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Environmental Science & Policy Program, Chapman University

**RESEARCH FIELD:** Effects of climate change on human and ecological communities

## EDUCATION

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

## PROFESSIONAL EXPERIENCE

| Year         | Institution   | Details  |
|--------------|---|--|
| 2022-present | Chapman University  | Director & Advisor, Environmental Science & Policy Program                         |
| 2021-present | Chapman University  | Assistant Professor of Environmental Science & Policy, Schmid & Wilkinson Colleges |
| 2021-present | Southern California Academy of Sciences                               | Board of Directors; DEI Chair  |
| 2020-present | Journal of Zoology  | Senior Editor, Reviews & Perspectives  |
| 2019-2021    | National Network for Ocean and Climate Change Interpretation (NNOCCI) | Science Director   |
| 2020-2021    | University of California, Davis                                       | CA Sea Grant Delta Science Postdoctoral Fellow (Advisor: Anne Todgham)             |
| 2018-2020    | 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)               |

## 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:<br>Stan Kenton Endowed Award (\$100K) |

**GRANTS (since 2020)**

| Year                       | Source   | Details  |
|----------------------------|--|--|
| 2023-2024                  | California Sea Grant                                     | Pathways to Inclusive Research Training, \$75K               |
| 2022-2023                  | Chapman University                                       | Research Seed Funding, \$20K                                 |
| 2021-2024                  | Delta Stewardship Council                                | Delta Science Award, \$152K (\$1M award)                     |
| 2021-2023                  | NOAA   | NNOCCI support, \$100K                                       |
| 2022-2023                  | NOAA   | eeBLUE – NNOCCI research support, \$15K                      |
| 2021                       | Company of Biologists                                    | Scientific Meeting Grant, £3,000                             |
| 2020                       | Company of Biologists                                    | Scientific Meeting Grant, £2,000                             |
| 2020-2022                  | California Sea Grant                                     | Delta Science Fellowship, \$230K                             |
| 2020-2021                  | Evolving Seas Research<br>Coordination Network           | Junior Professional Development Exchange,<br>\$2,000         |
| 2020                       | Society for Integrative and<br>Comparative Biology (NSF) | Travel Funding, NSF-funded complementary<br>session, \$1,300 |
| <b>Grants under review</b> |  |  |
| 2023                       | NSF  | BIO-LEAPS, \$500K  |
| 2023                       | NSF  | Building Research Capacity in Biology, \$500K                |

**PUBLICATIONS & PRESENTATIONS**

Google Scholar: <https://scholar.google.com/citations?user=Jxy-8a8AAAAAJ&hl=en>

**PEER REVIEWED**

<sup>s</sup> Mentored student

20. Hagani JS, Takekawa JY, Chappell SC, **Tanner RL**, Ernst AR, Kettenring KM (2023). A remote sensing approach to assess the historical invasion of *Phragmites australis* in a brackish coastal marsh. *Frontiers in Ecology and Evolution*. 11: 1171245. doi: 10.3389/fevo.2023.1171245
19. **Tanner RL** & Onthank KL (2022). Open source solutions in experimental design: an introduction to the symposium. *Integrative & Comparative Biology*. ica132. doi: 10.1093/icb/icac132 **Special symposium grouping** “Open technology in experimental biology”.
18. **Tanner RL** & Moore TY (2022). Virtual expeditions facilitated by open source solutions broaden student participation in natural history research. *Integrative & Comparative Biology*. icac065. doi: 10.1093/icb/icac065 **Special symposium grouping** “Open technology in experimental biology”.
17. Oellermann M, Jolles JW, Ortiz D, Seabra R, Wenzel T, Wilson H, & **Tanner RL** (2022). Open hardware in science: the benefits of open electronics. *Integrative & Comparative Biology*. icac043. doi: 10.1093/icb/icac043 **Special symposium grouping** “Open technology in experimental biology”.
16. **Tanner RL**, Gleason LU, & Dowd WW (2022). Environment-driven shifts in interindividual variation and phenotypic integration within subnetworks of the mussel transcriptome and proteome. *Molecular Ecology*. 31(11): 3112-3127. doi: 10.1111/mec.16452
15. Burnett NP, Hernandez AM, King EE, **Tanner RL**, & Wilsterman K (2022). A push for inclusive data collection in STEM organizations. *Science*. 376(6588):37-39. doi: 10.1126/science.abo1599
14. Nguyen KH, Akiona AK, Chang CC, Chaudhary VB, Cheng S, Johnson SK, Kahanamoku SS, Lee A, de Leon Sanchez EE, Segui LM, & **Tanner RL** (2021). Who are we? Highlighting nuances in Asian American experiences in ecology and evolutionary biology. *Ecological Society of America Bulletin*. e01939. doi: 10.1002/bes.2.1939

