P1.31 UNDERGRADUATE WORKSHOP FOR INTEGRATION OF LEADERSHIP AND LEVERAGING (U-WILL)

Sarah E′. Allen and Paul J. Croft*
University of Louisiana at Monroe, Monroe, Louisiana

1. INTRODUCTION

Hosted for only the second time ever by the National Center for Atmospheric Research (NCAR), the NCAR Undergraduate Leadership Workshop (Summer 2003) is a program designed for undergraduate students within the fields of earth and atmospheric sciences who are interested in both leadership roles within the scientific community and their own leadership development.

These students were selected (following their nomination by their host institution) based on their academic achievement, personal interests in leadership roles, and future academic and professional development and research potential. Students from across the country as well as international students were given the opportunity to establish a network with some of the world's leading scientists working with NOAA, UCAR, and NCAR as well as with their fellow peers.

This workshop is designed to help students recognize the wide range and variety of studies contained in atmospheric and earth sciences. These range from meteorology and numerical weather prediction to climatology. The workshop also included education and outreach programs that involve the sciences. Students were allowed to visit some of the most sophisticated research facilities in the world while being shown the future technologies used in both operations and research.

Each aspect of the workshop incorporated the importance of leadership within the scientific community through operational, research, and educational roles. Each student is expected to present their experiences of the Leadership Workshop to their peers at their home institution (completed by student during Fall 2003 Semester) with the intent of future program involvement and for exploration of post-graduate opportunities. In this manner, the students are also able to focus on their own professional development and bring that aspect back to their fellow classmates and peers.

2. INTEGRATED LEADERSHIP

The workshop included numerous tours of facilities and interaction with guest speakers and professional mentors. On Tuesday, the students arrived at the Mesa Lab for a Leadership Dialogue with Dr Kelvin Droegemeier in which he emphasized the importance of leadership and ways each student can implement their leadership abilities within their university and career. Dr. Tim Killeen, President of NCAR, explained the mission and purpose of NCAR and the range of opportunities it provides to the scientific community.

After these introductions, the students heard from several scientists about their work with NCAR and their research interests. Dr. Gerry Meehl focused discussion on the various areas of study within the field of climate change. Robert Henson previewed his research with climate and discussed how the scientific community communicates science and discoveries to the public through photography and journalism.

During Wednesday, the students were introduced to the President of the University Corporation for Atmospheric Research (UCAR), Dr. Rick Anthes. He discussed the goals of UCAR and its interaction with university members as well as student programs for research and leadership opportunities. He explained how scientists are preparing for the challenges faced by the general society regarding atmospheric conditions. He also emphasized the significance of leadership within the scientific community.

Dr. Robert Gall, lead scientist of the U.S. Weather Research Program and Division Director of Microscale and Mesoscale Meteorology, discussed the Meteorological Research performed at NCAR. Dr. Tim Spangler, Director of the Cooperative Program for Operational Meteorology, Education, and Training (COMET), discussed the goals and uses of the COMET Program resources and the development of new web-based modules. Most of

* *Corresponding Author Address*: Dr. Paul J. Croft – Associate Professor of Meteorology, University of Louisiana at Monroe, Department of Geosciences, 700 University Drive, Monroe, LA 71201; email <croft@ulm.edu>.

the students had used the COMET program resources within their university atmospheric science programs.

The students then toured the NOAA Building where they were given a weather briefing and forecast discussion through use of the AWIPS Program. Students also saw a demonstration of "Science on a Sphere" and visited the Space Environment Center. Upon leaving the NOAA Building, students met with two of the leading Climate Change Research Scientists, Dr. Warren Washington and Dr. Caspar Ammann of the Climate Change Research Section of the Climate and Global Dynamics Division of NCAR.

Dr. Washington described the aspects of his research as well as his career path. Dr. Caspar Ammann, with the Advanced Studies Program, discussed his work on climate of past centuries using both climate models and climate proxy datasets, the interdisciplinary work between geology, history, and meteorology, and research opportunities at NCAR within the various fields.

Thursday, the students were given insight to the technology used by NCAR, UCAR, and the broader atmospheric science community. Dr. Dave Carlson of the NCAR Atmospheric Technology Division discussed the importance of remote sensing in research and the instrumentation being developed, which included the NSF/NCAR Electra Aircraft, NSF C-130, and the new HAIPER Aircraft. He explained the LAOF System Request and Allocation Processes and the development of a field project as well as current deployments of researchers from various universities and the partnerships among universities.

Tim Barnes, one of the main leaders of the workshop, gave a VISLAB Demonstration. VISLAB implements 3-dimensional technology to describe the behavior and development of various atmospheric events such as forest fires and severe thunderstorms. On Friday, students learned about the Education and Outreach aspect of leadership within the community when Mary Marlino introduced DLESE, a Digital Library for Earth System Education. Roberta Johnson, Director of the UCAR Office of Education and Outreach, discussed the role of scientists in education through the Windows Program combining earth and space sciences.

Other aspects of scientific research were also considered in the activities. Dr. Gang Lu of NCAR's High Altitude Observatory discussed the solar spectrum, solar influences of the upper atmosphere and the relationships between surface and solar features, and the overall Earth-Sun System. Dr. Terry Lindholm, Manager of the Engineering Group at NCAR's Research Application Program, discussed aviation weather research. He reviewed their work to improve safety and reduce delays with a collaborative approach between government and universities and industry.

He also explained the influences of thunderstorms, turbulence, winter weather, ceiling and visibility, and information dissemination and aviation weather. The day concluded with sessions regarding student opportunities with NCAR and UCAR. Students also heard from Dr. Tom Windham about the SOARS Program (Significant Opportunities in Atmospheric Research and Science). Dr. Al Cooper, scientist and Director of the Advanced Studies Program at NCAR, discussed research opportunities for students of different academic levels as well as NCAR research procedures.

3. PROFESSIONAL DEVELOPMENT

Saturday, June 21st, the students concluded the workshop with presentations on what they felt were the main topics of the workshop as well as popular topics within the scientific community. Students were asked to present the material covered at the workshop, as well as what they had learned about the institutions of NCAR and UCAR, to their universities in order to spark an interest in research and future participation in NCAR's Undergraduate Leadership Workshop.

The program was an experience that changed and motivated the student for the final semester of undergraduate education. The broader perspectives, the inter-connectedness of the field, and the responsibilities of leadership within the community were lessons useful to implement at the home institution and to practice for using in career and professional development. The relevance of experiences to the local student AMS chapter, and to other atmospheric science majors, is significant. In addition, it will enhance the student's SCEP assignment and leverage this with future career growth.

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