# NWAC Lesson 2

**Snow Water Equivalency**

**Learning Objectives:**

* Students will learn the recipe for an avalanche.
* Students will learn that new snow can act as a trigger to an avalanche
* Students will learn to measure and extract
* Students will learn how density of snow impacts watershed.

**Lesson Goals:**

* Students use tools to measure and make SWE predictions.
* Students learn that there is a science dedicated to understanding snow and avalanches.
* Students make a connection between snow density and how it impacts watershed.

**Materials:**

* SWE tools
* SWE worksheet

**Timing:**

* 20 minutes

**Assessment:**

* Assessment is embedded in the activity as it progresses. Inquiry-based teaching techniques are recommended. Questions posed to the group will lead to answers and discussions the educator can use to assess student connection and content understandings.

## Background Information:

Avalanche hazard is a natural phenomenon that we can forecast. This is similar to forecasting significant weather events like wind and precipitation. Scientist and avalanche professionals have studied snow to learn about why avalanches happen, and what weather conditions and terrain features make them more likely to occur. SWE tests are one of many tools that avalanche forecasters use in order to better understand the likeliness of an avalanche occurring, and use them as part of their avalanche forecast.

## Snowpit Activity:

1. [4 minutes] Introduce yourself, the center, and how our forecasters are snow scientists. Talk about what an avalanche is and the recipe for an avalanche occur.
2. [5 minutes] What: Identify snow loading as a potential trigger for avalanches.
   1. We want to know how much weight is being added.
   2. Water gives snow strength – think about a soggy based of a snowman vs the surface snow here
   3. Measure the amount if water as a way to talk about the load – a common language b/w snow scientist.
   4. We could measure by melting a sample and measuring the column of water
   5. We could measure by weighing a sample and using density – this is how we do it as snow scientist
3. [11 minutes] How: Snow Water Equivalency Test
   1. [2 minute] Introduce the equipment and units of measure
      1. Height of water is readily compared with height of snow – important for looking at trends
   2. [5 minutes] Take a sample as a class to show the process. Review with pre-marked sample sheet.
      1. Is there a lot of water or a little water in our snow?
      2. What do you think is typical?
      3. Most snow that falls is b/w 8-12%. Link sample measurements to the story of recent weather
   3. [2 minutes] Watershed back-link:
      1. Hard snow, compressed throughout the season, lasts longer into the summer. Thereby increasing our waterbank for the coming season.
      2. How can scientists use snowpack data to estimate water resources for a given watershed? What types of data are important in this case?
         1. Citizen science from OSU – David Hill: <http://communitysnowobs.org/>
   4. [2 minutes] Questions and wrap-up.