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INCORPORATING ELEMENTS OF PROJECT DATASTREME INTO A UNIVERSITY-LEVEL IN-SERVICE COURSE ON NATURAL DISASTERS

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1. INTRODUCTION

Over the past ten years, the American Meteorological Society (AMS) has been involved in pre-college meteorological education through two innovative programs. Project Atmosphere, funded by the National Science Foundation (NSF) and the National Weather Service, and the DataStreme Project, funded by NSF and the AMS 75th Anniversary Campaign, have provided elementary and secondary school teachers with the opportunity to interact with professional meteorologists and meteorological educators, and to bring the atmospheric sciences into their classrooms.

Project Atmosphere (Geer, et al., 1996) was an educational initiative designed to bring elementary and secondary school teachers to the National Weather Service Training Center (NWSTC) in Kansas City, MO for an intensive two-week seminar in all aspects of meteorology. Many participants became Atmospheric Education Resource Agents (AERAs), spreading the knowledge they had learned among their colleagues, and advocating increased meteorological education within their school curricula. In subsequent summers following their visit to the NWSTC, the AERAs also spent time at the National Center for Atmospheric Research (NCAR) in Boulder, CO, the National Severe Storms Laboratory (NSSL) in Norman, OK and the University of Wisconsin-Green Bay. Many have also attended AMS Annual Meetings and have participated as both attendees and presenters at earlier Symposia on Education. Many also serve on AMS Standing Committees.

The DataStreme Project (Moran, et al., 1996) was a distance-learning initiative that brought an introductory meteorology course to thousands of elementary and secondary school teachers and administrators via the internet. The project was directed by the AMS Education Office in Washington, DC, and conducted via Local Implementation Teams (LITs) whose members acted as mentors for the participants in the 12-week long program. Both initiatives were successful far beyond the expectations of those involved in their development and operation.

Many of the participants in Project Atmosphere continued their educational growth, as well as their involvement as AERAs by organizing a series of teacher workshops (Smith, et al., 1994; Smith, et al., 1996; Smith, et al., 1997) that brought educators together to learn about hazardous weather from some of the foremost experts in the field. Project DataStreme participants have reported on how they have successfully brought their experiences into the classroom (Ibarra, et al., 1999; Pearson, 2000).

In late 1999, the authors, all faculty members in the Department of Physics & Earth Sciences at Central Connecticut State University in New Britain, Connecticut, decided to develop an intensive two-week summer-session course for in-service elementary and secondary school teachers entitled “Natural Disasters.” This paper describes the elements of the course, and shows how elements of Project DataStreme were incorporated and enhanced to provide the participants with valuable information and resources that could be used in their own classrooms.

2. THE “NATURAL DISASTERS” COURSE

The course described in this paper was entitled “Natural Disasters.” It was designed to be an upper division/graduate level course for in-service science teachers. The course was conducted during Summer Session, 2000 over a nine-day period (3 July – 14 July) by the authors who are, respectively, a meteorologist, a geologist, and an astronomer/astrophysicist in the Physics & Earth Science Department at Central Connecticut State University. Seventeen students participated in the course. Of these, 15 were certified science teachers in the State of Connecticut. The other

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two were completing their requirements for Connecticut certification.

The course met for nine days from 1 PM to 5:15 PM each day. The aim of the course was to demonstrate to the participants the interdisciplinary nature of the topic, and to aid them in integrating these types of topics into their classrooms. Each topic included an investigation element where participants explored the topic using maps, videos, internet resources, or other hands-on activities. As part of the astronomy section, parallels were drawn between similar phenomena on different astronomical bodies (including Earth). Each of the faculty members spent time discussing the interrelationships of each area of Earth Sciences with the others, treating the Earth as a "system."

Each of the instructors was allotted three full days to deal with natural disasters in their field of expertise. The section on meteorological disasters included one day each on various types of severe weather. The first day dealt with thunderstorms, the second with tornadoes and hail, and the third with hurricanes. The section on geological disasters dealt with floods for one day, volcanoes for a second day, and earthquakes for a third. The section on astronomical disasters dealt with climate changes on Earth as well as on other planets, volcanism on other planetary systems (including the moon), and impact-related disasters on earth, as well as on other planets.

