

# Preventing winterkill with data loggers

**O**ver the past few winters, turf in the northeast United States have been subjected to some of the most extreme weather conditions seen in decades. Steve Thys, superintendent of the Worcester Country Club in Massachusetts, says that two winters ago, he did a routine check of one of his greens after snowfall on an already covered ground. According to Thys, "Everything looked as lush green as it had in November because it had not hardened off by the time the first snowfall fell." Just a little over a week later, he checked the green again, only to find winterkill.

"Something happened during those ten days, but it was impossible for us to pinpoint any specific weather occurrence," Thys says. "Nevertheless, we had a big problem on our hands, and it was a race against time to get the damage repaired since our members flock to the course the minute the snow melts."

Thys' story is so common in the Northeast that that he and other superintendents are beginning to monitor greens in the off-seasons with battery-powered data loggers.

Data loggers are compact instruments that incorporate built-in micro processing, high-accuracy temperature sensing, and battery power in an enclosure designed for long-term deployment outdoors. Loggers can be placed under turf covers during the winter months, where they will collect temperature data at user-defined intervals (e.g., every 10 minutes) and store it digitally into logger memory.

Data loggers are perhaps one of the simplest and most straightforward of PC-based technologies. Using them involves four basic steps: logger set-up, deploy-

ment, data retrieval, and analysis.

Setting up a logger is typically done by connecting the device to a PC and using accompanying logger software to make a number of point-and-click selections. These include how often the logger should take a turf temperature measurement, and the specific date and time the logger should start recording. Deployment involves determining optimal placement of the logger on the green and physically installing the logger under its covering. Data retrieval can be accomplished manually, where the turf manager offloads the collected data onto a PC, laptop or data shuttle, or, in certain cases, automatically, where the logger transmits the data to a PC via wireless communications.

Analysis of the data is typically performed using the accompanying data logger software to translate the data into time/date-stamped graphs that show spikes and drops in turf canopy temperature over the given data collection period.

Peter Hasak, superintendent of Tedesco Country Club in Marblehead, MA, has been experimenting with data loggers and various types of greens covers to understand the differential temperatures above and below the cover surfaces and to correlate that data with potential damage to the greens.

"While we've typically been using translucent covers that let a lot of sunlight in, we are looking at making the change to solid white covers in some areas," he says. "The idea of bringing solid white covers into this part of New England is relatively new, but it's an idea worth considering in certain situations." **ST**

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