

# Zechariah Meunier

COASTAL ENVIRONMENTS • QUANTITATIVE ECOLOGY

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## Education

**Oregon State University, Corvallis, OR** 2017 – 2023  
PhD in Integrative Biology, PhD minor in Statistics  
Advisors: Sally Hacker and Bruce Menge

**Lawrence University, Appleton, WI** 2011 – 2015  
BA in Biology and Environmental Studies (double major), *summa cum laude*  
Ecology Honors Thesis, *summa cum laude* Advisor: Alyssa Hakes

## Professional Appointments

**Postdoctoral Research Associate** 2023 – 2024  
College of Earth, Ocean, and Atmospheric Sciences, Oregon State University, Corvallis, OR  

- Developing R and Julia packages for scientific machine learning (SciML) methods as part of NSF-funded cyberinfrastructure project
- Applying SciML methods to predict regime shifts in marine ecosystems

**Graduate Teaching Assistant** 2022 – 2023  
Department of Integrative Biology, Oregon State University, Corvallis, OR 2018 – 2019  

- Taught introductory biology labs, marine biology lab and field methods, and statistical analyses
- Presented lectures and graded quizzes, media, presentations, lab reports, and research projects

**National Science Foundation Graduate Research Fellow** 2019 – 2022  
Department of Integrative Biology, Oregon State University, Corvallis, OR  

- Designed, installed, and monitored field experiments in rocky intertidal habitats; processed lab samples
- Analyzed population, community, and ecosystem data using a variety of statistical methods
- Wrote manuscripts; presented findings at local, regional, national, and international conferences

**Provost's Distinguished Graduate Fellow** 2017 – 2018  
Department of Integrative Biology, Oregon State University, Corvallis, OR  

- Conducted field experiments and observational studies in rocky intertidal habitats
- Evaluated marine protected area commitments for level of protection and stage of establishment

**Technical Services Analyst** 2015 – 2017  
Epic Systems Corporation, Verona, WI  

- Provided onsite software support to front desk staff, technologists, and radiologists at inpatient and outpatient facilities in 12 health care systems including Johns Hopkins Hospital, Stanford Cancer Center, and Brigham and Women's Hospital
- Offered long-term technical support to IT teams at three health care systems; assisted with teaching, troubleshooting, implementing workflows, and configuring and upgrading software
- Organized and developed the Radiant Technical Services new hire training curriculum

## Publications

Undergraduate student mentee

### Journal Articles

4. **Meunier ZD**, Hacker SD, and Menge BA. [Accepted](#). Regime shifts in rocky intertidal communities associated with a marine heatwave and disease outbreak. *Nature Ecology & Evolution*
3. Cameron NM, Scrosati RA, Valdivia N, and **Meunier ZD**. 2024. Global taxonomic and functional patterns in invertebrate assemblages from rocky-intertidal mussel beds. *Scientific Reports* 14:26. <https://doi.org/10.1038/s41598-023-50549-8>

2. Grorud-Colvert K, Constant V, Sullivan-Stack J, Dziedzic K, Hamilton SL, Randell Z, Fulton-Bennett H, **Meunier ZD**, Bachhuber S, Rickborn AJ, Spiecker B, and Lubchenco J. 2019. High-profile international commitments for ocean protection: Empty promises or meaningful progress? *Marine Policy* 105:52-66. <https://doi.org/10.1016/j.marpol.2019.04.003>
1. Hakes AS and **Meunier ZD**. 2018. Nonhost neighborhood increases biocontrol weevil damage to the nontarget, federally threatened Pitcher's thistle (*Cirsium pitcheri*). *Global Ecology and Conservation* 13:e00376. <https://doi.org/10.1016/j.gecco.2018.e00376>

### Encyclopedia Entries

2. Menge BA, Tonra KJ, Bachhuber SM, Feezell MK, Fulton-Bennett HK, **Meunier ZD**, Freidenburg TL, and Iles AC. 2024. Keystone Species in Scheiner, SM (ed.) *Encyclopedia of Biodiversity 3rd edition*, vol. 5, pp. 133-151. Oxford: Elsevier. <http://dx.doi.org/10.1016/B978-0-12-822562-2.00143-2>
1. **Meunier ZD**. 2023. The Blob: Impacts of the 2013-2016 Marine Heatwave on Oregon in *The Oregon Encyclopedia*. <https://www.oregonencyclopedia.org/articles/the-blob-of-2015/>

### Manuscripts in Preparation

**Meunier ZD**, Scrosati RA, Ellrich JA, and Menge BA. Interoceanic comparison of benthic-pelagic coupling along rocky coasts of the northeast Pacific and northwest Atlantic.

