

Unidata Community Equipment Awards

**Final Report on Installation of RAMADDA, THREDDS, and LDM at
UWM**

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The University of Wisconsin at Milwaukee (UWM) offers bachelors, masters, and doctoral degrees in atmospheric sciences. The program, consisting of 7 faculty, and approximately 15 graduate and 30 undergraduate students, prepares students for career pursuits by stressing breadth of knowledge in course studies in the various sub-fields of atmospheric science and the development of quantitative thinking through a unique emphasis on the mathematical and computational aspects of the discipline. In addition, the program offers students real operational experience through the Innovative Weather Program (Roebber et al. 2010; hereafter, IW), where students provide weather-based decision support for paying community clients. Through IW and other initiatives, the program maintains strong ties with regional employers in both the private sector and the National Weather Service, where many of our recent graduates have been placed.

Computational resources in the program include a weather lab for scientific visualization, access to a campus high performance computing service for large jobs [such as running ensemble versions of the Weather Research and Forecasting (WRF) model in real-time and research modes], and a fully equipped forecast facility. Prior to 2012-13, however, the program was unable to be an active participant in Unidata. Recent funding from Unidata, however, supported the installation of RAMADDA, THREDDS, and LDM. A Dell PowerEdge T710 server, featuring a six-core Intel Xeon E5649 2.53GHz processor, 48 GB RAM, eight 2 TB hard drives in a RAID 5 configuration, five years of hardware support, and an uninterruptible power supply, were purchased. Approximately 12 TB of disk space are dedicated to sharing current and archived data obtained via LDM; local model output from both deterministic and ensemble model systems; case study analyses; and data obtained as part of students' thesis and dissertation research.

The THREDDS Data Server, which will shortly become “live” on the web at the address atmo.math.uwm.edu:8080, has been installed on the new equipment and will point to some of these new datasets. The new server also has the GEMPAK suite of programs installed, and is being used to create new real-time products. There is a developing synergy at UWM between the pure academic setting of our classrooms and laboratories and the weather forecast decision support of IW, which has been facilitated by the Unidata technology. The products and data generated will be used in “Introduction to Weather Analysis and Forecasting,” a class to be offered to our students for the first time in Spring 2014. Additionally, we are now in the process of revising our Synoptic and Mesoscale Meteorology courses to take advantage of this new resource.

Increasing emphasis is being placed by funding agencies upon the ability for others to be able to access data produced as a part of the normal conduct of grant-supported research. In that regard, the RAMADDA data server, accessible via the web at atmo.math.uwm.edu:8181, makes approximately 4 TB worth of data available to the community at large, including: LDM products; a 14-day running archive of raw WRF-ARW output from Evans' real-time Great Lakes WRF Ensemble; a running archive of NAM and GFS 0-h operational analysis products dating back to December 2011; and multiple reanalysis data sets, including the full NCEP-NCAR and NCEP-DOE-II Reanalyses and NARR data between 2010-2012. This data sharing provides system redundancy and benefits any schools that currently do not have the LDM/IDD feed (e.g., like UWM previously). Further, the core mission of IW is student education and training

through interactions with community clients in a professional setting. Thus, the LDM/IDD feed and data-sharing capabilities of RAMADDA will extend the capabilities of this community outreach program.

References

Roebber, P.J. M. Westendorf and G.R. Meadows, 2010: Innovative Weather: A new strategy for student, university and community relationships. *Bull. Amer. Meteorol. Soc.*, **91**, 877-888.