

FOUR-DIMENSIONAL RESPONSE OF THE AQUIFER AND AQUITARD SYSTEM IN TOKYO TO GROUNDWATER WITHDRAWAL AND REGULATION

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ABSTRACT

The aquifer-aquitard system in the lowland and upland in Tokyo Metropolitan area had been under great stress due to groundwater withdrawal after the second World War. The stress had resulted in one of the most severe land subsidence in the world. Groundwater management policy adopted by Tokyo Metropole succeeded in stopping the land subsidence in the lowland by prohibiting the withdrawal, but groundwater is still in use in the upland area. Changes of the regional groundwater flow pattern in three-dimensional space were made clear by constructing the distribution map of the hydraulic head on two-dimensional vertical cross-section for years 1970, 1980, and 1987. Data used are the water level of observation wells, well logs with a single screen, and the static water level of wells for municipal water supply. From the revealed pattern of regional groundwater flow, roles of Tama and Sayama hills and the Tama River as groundwater recharge source, the function of Tachikawa fault in preventing groundwater flow, and areal differences in response of the aquifer-aquitard system to regulation and prohibition against groundwater withdrawal are made clear.

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