13. Bonanno A, Ennes M, Hoey J, Moberg E, Nelson SM, Pletcher N, & **Tanner RL** (2021). Empowering hope-based climate change communication techniques for the Gulf of Maine. *Elementa*. 9(1): 00051. doi: 10.1525/elementa.2020.00051 **Invited submission** to special issue “Gulf of Maine 2050”.
12. Burnett NP, Armstrong EJ, Romero R, Runzel C, & **Tanner RL** (2021). Kelp morphology and herbivory are maintained across latitude despite geographic shift in kelp-wounding herbivores. *Biological Bulletin*. 241(2): 168-184. doi: 10.1086/715039
11. McAlpine-Bellis L<sup>S</sup>, Stillman JH, & **Tanner RL** (2021). Acclimation to future climate exposes vulnerability to cold extremes in intertidal sea hares. *Integrative and Comparative Biology*. doi: 10.1093/icab087 **Invited submission** to *Integrative and Comparative Biology*.
10. **Tanner RL**, Grover N, Anderson ML, Crocker KC, Dutta S, Horner AM, Hough LE, Moore TY, Rosen GL, Stack-Whitney K, Summers A (2021). Examining Cultural Structures and Functions in Biology. *Integrative and Comparative Biology*. doi:10.1093/icb/icab140 **Invited submission** to special issue from the NSF Reintegrating Biology Jumpstart Meeting.
9. **Tanner RL** & Collins LE (2021). Using publicly-available long-term climate records in undergraduate interdisciplinary big data curriculum. *Journal of College Science Teaching*. 51(2): 51-55.
8. Burnett NP, King EE, Salcedo MK, **Tanner RL**, & Wilsterman K (2020). Conference scheduling undermines diversity efforts. *Nature Ecology & Evolution*. 4: 1283-1284. doi: 10.1038/s41559-020-1276-5
7. **Tanner RL**, Bowie RCK, & Stillman JH (2020). Parental effects on thermal tolerance plasticity under climate change scenarios in the eelgrass sea hare. *Marine Ecology Progress Series*. 634: 199-211. doi: 10.3354/meps13207
6. **Tanner RL**, Obaza AK, & Ginsburg DW (2019). Secondary Production of Kelp Bass *Paralabrax clathratus* in Relation to Coastal Eelgrass *Zostera marina* Habitat in a Southern California Marine Protected Area. *Southern California Academy of Sciences Bulletin*. 118(3): 158-172. doi: 10.3160/0038-3872-118.3.158
5. Wang T<sup>S</sup>, **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 **Invited submission** to special issue “Mechanisms of biological sensitivity and resistance to a rapidly changing ocean”.
3. **Tanner RL**, Faye LE<sup>S</sup>, & 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**

23. Gleason LU, Fekete F, **Tanner RL**, Dowd WW (in review). Paired RNA-seq and proteomics data reveal unique roles of transcriptional and post-transcriptional gene regulation in the intertidal mussel *Mytilus californianus*. *Journal of Experimental Biology*.
22. **Tanner RL**, Burnett NP, King EE, Todgham AE (in review). Short-term research opportunities provide valuable perspective and confidence to undergraduate STEM students. *Integrative and Comparative Biology*.
21. **Tanner RL**, Bowie RCK, Wang-Claypool CY, & Stillman JH (in review). High thermal tolerance, but not its plasticity is driven by habitat temperature and genotype in an intertidal sea hare. *Journal of Experimental Biology*.