**Meunier ZD**, Miksell LL, Van Belle EM, Menge BA, and Hacker SD. Predation pressure modifies the sign and strength of interactions between rocky intertidal foundation species.

### Awards & Honors

McCarter Graduate Student Policy Award	Ecological Society of America	2021
Phi Beta Kappa	Lawrence University	2015
Dean's List	Lawrence University	2011 – 2015
Herpetology 1 <sup>st</sup> Place	Science Olympiad National Tournament	2008

### Grants Funded

Grant Title	PI and co-PIs	Agency	Years (\$)
Do tipping points loom? Extending 20+ years of long-term monitoring to assess impacts of climate change on rocky shore macrophyte assemblages	<u>Menge</u> , Fulton-Bennett, Gravem, Meunier	Oregon Ocean Science Trust	2023 – 2025 (\$190,422)
Detecting early warning signals of intertidal algae critical transitions	<u>Meunier</u> , Menge, Hacker	Phycological Society of America	2021 (\$1,950)
Interoceanic comparison of upwelling conditions, surf zone hydrodynamics, and benthic-pelagic coupling between Oregon and Nova Scotia	<u>Meunier</u> , Menge, Scrosati	Sigma Xi	2019 (\$750)
Oceanographic drivers of supply-side ecology in rocky intertidal ecosystems of Oregon and Nova Scotia	<u>Meunier</u> , Menge, Scrosati	IB Dept., Oregon State University	2019 (\$300)

### Fellowships & Scholarships

#### Fellowships

Graduate Research Fellowship, National Science Foundation	\$138,000	2019 – 2022
Provost's Distinguished Graduate Fellowship, Oregon State University	\$32,000	2017 – 2018

### Research & Travel Awards

Student Travel Award, College of Science, Oregon State University	\$500	2022
Summer Research Assistantship, Biology Dept., Lawrence University	\$3,600	2014
Summer Research Assistantship, Biology Dept., Lawrence University	\$3,500	2013

### Selective Scholarships

Udall Environmental Scholarship, Udall Foundation	\$5,000	2014
Gilman International Scholarship, Institute of International Education	\$4,500	2013
Wriston Scholarship, Lawrence University	\$15,000	2012
Warch Honor Scholarship, Lawrence University	\$60,000	2011
National Merit Scholarship, Lawrence University	\$8,000	2011

### Invited Presentations

School of Computing and Information Sciences Seminar, Willamette University (Salem, OR) Detecting marine heatwaves and analyzing their impacts on Caribbean coral reefs	2024
Mathematical Biology Seminar, Oregon State University (Corvallis, OR) Forecasting coral reef dynamics using scientific machine learning	2024
New Directions in Coastal Science & Management, Oregon Shores Conservation Coalition (Virtual) Assessing the vulnerability of rocky intertidal communities to marine heatwaves	2023
PhD Defense Seminar, Department of Integrative Biology, Oregon State University (Corvallis, OR) The roles of recruitment, species interactions, and oceanographic context in structuring rocky intertidal communities of the Pacific Northwest and Atlantic Canada	2023
College of Fisheries and Ocean Sciences Seminar, University of Alaska (Fairbanks, AK) Evidence of regime shifts? Measuring changes in rocky intertidal community structure associated with a marine heatwave and sea star wasting disease	2023
Young Scientists & Wave Makers Webinar, Cape Perpetua Marine Reserve Collaborative (Virtual) Changing ocean conditions have local impacts: Effects of the NE Pacific marine heatwave and sea star wasting disease on rocky intertidal communities	2023
Nature Matters Seminar, Lewis and Clark National Historical Park & North Coast Watershed Association (Astoria, OR) Drivers of change in rocky intertidal communities	2022
CoastWatch Webinar, Oregon Shores Conservation Coalition (Virtual) Exploring Oregon's rocky intertidal habitats	2020
Biology Department Seminar, St. Francis Xavier University (Antigonish, NS) Benthic-pelagic coupling in rocky intertidal meta-ecosystems of Oregon and Nova Scotia	2019
Mathematical Biology Seminar, Oregon State University (Corvallis, OR) Multidimensional methods to assess rocky intertidal community succession	2018
Study Abroad Funding Workshop, Lawrence University (Appleton, WI) Gilman scholarships to study and intern abroad	2016
Research Symposium, Centre ValBio & University of Antananarivo (Madagascar) Climatic drivers of tree phenology in Ranomafana National Park	2013

