

## 4<sup>th</sup> LandFlux Workshop

4–5 October 2012  
Paris, France

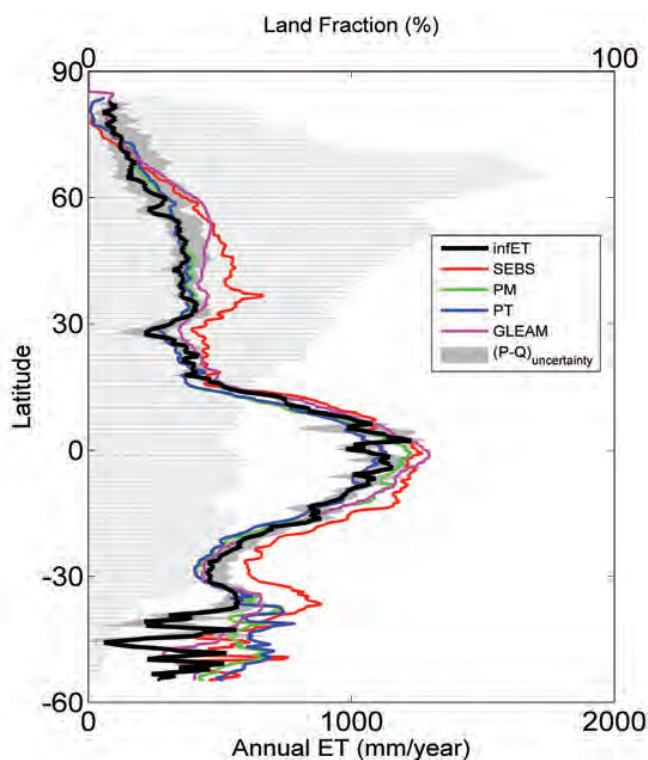
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LandFlux is an initiative of the GEWEX Global Data Assessment Panel (GDAP) to develop a multi-decadal, global land-based surface heat flux data set that is spatially and temporally compatible with the other GEWEX data products. The Workshop, which was hosted by the Paris Observatory, reviewed the status and plans of the initiative, including evaluations of current products, intercomparisons, and the use of land heat flux products.

The LandFlux Version 0 product uses four different evapotranspiration methodologies (Su, 2002; Mu et al., 2007; Fisher et al., 2008; Miralles et al., 2011) that were run for the period 1984–2007 with a common forcing data set (Vinukollu et al., 2011). Previous intercomparisons have highlighted large differences in the satellite-based heat flux products that exist for particular regions and periods (Jimenez et al., 2011). Identifying the causes and mechanisms that produce these differences is an ongoing exercise, and participants are encouraged to contribute their independent estimates and analysis to this effort. Those interested in contributing to the LandFlux analysis may download the flux estimates and assess them in the framework of other relevant products. In addition, the forcings may be obtained for running with other methodologies. The estimates from these assessments will be used for comparisons with the other flux simulations. Requests to access the data or to contribute with new estimates and analysis may be directed to the LandFlux Data Coordinator ([carlos.jimenez@obs-ppm.fr](mailto:carlos.jimenez@obs-ppm.fr)).

A large part of the workshop was dedicated to the initial evaluation of the daily latent flux estimates. Representatives from Princeton University and the University of Bristol presented comparisons with other inferred evaporation estimates and ground measurements from the eddy covariance Flux Tower Network (FluxNet). A comparison with inferred precipitation minus discharge estimates is given in the figure on this page. Although the use of common forcing narrows the differences between the flux estimates, significant differences were evident at a number of locations throughout the simulation time period. A study by the University of New South Wales illustrated the challenges of evaluating model runs against in situ flux data by presenting a comparison of the different flux models using tower-based meteorology. The challenges of producing independent sensible heat flux data (as opposed to calculation via the residual of the surface energy balance, given knowledge



Comparison of the four global LandFlux V0 ET estimates with ET inferred from  $P-Q$  as estimated from a set of five global gridded precipitation data sets and the Global Runoff Data Centre water balance model composite gridded runoff climatology. The gray shading represents the uncertainty in  $P-Q$  as quantified by the different precipitation data sets. Horizontal bars show the fraction of land per latitude band.

of the latent heat flux) and limitations in model choice related to the availability and quality of global forcing (e.g., the air-surface temperature gradient) were also discussed.

The Swiss Federal Institute of Technology (ETH) Zürich is developing a benchmarking data set that provides summary statistics of existing evapotranspiration products. The data set builds upon the earlier analysis by Mueller et al. (2011) and will be available on a monthly time scale for the periods of 1989–1995 and 1989–2005. Statistical and physical constraints were applied to ensure the realism of the derived estimates. The product and a publication documenting this effort are nearly complete and will be made available via the LandFlux-Eval website at: <http://www.iac.ethz.ch/url/Land-Flux-EVAL>. It was also demonstrated how this new product can be used to evaluate the robustness of recent analyses on global evapotranspiration trends, as well as to validate the new Coupled Model Intercomparison Project-Phase 5 (CMIP-5) global climate model simulations.

