Society for Integrative and Comparative Biology

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Meeting Abstract

21.4 Wednesday, Jan. 4 **Bivalves as Infaunal Hydraulic Ecosystem Engineers vs Wimps of the Class** *WOODIN, S.A.*; HEWITT, J.E.; PILDITCH, C.A.; POLERECKY, L.; THRUSH, S.F.; VOLKENBORN, N.; WETHEY, D.S.; Univ South Carolina, Columbia; NIWA, Hamilton, NZ; Univ Waikato, Hamilton, NZ; Max Planck Inst Marine Micro, Bremen, DE; NIWA, Hamilton, NZ; Univ South Carolina, Columbia; Univ South Carolina, Columbia*
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In 2010 we proposed that organisms living in sediments could be categorized according to the frequency, direction and strength of their hydraulic activities within the sediments and that this axis was likely to be as significant in driving community dynamics as sediment turnover or organism mobility. Data on the impact of bioadvection on the availability of transport of both nutrients and heat were presented to support our claim (Woodin et al. 2010). We further proposed that infauna could be characterized by the complexity and magnitude of their hydraulic activities. Specifically, tellinid bivalves, arenicolid polychaetes and thalassinid crustaceans were suggested to be enormously important in terms of porewater movement and those hydraulic activities might be more important than sediment turnover, the typical focus of research on infauna. In contrast, we proposed that suspension feeding bivalves in general were at the opposite end of the bioadvective gradient, having simple hydraulic signals of low magnitude. Planar optode plus pressure sensor data from common bivalves of intertidal flats of New Zealand, Germany, and the Pacific northwest of the United States are used here to illustrate that our original proposal appears to be correct. Activities of tellinid bivalves result in strong pressure changes within the sediment that are uniquely associated with a range of behaviors and are bidirectional. In contrast, excluding initial burrowing, the activities of a suspension-feeding venerid bivalve do not result in strong pressure changes though brief pressure pulses are seen during feeding.