# MAURICE GOODMAN

Marine Ecology & Biogeography

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Maurice-Goodman


## SUMMARY


As a Research Scientist with the UW Punt lab and NOAA Alaska Fisheries Science Center, my work uses a variety of statistical and computational approaches to examine climate impacts on population and predator-prey dynamics in coastal marine systems to inform conservation and fisheries management. Prior to my current role, I earned my PhD at Stanford's Hopkins Marine Station and worked as a data analyst and field technician for community ecology and behavioral ecology labs at Cal Poly, San Luis Obispo. I'm also passionate about teaching, community outreach and engagement, and open science practices.


## EDUCATION

2024 **PhD, Biology** — **Stanford University**
Committee: Giulio De Leo, Fiorenza Micheli, Elliott Hazen, Stephanie Brodie, Barnabas Daru

2017 **BS, Biological Sciences, Cum Laude** — **California Polytechnic State University SLO**
Concentration in Marine Biology, Minor in Statistics

## PUBLICATIONS

2025 **Goodman, M.C.** et al. *Climate covariate choice and uncertainty in projecting species range shifts: a case study in the Eastern Bering Sea.* Fish and Fisheries. doi.org/10.1111/faf.12875

2024 **Goodman, M.C.** et al. *Reef shark population declines on remote Pacific reefs: Inferences from multiple methods in a data-limited fishery.* Marine Ecology Progress Series. doi.org/10.3354/meps14746

—— Kumagai, J., **Goodman, M.C.**, et al. *Trophic cascades in marine protected areas promote resilience of kelp forests to marine heatwaves.* Global Change Biology. doi.org/10.1111/gcb.17620

—— Gissi, E., **Goodman, M.C.**, et al. *Sex-based species interactions matter in ecological communities.* Trends in Ecology and Evolution. doi.org/10.1016/j.tree.2024.07.006

—— Rempel, H.S. et al. *Ecological drivers of parrotfish coral predation vary across spatial scales.* Marine Ecology Progress Series, 740:145-160. doi.org/10.3354/meps14633

2023 Faiad, S.M., Williams, M.A., **Goodman, M.**, et al. *Temperature affects predation of schistosome-competent snails by a novel invader, the marbled crayfish Procambarus virginalis.* PLoS One, 18(9). doi.org/10.1371/journal.pone.0290615

2022 Andrzejaczek, S., Lucas, T., **Goodman, M.**, et al. *Diving into the vertical dimension of elasmobranch movement ecology.* Science Advances, 8(33). doi.org/10.1126/sciadv.abo1754

—— **Goodman, M.C.** et al. *Shifting fish distributions impact predation intensity in a sub-Arctic ecosystem.* Ecography, doi.org/10.1111/ecog.06084

—— McCalla, L.B. et al. *Effectiveness of a Constructed Wetland with Carbon Filtration in Reducing Pesticides Associated with Agricultural Runoff.* Archives of Environmental Contamination and Toxicology, doi.org/10.1007/s00244-021-00909-0

2021 O'Leary, J.K., **Goodman, M.C.**, Walter, R.K., Willits, K., Pondella, D.J., & Stephens, J. *Effects of Estuary-Wide Seagrass Loss on Fish Populations.* Estuaries and Coasts, doi.org/10.1007/s12237-021-00917-2

2020 O'Leary, J.K., **Goodman, M.**, Tuda, A., Machumu, M., & West, L. *Opportunities and challenges in achieving co-management in marine protected areas in East Africa: a comparative case study.* Journal of the Indian Ocean Region, 16(3). doi.org/10.1080/19480881.2020.1825201

2019 Hart, L., **Goodman, M.C.**, Walter, R.K., Rogers-Bennett, L., Shum, P., Garrett, A.D., Watanabe, J.M., & O'Leary, J.K. *Abalone recruitment in low-density and aggregated populations facing climatic stress.* Journal of Shellfish Research, 39(2), 359-373. doi.org/10.2983/035.039.0218

**Goodman, M.C.**, Hannah, S.M., & Ruttenberg, B.I. *The relationship between geographic range extent, sea surface temperature, and adult traits in coastal temperate fishes.* Journal of Biogeography, 46(7), 1438-1450. doi.org/10.1111/jbi.13595

## OTHER RESEARCH WORKS

NMFS Stock Assessment — Kineen, M., **Goodman, M. C.** et al. (2025) *Status of widow rockfish stock off the U.S. West Coast in 2025.* Pacific Fishery Management Council, Portland, Oregon. pam.pcouncil.org

Book Chapter — O'Leary, J.K., Bockman, E.E., **Goodman, M.**, Grimsditch, G., Madej, M.A., Mohammed, A., & Tyburczy, J. (2024). *Conserving and Managing Estuaries during Climate Change. In Book: Climate Change and Estuaries.* doi.org/10.1201/9781003126096

Manuscript — Lippert, M., **Goodman, M.C.**, Adams, N. (2021). *Comparative effects of Chemical and Physical Sunscreen on Fertilization of Purple Sea Urchins (Strongylocentrotus purpuratus).* Cal Poly Digital Commons, digitalcommons.calpoly.edu/biosp/44

Technical Report — O'Leary, J.K., Tuda, A., Machumu, M., Nyunja, J., & **Goodman, M.C.** (2017). *Technical report to the Western Indian Ocean Marine Science Association. Developing a model for strategic adaptive management of MPAs in the Western Indian Ocean.* 34 pp.

