

# **Spatial and seasonal variations in the composition of dissolved organic matter in a tropical catchment: the Lower Kinabatangan River, Sabah, Malaysia**

## **Abstract**

Dissolved organic matter (DOM) was characterised in water samples sampled in the Lower Kinabatangan River Catchment, Sabah, Malaysia between October 2009 and May 2010. This study aims at: (i) distinguishing between the quality of DOM in waters draining palm oil plantations (OP), secondary forests (SF) and coastal swamps (CS) and, (ii) identifying the seasonal variability of DOM quantity and quality. Surface waters were sampled during fieldwork campaigns that spanned the wet and dry seasons. DOM was characterised optically by using the fluorescence Excitation Emission Matrix (EEM), the absorption coefficient at 340 nm and the spectral slope coefficient (S). Parallel Factor Analysis (PARAFAC) was undertaken to assess the DOM composition from EEM spectra and five terrestrial derived components were identified: (C1, C2, C3, C4 and C5). Components C1 and C4 contributed the most to DOM fluorescence in all study areas during both the wet and dry seasons. The results suggest that component C4 could be a significant (and common) PARAFAC signal found in similar catchments. Peak M (C2 and C3) was dominant in all samples collected during wet and dry seasons, which could be anthropogenic in origin given the active land use change in the study area. In conclusion, there were significant seasonal and spatial variations in DOM which demonstrated the effects of land use cover and precipitation amounts in the Kinabatangan catchment.