NEW 2 and 3 INCH DIAMETER CRREL SNOW SAMPLERS

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EXTENDED ABSTRACT

Two new sampling tubes have been designed by CRREL for use in shallow snow packs. The 2 in. (5.1 cm) sampler was selected in an attempt to improve on the performance of the smaller diameter western samplers and the larger diameter eastern samplers for measurement of roof snow water equivalents. The 3 in. (7.6 cm) sampler is very similar to the Adirondack sampler which is no longer commerically available. USACRREL in its snow field research programs required the need for samplers for use in eastern snowpacks and the Adirondack sampler has proven to be the most accurate[1] in eastern snowpacks having ice lenses and freeze thaw cycles.

Both samplers were constructed from the same component materials and differ only in the diameter of the sample obtained. Each features a cutter, tube and a tee handle. The cutter design is modeled after the relatively successful Bowman and Federal cutters. Three steel leaf springs, 120 degrees apart, are located inside the 3 in. (7.6 cm) cutter to assist in catching and removing the sample. The stainless steel cutter is attached to a length of reinforced fiberglass epoxy resin pipe which is light weight, strong, and not susceptible to freezing of water or snow to its surface. The tee handle provides the mechanism to force the sampler into the snow. The 3 in. (7.6 cm) diameter, 59 in. (150 cm) long sampler was developed for use in northeastern watersheds in snowpack depths from 8 in. (20 cm) to 59 in. (150 cm) deep. The 2 in. (5.1 cm) diameter, 42 in. (107 cm) long sampler will be used to measure ground and roof snowpack depths up to 39 in. (100 cm) deep to help determine roof snow load criteria. A number of prototypes were constructed for use during the 1979-80 winter but the general lack of snow hampered testing to date.

Figure 1 shows the 2 in. (5.1 cm) sampler for use in roof snow load research and figure 2 shows the modified Adirondack sampler. Both cutters have very aggressive cutting teeth to penetrate the ice lenses which are found in the eastern snow packs. The larger sampler requires the spring load catcher for retrieving the sample.

[1] Work, et al. (1965) "Accuracy of Field Snow Surveys", USACRREL Technical Report 163, Report prepared by Soil Conservation Service, U.S. Department of Agriculture.

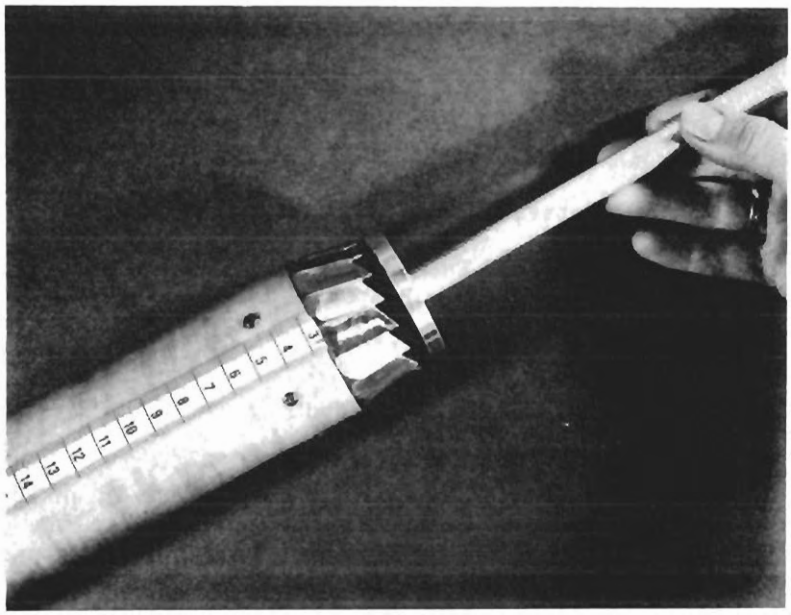

Figure 1. Shows the cutter end of the 2 in. (5.1 cm) sampler and the push rod for sample removal.

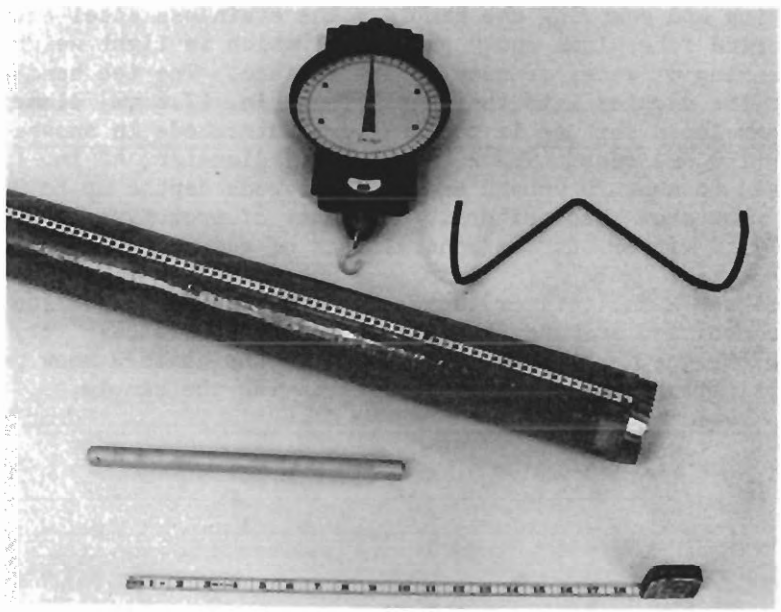

Figure 2. Shows the components of the 3 in. (7.6 cm) sampler. Not shown in figure are the three sample catchers.