

Dive Behavior of Adult and Subadult Harbor Seals in Alaska as Measured by Satellite Data Recorders

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From 1992 to 1996, 108 adult and subadult harbor seals from Southeast Alaska (SE), Prince William Sound (PWS), and Kodiak Island were instrumented with satellite data recorders (SDRs), resulting in 25,000-32,000 histograms collected concerning dive depth, dive duration and time-at-depth. Our objectives were to (1) quantify dive parameters for Alaskan harbor seals, and (2) examine variation in dive parameters among age-classes, sexes, seasons, regions and diurnal periods. Dive parameters included: proportion time wet, variability in dive depth (focus), dive depth (modal depth bin), dive duration, dive frequency, and total time diving. We also developed analysis techniques that accounted for the binned-nature of SDR data, repeated measures on individuals, and temporal auto-correlation in the data. Proportion time wet averaged 0.72 and varied little among regions and seasons, though PWS seals spent more time hauled-out during the breeding season than during winter. Strong diurnal variation with most time hauled-out during the morning (0300-0859) and day (0900-1500) was apparent only during the breeding season. Seals generally focused diving within one of six depth ranges (*e.g.*, bins; focus = 0.64-0.69 on a scale of 0.167 to 1.0). Dive depth and focus varied little with season for Kodiak seals, but focus decreased and depth increased during winter for PWS and SE seals. Dive depths of adults and females were more focused than those of subadults and males. Subadults dived deeper than adults in Kodiak and PWS. Diurnal variation in focus was apparent in all seasons, age-classes and regions, with greatest focus during the day. Deepest diving occurred during the day in winter in regions where seals had access to deep water nearshore (SE and PWS), suggesting these seals fed on vertically migrating prey in winter. These analyses will provide insight into how these dive parameters combine to describe foraging strategies of Alaskan harbor seals.

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