

SELENE FREGOSI

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sfregosi.github.io

EDUCATION

Oregon State University Corvallis, OR
PhD Wildlife Science June 2020
Applications of slow-moving autonomous platforms for passive acoustic monitoring and density estimation of marine mammals

MSc Wildlife Science June 2015
Development and evaluation of an animal-borne active acoustic tag to conduct minimally invasive behavioral response studies on marine mammals

University of San Diego San Diego, CA
BA Marine Science – Biology Concentration, *magna cum laude* May 2009

PROFESSIONAL POSITIONS

Contractor with Ocean Associates, Inc. *in support of*
Cetacean Research Program, NOAA Pacific Islands Fisheries Science Center
Cetacean Acoustician Honolulu, HI
Supervisor: Matt Morris November 2020 – present

Southall Environmental Associates, Inc.
Associate Scientist Aptos, CA
Supervisor: Dr. Brandon Southall 2011-present

Cooperative Institute for Marine Resources Studies
Oregon State University and NOAA Pacific Marine Environmental Laboratory
Postdoctoral Researcher Newport, OR
Supervisor: Dr. David Mellinger July-November 2020

Cooperative Institute for Marine Resources Studies
Oregon State University and NOAA Pacific Marine Environmental Laboratory
and Department of Fisheries and Wildlife
Graduate Research Fellow/Assistant (PhD) Newport, OR
Supervisors: Drs. Holger Klinck and David K. Mellinger October 2014 – June 2020

Graduate Research Fellow/Assistant (MSc) Newport, OR
Supervisors: Drs. Holger Klinck and Markus Horning April 2013 – June 2015

Research Assistant Newport, OR
Supervisor: Dr. Holger Klinck November 2012 – April 2013

Duckworth Lab, University of Arizona
Wildlife Biologist/Lead Missoula, MT
Supervisor: Dr. Renee Duckworth May – Oct 2012; May – Aug 2011

Pinniped Cognition and Sensory Systems Lab, University of California, Santa Cruz
Research assistant Santa Cruz, CA
Supervisor: Dr. Colleen Reichmuth Nov 2011 – Apr 2012; Oct 2010 – Mar 2011

GLIDER PILOTING AND SHIP TIME

Total piloting time to date: 13 months; total ship time to date: 15 weeks

Cooperative Institute for Marine Resources Studies Oregon State University and NOAA Pacific Marine Environmental Laboratory and Department of Fisheries and Wildlife

AUV piloting: Mar 2014, SG158 – Oregon; Oct 2014, SG607 – Oregon; Apr 2015, SG607 & Q003 – Washington; May 2015, SG607 & SG608 – Oregon; Jun-Jul 2015, SG608 – Gulf of Mexico; Dec 2015 – Jan 2016, SG158, Q001 & Q002 – Southern California; Jul-Aug 2016, SG607 & Q003 – Southern California; May 2017, SG607 & SG639 – Oregon; Jun-Jul 2017, SG607 – Gulf of Mexico; May-Jun 2018, SG639 – Gulf of Mexico; Feb-Mar 2020 – Southern California.

Ship time: 20-23 December 2015 and 4-6 January 2016, U.S. Navy RSC-4, Point Loma, CA – Glider and float deployment and recovery; 18 July – 3 August 2016, *M/V Horizon* San Diego, CA, *M/V Vibrio*, Two Harbors, CA – Glider, float, moored hydrophone, and buoy deployment, daily repositioning, and recovery; day trips 2013-2018, Newport, OR – glider deployments

Southall Environmental Associates, Inc.

Ship time: 2-3 weeks/yr 2012-2017, *M/V Truth*, Santa Barbara, CA, *M/V Magician*, San Pedro, CA, *R/V Ziphid* and *Musculus* (RHIBs) – tagging, focal follow, photo id, passive/active acoustics

