



## **A magnetic and geochemical record of centennial mid-Holocene fluvial-marine interaction at the apex of the Yangtze River delta**

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Magnetic properties, particle size and geochemical determinations were carried out on a 53.58 m long core of mid-Holocene age drilled at the apex of the Yangtze River delta. Based on these analyses, core JD01 has been divided into seven units. Magnetic properties and major elements geochemistry indicate that the whole core has a similar sediment provenance. Magnetic mineral concentrations are positively correlated with the  $>125 \mu\text{m}$  fraction, while reductive diagenesis of ferrimagnetic mineral is more marked in fine-grained sediments. Total organic carbon (TOC), total nitrogen (TN) and their ratio (C/N) and stable carbon isotope ( $\delta^{13}\text{C}$ ) measurements suggest that the sedimentary environment changed from marine dominated to terrestrial dominated at around 34 m, dated to ca. 6200 cal. yr BP. Diagenesis of magnetic minerals, characterized by lower magnetic S-ratios and lower ferrimagnetic mineral concentrations, is evident in marine facies unit 3 (U3) and delta plain facies unit 7 (U7). The basal part of delta front sediments are characterized by higher TOC concentrations with significant terrestrial organic matter input. This sedimentary layer lasts from ca. 6200 to 5500 cal. yr BP, corresponding to a period of warmer and wetter East Asian monsoon climate. It is suggested that strengthened precipitation led to stronger fluvial sediment discharge to the delta region. In addition, dramatic fluctuation in organic matter sources is also evident during this period, indicating centennial-scale climate instability during the mid-Holocene. The  $\delta^{13}\text{C}$  and chemical weathering index (CIA) values also suggest a general weakening of the Asian summer monsoon from 6200 to 5700 yr. BP. This study suggests that delta deposits with rapid sedimentation are potentially capable of providing high-resolution paleoenvironmental information for parts of the Holocene