

Roxanne Beltran

COMPARATIVE ECOLOGY · GLOBAL CHANGE PHYSIOLOGY

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Current Appointment

2018-Now **Post-Doctoral Researcher**, University of California Santa Cruz

Supervisors: Drs. Daniel Costa & Erika Zavaleta

2020- **Assistant Professor**, University of California Santa Cruz

Education

- 2018** **PhD, University of Alaska Fairbanks** (Biology & Wildlife)
Bridging the gap between pupping and molt phenology: behavioral & ecological drivers in Weddell seals.
- 2015** **MSc, University of Alaska Anchorage** (Biological Sciences)
An agent-based model for predicting impacts of environmental change on Weddell seals.
- 2013** **BSc, University of California Santa Cruz** (Marine Biology, Honors)
Fine-scale calibration of pinniped whisker growth using photogrammetry and stable isotopes.

Awards

- 2019** Chancellor's Postdoctoral Fellow, UC Santa Cruz
- 2017** Best Young Researcher in Ecological Modeling
- 2017** National Geographic Young Explorer
- 2017** Best Student Talk, Biologging Symposium, Germany
- 2015** Best Student Talk, Society for Marine Mammalogy, USA
- 2013** Best Student Talk, Society for Marine Mammalogy, New Zealand
- 2013** Thimann Scholarship for "showing the most promise as a future scientist"

Publications (PDFs available on website)

- IN PREP.** ME Cronin, **RS Beltran**, E Zavaleta. Policy Forum: Why field science needs harassment and assault prevention.
- IN REVIEW.** DC Alvarado, PW Robinson, NC Frasson, DP Costa, **RS Beltran**. Calibration of aerial photogrammetry to estimate elephant seal mass.
- IN REVIEW.** **RS Beltran**, GA Breed, AM Kilpatrick, T Adachi, A Takahashi, Y Naito, PW Robinson, WO Smith Jr., AL Kirkham, JM Burns. Sea ice dynamics vertically shift Antarctic food web.
- [2019]** **RS Beltran**, AL Kirkham, GA Breed, JW Testa, JM Burns. Reproductive success influences moult phenology in Weddell seals. Scientific Reports. 9,5221.
- [2019]** G Frankfurter, **RS Beltran**, M Hoard, JM Burns. Rapid prototyping and 3D printing of Antarctic seal flipper tags. The Wildlife Society Bulletin. WSB964.
- [2018]** **RS Beltran**, JM Burns, GA Breed. Review: Convergence of biannual moulting strategies across birds and mammals. Proceedings of the Royal Society of London B. 20180318.
- [2018]** Z Smeele, JM Burns, K Van Doorsaler, S Kraberger, RS Fontenele, K Waits, D Stainton, MR Shero, **RS Beltran**, AL Kirkham, G Frankfurter, R Bergartt, P Lefeurve, A Varsani. Diverse papillomaviruses identified in Weddell seals. General Virology. 99, 549-557.
- [2018]** **RS Beltran**, **B Ruscher-Hill (undergrad)**, AL Kirkham, JM Burns. An evaluation of three-dimensional photogrammetric and morphometric techniques for estimating volume and mass in Weddell seals. PLOS ONE.

9. [2017] E Fahsbender, JM Burns, S Kim, S Kraberger, G Frankfurter, A Eilers, MR Shero, **RS Beltran**, AL Kirkham, R McCorkell, R Berggatt, M Male, K Rosario, G Ballard, DG Ainley, M Breitbart, A Varsani. Diverse and highly recombinant alleloviruses associated with Weddell seals in Antarctica. Journal of Virus Evolution. 3,1-11.
10. [2017] **RS Beltran**, JW Testa, JM Burns. An agent-based model for predicting impacts of environmental change on a top marine predator, the Weddell seal. Ecological Modelling. 351, 36-50.
11. [2016] N Lubcker, R Condit, **RS Beltran**, PJN de Bruyn, MN Bester. Vibrissal growth parameters of southern elephant seals: obtaining fine-scale, time-based stable isotope data. Marine Ecology Progress Series. 559, 243-255.
12. [2016] **RS Beltran**, SH Peterson, EA McHuron, C Reichmuth, LA Huckstadt, DP Costa. Pinnipeds are what they eat, plus what? Determination of trophic discrimination factors in six seal species. Rapid Communications in Mass Spectrometry. 30, 1115–1122.
13. [2015] L Schwarz, S Villegas-Amtmann, **RS Beltran**, DP Costa, C Goetsch, LA Huckstadt, J Maresh, SH Peterson. Comparisons and uncertainty in fat and adipose tissue estimation techniques: The Northern Elephant Seal as a Case Study. PLOS ONE.
14. [2015] **RS Beltran**, MS Connolly, SH Peterson, R Condit, C Reichmuth, DP Costa. Whisker growth dynamics: a validated approach for assigning timescales to stable isotope analyses. Marine Ecology Progress Series. 523, 233-241.
15. [2014] M Connolly, **RS Beltran** and C Reichmuth. A calibration procedure for measuring pinniped vibrissae using photogrammetry. Aquatic Mammals. 40(2), 213-218.
16. [2014] **RS Beltran**, N Kreidler (undergrad), D Van Vuren, S Morrison, E Zavaleta, K Newton, B Tershy D Croll. Passive recovery of vegetation from herbivore eradication on Santa Cruz Island, California. Restoration Ecology. 22(6), 790-797. Cover photo.

