



Daily cycles of suspended sand at coral reefs: A biological control

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ABSTRACT: Sediment resuspension has a major ecological role in many coastal habitats, lakes, and marine environments. Waves and currents are generally thought to be the major control on sediment resuspension. In this study, the temporal and spatial distributions of suspended sand concentrations (SSAC) were measured at five coral reefs in the northern Gulf of Aqaba, Red Sea, by directly filtering seawater through 100- μ m mesh nets. Levels of nearbottom SSAC were twice as high during the day (4.8-9.7 mg m⁻³) than at night (2.3-5.2 mg m⁻³). Vertical profiles showed a sharp increase of SSAC (2-6-fold) toward the bottom during the daytime but not at night. The contributions of wind, waves, and currents to variations in SSAC were nonsignificant except during rare southern storms. Temporal and spatial changes in the level of SSAC during the day corresponded with the abundance of benthivorous fish and their activity pattern. Resuspension activities by fish numbered >1.5 resuspension events m² h⁻¹ and were confined to daytime. An in situ experiment in which fish were excluded from a large section (250 m²) of the reef resulted in elimination of the day-night differences and a significant decrease in daytime SSAC over the treated reef section in comparison to the open, control sites. This study is the first report of a daily pattern of suspended sediment at coral reefs with fish activity as its causative agent.

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