Study Comparison: Avalanche Snow Probes versus Conventional Snow Pit in Determining Avalanche Danger

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The purpose of this research was to develop a snow probe that determines the dangers of snow-slab conditions. The probes were developed in order to equate similar, if not more accurate, data than snow pits. Because of their time consuming process, conventional snow pits result in frustration and extra exposure to winter conditions. In order to address these issues, ten prototype probes were developed with the finalized probes developed in late 2020. Acrylic, polycarbonate, steel, zinc-bonded steel, and aluminum probes were tested to find what material is best suited for collecting a snow core. Additionally, the shape and diameter of each probe was adjusted in order to find if friction played a strong role in snow recovery. A hypodermic needle like structure was sawed into the bottom of each prototype in order to pierce layers of snow slabs that wouldn't have been reached otherwise. Further, holes drilled into each probe—spaced 2 cm and 5 cm—were used in order to magnify the vision of sublimated snow crystals. The results from each probe were compared with the data collected by building a snow pit and manually locating the sublimated crystals through snow-slab study. This process delivered satisfactory results in comparison to the controlled snow pits. Conclusively, the aluminum and steel prism probes with a 1.25 diameter and holes spaced 2 cm proved to gather the most accurate results while being most user-friendly; however, the necessity and self-assurance that comes from conventional snow pit study--qualitative information about snow-pack strength-- remains imperative to avalanche study.

Awards Won: