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Geophysical Research Abstracts
Vol. 15, EGU2013-12675, 2013
EGU General Assembly 2013

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The recent increases in temperature and water deficit as a result of climate changes have already impaired forest functioning and might trigger tree dieback worldwide in the near future. The assessment of future forest conditions relies on mechanistic models that predict changes in trees and forest functioning as a function of meteorological drivers. Currently, global and regional models (GCM and RCM) are the main providers of climate forcing in impact studies. One large uncertainty when forecasting the forest functioning is associated with the coarse spatial resolution of climate scenarii. In this study we assessed how the spatial resolution in climate forcing provided by the RCM WRF impacted the simulated productivity and distribution of three species (Fagus sylvatica, Quercus ilex) over France. We ran the forest model CASTANEA over France (that simulates fluxes of carbon and water and forest growth) using the output of WRF at different spatial scales (50 km, 20km, 8km and 1km) as forcing climate entries. The productivity simulated by CASTANEA was used as a surrogate of beech persistence for the reference period of WRF (1988-2008). Because climate variables simulated by WRF exhibited large bias compared to surface observations, WRF was first corrected using a reference dataset (SAFRAN database) upscaled at the WRF resolution (50km and 20 km). Additionally, on 2 specific limited areas (the Languedoc Roussillon and the Bourgogne region) we used a statistical downscaling of the WRF forcing entries in order to increase the spatial resolution up to 1km. Our results showed that simulations at finer resolution had relatively little impact on the mean and variance of beech productivity over France compared to coarser resolutions. However, at the finest resolutions, we observed strong local gradients with important variations in the mean and the variance of forest productivity (up to 60%). These results are particularly noticeable in regions characterized by complex orography such as the Alps or the Mediterranean. Our results highlight the need to consider the importance of spatial scale of climate input when studying climate impacts on tree distributions in areas with steep climatic gradients.