

# **GEOENGINEERING**

## **Weather Modification**

and

## **Weaponizing Nature**

**A Presentation by Jim Lee of ClimateViewer News  
given at the Freedom Force International's 3<sup>rd</sup>  
Congress in Phoenix, Arizona. December 3, 2016**

**CLIMATEVIEWER.COM**

**CLIMATEVIEWER.ORG**

**WEATHERMODIFICATIONHISTORY.COM**

# Weather Modification History

1800 - 2017

**Global warming alarmists and climate scientists would have you believe that the latest **extreme weather events can surely be blamed on rising CO<sub>2</sub> levels** while never mentioning the effects of daily weather experiments overhead.**

**[WeatherModificationHistory.com](http://WeatherModificationHistory.com)**

**Coming soon**

# Weather Is Not Climate

“No, weather is NOT climate...even when it’s warm outside. But in case there’s a climate cultist in your life that insists otherwise, here are some facts about ~~global warming, climate change, climate disruption, global weirding and vaguely-defined “extreme” weather~~ that you can use to talk some sense into them.”

[www.corbettreport.com/weather-is-not-climate/](http://www.corbettreport.com/weather-is-not-climate/)  
**James Corbett, The Corbett Report**



Full Event: Hillary Clinton Rally with Al Gore in Miami, Florida (10/11/2016) Hillary Live Speech

A screenshot of a Live Science article. The article title is "US in Longest 'Hurricane Drought' in Recorded History" by Laura Geggel, dated May 4, 2015. The article discusses the longest "hurricane drought" in recorded history, mentioning Hurricane Wilma in 2005. A satellite image of a hurricane is shown. On the right side of the page, there is a "Science Newsletter: Subscribe" form and a "Follow Us" section.

# **100 Years Of Weather Control** **and nobody knew...**

**Did you know?**

**Weather Warfare was banned October 5, 1978**

**ENMOD**

**“Environmental Modification Convention”**

**aka**

**Convention on the Prohibition of Military or Any Other Hostile Use of  
Environmental Modification Techniques**

# Charles Mallory Hatfield – 1915-1916

## The Moisture Accelerator

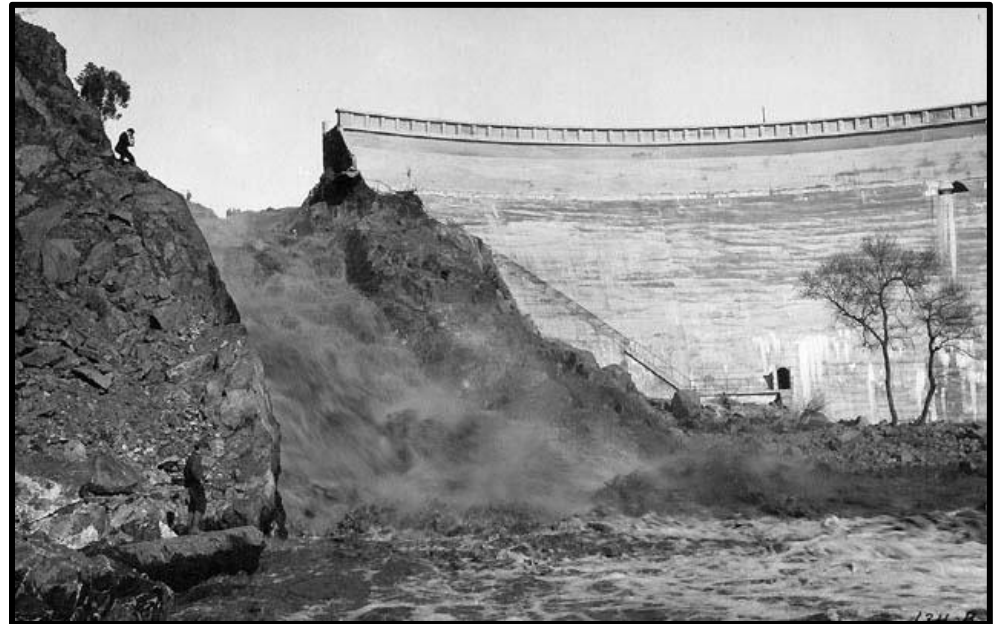
Created a secret mixture of 23 chemicals in large galvanized evaporating tanks that, he claimed, attracted rain.



# Charles Mallory Hatfield – 1915-1916

**Contracted to fill  
Lake Morena  
reservoir in San  
Diego, California.**

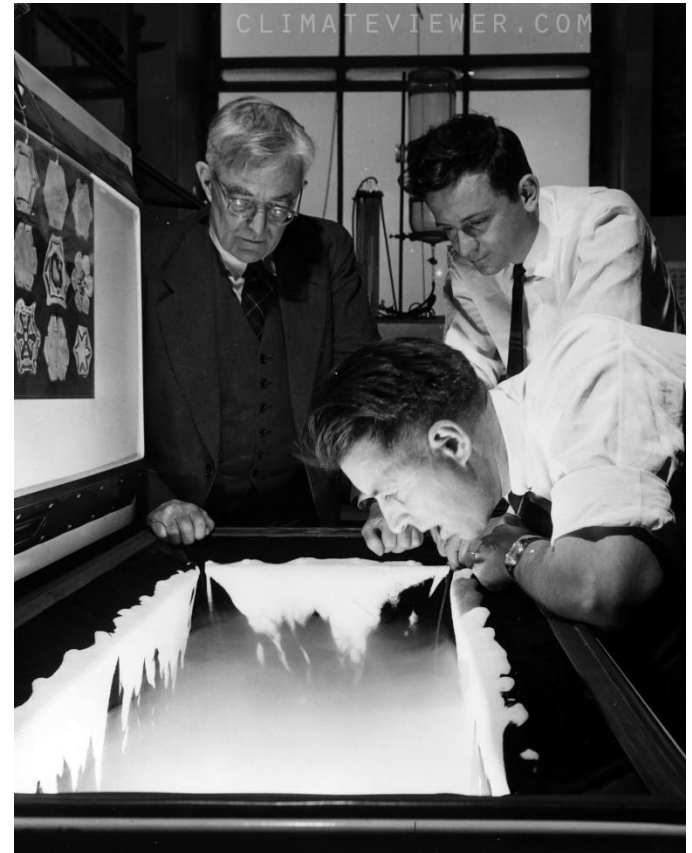
**Never paid  
\$10,000 contract  
due to \$3.5  
million flooding.**



# The Birth of **Cloud Seeding**

November 13, 1946

**Vincent Schaefer, Irving Langmuir, and Bernard Vonnegut**





# First Hurricane Modification Attempt

October 13, 1947



## PROJECT CIRRUS

The US Army, Navy, Weather Bureau, and General Electric scientists seed the first tropical storm ever on October 13, 1947 with 180 pounds of dry ice dropped by aircraft.

**The Cape Sable hurricane formed,** abruptly changed color and direction (120 degrees), and slammed into Savannah Georgia causing 1 death and \$3.2 million in damages.

CLIMATEVIEWER.COM

# Irving P. Krick Invents Ground-based Cloud Seeder - 1949

Irving P. Krick - Inventor of the Ground-based Cloud Seeding Station



CLIMATEVIEWER.COM

# Cloud Seeding Projects 1952 – 1965

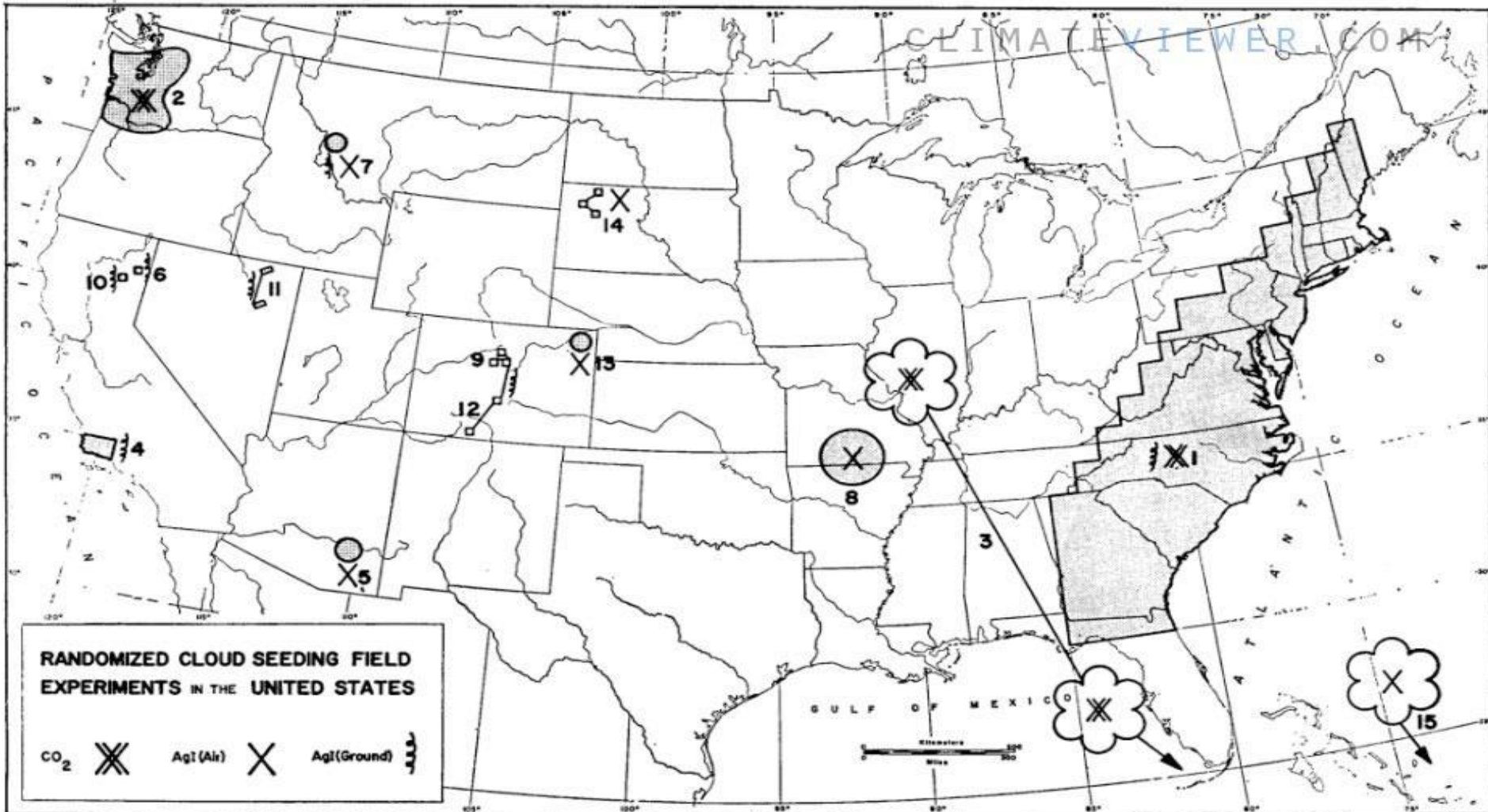


FIGURE 1

Randomized cloud seeding field experiments in the United States.

# Jet Aircraft's "Artificial Clouds" Block Sun - 1958

Spokane Daily Chronicle, Saturday, Dec. 6, 1958. 11

CLIMATEVIEWER.COM

## Darn Sky Riders

### Jet Trails Dim Sun, Palm Springs Gripes

WASHINGTON, Dec. 6. (UPI)—The air force is long since resigned to the fuss about noise from its jets. Now comes Palm Springs, Calif., with a new complaint—that jet trails overhead are so thick they are beginning to blot out the sun.

Jimmy Cooper, manager of the Palm Springs Chamber of Commerce, outlined this "most serious and urgent problem" in a telegram to Representative D. S. (Judge) Saund (D-Calif.), who has asked the air force what can be done.

"As you know," Cooper wired Saund, "our entire economy is dependent upon the tourist trade, which is predicated on our bright sunshine and warm climate. Recently our sky has resembled a mob of exuberant sky riders performing an aerial circus."

"The 'contrails' are not disappearing but are breaking down into a haze and creating a cloud-like appearance in the sky."

"With the unlimited expanse of barren, uninhabited land in the west, does such activity have to be centered over a resort area, which is offering the visitor cloudless skies and unlimited sunshine?"

The air force, so far, is flabbergasted. No doubt in time it will recover its aplomb sufficiently to give Saund the usual answer to all congressional inquiries—

that the matter will be investigated.

The air force figures its jets couldn't blot out the sun short of a wing-to-wing mass flight like the European bombing raids of World War II. If anything like that is going on out of March air force base at Riverside, Calif., the nearest jet base to Palm Springs, air force officials here want to know all about it.

## Shill Ousted by Minister

TOPEKA, Kan., Dec. 6. (AP)—Maurice D. Tulloch, who gave up the life of a Baptist minister to become a shill in a Las Vegas gambling casino, was stripped of his ministerial standing yesterday.

The action was taken by the executive committee of the Kansas Baptist convention.

Tulloch, a graying, spectacled man with crew-cut hair who looks closer to 40 than his 50 years, was pastor of the First Baptist church of Sabetha, Kan. Last September 29, he walked out of a meeting of Baptist pastors in Hutchinson, Kan., and disappeared.

On November 26 he was located in Las Vegas, working as a shill—a gambling casino employee who poses as a customer to drum up trade.

Google news

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Search the Web

Archive Search Help

The Bulletin - Dec 6, 1958

Browse this newspaper »

Browse all newspapers »

CLIMATEVIEWER.COM

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## Russians Claim Flank Exposed

MOSCOW (UPI)—Russia said today that the projected U.S.-Iranian military pact exposes the Soviet Union's southern frontier to "direct danger."

"The Communist Party newspaper Pravda said Russia could not remain indifferent to the situation.

The newspaper quoted what it said were fact that demonstrate that "certain circles in Iran, following the lead of external sources, are aiming at a deterioration of Soviet-Iranian relations and the sowing of mistrust between the two states."

Some 40 houses, we

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# Navy creates/destroys artificial clouds with Carbon Black dust - 1958

## TOLEDO BLADE

One Of America's Great Newspapers

123rd Year

TOLEDO, OHIO, TUESDAY, SEPTEMBER 23, 1958

★ ★ ★ ★

### Blue Skies Or Stormy Weather

## Navy Scientist Creates Clouds, Breaks Them Up

### New Technique May Make Rain

WASHINGTON, Sept. 23 (AP)—The navy said today it has created clouds and destroyed others by seeding them with ordinary carbon black.

A woman scientist who discovered the new method said experiments over southern Georgia produced a series of clouds at a cost of 18 cents a cloud.

Much experimentation must be done before the value of the new technique can be determined. It could open the way to cheap and reliable means of making rain, or of breaking up storm clouds, or of dissipating fog.

The technique was developed by Dr. Florence W. Van Straten, who livened up a desk job with the chief of naval operations by theorizing along new lines as to how rain is formed.

Earlier cloud-seeding methods using more expensive dry ice and silver iodine have

been confined to super-cooled clouds. The carbon method, Dr. Van Straten said, appar-



—Associated Press Wirephoto  
**DR. FLORENCE VAN STRATEN**  
Her cloud theory works

ently works with clouds at any temperature.

In the Georgia experiments, a navy airplane dropped carbon black in both solid and liquid-suspension form into clouds and into clear skies. Additional studies using radar-tracked balloons currently are under way over Chesapeake Bay.

Results indicate that when the carbon is sprayed or sprinkled into a clear sky it causes clouds to form, and when it is introduced into clouds it clears them up. Whether it actually produces rain in this process has not been determined definitely.

"We dropped carbon black, suspended in liquid, over a track a mile long and produced a solid line of clouds one mile long," Dr. Van Straten told a reporter.

"When we dropped 1½-pound dry packages of carbon black, we produced single clouds with each drop."

The navy team seeded seven clouds with carbon, and dissipated each of them in from 2½ to 20 minutes.

"Each cloud turned gray and

then rapidly disappeared," Dr. Van Straten said.

"Aside from the cost of the airplanes, we spent less than \$5 on the experiments in Georgia."

Carbon black, used in printer's ink and automobile tires, is nothing more than soot. It is available cheaply, in commercial quantities, as a by-product of the burning of natural gas.

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WEATHER MODIFICATION HISTORY

# Project Skyfire - 1960-1967

**Preventing  
forest fires with  
Cloud Seeding**


1176  
U583

ADA 952223

The PROJECT *Skyfire*  
CLOUD-SEEDING GENERATOR

by  
Donald M. Fuquay And H. J. Wells

CLIMATEVIEWER.COM



DTIC  
ELECTRONIC  
SEP 16 1983

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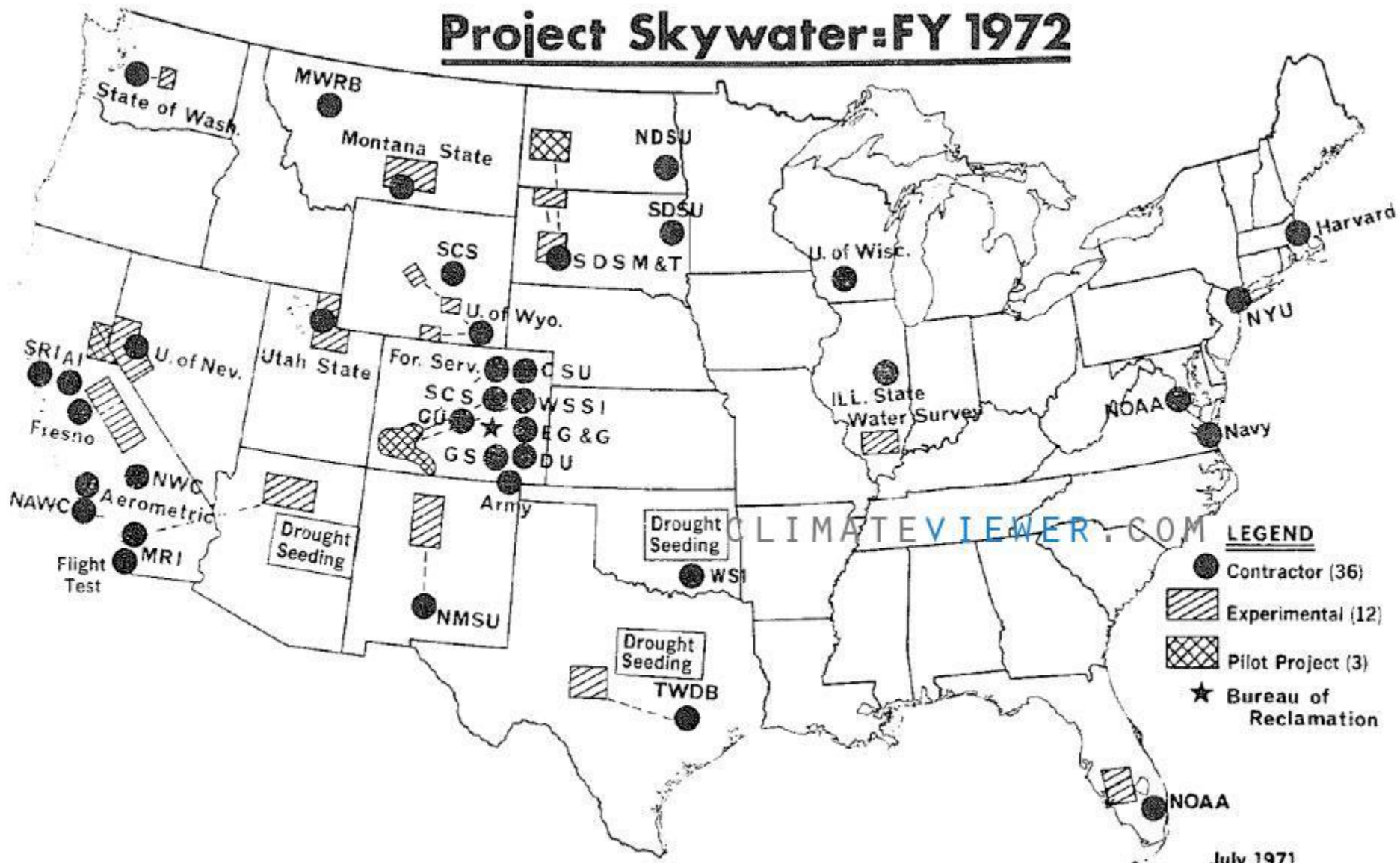
DTIC FILE COPY

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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION  
FOREST SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
Ogden, Utah  
Reed W. Bailey, Director

