



Vista Data Vision: A Case Study

Schmeeckle Reserve, University of Wisconsin-Stevens Point



Schmeeckle Reserve

Schmeeckle Reserve is a 280-acre natural area on the campus of the University of Wisconsin-Stevens Point (UWSP). Its mission is to preserve and manage native habitats of Central Wisconsin, serve as an outdoor laboratory for the university, and provide recreational opportunities for the community. The Reserve is a significant field station for the university. In the 2008-2009 academic year, over 2,400 students attended classes or conducted research in Schmeeckle for a total of 9,000 hours. UWSP faculty and staff teach hands-on classes in forestry, natural resources, soils, waters, wildlife, biology, geography, ecology, and history. Student organizations conduct research and activities in the Reserve, such as white-tailed deer, flying squirrel, and bat population studies, ecological restoration, prescribed burning, and timber harvesting.



UWSP students are involved with every portion of the Schmeeckle monitoring station. Here, two students install the wind vane at the top of the tower.

Environmental Monitoring Stations

In 2002, the UWSP Biology Department funded the installation of two environmental monitoring stations in the northwest corner of Schmeeckle Reserve. Data was manually downloaded with a handheld computer every 20 days, brought back to campus, and converted into a complex spreadsheet for processing. Dr. David Hillier, a Biology faculty member who coordinated the monitoring stations, developed the spreadsheet and converted data into graphs that could be posted on the Internet. Although effective for general courses, this was a time-consuming system and provided only limited access to the true potential for data. When Dr. Hillier retired in 2005, data was no longer downloaded from the stations and they fell into disrepair.

Schmeeckle Reserve became interested in upgrading the stations and developing a more simple way to collect and disseminate the data. In late 2009, funding became available through the College of Natural Resources that allowed a committee to consider different options for the monitoring stations. It was decided that one of the stations would be upgraded and moved closer to the Reserve's visitor center. Here, it could be connected to the building's electricity and network system, allowing automatic collection and the ability to show real-time data.

To avoid the complex spreadsheets and manually created graphs, we also looked for software that would provide simple online access to the monitoring data for faculty and students. Vista Data Vision was the perfect fit for our needs. It automatically translates and imports the monitoring station data into a database. The data is instantly accessible online and can be viewed as graphs or downloaded into spreadsheets for further processing. The students and faculty can choose specific time frames to look at based on their classes or studies. It does everything that the old "manual" method accomplished and more... and does it quickly and automatically. The software is an incredible time saver and makes the data much more accessible to a large number of people.

Setting Up Vista Data Vision

As an institution of higher education, the environmental monitoring station and VDV serve a significant role in student learning. As many students entering the natural resources or biology fields will likely be using monitoring stations and environmental data as part of their careers, the UWSP station serves as an educational model. We developed a web page at <http://www.uwsp.edu/cnr/schmeeckle/Weather/> that describes the station's sensors and location. The page also connects to the VDV data access site at <http://schmeec1.uwsp.edu/vdv/>. We decided to keep this site open to all Internet users, as community members and off-campus researchers may also find value in the data.

The UWSP VDV website graphs data from several environmental monitoring sensors, including air temperature (two different heights), relative humidity, precipitation, solar radiation, wind speed (at three different heights), wind direction, and soil temperature and moisture (at two different depths). Data is collected on 10-minute intervals, 1-hour intervals, and 24-hour intervals. Setting up different graphs based on sensors and intervals was easy and fast. It is exciting to visually see the trends over time and simple to adjust the time intervals to view. The ability to download raw data for further processing is essential to a university training curriculum, and with a quick click of a button, the file is instantly saved in a table format.

Using Vista Data Vision at UWSP

Although we just recently finalized the installation of Vista Data Vision, it has already become a valuable tool for UWSP faculty and students, and will continue to become more valuable as it is integrated into classes and studies in the future. Some applications include:

- An Environmental Education student used the program to show wind speed and direction over different time intervals for a public presentation entitled "Whoosh! The Story of Wind."
- Students in the Wildlife Society monitor solar radiation in conjunction with the activity of flying squirrels in the Reserve.
- A Forestry faculty member will use several monitoring factors in an ecological restoration course to determine the suitability for prescribed burns on the site.
- A Soils faculty member will use the soil temperature and moisture to show changes during the fall and spring in a typical Central Wisconsin woodland.
- A Waters faculty member is currently monitoring water levels in a creek and lake in the Reserve, and this data will be added as another valuable page to the VDV site.
- Students in a Wildlife course set up their own research projects in the Reserve, such as small mammal trapping, and will use the more site-specific data provided to analyze activity based on temperature, precipitation, and solar radiation.
- The Wisconsin Department of Natural Resources currently has an acoustic bat monitoring station set up near the environmental monitoring station. Bat researchers will use the environmental data to correlate bat populations and activity with temperature, solar radiation, and wind.



UWSP students at Schmeeckle Reserve use VDV to view the wind gusts during a recent autumn storm.

Vista Data Vision is an intuitive tool that will provide innumerable learning opportunities for our university students and help increase our understanding of Schmeeckle Reserve.