Final report of "**Upgrade the JSU Meteorology Computing Lab by installation of AWIPS II EDEX Server and CAVE Clients**"

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Jackson State University Meteorology Program (JSUMP) received a 2018 Unidata Community Equipment Award in the amount of $12,492 to upgrade existing computing infrastructure and install AWIPS-II clients to strengthen the curriculum of the program. Funds were mainly used to purchase 8 CAVE client workstations (seven for students and one instructor workstation) and a Dell PowerEdge T330 server to act as a web server of local real-time WRF modeling forecast. A summary of the equipment purchased is listed below:

| Item	Quantity
Dell PowerEdge T330 , Xeon E3-1240V5 3.5 GHz - 8 GB - 1 TB	9
NVIDIA Quadro K620 Graphics Card - 2 GB RAM	2
ViewSonic VA2055SM 20" LED-backlit LCD - Black	10
GR2 Analyst 2.00 license	5

With the rapid and sustainable growth of the JSUMP, the objective of our proposal was to seek a support to expand Unidata visualization and advance data access to continue to provide innovative instruction and opportunities for under-represented students seeking careers in meteorology. The proposal originally requested funding to acquire hardwares for installing the next generation one (1) advanced Weather Interactive Processing System (AWIPS II) Environmental Data Exchange (EDEX) server and nine (9) Common AWIPS Visualization Environment (CAVE) clients in order to enhance the ability to project high definition graphics in a weather analysis and forecasting classroom. The EDEX server is not installed as recommended by Unidata Award Panel. The clients are connected to the existing cloud-based EDEX server made available by Unidata. We also requested fund to purchase a PC workstation to replace aging WRF model web server. In addition, 5 GR2 Analysis software licenses were purchased through the assistance of this project. The CAVE client machines were installed in JSUMP computer Lab (JSH Room 259). Linux system , CentOS version 7, was installed in client machines to host AWIPS II implementation.

Unfortunately, because of slow internal purchasing processing issue, the computers were not obtained and installed until December 2018. The application and implementation of AWIPS II and GR2 Analysis are wisely used till Spring Semester, 2019. This semester, many courses, Computational Data Analysis and Visualization (MET270), General Meteorology (MET311), Weather Analysis/Forecast (MET299/399) (Fig. 1), are utilizing the updated system into their classes to provide JSUMP students the opportunity to integrate lecture material with actual data and modeled output that can helps them visualize atmospheric processes. It is critical that students learn how to use these tools and software in meteorology, which may be used in many aspects in their future professions.

Fig.1 *JSUMP students learned to use AWIPS-II and GR2 in the class of MET299/399*

In addition, JSUMP has an operational WRF model running for few years. The real-time model forecasts have been accessed from website (http://twister.jsums.edu/JSU_WRF). The model products have been used for the purposes of teaching, training and research. However, the computer serving as a web server for WRF model forecast failed last year. After obtaining new computer, we reinstalled the web system and resume the real-time WRF model forecast since December, 2018 (Fig. 2).
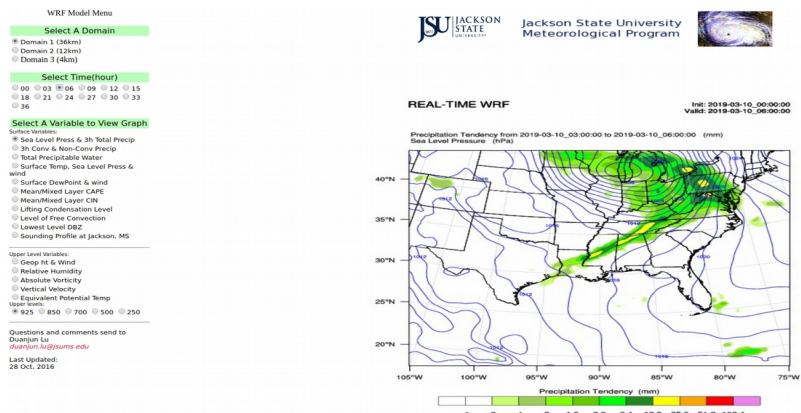
Fig. 2 *WRF model real-time forecast on April 3, 2019*

Due to improvement of JSUMP computer facilities we expect that many education and professional benefits will be gained in the future including expanding use of Unidata products, and implementing AWIPS-II into the curriculum that provides opportunities for minority students (mainly African American) to experience meaningful software used on a daily basis at NWS Weather Forecast Offices. It will also benefit several undergraduate and graduate classes, in particular those courses with enhanced laboratory components in the current curriculum and enable JSUMP further to enhance education/research environment, as well as community participation.