

Melinda Fowler, PhD

Assistant Professor of Biology
Springfield College
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Education:

PhD-Ecology and Evolutionary Biology, University of California, Santa Cruz (2007- 2012), Thesis research focus: Regulation of lipid metabolism in fasting and lactating northern elephant seals (*Mirounga angustirostris*). Department of Ecology and Evolutionary Biology. Advisor: Dr. Dan Costa.

Master of Science-Biology (2006), Sonoma State University, Rohnert Park, California. Thesis: 'Hormonal regulation of glucose clearance in lactating northern elephant seals (*Mirounga angustirostris*).' Advisor: Dr. Dan Crocker.

Bachelor of Science-Biology (2003), Southampton College of Long Island University, Southampton, New York. Graduated *summa cum laude*, Honors Program Thesis 'Spatial distribution of male New Zealand fur seals (*Arctocephalus forsteri*) during the breeding season.'

Teaching Experience:

Instructor:

Springfield College:

- Introductory biology course, '*Bioscience I*'. Fall 2015, Spring 2016
- Introductory biology laboratory course, '*Bioscience I Lab*'. Fall 2015
- Introductory anatomy course, '*Anatomy & Physiology Concepts I*'. Fall 2015, Spring 2016
- Upper division biology course, '*Animal Biology*'. Spring 2016

University of California Santa Cruz:

- Introductory biology course, '*Structure and Function*'. Fall 2010 & 2012; Summer 2012
- Upper division biology course, '*Animal Physiology*' and associated laboratory. Summer 2010

Teaching Assistant:

- Animal Physiology, University of California, Santa Cruz, CA (2011)
- Invertebrate Zoology, University of California, Santa Cruz, CA (2011)
- Human Physiology, University of California Santa Cruz, CA (2009)
- Biology of Marine Mammals, University of California Santa Cruz, Santa Cruz, CA (2009)
- Structure and Function, University of California Santa Cruz, Santa Cruz, CA (2007)
- Environmental Physiology, Sonoma State University, Rohnert Park, CA (2005)
- Diversity, Structure and Function, Sonoma State University, Rohnert Park, CA (2004-2005)

Other:

Designed, prepared and led laboratory exercise as guest lecturer for UCSC Animal Physiology course. "Lipid metabolites in northern elephant seals: using a microplate reader to measure physiological variables" 2011

Continuing Education:

- An Introduction to Evidence Based Undergraduate STEM Teaching. Vanderbilt University and the Center for the Integration of Research, Teaching and Learning. Statement of Accomplishment earned (2014)
- Attended workshop: Rethinking Science and Engineering Learning and Teaching through the Institute for Scientist and Engineer Educators, University of California Santa Cruz (2009)

Research Experience:

Assistant Professor of Biology, Springfield College, Springfield, MA. 2015-present

Postdoctoral researcher at Simon Fraser University, Dr. Tony Williams, supervisor. Research topics: Physiological ecology and foraging behaviour of provisioning songbirds (2013-2014).

Collaboration with Dr. Frederic Kraemer, Chief, Division of Endocrinology, Gerontology and Metabolism, Stanford University (2009-2012).

Field Leader:

- Physiological and behavioural determinants of reproductive success in the European starling (*Sturnus vulgaris*); Langley, British Columbia (2013-2014)
- Fasting physiology and foraging ecology in the Northern elephant seal (*Mirounga angustirostris*); Año Nuevo California (2005-2006; 2008-2010)
- Foraging ecology of the California sea lion (*Zalophus californianus*); Channel Islands, California (2008-2009)

Field Assistant:

- Diving physiology in the Emperor penguin (*Aptenodytes forsteri*); Cape Washington, Antarctica (2011)
- Foraging ecology in the Northern elephant seal (*M. angustirostris*); San Benitos Mexico and Año Nuevo California (2005-2006; 2008, 2011)
- Foraging ecology in the California sea lion (*Z. californianus*). Channel Islands, California (2007-2008)
- Reproductive behaviour and foraging ecology of Galapagos sea lions (*Zalophus wollebaeki*) and Galapagos fur seals (*Arctocephalus galapagoensis*); Galapagos Islands (2007 & 2010)
- Population demography and behaviour in the Hawaiian monk seal (*Monachus schauinslandi*); Northwest Hawaiian Islands (2004, 2006)
- Reproductive behaviour in the New Zealand fur seal (*A. forsteri*); Kangaroo Island, Australia and Kaikoura, New Zealand (2003-2004)
- Maternal investment in the Steller sea lion (*Eumetopias jubatus*); Seward Alaska (2001-2003)

