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Behavioral Response of Atlantic Mud Crab Megalopae to Coherent Shear Flows D.R. WEBSTER, A.C. TRUE, M.J. WEISSBURG, J. YEN, Georgia Tech — Behavioral assays with megalopae of the Atlantic mud crab (*Panopeus herbstii*) were performed in a laboratory mimic of hydrodynamic structure associated with fronts and clines. A laminar, planar free jet was used to create fine-scale upwelling, downwelling, and horizontal shear flows. Analyses of digitized trajectories established orientation-specific behavioral shear strain rate thresholds in the range 0.04 – 0.1 s^{-1}. Changes in average kinematics revealed area-restricted searching in the vicinity of horizontal shear flows and excited area-restricted searching in the vicinity of both vertical shear flows, although not in the layers themselves. These responses could produce aggregations in the vicinity of coherent shear flows, although there is avoidance of vertical flow regions. Reduction in the net-to-gross displacement ratio (NGDR) and the vertical-net-to-gross displacement ratio (VNGDR) with respect to stagnant conditions indicate that trajectories become more sinuous and that larvae enhance depth-keeping in all shear flows. Collectively, this is consistent with foraging and sampling behaviors in which shear flow cues larvae to restrict search volume in hopes of exploiting some coincident cue or resource patch, typical in fronts and clines. Area-restricted searching along with depth-keeping seen here reveals that larvae may utilize the information contained in coherent shear flows to optimize needs operating on disparate space and time scales (e.g. foraging and site selection for settlement).

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