# Project Skywater 1961-1988

## Project Skywater: FY 1972



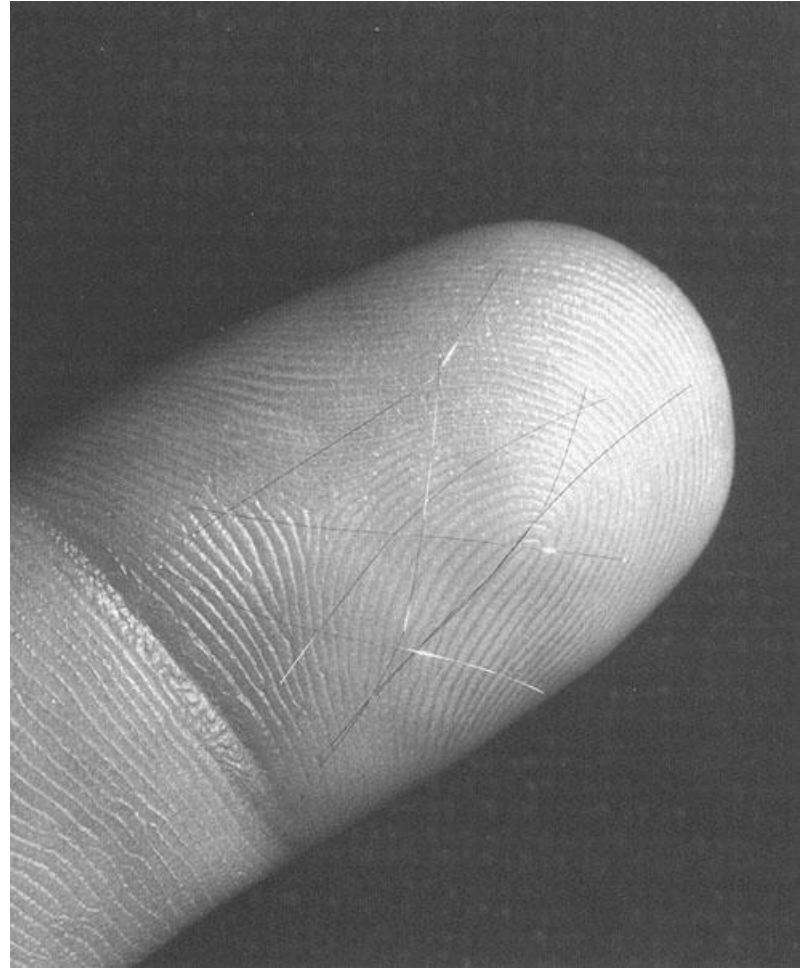
# Project West Ford

**October 21, 1961 - September 5, 1963**

## Creating an Artificial Ionosphere

**480,000,000 copper  
dipole antennas  
launched into orbit.**

**Some are still up there.**





# Project Storm Fury

August 17, 1962 - 1983

**NOAA**  
**Hurricane**  
**mitigation**  
**cloud**  
**seeding**  
**experiments**



# Plasma Seeding Begins – May 1963

## Space Weather Modification

MAGNETOSPHERIC MODIFICATION

1037

“Create an artificial ion cloud in interplanetary space for studying the state of the interplanetary medium .. sounding rocket experiments”

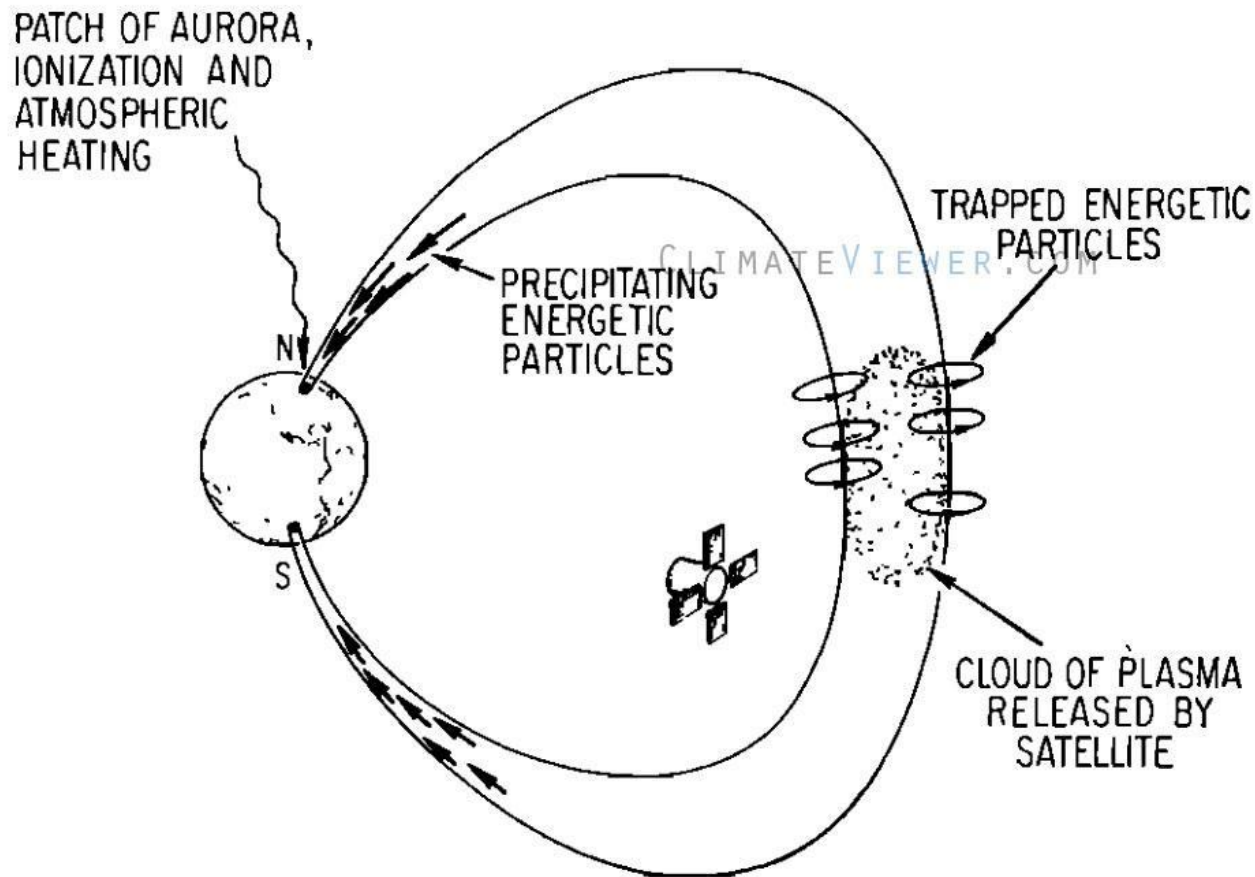


Fig. 1. Schematic view of a plasma injection experiment.  
(From Cornwall [1972].)

# Artificial Strontium and Barium Clouds in the Upper Atmosphere - 1964

“So far seven different experiments have been carried out with **sounding rockets** in the Sahara and in Sardinia.”

## ARTIFICIAL STRONTIUM AND BARIUM CLOUDS IN THE UPPER ATMOSPHERE

H. FÖPPL, G. HAERENDEL, L. HASER, J. LOIDL, P. LÜTJENS,  
R. LÜST, F. MELZNER, B. MEYER, H. NEUSS and E. RIEGER  
Max-Planck-Institut für Physik und Astrophysik, Institut für extraterrestrische Physik,  
Garching bei München

(Received 24 September 1966)

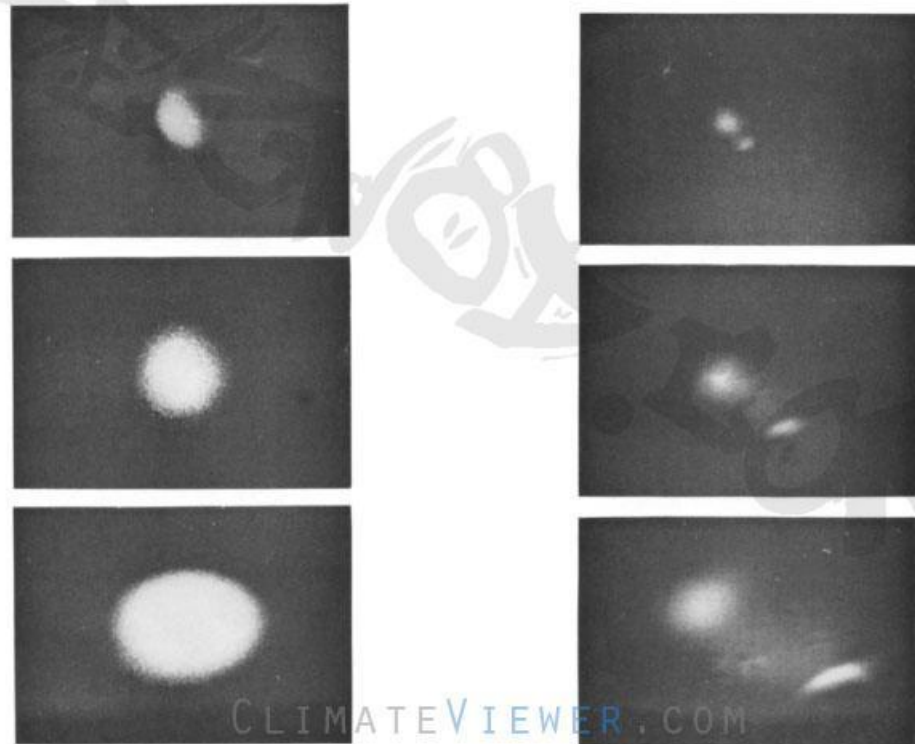
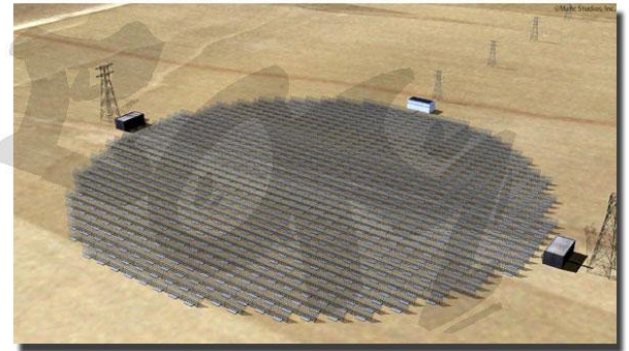
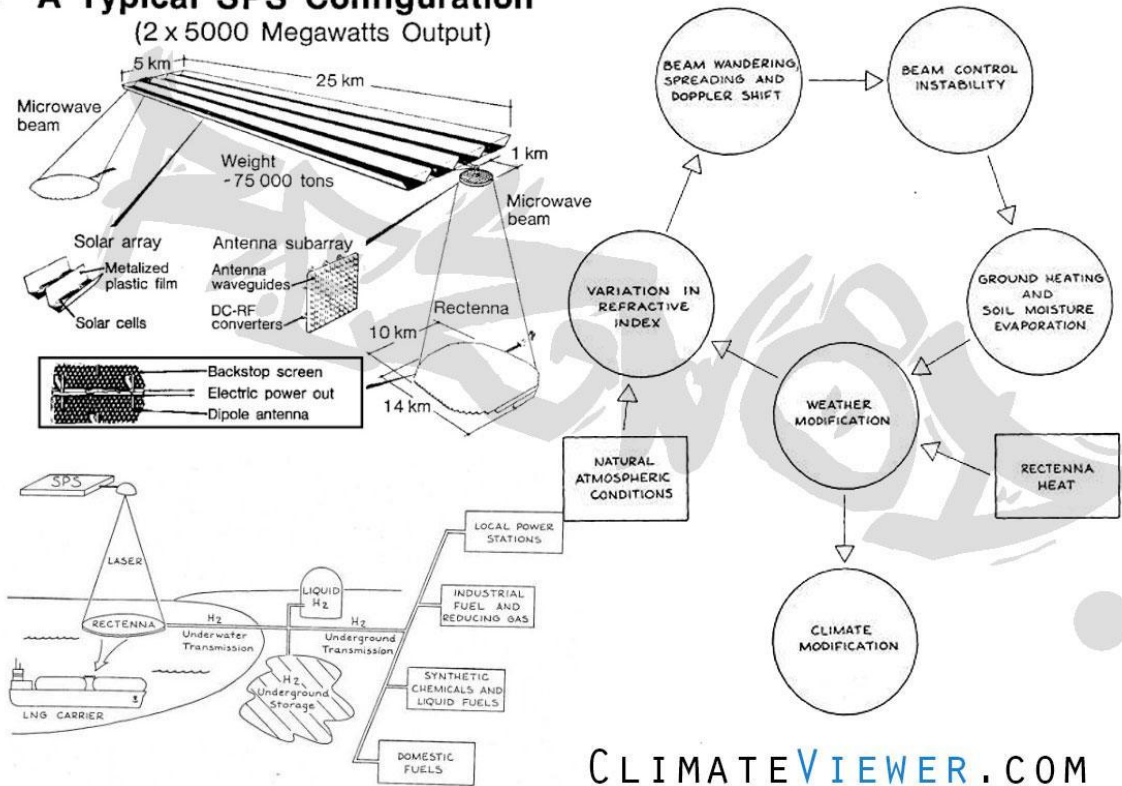


FIG. 2. (d). THE CLOUD OF JULY 6, 1964, IN Sr I LIGHT AS SEEN FROM LA MADDALENA 52 sec, 4 min, AND 22 min AFTER EVAPORATION.

FIG. 3. (d). THE Sr I AND Ba II CLOUDS OF NOVEMBER 27, 1964, 2 min 44 sec, 7 min 3 sec AND 12 min 25 sec AFTER EVAPORATION.

# SOLAR POWER SATELLITE 1968

## A Typical SPS Configuration (2 x 5000 Megawatts Output)



“as long as the program was called Solar Energy by the United States, it could not be considered a **weapons project.**”

# Commercial Airlines To End “Smoke Pollution of the Skies” 1970

St. Petersburg Times - Jan 19, 1970 [Browse this newspaper »](#) [Browse all newspapers »](#)

12-A St. Petersburg Times, Monday, January 19, 1970

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## U.S. To Clamp Down On Jet Pollution

WASHINGTON (AP) — The government will tell the nation's 43 commercial airlines Tuesday that they must end pollution of the skies with jet-engine smoke by 1972 or face punitive legislation from Congress.

Top airline executives will get the blunt message of quick voluntary cleanup or else at a



JOHN A. VOLPE

... calls Tuesday meeting.

meeting called by Secretary of Health, Education and Welfare (HEW) Robert H. Finch and Secretary of Transportation John A. Volpe.

The executives will be told of the Administration's intention to push tough legislation already nearing passage unless they seize this final opportunity of doing the job themselves, HEW pollution fighters said.

MAINLY AT issue is the installation of a redesigned combustor — or burner can — on 3,000 existing commercial jet engines of one maker that reportedly account for 70 per cent of all smoke pollution from airliners.

The government estimates all existing Boeing 727, Boeing 737 and Douglas DC9 jetliners with the Pratt and Whitney JT8B engines can be converted to smoke-free operation by the end of 1972 at a cost of \$13.5-million.

The airline industry has told the Federal Aviation Administration it can do the job by the end of 1974, but only then at a cost of \$30-million.

THE SMOKE that pours from jet engines is caused by incomplete fuel burning in the standard combustor. The redesigned combustor eliminates smoke plumes almost completely, federal specialists

say.

The government is limited to persuasion about jet pollution at present because it lacks specific congressional authorization to attack the problem.

California already has laid down a Jan. 1, 1971, deadline for ending jet pollution in that state. Additionally, Illinois and New Jersey have filed suits to force a quick cleanup.

REPLACE YOUR WINDOWS

REPLACE

REPLACE

REPLACE

ROTTEN WOOD DRAFTY JALOUSIE RUSTY CASEMENT

WITH WINDOWS LIKE THESE

Lawsuit by **Illinois and New Jersey vs. Airline industry**,  
Settled out of court by Secretary of Transportation Volpe.  
Install **“Burner Cans,”** reduce particulate emissions by 70%

# **Cloud Seeding Used As Weapon**

## **30 Years After Invention**

# Operation Popeye

## Weather Warfare over Vietnam

*“Make mud, not war”*

March 20, 1967 - July 5, 1972

**WC-130E with  
Silver Iodide  
dispenser rack**



**USAF 54th Weather Reconnaissance Squadron  
(3 planes total)**

# Operation Popeye

## Weather Warfare over Vitenam

### GOALS

- **Softening road surfaces**
- **Causing landslides along roadways**
- **Washing out river crossings**
- **Maintain saturated soil conditions beyond the normal time span.**





# Operation Popeye **BUSTED!**

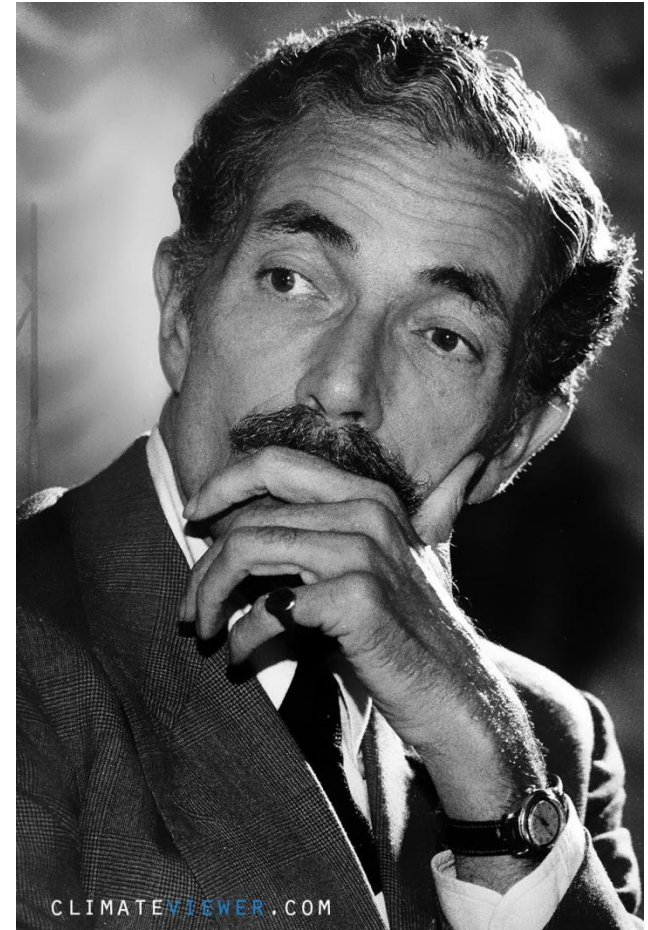
## Reporter Jack Anderson



**Saw a secret memo**

Operation Popeye first came to public light in March 1971, when reporter Jack Anderson published a story based on a secret 1967 memo from the Joint Chiefs of Staff to President Johnson. The memo read: “Laos operations – Continue as at present plus **Pop Eye** to reduce the trafficability [sic] along infiltration routes & Authorization requested to implement operational phase of weather modification process previously successful tested and evaluated in some area”.

