

TRANSCRIPT

Karl Wetlaufer Explains Snow Measuring Techniques

How do you measure the snowpack?

There are two main ways, and one of them is with those automated weather stations. We measure the snow-water equivalent, which is the amount of liquid water stored in the snowpack, using a snow pillow, which is basically a fluid-filled bladder on the ground. And the more pressure that is applied to that, it forces some fluid out of that bladder and we are able to measure the actual liquid water content. Then we measure snow depth with an acoustic sensor that actually bounces a sound wave off the snow surface, and we are able to measure how deep it is.

Our manual course, the snow course is we actually go out on a monthly basis, and we take our sample of the entire snow pack, and we weigh it, and then we are actually able to get the same information about the whole snowpack in a different manner.

What are some of the challenges when it comes to measuring the snow pack?

Some of the major challenges that we face are the spatial distribution. There are people who are working on accurately doing that from space, but for now the most accurate way is actual sites in the mountains, but you can only have so many. So we have to take all these point measurements from our SNOTEL sites and our snow courses and then try and use different methods to infer how much water is actually going to result from that.

Can you talk a little bit more about space measurements of snow?

There has been a lot of research done over the years to actually get snow-water equivalent from a space-based platform. And there are currently some operational programs that are doing that, through NOAA, the National Oceanic and Atmospheric Administration. But recently, NASA has reinstated kind of a push to really refine these methods through a program called SnowX,

where they did a huge month-long campaign two winters ago in 2017. There is a revitalized push to use our ground-based data with space platforms to really get an idea of how much snow is across the entire landscape.