Geophysical Research Abstracts
Vol. 14, EGU2012-4390, 2012
EGU General Assembly 2012

Implementation and offline evaluation of a land carbon module within the ECMWF global land surface model: CTESSEL

S. Boussetta, G. Balsamo, A. Bejaars, A. Agusti-Panareda, E. Dutra, and A. Manrique Sunen
European Centre for Medium-Range Weather Forecasts, Shinfield Park, Reading, RG29AX, UK

Session: BG2.6
Earth observation for monitoring the global energy, water and carbon cycles over land

Abstract
The vegetation layer, via its impact on radiation, winds, rainfall interception and transpiration in one hand and on the carbon assimilation and release on the other hand, plays an important role on the surface-atmosphere exchanges, and therefore an accurate representation of the processes driven by vegetation is essential in Earth System Modeling.
In this study, a carbon module has been added to the land surface model of the European Centre for Medium Range Weather Forecasts (ECMWF) in order to improve the physical representation of the vegetation allowing at the same time to simulate the photosynthesis processes and the release of carbon dioxide via land biogenic processes and taking into account cold processes. This development, added to the Hydrology-Tiled ECMWF Scheme for Surface Exchange over Land (HTESSEL) benefits from quite accurate simulations of soil moisture and energy fluxes at the surface, and introduces the capability of interacting with atmospheric carbon transport models and providing the biospheric Net Ecosystem Exchange (NEE) as surface boundary condition.
An extensive verification based on a number and variety of field site experiments, gathered by the FLUXNET, CEOP and BERMS Observing networks has been performed. In areas where field-sites observations are not available intercomparison with widely used NEE products are presented. The key facts and limitations of the current scheme are evaluated in offline simulations driven by accurate meteorological forcing to mainly focus on the land surface exchanges.