Richelle Tanner, Ph.D.
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School of Biological Sciences, Washington State University, Pullman, WA 99164

RESEARCH FIELD: Ecological and evolutionary physiology of invertebrates

EDUCATION

Year	Degree
2018	**Ph.D. Integrative Biology**; University of California, Berkeley Climate change effects on thermal tolerance plasticity and population dynamics in the eelgrass sea hare, *Phyllaplysia taylori* (Advisors: Jonathon Stillman & Wayne Sousa)
2015	**B.S. Environmental Studies**; University of Southern California Correlating secondary productivity and habitat composition in a Southern California Marine Protected Area (Advisors: David Ginsburg & Lisa Collins)
2015	**B.M. Jazz Studies**; University of Southern California, Thornton School of Music Piano Performance

PROFESSIONAL EXPERIENCE

Year	Institution	Details
2019-present	National Network for Ocean and Climate Change Interpretation	Science Partnerships Committee Chair, Executive Committee
2018-present	Washington State University	Postdoctoral Research Associate, School of Biological Sciences (Advisor: Wes Dowd)
2015	Naval Postgraduate School	Naval Research Enterprise Internship Program (Advisor: Wendell Nuss, IDEA Lab)

HONORS & AWARDS

Year	Organization	Description
2015-2018	National Science Foundation	Graduate Research Fellowship ($132K)
2015	University of Southern California	Renaissance Scholar, Discovery Scholar
2013-2015	University of Southern California	Provost Research Fellowship ($4K)
2011-2015	University of Southern California	Presidential Scholar ($100K)
2011-2015	USC Thornton School of Music	Thornton Faculty Fellowship: Stan Kenton Endowed Award ($100K)

GRANTS

Year	Source	Details
2020	Society for Integrative and Comparative Biology (NSF)	Travel Funding, NSF-funded complementary session, $1,000
2019	Company of Biologists	Scientific Meeting Grant, £1,000
2019	Society for Integrative and Comparative Biology (NSF)	Travel Funding, NSF-funded complementary session, $300
2018-pres.	NSF	Extreme Science and Engineering Discovery Environment Startup Allocation, $1,500

2016, 2017	Company of Biologists	Research Travel Grant, administered by the Society for Experimental Biology, £500/year
2016-2018	UC Berkeley	Graduate Student Research Funding, Integrative Biology Department, $300/semester
2017	UC Berkeley	Graduate Student Summer Research Funding, Integrative Biology Department, $1,750
2015	UC Berkeley	Student Technology Fund, $5,000
2014	USC	Undergraduate Research, $1,500
2013	USC	Undergraduate Research, $1,500
Grants awaiting decision		
2019	EcoAmerica	American Climate Leadership Award (submitted as NNOCCI Leadership), $50,000
Major grant applications not funded		
2019	American Physiological Society	Postdoctoral Research Fellowship ($50K requested) *final round candidate*
2019	NSF	Postdoctoral Research Fellowship in Biology ($138K requested) "Evolution of plasticity in fluctuating environments"
2016	NSF	Preliminary Proposal (SG) "Epigenetic signaling in thermal tolerance heritability between alternating generations of *Phyllaplysia taylori*"
2015	California State University	CSU Council on Ocean Affairs, Science & Technology Rapid Response Funding Program ($7,500 requested) "*Aplysia californica* in the bay: are they here to stay?"

PUBLICATIONS & PRESENTATIONS

Google Scholar: https://scholar.google.com/citations?user=Jxy-8a8AAAAJ&hl=en

PEER REVIEWED

[S] Mentored student

6. **Tanner RL**, Obaza AK, & Ginsburg DW (in press). Correlating secondary productivity and habitat composition in a Southern California Marine Protected Area. *Southern California Academy of Sciences Bulletin*.
5. Wang T[S], **Tanner RL**, Armstrong EJ, Lindberg DR, & Stillman JH (2019). Thermal plasticity in file limpet, *Lottia limatula*, across oceanic to estuarine gradients in habitat temperature. *Aquatic Biology* 28: 113-125. doi: 10.3354/ab00714
4. **Tanner RL** & Dowd WW (2019). Inter-individual variation in responses to environmental variation and environmental change: Integrating across traits and time. *Comparative Biochemistry and Physiology Part A: Molecular and Integrative Physiology* 238. doi:10.1016/j.cbpa.2019.110577
3. **Tanner RL**, Faye LE[S], & Stillman JH (2019). Temperature and salinity sensitivity of respiration, grazing, and excretion rates in the estuarine eelgrass sea hare, *Phyllaplysia taylori*. *Marine Biology* 166:109. doi:10.1007/s00227-019-3559-4