**REPORTS**

- Tanner RL** & student contributors (2022). California Water Accessibility Communications Toolkit. [www.seaclab.com/outreach-training](http://www.seaclab.com/outreach-training)
- Ocean Science Trust (2022). Pathways to advance diversity, equity, and inclusion in California's coastal and ocean sciences. [https://www.oceansciencetrust.org/wp-content/uploads/2022/08/Pathways-to-Advance-DEI-in-CA-Coastal-and-Ocean-Sciences-2022\\_rev.pdf](https://www.oceansciencetrust.org/wp-content/uploads/2022/08/Pathways-to-Advance-DEI-in-CA-Coastal-and-Ocean-Sciences-2022_rev.pdf) [contributor]
- Tanner RL** (2022). Community function under *Phragmites* invasion stress in tidal wetlands in Suisun Marsh. State Water Contractors.
- Tanner RL** & student contributors (2021). Orange County Oil Spill Communications Toolkit. [www.seaclab.com/outreach-training](http://www.seaclab.com/outreach-training)
- Anderson M, Crocker K, Dutta S, Grover N, Horner A, Hough L, Mangiamele L, Moore T, Rosen G, Stack-Whitney K, Summers A, & **Tanner R** (2020). Knowledge hidden in nuances: from molecules to society. *NSF Reintegrating Biology Jumpstart Meeting*.
- Oellermann M, Jolles JW, Ortiz D, Seabra R, Wenzel T, Wilson H, & **Tanner RL** (2021). Harnessing the Benefits of Open Electronics in Science. <https://arxiv.org/abs/2106.15852>

**HANDLING EDITOR** *as Reviews & Perspectives Editor at JoZ*

- Carbajal, A (in review). Non-invasive measurement of glucocorticoids: the reptile perspective. *Journal of Zoology*.
- Echols, S (in review). Rewilding with Ungulates to Promote North American Rangeland Biodiversity. *Journal of Zoology*.
- Van der Wal (2023). Do honey badgers and greater honeyguide birds cooperate to access bees' nests? Ecological evidence and honey-hunter accounts. *Journal of Zoology*.
- Hsu, GC (2023). An experimental framework for quantifying the degree of intraguild predation in a three-species omnivorous food web in the field. *Journal of Zoology*.
- Pretorius, M (in review). Quantifying crop-feeding and viral infection of Pteropodid bats in tropical and subtropical landscapes. *Journal of Zoology*.
- Pamenter, M (2022). Oxidative Stress and Cognition in Ecology. *Journal of Zoology*.
- Córdoba-Aguilar, A (2022). Dragon colors: the nature, function, and evolution of Odonata (dragonfly and damselfly) coloration. *Journal of Zoology*.
- Schalz, S (retracted). Local Adaptation or Phenotypic Plasticity? A Systematic Review of Common Garden Experiments with Avian Populations. *Journal of Zoology*.

**SYMPOSIA ORGANIZED**

| Year | Event   |
|------|---|
| 2022 | Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ<br>“Open Source Solutions in Experimental Design”   |
| 2021 | Society for Experimental Biology Annual Meeting, Antwerp, BE<br><b>*RESCHEDULED FROM 2020 DUE TO COVID-19</b><br>“Science with Impact: Lowering the barriers to science with Open Hardware” |
| 2021 | Society for Experimental Biology Annual Meeting, Antwerp, BE<br><b>*RESCHEDULED FROM 2020 DUE TO COVID-19</b><br>“Open Electronics in Experimental Biology”                                 |
| 2020 | NNOCCI, Annual Planning Retreat, virtual<br>“Incorporating Justice, Equity, Diversity, and Inclusion Moving Forward”  |
| 2020 | NNOCCI, Annual Conference, virtual<br>“Ask a Scientist”   |
| 2019 | NNOCCI, virtual<br>“Extreme Events Webinar”   |

