

Webinar Highlights

Microplastic Pollution and Phthalates in Seabirds

During this webinar, **Veronica Padula** discussed her ongoing research and results from the 2020 study “Plastic-derived contaminants in Aleutian Archipelago seabirds with varied foraging strategies.” Padula’s work highlights the growing concern for high microplastic concentrations in remote environments and the potential toxic impacts of chemical contaminants from plastics moving across the biological boundary into marine food webs. The study found phthalates, which are known endocrine disrupting chemicals (EDCs), in seabirds collected around Alaska’s Aleutian Archipelago. Contaminant circulation in food webs may also play a role in human exposure to phthalates and other plastic-derived toxics.

Featured Speaker: Dr. Veronica Padula, Research Scientist for the Clean Seas Program at the Seattle Aquarium, speaking July 28, 2021.

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The Problem

Plastic waste in the ocean is harmful to marine ecosystems in many ways. Moving debris damages sensitive habitats. Ghost nets and plastic bands entangle marine life. Plastic pieces in the ocean, including microplastics, get eaten mistakenly by animals. Plastic ingestion can lead to ulcerations, starvation, or death.

Plastic ingestion could also be a route of exposure to potentially toxic chemicals. Plastics can contain thousands of chemicals, including phthalates, a class of chemicals commonly used in plastics. Phthalates do not occur in nature, and they can leach out of plastic products into the environment.



Padula's study took samples from the 10 different species of seabird shown here. These birds all live around Alaska's Aleutian Islands and use a range of foraging strategies. By sampling these different species, the study was able to look for phthalate contamination in different parts of the food web.

The study specifically looked for the six phthalates that are listed as priority pollutants by the US Environmental Protection Agency (EPA).

Key Finding: Phthalates were detected in 100% of the tested birds.

The phthalate concentrations found in the birds "suggested that these phthalates are ubiquitous in the environment."

While phthalate exposure could come from different pathways, the predominant route is likely through plastic ingestion. The researchers also inspected a subsample of the seabirds' stomachs for plastic particles. They found plastic particles in 36.5% of the sampled stomachs.

They also tested six murre eggs from St. Paul Island. All of the eggs contained phthalates. Murre eggs are a subsistence food for people living on St. Paul Island.

Separate studies have been done on bird reproduction and phthalate exposure. One of these studies found that phthalate exposure was associated with a significant reduction in hatching success, and phthalate exposure was also shown to be associated with birth

defects in chicks. Some bird populations in this region are declining, and phthalate exposure might be one of the drivers of this decline.

Recommendations

Groups across Alaska are working to fight marine debris and plastic pollution. Marine debris removal is an important step to remove the pollution that already exists. Larger pieces of plastic quickly break down into microplastics, at which point removal becomes much more difficult. In 2019, St. Paul Island community members removed over 20,000 lbs of debris from the island's shorelines. Removing marine debris is important work, but not a long-term solution.

"Marine debris is a matter of environmental justice...there are lots of coastal and island communities worldwide that are disproportionately impacted by the marine debris crisis."

The St. Paul Island community is working with local commercial and packaging industries to try to decrease plastic pollution from those industries.

Dr. Padula stressed that plastic pollution needs to be reduced and prevented at its source. Plastic production entails the extraction of raw materials, the manufacture of plastics, and the use of those plastics in products. Addressing the marine debris crisis requires tackling the problem at every stage, not just at the final waste stage.

"At every point in the production of plastic materials, there is an environmental impact."

In addition, the polluters need to be held responsible for the waste that they generate.

To Find Out More

- Watch the July 28, 2021 webinar: <https://www.akaction.org/webinars/microplastic-pollution-and-the-effects-of-phthalates-and-other-plastic-born-chemicals-on-alaskas-ecosystems-and-alaskans-health/>
- Read the webinar slides: https://www.akaction.org/wp-content/uploads/Padula_July2021_presentation.pdf
- Read the study: <https://pubmed.ncbi.nlm.nih.gov/32753218/>

About the Speaker



Veronica Padula is the Research Scientist for the Clean Seas Program at the Seattle Aquarium. She received her Ph.D. at the School of Fisheries and Ocean Sciences at the University of Alaska Fairbanks (UAF) in 2022. In her research, she investigated the impacts of plastic marine debris and phthalate exposure on Bering Sea food webs. Her work also explores trends in marine debris in this region and threats to subsistence species on St. Paul Island,

Alaska.