Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

AHW29-02 Room:314 Time:May 2 14:30-14:45

Examining initialization procedures of terrestrial carbon cycle models

ITO, Akihiko[1*]

[1]National Institute for Environmental Studies

It has been realized that long-term trends in model simulation is affected by initialization procedure. In terrestrial carbon cycle models, insufficient stabilization can result in artificial trends (lingering sink or source in CO2 flux) in the simulated carbon budget, making it difficult to interpret simulation results and make comparison with observational data. Conventionally, an equilibrium state of terrestrial carbon budget has been obtained through iterative calculations using an appropriate forcing data. This spinning-up method requires high computational cost, typically, at over 90% of total computational cost. On the other hand, terrestrial modeling has another problem related to initialization; actual ecosystems are not always at steady state due to disturbance and environmental change. As a result, different model groups adopt different initialization procedures, raising some problems in inter-model comparison. In this study, I examined how an alternative initialization method (semi-analytical solution) works in a terrestrial carbon cycle model and is effective to reduce computational cost in comparison with the conventional spinning-up. I discuss possibility of better initialization procedures, in terms of idealism, realism, and generality, not only with model researchers but also with filed researchers.

Keywords: terrestrial ecosystem model, initialization, carbon budget