

## Interim Report

### Integrating Campus Meteorological and Air Quality Data in Environmental Courses

**Greg Carbone and Helen Power**  
**Department of Geography, USC**

The goal of this project was to make available, to students and faculty, meteorological and air quality data that are currently measured on the USC-Columbia campus. This will be accomplished with a wireless data transceiver system that will remotely retrieve data from the National Weather Service (NWS) cooperative weather station and from an automated weather station in A.C. Moore Garden. These data will be transmitted to a personal computer in the Callcott Building. From there, the data will be made accessible via a web-browser.

To date, we have accomplished the following tasks:

1. Secure installation of a tripod, mast, antenna, and grounding and data cables on the roof of the Callcott Building.
2. Secure installation of antenna and grounding cable at the NWS weather station.
3. Dug a trench at the NWS weather station and installed a below-ground power supply cable (inside a conduit) from the DHEC AC outlet to our radio transceiver.
4. Bench-tested the radio transceivers and an automatic data download schedule using dataloggers and software. The two transceivers were initially tested side-by-side in the Geography Department climate lab, without antennae, and then on the roof of Callcott, with two antennae, which amplify the signal. Each of these tests was successful.
5. Creation of java servlets and a java class library (called Jfreechart) to dynamically create tabular and graphical output from sample meteorological data. These sample data are in a similar format to the data we will eventually retrieve from the weather stations. Two **sample files** are attached to the email message: `interface.bmp` and `combinedplot.jpeg`. The bitmap image illustrates how the web interface will look, while the jpeg file is a preliminary example of how the data may be displayed from the interface.
6. Coordination with the CLA computer lab in order to use white server for future web access.
7. Sent pyranometer to Licor Inc. for recalibration.

The tasks that remain to be completed include:

1. Installation of conduits on the roof of Callcott to protect the data cable.
2. Installation of enclosure, radio transceiver, and data cable at the NWS weather station.

3. Reinstall calibrated pyranometer and reprogram data logger at the NWS weather station.
4. Test the data transmission between the NWS weather station and the PC in the Callcott climate lab.
5. Establish a method for continuously streaming data from our PC in the Callcott climate lab to the College of Liberal Arts server.
6. Improve and expand data processing and graphics capabilities of the java servlets.
7. Put java software onto CLA server.
8. Evaluate procedure for data transmission from A.C. Moore Garden to Callcott building. This will involve installation of radio-signal relay units from the garden to Callcott. We are also awaiting the installation of a pole for mounting an anemometer, wind vane, and precipitation gage.

Since we submitted our proposal, we have learned that none of the DHEC air quality data are available real-time; all samples are analyzed in the lab. This means we will not be able to incorporate air quality data in our data transmission.