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Environment - Kuwait Oil Fires [1991]

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THE WHITE HOUSE

WASHINGTON

April 18, 1991

Dear Mr. Stettes,

I am delighted to receive from you the Sixth Edition of the National Geographic Atlas of the World, particularly with its personal inscription from Mr. Grosvenor.

I am afraid that he and I started our telephone conversation with wildly wrong information at both ends and so our discussion was a little strange until we were able to sort things out.

I want to take this opportunity to congratulate all of you at the National Geographic Society for your participation in what will be an absolutely unique experiment taking advantage of the Kuwait oil fires to study, in a way never before possible, the injection of large amounts of carbon particulates into the atmosphere.

Your help has been of critical importance in putting together the international effort that is needed to obtain the maximum amount of information while this experimental situation exists, and I fully anticipate that your magazine will play a very major role in conveying that, and related information, to an interested public.

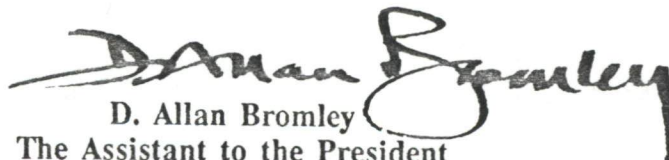
As one of those who grew up waiting avidly each month for the newest National Geographic as a vehicle to vicarious travel to the farthest reaches of the planet, I realize that I owe the Society over 50 years of heartfelt thanks.

Again, my special thanks for the Atlas of the World which I shall put to excellent use.

Please convey these thanks to Mr. Grosvenor.

With all best wishes,

Sincerely yours,



D. Allan Bromley
The Assistant to the President
for
Science and Technology

Mr. Steven S. Stettes
Assistant to the President
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COMMITTEE FOR RESEARCH AND EXPLORATION
WASHINGTON, D. C. 20036

STEVEN S. STETTES
ASSISTANT SECRETARY

April 16, 1991

The Honorable D. Allan Bromley
Assistant to the President
for Science and Technology
Old Executive Office Building, Suite 358
17th Street & Pennsylvania Ave., N.W.
Washington, D.C. 20506

Dear Mr. Bromley:

On behalf of Mr. Gilbert M. Grosvenor, President and Chairman of the National Geographic Society, please accept the accompanying Sixth Edition National Geographic Atlas of the World. As indicated by Mr. Grosvenor's personal note inside the front cover, he hopes that the accuracy of the atlas will prove to be better than his initial information regarding the Office for Science and Technology.

Also included with this letter is background information on the Society's effort to raise support for the Kuwait Oil-Well Fire Atmospheric Assessment Project. Progress is continuing as the Society, in cooperation with the National Center for Atmospheric Research (NCAR), the University Corporation for Atmospheric Research (UCAR), and several universities seek to develop a two-phase scientific atmospheric assessment plan to collect and measure air pollutants generated by these fires. The project is being coordinated by the National Science Foundation.

Please note that our efforts are focused from a scientific research perspective. This is not a media or journalistic endeavor on the part of the Society. Our goal is to bring public and private interests together to produce valuable scientific data for basic research.

Any assistance or advice in this effort would be greatly appreciated. Mr. Grosvenor would welcome a telephone call [(202) 857-7788] should you have any questions, or to further discuss this project.

Sincerely,



Steven S. Stettes
Assistant to the President
Kuwait Oil-Well Fire
Atmospheric Assessment Project

KUWAIT OIL-WELL FIRE ATMOSPHERIC ASSESSMENT PROJECT

April 1, 1991

Introduction

The 500+ oil-well fires currently burning in Kuwait offer a unique opportunity to study the impact of massive fossil fuel fires on weather and climate systems in the Persian Gulf region. The magnitude of these fires is unprecedented, and indeed the impact may be global in scale.

The National Geographic Society, in cooperation with the National Center for Atmospheric Research (NCAR), the University Corporation for Atmospheric Research (UCAR), and several U.S. universities, is developing a two phase scientific atmospheric assessment plan to collect and measure air pollutants generated by these fires. These efforts, as well as those by other interested scientific organizations and Federal agencies are being coordinated by the National Science Foundation.

Objectives

The following are objectives of the overall atmospheric assessment plan:

- To identify and characterize the regional emission rates of smoke particles and trace gases;
- To measure radiative properties of the smoke particles, and the net radiative effects of the plumes, while focusing on how the radiation affects the altitudes of the plumes, and the stability of the atmosphere;
- To measure individual characteristics of the smoke particles and determine if the particles have a hygroscopic (moisture retention) component, (or if they acquire such a component through chemical transformations) that would accelerate their removal from the atmosphere;
- To search for direct evidence that smoke particles are scavenged in clouds, and to determine the effects of the smoke on the composition and radiative properties of clouds;

- To measure the chemical composition of the collective smoke plumes, and determine how the composition may change with time. Such measurements will aid in developing estimates of the atmospheric residence time of the smoke;
- To track, and map, the atmospheric extent of the distribution of pollutants from the oil-well fires;
- To study regional weather anomalies associated with these smoke emissions.

