B. Project Summary

This equipment request will allow us to: (1) upgrade our servers used to ingest, process, and forward data from the Unidata data stream; and (2) establish an electronic map wall at SJSU, allowing for a significant advance in our synoptic and other teaching capabilities.

SJSU has been an active participant in the Unidata community for over a decade. Our servers ingest data from the Unidata stream, and process the data both to forward on to users beyond SJSU, and to display on the department weather page (http://www.met.sjsu.edu/weather/weather.html). The data processing is performed by in-house servers which are now typically five years old. In part (1) of our proposal, we seek to replace our older servers with a new multi-core server in order to keep pace with technical and software developments in the last five years and anticipated over the next five years (multi-core processors, processing speed, RAM and storage requirements). Additionally, the new server will make use of new Unidata THREDDS/RAMADDA capabilities.

In part (2) of our proposal, we seek to purchase and install our first electronic weather map wall. SJSU also has a very strong teaching record and emphasis on synoptic and forecasting meteorology, especially at the undergraduate level. We propose a modest start, with a 4x2 array of monitors. The map wall will be used to display a variety of fields (radar, satellite imagery, surface obs, forecast maps etc.) at both synoptic and regional/mesoscale, and will be used in a wide array of classes, including the senior-level synoptic/forecasting classes (171A,B), the junior-level forecasting classes (170A,B), and the sophomore lab (60), as well as other classes (mesoscale, fire weather, remote sensing). The wall will also be used by students at all levels (including graduate) participating in the Weather Challenge, as well as by faculty and students in informal weather discussions.

SJSU is developing a fire weather research program under Dr. Craig Clements. The electronic map wall will be of great benefit to this group as a tool for both research and real-time applications in fire season. This group has developed two versions of the WRF model: one to produce real-time forecasts for the San Francisco Bay Area (SFBA), and one for fire weather applications. We will display results from both models online with an anticipated start date of 4/1/11. Both sets of simulations can be made available to the broader community using THREDDS/RAMADDA via the proposed new server.

C. Project Description

Our proposal concerns the acquisition of two hardware packages: first, a new server which will ingest, process, and distribute data from the Unidata stream making use of emerging THREDDS/RAMADDA capabilities; and second, hardware necessary to establish our first electronic weather map wall at SJSU. Each request is described below.
a) **New data server**

We currently ingest data using a server (*rossby*) which is roughly five years old. Some data processing is conducted by *rossby*, while other tasks (processing, map generation etc.) are farmed out to three other servers each also about five years old. We propose to replace *rossby* with a new server that will perform these functions, and allow for a significant expansion of capabilities over the next five years. We plan to purchase and install a 12-core server which will allow the following processes to run efficiently and essentially simultaneously: data download and ingest from the Unidata stream; data processing and archival; forwarding to our web page; forwarding off-campus to external users; data upload of in-house generated products and case studies; multiple student access of products in real time for classwork. The new server will allow us to download and upload data using new THREDDS/ RAMADDA capabilities as outlined below.

As mentioned, our current servers (*rossby* etc.) which ingest data via the IDD system are about five years old (some older). Our synoptic teaching lab includes 12 workstations for student use in analysis and forecasting classes, discussions etc. In 2010 we were able to upgrade these student workstations, but not the servers “behind the scenes”. Currently both the Unidata Integrated Data Viewer (IDV) and GEMPACK are used to generate products for our analysis and forecasting courses, as well as our web page. In purchasing a server on which both THREDDS and RAMADDA will also be installed, we expect to use IDV and GEMPAK more extensively in these forecasting courses. There will also be a natural application of the technology in a wide range of other courses, including Numerical Weather Prediction, Climate Modeling, and Statistical Meteorology, where convenient and fast access to various models and datasets facilitates the educational process.

