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Geosci. Model Dev., 6, 563-582, 2013

www.geosci-model-dev.net/6/563/2013/

doi: 10.5194/gmd-6-563-2013

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ECOCLIMAP-II/Europe: a twofold database of ecosystems and surface parameters at 1 km resolution based on satellite information for use in land surface, meteorological and climate models

S. Faroux¹, A. T. Kaptué Tchuenté^{1,*}, J.-L. Roujean¹, V. Masson¹, E. Martin¹, and P. Le Moigne¹

¹CNRM-GAME (Météo France, CNRS), UMR3589, 42 avenue Gaspard Coriolis, 31057 Toulouse CEDEX, France

* now at: South Dakota State University, 926 Harvey Dunn St, Brookings, SD 57006, USA

Abstract. The overall objective of the present study is to introduce the new ECOCLIMAP-II database for Europe, which is an upgrade for this region of the former initiative, ECOCLIMAP-I, already implemented at global scale. The ECOCLIMAP programme is a dual database at 1 km resolution that includes an ecosystem classification and a coherent set of land surface parameters that are primarily mandatory in meteorological modelling (notably leaf area index and albedo). Hence, the aim of this innovative physiography is to enhance the quality of initialisation and impose some surface attributes within the scope of weather forecasting and climate related studies. The strategy for implementing ECOCLIMAP-II is to depart from prevalent land cover products such as CLC2000 (Corine Land Cover) and GLC2000 (Global Land Cover) by splitting existing classes into new classes that possess a better regional character by virtue of the climatic environment (latitude, proximity to the sea, topography). The leaf area index (LAI) from MODIS and normalized difference vegetation index (NDVI) from SPOT/Vegetation (a global monitoring system of vegetation) yield the two proxy variables that were considered here in order to perform a multi-year trimmed analysis between 1999 and 2005 using the K-means method. Further, meteorological applications require each land cover type to appear as a partition of fractions of 4 main surface types or tiles (nature, water bodies, sea, urban areas) and, inside the nature tile, fractions of 12 plant functional types (PFTs) representing generic vegetation types – principally broadleaf forest, needleleaf forest, C3 and C4 crops, grassland and bare land – as incorporated by the SVAT model ISBA (Interactions Surface Biosphere Atmosphere) developed at Météo France. This landscape division also forms the cornerstone of a validation exercise. The new ECOCLIMAP-II can be verified with auxiliary land cover products at very fine and coarse resolutions by means of versatile land occupation nomenclatures.

Citation: Faroux, S., Kaptué Tchuenté, A. T., Roujean, J.-L., Masson, V., Martin, E., and Le Moigne, P.: ECOCLIMAP-II/Europe: a twofold database of ecosystems and surface parameters at 1 km resolution based on satellite information for use in land surface, meteorological and climate models, *Geosci. Model Dev.*, 6, 563-582, doi:10.5194/gmd-6-563-2013, 2013.

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