

*The following supplement accompanies the article*

## **Vibrissal growth parameters of southern elephant seals *Mirounga leonina*: obtaining fine-scale, time-based stable isotope data**

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*Marine Ecology Progress Series 559: 243–255 (2016)*

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**Fig. S1:** The atypical, synchronous vibrissal shedding of southern elephant seals observed during post-moult satellite-tag deployments on Marion Island. The vibrissae were either completely (left), partially (middle) shed, or not shed (right).



**Fig. S2:** Example of a southern elephant seal with a full complement of mystacial vibrissae, photographed during the winter resting haulout.



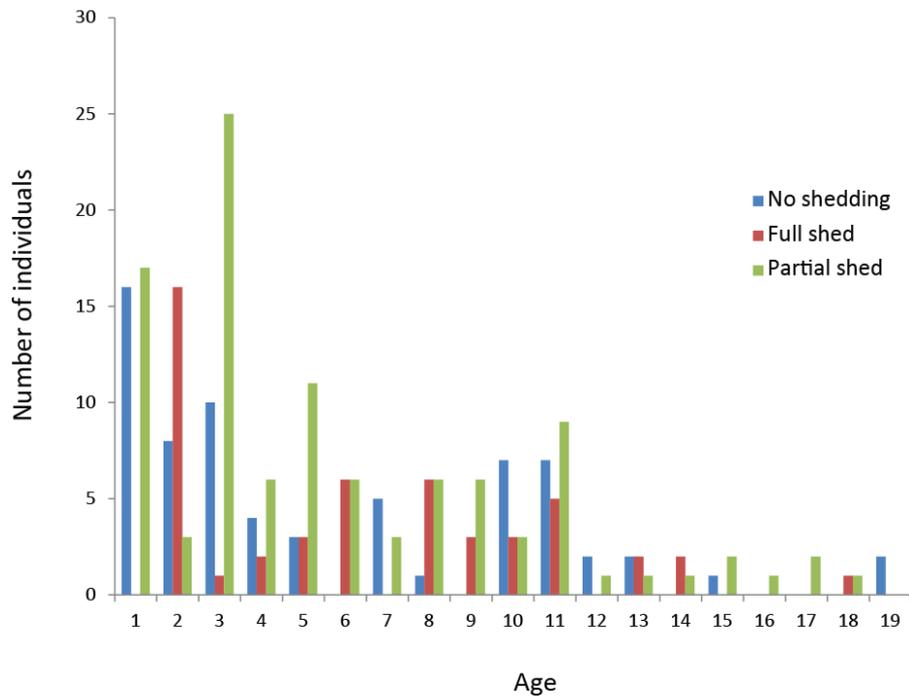
**Fig. S3:** Example of a southern elephant seal that completely shed its vibrissae during the annual pelage moult.



**Fig. S4:** Example of a southern elephant seal that completely shed its vibrissae during the annual pelage moult, with new vibrissal regrowths visible. Only two prominent vibrissae were retained and fine, new vibrissal regrowths are observable shortly after shedding suggesting that vibrissae replacement occurs rapidly.



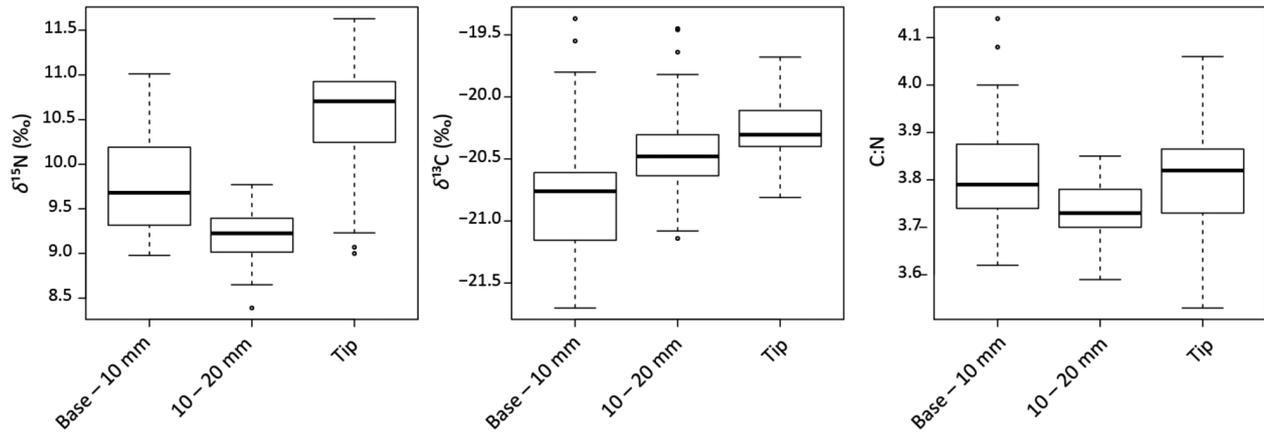
**Fig. S5:** Example of the vibrissal regrowths collected from a juvenile southern elephant seal. Regrowths are easy to identify visually due to their blunt, large diameter distal ends (indicated by the red arrow).



**Fig. S6:** Number of individual southern elephant seals included per age-class that shed, partially shed, or displayed no signs of vibrissal shedding.



**Fig. S7:** Vibrissal shedding and replacement observed in a juvenile southern elephant seal (Seal 5). After arriving for the annual moulting period (left) with a full vibrissal complement, the vibrissae were completely shed by the post-moult period (middle). New vibrissal regrowths were already observable during the post-moult period (middle). This individual was recaptured four months later (138 days) with a full complement of vibrissae (right), albeit that the vibrissae were still growing.



**Fig. S8:** The isotopic signature captured in the base of the plucked vibrissae was significantly different from the adjacent 10 mm ( $p < 0.001$ ), likely due to the presence of molecules other than keratin (Seal 4).