A Final Report to the

Unidata Community Equipment Awards Program
for
Increasing AWIPS II Capabilities at the University of Wisconsin

Prof. Jon Martin
Atmospheric and Oceanic Sciences (AOS)
University of Wisconsin at Madison

Wayne Feltz
Cooperative Institute for Meteorological Satellite Studies (CIMSS)
Space Science and Engineering Center (SSEC)
University of Wisconsin at Madison

Technical Research Support: Pete Pokrandt AOS and Jordan Gerth SSEC

A 2013 Unidata Equipment grant collectively awarded to the University of Wisconsin (UW) Department of Atmospheric and Oceanic Sciences (AOS) and the Space Science and Engineering Center (SSEC) had two primary goals. One goal was to upgrade the earth science data storage and serving capabilities of the UW-AOS department. The second was to increase the users of the UW-SSEC Advanced Weather Interaction Processing System (AWIPS) II Environmental Data Exchange (EDEX) server and Common AWIPS Visualization Environment (CAVE) workstation capabilities, and provide a lab of AWIPS II clients in the UW-AOS computer classroom as a resource for UW-AOS classes and other scientists and researchers in the building. SSEC scientists are able to connect to the EDEX server from existing desktop workstations, and access from outside the building will eventually be possible.

The UW-AOS storage server arrived near the end of 2013 and is currently ingesting data and serving throughout the department, replacing an existing 2005 era data server. Three terabytes of high throughput redundant storage are available for real time and recent historical data, and nearly 21 terabytes of nearline redundant storage are available for archived and case study data. Work is in progress to implement a THREDDS server to make this data readily available to anyone as an additional real-time data repository.

Over the past 20 years, UW-AOS has assembled a sizeable collection of historical case study data that has been used in our senior level undergraduate Synoptic Laboratory courses. UW-AOS is in the process of copying this data to the archive disk array on the server, where it will ultimately be cataloged with RAMADDA and served via THREDDS to the Unidata community at large.

The AWIPS II client software has been installed on workstations in the UW-AOS computer classroom, where it accesses data and imagery from the UW-SSEC EDEX server. The EDEX server ingests, processes, and stores a wide array of meteorological imagery and products in real-time. Other workstations in SSEC also connect to the same EDEX server to request the real-time weather data, as well as satellite imagery and products that SSEC produces and formats

specifically for AWIPS II. An investigation is underway to determine how AWIPS II can be integrated into UW-AOS classes, as well as how to use the classroom as a resource to expose scientists, teachers, and others to the CAVE platform. It is anticipated that AWIPS II will be able to assist with student research projects and provide timely figures for weather briefings and publications.

As a result of the additional equipment, scientists at the Cooperative Institute for Meteorological Satellite Studies (CIMSS), within SSEC, have been able to further advance their software development skills (Figure 1), and increase the amount of meteorological training presentations that use weather data, imagery, and model output from the CAVE. Most recently, CIMSS has developed a new plug-in to ingest and display a new science product, output from an algorithm which combines information from radar and satellite to ascertain a probability of severe weather from a given storm cell (Figure 2), that is scheduled for demonstration as part of the National Weather Service Hazardous Weather Testbed in spring 2014. The development of this plug-in will accelerate the transition of research to operations, a component of the CIMSS mission. The plug-in will eventually be incorporated into the baseline software so that government and other users will have the opportunity to gain additional decision support for the issuance of severe storm warnings over the continental United States. The development of other plug-ins and software modifications is underway to improve the software.

