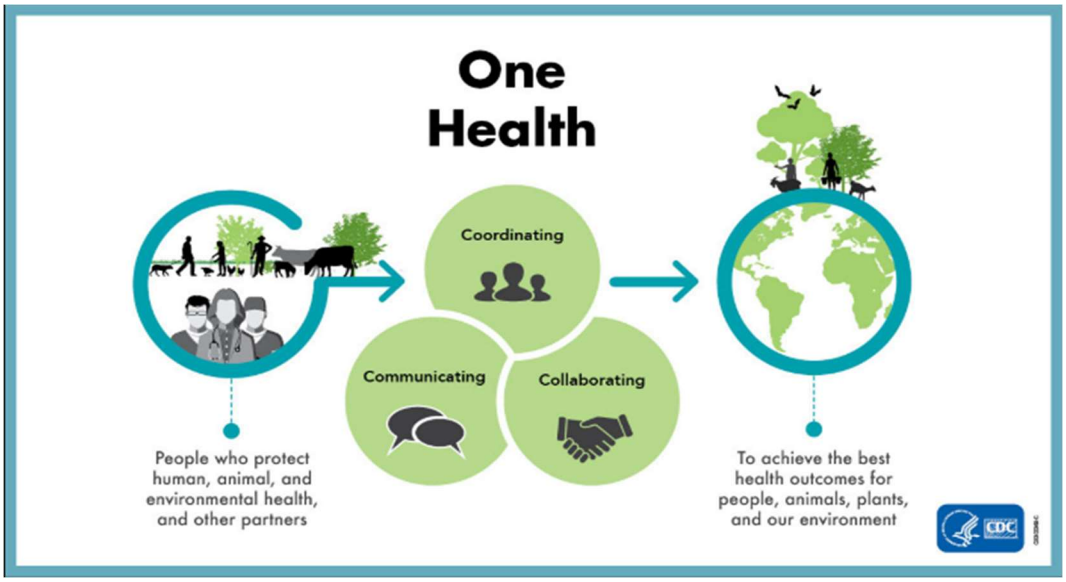
How Georgia Uses a One Health Approach for Fish Tissue Monitoring

What is One Health?

The One Health approach recognizes that the health of people is connected to the health of animals and our shared environment. With the interconnections of our world also comes shared exposures. These can come in the form of ingesting contaminated food or water, consuming meat or fish that has been contaminated, or being exposed to contaminants directly through air or other media. As a result, the cooperation of multiple partners and professionals in different areas of expertise is crucial in addressing the "one health" of humans, animals, and the environment.



Source: *CDC*

To illustrate how state agencies may use the One Health approach, whether they recognize it or not, ECOS interviewed staff from the Georgia Environmental Protection Division (EPD) on their work around fish tissue monitoring for human and environmental health.

Fish Tissue Monitoring

Monitoring the chemical contamination of fish tissue is used across the country as an indicator of the environmental quality of waterbodies and to protect public health from toxic chemical exposure. Because fish can accumulate toxins directly from the water and through their diet, fish tissue monitoring can be used to identify water and/or sediment contamination. High concentrations of toxic chemicals in fish tissue may also lead to fish consumption advisories to prevent the public from exposure to the identified toxin. Chemicals for which fish tissue are regularly sampled include mercury, polychlorinated biphenyls (PCBs), dioxin, and recently, in some states, per- and polyfluoroalkyl substances (PFAS). In Georgia, testing has found fish tissue that contains mercury, PCBs, arsenic, chlordane, toxaphene, and dieldrin. To protect subsistence fishers and to provide a large measure of protection, Georgia's consumption recommendations are based on health-risk calculations for someone eating fish with similar contamination for 30 years or more.

Partnerships

While Georgia does not have an official One Health initiative, as early as 1992, staff in Georgia were working across agencies on fish tissue monitoring. A Fish Tissue Advisory Committee was created to develop the fish tissue sampling and analysis protocol.

