

Simulation of sediment disasters in the Shizugawa district, Uji

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Generally, the methods of predicting landslides can be divided into two types - statistical model and numerical model. Compared with the statistical model, the numerical model can provide more detail and precise result, but is difficult to employ on basin-scale because of time-consuming calculation. This paper proposed a novel method, which was based on numerical model (Integrated rainfall infiltration slope stability, IRIS) and multiple regressions as well as using the slope unit as the slope-stability analysis target, to predict the landslides on a basin scale. This method used a new warning indicator, critical water content (W_{cr}), which is derived from numerical model (IRIS). **Fig.1** shows that the result of using the regression formulation is very close to the result of the IRIS model in calculating the water content. The new method also had great performance on calculation to predict the occurring time and the locations of landslides (**Fig.2**). The heavy rainfall disaster occurring in the Shizugawa basin in 2012, located in Uji, Kyoto, was simulated by the new method. The simulation results were shown in **Table 1** and **Fig. 3**. The accuracy of landslide prediction was 89.7%.

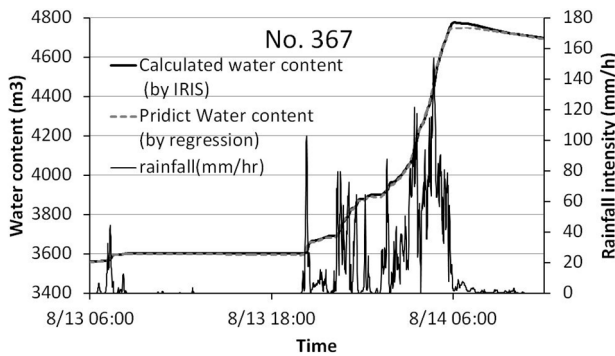


Fig.1 The change of the water content using the IRIS model and the regression formula

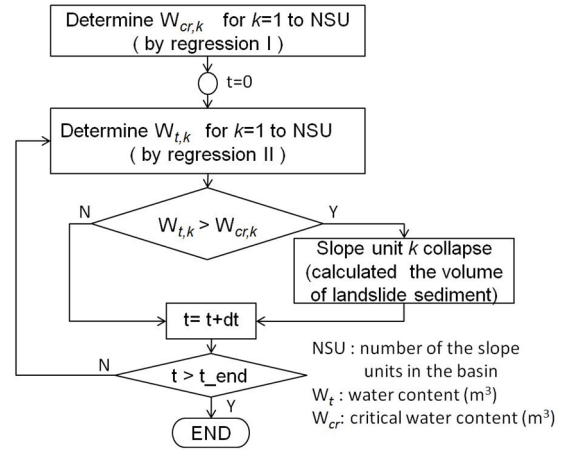


Fig.2 The flowchart of assessing the slope stability by W_{cr}

Table 1 The comparison of prediction and actual landslides in the Shizugawa basin

Number of the slope units		Prediction	
		Collapse	Non-Collapse
Actuality	Collapse	5	5
	Non-Collapse	40	385

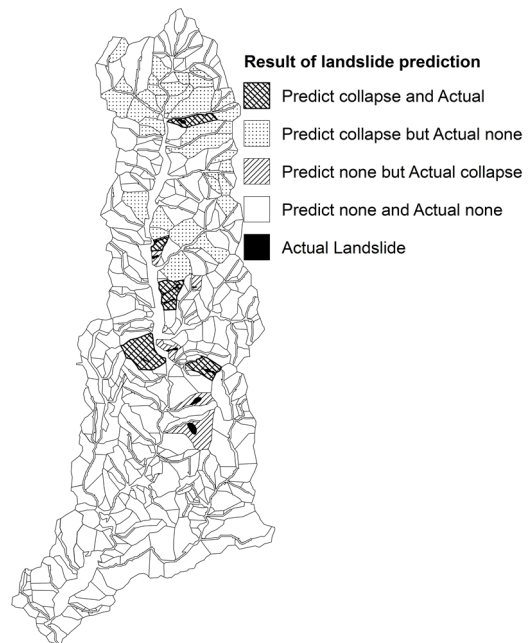


Fig.3 The result of comparing prediction with actuality for the landslides in the Shizugawa basin