## Senator Claiborne Pell



**Held secret hearings**

# **Weather Warfare Politics**

**Weather modification meets full disclosure**

# Top Secret Congressional Hearings

**January 25, March 20, and  
July 26, 1974**

*Benjamin Forman, a senior Department of Defense lawyer, reiterated [Secretary of Defense Melvin] Laird's denial later that year:*

***“We have not, as Secretary Laird has previously said, ever engaged in weather modification activities in Northern Vietnam.”***

**Discussing the need  
for ENMOD**

*Indochina Resource Center*

## WEATHER MODIFICATION

HEARINGS  
BEFORE THE  
SUBCOMMITTEE ON  
OCEANS AND INTERNATIONAL ENVIRONMENT  
OF THE  
COMMITTEE ON FOREIGN RELATIONS  
UNITED STATES SENATE  
NINETY-THIRD CONGRESS  
SECOND SESSION  
ON  
THE NEED FOR AN INTERNATIONAL AGREEMENT PROHIBITING THE USE OF ENVIRONMENTAL AND GEOPHYSICAL MODIFICATION AS WEAPONS OF WAR  
AND  
BRIEFING ON DEPARTMENT OF DEFENSE WEATHER MODIFICATION ACTIVITY

JANUARY 25 AND MARCH 20, 1974

[Top Secret hearing held on March 20, 1974; made public on May 19, 1974]

CLIMATEVIEWER.COM



Printed for the use of the Committee on Foreign Relations

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1974

30-544 O

# Weather Modification Reporting Laws

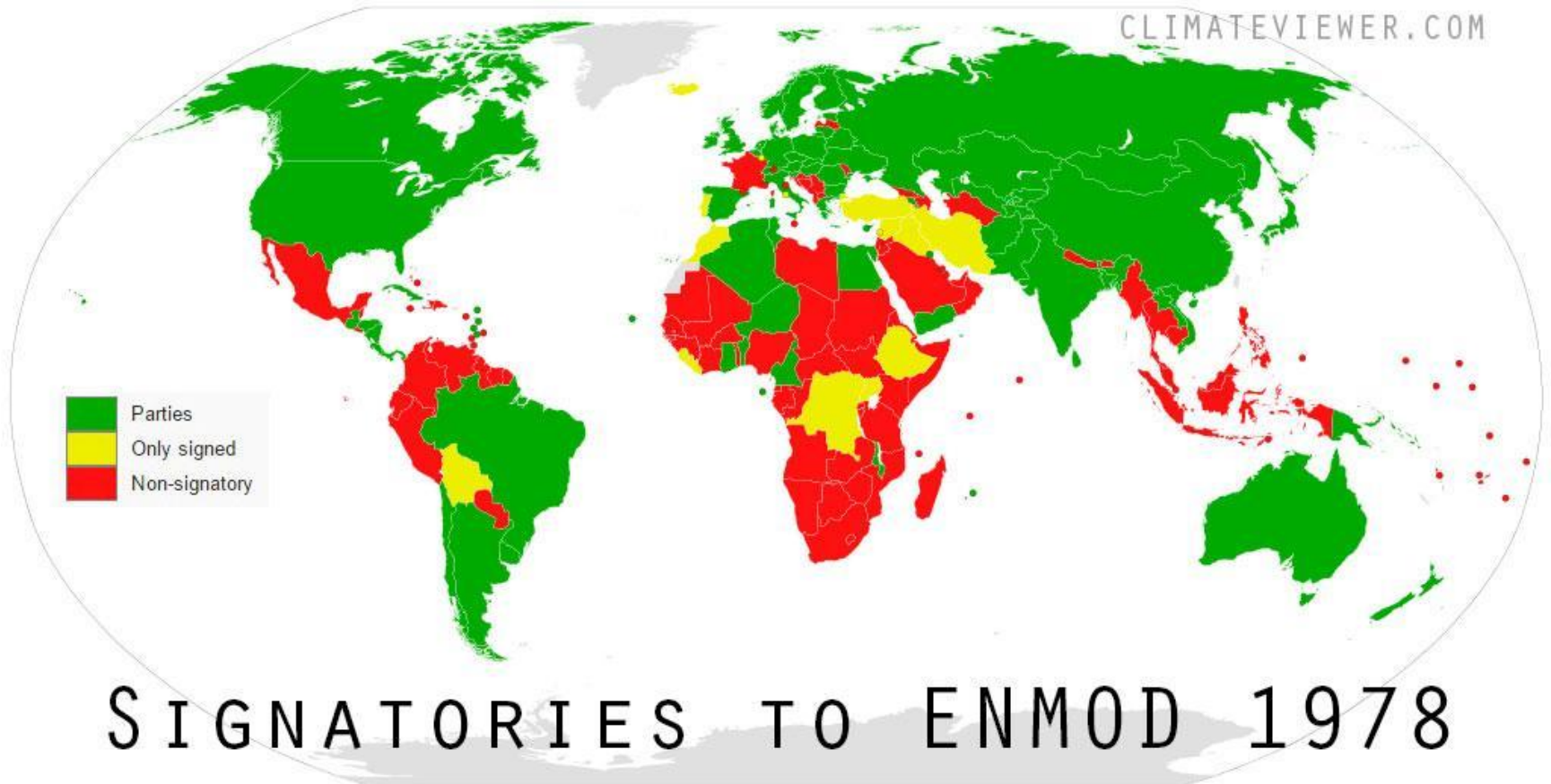
- **Weather Modification Reporting Act of 1972** – *Public Law 92-205* “AN ACT To provide for the reporting of weather modification activities to the Federal Government”  
*15 CFR Part 908* — “Maintaining Records and Submitting Reports on Weather Modification Activities”
- **National Weather Modification Policy Act of 1976** – *Public Law 94-490* “AN ACT To authorize and direct the Secretary of Commerce to develop a national policy on weather modification, and for other purposes”  
*15 U.S. Code Chapter 9A* – “Weather Modification Activities or Attempts; Reporting Requirement”

# Weather Modification Reporting Forms

Complete in accordance with instructions on reverse and forward copy:			Form Approved: OMB No. 0648-0025 Expires 12/31/2007		
TO: National Oceanic and Atmospheric Administration Office of Oceanic and Atmospheric Research 1315 East-West Highway SSMC-3 Room 11216 Silver Spring, MD 20910			NOAA FORM 17-4 U.S. DEPARTMENT OF COMMERCE (4-81) NAT'L OCEANIC AND ATMOSPHERIC ADM. <b>INITIAL REPORT ON WEATHER MODIFICATION ACTIVITIES</b> (P.L. 205, 92 <sup>ND</sup> , CONGRESS)		
<b>1. PROJECT OR ACTIVITY DESIGNATION, IF ANY</b>			<b>2. DATES OF PROJECT</b>		
<b>3. PURPOSE OF PROJECT OR ACTIVITY</b>			a. DATE FIRST ACTUAL WEATHER MODIFICATION ACTIVITY IS TO BE UNDERTAKEN		
<b>4. (a) SPONSOR</b>			<b>4. (b) OPERATOR</b>		
NAME			NAME		
AFFILIATION CLIMATEVIEWER.COM		PHONE NUMBER	AFFILIATION		PHONE NUMBER
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
<b>5. TARGET AND CONTROL AREAS (See Instructions)</b>					
TARGET AREA			CONTROL AREA		
LOCATION		SIZE OF AREA SQ.MI	LOCATION		SIZE OF AREA SQ.MI.
<b>6. DESCRIPTION OF WEATHER MODIFICATION APPARATUS, MODIFICATION AGENTS AND THEIR DISPERSAL RATES, THE TECHNIQUES EMPLOYED, ETC. (See Instructions)</b>					



# ENMOD Weather Warfare Ban



**Opened for signature May 18, 1977**  
**Signed October 5, 1978**

# ENMOD Weather Warfare Ban

“Each State Party to this Convention undertakes not to engage in **military or any other hostile** use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party”

**REQUIRES HOSTILE INTENT**

UNITED NATIONS  NATIONS UNIES

POSTAL ADDRESS—ADRESSE POSTALE UNITED NATIONS, N. Y. 10017  
TELEPHONE ADDRESS—ADRESSE TELEGRAPHIQUE UNITED NATIONS

REFERENCE C.N.263.1978.TREATIES-12

27 October 1978

CONVENTION ON THE PROHIBITION OF MILITARY OR ANY OTHER  
HOSTILE USE OF ENVIRONMENTAL MODIFICATION TECHNIQUES  
APPROVED BY THE GENERAL ASSEMBLY OF THE UNITED NATIONS  
ON 10 DECEMBER 1976

TRANSMISSION OF CERTIFIED TRUE COPIES OF THE CONVENTION  
RECTIFICATION OF THE CERTIFIED TRUE COPIES (ENGLISH TEXT)  
OF THE CONVENTION

Sir,

I have the honour, upon instructions from the Secretary-General,  
..... to transmit herewith two certified true copies of the Convention on the  
Prohibition of Military or Any Other Hostile Use of Environmental Modification  
Techniques, approved by the General Assembly of the United Nations on  
10 December 1976.

You will note, however, that these texts are certified true copies  
subject, in the English text, to the capitalization of the word "earth" in  
the third line of article II and the deletion of the comma after the word  
"Convention" at the end of the third line in article VIII (3), so as to  
conform to the original.

Accept, Sir, the assurances of my highest consideration.

  
Erik Suy  
The Legal Counsel

Sent to the Ministry of Foreign Affairs  
of Member States



# Weather Modification: Programs, Problems, Policy, and Potential

**May 1978**

784 page accounting of weather modification activities in the USA

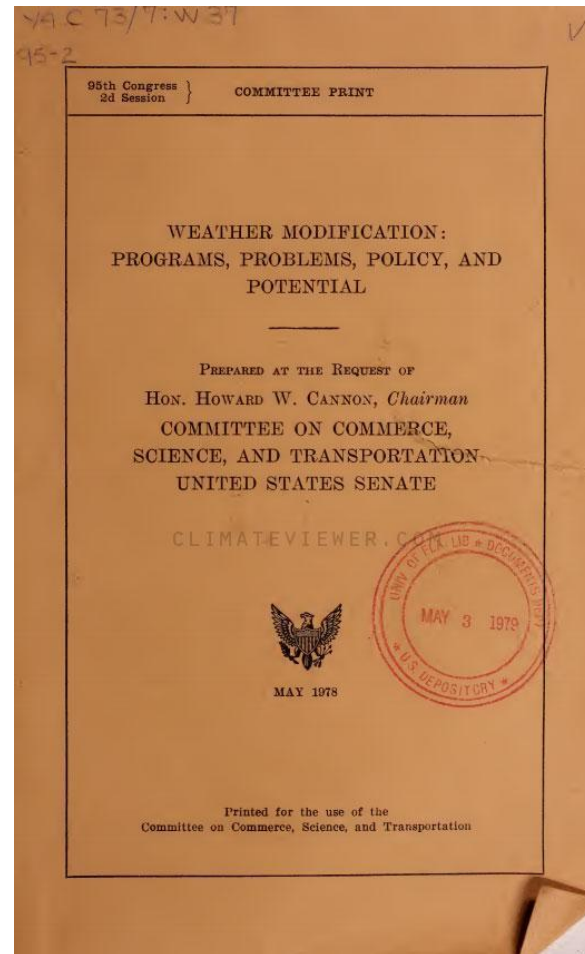


Table 6.--Summary of reported data for CY 1979

	<u>Federal</u>	<u>Nonfederal</u>	<u>Total</u>
(a) Modification days (cumulative)	147	1,091	1,238
(b) Modification days (increase precipi- tation)	113	974	1,087
(c) Modification days (hail suppression)	0	133	133
(d) Modification days (fog dispersal)	34	56	90
(e) Modification days (research)	54	22	76
(f) Airborne apparatus operation (hours)	355	2,043	2,398
(g) Ground-based apparatus operation (hours)	984	14,621	15,605
(h) Dry Ice (kg)	1,530	15,933	17,463
(i) Silver iodide, dispensed (kg)	224	678	902
(j) Liquid propane (gal)	11,077	0	11,077
(k) Polyelectrolyte (kg)	0	641	641

# Summary of Weather Modification Activities Reported in 1979

# ENMOD Has No Teeth

- **ENMOD is just an agreement (paper)**
- **No way to detect weather warfare**
- **No way to prove case**
- **No way to enforce punishment**



**#WTF**

# Where Are We Today?

## The Blue Gold Rush

*“Fresh water has been dubbed “**Blue Gold**” in many publications as potable **water will be to this century what oil was to the last century.**”*

# Cloud Seeding is Big Business

Bloomberg the Company & its Products | Bloomberg Anywhere Remote Login | Bloomberg Terminal Request a Demo

Bloomberg



## Weather on Demand: Making It Rain Is Now a Global Business

Welcome to the strange world of cloud seeding.

By Amanda Little | October 28, 2015

From Bloomberg Businessweek

CLIMATEVIEWER.COM

CAPITALDOM

News - Europe - Asia - USA

## Countries are spending millions to control the weather — here's why

News / Capital 3 months ago

BUSINESS INSIDER

SCIENCE

China spent millions on a shady project to control the weather ahead of the Beijing Olympics — and dozens of other countries are doing it too

Enkai 12  
34.26.2015 8:08 PM A 1100

This summer, China set aside \$30 million for a controversial project that involves shooting salt-and-mineral-filled bullets into the sky.



Feedback Sunday, Nov 27th 2016 11:01 AM GMT+00:00 1 Day Forecast

Daily Mail .com

Travel News

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Local | Features | Travel | Destinations | Travel Tips | Travel Reviews | Best Travel | Travel Deals | Best Vacations | Cruise Travel

## Would YOU pay £100,000 to guarantee a sunny wedding? Travel company offers 'cloud bursting' service to banish rain for couples' big day

- Oliver's Travels say service will guarantee blue skies on the special day
- The technique is also known as cloud seeding and is widely used in China
- Method involves firing rockets filled with silver iodide crystals into clouds
- Particles freeze water droplets causing the clouds to burst and then vanish
- The technique was used ahead of 2008 Beijing Olympics opening ceremony to keep stadium dry
- It was also reportedly used by the Duke and Duchess of Cambridge before their 2012 wedding



# Cloud Seeding Projects Worldwide

The screenshot displays the ClimateViewer 3D web application interface. The main map shows the United States with various weather icons (clouds, sun, snow, rain) and a 300 km scale bar. The sidebar on the right contains a search bar, the title "CLIMATEVIEWER 3D", and a "CHOOSE CATEGORY" menu. The menu items are: ACTIVE, COLLAPSE, TOP, and CLOSE. Below the menu is a search bar with the text "Enter an address or landmark...". The "CHOOSE CATEGORY" menu is expanded, showing the following categories: ALERTS, WEATHER, SATELLITES, POLLUTION, SURVEILLANCE, and GEOENGINEERING. The "GEOENGINEERING" category is selected, and a list of projects is displayed:

- Geoengineering SRM Field Experiments
- Weather Modification Inc. Projects (Worldwide)
- UCAR Earth Observing Lab Field Projects (Worldwide)
- Wyoming Weather Modification Pilot Program (Generators)
- Central Colorado Rocky Mountain Program (Generators)
- Grand Mesa Colorado Cloud-Seeding (Generators)
- Humboldt River Basin Cloud-Seeding (Generators)
- Carson-Walker Basin Cloud-Seeding (Generators)
- Santa Barbara California Cloud-Seeding (Generators)
- Idaho Power Company Cloud-Seeding (Generators)
- NOAA Reported Weather Modification Activities (2012)
- NOAA Reported Weather Modification Activities (2011)
- NOAA Reported Weather Modification Activities (2010)
- NOAA Reported Weather Modification Activities (2009)
- NOAA Reported Weather Modification Activities (2008)
- NOAA Reported Weather Modification Activities (2007)
- NOAA Reported Weather Modification Activities (2006)
- NOAA Reported Weather Modification Activities (2005)
- NOAA Reported Weather Modification Activities (2004)

Below the list are the categories: ELECTROMAGNETIC, EDUCATIONAL, and BASE LAYER OVERLAY. At the bottom of the sidebar is the "IMAGERY" option. The ClimateViewer logo and "CLIMATEVIEWER.ORG" are visible at the bottom of the map.

[climateviewer.org/3D/](https://climateviewer.org/3D/)

# Homeland Security Hurricane Control

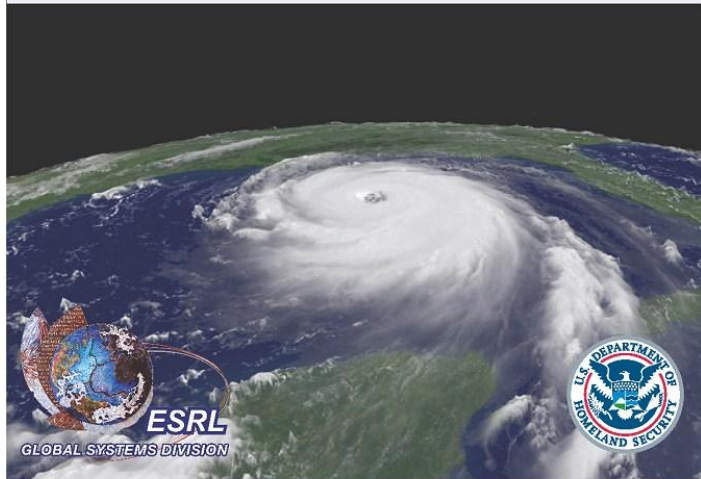
## Hurricane Modification Workshop



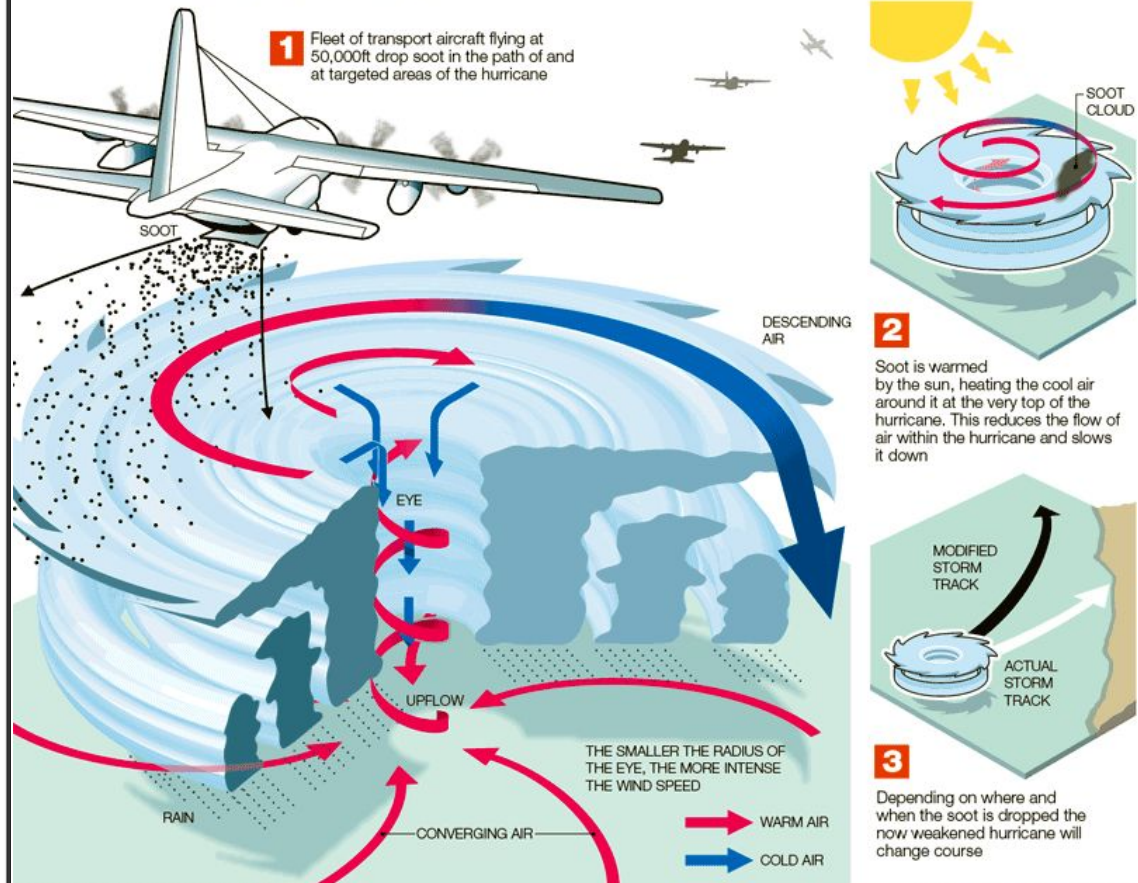
Boulder

February 6-7, 2008

David Skaggs Research Center  
Downstairs/Multipurpose Room  
GC402



## HOW TO HALT A HURRICANE



“The Hurricane Modification Workshop was initiated by Under Secretary Jay Cohen, DHS S&T, to investigate the possibility of minimizing the tremendous loss of life, property, and economic stability by reducing the destructive forces of a hurricane. This may be accomplished by **modifying its track, speed, winds, and rain.**”

# Homeland Security Hurricane Control





# US Military Violating ENMOD

## 1994 FOIA – USAF Phillips Lab, USN China Lake

### NON LETHAL WARFARE PROPOSAL

TITLE: WEATHER MODIFICATION

TYPE OF EFFORT: S&T

PROPOSED BY: Code C2741 (Warhead Development Branch) NAWCWPNS,  
China Lake, CA 93555-6001

CAPABILITY & USES: (1) To impede or deny the movement of personnel and material because of rains-floods, snow-blizzards, etc.  
(2) To disrupt economy due to the effect of floods, droughts, etc.

TECHNICAL DESCRIPTION: By way of background, weather modification was used successfully in Viet Nam to (among other things) hinder and impede the movement of personnel and material from North Viet Nam to South Viet Nam. Since that time military research on Weather Modification has dwindled in the United States but not necessarily in the Soviet Union (Russia). Commercial weather modification is an active industry.

The approach of this proposal is to (1) determine the current state-of-the-art technology in weather modification; (2) determine the applicability of current weather modification techniques and devices to military application and utilization; and (3) generate a E&MD Program Plan(s) to modify (or develop as necessary) weather modification techniques and devices suitable for military application. Current industrial techniques and devices are not likely to be suitable for military application or meet military requirements.

The successful completion of the proposed effort and the follow-on E&MD program(s) will give the U.S. military a viable, state-of-the-art weather modification capability again.

RISK & LIMITATIONS: The risk is low in that this initial proposed study effort/investigation and its assumed E&MD follow-on involve the modification of commercial techniques and devices to meet military applications and not the development of new technology.

The application of weather modification requires suitable meteorological conditions and, therefore, has that operational limitation.

I know of no countermeasures.

#### PROJECT PLAN:

ACTIVITY/FY	FY-1	FY-2
Determine State-of-Art	1/2 man-year/\$65K	
Investigate Applicability to Military Utilization	3/4 man-year/\$100K	3/4 man-year/\$105K
Generate Follow-on Proposals [E&MD(s)]		1/2 man-year/\$70K
<b>TOTALS</b>	<b>1 1/4 man-year \$165K</b>	<b>1 1/4 man-year \$175K</b>

13:27 FAX 703 588 6378

11 CS/SCSRLD

94-159  
Phillips Lab

1. Title: Weather Modification Using Carbon Black

2. Type Effort: S&T

3. Proposed by: Phillips Laboratory (AFMC), Geophysics Directorate

4. Capability Sought and Uses to Which it Could be Put:

4.1 Increase Precipitation:

4.1.1 Muddy dirt roads to decrease tractability.

4.1.2 Flood fields and small rivers.

4.1.3 Decrease troop comfort level.

4.1.4 Decrease tractability by snow or freezing rain when the temperature condition

right.

