

A Short Note on Catchment Water Pollution with Shallow Landslides

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DESCRIPTION

The water stored by the natural landscape while raining, the process is like cupping hands when raining and the water stored in that area is called catchment water. This catchment area is also known as drainage basin, water is stored in that area because of gravitational difference, basically these are located at the downhill. The outside edge of the catchment is always highest point. Soil and water interactions made changes in stream water quality because the chemical properties of water within a catchment vary as water interacts with basement rocks and surficial soils. The environmental changes in upstream catchment region may cause threaten to the downstream ecosystems. The water resource management and ecosystem in mountain areas is depends on catchment water. The quality of stream water is sudden and long term deterioration is caused by the releasing contaminants into the stream while shallow landslides caused by earthquakes or heavy streams due to rains. The recent studies states that water pollution is also cause due to shallow landslide while heavy rain falls. The water of Peace River in Canada is polluted with the toxic heavy metals like barium, arsenic, lead, lithium, and cadmium due to repeated landslides. In the aquatic Fiordland on South Island, New Zealand contains Ferrous and Manganese in river water due to landslides. The river in Scotland named Glengonnar Water is studied geomorphology and pollution and found that river bank erosion and water in the river is affected by metal contaminants. In another study found that release of mercury (Hg) from riverbank erosion along the South River in Waynesboro, USA.

The water pollution due the landslide process is contaminated soil is slides into the river, Contaminants in the landslide run out deposit are released into water, then the released contaminants in river water reach concentrations that exceed relevant Environmental Quality Standards (EQS).

The impact of shallow landslides on stream water chemistry at catchment area is studies using mapping methods, and collecting surface water samples of the catchment area. The co-efficiency value between stream water chemistry and topographic indices is known as coefficient of determination (R^2), which is calculated by using scikit-learn library in Python version 3.9 analysis tool. Soil samples were also taken from landslide scrap to investigate the elemental compositions and mineralogy of landslide mass. The landslide mapping is designed by using Digital Elevation Models (DEMs), by using this landslide deposits and landslide scars were mapped. The manual mapping is conducted by using aerial photography with 0.3 m/pixel and using ArcGIS Pro software. The polluted water due to shallow landslides catchment water originates from meteoric water and has a mean transit time ranging from months to years, where shallow landslides have occurred the polluted surface water is mixed with ground water. Surface water interacts with sliding surfaces, landslide-dammed lakes, and landslide deposits, resulting in shallow-landslide-driven changes in stream water chemistry. The isotopic composition of water is a powerful tool for inferring the origin and flow path of water, and can also corroborate the impact of shallow landslides on stream water quality. The spreading of metal containments is fast in rivers than lakes, different mechanisms operating at a wide range of scales.

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