### Contributed Presentations

Association for the Sciences of Limnology and Oceanography Meeting (Madison, WI) Forecasting coral reef dynamics using scientific machine learning	2024
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<b>Coastal &amp; Estuarine Research Federation Conference (Portland, OR)</b> Interoceanic comparison of benthic-pelagic coupling along rocky coasts of Nova Scotia and Oregon	2023
<b>SACNAS National Diversity in STEM Conference (Portland, OR)</b> Interoceanic comparison of marine subsidy delivery along rocky coasts of Nova Scotia and Oregon	2023
<b>Ecological Society of America Meeting (Portland, OR)</b> Interoceanic comparison of benthic-pelagic coupling along rocky coasts of Nova Scotia and Oregon	2023
<b>State of the Coast: Oregon's Coastal Conference (Newport, OR)</b> Regime shifts in rocky intertidal communities associated with a marine heatwave and disease outbreak	2022
<b>Ecological Society of America – Canadian Society for Ecology &amp; Evolution Meeting (Montreal, QC)</b> Regime shifts in rocky intertidal communities associated with a marine heatwave and disease outbreak	2022
<b>Ecological Society of America Meeting (Virtual)</b> Hindsight in 2020: Using past community states to predict future community structure in rocky intertidal succession	2020
<b>Western Society of Naturalists Meeting (Tacoma, WA)</b> Cross-continental comparison of cooling events in Oregon and Nova Scotia	2018
<b>BioFest, Lawrence University (Appleton, WI)</b> Flowers in space attacked by aliens: Understanding the spatial ecology behind the devastating damage by a thistle bud weevil on Pitcher's thistle at Whitefish Dunes State Park, WI	2015

## Teaching

### Graduate Teaching Assistant, Oregon State University

<b>BI 450. Marine Biology and Ecology</b> Lecture, lab, and field: 28 students	Sp 2023
<b>BI 102. Animal Biology: Genes, Behavior, and Evolution of Life</b> E-campus: 146 students	Wi 2023
<b>BI 101. Environmental Biology: Ecology, Conservation, and Global Change</b> On-campus: 318 students, E-campus: 103 students	Fa 2022
<b>BI 450. Marine Biology and Ecology</b> Lecture, lab, and field: 27 students	Sp 2019
<b>BI 212. Principles of Biology: Structure and Function from Cells to Organisms</b> Lab: 80 students	Wi 2019
<b>BI 211. Principles of Biology: Diversity of Life</b> Lab: 80 students	Fa 2018

### Guest Lecturer, Oregon State University

<b>BI 351. Marine Ecology</b>	Wi 2023
<b>BI 450. Marine Biology and Ecology</b>	Sp 2020, Sp 2021

### Lab Assistant, Lawrence University

<b>BIOL 330. Aquatic Ecology</b>	Fa 2014
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## Advising & Mentorship

### Undergraduate Students Supervised

<b>Rana Almassmoum</b>	<b>URSA Engage</b>	<b>2022 – 2023</b>
<ul style="list-style-type: none"> <li>Presented poster “How can mussels increase habitat complexity and promote macroinvertebrate richness, abundance, and diversity?” at 2023 SACNAS National Diversity in STEM Conference and 2023 Celebrating Undergraduate Excellence</li> </ul>		
<b>Lily Miksell</b>	<b>Summer Undergraduate Research Experience, Work Study</b>	<b>2020 – 2022</b>
<ul style="list-style-type: none"> <li>Presented talk “The influence of surfgrasses on mussel mortality” at 2020 Summer Undergraduate Research Symposium</li> </ul>		
<b>Emily Van Belle</b>	<b>Summer Undergraduate Research Experience, URSA Engage</b>	<b>2020 – 2022</b>
<ul style="list-style-type: none"> <li>Presented talk “The co-occurrence of ecosystem engineers: Do foundation species interact in rocky intertidal ecosystems?” at 2021 Summer Undergraduate Research Symposium</li> <li>Presented talk “From outer space to the intertidal: Using satellite data to investigate connections between oceans and rocky shores” at 2021 Celebrating Undergraduate Excellence</li> </ul>		
<b>Emily Cook</b>	<b>URSA Engage</b>	<b>2021 – 2022</b>
<ul style="list-style-type: none"> <li>Presented poster “How marine heatwaves affect ecological subsidies” at 2022 Celebrating Undergraduate Excellence</li> </ul>		
<b>Elyse Shanley</b>	<b>URSA Engage</b>	<b>2021 – 2022</b>
<ul style="list-style-type: none"> <li>Presented poster “The impact of surf zone hydrodynamics on the delivery of barnacles to rocky intertidal communities” at 2022 Celebrating Undergraduate Excellence</li> </ul>		
<b>Kerry Jacobs</b>	<b>URSA Engage</b>	<b>2020 – 2021</b>
<ul style="list-style-type: none"> <li>Presented talk “Testing the intermittent upwelling hypothesis using chlorophyll <i>a</i> and particulate organic carbon on the Oregon and Nova Scotia coasts” at 2021 Celebrating Undergraduate Excellence</li> </ul>		