#### 7. Project Plan - Major Milestones

- Numerical model studies completed 1996
- Engineering design of test engine mod. 1997
- Ground-based field trials completed 1999
- Airborne test and evaluation of prototype completed 2001
- Engineering design for airborne carbon black delivery system completed 2003
- Operational capability 2004

#### 8. Project Cost by Fiscal Year: (\$M)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
6.1	1.0	1.0	1.0							
6.2			1.5	1.5	1.5	1.5	1.5			
6.3					2.0	2.0	3.0	2.0	2.0	2.0
Total	1.0	1.0	2.5	2.5	3.5	3.5	3.5	2.0	1.0	2.0

Rough estimate of total cost to operational capability: \$23.5M. Life cycle costs have not been estimated.

#### 9. Organization Point of Contact:

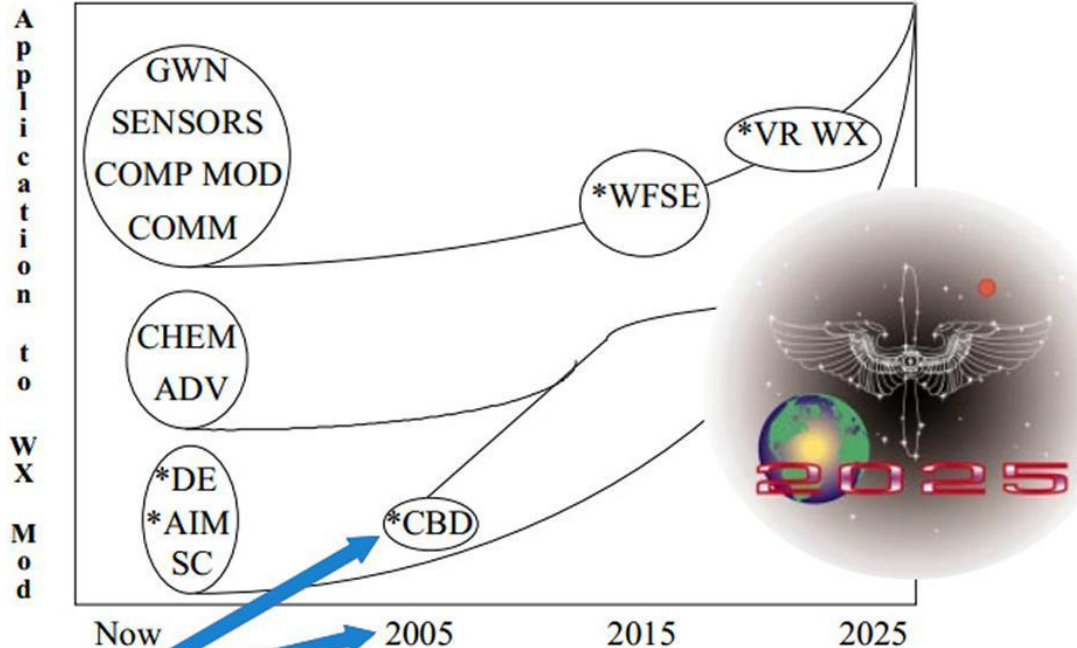
[Redacted]

# US Military Violating ENMOD

## 1995-1997 – AF2025, WXM0D Test Technology Symposium '97

### Weather as a Force Multiplier: Owning the Weather in 2025

by Col Tamzy J. House, Lt Col James B. Near, Jr., LTC William B. Shields (USA), Maj Ronald J. Celentano  
 Maj David M. Husband, Maj Ann E. Mercer, Maj James E. Pugh, August 1996  
<http://csat.au.af.mil/2025/volume3/vol3ch15.pdf>



**Legend**

ADV	Aerospace Delivery Vehicles	DE	Directed Energy
AIM	Artificial Ionospheric Mirrors	GWN	Global Weather Network
CHEM	Chemicals	SC	Smart Clouds (nanotechnology)
CBD	Carbon Black Dust	SENSORS	Sensors
COMM	Communications	VR WX	Virtual Weather
COMP MOD	Computer Modeling	WFSE	Weather Force Support Element

\* Technologies to be developed by DOD

Figure 5-2. A Systems Development Road Map to Weather Modification in 2025.



### CLOUD SEEDING

- WEATHER MODIFICATION USING CARBON BLACK (1)
  - Increase Precipitation
    - » Muddy dirt roads to decrease tractability
    - » Flood fields and small rivers
    - » Decrease troop comfort level
    - » Decrease tractability by snow or freezing rain when the temperature conditions are right
  - Decrease Precipitation #
    - » Dry out roads/fields for improved tractability
    - » Deny fresh water to troops in semi-dry regions

TTS 97

Weather Modification/PL/OP/AA/BS/970402 9



### CLOUD SEEDING (cont.)

- WEATHER MODIFICATION USING CARBON BLACK (2)
  - Increase Cirrus Cloud Cover
    - » Deny visual satellite or high altitude reconnaissance
    - » Decrease light level for night time operations
  - Dissipate Fog
    - » Uncover targets for visual raids
    - » Provide visual inspection of damage
    - » Provide visual reconnaissance
    - » Open airfields for landing / recovery

TTS 97

Weather Modification/PL/OP/AA/BS/970402 10

# Cloud Ionizers – Electric Rainmaking

**Meteo Systems – “WeatherTec”**  
 www.meteo-systems.com  
 Cloud Ionizer

**United States Patent Application 20110174892**  
**APPARATUS AND RELATED METHODS FOR WEATHER MODIFICATION BY ELECTRICAL PROCESSES IN THE ATMOSPHERE**

**Ionogenics ELAT “Cloud Ionizer”**  
 Electrification of the Local Atmosphere  
 WEBB COUNTY, TEXAS

IONOGENICS IONIZATION PLUME (SUMMER)  
 PREVAILING WINDS (SUMMER)  
 WITNESS STATION (FREER, TX)  
 NUEVO LAREDO  
 LAREDO  
 IONOGENICS IONIZATION STATION

The white dots represent ELAT stations operating in precipitation enhancement mode and the blue dot represents an ELAT station that in 2002 was operating in precipitation inhibiting mode.

The green areas are where ELAT stations were operational. In some cases (Tamps, Coah and Son) the ionization stations located in the green areas covered only part of the state. The names of the different states are as follows:

Son	= Sonora	Coah	= Coahuila
Chih	= Chihuahua	NL	= Nuevo Leon
		Tamps	= Tamaulipas
		Sin	= Sinaloa
		Dgo	= Durango
		Zac	= Zacatecas
		SLP	= San Luis Potosi
		Nay	= Nayarit
		Ags	= Aguascalientes
		Jal	= Jalisco
		Gto	= Guanajuato
		Oro	= Queretaro
		Hdgo	= Hidalgo

Legend:  
 ■ Operational  
 ■ Non-Operational  
 ● ELAT Stations  
 ● Special ELAT Station

ions ions  
 High Voltage Lines  
 Equipment Shack

CLEAR SKY MANAGER has been tested on various occasions such as in Russia (Vladivostok, October 2003) as well as put into practice with success in DUBAI in the period September 2006-January 2007.



Ionizer installed on a flat roof in Dubai (2006)

Dubai skyline during tests in 2006

**Australian Rain Technologies** “ATLANT” Cloud Ionizer

www.australianrain.com.au

# Cloud Ionizers – Electric Rainmaking



“Fresh water has been dubbed “Blue Gold” in many publications as potable water will be to this century what oil was to the last century.

While large efforts and money are being allocated for localized weather modification, SciBlue is looking to use the tropospheric rivers to deliver rain to parched areas of the world now and possibly abatement operations of severe weather in the near future.”

David Kutchinski,  
CEO Sciblu, Inc.  
US. Air Force Company  
La Junta, Colorado, USA

## ELECTROMAGNETIC WEATHER CONTROL IS HERE!

### U.S. Drought Monitor

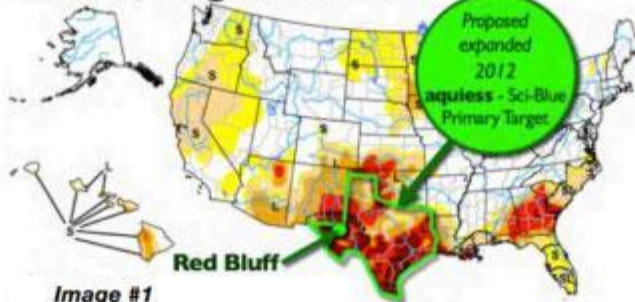


Image #1

Primary Target Red Bluff, Secondary Target: Texas

CONUS - Florida Base Current 7 Day Forecast of Rainfall Precipitation  
Valid at 5/15/2013 1300 UTC - Created 5/15/13 13:38 UTC

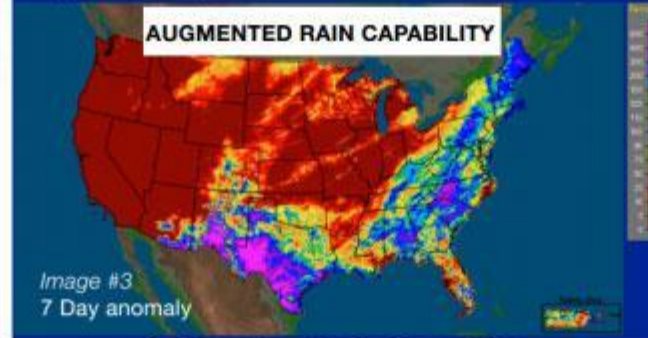


Image #3

7 Day anomaly

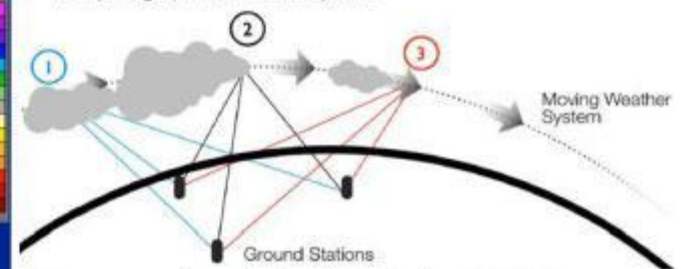
Project Start  
16th April 2012

The proprietary weather modification system operates by utilizing 'resonance' signals to divert oceanic atmospheric-rivers into areas experiencing severe drought

Image

The Moisture Feed Plan

Signals are launched from ground based servers, to adjust flight paths of weather systems



Texas experiment April 16 - July 16, 2012

Aquiness has intervened in over 40 rainfall projects, many on massive scale.

**aquiness is offering sovereign states an augmented rainfall capability as part of its new regional 'tool-box' - to strengthen economies, replenish dry-land agriculture and improve food security - David Miles CEO**

<https://climateviewer.com/2015/05/28/how-texas-stole-californias-rain/>

<https://climateviewer.com/2014/03/26/cloud-ionization-electric-rainmaking-laser-guided-weather-modification/>

<https://climateviewer.com/2014/02/02/blue-gold-rush-future-water-wars-using-rivers-troposphere/>

# Cloud Ionizers – Electric Rainmaking

WMO DOCUMENTS ON WEATHER MODIFICATION  
Updated in the meeting of the Expert Team on Weather Modification Research  
Abu Dhabi, 22-24 March 2010

WORLD METEOROLOGICAL ORGANIZATION

**“Weather Modification technologies that claim to achieve such large scale or dramatic effects do not have a sound scientific basis (e.g. hail canons, ionization methods) and should be treated with suspicion.”**

EXECUTIVE SUMMARY OF THE WMO STATEMENT ON WEATHER MODIFICATION

## INTRODUCTION

The activities of the WMO in the area of weather modification are aimed at research projects, and at providing guidance about best practices for operational projects.



It should be realised that the energy involved in weather systems is so large that it is possible to create cloud systems that rain, alter wind patterns to bring water vapour into a region, or completely eliminate severe weather phenomena. Weather Modification technologies that claim to achieve such large scale or dramatic effects do not have a sound scientific basis (e.g. hail canons, ionization methods) and should be treated with suspicion.

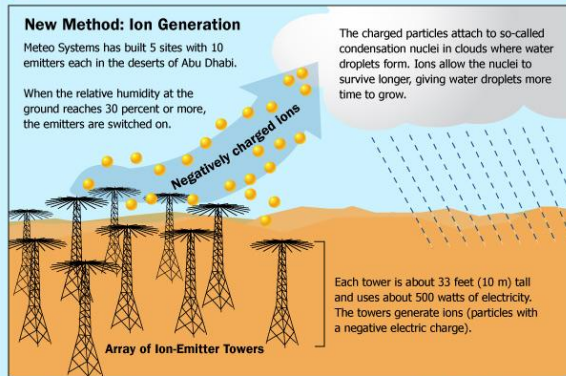
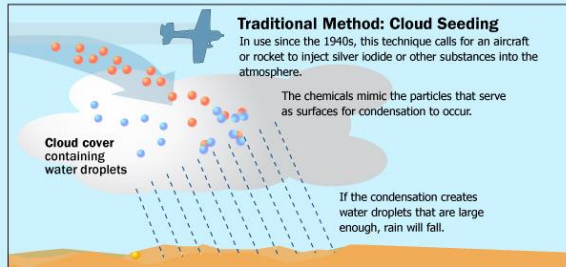
Purposeful augmentation of precipitation, reduction of hail damage, dispersion of fog and other types of cloud and storm modifications by cloud seeding are developing technologies which are striving to achieve a sound scientific foundation.

Operational programmes in fog dispersion, rain and snow enhancement and hail suppression are taking place in many countries around the world. The primary aim of these projects is to obtain

LIVE SCIENCE, [www.LiveScience.com](http://www.LiveScience.com)


## Science Plays Rain God: Seeding and Ions

An ambitious project attempts to ionize the lower atmosphere and create conditions where raindrops can easily form. Here is a look at old and new techniques of trying to induce rainfall:



SOURCE: METEO SYSTEMS

KARL TATE, LiveScience.com

A close-up portrait of William Cohen, Secretary of Defense, looking slightly to the right with a serious expression. He is wearing a dark suit, a white shirt, and a patterned tie.

**“Others are engaging even in an eco-type of terrorism whereby they can alter the climate, set off earthquakes, volcanoes remotely through the use of electromagnetic waves.”**

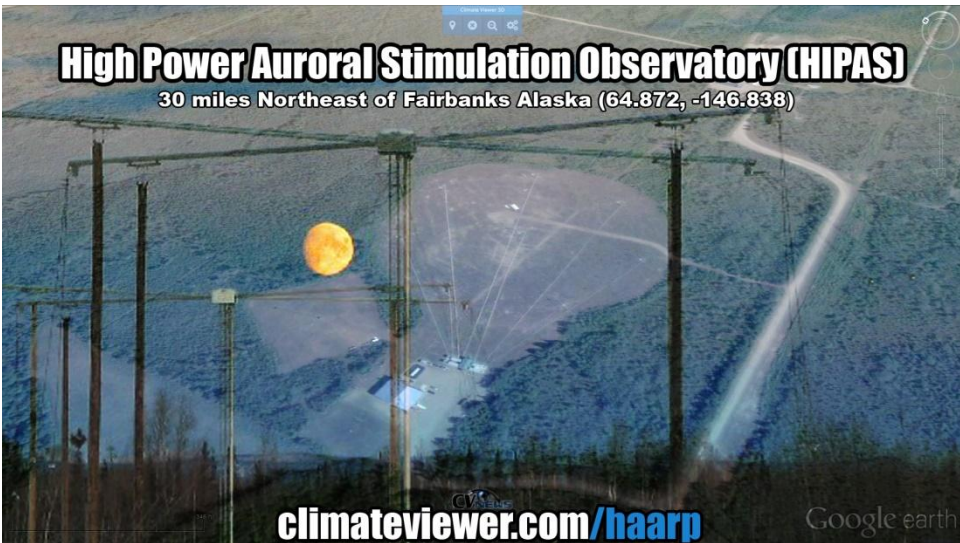
**Secretary of Defense William Cohen**

**GEOPHYSICAL WARFARE**

# Ionospheric Heaters

## High Power Auroral Stimulation Observatory (HIPAS)

30 miles Northeast of Fairbanks Alaska (64.872, -146.838)



[climateviewer.com/haarp](http://climateviewer.com/haarp)

Google earth

## Arecibo Observatory Enhanced HF Ionospheric Heating Instrument

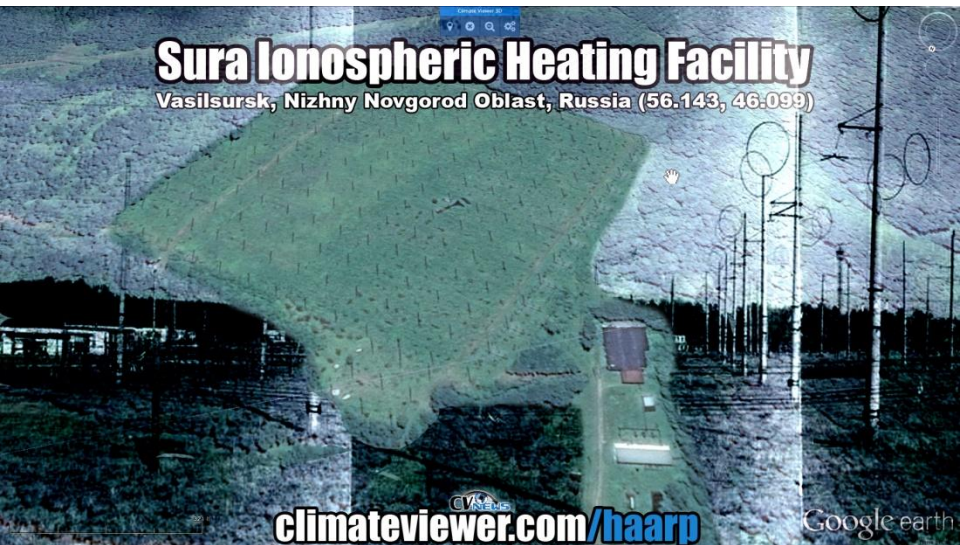
Arecibo Observatory, Arecibo, Puerto Rico (18.344, -66.752)



[climateviewer.com/haarp](http://climateviewer.com/haarp)

## Sura Ionospheric Heating Facility

Vasilsursk, Nizhny Novgorod Oblast, Russia (56.143, 46.099)

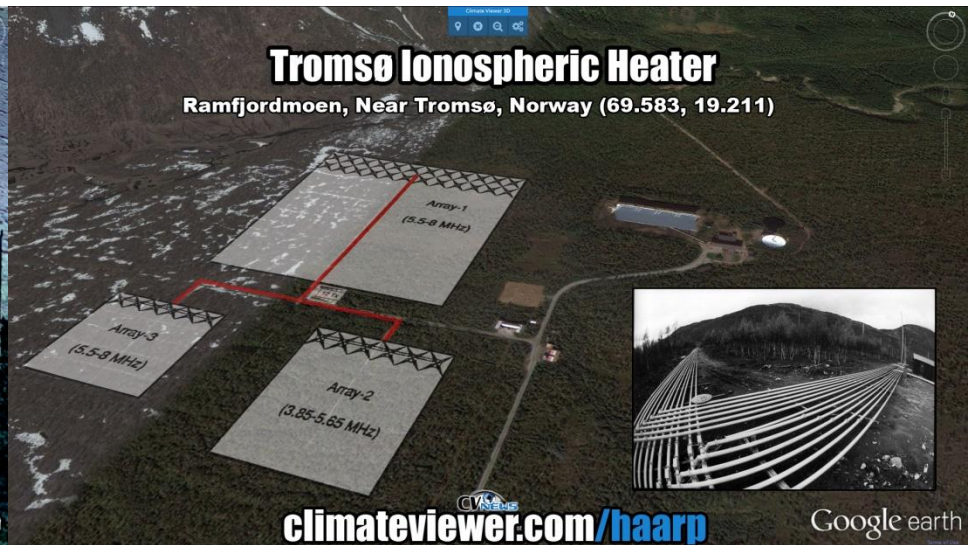


[climateviewer.com/haarp](http://climateviewer.com/haarp)

Google earth

## Tromsø Ionospheric Heater

Ramfjordmoen, Near Tromsø, Norway (69.583, 19.211)



[climateviewer.com/haarp](http://climateviewer.com/haarp)

Google earth

# HAARP IRI – Gakona, Alaska

November 28, 2016

## High Frequency Active Auroral Research Program HAARP

100 m

ACTIVE COLLAPSE TOP CLOSE

Enter an address or landmark...

