



## Late Holocene carbon and nitrogen input into the Java Sea recorded in sediment cores off rivers from Java and Kalimantan

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Beginning a few thousand years ago, global climate and environmental change have become more and more affected by human activities. Hence, quantifying the 'human component' becomes increasingly important in order to predict future developments. Indonesia and the surrounding oceans are key in this respect, because it is in the region (i) that receives the highest inputs of water, sediment and associated dissolved and particulate substances and (ii) that suffers from anthropogenically modified landscapes and coastal zones. As opposing the global trend, land-based human activities have increased the sediment input into the ocean from Indonesia since pre-human times. Nevertheless, there are strong gradients in land use/cover and resulting river fluxes within Indonesia as, for example, between Java and Kalimantan. Major goal of this study is to identify the contribution of human activities in river catchments (i.e. land use/cover change, hydrological alterations) to gradients in carbon and nitrogen deposition in sediments of the Java Sea between densely populated Java and sparsely populated Kalimantan during the Late Holocene. We hypothesized that the riverine input of C and N increased during the late Holocene and increased more off Java than off Kalimantan. Sediment cores (80 to 130 cm long) off major river mouths from Java (2 cores off Bengawan Solo) and Kalimantan (1 core off Pembuang, 1 core off Jelai) were dated and analysed for Corg, Ntot, carbonate and stable isotope composition ( $\delta^{13}\text{C}_{\text{Corg}}$ ,  $\delta^{15}\text{N}$ ) in 3 cm intervals. Sedimentation rates off the Kalimantan rivers with 0.05-0.11 cm yr<sup>-1</sup> were higher than off the Bengawan Solo, the largest river catchment on Java (<0.04 cm yr<sup>-1</sup>). Ntot contents in all sediment cores were low with ~0.07% and varied little over time. A higher Corg content, molar C/N ratio and variability over the past 5000 years in all parameters in the core closer to the river mouth off the Bengawan Solo than the one further offshore indicates that terrestrial input into the Java Sea was limited to approx. 15 km off the river mouth. Both cores off Kalimantan and the core off Java close to the Bengawan Solo had similar Corg contents (~0.8%) and molar C/N-ratios (11-19).  $\delta^{13}\text{C}_{\text{Corg}}$  of -24‰ and low carbonate contents (~7%) indicate an even higher contribution of terrigenous organic matter off the Kalimantan rivers than off the Bengawan Solo, where  $\delta^{13}\text{C}_{\text{Corg}}$  of -22‰ and CaCO<sub>3</sub> contents of ~17% rather point to marine phytoplankton as major organic matter source. Our preliminary results indicate a higher input of terrigenous organic matter from Kalimantan than from Java and show little evidence for anthropogenic impact on organic matter inputs into the Java Sea during the late Holocene.