

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

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To investigate the transport processes of earth surface materials in reservoir-catchment system, temporal changes in deposition fluxes of atmospheric radionuclides (^{210}Pb and ^7Be) and their sedimentation fluxes in the irrigation reservoir were observed in Noto Peninsula. Atmospheric deposition fluxes of ^{210}Pb and ^7Be 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 ^7Be 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 ^7Be 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 ^7Be was almost same level with deposition flux from the atmosphere, suggesting that the contribution of the catchment-derived ^7Be 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 ^7Be (53 days) and the residence time in the catchment area.

Keywords: atmospheric radionuclides, earth surface materials, transport processes, reservoir-catchment system