Georgia Fish Tissue Advisory Committee Representatives
• Georgia Environmental Protection Division • Georgia Fish and Game Division (later, Wildlife Resources Division) • Agency for Toxic Substances and Disease Registry • U.S. EPA Region IV • Academics

Staff work across state agencies to collect and test fish tissue and to communicate the results with the public. Staff from the Wildlife Resources Division (WRD) gather fish tissue samples that are analyzed by the Georgia EPD lab. Using those results, EPD staff develop a Fish Consumption Guidelines (FCG) booklet with fish consumption advisories that is used by EPD, WRD, and the Georgia Department of Health to inform the public which fish are safe to eat.

EPD makes the booklet available through its **water quality assessment webpage**. The FCG booklet includes information on the contaminants found in fish in Georgia, where those contaminants come from and how they get into fish, the benefits and risks of eating fish, and how to reduce those risks. Because fish accumulate toxins over their lifetime, the booklet breaks down the consumption advisories for lakes based on fish size, with the larger size indicating older fish.

EPD provides printed copies of the FCG booklet to the Georgia Department of Health, which works with District and County Health Departments and others to distribute the booklets to the public. The Department of Health and the Department of Natural Resources, which houses both the EPD and the WRD, have worked together to develop fish consumption guidelines specifically

for women to help protect fetuses and nursing babies. The guidelines are available in both English and Spanish and provide information by river basin/geographic area and generally for the state.

The Wildlife Resources Division has turned the fish consumption advisory information in EPD's FCG booklet into a color-coded fact sheet that uses a green, blue, orange, and red scale to indicate no restrictions, one meal per week, one meal per month, and do not eat, respectively. This visual representation of the recommended guidelines provides fishers a simple way to identify consumption advisories. WRD also provides copies of the guidebook to popular fishing-related outlets to help get information to people fishing in the state. For the most recent online version of the FCG booklet, EPD has adopted the fish consumption color coding used by the WRD to make the information in the guidebook easier to review. However, the state has found that it is cost prohibitive to print a color-coded version of the booklet.

Challenges

While the state agencies have worked together to inform the public about potential fish contamination, they have faced challenges. One challenge is ensuring that both EPD and WRD staff understand and follow the fish tissue monitoring strategy that was originally developed in 1992. As this document is over 30 years old, the staff involved in initially writing and implementing the strategy are no longer at the agencies. Even so, EPD and WRD staff need to understand the rationale behind the strategy to ensure appropriate samples are gathered and appropriate conclusions are drawn from the test results. EPD staff may also need to explain how they use the results of the fish tissue testing as an indicator of water quality over time to help WRD staff understand the need to return to previously tested waterbodies.

Funding cuts are another challenge. They have led to delays in samples being tested, which has slowed the publication of the updated/annual version of the guidebook.

Given limited resources, EPD and WRD need to work together to ensure their most valuable use by identifying the more frequently fished waterbodies, the types of fish people catch and eat, and how often to return to previously tested waterbodies to see if contamination levels have changed. These activities have not always been coordinated, leading to testing of waterbodies and fish that are unlikely sources of human exposure.

Opportunities

EPD plans to work with WRD to develop a standardized sampling rotation schedule to return to key waterbodies for fish tissue sampling and testing to provide better information about changing water quality over time. Previous sampling methods were not standardized and not on a rotation, causing many of the waterbodies to not be retested often enough to provide current data for the systems. Establishing the standardized rotation will eliminate this and keep the data current and relevant to the state's consumers.

Other Opportunities for One Health Collaboration

As EPD, WRD, and the Department of Health have already established a working relationship around recreational users at state waterbodies, expanding this relationship to address harmful algal blooms could be a next step to expanding use of a One Health approach in the state.

This report was funded by the U.S. EPA under grant number 840495011. The findings and conclusions in this document do not necessarily represent the official position of the U.S EPA or the other organizations involved, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.