

Influences of Vegetation Species Difference on Groundwater Recharge Process

Junichi Kakubari[1]; Tadashi Tanaka[2]; Shin-ichi Iida[3]; Yohei Hamada[4]

[1] Natural Sci., Tsukuba Univ; [2] GS, Life & Environ. Sci., Univ. Tsukuba; [3] Inst. Geoscience, Univ. Tsukuba; [4] TERC, Univ. Tsukuba

In order to evaluate influences of vegetation species difference on groundwater recharge process, pressure heads of soil water in the vicinity of Japanese red pine (*Pinus densiflora*) and evergreen oak (*Quercus myrsinaefolia*) were measured in the forest located at the Terrestrial Environment Research Center, University of Tsukuba, Japan.

The results of field observation showed highly spatial variability in the distribution of pressure heads just after the rainfall. Firstly, when the soil is in moist condition, the pressure heads of evergreen oak side raised up more than that of Japanese red pine side. And at that time, the water table moved upward under evergreen oak like a mound. It is thought that the difference of stem flow amount between evergreen oak and Japanese red pine caused these phenomena. Secondly, when the soil is in dry condition, convergent zero flux planes (C-ZFP) were formed just beneath of both trees, and it remained in 80-100cm depth at Japanese red pine side. It is considered that the water uptake by Japanese red pine causes this phenomenon. Then, divergence zero flux plane (D-ZFP) was formed and it moved downward at evergreen oak side more deeply. Formation of D-ZFP in surface layer indicates that evergreen oak absorbs soil water in the vicinity of the surface. These differences in water absorption depth between Japanese red pine and evergreen oak correspond to each root system structure.

In conclusion, groundwater recharge at evergreen oak side is attended more faster than at Japanese red pine side. It is suggested that the difference of vegetation species makes a large influence on the groundwater recharge process.