Additional research skills:

- Coordination between multiple collaborating entities (international collaborators, National Marine Fisheries Service Project, Tagging of Pacific Predators project)
- Field logistics and personnel management, including extensive training of field assistants
- Electronic tag (VHF, satellite, time depth recorder, GPS, Crittercam, ECG) deployment and recovery
- Animal capture and chemical immobilization; milk, blood and tissue sampling

Public Outreach:

- Research presentation to undergraduate introductory biology lab sections, Simon Fraser University (2014)
- After school activities/presentations Campus Kids Connections/Outdoor Explorer Group; kids ages 7-10 years (2011-2012).
- Lab tour and career talk to Cabrillo College students as part of NSF project to engage underprepared students for careers in science and education (2010-2011)
- Presentation to high school biology classes and correspondence from the field; Moniteau County C-1 School, Jamestown, Missouri (2003-2014).
- Participated in career day mentoring panels for several high schools in Santa Cruz (2009-2011).
- Involved with Graduate Students for the Enhancement of Diversity (GCDE). Helped plan and execute Science Education Day at Long Marine Lab to educate middle school children about opportunities in science (2008, 2012).
- Worked to develop field research internships to involve undergraduates in field research with elephant seals
- Presented research at MESA Science Day Fair; and Pacific Collegiate School Math and Science Day (middle/high school audience) (2009)
- Blogged for www.TOPP.org (Tagging of Pacific Pelagics) about deployment/recovery of satellite tags on pinnipeds (2008-2009)
- Coordinated filming of elephant seal tagging for PBS Nova, National Geographic and local media outreach (<http://video.pbs.org/video/1051884361/>)
- Docent education talks at Año Nuevo State Reserve outlining elephant seal research objectives
- Mentored several undergraduate students for fieldwork and senior theses.

Ashley Pearson

Molly McCormley

Erin Pickett

Teri Wu

Anna Kosztowny

John Harley

Jeff Sharick

Sarah Grey

Publications:

- Fowler, M;** Debier, C; Champagne, CD, Crocker, DE, Costa, DP. (2016) The demands of lactation promote differential regulation of lipid stores in fasting elephant seals. *General and Comparative Endocrinology*. 225:125-132. <http://dx.doi.org/10.1016/j.ygcen.2015.09.024>
- Fowler, M;** Williams, TD. (2015) Individual variability in parental workload and breeding productivity: is the payoff worth it? *Ecology and Evolutionary Biology*. 5(17): 3583-3599. doi:10.1002/ece3.1625
- Fowler, M;** Kraemer, R; Shen, W-J; Crocker, DE, Costa, DP (2015) Hormone sensitive lipase and adipose triglyceride lipase in fasting and lactating northern elephant seals. *Physiological and Biochemical Zoology*. 88(3):284-294. doi: 10.1086/680079.
- Williams, TD, **Fowler, M.** (2015) Individual variation in workload during parental care: can we detect a physiological signature of quality or cost of reproduction? *Journal of Ornithology*. 1:11. doi: 10.1007/s10336-015-1213-6.
- Williams, TD; Bourgeon, S; Cornell, A; Ferguson, L; **Fowler, M,** Fronstin, RB; Love, OP. (2014) Mid-winter temperatures, not spring temperatures, predicts breeding phenology in the European starling *Sturnus vulgaris*. *Royal Society Open Science*. 2(140301)
- Crocker, DE; Champagne, CD; **Fowler, MA;** Houser, DS. (2014) Adiposity and fat metabolism in lactating and fasting northern elephant seals. *Advances in Nutrition*. 5:57-64.