PUBLICATIONS

*indicates undergraduate mentee

8. Barlow, J, **Fregosi, S**, Thomas, L, Harris, D, Griffiths, ET. (2021). Acoustic detection range and population density of Cuvier's beaked whales estimated from near-surface hydrophones. *Journal of the Acoustical Society of America*, 149(1): 111-125. doi:10.1121/10.0002881
7. **Fregosi, S**, Harris, DV, Matsumoto, H, Mellinger, DK, Barlow, J, Baumann-Pickering, S, & Klinck, H. (2020). Detections of whale vocalizations by simultaneously deployed bottom-moored and deep-water mobile autonomous hydrophones. *Frontiers in Marine Science*, 7: 721. doi:10.3389/fmars.2020.00721.
6. **Fregosi, S**, Harris, DV, Matsumoto, H, Mellinger, DK, Negretti*, C, Moretti, DJ, Martin, SW, Matsuyama, B, Dugan, P, Klinck, H. (2020). Comparable detections of fin whale 20 Hz calls by mobile and stationary autonomous recorders. *Journal of the Acoustical Society of America*, 147(2): 961-977. doi:10.1121/10.0000617.
5. Southall, BL, DeRuiter, S, Friedlaender, AS, Stimpert, AK, Goldbogen, J, Hazen, E, Casey, C, **Fregosi, S**, Cade, D, Allen, A, Harris, C, Falcone, E, Schorr, G, Moretti, DJ, Gailey, G, Guan, S, Calambokidis, J. (2019). Behavioral responses of individual blue whales (*Balaenoptera musculus*) to mid-frequency military sonar. *Journal of Experimental Biology*, 222(5): jeb190637. doi:10.1242/jeb.190637
4. Niekirk, SL, **Fregosi, S**, Mellinger, DK, & Klinck, H. (2016). A complex baleen whale call recorded in the Marianas Trench Marine National Monument. *Journal of the Acoustical Society of America*, 140(3): EL1-6. doi:10.1121/1.4962377.
3. **Fregosi, S**, Klinck, H, Horning, M, Mellinger, DK, Costa, DP, Mann, DA, Sexton, K, Hückstädt, L & Southall, BL. (2016). An animal-borne active acoustic tag for minimally invasive behavioral response studies on marine mammals. *Animal Biotelemetry*, 4: 9. doi:10.1186/s40317-016-0101-z.
2. Klinck, H, **Fregosi, S**, Matsumoto, H, Turpin, A, Mellinger, DK, Erofeev, A, Barth, JA, Shearman, RK, Jafarmadar, K, & Stelzer, R. (2016). Mobile autonomous platforms for passive-acoustic monitoring of high-frequency cetaceans. In A. Friebe and F. Haug (Eds.), *Robotic Sailing 2015*, Springer International Publishing, pp. 29–37. doi:10.1007/978-3-319-23335-2_3

1. Matsumoto, H, Haxel, J, Turpin, A, **Fregosi, S**, Klinck, H, Klinck, K, Baumann-Pickering, S, Erofeev, A, Barth, JA, Dziak, RP, & Jones, C. (2015). Simultaneous operation of mobile acoustic recording systems off the Washington Coast for cetacean studies: System noise level evaluations, *Oceans 2015 MTS/IEEE*, 19-22 October, 2015, Washington, D.C.

In Revision or Review

- Harris, DV, **Fregosi, S**, Klinck, H, Mellinger, DK, Thomas, L. (In Revision). Assessing the effect of ocean glider movement on distance sampling assumptions. *Remote Sensing in Ecology and Conservation*.

In Prep

- Fregosi, S**, Harris, DV, Matsumoto, H, Mellinger, DK, Martin, SW, Matsuyama, BM, Barlow, J, & Klinck, H. (In Prep). Detection probability and density estimation of fin whales by a Seaglider.

PEER-REVIEWED REPORTS

8. **Fregosi, S**, Mellinger DK, & Ampela, K. (2020) Passive acoustic monitoring of large whales on and off the continental shelf of Southern California using autonomous underwater vehicles. Draft Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, San Diego, CA. Submitted to Naval Facilities Engineering Command Pacific (NAVFAC PAC), Pearl Harbor, HI under Contract No. N6247015D8006, Task Order 18F0147, issued to HDR Inc., San Diego, CA. November 2020.
7. Mellinger, DK & **Fregosi, S**. (2019). Assessment of ocean ambient sound levels in the northern Gulf of Mexico, May – June 2018. Preliminary Report. Prepared for the Bureau of Ocean Energy Management (BOEM), United States Department of the Interior under Contract No. M17PC00001, Task Order M17PD00011, issued to HDR Inc., Vienna, VA, USA. Prepared by Oregon State University, Newport, OR, USA. February 2019.
6. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2016). *Cetacean Studies on the Kona Coast in March 2010: Passive Acoustic Monitoring of Marine Mammals Using Gliders – Results from an Engineering Test*. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB25, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. April 2016. 36 pages.
5. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2016). *Cetacean Studies in the Gulf of Alaska Temporary Maritime Activities Area in July-August 2015: Passive Acoustic Monitoring of Marine Mammals Using Gliders*. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB25, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. March 2016. 44 pages.
4. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2016). *Cetacean Studies on the Mariana Islands Range Complex in March-April 2015: Passive Acoustic Monitoring of Marine Mammals Using Gliders*. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB25, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. March 2016. 52 pages.
3. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2015). *Cetacean Studies on the Quinault Range Site in June 2012: Passive Acoustic Monitoring of*

