



Spatio-temporal variation of stream-aquifer interaction: Effect of a weir construction in Korea

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The Four Major Rivers Restoration Project was conducted to secure sufficient water resources, introduce comprehensive flood control measures, and improve water quality while restore the river ecosystem in Korea. The dredging of river bed and the installation of 16 weirs were done in Han, Geum, Yeongsan, and Nakdong rivers from late 2010 to early 2012 as a part of the project. Groundwater data obtained from 213 groundwater monitoring wells near the four major rivers were used to analyze the impacts of weir construction on the nearby groundwater flow system. The groundwater level and chemical characteristics were analyzed to investigate how the groundwater flow system and water quality changed after the weir construction. The results showed that groundwater level rose immediately following the rise of stream stage after the weir construction. Also, the hydrologic condition of the stream in some upland of the weirs was changed from a gaining to a losing stream. Consequently, the direction of groundwater flow was changed from perpendicular to parallel to the stream, and it swapped the groundwater in the downstream of the weir for the water recharged from the stream. Considering the results, some groundwater quality is expected to be changed and become similar to that of the stream, although the change has been not observed yet. Therefore, both further monitoring of the groundwater quality and hydrogeochemical analysis are required for quantitatively evaluating the effect of the weir.