Fact Sheet

SELF-RECORDING SNOW DEPTH PROBE

PROBLEM

Many practical problems related to snow require extensive measurements of snow depth. For example, to predict the runoff from a basin for allocating water resources for irrigation or human consumption, or to assess how deep frost will penetrate into the ground, it is necessary to know how the snow depth varies over an area. This can require dozens to hundreds of measurements.

Measuring snow depth can be tedious and time consuming; in addition to making the measurement, the observed values must be recorded by hand. We have developed a device that makes manual recording unnecessary, and which improves the operator's comfort because he or she need no longer stoop to make the measurement.

HISTORY

Snow depth is generally measured by pushing a graduated rod or probe into the snow and then bending over to read the value on the side of the rod. Typical probes that have been used for making measurements include ski poles without baskets, or sectioned aluminum tubing. Some automated devices have also been invented (ultrasonic sounders and auto-actuated probes, Borschung et al., patent 4,600,842), but these have been installed at fixed locations and are not suitable for making measurements over a wide area.

SOLUTION

We have developed a self-recording snow depth probe, similar in shape and size to a ski pole, that is connected to a lightweight data logger carried in a small backpack. The ski-pole-like portion of the device has a sliding basket. The pole is pushed into the snow until the tip hits the ground. At that time, the operator pushes a thumb switch on the handle and the measurement is recorded on the data logger with an accuracy of ± 0.5 cm. The device can store thousands of measurements and typically can be used to make more than 200 readings in less than 10 minutes. Data from the device can be downloaded directly into a spreadsheet on a computer. More than 10,000 measurements have been made reliably at temperatures as low as –30°C using the device.

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