

## **Modeling of radionuclide transport in watershed –rivers-reservoir system of Niida river**

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The Niida River in Fukushima prefecture after the Fukushima Daiichi accident transports radiocesium from the heavy contaminated mountain areas of the evacuated zone of the accidental fallout to the flat coastal area of the watershed at Minamisoma city. A part of the radionuclides transported transported by being attached to sediments in the Mizanushi River, - the right mountain tributary of Niida River are trapped in the deep reservoir Takanokura. This watershed – river – reservoir system, that is intensively monitored after since 2011 provides a good test case for the research of the main driving mechanism of radiocesium transfer in complicated freshwater system. From other side there are needs for the development of the modeling tools for the predictive modeling of radiocesium fluxes and fate in this and neighboring river basins for the prediction of radiocesium dynamics during future high floods and for the assessment of the efficiency the clean up activities planned and started in some places at the river floodplain,

The open source distributed hydrological and sediment transport model DHSVM of University of Washington, has been extended is studies of Niida river by the including of the module of radionuclide particulated transport and transport in solute, n=based on the system of the equations tested in the studies for the rivers contaminated after the Chernobyl accident. New model has been calibrated versus the data measured on the experimental plots in Fukushima Prefecture, The two dimensional model of radionuclide transport COSTOX was implemented to simulate the dynamics of radionuclide in water, sediment and bottom deposition of Takanokura reservoirs, It was studied the difference in the temporal dynamics of particulated radiocesium conversation in dry weight for small tributaries – increasing during the high flood and for the main river flow crossing less polluted areas – decreasing during the flood. The weak impact of the small scale cleanup activities on water contamination was demonstrated in the set of the numerical experiments.