

The Effect of Molting Status on Resting Metabolism of Alaskan Seals In Water and During Haul Out

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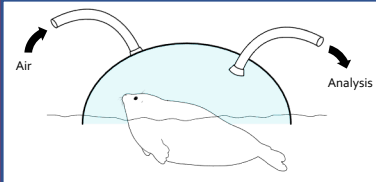


Alaskan ice seals are experiencing ongoing sea ice loss and associated reductions in available haul-out substrate. Seals will be forced to move with retreating sea ice, travel to terrestrial haul-outs, and/or spend increasing amounts of time in water. These scenarios pose potential negative energetic consequences, which may be exacerbated during the molting season. Here, we directly evaluate the energetic costs incurred by ice-associated seals in air and in water as a function of molting status.

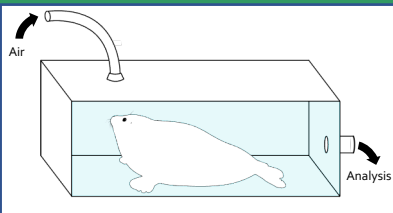
- H₀** If seals can control heat loss via skin perfusion during molt, then metabolic costs of resting in water will be similar to those costs incurred during haul out (*water* \approx *air*)
- H₁** If seals have a reduced ability to regulate blood flow to the periphery during molt, then metabolic costs of resting in water should be higher than in air (*water* $>$ *air*)

Open-flow Respirometry

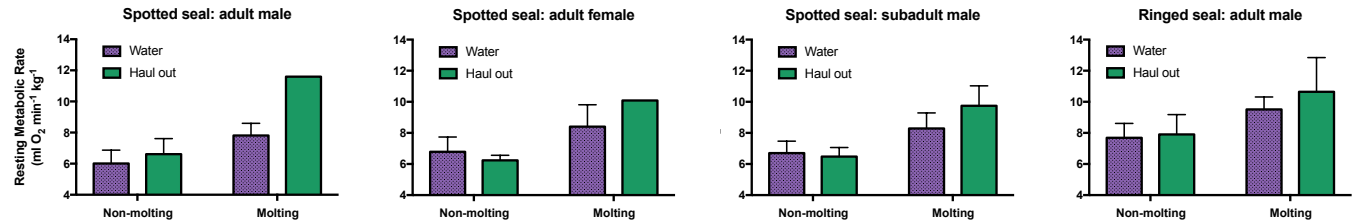
In Water



Haul out



Measured resting metabolism of trained spotted and ringed seals at the Alaska SeaLife Center



Direct measurements of Resting Metabolic Rate (RMR) are not higher when seals are in water. This supports **H₀** indicating that spotted and ringed seals have control over their peripheral blood supply and heat loss, irrespective of molting status. An improved understanding of thermoregulation and the implications of increased time in water during molt will be required as preferred haul-out substrate for Alaskan seals continues to retreat.

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