Marine Mammals Using Gliders – Results from an Engineering Test. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB25, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. November 2015. 33 pages.

2. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2015). *Cetacean Studies in the Hawaii Range Complex in December 2014–January 2015: Passive Acoustic Monitoring of Marine Mammals Using Gliders*. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB23, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. October 2015. 58 pages.
1. Klinck, H, Nieukirk, SL, **Fregosi, S**, Klinck, K, Mellinger, DK, Lastuka, S, Shilling, GB, & Luby, JC. (2015). *Cetacean Studies on the Mariana Islands Range Complex in September-November 2014: Passive Acoustic Monitoring of Marine Mammals Using Gliders*. Final Report. Prepared for Commander, U.S. Pacific Fleet, Environmental Readiness Division, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command (NAVFAC) Pacific, Pearl Harbor, HI under Contract No. N62470-10-D-3011, Task Order KB25, issued to HDR Inc., Honolulu, HI. Prepared by Oregon State University, Newport, OR, and the Applied Physics Laboratory of the University of Washington, Seattle, WA. August 2015. 50 pages

SELECTED CONFERENCE PRESENTATIONS

- Fregosi, S**, Harris, DV, Matsumoto, H, Mellinger, DK, Martin, SW, Matsuyama, BM, Barlow, J, & Klinck, H. (2020). Detection probability and density estimation of fin whales by a Seaglider. 179th Meeting of the Acoustical Society of America, Virtual, 7-11 Dec 2020. (Oral presentation)
- Fregosi, S**, Harris, D, Mellinger DK, Barlow, J, Thomas, L, Klinck, H. (2018). Detection probability of Cuvier's beaked whale clicks from a glider and a deep-water float. 174th Meeting of the Acoustical Society of America, Victoria, BC, Canada, 4-10 Nov 2018. (*Invited speaker*)
- Fregosi, S**, Klinck, H., Matsumoto, H, Turpin, A, Martin, SW, Matsuyama, BM, Helble, TA, Henderson, EE, Moretti, DJ, Morrissey, RP, and Mellinger, DK. (2016). Simultaneous recordings of marine mammal calls by a glider, float, and cabled hydrophone array. 172nd meeting of the Acoustical Society of America, Honolulu, HI, USA 28 Nov – 3 Dec 2016. (Oral presentation)
- Fregosi, S**, Klinck, H, Horning, M, Mellinger, DK, Costa, DP, Mann, DA, Sexton, K, Hückstädt, L & Southall, BL. (2015). Turn down for what: Animal-borne controlled exposure as an innovative tool for dive manipulation in free-ranging marine mammals. 21st Biennial Conference on the Biology of Marine Mammals, San Francisco, CA, USA, 12-18 December 2015. (Oral presentation)
- Fregosi, S**, Klinck, H, Matsumoto, H, Turpin, A, Mellinger, DK, & Baumann-Pickering, S. (2015). Field comparison of PAM capabilities between a commercially available glider, a float, and a bottom-moored system. The 7th International Detection, Classification, Localization, and Density Estimation Workshop, La Jolla, CA, USA, 13-16 July 2015. (Oral presentation)
- Fregosi, S**, Klinck, H, Horning, M, Mellinger, DK, Costa, DP, Mann, DA, Sexton, K, Hückstädt, L & Southall, BL. (2014). Integration of an active acoustic playback system with an animal-borne sensor suite for behavioral response studies. 5th International Bio-logging Science Symposium, Strasbourg, France, 22 - 27 September 2014. (Poster presentation)
- Fregosi, S**, Klinck, H, Horning, M, Mellinger, DK, Costa, DP, Mann, DA, Sexton, K, & Hückstädt, L. (2013). Use of an animal-borne active acoustic tag to conduct minimally-invasive behavioral

response studies. 166th Meeting of the Acoustical Society of America, San Francisco, USA, 2-6 December 2013. (Oral presentation)

