

2016 UNIDATA COMMUNITY EQUIPMENT AWARD
Final Report

AWIPS-II Infrastructure Upgrade at the University of Louisiana at Monroe

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Principal Investigator: Dr. Todd Murphy
Title: Assistant Professor of Atmospheric Science
Institution: University of Louisiana at Monroe
Telephone Number: 318.342.3428
Street Address: 700 University Ave, Monroe, LA 71209-9000
Email: murphy@ulm.edu

Co-Principal Investigator: Dr. Kenneth Leppert, II
Title: Assistant Professor of Atmospheric Science
Institution: University of Louisiana at Monroe
Telephone Number: 318.342.1918
Street Address: 700 University Ave, Monroe, LA 71209-9000
Email: leppert@ulm.edu

The University of Louisiana at Monroe (ULM) Department of Atmospheric Science (ATMS) received a 2016 Unidata Community Equipment Award in the amount of \$17,904 to upgrade existing department computing infrastructure and deploy AWIPS-II across the curriculum. The existing student Linux workstations were originally purchased under a 2009 Unidata Equipment Award and were near end of life and in need of immediate replacement. Funds were used to purchase five CAVE client workstations (four student and one instructor workstation) and a Dell PowerEdge R730 server to act as an EDEX data server. Matching funds by ULM in the amount of \$1,068 allowed purchase of a dual-monitor display solution for the CAVE workstations and increasing the RAM on the EDEX server from the original request of 16 GB to 64 GB. The equipment upgrade will enhance local research and education by increasing our ability to use Unidata products across the ULM ATMS curriculum, including AWIPS-II. A summary of the equipment purchased is listed below:

Dell PowerEdge R730 Server (EDEX server)

Intel Xeon E5-2640 v3 (8C/16T 2.6 GHz) Processor
4 x 16 GB RDIMM (2133 MT/s) RAM
2 x 200 GB SSD SATA 6Gbps (Operating System)
8 x 1 TB 7,200 RPM SATA 6Gbps Hard Drives (Storage)
PERC H730 RAID Controller, 1 GB Cache
DVD ROM

CAVE Client Machines (assembled by Eastern Data Inc.)

Intel Core i7-4790K (Quad Core 4 GHz) Processor
2 x 8 GB (DDR3 1600 MHz) RAM
256 GB Samsung 850 Pro Series SSD (Operating System and Storage)
PNY GeForce GTX 960 (2048MB GDDR5 memory)
LG 24x DVD/CD Burner
Antec Mid-Tower Case and EDGE750 750W Power Supply
iMicro 3.5" USB3.0 Card Reader
2 x Dell UltraSharp 24" Widescreen LCD Monitor

The EDEX server was installed in the ULM data center and is managed by the ATMS faculty and ULM IT staff. The CAVE client machines were installed in the ATMS Synoptic Meteorology Lab, alongside four Mac Minis and a modeling workstation that utilizes the WRF model for teaching and research. The CAVE client has also been deployed on the Mac Minis. In the future, the CAVE client will be deployed on additional workstations in the ATMS Weather Research Center. CentOS 7 was installed on the EDEX server and the CAVE client machines dual-boot CentOS 7 and Windows 7. Both CAVE and EDEX have recently been updated to v.17.1.1 to support ingest and display of provisional GOES-16 data.

Unfortunately, due to internal purchasing issues, the EDEX server and CAVE client machines were not installed until early December 2016. This limited curriculum integration during the award period to only two relevant courses during the Spring 2017 semester: ATMS 3025 (Intermediate Weather Forecasting) and ATMS 4004 (Mesoscale Meteorology). The infrastructure upgrades and AWIPS-II were utilized heavily in ATMS 3025, where students are tasked with producing deadline driven, site-specific daily weather forecasts. AWIPS-II allowed

students to consolidate much of their data gathering and transformed the course into a mock NWS forecasting shift. AWIPS-II was used during ATMS 4004 primarily during nowcast and forecast discussions of severe and hazardous weather. A larger expansion of AWIPS-II in the curriculum is planned for the upcoming Fall 2017 semester. We also plan to host NWS meteorologists from WFO Shreveport during the Fall 2017 semester for an AWIPS-II workshop with our students. The improved infrastructure has allowed students to incorporate AWIPS-II and other Unidata products into research, primarily in examining data for case studies (Figure 1).

