

Sensitivity Analysis of a Photosynthesis-Stomatal Resistance Model

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One of the biggest problems that we face in the 21st century is climate change, especially global warming. The Community Land System Model (CLM) helps scientists understand how human and vegetation can affect the climate. An important task at the moment is to link measurements collected at a site with results computed by the CLM components. This project will investigate the influences of critical parameters to photosynthesis by carrying out sensitivity and uncertainty analyses of a leaf photosynthesis-stomatal resistance model that is utilized by the CLM. Such techniques will allow us to understand how the variation in the output parameters can be related to changes in input parameters. SimLab software was used for Monte Carlo analysis and generation of sensitivity indices through the methods of Extended FAST, Sobol, regression, and Morris. A ranking of influential parameters can then be determined based on each method. The results shed light on the influential significance of vegetation temperature to photosynthesis.