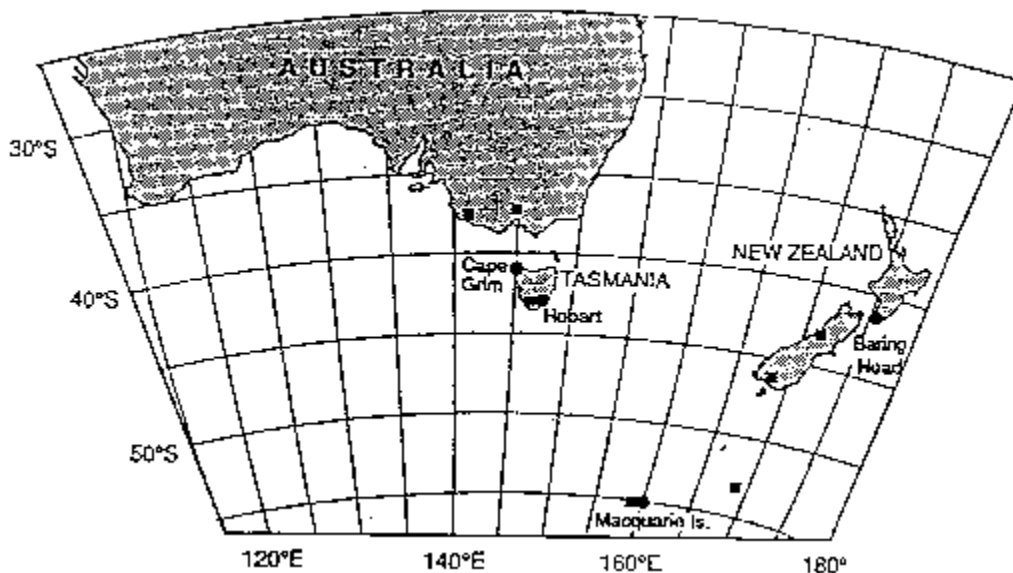




NEWS  
RELEASES

## Scientists, Ships, and Aircraft Head to South Pacific to Study Airborne Particles That May Be Cooling the Earth



**27 October 1995**

BOULDER-Scientists now suspect that increasing numbers of small particles of sulfur compounds and other pollutants floating in the atmosphere may cancel or even reverse greenhouse warming in heavily industrialized regions. By reflecting sunlight back to space, these tiny airborne particles, called aerosols, can cool the earth beneath and possibly slow a rise in global average temperature.

To learn more about "background" aerosols--the naturally occurring counterparts to these pollutants--researchers from eight universities and the National Center for Atmospheric Research (NCAR) in Boulder are flying on October 31 from Boulder to the remote marine skies of Tasmania, with stops in Alaska, Hawaii, and other sites along the way. Flight operations for detailed studies of the "clean" ocean air in the Southern Hemisphere will be based at Hobart, Tasmania, November 15-December 14.

Over 100 investigators from fifty-seven institutions representing Australia, France, Germany, Italy, Japan, the Netherlands, New Zealand, Sweden, the United Kingdom, and the United States are

participating in this major study of airborne particles. The National Science Foundation (NSF) is the primary sponsor of the U.S. component.

"Existing theories suggest that it should be very hard to create new particles in the lower atmosphere, yet they keep showing up," says principal investigator Barry Huebert of the University of Hawaii, Honolulu. "We're deploying state-of-the-art instruments to the remote marine atmosphere for the first time to seek the source of these new particles. This is the largest and most comprehensive experiment on natural background aerosols that we have ever done." Among the high-tech instrumentation will be NCAR's dual-wavelength airborne lidar, which will map the vertical extent of aerosol layers in the atmosphere.

A fully equipped C-130 research airplane owned by NSF and operated by NCAR will join the Seattle-based research vessel *Discoverer* of the National Oceanic and Atmospheric Administration (NOAA). Australia will provide a second research ship, the *Southern Surveyor*.

Researchers aboard the C-130 will spend as many flight hours taking measurements during the two-week trip from the north Alaska coast to south of New Zealand as they will during the operations in Tasmania. In Alaska, they will begin their research measurements with a flight toward the North Pole and back. While in Hawaii on November 5 and 6, the C-130 will fly through the Kilauea volcano plume to study how its particles form and how much sunlight they reflect. After arrival at Hobart, a flight toward the South Pole will complete the study's nearly pole-to-pole measurements, giving the distribution of remote marine aerosols from 78°16'N to 70°16'S latitude. The target altitude for observations ranges between seven and eight kilometers on the journey and within the lowest one or two kilometers of the atmosphere in the area of operations.