- Crocker, DE; **Fowler, MA**; Champagne, CD; Vanderlugt, AL; Houser, DS. (2014) Metabolic response to a glucagon challenge varies with adiposity and life-history stage in fasting northern elephant seals. *General and Comparative Endocrinology*. 195 (99-106)
- Fowler, M**; Debier, C; Crocker, DE; Costa, DP. (2013) Fatty acid mobilization and comparison to milk fatty acid content in northern elephant seals. *Journal of Comparative Physiology Part B*. 184(1): 125-135. DOI 10.1007/s00360-013-0787-7
- Naito, Y; Costa, DP; Adachi, T; Robinson, PW; **Fowler, M**; Takahashi, A (2013) Foraging adaptation in deep water by adult female northern elephant seals. *Functional Ecology*. doi: 10.1111/1365-2435.12083
- Champagne, CD; Boaz, SM; **Fowler, MA**; Houser, DS; Costa, DP; Crocker, DE. (2013) A profile of carbohydrate metabolites in the fasting northern elephant seal. *Comparative Biochemistry and Physiology, Part D* 8: 141-151.
- Champagne, CD; Houser, DS; **Fowler, MA**; Costa, DP; Crocker, DE. (2012) Gluconeogenesis is associated with high rates of tricarboxylic acid and pyruvate cycling in fasting northern elephant seals." *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology* 303: R340-R352.
- Champagne, CD; **Fowler, MA**; Houser, D; Crocker, DE. (2012) Fasting Physiology of the Pinnipeds: the challenges of fasting while maintaining high energy expenditure and nutrient delivery for lactation. Book chapter in: "The Comparative Physiology of Fasting and Starvation". pp 310-316. editor: McCue, M. Springer Publishing.
- Robinson, P.W.; Costa, D.P.; Crocker, D.; Gallo-Reynoso, J.P.; Champagne, C.; **Fowler, M.**; Goetsch, C.; Goetz, K.; Hassrick, J.L.; Huckstadt, L.A.; Kuhn, C.; Maresh, J.; Maxwell, S.M; McDonald, B.; Peterson, S.; Simmons, S.E.; Teutschel, N.M.; Villegas-Amtmann, S.; Yoda, K. (2012) Foraging behavior of female northern elephant seals. *PLoS One* 7(5): e36728.
- Debier C; Crocker D; Houser D; Vanden Berghe M; **Fowler M**; Mignolet E; de Tillesse T; Rees J-F; Thomé J-P; Larondelle Y. (2012) Impact of fasting and lactation on the concentrations of fat-soluble vitamins and pollutants in northern elephant seals: a comparative approach. *Comparative Biochemistry and Physiology, Part A*. 162 (4): 323-330. doi: [10.1016/j.cbpa.2012.04.001](https://doi.org/10.1016/j.cbpa.2012.04.001)
- Boaz, SM; Champagne, CD; **Fowler, MA**; Houser, D; Crocker, DE. (2012) Metabolomics measurement of fasting serum water-soluble vitamins in northern elephant seals (*Mirounga angustirostris*) *Comparative Biochemistry and Physiology, Part A*. 161:113-121.
- Hayes, SA; Teutschel, NM; Michel, CJ; Champagne, CD; Robinson, PW; **Fowler, MA**; Yack, T; Mellinger, D; Simmons, S; Costa, DP; MacFarlane; RB. (2011) Mobile receivers: Releasing the mooring to 'see' where fish go. *Environmental Biology of Fishes*. doi: 10.1007/s10641-011-9940-x.
- Caudron AK; Negro SS; **Fowler M**; Boren L; Poncin P; Robertson BC; & Gemmell NJ; (2009) Alternative mating tactics in the New Zealand fur seal *Arctocephalus forsteri*: When non-territorial males are successful too. *Australian Journal of Zoology* 57 (6):399-408.
- Fowler, M**; Houser, D; Champagne, CD; Crocker, DE; (2008) Hormonal regulation of glucose clearance in lactating northern elephant seals (*Mirounga angustirostris*). *Journal of Experimental Biology*, 211:2943-2949.
- Fowler, M.** (2006) Hormonal regulation of glucose clearance in lactating northern elephant seals (*Mirounga angustirostris*). Master of Science Thesis. Sonoma State University, Rohnert Park, California.
- Fowler, M.** (2003) Spatial distribution of male New Zealand fur seals (*Arctocephalus forsteri*) during the breeding season. Bachelor of Science Honors Thesis. Southampton College of Long Island University, Southampton, New York.

