J8.7   USING AWIPS EMULATION SOFTWARE IN AN UNDERGRADUATE FORECASTING CLASS

Alan C. Czarnetzki*
University of Northern Iowa, Cedar Falls, Iowa

1.   INTRODUCTION

The Science Center for Teaching, Outreach, and Research on Meteorology (the STORM Project) at the University of Northern Iowa sponsored an undergraduate forecasting course in June 2001. Twenty-two students from across the U.S. attended this intensive 2-week course devoted to weather analysis and forecasting. The participants gained forecasting experience with FX-Net (NOAA 1999), AWIPS emulation software developed by NOAA's Forecast Systems Laboratory. Case studies were also presented by National Weather Service personnel using D2D playback software (Page et al. 2001).

2.   COURSE DESIGN

The target audience for the course was junior-level undergraduate students majoring in atmospheric science. Applications were sought from students across the country and acceptance into the course was based on applicant's previous coursework in atmospheric science and an essay on their personal interest in learning about the forecast process. Participants were housed on campus and attended full-day classes in a newly renovated computer classroom.

The intent of the course was to immerse students in the forecast process and to introduce participants to users of operational forecasts. Fundamental dynamics and thermodynamics were reviewed and evaluated using real-time data. The centerpiece forecast technology for the course was FX-Net, which provides Internet access to AWIPS products via a browser that is nearly identical to the AWIPS interface. FX-Net was used to illustrate diagnostic procedures and to practice real-time forecasting. Each student was also part of a group that would cooperatively produce a forecast of salient weather features for a given site. Group forecasts were presented to the class at the end of each day and were verified the following morning.

Topics covered in the course included situation awareness, data plotting and analysis, geostrophic theory, the thermal wind, divergence and deformation, satellite image interpretation, numerical weather prediction and guidance, the conceptual model of a hydrodynamic vortex, isentropic analysis, potential vorticity, jet streak dynamics, Q-vectors, slantwise convection, radar image interpretation, potential instability, severe thunderstorm structure and diagnosis, flash flooding and derechos, and building and using forecast procedures. Topics were chosen based on their importance to forecasting and on the ability to evaluate each using FX-Net.

National Weather Service personnel led the class through two case studies using the D2D software and presented on topics that included WSR-88D radar products and warning decision making. Guest speakers addressed the use of weather information by non-meteorologist decision makers.

3.   RESULTS

All students completed an evaluation of the course and of the FX-Net software. Nearly universally appealing to the students was the intuitive design of the browser interface. Many students commented that dynamical concepts they had previously studied at their home institutions were now more concrete because they could be evaluated with FX-Net; the technology facilitated the process of inquiry. Students noted the obvious benefits the experience gave them if they were to seek employment by the National Weather Service, but also noted that the course gave them the power to understand and communicate with NWS forecasters in the event that participants would be employed in broadcasting or by private forecasting firms.   Skills gained by using FX-Net readily transferred to the D2D platform when the case studies were explored.

Students did comment that access to archived data would greatly enhance the usefulness of FX-Net as a teaching tool by allowing them to investigate why a previous forecast may have performed poorly. Finally, a number of participants expressed the desire that FX-Net manipulate observed data as easily as it does forecast products, an encouraging statement about the mindset of novice forecasters in an era of increasing automation.

4.   REFERENCES

National Oceanic and Atmospheric Administration, 1999: FSL in review: 1998-1999. Environmental Research Laboratories, U.S. Department of Commerce, 128 pp.

Page, E. M., D. L. Davis, and M. Magsig, 2001: Case study playback functionality in AWIPS. Proc., 17th Inter. Conf. on IIPS for Meteorology, Oceanography, and Hydrology, Albuquerque, NM, Amer. Meteor. Soc., 82-83.

*Corresponding author address: Alan C. Czarnetzki, Dept. of Earth Science, University of Northern Iowa, Cedar Falls, IA 50614-0335; e-mail: Alan.Czarnetzki@uni.edu