[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-P29]Possibility of Nitrogen Emissions Evaluation from the Viewpoint of State-Scale Agricultural Product Production and Transport in Brazil

*Kunihide Miyaoka[1], Masato Fukuoka[2], Norio Tase[3], Shin-ichi Onodera[2], Mitsuyo Saito[4], Yuta Shimizu[5], Ricardo Shirota[6] (1.Faculty of Education, Mie University, 2.Graduate School of Integrated Arts and Science, Hiroshima University, 3.Faculty of Education, Ibaraki University, 4.Graduate school of environmental and life science, Okayama University, 5.National Agriculture and Food Research Organization, Western Region Agricultural Research Center, 6.College of Agriculture, Sao Paulo University)

Keywords:Brazil, sugar cane, regional disparities, transportation costs, nitrogen Emissions

In Brazil, the major exporting country of agricultural products, the production of sugar cane and soybean are increasing in recent years, because of growing global demand for bioethanol and for worldwide food situation. Regional disparities are remarkable among states, prices and labor costs are different as well. It is thought that these regional differences reflects in the cost per unit of sugar cane production. There is a possibility that the transportation cost can be offset when considering the total balance of personnel expenses, mechanization, energy costs (water supply and electricity), etc. even in areas far from consumers and ports. Also, depending on natural environment and cultivar varieties, there may be regional differences in fertilizer application

In this study, we estimate the amount of nitrogen emission per unit production amount, considering the different social and natural environments of nitrate contamination of groundwater by local fertilization. Based on the results, consider appropriate sugar cane cultivation form and nitrogen emission control for sustainable development. In this presentation, as the first stage of research, we discuss that may estimate nitrogen emissions in each state by considering socio-economic environment effect, changes in sugar cane production volume, distribution form, and distribution cost.

The population pyramid shows that many states in the south are types of developed countries, whereas in the north there are many states of the type of developing countries. The distribution of economic power by city shows that the economic power is high in the large cities of the south and its surrounding cities, whereas in the northern part the major cities such as Recife have some economic power, but there are relatively low in the many city. Sugar cane production areas are concentrated in Pernambuco State, Aragoas State, Minas Gerais State, Sao Paulo State, Mato Grosso do Sul State. The economic power of these states is high throughout the state in Sao Paulo State and Minas Gerais State in the southern part, but in the states in the northeastern region there is a big disparity within the state. Produced sugar cane is accumulated in Recife in the northeastern part and accumulated in Santos in the south. The cost of being transported from various parts of the southern part to Santos is not cheaper as the distance is shorter, and there is no proportional relation between distance and transportation cost.
Further, it is needs to collect the data, such as transportation costs and labor costs for each city.
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