Called ACE-1, the study is the first of the Aerosol Characterization Experiments, a series of international field programs to help scientists understand the chemical, physical, and optical properties of aerosols; how aerosols form and grow; and their effect on radiation and climate. The series is part of the International Global Atmospheric Chemistry Program.

Like carbon dioxide, sulfate aerosols are produced by human activity, mainly the burning of fossil fuels. They also exist naturally as sulfur emissions from living organisms and volcanoes. By scattering incoming solar energy back to space, both the natural and pollutant aerosols directly affect the amount of radiation entering the earth's atmosphere. They also serve as tiny sites for water vapor to condense on, allowing more small droplets to form within a cloud. This change in the droplets' size distribution makes the cloud more reflective, bouncing more solar radiation back to space and cooling the earth below.

In ACE-1, scientists will study the natural marine system distant from the Northern Hemisphere sulfate aerosols produced by human activity. ACE-2, scheduled for 1997, will focus on the polluted marine atmosphere near European industrialized areas. As scientists learn more about aerosols naturally occurring in the undisturbed atmosphere, they can better assess the growing influence of human-produced sulfate aerosols on climate.

"Until recently all climate models have supposed that the only human activity driving climate change was the production of carbon dioxide and other greenhouse gases," explains Tom Wigley, NCAR senior scientist and a lead author of this year's Intergovernmental Panel on Climate Change report. "We now believe that other factors may be as important as greenhouse gases, particularly sulfate aerosols."

NCAR is managed by the University Corporation for Atmospheric Research (UCAR) under sponsorship of the National Science Foundation. Please see following pages for contact information.

## Note to Editors and Reporters

Before the ACE-1 team's departure from Boulder, reporters are invited to interview principal investigator Barry Huebert or project manager Al Schanot, pick up press packets, and photograph the aircraft. Please contact David Hosansky, UCAR Communications, 303-497-8611 or [hosansky@ucar.edu](mailto:hosansky@ucar.edu) to set up an appointment or to have a map of the area faxed to you.

In Hawaii on Saturday, November 4, reporters are invited to tour the aircraft, pick up press packets, and interview researchers from noon until 3:00 p.m. The airplane will be at Circle Rainbow Aviation at the Honolulu International Airport. Call 808-956-7410 to confirm date, receive more information, or make an appointment.

For on-site interviews in Hobart, Tasmania, between November 15 and December 14, reporters should contact operations director Gus Emmanuel. Emmanuel's e-mail, telephone number, and fax number at the operations center will be available after November 5. Contact Louise Carroll, UCAR Communications, 303-497-8611, [lcarroll@ucar.edu](mailto:lcarroll@ucar.edu) for this information.

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## Contact Information

### Project manager

Allen Schanot, Jr., Research Aviation Facility, NCAR, Boulder, Colorado, tel. 303-497-1063, [schanot@ncar.ucar.edu](mailto:schanot@ncar.ucar.edu)

### Principal investigators

Barry Huebert, Department of Oceanography, University of Hawaii, Honolulu, tel. 808-956-6896, fax 808-956-9225, [huebert@okika.soest.hawaii.edu](mailto:huebert@okika.soest.hawaii.edu)

John Gras, Division of Atmospheric Research, Commonwealth Scientific and Industrial Research Organization, Mordialloc, Victoria, Australia, tel. 61-3-586-7666, fax 61-3-586-7600, [jlg@dar.csiro.au](mailto:jlg@dar.csiro.au)

Timothy Bates, Pacific Marine Environment Laboratory, NOAA, Seattle, Washington, tel. 206-526-6248, fax 206-526-6744, [bates@pmel.noaa.gov](mailto:bates@pmel.noaa.gov)

### Operations director

Gus Emmanuel, University Corporation for Atmospheric Research, tel. 303-497-8693, [cbe@ucar.edu](mailto:cbe@ucar.edu).

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### Contact: David Hosansky, UCAR Communications

Boulder, Colorado 80307-3000

Telephone: (303)497-8611

E-mail: [hosansky@ucar.edu](mailto:hosansky@ucar.edu)

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**operates the National Center for Atmospheric Research with National Science Foundation sponsorship.**

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[Julie Jargon <Julie\\_Jargon@qgate.ucar.edu>](mailto:Julie_Jargon@qgate.ucar.edu)

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