

## **Size and Energy Influenced Niche Packing in Experimental Wood-Fall Communities**

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Theoretical and empirical studies suggest that the total energy available in natural communities influences standing stock, body size, and diversity. But the precise mechanisms underlying relationships or how these three ecological properties relate remain elusive. We address five hypotheses relating energy availability among standing stock, body size, and diversity in experimental deep-sea wood falls. In November 2006, 32 *Acacia* sp. logs were deployed at 3203 m in the Northeast Pacific Ocean (Station Deadwood: 36.154098° N, 122.40852° W). The *Acacia* logs ranged in size from 0.6 to 20.6 kg and correspond to different level of energy available to the invertebrate communities assembling on wood falls. Sixteen *Acacia* logs were collected in October 2011 (Set 1, 5 years) and 16 in October 2013 (Set 2, 7 years). With increasing productivity, increases in species richness correlated with increases in abundance. However, these increases in species diversity resulted from packing species into a modal size class. Increases in richness in the modal size class with increasing energy were concordant with increases in abundance within that size class. The results suggest that community assembly at high-productivity food falls and chemosynthetic habitats may be driven by specific niches tied to body size in conjunction with overall availability of energy.