2. Armstrong EJ, **Tanner RL**, & Stillman JH (2019). Warm-adaptation is negatively correlated with upper thermal tolerance plasticity in North Eastern Pacific nudibranch mollusks. *Physiological and Biochemical Zoology* 92(4): 430-444. https://doi.org/10.1086/704519 **Featured on issue cover.**
1. **Tanner RL** (2018). Predicting *Phyllaplysia taylori (Anaspidea: Aplysiidae)* presence in Northeastern Pacific estuaries to facilitate grazer community inclusion in eelgrass restoration. *Estuarine, Coastal and Shelf Science* 214: 110-119. doi:10.1016/j.ecss.2018.09.011

IN REVIEW

7. **Tanner RL**, Bowie RCK, & Stillman JH (in review). Parental effects on thermal tolerance plasticity under climate change scenarios in the eelgrass sea hare, *Phyllaplysia taylori*. *Marine Ecology Progress Series.*
8. **Tanner RL** & Collins LE (in review). Using publicly-available long-term climate records in undergraduate interdisciplinary big data curriculum. *Journal of College Science Teaching.*

IN PREPARATION (manuscripts available upon request)

9. **Tanner RL**, Wang-Claypool CY, Bowie RCK, & Stillman JH. Local adaptation in thermal tolerance plasticity across a latitudinal gradient in the eelgrass sea hare, *Phyllaplysia taylori*.
10. **Tanner RL**, Gleason LU, & Dowd WW. Patterns in gene and protein expression variability expose constraints in functional pathways in *Mytilus californianus*.

SYMPOSIA ORGANIZED

Year	Event
2020	Society for Experimental Biology Annual Meeting, Prague, CZ "Science with Impact: Lowering the barriers to science with Open Hardware"
2020	Society for Experimental Biology Annual Meeting, Prague, CZ "Open Electronics in Experimental Biology"
2019	National Network for Ocean and Climate Change Interpretation, online "Extreme Events Webinar"

INVITED PRESENTATIONS

Year	Event
2019	Department seminar series, Biological Sciences Department, Sacramento State University "How does environmental variation influence physiology in intertidal invertebrates?"
2019	Biolunch, School of Biological Sciences, Washington State University "Inter-individual variation in *Mytilus* mussel physiology"
2019	Science Talk, Portland OR "Social strategies for climate communication" (workshop)
2019	Department seminar series, Department of Biology, Walla Walla University "How does environmental variation influence physiology in intertidal invertebrates?"
2018	Department seminar series, School of Biological Sciences, Washington State University "Thermal tolerance plasticity of the eelgrass sea hare in a changing climate"
2018	Special seminar, Monterey Bay Aquarium, Monterey CA "The eelgrass sea hare: super slugs in a changing climate"
2018	Department seminar series, Estuary and Ocean Science Center, Department of Biology, San Francisco State University "Climate change effects on thermal tolerance plasticity and population dynamics in the

eelgrass sea hare, *Phyllaplysia taylori*"

2018 Department seminar series, Integrative Biology, UC Berkeley
"Climate change effects on thermal tolerance plasticity and population dynamics in the eelgrass sea hare, *Phyllaplysia taylori*"

2017 Department seminar series, Estuary and Ocean Science Center, Department of Biology, San Francisco State University
"Ask me about climate change: a strategic approach to talking about climate change with the public"

2017 Summer seminar series, Roskilde University, Søeminestationen
"Physiological effects of climate change on a sea slug in San Francisco Bay"

2016 50 years of research on Catalina Island, Southern California Academy of Sciences annual meeting, Los Angeles CA

CONTRIBUTED CONFERENCE PRESENTATIONS (ORAL)

