A Framework for Benchmarking Land Models

Objective:

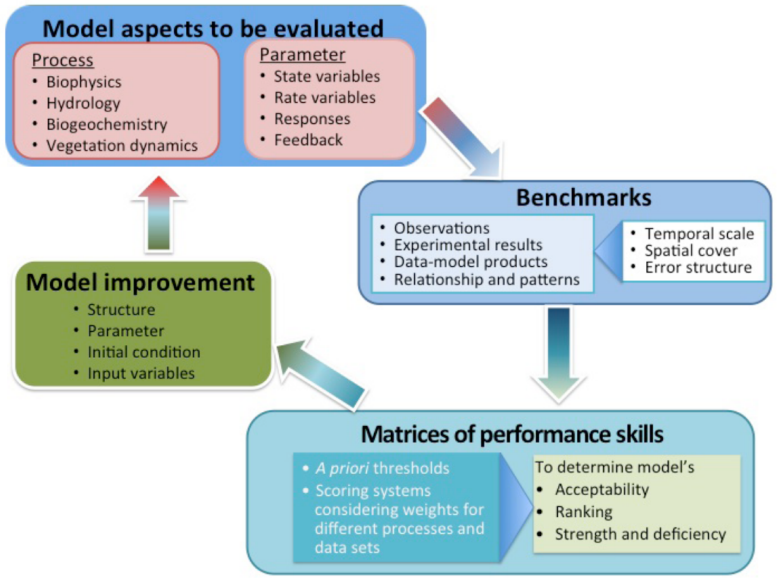
Propose a framework for systematic evaluation of land model performance and highlight major challenges for community benchmark analysis.

Approach:

- Benchmarks should be defined to measure model prediction skills for simulating ecosystem responses and feedbacks to climate change based on comparison with observations.
- Model performance metrics must quantify model-data mismatches for many processes at a range of spatial and temporal scales.

Results/Impacts:

- Candidate benchmarks for biophysical processes, biogeochemical cycles, and vegetation dynamics were identified by the international community.
- A model benchmarking framework would standardize model assessments and provide a basis for quantifying model improvement.



A systematic benchmarking framework for assessing land model performance includes components for identifying model aspects to be evaluated, selecting benchmark standards, developing a reference scoring system, and stimulating model improvement.

Luo, Y. Q., J. T. Randerson, G. Abramowitz, C. Bacour, E. Blyth, N. Carvalhais, P. Ciais, D. Dalmonech, J. B. Fisher, R. Fisher, P. Friedlingstein, K. Hibbard, F. Hoffman, D. Huntzinger, C. D. Jones, C. Koven, D. Lawrence, D. J. Li, M. Mahecha, S. L. Niu, R. Norby, S. L. Piao, X. Qi, P. Peylin, I. C. Prentice, W. Riley, M. Reichstein, C. Schwalm, Y. P. Wang, J. Y. Xia, S. Zaehle, and X. H. Zhou (2012) "A Framework for Benchmarking Land Models." *Biogeosci.*, 9(10):3857–3874. doi:10.5194/bg-9-3857-2012.