

Recreational Water Contact and Fish Consumption Assessment to Inform Risk Estimates and Evaluate Ecosystem Services

Kim A. Angelon-Gaetz¹, Liesel M. Seryak², and Timothy J. Buckley³

¹Oak Ridge Institute for Science and Education (ORISE) Postdoctoral Research Participant at Human Exposure and Atmospheric Sciences Division (HEASD), National Exposure Research Laboratory (NERL), Office of Research and Development (ORD), U.S. Environmental Protection Agency (EPA), Research Triangle Park, NC, USA; ²Division of Epidemiology, College of Public Health, Ohio State University, Columbus, OH, USA; ³ HEASD, NERL, ORD, U.S. EPA, Research Triangle Park, NC, USA

Planned Submission for Presentation at the Annual Meeting of the International Society of Exposure Science, Oct 18 – 22, 2015, Henderson, NV

Presenter: Kim Angelon-Gaetz

Senior Author: Tim Buckley

Communicating Author: Kim Angelon-Gaetz

Abstract

Background: Surface waters provide invaluable ecosystem services, including drinking water, food, waste water disposal, and recreation. The nature and frequency of recreational contact with surface waters is a critical consideration in evaluating benefits to human well-being (e.g. exercise) and assessing health risks (e.g. infection). This risk-benefit analysis must be conducted using population-specific exposure factor estimates, which are not readily available. To address the need for such estimates, we measured the prevalence of recreational surface water contact and fish consumption among Ohioans.

Methods: We designed relevant survey questions which were administered within the state-added module of the 2012 Ohio Behavioral Risk Factor Surveillance Survey (BRFSS), which was completed by phone among a stratified sample of 9,565 residents. Results were weighted to adjust for the complex survey design and non-response.

Results: Weighted results revealed that 44.5% of residents (95% Confidence Interval (CI): 43.0, 45.9) visited Ohio waters for work or recreation, and 32.5% (95% CI: 31.2, 33.9) ate locally caught fish in the previous year. About one-quarter of Ohioans participated in recreational activities leading to potential exposure to chemical or biological contaminants via dermal, ingestion, and/or inhalation routes. The prevalence of frequent local fish consumption (once a week or more) was 1.9 times higher (95% CI: 1.3, 2.7) among residents with household income <\$25,000 compared ≥\$25,000. The prevalence of frequent fish consumption was 1.3 times higher (95% CI: 1.1, 1.7) among residents ≥65 compared to <65 years old.

Conclusions: We identify the value of surface waters and locally caught fish to Ohio residents. The extensive contact reported is indicative of both the ecosystem services provided and the potential for exposure to contaminants. These results provide strong justification for protecting Ohio watersheds to optimize well-being and minimize risk.

