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### Curriculum Vitae

**Stephen J. Trumble Ph.D.**

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Trumble Lab Page: [http://blogs.baylor.edu/stephen\\_trumble/](http://blogs.baylor.edu/stephen_trumble/)

Baylor Media Kit: [www.baylor.edu/mediacommunications/whale](http://www.baylor.edu/mediacommunications/whale)

**Education** University of Alaska Fairbanks Ph.D. Marine Biology  
Moss Landing Marine Laboratories M.S. Marine Science  
Texas State University (SWTSU) B.S. Marine Biology

### Appointments:

2013-present; Associate Professor, Department of Biology, Baylor Univ., Waco, Texas

2008 – 2013; Assistant Professor, Department of Biology, Baylor Univ., Waco, Texas

2006 – 2008; Assistant Professor, Univ. of Michigan, Flint, Michigan

### Academic Employment History

**Assistant Professor: University of Michigan; Vertebrate Physiologist, Department of Biology.** Teaching responsibilities include Mammalian Physiology (Bio 432/532), Physiological Ecology (Bio 483/583)

**Postdoctoral Researcher: University of Texas Southwestern Medical Center;** The molecular signals that regulate the ontogeny of aerobic capacity, lipid metabolism and elevated myoglobin concentrations in the skeletal muscles of Weddell Seals; Antarctica. 2005/2006. Dr. Dan Garry/Dr. S. Kanatous.

**National Research Council (National Academy of Science) Postdoctoral Fellow;** *Assessing the digestive constraints on juvenile Steller sea lions*. September 2003-2005. Project PI, Dr. S. Trumble, Dr. D. Calkins and Dr. Tom Loughlin. This project assessed digestive and physiological constraints of Steller sea lions and the potential influences of varying prey quality. This project addresses the “junk-food” hypothesis from a digestive physiology approach in captive juvenile sea lions.

**Doctoral Researcher: University of Alaska Fairbanks;** *Foraging biochemistry of freely diving Weddell seals*. Antarctica, 2002-2006. Project PI, Dr. M. Castellini (907-474-6825). The primary goal of this NSF study is to quantify the dynamics of lipid uptake and utilization in a naturally foraging mammalian carnivore by examining freely diving Weddell seals in Antarctica.

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**Co-PI:** Glacier Bay, Alaska Harbor seal captures (ADF&G). 25 April – 5 May 2006. Dr. Gail Blundell, PI (ADF&G). Capture harbor seals hauled out on ice substrate. Physiological sampling and implanted devices in harbor seals.

**Research Collaborator:** Cook Inlet, Alaska. 25 August- 5 September 2004. Capturing and Satellite tagging of harbor seals in Kachemak Bay Alaska. National Marine Mammal Lab. Seattle WA.

**Consultant:** Glacier Bay, Alaska Harbor seal captures (ADF&G). April 11-26 2004. Dr. Gail Blundell, PI (ADF&G). Designed new capture methodology for harbor seals hauled out on ice substrate. Physiological sampling and implanted devices in harbor seals.

**Research Collaborator:** NMML, Dr. Brian Fadely; chief scientist (206-526-6173). Steller sea lion cruise November 2003, Aleutian Islands, Alaska. My responsibility was to assist in the capturing-handling and physiological measurements (bleeding etc.) of juvenile Steller sea lions.

**Research Collaborator:** Bristol Bay, Alaska. Kathy Frost and Lloyd Lowry (Co-PI's). June 2002. Capturing and processing of harbor seals in Bristol Bay. Responsible for physiological sampling and techniques.

**Research Collaborator:** Ph.D. Candidate, Alaska Department of Fish and Game, Anchorage Alaska. June 1997-June 2000; Tugidak Island, Alaska. Supervisor: Dr. R. Small, 907-465-6167 (Supervisor may be contacted). Involved in developing capture techniques, capturing, handling, instrument fitting, collecting blood (including Evans Blue techniques) and morphology samples of harbor seal pups on Tugidak Island. I was responsible for designing the health and condition aspect of this project. My responsibility included (Ph.D. work) analyzing data as it pertains to the health and condition of the pups and establishing blood chemistry reference ranges for pups captured on Tugidak Is. and also within Prince William Sound, Alaska.

**Consultant:** **GLOBAL OCEAN ECOSYSTEMS DYNAMICS I AND II**, Weddell Sea Antarctica, April-Sept 2001. PI's; Dr. Dan Costa and Dr. Jennifer Burns. Foraging ecology of crab eater seals. Blood sampling and dive analysis along with capture and drugging protocol.

**Research Collaborator: Antarctic Pack Ice Seals (APIS) Cruise 1999-2000, Antarctica. Senior PI; Dr. John Bengston. Immediate Supervisor and co-PI, Dr. Michael Castellini 907-474-6825 (Supervisor may be contacted). Duties included capturing and handling Weddell, crab eater, Ross and leopard seals from a ship-based (RVIB N.B. Palmer) research station in the Ross Sea, Antarctica. Other duties included bleeding animals, ultrasound techniques, developing methods for weighing seals, and all laboratory techniques involved with seal physiology.**

**Research Collaborator: (National Marine Mammal Laboratory):** Aialik Bay, Alaska, August 1997 and August 1998. Supervisor, Dr. Dave Withrow, National Marine Mammal Laboratory. Duties included developing methods of capturing harbor seals from ice floes near Resurrection Bay, Alaska. Other duties included the handling of seals, along with obtaining blood and morphological samples.

**Research Collaborator:** (Alaska Department of Fish and Game), Anchorage Alaska. Steller Sea Lion Cruise January 1998. Areas near Kodiak Island, Alaska. Supervisor: Mr. Kenneth Pitcher, ADF&G. Duties included aiding in the capture of SSL juveniles from a ship-based station. Other duties included obtaining physiological samples (blood, BIA and ultrasound) for later assessment of health.

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**Research Investigator:** Alaska SeaLife Center, School of Fisheries and Ocean Sciences, University of Alaska, Fairbanks, PO Box 757220, Fairbanks, AK, 99775. April 1998-September 2000; Supervisor: Dr. Michael Castellini, 907-474-6825 (Supervisor may be contacted). Duties were to perform laboratory techniques on the physiology and ecology of captive harbor seals. I was responsible for designing experiments, collecting and analyzing data, and publication and distribution of results. Primarily, I designed a research program to assess the seasonal condition and health status of harbor seals on varying dietary regimes. Worked closely with ASLC husbandry staff on numerous projects.

