Poster: Gulf of Alaska – Seabirds & Marine Mammals

Identifying regional variation in harbor seal fatty acid signatures using analysis of similarity (ANOSIM)

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A decline in prey availability and quality is a common hypothesis proffered to explain declines in several marine mammal populations. We used analysis of similarity (ANOSIM) to compare blubber fatty acid (FA) signatures from 350 harbor seals in five regions of Alaska with differing population trends: Glacier Bay (GB) which is decreasing rapidly (-14.7% 1992-2005); Prince William Sound (PWS) which is stabilizing with an increasing short-term trend (-2.4% 1990-2005; +9.0% 2000-2005); Southeast (SE) which is stable (+0.6% Sitka, 1984-2005) or increasing (+5.0% Ketchikan, 1983-2003); Bristol Bay (BB) which is increasing (+7.0% 1995-2005); and Tugidak Island (Tug), which is increasing (+7.5% Kodiak, 1993-2004). Dietary fatty acid composition influences the composition of blubber, thus, the FA composition, or signatures from blubber can be used to indicate variations in harbor seal diets. We found significant differences in FA signatures between all five regions. PWS and GB were most similar (ANOSIM $R = 0.355$, $p<0.001$) and both had decreasing population trends when blubber was collected (1997-2001). We found the greatest difference in fatty acid signatures when comparing Tug to GB (ANOSIM $R = 0.826$, $p<0.001$) and Tug to PWS (ANOSIM $R = 0.837$, $p<0.001$); regions with opposite population trends during sampling. Our analysis indicates that harbor seals from these five sites differ in diet composition, which may support the hypothesis that prey availability or quality influences population trends. Further investigation on other factors that may differ among populations is required.

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