

Gulf of Alaska - Marine Mammals

Use of Ice and Terrestrial Habitat by Harbor Seals in Glacier Bay, Alaska: Why Pup in the Ice?

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Glacial fjords are important habitat for pupping and breeding harbor seals (*Phoca vitulina*), seasonally supporting disproportionate numbers of mothers and pups relative to the total population. In Glacier Bay National Park, Alaska USA, over ¾ of the seals haul out on icebergs in Johns Hopkins Inlet (JHI); others use terrestrial sites. In 2004-2006, we captured and obtained samples from 291 harbor seals in Glacier Bay and equipped a subset captured in JHI (“ice seals” n=8) and at terrestrial sites in the Bay (n=19) with Time Depth Recorders and VHF transmitters to track foraging locations and dive behavior. We examined time/energy budgets, diet (stable isotopes), and body condition (% body fat) of ice and terrestrial seals. Body condition at capture was similar but foraging strategies differed by habitat. Ice seals traveled further; some ranging up to 100km from their capture site to forage (mean distance 32.5 +/- 7.3km), while terrestrial seals foraged near their haul outs (4.6 +/- 0.7km). Ice seals had diets significantly higher in high-lipid/high-protein pelagic fishes, and most foraging trips started from 00:00 to 02:00, coinciding with nocturnal, near-surface availability of pelagic/forage fishes. Terrestrial seals started foraging midday and proportion of time hauled out was tidally influenced. For females, proportion of time-hauled-out did not differ by habitat, except during pupping season when adult females in ice spent significantly more time hauled out than did adult females from terrestrial sites, followed by longer foraging trips post-weaning. At times other than during pupping, costs of longer foraging distances for ice seals are apparently offset by obtaining better-quality diets. Seals pupping in JHI may accept temporary tradeoffs, using more body reserves than terrestrial females while bypassing distant foraging opportunities. Pupping in ice could enhance offspring survival via reduced predation pressure (hauling out on floating icebergs) and possibly through greater weaning-weights resulting from increased opportunities to nurse, irrespective of tide. Whether pupping in ice confers higher survival probability for pups or has lingering costs for females is currently being investigated.



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