

Neodymium isotope constraints on past hydrological variability in the Congo Basin

Bayon G, E Schefuss, L Dupont, A Laraque, AV Borges, F Darchambau, S Bouillon, G Moukangui, J-P Tathy, C Skonieczny, S Bermell, E Ponzevera, B Dennielou & L André

Major events of vegetation changes and soil erosion occurred in Central Africa during the last few millennia, at a time when the first farmers settled in the rainforest. The palaeoclimatic context in which these environmental changes took place still remains poorly constrained. Improving our knowledge on the drivers of past hydrological variability in Central Africa is important to further evaluate the relative role of climate versus humans in shaping late Holocene African landscapes. In this study, we have used neodymium (Nd) isotopes in a marine sediment core to reconstruct the composition of the sediment load exported from the Congo Basin during the Holocene. Core KZR23 was recovered at 2200 m water depth from within the Congo submarine canyon and is characterized by high sedimentation rates (about 2m/kyr), thereby allowing reconstruction of past river sediment discharge at an unprecedented high temporal resolution. A suite of river particulate samples collected from the main tributaries within the Congo watershed was analyzed in order to tag each major sub-basin with the characteristic geochemical and Nd isotopic signatures of its source region. In parallel, an annual series of suspended particles sampled on a monthly basis at the Congo River ORE-HYBAM station (Brazzaville) was also analyzed to characterize the seasonality of sediment provenance in relation with present hydrological cycle. Using Nd isotopes as tracers for sediment provenance together and other proxy data for past erosion, vegetation and rainfall patterns (i.e. bulk sediment radiocarbon data, pollens, biomarkers, compound-specific isotope analyses), we will provide a more comprehensive picture of past hydrological variability in the Congo Basin for the Holocene period.