Hi There! My name is Jackson Hawkins, and I'm heading into my last semester at Middlebury College. **This object you've found is a water sampler** I'm using for my senior thesis in the Geology department. I visit this site about every 3 weeks to empty the sampler and change out the battery powering it, but if I didn't cross paths with you, I hope this document can answer a few common questions you may have, and that you enjoy(ed) your time at White Rocks!

What are you studying?

I'm trying to figure out where the water in this spring is coming from, and how it impacts the nearby region! Throughout the year, the water likely comes from different sources, such as fresh snowmelt in the springtime, mid-summer rainstorms, groundwater, and yes, even melting ice which persists within the talus (boulder field) throughout the year. I'm interested in exactly how that source varies throughout the non-winter months, and what that may mean for the reliability of water sources like these and the ecosystem. I deployed my sampler in late April, and will retrieve it in September or October, before it freezes.

Why is this important?

Talus slopes and other "cold rocky landforms" and their associated outflow of chilled air and water can create small, cold microclimates right at their base. These microclimates can offer a habitat for plants and animals that might otherwise find the surrounding region too warm to survive, helping to increase regional biodiversity and resilience to

disturbances. Understanding the source of the cold air and water coming from the talus can help predict how these microclimates may persist (or not persist) in the face of climate change, as well as how backcountry water sources like this spring may (or may not) dry up as a result of melting ice not being replenished as the region warms.

How do you study that?

The primary way I'm studying the source of the water is by tracking its stable isotope signature, specifically the ratio between O^{16} and O^{18} (oxygen atoms with 16 & 18 neutrons, respectively). Each water source (snowmelt, rain, groundwater, and icemelt) will have its own isotope signature, so the origin of the water can be determined by analyzing the water samples collected by this sampler. I'm also interested in a few other geochemical metrics of the water, such as which cations or anions are dissolved in the samples, as that can help understand how much time the water has been in contact with the earth (think groundwater flow vs. rainfall). Additionally, I've deployed various temperature loggers around the region in both air and water to track climatic changes and help understand if there is, in fact, a colder microclimate at the base of the talus field. If there is, that could be great motivation for a biologist to study some of the flora and fauna of the region!