

## Influence of decontamination using observational data on sediment discharge from mountain stream to river and cesium dynamics in Yamakiya district

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A large amount of radioactive material was diffused into the air due to the accident at the Fukushima Daiichi Nuclear Power Station. It is estimated that about 80% of the radioactive material diffused into the air has fallen into the ocean and the rest into land. In particular, <sup>137</sup>Cs has a long half-life and a large impact on the environment. Therefore, it is important to elucidate the dynamics of <sup>137</sup>Cs in the environment. Decontamination has been carried out in areas where radioactive material has been deposited. While decontamination is expected to lower the air dose rate, soil erosion is likely to occur due to changes in land cover due to stripping of topsoil and disturbance of the soil. There are not so many studies on sediment runoff and <sup>137</sup>Cs dynamics than at decontamination sites. For this reason, it is not known how decontamination in upstream headwaters will affect river sediment discharge.

In the target area of this study, decontamination was carried out in Yamakiya district, Kawamata-town, Date-gun, Fukushima prefecture from 2013, and decontamination was completed in spring 2016. In addition, decontamination work has been completed in 2017, and residents have been returned, and in some areas, farmland has been restored and cultivation has resumed. For this reason, sediment runoff due to human activities different from the sediment runoff due to decontamination has occurred.

The purpose of this study was to study the relationship between sediment dynamics and Cs

dynamics due to decontamination, and the changes in sediment dynamics due to the return of residents. Observations and historical data were analyzed at Iboishi mountain in the forest and in the middle stream of Kuchibuto. We have been monitoring suspended sediment Cs-137 concentration, water runoff, and suspended sediment runoff since 2014 at the middle point of the Kuchibuto River and since 2013 at Mt.Iboishi. The change in LQ curve and <sup>137</sup>Cs concentration showed that <sup>137</sup>Cs concentration decreased sharply between 2014 and 2015 as an effect on decontamination in the forest sites. And Decontamination also increased the amount of sediment runoff in the river, but then decreased. Furthermore, by comparing the data of the forest sites and the river, it became clear that the effect of decontamination of the headwater basin appears on the river about one year later. It was also suggested that sediment runoff was increasing due to the impact of the return of residents.

Keywords: GIS, decontamination, <sup>137</sup>Cs