

**2006 Committee of Visitors Report for the
UCAR and Lower Atmospheric Facilities Oversight Section**

DATE OF COV: AUGUST 2-3, 2006
PROGRAM: UCAR AND LOWER ATMOSPHERIC FACILITIES OVERSIGHT SECTION
DIVISION: ATMOSPHERIC SCIENCES
DIRECTORATE: GEOSCIENCES

COMMITTEE MEMBERSHIP:

Maria Pirone, Atmospheric and Environmental Research, Inc. (Chair)
Paul Krehbiel, New Mexico Institute of Mining and Technology
Joseph Salah, MIT Haystack Observatory
Lisa White, San Francisco State University

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Overview

The Committee of Visitors (COV) review of the NSF/GEO/ATM's UCAR and Lower Atmospheric Facilities Oversight Section (ULAFOS) was conducted on August 2-3, 2006 at the National Science Foundation headquarters in Arlington, Virginia. The charge to the Committee is contained in the letter to Committee members from Assistant Director Margaret Leinen dated July 19, 2006. Members of the COV were:

Maria Pirone, Atmospheric and Environmental Research, Inc. (Chair)
Paul Krehbiel, New Mexico Institute of Mining and Technology
Joseph Salah, MIT Haystack Observatory
Lisa White, San Francisco State University

This is the fourth COV review of ULAFOS, the last one having been conducted in August 2003 and chaired by Elbert (Joe) Friday.

Materials for the review consisted of (i) a notebook of background information (including a CD-ROM) provided by the ULAFOS office; (ii) a presentation by the ULAFOS Section Head, and (iii) a lengthy meeting with ULAFOS staff and ATM Director, Jarvis Moyers. There was also additional material, including the prior COV review, available via the ULAFOS Staff.

Major Findings

The COV wishes to highlight the following findings, including successes and challenges, for the NSF management's attention. Additional comments and recommendations are contained in the evaluation template following this summary.

- The ULAFOS staff are doing excellent work in overseeing the management of UCAR/NCAR, the Lower Atmospheric Facilities groups, and the related Supporting Activities.
- The ULAFOS program is complex but is functioning very well. It is a major national resource, not only in Atmospheric Science research but also in applying expertise to other areas of national concern such as aviation weather and atmospheric and dispersion modeling.
- Overall, the COV found the complex ULAFOS programs to be well managed by a lean staff. They presented themselves in a knowledgeable and cohesive manner, displaying a high degree of coordination as a section. They have intimate knowledge of the UCAR/NCAR program and plans. They also communicate clearly the appropriate level of guidance and encouragement in the development of these programs and plans.
- Recent initiatives were introduced by ULAFOS staff to modify and improve NSF oversight. They include:
 - a) Dynamic quarterly reporting by NCAR through a web-based system.
 - b) Request for the establishment of meaningful metrics for evaluating NCAR program performance.
 - c) Frequent communication and coordination with other ATM and NSF sections and divisions on interdisciplinary and other programs.
- Under ULAFOS oversight, NCAR is a dynamically evolving organization that is responding to both current and future needs of the Atmospheric Sciences, both nationally and globally.

Notable Activities and Successes

The COV found a considerable number of accomplishments by the ULAFOS team since the last COV review that warrant mentioning. This is not an exhaustive list but instead a brief acknowledgement of activities that the COV wishes to recognize.

- Since the previous COV, NCAR has undergone a major review examining among other things, their recent reorganization aimed at improving their effectiveness and preparing to deal with future challenges.
- Upon ULAFOS request, UCAR/NCAR's procedures (i.e. **Joint Office Science Support** transition) and structure for planning and allocating requests for field programs have been changed to better anticipate and prepare for the needs of the programs. The deployment pool (i.e. funding) for supporting field programs has steadily increased.
- The procurement, fabrication and project management of the HIAPER aircraft has been a major success story, not only for NCAR and ULAFOS but also government-wide. This is but one example of a number of successful innovations and forward-thinking activities that are taking place within NCAR and UCAR through NSF guidance and funding.
- The ULAFOS program is carefully assessing and revising the current makeup of field program facilities within NCAR and the Lower Atmospheric Facilities. In addition, it is making good progress in a government-wide evaluation of support facilities for the atmospheric research community.
- ULAFOS and ATM have coped well with the constraints of a flat budget over the past several years. They have also maintained an appropriate balance between funding for NCAR/Lower **Atmospheric Observing Facilities** (through ULAFOS) and that for university investigators (through ATM).

Challenges/issues/concerns

Upon careful scrutiny, the COV also found that although there have been notable accomplishments since the last review, ULAFOS is not without challenges in the coming months/years. There are no clear metrics to quantify the impact of the issues relating to these challenges but the COV felt they warranted consideration by NSF management.

- Over the last few years, non-NSF funding of NCAR activities/initiatives has increased dramatically through both interagency transfers and direct agency funding. While the interagency funding is under NSF oversight, the direct agency funding is not. The COV is concerned about the potential impact of non-NSF funded initiatives (currently approximately 30%) on the mission and balance of programs at NCAR.

Recommendation 1: The COV recommends that NSF develop a formal mechanism to monitor the funding levels of non-NSF research and development initiatives at NCAR and consider whether corrective action needs to be taken.

- Although ULAFOS staff has emphasized the need to close the diversity gap within NCAR, the COV recognized the need for more work in this area.

Recommendation 2: The COV recommends that ULAFOS continues to guide NCAR management to pursue more creative means in addressing the diversity gap.

- While ULAFOS has suggested that NCAR management establish more meaningful metrics to connect goals and accomplishments to monitor their performance, the COV recognized a potential issue in fulfilling this task. As NCAR programs become more interdisciplinary in nature, this task will become more difficult to accomplish.

Recommendation 3: The COV recommends that ULAFOS encourage (and/or support) NCAR management to pursue workshops or other focused efforts on the development and use of metrics.

- The COV recognized ULAFOS staff to be efficient yet somewhat lean based on the current workload and upcoming initiatives, such as the competition for NCAR management. It is essential under these conditions to maintain continuity of a highly qualified and knowledgeable staff.

Recommendation 4: The COV strongly recommends that ATM make its best effort to provide a stable staffing situation within ULAFOS and assist in providing resources within ATM and/or elsewhere to enable continued successful oversight activities. This is particularly important in view of the upcoming competition for the management and operation of NCAR and for the continued oversight functions of ULAFOS.

- The NCAR and Lower Atmospheric Facilities are used by scientists across the nation and indeed around the world, and are in growing demand. The main challenge for NSF and ULAFOS is to support this increased usage of these resources.

Recommendation 5: The COV recommends that ATM ensure that the funds for deploying facilities in observational programs (deployment pool) are appropriately matched to the capacity of the facility providers to provide services, and to the need for those services to fulfill the science objectives of funded peer-reviewed research. In addition, ULAFOS should ensure that deployment pool funds and facility-provided capacity allow for both large and smaller field studies to be supported.

Competing the NCAR Management Agreement

The COV recognized the biggest challenge facing ULAFOS to be the upcoming competition of the NCAR management agreement. The COV supports NSF's decision to take on this task, with recognition that it needs to be done in a transparent and efficient manner. Due to the high profile and highly regarded reputation of NCAR and its scientists, the atmospheric community will be monitoring this effort closely. It is important that this process be flawless in its execution. The COV makes note of and recommends the following:

- As indicated above the competition of the NCAR management is an important process, as is recognized by ATM and ULAFOS and the COV.

Recommendation 6: The COV recommends that ATM/NSF continue to provide appropriate resources and support to ULAFOS

- The COV recognizes that the outcome of this competition is critically important to the continued existence and success of NCAR as a strong, national research and development center with international visibility.
- It is essential for the process to be least disruptive to NCAR operations in order to preserve intellectual and technical expertise.

Recommendation 7: The COV commends ULAFOS for close communications with NCAR staff on issues involving the process of the competition and recommends these discussions continue.