Conference proceedings:

- Williams, TD, **Fowler, M.** Individual variation in workload during parental care: can we detect a physiological signature of quality or cost of reproduction? 26th International Ornithological Congress. Tokyo, Japan. August 2014.

- Debier, C; Crocker, D; Houser, D; Vanden Berghe, M; Xhonneux, V; de Tillesse, T; Mignolet, E; **Fowler, M**; Rees, J-F; Thome, J-P; Larondelle, Y. Impact of fasting/lactation on the levels of PCBs, DDTs and fat-soluble vitamins in northern elephant seal tissues: similarities, discrepancies and recommendations for future studies. 31st International Symposium on Halogenated Persistent Organic Pollutants, Brussels, Belgium, August 2011.
- Adachi, T., Takahashi, A., **Fowler, M.**, Teutschel, N., Huckstadt, L., Costa, D., Yoda, K., and Yasuhiko Naito. Fine-scale foraging behaviour of female northern elephant seals during the entire post-breeding migration. 4th International Symposium on Biologging, Hobart, Tasmania, Australia, March 2011.
- Goetsch, C; **Fowler, M**; Teutschel, NM; Simmons, SE; Crocker, DE; Costa, DP. When is El Niño too hot to handle? Evidence of a tolerance threshold for a marine top predator. 4th International Symposium on Biologging, Hobart, Tasmania, Australia, March 2011.
- Naito, Y; Takahashi, A; Adachi, T; Yoda, K; **Fowler, M**; Teutschel, NM, Huckstadt, L; Costa, DP. Paradox of diverse divers into the deep depth: a new aspect of foraging behavior of northern elephant seals. 4th International Symposium on Biologging, Hobart, Tasmania, Australia, March 2011.
- Champagne, C; **Fowler, M**; Costa, DP; Crocker, DE. Environmental and handling impacts on cortisol in the northern elephant seal. American Physiological Society; Comparative Physiology conference. Denver, CO. August 2010.
- Adachi, T; Takahashi, A; **Fowler, M**; Teutschel, N; Huckstadt, L; Costa, D; Yoda, K; and Yasuhiko Naito. Fine-scale foraging behaviour of female northern elephant seals during the entire post-breeding migration. The 32nd Symposium on Polar Biology. Tachikawa, Tokyo Japan. November, 2010.
- Champagne, C; Houser, D; **Fowler, M** ; Costa, D; Crocker, D. A complete profile of carbohydrate metabolism during prolonged fasting in the northern elephant seal. Experimental Biology Conference, Anaheim, CA, April 2010.
- Champagne, C; Houser, D; **Fowler, M** ; Costa, D; Crocker, D. A complete profile of carbohydrate metabolism during prolonged fasting in the northern elephant seal. Society for Comparative and Integrative Biology Annual meeting. Seattle, WA, Jan 2010.
- Boaz, S; Champagne, C; **Fowler, M**; Houser, D; Crocker, D. Plasma water-soluble vitamin levels of fasting northern elephant seals are undetectable using metabolomics. 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada, Oct 2009.
- Harris, KR; **Fowler, M**; Maniscalco, JM; Parker, P. Interannual variation tracking of naturally marked Steller sea lions (*Eumetopias jubatus*). 15th Biennial Conference on the Biology of Marine Mammals, Greensboro, NC, December 2003.

Public talks/Presentations:

- Invited speaker, Springfield College, Springfield, MA. 'Thermal Relations in Animals'. March 2015.
- Guest speaker, Animal Physiology Course. Simon Fraser University. 'Physiological strategies for extreme life history stages in seals'. September 2014.
- Invited speaker, Kwantlen Polytechnic University, Surrey, BC. 'From Seals to Songbirds: Comparative Metabolic Physiology'. July 2014.
- Guest speaker, Endocrinology Course. Simon Fraser University. 'Endocrinology of extreme life history strategies in seals'. March 2014.
- Society for Comparative and Integrative Biology annual meeting, Austin, TX. Oral presentation: 'Individual variation in provisioning effort does not result in larger offspring at fledging'. **M. Fowler, TD. Williams.** January 2014.
- Les Ecologiste Seminar Series invited presentation, Simon Fraser University. Oral presentation: 'From Seals to Songbirds: A Story of Comparative Physiology'. October 2013.
- Society for Comparative and Integrative Biology annual meeting, San Francisco, CA. Oral