In our undergraduate program, we have historically placed a strong emphasis on weather analysis and forecasting. In their senior year, students take two three-unit Analysis and Forecasting classes (METR 171A,B), a Mesoscale class (172), a Remote Sensing class (155), and elective classes in which Unidata products will be used. Seniors also conduct a senior thesis research project, and several students choose topics for which these facilities are used (e.g., case studies). Prior to their senior year, students take two one-unit Analysis and Forecasting classes (170A,B), and all students (including graduates) are invited to participate in The Weather Challenge forecast contest, for which our data ingest/processing/display capabilities are key (SJSU has had 1st place finishes in both team and individual categories).

Within the last year we have renamed ourselves the Department of Meteorology and Climate Science, and introduced a new concentration in Climate Science. Some of the classes associated with this new concentration (e.g., Global Climate Modeling) will strongly benefit from enhanced access to climate data. This especially includes access to large datasets from climate simulations. This capability will be enhanced by the acquisition of a new THREDDS/RAMADDA server.

Under the leadership of Assistant Professor Craig Clements, a new Fire Weather research group has been formed at SJSU, and we anticipate that they will be significant
users of our upgraded capabilities. Anticipated uses of the electronic map wall are discussed below. In addition, the group has developed two versions of the WRF model: one producing real-time forecasts for the SFBA, the other for real time fire weather products and applications. The group plans to display results from both models online starting on 4/1/11. We anticipate that results from both sets of simulations can be made available to the broader community using the THREDDS and RAMADDA systems. In particular, we expect to generate and provide case studies of particular wildland fires, including meteorological conditions, measurements, and simulations.

In addition to our in-house data use, we serve clients beyond our university community, including other universities, government institutions and private industry. We are a primary feed for the Naval Research Laboratory in Monterey, CA; the University of Alaska, Fairbanks, School of Fisheries and Ocean Sciences; and Pacific Gas and Electric in Northern California. We provide backup service to the University of Arizona, Stanford University, the Naval Post Graduate School in Monterey and Fleet Numerical Meteorology and Oceanography Center, also in Monterey. We expect to continue to provide products to the community, and the new server and its expanded capabilities will be important in allowing us to do this.

The THREDDS and RAMADDA middleware packages developed by Unidata will greatly facilitate all aspects of data ingest/manipulation/display/sharing in all teaching, research and applied functions in which SJSU is engaged. The new server is requested in order to fully realize these capabilities.

b) Electronic Map Wall

We also propose to create an electronic weather map wall, the first at SJSU. The proposed map wall will consist of 8 monitors (in a 2x4 configuration). Each pair of monitors will be “driven” by a low-end CPU, and the four low-end CPUs will be “driven” by a new server tasked with data ingest and processing from the Unidata stream and dedicated to the map wall. The map wall will be able to display both real time and archival datasets, depending on individual user needs. The main server requested, with dual six-core Xeon processors, will allow for an expansion of the system in the coming years.

The establishment of the map wall is a critical component of this proposal. Our current display capabilities are outdated. Of the 12 workstations in the synoptic/forecasting lab, only one is configured for projection, and thus we can only display one product at a time. The requested map wall package (monitors, CPUs and dedicated server) will modernize our facility and maintain our competitiveness in educating future forecasters and earth system scientists.

Classes in which the map wall will be used were listed above in connection with the requested new data server. Potentially, a significant number of our majors classes can make use of the electronic map wall to allow students to better visualize atmospheric behavior, especially at the beginning level. There are also potential research and applied uses of the map wall. For example, during the California fire season professor Clements’ Fire Weather group can use the map wall for planning and coordination of measurement campaigns. This could involve external groups such as CAL-FIRE, with whom Dr.
Clements is working. As mentioned, the group has started creating real-time simulations over Northern California using the WRF model. The electronic map wall will enable us to display these WRF results as well as suitable imagery and synoptic products.