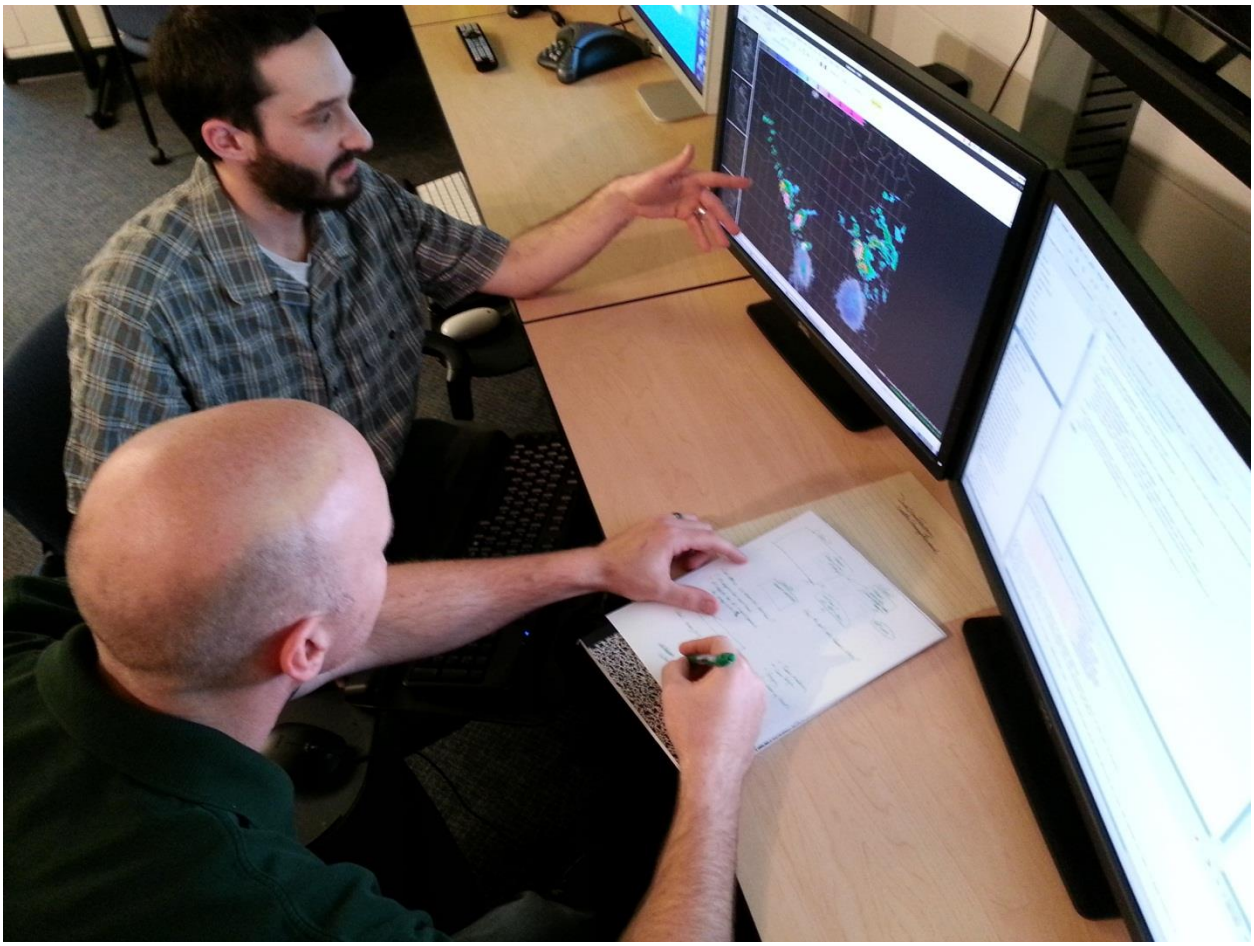

Figure 1. John Cintineo (top) and Lee Cronce (bottom), CIMSS science staff, develop the AWIPS II plug-in to display the storm cell severe probability on top of radar data. The workstation was procured with Unidata community equipment grant funds.

