

SLIDE 1

Hello, my name is Ameyalli Manon-Ferguson and my project is on PBDEs/Methylmercury and Immune Function in Non-Stranded Male California Sea Lions.

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This was done in partnership with the Oregon Department of Fish and Wildlife and the Columbia River Intertribal Fish Commission, which looked at non-breeding California sea lion males in the Columbia River Basin that were preying on migratory salmon. This was done predominantly around Willamette Falls and Bonneville Dam, where past hazing strategies did not prove effective and they decided on lethally removing some individuals. Because of the Marine Mammal Protection Act, this issue had to be taken all the way up to Washington, D.C. where it was approved and gave us a really unique opportunity to look at fresh tissue samples. Unfortunately, I was not able to be in the lab this summer, but I was able to do a literature review of 19 different publications looking at our past information and areas for improvement.

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Polybrominated diphenyl ethers, or PBDEs, are a group of commercially used flame retardants and methylmercury which is largely caused by human pollution are both persistent ecotoxins of increasing international health concern. They are both rising in their levels in the Columbia River Basin, particularly in the Willamette River which passes through urban centers such as Portland. I found studies that linked both to immunosuppression fish and marine mammals. PBDEs are lipophilic and both are bioaccumulative, meaning they magnify as they move up the trophic levels, making predators such as the California sea lion so important. Unfortunately, I found very few pinniped studies which is needed because of the unique way they store and use fat reserves and because they are migratory and coastal species, meaning they share habitat and food bases with humans. I could not find holistic studies largely due to the protections I mentioned before and because of financial restrictions. The few pinniped studies I found were largely inconclusive due to differences in life history, feeding strategies, sex and age – which was caused by limited sampling opportunities.

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The significance of this research project will be that we will have access to a relatively large sample size in the field. Blood is the best biomarker for methylmercury and blubber is the best for PBDEs – having access to both will provide a holistic idea of exposure in these individuals. There were few studies examining blood mercury levels and past studies used annual pelage molt as their substrate, which only offers a timestep snapshot of this information. Most importantly, we will have access to fresh samples which greatly improves our accuracy compared to the degraded samples we had access to in the past. All of this will be a good indication of coastal marine ecosystem, ocean, and human health, and can inform wildlife management, coastal communities, and tribal governments in the future. Thank you.