

Monitoring of radioactive Cs in stream discharge from small un-decontaminated forest in Fukushima

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Huge amount of radioactive materials were emitted by the accident of Fukushima dai-ichi nuclear power plant following to the Great East Japan Earthquake on March 2011. Five years have passed and decontamination has been proceeding at residential area and agricultural fields. Some evacuated areas are planning to accept return of former residences. However, especially in Fukushima, forest covers large area of the polluted region. A 70% of the area in Fukushima is covered by forest and most of them are still un-decontaminated. For returning village people, effects of polluted forest is important issue. From May 2016, we set monitoring and water sampling facility at the outlet of a small un-decontaminated forest. Water sampling was conducted when water level of the stream exceeded a threshold. Stream data and climate data at neighbor were transfer to the data storage by Field Reuter (X-ability, Inc.).

Water level-flow rate relationship and turbidity-suspension concentration relationship were determined, separately. Discharge of radioactive Cs was estimated by using those equations. Estimated discharge was 1470 MBq for 6 months since May till November, 2016. The number was 0.1 to 0.4% of the initial deposit (1 to 3 MBq m⁻²) of radioactive Cs at the nuclear power plant accident on March 2011.

Suspended sediments filtered by 0.45 μ m mesh membrane filters were subjected to imaging plate analysis. When suspended sediments seemed to be inorganic particles such as silt, sediments evenly contained radioactive Cs while when most of the sediments were consisted of organic matter, only several strongly radioactive Cs holding particles contributed most of radiation of the sediments. This suggested radioactive Cs in a sediment flowing a stream may variate temporarily depending on watershed conditions.

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