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PROFESSIONAL PREPARATION	Organization	Degree	Date	Field of Study
	National Science Foundation – Ocean Sciences Division	Postdoctoral Fellow (2308398)	2023-2025	Physiological Ecology
	Florida State University	PhD	2023	Biological Science
	Florida State University	MSc	2023	Biological Science
	University of California Santa Barbara	BSc	2009	Aquatic Biology

APPOINTMENTS & POSITIONS		
2023-present	Postdoctoral Researcher, California Collaborative Fisheries Research Project, Moss Landing Marine Laboratories, Moss Landing CA USA	
2024-2026	Research Scientist, California Polytechnic University San Luis Obispo	
2012-2018	Staff Research Associate II, University of California Santa Barbara, Marine Science Institute, Carlsbad CA USA	
2010-2012	National Science Foundation Research Technician, California State University Northridge	

PRODUCTS	
1.	Spindel N.B. , Munstermann M., Karelitz S., Ferraro R., Pontier O., Collicutt B., Rolheiser K., Gimenez I., Cronmiller E., Foss M., Mahara N., Swezey D.S., Rogers-Bennett L., Okamoto D.K. <i>Contemporary ocean acidification and marine heatwaves shape individual energetics and rates of herbivory in a dominant ecosystem engineer. (In review)</i> Research Square Preprint
2.	Spindel N.B. , Galloway A.W.E., Schram J.B., McNeill G.D., Bellis S.K.V., Guujaaw N., Yakgujanaas J., Thompson M., Ferraro R., Lee L.C., Okamoto, D.K. <i>Biomarkers of recovery: characterizing trophic flow following ecological restoration. Journal of Applied Ecology.</i> 2026. 63, 4, e70355, doi: 10.1111/1365-2664.70355
3.	Spindel N.B. , Galloway A.W.E., Schram J.B., McNeill G.D., Bellis S.K.V., Guujaaw N., Yakgujanaas J., Pontier O., Thompson M., Lee L.C., Okamoto, D.K. <i>Consumer resilience suppresses the recovery of overgrazed ecosystems. Ecological Applications.</i> 2026. 36, 2, e70196, doi: 10.1002/eap.70196.
4.	Okamoto, D. K., Spindel, N. B. , Munstermann, M. J., Karelitz, S., Collicutt, B., Gimenez, I., Rolheiser, K., Cronmiller, E., Foss, M., Mahara, N., Swezey, D., Ferraro, R., Rogers-Bennett, L., Schroeter, S. C. Thermal suppression of gametogenesis can explain historical collapses in larval recruitment in <i>Strongylocentrotus purpuratus</i> . Nature Communication Biology 8, 1490, doi:10.1038/s42003-025-08829-8 (2025).
5.	N.B. Spindel , R.K. Walker, K. Chen, Y. Wang, C. White, B.I. Ruttenberg. 2025. Fishing the line or playing it safe? Spatial and temporal patterns of fishing effort in relation to dynamic closures. Within Using Outcomes of Marine Protected Area Implementation to Infer Potential Socioeconomic Consequences of Offshore Energy Development to Commercial Fisheries. U.S. Department of the Interior, Bureau of Ocean Energy Management.
6.	McCoy S.J., Pueschel C.M., Cornwall C.E., Comeau S., Kranz S.A., Spindel N.B. , Borowitzka M.A. <i>Calcification in the Coralline Red Algae: A Synthesis. Phycologia.</i> 2023. 62, 648-666, DOI:10.1080/00318884.2023.2285673.

