THE IMPACT OF NEARSHORE RECREATIONAL ACTIVITIES ON ARSENIC EXPOSURE IN CONTAMINATED LAKES: A STUDY OF SEDIMENT DISTURBANCE AND WATER QUALITY

Kirsti Lipphardt, James E. Gawel

Climate change is drawing more people to lakes to cool down, but contaminated sediments may reduce accessibility and increase the risk of cancer. Many lakes in Western Washington are contaminated with arsenic (As) due to a history of smelting. The sediments in these lakes contain higher concentrations of As than the water column. Prior work found As from shallow lakes is deposited into nearshore sediment, resulting in high concentrations similar to deep lake sediments. We hypothesize the physical action of nearshore play may suspend As-contaminated sediments and increase As concentrations in the water column, consequently increasing As exposure through accidental ingestion of suspended sediments. Samples were collected from three lakes varying in As contamination levels. To analyze changes in As availability in the water column, we collected filtered and unfiltered water samples before and after simulated nearshore play. Surface sediment samples were analyzed for grain size and total As. We found a significant increase in As concentration after sediment disturbance in the unfiltered samples but no significant change in As concentration of filtered samples. These results suggest contaminated sediments increase the risk of As exposure during nearshore play due to the addition of As-contaminated suspended sediments. This study provides insight into the potential risks of recreational activities in As-contaminated lakes and highlights the importance of understanding the effects of sediment disturbance on water quality and human health.