Plan Outline and Methodology

PHASE ONE

The primary tools to be utilized are research aircraft of the National Center for Atmospheric Research (Lockheed *Electra*) and the University of Washington (Convair C-131A).

The *Electra* aircraft is currently undergoing inspection and repairs by the Zantop Corporation in Macon, Georgia. It will soon return to Boulder, Colorado where it will be calibrated and extensively equipped with instrumentation to provide smoke aerosol characterization, to study aerosol/cloud interactions, to measure (by a combination of *in-situ* and remote sensing) the regional mass flux of aerosols and trace gases, to detail the chemistry of the smoke and its alterations with time, and to examine the dynamical interactions of solar heating on the smoke plume. With more than twice the range of the Convair, and a superior service ceiling, the *Electra* will devote extra effort to the long distance plume assessment.

The Convair C-131A, with a long history of studying large fires, is similarly equipped with special strengths for characterization of the optical properties of the smoke and the spectral albedo of the smoke plume. Grab samplers will be deployed to measure specialized emission factors by means of carbon balance methods.

A key element in effective use of the aircraft and in regional plume impact assessment will be the analysis of satellite imagery. Analysis of this imagery, together with plume trajectory modeling, will allow the aircraft to intercept plume fragments well downwind, and in regions of plume/cloud interaction.

PHASE TWO

Phase two will focus on longer term issues and will emphasize surface based monitoring. Additional atmospheric testing by aircraft will be continued as necessary. Surface sampling and analysis stations will focus on issues dealing with radiation balance, optical depth and precipitation chemistry, and will include at least one research grade meteorological radar to observe precipitation formation over heat sources, in the downwind plume zones, and in unaffected areas to seek to identify acute meteorological anomalies.

Some elements of phase two will be of sufficient long-term duration to assess the results of the decay of the sources as fires are extinguished. The surface albedo will be assessed in areas with both wet and dry deposition of soot, and compared to areas with no soot fallout.

Project Participants

The total number of project participants in the Persian Gulf region is estimated at 30, and will include scientific, operational and technical personnel. Supplemental and related studies may include additional individuals for numerical modeling efforts aimed at simulating the transport, chemical and nucleation properties of the smoke plume and it's attendant precipitation.

The following are organizations and agencies currently involved in this project:

- Desert Research Institute, University of Nevada
- Drexel University
- University of Hawaii
- National Center for Atmospheric Research (NCAR)
- National Geographic Society
- National Oceanic and Atmospheric Administration (NOAA)
- National Science Foundation (NSF)
- Rhode Island University
- University Corporation for Atmospheric Research (UCAR)
- University of Washington
- United States Geological Survey (USGS)

Efforts are underway to enlist assistance from the U.S. Department of Commerce, the Department of Defense (DOD)/Joint Chiefs of Staff, the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Department of State.

Anticipated Costs

In addition to political support from the U.S. government, a minimum of \$1.66 million must be raised to fund this project. The breakdown of necessary funding is as follows:

•National Center for Atmospheric Research*	\$ 836,000
•University of Washington	725,000
•University of Hawaii	60,000
•Desert Research Institute	40,000

TOTAL	\$1,661,000

*(The NCAR budget includes participation by Drexel University and Rhode Island University)

Fuel costs alone are estimated at +/- \$200,000, and efforts are underway to seek contributions by the military of fuel for the project aircraft. In addition, it is hoped that the U.S. military in the region may be able to provide housing and food for the program participants, and security for project operations.

Cooperation is also being sought from other agencies or organizations that may have weather reconnaissance aircraft and/or weather radar already in the area.

Program Schedule

The phase one airborne atmospheric assessment component of the project is scheduled to depart the United States by May 1, 1991 for a field operation of approximately 30 days duration. The project design is for each aircraft to fly an estimated 100 hours of research missions based out of either Bahrain or Dhahran, Saudi Arabia.

The timing of this project during the month of May is critical for the following reasons:

- It is the earliest that the airborne teams can reasonably depart;

- It is the crucial meteorological transition to the dry season which will allow the observation of smoke plumes under both cloudy and cloud-free conditions;
- Climatological modeling of plume trajectories shows that during this time plumes will remain in airspace accessible to aircraft more than 80% of the time.

The phase two schedule remains to be outlined, and is subject to the outcome--and the success--of the highly critical first phase of this project.

Withdrawal/Redaction Sheet

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01. Letter	To: Don Atwood From: Allan Bromley Re: Kuwait oil fires research (2 pp.)	4/18/91	(b)(1)	

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