

Comparing fabrika and Hatila Creek watersheds with respect to some water quality parameters and total suspended sediment (TSS) amounts

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Abstract: As a hydrological unit, a watershed plays vital roles on both sustainability and quality of water resources and protection of soil resources against erosion depending on its land use (e.g. forest, grassland, agriculture, settlements, etc.). However, it is known that large-scaled land use changes caused by anthropogenic interferences particularly affecting water quality and sediment yield of watersheds. The Coruh River Watershed is one of the watersheds where the mentioned effects are needed to be determined since it has been facing important changes due to large dams, road constructions, mining, and urbanization. For this purpose, Fabrika Creek Watershed (FCW) and Hatila Creek Watershed (HCW), two of the sub-watersheds with different land uses were chosen as the research area. In total of 10 sampling points, 7 within the FCW and 3 within the HCW, water quality parameters of pH, dissolved oxygen (DO), total dissolved substance (TDS), ammonium (NH₄-N), ammonia (NH₃-N), nitrate (NO₃-N), salinity, conductivity, and temperature were determined in the field using YSI (Professional Plus) portable instrument. In addition, monthly measurements of water discharge and TSS values for both watersheds were done for a year. Preliminary results indicated that all the values of water quality parameters measured for both creeks were below the standards set by the Turkish Water Quality Control Regulation. However, when considering the average amounts detected only at the outlet point of each creek, it was clear that FCW had poor quality of surface water compared to HCW for all the parameters. For example, the values of TDS (230 and 120 mg/l), conductivity (280 and 130 µS/cm), ammonium (0.41 and 0.02 mg/l) and nitrate (0.20 and 0.04 mg/l) were much higher in FCW than HCW, respectively. Similarly, the average amount of TSS was also higher from the outlet of FCW with 47.86 than the outlet of HCW with 11.71, as expected. This outcome can be associated with the fact that while HCW is located within the Hatila Valley National Park with limited human interaction, the FCW is affected by relatively high rate of urbanization, particularly the lower section of the watershed, causing more domestic wastewater discharge into the creek.

Keywords: Water quality, Total suspended sediment, Land use, Fabrika Creek, Hatila Creek, Artvin