State of Alaska Epidemiology **Bulletin**

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# Per- and Polyfluoroalkyl Substances in Marine Fish — Alaska, 2022–2024

### Background

Per- and polyfluoroalkyl substances (PFAS) are persistent environmental contaminants that have been used in industrial processes and consumer products for over 75 years. While exposure to elevated levels of certain PFAS compounds has been associated with adverse health effects, our understanding of the toxicology of low-dose PFAS exposure and their effects on human health remains limited and continues to evolve.[1]

Fish and shellfish represent a potential dietary source of PFAS.[2] However, until recently, data on PFAS concentrations in Alaska fish have been limited, constraining exposure assessments. Such assessments are particularly important in Alaska because residents tend to consume fish at high rates.[3] Although both freshwater and marine fish are eaten in Alaska, marine species such as salmon, halibut, and cod account for the majority of fish consumed.

Alaska has not established fish consumption guidelines for PFAS. While some states and countries have developed PFAS-specific fish consumption guidelines, the PFAS concentrations used as thresholds for fish consumption advisories differ substantially among jurisdictions, varying by orders of magnitude in some cases. This wide variation reflects ongoing scientific uncertainty regarding the toxicologic effects of PFAS on human health.

To better assess potential PFAS exposure from fish consumption in Alaska, the Alaska Departments of Environmental Conservation (DEC) and Health (DOH) sought to quantify PFAS levels in Alaska marine fish to establish baseline concentrations and inform future fish consumption guidance. This *Bulletin* provides a summary of the rationale, methods, data, and findings contained within a recently published peer-reviewed article (Furin et al. 2026).[4]

### Methods

Fish and shellfish were collected by commercial fishermen from Southeast Alaska, the Gulf of Alaska, and the Bering Sea/Aleutians during 2022–2024. Samples were homogenized as composites of 12 individual fish, then shipped frozen to SGS AXYS Analytical Services (Canada). Samples were analyzed using EPA method 1633 to quantify 40 target analytes. Species and sample sizes included: red king crab (1), *Chionoecetes bairdi* crab (2), chinook salmon (4), chum salmon (5), coho salmon (5), pink salmon (5), sockeye salmon (5), Pacific cod (5), Pacific halibut (5), pollock (7), and sablefish (7).

### Results

A total of 51 composite samples were analyzed, representing 610 individual specimens, including nine species of finfish and two species of crab. Across all samples, 10 individual PFAS analytes were detected. Most analytes were below the Limit of Quantification (LOQ), which is the threshold for accurate quantification of a compound in a sample. Perfluoroundecanoic acid (PFUnA) exceeded the LOQ in two *C. bairdi* crab samples (0.58 and 0.61 ng/g wet weight [ww]); perfluorotridecanoic acid (PFTrDA) exceeded the LOQ in two *C. bairdi* crab samples (0.65 and 0.73 ng/g ww); and perfluorooctane sulfonate (PFOS) exceeded the LOQ in one pollock sample (0.81 ng/g ww).

### Discussion

These data provide preliminary baseline PFAS concentrations in the edible tissue of several key Alaska marine fish and shellfish species and indicate that PFAS concentrations were undetectable or very low across the species evaluated. Of 51 composite samples analyzed, only PFOS, PFTrDA, and PFUnA were quantified above the LOQ. The highest concentrations measured were all below established consumption guidance thresholds for PFAS in food in the European Union and Japan.[5,6] The U.S. Environmental Protection Agency has not yet established such guidelines for the United States.

The low PFAS concentrations measured in this assessment were not unexpected, as the findings are consistent with U.S. Food and Drug Administration market basket reports and other studies.[4] These results provide encouraging evidence that the marine fish and shellfish evaluated do not represent a substantial source of PFAS exposure through dietary consumption. Fish consumption provides important nutritional benefits, including high-quality protein and essential nutrients such as omega-3 fatty acids, vitamin D, and selenium. Given the low PFAS concentrations measured in the marine fish and shellfish evaluated in this assessment, the nutritional benefits of fish consumption are expected to outweigh potential risks associated with low-level PFAS exposure.[7]

Most known PFAS-contaminated sites in Alaska are associated with historical use of aqueous film forming foam (AFFF) to suppress petroleum-based fires at airports and fire training centers. Highly water-soluble PFAS compounds in AFFF can dissolve and migrate into surface water and groundwater and potentially enter the freshwater environment. Quantifying and assessing PFAS in freshwater fish was beyond the scope of this investigation and will be examined in future assessments.

Additional testing is needed to further characterize PFAS concentrations in commonly consumed Alaska marine fish and shellfish. Continued monitoring by DEC and DOH will strengthen the scientific basis for evaluating PFAS exposure and developing fish consumption guidance for Alaskans.

### Recommendations

1. Clinicians should reassure patients that PFAS concentrations measured to date in the marine fish and shellfish tested have been low.
2. Clinicians should continue to encourage fish consumption as part of a healthy diet, recognizing that the nutritional benefits of eating fish are expected to outweigh potential risks from the low PFAS levels found in this assessment.[7]
3. While no PFAS-specific fish consumption guidance has been established for Alaska, pregnant and nursing women and parents of young children should use the Eating Fish Safely Calculator to make informed choices about fish consumption as it pertains to mercury exposure.

### References

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