One of us (AB) has recently worked with a graduate student on the analysis of atmospheric data from the Mars Global Surveyor spacecraft. The student made use of the NASA-Ames hyperwall (http://people.nas.nasa.gov/~creon/hyperwall/abstract.pdf) which is a research version of the map wall proposed here. The hyperwall was invaluable in displaying large quantities of data simultaneously, and we anticipate that the SJSU map wall can serve a similar purpose when not being used in classes. This may have particular benefit for the field of climate science. An obvious example will be the ability to display the evolution of fields from multiple simulations by multiple models for multiple scenarios etc. (currently the CMIP3 suite; soon to be CMIP5).

In summary, the installation of the proposed electronic map wall will allow a significant enhancement of the teaching environment in our synoptic analysis and forecasting classes, as well as new opportunities in near real-time activities such as planning for fire weather measurement campaigns, and finally for our research activities.

D. Budget

Our equipment proposal consists of two parts: (1) replacing our existing IDD server; and (2) creating an electronic map wall. The proposed THREDDS server will be a high-end multi-core machine with large storage capacity and high RAM. The proposed electronic map wall consists of eight 24 inch LCD HD monitors. Each pair of monitors will be driven by a low-end mini-tower CPU, and the map wall system will be driven by a new multi-core server. The equipment breakdown is as follows:
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<th>ITEM COST</th>
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<td><strong>Electronic map wall system</strong></td>
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<td>Eight Samsung 32” LED-LCD HDTV 720p monitors (via bestbuy.com)</td>
<td>8 @ $500.- $500. is the current price at bestbuy.com</td>
<td>$4,000.- 400.</td>
<td>$4,000.- 400.</td>
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<td>Four mini-tower CPUs (e.g., Dell Optiplex 780), each with the following specs: Intel 9660 Core2 Quad CPUs, 8GB RAM, 256MB nVidia GeForce 9300, 250MB SATA Hard Drive</td>
<td>4 @ $639.- copy of estimate attached:</td>
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Cost Sharing: The Department of Meteorology and Climate Science will provide funding for the installation of the software and hardware (cables, racks, additional power etc.) up to $2,000.

E. Project Milestones

Assuming funding awarded on June 1, 2011:

a) June 1-15: re-compute bids to allow for cost changes and hardware improvements between the dates of proposal submission and award (applies to all servers plus the HD display monitors); order all equipment. We have attached bids for the two main servers and for the smaller CPUs from dell.com.

b) July 15 - October 15: for the upgraded server project, install server in parallel with current servers; install and test data access, processing and display software (IDD, IDV, GEMPACK, THREDDS, RAMADDA) and configure the new server to replicate the current functions of the old servers (rossby etc.) Take rossby etc. offline when this stage is complete. We can then begin to access new THREDDS etc. capabilities in various classes.

Personnel from the department and from the College of Science network support group will install the hardware and software, and will provide maintenance once it is operational. The department is currently recruiting to hire a tenure-track faculty member in the area of synoptic/forecasting meteorology, and we expect that he/she will actively participate in this process.

c) July 15 - November 15: for the map wall project, install the new server that will access and process data; install and test data access software (IDD, IDV, GEMPACK etc.); test the map wall function first with one pair of monitors and one CPU connected to this server; replicate with multiple monitors.

d) November 15 - December 15: for the map wall project, physically install monitors; run cables (and addition power if needed) within campus specs. Dedicate new map wall!

e) We anticipate that all hardware can be installed and running by 12/31/11, and that the map wall will be ready for use in classes in the Spring 2012 semester. Implementation of all THREDDS and RAMADDA functions will be an ongoing process once the new server is up and running.
## PowerEdge T610

### Price Summary
- **Price:** $6,074.25
- **Instant Savings:** $2,024.75
- **Final Price:** $6,074.25
- **Preliminary Ship Date:** 3/30/2011

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San Jose State University

E-quote Number: 1019982010272
E-quote Name: met mini me
E-Quote Description: met mini me
Phone Number: (408) 924-5195
Purchasing Agent: ckozak@email.sjsu.edu
Note/Comments:
Additional Comments:

Premier Page Name: San Jose State University

Product Details

Dell Precision T5500 64bit Dual Processor
Date & Time: March 14, 2011 11:44 PM CST

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Catalog Number: 25 E1763_64_2

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*Exemptions reflected in final checkout page only

**Total Price** $4,181.30
REVIEW YOUR SUMMARY

Congratulations! You have finished personalizing!
We have some recommendations for you highlighted in green below.

