# Research Overview

Japan is posed to risks of sediment-related disasters. In recent years, excessive rainfall, which is over the current design level, and natural sudden phenomena such as Mt. Ontake-eruption or Kumamoto-earthquake, have frequently occurred. It is required to mitigate or recover from these disasters quickly and effectively in the early stage. Our main researches are as follows.

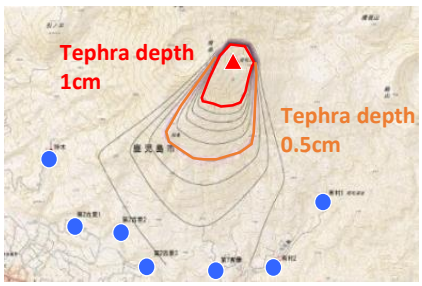
## Research to estimate potential areas affected by sediment movement based on monitoring

### Debris flow risk evaluation after the eruption

#### 1. Quantity of ash fall during the eruption

- Improvement of the observation equipment and measurement precision for the tephra depth by eruption.
- Estimation of deposition range and tephra depth .

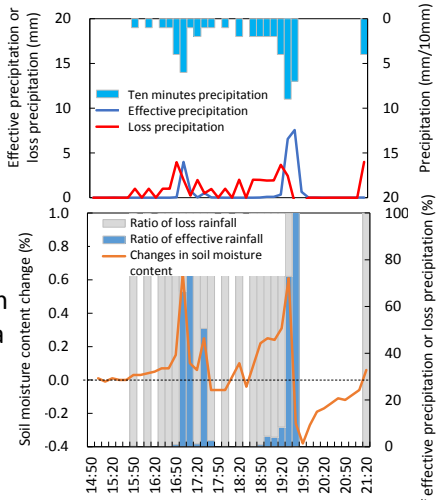

Examination on the new measurement method of tephra depth.




A isopach map about the tephra depth based on interpolation method.

#### 2. Prediction of the area affected by mudflow

- Observation of the change of the infiltration ability of the slope covered with tephra.
- Outflow analysis in consideration of the infiltration capacity changes.




(figure)
Effective precipitation increases as there is a large rise in soil moisture content.

→The analysis is needed to evaluate not only the outflow during a heavy rain but also the ratio of rainfall loss and infiltration capacity changes during a sprinkle.

#### Monitoring technology of debris flow

- Estimate technique on the gravity transformation slope scale.
- Detection technique on extremely sediment movement.

### Driftwood outflow risk evaluation

#### 3. Study to plan the driftwood measures in the wide area basin.

- Suggestion to estimate the driftwood outflow in the wide area basin.
- Suggestion of risk evaluation of the retransfer driftwood.

Driftwood overflowed the sabo dam

### Sabo facilities design by the debris flow

#### 4. Explication of the destruction mechanism of sabo dam

- Investigation of the damage actual situation of sabo dam.
- Explication of the destruction mechanism of sabo dam when the excess external force acted.

Sabo dam damaged by Kyushu disaster in 2017

#### 5. Advancement of the initial correspondence after debris flow

- Examination of the risk evaluation technique after debris flow disaster.
- Suggestion on the examination technique of the emergency procedure construction after debris flow disaster.


Examination of the stability by field work and experiment about the temporary structure.


Investigation of unstable sediment area in the torrents with UAV and SfM.