

# A Retrospective Analysis of Mussel Monitoring in the Puget Sound

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## Introduction

The purpose of this report is to provide a retrospective analysis of data generated by previous mussel monitoring surveys coordinated under Washington Department of Fish and Wildlife's (WDFW) Toxics Biological Observation System (TBIOS). We determine how existing historical mussel contaminant data can be used for in a Toxics in the Nearshore Vital Sign indicator. In addition, we assess the predictive ability of existing sampling rate to predict expected contaminant trends.

Toxics data was obtained by transplanting relatively uncontaminated mussels from a local aquaculture source to locations along the Puget Sound shoreline, covering a broad range of upland land-use types from rural to highly urban. Mussels were then recovered, and concentrations of several major contaminant classes were measured. Four mussel surveys were performed, with mussels being retrieved in 2013, 2016, 2018, and 2020.

Our analysis focuses on polycyclic aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (PBDEs), and polychlorinated biphenyls (PCBs) due to their significance in both ecosystem and human health.

## 25 **Methods**

## 26 **Data**

27 -explanation of data -point on the repo -describe raincloud plots and maps

## 28 **Modeling**

29 explain LMM

## 30 **Results**

31 -maps -cloud plots

32 -model -R2 -estimated effect of WIRA by year

## 33 **Discussion**

34 -note deficiencies in data -what we can and can't say

## 35 **Acknowledgments**

## 36 References