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Project Proposal

Suspended Sediment comparison of Developed and Undeveloped Drainage Basins in Humid Mountainous Terrain

Problem: Mount Mansfield located in Stowe, Vermont has a high rate of development on its eastern slope. The eastern slope is home of the Stowe Ski Resort, which includes many ski condos, parking lots, roads, and lodges as well as ski trails. New development of ski trails and lodges are proposed. The impact of ski trail deforestation and development increases suspended sediment in the west branch drainage basin and has a negative effect on river ecosystems. The ranch brook drainage basin is an undeveloped basin adjacent to the west branch. We are interested in comparing the two basins suspended sediment load and determining the effect of development on the west branch.

Methods: Suspended sediment will be collected from the Notch Brook (west branch) at an arbitrary point down stream from the resort development. Using a topographic map we will calculate the drainage basin area up stream from the collection point. We will then find a location in the ranch brook basin on the Ranch Brook with a similar area as the calculated area of west branch basin. Suspended sediment data will also be collected at this location. We will use 1-liter containers to collect the suspended sediment at each site, by holding the container in the stream flow until it is full. We will take samples once during a dry period to compare the basins normal flow. We will also sample during 2 or 3 storm events from which we expect suspended sediment from the developed west branch to be greater. The samples will be taken to the lab where the water will be evaporated off leaving the suspended sediment. The sediments will be weighed and volume calculated. The results will be used to compare the erosion rates of developed

basins with undeveloped basins in a humid mountainous terrain. We will also be looking at Beverly Wemple collected percentage data on the developed and cleared lands on each basin to aid us in our comparison.

Conclusion: Deforested steep slopes and development are known to be a cause of increased erosion. We believe the developed west branch basin will have a greater suspended sediment load due to resort development. We expect our data to reflect this hypothesis. By quantifying the impacts of resort development we may be able to lessen the impact on the environment in the future.

Tools:
GPS
1-liter sample bottles
Topo maps
Scale