Linking nearshore processes with intertidal diversity in Puget Sound

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A collaborative team from UW and the DNR's Nearshore Habitat Program is investigating processes responsible for ecological gradients in pebble-sand beaches along the north-south axis of Puget Sound. Previous monitoring work has demonstrated a striking gradient in intertidal species richness among physically similar beaches, with south-sound beaches having roughly half the species of north-sound beaches. This pattern is consistent across trophic groups and in both epibiota and infauna. In 2004, we initiated a series of experiments that test our hypotheses that diversity is positively related to recruitment and productivity; that sediment instability reduces the diversity of epibiota; and that fine sediments increase the diversity of infauna. After one year of sampling, preliminary data show relationships between physical gradients (salinity, temperature, wave action) and ecological processes (productivity, recruitment) in driving observed diversity patterns. We are gathering data on algal and suspension feeder growth rates, and on biomass and recruitment rates of both epibiota and infauna. Temperature data are gathered with a variety of dataloggers, and scouring/disturbance rates with other methods. This work addresses gaps in previous research on estuarine gradients, which seldom control for substrate and often lack sufficient replication.