

Demography and movement of the amphipod *Corophium volutator* on mudflats in the Bay of Fundy: metapopulation dynamics and implications

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The tube-dwelling amphipod *Corophium volutator* (hereafter *Corophium*) inhabits the extensive intertidal mudflats of the upper Bay of Fundy. The populations of *Corophium* are typically abundant and densely concentrated, and represent an important component of the mudflat community. *Corophium* are a primary food for various animals, including large flocks of migratory shorebirds. We sampled multiple mudflats over multiple years and found that some mudflat populations of *Corophium* are more stable than others. Demographic analysis indicated that a population on a mudflat is a spatially homogenous population; this occurs because *Corophium* swim in the water column in large numbers (specifically during night tides at full and new moon), and so the population is well mixed. The importance of swimming was surprising because females brood their young, and juvenile *Corophium* start making burrows as soon as they hatch (i.e., there is no obvious planktonic stage in the *Corophium* life cycle). Could this swimming propensity connect mudflat populations into a metapopulation? Genetic analysis, as well as a separate sampling study of narrow muddy shores in between mudflats, indicated high connectivity between different mudflats, though we still need to better quantify this connectivity to appropriately model metapopulation dynamics. Our present research questions include: (i) Are there source and sink populations of *Corophium*? (ii) On which populations should we focus conservation efforts? And (iii) if population rescue is possible, how long does it take for a collapsed population to recover?

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