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Evolution of hydrological, sedimentary and biogeochemical cycles
in the the critical zone.

Hot spots of recent organic carbon burial in Amazon lake sediments along the latitudinal gradient

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Resume: Lake sediments have been recognized as important atmospheric carbon (C) reservoirs in a large variety of climate zones, among which critical conditions to life, as temperature and precipitation, vary naturally and could improve our understanding on the effects of global change on organic carbon (OC) burial in biomes. However, there is still a paucity of data on sediment OC burial in representative lakes at low latitudes, where large inputs from productive forests may contrast with intense organic mineralization. In order to assess recent OC burial rates (last 50-100 years by ²¹⁰Pb dating) in lake sediments, here we performed a compilation in the published literature in other biomes (N=135 in boreal and temperate) and own tropical survey (N=18 lakes in Amazon basin). Our results confirmed high OC burial rates in amazon lakes, averaging (\pm SE) 284.5 (\pm 67.5) g C m⁻² yr⁻¹, around seven higher than those temperate and boreal latitudes. The upscaling of the recent OC burial in lakes revealed one of major C sinks in the biosphere, reaching 4.74-8.33 Tg yr⁻¹, with conservative 3.39 % from amazon lakes (not including wetlands). Therefore, our findings suggest that Amazon lakes may show hotspots for OC burial, representing a potentially important but still neglected global C reservoir.

Keywords: Amazon lakes, Organic Carbon Burial, ²¹⁰Pb.

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