

Landscape-Level Stress Assessment: Macro-ecological patterns of physiological health in the Wood Frog (*Lithobates sylvaticus*).

Nichole M. Mattheus

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Understanding variation in intraspecies physiological responses to environmental change is key for forecasting how species respond to disturbance. More specifically, analysis of an organismal response to stressors across a natural landscape of environmental variation would be highly informative (Wingfield 2008) and recent works have begun to shed light on the potential causes to natural differences in the strength of a physiological stress response (Busch *et al.* 2011; Dahl *et al.* 2012). Glucocorticoid steroid hormones (corticosterone in amphibians) are released in response to environmental variation (Sapolsky, Romero & Munck 2000) and are measured for indication of individual and population health (Romero 2004; Wikelski & Cooke 2006). We sampled Wood Frog populations across eastern North America in order to examine patterns of steroid hormone response (corticosterone and testosterone) across known macro-ecological drivers such as latitude, range location, and climatic suitability. Most populations exhibited an increase in corticosterone and a decrease in testosterone in response to a stress challenge and baseline corticosterone levels negatively correlated with climatic suitability as expected. Body condition, weight and testosterone are independently predictive factors of mean stress response. Body size decreased with latitude, unlike the positive pattern seen in other vertebrates. Our broad sampling efforts revealed results clarifying the association between corticosterone, testosterone, body condition and suitable climate as indicators of health and potential tool for conservation ecologists.