Change of groundwater flow by an artificial construction of river channel-A case study of the Kusatsu river,Shiga prefecture-

Masao Kobayashi[1]; Shigekazu Kawazoe[2]

[1] Natural Sci., Osaka Kyoiku Univ.; [2] Hydrological Sci.,Osaka kyoiku Univ.

River flow,well water level,piezometric head beneath a river-bed,water quality and hydrogen and oxygen isotopes of river and well waters were measured to examine the change of groundwater flow system by an artificial construction of river channel in the Kusatsu river basin from November 2003 to September 2004.

River water lost in the upper region and the discharge is nearly equal to the volume of the discharge water through river bed estimated by piezometric head measurements.Also,the discharge area along river channel has extended towards the upper region compared to that area before new river construction.However,river channel usually gains much water in the lower region.These results indicate that groundwater is recharged by river water in the upper region,however,shallow groundwater discharged into the river in the lower region.The distribution of equi-contours of groundwater table showed that shallow groundwater flow in the lowland area has not changed since the new river construction,except the are around the new river channel.Isotopic ratio of oxygen and hydrogen of well waters near the estuary(old-Kusatsu river)and also the beginning point of new river channel were lower than those around the lowland area.This seems to be that shallow groundwater which was recharged in the upper region flows in these areas.These results are not consistent with the geological cross section view.