Year	Event
2020	Society for Integrative and Comparative Biology (SICB), Austin TX **Tanner, R.L.**, Gleason, L.U., & Dowd, W.W. "Pathway-dependent patterns of gene and protein variation exposed by thermal stress in the intertidal mussel"
2019	SICB, Tampa FL **Tanner, R.L.**, Gleason, L.U., & Dowd, W.W. "Transcriptomic and proteomic analyses of inter-individual variation among intertidal mussels"
2019	SICB, Tampa FL **Tanner, R.L.** "Social change for climate change: communication tactics from the National Network for Ocean and Climate Change Interpretation"
2018	Society for Experimental Biology (SEB), Florence, Italy **Tanner, R.L.** & Stillman, J.H. "Parent-specific plasticity in reproduction and development limit population response to climate change in the eelgrass sea hare, *Phyllaplysia taylori"*
2018	SICB, San Francisco CA **Tanner, R.L.** & Stillman, J.H. "Transgenerational thermal tolerance plasticity may play a role in maintaining seasonal differences between populations of *Phyllaplysia taylori* with climate change"
2017	Western Society of Naturalists (WSN), Pasadena CA **Tanner, R.L.**, Sousa, W.P., & Stillman, J.H. "Local extirpation of *Phyllaplysia taylori* from San Francisco Bay after heavy winter rains"
2017	SEB, Göthenburg Sweden **Tanner, R.L.** & Stillman, J.H. "The role of developmental plasticity under temperature and pH stress in locally adapted *Phyllaplysia taylori* populations"
2017	SICB, New Orleans LA **Tanner, R.L.**, Armstrong, E.J., Sousa, W.P., & Stillman, J.H. "Locally adapted *Phyllaplysia taylori* populations in Central California show higher thermal tolerance plasticity potential"
2016	Beyond the Golden Gate Symposium, Tiburon CA **Tanner, R.L.** "Incorporating the invertebrate grazer, *Phyllaplysia taylori,* into the eelgrass restoration framework: physiological and ecological investigations"
2016	WSN, Monterey CA **Tanner, R.L.**, Sousa, W.P., & Stillman, J.H. "Acute thermal stress during

embryonic development influences hatching success differently based on maternal origin in the sea hare, *Phyllaplysia taylori"*

2016 SICB, Portland OR
Tanner, R.L., Obaza, A.K., & Ginsburg D.W. "Correlating Secondary Productivity and Habitat Composition of Eelgrass Beds in a Southern California Marine Protected Area"

2014 WSN, Tacoma WA
Tanner, R.L., Obaza, A.K., & Ginsburg D.W. "Correlating Secondary Productivity and Habitat Composition of Eelgrass Beds in a Southern California Marine Protected Area"

CONTRIBUTED CONFERENCE PRESENTATIONS (POSTER)

Year	Event
2020	SICB, Austin TX **Tanner, R.L.** "Building a network of science communicators for change: strategies from the National Network for Ocean and Climate Change Interpretation"
2018	SEB Special Session (The height, breadth, and depth of physiological plasticity), Florence Italy **Tanner, R.L.**, Armstrong, E.J., Sousa, W.P., & Stillman, J.H. "Plasticity of upper critical limits in the eelgrass sea hare, *Phyllaplysia taylori*, not correlated with habitat thermal history"
2014	Southern California Academy of Sciences, Camarillo CA Staniec, K.J., **Tanner, R.L.**, Obaza, A.K., & Ginsburg D.W. "Correlating Secondary Productivity and Habitat Composition of Eelgrass Beds in a Southern California Marine Protected Area"

*Only first (and first co-)author presentations listed. Ten co-authored presentations, including those of mentored students, not listed.

