Unidata Activities at Texas A & M International University

The Center for Earth and Environmental Studies (CEES) at Texas A&M International University (TAMIU) has a long history of conducting hydrometeorology research. We have focused on watersheds from both the South Texas borderland region and around the world. Main activities (2013-2014) associated with our Unidata initiative includes (1) Development a web-based application for the dissemination of METAR data in Texas obtained through an LDM interface; (2) Data archiving of NEXRAD Level III precipitation data through THREDDS; (3) Enhancement of hydrometeorology research at CEES; and (4) Supporting educational activities associated with hydrometeorology at a Hispanic Serving Institute.

CEES developed an application to decode the contents of METAR files into a human readable form while formatting the output file into a format that can be used within a GIS system (Figure 1; geo02.tamiu.edu/applications/metar_data/). The program is executed on a regular basis to append the output tables with the most recent real-time data. Using Python, output tables are written to a web-based application available to anyone (Figure 2). The user can employ a map in the web application to identify a station and obtain its ICAO code. A task window offers the user the option to request data from the server and the service returns an Excel file with the requested data.

The THREDDS server (cees-unidata.tamiu.edu:8080/thredds/) recently deployed at TAMIU is making available NEXRAD Level III precipitation data otherwise called the Multi-sensor Precipitation Estimator (MPE). CEES has an archive, dating back to 2003, of radar precipitation data, in an ascii format that is preferred by most hydrologists. This data spans five NWS River Forecast Centers from across the southern United States. Currently, data from the West Gulf Coast River Forecast Center is available, with plans to make data from the four other centers available by the end of Summer 2014.

The experience gained with manipulating the METAR data feed will prove invaluable in sustaining future watershed scale studies in CEES. Now we have the capability of supporting near real-time modeling of hydrology and water quality from basins across Texas. Additionally, we plan to present our methodology at the Texas GIS Forum, October 2014. Finally, we will attend and share lessons learned at the 2015 Unidata Users Workshop.

Unidata support has and will continue to enhance the geosciences curriculum at TAMIU. During the Fall 2013 semester, Dr. Tobin taught a sophomore level Atmospheric Science course for which we developed a laboratory exercise where students learned how to decode METAR information (Figure 3). During the Fall 2014 semester, Dr. Tobin will teach an Introduction to GIS courses to advanced undergraduates and graduate students. The web-based application will form a valuable teaching tool and will support student projects in this class. Additionally, Dr. Tobin periodically teaches undergraduate research sections that focus on geohydrology where this resource could be very useful. Finally, during 2015, plans

include the development of a real-time weather laboratory assignment for both Survey of Earth Science and Atmospheric Science courses. The Earth Science course is particularly noteworthy as over 140 students are taught each semester, greatly extending the audience impacted by Unidata resources.