

WHITE HOUSE FILES

FIRST TERM

FOLDER TITLE White House - Atmospheric Sciences

S&T NUMBER

DATE

FROM/TO

SUBJECT

9/17/71

David/Whitaker

Weather modification

ADMINISTRATIVELY CONFIDENTIAL

September 17, 1971

MEMORANDUM FOR

MR. JOHN C. WHITAKER

WHITE HOUSE

*Attn: [unclear]
[unclear]*

SUBJECT: Weather Modification

The group of weather modification projects currently under consideration in the new initiatives effort include:

1. Hurricane modification -- to develop a seeding technology to reduce the maximum surface winds associated with hurricanes and to develop techniques for the detection, forecasting and modification of hurricanes.
2. Lightning Suppression -- to develop a seeding technology to reduce the frequency of forest fire-starting lightning strokes from cumulonimbus clouds.
3. Cumulus modification -- to develop a seeding technology to promote the growth of cumulus clouds in order to increase the resulting natural rainfall in areas where needed.
4. Hail suppression -- to develop a seeding technology to reduce the incidence of damaging hailfall from cumulonimbus clouds without adversely affecting the associated rainfall.
5. Great Lakes snow redistribution -- to develop a seeding technology to spread the heavy snowfall of the Great Lakes coastal region farther inland.

This group of programs will cost about \$15 million in the first year, and we would expect this cost to grow to \$20 million in the second year.

It is my judgment that a new initiative on weather modification will be requested in the final package.

LAG/JDB:mas
copy to
Mr. William Magruder

Edward E. David, Jr.
Science Adviser

cc: Dr. F. G. Blake
OST File & Chron
FED File & Chron

9/17

J T B:

I believe the info
on ^{uses} ground generators in moun-
tainous areas and of air-dropped
sources of silver iodide in
flat terrain is O.K. Point
is the ground generators are
not "rockets" — They ~~are~~
simply ~~rockets~~ release
silver iodide to be carried
aloft by the winds and ^{vertical}
air currents, which are
indeed more predictable in
mountainous areas than
in flat country — as glider
pilots well know. Krich, who
(the memo says) advocates
ground generators is from
Colorado, not Oklahoma.
Ground generators are I believe
used in California by PG&E
to increase rainfall in the Sierra
Nevada to fill their reservoirs.

J T B

PS: As far as I have been able
to go ~~so far~~ I have no argument with
EED memo to SC Whitaker

1. Scope of Investigations in weather mod.

2. Cost for package

3. tentative judgment - that priority-weather mod will survive -

Co-ord w/ McClellan.

Gill Blake → check accuracy of assertion that ground method better for mountainous terrain.

9/16/71 - 11:30
am

Dr. Balzhiser:

Dr. Baldeschwieler says he wld like you to ask Drs. Blake and McRae to help you on this. There is some backup material that is understood by Herb Simon whom you can contact. There is also an initiative in this area and for that you shld talk with Dr. Goldmuntz or his secy for a copy of the material on this subject.

Dr. Baldeschwieler wld like to have this later today.

marie

O.K. w/ 4/9
Magwaller.
Go to EED

Do Not Detach This Slip

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY

To: Dr. David Date: 9/16/71

Dr. Blake

Dr. Balzhiser Action

Dr. Baldeschwieler 1st
9/16 Dr. Goldmuntz

For:

XX

Appropriate Action

Information

Direct Reply

Note and Return

Comment

Concurrence

Recommendation

XX Official Files

Prepare Reply for _____

Dr. Balzhiser - please prepare a change
for the David signature to be. Dr. Baldeschwieler

Remarks: Memo fr. Whitaker/WH 9/15/71-Weather

Modification-Requests 1 pg -scope of new initiatives;

cost of package; tentative judgment that

"prioritywise " weather modification will or will not

survive final new technology package

From: Pagnotta

THE WHITE HOUSE
WASHINGTON

September 15, 1971

DETERMINED TO BE AN
ADMINISTRATIVE MARKING
E.O. 12958, Section 1.1
By 4 NARS, Date 6-3-85

CONFIDENTIAL

MEMORANDUM FOR ED DAVID

FROM: John C. Whitaker 
SUBJECT: Weather Modification

In view of the President's interest in weather modification, could you give us one page quickly on this addressing in one paragraph (1) the scope of the new initiatives as you see it, (2) a second paragraph on what it costs if you buy the package, and (3) a third paragraph on your tentative judgment that "prioritywise" the weather modification will or will not survive in your final new technology package -- taking budget priorities into consideration.