### Advising

1 PhD student	<b>Peer Mentor, Integrative Biology Graduate Mentoring Program</b>	<b>2020 – 2021</b>
25 undergrads	<b>Gilman Alumni Ambassador, Institute of International Education, U.S. Department of State</b>	<b>2015 – 2016</b>

## Science Education & Communication

### Science Olympiad (B = middle school students, C = high school students)

Ecology, Event Supervisor, B & C	State Tournament, Portland, OR	<b>2024</b>
Green Generation, Event Supervisor, B & C	State Tournament, Portland, OR	<b>2023</b>
Experimental Design, Event Supervisor, C	State Tournament, Portland, OR	<b>2023</b>
Write It, Do It, Event Supervisor, C	State Tournament, Portland, OR	<b>2023</b>
Green Generation, Event Supervisor, B	State Tournament, Fairbanks, AK	<b>2023</b>
Experimental Design, Event Supervisor, B	State Tournament, Fairbanks, AK	<b>2023</b>
Ornithology, Event Supervisor, B & C	State Tournament, Eugene, OR	<b>2022</b>
Ornithology, Event Supervisor, B & C	State Tournament, Virtual, OR	<b>2021</b>
Herpetology, Event Supervisor, B & C	State Tournament, Corvallis, OR	<b>2019</b>
Herpetology, Event Supervisor, B & C	State Tournament, Corvallis, OR	<b>2018</b>
Ecology, Event Supervisor, C	Invitational Tournament, Slinger, WI	<b>2017</b>
Green Generation, Event Supervisor, C	Regional Tournament, Madison, WI	<b>2016</b>
Robot Arm, Event Supervisor, C	Regional Tournament, Milwaukee, WI	<b>2016</b>
Green Generation, Event Supervisor, C	Invitational Tournament, Boyceville, WI	<b>2015</b>
Forestry, Event Supervisor, B & C	Invitational Tournament, Boyceville, WI	<b>2011</b>
Ornithology, Assistant Event Supervisor, C	National Tournament, Madison, WI	<b>2011</b>

### National Ocean Sciences Bowl

Scorekeeper	Salmon Bowl, Corvallis, OR	<b>2019</b>
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### Community Outreach

Science Discovery Days	Oregon State University, Corvallis, OR	<b>2022</b>
Plant conservation workshops	Department of Natural Resources, Door County, WI	<b>2013</b>

## Professional Service

### Conferences

**AV Support and Moderator**, Various Sessions, ESA Meeting 2023

**Co-organizer and Moderator**, Organized Oral Session, ESA & CSEE Meeting 2022

Drivers of change in coastal community structure and function

### Departmental Committees

Graduate Curriculum Task Force, Oregon State University 2021 – 2022

Search Committee for Seasonal Research Technicians, Oregon State University 2021

Search Committee for Assistant Professor of Biology (microbiology), Lawrence University 2013

Search Committee for Assistant Professor of Biology (plant ecology), Lawrence University 2012

### Peer Review

*PLOS ONE* (1 manuscript) 2024

*Marine Pollution Bulletin* (1 manuscript) 2023

*Scientific Reports* (2 manuscripts) 2020, 2022

### Organization Leadership

**President**, Science Policy Club, Oregon State University 2020 – 2021

**Treasurer**, Integrative Biology Graduate Student Association, Oregon State University 2018 – 2021

### Funding Review

**Alumni Representative**, Marshall Scholarship Foundation Selection Committee 2016 – 2017

## Certifications & Skills

**Scuba Diving** AAUS Scientific Diver, NAUI Master Diver, NAUI Dry Suit Diver, PADI Rescue Diver, TDI Nitrox Diver, Reef Check Oregon – Kelp Forest Monitoring

**Programming** R, Julia, Markdown, Caché ObjectScript (M), SQL, LaTeX, ArcGIS

**Emergency** CPR and First Aid, Oxygen Administration

## References

**Sally Hacker** Professor, Department of Integrative Biology, Oregon State University  
[hackers@oregonstate.edu](mailto:hackers@oregonstate.edu)

**Bruce Menge** Distinguished Professor, Department of Integrative Biology, Oregon State University  
[mengeb@oregonstate.edu](mailto:mengeb@oregonstate.edu)

**Ricardo Scrosati** Professor, Department of Biology, St. Francis Xavier University  
[rscrosat@stfx.ca](mailto:rscrosat@stfx.ca)

**James Watson** Associate Professor, College of Earth, Ocean, and Atmospheric Sciences, Oregon State University  
[james.watson@oregonstate.edu](mailto:james.watson@oregonstate.edu)