

FISH TISSUE MONITORING FOR MERCURY IN NEW JERSEY

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ABSTRACT

Mercury is a unique persistent, bioaccumulative and toxic (PBT) compound as the inorganic form of this metal is methylated by bacteria into a highly bioavailable organic form. This process results in highly elevated levels of mercury in fish and wildlife as compared to the levels in surface water. NJDEP's Division of Science, Research & Technology's Routine Monitoring Program for Toxics in Fish (Fish Monitoring Program) and prior research indicate that mercury is found in all NJ fish species, and levels are highest in upper trophic level fish. Notably, these data have shown that NJ freshwater fish (26 species) averaged 0.36 $\mu\text{g/g}$, whereas similar species nationwide averaged 0.26 $\mu\text{g/g}$ (EPA, 2003). However, when examined on a regional basis, mercury in fish (5 species) from the NJ Pinelands averaged 0.80 $\mu\text{g/g}$, whereas in the rest of the state they averaged 0.23 $\mu\text{g/g}$, closer to the national average. The NJ Fish Monitoring Program has divided the state's fresh, estuarine and marine waters into five regions that are sampled on a rotating basis. Four of the five regions have been sampled between 2002 and 2007. These more recent data were compared to data collected in the 1990s. Initial comparisons of mercury in select species have indicated no consistent increase or decrease in concentrations.

Due to the bioaccumulative nature of mercury (i.e., bioaccumulation factors [BAFs] on the order of approximately 10^5 to 10^7), monitoring of mercury in fish tissue is essential in order to provide data to protect human health as well as fish and wildlife from this highly bioaccumulative metal. NJ has used the fish tissue data since 1994 to issue fish consumption advisories in the state. Continued monitoring is also warranted to determine if the state's substantial past and projected control efforts are effectively reducing mercury levels in the environment and food chain. Similar to efforts in Florida and Massachusetts, NJ in 2007 has initiated a long-term project to examine the levels of Hg in largemouth bass in select lakes that are near local sources of Hg. These sources are expected to significantly reduce their loading of mercury in the near term.

KEYWORDS: Mercury, Fish Tissue, Statewide Monitoring, Bioaccumulation