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# Vegetation hinders sediment transport towards saltmarsh interior

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The resilience of saltmarshes mainly depends on their ability to gain elevation by sediment accretion to keep pace with sea level rise, and tidal channels play a crucial role in the transport of sediments towards their interior. While feedbacks between geomorphology and vegetation are increasingly recognized as key drivers shaping a variety of tidal channel network structures, the resulting impact on long-term sediment accretion over the vegetated platforms has been poorly studied so far. Here, we compare two saltmarsh species with contrasting colonization strategies and morphological traits: *Spartina* marshes, characterized by patchy colonization patterns, encroaching tidal flats in small, isolated patches (1-10 $m^2$) that slowly grow laterally (few m/year) with dense stands of tall stems; *Salicornia* marshes, characterized by more homogeneous colonization patterns, establishing quickly over large areas (100-1000 $m^2$) with much less dense and shorter stems. Through different model scenarios (without vegetation, with *Spartina* plant traits, and with *Salicornia* plant traits), we investigate the impact of saltmarsh vegetation on self-organization of tidal channel networks, and the resulting consequences on long-term sediment accretion over the vegetated platforms, while disentangling the role of plant morphological traits (stem density, height, diameter) from colonization traits (patchy vs. homogeneous). In agreement with previous literature, we find that saltmarsh vegetation (especially denser *Spartina*) increases channel density (a measure of alleged efficiency with which channel networks serve the vegetated platforms, solely based on their geometric characteristics). However, by contrast with what is usually assumed, our results reveal that higher channel density does not necessarily lead to higher sediment accretion rates over the platforms. That is because vegetation (especially denser *Spartina*) increases friction and hinders sediment transport towards the platform interiors, leading to the formation of levees close to the channels and depressions away from them. Our results also suggest that plant colonization traits (patchy vs. homogeneous) have a dominant impact on sediment accretion during the colonization phase, but that plant morphological traits (stem density, height, diameter) prevail on the long term.