

Daniel Sergio Swezey

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RESEARCH INTERESTS

Shellfish and seaweed aquaculture, marine aquaculture technology, ocean acidification, climate adaptation, conservation aquaculture, aquaculture policy.

EDUCATION

Ph.D. Population Biology: 2015

University of California, Davis (UCD)

Ocean Acidification on the California Coast: Responses of Marine Bryozoa to a High CO₂ future.

Committee: Eric Sanford (Chair), Jay Stachowicz, Brian Gaylord and Rick Grosberg.

B.A. Biology (High Honors): 2006

College of Creative Studies, University of California, Santa Barbara (UCSB)

Languages Spoken and Written: English and Spanish

RECENT POSITIONS AND APPOINTMENTS

2020-Present, Assistant Project Scientist II, Bodega Marine Laboratory

2016-2019, Research Associate, Bodega Marine Laboratory

2015-2021, Lead Scientist, The Cultured Abalone Farm LLC. (TCAF)

2014-2015, Graduate Student Researcher VII, Bodega Marine Laboratory

2011-2013, NSF Graduate Research Fellow, UCD

2008-2010, NSF REACH IGERT Trainee, UCD

2007-2008, Research Assistant/Diver, Monterey Bay Aquarium Research Institute (MBARI)

2006 Mennon-Watson Fellow, UCSB

FELLOWSHIPS AND AWARDS

2019 Travel award from the International Atomic Energy Agency (IAEA), Ocean Acidification International Coordination Centre (OA-ICC) and Xiamen University (\$5,000)

2015 Bodega Marine Laboratory Graduate Fellowship. (\$7,500)

2014 Bodega Marine Laboratory Graduate Fellowship. (\$7,500)

2014 Best Poster (Honorable Mention) Western Society of Naturalists, Tacoma, WA.

2011-2013 NSF Graduate Research Fellowship. (\$120,000)

2010 NSF REACH IGERT International Travel Award. (\$7,500)

2008-2010 NSF REACH IGERT Traineeship. (\$80,000)

2007 NSF International Travel Award. (\$2,500).

2006 Best Talk (Honorable Mention) Benthic Ecology Conference, Quebec City, Canada.

PEER-REVIEWED PUBLICATIONS

Tjeerdema, E., **Swezey, D.S.**, Loehner, M., Marshman, B., Sanford, E., Moore, J., and Aquilino, K.M. Interactive effects of ocean acidification and warming on disease virulence in the endangered white abalone (*Haliotis sorenseni*). In prep for *Global Change Biology*.¹

Boles, S.E., **Swezey, D.S.**, Aquilino, K.M., Stott, H.K., Catton, C.A., Hill, T.M., Rogers-Bennett, L., Bush, D., Sanford, E., and Whitehead, A. Ocean acidification and settlement diet differentially affect populations of red abalone (*Haliotis rufescens*). In prep for *The Journal of Experimental Biology*.

Swezey, D.S., Boles, S.E., Aquilino, K.M., Stott, H.K., Bush, D., Whitehead, A., Rogers-Bennett, L., Hill, T.M. and Sanford, E. (2020). Evolved differences in energy metabolism and growth dictate the impacts of ocean acidification on abalone aquaculture. *Proceedings of the National Academy of Sciences of the USA*, 117(42), 26513-26519.²

Swezey, D.S., Bean, J.R., Ninokawa, A.T., Hill, T.M., Gaylord, B. and Sanford, E. (2017). Interactive effects of temperature, food and skeletal mineralogy mediate biological responses to ocean acidification in a widely distributed bryozoan. *Proceedings of the Royal Society B: Biological Sciences* 284.³

Swezey, D.S., Bean, J.R., Hill, T.M., Gaylord, B., Ninokawa, A.T. and Sanford, E. (2017). Plastic responses of bryozoans to ocean acidification. *The Journal of Experimental Biology*. doi: 10.1242/jeb.163436

Wetzel, W., Lacher, I., **Swezey, D.S.**, Moffitt, S., and Manning, D. (2012). Analysis reveals potential rangeland impacts if Williamson Act eliminated. *California Agriculture* 66(4), 131-136. **Feature Cover Article. *Authorship order randomly selected; all authors contributed equally.**⁴

Sanford, E. and **D.S. Swezey**. (2008). Response of predatory snails to a novel prey following the geographic range expansion of an intertidal barnacle. *Journal of Experimental Marine Biology and Ecology* 354: 220–230.