I'm sending a copy of this memo and attachments to Bill Magruder and would appreciate a memo you can both agree on.

cc: Bill Magruder

Date: September 14, 1971

Time: 2:00

FOR ACTION: J. Whitaker

cc (for information):

FROM THE STAFF SECRETARY

DUE: Date: September 21, 1971

Time: 2:00 pm

SUBJECT:

Cloud Seeding Report

ACTION REQUESTED:

☐ For Necessary Action☐ For Your Recommendations☐ Prepare Agenda and Brief☐ Draft Reply☐ For Your Comments☐ Draft Remarks

REMARKS:

PLEASE ATTACH THIS COPY TO MATERIAL SUBMITTED.

If you have any questions or if you anticipate a delay in submitting the required material, please telephone the Staff Secretary immediately.

JON M. HUNTSMAN
For the President

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

CONFIDENTIAL

September 13, 1971

MEMORANDUM FOR:

JOHN C. WHITAKER

FROM:

JON M. HUNTSMAN *JMH*

SUBJECT:

Cloud Seeding Report

The President read with interest your memorandum of September 1, 1971 on the subject of Cloud Seeding Progress.

Your last paragraph was specifically noted. The President suggested a strong follow-up be made here.

Please submit your report to the Office of the Staff Secretary.

Thank you.

cc: John D. Ehrlichman
H. R. Haldeman
Alexander P. Butterfield

DETERMINED TO BE AN
ADMINISTRATIVE MARKING
E.O. 12356 Section 1.1
By *EL* NARS, Date *6-3-81*

CONFIDENTIAL

THE WHITE HOUSE
WASHINGTON

SEP 1 1971

September 1, 1971

Information
Cloud Seeding Report

MEMORANDUM FOR THE PRESIDENT

THROUGH: John D. Ehrlichman

FROM: John C. Whitaker

John C. Whitaker

Your memorandum of August 6 asked for a report on our progress with regard to cloud seeding. The question arose during your meeting with the farm editors when you were asked by Ferdie Deering of the Farmer-Stockman Magazine about Federal resistance to new techniques.

Deering was the Chairman of Oklahoma Governor Hall's Weather Modification Study Committee. That Committee recommended to the Governor that 12 drought-plagued counties in Southwestern Oklahoma be declared an emergency area and that a contract to perform the cloud seeding be let to a corporation headed by Dr. Irving Krick.

Dr. Krick, one of the leading innovators in the field, has recently changed from advocacy of silver iodide seeding by aircraft to a system of introduction of the silver iodide from ground generators. In this system, computer modeling of meteorological data is used to determine when particular generator locations should be activated. Federal scientists feel that the drawback to this method is that it does not permit close control of the seeding material after it leaves the generator and is thus more random in its effect on particular cloud formations than is the airborne introduction method. The random nature of the trajectories of the seeding material in the upper air is accentuated in the summertime over flat terrain such as Oklahoma. In addition, the effectiveness of silver iodide decreases with exposure to the sun and the ground generator method increases such exposure time. Research on the ground generation method by Interior's Bureau of Reclamation has shown that acceptable results are generally achieved with this method only in mountainous areas where the airborne trajectories are more predictable.

On August 16, the Bureau of Reclamation, together with the Office of Emergency Preparedness, announced a \$210,000 emergency program of cloud seeding in the 12 Oklahoma counties in response to Governor Hall's request. The technique of airborne introduction of silver iodide will be augmented by aerial hygroscopic seeding of warm clouds with a mixture of ammonium nitrate, urea and water. The hygroscopic technique provides for the introduction of very small nuclei into a cloud to act as embryos for the formation of raindrops.

Within the Federal Government applied research and development in alternate methods of weather modification, including rainmaking, are being carried out by Agriculture, Commerce (NOAA), Defense and Interior. Basic research is generally conducted by the National Science Foundation, which has sponsored 110 pure research projects in the field during the last few fiscal years. NSF's National Center for Atmospheric Research is funded at about \$15.0 million per year, plus an addition of \$1.5 million per year for research on hail suppression.

In summary, the Krick method of ground generation of silver iodide was found inappropriate for the particular geographical and meteorological conditions in Oklahoma, but it is still under active development together with a range of other options as part of the overall Federal program of weather modification.

There is always the possibility I am getting led down the garden path by entrenched bureaucratic science expertise and that Krick's ideas are very good, but I don't think so.

On the larger question of a more massive research and development program for weather modification, this is one of the subjects Dr. Edward David is looking into on the Domestic Council "new technology" study which Bill Magruder (SST) will be coming aboard to handle.

CROSS REFERENCE INDEX

Date: April 6, 1970

INDEX: WHITE HOUSE-Atmospheric Science

To: Kenneth Cole/White House'

From: DuBridge/OST

Summary: Annual Report of World Weather Program for FY 1971

FILED: WHITE HOUSE-President

Indexer: vg

Remarks: