Dear Bob:

We would like to thank you, Franco Einaudi, and the other members and observers of the UCAR Scientific Program Evaluation Committee (SPEC) for your participation with NSF in the reviews of the NCAR divisions and UCAR and NCAR management that took place during September-November 2001. We acknowledge with thanks the two valuable reports that you prepared: Report of UCAR Scientific Programs Evaluation Committee (SPEC) and Observers on the NSF Review of UCAR/NCAR Management, 13-15 November 2001 and Report to the UCAR Members on the NSF Review of the National Center for Atmospheric Research by the UCAR Scientific Programs Evaluation Committee (SPEC) and Observers, 4 February 2002. This letter is the UCAR and NCAR response to these two reports.

With respect to the first report, we are pleased that you “agree completely with the conclusions and recommendations of the NSF panel that evaluated the management of UCAR and NCAR.” As you know, we have responded in detail to the NSF report, and rather than repeat that response here, we are attaching it for your information. We note that you and Franco “were involved fully in the NSF review process and participated in all of the discussions and considerations of recommendations.” We also agree with the NSF review panel’s comments on yours and Franco's involvement: “The panel is also grateful for the participation of two UCAR-appointed observers who summarized the Science Review process and recommendations obtained from the NSF review of the science and facilities divisions of NCAR. These observers contributed thoughtful questions and insights to this review.”

The second report commented on a number of specific issues related to the review of the NCAR divisions. Each NCAR Division was reviewed by an NSF panel and two members of SPEC or an observer appointed by SPEC. We are pleased that the SPEC observers were “well integrated into the overall review process for all nine reviews.” We are also pleased with the overall conclusion of your report: “The SPEC observers agreed unanimously that the NSF divisional review process and reports were thorough, fair, provided constructive guidance, and accurately reflected the conclusions of the reviewers. SPEC observers were very impressed by the high quality of the personnel and the excellent research and other programs being undertaken by NCAR. Furthermore, SPEC observers were impressed by the management of NCAR/UCAR, and, as pointed out in the review of the overall NCAR/UCAR management, by ‘NCAR, UCAR and NSF having developed a mutually supportive relationship.’”

We turn now to the specific recommendations of the second report. These fall into ten areas: (1) cross-divisional interactions, (2) strategic planning, (3) staffing, (4) interactions with the university community, (5) funding, (6) space, (7) computing, (8) educational outreach, (9) management-related recommendations to specific divisions, and (10) possible improvements to the review process.
1. **Cross-divisional interactions**

We are pleased that the SPEC review panel recognizes that “there has been a strong effort to improve cross-divisional cooperation and collaboration at NCAR during the past several years.” However, we also take note of the concern expressed by the SPEC committee that “cross divisional interactions remain somewhat of a problem within the NCAR structure and that improvements may take further deliberate action by the NCAR leadership.” We agree with this assessment and also concur with the Panel’s sense that interdisciplinary efforts are becoming ever more important to 21st century atmospheric and related science research. In response, NCAR management reaffirms its strong commitment to the sustained support of the needed cross-divisional interactions. Such interactions will be fostered in a number of ways:

   a) Implementing the new NCAR strategic plan which places emphasis on interdisciplinary research,

   b) Increasing the funding wedge associated with the NCAR inter-divisional Strategic Initiatives and expanding the NCAR Director’s Opportunity Fund in support of projects that seed interdisciplinary innovation,

   c) Sponsoring a series of inter-divisional workshops on specific interdisciplinary research opportunities, and

   d) Working towards further integration of the Environmental and Societal Impacts Group (ESIG) priorities and staff into the activities of other NCAR divisions through joint appointments, participation in multi-divisional strategic initiative programs, etc.

In response to the SPEC Panel’s more specific comment with regard to the Mesoscale and Microscale Meteorology (MMM) and Climate and Global Dynamics (CGD) divisional interactions, NCAR is planning two internal workshops this Spring to “jump start” more effective collaborations in two specific areas: the cloud-climate relationship and land surface processes and microphysics.

In addition, several joint projects are being funded (as NCAR initiatives) to support inter-divisional work across all of NCAR. These include the biogeosciences initiative, the Whole Atmosphere Community Climate Model (WACCM) initiative, the data assimilation initiative, the “water cycle across scales” initiative, and the climate assessment science initiative.

The NCAR strategic plan for scientific simulation is being implemented, and this will lead to improved collaborations across UCAR (including the UCAR Office of Programs-UOP) in the areas of data assimilation, data management, collaboration technology, networking, and computational sciences. These efforts will provide important impetus to NCAR/UOP interactions in the information technology (IT) arena.

Finally, we are pleased to see that the SPEC Panel thought that the Advanced Study Program (ASP) is “fulfilling its role in providing opportunities to initiate and foster interdisciplinary programs.” We intend to continue and augment these efforts including providing enhanced support for the interdisciplinary Geophysical Turbulence Project (GTP).

2. **Strategic planning**

We agree with the SPEC Panel’s comments regarding strategic planning at NCAR. We further agree that the strategic plans of several divisions need to be further developed and/or elaborated and that every divisional strategic plan should track with the NCAR-wide strategic plan. The nested set of plans should define the priorities of the divisions clearly and include implementation steps. This work is ongoing at the divisional level, with the NCAR strategic plan as a guidepost. Each divisional advisory
committee will be involved in reviewing the evolving strategic plans of each division. We are pleased to hear that the SPEC Panel was supportive of the strategic initiative approach to target resources into particularly exciting new areas. We are already responding to the suggestion that resources be focused on fewer and more ambitious efforts and believe that the FY2002 budget allocations made recently already embody this viewpoint. It is certainly our strong intention to involve the external university community as much as possible to extend the range of expertise represented at NCAR to “attract high quality additional breadth.” One approach is to initiate a new Early Career Faculty Fellowship program designed to engage university professors in the evolution and implementation of the NCAR strategy. A community workshop to initiate this latter effort is planned for the summer of 2002.

3. **Staffing**

We are pleased that the SPEC observers noted that “in general, morale at NCAR is high.” We are proud of the advances we are making in building improved gender diversity among the scientist ranks, and we will continue to work hard on building the participation of other under-represented groups in both the scientist and non-scientist positions. The following sentences provide responses to the specific comments of the Panel regarding staffing issues:

*a) The Panel recommended that all NCAR Divisions include all levels of scientific staff in their planning processes. We will discuss this suggestion at an upcoming NCAR Division directors meeting and address the possible development of a more formal “inclusive” policy for the conduct of divisional planning.*

*b) The Panel applauded recent efforts to hire new, junior scientists at NCAR, but cautioned us about the loss of expertise due to retiring scientists. We are concerned about this issue and will continue to pay careful attention to both questions of demographic balance and the preservation of critical expertise.*

*c) The Panel recommended the development of “clearly defined criteria for performance evaluation, advancement, and career development” across all divisions. We acknowledge this as an issue of concern across NCAR and are moving in this direction. We believe that two ongoing efforts will help address the concern. First, an NCAR-wide committee has been conducting a systematic review of policies with regard to the associate scientist and project scientist tracks at NCAR. The recommendations from this committee will speak to the issues of evaluation, advancement, and career development mentioned by the SPEC Panel. We also anticipate that the work done by this committee will have implications for other career tracks at NCAR. Second, we have initiated a UCAR-wide program to support career development for all staff at UCAR/NCAR/UOP. This multi-faceted effort (termed *Developing Our Human Capital Program*) has involved staff surveys and focus group discussions, the establishment of peer mentoring groups, a formal mentoring program for early career scientists, mandatory supervisor training programs, and the development of five-year career development plans for all staff. These two efforts will help establish improved and more clearly articulated norms and expectations for career advancement across all of NCAR’s divisions.*

4. **Interactions with the university community**

We appreciate the Panel’s comments concerning the need for “close and mutually profitable interactions between NCAR and its divisions and the university community,” and particularly, we are pleased to hear of the Panel’s sense that these interactions were “strong and growing.” The whole area of improved connectivity to the university community is a major priority for NCAR, as can be seen from...
Chapter 3 of the new NCAR Strategic Plan, which is wholly devoted to this topic. This chapter, entitled “The NCAR University Alliance,” speaks to several new approaches that are being implemented to nurture and expand the alliance. These include topics mentioned by the SPEC Panel, such as increased sabbaticals and involvement of the university community in planning. Other programs designed to improve the NCAR/University alliance include an early-career faculty fellowship program, an undergraduate leadership workshop (the first of which will be held during the summer of 2002, with its objective to increase the number of applications of qualified and enthusiastic undergraduates to UCAR graduate schools), an enhanced graduate fellowship program, and a bi-directional sabbatical program.

5. Funding

NCAR and UCAR management agree with the Panel’s view of the deleterious trends at NCAR brought about by a decade of sub-inflationary growth in the core program, coupled with slow growth of external “soft” dollars related to grants and contracts. This situation has led to a demographic imbalance in the scientist ranks (favoring senior levels) and slow but steady erosion of programmatic flexibility. We are addressing these concerns aggressively by several means. With support from UCAR, NCAR has instituted an early career scientist recruitment program with co-sponsorship from central and divisional resources. This program led to the hiring of nine Scientist I’s in 2001, an important down payment on a resolution of the demographic imbalance problem. An additional four slots are being made available in 2002. A new annual budgeting process has been instituted which will ensure that the funded program remains innovative and responsive to the NCAR mission. Finally, during the last two budget cycles we have successfully received a super-inflationary increment from NSF, which we attribute to the caliber and significance of our strategic plan. Clearly, however, significant management challenges remain due to funding trends that will need to be addressed at both the divisional and center levels.

On the issue of the “transference of one division’s costing to another segment of the NSF base,” we believe that the annual budgeting process ensures that divisional balance and important priorities are considered carefully each year.

6. Space

We agree with the SPEC Panel’s recommendation that a long-range plan for space for both NCAR and UCAR over the next several decades is needed, and this effort has been initiated.

7. Computing

We are gratified by the Panel’s comments concerning the importance of the NCAR-led common modeling infrastructure and the thoroughness of our procurement process for the Advanced Research Computing System. We fully agree with the insight concerning NCAR’s challenge to assume a greater level of national leadership in developing computational capabilities for the atmospheric and related sciences.

We believe that our strategic plan for scientific simulation provides us with a sound basis for moving forward in this area. Specifically, NCAR management continues to look to the Scientific Computing Division (SCD) for leadership in the implementation of our strategic plan. A near term goal in this regard is the development of a knowledge environment for the geosciences, which includes an augmented capability in computational and computer science, advances in algorithms, and massively parallelized code efficiencies.

8. Educational outreach
We are gratified by the assessment of the Panel that the “outreach and education programs of UCAR/NCAR are outstanding.” We will continue to support and augment our efforts in this important area. NCAR and UCAR will continue to strongly support the SOARS program and other key diversity efforts. Several new education/outreach programs are beginning in 2002 and will be funded from NCAR resources. These include: an annual middle/high school teacher summer workshop on climate change and global change, an annual undergraduate student leadership conference, a new budget line to support improvements to the tours and exhibits programs, a new education and public outreach website for NCAR, and an expanded graduate fellowship program. The new UCAR Education and Outreach Office is collaborating with NCAR scientists on a number of other direct-sponsored outreach efforts including an annual workshop on modeling in the geosciences for middle and high school educators, the first of which will be held in 2003.

9. Management-related recommendations to specific divisions

We appreciate the thoughtful set of recommendations concerning specific divisions, and these will all be considered carefully. Some initial specific responses follow:

ACD: “The division should be organized by the division’s three thematic foci, rather than by technique.” The new ACD strategic plan, currently under development, involves a strong thematic organization, and the divisional organization is under review by the new director, Danny McKenna.

ASP: “Any further growth in the Graduate Fellowship Program should be carefully planned by forming an NCAR community committee to define the scope of an expanded program and program details.” We agree. The plans for an augmentation in the graduate fellowship program will be discussed carefully by a group including university participants and the University Relations Committee. We feel strongly that the restored NCAR Graduate Fellowship Program should support the graduate student educational enterprise in the university departments and not be considered as a source of relatively cheap scientific labor at the center. We point out that there has been no recent growth in this program, and the total number of current graduate fellows at NCAR is five, well down from historical levels and below what might be considered appropriate for an institution the size of NCAR, given the extent and nature of the research conducted here.

SCD: “The Computational Sciences Section should be doubled in size.” The NCAR strategic plan for high performance simulation also recommends an augmentation of the CSS section (although it does not give a numerical target). A reorganization and refocusing of the CSS section is currently underway with a new section head, Rich Loft. The section expects to hire a new Scientist I and approximately seven software engineers during 2002.

ESIG: “Development of a strategic plan focused around a single theme such as weather and climate initiative is needed.” The ESIG strategic plan is being reworked to reflect a greater focusing of activities and efforts.

ESIG: “Key hiring of social and interdisciplinary scientists and great internal collaboration will be required.” We agree with this recommendation. ESIG is currently hiring a Scientist II or III from the social sciences. Additional hires of social and interdisciplinary scientists at ESIG (at the rate of approximately one per year over the next five years) are planned.

ESIG: “The center’s vitality depends on integrating its work with the rest of NCAR.” We agree and have made this a clear priority in the new NCAR-wide strategic plan and its planned implementation.
ESIG: “Clear career paths and incentives are needed for social scientists and others who bridge gaps between the physical and societal aspects of NCAR’s research.” We fully agree with this recommendation and will work to augment the standing and influence of social science at NCAR.

MMM: “There is a need to ensure adequate staffing to support current and future community model efforts.” We agree and have already augmented the MMM budget in 2002 to buttress these efforts on behalf of the community.

10. Possible improvements to the review process

We thank the SPEC Panel for all of their constructive comments about the review process and the nature and content of the written review materials provided to them. We will work closely with NSF to improve future reviews along these lines.

Sincerely,

Richard Anthes, Timothy Killeen,
President Director
University Corporation for National Center for
Atmospheric Research Atmospheric Research

cc:
Otis Brown
Cliff Jacobs
SPEC members and observers
Susan Avery
Robert Duce, Chair
Brian Heikes
Terry Nathan
Lisa Sloan
Eric Barron
Franco Einaudi
Barry Huebert
Patricia Reiff
Eugene Takle
Chris Bretherton
Chris Fairall
Daniel Jacob
Bert Semtner