

CO₂ FLUXES OVER PANTANAL REGION UNDER DRY AND FLOOD CONDITIONS

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CO₂ fluxes over Pantanal region

The Pantanal area, covering a large part of the center-western region of Brazil, is characterized by a strong seasonality throughout the year, with very dry periods in the dry season and frequently flooded areas during the wet season. As part of the Interdisciplinary Pantanal Experiment (IPE), eddy covariance measurements of surface fluxes of sensible heat, water vapor and CO₂ have been carried out at the so called “Base de Estudos do Pantanal” of the University of Mato Grosso do Sul, in Pantanal region, for 2 months in May and June 2001, and now on a continuous base, since late November 2001. The system used is an Eddy Covariance System, installed at 23 m height.

Carbon release during flood period

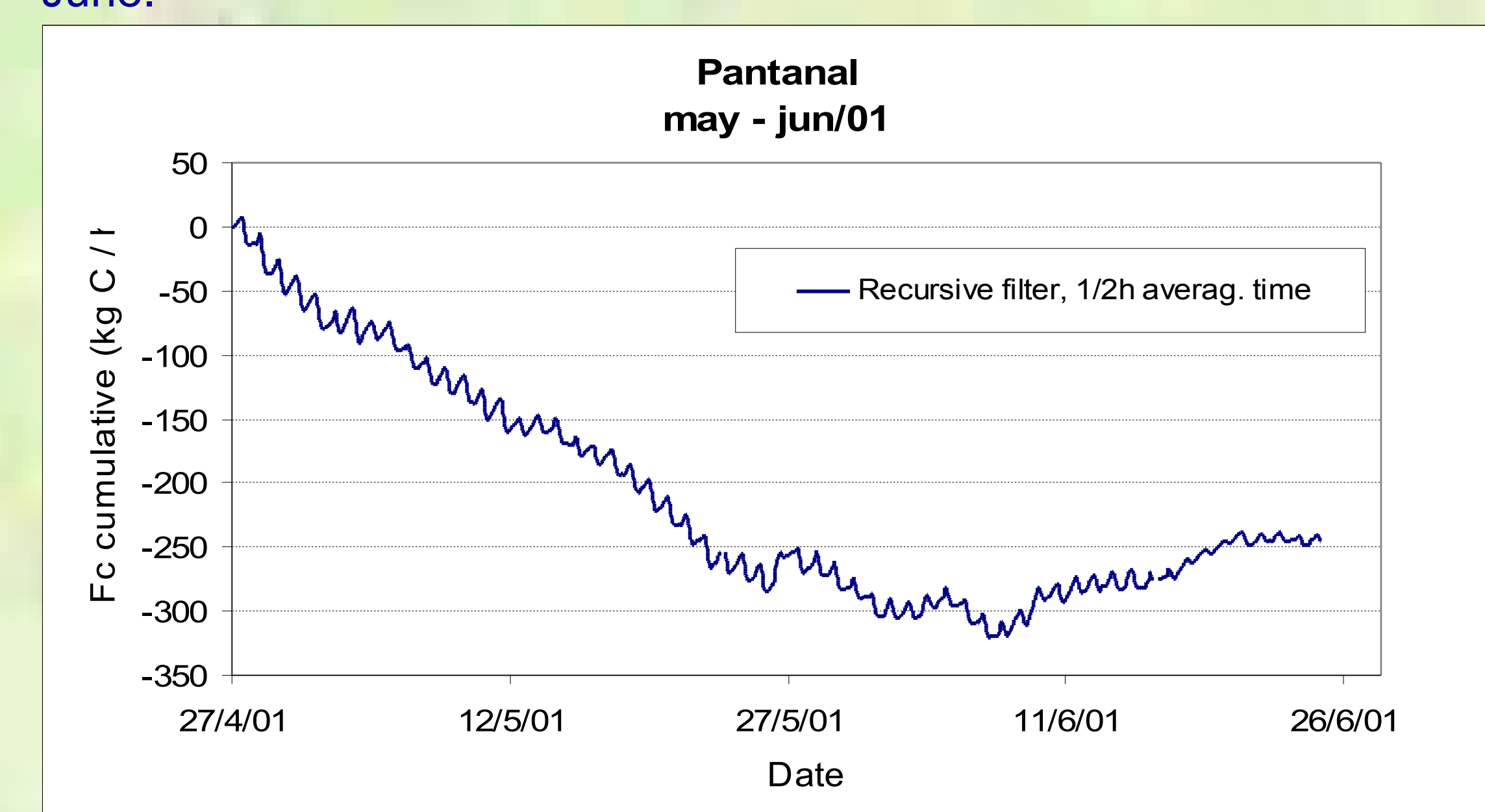
During the wet season 2001/2002 the experimental site of Pantanal presented large flood areas surrounding the tower. The water layer at the tower quickly raised up to 55 cm from mid to late december 2001. By that time the surface turned into a source of carbon, presenting a NEE average rate of $+11 \pm 5$ kg C/ha/day, for the next 30 days. After that, the surface slowly turned back to a sink of CO₂, as the water layer dries out.

