



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

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Appendix B. Calculation of Fish Advisories (July 2023)

Calculation of Fish Advisories

The Fish Consumption Advisories (FCA) described here were calculated to address public health concerns regarding consumption of fish from the Middle and Lower Cape Fear River. FCAs are developed on a site-specific basis, and since the Cape Fear River is a moving water body, fish were collected throughout a 160-kilometer section of the river in accordance with methods described in Appendix A to inform the development of PFAS-specific Fish Consumption Advisories (Figure 1).

Table 1 shows the average concentrations of PFAS chemicals for each species. Although multiple PFAS were detected in low concentrations in multiple species, concentrations of PFOS were consistently the highest amongst all species sampled. These consistently elevated concentrations in conjunction with the new, lower reference dose for PFOS released by the United States Environmental Protection Agency (USEPA) in March 2023 informed the decision to base the derived fish advisories on PFOS concentrations. Additionally, we considered both cancer and noncancer toxicological information published by the USEPA for our calculations (USEPA 2023). However, use of the non-carcinogenic reference dose resulted in more protective fish consumption advisories and thus drove our calculations. As new toxicological data becomes available for other PFAS detected, the data will be reevaluated to ensure that fish consumption advisories remain protective of public health.

Based on analysis from the North Carolina Department of Environmental Quality (NCDEQ) there was no statistical difference in PFAS concentrations from each site, with fish species being the only significant variable affecting PFAS concentrations (Appendix A). Therefore, we first calculated an average PFOS concentration for each species, using data from all sites (Table 1), and then meal limits for each species using Equations 1 and 2. Values for the other variables used in Equations 1 and 2 were taken from OEEB's Fish Consumption Advisory Standard Operating Procedure. We then averaged similar species-specific meal limits within two categories to develop the final values in Tables 2 and 3.

American Shad were included in the calculation of the less restrictive meal limit tier because they are a migratory species that can be found throughout the Cape Fear River system depending on the time of year, thus concentrations of PFAS in American Shad are assumed to be representative of other American Shad caught throughout the Cape Fear River.

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