7. **Spindel NB.** 2023. *Bioenergetic effects of abiotic drivers and food on dominant consumers and their consequences for coastal ecosystems*. The Florida State University ProQuest Dissertations & Theses. [Link](#)
8. L.C. Lee, C. Eppers, C. Houston, D.K. Okamoto, **Spindel, N.B.**, C. Brooks, G. Saunders, A.W.E. Galloway, J. Burton, M. Post. 2022. Gwaii haanas chiixuu tll iinasdll: nurturing seafood to grow – restoring the marine health of temperate rocky reef ecosystems in gwaii haanas national park reserve, national marine conservation area reserve, and haida heritage site. Final report. Skidegate, BC.
9. **Spindel N.B.**, Lee L, Okamoto D. Metabolic depression in sea urchin barrens associated with food deprivation. **Ecology**. 2021. [Link](#);
10. **Spindel N.B.**, Lee L, Okamoto D. "Zombies of the Nearshore: Metabolic Depression in Sea Urchin Barrens Associated with Food Deprivation". **The Bulletin of the Ecological Society of America**. [Link](#)
11. Lee L, Daniel McNeill G, Ridings P, Featherstone M, Okamoto D, **Spindel N.B.**, Galloway A, Saunders G, Adamczyk E, Reshitnyk L, Pontier O, Post M, Irvine R, Wilson G, Bellis S. Chiixuu Tll iinasdll: Indigenous Ethics and Values Lead to Ecological Restoration for People and Place in Gwaii Haanas. **Ecological Restoration**. 2021 [Link](#)
12. Elias M, Kandel M, Mansourian S, Meinzen-Dick R, Crossland M, Joshi D, Kariuki J, Lee L, McElwee P, Sen A, Sigman E, Singh R, Adamczyk E, Addoah T, Agaba G, Alare R, Anderson W, Arulingam I, Bellis S, Birner R, De Silva S, Dubois M, Duraisami M, Featherstone M, Gallant B, Hakhu A, Irvine R, Kiura E, Magaju C, McDougall C, McNeill G, Nagendra H, Nghi T, Okamoto D, Paez Valencia A, Pagella T, Pontier O, Post M, Saunders G, Schreckenberger K, Shelar K, Sinclair F, Gautam R, **Spindel N.B.**, Unnikrishnan H, Wilson G, Winowiecki L. *Ten people-centered rules for socially sustainable ecosystem restoration*. **Restoration Ecology**. 2021. [Link](#)
13. Comeau S, Edmunds P, **Spindel N.B.**, Carpenter R. Diel pCO₂ oscillations modulate the response of the coral *Acropora hyacinthus* to ocean acidification. **Marine Ecology Progress Series**. 2014. [Link](#)
14. Comeau S, Edmunds P, **Spindel N.B.**, Carpenter R. Fast coral reef calcifiers are more sensitive to ocean acidification in short-term laboratory incubations. **Limnology and Oceanography**. 2014 [Link](#)
15. Comeau S, Edmunds P, **Spindel N.B.**, Carpenter R. The responses of eight coral reef calcifiers to increasing partial pressure of CO₂ do not exhibit a tipping point. **Limnology and Oceanography**. 2013. [Link](#)
16. Annual Report of the Status of Condition C: Kelp Reef Mitigation. 2012-2018. San Onofre Nuclear Generating Station (SONGS) Mitigation Program. Submission to California Coastal Commission. (http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/index.html)

HONORS & AWARDS

• California Sea Grant Graduate Research Fellowship – Faculty Mentor	2026-2028
• National Science Foundation Ocean Sciences Postdoctoral Research Fellow (NSF OCE - 2308398)	2023-2025
• Smithsonian Institution Anthony Coates Postdoctoral Fellow – Smithsonian Tropical Research Institute, Panama. <i>*declined*</i>	2023
• CEO Award of Excellence, Excellence in Innovation, Parks Canada	2022
• Smithsonian Institution Predoctoral Fellow – Smithsonian Tropical Research Institute, Panama	2021
• Ben and Karen Thrower Award, FSU Department of Biological Science	2021
• Horace Loftin Award for Research in Neotropical Environments	
• Mote Research Assistantship, William R. and Lenore Mote Eminent Scholar in Marine Biology Endowment at FSU	2018, 2020-2021

• Phycological Society of America Grant-in-Aid of Research	2020
• Lamarr and Edith Trott Endowed Scholarship	2020
• Professional Association of Diving Foundation Research Grant	2019
• Academy of Underwater Arts and Sciences Zale Parry Scholarship	2018
• Kelp Forest Ecology Doctoral Fellowship, FSU	2018

