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Particulate organic carbon transported by turbidity current

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Turbidity currents act as efficient transport pathways of sediments and particulate organic carbon (POC), yet the characteristics of POC are not comprehensively understood due to the hardness of capturing the phenomena. Here we deployed a sediment trap and caught a core induced by two turbidity currents in the Manila Trench. We found significant differences in sediment physics and POC properties among such a core, the "naturally" sinking POC by sediment traps, and surface sediments from box corer: The “naturally” sinking POC had the highest total organic carbon (TOC) content with more marine sources, whereas the core POC was mostly from older terrestrial sources. The surface sediments have similar TOC content with the core but more marine sources. The POC flux during turbidity currents can reach up to 4000 times more than the natural POC sinking. While hydrodynamic processes during long-distance transport sort and redistribute POC and minerals during turbidity currents, frequent turbidity currents can enhance POC transport which accelerates carbon burial in the oceans. We propose that previous global organic carbon burial may have been underestimated due to a lack of turbidity current unit.