

Title: PFAS Bioaccumulation and Tissue Distribution in Lake Michigan Fish

Abstract: Per- and polyfluoroalkyl substances (PFAS) are persistent and bioaccumulative pollutants that pose risks to human and environmental health. PFAS contamination permeates the Laurentian Great Lakes, which contain 20% of the world's freshwater and support a \$7 billion annual fishing industry. Studies on the distribution of PFAS across fish tissues and organs are generally limited to laboratory studies, and few data exist for native Lake Michigan fish. Here, we measured PFAS concentrations in tissues from 216 Lake Michigan fish to determine how PFAS moves within fish and through the food web. We hypothesize that PFAS concentrations will vary among species, trophic levels, and tissue types. We expect higher concentrations in (1) tissues rich in proteins (e.g., liver and kidney) because of PFAS affinity for proteins; (2) higher trophic levels due to biomagnification; and (3) benthic species (e.g., round goby and burbot) due to increased interaction with sediments. Lake whitefish, lake trout, yellow perch, round goby, alewife, walleye, rainbow smelt, and burbot were collected along with environmental samples (e.g., sediment and water) from Lake Michigan. Individual fish were dissected for muscle, heart, liver, gills, kidney, digestive tract, and gonads. Preliminary data on salmonids indicate higher PFOS in tissues such as heart, kidney, and liver compared to muscle and stomach. Next, we will expand analyses to 35 PFAS compounds and determine trophic position using stable isotopes. This work will provide novel information on PFAS pathways in Lake Michigan and inform management strategies to protect the environment and human health.

Authors: Babita Bhatta, Alison M. Zachritz, Whitney M. Conard, Heather D. Whitehead, Graham F. Peaslee, Daniele A. Miranda, and Gary A. Lamberti,