An improved characterization of the land surface heterogeneity over Africa for use in Land Surface Models

Details

Meeting	2011 Fall Meeting
Section	Biogeosciences
Session	Understanding Terrestrial Ecosystem Carbon Fluxes, Structure, and Dynamics by Model Data Syntheses Across Space and Time I Posters
Identifier	B43F-0358
Authors	Kaptue, A*, GIScCE, SDSU, Brookings, SD, USA Roujean, J, CNRM, Meteo France, Toulouse, France Begue, A, TETIS, CIRAD, Montpellier, France Faroux, S, CNRM, Meteo France, Toulouse, France Boone, A, CNRM, Meteo France, Toulouse, France Hanan, N P, GIScCE, SDSU, Brookings, SD, USA Prihodko, L, GIScCE, SDSU, Brookings, SD, USA
Index Terms	Biosphere/atmosphere interactions [0426] Ecosystems, structure and dynamics [0439] Remote sensing [0480]

Abstract

Information related to land surface is immensely important to global change science. For example land surface changes can alter regional climate through its effects on fluxes of water, energy and carbon. In the past decades, data sources and methodologies for characterizing land surface heterogeneity (e.g. land cover, leaf area index, fractional vegetation cover, bare soil and vegetation albedos) from remote sensing have evolved rapidly. The double ECOCLIMAP database - constituted by a land cover map and land surface variables and derived from AVHRR observations acquired between April 1992 and March 1993 - was developed to support investigations that require information related to spatio-temporal dynamics of land surface. Here we describe ECOCLIMAP-II, a new characterization of the land surface heterogeneity based on the latest generation of sensors, which represents an update of the ECOCLIMAP-I database over Africa. Owing to the many features of the MODIS sensors (a better accurate in spatial resolution and spectral information compared to the AVHRR sensor), a variety of methods have been developed for an extended period of 8 years (2000 to 2007) to strengthen consistency between land surface variables as required by the meteorological and ecological communities. The relative accuracy (or performance) quality of ECOCLIMAP-II was assessed (i.e. by comparison with other global datasets). Results illustrate a substantial refinement. For instance, the fractional vegetation cover resulting in a root mean square error of 34% instead of 64% in comparison with the original version of ECOCLIMAP. These new datasets have been implemented in land surface models (LSM) to investigate the sensitivity of energy, water and carbon fluxes to the land surface heterogeneity over the Sahel.

Cite as: Author(s) (2011), Title, Abstract B43F-0358 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.