### CLIMATEVIEWER 3D

CHOOSE CATEGORY

- ALERTS
- WEATHER
- SATELLITES
- POLLUTION
- SURVEILLANCE
- GEOENGINEERING
- ELECTROMAGNETIC**

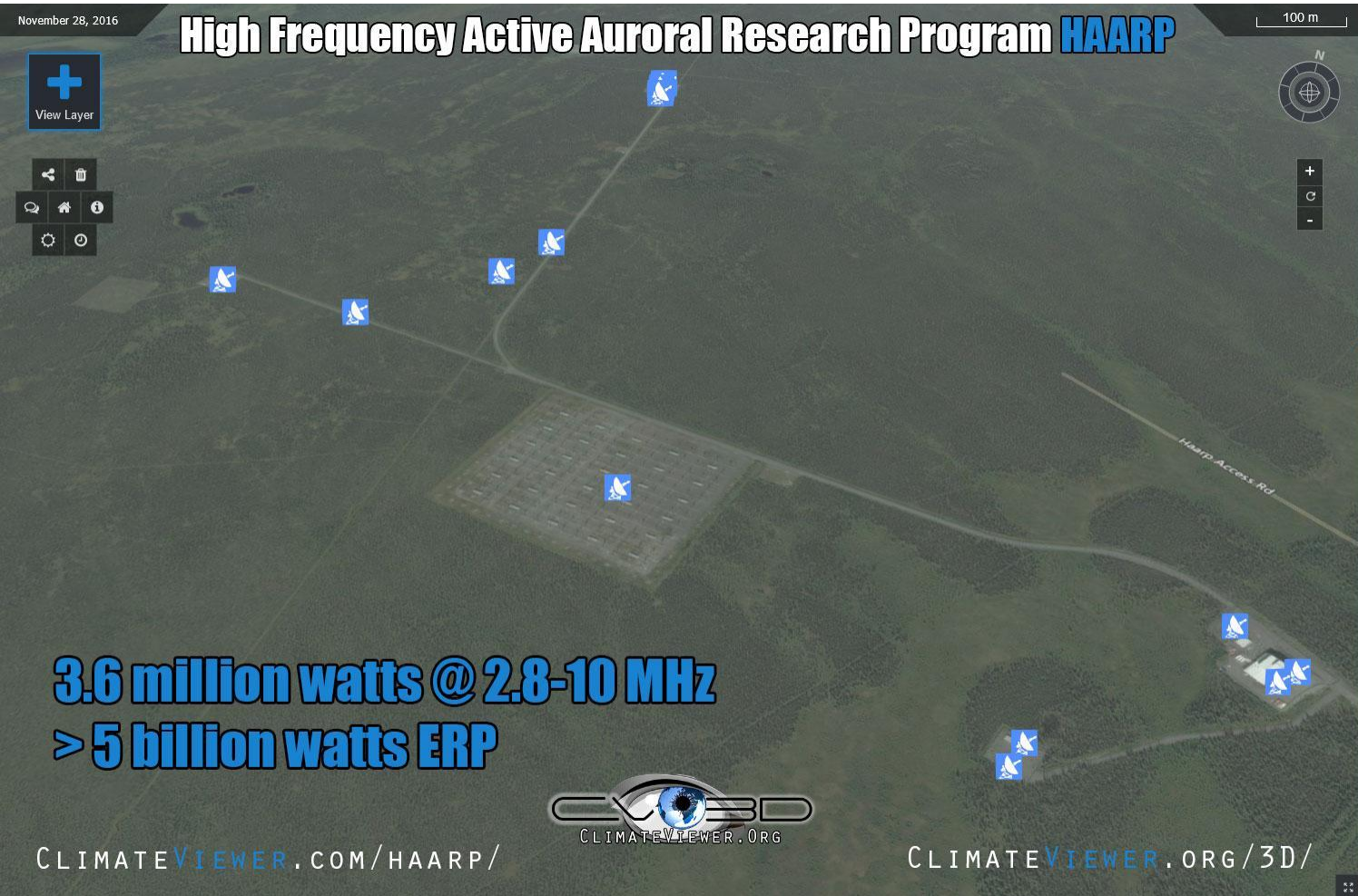
- ▶ Missile Defense Radars (Star Wars)
- ▶ Ionospheric Heaters
- ▶ **High-Frequency Active Auroral Research Project**

Map Markers


1. HAARP
2. HAARP Digisonde
3. HAARP Optical Shelters
4. HAARP Research Building
5. (IRI) Ionospheric Research Instrument
6. VHF Ionospheric Radar
7. Aircraft Alert Radar
8. Aircraft Alert Radar
9. VHF Classic Riometer Antenna
10. Modular UHF Ionospheric Radar
11. Power Plants
12. Diagnostic Instrument Pad 1
13. Diagnostic Instrument Pad 2
14. Diagnostic Instrument Pad 3

- ▶ Super Dual Auroral Radar Network (SuperDARN)
- ▶ DIGISONDE® Ionosonde Network
- ▶ ELF and VLF Transmitters
- ▶ ELF and VLF Visual Reference
- ▶ Lasers and Directed-Energy
- ▶ NEXRAD Doppler Radar Stations
- ▶ Canadian Sigmnet Doppler Radar Stations
- ▶ Terminal Doppler Weather Radar (TDWR) Stations
- ▶ Joint Surveillance System (JSS), FAA Long-range Radar
- ▶ Integrated Ocean Observing System (IOOS) Radar
- ▶ NOAA Profiler Network (NPN) Wind Radar
- ▶ MARS SAR Wind Radar

3.6 million watts @ 2.8-10 MHz  
> 5 billion watts ERP



CLIMATEVIEWER.ORG/HAARP/



CLIMATEVIEWER.ORG/3D/



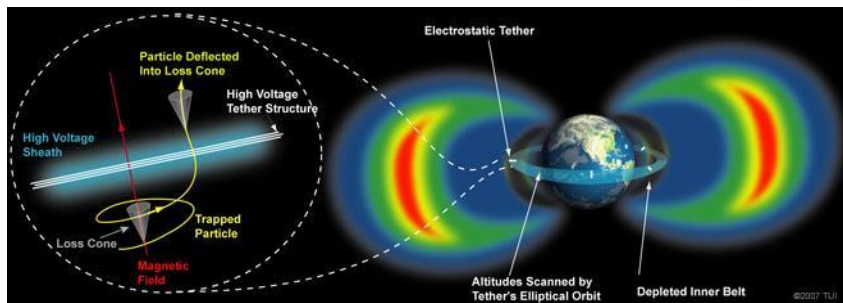
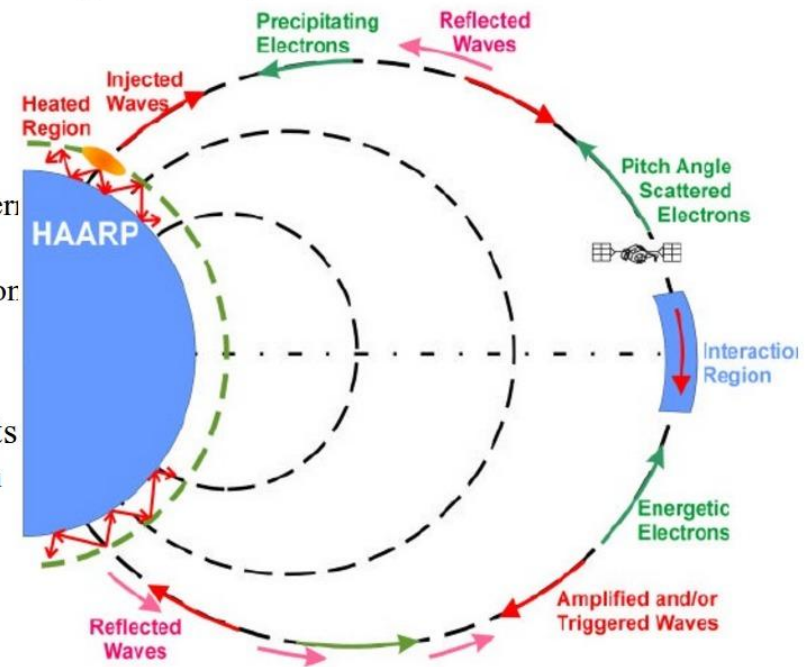
# Radiation Belt Remediation aka Draining the Van Allen Belts

“we don’t think there is any downside to not having them [Van Allen belts]” says Dr. Jacob Bortnik, UCLA. “That’s the most any of us can really say at the moment.”

## TETHER Panel Recommendation:

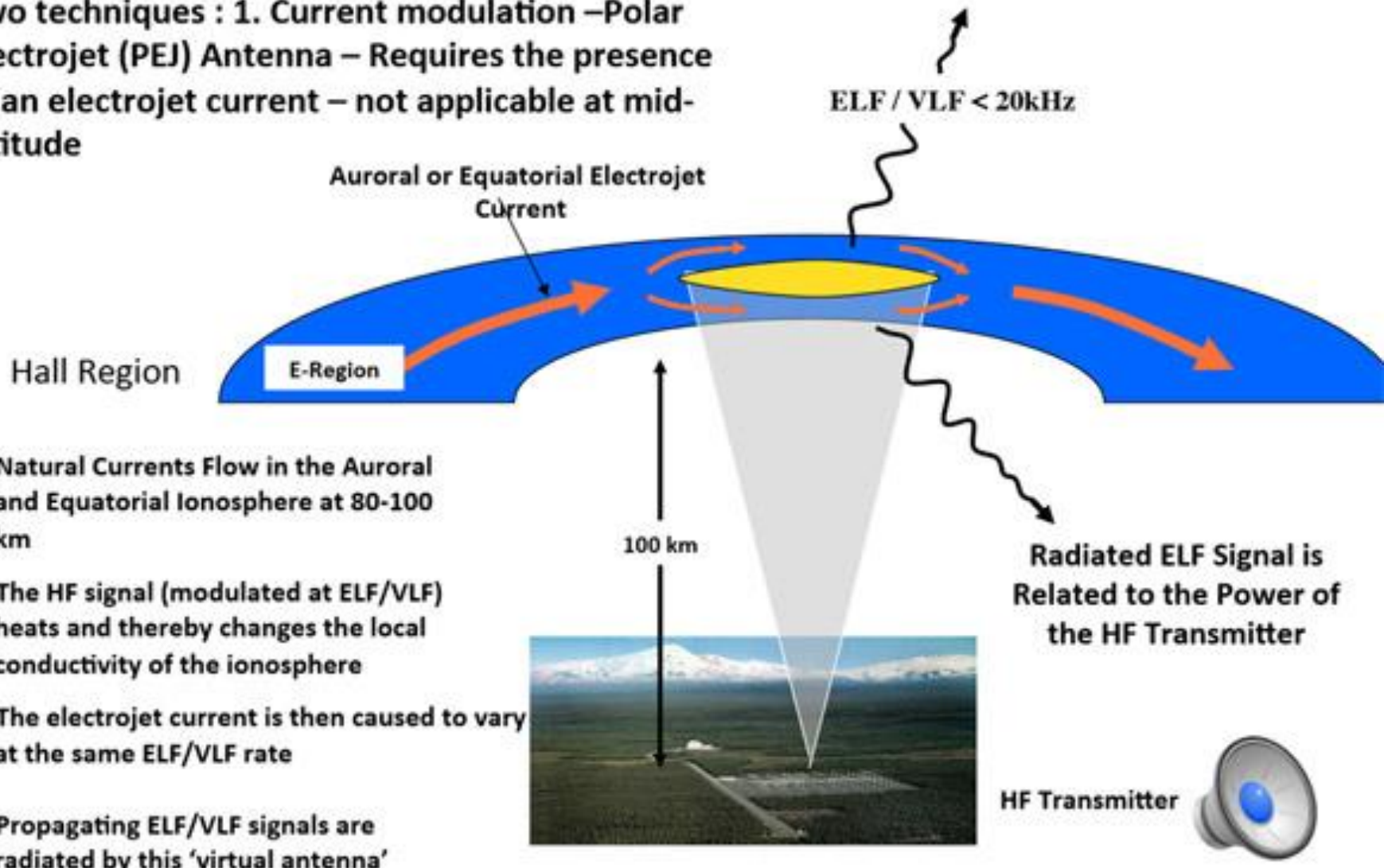
Use HAARP facility in Alaska as a “wind tunnel” to determine the feasibility and engineering specifications of a mitigation system.

- Observe amplified and triggered waves
  - At conjugate region (Southern Pacific)
  - Near HAARP upon reflection in the south
- Observe ionospheric effects of precipitated electrons with HAARP diagnostics



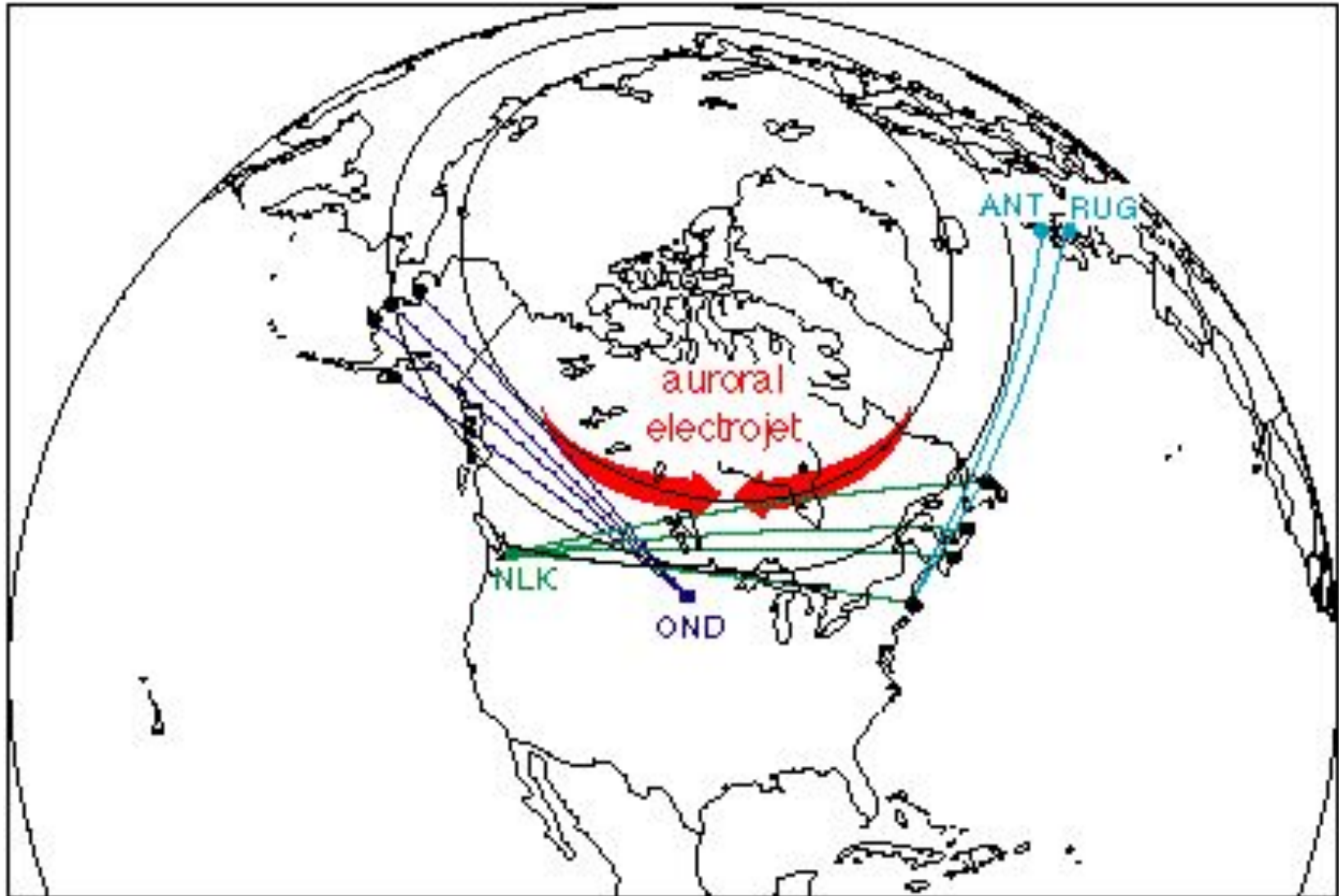
# HF Ionospheric Heaters as “VIRTUAL” ULF/ELF/VLF Antennae

Two techniques : 1. Current modulation –Polar Electrojet (PEJ) Antenna – Requires the presence of an electrojet current – not applicable at mid-latitude



- Natural Currents Flow in the Auroral and Equatorial Ionosphere at 80-100 km
- The HF signal (modulated at ELF/VLF) heats and thereby changes the local conductivity of the ionosphere
- The electrojet current is then caused to vary at the same ELF/VLF rate
- Propagating ELF/VLF signals are radiated by this 'virtual antenna'

# Polar Electrojet PEJ Heating E Region





# F-Region ULF/VLF "Virtual Antenna – Ionospheric Current Drive (ICD)

**DOES NOT REQUIRE EJETA – CAN BE IMPLEMENTED ANYWHERE AND ANYTIME**

Papadopoulos et al.

GRL 2011a,b

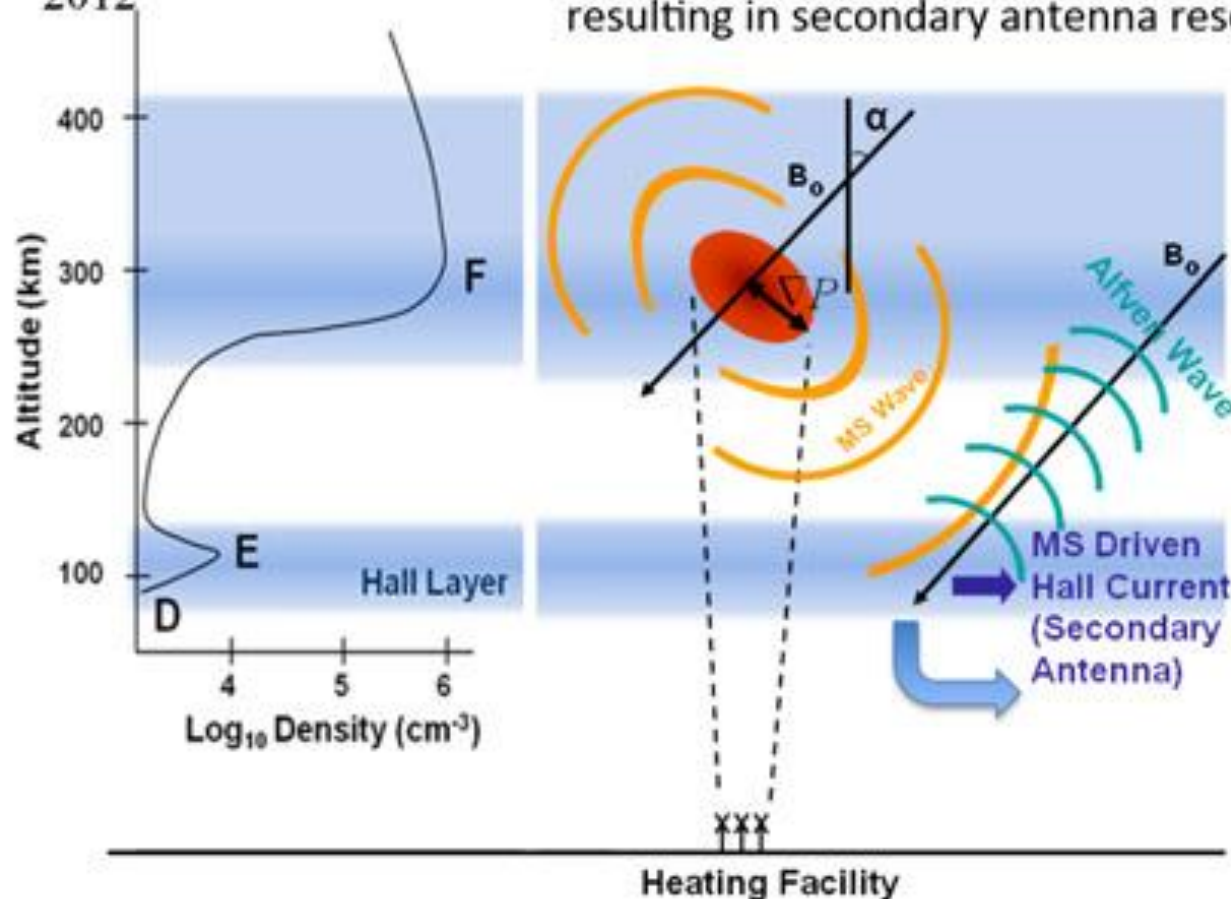
Eliasson et al., JGR

2012

Based on Modulated F-Region Heating (Diamagnetic current)

Step 1: 
$$\Delta J = \frac{B \times \nabla \delta p}{B^2} \exp(i\omega t)$$
 **Magnetosonic (MS) Wave**

Step 2: E field of MS wave drives Hall current in E-region resulting in secondary antenna resembling PEJ



F- region cooling response does not allow frequencies higher than 60-70 Hz

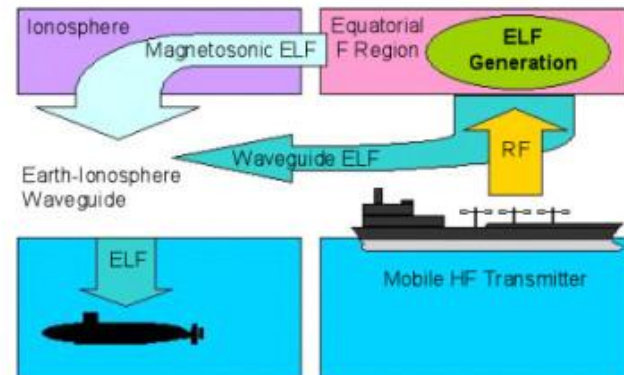
Injects MS & SAW upwards and ELF in the Earth-Ionosphere Waveguide

