Got some Soil,
Soil in Natural vs Humanmade Dams

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Intro to Earth Science (Geology 100)

Research Question & Background

Our group was fascinated by sediments and wondered what causes sediments to vary in size within a watershed. Was there something humans have done to change sediments? Creating dams. Upon further investigation we found out that, “dams control stream flow leading to increased sedimentation upstream...”(Maginnis, 2006, p.20). We wondered what sediment size within Lake Whatcom’s dam to Whatcom Falls Park would look like within jars, was it something that could be visible on that scale? This all lead to the question is there a relationship between sediment size and kinds of dams?

Methods

Materials & Location

To collect our data, we needed only four glass jars. On November 6th, Kai drove to Whatcom Lake’s dam (human-made dam). He then used two jars to collect a mixture of water and sediments. One jar was used to collect before the humanmade dam and labeled H-before and the other jar was after the dam and labeled H-After. On the same day Kai drove and walked to find a natural dam in Whatcom Falls Park. He then repeated the process of collecting two jars with water and sediments. One jar was used to collect before the natural dam and labeled N-Before. Another jar was used after the natural dam and labeled N-After. We now had four jars full of sediments and water, ready to analyze.

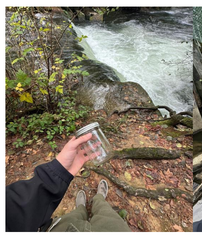

Figure 1.

Figure 2.

Figure 1. Is located at Whatcom Falls Park and represents retrieving sediments before a natural dam.

Figure 2. Is located at Lake Whatcom and represents retrieving sediments after a human-made dam.

Procedure

Rakiya crafted a non-invasive jar centrifuge method by using Milkwood’s Jar Test video combined with observations, measurements (taken in cm and converted into mm), along with various calculations to find the total amount of sediments in N-Before, N-After, H-Before, and H-After. She then remeasured all four jars to find specific types of sediments: clay, silt and sand. In preparation to use the soil texture triangle the measurements were then converted from millimeters into percentages.

Soil Texture Triangle

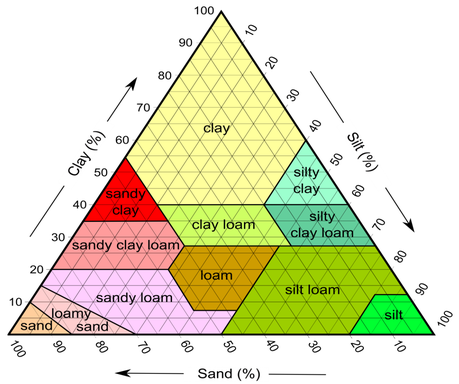

Figure 3. Is a soil texture triangle which is used to determine the type of soil within our jars.

Human-made & Natural Dam Results

N-Before (Natural Dam-Before) | **N-After (Natural Dam-After)** | **H-Before (Human-made Dam Before)** | **H-After (Human-made Dam After**

Names of Jars:	N-Before	N-After	H-Before	H-After
Precent of Clay:	0%	2%	0%	0%
Precent of Silt:	39.1%	10.5%	25%	16.7%
Precent of Sand:	60.9%	87.5%	75%	83.3%
Results:	Sandy loam	Sand	Loamy sand	Loamy sand

Table 1. Outlines the results found by using the soil texture triangle for all four jars (N-Before, N-After, H-Before & H-After).

Discussion

For our research, Rakiya was able to successfully find different amounts of sediments and overall soil texture within Whatcom Falls Park (Jars: N-Before & N-After) and Lake Whatcom (Jars: H-before & H-After). Jar N-Before (Before Natural Dam) is a sandy loam texture with a more even amount of silt and sand compared to jar N-After (After Natural Dam) which has a sandy texture with the majority of the jar being sand. Jar H-Before (Before a human-made dam) is a loamy sand texture with a high percentage of sand compared to silt. Jar H-After (After a human-made dam) shares the same texture and high percentage of sand to silt with H-Before. We were looking at the relationship between dams and size of sediments because, “dams are important source of stress because they alter the hydrology of rivers, change the water quality parameters of both the river downstream, and the impoundment upstream, increase temperatures, and cause the buildup of sediments...”(Maginnis, 2006). However, we did not find an increase or a buildup in sediments at Lake Whatcom (Jars: H-Before & H-After). We do consider that this result could be due to our inability to collect much sediments within the Lake Whatcom jars. There is evidence to suggest that Whatcom Falls Park’s natural dam transports more sediments as there was a change in soil texture in jars (N-Before & N-After). However, we recognize there could be inconsistencies with the results as we created a methodology to test our research question.

For future research Rakiya would suggest collecting more jar samples around Lake Whatcom’s dam and Whatcom Falls Park’s natural dam. It would also be advised to re-replicate our methodology, which can be found in SciNote. This action could prove that this was a useful and successful methodology for our research.

Acknowledgements

We would like to first and foremost thank Coast Salish people for taking care of this land for millenniums and continuing to do so by doing the utmost work for the environment’s health. We’d also like to thank Dr. Kaatje, our professor, for creating an opportunity for us to do research and helping us navigate difficulties. And a shout out to lab technician Kris for providing our materials and teaching Rakiya how to use the soil texture triangle.

Work Cited

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