Appendix 1

**Fig A1** Rescaling functions used to convert precipitation isoscapes to tissue-specific isoscapes with ordinary least squares regression. The precipitation values were extracted from the new long-term isoscapes generated from a subset of stations from the known origin of the calibration samples. Rescaling functions for (a) monarch butterfly wing chitin ($R^2 = 0.58$) and (b) reed warbler feather keratin ($R^2 = 0.74$). Gray lines represent the 1000 simulated regressions. Regressions for the original short- and long-term periods are available in Vander Zanden et al. (2014).