Charge for the National Science Foundation Atmospheric Science Facilities Committee

INTRODUCTION

Emerging instrument technologies in atmospheric science offer improving capabilities for new discoveries and knowledge. New ideas for intensive observational field experiments and longer-term climate studies benefit from instrument miniaturization, greater portability, and autonomous operations, but also place an increasing demand on current atmospheric science facilities and instrumentation. In times of limited science funding, strategic planning and community partnerships become vital to target appropriate investments in new capabilities and to facilitate the sharing of current resources. To address these issues, a comprehensive review of facilities and technologies is needed to identify gaps in scientific measurement capabilities and other salient issues. To complement this effort, consideration also should be given to which aging and obsolete instruments (and instrument systems) are appropriate candidates to replace with the most modern and proven technologies.

PURPOSE

The National Science Foundation (NSF) will lead an assessment of the current status of national and international atmospheric science facilities and will provide a forum for the development of community partnerships. The NSF UCAR and Lower Atmospheric Observing Facilities program office and the Earth Observing Laboratory (EOL) of the National Center for Atmospheric Research (NCAR) will conduct a community-wide assessment of atmospheric science instrumentation. This assessment will consider facilities across government agencies, universities, national laboratories, international organizations, and private companies. The assessment will consider a wide breadth of technologies including currently available instrumentation and systems under development. Expertise within the atmospheric science community will be drawn on broadly to assist with the assessment. This broad community participation will facilitate the identification of potential partnerships for sharing multi-purpose facilities and instrumentation for the greatest community benefit.

Based on the results of this assessment, a workshop sponsored by NSF will be held to discuss gaps in atmospheric science measurement capabilities and how resource sharing and strategic investments that will increase both availability and capability of future instrumentation may fill these gaps. Emerging technologies for new observation capabilities, miniaturization, or autonomous operation will be a major element of the assessment.

APPROACH AND EXPECTATIONS

NSF requests NCAR to form a steering committee that will appoint a committee to assess the status of national and international atmospheric science facilities and provide broad oversight of the facilities assessment study. The steering committee, with NSF concurrence, will select the committee membership from the NSF community inside and outside of NCAR and will supervise the activities of the committee including the development of a project plan outlining schedule, deliverables, and regular reporting to NSF. The formulation of additional sub-groups may be deemed necessary by the committee in order to investigate key capabilities or topic areas.

In addition to conducting the assessment study, the assessment committee will be tasked with outreach efforts to the community. This could include, but is not limited to, the following activities:

1. Establish a web-based resource that provides descriptive information of atmospheric science facilities and instrumentation in a consistent, easy-to-read format as a resource for the broad atmospheric science community.
2. Prepare an overview paper suitable for submission to the Bulletin of the American Meteorology Society (BAMS) or another journal of equal scientific stature. The paper will review current atmospheric science ground-based and airborne facilities and instrumentation and identify gaps in current scientific measurement capabilities. Potential partnering opportunities and complementary measurements that enhance current scientific capabilities will be assessed.
3. Organize and implement a workshop to comment on the committee work and to revise as necessary the overview paper before journal submission. The workshop will provide an additional opportunity to augment the facilities assessment study with overlooked measurement facilities or gaps in capabilities. Attendees will be by invitation.

It is anticipated that the outcome of the committee work, including input from the workshop, will be documented and distributed widely to enhance community awareness both of the existing atmospheric facilities as well as the new and emerging facilities. These activities will assist NSF in strategic planning and budgeting for future instrumentation and facility development for use in field experiments and long-term field observations. Emerging technologies that could benefit from strategic investments will be identified. The overview and web-based resource will also serve as a valuable reference document for other governmental agencies and community partners who have the need to utilize or share atmospheric science facilities.

CHARGE

The Earth Observing Laboratory, NCAR, with concurrence from the NSF, will establish a committee of experts in observing facilities technologies (existing and emerging). The committee will develop a common format for the database of facility/instrument entry, appoint the subgroups as needed, assess the status of the instruments and facilities reviewed, and plan the follow-on workshop.