Tower at Fazenda São Bento – MS
(19° 33' S; 57° 54' W)



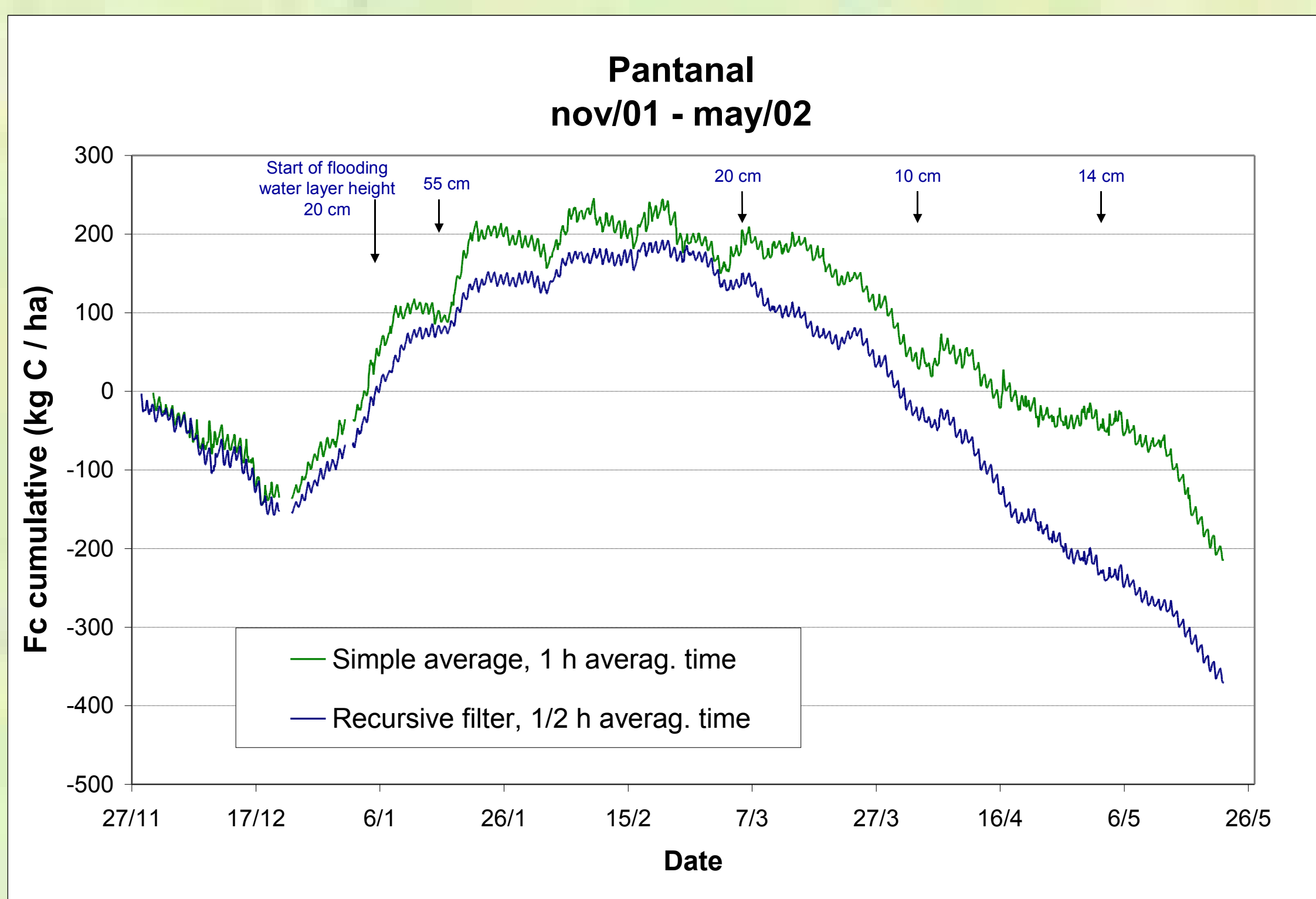
Fluxes under dry conditions

During the transition period, from wet to dry season the daily average net ecosystem exchange (NEE) rate ranged from a strong sink of -10 ± 5 kg C/ha/day in May to a situation close to balance in June.