MEDIA COVERAGE OF MY RESEARCH

(1) "Will climate change ruin the white abalone's last chance at survival?" *The Washington Post*.

Link: <https://www.washingtonpost.com/sf/brand-connect/ucdavis/will-climate-change-ruin-the-white-abalones-last-chance-at-survival/>

(2) "Dying Oceans: Abalone Restoration in California" feature documentary as part of "Earth Focus," Southern California PBS. Link: <https://www.pbs.org/video/dying-oceans-abalone-restoration-in-california-hgc0yd/>

(2) "Abalone diving is banned, and work goes on to restore the giant sea snail on California's coast," Front Page Article, *San Francisco Chronicle*. Link: <https://www.sfchronicle.com/local/environment/article/Abalone-diving-is-banned-and-work-goes-on-to-16104928.php>

(3) "Ocean Acidity Causing Problems In Kelp Forests" as part of "The Jefferson Exchange" Oregon Public Radio. Link: <https://www.ijpr.org/show/the-jefferson-exchange/2017-04-24/ocean-acidity-causing-problems-in-kelp-forests>

(3) "UC Davis study: North Coast water changes affecting marine life," Front Page Article, *The Santa Rosa Press Democrat*. Link: <https://www.pressdemocrat.com/article/news/uc-davis-study-north-coast-water-changes-affecting-marine-life/?ref=related>

(4) "Rangeland at Risk" as part of *KQED Forum*, Bay Area Public Radio. Link: <https://www.kqed.org/forum/201210300930/rangeland-at-risk>

MAJOR RESEARCH FUNDING

NOAA Saltonstall-Kennedy Grant Program (Science or Technology that Promotes Sustainable U.S. Seafood Production and Harvesting) (\$299,998) “*Developing Domestic Formulated Feeds and Sea Cucumber Polyculture Integration in California Abalone Aquaculture.*” 2022-2024. Lead PI with co-investigators Dr. Luke Gardner (MLML), Dr. Christopher Simmons (UCD), Dr. Kristin Aquilino (UCD), Doug Bush (TCAF), Severino Gomes (KBPI), Nina Hapner (KBPI), Abby Gomes (KBPI) and Fred Carr (KBPI) (Kashia Band of Pomo Indians of the Stewarts Point Rancheria). (*In review*)

National Science Foundation (OCE Collaborative Research) (\$1,131,023 total award, \$284,007 to UCD) “*The effects of marine heatwaves on reproduction, larval transport and recruitment in sea urchin metapopulations.*” 2021-2023. Co-investigator with PI’s Drs. Dan Okamoto (FSU), Laura Rogers-Bennett (UCD), Jonathan Dennis (FSU), Rachel Simons (UCSB) and Stephen Schroeter (UCSB).

California Sea Grant (Sustainable Fisheries and Aquaculture) (\$79,998) “*Vegetative Propagation of California Pyropia Species to Optimize Commercial Production.*” 2020-2022. Lead PI. (UCD)

California Sea Grant (Sustainable Fisheries and Aquaculture) (\$99,942) “*Using Transgenerational Plasticity as an Adaptation Measure for Ocean Acidification impacts to Abalone Aquaculture.*” 2020-2022. Co-investigator with PI’s Isabelle Neylan and Jay Stachowicz. (UCD)