Each days' session consisted of approximately 90 minutes of classroom lecture on the topic being covered, a 30-40 minute related video or internet presentation, and a two-hour hands-on "laboratory" experience where participants could conduct an investigation into the topic being covered. In some cases, the hands-on activities were goal-oriented, while in others, the result was merely the acquisition of knowledge about the phenomenon, and how to find sources of information online.

The participants' grade was based on a term-project, which was to be handed in prior to the mid-term date of the Fall, 2000 semester. Each participant was required to develop a teaching unit on one of the major areas covered in the course. This teaching unit was to include a) instructional goals and objectives, b) content lesson plans including (where appropriate) readings, maps, diagrams, vocabulary sheets and lab exercises, c) topic questions for further study, and d) a bibliography.

3. THE DATASTREME COMPONENT

The Meteorology section of the course was conducted during the middle three-day period. The first day focused on thunderstorms, the second on tornadoes, and the third on hurricanes. Lecture material was prepared from the instructor's course notes for the Introductory Meteorology course offered each semester at CCSU. Each lecture lasted approximately 90 minutes. A short video was then presented dealing with the topic covered. After a break, the participants were given an opportunity to complete a hands-on exercise dealing with the topic of the day. The exercises were drawn from the severe weather components of the Project DataStreme course offered by the AMS Education program. These exercises, originally delivered via the internet, present general information, and topical data related to weather events that have recently occurred. Because the internet component of the DataSteme course lends lends itself to continuous updating with current weather information, it was possible to enhance the meteorological exercises presented in the "Natural Disasters" course with more recent meteorological data. This, of course added a fresh dimension to the course that the participants found quite valuable. Examples of the exercises used will be exhibited as part of the poster session during which this paper will be presented.

4. COURSE OUTCOMES

Reaction to the DataStreme exercises among the participants was universally positive. They found the information presented both stimulating and challenging. They enjoyed the exercises and talked about how they would be useful in their own classrooms. At the conclusion of the meteorology unit, the participants were briefed on the details of Project DataStreme. Three of the participants subsequently filled out application forms and participated in the Fall, 2000 DataStreme session conducted by the Connecticut-based Local Implementation Team. Approximately one-third of the participants in the class chose to prepare their required lesson plans and curricula in the meteorology area. A sampling of the student-prepared curricula and lesson plans in all three of the areas covered in the "Natural Disasters" course will be exhibited as part of the poster presentation.

5. REFERENCES

Geer, I.W., and Coauthors, 1996: Project Atmosphere: five years of K-12 education for the Atmospheric Sciences. *Preprint Volume of the Fourth International Conference on School and Popular Meteorological and Oceanographic Education*, Royal Meteorological Society, Reading, UK, 104-108.

Ibarra, H., R. Wolf, J. Meyer, and J. Mlodzik, 1999: DataStreme: weather education from the AMS to the classroom. *Bull. Amer. Meteor. Socl,* ***80***, 1901-1905.

Moran, J.M., and Coauthors, 1996: The DataStreme Project, teacher enhancement via the internet. *Preprint Volume of the Fourth International Conference on School and Popular Meteorological and Oceanographic Education*, Royal Meteorological Society, Reading, UK, 181-184.

Pearson, D.C., 2000: The DataStreme Project and Arkwright Elementary School. *Bull. Amer. Meteor. Soc.,* ***81***, 2681-2682.

Smith, D.R., and Coauthors, 1994: AERAs host teacher workshop: Hazardous weather conference for educators. *Bull. Amer. Meteor. Soc.,* ***75***, 1839-1845.

_____, and Coauthors, 1996: Mid-Atlantic AERAs conduct second annual hazardous weather conference. *Bull. Amer. Meteor. Soc.,* ***77***, 115-122.

_____, and Coauthors, 1997: Mid-Atlantic AERAs conduct Third Annual Regional Hazardous Weather Conference. *Bull. Amer. Meteor. Soc.,* ***78***, 499-505.