# Ionospheric Current Drive ICD Heating



## SUMMARY

- ELF produced by HAARP with ***NO Electrojet – A Major Breakthrough*** based on discoveries in recent HAARP campaigns under MURI/ONR and BRIOCHE/DARPA programs
  - Predictable and repeatable ELF generation up to 50 Hz on daily basis
  - $M_{\text{eff}} \approx 4 \times 10^9 \text{ A-m}^2$
  - Validated technique: plasma currents driven by HF heating in the F/E layers
  - Technology transferable to low latitude regions with robust F & no E'Jet
- An efficient Ionospheric ELF source that can be positioned in theater on a mobile platform
  - Data rate  $\gg$  FELF system
    - Higher source strength
  - High TRL level for transitioning





# Implications - Barge or Shipboard Option

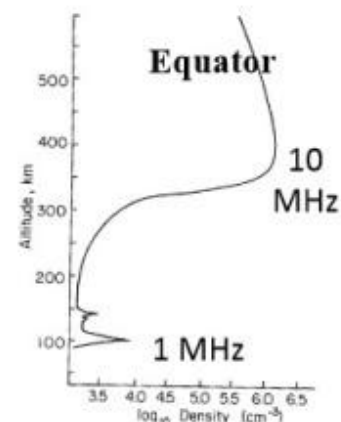
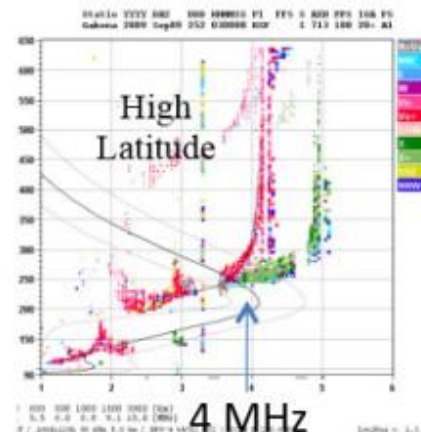
Combination of low HF power and high HF frequency requirements allow for mobile option



Strawman HF Array

- HF frequency 8-10 MHz
- Linear polarization
- Twenty 25-kW solid state transmitters
- Ship provided power

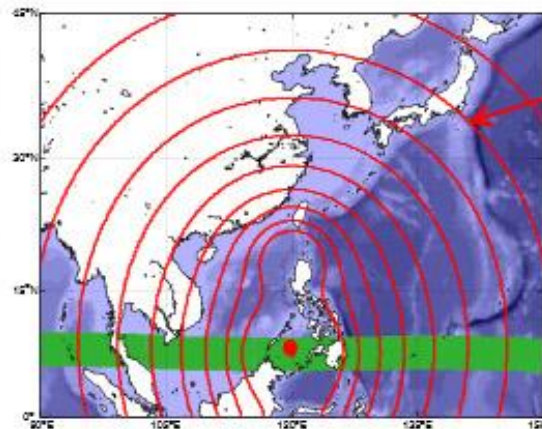
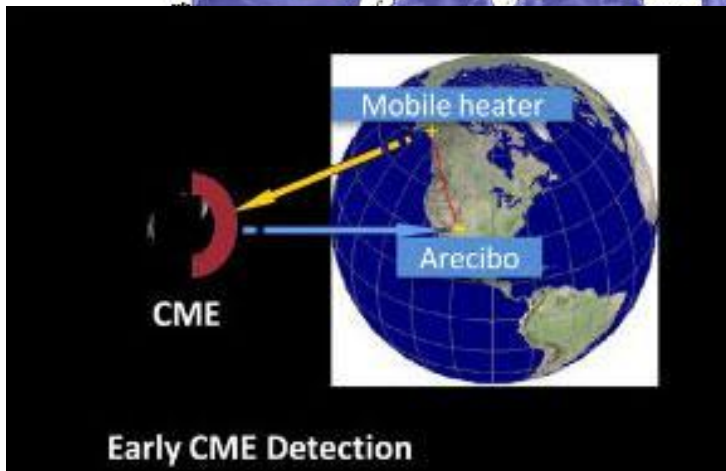
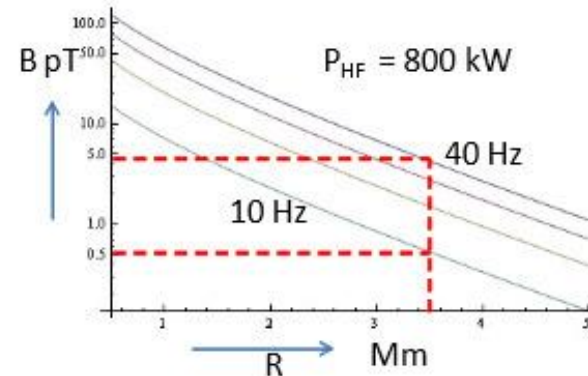
- Can provide theater and strategic sub communications
- Enhance Blue-Green laser tactical communications by providing info as to transmit and receive locations





# ELF Mobile Array Performance

- Optimal area for Mobile Array along Magnetic Equator (green band, within 2° from dip equator)
- Power requirements depend on location
  - Example: Korea - Yellow Sea
    - 800 KW system can provide data rates in the tens of bit/sec
    - Signal as large as 5 pT at 40 Hz or more at range of 3500 km
    - Typical background noise at 40-80 Hz is 200-500 fT/Hz<sup>1/2</sup>



800 kW HF System  
5 pT line at 40 Hz

Optimal Region  
For ELF Array

# Project LUCY in the Sky with Diamonds

“noctilucent clouds formed from the breakdown of methane in a circular zone above the HAARP transmitter”

## The Technology

Methane in the air is decomposed in between radio transmitters that each use slightly different radio frequencies.

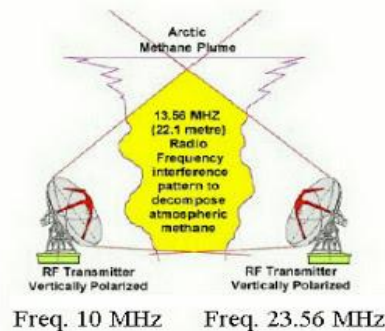
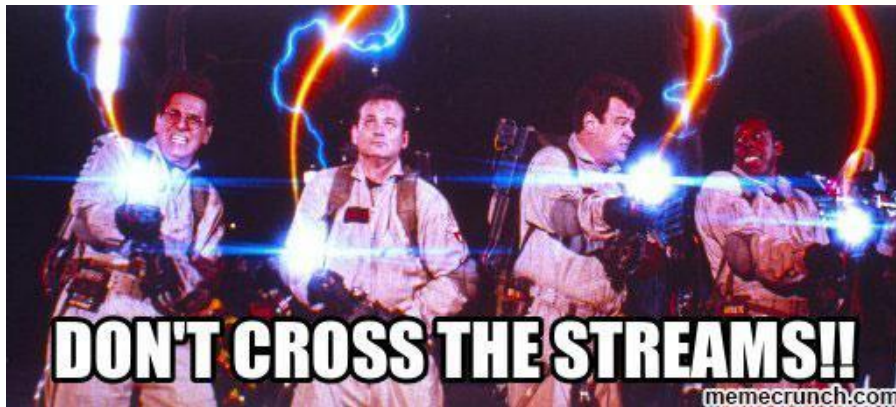
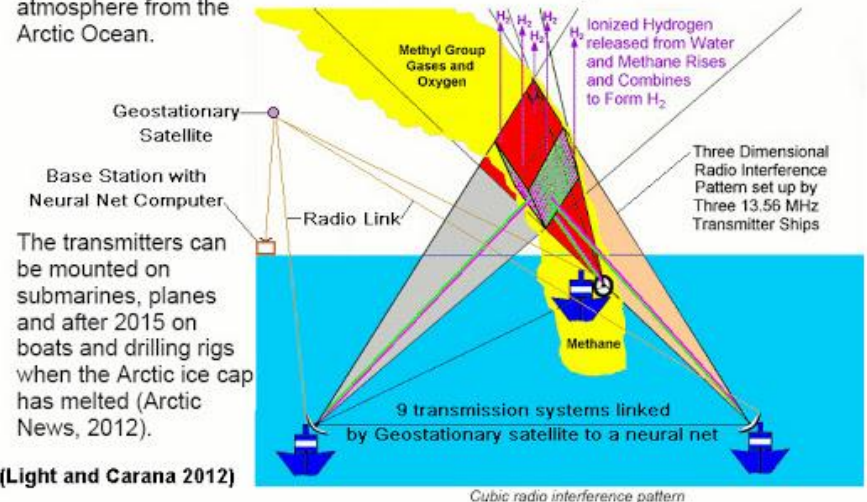


Figure 4. Schematic representation of two beamed parabolic radio transmitters using slightly different frequencies, the radio interference pattern of which is designed to decompose methane in a plume rising into the Arctic atmosphere from unstable surface and submarine methane hydrates



## Figure 7. Project Lucy Radio and Laser Atmospheric Methane Cloud Detection, Energisation and Methane Destruction

Project Lucy therefore aims to design, build and test a microwave transmission system targeting low-altitude methane clouds with the aim of breaking the first C-H bond as soon as the methane erupts into the atmosphere from the Arctic Ocean.



The transmitters can be mounted on submarines, planes and after 2015 on boats and drilling rigs when the Arctic ice cap has melted (Arctic News, 2012).

(Light and Carana 2012)

Geostationary satellite links 9 transmission systems to a neural net which continuously monitors the methane content in the cloud & automatically adjusts the frequency, polarization, phase shifts and beam directions of all three separate transmitter arrays to achieve maximum methane destruction

- Three Dimensional radio interference pattern set up by three 13.56 MHz transmitter ships with attached LIDAR and Methane heating lasers with the ability to scan the 3D radio interference pattern in the methane cloud subparallel to the 13.56 MHz radio transmission beam
- LIDAR methane detection laser with 50 km effective range continuously scanning 3D radio interference pattern ahead of the Methane heating laser (Ehret, 2012)
- Methane heating laser continuously scanning 3D radio interference pattern and following behind LIDAR laser (Sternowski, 2012)



**GEOENGINEERING**

AKA

**CLIMATE ENGINEERING**

AKA

**CLIMATE INTERVENTION**

# Terminology

**Solar Radiation Management (SRM)**

**Stratospheric Aerosol Injection (SAI)**

**Marine Cloud Brightening (MCB)**

**Thermal Radiation Management (TRM)**

**Short Wave Climate Engineering (SWCE)**



# Terminology – Google Scholar Results

- geoengineering [[25,200 results](#)]
- weather modification [[20,900 results](#)]
- weather control [[4,130 results](#)]
- climate modification [[5,310 results](#)]
- climate engineering [[2,460 results](#)]
- climate intervention [[119 results](#)]
- ecological alteration [[366 results](#)]
- albedo modification [[531 results](#)]
- albedo enhancement [[1,580 results](#)]
- solar radiation management [[1,470 results](#)]
- stratospheric aerosol injection (SAI) [[173 results](#)]
- stratospheric aerosol geoengineering (SAG) [[84 results](#)]

# Can Dr. Evil Save Us From Global Warming?

## Can Dr. Evil save us from Global Warming? part 1

### Global Warming and Ice Ages:

#### I. Prospects for Physics-Based Modulation of Global Change

E. Teller  
L. Wood  
R. Hyde



This paper was prepared for submittal to the  
22nd International Seminar on Planetary Emergencies  
Erice (Sicily), Italy  
August 20-23, 1997

August 15, 1997



preprint of a paper intended for publication in a journal or proceedings. Since  
may be made before publication, this preprint is made available with the  
understanding that it will not be cited or reproduced without the permission of the

## Can Dr. Evil save us from Global Warming? part 2

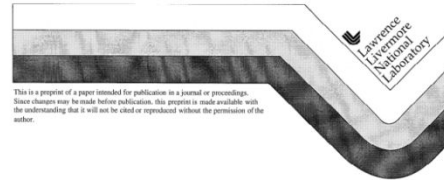
### Long-Range Weather Prediction And Prevention of Climate Catastrophes: A Status Report

E. Teller, K. Caldeira, G. Canavan,  
B. Govindasamy, A. Grossman, R. Hyde,  
M. Ishikawa, A. Lelchevich, C. Lesiak,  
C. Motenkamp, J. Nuckolls, L. Wood



This paper was prepared for submittal to the  
24th International Seminar on Planetary Emergencies  
Erice, Italy  
August 19 - 24, 1999

August 18, 1999



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author.

## Can Dr. Evil save us from Global Warming? part 3

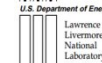
Preprint  
UCRL-JC-148012

### Active Climate Stabilization: Practical Physics-Based Approaches to Prevention of Climate Change

Edward Teller, Roderick Hyde and Lowell Wood

This article was submitted to the  
National Academy of Engineering Symposium  
Washington, D.C.  
April 23 - 24, 2002

April 19, 2002



## Albedo Enhancement by Stratospheric Sulfur Injections – A Contribution to Resolve a Policy Dilemma by Paul J. Crutzen (Nobel prize winner)

“Building trust between scientists and the general public would be needed to make such a large-scale climate modification acceptable, even if it would be judged to be advantageous.

Finally, I repeat: the very best would be if emissions of the greenhouse gases could be reduced so much that the stratospheric sulfur release experiment would not need to take place.

Currently, this looks like a pious wish.”

# Geoengineering SRM Funding

The Fund for Innovative Climate and Energy Research

**“FICER”**

**All your weather are belong to me**



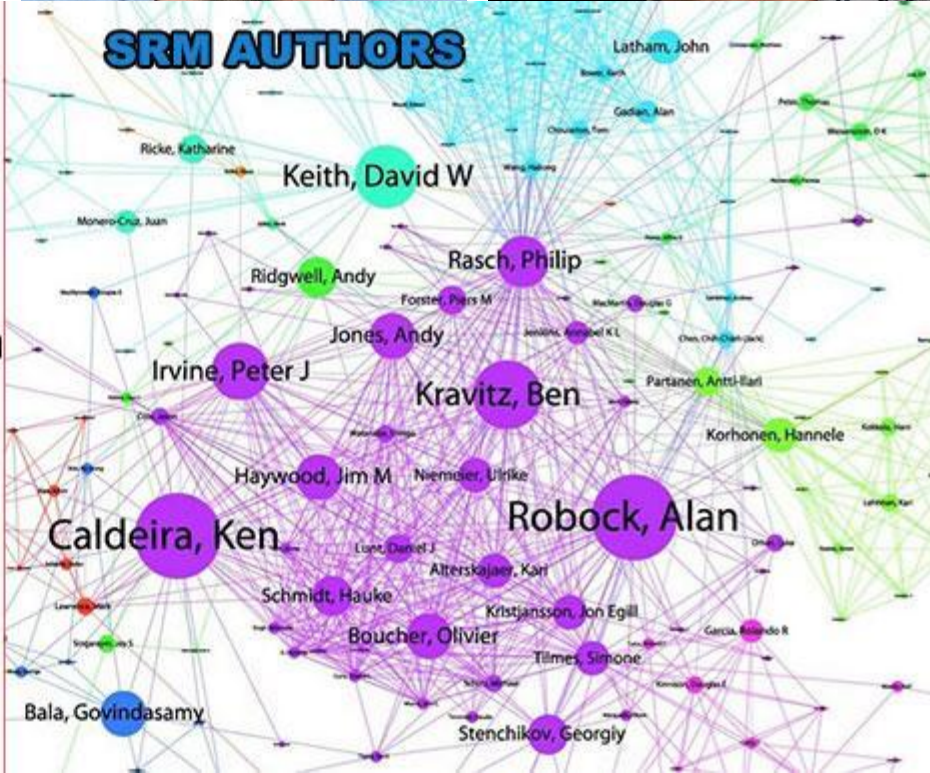
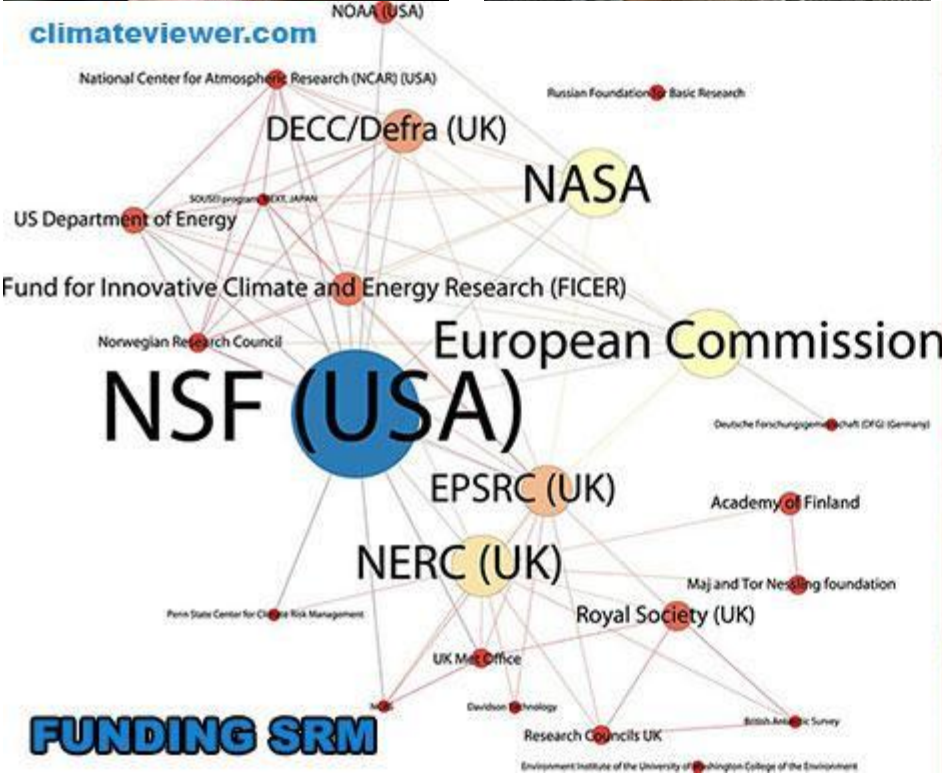
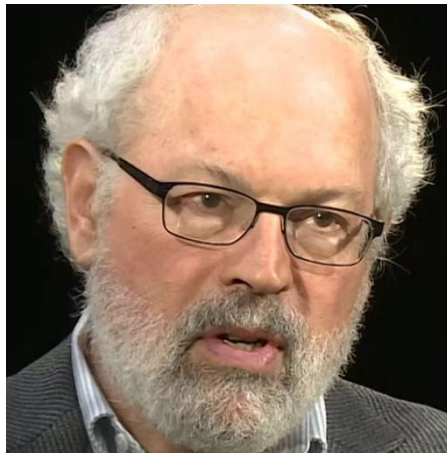
# Geoengineering SRM Lobbyists