- The COV recognizes that ULAFOS's process is well thought out and designed (strategic plan revision, management review, concept of design approach, etc). However, the COV found the time scale tight with no buffer for unplanned events.

Recommendation 8: The COV recommends that ULAFOS modify the time line for procurement and award to address contingencies, keeping in mind that outside resources may be necessary.

- The COV found ULAFOS staff to be keenly aware of complex issues needing resolution prior to solicitation release (e.g. property, buildings etc) and taking proper steps to address these issues.

Recommendation 9: The COV commends ULAFOS staff for identifying this as an area of potential risk and recommends that they closely monitor the progress of this activity.

- The COV recognizes the competition process to be time-consuming for both ATM/ULAFOS and NCAR to undertake frequently.

Recommendation 10: The COV agrees with the recommendation in the prior COV report (2003) to include an option to extend the next agreement for at least one 5-year period.

Response to Previous COV Report

For the most part, the COV found ULAFOS' response to the 2003 COV's recommendations to be appropriate and completed in a timely manner. The ULAFOS staff provided closure on six of the eleven recommendations. Of the remaining five recommendations, two were addressed but required no actions and three required action but are still awaiting closure (see summary table).

In support of the 2003 COV review, the current COV is in strong agreement with the need and activity proposed in the remaining open recommendations. Specifically, the current COV recommends that:

- The temporary staff brought in under for recommendation # 2 be converted to a permanent position.
- The NCAR competition award include an optional 5 year extension to the 5 year award.
- The template for the ULAFOS COV report be completely replaced (not modified) with a more appropriate template meeting both NSF's requirements and the ULAFOS reviewers' needs.

Furthermore, in light of the current and prior COVs' position on this issue, we strongly urge ATM/ULAFOS management to act expeditiously to provide dependable, stable and adequate

resources to the Section, particularly during the competition and transition period leading to a new award for the management of NCAR.

Status of Previous COV Recommendations

	Recommendation:	Status
1.	Complete UCAR CA award by 1 Oct 2003	Completed
2.	Permanent ULAFOS resources for NCAR Competition activities	Not Completed
3.	Permanent IPA Position	No action was taken
4.	Develop govt-wide facilities plan for interagency assets	Completed (in process)
5.	Independent review for support needed to achieve NSF scientific research and education goals	Completed
6.	Conduct timely NCAR review	Completed
7.	Seek 5 yr Cooperative Agreement with 5 yr extension	Not Completed (in process)
8.	Use CHILL radar where cost-effective	In process
9.	T-28 Replacement aircraft	Completed (in process)
10.	IGERT program participation at NSF	Completed
11.	Review template not applicable to ULAFOS review	Not Completed

FY 2006 COV Report Template

The table below should be completed by program staff.

Date of COV: 2-3 August, 2006
Program/Cluster/Section: ULAFOS
Division: ATM
Directorate: GEO
Number of actions reviewed: Awards: 1 Declinations: 0 Other: 10
Total number of actions within Program/Cluster/Division during period under review: Awards: 4 Declinations: 0 Other: Many
Manner in which reviewed actions were selected: <i>We are presenting information covering our entire portfolio.</i>

Part A. Integrity and Efficiency of the Program's Processes and Management

Briefly discuss and provide comments for *each* relevant aspect of the program's review process, oversight, and internal management processes. Comments should be based on a review of existing awards and other oversight functions that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

A.1 Questions about the quality and effectiveness of the program's use of merit review procedures in the on going oversight of existing awards.

Provide comments in the space below the question. Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ¹
1. Is the oversight mechanism appropriate? (panels, ad hoc reviews, site visits) <u>Comments:</u> ULAFOS is doing an excellent oversight job. Frequent communications, visits, reviews, interactions with UCAR and NCAR management and Board. Interactions are at all levels.	YES
2. Is the oversight process efficient and effective?	YES

¹ If "Not Applicable" please explain why in the "Comments" section.

<p><u>Comments:</u> The management process is one that relies on communication of priorities and shared values, which allows UCAR/NCAR to implement activities that produce results consistent with ULAFOS and NSF priorities. Oversight is at the proper level and does not involve micromanagement.</p>	
<p>3. Do the oversight processes provide sufficient information for the awardee to understand the basis for the oversight recommendation?</p> <p><u>Comments:</u> The close interaction between ULAFOS staff and the management of both UCAR and NCAR ensure that the bases for recommendations are well understood.</p>	YES
<p>4. Does the written and verbal oversight guidance provide sufficient information for the awardee to understand the basis for the guidance and recommendations?</p> <p><u>Comments:</u> Formal written guidance is provided when necessary, but most guidance is provided verbally or through email. ULAFOS explains NSF's priorities, expectations and requirements. NCAR/UCAR is expected to find ways to implement, with ULAFOS oversight. ULAFOS also works well with other ATM sections in coordinating field programs and in shared oversight of ESSL.</p>	YES
<p>5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?</p>	N/A
<p>6. Is the time to decision appropriate?</p> <p><u>Comments:</u> The Cooperative Agreement with UCAR was completed just in time for the Oct 1, 2003 deadline. HIAPER instrumentation had a tight time schedule for review that was successfully adhered to. The cooperative agreement with CHILL is under a one-year extension to allow time for the overall facilities assessment to be completed and for discussions between CHILL and S-POL groups to discuss possible cost-saving measures.</p>	YES
<p>7. Additional comments on the quality and effectiveness of the program's use of oversight procedures:</p> <p>For the size of the program and the breadth of facilities involved, ULAFOS provides high quality and effective oversight with a small staff.</p>	

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by in the oversight process.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ²
<p>1. Has NSF oversight addressed both merit review criteria?</p> <p><u>Comments:</u> Intellectual merit is properly applied, as demonstrated by impressive results for ideas, tools and people development. ULAFOS oversees a number of programs having strong broader impact components: Unidata (teaching and outreach), SOARS (mentoring and diversity), Junior Faculty Forums, Summer Colloquia, Undergraduate Leadership workshops, REU programs at CHILL, and the long-running Advanced Study Post-doc program. The Research Applications Lab is substantially contributing to applying NCAR's atmospheric science expertise to other governmental groups (e.g., FAA, DOD)</p>	<p>YES</p>
<p>2. Have the written and verbal communication addressed the implementation of both merit review criteria?</p> <p><u>Comments:</u> ULAFOS ensures that NCAR takes care to address and implement the merit review criteria in their internal funding.</p>	<p>YES</p>
<p>3. Have the <i>review analyses</i> (Form 7s) addressed both merit review criteria?</p> <p><u>Comments:</u> In the HIAPER instrumentation proposals, more attention was necessarily paid both by the proposers and the reviewers to the technical merit of the proposals than to the broader impacts. The SOARS proposal very adequately addressed both criteria as noted by the reviewers.</p>	<p>YES</p>
<p>4. Additional comments with respect to implementation of NSF's merit review criteria:</p> <p>ULAFOS did not review a proposal for the operation and maintenance of NCAR during the review period of performance reviewed by the current COV</p>	

² In "Not Applicable" please explain why in the "Comments" section.

A.3 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE ³
<p>1. Did the program make use of an adequate number of reviewers?</p> <p><u>Comments:</u> The COV examined samples from three review-based activities in ULAFOS.</p> <p>(a) HIAPER instrumentation competition: For each proposal, 5-6 mail-in reviews were solicited and the panel was constituted with 8 expert panelists. This is an adequate number and resulted in a uniform and well-based final evaluation of each proposal and sound recommendations to the program director.</p> <p>(b) SOARS: 8 experts were invited and 5 were able to provide mail-in reviews and their recommendations were used appropriately by the program director.</p> <p>(c) NCAR Management: 12 reviewers (8 assembled panelists and 4 mail-in reviewers) were invited to participate and the number was adequate to provide the appropriate level of evaluation to ULAFOS.</p>	<p>YES</p>
<p>2. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p><u>Comments:</u> (a) HIAPER instrumentation: The reviewers and panelists all had sufficient experience in atmospheric instrumentation development and its application to airborne measurements. They were all well qualified and provided well-informed and detailed evaluations.</p> <p>(b) SOARS: The reviewers were well qualified in the area of promoting diversity in science through mentoring opportunities and research.</p> <p>(c) NCAR Management: The panelists and reviewers are some of the leading directors, administrators, and managers of large university and federal labs. Their individual and collective expertise in managing sizable research units provided valuable expertise to the review process.</p>	<p>YES</p>
<p>3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?⁴</p> <p><u>Comments:</u></p>	<p>YES</p>

