Geophysical Research Abstracts, Vol. 8, 10424, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10424

Upper Miocene vegetation reconstruction using proxy-data and the CARAIB model – a comparison

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The Upper Miocene is a crucial phase in the Cenozoic vegetation evolution and is characterised by the first expansion of grasslands. Based on published fossil floras (palynofloras and megafloras) we reconstruct a grid-based global vegetation map for the Upper Miocene Tortonian stage. Using the vegetation model CARAIB, driven by the output from a Tortonian climate modelling study with the AGCM ECHAM, we also produced a model-based vegetation map for the same time period. A grid-based comparison of the proxy- and model-vegetation maps reveals similar overall trends if the present-day vegetation map is used as a reference state. On the other hand there are significant differences which may either represent weaknesses in the CARAIB model or errors in the input climatic fields used to run the CARAIB model. In particular, the model-vegetation overestimates the distribution of grasslands and desserts as compared to the proxy-vegetation.