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Hurricanes accelerate dissolved organic carbon cycling in coastal ecosystems

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Extreme weather events such as tropical storms and hurricanes deliver large amounts of freshwater (stormwater and river discharge) and associated dissolved organic carbon (DOC) to estuaries and the coastal ocean, affecting water quality and carbon budgets. Hurricane Harvey produced an unprecedented 1000-year flood event in 2017 that inundated the heavily urbanized and industrialized Houston/Galveston region (Texas, USA). Within a week, storm-associated floodwater delivered 105±10 Gg of terrigenous dissolved organic carbon (tDOC) to Galveston Bay and the Gulf of Mexico continental shelves. In-situ decay constants of 8.75-28.33 yr^{-1} resulted in the biomineralization of ~70% of tDOC within one month of discharge from the flood plain. The high removal efficiency of tDOC was linked to a diverse microbial community capable of degrading a wide repertoire of dissolved organic matter (DOM), and suggested hurricane-induced flood events affect net CO_2 exchange and nutrient budgets in estuarine watersheds and coastal seas.