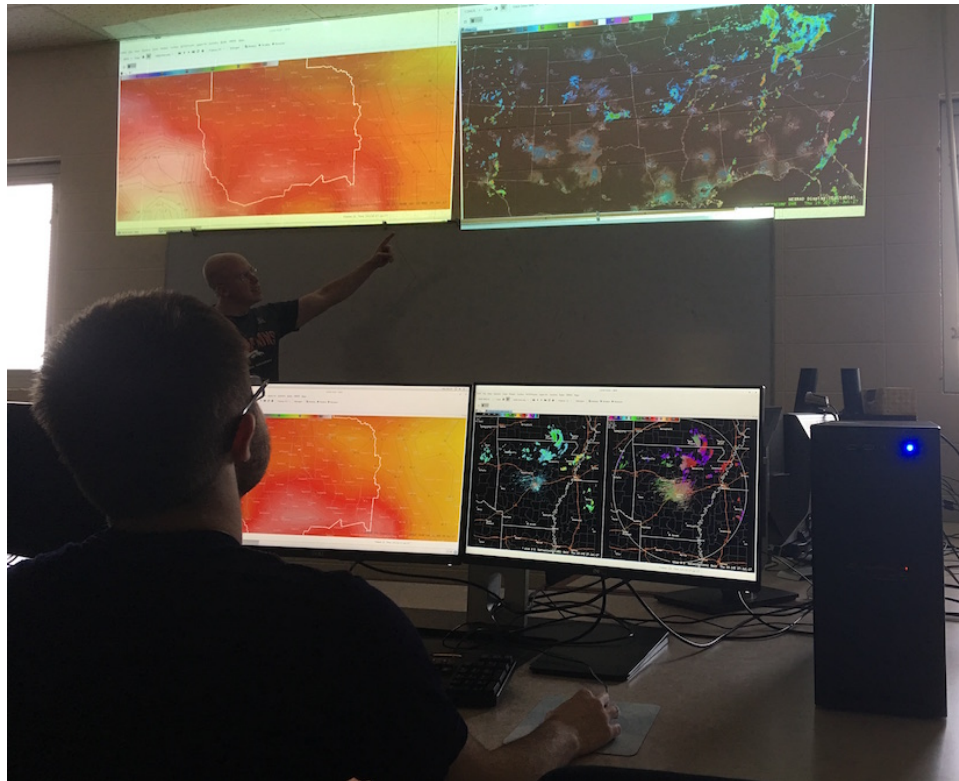


Figure 1: Undergraduate student Alex Melancon receives instruction from ULM ATMS faculty Dr. Ken Leppert on using AWIPS-II.

PI Murphy has been working with NWS WFO Shreveport and Jackson (MS), as well as NWS Southern Region, on making the ULM S-band polarimetric Doppler weather radar data available in AWIPS-II. Progress has been made on converting the raw radar data (in a proprietary format) to the WSR-88D Level2 format using the NCAR RadX programs. It is hoped ULM radar data will be available to those NWS offices in AWIPS-II by the end of the year. These offices currently receive live ULM radar data via the Gibson Ridge GR2Analyst application.

Finally, there are plans to utilize AWIPS-II to display local weather information on a soon to be installed digital weather map wall outside the Weather Research Center (initially a 2x2 led screen array). This will ensure a larger student population (i.e., not just ATMS students) are exposed to weather data, as it is a heavily trafficked area. ATMS students will largely be responsible for what information is displayed based on the current local/regional/national weather trends.