

Mass transport process in a small mountainous catchment; a case of a region around Seto Inland Sea

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To evaluate the output of trace metal in burned mountainous catchments, we monitored the temporal variation in dissolved trace metal concentration and adsorbed content of sediment load at the steep headwater stream in a burned catchment, western Japan. Most of Mn and Zn supplied by rainfall were adsorbed in a forested catchment, whereas those were released from soil in a burned catchment. Because of the soil acidification in a burned catchment, supplied proton was exchanged with trace metals in the soil. During storm events, the subsurface flow component through the surface soil layer increased and trace metal contents in stream water increased with the decline of pH at the source area. These results suggest flash transport of trace metals in the surface soil layer. However, the dissolved concentrations declined with an increase of sediment load within the stream from the source area to the down area before just becoming second order stream. The adsorbed trace metal contents in sediment were higher than those in surface soil on slope. The results suggest dissolved trace metals are quickly adsorbed to sediment with increase of pH with the stream. Based on our research, we could confirm the increase of trace metal load by soil acidification after the fire and transport process of trace metal by sediment load during storm events.