

Evaluation of Stream Flow and Water Quality Impact of Yeongsan River Basin by Inter-Basin Water Transfer using SWAT

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(a) Purpose of study or research hypothesis

To evaluate the stream flow and water quality behavior by inter-basin water transfer using SWAT (Soil and Water Assessment Tool)

(b) Key issue(s) or problem(s) addressed

The Yeongsan river has the chronic problem of stream flow deficiency by stream flow withdrawals for agricultural activities and affects the stream water quality. To solve these problems, the necessary waters are com from the neighbor Seomjin river basin since 1991 by government decision. Such water transfer between watersheds provokes the water troubles and conflicts for sustainable water resources management and water environment.

(c) Methodology or approach used

To evaluate the stream flow and water quality behavior of Yeongsan river, The SWAT was built with 2 weirs (Seung-chon weir and Juk-san weir) considering inter-basin water transfer in the river reaches. After the SWAT was calibrated using daily streamflow, weir inflow, water quality, and water transfer data, the 6 water transfer scenarios were applied to understand water transfer impact on stream flow and water quality.

(d) Results or conclusions derived from the project

The SWAT calibration was set to 9 years (2012~2020). The average Nash-Sutcliffe efficiency (NSE) and the coefficient of determination (R²) of streamflow and weir inflows were 0.79-0.81. The water quality R² were 0.52-0.71.

(e) Implications of the project relevant to congress themes

This study can help to understand the stream environmental impact of inter-basin water transfer using the available field data and watershed modelling and to use for decision makers about inter-basin water resources distribution.

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