

A presentation from Dr. Rea (UAF) provided an in-depth look into the study of mercury in the Aleutian Island food webs, which was designated as “Noteworthy” in the 2021 AI ESR¹. The SSC commends this uniquely integrated, long-term, and collaborative approach. In brief, relatively high total mercury concentrations have been found in Steller sea lion (SSL) pups in the central and western Aleutian Islands, with higher concentrations observed in the western Aleutian Islands in both SSL and in sampled fish. It was noted that of 1611 fish sampled, only 13 had concentrations above thresholds of concern (1ppm) for human consumption and almost all were yellow Irish lord. The proportion of SSL pups at Agattu island that are in the high-risk category (with mercury concentrations above published thresholds for health impacts) has doubled over 10 years.

The research team, which includes UAF, ADF&G, AFSC, Ocean Peace Inc., and Texas A&M, has several on-going, and planned projects that are building off of these efforts to explore the questions related to the source(s) of the mercury: “Is higher mercury in the western Aleutian Islands due to diet difference in adult female SSLs?” and “Has the diet of adult females changed over time, potentially leading to an increase in mercury transferred *in utero* to their pups?”. The SSC looks forward to hearing the results of the on-going diet modeling that pairs samples from fish and SSL pups from 2011-2021. In partnership with USFWS, the UAF team is currently looking at mercury in invertebrates, as these relatively immobile species may be good indicators of ‘point sources’ of mercury in the Aleutian Islands. Graduate students are also exploring temporal changes in mercury in fish, and spatial patterns of mercury in fish using delineations based on passes between the islands (instead of SSL management units). In the SSC’s December 2021 minutes, the SSC noted the lack of ecosystem-level studies in the Aleutian Islands region, which presents challenges for interpreting the impacts of various indicators and for fisheries management in the region. **The SSC continues to strongly support efforts that take integrative approaches to studying this ecosystem,** and specific to this study, discussed opportunities to include sampling of seawater and air to aid in discerning potential sources of mercury inputs into the marine environment. As many of these species explored may be important for coastal communities, **the SSC is encouraged to see the involvement of one local community in the study of mercury, and encourages further efforts toward co-production of information, outreach, and the dissemination of research results to local communities, especially for research such as this with potential human health implications related to the contamination of subsistence resources.**

More broadly, the SSC discussed the importance of upper-trophic level predators as sentinels of food webs and encouraged expanding efforts to improve our understanding of linkages between marine mammals, the physical environment, and prey species. For example, population monitoring of SSLs in the Gulf of Alaska suggests impacts of the recent marine heatwaves (see below) and the SSC suggested that sea lion diet information that spans these changes would be informative for understanding what may have driven the observed patterns in non-pup and pup counts. Similarly, the SSC encouraged studies of diets and telemetry-based foraging behaviors of walrus in the Eastern and Northern Bering Sea as sea ice continues to shift. These regions are seeing dramatic shifts in the benthic communities and crab stocks; as benthic foragers, walrus may be a good indicator of overall benthic production, carrying capacity, or expansion of harmful algal blooms.

Population Trends/Distributions

Updates were provided for a number of species on the current population trends. In brief:

Steller sea lions

Population surveys were flown in 2021 in the GOA. Non-pups and pup numbers were all trending positive across the 15yr window (2006-2021) with increases of 1.8-2.8% annually. Context was provided of trends

¹ Topics designated as “Noteworthy” in the 2021 ESRs were formerly designated as “Hot Topics.”