TEACHING AND MENTORING

GUEST LECTURES

Term	Course (University)	Topic
Fall 2018	Field Ecology (St. Mary's College)	Sea hare ecophysiology
Spring 2016	Invertebrate Zoology (UC Berkeley)	Nudibranchs and climate change
Fall 2015	Oceans (UC Berkeley)	Marine community ecology

UNIVERSITY COURSES TAUGHT

Term	Course #	Title	Section
Spring 2018	UC Berkeley, IB 103LF (Graduate Student Instructor)	Invertebrate Zoology	Laboratory
Fall 2015	UC Berkeley, IB/EPS/GEOG c82 (Graduate Student Instructor)	Oceans	Discussion (3)
Summer 2014	USC, ENST 320A (Teaching Assistant)	Water and Soil Sustainability	Laboratory

CERTIFICATES

Year	Description	Organization
2018	Certificate in Teaching and Learning in Higher Education	University of California, Berkeley
2018	Expert Facilitator in Science Communication Instruction	National Network for Ocean and Climate Change Interpretation

CURRICULUM DEVELOPMENT

Course curricula development

Pilot Year	Title	Organization (Role)	Target Audience
2020	Climate change communication: using social science research in framing	NNOCCI (Co-lead)	Graduate students
2018	Expert Level Facilitator Training Course	NNOCCI (Contributor)	Informal science educators & early career academics
2017	Indirect effects of climate change on intertidal invertebrates	Community Resources for Science (Lead)	3rd grade students
2016 & 2017	National trivia bowl question development (biology focus)	National Ocean Sciences Bowl (Lead)	High school students
2015	Food webs in estuaries	Community Resources for Science (Lead)	3rd grade students
2015	IB/EPS/GEOG c82 discussion materials	UC Berkeley (Contributor)	Undergraduate students

Training workshop development

Pilot Year	Title	Organization (Role)	Target Audience
2018	Science Communication Beginner Workshop	NNOCCI (Lead)	Early career academics

Workshop for teaching newly developed curricula

Pilot Year	Title	Organization (Role)	Target Audience
2017	Environmental Literacy Summer Institute	Lawrence Berkeley Hall of Science (Contributor)	K-5 teachers
2016	Indirect effects of climate change on intertidal invertebrates	San Francisco State University, as part of NSF grant fulfillment (Contributor)	Middle school teachers

STUDENTS MENTORED

**Resulted in manuscripts for submission to peer-reviewed journals*

[+]Graduate student; all others undergraduate students

Dates	Name	School (Department)	Role	Current Position
2019-pres.	John Langrell	Washington State University (School of Biological Sciences)	Research advisor	Undergraduate student

2018-pres.	Thomas LeClair	Washington State University (SBS)	Research advisor*	Undergraduate student
2018-2019	Grace Chan+	Washington State University (SBS)	Research advisor	Graduate student
2016-2018	Elizabeth McAlpine	UC Berkeley (Integrative Biology)	Research advisor*	Graduated
2016-2017	Terrance Wang	UC Berkeley (College of Natural Resources)	Thesis advisor*	GIS Analyst (NOAA)
2015-2018	Valerie Bednarski	UC Berkeley (Earth & Planetary Science)	Thesis advisor*	National Parks Service Intern
2016-2018	Shiran Hershcovich	UC Berkeley (IB)	Research advisor*	Graduated
2016-2017	Chandler Shaeffer	UC Berkeley (CNR)	Thesis co-advisor	Graduated
2015-2018	Lindsay Gilkerson	UC Berkeley (CNR)	Research advisor	Outdoor education specialist
2017-2018	Laura Mackenzie	UC Berkeley (IB)	Research advisor	Undergraduate student
2016-2017	Morgan Ziegenhorn	UC Berkeley (CNR)	Research advisor	Masters student (UCSD)

PUBLIC OUTREACH

INVITED OUTREACH PRESENTATIONS

Year	Event
2019	Skype A Scientist LIVE "Superheroes of our seas: how physiology forecasts climate change effects" https://www.youtube.com/watch?v=ayFYJDDQCZE
2018	Skype A Scientist (4 events, nationally) "Is it getting hot in here? Sea slug physiology tells us how the oceans are changing"
2017	Point Reyes National Seashore Association "Science at the Seashore", Inverness CA "Do your neighbors make you crabby? Behavioral physiology and climate change"
2017	Instructor Seminar Series, NatureBridge, San Francisco CA "Restoration in the Bay Area: what we learn from physiology and ecology"
2017	Deep Dive into Ocean Acidification Workshop, Bay Area Climate Literacy Impact Collaborative, San Francisco CA "The physiological effects of climate change and ocean acidification on marine invertebrates"
2017	Marin Science Seminar, San Rafael CA "How does physiological plasticity shift climate change responses in the eelgrass sea hare?

