Earth Syst. Sci. Data Discuss.,
https://doi.org/10.5194/essd-2017-130-RC2, 2018

Open Access Earth System Science Data Discussions

Interactive comment on "Upscaled diurnal cycles of land-atmosphere fluxes: a new global half-hourly data product" *by* Paul Bodesheim et al.

Anonymous Referee #2

Received and published: 6 March 2018

This paper applies standard machine learning (ensemble, random forest regression) algorithms to upscale measured site fluxes (GPP, TER, NEE, LE, H, net radiation) to global scales. This approach is reasonable, and suitable for ESSD provided the following comments are fully addressed in a revised paper.

(1) Sections 1 and 6 (Introduction and Results): It is essential to provide some context regarding other competing measurement-model estimates of some of these fluxes (e.g. NOAA Carbon Tracker, etc.) and to compare the fluxes in Section 6 to these wherever appropriate.

(2) Section 2 and Appendix A (Data Sources): To judge the adequacy of the global land spatial coverage of the eddy covariance tower data that underpin the model development and testing, it would be essential to show a latitude-longitude map of their

Printer-friendly version

Discussion paper

locations superimposed on lat-long maps of the computed variables (GPP, etc) and to comment on geographical regions where the upscaling model has not been adequately assessed using observations.

(3) Sections 6 and 8 (Data uncertainties): The half-hourly data are provided without an explicit measure of their uncertainties, which is not satisfactory if they are to be used e.g. to compare with other estimates of the computed variables, or to use e.g. as priors in a "top-down" optimal estimation of these variables using atmospheric models and CO2 mole fraction data. In this respect, while the Nash-Sutcliffe model efficiency (NSME) values given in the text help give confidence in the model, they are not directly applicable to uncertainties in the data. As a proxy for these uncertainties you could at least show the rms values of the model-observation residuals used in the calculation of the NSME values. While these would not be applicable to the uncertainties in the poorly observed regions, they would at least provide lower limits to them.

(4) Data access: Not only are registration and notification required, but finding appropriate software to facilitate the download, viewing and display took time. It would be very useful if concrete suggestions of what software works (Panoply, etc.) were given prominently in this paper and on the BACI website.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2017-130, 2018.

Printer-friendly version

Discussion paper