Several factors influencing the fluxes during flood period

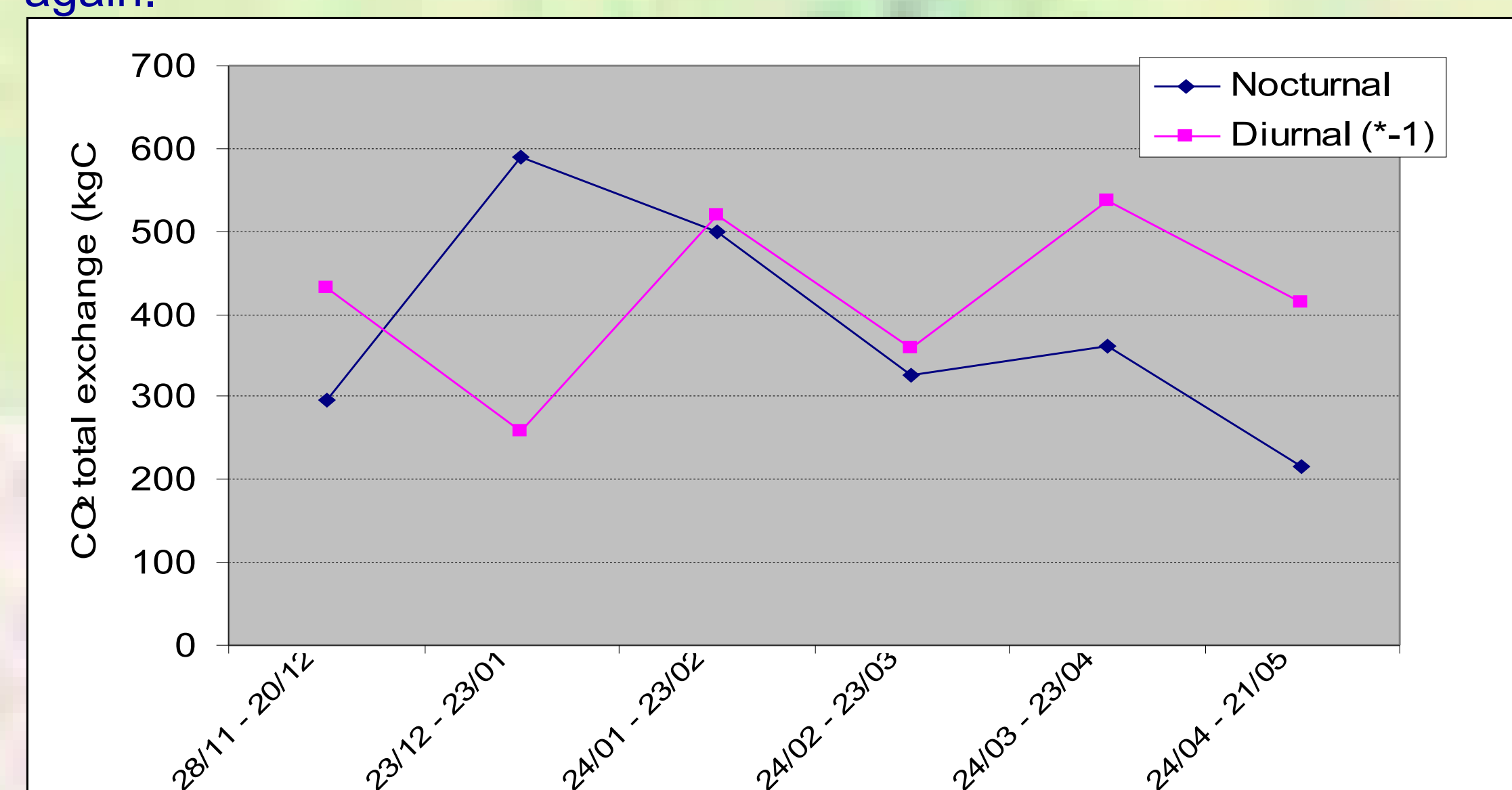
During the flood period, frontal passages and cloudy disturbed days may influence the CO₂ fluxes. The changes in wind direction clearly affects the net exchange.



