
[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 synthesize 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-P09]Long term variation of water balance controlled by land use change in an urbanization catchment, Yamato River

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Keywords:Yamato River, land use change, Long term variation, SWAT Model, water balance

Land use change play an important role in catchment hydrology cycle. Studying the impact of land use change on water cycle is of great significance for analyzing the status of water resources at regional scale. By using Geographic Information System technology, and based on the analysis and prediction of the land use change in Yamato River basin. The water balance was simulated using the Soil and Water Assessment Tool (SWAT2012). Model calibration and uncertainty analysis were performed with sequential uncertainty –tting (SUFI-2). The effects of different land use on surface runoff and groundwater in the same climatic environment between 1976 and 2014 were simulated and validated. The correlation coefficient is from 0.75 to 0.84 and the Nash–Sutcliffe coefficient is 0.71 to 0.80 during rate fixing and verification. Between 1976 to 2014, farmland was reduced by 39.66% and wasteland by 73.57%. Urban area increased by 67.4%, rail and road area increased by 98.44%. At the same time, the surface runoff increased by 15.68%, and the groundwater decreased to a certain extent. The results indicate that the farmland had negative effect on the runoff depth with the city is a positive influence and the both the effects are non-linear.