

Possible decadal scale change in the cycling of organic carbon on Luzon island of the Philippines

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Southeast Asia is the region with the highest land-ocean fluxes of sediment in the world. Previously, we have characterized the organic matter composition of riverine sediments from the island of Luzon from the Philippines [1]. In this study, we returned to the same sampling sites to investigate the changes taking place in the cycling of carbon from this dynamic sedimentary system. Between the time of first sampling in 2007 and the time of second sampling in 2016, we observe marked changes in the radiocarbon age of sedimentary organic carbon appearing to reflect increased erosion of older earthen material into rivers. As the type of organic matter based on stable carbon isotope signatures appears to remain similar on average, these older ages may reveal increased mobilization of deeper soil material. This strong change we observe within the timespan of a decade appears to reflect rapid environmental changes likely related to regional anthropogenic activity and or global climate change. If the interpretation of our radiocarbon time series is correct, the loss of deeper soil layers implies that organic carbon that has built up on land over centuries is being transferred to the ocean where it faces an uncertain source-to-sink fate. We emphasize the importance of time series observations for understanding the dynamic changes taking place in our Earth system today and we will present the progress of our interpretations.

Reference:

[1] Lin, Liu, Eglinton, Blattmann, Kandasamy, Haghipour & Siringan (2021) *Journal of Geophysical Research: Biogeosciences* 126, 7.