

Project Proposal - Lelia Pascale, Marianne Muth

Statement of Problem

The Stowe Mountain Resort, located in Stowe, VT, is built on Mt. Mansfield, Vermont's highest peak. The resort is built within the boundaries of the West Branch watershed. Consequently, this area of land has undergone a significant amount of manipulation, from deforestation to redirection of stream flow. We are interested in determining how much of an effect the unpaved parking lot at Spruce Peak, an area of the ski resort, has on the West Branch watershed. More specifically, we are interested in determining the amount of increase in sediment runoff into the West Branch stream during a storm event.

Significance

The findings of this study will determine the effect of the parking lot on the stream, and thus aid in determining the effect of the ski resort on the watershed. Some of these effects could include sediment buildup, increased erosion, or stream flow redirection, all of which dictate the condition of the watershed. Should the data reveal that the parking lot is a detriment to the watershed, steps could be taken by Stowe Mountain Resort to minimize the effect of the parking lot and restore the condition of the stream. This could also be applied to other ski resorts, allowing for better watershed management.

Methodology

Preferably, data will be collected over a period of time during a storm event. Samples of the stream water will be taken simultaneously from above and below the parking lot at Spruce Peak every 30 minutes for the duration of 2 to 3 storm events. The 1 liter sample bottles will be filled by being dipped into the stream and moved up and down within the water, creating an 'average' water sample. These samples will be taken to the lab where the water will be decanted, the sediment dried for a period of one night, and weighed in order to determine the total suspended sediment. A Loss-on-Ignition test will also be done to measure the inorganic vs. the organic sediment. An extremely hot oven will be used after the sediment is dried to burn off the organic material. The remaining material will then be weighed and compared to the total sediment, giving us the amount of organic material. The area will also be mapped in order to determine whether or not the stream is a discreet outfall.

In the case of a very dry period, an artificial storm will be created. This would be done by sectioning off a 2 by 2 meter area of parking lot and surrounding it with 0.5m tall sheet metal. A hole would be dug on one end of the section, and a bucket placed in the hole would catch the runoff. Runoff would be carried by water sprinkled in a rain-like fashion from a hose for a period

of 2 hours. The water and sediment from the buckets would be analyzed in the same manner as the water and sediment samples from the stream.

As a fallback to the artificial storm, samples have already been collected in the winter and summer months from March to May, 2001 and June to September, 2001. This data could be analyzed and compared in the same manner as the samples that would have been collected at this time.