The aquifer characterization in the headwater region by using ERT

Masahiko Ono[1]; Jun Shimada[2]; Reo Ikawa[3]

[1] Grad. school of Sci. & Tech., Kumamoto Univ.; [2] Grad. Sch. of Sci. & Tech., Kumamoto Univ.; [3] Grad. Sch. Sci. & Tech., Kumamoto univ.

http://www.sci.kumamoto-u.ac.jp/earthsci/hydrolab/index.html

The definition of watershed in the headwater region is well defined relatively, and many studies have been conducted about the hydrological process in the headwater region using multi hydrometric method. Especially, many researchers have done about the rain fall-run off processes, and now we could generally understand about the schematic aquifer system. However, it is difficult to estimate the detail aquifer system with only observed hydrological data. So we apply the electrical resistivity tomography, the one of geophysical exploration techniques, to understand about the aquifer system precisely. In this study, we will estimate the groundwater aquifer system in the headwater region using ERT.

The study area is the Kahoku experimental watershed-3, north of Kumamoto Prefecture, Japan. This area is managed by the Kumamoto Regional Foresty Offices. Bedrock is composed of crystalline schist.

We have conducted resistivity survey with electrode spaced at 2m interval using Wenner method. We have 2 lines, one is the valley line(has 238m length) trending north-south, the other line is perpendicular to valley line(has 92m length). We used the multi-electrode system , NEXT-400 manufactured by Kowa Company. Also we have measured the discharge at upstream, midstream and downstream, and the groundwater level above the surface of bedrock at the borehole.

At this time, we describe about the hydrological properties in the Kahoku experimental watershed, and groundwater aquifer characterization estimated by resistivity surveys in this headwater region.