Engineering Student Technology Committee

http://www.engr.colostate.edu/ESTC

College of Engineering

Colorado State University

1. Title of Proposal: Replacing Atmospheric Science Data Server and Weather Lab Computer

2. Proposal Participants:

Primary Contact for Proposal

Name: Sean Freeman_____E-Mail: sean.freeman@colostate.edu

Department/Major: Atmospheric Science

Check One: _____ **Faculty** _____ **Staff** ___ X __ **Student**

Additional proposal participants

Name: Erik Nielsen_____E-Mail: Erik.Nielsen@colostate.edu

Department/Major: Atmospheric Science

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Additional proposal participants

Name: Dr. Russ Schumacher _____E-Mail: Russ.Schumacher@colostate.edu ____

Department/Major: Atmospheric Science and Colorado Climate Center_____

Check One: ___X__ **Faculty** _____ **Staff** _____ **Student**

3. Proposal Abstract (limit to 100 words):

The Local Data Manager (LDM)/Student Data Server at ATS (previously funded by the ESTC through a FY14 strategic proposal) has failed and requires replacement and an upgrade to meet the increasing data storage needs of atmospheric science, and the computer used to display the data from the LDM in the "Weather Lab" needs to be replaced as well. The LDM provides access to datasets for students that are not archived elsewhere or are stored on disparate websites. We are asking for ESTC to cover the cost of this invaluable resource for ATS students.

4. Proposal Budget

List of items to purchase and cost of each

Item	Quantity	Total Cost
Aspen Systems SuperMicro 8 core 32GB RAM 4U server with 36 3.5" drive bays	1	$3500
10 TB SAS Drive	36	$13500

Weather Lab Computer (HP Z6 with PCI-E SSD and SATA HDD; 32 GB RAM; dual NVIDIA Quadro P1000 video cards)	1	$5000
Install/maintenance costs		$3000
Total		$25,000

Dollar or percentage amount requested from ESTC:
- 88% = $22,000 (remainder will come from ESTC departmental allocation)

5. Full description of proposal:

The Atmospheric Science department retrieves real-time weather data (including surface observations, satellites, and models) via a Local Data Manager (LDM) and stores it locally for use in courses and student-led public weather discussions. The LDM provides observational and forecast data to the student weather lab, a project funded largely by student fees and invaluable for the department. The weather lab includes 8 high-definition monitors and must be powered by a high-end PC that drives output to the 8 high-definition monitors. This high-end PC is now over 5 years old and must be replaced. The lab holds many public weather discussions and is used in synoptic and mesoscale meteorology courses (ATS 640 and 641) taken by all graduate students. However, the LDM, which has been in operation since 2014, recently failed, leaving a data gap in the department.

We have proposed to both replace the LDM and significantly expand its storage capacity (up to 300TB) and to replace the aging weather-lab computer to meet the needs of the constantly growing datasets in Atmospheric Science. A major obstacle to students is downloading data from various agencies, which is both time consuming and, in the case of new high-resolution data sets, storage-prohibitive on personal computers (e.g., the new GOES-16 satellite collected 299 TB of data in just half of 2017). The proposed server will centralize access to the most commonly used products and give students fast, local network access to the largest datasets. It will be configured such that its data storage can be easily mounted to any desktop machine in the department, and thus used as if it were a "local" hard drive. This will enable wider use of real-time data for everyone on the department's network and make collaboration simpler.

Centralized access to common datasets will greatly benefit students in the classroom as well. Numerous courses, including ATS 655: Objective Analysis, emphasize statistical analysis techniques that would be enhanced by the use of real-world data, aiding to blend theory with modeled and observational data used in research applications. With ready access to the real-time datasets that could be read into any number of software packages, and a local server to conduct some of the data processing, lab assignments could be done with dynamic digital datasets instead of static images. In all, this will enable more "hands-on" experience and experimentation with different types of data in the classroom, better preparing students for their own research and future careers.