

Long-term trends in stream water discharge and the Sr-90 concentration at the Chernobyl zone river

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The concentration of dissolved 90Sr in stream water was observed from August 1988 at the Sakhan river in the Chernobyl zone, located 7 km north west of the Nuclear power plant. Stream water was sampled; discharge rate was observed at intervals of approximately 1 or 2 times per month. The average rainfall from 1986 to 2014 was 642.1 \pm 86.5 mm/year, and rainfall was relatively large in summer time (from June to August). On the other hand, stream discharge rate began to increase from March to April, and started to decrease thereafter, reaching the minimum in August. Dissolved 90Sr increased during spring season, and decreased in summer time. We focused on the relationship between the dissolved 90Sr concentration and stream discharge rate, applied the conceptual dilution process model. The long-term trend of 90Sr concentration is well explained by the simple mixing of surface water with ground water and the physical decay constant. This result implies that the dilution by both surface water and ground water is the one of the key process responsible for 90Sr concentration in the stream discharge.