Reducing Uncertainty in Biogeochemical Interactions Through Synthesis and Computation

The RUBISCO Scientific Focus Area (SFA)

U.S. DEPARTMENT OF ENERGY

Office of Science

RUBISCO

Enhancing Global Change Experiments through Integration of Remote Sensing Techniques

Objective: To identify how remote sensing techniques and related analysis methods may improve global change experiments.

Approach: Investigate how near-surface, airborne, and satellite remote sensing can provide additional insights into ecological processes while reducing costs.

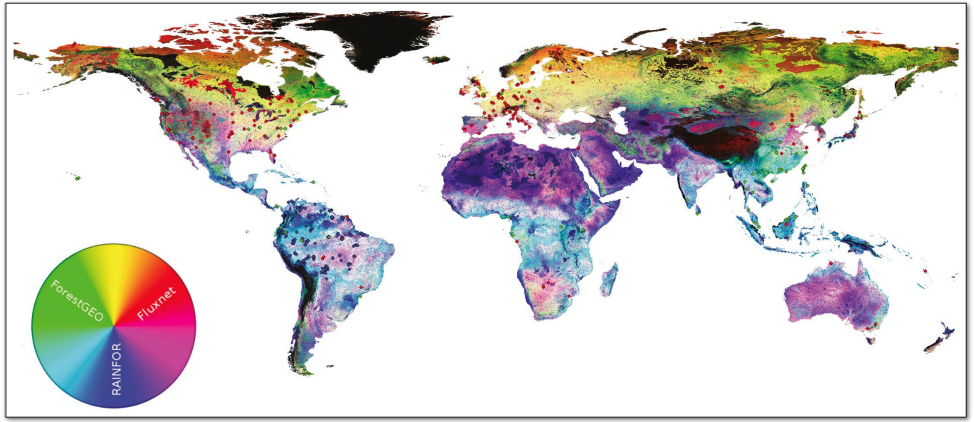

Figure: Global representativeness of three sampling networks using the site-based metric. Colors indicate bioclimatic similarity to sites in the FLUXNET (red), RAINFOR (blue), and CTFS-ForestGEO (green) networks.

Results/Impacts: Near-surface techniques—including spectroscopy, thermal and fluorescence imaging, terrestrial laser scanning, digital repeat photography, and unmanned aerial systems—provide novel information and improve the context, accuracy, and completeness of traditional observations. Airborne and satellite data can be used to understand the representativeness of sites and search for patterns of change.

Shiklomanov, A. N., B. A. Bradley, K. M. Dahlin, A. M. Fox, C. M. Gough, **F. M. Hoffman**, E. M. Middleton, **S. P. Serbin**, L. Smallman, W. K. Smith (2019), Enhancing Global Change Experiments through Integration of Remote-sensing Techniques, *Front. Ecol. Environ.*, 17(4):215–224, doi:10.1002/fee.2031.