**M.S. Student:** Moss Landing Marine Laboratories, Moss Landing, California. 1991-1995. Supervisor: Dr. James T. Harvey 831-771-4434 (Supervisor may be contacted). Duties included leading researchers and students in the capturing harbor seals in and around Elkhorn Slough and Monterey Bay, California. Involved with the capturing and handing of approximately 400 harbor seals. Also, I worked on various projects capturing California sea lions within Monterey Bay. Involved with a season (3 months) on St. Paul and St. George in the Pribilof Islands; handled thousands of fur seal pups for mark and recapture study. Other duties and experiences included fitting seals with telemetric devices, tracking animals, and using night-vision devices in mother-pup energetics project. Also, I was involved with necropsies (collection of histological and pathological samples) on sea birds, pinnipeds, and whales. Also, I was involved with a study near La Paz, Mexico (December 1993-January 1994) capturing California sea lions using large capture nets (e.g. salmon nets) from haul-out sites and fitting with TDR recorders. Involved as a Research Assistant in a research project (NMFS) on the Pribilof Islands (August 1991).

**Fishery Biologist:** California Department of Fish and Game, Region IV, Anadromous Fisheries Division. 1989-1990, Supervisor: Bill Loudermilk. Duties included mark and recapture study of salmon in the Merced River area of central California. Responsible for sampling river for salmon carcasses and tagging techniques, traversing river with boat, collecting and analyzing data and writing reports.

### Professional Teaching Experience

2008-

#### **Baylor University**

Comparative Vertebrate Physiology (BIO 4431)  
Integrative Ecophysiology (BIO 5380)  
Modern Concepts in Biology (BIO 1306)  
Honor Biology (1306H)  
Animals Models in Human Research (BIO 5100)  
Ecology (BIO 3303)  
Graduate seminars

2006-2008

#### **University of Michigan**

Mammalian Physiology (Biology 432/532)  
Special Topics class (Biology 483/583); *Life at the edge, Physiological ecology of animals in extreme environments.*

## Scholarly Activity

### *Selected Presentations*

#### Posters/Oral (\*denotes students)

1. **Trumble**, S.J., Usenko, S., Thewissen, J.G.M.H., George, J.C., Lysiak, N.S., Sanders, R., Winfield, Z. and A. Stevens. 2015. Using the earplug of a female bowhead whale to reconstruct its lifetime chemical profiles. 21<sup>st</sup> Biennial Conference on the Biology of Marine Mammals. San Francisco, California. Oral Presentation. December 12-18.
2. Lysiak, N.S., S.J. **Trumble**, M.J. Moore, A.R. Knowlton, \*R. Sanders, \*A.E. Clark, S. Usenko. 2015. Untangling the life of an entangled North Atlantic right whale with chemical profiles of baleen. 21<sup>st</sup> Biennial Conference on the Biology of Marine Mammals, San Francisco, CA. Poster Presentation. December 12-18.
3. Usenko, S., Norman, S.A., Rickman, B.H. et al. and S.J. **Trumble**. 2015. Chemical profile in a harbor porpoise (*Phocoena phocoena*) with lymphoma. 21<sup>st</sup> Biennial Conference on the Biology of Marine Mammals. San Francisco, California. Oral Presentation. December 12-18.
4. **Trumble**. S.J. and S. Usenko. 2015. Bowhead whale earplug exposes lifetime chemical profiles. Alaska Marine Science Symposium. 18-22 January, Anchorage AK.
5. **Trumble**. S.J., Potter, C.W., Berman, M. and S. Usenko. 2013. Earplugs from baleen whales reveal lifetime contaminant exposure and hormone profiles. 20<sup>th</sup> Biennial Conference on the Biology of Marine Mammals. Dunedin, New Zealand. Oral Presentation. December 7-13.
6. \*Sanders, R.L. Oxman, D.S. and S.J. **Trumble**. 2014. Stress response associate with hatchery conditions in developing chum salmon. Poster; Society of Integrative and Comparative Biology, Austin TX.
7. \*Moore, C., Fahlman, A., Moore, M.J., Willoughby, D.S., Robins, and S. J. **Trumble**. 2014. Muscle fiber typing in elephant seals. Oral Presentation. Society of Integrative and Comparative Biology, Austin TX.
8. \*Moore, C.D., Fahlman, A., Moore, M., Willoughby, D., Kanatous, S and S.J. **Trumble**. 2013. Significance of type IIb muscle fibers in diving mammals. Texas Society of Mammalogists. Feb 2013, Junction TX.
9. Pearson, L.E., Goetz, K.T., Costa, D.P. **Trumble**, S.T. and J.M. Burns. 2013. Potential over-winter diet shift in Weddell seals from McMurdo Sound. SCAR Meeting. Auckland NZ.
10. \*Moore, C.D., Fahlman, A., Moore, M., Willoughby, D., Kanatous, S and S.J. **Trumble**. 2013. Significance of type IIb muscle fibers in diving mammals. Experimental Biology. April 2013, Boston MA.

