



## **Ecosystem fluxes in a semi-arid tropical grassland in the Okavango Delta, Botswana**

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The Okavango Delta of Botswana is situated in the semi-arid Kalahari Desert. Average rainfall in the Delta is about 550 mm per year, but varies extensively within and between years. Due to its exceptional hydrological regime parts of the Delta flood annually, resulting in the Delta's mosaic-like structure of permanent swamps, floodplains and "real" semi-arid areas.

Our study aimed to identify and investigate those environmental variables that cause spatial and temporal differences in carbon dioxide exchange and evapotranspiration in three different tropical grassland ecosystems in the Delta, covering its hydrological gradient. Ecosystem fluxes were determined with the eddy covariance method.

The semi-arid grassland, the driest of the investigated ecosystems, characterized by a very low vegetation cover (Leaf area index (LAI)  $\leq 1$ ), had unexpectedly high CO<sub>2</sub> net uptake rates, on a short term basis. Without water limitation maximum CO<sub>2</sub> net ecosystem exchange was about  $-24 \mu\text{mol m}^{-2} \text{s}^{-1}$ . These maximum net uptake rates of CO<sub>2</sub>, not only exceeded maximum uptake rates compared to a nearby densely vegetated floodplain but even those reported from an Amazonian rainforest (LAI 4-5).

Here, I will present the underlying mechanisms that cause these exceptional high CO<sub>2</sub> uptake rates of a tropical grassland growing on a nutrient-poor soil in a semi-arid environment.