[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

[A-HW20]Materials transport and nutrient cycles in watersheds; Human and climate impacts

convener:Mitsuyo Saito(Graduate School of Environmental and Life Science, Okayama University), Shin-ichi Onodera(Graduate School of Integrated and Arts Sciences, Hiroshima University), Takahiro Hosono(熊本大学大学院先導機構, 共同), Adina Paytan(University of California Santa Cruz)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session aims to synthetize watershed sciences in order to understand dynamical processes of materials transport and nutrient cycles in watersheds from headwaters to coastal seas focusing on human and climate impacts. The session will be integrating a variety of research disciplines including limnology, ground water hydrology, coastal oceanography, meteorology, pedology, sedimentology, forestry, agriculture, fishery, social science and more. The watershed sciences also challenge us to solve environmental issues emerged in the watersheds through our profound understanding of relations between humanity and nature. For instance, on one hand, human land uses alter water resources, dynamics of sediments, nutrients and pollutants in waters and soils on watershed scales, while changing climates may alter water cycle, the frequency and intensity of materials transport and natural disaster, sometimes having catastrophic effects on the watershed systems. This session also calls for ideas on new methods for the watershed sciences, such as tracer and molecular technique, hydrological modeling, paleontological approaches, laboratory and field experiments, social-scientific evaluation of ecosystem services and social-ecological systems, and so on, in order to elucidate physical, chemical and biological mechanisms for shedding light on natural phenomena and their changes over time in complex and dynamic watershed systems. Through this session, we would like to facilitate interdisciplinary collaboration among participants to create new knowledge on watershed sciences.

[AHW20-P07]Dynamics of radioactive and stable cesium in a forest in Fukushima, Japan

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Keywords:Forest, Radiocesium, Stable cesium

Following the Fukushima Daiichi Nuclear Power Plant accident in 2011, a large quantity of radionuclides contaminated a wide area in the Tohoku and Kanto regions of Japan. Radiocesium, which has a long half-life, was initially trapped mainly in the canopy and litter layer of forests; over time, it has gradually migrated into mineral soil. To evaluate the long-term environmental impact of radiocesium it is necessary to understand the dynamics of radiocesium in forested ecosystems. In this study, we monitored the inventory and transport of radioactive and stable cesium isotopes (Cs-137 and Cs-133) in a coniferous plantation forest in Fukushima. Cs-137 concentrations in litterfall, throughfall, litter leachate, and soil water gradually decreased throughout the monitoring period. Following infiltration, the Cs-137 concentration in soil water rapidly decreased with depth, demonstrating the strong ability of clay minerals to capture radiocesium. In contrast, the Cs-133 concentration in soil water was almost constant with depth. These findings suggest that the supply of Cs-133 from soil material due to weathering is balanced by its capture by clay minerals and leaching by flowing water.