Children’s Book

RS Beltran and PW Robinson. *A Seal Named Patches*, Snowy Owl Press, ISBN 1602233314.
 2018 Moonbeam Award in Environmental Issues, Silver
 2017 DeBary Children’s Science Book Award
 School Library Journal Star for Children’s Book

Book Chapter

[In Prep] **RS Beltran**, MA Hindell, CR McMahon. *Ethology of Elephant Seals. In Ethology and Behavioral Ecology of Earless or True Seals, the Phocids*. Springer.

Fellowships & Grants (total: \$417,000)

FELLOWSHIPS

\$138,000	2018-2020	NSF Post-Doctoral Research Fellowship in Biology (Diversity & Inclusion)
\$138,000	2015-2018	NSF Graduate Research Fellowship
\$35,000	2014-2015	NIH IDeA Networks of Biomedical Research Excellence Fellowship

GRANTS

\$29,794	National Geographic Changing Planet	\$1,000	Nicholas F. Hughes Memorial
\$25,000	National Geographic Wildlife	\$1,000	PADI Foundation, Marine Mammals
\$8,000	LGL Graduate Student Research	\$1,000	PADI Foundation, Outreach & Education
\$7,560	National Geographic Waitt	\$1,000	Women Divers Hall of Fame
\$5,769	Alaska INBRE	\$700	LGL Graduate Student Research

\$5,000	NSF Graduate Research Internship Program	\$700	UC Santa Cruz EEB Department
\$4,500	National Geographic Young Explorers	\$700	Society for Marine Mammalogy
\$3,000	Kenneth and Ann Thimann	\$600	College of Natural Science & Math
\$2,000	American Cetacean Society Baldrige Award	\$500	Myers Oceanographic Trust
\$1,500	SCAR AnT-ERA	\$500	Friends of Long Marine Lab
\$1,200	Erich Follmann Memorial Award	\$500	SCAR State of the Antarctic Ecosystem
\$1,200	Biomedical Learning and Student Training	\$500	Stevenson College
\$1,100	Society for Marine Mammalogy	\$500	UCSC Department of Student Affairs
\$1,100	Society for Ecological Modeling	\$200	UC Natural Reserve System

Undergraduate Mentees

Emily Nazario (2019), Leandri deKock (2019), Alex Yuen (2019), Sarah Wood (2019), Christina Langford (2019), Laura Christianson (2018), Diana Alvarado (2018, STEM Diversity Packard Fellow), Shannon Bent (2017), Kaitlyn Martinez (2016), Kelly Shrader (2016), Jeanette Pirlo (2016), Nadja DiMartino (2016), Clara Woolner (2015, NSF Research Experience for Undergraduates), Brandi Ruscher-Hill (2015)

Teaching

Lecturer	BIOE108; Marine Ecology	UC Santa Cruz
Lecturer	BIOL179; Oceanography Laboratory	U Alaska
Teaching Assistant	BIOE128L; Field Methods in Large Marine Vertebrates	UC Santa Cruz
Learning Assistant	BIOE20B; Development & Physiology of Organisms	UC Santa Cruz
Guest Lectures	U Alaska BIOLA490 Antarctic Ecology. UC Santa Cruz BIOE128L Field Methods in Large Marine Vertebrates (6x). U Alaska BIOLA170 Oceanography. UC Santa Cruz BIOE129 Marine Mammals. UC Santa Cruz BIOE200B.	

Invited Presentations

- 2019 Moss Landing Marine Labs (USA)
Physiological constraints and life history trade-offs drive marine mammal behavior
- 2019 California Academy of Sciences (USA)
Fashionable fur and feathers
- 2017 National Institute of Polar Research (Japan)
Antarctica, as viewed by instrumented seals
- 2017 Seymour Marine Discovery Center Science Sunday (USA)
What Weddell seals taught us about life at the bottom of the world
- 2017 International Society for Ecological Modeling (South Korea)
Individual-based modeling of a top polar predator
- 2016 Harvard University, PRISE Distinguished Speaker (USA)
Predicting impacts of climate change on polar marine mammals
- 2016 International Statistical Ecology Conference (USA)
A simulation model for quantifying the resilience of a polar predator

Contributed Presentations

- 2019 Society for Marine Mammalogy (Spain)
Variation, selection, and heritability of foraging strategies and their influence on lifetime reproductive success in northern elephant seals
- 2018 POLAR SCAR/Arctic Summit Conference (Switzerland)
Molt phenology mediates colony attendance in Weddell seals

- 2017 Biologging Symposium (Germany)
Reconstructing the year-round foraging behavior of Weddell seals
- 2017 Society for Marine Mammalogy Conference (Canada)
Weddell seal dives suggest a vertical ecosystem shift concurrent with seasonal phytoplankton blooms
- 2017 SCAR Biology Conference (Belgium)
Reproductive effort affects the annual dive behavior of adult, female Weddell seals
- 2016 Biomedical Research Conference (USA)
Ecophysiology in a top polar predator
- 2015 Society for Marine Mammalogy Conference (USA)
Agent-based models predict responses of top predators to environmental change
- 2015 Animal Behavior Conference (USA)
Diving deeper into the over-summer foraging behavior of a top polar predator
- 2015 Ecological Society of America (USA)
An agent-based model for predicting resilience to global change
- 2014 Biologging Symposium (France)
Using simple biologging metrics to inform dynamic bioenergetics models
- 2014 SCAR Open Science Conference (New Zealand)
A generalized bioenergetic model for pinnipeds
- 2013 Society for Marine Mammalogy Conference
Whisker growth dynamics: a validated approach for assigning timescales to stable isotope analyses
- 2013 UCSC Undergraduate Research Symposium (USA)
Body size impacts on hierarchical dominance in male northern elephant seals
- 2013 Monterey Bay National Marine Sanctuary Symposium (USA)
A calibration procedure for pinniped whisker length estimation using photogrammetry
- 2012 Seymour Center Continuing Education Workshop (USA)
Everything you always wanted to know about sex in the sea

Science Communication

- Training**
- SEPAL Scientific Teaching for Diverse Learners Workshop (1 day)
 - National Geographic Science-telling Bootcamp (5 days)
 - Alan Alda Workshop for Communicating Science (3 days)
 - Seymour Center Docent Training (11 days)
- K-12**
- Co-Founder of Alaska K-12 Classroom Visits (4,000 students)
 - Panelist for Tech Museum Youth Climate Action Summit (500 students)
 - Co-Founder of California K-12 Classroom Visits with Virtual Reality (300 students)
 - Young Scientists Club K-6 Visit (100 students)
 - Ambassador for “Kids2College” (100 students)
 - Visitor for “Skype a Scientist” (50 students)
 - Visitor for “WhaleTimes” Skype (30 students)
 - Participant in “Letters to a Pre-Scientist” for underprivileged students (3 students)
- Public**
- Live PolarTREC Webinar from Antarctica (4,000 viewers)
 - University of Alaska STEM Expo (1,000 visitors)
 - “Sealebration” Año Nuevo State Park Outreach Event (600 visitors)
 - CA State Parks Live Periscope Interview (600 viewers)
 - Animal Behavior Society Outreach Fair (200 visitors)
 - Seymour Center Fish Fins and Flukes festival (175 visitors)
 - Presentation at Alaska Department of Fish and Game (100 people)

Presentation at Opportunities for Lifelong Education Alaska (75 people)
 Host, "Seal Count" public outreach event (10 people)
 Santa Cruz Public Library Citizen Science event
 Contributor to PolarTREC Lessons, Journals, and Blog
 Contributor to National Geographic Open Explorer Blog
 Contributor to State Park PORTS (Parks Online Resources for Teachers) Program Outreach

Media

Video BBC film "Supergiant Animals"; KTVF 11 Fairbanks TV
Radio KQSD 90.7 "Santa Cruz Naturalist" Podcast; Wild Lens "Eyes On Conservation" Podcast; KFBX AM 970; KIAK 102.5FM
Print Interior Alaska News Miner (2x); UCSC News Center (2x); UC Natural Reserve System News

Service

Permit Author National Marine Fisheries Service Marine Mammal Permit (Costa, #23188)
 Institutional Review Board for Human Subjects Research (Zavaleta, #HS3230)

Grant Reviewer National Geographic Explorer Advisory Panel
 National Geographic Grants Program
 North Pacific Research Board

Journal Reviewer Nature Scientific Reports
 Marine Ecology Progress Series
 Deep Sea Research Pt II
 Endangered Species Research
 Mammalian Biology
 Marine Mammal Science
 Rapid Communications in Mass Spectrometry
 Ibis
 Ecosphere

Leadership Association of Polar Early Career Scientists Council (3 years)

Facilitator Workshop on Sexual Harassment and Assault in the Field (60 participants)