Fregosi, S., Klinck, H, Mellinger, DK, Bogue, NM, & Luby, JC. (2013). Acoustic observations of mid-frequency cetaceans in the eastern North Pacific using a glide. Sixth International Workshop on Detection, Classification, Localization, and Density Estimation of Marine Mammals using Passive Acoustics, 12-15 June 2013, St. Andrews, Scotland. (Poster presentation)

FELLOWSHIPS AND GRANTS

Total funding to date: \$460k

2019	Autonomous Underwater Vehicle Passive Acoustic Monitoring of Beaked Whales in the Southern California Area, NAVFAC HDR Contract (\$260k)
2018	Oregon Lottery Graduate Scholarship, OSU (\$2000)
2017	Mamie L. Markham Research Award, HMSC (\$8000)
2014	National Defense Science and Engineering Graduate Fellowship, American Society for Engineering Education & Office of Naval Research, 3 years (\$142k) Dr. Nancy Foster Scholarship, NOAA, declined
2013	Provost Distinguished Graduate Fellowship, OSU (\$36k) Markham First Year Award, Hatfield Marine Science Center (HMSC) (\$6000) Laurel's Block Grant Tuition Scholarship, OSU (\$6800)

AWARDS AND HONORS

2019	Briggs Scholarship in Biogeography, OSU (\$1000)
2018	Bob Moch Memorial Endowment Service Award, Hatfield Student Organization Robert Anthony Graduate Scholarship in Population Ecology, OSU (\$2000) Graduate Student Travel Award, OSU (\$1000) Student Travel Subsidy, Acoustical Society of America (\$200)
2018	GoMRI Scholar, Gulf of Mexico Research Initiative
2017	Thomas G. Scott Grant Scholarship, outstanding PhD student, OSU (\$2000) Lillian Brucefield Reynolds Scholarship Fund Award, HMSC (\$1000) Hatfield Student Organization Travel Award, HMSC (\$400)
2016	Chairman's Leadership Award, OSU Department of Fisheries and Wildlife Student Travel Subsidy, Acoustical Society of America (\$175) Mastin Student Travel Award, OSU, Dec 2016 (\$1000) Hatfield Student Organization Travel Award, HMSC, OSU, Dec 2015 (\$250)
2015	Student Travel Support, DCLDE Workshop (\$1200)
2014	Student Travel Support, 5 th Biologging Science Symposium (\$1400) Mastin Student Travel Award, OSU (\$2000) Hatfield Student Organization Travel Award, HMSC, OSU (\$250)
2013	Student Travel Award, DCLDE Workshop (\$1200) Student Travel Award, Acoustical Society of America (\$120)
Pre-2012	Trustee Scholarship, USD (\$48,000) Valedictorian, St. Patrick- St. Vincent High School

SELECTED PUBLIC TALKS

Fregosi, S. (2018). The How and Why of Using Underwater Gliders to Listen for Whales, Oregon Chapter of the American Cetacean Society, Newport Public Library, Newport, OR, USA 10 February 2018.

Fregosi, S., Nelson, D, & Diogou, N. (2015). #SciComm: The Social Media – Science Connection. Monday Tech Talk, HMSC, Newport, OR, USA 2 February 2015.

Fregosi, S & Diogou, N. (2014). Do you speak whale? Oregon Chapter of the American Cetacean Society, Newport Public Library, Newport, OR, USA 13 December 2014.

Reichmuth, C, Southall, BL, Casey, C, & **Fregosi, S.** (2012). Bioacoustics of northern elephant seals. Año Nuevo State Park Docent Seminar, Año Nuevo, CA, USA, January 2012.