Efforts by other international groups were reviewed in terms of flux production, evaluations, modeling, and use of existing estimates for scientific analyses. The Water Cycle Multi-mission Observation Strategy (WACMOS)-Evapotranspiration (ET) Project, a European Space Agency initiative, will produce ET

estimates using a range of methodologies. It will focus on flux simulation at continental and regional scales, with a special effort to develop an internally consistent reference input data set that will provide the forcing needed to derive and evaluate these estimates. A high-resolution climate data record of land surface fluxes (referred to as HOLAPS) developed by the Max Planck Institute for Meteorology was presented, including the efforts to evaluate it. An analysis by the Laboratoire des Sciences du Climat et l'Environnement of land-heat flux observations over Europe to constrain regional climate change projections was also presented. The Centre for Ecology and Hydrology is conducting analyses using simple conceptual models to characterize the partitioning of heat flux components for evaluation against the Joint UK Land Environment Simulator (JULES). The Laboratoire d'Océanographie et du Climat-Institut Pierre-Simon Laplace is working on assessing and improving the surface hydrology simulation over the Amazon River Basin in the land surface model ORCHIDEE. The Amazon River Basin is one of the largest contributors to global latent fluxes, and the use of observational ground- and satellite-based products to evaluate the seasonality of the fluxes and the relative contribution of their components (i.e., the partition between interception and transpiration) was discussed.

The next step is for the LandFlux Version 0 product to be merged into the GEWEX Integrated Product. This GDAP-led effort is directed at facilitating an observation-based analysis of the water and energy cycles by offering a suite of products developed using common ancillary data and consistent processing and packaging protocols. For LandFlux, this requires the production of 3-hourly estimates, independent sensible and latent flux estimates, and the adoption of forcing based on common ancillary data sets. To assist in this effort, representatives from the GEWEX SeaFlux Initiative, the Surface Radiation Budget Project, and the International Satellite Cloud Climatology Project provided explanations of the proposed data sets and the necessary adaptations required, based upon previous experience. A joint SeaFlux/LandFlux workshop is being planned during the 2013 EUMETSAT Meteorological Satellite Conference and 19<sup>th</sup> American Meteorological Society Satellite Meteorology, Oceanography, and Climatology Conference being held in Vienna in September 2013.

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## GEWEX Hydroclimatology Panel Meeting

11–13 October 2012  
Sydney, Australia

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The GEWEX Hydroclimatology Panel (GHP) Meeting was held at the University of New South Wales (UNSW) in Sydney, Australia, and was hosted by Drs. Jason Evans and Matt McCabe of the UNSW Centre of Excellence for Climate System Science. The meeting focused on results from the past year, the continued restructuring of GHP science elements, and planning for the GHP contribution to the climate research challenges and questions posed for Phase III of GEWEX.

The organization of GHP has been simplified into two main activities—Regional Hydroclimate Projects (RHPs) and crosscutting projects that are research topic based. Current and proposed crosscutting project topics are: (1) extremes (e.g., drought and high frequency precipitation); (2) water and energy exchanges studies; (3) high elevation science; and (4) seasonal stream flow forecasting.

#### Regional Hydroclimate Projects (RHPs)

New criteria for defining and evaluating RHPs and their contributions to GEWEX were endorsed by the GEWEX Scientific Steering Group, and provides a framework for GHP to assign the designations of “former, current, or prospective” to the RHPs (see the figure on the next page). Using these criteria, GHP approved the continuation of four regional studies and their proposed end dates: (1) the Baltic Sea Experiment (BALTEX) 2013; (2) the Northern Eurasian Earth Science Partnership Initiative (NEESPI) 2015; (3) the Monsoon Asian Hydro-Atmospheric Science Research and prediction Initiative (MAHASRI) 2015; and (4) the Hydrological cycle in the Mediterranean Experiment (HyMeX) 2016. Of the regional studies designated as “Prospective,” the Saskatchewan River Basin Project was shown to be the most mature in its planning and was endorsed by the Panel as an Initiating RHP.

#### GHP Crosscutting Projects

The goals for GHP crosscutting activities are: (1) to generate interactions between RHPs; (2) maintain links with completed RHPs; (3) advance the GHP contributions to the GEWEX Science Questions (GSQs); and (4) address issues of common concern with the other GEWEX Panels and WCRP projects. Crosscutting projects are limited to a duration of 2–3 years with the possibility of extension. Proposals for these projects follow a prescribed template with specifics related to the GHP science objectives, the relationship of the project to the RHPs, and to the GEWEX Imperatives and GSQs. A design-