

### Use of stable carbon and nitrogen isotopes in harbor seal vibrissae to detect seasonal changes in diet

Karpovich, Shawna<sup>1</sup>; Herreman, Jason<sup>3</sup>; Blundell, Gail<sup>2</sup>

(1) Alaska Dept of Fish & Game, Wildlife Conservation, 1300 College Road, Fairbanks, Alaska, 99701, USA

(2) N. Slope Borough, Dept. of Wildlife Management, PO Box 69, Barrow, Alaska, 99723, USA

(3) Alaska Dept. of Fish & Game, Wildlife Conservation, 802 3rd St., Douglas, Alaska, 99824, USA

Corresponding author: shawna.karpovich@alaska.gov

Changes in prey quality and quantity are common suggestions to explain the decline in some populations of harbor seals (*Phoca vitulina*) in Alaska. Currently, most dietary studies examine stable isotopes (SI) of various tissues, blubber fatty acids, or stomach/scat contents. Each method provides a “snapshot” of diet at one point in time, making examination of seasonal changes in diet difficult. Harbor seal vibrissae grow continuously, shed annually and have SI signatures that remain biologically unchanged once deposited; creating a temporal map of seasonal dietary changes along the vibrissa length. Serial 1mm sections (n=129) of a harbor seal vibrissa were analyzed for  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$ . Two distinct groups of data emerge in the  $\delta^{15}\text{N}$  vs.  $\delta^{13}\text{C}$  plot. First, from the root to 47mm, during slow growth Sept.-April;  $\delta^{15}\text{N}=15.9$ ,  $\delta^{13}\text{C}=-12.4$ , slope=0.40; and second, from 48mm to the tip, during rapid growth June-Sept.;  $\delta^{15}\text{N}=16.3$ ,  $\delta^{13}\text{C}=-13.5$ , slope=-0.015. This suggests a seasonal shift in diet. Because SIs are integrated and cleared from tissues at different rates, SI signatures from serum, red blood cells (RBC) and hair collected from the same animal were adjusted for fractionation and compared to the corresponding vibrissae sections to verify the timeline. Serum ( $\delta^{15}\text{N}=15.9$ ,  $\delta^{13}\text{C}=-13.4$ ) and the vibrissae section at the root ( $\delta^{15}\text{N}=15.9$ ,  $\delta^{13}\text{C}=-13.4$ ) contain SIs from the previous weeks and are the same. RBCs ( $\delta^{15}\text{N}=15.9$ ,  $\delta^{13}\text{C}=-12.7$ ) and the 1<sup>st</sup> 8mm of vibrissa ( $\delta^{15}\text{N}=15.8$ ,  $\delta^{13}\text{C}=-12.5$ ) contain SIs from ~4 previous months and did not differ ( $p>0.05$ ). Hair ( $\delta^{15}\text{N}=16.1$ ,  $\delta^{13}\text{C}=-12.7$ ) and the 58mm-106mm vibrissa sections ( $\delta^{15}\text{N}=15.8$ ,  $\delta^{13}\text{C}=-12.5$ ) contain SIs from ~molt, July/August and did not differ ( $p>0.05$ ). Preliminary results from one vibrissa indicate serial sections of harbor seal vibrissae can be used to map seasonal changes in diet.



# 19TH BIENNIAL CONFERENCE

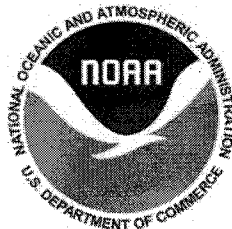
ON

## THE BIOLOGY OF MARINE MAMMALS

TAMPA, FLORIDA  
NOVEMBER 27 - DECEMBER 2, 2011

### HOSTED BY

National Marine Fisheries Service  
Southeast Regional Office  
National Oceanic and Atmospheric  
Administration  
St. Petersburg, Florida



### SOCIETY FOR MARINE MAMMALOLOGY

Randall Wells - *President*  
Helene Marsh - *President-elect*  
Heather Koopman - *Secretary*  
Jim Harvey - *Treasurer*  
Emer Rogan - *Member-at-large*  
Simon Goldsworthy - *Member-at-large*  
Inez Campbell - *Student member-at-large*



### CONFERENCE COMMITTEE

Laura Engleby - *Co-chair*  
Vicki Cornish - *Co-chair*  
Cheryl Bonnes - *Assistant to the Co-chairs*  
Stacey Horstman - *Logistics, foreign travel*  
Lt. Gregory Schweitzer - *Registration*  
Inez Campbell - *Student liaison*  
Joel Ortega-Ortiz - *Workshops*  
Michael Scott - *Posters*  
Kristy Long - *Green committee*  
Nick Lunn - *Awards*  
Nicole Adimey - *Field trips*  
Jessica Powell - *Events*  
Erin Fougères - *Events*

### SCIENTIFIC PROGRAM COMMITTEE

Tara Cox - *Chair*  
Katherine Doyle - *Assistant to the Chair*  
Mary C. Curran  
Ari Friedlaender  
Heather Koopman  
Charles Littnan  
Eric Montie  
Katie Moore  
Paul Nachtigall  
Joel Ortega-Ortiz  
Ester Quintana-Rizzo  
Emer Rogan  
Patricia Rosel  
Lori Schwacke  
Liz Slooten  
Brandon Southall  
Mason Weinrich

### CONSULTANTS

Michel Fougères - *Website design*  
Stephanie Morrison - *Logo design*  
Kim Schauwecker - *Experient*  
Allison Garrett - *Media*