Ocean Protection Council Proposition 84 Competitive Grants Program (Ocean Acidification and Hypoxia) (\$249,987) “*Assessing the Combined Effects of Ocean Acidification and Warming on Disease Susceptibility and Restoration Success of the Critically Endangered White Abalone.*” 2019-2021. Co-PI with Drs. Kristin Aquilino, Jim Moore and Eric Sanford. (UCD)

NOAA Saltonstall-Kennedy Grant Program (Marine Aquaculture) (\$299,745) “*Adapting Red Abalone Aquaculture for a Changing Ocean*” 2017-2019. Co-PI with Drs. Kristin Aquilino, Tessa Hill, Eric Sanford, Brian Gaylord and Andrew Whitehead. (UCD)

NOAA Small Business Innovation Research (Improving Seed Production for Marine Shellfish Aquaculture in the United States) (\$399,987) “*Developing Resilience to Ocean Acidification in Red Abalone Aquaculture, Phase 2.*” 2016-2018. Lead PI with co-investigators Drs. Kristin Aquilino, Tessa Hill, Eric Sanford, Brian Gaylord and Andrew Whitehead. (TCAF)

NOAA Small Business Innovation Research (Improving Seed Production for Marine Shellfish Aquaculture in the United States) (\$94,647) “*Developing Resilience to Ocean Acidification in Red Abalone Aquaculture, Phase 1.*” 2015. Lead PI (TCAF)

2014 California Sea Grant (Climate – Ocean Acidification) (\$81,855) “*Interactive Effects of Acidification and Hypoxia and Adaptive Potential in Red Abalone.*” 2014-2015. Co-investigator with PIs Drs. Andrew Whitehead, Laura Rogers-Bennett and Eric Sanford. (UCD)

INVITED TALKS

West Coast Abalone Conservation Workshop. Virtual. “*Developing resilience to ocean acidification in red abalone aquaculture.*” October 15, 2020.

California Polytechnic University. San Luis Obispo, CA. “*Developing resilience to ocean acidification in abalone aquaculture.*” March 6, 2020.

California Polytechnic University. San Luis Obispo, CA. “*Prospects for California halibut aquaculture.*” March 5, 2020.

World Congress of Malacology. Pacific Grove, CA. “*Developing resilience to ocean acidification in abalone aquaculture.*” August 16, 2019.

Xiamen University. Xiamen, China. “*Developing resilience to ocean acidification in red abalone aquaculture.*” April 22, 2019.

Global Ocean Acidification Observing Network. Hangzhou, China. “*Developing resilience to ocean acidification in California shellfish aquaculture.*” April 14, 2019.

Coastal and Marine Sciences Institute. Davis, CA. “*Sustainable aquaculture in a changing climate.*” December 18, 2017.

San Diego State University. San Diego, CA. “*Ocean acidification impacts to red abalone aquaculture.*” Dec 11, 2016.

National Oceanic and Atmospheric Administration. Silver Spring, Maryland. “*Developing resilience to ocean acidification in red abalone aquaculture.*” May 18, 2016.

Science Uncorked. Bodega Bay, CA “*Ocean acidification along the California coast: what it might mean for marine life and what experiments can tell us about it.*” May 26, 2015.

Sonoma State University. Rohnert Park, CA. “*Changing waters: potential adaptation strategies for ocean acidification.*” April 8, 2015.

UC Davis Ocean and Coastal Law. Bodega Bay, CA. “*Aquaculture in a changing world.*” March 15, 2015.

Kiwanis Club of Sonoma County. Sebastopol, CA. “*Ocean acidification and the Bodega Marine Laboratory.*” Aug 16, 2013.

Santa Barbara Board of Supervisors. Buellton, CA. “*Analysis reveals potential rangeland impacts if Williamson Act eliminated.*” Jan 9, 2013.

REACH IGERT Fall Symposium. Davis, CA. “*Consequences of eliminating the Williamson Act for ranching and conservation in California.*” September 14, 2010.

Scripps Institute of Oceanography. La Jolla, CA. “*Response of predatory snails to a novel prey following the geographic range expansion of an intertidal barnacle.*” February 11, 2008.