CONFERENCES & PRESENTATIONS	2025	• <i>Fish density and size gradients reveal pervasive ‘fishing the line’ effects across the largest scientifically-designed network of marine protected areas.</i>	Western Society of Naturalists Conference
	2024	• <i>Impacts of closures, cost efficiency, habitat, and fish mobility on spatial patterns of fishing effort and targeted stock abundance.</i>	Western Society of Naturalists Conference
		1. <i>Ecophysiology of ecosystem engineers: bioenergetic effects of climate and food on dominant consumers and their consequences for coastal ecosystems.</i>	Invited Seminar – CSUMB Natural Science Seminar Series & MLML Seminar Series
	2023	2. <i>Biomarkers of recovery: a case study of how primary consumers assimilate and partition enhanced nutrition following kelp forest restoration.</i>	Western Society of Naturalists Conference
		1. <i>Quantifying benthic dietary shifts and their consequences for individual herbivore performance and population dynamics in a recovering kelp forest: a hybrid survey-biotracer approach.</i>	Benthic Ecology Meeting
		2. <i>Effects of high pCO₂ and oscillation versus static mean exposure on the bioenergetic thermal performance of the model sea urchin, <i>Strongylocentrotus purpuratus</i>.</i>	International Temperate Reef Symposium
		3. <i>Chiixuu Tll iinasdll: Indigenous and scientific leadership in kelp restoration builds connections and knowledge for people and place in Gwaii Haanas.</i>	International Temperate Reef Symposium
	2022	4. <i>Building an open-access lipid biomarker library for genetically-verified cryptic algae.</i>	Southeastern Phycological Colloquy
		1. <i>Effects of high pCO₂ and oscillation versus static mean exposure on the bioenergetic thermal performance of the model sea urchin, <i>Strongylocentrotus purpuratus</i>.</i>	Western Society of Naturalists Conference
	2021	2. <i>Adventures in Marine Biology</i>	Invited Lecture – FSU Marine Biology Honors Program
		1. <i>Individuality in ecosystems: scaling up present day and legacy environmental effects on individual level physiology and ecology in the sea.</i>	Invited Lecture – FSU Fellows Society
	2020	2. <i>Zombies of the nearshore: metabolic depression in sea urchin barrens associated with food deprivation.</i>	Western Society of Naturalists
		1. <i>Metabolic plasticity and resilience in consumptive</i>	Southeastern SACNAS

	<i>capacity in sea urchins.</i>	Regional Meeting
	2. <i>Calcification in the coralline algae: a synthesis and conceptual model.</i>	Ocean Sciences Meeting
2019	3. <i>Collaborative coastal marine habitat restoration within an indigenous co-management context in Gwaii Haanas, Haida Gwaii, Canada</i>	Western Society of Naturalists
2017	<i>Determining long-term biological performance of a large artificial reef in southern california: the wheeler north artificial reef.</i>	Western Society of Naturalists

MENTORING & TEACHING

2025	Co-Instructor Moss Landing Marine Laboratories (MLML) - MS285 Graduate Seminar: Selection, Convergence, and the Ecological Niche Co-Instructor MLML – MS 272 Subtidal Ecology Co-Instructor MLML – MS 203 Advanced Marine Ecology Co-Advisor for MLML Masters student, Kayla Vidal, thesis title “Bioenergetic impacts of warming, acidification, and hypoxia on reproduction and conservation aquaculture efficiency of the dominant nearshore grazer, <i>Strongylocentrotus purpuratus</i> ” Committee member for MLML Masters student Caroline Daley thesis title “Exploring the Foundations of California’s MPA Network” Co-mentor CSUMB UROC Fellow, Karla Buitrago-Yepes, senior capstone project on sea urchin microbiomics Consultant on quantitative ecology for MLML graduate students
2024	Mentor for National Science Foundation Research Experience for Undergraduates (NSF-REU). Supervised independent research project on population-specific phenotypic plasticity in response to upwelling in purple sea urchins, <i>Strongylocentrotus purpuratus</i> , (Julia Zapadka). Mentor for National Institute of Health Undergraduate Research Training Initiative for Student Enhancement (U-RISE). Supervised independent research project on the effects of temperature and food availability on the energetics of early life stage endangered sunflower sea stars, <i>Pycnopodia helianthoides</i> (Ahira Diaz).
2023-2025	Co-mentor for multiple graduate students at Moss Landing Marine Laboratories. Advised on quantitative methods and experimental design for theses on several subjects including spatiotemporal white shark distribution patterns (Kelsey Montalto, M.Sc. Student), rockfish ecophysiology (Dylan Sarish, Quinn Carey, Sam Perrello, Madison Sandquist, Bruno Mattioli - all M.Sc. Students), sea star ecophysiology (Haylee Bregoff, M.Sc. Student), sea urchin ecophysiology (Nicholas Kolasa-Lenarz, M.Sc. Student), and rockfish distribution modeling (Jake Todd, M.Sc. Student).
2023	Lead Teaching Assistant for Dr. Kevin Dixon - ZOO3141L Animal Diversity, upper division Biology Major course in FSU Department of Biological Science Teaching Assistant for Dr. Brittany Kraft - BSC2011L Biology 2 Lab
2022	Mentor for laboratory technician focused on lipid biochemistry, annual growth estimation using mark-recapture, and reproductive capacity assays using histology (technician: Rachele Ferraro).
2018-2021	Mentor for five students enrolled in Florida State University’s Undergraduate Research Opportunity Program (UROP). Supervised independent UROP research projects involving fatty acid biomarker analysis and annual growth estimation using mark-recapture (students: Sofia Perez Yudin, Isaiah Vsquez, Maria Nunez, Trevor Alspach, Anthony Cappellino).
2020	Teaching Assistant* for Dr. Kevin Dixon - ZOO3141L Animal Diversity, upper division Biology Major course in FSU Department of Biological Science
2019	Teaching Assistant* for Dr. Trisha Terebelski - ZOO3141L Animal Diversity, upper division Biology Major course in FSU Department of Biological Science *Average Supervisor Rating for Teaching Assistant Role: 4.75/5.0

