

Effects of drought on low flows and freshwater shrimp (*Macrobrachium*) distributions in a tropical montane drainage network, Luquillo Experimental Forest, Puerto Rico

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Abstract. Disturbances such as extreme, infrequent events droughts influence upstream migration and locally alter distributions of freshwater fishes and shrimps. Palaemonid river shrimp (*Macrobrachium* spp.) are among the largest decapod predators in headwater pools throughout the Caribbean. These shrimp are distributed along an elevational gradient (274 to 456 m) in the Rio Espiritu Santo drainage network, in the Luquillo Mountains of northeastern Puerto Rico. A drought in 1994 was the driest year in 28 years of record and had a major impact on shrimp distributions. The lowest mean density of *Macrobrachium* occurred during the 1994 drought while *Macrobrachium* abundance increased for five years following the drought. *Macrobrachium* abundance declined with elevation during most years. These large predatory shrimp feed on smaller shrimps (*Atya lanipes* and *Xiphocaris elongata*), other invertebrates (such as aquatic insects and juvenile crabs), leaf litter and periphyton that are all readily available in headwater pools. The drought apparently concentrated prey resources and led to increased survivorship and abundance of *Macrobrachium* following the drought. These long-term responses to drought are being studied as part of the NSF's Long Term Ecological Research program and a BioComplexity project dealing with human impacts and harvests of shrimps from pools near roads.

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