Geophysical Research Abstracts
Vol. 14, EGU2012-14284, 2012
EGU General Assembly 2012

Spatial and temporal CH4 flux variability in a shallow tropical floodplain lake, Pantanal, South America

R Peixoto (1), A Enrich Prast (1), E C Silva (1), L Pontual (1), H Marotta (2), L Pinho (1), and D Bastviken (3)
(1) Federal University of Rio de Janeiro, Rio de Janeiro, Brazil, (2) Federal University of Fluminense, Niteroi, Brazil, (3) Linköping University, Linköping, Sweden

Spatial and temporal CH4 flux variability in a shallow tropical floodplain lake, Pantanal, South America

Peixoto, R, Enrich-Prast, A., Silva, E. C., Pontual, L., Marotta, H., Pinho, L. Q. and Bastviken, D.

Methane (CH4) is an important greenhouse gas produced during anaerobic decomposition of organic matter (OM). It can play a significant role in carbon emissions from tropical aquatic ecosystems to the atmosphere and have a substantial participation in greenhouse gas balances. However, most studies report low numbers of short-term ($\leq$ 24h) measurements in each system and the spatial and temporal variability is poorly understood. In this study we analyzed the temporal and spatial variability of CH4 emissions from a shallow Pantanal lake. Pantanal is the world's largest savanna tropical floodplain with a significant input of organic matter from the drainage area around and an annual inundation pulse. Methane fluxes were measured in September 2008 with floating chambers over 24 hour periods for five consecutive days. We used > 20 chambers along transects from the marginal vegetated regions of the lake to the central parts of the lake. Methane fluxes were determined as described by Bastviken et al. 2010 (doi: 10.1021/es1005048).

There was no significant difference of methane fluxes among sampling days. Methane fluxes at the vegetated area and the margin were significantly higher than at central parts of the lake showing clearly the importance of different compartments within lakes. This study indicates that a) 24 hour measurements may be representative for time perspectives of a week given similar weather conditions, while b) spatial variability within lakes must be considered to correctly evaluate CH4 emissions from aquatic systems.