University of California, Santa Barbara. Santa Barbara, CA. “*Fueling Restoration: Arundo donax.*” August 10, 2007.

TEACHING

Courses developed

PBG 298: BML Video Project (Graduate) (2014). Co-taught with Eric Sanford.

Organized and developed graduate student seminar on scientific film making, emphasizing interviewing technique, story boarding and the presentation of scientific information and techniques for reaching general audiences. Resulted in production of the “BML Video” by UC Davis graduate students highlighting research at BML, now used in BML promotion.

Link: http://www.youtube.com/watch?v=DYI_gw72bk8

BIS 124: *Scientific Communication Through Video* (Undergraduate) (2017). Co-taught with Eric Sanford. Similar to above, but with focused lectures and activities analyzing specific documentary film, and undergraduate communication modules and discussions aimed at expanding student awareness of techniques for storytelling and science communication. Involved written assignments, oral presentations and resulted in the supervised production of student shorts focused on their summer research projects.

Link: <https://www.youtube.com/watch?v=Mae5rV3K29Q>

Teaching Assistant for

EVE 114: Experimental Invertebrate Biology (2009).

BIS 124: Coastal Marine Research (2009).

TA for courses focused on hands-on studies of the marine environment, covering the biology, ecology, and evolution of local marine invertebrates. Supervised field trips and hands-on labs with an emphasis on testing hypotheses in ecology and evolution. Guided student experiments and independent research projects covering all aspects of the research process including scientific observation, hypothesis testing, experimental design, data analysis and scientific communication.

MENTORSHIP

Postdoctoral researchers

Sam Karelitz (Florida State University). Postdoctoral researcher and co-investigator based at BML collaborating on sea urchin biological responses to marine heat waves.

Sara Boles (UC Davis). Former graduate student collaborator who completed PhD research at UCD with Dr. Andrew Whitehead. Co-investigator pursuing physiological and genetic responses of red abalone to ocean acidification. Now a continuing collaborator as a postdoctoral scholar in the UCD Aquaculture Cooperative Extension Lab.

Graduate Students

Evan Tjeerdema (Scripps Institute of Oceanography). Graduate student collaborator completing PhD research at UCSD with Dr. Amro Hamdoun. Co-investigator pursuing research on environmental triggers of white abalone disease virulence under climate change, 2018-present.

Isabelle Neylan (UC Davis). Graduate student collaborator completing PhD research at UCD with Dr. Jay Stachowicz. Co-investigator pursuing epigenetic responses of red abalone to climate change, 2019-present.

Undergraduates Mentored

Jordan Mann (SDSU) (*Pyropia* and abalone projects 2021)

Gabrielle Yang (Cal Poly Pomona) (*Pyropia* and abalone projects 2021, now pursuing PhD at UCD)

Audrey Deutsch (UCSC) (lab technician 2020-present)

Evan Tjeerdema (UCD) (lab technician 2019-2021, now pursuing PhD at UCSD)

Malina Loher (UCD) (lab technician 2019, now pursuing PhD at VIMS)

Elijah Ferrer (UCD) (white abalone disease project 2019)

Dominick Dickerson (UCD) (aquaculture/acidification project 2019, now researcher at FHL)

Emily Hubbard (UCD) (lab technician 2016-2019, now pursuing MS at Texas A&M)

