

## 100 Years of New York Weather

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by Peter Seem

GENEVA, NY: Monitoring the weather is a critical activity at the New York State Agricultural Experiment Station in Geneva, NY. The weather station there measured 4.12 inches of rain for the first two days of August, which sounds like a lot, for instance, but records show it doesn't begin to match the record two-day accumulation of 5.05 inches that fell on August 23 and 24 in 1922.

"We have been logging daily maximum and minimum temperatures and precipitation for over 100 years," said Robert Seem, the plant pathologist who manages the weather station.

Temperature and precipitation are important factors in the growth patterns of crops and the development and life cycles of pests. Surface wetness is an important measure for studying the conditions under which diseases flourish. "The data is used mostly by the research community, but it also serves as a climate record for the region," said Seem. "Researchers use weather records so they know the conditions under which their experiments were conducted."

Data collected and stored in the Geneva database is also available for public inquiry as a service to the community, said Seem. "We get requests from lawyers, insurance companies,



Suggested caption: Steve Gordner takes a measurement from the evaporation pan, one of the last readings still taken manually at the weather station at the Fruit and Vegetable Farm. CREDIT: K. Stevens/NYSAES/Cornell

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state police, and the attorney general's office." When sudden, heavy winds knocked over steel girders during the 1998 construction of the Guardian Glass factory, for instance, a worker was killed. At the trial, the court requested wind speed records and the Experiment Station provided them.

The data is sent to the Northeast Regional Climate Center at Cornell University, the National Weather Service, the Natural Climate Data Center, the Natural Resource Conservation Service, and the Natural Resource Ecology Lab.

### **SOME DATA IS STILL COLLECTED BY HAND**

The Experiment Station's weather station sits in a small fenced area atop a hill on the Fruit and Vegetable Research Farm off County Road #4. Additional equipment has been added since 1900. Now devices measure wind speed, evaporation, water temperature, soil temperature from 2 to 12 inches deep, soil moisture, solar radiation, surface wetness, relative humidity, and ultraviolet B radiation. Each morning, Steve Gordner or Lee Hibbard, from the Station's Field Research Unit, visits the weather station to record precipitation, evaporation, and daily high and low temperatures. All of the other measurements are recorded daily, hourly, or every 15 minutes, then logged and stored in a database. Daily summary data is compiled and entered into the database and provided to the public over the Internet, along with over 100 years of archives at <http://www.nysaes.cornell.edu/weather/>

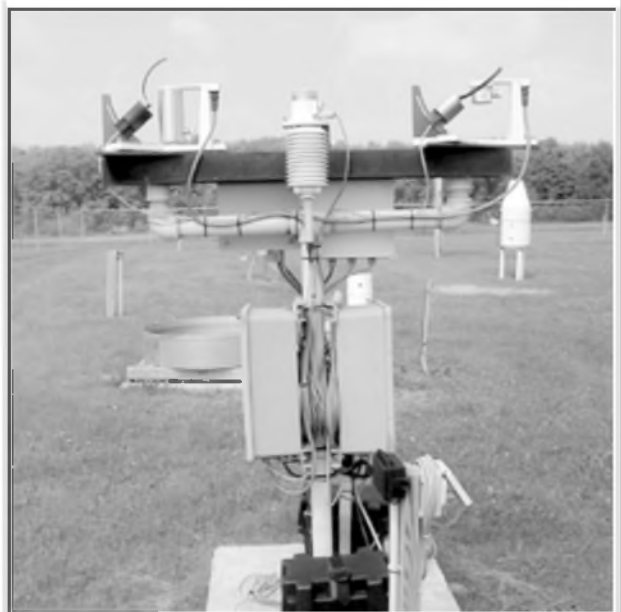
After taking the readings, Hibbard calls a computer run by the National Weather Service (NWS) to dial in the previous day's information. The data also goes to the Northeast Regional Climate Center at Cornell and the National Climate Data Center's database.

The Natural Resource Conservation Service has installed soil monitoring equipment at the Geneva site. Soil readings and the rest of the data, are integrated into the Soil Climate Analysis Network and made available for the scientific community at <http://www.wcc.nrcs.usda.gov/scan/>

"The data have a wide variety of users... agriculture, the Federal Emergency Management Agency, engineering, researches, and global climate change to name a few," said Garry Schaefer, a hydrologist in Portland, Oregon, who leads the Hydromet Data Acquisition and Technology team of the National Water and Climate Center.

### **AND THEN THERE'S ULTRAVIOLET B**

The Geneva site is also used by scientists at the USDA UV-B Radiation Monitoring Program



Suggested caption: This UV-B monitoring station, installed at Geneva by Colorado State University, is one of 28 sites in North America that submit data to the UV-B network. CREDIT: P. Seem/NYSAES/Cornell

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operated by the National Resource Ecology Laboratory at Colorado State University. Geneva is part of a network of 26 sites in the U.S. and two in Canada where Colorado State has installed a monitoring station for ultraviolet B, the mid-level energy form of UV radiation, 320-290 nm. Geneva's UV-B equipment is connected to a phone line that transmits data to the headquarters in Fort Collins each night.

"The Department of Agriculture wants to have a ground-based set of data for ultraviolet radiation. NASA satellites measure the ozone and predict ultraviolet radiation; we are a ground truth test for those measurements," said Bill Durham, manager of the UV-B Monitoring Network who installed the equipment at the initial sites, including Geneva, in 1994.

Ultraviolet B, which is expected to increase as a result of the depletion of the ozone, affects the metabolism, photosynthesis and gene activity of plants. There hasn't been enough research to put the data to immediate use for growers, but the UV-B program is trying to create a basis for such work.

"We're in the beginning stages of research. The information we gather can be used in conjunction with experiments to test UV-B's effects on plants. It's new research and we feel the data is of high quality," said James Slusser, director of the UV-B monitoring program. All of the radiation data is available for free, broken down by site, at <http://uvb.nrel.colostate.edu>

Weather at the Station? Small talk? Hardly.

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