Geophysical Research Abstracts
Vol. 14, EGU2012-12410-1, 2012
EGU General Assembly 2012

FOREST-SAGE, a new deforestation model for climate models and an example deforestation climate impact experiment in the Congo.

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The impact of deforestation on climate is often studied using highly idealized "instant deforestation" experiments due to the lack of generalized deforestation scenario generators coupled to climate model land-surface schemes. A new deforestation scenario generator has been therefore developed to fulfill this role known as the deFORESTation ScenArio GEnerator, or FOREST-SAGE. The model produces distributed maps of deforestation rates that account for local factors such as proximity to transport networks, distance weighted population density, forest fragmentation and presence of protected areas and logging concessions. The integrated deforestation risk is scaled to give the deforestation rate as specified by macro-region scenarios such as "business as usual" or "increased protection legislation" which are a function of future time.

FOREST-SAGE is based on the framework of the widely used Community Land Model (CLM), which is the land model for the Community Earth System Model (CESM), the Community Atmosphere Model (CAM) and the 4th generation ICTP regional climate model REGCM4. Example potential future deforestation scenarios for central Africa are shown, along with the resulting climate impact as modelled by REGCM coupled to CLM.