**INVITED PRESENTATIONS**

| Year | Event   |
|------|---|
| 2023 | Gordon Conference for Biology Education Research, Bates College<br>“Fostering a community of care in our classrooms and conferences”  |
| 2023 | California State University San Bernardino Biology Department Seminar Series<br>“An advocacy-based research agenda for climate change biology”  |
| 2022 | California State University Northridge Biology Department Seminar Series<br>“Science is not apolitical: an imperative of community advocacy in climate change biology research”                       |
| 2021 | Thoreau Environmental Fellows Program, University of Florida<br>“Social change for climate change: strategies from the National Network for Ocean and Climate Change Interpretation”                  |
| 2021 | Schmid Science Forum, Chapman University<br>“Socio-ecological approaches to climate change adaptation”  |
| 2021 | Department seminar series, Chapman University<br>“Socio-ecological effects of climate on communities”   |
| 2020 | McGuire Seminar Series, University of Florida <b>*VIRTUAL DUE TO COVID-19</b><br>“The effects of environmental variation on ecosystem function in nearshore habitats”                                 |
| 2020 | Barrows Lecture, Project Dragonfly, University of Miami <b>*VIRTUAL DUE TO COVID-19</b><br>“Climate change effects and community-level solutions”   |
| 2020 | Department seminar series, Biology Program, University of Alaska Southeast<br><b>*VIRTUAL DUE TO COVID-19</b><br>“How does environmental variation influence physiology in intertidal invertebrates?” |
| 2020 | Department seminar series, Chesapeake Biological Laboratory, University of Maryland <b>*CANCELED DUE TO COVID-19</b><br>“Climate change effects: from society to evolutionary biology”                |
| 2020 | Department seminar series, Biology Department, University of Mississippi<br>“How does environmental variation influence physiology in nearshore invertebrates?”                                       |

- 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, Sømestationen  
“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  |
|------|--|
| 2023 | Society for Experimental Biology (SEB), Edinburgh Scotland<br><b>Tanner R.L.</b> , Haworth L.E., Nancollas S., and Todgham A.E. “Can invasion stress mitigate climate stress? The physiological performance of mud-dwelling invertebrates in a restored tidal wetland” |
| 2022 | Western Society of Naturalists (WSN), Oxnard CA<br><b>Tanner R.L.</b> , Haworth L.E., Nancollas S., and Todgham A.E. “Can invasion stress mitigate climate stress? The physiological performance of mud-dwelling invertebrates in a restored tidal wetland”            |
| 2022 | Society for Integrative and Comparative Biology (SICB), Phoenix AZ<br>“An introduction to the symposium: open technology in experimental biology”  |
| 2021 | SEB, virtual<br><b>Tanner R.L.</b> , Bowie R.C.K., Wang-Claypool C.Y., & Stillman J.H. “High thermal tolerance, but not its plasticity are driven by habitat temperature and genotype in an intertidal sea hare”   |
| 2021 | SICB, virtual  |

- Tanner R.L.**, Bowie R.C.K., Wang-Claypool C.Y., & Stillman J.H. “High thermal tolerance, but not its plasticity are driven by habitat temperature and genotype in an intertidal sea hare”  
2020 WSN, virtual
- Tanner R.L.** “Sea slugs safeguard seagrasses: an overview of thermal tolerance in epiphyte grazers”  
2020 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 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  |
|------|--|
| 2021 | SEB, virtual<br><b>Tanner R.L.</b> , LeClair T.A., Langrell J., & Dowd W.W. “Manipulating body temperatures of individual mussels in the laboratory using Arduino-based solutions”   |
| 2020 | SICB, Austin TX<br><b>Tanner R.L.</b> “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<br><b>Tanner R.L.</b> , Armstrong E.J., Sousa W.P., & Stillman J.H. “Plasticity of upper critical limits in the eelgrass sea hare, <i>Phyllaplysia taylori</i> , not correlated with habitat thermal history” |
| 2014 | Southern California Academy of Sciences, Camarillo CA<br>Staniec K.J., <b>Tanner R.L.</b> , 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. >25 co-authored presentations, including those of mentored students, not listed.