presentation: 'Insulin as a differential regulator of lipid mobilization in fasting northern elephant seals' **M. Fowler**, C. Debier, CD Champagne, DE Crocker, DP Costa. January 2013. Experimental Biology, San Diego, CA. Poster presentation: 'Lipid mobilization and milk production in lactating northern elephant seals' **M. Fowler**, D. Costa, C. Debier, DE Crocker. April 2012. University of California Santa Cruz Dept of Ecology and Evolutionary Biology Graduate Student Symposium 'What do seals do with all that blubber? Regulation of lipid metabolism in northern elephant seals' March 2012.

Guest speaker, Animal Physiology. University of California Santa Cruz. 'Cell Signalling and Endocrinology' July 2011.

Guest speaker, Biology of marine mammals. University of California Santa Cruz. 'Osmoregulation in marine mammals' April 2010 and 2012.

Docent training lecture series, Invited speaker, Año Nuevo State Reserve, CA. 'Fasting physiology research in the northern elephant seal' March 2009, 2010.

Society for Integrative and Comparative Biology Annual meeting, Seattle, WA. Poster presentation : 'Adiposity, development and lactation impact responses to glucagon in northern elephant seals' **M. Fowler**, CD Champagne, DS Houser, DE Crocker. January 2010.

18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Quebec. Oral presentation: 'Adiposity, development and lactation impact responses to glucagon in northern elephant seals' **M. Fowler**, CD Champagne, DS Houser, DE Crocker. Oct 2009.

Sonoma State University Biology Colloquium, Oral presentation: 'Hormonal regulation of glucose clearance in lactating northern elephant seals (*Mirounga angustirostris*)' **M. Fowler**, March 2006.

16th Biennial Conference on the Biology of Marine Mammals, San Diego, California. Oral presentation: 'Hormonal regulation of glucose clearance in lactating northern elephant seals (*Mirounga angustirostris*)' **M. Fowler**, C. Champagne, D. Houser, D. Crocker, Dec 2005.

15th Biennial Conference on the Biology of Marine Mammals, Greensboro, North Carolina. Poster presentation: 'Spatial distribution of male New Zealand fur seals (*Arctocephalus forsteri*) in a breeding colony: more space allows for more variation?' **M. Fowler**, A. Caudron, LJ Boren, NJ Gemmell. December 2003.

BrainWash Seminar Series, Southampton College; Oral presentation. Spatial distribution of male New Zealand fur seals (*Arctocephalus forsteri*) during the breeding season. **M. Fowler**, April 2003.

Grants/Awards/Honors:

- University of California Santa Cruz President's Dissertation Year Fellowship 2011-2012
- Achievement Reward for Collegiate Scientists Foundation Fellowship 2011
- Friends of Long Marine Lab Student Research and Education Award 2008
- Mildred E. Mathias Graduate Student Research Award 2008
- Lerner-Gray Fund for Marine Research 2008
- STEPS Fellowship, University of California Santa Cruz 2007-2012
- Graduate Equity Fellowship, Sonoma State University 2006-2007
- John and Delores Headley Scholarship, Sonoma State University 2005-2006
- Yvette M. Fallandy Scholarship Sonoma State University 2004-2005
- Edgar and Beulah Dryden Fund Scholarship Sonoma State University 2004-2005

Other Skills:

- Proficient in R and Systat statistical analyses
- Extensive physiological assay laboratory experience (hormone, metabolite, oxidative stress, radiometric assays)
- Wilderness First Aid certified 2013
- Open water SCUBA certified

Institutional Service:

- Controlled Substances Manager and liason between Costa Lab and University of California Santa Cruz EH&S Department 2008-2012
- Institutional Animal Care and Use Committee (IACUC) member and alternate for Dan Costa; University of California Santa Cruz; 2011

Reviewer for:

- Science of the Total Environment; 2015
- Comparative Biochemistry and Physiology; 2014
- Frontiers in Aquatic Physiology; 2011-2013
- Journal of Experimental Biology; 2012
- Proceedings of the Royal Society B; 2011-2012
- Review Editorial Board of Frontiers in Aquatic Physiology; 2013-15

References:

Dr. Daniel Costa, PhD Advisor
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