Kat Magaña (UCD) (lab technician 2016-2019)
Gabriella Ayad (UCD) (aquaculture/acidification project 2018, now pursuing PhD at LSU)
Priya Shukla (UCD) (lab technician 2018, now pursuing PhD at UCD)
Tim Leung (UCD) (aquaculture/acidification project 2018, now pursuing MS at HSU)
Sebastian Garcia (UCD) (aquaculture/acidification project 2018, now pursuing MS at LBSU)
Marcela Portales (UCD) (aquaculture/acidification project 2018)
Madison Heard (CSU Monterey Bay) (aquaculture/acidification project 2018, now pursuing MS at UCSB)
Hannah Weinberger (aquaculture/acidification project 2017, now pursuing MS at Chico State)
Amanda Broffman (UCD) (lab technician 2016, now pursuing MS at Bordeaux Sciences Agro)
Haley Stott (UCD) (lab technician 2015-2017)
Aaron Ninokawa (UCD) (lab technician 2014-2015, now postdoc at FHL)
Joseph Yull (Santa Rosa JC) (bryozoan mineralogy and ocean acidification project 2014)
Duncan MacLeod (Eckerd College) (bryozoan mineralogy and ocean acidification project 2014)
Jordan Lankford (Sonoma State) (bryozoan mineralogy and ocean acidification project 2013-2014)
Daniel Stone (Santa Rosa JC) (bryozoan mineralogy and ocean acidification project 2013-2014)
Laura Heidenreich (SFSU) (bryozoan mineralogy and ocean acidification project 2013-2015)
Lian Rother (UCD) (bryozoan mineralogy and ocean acidification project 2013)
Margaret Carroll (UCD) (bryozoan mineralogy and ocean acidification project 2012-2014)

SELECTED CONTRIBUTED PRESENTATIONS AND POSTERS

Swezey, D.S., Tjeerdema, E., Loeher, M., Marshman, B., Sanford, E., Moore, J., Aquilino, K.
“Effects of ocean acidification and warming on disease virulence in the endangered white abalone
(*Haliotis sorenseni*).” Aquaculture 2022, San Diego, CA. March 4, 2022.

Swezey, D.S., Boles, S.E., Aquilino K.M., Stott, H., Bush, D., Hill, T.M., Gaylord, B., Catton, C.,
Rogers-Bennett, L., Whitehead, A. and E. Sanford. “Ocean acidification differentially affects
survival of red abalone populations.” Ecological Society of America, New Orleans, LA. August 10,
2018.

Swezey, D.S., Boles, S.E., Aquilino K.M., Stott, H., Bush, D., Hill, T.M., Gaylord, B., Catton, C.,
Rogers-Bennett, L., Whitehead, A. and E. Sanford. “Developing resilience to ocean acidification in
red abalone aquaculture.” Meeting of the National Shellfisheries Association, Seattle, WA. March
21, 2018.

Swezey, D.S., Boles, S.E., Aquilino, K.M., Bush, D., Hill, T.M., Gaylord, B., Sanford, E. and A.
Whitehead. “Effects of ocean acidification on larval and post-settlement red abalone.” Western
Society of Naturalists, Monterey, CA. November 12, 2016.

Swezey, D.S., Bean, J.R., Ninokawa, A., Hill, T.M., Gaylord, B. and E. Sanford. “Interactive effects
of temperature, food, and skeletal mineralogy mediate responses to ocean acidification in a globally
distributed bryozoan.” 4th International Symposium on the Ocean in a High CO₂ World, Hobart,
Australia. May 4, 2016.

Swezey, D.S., Bean, J.R., Ninokawa, A., and E. Sanford. “Bryozoans as indicators of global
change: predictable shifts in morphology and carbonate mineralogy in response to warming and
acidification.” Meeting of the American Geophysical Union, San Francisco, CA. Dec 18, 2014.

Swezey, D.S., Bean, J.R., Ninokawa, A., and E. Sanford. “Bryozoan morphology and mineralogy in
a high-CO₂ ocean: plastic responses and new oceanographic proxies.” *Winner of Best Student
Poster Award (Honorable Mention). Poster at the Western Society of Naturalists, Tacoma, WA.
Nov 14, 2014.

PROFESSIONAL SERVICE

2021-Present **California Aquaculture Action Plan** (Science Committee). Invited contributor of best available science and policy perspectives for California's aquaculture development plan.

2021 **Peer Group Member JMIE**. Served on the review/merit advancement committee of UCD Project Scientists from the Joh Muir Institute of the Environment.