**TEACHING AND MENTORING****UNIVERSITY COURSES TAUGHT**

| Term                  | Course #  | Title  | Section           |
|-----------------------|---|--|-------------------|
| Interterm 2024        | Chapman University, ENV329                                    | Diverse Perspectives in Conservation Biology | Lecture/Lab/Field |
| Fall 2023             | Chapman University, ENV201                                    | Introduction to Environmental Justice        | Lecture           |
| Spring 2022           | Chapman University, ENV329                                    | Applications in Invertebrate Zoology         | Lecture/Lab       |
| Fall 2021, 2022, 2023 | Chapman University, ENV101                                    | Introduction to Environmental Science        | Lecture           |
| Fall 2021, 2022       | Chapman University, ENV360                                    | Environmental Advocacy Through Story         | Lecture           |
| Spring 2018           | UC Berkeley, IB 103LF<br>(Graduate Student Instructor)        | Invertebrate Zoology                         | Laboratory        |
| Fall 2015             | UC Berkeley, IB/EPS/GEOG c82<br>(Graduate Student Instructor) | Oceans                                       | Discussion (3)    |
| Summer 2014           | USC, ENST 320A (Teaching Assistant)                           | Water and Soil Sustainability                | Laboratory        |

**GUEST LECTURES**

| Term | Course (University) | Topic |
|------|---------------------|-------|
|------|---------------------|-------|



|                      |   |                                    |
|----------------------|---|------------------------------------|
| Spring 2022,<br>2023 | Marine Biology (Chapman University)                   | Mollusk physiology                 |
| Fall 2020            | Life at the Extremes (University of Alaska Southeast) | Intertidal invertebrate physiology |
| 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           |

**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                                     |
|----------------|--|--|---|
| 2024           | Diverse Perspectives in Conservation Biology                           | Chapman University (Lead)              | Undergraduate students                              |
| 2023           | Introduction to Environmental Justice                                  | Chapman University (Co-lead)           | Undergraduate students                              |
| 2021           | Environmental Advocacy Through Story                                   | Chapman University (Lead)              | Undergraduate students                              |
| 2021           | Climate change communication: using social science research in framing | NNOCCI (Co-lead)                       | Graduate students                                   |
| 2021           | Suisun Food Webs Research Experience for Undergraduates                | UC Davis (Lead)                        | Undergraduate 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) | 3 <sup>rd</sup> grade students                      |
| 2016 &<br>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) | 3 <sup>rd</sup> grade students                      |
| 2015           | IB/EPS/GEOG c82 discussion materials                                   | UC Berkeley (Contributor)              | Undergraduate students                              |

**Training workshop development**

| Pilot Year | Title   | Organization (Role)       | Target Audience             |
|------------|---|---------------------------|-----------------------------|
| 2023       | Equity, Diversity, Inclusion Associate Editors Workshop | Chapman University (Lead) | Academic journal leadership |
| 2022       | Framing for Climate Science Workshop                    | Chapman University (Lead) | Advocacy groups             |

|      |  |               |                           |
|------|--|---------------|---------------------------|
| 2018 | Science Communication<br>Beginner Workshop | NNOCCI (Lead) | Early career<br>academics |
|------|--|---------------|---------------------------|

**Workshop for teaching newly developed curricula**

| Pilot Year | Title   | Organization (Role)                                | Target Audience           |
|------------|---|--|---------------------------|
| 2017       | Environmental Literacy Summer<br>Institute                        | Lawrence Berkeley Hall<br>of Science (Contributor) | K-5 teachers              |
| 2016       | Indirect effects of climate<br>change on intertidal invertebrates | San Francisco State<br>University (Contributor)    | Middle school<br>teachers |

**UNDERGRADUATE STUDENTS MENTORED: >75 individuals at 9 institutions since 2015****PUBLIC OUTREACH****INVITED OUTREACH PRESENTATIONS**