**Ken Caldeira**

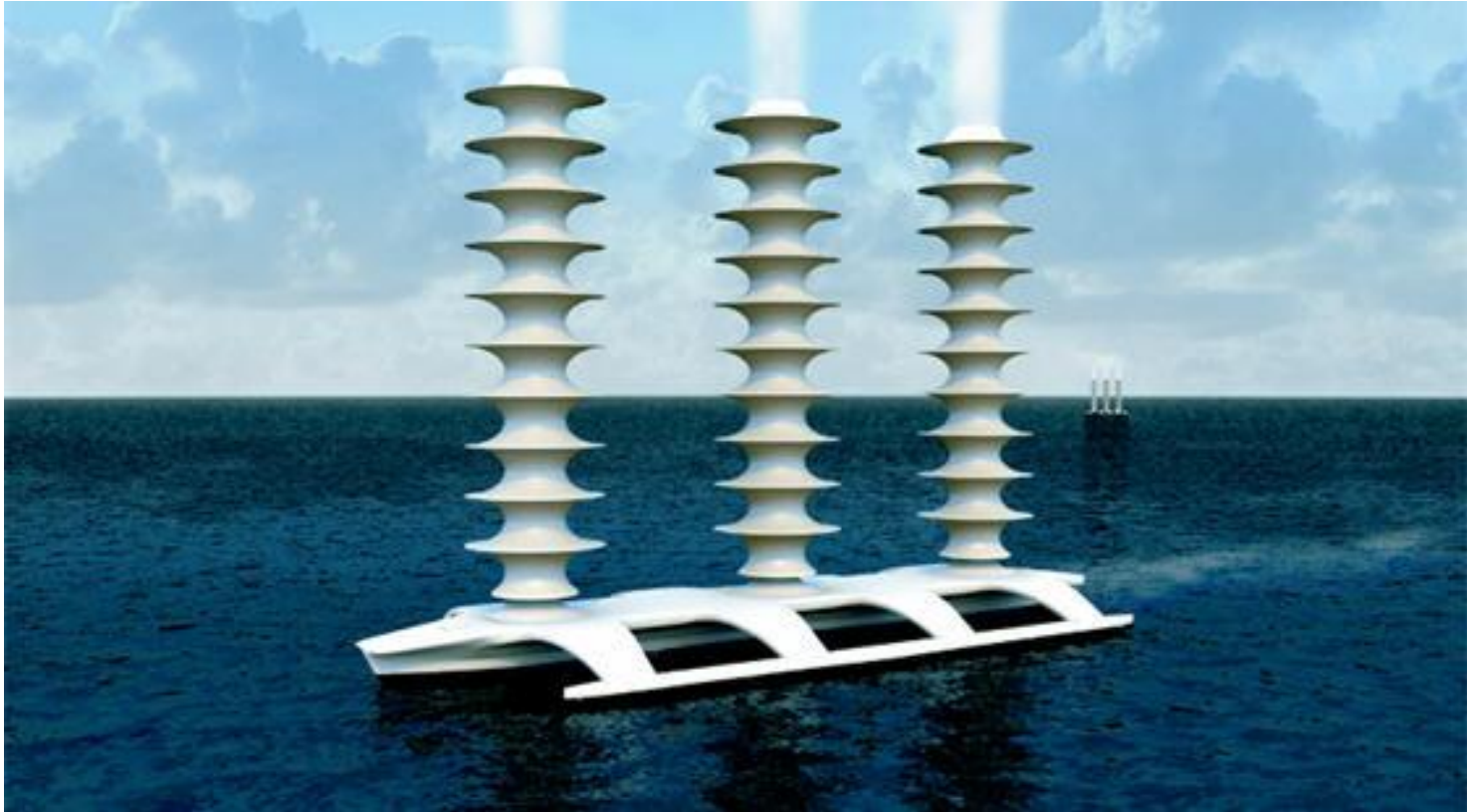
**Alan Robock**

**Ben Kravitz**

**David Keith**

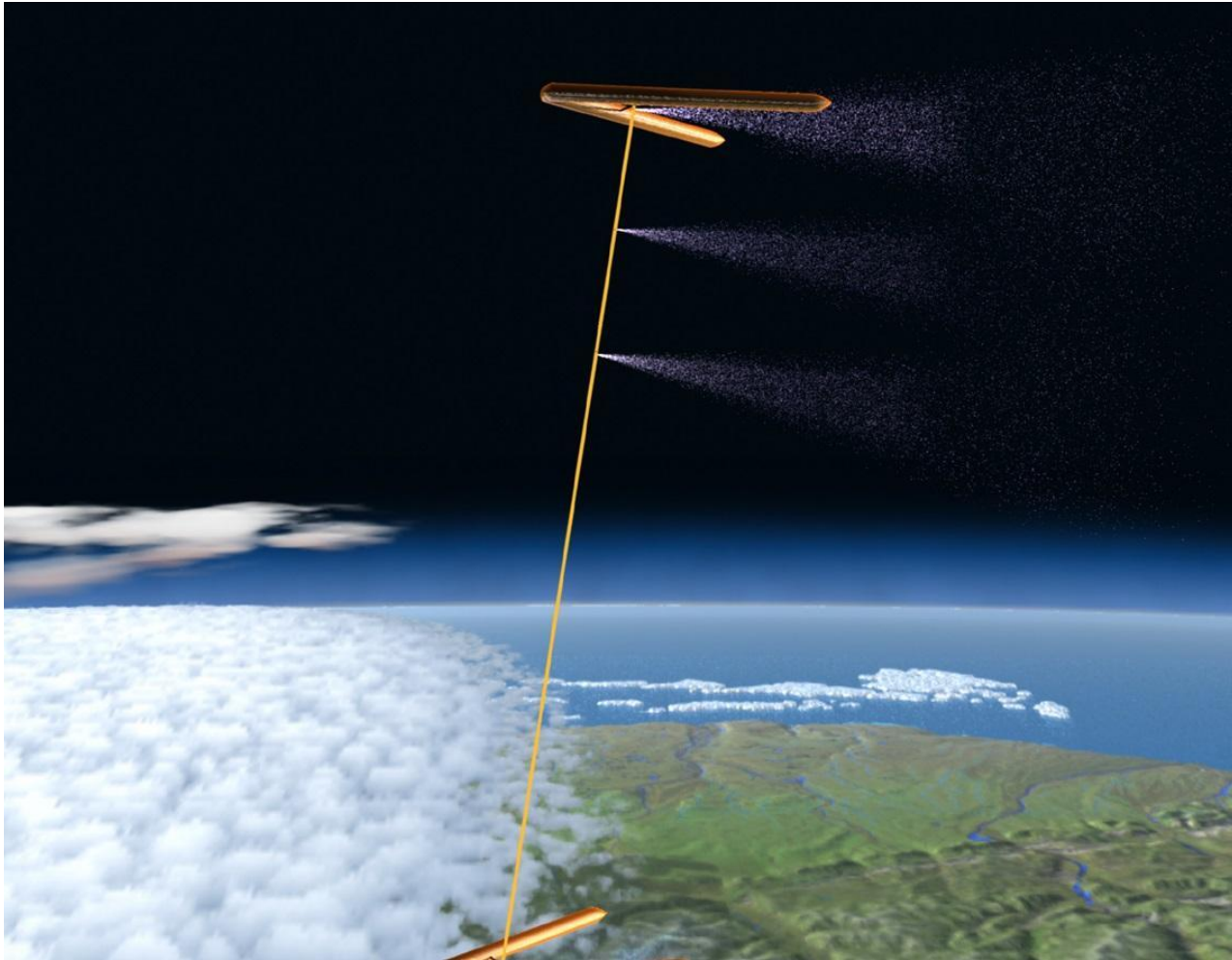


# Geoengineering SRM Projects



**The Silver Lining Project - Marine Cloud Brightening**

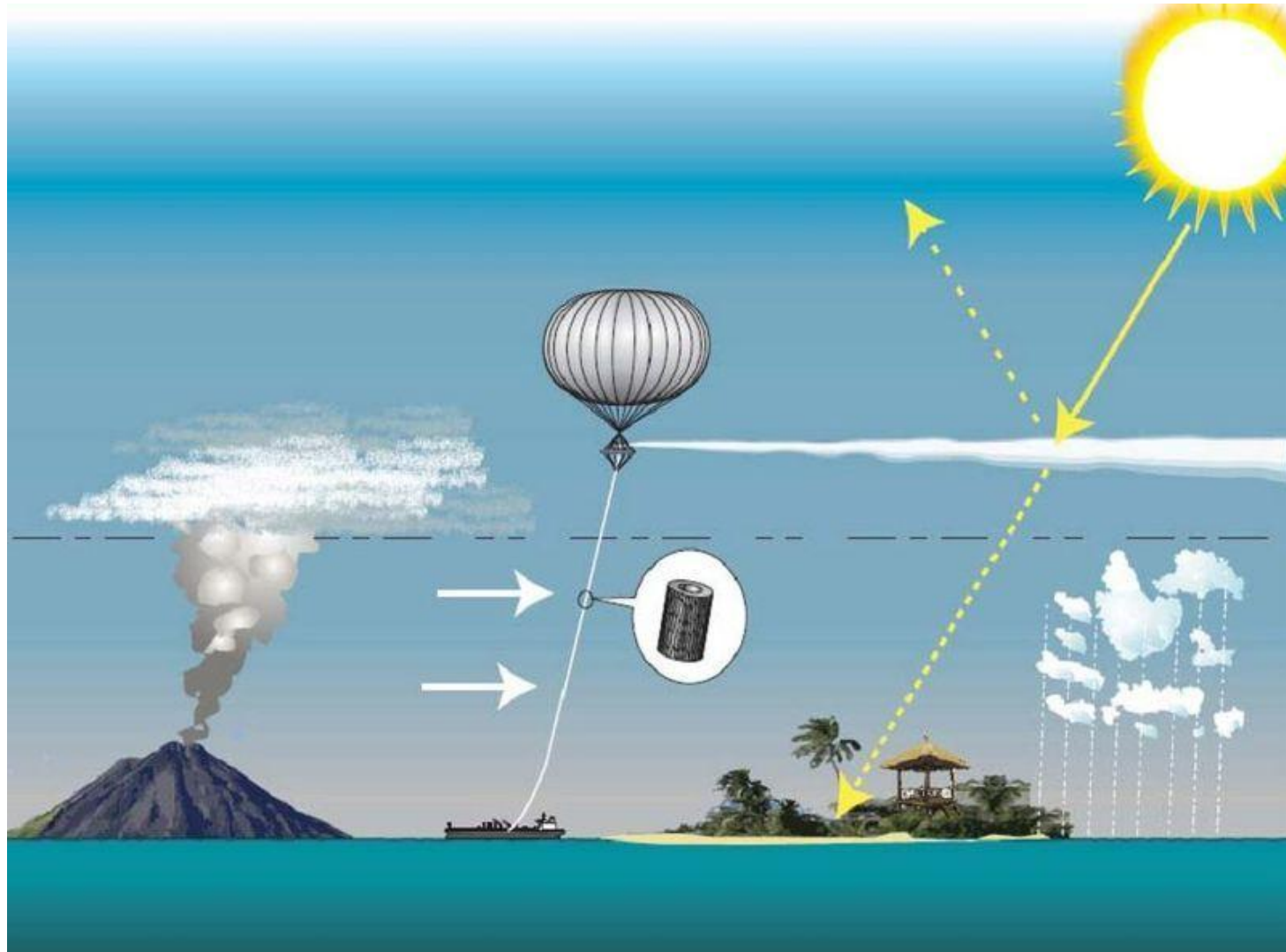
# Geoengineering SRM Projects



**The Stratoshield "Hose to the Sky"**



# Geoengineering SRM Projects



**Stratospheric Particle Injection for Climate Engineering SPICE**

# The Asilomar International Conference on Climate Intervention Technologies

March 22-26, 2010  
Asilomar Conference Center  
Pacific Grove, California

**In other words, if the public comes to see geoengineering as, as one attendee put it, "a crazy idea cooked up by rich Anglo Saxons to dominate the climate," then they will all be rightfully tarred and feathered.**

**As for the U.S. Department of Defense — forget about it. To this group, such involvement prompts nightmares of a new military-industrial-geoengineering complex.**

CLIMATE RESPONSE FUND



# Geoengineering Will Kill People

“It is likely that any **SRM geoengineering intervention will create winners and losers** and some nations may always be against any intervention whatsoever.”

“In any given year there are floods, droughts, heatwaves, etc. but during this field trial a fraction of these events would be attributed (rightly or wrongly, partially or fully) to the intervention. Two questions arise:”

“Could it be determined if any changes in the climate (outside of the target area) had occurred as a result of the intervention during a 10 year trial?”

“How would aggrieved nations or peoples seek reparations for perceived negative impacts (scientifically proven or otherwise)?”

- [Pete Irvine, PhD student. School of Geographical Sciences, University of Bristol.](#)

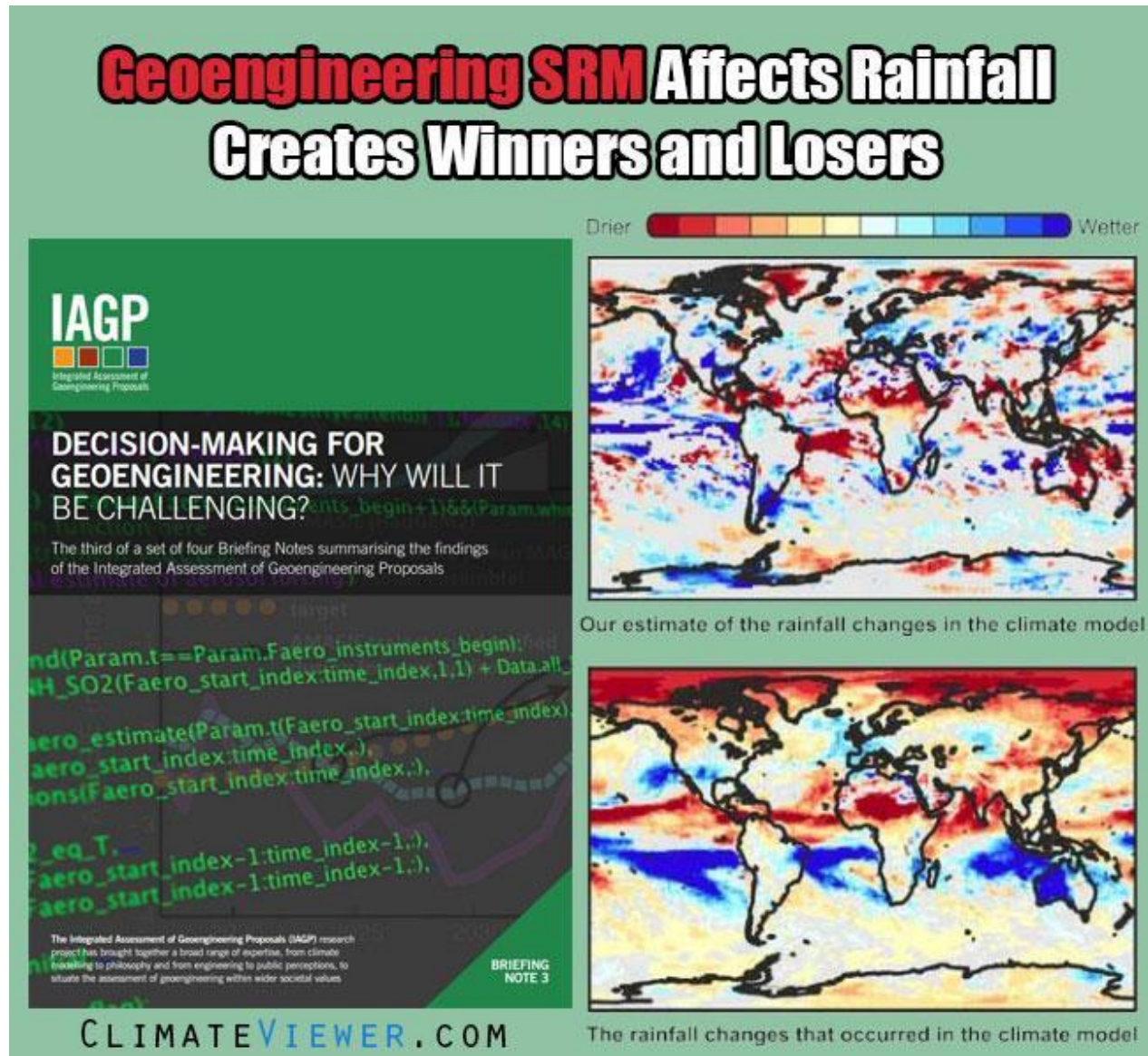
# Geoengineering Will Kill People

- the solar geoengineering led to serious side-effects, e.g., reduced rainfall over the semi-arid area south of the Sahara desert

- When when solar geoengineering stopped, the climate rapidly rebounded

- we cannot tell how much cooling was caused by solar geoengineering and how much resulted from natural climate variability, e.g. volcanic eruptions”

**- Integrated Assessment of Geoengineering Proposals**



# Geoengineering Ban

***that no climate-related geo-engineering activities\*\* that may affect biodiversity take place***, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting  
– Convention for Biological Diversity, Climate-related Geoengineering and Biodiversity, 2012

**“The U.S. is not a party to the 1992 accord and thus was **NOT** officially involved in the geoengineering decision.”**

# Geoengineering and COP21

“Within the **Paris agreement** **there’s an implicit assumption** that there will need to be greenhouse gases removed,” said Phil Williamson, a scientist at the U.K.’s University of East Anglia, who worked on the report.

“**Climate geoengineering is what countries have agreed to do,** although they haven’t really realized that they’ve agreed to do it.”



The screenshot shows the BusinessGreen website header with the tagline "Sustainable thinking". The navigation menu includes HOME, NEWS, ENERGY, POLICY, MANAGEMENT, TECHNOLOGY, and INVESTMENT. The article title is "Academics call for geoengineering preparation in wake of Paris Agreement's 'deadly flaws'". The byline is "By Jocelyn Timperley | 11 Jan 2016 | 2 Comments".



The screenshot shows the Bloomberg website header with a search icon. The article title is "Geoengineering to Alter Climate Moves Closer to Reality". The background image shows a sunset over a body of water with a large rock formation in the distance and a boat in the foreground.

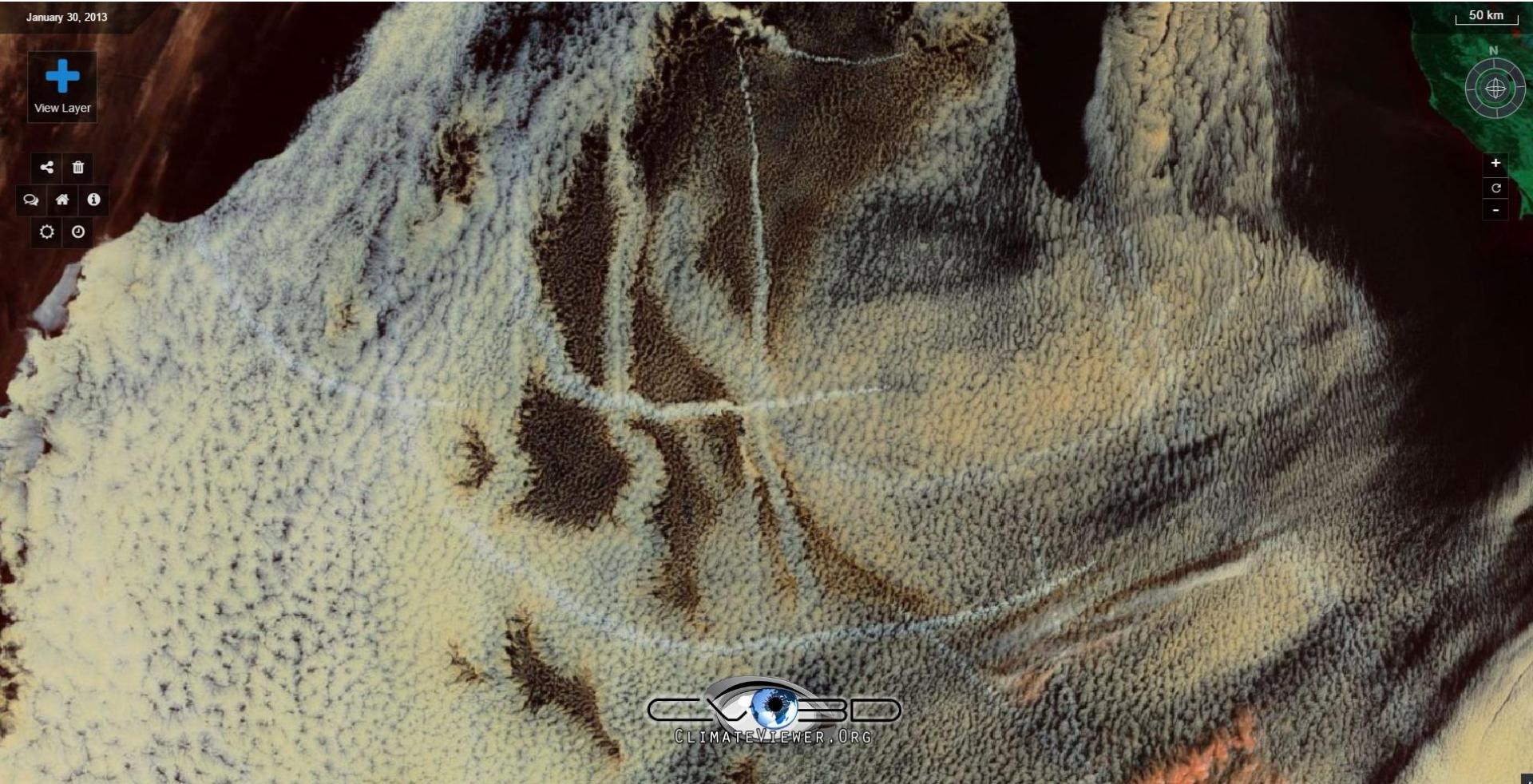
by **Anna Hirtenstein**  
October 31, 2016 — 6:00 PM EDT  
*Updated on* November 1, 2016 — 4:52 AM EDT

# **Geoengineering Is Already Happening**

***“The emissions and the climate change that we’re causing with that is **already a massive experiment on our world** that we don’t really know the outcome of. So I don’t think we should **start another set of experiments and go into geoengineering**. I think we should get our act together and reduce our emissions.”***

***U.N. Assistant Secretary-General Janos Pasztor***

# Geoengineering Is Already Happening “ARTIFICIAL CLOUDS” – Ship Tracks



**MODIS Terra Corrected Reflectance**  
**3-6-7 band - January 30, 2013**



# Geoengineering Is Already Happening

## “ARTIFICIAL CLOUDS” – Ship Tracks



### How 16 ships create as much pollution as all the cars in the world

By FRED PEARCE  
UPDATED: 17:13 EST, 21 November 2009



138  
View comments

Last week it was revealed that 54 oil tankers are anchored off the coast of Britain, refusing to unload their fuel until prices have risen.

But that is not the only scandal in the shipping world. Today award-winning science writer Fred Pearce – environmental consultant to New Scientist and author of *Confessions Of An Eco Sinner* – reveals that the super-ships that keep the West in everything from Christmas gifts to computers pump out killer chemicals linked to thousands of deaths because of the filthy fuel they use.