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11. \*Robinson, E.M., **Trumble**, S.J. and S. Usenko. 2013. Reconstruction of Pesticide, PCB, and PBDE Profiles in Gray and Blue Whale Earplugs. American Chemical Society 246th National Meeting and Exposition, New Orleans, LA, Poster Presentation.
12. \*Robinson, E.M., **Trumble**, S.J., Subedi, B., Berman-Kowalewski, M., Sanders, R. and Usenko. 2013. Reconstruction of Chemical Profiles in Marine Ecosystems using Whale Earplugs. SETAC South-Central Regional Meeting, Clear Lake, TX, Poster Presentation.
13. \*Robinson, E.M., **Trumble**, S.J., Subedi, B., Berman-Kowalewski, M., Sanders, R. and Usenko. 2013. Reconstruction of Contaminant Profiles in Marine Ecosystems using Whale Earplugs. SETAC Europe 23rd Annual Meeting, Glasgow, United Kingdom, Poster Presentation.
14. Pearson LE, **Trumble** SJ, Costa DP, Burns JM. 2012. Seasonal differences in fatty acid composition of blubber and muscle of Weddell seals. SCAR Open Science Conference, Portland OR. July 16-19 2012. Poster.
15. \*Robinson, E.M., **Trumble**, S.J. and S. Usenko. 2012. Reconstruction of Pesticide, PCB, and PBDE Profiles in Gray and Blue Whale Earplugs. SETAC North America 33rd Annual Meeting, Long Beach, CA, Poster Presentation.
16. \*Locklin, J. L. and S. J. **Trumble**. 2011. A Preliminary Assessment of lipid content and body mass of the monarch butterfly (*Danaus plexippus*) (Lepidoptera: Danaidae) during the fall migration in Texas. Ecological Society of America. Austin Tx. August 2011.
17. \*Sanders, R.L. Oxman, D.S. and S.J. **Trumble**. 2011. Stress response associate with hatchery conditions in developing chum salmon. Poster; American Fisheries Society. Seattle. 2011.
18. \*Young, K.E. and S.J. **Trumble**. 2011. Sphingolipids in marine mammal skeletal muscle. 19<sup>th</sup> Biennial Conference for the Biology of Marine Mammals. Tampa, FL. Nov 2011.
19. \*Robinson, E., Trumble, S. and S. Usenko. 2011. Whale earwax plugs as a matrix for reconstructing contaminant profiles in a marine ecosystem. SEATAC, North America. Seattle WA, November 2011.
20. \*Moore, C.D., Fahlman, A., Moore, M., Niemeyer, M., Lentell, B., Oakes, S. and S.J. **Trumble**. 2011. Histological investigation of the “slip” in marine mammal tracheas. 19<sup>th</sup> Biennial Conference for the Biology of Marine Mammals. Nov. 2011.
21. \*Robinson, E.M., **Trumble**, S.J. and S. Usenko. 2011. Pesticides and Polychlorinated Biphenyls in Bowhead Whale Layers. SETAC Europe’s 21st Annual Meeting, Milan, Italy, Poster Presentation.
22. \*Robinson, E.M., **Trumble**, S.J. and S. Usenko. 2011. Reconstruction of Contaminant Profiles in Marine Ecosystems using Whale Earwax Plugs matrices. SETAC North America 32<sup>nd</sup> Annual Meeting, Boston, MA, Poster Presentation.
23. \*Young, K.E., \*Quinn, S.M., Waite, J.N., Usenko, S., Andrews, R.D., **Trumble**, S.J. (2010) Using GC-FID in Conjunction with GC-MS to Identify Fatty Acid Methyl Esters in Sympatric Marine Mammal Species. Society of Integrative and Comparative Biology. Seattle, WA. Poster.

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24. \*Robinson, E., **Trumble**, S.J., Kanatous, S.K. and S. Usenko. 2010. Semi-volatile organic compounds in Weddell Seals Blubber and Muscle Tissue from McMurdo Sound, Antarctica. SETAC 2010, Europe 20th Annual in Seville, Spain from 23-27 May 2010.
25. \*Robinson, E.M., **Trumble**, S.J., Kanatous, S.B. and S. Usenko 2010. Semi-Volatile Organic Compounds in Weddell Seal Blubber and Muscle Tissue from McMurdo Sound, Antarctica. SETAC North America's 31st Annual Meeting, Portland, OR, Poster Presentation.
26. \*Robinson, E.M., **Trumble**, S.J., Kanatous, S.B. and S. Usenko 2010. Semi-Volatile Organic Compounds in Weddell Seal Blubber and Muscle Tissue from McMurdo Sound, Antarctica. SETAC South-Central Regional Meeting, Junction, TX, Platform Presentation.
27. **Trumble**, S.J, Hawke, T.J, Pearson, L.E, Noren S.R and S.B. Kanatous. 2009. Ontogenetic Changes in Lipid Utilization in Weddell Seal Skeletal Muscle: Roles in Thermogenesis, Energy Reserves, and Prolonged Diving. 18th Biennial Conference on the Biology of Marine Mammals 12-16 October, Quebec City, Quebec, Canada.
28. \*Robinson, E.M., Young, K.E., Trumble, S.J. and S. Usenko. 2009. Determination of PBDEs, Pesticides, and PCBs in Bowhead Whale Blubber. SETAC North America's 30th Annual Meeting, New Orleans, LA, Poster Presentation.
29. **Trumble**, S.J, Hawke, TJ, Pearson, LE, and SB Kanatous. 2008. Skeletal muscle lipids in Weddell seals (*Leptonychotes weddellii*): Differences in age class and possible response to resource limitations. FASEB J. 22
30. Kanatous, SB, Hawke, TJ, **Trumble**, S.J, Pearson, LE and RW Davis. 2008. The ontogeny of skeletal muscle adaptations that enable long deep dives in Weddell seals. FASEB J. 22
31. Cornick, L, Castellini, MA, Rea, L, and S. **Trumble**. 2007. Where's the fat? Plasma lipemia as evidence of feeding in Weddell seals. Accepted. 16<sup>th</sup> Biennial Conference on the Biology of Marine Mammals. South Africa, December 2007.
32. Noren, S., Pearson, L., Davis, J., **Trumble**, S. and S. Kanatous. 2007. Development of thermoregulation of a polar mammal. FASEB J. 21 (5), A592-A593.
33. **Trumble**, S.J. and M.A. Castellini. 2005. The benefits of diet mixing in an aquatic carnivore, the harbour seal. IUPS/FASEB, San Diego CA, April 2005.
34. **Trumble**, S.J., Barboza, P.S. and M.A. Castellini. 2002. Digestive constraints on an aquatic carnivore: Tradeoffs between fish quantity and quality for harbor seals. American Physiological Society, San Diego CA. 2002.
35. **Trumble**, S.J., and M.A. Castellini. 2002. Digestive efficiency of pollock and herring in harbor seals: addressing the "Is it Food?" hypothesis. FASEB. New Orleans, LA. 2002.
36. **Trumble**, S.J., and M.A. Castellini. 2001. Using Plasma Chemistry Profiles to Assess the Health of Harbor Seal Populations in Alaska: A Novel Technique used in Determining Outliers in Population Studies. Presented at the 14<sup>th</sup> Biennial Conference for the Biology of Marine Mammals. Vancouver BC. 2001.

