Transport processes of earth surface materials and atmospheric radionuclides in reservoir-catchment system

*落合 伸也[1]、長尾 誠也[1]、宮田 佳樹[1,2]、松木 篤[1]
*Shinya Ochiai[1], Seiya Nagao[1], Yoshiki Miyata[1,2], Atsushi Matsuki[1]

1. 金沢大学 環日本海域環境研究センター、2. 金沢大学 先端科学・イノベーション推進機構
1. Institute of Nature and Environmental Technology, Kanazawa University, 2. Organization of Frontier Science and Innovation, Kanazawa University

To investigate the transport processes of earth surface materials in reservoir-catchment system, temporal changes in deposition fluxes of atmospheric radionuclides (^{210}Pb and ^{7}Be) and their sedimentation fluxes in the irrigation reservoir were observed in Noto Peninsula. Atmospheric deposition fluxes of ^{210}Pb and ^{7}Be were observed during one month with a collecting pan installed in Noto Atmospheric Monitoring Observatory in Suzu City during June 2016 to September 2017. Sedimentation fluxes of ^{210}Pb and ^{7}Be were also observed with sediment trap installed in the Shin-ike reservoir located at the 5 km from the atmospheric monitoring site for same intervals of atmospheric deposition.Deposition fluxes of atmospheric ^{210}Pb and ^{7}Be ranged 0.5-5.5 Bq/m/day and 3.1-25 Bq/m/day, respectively, and showed clear seasonal fluctuation with high deposition flux during winter and low during summer. Sedimentation flux of ^{210}Pb to the reservoir bottom was much larger than ^{210}Pb deposition flux from the atmosphere, suggesting that ^{210}Pb eroded from the catchment was major source to reservoir sediment. On the other hand, sedimentation flux of ^{7}Be was almost same level with deposition flux from the atmosphere, suggesting that the contribution of the catchment-derived ^{7}Be is negligible. These differences in contributions of catchment-derived radionuclides to reservoir sediment may be associated with the half-lives of ^{210}Pb (22.3 years) and ^{7}Be (53 days) and the residence time in the catchment area.

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