

Effects land surface type, land use, and land use change on aquatic-atmosphere fluxes of CO<sub>2</sub> from tropical forests and peat lands of Borneo.

W. Oechel, O. Abelleira, G. Anshari, H. Ikawa, W. Lawrence, M. Metz, M. Neteler, M. Nuriman, D. Rocchini, Donatella Zona

Tropical peat lands appear to be losing huge amounts of CO<sub>2</sub> to the atmosphere due to patterns of land use and land use change including conversion of tropical forest peat lands to palm oil production and other agricultural endeavors and forest exploitation. Here, we look at the effect of land use patterns on the export of carbon to tropical river systems and the efflux from tropical rivers to the atmosphere. Levels of DOC and POC were measured in the Kapuas River, the longest river in Borneo. Patterns of land use and land use change were correlated with export rates of organic matter to the river as well as the vertical fluxes of CO<sub>2</sub> from the river and delta to the atmosphere. Land conversion of tropical forests on peat land soils to agriculture, including palm oil production, had some of the highest rates of lateral fluxes of organic carbon to the river system, and among the highest fluxes of CO<sub>2</sub> from the river to the atmosphere. This approach illustrates the utility of using a combination of methods: pCO<sub>2</sub> measurement, boat based eddy covariance, water chemistry, temporal remote sensing, and modeling to understand and quantify the impact of land use change on GHG emissions from tropical peat lands.