Desalination and Water Treatment
www.deswater.com
19 (2010) 105–112
July
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doi: 10.5004/dwt.2010.1902

The effect of climate change on Byeongseong stream's water quantity and quality

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Received 11 September 2009; Accepted 11 March 2010

ABSTRACT

For the assessment of climate change impacts for the Byeongseong stream, CSIRO-Mk3.0 is selected as future climate information. The projections come from CSIRO Mark 3.0 used to simulate the green house gases emission scenario known as A2. Air temperature and precipitation information from the global climate model simulations are converted to regional scale data using the statistical downscaling method known as multi-site precipitation generator. Downscaled climate data from global climate model are then used as the input data for the soil and water assessment tool to generate regional runoff and water quality estimates in the Byeongseong stream. As a result of simple sensitivity analysis, the increase of CO_2 concentration leads to increase water yield through reduction of evapotranspiration and increase of soil water. Hydrologic responses to climate change are in phase with precipitation change. Climate change is expected to increase water yields in wet season. In dry season, stream flow is expected to be reduced slightly. Soil losses and nutrient discharges are also in phase with precipitation change. However, it should be noted that there are many uncertainties in such multiple-step analysis used to convert climate information from global climate model based future climate projections into hydrologic information.

Keywords: Byeongseong stream; Climate change; Global climate model; Soil and water assessment tool; Water quality; Water quantity

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