

A nesting model to integrate regional groundwater flow and local groundwater flow/land subsidence processes, an example from Tokyo

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Quantitative estimation of possible land subsidence by resuming groundwater extraction will provide us necessary information on whether it is feasible to control groundwater potential in the urban areas such as Tokyo. Using a coupled groundwater flow/land subsidence modeling is one of the candidates for this assessment though it is necessary to analyze both a fine-scaled model for detailed pore pressure distribution in aquitards and a regional groundwater flow model simultaneously. However, high resolution simulation covering large area would be very computer intensive, and hence, new approach for integrating these two spatially different problem should be developed. Here, we have developed a new scheme to integrating a regional groundwater flow simulator and small scale groundwater flow-deformation coupling simulator by a nesting technique. Preliminary simulation was carried out by our new simulation method for the Kanto Area as regional scale and a coupled groundwater flow/land subsidence model for the Tokyo Lowland. This nesting model has reproduced the temporal change of the effective stress in the aquitards and the land deformation in the Tokyo Lowland.