## PROFESSIONAL EXPERIENCE

2024-Present — **Research Scientist III** — **University of Washington / NOAA AFSC (Affiliate)**
Currently conducting projects aimed at advancing climate-adapative fisheries management objectives for eastern Bering Sea fisheries, including by incorporating species range shifts into multispecies and ecosystem modeling approaches in operational use. Oversee and contribute to multiple projects as part of the interdisciplinary Alaska Integrated Climate Modeling (ACLIM) project and Changing Ecosystems and Fisheries Initiative (CEFI). Primary Investigators: Andre Punt (UW), Kirstin Holsman (NOAA AFSC).

2022-2024 — **Independent Contractor** — **University of Washington**
Built species distribution models for a suite of eastern Bering Sea groundfish and crab species as part of ACLIM. Produced species range and spatial overlap projections under multiple earth systems models. Created an R "Shiny" based web app for navigating outputs (mgoodman.shinyapps.io/aclim2_sdms_explorer). Partial research outputs published in Fish & Fisheries (2025).

2022 — **Independent Contractor** — **Granite Canyon Marine Labs**
Analyzed data from experiments aimed at reducing wetland agricultural runoff. Produced figures and contributed to writing of peer-reviewed manuscript summarizing results.

2017-2018 — **Data Analyst & Field Technician** — **California Sea Grant**
Responsible for the analysis, management, and visualization of ecological and social data from Tanzania, Kenya, and Morro Bay, California in the lab of Dr. Jennifer O'Leary. Assisted with writing reports and manuscripts. Full-time.

2016-2018 Summer — **Research & Dive Technician** — **Cal Poly SLO**
Worked alongside Dr. Ben Ruttenberg to conduct benthic surveys and fish follows on SCUBA to characterize coral community and document parrotfish feeding behavior in St. Croix, USVI. Responsible for entering and managing photo, video, and GPS data, and for gear and boat maintenance. Seasonal.

2016, 2018 — **Aquarist** — **Central Coast Aquarium**
Assisted in managing, training and mentoring volunteers and interns in the husbandry department. Maintained all tanks and systems, collected and acclimated new animals, curated exhibits, and regularly monitored water quality. Part-Time.

## TEACHING EXPERIENCE

2022, 2024 **Instructor** **BIO / OCEANS 143: Quantitative Ecology**
Developed and taught 3 weeks of labs and lectures based on material I designed for the previous years' course (see below), focusing on frequentist parameter estimation and species distribution modeling. Assisted students with labs and assignments and graded student submissions.

2021 **Co-Instructor** **BIOS 207: Software Engineering for Science**
Co-developed materials for teaching software development concepts (code documentation, version control, modular programming, testing and validation) for "Just Enough Software Engineering for Science" short course. Led discussions, assisted students with programming challenges, and evaluated student assignments.

—— **Teaching Assistant** **BIOHOPK 143H: Quantitative Ecology**
Designed and taught 3 weeks of labs and lectures on parameter estimation for nonlinear and dynamic models using frequentist and Bayesian principles, as well as species distribution modeling with GAMs (github.com/mcgoodman/quant-eco-2021). Assisted students in learning material taught by other course instructors, held weekly office hours, and assisted students in designing and executing final projects. Awarded Stanford School of Humanities and Science's "Centennial" Teaching Award and Stanford Biology's "Excellence in Teaching" Award.

2019 **Teaching Assistant** **BIO 85: Evolution**
Co-developed lesson plans, teaching materials, homework assignments and tests. Led a section where students reviewed and reinforced material from lecture, held weekly office hours, and graded student assignments. Awarded Stanford Biology departments "Excellence in Teaching" Award.

2017 **Teaching Assistant** **ZOO 336: Invertebrate Zoology**
Prepared lab specimens and activities for class, collected new specimens, demonstrated lab methods and dissections to students, and assisted students with lab and field activities.

## OUTREACH, LEADERSHIP, & SERVICE

2022 - 2023 **President** **Hopkins Marine Station Graduate Student Association**
Engaged the graduate student community in multiple community-building initiatives, including organizing inclusivity trainings, social events, and graduate student retreats, representing grad students to Dean and Hopkins faculty and administrative and DEI meetings, and obtaining funds to renovate grad student work & social spaces. Previously served as webmaster for graduate student association (Fall 2019 - Summer 2021).

2020-2022 **Student Liaison** **MARINE**
Served for two academic years as Hopkins Marine Station's liaison for Monterey Area Research Institutions' Network for Education (MARINE), an organization of marine science students and early career researchers from seven academic institutions in the Monterey Bay area. