How Turbidity Changes with elevation along lower Montana Creek, Juneau, Alaska

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Introduction

The goal of this study was to collect water samples and measure the turbidity of those samples, from upper Montana Creek, including its' confluence with McGinnis Creek. The study area is easily accessible via the Montana Creek Trail, on the west side of the Mendenhall Lake, at the end of Montana Creek Road. The goal was to analyze the turbidity data for changes in turbidity with changes in elevation.

Fig. 1. Montana Creek, at waypoint 7

Materials and methods

For this study, a Hach turbidity meter, a Garmin etrex gps receiver, a Nikon Coolpix camera, a notebook, a pencil, a stopwatch, a backpack, a Ziploc baggie (gallon size), and ten water sample vials (~25mL) were used. Ten samples were gathered along the 2.1 mile section of the river. Waypoints were marked and pictures were taken at each sampling spot. Upon return to campus, the waypoints were plotted on a 1:25,000 topographic map of the study area. Water samples were analyzed for turbidity using the Hach instrumentation.

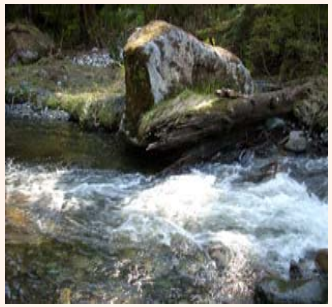
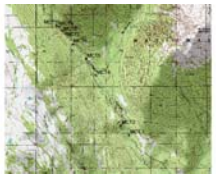


Fig. 2. Rapids along Montana Creek, near Waypoint 5 on map.

MCT10	0.66	
MCT 9	0.27	
MCT8	0.36	
MCT7	0.46	
MCT6	0.59	
MCT5	0.65	
MCT4	0.69	
MCT3	0.95	
MCT2	0.97	
MCT1	0.77	



Figres 3A abd 3B: Waypoints and corresponding Turbidity levels.

Figure 4: this culvert is located at Waypoint 2 on the map.

Figure 5: General location of study area
Photo courtesy of: http://www.olwm.com/promotion-includes/alaska/images/alaska_map.jpg

Results

Turbidity levels for ALL samples gathered from Montana Creek for this study were found to have values of less than 1.00. It was found that values decrease with altitude between waypoints 2 and 9. The highest turbidity value was at Waypoint 3, which is the first point downstream of the culvert, at Waypoint 2 (pictured at left.) Waypoints 1 and 10 did not follow this trend. (The higher value for sample 1 may be due to the fact that it is near a trailhead, used by 4-wheelers and for sample 10, it may be caused by a slowing in current at a logjam.)

Figure 6: Un-named Creek flowing into Montana Creek, at Waypoint 8

Figure 7: Montana Creek near Waypoint 6.

Conclusions

Although surface water accounts for less than 1% of the world's fresh water supply, many of us are concerned about the health of these water systems. After all, we cannot survive without this precious resource. Turbidity is measured in levels that range from 0 to 1000. At Montana Creek in Juneau, water turbidity levels were less than 1.00, reflecting the relatively undisturbed status of this creek. In Alaska, much of our surface water has naturally high turbidity levels, due to glacial flour and other glacially derived sediments being carried as part of the stream load. This is not the case with Montana Creek, and some of the following pictures illustrate the crystal clean waters and even some of the snow that supplies it.

Figure 8: Montana Creek, supplied by snowmelt.

Literature cited

Murck, B. W., Skinner, B. J., and Mackenzie, D. (2008). *Visualizing Geology*. John Wiley & Sons: USA

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For further information

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