding the Chinese claims. In February 2009, China also blasted iodide sticks over Beijing to artificially induce snowfall after four months of drought, and blasted iodide sticks over other areas of northern China to increase snowfall. The snowfall in Beijing lasted for approximately three days and led to the closure of 12 main roads around Beijing.^[32] At the end of October 2009 Beijing claimed it had its earliest snowfall since 1987 due to cloud seeding.^[33]

Cloud-seeding also has been used to improve the air quality by encouraging rainfall throughout Asia. In India, cloud seeding operations were conducted during the years 1983, 1984-87, 1993-94 by Tamil Nadu Government due to severe drought.^[34] In the years 2003 and 2004 Karnataka government initiated cloud seeding. Cloud seeding operations were also conducted in the same year through US-based Weather Modification Inc. in the state of Maharashtra.^[35] In 2008, there are plans for 12 districts of state of Andhra Pradesh.^[36] In the United Arab Emirates, cloud seeding is being conducted by the weather authorities to create artificial rain.^[37] The project, which began in July 2010 and cost \$ 11 million, has been successful in creating rain storms in the Dubai and Abu Dhabi desert.^[38]

North America

In the United States, cloud seeding is used to increase precipitation in areas experiencing drought, to reduce the size of hailstones that form in thunderstorms, and to reduce the amount of fog in and around airports. Cloud seeding is also occasionally used by major ski resorts to induce snowfall. Eleven western states and one Canadian province (Alberta) have ongoing weather modification operational programs [1] (<http://www.naiwmc.org>) . In January 2006, an \$8.8 million cloud seeding project began in Wyoming to examine the effects of cloud seeding on snowfall over Wyoming's Medicine Bow, Sierra Madre, and Wind River mountain ranges.^[39]

A number of commercial companies offer weather modification services centered on cloud seeding. The U.S. signed an international treaty in 1978 banning the use of weather modification for hostile purposes.^[40]

During the sixties, Irving P. Krick & Associates operated a successful cloud seeding operation in the area around Calgary, Alberta. This utilized both aircraft and ground-based generators that pumped silver iodide into the atmosphere in an attempt to reduce the threat of hail damage. Ralph Langeman, Lynn Garrison, and Stan McLeod, all ex-members of the RCAF's 403 Squadron, attending the University of Alberta, spent their summers flying hail suppression.

File:VHLEM.JPG

This Cessna 441 is used to conduct cloud-seeding flights on behalf of Hydro Tasmania

A number of surplus Harvard aircraft were fitted with racks under each wing containing 32 railroad fuzes that were impregnated with silver iodide. These could be ignited individually or all at once, depending upon the threat. In coordination with ground units, the aircraft would lay a plume of silver iodide in front of approaching cumulonimbus clouds with noticeable effect. Large, active CBs were reduced to nothing. Heavy hail storms were reduced in intensity. This effective program was funded by farmer contributions and government grants.
[citation needed]

Europe

Cloud seeding began in France during the 1950s with the intent of reducing hail damage to crops. The ANELFA project consists of local agencies acting within a non-profit organization.^[41] A similar project in Spain is managed by the Consorcio por la Lucha Antigranizo de Aragon.^[41] The success of the French program was supported by insurance data; that of the Spanish program in studies conducted by the Spanish Agricultural Ministry.^[41]

Soviet military pilots seeded clouds over the Belorussian SSR after the Chernobyl disaster to remove radioactive particles from clouds heading toward Moscow.^[42] At the July 2006 G8 Summit, President Putin

commented that air force jets had been deployed to seed incoming clouds so they rained over Finland. Rain drenched the summit anyway.^[43] In Moscow, the Russian Airforce tried seeding clouds with bags of cement on June 17, 2008. One of the bags did not pulverize and went through the roof of a house.^[44] In October 2009, the Mayor of Moscow promised a "winter without snow" for the city after revealing efforts by the Russian Air Force to seed the clouds upwind from Moscow throughout the winter.^[45]

Australia

In Australia, the activities of CSIRO and Hydro Tasmania over central and western Tasmania between the 1960s and the present day appear to have been successful.^[46] Seeding over the Hydro-Electricity Commission catchment area on the Central Plateau achieved rainfall increases as high as 30% in autumn. The Tasmanian experiments were so successful that the Commission has regularly undertaken seeding ever since in mountainous parts of the State.

