

## Development of erosion model by using fallout radionuclides for surface erosion on hill-slope

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Conversion models using fallout radionuclides have been proposed to evaluate the erosion rate by surface erosion on various landscapes such as agricultural land, grass land, pasture and forest. However, the disagreement in erosion rate between the estimates by cesium-137 ( $^{137}\text{Cs}$ ) and lead-210 excess ( $^{210}\text{Pb}_{ex}$ ) is recognized on hillslope where interrill erosion occurs. Here we review the problem of established conversion models and develop them. The diffusion and migration model (DM model) based on  $^{137}\text{Cs}$  is one of the most useful models among the conversion models. This model is based on the budget of  $^{137}\text{Cs}$  associated with deposition into the soil by fallout, diffusion and migration, and with loss by soil erosion and radioactive decay. In the application of  $^{210}\text{Pb}_{ex}$  to DM model, the erosion rate can be underestimated due to the increase in input of  $^{210}\text{Pb}_{ex}$  associated with soil particle from above by interrill erosion. We develop the DM model by incorporating the input of  $^{210}\text{Pb}_{ex}$  associated with the actual erosion process. The erosion rate estimated by developed model is evaluated by DM model based on  $^{137}\text{Cs}$ .