³ If “Not Applicable” please explain why in the “Comments” section.

⁴ Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

<p>(a) HIAPER instrumentation: Selection of reviewers was well-balanced geographically and amongst types of institutions.</p> <p>(b) SOARS: Reviewers were concentrated in the eastern and midwestern regions of the country but gender and ethnic balance was achieved.</p> <p>(c) NCAR management: The reviewers selected were well-balanced geographically and represented a variety of government, private, and educational institutions. A good gender and ethnic balance among the reviewers was also achieved.</p>	
<p>4. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p><u>Comments:</u></p> <p>(a) HIAPER instrumentation: No Conflict Of Interest (COI) was apparent. UCAR, developer of HIAPER, won 4 out of 4 of its proposals, but was not involved in the review process at all. This was carefully examined by the COV and there was no COI.</p> <p>(b) SOARS: No COI was apparent</p> <p>(c) NCAR management: No COI was apparent.</p>	<p>YES</p>
<p>5. Additional comments on reviewer selection: NONE.</p>	

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

<p>RESULTING PORTFOLIO OF AWARDS</p>	<p>APPROPRIATE, NOT APPROPRIATE⁵, OR DATA NOT AVAILABLE</p>
<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p><u>Comments:</u> ULAFOS oversees a good mix of research projects examined by the COV during the prescribed period including technical projects (HIAPER instrumentation, Wyoming King Air and CHILL radar), as well as the successful education project (SOARS) at UCAR aimed at improving diversity through training opportunities for groups underrepresented in the atmospheric sciences.</p>	<p>APPROPRIATE</p>
<p>2. Are awards appropriate in size and duration for the scope of the projects?</p> <p><u>Comments:</u> The HIAPER instrumentation projects were well matched in terms of size and duration to the specific measurement requirements and to the overall deployment schedule. The 5-year award to the SOARS program was also appropriate and will support 12 students in a year-around and intensive summer research experience.</p>	<p>APPROPRIATE</p>
<p>3. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Innovative/high-risk projects?⁶ <p><u>Comments:</u> Selection of HIAPER instrumentation took into account the innovative aspects of some of the measurement systems with acceptable risk. It was noted that some proposals which could result in low risk approach based on existing technology were declined in favor of the more innovative approaches despite the inherent risk, based on panel recommendations, which is quite appropriate for advancing the field.</p>	<p>APPROPRIATE</p>

⁵ If “Not Appropriate” please explain why in the “Comments” section.

⁶ For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

<p>4. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Multidisciplinary projects? <p><u>Comments:</u> The multidisciplinary aspects of the ATM program were well recognized and articulated by ULAFOS to UCAR/NCAR, and resulted in the establishment of a re-organized structure for NCAR representing a major change that will promote closer scientific interactions amongst groups and a stronger overall program to serve the community.</p>	<p>APPROPRIATE</p>
<p>5. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Funding for centers, groups and awards to individuals? <p>Comments: The primary dominant award by ULAFOS is for a center (NCAR and LAOF). There are a few smaller awards selected by ULAFOS that are external to the large award for NCAR, such as the HIAPER instrumentation, Wyoming King Air and CHILL radar.</p>	<p>APPROPRIATE</p>
<p>6. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Awards to new investigators? i.e awardee's commitment to new investigators (new hires) <p>Comments: Same reasons as for 5 above.</p>	<p>NOT APPLICABLE</p>
<p>7. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? <p>Comments: The HIAPER instrumentation recommendations for award appeared to be reasonably well balanced in terms of geographical distribution, although UCAR won ~25% of the awards based on merit.</p>	<p>APPROPRIATE</p>
<p>8. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>Comments: Same reasons as for 5 above.</p>	<p>NOT APPLICABLE</p>
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Projects that integrate research and education? <p>Comments: UCAR/NCAR in combination have developed a good mix of projects that provide research experiences to students as part of their education. Emphasis on supporting groups underrepresented in the sciences is commendable since other ATM-funded activities elsewhere have more difficulty succeeding in this area.</p>	<p>APPROPRIATE</p>

