

Traits associated with of species associated with deep-sea wood falls and niche width expansion shared between chemosynthetic communities

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Deep-sea wood falls represent high productivity communities within a background food desert and are typified by a unique fauna that share characteristic species with hydrothermal vent, cold seep and whale fall communities. Several of these species are obligate wood consumers that serve as ecosystem engineers creating niches for other wood fall specialists. As a small localized community that exists within a biogeochemical halo associated with the wood substrate several trophic pathways emerge including predation on wood associates, chemolithoautotrophy, fecal miners and opportunists. Size of the wood fall impacts β -diversity but predictors of common traits that create subsets of species complexes are unknown. A trait based approach is used to determine if these community complexes are random or if they are filtered based on niche. Body size, feeding guilds, motility, sensu trophic state and successional stage are used to delineate natural groupings of species associated with deep-sea wood falls. Niche width is best determined by successional stage of the wood falls as shown by cluster analysis but some overlap between moderate and significant sulfidic sediment halos indicate that not all species groups are determined by this trait alone. Plasticity of niche widths when competing for valuable but rare resources may allow species to effectively use chemosynthetic resources at multiple community types and thus help explain the overlap of some common species between chemosynthetic habitats.