



## Effects of turbulence-mediated larval behavior on larval supply and settlement in tidal currents

Fuchs, Heidi L., Michael G. Neubert, Lauren S. Mullineaux

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**ABSTRACT:** Intertidal gastropod larvae retract their vela and sink in strong turbulence, and this behavior potentially increases settlement in turbulent coastal habitats. We incorporated turbulence-induced sinking behavior of mud snail larvae (*Ilyanassa obsoleta*) in a vertical advection-diffusion model to characterize behavioral effects on larval supply and settlement in a tidal channel. Throughout flood and ebb tides, larvae that sink in turbulence have higher near-bed concentrations than passive larvae. This high supply of larvae enables behaving larvae to settle more successfully than passive larvae in strong currents characteristic of tidal inlets. Unlike passive larvae, those that sink in turbulence settle more successfully in stronger currents than in weaker ones and would concentrate their settlement in energetic tidal zones. Turbulence-mediated behavior may give intertidal larvae a greater ability to select habitats and may reduce larval mortality rates due to settlement failure.

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