[EJ] Evening Poster | H (Human Geosciences) | H-CG Complex & General

[H-CG26]What scientists should do for reconstruction after Fukushima Daiichi Nuclear Power Plant Accident

convener:Taku Nishimura(Deptartment of Biological and Environmental Engineering, Graduate School of Agricultural and Life Sciences, University of Tokyo), Masaru Mizoguchi(Graduate school of Agricultural and Life Sciences, The University of Tokyo), Kosuke Noborio

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Seven years have passed since the Fukushima Dai-ichi Nuclear Power Plant accident on March 2011. Some local villagers have started returning their own home. Most of suspension on shipment of agricultural products from Fukushima has been released. Scientists temporarily concentrated on Fukushima-related issues are returning to their own research topics although we still need to solve various problems from application levels to pure scientific topics. For example, it is critical for farmers in Fukushima how to recover productivity of decontaminated agricultural lands. Radiocesium (Cs)-bearing microparticles having relatively high specific radioactivity (Bq/kg) had recently been discovered; however, the fate of the Cs-bearing microparticles, e.g., inert or not, is not well understood to date. It is about time for rural planning scientists to propose their own opinions rather than reporting case studies. We had preliminary discussion at ASA, CSSA and SSSA International Annual Meeting in Tampa, USA 2013 by driving a session of "Battles of Soil Scientists in Fukushima, Japan". In addition, we had "Battles of soil scientists for recapturing Fukushima land from Nuclear Power Plant accident. What can we do then?" last year. In this session, we are looking forward to presentations from soil and water sciences to social and agronomic sciences related to interaction of human and nature under the condition of post-nuclear power plant accident.

[HCG26-P04]Variation of ^{137}Cs dynamics from 2013 to 2017 and its analysis with GeoWEPP in Fukushima, Japan

*Saito Mari[1], Kazutoshi Osawa[1], Taku Nishimura[2] (1.Utsunomiya University, 2.Deptartment of Biological and Environmental Engineering,Graduate School of Agricultural and Life Sciences,University of Tokyo)

A large amount of radiocesium, ^{137}Cs and ^{134}Cs, were released and deposited on the soil surface due to the accident at Fukushima Daiichi Nuclear Power Plant, FDNPP, due to the Great East Japan Earthquake that occurred on March 11, 2011. Radiocesium are redistributed to waterways, rivers, lakes and coastal areas by rainfall-runoff process. ^{137}Cs has a half-life of about 30 years, so long-term influences on residents' lives and agricultural, forestry and fishery products in the area surrounding the accident are concerned. Therefore, it is necessary to continuously monitor the dynamics of ^{137}Cs in watershed scale.

In this study, river monitoring was conducted on two rivers, Hiso river and Mano river, in Iitate village, Fukushima Prefecture from 2013 to 2017. We investigated the temporal variation of radiocesium export which has been rarely studied using continuous monitoring values up to the present. We also conducted laboratory experiments of soil erosion to identify the soil erodibility for the Water Erosion Prediction Project, WEPP, by using three representative soils in this area. Combining these monitored ^{137}Cs concentration of suspended sediment, SS, and calculated sediment discharge using GeoWEPP, the amount of ^{137}Cs export was estimated.

The ^{137}Cs concentration of SS dropped drastically after the extreme large flood due to Typhoon Etau in 2015, and the concentration remained low until 2017. This decrease was probably related to the changes of soil erosion processes due to heavy rainfall and the effects of removing the contaminated soil in agricultural lands as decontamination works in 2015. The soil erodibilities obtained in laboratory experiments slightly improved the accuracy of the sediment discharge rather than the estimated erodibilities calculated by WEPP. Meanwhile, the calculated sediment discharge and ^{137}Cs export tended to overestimate in the large rainfall event, such as the event with Typhoon Etau in 2015.