Sascha Usenko B.S., Ph.D.

Professor of Environmental Science. Director, Environmental Science Graduate Program at Baylor University

Baylor, TX, US

Dr. Usenko is the Associate Professor of Environmental Science and Director, Environmental Science Graduate Program at Baylor University.

Biography

Dr. Sascha Usenko's, associate professor of environmental science, current research on whale earwax builds on his Ph.D. research, where he gained expertise reconstructing organic contaminant profiles in sediment cores. He obtained a bachelor's degree in environmental science and a doctorate degree in analytical chemistry from Oregon State University. Using a wide range of analytical techniques such as pressurized liquid extraction and GC/MS, he reconstructed more than 280 contaminant profiles for 14 national parks throughout the western United States. Now using similar analytical techniques, his laboratory has developed the ability to reconstruct organic contaminant and mercury profiles for an individual whale using its laminated earwax plug. As an analytical and environmental chemist, he was fascinated to learn that many whale species accumulate layers of wax in their ear canal forming an earplug over their entire lifespan, which is sealed from the external environment. "I was elated to then learn that scientists in the past have used this waxy matrix as an aging tool, similarly to counting tree rings," Usenko said. "Then the question arose, could earwax plugs chronologically archive fat-soluble chemicals, such as man-made pollutants?" Over the past two years, Usenko's laboratory has been working on developing the analytical methods capable of answering that very question. "The answer is an emphatic yes! I am happy to report we now have the analytical methods capable of measuring organic contaminants, mercury, and now hormones in whale earwax," Usenko said. "Utilizing these methods, we can now reconstruct lifetime chemical profiles (i.e. from birth to death) for an individual whale for the first time."

Industry Expertise

Education/Learning, Research

Areas of Expertise

Anthropogenic Contaminants , Spatial and Temporal Scales, The Transformation and Bioavailability of Persistent, Bioaccumulative, and Toxic Chemicals in the Environment, Environmental Forensic Chemistry, Identifying Unique Chemical Fingerprints, Contaminants, Aquatic Ecosystems,

Affiliations

Center for Reservoir and Aquatic Research Systems, American Chemical Society, Society of Environmental Toxicology and Chemistry, Chemistry Steering Committed for SETAC, Chemistry Advisor Group for SETAC, University Sustainability Committee, Phi Lambda Upsilon Honor Chemical Society

Education

Oregon State University,
Ph.D.

Oregon State University,
B.S.

Accomplishments

National Science Fellowship Award
Awarded to Sarah Guberman for the Usenko Lab's work on pesticides.