My System Details

BASE
- OptiPlex 780 Small Form Factor for Standard PSU

OPERATING SYSTEM
- Genuine Windows 7 Home Premium (32-bit, English)

PROCESSOR
- Intel Pentium Dual-Core Processor E5500 (2.80GHz, 2M, 800MHz FSB)

OFFICE SOFTWARE
- Microsoft Office Starter: reduced functionality Word and Excel with add. No PowerPoint or Outlook

SERVICES & WARRANTY
- 3 Year Basic Limited Warranty

MEMORY
- 4GB DDR2 667 Mhz EDIMM

MONITOR
- No Monitor

HARD DRIVE
- 250GB 7,200 RPM SpinPoint P7A HDD with 8MB Cache

VIDEO CARD
- 256MB NVIDIA G84-700-A2 2 DVI Video Card

OPTICAL DRIVE
- 6X Scott CAM Optical Drive w/ M-Disc Burner, No Media

SPEAKERS
- No Speaker, OptiPlex

KEYBOARD
- Dell USB Easy Keyboard

MOUSE
- Dell USB 2-Button Laser Mouse

HARD DRIVE
- No RAID

CONFIGURATION
- Additional Memory: 8GB DDR2 SODIMM 800MHz

Save $16.95 w/ this Credit offers.

Important Product and Service Details

Small & Medium Business

Shop

Support

- All Support Options
- Drivers and Downloads
- Order Status
- Getting Started
- Product Support
- Parts & Upgrades

Community

- Join the Discussion
- Share Your Ideas
- Read our Blog
- Ratings & Reviews
- Community Home

Company Information

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My Account

- Sign-in / Register
- Order Status
- Make a Payment

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Samsung - 32" Class / 720p / 60Hz / LED-LCD HDTV

Model: UN32C4000 | SKU: 1093581

Customer Reviews: ★★★★★ 4.3  Read reviews (28)

Shipping: Usually leaves our warehouse in 1 business day
Estimate Arrival Time
Store Pickup: Check Stores

Special Offers:
- On Sale
- 50% Off Geek Squad Service: See How

Financing:
- 24 Month Financing
- 18 Month Financing
- 6 Month Financing

Protect Your Product
- 2-Year Protection Plan $99.99
- 4-Year Protection Plan $99.99

Buy Back Program
- Calculate Value
- 4-Year Buy Back Plan $39.99

Overview Specifications Accessories Customer Reviews Research

Customer Rating
- ★★★★★ 4.3
- Read reviews (28)
- Write a review

Overall Samsung.com Rating
- ★★★★★ 4.7
- Read reviews from Samsung.com customers (20)

What's Included
- Samsung 32" Class / 720p / 60Hz / LED-LCD HDTV
- Stand
- Owner's manual

Product Features
- 31-1/2" screen measured diagonally from corner to corner
  For optimal viewing in medium-size rooms.
- Ultra-slim design (1-1/4" deep)
  Ideal for wall mounting (with optional mounting kit, not included).
  200 x 200 VESA compatible.
- Wide Color Enhancer Plus

This HDTV features Wide Color Enhancer Plus technology that delivers brilliant colors for detailed images when watching your favorite TV shows, movies or sporting events. Two 10W speakers with Dolby Digital and DTS decoders provide a lush soundscape.

Have questions about this product?
- Ask Mr. Samsung, fellow shoppers and Best Buy staff. Share your answers.

Product Q&A
- 22 Questions
- 40 Answers

 данного планшета.

