

Interactive comment on “SHORT COMMUNICATION: Massive Erosion in Monsoonal Central India Linked to Late Holocene Landcover Degradation” by Liviu Giosan et al.

Anonymous Referee #2

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This manuscript presented the sediment flux and age offset (TOC radiocarbon age offset relative to depositional age) records since the Holocene from a sediment core in the Bengal Fan. Combined with previous precipitation and ecology reconstructions based on pollen and leaf wax carbon isotopes of the same core, they suggested strengthened human activity on the Deccan Plateau increased soil erosion and the age of exported organic carbon, which were recorded in the offshore sediment proxies of sediment flux and age offset. In general, the data is very interesting and impressive, the paper is well written and thus I recommend it to be published in Earth Surface Dynamics. However, there are some serious issues, such as provenance, effect of sealevel change, and estimate of age offset, which are not clearly illustrated in current MS. Thus I suggest a

major revision. My comments are as follows: 1. The discussion about the provenance is very unclear. The authors only provided a figure with final result of percent of Deccan contribution by Nd isotope. However, there are no details how they estimated. At least they should provide information about the Nd isotopes of two end-members they used in the estimation. Moreover, it's more common to use Sr-Nd isotopes set to constrain sediment provenance rather than only Nd isotope, which is not convincing. To my knowledge, they should first compare all the potential river sources including Brahmaputra and Ganges, not only Godavari River. Although the first two rivers are relatively a little far from the study core, however, they still possibly delivered suspended sediment to the core and they have at least 20-times higher sediment flux than Godavari River. This means that any small changes in the relative contribution between these two end-members will significantly change the Nd isotopes seen at the core. I really don't think that the increasing Nd isotopes must indicate the higher sediment flux from Deccan Plateau. If this is the case, any changes of proxies at the core not necessarily related to environment changes in source region, but also possible links to the relative contribution of two different end-members in different rivers. I strongly suggest the authors add Sr isotopes and constrain the provenance tougher by more clear end-members. This is the basis of this study must be carefully revised. 2. The possible effect of Sea-level change on sediment proxies was not discussed. Although I agree with the authors that increased human activity and decreased landcover would potentially increase erosion. However, on the timescale since about 11 ky, the influence of sea-level must be considered. In my view, the general decreasing or increasing trend of all proxies occurred since about 8-11 ky, rather than only since about 2ky. This cannot be ascribed to authigenic influence, which only became evident since about 2ky. The influence of sea-level on sediment flux may be indirectly through upper current or coastal current, which possibly changed the relative contribution from different river sources. Please consider more thoroughly. 3. The estimation of age offset is not clear. For example, they applied an equation as "error offset = ((err. TOC 14C measurement)² + (max. err. Foram 14C measurement)²)^{1/2}". Why? Where is the reference? Why not directly use

offset between ages of TOC 14C and Foram 14C? In addition, the supplementary table 1, 2, 3 wrongly wrote “yr” as “kyr”. Table1, no errors provided for Nd isotopes. Table3, unclear for the captions of the age columns.

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Discussion paper

