Geophysical Research Abstracts
Vol. 21, EGU2019-1366-1, 2019
EGU General Assembly 2019

Development of a sensitivity analysis procedure for coupled socioeconomic and environmental models

Xingyu Peng, Jan Adamowski, Inam Azhar, and Julien Malard
Department of Bioresource Engineering, McGill University, Montreal, Canada

A dynamically coupled model, encompassing a system dynamics model representing socioeconomic behaviors and a physical-based model simulating environmental processes, is a promising approach for yielding a holistic understanding of socioeconomic and environmental interactions. Such models, typically constructed to represent behavior patterns of simulated systems are associated with high parameter uncertainty, intensive computational requirements, and multiplicity of interacting parameters. In this context, the identification of the suitability of the application of behavior-based SA (pattern changes in output behaviors resulting from changes in model inputs) on such coupled models, compared to the application of conventional numerical SA (numeric changes in output values resulting from changes in model inputs), remains challenging. This presentation aims to develop a systematic behavior pattern-based SA procedure incorporated with two global sensitivity analysis (GSA) techniques, Morris and EFAST to investigate the changes associated with output behavior mode (e.g., exponential, logistic, oscillation) yielded by changes in input parameter values, and compare with conventional numerical SA. A coupled system dynamics and environmental model (P-GBSDM) was applied in the developed procedure for water table depth simulation in the Rechna Doab sub-basin, Pakistan.