[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-P10]Estimation of water budget including deep groundwater discharge in small islands, using hourly resolution SWAT Model analysis

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Keywords:SWAT, island, hourly simulation, water budget, runoff

This study used hourly simulations in the SWAT model to research the water budget in small catchments on the Ikuchijima island. Satisfactory results were obtained for flow simulations in the small catchments using hourly precipitation data. The results show that R^2 and NS both above 0.5 during the calibration and the validation period. And |PBIAS| is below 10 in the both cases. Based on this result, we found that SWAT hourly simulations performed well in rainstorms in small catchment areas and it successfully simulated the flood in this catchment during the simulation period. Therefore, it is considered that SWAT model hourly simulation is reliable in rainstorm and flood forecasting. This study also analyzed water balance components such as surface runoff, lateral flow, base flow and evaporation in this small catchment area, and the results were consistent with the actual conditions of the catchment such as climate, vegetation and geology.

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