<p>10. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and subdisciplines of the activity and of emerging opportunities? <p><u>Comments:</u> UCAR/NCAR appears to be well positioned to take advantage of emerging opportunities. Studies are underway to develop the Petascale collaboration, the successor to the COSMIC satellite system through AROS, and the midscale observing facilities.</p>	<p>APPROPRIATE</p>
<p>11. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p><u>Comments:</u> COV cannot comment on this topic since the demographics within UCAR/NCAR were not available for review. SOARS stands out as the major contribution to develop and engage future generations of groups traditionally underrepresented in the atmospheric sciences.</p>	<p>NOT APPLICABLE</p>
<p>12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.</p> <p><u>Comments:</u> Priorities within NCAR reflect well the national priorities as guided by NSF, and the emphasis on important investigations such as climate change, pollution, and space weather is in the national interest. In the reorganized NCAR structure, the Research Applications Lab aims at applying the research results to practical needs of NSF and other federal agencies. The COV recommended close attention to the balance of such external 'customer' needs relative to the main NSF mission.</p>	<p>APPROPRIATE</p>
<p>13. Additional comments on the quality of the projects or the balance of the portfolio: NONE.</p>	

A.5 Management of the program under review.

Please comment on:

1. Management of the program.

Comments:

The ULAFOS program is competently managed by the section head, Dr. Jacobs, and the small number of ULAFOS staff in the section is well motivated and coordinated to handle the oversight responsibilities. There was no complaining about the effort involved or the need for additional resources despite COV members' inquiries about such a need. The COV recognizes the challenges confronting ULAFOS in the recompetition of NCAR management, and is aware of the visibility of the process in the broad community. The COV commends the ULAFOS team regarding their preparations and approaches to the challenge but advises that NSF resources within ATM or elsewhere need to be applied at the appropriate time if requested by ULAFOS during the competition process. Special priority must be accorded ULAFOS during this activity due to its importance.

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

The ULAFOS program is well tuned to the various emerging opportunities within NSF and is guiding UCAR and NCAR towards these opportunities, allowing them to compete directly for the additional support needed. ULAFOS is very supportive of NCAR as a federal laboratory and the importance of allowing the center to grow to best meet NSF's mission.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments:

By definition and design, the ULAFOS portfolio is narrowly focused on NCAR and a few additional community observing facilities. ULAFOS has encouraged proper strategic planning and prioritization by NCAR to meet NSF's goals and to be consistent with NSF's priorities and monitors the progress in an innovative dynamic manner. Frequent communications between ULAFOS and UCAR/NCAR results in an overall cohesive and mutually-supportive effort.

4. Additional comments on program management:
NONE.

Part B. ULAFOS as it Relates to NSF's Strategic Outcome Goals

Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for PEOPLE: Developing “a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens.”

Comments:

SOARS

The SOARS program continues to provide meaningful research opportunities for up to 12 undergraduate and graduate students from underrepresented groups annually at UCAR (NCAR, UOP, or EO). Since the program's inception 10 years ago, the overall success rate (defined by the numbers of students who have graduated from the program or are currently in the program divided by the total number of students to enter the program) is 91%. In 2005 the Ethnography and Evaluation Research unit (E&ER) at the Center to Advance Research and Teaching in Social Sciences at the University of Colorado completed a two-year, in-depth evaluation of the SOARS program. The E&ER team concluded that a number of structural elements contribute to the success of SOARS. Among these are the quality of the research projects, mentoring and collegiality, support for the protégés' professional development, and the strong institutional support at all levels in addition to the prestige of the institution.