| Year | Event  |
|------|--|
| 2023 | Brain Public<br>“Our social responsibility for equitable climate action”   |
| 2022 | Climate Reality Project Orange County Chapter<br>“Climate communication and advocacy”  |
| 2022 | State Water Contractors Science Advisory Board<br>“Joining social and ecological approaches for invasive species management and wetland restoration in Suisun Marsh” |
| 2022 | Sustainable Living Fair ( <b>keynote address</b> )<br>“The power of sharing your climate story”  |
| 2022 | Irvine Councilman Larry Argan’s Earth Year Event<br>“Nudibranchs and climate change: community science in Orange County”   |
| 2022 | Delta Interagency Invasive Species Council<br>“Joining social and ecological approaches for invasive species management and wetland restoration in Suisun Marsh”     |
| 2022 | Interagency Ecological Program Annual Workshop<br>“ <i>Phragmites</i> invasion in tidal wetlands: community stress or climate refuge?”                               |
| 2022 | Science on Tap<br>“Socioecological approaches to climate solutions”  |
| 2021 | California Fish & Wildlife, Orange County Coastkeepers, LA Nature for All<br>“Orange County Oil Spill Communications Toolkit”  |
| 2020 | Suisun Adaptive Management Advisory Team<br>“ <i>Phragmites</i> stress impacting community function in Tule Red”   |
| 2020 | Suisun Resource Conservation District Landowner Meeting<br>“ <i>Phragmites</i> stress impacting community function in Tule Red”                                      |
| 2020 | Washington State University Wildlife Society<br>“How does environmental variation influence physiology in nearshore invertebrates?”                                  |

- 2020 Skype A Scientist (2 events, internationally)  
“Climate change effects on our oceans”
- 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?”

**SERVICE CONTRIBUTIONS**

| Year       | Organization   | Role   |
|------------|--|--|
| 2023-pres. | Orange City Council  | Sustainability Sub-Committee Member                        |
| 2021-pres. | Chapman University   | Search Committee Member (4 searches)                       |
| 2023       | Southern California Academy of Sciences                                      | Research Training Program<br>AAAS meeting faculty delegate |
| 2022-2023  | Council on Undergraduate Research: Scholars Transformed Through Research     | Faculty mentor   |
| 2022       | National Center for Faculty Development & Diversity: Faculty Success Program | Participant  |
| 2021-2022  | Women Editors in Ecology Round Table   | Participant  |
| 2021-pres. | Frontiers in Physiology Journal  | Peer Reviews Editor  |
| 2020       | Western Society of Naturalists   | Student Presentation Judge,<br>Session Moderator           |
| 2020       | “Asking Different Questions” Scholars, UC Davis Feminist Research Institute  | Participant  |
| 2020       | NSF “Organismal System-type Modeling Network” RCN                            | Participant, <b>*CANCELED FOR COVID-19</b>                 |
| 2020       | NSF “Genome-to-Phenome” RCN  | SICB Session Chair,<br>complementary session               |
| 2019       | NSF Reintegrating Biology Jumpstart Meeting                                  | Participant  |
| 2019-2021  | NSF “Evolving Seas” RCN  | Participant, <b>*CANCELED FOR COVID-19</b>                 |
| 2019-2022  | Society for Integrative and Comparative Biology                              | Student Presentation Judge                                 |

|                 |   |                     |
|-----------------|---|---------------------|
| 2018-2021       | National Network for Ocean and Climate Change Interpretation (NNOCCI), Boston, MA | Science Committee   |
| 2018            | Monterey Bay Aquarium, Monterey CA  | Exhibit advisor     |
| 2016-2018, 2021 | National Ocean Sciences Bowl, Washington D.C.                                     | Competition Judge   |
| 2017            | NNOCCI, Boston, MA  | Science Fellow      |
| 2016            | Exploratorium, San Francisco CA   | Exhibit advisor     |
| 2015            | womENST (undergraduate professional development series at USC)                    | Co-founder          |
| 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, Nature Climate Change, Evolutionary Applications, Journal of Applied Ecology, Biological Reviews, Journal of Evolutionary Biology, Physiology & Behavior, Hydrobiologia, Journal of Comparative Physiology A, Journal of Sea Research, Frontiers Physiology, Scientific Reports, and EvoDevo.*

#### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

| Year         | Organization   |
|--------------|--|
| 2015-2022    | Society for Integrative and Comparative Biology (SICB) |
| 2016-present | Society for Experimental Biology (SEB)                 |
| 2019-2020    | American Physiological Society (APS)                   |
| 2017-2018    | Graduate Women in Science                              |
| 2016-present | 500 Women Scientists                                   |
| 2014-present | Western Society of Naturalists (WSN)                   |
| 2014-present | Southern California Academy of Sciences (SCAS)         |
| 2014-present | Phi Beta Kappa Honor Society                           |
| 2013-present | American Academy of Underwater Sciences                |