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37. Castellini, J.M., S.D Inglis, S.J. **Trumble**, and M.A. Castellini. 2001. Condition and health indices in rehabilitated harbor seal pups at the Alaska SeaLife Center. 14th Bi-annual Conference on the Biology of Marine Mammals, Vancouver, BC.
38. Castellini, M.A., Rea, L.D., Cornick, L., **Trumble**, S., Mau, T., Inglis, S., Harper, S., and J.M. Castellini. The natural foraging biochemistry of Weddell seals. 2004. Proceedings of the Third International Conference of Comparative Physiology & Biochemistry in Africa. *Animals and Environment*. Ntshondwe, ITHALA Game Reserve, KwaZulu-Natal, South Africa.
39. Castellini, M.A., Rea, L.D., Cornick, L., **Trumble**, S., Mau, T., Inglis, S., Harper, S., and J.M. Castellini. Lipid chemistry of natural foraging in Weddell seals. 2003. Proceedings of the 15th Biennial Conference on the Biology of Marine Mammals. Greensboro, NC.
40. Castellini, M.A., J.M. Castellini, D. Calkins, V. Burkanov, S. **Trumble**, and T. Mau. 2002. Diet alone does not predict body condition in marine mammals. Experimental Biology, New Orleans.
41. Castellini, M.A., D. Calkins, V. Burkanov, J. Castellini, S. **Trumble**, and T. Mau. 2001. Long-term feeding trials with harbor seals and Steller sea lions: impact of different diets on health and nutrition. 14th Biennial Conference on the Biology of Marine Mammals, Vancouver, BC.
42. **Trumble**, S.J., and M.A. Castellini and R.J. Small. 2000. Comparing blood chemistry and hematology values and assessing health in harbor seal pups on Tugidak Island and within Prince William Sound 1997-1999. Presented at the 13<sup>th</sup> Biennial Conference for the Biology of Marine Mammals. Maui, Hawaii.
43. Castellini, M.A., Castellini, J.M., **Trumble**, S.J. and T Mau. 2000. How do dietary lipids impact the body condition and health of seals. FASEB J 14 (4) A440-A440.
44. **Trumble**, S.J., and M.A. Castellini. 1997. Plasma Chemistry and Hematology Values for Harbor Seal Pups from Alaskan Waters. Presented at AAAS. Valdez, AK.

### **Invited Speaker Presentations** (underline denotes key speaker)

1. **Trumble, S.J.** Earplugs from baleen whales reconstruct lifetime chemical profiles: a new tool in whale conservation. Seville Spain, 19 May 2014.
2. **Trumble, S.J.** 2014. Earplugs from baleen whales reveal lifetime contaminant exposure and hormone profiles. McMaster University, Hamilton Ontario Canada, Feb 26-28 2014.
3. **Trumble, S.J.** 2014. Earplugs from baleen whales reveal lifetime contaminant exposure and hormone profiles. Northeast Ohio Medical University. Feb 13 2014
4. **Trumble, S.J.** and S. Usenko. 2013. Reconstructing stress and contaminant profiles in a blue whale. Smithsonian Zoology Seminar Series. Washington D.C. June 2013.
5. **Trumble, S.J.** and S. Usenko. 2012. A Whales Tale: Reconstructing stress and contaminant profiles in a blue whale. Woods Hole Seminar Series, November 15<sup>th</sup>, Woods Hole, MA. November 2012.

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6. **Trumble, S.J.** and S. Usenko. 2012. Anthropogenic and Physiological Data Reconstructed from Whale Ear Plugs. American Society of Mammologists. Reno NV.
7. **Trumble, S.J.** and S. Usenko. 2011. Anthropogenic and Physiological Data Reconstructed from Whale Ear Plugs. 13<sup>th</sup> Biennial Meeting for the Society of Marine Mammals. Tampa, FL. November, 2011.
8. **Trumble, S.J.** 2009. Furman University Student Speaker Award (Yearly student's choice award for physiology/ecology speaker). *Ontological differences in skeletal muscles of Weddell seals*.
9. **Trumble, S.J.**, Hawke, T.J, Pearson, L.E, Noren SR and SB Kanatous. 2009. Skeletal muscle lipids in Weddell seals (*Leptonychotes weddellii*): Differences in age class and possible response to resource limitations. SICB, Boston MA. P. 172.
10. **Trumble, S.J.** et al. 2006. The Born Identity: Genotypic Variation Reflected in Blood Chemistry. The Wildlife Society's 13<sup>th</sup> Annual Conference in Anchorage, Alaska, September 23-27.
11. **Trumble, S.J.**, Barboza P.S. and M.A. Castellini. 2003. The skinny on fat intake: can seals survive on "junk-food"? The 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals. December 13-19 2003, Greensboro NC.
12. **Castellini, M.**, Rea, L., Cornick, L., **Trumble, S.** et al. 2003. Lipid chemistry of natural foraging in Weddell seals. 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals. December 13-19 2003, Greensboro NC.
13. **Trumble, S.J.** Assessing the health of harbor seals in Alaskan waters. Rasmuson Fisheries Board. Anchorage, AK. March 21, 2003.
14. **Trumble S.J.** The health of harbor seals in Alaska: Can blood values and digestive physiology answer the "junk food" hypothesis? AAAS Conference, Valdez AK. 1998.