COV Finding

Support by the NSF for SOARS is important element of both institutions' diversity goals and the COV encourages continued investment in the program. Extension of, and greater institutionalization of, the program should be considered to encourage greater diversity at all levels of the NCAR scientific community.

Faculty, Post-Doc, and Undergraduate Fellowship Programs at UCAR

UCAR continues to invest heavily in its own scientific staff and in the careers of young scientists in the broader research community by promoting collaboration and opportunity through faculty programs. Graduate students and post-doctoral researchers also come together at NCAR for sponsored colloquia and workshops on cross-disciplinary topics such as exploring the impact of weather and climate on humans. Opportunities for undergraduate students at NCAR and NCAR facilities are more limited but include the CSU-CHILL program at the National Radar Facility supported by an REU award and the five-day Undergraduate Leadership Workshop.

COV Finding

The COV acknowledges the importance of such onsite opportunities, particularly for scientists in the early stages of their careers. These opportunities could be better complemented by encouraging more NCAR scientists to spend time in residence at a U.S. university which is part of the goals of the NCAR Faculty Fellowship Program inaugurated in the summer of 2005. The COV recommends that ULAFOS continue to support these opportunities at UCAR and NCAR and we encourage more integration of elements of the faculty and student programs to the goals of a more diverse workforce among the NCAR community of scientists.

B.2 OUTCOME GOAL for IDEAS: Enabling “discovery across the frontier of science and engineering, connected to learning, innovation, and service to society.”

Comments:

NCAR and the ULAFOS program as a whole is fully engaged in leading edge research and engineering in virtually all of their programs. ULAFOS exercises valuable oversight not only over this work but has initiated forward-looking exploration of emerging opportunities and technologies in several areas (e.g., AROS and the Petascale collaboration).

B.3 OUTCOME GOAL for TOOLS: Providing “broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation.”

Comments:

ULAFOS has had direct and detailed oversight of the highly successful development of the HIAPER aircraft, and of instrumentation for the aircraft, which will provide a major advance in airborne atmospheric measurements and observations. Both the observational facilities within NCAR and the Lower Atmospheric Observing Facilities (CHILL and the King Air) continue to be valuable tools for conducting state-of-the-art research. The T-28 storm penetration radar has been decommissioned but ULAFOS is overseeing a focused effort to acquire an A-10 aircraft as a modern, needed replacement.

In addition to observational facilities, NCAR provides state-of-the-art models and computational facilities that are major tools for predicting and nowcasting weather systems, understanding atmospheric chemistry, and for long-term climate investigations. NCAR also provides data distribution, archiving, and calibration services in support of both observational and computational research. In short, they provide the full suite of modern techniques and abilities that enable discovery, learning and innovation.

B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing “an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices.”⁷

Comments:

The ULAFOS staff utilizes effective management practices in overseeing UCAR, NCAR, and the Lower Atmospheric Observing Facilities. This has resulted in excellent organizational outcomes.

⁷ For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF’s Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

Part C. Other Topics

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The ULAFOS staff functions very effectively and does not have gaps in its operation.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

C.4 Please provide comments on any other issues the COV feels are relevant.

The fact that HIAPER is an official government aircraft and is certified increases the cost and effort required to conduct research with the aircraft. In addition, the FAA, OMB, and congress have increased the reporting and documentation requirements on the use of federal aircraft, particularly since 9/11. Both of these have significantly increased the workload not only for NCAR personnel and researchers working with the aircraft, but also for ULAFOS staff. NSF needs to be cognizant of this increase.

Additional comments are attached.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

The COV reiterates that the report template is completely inappropriate for evaluating a group such as ULAFOS. We strongly recommend that NSF replace this major impediment to conducting intelligible and effective reviews. COV recommends that ULAFOS be tasked to provide an appropriate evaluation form for their type of program.