Geophysical Research Abstracts
Vol. 16, EGU2014-14945, 2014
EGU General Assembly 2014

Energy and water fluxes at different spatial scales from an energy water balance model, eddy covariance towers and remote sensing land surface temperature

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Estimates of water and energy fluxes are extremely important for irrigation management in particular in area characterized by scarce water availability. Remote sensing data at different spatial and temporal resolution (from airborne to satellite) are used to implement a pixel to pixel calibration procedure of soil hydraulic and vegetation parameters into a distributed energy-water balance model in a heterogeneous agricultural area. Soil hydraulic parameters have an important role in hydrological models due to their involvement in the computation of the principal fluxes, but their spatial definition is still a difficult issue. The distributed hydrological model, Flash–flood Event–based Spatially–distributed rainfall–runoff Transformation- Energy Water Balance model (FEST-EWB) will be used, based on the system between energy and mass balances which are solved in terms of the representative equilibrium temperature. This equilibrium surface temperature is compared to remote sensing land surface temperature to calibrate soil hydraulic and vegetation parameters in each single pixel of the study area minimizing the errors.
The second target is the definition of the length scales of different processes (evapotranspiration and soil moisture) above which the variance of the different variables becomes insignificant for the process, so that bare soil and vegetation behaviours are no longer distinguishable
The procedure will be applied to the Barrax agricultural district characterized by a patchwork of cultivated and non cultivated fields using data from different field campaigns.