

Resistivity monitoring of water-leaking paddy field filled with water

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A large earthquake causes high hydraulic conductivity zones in the soil and the high hydraulic conductivity zones of soil often lead to leakage of water from a paddy field. Although the locations of infiltration have to be estimated, the locations cannot be observed from the surface. Electrical resistivity survey can provide spatial geological information non-invasively because electrical resistivity is strongly affected by the level of water saturation in the soil. After the 2016 Kumamoto earthquake occurred, although the amount of leakage from a paddy field increased, the location of infiltration was not observed. In this study, resistivity monitoring of a water-leaking paddy field filled with water was conducted. A resistivity change derived from 2D inversion of resistivity survey data was small beneath the paddy field and the resistivity beneath the bank of the paddy decreased 4 hr. after the start of filling with water. Since some rain occurred before the filling test, there was a possibility that the high saturation level caused no change beneath the paddy field. However, the resistivity beneath the paddy field decreased 24 hr. after the start of filling with water.

These results suggest that the leakage occurred beneath the bank of the paddy rather than beneath the paddy field.

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