	2013-2018	Mentor for 20 seasonal scientific diver technicians hired for the San Onofre Nuclear Generating Station Mitigation Monitoring Project to evaluate the ecological performance of the world's largest artificial kelp forest reef in relation to nearby natural reefs. Trained technicians in subtidal benthic survey methodology, research vessel operation, field identification of temperate rocky reef biota, and SQL-based relational database quality control.
CAMPUS & COMMUNITY SERVICE	2025	Research Affiliate Representative to MLML Diving Control Board
	2024-2025	Fellow in the American Geophysical Union's (AGU) Leadership Academy and Network for Diversity and Inclusion in the Geosciences.
	2020-2023	- Member of Diversity Equity and Inclusion Committee at Florida State University. Led an initiative to evaluate and reform undergraduate compensation for research in the FSU Biology Department as a means of promoting equity. - Elected Student Representative to FSU Diving Control Board
	2020	Elected Liaison to Faculty for Ecology and Evolution graduate students in the FSU Biology Department.
	2019-2023	Assisted with instruction of FSU Scientific Diving Course
	2010-2018	Marine Biologist/Collector at Agua Hedionda Lagoon Foundation Discovery Center in Carlsbad, California

SKILLS

Laboratory

- Lipid and fatty acid (FA) extraction and quantitative analysis using data from a gas chromatograph – mass spectrometer. Emphasis on the application of FA biomarkers to make inferences about food web dynamics as well as to better understand biochemical modification of FAs during the process of tissue building.
- Aquatic respirometry
- Acoustic telemetry technology for movement ecology.
- Carbonate chemistry analysis and manipulation. Emphasis on the role of carbonate chemistry in global change biology.
- Marine calcification assays including buoyant weight and alkalinity anomaly.
- Demonstrated working knowledge of reef fish, invertebrate, and algal taxonomy.
- Dissection, general anatomy, and taxonomic classification of various aquatic animal phyla.
- Experimental aquarium design, construction, and husbandry.
- Operation of machine shop tools and custom fabrication.
- Advanced microscopy.

Scientific Diving & Boating

- Research Affiliate Representative to MLML Diving Control Board
- Graduate Student Representative to Florida State University Diving Control Board
- American Academy of Underwater Sciences (AAUS): 1100+ Scientific Dives logged; 100 ft depth rating; Lead Diver on multiple temperate and tropical dive plans; high proficiency in range of challenging conditions including low visibility, high current, high surge, cold water (drysuit).
- SSI Specialty Diver: NITROX
- NAUI Specialty Diver: Reef Check California
- PADI Open Water Certification
- DAN Diving First Aid/CPR/O2 Administration for Professional Divers Certified
- Extensive field operations using small research craft (19-26ft) and skiffs (15ft) working in

both temperate and tropical environments.

Computation

- Statistics, procedural programming, and data visualization: R, JMP, SAS, and Matlab.
 - Productivity: Microsoft Office and comparable Mac software.
 - Dynamic OOP-style web application development: PHP, MySQL, HTML, CSS, JS
 - Collaborative coding: Subversion, GitHub
 - Relational database management: MySQL, PostgreSQL
 - Automation: PHP-based unit testing for granular QA/QC for millions of rows of data
 - Geographic Information System: QGIS, ArcGIS Pro
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