Time scale of sediment transport in the Changjiang (Yangtze River) estuary during the last 13 kyrs

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The time scale of sediment transport in Changjiang (Yangtze) estuary is crucial to understand the river evalution and decipher the paleoceanographic archives in East Asian marginal seas (e.g. the East China Sea). In this contribution, we present U–Sr–Nd isotopic compositions of sediment core (CM97) collected from the Changjiang estuary dating back to 13 ka. In particular, the time scale of sediment transport for the Changjiang estuary sediment is constrained by *comminution age* based on $^{234}U/^{238}U$ for fine lithogenic frations.

The $^{234}U/^{238}U$ values for sediment core CM97 in the Changjiang estuary vary from 0.902 to 0.944, and average at 0.928. On basis of $^{234}U/^{238}U$, together with the α-recoil loss factor, we calculate the sediment transport time, which vary from 207 to 538 kyrs depended on different sediment provenance. It is notable that the provenance of sediments accumulated in CM97 from the Changjiang Estuary shifted during the last 13 kyrs. It gradually changed from the upper vally during the late glacial period to the mid-lower valley in the early-mid Holocene due to the asynchronous evolution of the Indian and East Asian summer monsoon. However, it shifted back to the upper vally again, as a result of intensive agricultural cultivation and urbanization development during the last 2 kyrs. Our study reveals that the sediment transport time decreases from 450 to 200 kyrs between 13 and 2 ka while increase from 200 to 500 kyrs after 2 ka. The longer sediment transport time suggests that sediment may derive from some distant sources, like the upper vally, while shorter sediment transport time implies that sediment may derived from some proximal sources, like the mid-lower vally. This interpretation of alteration of sediment transport time coincides with previous provenance study and provides quantitative constraints on the sediment source-to-sink processes during the late Quaternary in East Asia.

Acknowledgement: This work was supported by National Science Foundation of China (Grant No. 41676035).