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EFFECTS OF HYPOXIA ON ANIMAL BURROW CONSTRUCTION AND CONSEQUENT EFFECTS ON SEDIMENT REDOX PROFILES. [Eric J. Weissberger](#)

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We investigated the effects of mild hypoxia on the burrowing behavior of three marine species (the hard clam *Mercenaria mercenaria*, the polychaete worm *Nereis virens*, and the amphipod *Leptocheirus plumulosus*) and consequent effects on sediment redox profiles. Animals were introduced at natural densities into defaunated sediment cores and allowed to burrow for four months at mildly hypoxic (2 mg l^{-1}) and saturated (7 mg l^{-1}) dissolved oxygen levels. Sediment redox profiles were taken at varying temporal intervals for the duration of the experiment. At the end of the experiment, cores were imaged using computed tomography to quantify burrow volume and location. For all species, burrow volume remained constant over DO treatments, but burrows were shallower in hypoxic treatments compared to normoxic treatments. Redox profile discontinuity depth was shallower in hypoxic treatments compared to normoxic treatments for experiments with and without animals, indicating that water column oxygen concentration influences both bioturbation and diffusion of oxygen into the sediment. In hypoxic treatments, clams and worms increased the RPD depth relative to no-animal controls. In normoxic treatments, all species increased RPD depth relative to controls. These results suggest that under hypoxic conditions, burrowing infauna may increase the depth to which oxygen penetrates the sediment, but not to the same degree as they would under normoxic conditions.

Key words: hypoxia; burrowing; redox; computed tomography; *Mercenaria*; *Nereis*; *Leptocheirus*