2019-2021 **Bodega Marine Lab Diversity Committee**. Served on committee advising BML leadership on diversity, equity and inclusion issues at BML. Conveyed student DEI concerns and provided feedback on recruitment practices, lab community activities and other administrative decisions to foster greater inclusion of traditionally underrepresented groups at BML.

2018-Present **Leadership Board for the Kashia Pomo Aquaculture and Abalone Conservation Center**. Serving on the leadership board for project designing a new commercial aquaculture and abalone conservation research center led by the Kashia Band of Pomo Indians, a federally recognized tribe of Native Americans from the north coast of California.

2013-2014 **Bodega Marine Lab Seminar Committee**. Served in leadership capacity selecting, inviting and coordinating visits for seminar speakers in the John and Mary Louise Riley Seminar Series at the Bodega Marine Laboratory.

OTHER PROFESSIONAL TRAINING/EXPERIENCE

2019 **COMPASS (Communication Partnership for Science and the Sea) "Navigating West Coast Ocean Change."** Invited participant in week-long science communication training for marine conservation leaders, Asilomar, CA.

2017-2018 **NOAA Commercialization Assistance Program**. Completed year-long mentoring and training program with NOAA private sector advisors to transition SBIR-developed products to the marketplace. Developed TCAF's strategic action plan, business plan, and go-to-market strategy pertaining to ocean acidification resilience products developed for abalone aquaculture.

2017 **Mitchell Hamline School of Law**. Expert Witness Training Academy Fellow. Invited participant in weeklong training in techniques for delivering scientific legal testimony, St. Paul, MN.

2016 **UC Conservation Genomics Consortium**. Invited participant for weeklong workshop in transcriptomic methodologies and pipeline development, Asilomar, CA.

2009-2010 **NSF REACH (Responding to Rapid Environmental Change) IGERT**. Two-year coursework/training program in responses to rapid environmental change. Training in multi-stakeholder workshop organizing. Multidisciplinary group project focused on California tax policy and agricultural development. Internship with the Nature Conservancy's Asia Pacific Program in Honolulu, Hawaii and Brisbane, Australia.

2006-2008 **Monterey Bay Aquarium Research Institute (MBARI)**. Research Assistant in the lab of Steve Haddock. Executed blue-water scientific diving and participated in deep sea research cruises, bioluminescence research, forensic DNA analysis and new species discovery via ROV.

2006-2008 **College of Creative Studies, UCSB**. Menon-Watson Fellow. Led fellowship research on control of invasive species, environmental economics, biofuel development.

REVIEWER FOR

Global Change Biology
Marine Biology
PLOS ONE
California Sea Grant
Oregon Sea Grant
Natural Environment Research Council of the United Kingdom
Economic & Social Research Council of the United Kingdom
Marine Ecology Progress Series
Journal of Experimental Marine Biology and Ecology
ICES Journal of Marine Science
Marine Pollution Bulletin
Environmental Pollution
Aquatic Invasions
Estuarine, Coastal and Shelf Science

PROFESSIONAL ASSOCIATIONS AND SOCIETY MEMBERSHIPS

World Aquaculture Society
California Aquaculture Association
National Shellfisheries Association
California Farm Bureau as employee with TCAF
Western Society of Naturalists
Ecological Society of America

PROFESSIONAL REFERENCES

Eric Sanford – Professor, Department of Evolution and Ecology UCD.
Phone: (707) 875-2040
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Tessa Hill – Professor, Department of Earth and Planetary Sciences UCD.
Phone: (707) 875-1910
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Doug Bush – General Manager, The Cultured Abalone Farm LLC.
Phone: (805) 729-4830
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Gary Cherr – Director, Bodega Marine Laboratory.
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John Stachowicz – Professor and Chair, Department of Evolution and Ecology UCD.
Phone: (530) 752-1113
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Kristin Aquilino – Lead Scientist, NOAA White Abalone Captive Breeding Program.
Phone: (530) 902-9683
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