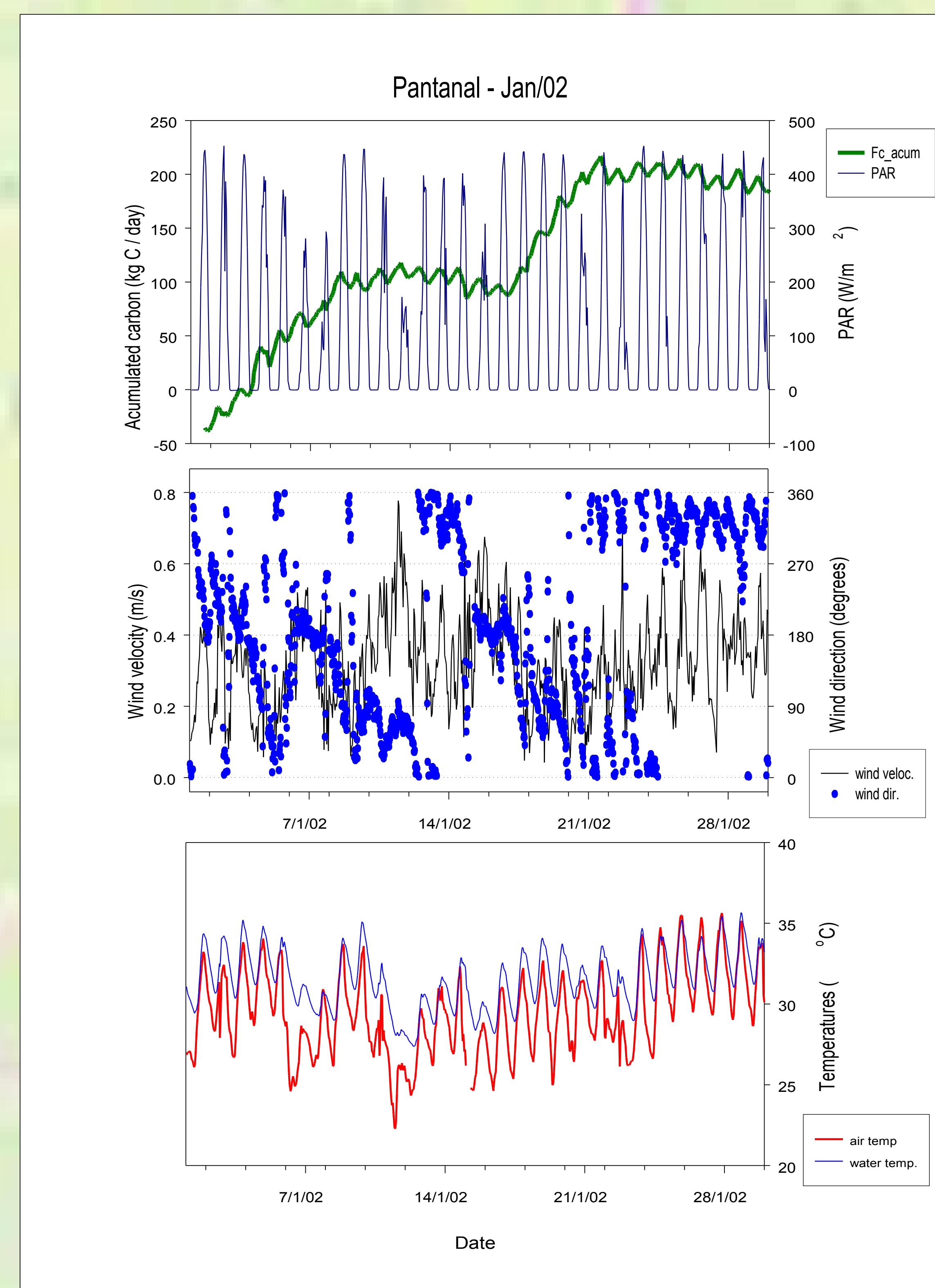
A carbon release of more than 300 kg C / ha were measured during the first 2 months of flood conditions

Diurnal versus Nocturnal fluxes

In the beginning of the flood period, the nocturnal release of CO₂ is strongly increased and the diurnal net uptake is reduced. After two months, the nocturnal fluxes diminish and diurnal uptake prevails again.



After 2 months of flood, even still with a small water layer, the surface turns back to a net sink of carbon.



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