

**Final report for Unidata equipment award: “Expanding Use of Real-Time and Archived Weather and Climate Data and Unidata Tools at Colorado State University”**

The Department of Atmospheric Science at Colorado State University has a long history of research and education in all aspects of the atmospheric sciences. Faculty, students, and staff use a wide variety of datasets in their research and teaching, from numerical models to gridded reanalyses to radar and satellite observations to measurements collected in the field and lab. However, the students in the department recognized two issues that were preventing these large datasets from being used to their full potential. First, although our department had consistently maintained a server running the Local Data Manager (LDM) to pull in real-time weather data, that server was very limited in its capabilities and many in the department were unable to use it (or even unaware that it existed). Second, commonly used datasets such as reanalyses (ERA-Interim, NCEP-NCAR, MERRA, JRA) were scattered on various research groups’ own servers, difficult to locate, and stored in numerous formats and resolutions. With these limitations in mind, the graduate students of the department initiated an effort to acquire a new server that would enhance the storage and use of both real-time and archived weather data. With a grant from the Unidata Equipment Grants program, along with a grant from the College of Engineering at CSU, we acquired a data storage server that makes many of these data sources readily and easily accessible to students.

We hold an archive of several datasets that are difficult to obtain after the fact because they are not archived by sources such as NOMADS; these datasets include the Short-Range Ensemble Forecast (SREF) system and the Global Ensemble Forecast System (GEFS), and the new Multi-Radar Multi-Sensor (MRMS) radar and precipitation dataset. We are building archives of up to a year in length for these datasets, along with storing the commonly used reanalysis products. The choices of datasets to archive on this system are driven by student interest and decisions are made by a subcommittee of student representatives.

The data storage system is also available for interactive access in our department’s weather lab, which is used in synoptic and mesoscale meteorology classes and for student-led weather discussions. This lab, which features several high-resolution monitors, can easily display graphics from the Web as well as running interactive programs such as the Interactive Data Viewer (IDV).

In February 2015, several staff members from the Unidata Program Center visited our department to see how students and faculty are using this new system, and to help with installation and configuration of other tools such as RAMADDA. We now have a local RAMADDA server that offers another means for exploring and accessing the archived data.

These resources are increasingly being used in courses and research in the department, and we expect that the students in the department will identify additional opportunities for using the real-time and archived data in creative ways. We appreciate that the NSF and Unidata make these Equipment Grants available to universities to enable the full use of weather and climate data in research and education.



Students and faculty take part in a student-led weather discussion in the renovated weather lab.



CSU atmospheric science graduate students assist with nowcasting for the research aircraft in the Front Range Air Pollution and Photochemistry Experiment (FRAPPE) in the summer of 2014.