

Study Protocols: Distribution of Intertidal Wrack Consumer beds over time

Field data on the zones of selected intertidal invertebrates were collected regularly (~ every 2nd day) from Summer 2011 to Summer 2012. The study was conducted on the western portion of Isla Vista beach, a narrow bluff-backed shoreline that is an SBC LTER core study site (IVWB) in Santa Barbara County, California.

We measured zonal dynamics for visible beds of two important invertebrate taxa of the upper and mid beach zones, talitrid amphipods and opheliid polychaetes, respectively. SBC beaches support up to four species of talitrid amphipods in the genus *Megalorchestia* and mean densities of talitrids can exceed 90,000 individuals m⁻¹ at the study beach. The distributions of talitrid amphipods change substantially over daily cycles. They are nocturnal and generally active on the sand surface primarily at night with distributions extending as low on the beach as the swash zone. They feed on freshly deposited macrophyte wrack, then move back upslope and spend daylight hours burrowed in dense beds of burrows in damp sand near the 24 hr high tide strand (HTS) or drift line. The positions of the burrows are marked by mounds on the sand surface near the high tide strand (HTS). The opheliid polychaete, *Euzonus mucronata*, (note recent genus name change to *Thoracophelia*) creates characteristic narrow, dense beds with burrows visible at the surface of the mid beach during low tides. These worms move deeper (vertically) into the sand during high tides and return to the sand surface during low tides for respiration and feeding. Mean densities of this polychaete at the study site can exceed 28,000 individuals m⁻¹ of shoreline.

To investigate the dynamics of the distributions of these characteristic mid- and upper-intertidal detritivores, we measured the locations of beds of invertebrate burrows and positions of shorelines (water table outcrop WTO, highest tide level in previous 24 h HTS), and the limits of the coastal strand vegetation zone on standard transects during early morning hours 195 times over 366 days. All locations were measured to the nearest meter relative to the toe of the sea bluff and means were calculated for each entity.