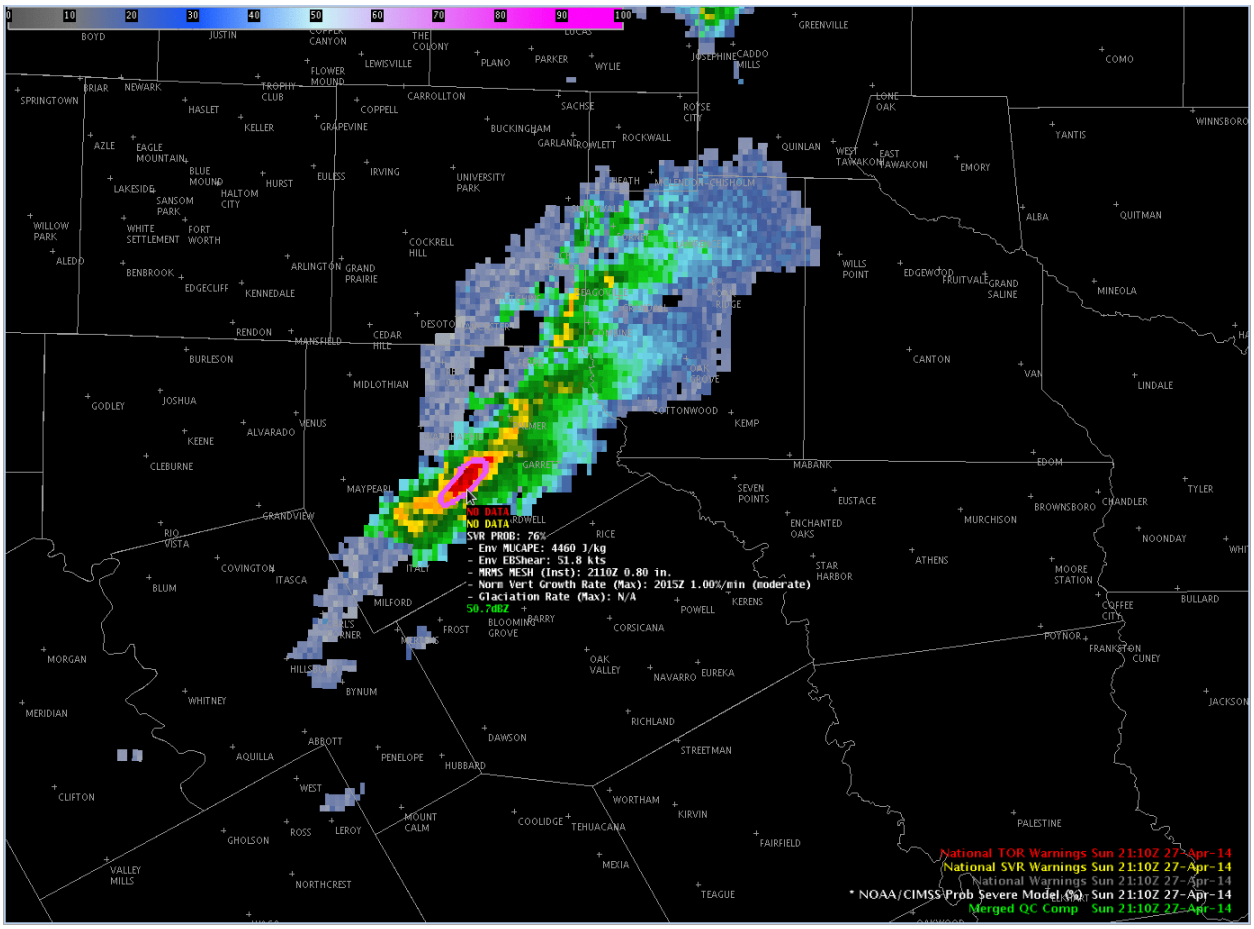

Figure 2. A screen shot from AWIPS II shows the "wireframe" shape and sampling output from AWIPS II. A plug-in developed to visualize a list of information in a ASCII text file will be used at the National Weather Service Hazardous Weather Testbed in Norman, Oklahoma, during the spring of 2014, where forecasters will assess the potential of the information to improve warning accuracy and lead times.