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**1. UPWARDS!**

Undergraduate student participation in weather outreach activities may be considered as a part of their professional development. The Kean University undergraduate Meteorology Program, within the Department of Geology and Meteorology, provides a variety of outreach and professional development opportunities. When assisting, their work helps in developing their skills set in atmospheric science as well as those important to employers.

These included activities for K-12 audiences (e.g., Upward Bound), teacher training and professional development (NJESTA), and undergraduate students (Epsilon Corps). During 2004 and 2005 several programs were offered including “What’s with the Weather?” for high school students, “Phenology – Nature’s Measure of Climate and Climate Change” for teachers, and “Observing the Geosphere – Weather Conditions in time and space” for new undergraduate students about to begin their college education.

Each of these programs considered the atmosphere and weather (or climate) with regard to exploration of scientific principles, measurement and interpretation of the atmosphere, and the use of these to assess and explain the characteristics and behaviors of weather and climate systems or simply the application of science and technology. In these situations students served as mentors, advisors, and active partners in the learning process with those who participated in the programs.

The components of each of these and their outcomes, particularly for application to real situations, are considered with regard to the enhancement of learning and outreach activities of the Department for a variety of K-12 and public initiatives. These are also providing for the development of professional partnerships and skills for both the undergraduate student majors and the

faculty at Kean University to enhance all research and outreach activities.

**2. OUTCOMES**

The Upward Bound program “What’s with the Weather?” afforded students an opportunity to assist high school students with the manipulation of weather data in a spreadsheet environment and with regard to its analysis. These included simple statistics summaries as well as plotting of data with time and relative to other variables. In these activities the Kean University students practiced their own skills and developed interaction, training, and teaching skills.

During the NJESTA workshop, student majors considered “Phenology – Nature’s Measure of Climate and Climate Change” which provided insight to the application of meteorological data over longer time periods. This included recognition of differences between weather and climate instruction by K-12 teachers and the nature by which principles could be taught in an experiential setting. The use of non-traditional approaches allowed the Kean University students to understand better the communications necessary to work outside of their own discipline.

In the third outreach activity several Kean University students assisted in the development and delivery of “Observing the Geosphere – Weather Conditions in time and space”. Their efforts required the use of inquiry-based learning methods along with the application of technology. During participation, the students were expected to serve as subject matter experts while maintaining a certain degree of removal from the learning process of the participants.

**ACKNOWLEDGEMENTS**

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