**Temporal response of mammal body size to temperature**

Kristina Riemer, Ethan P White

**Abstract**

**Introduction**

Current and future changes in the climate of the planet, in particular increasing global temperatures, have potential direct implications for the sizes of organisms. The relationship between the size of endotherm species and temperature is generally negative. This pattern is referred to as Bergmann’s rule due to it being initially described by the German biologist Karl Bergmann (Bergmann, 1847). Evidence for the prevalence of this rule among endotherm species has been documented for over a century [bunch of sources]. It has therefore recently been predicted that, due to increasing temperatures from climate change, endotherm species will be decreasing in size in the near future (Gardner et al., 2011; Sheridan and Bickford, 2011). Organismal size is an important ecological characteristic that affects many aspects of ecosystems, including resource use [source], interspecific interactions [source], and ecosystem processes [source]. Because of the diverse impacts of body size, changing sizes due to climate change could result in drastic changes in ecosystems.

There is some evidence that a negative temperature-body size relationship is not as common among endotherm species as previously believed (Riemer et al., 2018). Even if this relationship does occur, it is possible that the many other factors that affect body size in addition to temperature in ecosystems, including predator-prey interactions [source] and resource availability [source], have a more substantial impact. If temperature increases do not have a strong and directional impact on body size, it will be more difficult to predict how climate change will shift species body sizes. It is crucial to be able to predict these size changes because of the importance of size on the functioning of ecological systems. How body size responds to temperature over time also have been examined infrequently, though it has been shown that x [source] and y [source]. It is especially important to understand how size will change dynamically from shifting temperatures.

We addressed temporal shifts in body size due to temperature by compiling long-term time series of mammal communities from x locations. This consisted of size measurements for xxx,xxx individuals, which were used to determine average mass of xx species across at least 5 years. This was combined with a global temperature dataset to determine the strength and direction of the relationship between species mass and temperature. We were able to show how mammal size is impacted by temperature over time. This data-intensive approach addresses limitations of previous work on the temperature-mass relationship, which consisted of studies on single species and meta-analyses derived from those studies.

**Methods**

* Datasets
  + Temperature
  + Criteria for all time series datasets
  + Describe each time series dataset
* Analysis

**Results**

Misc: temperature change over time, mammal size change over time, relationship between these

**Discussion**

**Acknowledgements**

**References**