**Peer-Reviewed Publications (in press, submitted or in prep)**

1. Norman, S.A., Rickman, B.H. et al. and S.J. Trumble. Chemical profile in a harbor porpoise (*Phocoena phocoena*) with lymphoma. *In revision*
2. Sanders, R., Oxman, D.S. and S.J. Trumble. Stress Response Associated with Hatchery Conditions in Developing Chum Salmon (*Oncorhynchus keta*). Journal of Fisheries and Aquatic Sciences. *submitted*



**Peer-Reviewed Publications (\* denotes student)**

1. Usenko, S., **Trumble**, S.J. and N. Lysiak. 2015. GC–MS and UHPLC–MS-MS Analysis of Organic Contaminants and Hormones in Whale Earwax Using Selective Pressurized Liquid Extraction. *Chromatography* (2): 40-44.
2. Robinson, E.M., Jia, M., **Trumble**, S.J., and S. Usenko. 2015. Selective pressurized liquid extraction technique for halogenated organic pollutants in marine mammal blubber: A lipid-rich matrix. *Journal of Chromatography A* 1385, 111-115.
3. \*Moore, C., Fahlman, A., Crocker, D.E., Robbins, K., and S. J. **Trumble**. 2015. The degradation of proteins in pinniped skeletal muscle tissue: viability of post-mortem tissue in physiology research. *Conservation Physiology* Vol 3: 1-8. DOI: 10.1093/conphys/cov019
4. \*Moore, C., Crocker, D.E., Fahlman, A., Moore, M.J., Willoughby, D.S., Robins, K.A., Kanatous, S.B., and S. J. **Trumble**. 2014. Ontogenetic changes in skeletal muscle fiber type, fiber diameter and myoglobin concentration in the Northern elephant seal (*Mirounga angustirostris*). *Frontiers of Aquatic Physiology*. 217:1-9. DOI: 10.3389/fphys.2014.00217
5. Schlater, A.E., De Miranda, M.A., Frye, M.A., **Trumble**, S.J. and S. B. Kanatous. 2014. Changing Myoglobin's Paradigm: A Novel Link Between Lipids and Myoglobin. *Journal of Applied Physiology*. June 12 2014. DOI: 10.1152/jappphysiol.00973.2013
6. \*Moore, C., Moore, M., **Trumble**, S., Niemeyer, M., Lentell, B., McLellen, W., Costidis, A. and A. Fahlman. 2014. A Comparative Analysis of Marine Mammal Tracheas. *Journal of Experimental Biology*. 217:1154-1166. doi:10.1242/jeb.093146
7. \*Robinson, E. M., **Trumble**, S.J., Subedi, B., Sanders, R. and S. Usenko. 2013. Selective pressurized liquid extraction of pesticides, polychlorinated biphenyls and polybrominated diphenyl ethers in a whale earplug (earwax): A novel method for analyzing organic contaminants in lipid-rich matrices. *Journal of Chromatography A*. 1319:14-20.
8. **Trumble** S.J., Berman-Kowalewski, M., Potter, C. and S. Usenko. 2013. Blue whale earplug reveals lifetime contaminant exposure and hormone profiles. *Proceedings of the National Academy of Sciences*. 110 (42)16922-16926. DOI: 10.1073/pnas.1311418110
9. **Trumble** S.J. and S.B. Kanatous. 2012. Fatty Acid use in Diving Mammals: More than Merely Fuel. *Frontiers in Aquatic Physiology* 194 (3):1-8.
10. \*Usenko, C.Y., **Trumble**, S.J., Hopkins, D.C. and E.D. Bruce. 2012. Hydroxylated PBDEs induce developmental arrest in zebrafish. *Toxicology and Applied Pharmacology* 262(1):43-51.
11. D'souza, A.M, J.L. Beaudry, A.A. Szigiato, S.J. **Trumble** and M.C. Riddell. 2012. Consumption of a High Fat Diet Rapidly Exacerbates the Development of NAFLD that Occurs with Chronically Elevated Glucocorticoids. *AJP- Gastrointestinal and Liver Physiology* 302(8):850-863.
12. Waite, J.N., **Trumble**, S.J., Burkanov, V.N. and R.D. Andrews. 2012. Resource partitioning of sympatric Steller sea lions and northern fur seals as revealed by biochemical dietary analyses and satellite telemetry. *Journal of Experimental Marine Biology and Ecology* 416-417: 41-54.

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13. \*Young, K. E., Quinn, S.M. and S.J. **Trumble**. 2012. Comparing Gas Chromatographic Techniques Used in Fatty Acid Profiling of Northern Fur Seals (*Callorhinus ursinus*) and Steller Sea Lions (*Eumetopias jubatus*) from Lovushki Island Complex, Russia. *International Journal of Applied Science and Technology* 2(9):11-21.
14. **Trumble**, S.J., O'Neil, D., Cornick, L.A., Gulland, F., Castellini, M.A. and S. Atkinson. 2013. Endocrine changes in harbor seal (*Phoca vitulina*) pups undergoing rehabilitation. *Zoo Biology*. 32(2):134-141.
15. **Trumble**, S.J., Robinson, E., Noren, S., Usenko, S., Davis, J. and S.B. Kanatous. 2012. Assessment of legacy and emerging organic pollutants in Weddell seals (*Leptonychotes weddellii*) Near McMurdo Sound, Antarctica. *Science of the Total Environment* 439:275-283.
16. **Trumble**, S.J, Noren, S.R., Cornick, L.A., Hawke, T.J., and S.B. Kanatous. 2010. Age-Related Differences in Skeletal Muscle Lipid Profiles of Weddell Seals: Clues to Developmental Changes. *Journal of Experimental Biology* 213:1676-1684.
17. Kanatous, S.B., Hawke, T.J., **Trumble**, S.J., Pearson, L.E., Watson, R.R., Garry, D.J., Williams, T.M. and R.W. Davis. 2008. The ontogeny of aerobic and diving capacity in the skeletal muscles of Weddell seals. *Journal of Experimental Biology* 211:2559-2565.
18. Castellini, M.A., **Trumble**, S.J., Mau, T., Yochem, P. and B. Stewart. 2009. Body and blubber measurements of Antarctic pack-ice seals: implications for the control of body condition and blubber regulation. *Physiological and Biochemical Zoology* 82(2):113-120.
19. Noren, S.R., Pearson, L.E., Davis, J.W., **Trumble**, S.J. and S.B. Kanatous. 2008. Different Thermoregulatory Strategies in Nearly Weaned Pup, Yearling, and Adult Weddell Seals (*Leptonychotes weddellii*). *Physiological and Biochemical Zoology* 81(6):868-879.
20. **Trumble**, S.J., Castellini, M.A., Castellini J.M. and T. Mau. (2006). Dietary and seasonal influences on blood chemistry and hematology in captive harbor seals. *Marine Mammal Science* 22(1):104-123.
21. **Trumble**, S.J. and M.A. Castellini (2005). Diet mixing in an aquatic carnivore, the harbour seal. *Canadian Journal of Zoology* 83:851-859.
22. Zhao, L. Castellini, M.A., Mau, T. and S.J. **Trumble**. 2004. Trophic interactions of Antarctic seals as determined by stable isotope signatures. *Polar Biology* 27:368-373.
23. Burns J.M., Costa D.P., Fedak M., Hindell M.A., Bradshaw C.J.A., Gales N., McDonald G., **Trumble** S.J., and D. Crocker. 2004. Winter habitat use and foraging behavior of crabeater seals along the Western Antarctic Peninsula. *Deep Sea Research II*. 51: 2279-2303.
24. **Trumble**, S.J., Barboza P.S. and M.A. Castellini. 2003. Digestive constraints on an aquatic carnivore: effects of feeding frequency and prey composition on harbor seals. *Journal of Comparative Physiology B*. 173:501-509.
25. **Trumble**, S.J. and M.A. Castellini. 2002. Blood chemistry, hematology, and morphology of wild harbor seal pups in Alaska. *Journal of Wildlife Management* 66(4):1197-1207.

