OCEAN WISE

POLLUTION TRACKER USING EQUIS TO SUPPORT KILLER WHALE CONSERVATION

FOR EARTHSOFT

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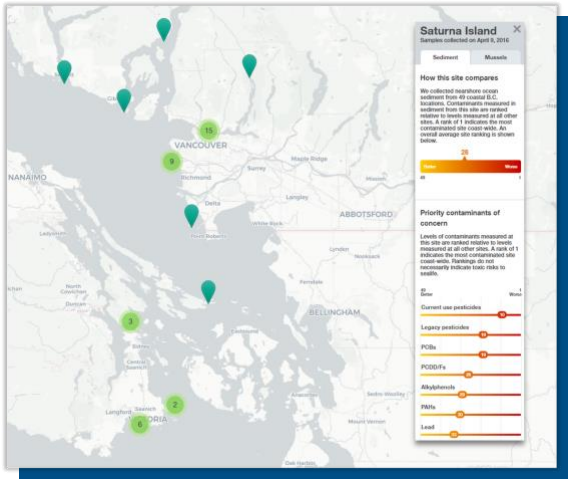
Introduction

Ocean Wise Conservation Association (Ocean Wise) is a not-for-profit organization based in Vancouver, British Columbia (BC), Canada, whose vision is a world in which oceans are healthy and flourishing. Under its Conservation Division's Whales Initiative, monitoring and research are being conducted to investigate the presence and effects of chemical contaminants in the marine environment.

Ocean Wise's PollutionTracker program, established in 2015, is the first coast-wide contaminant monitoring program in Canada. In partnership with multiple partners—First Nations communities, community organizations, port authorities, industry, and government agencies—hundreds of chemicals are being analyzed in marine sediment and shellfish to track trends over space and time. Pollution Tracker provides baseline data for a wide range of contaminants that inform source identification, emerging risks to marine life, and the effectiveness of regulations and best practices. Currently, the second phase of Pollution Tracker's work, conducted between 2018 and 2020, is now available, adding valuable updates to the previous Phase 1 (2015 – 2017) dataset.



EarthSoft's EQuIS™, an advanced environmental data management and decision support system, is used to store and manage the growing contaminants dataset and to facilitate reporting of results for the Pollution Tracker program. Ocean Wise adopted EQuIS Online, EarthSoft's software-as-a-service product on the Microsoft Azure cloud, to support their collaborative efforts with coastal partners because of its easy data retrieval and reliability.

RESEARCH

Two classes of 'legacy' chemicals, PCBs (polychlorinated biphenyls) and PBDEs (polybrominated diphenyl ethers),

With the recent Phase 2 PollutionTracker data release, Ocean Wise is continuing to support killer whale conservation research. The northeastern Pacific resident killer whales (Orcinus orca) were listed under the Canadian Species at Risk Act (SARA) in 2003 as "threatened" and "endangered" for the northern and southern resident populations, respectively. Despite nearly two decades of protection, the southern resident population has not recovered, numbering only 73 animals today, compared with a high of 98 in 1995 (Center for Whale Research July 1, 2022). Pollution, along with prey availability and noise and disturbance from human activities, is one of the top three threats to resident killer whale populations.

Two classes of 'legacy' chemicals, PCBs (polychlorinated biphenyls) and PBDEs (polybrominated diphenyl ethers), pose a threat to Canada's at-risk killer whale populations because they are slow to break down, accumulate in the marine food chain, and are known to have negative health effects by disrupting hormone function, immune and reproductive systems, as well as their development in marine mammals and other organisms. PCBs were formerly used in electrical equipment and hydraulic fluids, while PBDEs were used as flame retardants in manufactured materials. These persistent pollutants collect in coastal sediments through runoff from local land-based sources and through atmospheric deposition from regional or global sources.

Using Phase 2 Pollution Tracker data, a new study by Ocean Wise has determined levels of PCBs and PBDEs in marine sediment along the British Columbia (B.C.) coast are consistently higher than B.C. Ministry of Environment and Climate Change Strategy (BC MoECCS). Working Sediment Quality Guidelines (WSQGs) considered protective of killer whales. Additionally, hotspots were identified within B.C. where PCB and/or PBDE levels are relatively high (Kim et al., 2022).

Based on the results from this study, along with the precarious situation of BC's iconic southern resident population, Ocean Wise has recommended the need for immediate action from the federal government to improve and protect marine habitat and, with it, the future of Canada's endangered killer whales.

REFERENCE AND PHOTO CREDITS

Kim, J. J., Delisle, K., Brown, T. M., Bishay, F., Ross, P. S., & Noël, M. (2022). Characterization and Interpolation of Sediment Polychlorinated Biphenyls and Polybrominated Diphenyl Ethers in Resident Killer Whale Habitat along the Coast of British Columbia, Canada. Environmental Toxicology and Chemistry, 41(9), 2139–2151. https://doi.org/https://doi.org/10.1002/etc.5404

Photos courtesy of Ocean Wise

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