

Improvements in AOGCM by the introduction of a simple wetland scheme

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In projections of future climate change, reduction of biases in general circulation models (GCMs) is necessary in order to improve their reliability. In particular, warm bias over middle and high latitude land is a common feature among many GCMs. In the Arctic region, snow melt water remains as temporal ponds so that atmosphere-land interaction changes land surface heat and water balance. However, this effect has yet to be included in the GCM land. Nitta et al. (2014) introduced a simple wetland scheme into a GCM land sub-model and revealed that wetland reduces the warm bias. In the present study, we introduced this simple wetland scheme into a GCM and investigated the effect of this new scheme upon the climate system. We also performed global warming experiments by quadrupling the atmospheric carbon dioxide concentration with this new scheme to evaluate the effect of melt water under global warming.

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