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26. Burns, J.M., **Trumble**, S.J., Castellini, M.A. & Testa, J.W. 1998. The diet of Weddell seals in McMurdo Sound, Antarctica silverfish determined from scat collections and stable isotope analysis. *Polar Biology*, 19:272–282.

### Supplementary Publications

1. **Trumble**, S.J. and M.A. Castellini. 1998. A Comparison of blood chemistry and hematology values for harbor seals pups captured on Tugidak Island and with Prince William Sound Alaska, 1997. *In*: Small et al.; Harbor Seal Investigations in Alaska. Annual Report. NOAA GRANT NA57FX0367
2. Castellini, M.A., Castellini, J. M. and S.J. **Trumble**. 2002. Recovery of harbor seals. Phase II: Controlled study of diet and health. Exxon Valdez Oil Spill Restoration Project 98341. Final Report.
3. **Trumble**, S.J. Abundance, movements, dive behavior, food habits, and mother-pup interactions of harbor seals (*Phoca vitulina richardsi*) near Monterey Bay, California. M.S. Thesis. Moss Landing Marine Laboratories (CSU-Fresno). 100p.
4. Adkison M, **Trumble**, S.J., et al. 2001. HARBOR SEAL INVESTIGATIONS IN ALASKA ANNUAL REPORT NOAA GRANT NA87FX03000. 19p.

### Media

1. **Swiss Public Radio**, <https://www.srf.ch/play/radio/wissenschaftsmagazin/audio/leben-aus-dem-baukasten?id=dc33c243-87bb-4b2d-a67c-094e937acbbc&startTime=1150>
2. **Smithsonian Magazine**, Jan 25, 2017: <http://www.smithsonianmag.com/smithsonian-institution/for-scientists-chunks-whale-earwax-can-biological-treasure-troves-180961891/>
3. **Newsweek**, June 18, 2016: [The Story of the Arctic Is Written in Whale Earwax](#)
4. **Nature**, Sept. 16, 2013: [Whale earwax a time capsule for stress and toxins](#)
5. **National Geographic**, Sept. 16, 2013: [Biography of A Blue Whale, Told Through Ear Wax](#)
6. **Live Science**, Sept. 17, 2013: [10-Inch-Long Earwax Plug Reveals Blue Whale's Life History](#)
7. **National Geographic**, Sept. 16, 2013: [Giant Gob of Earwax Reveals Blue Whale Secrets](#)
8. **Smithsonian**, Sept. 16, 2013: [Blue Whale Earwax Reveals Pollution Accumulated Over a Lifetime](#)
9. **Christian Science Monitor**, Sept. 18, 2013: [In earwax, the tale of a whale](#)

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10. **Discovery Channel's Digital Planet**, Sept. 17, 2013: [Discoveries: Whale earwax](#) (VIDEO at 5:00 mark)
11. **MSN**, Sept. 18, 2013: [Want to know how old a blue whale is? Check its earwax](#) (VIDEO)
12. **Huffington Post**, Sept. 17, 2013: [Whale Ear Wax Reveals Animal's Exposure to Stress & Toxins, Scientists Say](#) (VIDEO)
13. **Yahoo!**, Sept. 16, 2013: [Earwax, Flame Retardants, and Hormones: The World's Weirdest Whale Study](#)
14. **Yahoo!**, Sept. 18, 2013: [10-Inch-Long Earwax Plug Reveals Blue Whale's Life History](#)
15. **NPR Morning Edition**, Sept. 16, 2013: [Ear Wax from Whales Keeps Record of Ocean Contaminants](#) (AUDIO)
16. **Los Angeles Times**, Sept. 17, 2013: [Like a tree's rings, blue whale's earwax tells a story of its life](#)
17. **Red Orbit**, Sept. 17, 2013: [Whale Earwax Reveals Secrets Of Their Past](#) (VIDEO)
18. **PBS News hour**, Sept. 17, 2013: [Reading a whale's life story from ear wax](#)
19. **NBC News**, Sept. 16, 2013: [A whale's life story is recorded in its ear wax](#)
20. **New Scientist**, Sept. 16, 2013: [Whales record major life events in their earwax](#)
21. **The Weather Channel**, Sept. 17, 2013: [Whale Earwax Traces a Lifetime of Contaminants](#)
22. **The Guardian (UK)**, Sept. 17, 2013: [Buried in every whale's earwax resides a record of their lifetime exposure to pollutants](#) (VIDEO)
23. **Discovery News**, Sept. 17, 2013: [Whale Ear Wax Tells of Short, Contaminated Life](#)
24. **Latinos Post**, Sept. 17, 2013: [Blue Whale's Earwax Offers a Window into the Whale's Life and Oceanic Pollutants](#) (VIDEO)
25. **ABC (Australia) Science**, Sept. 17, 2013: [Ear wax reveals whale's tale](#)
26. **Nature World News**, Sept. 17, 2013: [Blue Whale Earwax Reveals History into Whale, Ocean Health](#)
27. **Wired**, Sept. 17, 2013: [Whale earwax reveals a timeline of its exposure to contaminants](#)

