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# Reducing Uncertainty in Biogeochemical Interactions Through Synthesis and Computation

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*The RUBISCO Scientific Focus Area (SFA)*

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U.S. DEPARTMENT OF  
**ENERGY**

Office of Science

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# RUBISCO

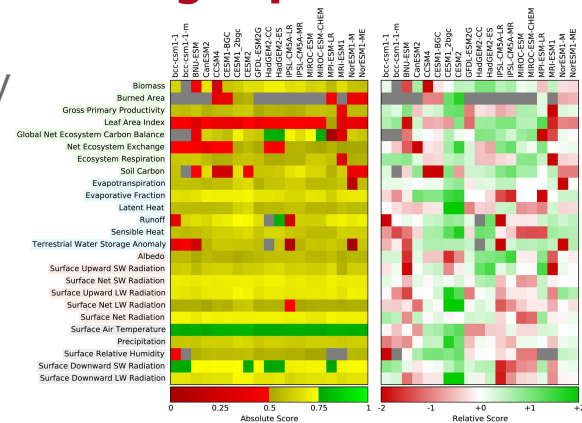
# ILAMB package provides rigorous model benchmarking capabilities

**Objective:** To provide a platform for objectively and systematically benchmarking terrestrial biogeochemistry & land surface models.

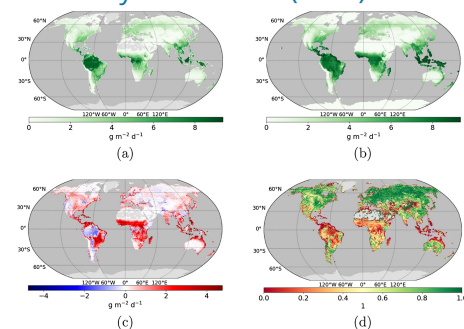
**Approach:** We developed an open source benchmarking software package that generates graphical diagnostics and scores model performance based on comparisons with observational data.

**Results/Impacts:** We used a suite of in situ, remote sensing, and reanalysis data sets in a Python package developed to evaluate model fidelity. Described is the benchmarking philosophy and mathematical methodology embodied in the ILAMB package, which is already in use in international modeling centers.

Collier, N., F. M. Hoffman, D. M. Lawrence, G. Keppel-Aleks, C. D. Koven, W. J. Riley, M. Mu, J. T. Randerson (2018), The International Land Model Benchmarking (ILAMB) System: Design, Theory, and Implementation, *J. Adv. Model. Earth Sy.*, 10(11):2731–2754, doi:[10.1029/2018MS001354](https://doi.org/10.1029/2018MS001354).



**Figure:** ILAMB scores land models (columns) across a variety of variables (rows).



**Figure:** Example model-data comparison for gross primary production (GPP).