Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12242, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12242
EGU General Assembly 2008

Modelling Late Miocene vegetation in Europe: results of the CARAIB model and comparison with palaeovegetation data

E. Favre (1), **L. François** (1), T. Utescher (2), J.-P. Suc (3), A. Henrot (1), A. Micheels (4), V. Mosbrugger (4)

(1) Institut d'Astrophysique et de Géophysique, Université de Liège, Bât. B5c, Allée du Six Août 17, B-4000 Liège, Belgium (francois@astro.ulg.ac.be), (2) Geologisches Institut, University of Bonn, Nussallee 8, D-53115 Bonn, Germany, (3) Laboratoire PaléoEnvironnements et PaléobioSphère, CNRS UMR 5125, Université Claude Bernard - Lyon 1, Bât. Géode, 27-43 Boulevard du 11 Novembre, F-69622 Villeurbanne Cedex, France, (4) Forschungsinstitut und Naturkundemuseum Senckenberg, Senckenberganlage 25, D-60325 Frankfurt, Germany

The CARAIB (CARbon Assimilation In the Biosphere) dynamic vegetation model is used to study the vegetation distribution during the Late Miocene (Tortonian). In this version, the plant classification is specifically adapted to study European vegetation during the Miocene. This adapted classification and the corresponding climatic tolerance parameters are based on the study of Laurent et al. (J. Veg. Sci., 15, 739-746, 2004) for the tree types currently present in Europe and on the distribution of analogue species in south-eastern Asia and North/Central America for the sub-tropical trees. The climatic inputs to CARAIB are obtained from the COSMOS model which is the AGCM ECHAM5 coupled to the OGCM MPIOM (Micheels, this session). The climatic anomalies (Tortonian minus Present) derived from COSMOS are interpolated to a higher spatial resolution before being used in the vegetation model. These anomalies are combined with a modern climatology to produce climatic fields with high spatial resolution (10'x10'). This procedure has the advantage of making apparent relief features smaller than the grid cells of the climate model and, hence, makes easier the comparison with local vegetation data, although it does not really improve the

quality of the Tortonian climate reconstruction. The CARAIB vegetation model was run over Europe at this higher spatial resolution. It calculates the potential distribution of 13 different classes of trees (including cold/cool/warm temperate, sub-tropical and tropical types), together with their cover fractions, net primary productivities and biomasses. The resulting model vegetation distribution reconstructed for the Tortonian is compared to available paleo-vegetation and pollen data. Before performing this comparison, the tree taxa present at the various data sites are assigned to one or several model classes, depending on the identification level of the taxa. If several classes are possible for a taxon, only those that can co-exist with the other tree classes identified at the site are retained. It narrows the range of tree types present at the various sites, by suppressing in the data the extreme types, such as the cold temperate and tropical trees. This methodology, similar to the coexistence approach used in vegetation-based paleoclimatic reconstructions, allows comparisons with the model simulation (1) on a presence/absence basis of classes of trees and (2) on a net primary productivity basis through the biodiversity score or the pollen abundance of each class.