ELECTRONIC APPENDIX 1 - .CSV FILE OF SENSITIVITY OF FRESHWATER INSECT GENERA TO CLIMATE VARIABLES FOR THE CONTIGUOUS UNITED STATES

In Chapter 4 of my dissertation, I examined the *climate-sensitivity* of freshwater insects in the contiguous United States, or the degree to which their geographic distributions are strongly determined by climatic variability, using relationships between climate and freshwater insect traits and trait profile groups (i.e., clusters of interrelated traits). Among the 11 traits and 3 trait profile groups that I considered, erosional flow preference, cold-cool eurythermal preference, and univoltine life-history traits were the most sensitive to climate. I used these traits to assess the climate-sensitivity of individual stream insect genera. Using these trait-based indicators, I found that insects in the orders Plecoptera and Trichoptera are likely the most sensitive to climate change.

Climate variables include the mean of the maximum temperature of the warmest month (bio 5) and mean precipitation of the warmest quarter (bio 18), created with the ‘biovars’ function in ‘dismo’ R package version 1.1-4 (Hijmans et al. 2017). Climate variables were calculated from PRISM temperature and precipitation data spanning the timeframe 2001 to 2018 (PRISM 2020). Each climatic variable was first averaged spatially for USGS HUC 4 watershed polygons for each year, and then averaged over the time period 2001-2018 to create a single spatial and temporal mean value by HUC4 watershed.

I present climate sensitivity scores of freshwater insects to these climate variables calculated in two different ways. I calculated climate sensitivity of freshwater insect genera using 1) trait profiles and 2) individual traits of rheophily, thermal preference, and voltinism. Higher sensitivity scores indicate a genus’ geographic distribution is strongly correlated with climate. Genera with high climate sensitivity may be more likely to experience changes in their geographic ranges, including range contractions, local extirpations, or extinctions, as a result of climate change. See dissertation Chapter 4 for detailed methodology and interpretation.

Columns in the .csv file are as follows: Genus, Family, Order, Trait\_profile\_group, Sensitivity\_trait\_profile\_group (climate sensitivity of the genus according to its trait profile), Rheophily\_abbrev (rheophily trait assigned to the genus), Thermal\_pref (thermal preference trait assigned to the genus), Voltinism\_abbrev (voltinism trait assigned to the genus), and Sensitivity\_trait (climate sensitivity of the genus according to its rheophily, thermal preference, and voltinism traits).

BIBLIOGRAPHY

Hijmans, R.J, S. Phillips, J. Leathwick, and J. Elith. 2017. [dismo: Species distribution modeling. (R package)](javascript:void(0)). Available online at: <http://cran.r-project.org/web/packages/dismo/index.html>.

PRISM 2020. PRISM Climate Group. Oregon State University, http://prism.oregonstate.edu.