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Eddy Flux Tower in Ankasa Park : a new facility for the study of the carbon cycle of primary tropical forests in Africa

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An Eddy Covariance station for the monitoring of CO2 and energy fluxes over a primary tropical forest in Ghana is operative as part of the CarboAfrica eddy covariance network. The facility, located in the Ankasa Conservation area (05° 16' 11.2"N; 02° 41' 41.55" W), includes a 65 m tall steel tower equipped with a system enabling the measurements of fluxes at the top of the structure, of CO2, air temperature and humidity along a vertical profile and of relevant physical parameters of the forest ecosystem.
The Ankasa flux tower is the first in the African continent collecting data on CO2 exchanges over a tropical primary forest, and from its activity a breakthrough in the understanding of the carbon cycling in this kind of environment is expected. Moreover the knowledge gained on the carbon balance of this primary forest can be used as a reference to thoroughly evaluate the impacts of deforestation, beyond the decrease of carbon stocks.
The analysis of preliminary data collected in the first week of August 2008 shows a daily uptake of 1.33±0.73 gC m-2 d-1 (mean±s.e.) and highlights the large magnitude of the storage of CO2 within the canopy space causing a discrepancy between the CO2 flux observed at the top of the tower (Fc) and the overall net ecosystem exchange (NEE). During night-time NEE reveals a respiration rate up to 4 times higher than Fc while in the first hours after dawn assimilation of CO2 in the canopy space is sensed at the top level of measurement with about 3 hours of delay.
Associated to the tower site, a field campaign to estimate biomass and biodiversity was carried out.
Two transects were demarcated for a total surface of 2 ha. Each transect measuring 1000 m x 10 m, they were divided into 10 subplots and intersected each other at the centre and they were perpendicular to one another. The point of intersection is located on the tower where they are located all the instrumentation for monitoring carbon fluxes.
All the data is still being processed but the first analysis has already highlighted the high biodiversity that characterizes Ankasa forest.