

Mammalian body size is determined by interactions between climate, urbanization, and life history traits

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Abstract

Anthropogenically-driven climate warming is a hypothesized driver of animal body size reductions. Less understood are effects of other human-caused disturbances on body size, such as urbanization. We compiled 140,499 body size records of over 100 North American mammals to test how climate and urbanization, and their interactions with species traits, impact body size. We tested three hypotheses of body size change across urbanization gradients; urban heat island effects, fragmentation, and resource availability. Our results unexpectedly demonstrate urbanization is more tightly linked with body size changes than temperature, most often leading to larger individuals, thus supporting the resource availability hypothesis. In addition, life history traits, such as thermal buffering, activity time, and average body size play critical roles in mediating the effects of both climate and urbanization on intraspecific body size trends. This work highlights the value of using digitized, natural history data to track how human disturbance drives morphological change.

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