

## Ringed seals and climate change: current status of ringed seals in Alaska

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Arctic sea ice has declined in extent, thickness, and duration; these declines are predicted to continue, along with a reduction in snow cover. Declines in snow cover and sea ice are expected to negatively affect body condition, productivity, and pup survival of ringed seals (*Pusa hispida*), which are believed to be dependent upon snow cover for the construction of pupping dens and sea ice for resting, pupping, and molting. There are no reliable estimates of ringed seal abundance or trend in Alaska; however, since 1960, the Alaska Department of Fish and Game has collected data from the Alaska Native subsistence harvest that can be used to index population health and status. We examined population indices between 1960 and 2012 to determine if declines in sea ice are currently affecting ringed seals. From 2000 to 2009, sternum blubber thickness was consistent with the recent 50 year average; from 2010 to 2012, however, seals had thicker blubber (0.5 cm increase). Seals born during the 2000s (except for 2006) tended to be longer than average, suggesting that the growth rate has increased in recent years. Pregnancy rates have varied minimally since the 1960s (range: 76–89%); however, since 1999, the average age of maturity has been the youngest observed (3.2 years,  $P < 0.05$ ). Additionally, pups were harvested in greater proportions during the 2000s (56%) than before (31%), indicating that pups are being produced, weaned, and are surviving to be harvested. Although it may be too early to observe effects of climate change on ringed seals, due to lag effects or minimum sea ice thresholds, ringed seals in Alaska currently have more blubber, are larger, and show no reduction in productivity or pup survival as was predicted to occur with climate change.

**Word count = 289**

*Max words = 300*

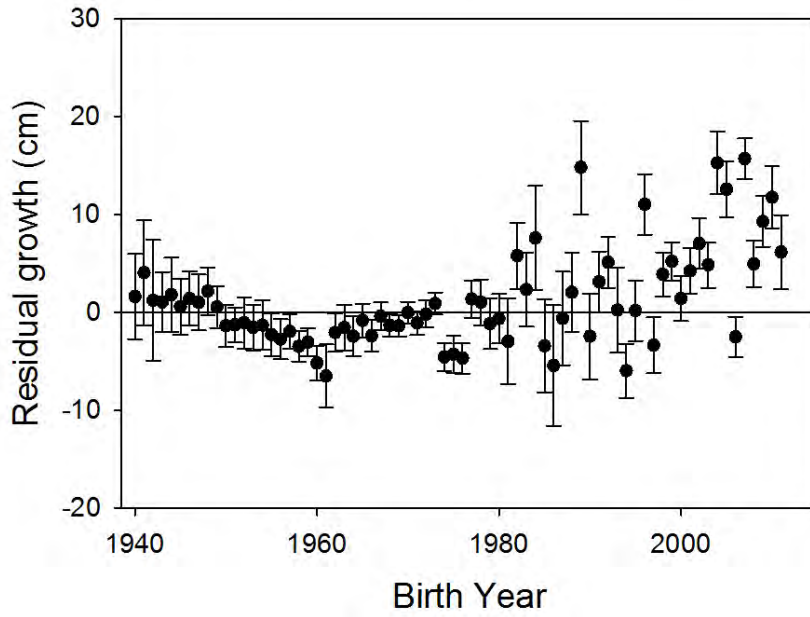
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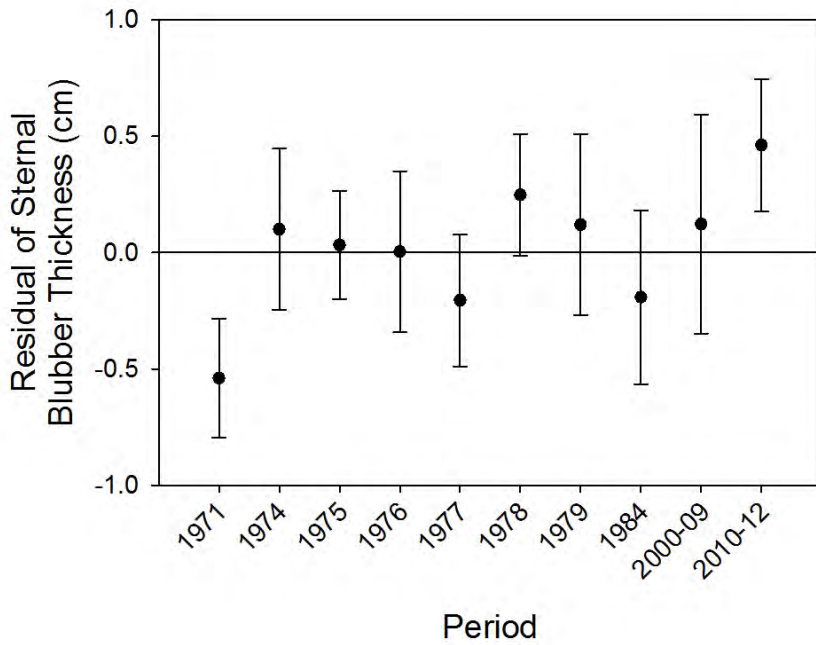
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**\*\*\* FIGURES on next page \*\*\***

### Residual Growth for ringed seals >=1 year of age by birth year, SEs



### Residual Sternal Blubber Thickness



Proportion of pups