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28. **Austin American-Statesman**, Sept. 17, 2013: [Whales' ear wax tells life story, tracks pollution](#)  
(VIDEO)
29. **Atlanta Journal-Constitution**, Sept. 17, 2013: [Whales' ear wax tells life story, tracks pollution](#)  
(VIDEO)
30. **Take Part**, Sept. 16, 2013: [Ear Wax, Flame Retardants and Hormones: The World's Weirdest Whale Study](#)
31. **Mother Nature Network**, Sept. 17, 2013: [Whale ear wax \(you heard that right\) carries a lifetime of ocean pollutants](#)
32. **International Science Times**, Sept. 17, 2013: [Whale Ear Wax Keeps Record of Ocean Pollution](#)
33. **Business Insider**, Sept. 18, 2013: [It Takes Only 10 Inches Of Earwax To Tell The Life Story Of A Blue Whale](#)
34. **HNGN**, Sept. 17, 2013: [Ear Wax Reveals Whale's Life History But Smells 'Terrible'; Could Show Human Effect On Environment](#)
35. **Ocean Leadership**, Sept. 17, 2013: [Whale Ear Wax \(You Heard That Right\) Carries a Lifetime of Ocean Pollutants](#)
36. **The Conversation**, Sept. 17, 2013: [Scientists plumb blue whales' secrets by looking in their ears](#)
37. **Motherboard**, Sept. 18, 2013: [Blue Whale Earwax Offers a Surprisingly Good Record of Pollution](#)
38. **The Atlantic Cities**, Sept. 19, 2013: [This Dead Whale Is Helping Science in an Incredibly Gross Way](#)
39. **DRadio "Deutschlandfunk"** (German Public Radio, Sept. 18, 2013: [Ein ganz besonderer Pfropfen](#) (AUDIO))
40. **Counsel & Heal**, Sept. 17, 2013: [The Key to Studying a Blue Whale? Look At the Ear Wax](#)
41. **iO9**, Sept. 16, 2013: [This is the secret to discovering a whale's life history](#)
42. **French Tribune**, Sept. 18, 2013: [Ear Wax May Throw Light on Lives of Free-Swimming Species](#)

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43. **Boating World Magazine**, Sept. 18, 2013: [Ear Wax From Whales Keeps Record Of Ocean Contaminants](#)
44. **Alaska Dispatch**, Sept. 18, 2013: [In earwax, the tale of a whale](#)
45. **Earth Preservers**, March 9, 2012: [Believe it or not, Scientists are Using Whales' Earwax to Study Ocean Contaminants](#)
46. **UWire**, Feb. 14, 2012: [Unusual pollution research studies whale earwax](#)
47. **Baylor Lariat**, Feb. 14, 2012: [Unusual pollution research: Earwax-environment link studied](#)
48. **Science Magazine**, December 2011: [Tracking Contaminants in Whales-Using Their Earwax](#)

### Mentoring Activities

- Mentor for Dr. Juan Beltran (U. Seville; Seville Spain); Fulbright Scholar, Summer 2015.

#### **Graduate Students; SJ Trumble (2008 to present)**

- Colby Moore PhD Student (Fall 2009 - 2014); *Assistant Professor at Harvard Medical School*.
- Rebel Sanders PhD student (MS 2012; PhD 2013 - 2017)
- Kathleen Robbins MS (MS 2014)
- Victoria Neises PhD student (2014 - )
- Genevieve Godfrey PhD student (2014 - )
- Danielle Crain (2015 - )
- Aaron Kirkpatrick (2015 - )

#### **Graduate Student Committee Involvement**

- Adrian Zapata (PhD student, Baylor U). 2011-2016
- Nicholas Green (PhD student, Baylor U.) 2008-2012
- Jason Waite (PhD student, U Alaska Fairbanks) 2006-2010
- Laura Dobbins (MS student, Baylor U.) 2008-2009
- Jeffrey Bardwell (PhD student, Baylor U.) 2008-2013
- June Wolfe (PhD student, Baylor U.) 2008-2009
- Crystal Usenko (PhD student, Baylor U) 2008-2012
- Martin Husemann (PhD student, Baylor U) 2010-2013
- Michael Spillane (PhD student, HHPR, Baylor U) 2013
- Neil Schwarz (PhD student, HHPR, Baylor U) 2014
- Lissette Aguilar (PhD student, ENV, 2013-)

#### **Undergraduate/High School Mentoring Activities**

- Amanda Stevens, BU, Honors (2015)
- Alex Horkowitz, BU (2014-15)
- Kayla Murphy, BU (2015)
- Brandy Ligocky, BU (2014)

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- Mentor in Baylor U; High School Student Summer Research Program  
Salina Lee (Summer 2009)
- Sarah Quinn, Undergraduate Research Program, Baylor U. (Summer 2009)
- Eugene Nwankwo (Summer 2009)
- Andrew Chang (Spring/Summer 2010)
- Prince Adotama (2010)
- Tim Dobin (2010)
- *Honors thesis students*; Rachel Marks (2013); Danielle Ochs (2012); Amanda Stevens (2015)

### Outreach Activities

- Whale earplug exhibit (Objects of Wonder), Smithsonian Museum of Natural History (March 2017-March 2019). Highlights research by S. Trumble and S. Usenko from Baylor.
- Baleen and earplug research at the London Museum of Natural History. London, England. Working with Richard Sabin and Roberto Portelo Miguez on blue whale exhibit which will be open to the public in early 2017.