ENERGY STAR Qualified
Product Support
- Order Status
- Shipping & Store Pickup
- International Orders
- Store Pickup
- Returns & Refunds
- Customer Service

Product Support
- Installation & Delivery
- Warranties & PSPs
- Check Gift Card Balance
- Product Recalls
- Buy Back Program
- Trade-in Center
- Recycling

Credit Cards
- Apply Now
- Make a Payment
- Financing Offers

Reward Zone® Program
- Learn More
- Check Your Points

Legal
- Conditions of Use
- Legal Notices
- Privacy Policy
- California Privacy Rights
- Price Match Guarantee
- New York Price Match
- Class Action

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<thead>
<tr>
<th>Warranty Terms - Parts</th>
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<tr>
<td>Warranty Terms - Labor</td>
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<tr>
<td>Product Width</td>
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<td>Power Consumption (watts) Stand-by</td>
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Warranty Terms - Parts

Corporate Info
- About Best Buy
- News - The BBY
- Careers
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- More Ways to Connect

Get Connected
APC - Smart-UPS 2200VA Battery Back-Up System

Model: SUA2200RMXLI3U | SKU: 9777557

Customer Reviews: 

Shipping: Usually ships in 2-5 business days
Estimate Arrival Time
Store Pickup: Not Available

Our Price: $1,275.99

Financing:
18 Month Financing
6 Month Financing

Overview Specifications Customer Reviews Research

Protect critical data and equipment with this battery back-up system that features 2200VA of power and an 880-joule rating to guard against power surges, spikes, lightning and more.

What's Included

- APC Smart-UPS 2200VA Battery Back-Up System
- USB cable, RS-232 cable, software CD-ROM
- Rack mounting support rails
- Owner's manual

Product Features

- From our expanded online assortment; not available in all Best Buy stores
- Pure sinewave battery backup
  Prevents interruptions, lost presets, missed DVR recordings, lost multimedia server data and premature projector bulb wear and tear when the power goes out.
- 880-joule rating
  Absorbs a high quantity of energy for enhanced performance.
- 2200VA capacity
  Along with automatic voltage regulation for safe system shutdown when power is lost.
- Eleven 120V outlets
  Protect critical data and equipment.
- Field-replaceable power distribution panel
  Ensures compatibility with equipment of various plug types.
- Intelligent battery management
  Maximizes battery performance, battery life and reliability through precise charging.
- Temperature-compensated battery charging
  Prolongs battery life by regulating the charge voltage according to battery temperature.
- Automatic battery self-test
  Ensures early detection of a battery that needs to be replaced; External replace battery LED indicator lets you know when the battery needs to be replaced.
- Disconnected battery notification
Problems & Solutions

- Automatic restart of loads after UPS shutdown
  Automatically starts up connected equipment upon the return of utility power.
- Power conditioning
  Protects connected loads from surges, spikes, lightning and other power disturbances.
- 8' cord
  Allows flexible room placement.
- Plug-and-play installation
  For simple setup.
- APC $150,000 equipment protection policy.

Order Support

- Order Status
- Shipping & Store Pickup
- International Orders
- Store Pickup
- Returns & Refunds
- Customer Service

Product Support

- Installation & Delivery
- Warranties & PSGs
- Check Gift Card Balance
- Product Recalls
- Buy Back Program
- Trade-in Center
- Recycling

Warranty Terms - Parts
2 years

Warranty Terms - Labor
2 years

Credit Cards

Product Height
5.29"

Product Width
19"

Product Weight
131 lbs

Product Depth
26"

Number of Outlets
11

Joules
880

Length of Cord
8'

VA Rating
2200

Rechargeable
Yes

Equipment Protection Warranty
$150,000

Overall Rating

Share this product:

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- Benefits of UPS PC Protection
- Learn about Intel's New Processor Numbers

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- Join us on Facebook
- Share your Ideas
- Community Forums
- RSS
- Best Buy on your Phone
- More Ways to Connect

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