

## **A statewide assessment of fish tissue mercury dynamics**

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Mercury contamination of aquatic systems has received much recent attention because of potential health concerns for wildlife and humans. Although factors affecting mercury deposition, conversion to biologically-active methylmercury (MeHg), and bioaccumulation in aquatic systems have been identified, equivocal results specific to particular species and systems have hampered policy making. Our study addresses this problem through a comprehensive, statewide synthesis of current data on mercury contamination and the environmental factors associated with MeHg formation and transport through aquatic food webs. Using data collected by the North Carolina Department of Environment and Natural Resources, the Environmental Protection Agency and others, we examined the relationship between a suite of biotic and abiotic factors and tissue mercury concentrations from fish in North Carolina waterbodies. Multivariate tests were conducted to create predictive models relating environmental variables to mercury in fish, and Akaike's Information Criterion (AIC) was used to examine the relative strength of candidate models. The best models in our analyses included species (ranked by mean total length), fish trophic status, ecoregion, and pH. Thus, we expect high concentrations of MeHg in large species of fish that are of high trophic level (piscivores) from systems that exhibit low pH in the coastal plain. Although previous investigations have indicated similar trends, our study is unique in that we examined the relative importance of a large number of biotic and abiotic variables across a range of environments and ecosystems. The results of these analyses should help policy makers in risk assessment decisions, and should serve as a template for future contaminant investigations.