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Methane fluxes from an ephemeral wetland in Africa over the drying period

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Wetlands have a great impact on atmospheric methane (CH4) pool, sometimes balancing a large part of positive benefits of carbon sequestration in soils and plants in terms of climate forcing. Since micrometeorological techniques have emerged as a tool for measuring trace gas exchange between the biosphere and atmosphere, experiments on these ecosystems have been conducted almost exclusively in the northern areas of the world like North America, Europe, Asia. Less attention was pointed at the tropics, despite flooded lands are rather widespread in this area. In this study we present the first results of a measurement campaign aimed to quantify CH4 fluxes by means of the eddy covariance technique over a costal fresh water swamp in Ghana. Sampling was carried out for one month during the drying of the water. First inspection of the data revealed highest methane concentrations and fluxes during the night rather than during the day. Half-hourly values interquartile range span from 10.0 to 25.0 nmol m-2 s-1 while the median daily value is set around 17.0 nmol m-2 s-1. Along with the fluxes estimate and the analysis of their relation with the main environmental driving variables (water temperature and depth, soil temperature and humidity) we try to explain this finding by the study of the footprint daily development and the comparison with concurrent enclosure measurements.