

Supplemental Appendix S4-- Metadata Ecoregion 69 and 70: Step-by-Step Calculation and Spreadsheet Tools for Predicting Stressor Levels that Extirpate Genera and Species

Susan M. Cormier[†], Lei Zheng[‡], Erik W. Leppo[‡], and Andrew Hamilton[‡]

[†]U.S. Environmental Protection Agency, National Center for Environmental Assessment, Cincinnati, Ohio

[‡]Tetra Tech, Inc., 0711 Red Run Blvd., Suite 105, Owings Mills, MD 21117, USA

Key Words: extirpation, specific conductivity, streams, Appalachia, sensitivity distribution

METADATA

Data are provided as an Excel® file (Appendix_S5-Data_69-70.csv). The data used in the case example are from a large field data set, the West Virginia Department of Environmental Protection (WVDEP's) in-house Watershed Assessment Branch database (WABbase). Chemical and biological samples are from 1996–2011 and 1997–2010, respectively. The WABbase contains data from Level III Ecoregions 66, 67, 69, and 70 in West Virginia (USEPA 2010; Omernik 1987; Woods et al. 1996). The example dataset includes 3,734 paired biological and specific conductivity samples throughout Ecoregion 69 and 70.

A wide range of SC levels were sampled, which is useful for modeling the response of organisms to different levels of ionic concentration. Data filters that excluded low pH ≤ 6 and high proportion of chloride ions ($[\text{HCO}_3^-] + [\text{SO}_4^{2-}] \leq [\text{Cl}^-]$) were applied prior to finalization of the data set. Additional criteria were used to identify macroinvertebrates for inclusion in the example extirpation concentration distribution: occurrence at reference sites and occurrence in 25 or more samples. A total of 176 macroinvertebrate genera were selected which occurred at 25 or more sampling locations. SC ranged from 15–11,646 $\mu\text{S}/\text{cm}$ which allowed the response of organisms to be modeled for a wide range of SC levels.

REFERENCES

Cormier, S.M., Zheng, L., Leppo, E.W. and Hamilton, A., 2018. Appendix 5. BEAT Data 69-70: Step-by-step calculation and spreadsheet tools for predicting stressor levels that extirpate genera and species. Integrated Environmental Assessment and Management.

- Omernik, J. M. 1987. Ecoregions of the conterminous United States. *Annals of the Association of American Geographers* 77:118-125.
- USEPA (Environmental Protection Agency). 2010. Primary distinguishing characteristics of Level III Ecoregions of the Continental United States. Available online at: ftp://ftp.epa.gov/wed/ecoregions/us/Eco_Level_III_descriptions.doc.
- Woods, A. J., J. M. Omernik, D. D. Brown. 1996. Level III and IV ecoregions of Pennsylvania and the Blue Ridge Mountains, the central Appalachian Ridge and Valley, and the central Appalachians of Virginia, West Virginia, and Maryland. EPA/600/R 96/077. Corvallis, OR: U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory.
https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryID=50329.