

Soil Moisture Sensor Installation Information

Site Selection

The chosen installation sites are an accurate representation of slope characteristics in this area. It was selected based on specific research needs and current knowledge. Installing moisture sensors at specified depths and locations will help answer the question, “what are the flow paths water takes during a storm?” Two different slope locations were selected with three measurement sites on each slope. The three sites represent the shoulder, backslope and footslope of the gradient. We aligned the sites at each of these positions, hoping to observe lateral water flow over a given period of time. By vertically aligning the sensors at 15cm, 35cm, and 75cm from the surface, we can observe potential vertical flow. We hypothesize that with enough data we will be able to characterize lateral and vertical water flow at different slope positions during precipitation events.

Installation

Poor installation is a primary cause of inaccurate soil moisture sensor data sets. There are many different methods of installation and all possibilities need to be reviewed in order to determine what is best fit for the research question. Things to consider are budget, experimental needs, and required accuracy/precision. Once the appropriate method is determined, basic installation components need to be considered such as site selection, depth of sensor installation, and soil type. All installation methods have their advantages and disadvantages. There are three primary installation techniques that are widely used. We chose the trench wall technique based on what we thought would best fit our research needs and have the least interference with flowpaths. We concluded that installing a sensor at the bottom of an auger hole would impede the flow of water and did not fit our research needs. Likewise, we could not guarantee a proper and tightly fitted installation using an auger.



Trench wall Technique (Used in this study)

Dig a trench in the ground at the desired depth. Choose a wall of the trench that will least disrupt the direction of water flow. Consider different depths below surface or different horizons. For example, we installed sensors at 15cm, 35cm, and 75cm from the surface, as pictured above. Backfill the trench in the order with which the soil was removed. It is important to maintain the bulk density of surrounding soil so it needs to be packed down while backfilling.