MEDIA COVERAGE

Acoustical Society of America (ASA). "Bioacousticians test passive acoustic monitoring to capture sounds of marine life." ScienceDaily. ScienceDaily, 1 December 2016.
www.sciencedaily.com/releases/2016/12/161201094452.htm

Oregon State University. "New, complex call recorded in Mariana Trench believed to be from baleen whale. News and Research Communication, Oregon State University 14 December 2016. <http://oregonstate.edu/ua/ncs/archives/2016/dec/new-complex-call-recorded-mariana-trench-believed-be-baleen-whale>

TEACHING/MENTORING EXPERIENCE

Instructor, FW302 Biology and Conservation of Marine Mammals, OSU, Spring 2020
Instructor, FW317 Mammalogy, OSU, Fall 2019
Guest Lecturer, FEW-875 Bioacoustics, University of Wisconsin, Madison Fall 2019
Guest lecturer, BI373-Biology and Conservation of Marine Mammals, OSU Summer 2013-2017
Teaching Assistant, ENVI210 Intro to Earth Systems, University of San Diego, Fall 2007 – 2008

January 2016 – 2019: Research mentor, OSU FW Undergraduate Mentorship Program
Christina Negretti, September 2017 – June 2019
Derek Garcia, September 2017 – June 2019
Chris Lundeberg, September 2016 – June 2017
Laura McCourt, September 2016 – June 2017
Liz Marquez, January – June 2016

January 2017 – June 2017: Research mentor, FW401, Ciera Edison
June-August 2013: Intern Supervisor, OSU/NOAA CIMRS, Carlissa Salant

DIVERSITY, EQUITY, AND INCLUSION

I am committed to promoting and enhancing diversity, equity, and inclusion (DEI) in the sciences.

White Allyship DEI Training (NOAA, Summer 2020)
Unconscious Bias DEI Training (NOAA, Summer 2020)
Practical Ways to be an Ally DEI Training (NOAA, Summer 2020)
Girls in Engineering and Marine Science, instructor (Oregon Coast STEM Hub, 2016 – 2018)
Designing our World, training and engineering role-model (Oregon Coast STEM Hub, 2016 – 2017)

SERVICE AND OUTREACH

Hatfield Student Organization, Treasurer (2017 – 2018)
Hatfield Student Organization, Community Outreach Coordinator (2014 – 2017)
Fisheries and Wildlife Graduate Student Organization, Communication's Officer (2014 – 2017)

Careers in Science Investigation, instructor (2017, 2018, 2020)
Wild About Wildlife Summer Camp, OSU, planning committee (2017 – 2018)
Discovering the Scientists Within, instructor (2017 – 2018)
Hatfield Marine Science Center, Marine Science Day, scientist volunteer (2013 – 2017)
Oregon Coast Renewable Energy Challenge, judge (2016 – 2017)
Girls in Engineering and Marine Science, mentor (2016)

SeaGlide Educator Workshop, instructor (2015 – 2016)
Winter Wonderings (science camp), instructor (2014)
Newport Science Fair, mentor (2013)

SPECIAL COURSES

- 11-24 Aug 2017: PhD Summer Course in Acoustic Communication, SNAK, University of Southern Denmark, Odense, DK: Advanced theoretical and practical course covering topics of terrestrial and marine animal acoustic communication.
- 31 Oct/7 Nov 2016: Designing Our World Training, Newport, OR.
Kick-off workshop for NSF program to engage young girls in engineering and science.
- 23-27 June 2014: Seaglider Pilot Training, Kongsberg UTI, Lynnwood, WA.
Intensive hands-on training course for piloting Kongsberg Seagliders.
- 16-20 June 2014: SeaBASS (BioAcoustics Summer School), National Conference Center
One-week foundational graduate course on marine animal biology and acoustics.
- January-March 2013: Introduction to Animal Bioacoustics, OSU
Graduate special topics course covering range of bioacoustics topics including sound recording and analysis, source-medium receiver theory, animal behavior and acoustic communication
- 12-24 August 2012: Methods in Marine Bioacoustics, Duke University Marine Laboratory
Two-week course on basics of active and passive marine bioacoustics methodology including theory and hands on equipment and software training

SKILLS/CERTIFICATIONS

Experienced MATLAB and R programmer
Acoustic analysis of low and high-frequency data, using various software and automated detection (Osprey, Ishmael, Raven, Triton, Pamguard, Adobe Audition)
Spatial analyses in ArcGIS and Matlab
Pilot for underwater AUV's including Seaglider and APEX float
American Boating Certification; experience with small boat driving, maintenance, and towing (including open ocean research activities)
Physiological sample collection for avian and pinniped species including blood collection
Captive marine mammal husbandry, behavioral observation, and health assessment

PROFESSIONAL MEMBERSHIP

Acoustical Society of America, Animal Bioacoustics Technical Committee
Society of Marine Mammalogy
Marine Technology Society

JOURNAL REVIEWER

Scientific Reports
Marine Ecology Progress Series
Animal Biotelemetry