

## Characteristics of sediment and solute runoff in the volcanic basins located in snowy mountain area

# Kazuya Akiyama[1]; Isao Machida[2]

[1] PWRI (Now in NILIM); [2] AIST

### 1. Introduction

It is an important subject to grasp the material movement in the basin of mountain area from the protection against disasters, ecosystem and environment. There is a little quantitative investigation in comparison with the phenomenon due to rain and the material movement through the year in the basin of snowy and volcanic area is not clear. Therefore, it is necessary to evaluate quantitative degree of a contribution to the material movement such as solute and non-solute material by snow and rain from the viewpoint of the run-off from the basin.

### 2. Outline of the investigation area and methods

The investigation area are two basins (Iougawa River: catchment area is 13.2km<sup>2</sup>, Koakazawa River: catchment area is 7.8km<sup>2</sup>) which locate at the west foot of Mt.Naeba in Tsunan-Town, Niigata Prefecture and Sakae-Village, Nagano Prefecture. These basins are mainly composed by basalt and andesite. Maximum day precipitation is about 150mm and maximum snow depth is 2.5 to 3m according to the weather observation in the past 4 years in the end of Koakazawa River basins. Snowfall term is from December to April and rainy season is from May to November. The continuously observation of water level, water temperature, turbidity, electric conductivity and pH and sampling river water have been carried out at the end of the basins. General water quality, degree of grain size, turbidity of the drifting sand and suspended solid were analyzed in the laboratory. Periodic sampling water in the river was measured from April 2000 to July 2004 and the continuously observation was observed from February 2002 to February 2005.

### 3. Results

1) Electric conductivity of Iougawa River was 0.01-0.06S/m and pH was 3.3-6.3. Water formation was composed of CaSO<sub>4</sub>-type on the trilinear diagram and a chemical formation hardly changed. Electric conductivity of Koakazawa River was 0.005-0.1S/m and pH was 6.2-7.8. Water formation was composed from CaSO<sub>4</sub> to Na<sub>2</sub>SO<sub>4</sub>/NaCl- type on the trilinear diagram and the formation ratio changed in the element of Ca<sup>2+</sup>, Na<sup>+</sup>, Cl<sup>-</sup> and SO<sub>4</sub><sup>2-</sup> without the relation to the river flux or the season.

2) The amount of discharge from the basin is large in order of the former half of the snow melt term, the latter half of snow melt term, the rainfall term and the snow term on the average of a day. Most non-dissolved material flown out in the snow melt and rainfall term. The amount of non-dissolved material beyond the snow melt term may occur when there is heavy rain in the rainfall term. The amount of dissolved material from the basin is large in order of the snow melt term, the rainfall term and the snow term on the average of a day and the former half of the snow melt term shows a tendency to the same or larger than the latter half of the snow melt term. The loading doses of dissolved material increase in order of the snow term, the rainfall term and snow melt term, and the former term is more equal from the latter term, or they show a tendency to be at snow melt term. The amount of dissolved material from the Iougawa River is about 5.6 times compared to the amount from the Koakazawa River.