Atmospheric Chemistry

FY 2000 Information

This summary is intended to be a supplement to NOAA's announcement of its FY 2000 Climate and Global Change Grants Program, *which gives the timetable, format, and submission procedures for proposals*. As an aid to those investigators considering preparing proposals, the present background document provides additional scientific information on the specific foci in atmospheric chemistry for which proposals are solicited.

Those interested in responding with a proposal to the FY 2000 NOAA solicitation should be cautioned that the availability of new funds cannot be accurately foreseen. FY 2000 budget constraints could severely limit available funds for new starts.

A. **NOAA's Emphases and Rationale**

A common major implicit theme in the NOAA's FY 1991 - FY 2000 grant's emphases is tropospheric ozone, which (i) is a radiatively important trace species, (ii) is important in controlling atmospheric oxidation, and (iii) is a secondary pollutant with significant impacts on biota. It is currently believed that a significant fraction of the ozone in the troposphere is produced photochemically from precursors, principally the oxides of nitrogen (NO_x) and non-methane hydrocarbons (NMHC), which have both human-influenced and natural sources. The lifetime of ozone in the troposphere varies from days/weeks in the summer to months in the winter, which implies that it can be transported across hemispheric scales. Thus, a predictive understanding of tropospheric ozone requires a focus on the chemical and transport processes that link regional emissions to hemispheric ozone trends and distributions.

B. **International Linkages**

International Global Atmospheric Chemistry (IGAC) Program. The Atmospheric Chemistry Project of NOAA's Climate and Global Change Program is continuing to direct its grants support to research that aids projects of International Global Atmospheric Chemistry (IGAC) program, which is a Core Project of the International Geosphere-Biosphere Program (IGBP). The IGAC program is focused on understanding the chemistry of the global atmosphere as it relates, in part, to the assimilative (i.e., oxidizing) capacity of the atmosphere and the impact of atmospheric composition on climate. The IGAC program has several projects that address key aspects of the chemistry of the globe, as well as crosscutting activities that support all projects (IGAC, 1998). The research activities of the IGAC program are in various stages of readiness: many are under way now and others are still being planned.

C. **Solicited Proposal Topic**

An IGAC activity that directly address the tropospheric chemistry of ozone and other chemically-active or chemically-produced greenhouse compounds will constitute the major FY 2000 emphasis of the Atmospheric Chemistry Project of the NOAA Climate and Global Change Program. The activity summarized below is deemed by the IGAC Scientific Steering Committee to be a well-planned and active area of research for which augmentations could produce needed, immediate, and high-quality results.

Proposals are invited that addresses stated aspects of the North Atlantic Regional Experiment (NARE) activity of IGAC. The objective of NARE is to investigate the chemical and transport processes that shape the distribution of ozone and other chemically-produced greenhouse compounds in the northern half of the Western Hemisphere and to estimate the impact of human-influenced emissions from North America and Europe on the production of these compounds and the related parameters on a hemispheric scale. The research needed to meet this objective involves measurements of the distributions and trends of ozone and other trace chemical species in the North Atlantic region. The goal of the research is the determination of the sources of these compounds, the discovery or verification of the processes responsible for their formation and the consequences of their formation. Several long-term observational sites are in place, with analyses under way. The current emphases of the FY 2000 grants of the Atmospheric Chemistry Project are:

- Development, construction, integration, and implementation of new airborne instrumentation and sampling methods for the NOAA P-3 in support of future studies. Particular attention will be paid to the development of techniques to measure the radiatively-important trace compounds that can be carried aboard this or similar aircraft flying in the troposphere during future IGAC field studies. The study should involve the design, construction, calibration and field testing of instruments aboard the NOAA P-3.

- Development of light-weight, low-power, automated measurements techniques to measure O3, CO, other ozone-precursors, or tracer compounds that can be operated at remote surface sites in the North Atlantic to better define the sources and processes that shape the ozone distribution in the North Atlantic.

- Development and deployment of well-calibrated methods to measure cloud droplet size distributions under a range of conditions and cloud types. These studies are to be done in concert with the investigations of the gas-phase chemical species referred to above, as well as cloud-radiative transfer measurements.

D. **Reference**

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