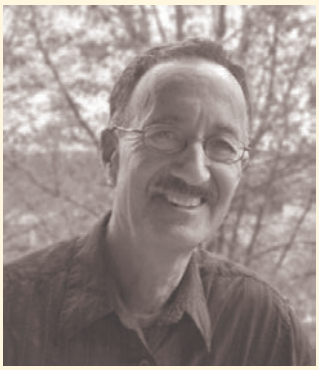
To the Point

UW-SRP* Research Snapshots



Dr. Evan Gallagher

A fish lives each day by successfully avoiding its predators and by finding food. What can fish, like the Pacific salmon, tell us about the challenges of survival these days? Research scientist, **Evan Gallagher**, looks at olfaction (sense of smell) in fish to answer that question. It is here, with signals from the nervous system, that a fish detects predators and returns to native streams for reproduction. Certain metals and chemicals in our waterways can have harmful impacts on fish olfaction, affecting essential survival skills. Exposure to metals such as copper and cadmium have an adverse effect on survival behaviors such as schooling and the recognition and avoidance of predators.

Dr. Gallagher's research focuses on trace metals found in fish. The decline in salmon populations in the Western United States has been linked to the deterioration of coastal habitat and the contamination of surface water. Greater understanding of these exposures may be integral to fish survival, ecosystem sustainability and to human health through fish consumption.

What are neurotoxicants?

Neurotoxicants include heavy metals, metalloids and chemical compounds that can cause damage to the central nervous system in humans and other animals. Dr. Gallagher's research focuses on copper and cadmium (heavy metals) that enter the aquatic environment.

How do neurotoxicants enter the environment?

Most often these contaminants are products of manufacturing and industrial waste, they can also be found in brake pads or as a component of vehicle exhaust, entering regional waterways as roadway runoff. Tobacco smoke also contains cadmium. Exposure to cadmium and copper may happen by contact with contaminated soil, contact with contaminated water and by inhaling contaminated air particles.

What does this research have to do with Superfund site hazardous chemicals?

Dr. Gallagher's research will include sampling in the Lower Duwamish Waterway Superfund site in Seattle, Washington. The Superfund is a federal program that was established to clean up the nation's priority hazardous wastesites. A list of the most harmful chemicals has been established by the Agency for Toxic Substances and Disease Registry (ATSDR). The Gallagher laboratory studies exposure to copper and cadmium, both identified on the ATSDR list.

What is already being done to protect the environment?

In 2010, Washington State passed a law reducing the use of toxic material in automotive brake pads and shoes. In 2015, use of several heavy metals and asbestos was restricted, along with the phasing out of the use of copper. Dr. Gallagher's research helped inform these state and federal regulatory policies. To learn more about the laws that protect our health see the Toxic Substance Control Act link below.

Linked resources for further information:

University of Washington Superfund Research Program: http://depts.washington.edu/sfund/
NIEHS Superfund Research Program: http://www.niehs.nih.gov/research/supported/srp/index.cfm
ATSDR ToxFAQs™: http://www.atsdr.cdc.gov/substances/toxchemicallisting.asp?sysid=39
EPA Superfund sites information: http://www.epa.gov/superfund/sites
EPA summary of the Toxic Substances Control Act: http://www.epa.gov/lawsregs/laws/tsca.html

*University of Washington Superfund Research Program