



Properties of intertidal marsh sediment mobilized by rainfall

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ABSTRACT: We conducted sprinkler irrigation experiments on a low-tide marsh to investigate the effects of rainfall on the redistribution of organic matter (OM) and nutrients in the intertidal zone. We irrigated 1-X 2-m plots at highmarsh, low-marsh, and channel bank sites and flood-irrigated 1-X 3-m plots in the high marsh and low marsh. We measured particulate density, OM content, organic carbon (OC) content, and nitrogen (N) content and calculated OM particulate density and atomic C:N ratios. The content of OM, OC, and N in rainfall-mobilized sediment was consistently higher than in the substrate. C:N ratios ranged from 13 to 15 and were consistently lower than the sediment substrate (16-21). These observations indicate that rainfall can mobilize N preferentially over OC; hence, rainfall events deplete the marsh substrate of OM, OC, and nutrients. Despite variability in the density of mobilized particulates, the calculated OM densities and the C:N ratios remained unchanged during the irrigation experiments. These results indicate that rainfall runoff processes preferentially and consistently mobilize OM-rich particulates with low C:N ratios, characteristic of mixed algal or vascular plant sources. The short-term OC fluxes during these rainfall experiments represent 3-20% of annual primary productivity.

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