

The LandFLUX initiative

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The Global Energy and Water Cycle Experiment (GEWEX) Radiation Panels (GRP) LandFlux initiative is focused on developing an operational approach for routine production of a multi-decadal global land based surface flux data set, in recognition of a current lack of such data in the Earth science community. Towards this end, different tasks are currently ongoing, including 1) reviewing the current state of the art in global flux estimation techniques; 2) compiling an inventory of available global surface heat flux products, spanning observationally-based (in situ and satellite), model-based, and mixed observation-model approaches; 3) developing a program for systematic intercomparison of these different approaches; and 4) identifying options for an operational approach and the needed protocols in producing such data sets.

A preliminary intercomparison of global products has proved to be an extremely interesting and valuable exercise, particularly in identifying consistencies and disparities between remote sensing and other model based estimation approaches. While there seemed to be generally good agreement between spatial patterns among the various approaches, there was also a large range in values across many regions of the world. Figure 1 shows as an example of yearly averaged latent heat fluxes for a range of products. The following products are displayed: (a) four remote sensing products from Oxford University (OXUNI, provided by Joshua Fisher), the University of Maryland (MAUNI, by Kaikun Wang), Paris Observatory (OBSPM, by Carlos Jimenez), and Princeton University (PRUNI, by Justin Sheffield and Eric Wood); (b) a global upscaling of eddy covariance measurements (FLUXNET) from the Max Planck Institute for Biochemistry (MPIBG, by Martin Jung and Markus Reichstein); (d) three reanalysis estimates (NCEP-DOE, ERA-INTERIM and MERRA); and (e) land surface model estimates from the GSWP-2 multi-model ensemble and the GLDAS participating models NOAH, CLM and MOSAIC. These first intercomparisons have now been expanded into an ongoing focused activity (LandFlux-EVAL), that includes multi-scale (spatial and temporal) data sets, assessment over longer time-periods, and identification of specific regions for focused analysis. ETH Zurich and the Observatoire de Paris are the contact institutions for this activity (see <http://www.iac.ethz.ch/url/LandFlux-EVAL>).

Recent publications are showing that there is a growing number of groups independently pursuing global scale estimation of flux components. These products vary in terms of the forcing data used, the governing equations employed, and the spatial and temporal scales of their application. The GEWEX LandFlux activity will provide a framework for undertaking coordinated evaluation and assessment of these various products, ultimately identifying and delivering a robust procedure for operational production of a global land surface flux data set to improve climate scale water and energy cycle characterisation.

Acknowledgements. All data producers are kindly acknowledged by making their estimates available and by being available for discussions concerning their products.

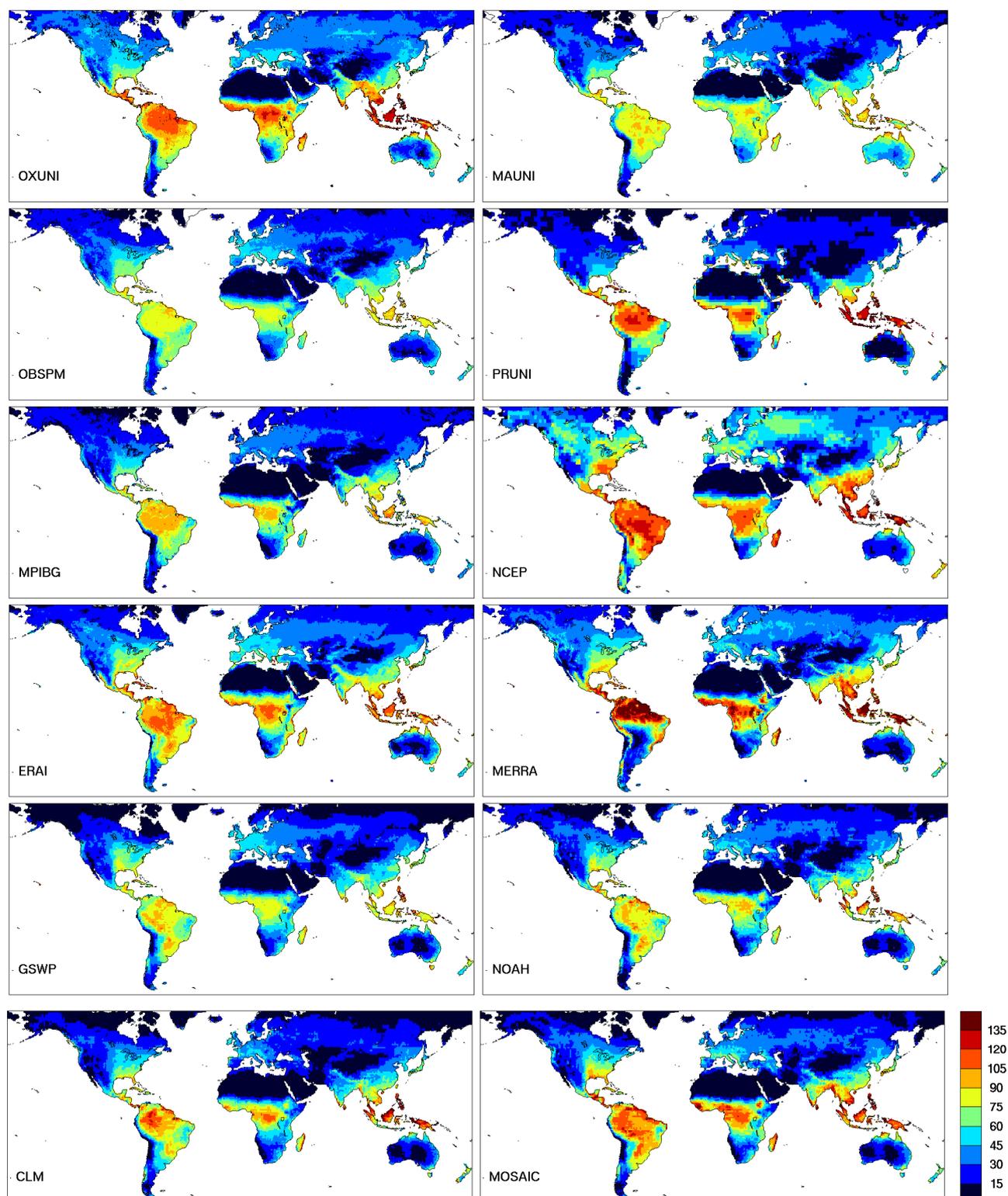


Figure 1: 1994 yearly averaged latent heat fluxes. See the text for details.