In 2004, Snowy Hydro Limited began a trial of cloud seeding to assess the feasibility of increasing snow precipitation in the Snowy Mountains in Australia.^[47] The test period, originally scheduled to end in 2009, was later extended to 2014.^[47] The New South Wales (NSW) Natural Resources Commission, responsible for supervising the cloud seeding operations, believes that the trial may have difficulty establishing statistically whether cloud seeding operations are increasing snowfall. This project was discussed at a summit in Narrabri, NSW on 1 December 2006. The summit met with the intention of outlining a proposal for a 5 year trial, focussing on Northern NSW.

The various implications of such a widespread trial were discussed, drawing on the combined knowledge of several worldwide experts, including representatives from the Tasmanian Hydro Cloud Seeding Project however does not make reference to former cloud seeding experiments by the then Snowy Mountains Authority which rejected weather modification. The trial required changes to NSW environmental legislation in order to facilitate placement of the cloud seeding apparatus. The modern experiment is not supported for the Australian Alps.

In December 2006, the Queensland government of Australia announced A\$7.6 million in funding for "warm cloud" seeding research to be conducted jointly by the Australian Bureau of Meteorology and the United States National Center for Atmospheric Research.^[48] Outcomes of the study are hoped to ease continuing drought conditions in the states South East region.

Africa

In Mali and Niger, cloud seeding is also used on a national scale.^{[49][50]}

Foreign Companies Involved in Cloud Seeding

The following non-US companies have been reported to offer cloud seeding and other weather modification services to foreign countries:

- Agni Aero Sports Adventure Academy (India)
- Space Wing (Saudi Arabia)
- Metro Systems International (Switzerland)
- Snowy Hydro Corporation (Australia)

See also

- Geoengineering
- Operation Popeye
- CIA/DI's Climate Change and Energy Technology Team

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9. ↑ "Beijing to keep skies clear on Games' opening day", BOCOG, 2007-04-26. Retrieved on 2007-04-27.
10. ↑ claims of success (<http://www.impactlab.com/2008/04/24/controlling-the-weather>)
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12. ↑ Big Hole Filled in Cloud Research (<http://www.sciencedaily.com/releases/2011/07/110701121623.htm>)
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29. ↑ "Modern Monarchy" , *Royal Thai Embassy Stockholm*
30. ↑ Hagelabwehr in Niederösterreich , Zentralanstalt für Meteorologie und Geodynamik
31. ↑ www.hagelabwehr.com -KSV- Herzlich Willkommen (<http://www.hagelabwehr.com/>)
32. ↑ China Lets it Snow to End Drought (<http://news.bbc.co.uk/2/hi/asia-pacific/7899086.stm>) . *BBC* 19 February 2009.
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External links

- Rainmaking in China (http://www.thingsasian.com/goto_article/article.2843.html)
- Weather Modification Association (<http://weathermodification.org/>)
- American Meteorological Society Policy Statement (<http://www.ametsoc.org/policy/wxmod98.html>)
- Nevada State Cloud Seeding Program (<http://cloudseeding.dri.edu/>)
- European patent EP 1 491 088 *Weather modification by royal rainmaking technology*

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Categories: Articles with dead external links from November 2009 | Articles with unsourced statements from October 2009 | Articles with unsourced statements from September 2009 | Articles with unsourced statements from March 2010 | Articles with unsourced statements from January 2011 | Weather modification | Geoengineering

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(U) Weather Modification

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From Intellipedia

You have new messages (last change).

(U) Weather Modification

(U) In general, any effort to alter artificially the natural phenomena of the atmosphere. (It is also referred to as weather control). The term usually refers to cloud seeding activities, but can also include constructing wind breaks, dissipating fog by the forceful addition of heat or water spray, or preventing frost formation on crops by cloud spray, heating, or mixing processes. Inadvertent weather modification refers to accidental weather effects resulting from the release of greenhouse gases, aerosols, and dust or changes in albedo or surface properties of the earth associated with urban, industrial, or agricultural activity.

(U) China and the Olympics

(U) China as the host of the 2008 Summer Olympics is interested in making sure that they have good weather. Besides investing in additional weather satellites, they are also working on modifying the weather, especially during the opening and closing ceremonies. ^[1]

Return to Environmental Technology Intelligence

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1. ↑ People's Daily Online: 'Beijing To Control Rain During Olympics Open Source Center

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