### Grants/Awards/Honors

#### *Grant proposals submitted, funded or in review*

- |      |  |
|------|--|
| 2016 | <b>Baylor Internal Grant</b> ; Determining decades of ocean productivity via astaxanthin in whale earwax. <i>Awarded</i> . PI; SJT (BU). \$7500  |
| 2016 | <b>Office of Naval Research</b> ; Reconstructing Stress and Stressor Profiles in Baleen Whale Earplugs. PIs; SJT (BU) and S. Usenko (BU). \$334,000. <i>Pending</i>  |
| 2016 | <b>Office of Naval Research</b> ; Small cetacean chronic and adaptive response to ambient noise levels. PIs; SJT (BU), S. Norman (BU) and R. Okrucky (Mexico). \$170,000. <i>Declined</i>  |
| 2016 | <b>North Pacific Research Board</b> ; Development of hormone profiles from opercula to reconstruct reproductive life histories of yelloweye rockfish. PIs; D. Oxman and K. McNeel (ADF&G) and SJT (BU). \$96,948 <i>Pending</i>  |
| 2016 | <b>National Science Foundation</b> ; Collaborative Research: Investigation of the Metabolic Pathways Used During Diving in Weddell Seals: Linking Prey Composition and Foraging Effort to Cellular Responses in the Blood, Blubber, and Skeletal Muscles. PIs; SJT, D. Crocker and S. Kanatous. 2015. \$428,889 (SJT). <i>Declined</i> |

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- 2016            **National Science Foundation;** Collaborative Research: Foraging ecology and physiology of the leopard seal (*Hydruga leptonyx*). PIs. D. Costa (UCSC), D. Crocker (SSU), S. Kanatous (CSU), S. Trumble (BU). \$204,309 (SJT)  
*Pending – ranked Highly Competitive*
- 2016            **North Slope Borough;** Using radioisotopes to age bowhead whale earplugs. \$50,000 to SJT and Sascha Usenko. *Awarded*
- 2015            **National Science Foundation;** Collaborative Research: Investigation of the Metabolic Pathways Used During Diving in Weddell Seals: Linking Prey Composition and Foraging Effort to Cellular Responses in the Blood, Blubber, and Skeletal Muscles. PIs; SJT, D. Crocker and S. Kanatous. 2015. \$211,321 (SJT).
- 2015            **National Science Foundation;** Collaborative Research: Foraging ecology and physiology of the leopard seal (*Hydruga leptonyx*). PIs. D. Costa (UCSC), S. Kienle (UCSC), S. Kanatous (CSU). \$270,000
- 2015            **Office of Naval Research (Warfighter Performance Dept.);** Using diving mammals as a model to improve human performance. 2015. PIs; Shane Kanatous (CSU) and SJT (BU); \$500,000.
- 2014            **Glasscock Award;** Net pens and stress in chum salmon *Oncorhynchus keta*. PI, S. Trumble. \$13,300. **Funded**
- 2013            **Office of Naval Research;** Determining baseline stress-related hormone values in large cetaceans. Submitted September 15, 2013. PI, S. Trumble and Co-PI, S. Usenko. \$217,215 (Sept 15 2013) **Funded**.
- 2013            **At-Sea Processors Association-Pollock Conservation Cooperative;** Northern fur seal foraging energetics and diet between rookeries in the Pribilof Islands, Alaska: implications for post-weaning survivorship and reproductive success. PI, Leslie Cornick (APU), Co-PI, S. Trumble (BU). **Funded** \$160,540
- 2012            **Baylor Faculty Grant;** Muscle physiology of developing elephant seals; (Trumble) **Funded** \$25,000
- 2011            **Marine Mammal Commission;** Anthropogenic and Physiological Data Reconstructed from Whale Earwax Plugs (PI's Trumble and Usenko) **Funded** \$45,000
- 2011            **Office of Naval Research;** Physiological monitoring of diving mammals. (PI's; Fahlman, Tyack, Moore, Zapol, Trumble). **Funded** 200,000.
- 2009            **Baylor University Young Investigator Development Program;** The Ontogeny of Aerobic Capacity and Lipid Metabolism in Ice Seals. PI, Dr. SJ Trumble. **Funded** \$25,000



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2008 **Alaska Sustainable Salmon Fund** – State of Alaska; *Stress effects and Mass Marking in Salmon*. Collaborative grant with Alaska Department of Fish and Game; PI's Dr. S. Trumble and Dr. Dion Oxman; **Funded \$100,000**

### *Awards*

2014 **Academic Minute Senior Superlative Meta Award** (National Award given by WAMC Public Radio)  
<http://academicminute.org/2014/12/stephen-trumble-baylor-university-whales-ear-wax/>

2010 **Nominated for George A. Bartholomew Award:** A Society-Wide Award (Society for Integrative and Comparative Biology) for Early Ph.D. Integrative Biologists.

2009 **Nominated for George A. Bartholomew Award:** A Society-Wide Award (Society for Integrative and Comparative Biology) for Early Ph.D. Integrative Biologists.

2009 **Furman University Student Speaker Award** (Yearly student's choice award for physiology/ecology speaker). *Ontological differences in skeletal muscles of Weddell seals*, March 2009.

1997-2003 **Rasmuson Fisheries Research Fellow;** the University of Alaska Fairbanks, Rasmuson Fisheries research Center, "Assessing the health of harbor seals in Alaska.

1992-1993 **Dr. Earl H. Myers and Ethel B. Myers Oceanographic and Marine Biology Trust Award;** California State University.

1993 **Ezaki Award for Best Graduate Presentation;** California State University Fresno. For oral presentation; "Harbor seal mother-pup interactions in Monterey Bay, California" \$500.

1988 **Research Fellowship,** University of Texas Marine Science Institute. \$2000

1984-1988 **Member of "T" Association at Texas State University** (formerly known as Southwest Texas State University) for academic and athletic achievements (Academic Deans List, graduate in 4 years while full scholarship Track and Field athlete)

### **Professional Service**

- **American Physiological Society;** Session Chair, Endocrinology and Reproductive Physiology. APS meeting, San Diego Oct 5-8 2014.

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- **National Science Foundation;** Neurophysiology and physiology review panel (Graduate Fellowship Research) 2010- 2014
- **Review Editor,** Frontiers in Aquatic Physiology (2010 - )
- **Manuscript Reviews**
  - Frontiers in Aquatic Physiology
  - Journal of Experimental Marine Biology and Ecology
  - PLOS
  - Marine Mammal Science
  - Physiological and Biochemical Zoology
  - Canadian Journal of Zoology
  - Journal of Comparative Physiology-B
  - Polar Biology
  - Functional Ecology
  - Marine Ecological Progress Series
  - American Journal of Physiology
  - Aquatic Mammals
  - Revista de Biología Marina y Oceanografía

### **Professional Societies**

American Physiological Society (2005 - )  
Society of Integrative and Comparative Biology (2007- )  
Society for Marine Mammalogy (2003 - )