POPULAR PRESS

Blogs (see personal blog at www.richelletanner.com/blog)

Tanner RL (2019). "Extreme: a word with many meanings and consequences for climate change communicators." *Climate Interpreter*.

Tanner RL (2019). "Surviving extremes or long-term warming? Super sea slugs have made their evolutionary choice." *Climate Interpreter, reprinted in the International Magazine for Heritage Interpretation September/October 2019 issue.*

Tanner RL (2019). "Communicating climate change: what can we learn from informal educators?" *Share Your Sci*, *cross-posted to Climate Interpreter & the University of California Agriculture and Natural Resources Green Blog.*

Tanner RL (2016). "Did You Know About Sea Slugs?" *BaySide Magazine Fall 2016, the quarterly newsletter for the San Francisco State University Romberg Tiburon Center.*

Tanner RL & Haw JA (2013). "USC Dornsife Scientific Diving: An analysis of *Sargassum horneri* ecosystem impact." *Scientific American*.

Interviews & Expert Panels

Hot Nudibranch Science!, This Week in Science (2019). Interviewer: Dr. Kiki Sanford.

Earth Day Special Extravaganza!, Science Sucks Podcast (2019). Interviewer: Ive Velikova.

Ask Dr. Universe, Washington State University (2019). Interviewer: Rachel Webber.

Leading Women in Marine Science Interview Series, University of York (2018). Interviewer: Hannah Rudd.

Alumni Spotlight, National Ocean Sciences Bowl (2018). Interviewer: Callan Yanoff.

Scientist & Engineer Panel, Science Education Resource Fair for Teachers, Chabot Space and Science Center / Community Resources for Science (2018). Moderator: Traci Grzymala.

Graduate Student Feature, UC Berkeley Integrative Biology Insight Newsletter (2017). Interviewer: Kirsten Mickelwait.

SERVICE CONTRIBUTIONS

Year	Organization	Role
2020	Society for Integrative and Comparative Biology	Session Chair, Genome-to-Phenome complementary session
2019	NSF Reintegrating Biology Jumpstart Meeting	Participant
2019-present	Society for Integrative and Comparative Biology	Student Presentation Judge
2018-present	National Network for Ocean and Climate Change Interpretation (NNOCCI), Boston, MA	Science Partnerships Committee
2018	Monterey Bay Aquarium, Monterey CA	Exhibit advisor
2016-2018	National Ocean Sciences Bowl, Washington D.C.	Competition Judge
2017	NNOCCI, Boston, MA	Science Fellow, Central CA Study Circle
2016	Exploratorium, San Francisco CA	Exhibit advisor
2015	California Science Center, Los Angeles CA	Exhibit contributor
2013-2015	USC Joint Education Project, Los Angeles CA	Presenter

Peer reviewer since 2016 for journals including the Proceedings of the Royal Society B, Hydrobiologia, Journal of Comparative Physiology A, Journal of Sea Research, and EvoDevo.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Year	Organization
2015-present	Society for Integrative and Comparative Biology (SICB)
2016-present	Society for Experimental Biology (SEB)
2019-present	American Physiological Society (APS)
2017-2018	Graduate Women in Science
2016-present	500 Women Scientists
2014-2018	Western Society of Naturalists (WSN)
2014-2016	Southern California Academy of Sciences
2014-present	Phi Beta Kappa Honor Society
2013-present	American Academy of Underwater Sciences

REFERENCES

Dr. W. Wesley Dowd (Postdoc advisor): wes.dowd@wsu.edu (509) 335-8122
Dr. Jonathon H. Stillman (PhD co-advisor): jstillman@berkeley.edu (415) 338-3790
Dr. Caroline M. Williams (PhD committee chair): cmw@berkeley.edu (510) 643-9775
Dr. Wayne P. Sousa (PhD co-advisor): wpsousa@berkeley.edu (510) 643-5782
Dr. David W. Ginsburg (Undergraduate advisor): dwginsbur@usc.edu (213) 740-8576
Hannah Pickard (NNOCCI Network Manager): hpickard@neaq.org (617) 226-2149