We've all noticed it. The filthy black smoke kicked out by funnels on cross-Channel ferries, cruise liners, container ships, oil tankers and even tugboats.



© Gerald Lewis/Writer Pictures  
Eco expert: Fred Pearce is an environmental consultant to New Scientist magazine

### World's 15 Biggest Ships Create More Pollution Than All The Cars In The World

By: [Jeremy Helms](#) | June 5th, 2013



### Big polluters: one massive container ship equals 50 million cars

Paul Evans | April 23rd, 2009

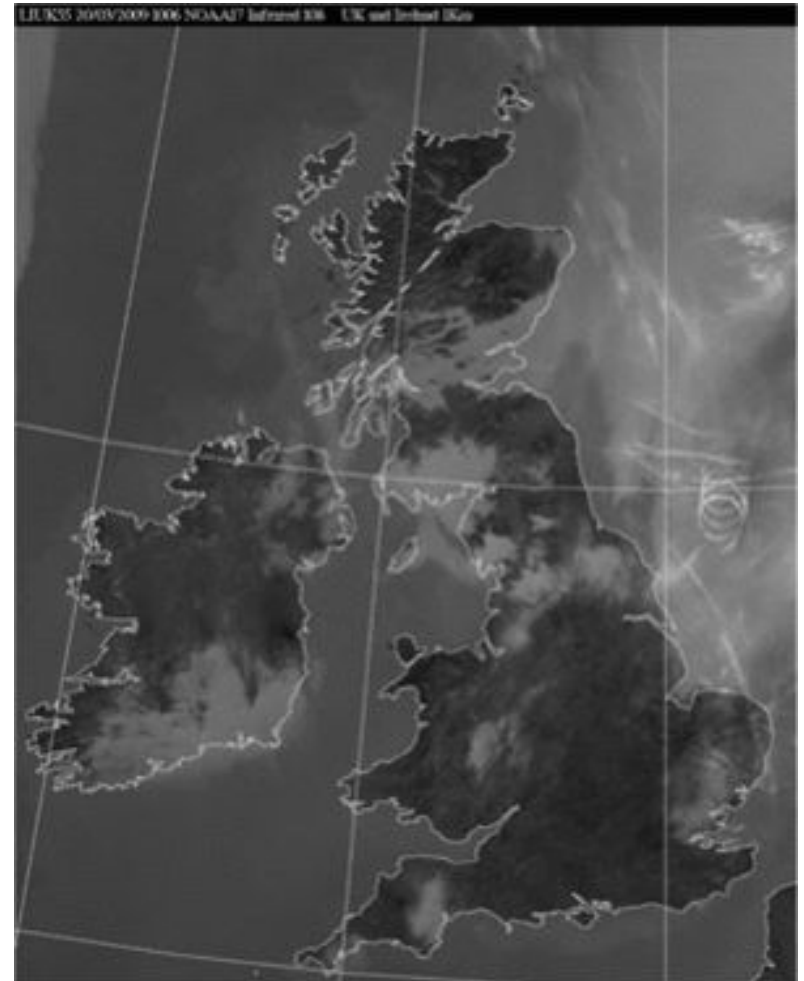


15 of the world's biggest ships may now emit as much pollution as all the world's 760m cars

**BUNKER FUEL** - “The real issue lies with the heavy fuel oil the ships run on and the almost complete lack of regulations applied to the giant exhaust stacks of these container ships.”

# Geoengineering Is Already Happening “ARTIFICIAL CLOUDS” – Contrail Cirrus

A case study of the  
radiative forcing of  
persistent contrails  
evolving into  
contrail-induced cirrus  
March 20, 2009

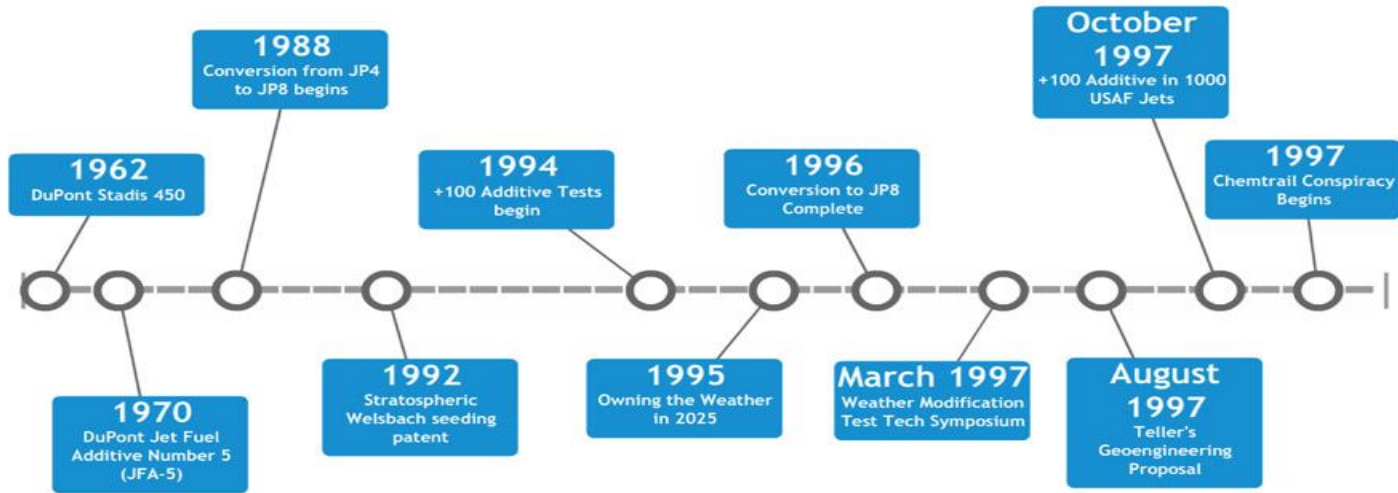


# “Chemtrails”

## TIMELINE

Jet Fuel Additives

By: Jim rezn8d Lee



**Stadis 450 DINNSA = Dinonylnaphthylsulfonic acid**  
**Barium Fuel Additive = Anti-Static Agent used since 1962**

Table ES-1. Elements detected in jet fuel.

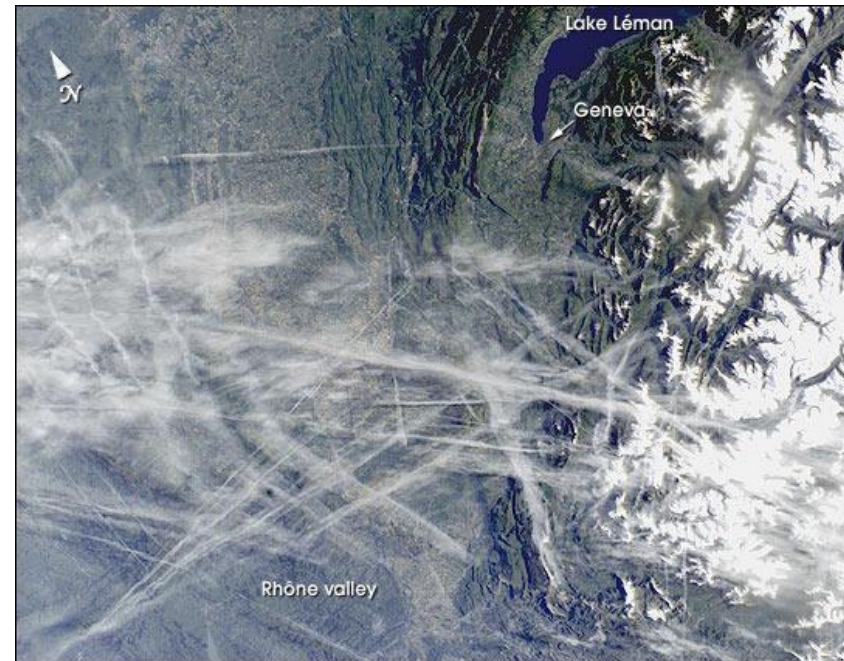
Element	Jet A (ppb)	JP5* (ppb)	JP8 (ppb)
Aluminum	ND	2144	9360
Barium	3	9	38



# Terminology – Credibility is Crucial

- Chemtrails
- Persistent Contrails
- Spreading Contrails
- Contrail Cirrus
- Contrail Induced Cloudiness
- Aviation Induced Cloudiness
- Aviation Induced Cirrus
- Induced Cirrus Cloudiness
- Man-made clouds
- **Artificial Clouds**

- **Sky Brightening**
- **Ice Haze**



# Jet Aircraft “Accidental Geoengineering”

**"I'm talking about a sub-visual  
contrail-generated haze of ice, which  
we do not classify as a cloud but gives  
blue sky more of a whitish tint."**

Chuck Long, a [CIRES](#) researcher at NOAA/ESRL's [Global Monitoring Division](#)

# **Sulfuric Acid from Aviation and Ship Tracks may be higher today than Geoengineering SRM would require in 2020**

*“25,000 metric tons of sulfuric acid to cut global warming in half after one year.” – David Keith*

**“1990 global aviation’s annual contribution to the atmospheric sulfur budget by aircraft of 2.E7 kg H<sub>2</sub>SO<sub>4</sub> (20,000 metric tons) .  
...by 2010 Aviation emissions could had [sic] been up 110%”**

*“So perhaps those in the GE community who are genuinely opposed to geoengineering should revise their premises and call for research into GE with the purpose of **ending this ‘unintended’, but failed and still ongoing experiment.**” – Oscar Escobar*

# Activists Take On Artificial Clouds At US EPA Hearing on Jet Pollution – September 2015

On August 11, 2015 I attended the [world's first EPA hearing on flight pollution](#) and told them to tell the airline industry stop making clouds:



**July 25, 2016** – [BREAKING: EPA To Limit Greenhouse Gases From Airplanes](#)

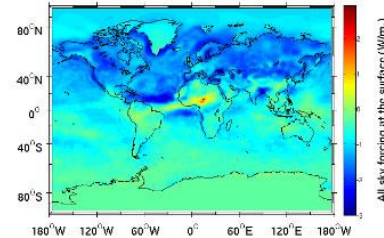
**July 31, 2016** – [White House releases “Federal Alternative Jet Fuel Research and Development Strategy”](#)

**September 3, 2016** – [China, U.S. and Europe pledge support for global aviation emissions pact](#)

**September 12, 2016** – [Greens move to dismiss EPA lawsuit over airplane emissions](#)

# Artificial Cloud Experimentation

## Stratospheric sulfate injections with commercial aircraft



**Figure 2.** Global mean of all-sky aerosol forcing at the surface when intercontinental flight routes are in the lower stratosphere and the sulfur content of the fuel is 50 times the current level. [3]

- Commercial aircraft could be used to deliver sulfate into stratosphere by increasing fuel sulfur content and the flight altitude of inter-continental flights
- The sulfur content of the fuel should be increased to about 50 times the current level to have a significant cooling effect
- The cooling effect would be confined to the Northern Hemisphere


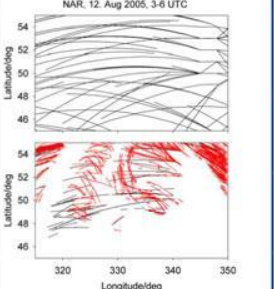
Department of Geosciences  
University of Oslo

## Cirrus cloud seeding

- Suggested seeding material:
  - Bismuth tri-iodide,  $\text{BiI}_3$
  - Cheap'ish and non-toxic.
- Seeding via commercial airliners?
- Advantage: seeding aerosol residence time is relatively short in the troposphere.
- Drawback: does not address ocean acidification issue.



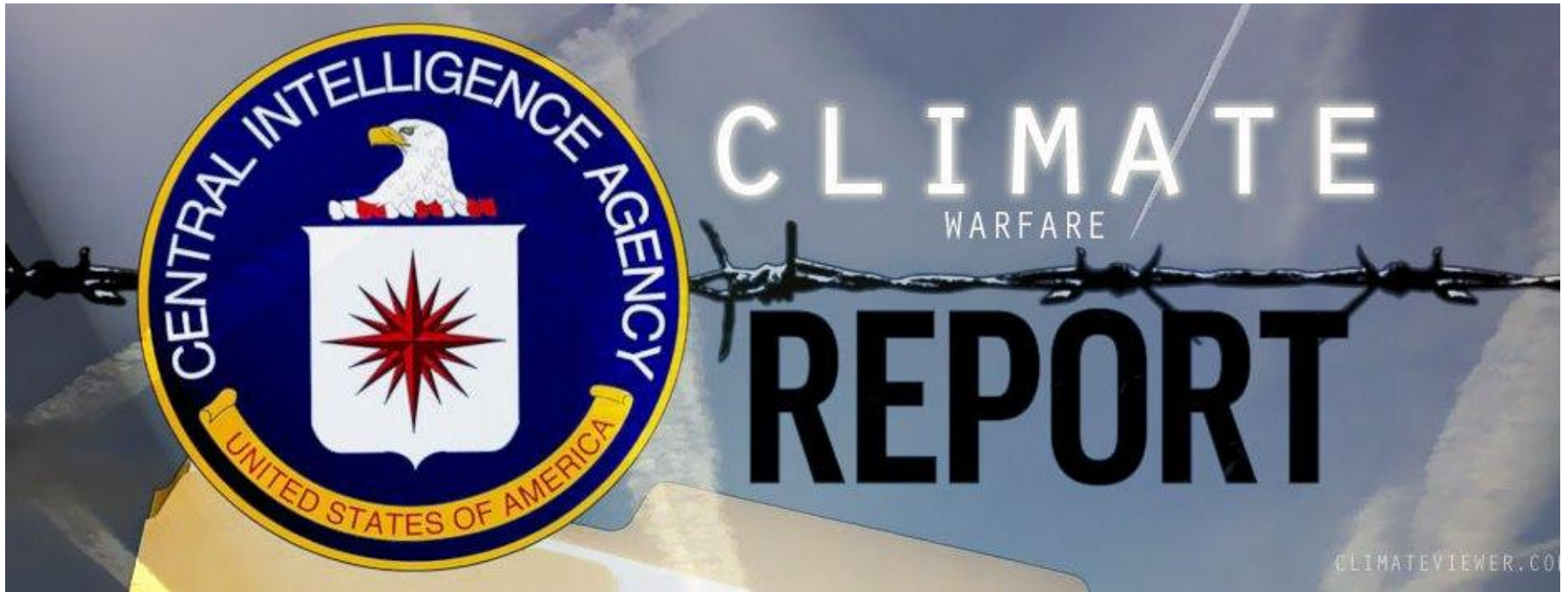
**A new model**  
**Contrail Cirrus Simulation and Prediction (CoCiP)**

<p><b>Input:</b> <u>Aircraft</u> (BADA)</p>  <p><b>Movements</b> (Eurocontrol, OAD, DFS)</p> <p><b>Meteorology</b> (NWP results, ECMWF, DWD)</p>	<p><b>Contrail Cirrus Prediction Tool</b> NAR, 12. Aug 2005, 3-6 UTC</p>  <p>• From regional to global • Comparable to observations</p>	<p><b>Output:</b> <u>Contrail</u>, life cycle, cover, radiation</p> <p><u>Cirrus</u></p> <p><u>Simulation</u> insitu, Lidar, Satellite</p> <p><u>Sensitivity studies</u></p> <p><u>Prediction</u> <u>Climate impact</u></p>
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# Geoengineering Is Already Happening

## Could We Detect “Rogue Geoengineering?”



*“I got a phone call from two men who said we work as consultants for the CIA and we’d like to know **if some other country was controlling our climate, would we know about it?**”*

*“I told them, after thinking a little bit, that we probably would.”*

**Alan Robock**

# Geoengineering Is Already Happening

## Could We Detect “Rogue Geoengineering?”



**A:** It depends ...

On SRM magnitude and duration  
On a sustained observing system

Seidel, D. J., G. Feingold, A. R. Jacobson, and N. Loeb, 2014: *Detection limits of albedo changes induced by climate engineering*. Nature Climate Change, 4, 93-98.

At [www.arl.noaa.gov/CVCAAnalysis\\_Pubs.php](http://www.arl.noaa.gov/CVCAAnalysis_Pubs.php)

3

*Dian J. Seidel – NOAA, speaking January 6, 2015 at the 20<sup>th</sup> Conference on Planned and Inadvertent Weather Modification*

# **Geoengineering/ENMOD Solution**

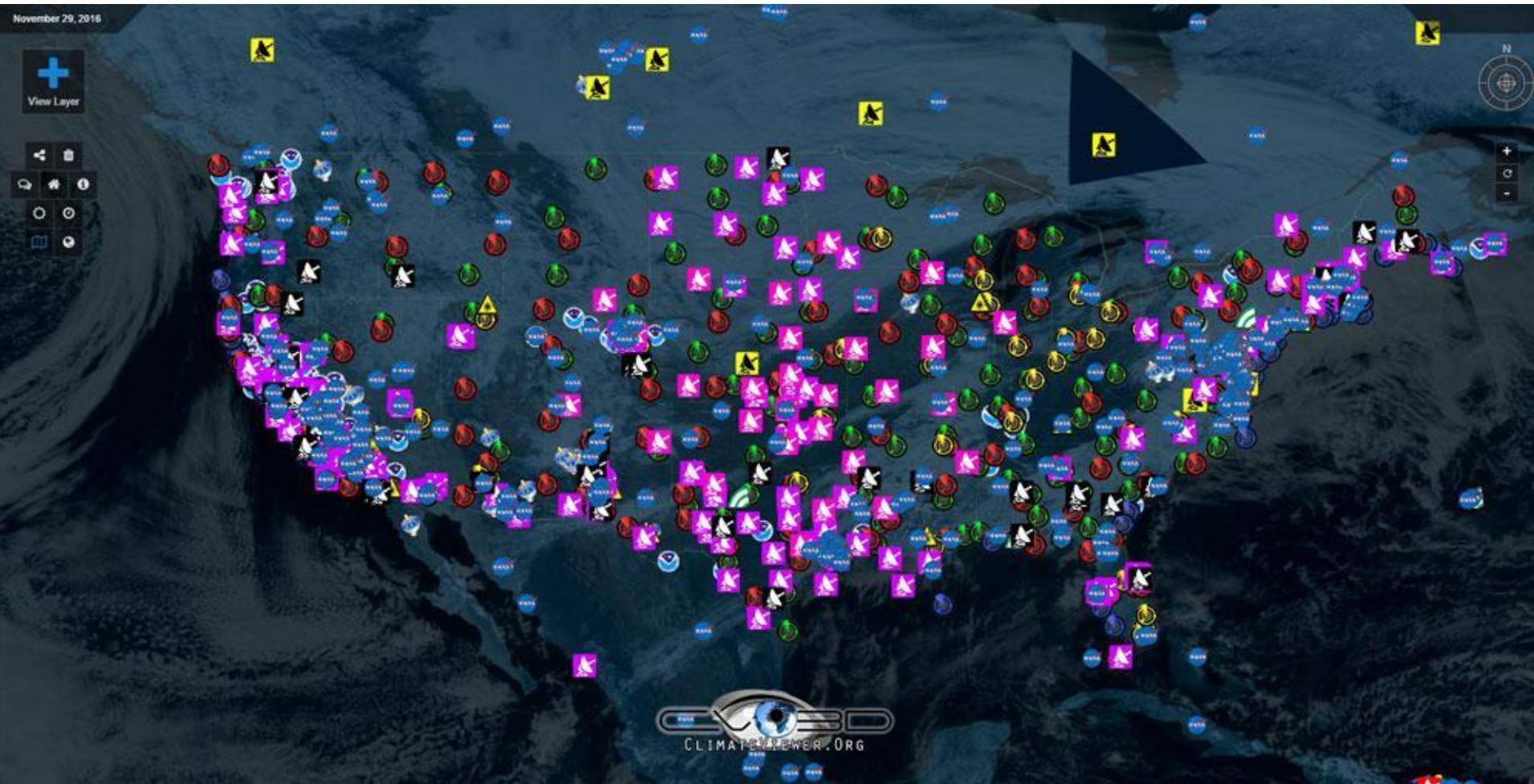
**Verification**

**and**

**Transparency**

# **The Clarity Clause**

# Clarity: A Sustained Observing System



## Citizen-Powered Sensor Network

# Clarity: A Sustained Observing System

- Detect Atmospheric Conditions
- All-sky camera (streaming video)
- **Aerosol detection**, analysis, and live display (nanoparticles, radioactivity, chemical composition)

**Citizen-Powered Sensor Network**

# Clarity: Transparency

1. Create a “multilateral **registry of cloud seeding, geoengineering, and atmospheric experimentation events** with information and data collection on key characteristics” and publish hourly updates on activities to a publicly available website.
2. Require nations/states/persons to notify the multilateral registry (at least) 24 hours prior to initiation of atmospheric experimentation/modification **to ensure public notice and liability should said experimentation/modification cause monetary, environmental, or physical losses.**

**Citizen-Powered Sensor Network**



# Thank you!

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**[CLIMATEVIEWER.ORG](http://CLIMATEVIEWER.ORG)**

**[WEATHERMODIFICATIONHISTORY.COM](http://WEATHERMODIFICATIONHISTORY.COM)**

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