



Prediction of the productivity of cedar plantation in the Southern Japan using a process-based model

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In Japan, there is increasing concern about the effects of climate change on the growth or decline of old Japanese cedar (*Cryptomeria japonica*) plantations. Process-based models can be an effective tool for predicting the responses of tree plantations to changing climate. In many cases, however, it is difficult to identify all of the model parameters by direct measurement. This study tested the practicability of Bayesian calibration to the parameterization of a process-based model for estimating the growth of Japanese cedar plantations. The process-based model Biome-BGC was used with the default parameters (evergreen needle leaf forest). We also used monitoring data for Japanese cedar plantations, including the monthly averaged data for the gross primary production (GPP) and ecosystem respiration (RE) for 2001–2003 in the Kahoku Experimental Watershed in Kyushu island, the Southern Japan. The simulations of GPP and RE were improved after Bayesian calibration, compared with the default values. In addition, the prediction map of net primary production (NPP) as an index of potential productivity in Kyushu island was created based on current and future climate scenarios at a 1-km resolution. The prediction map remains under development and the future work involves the validation using wide-area database and the calibration by multi-site flux data.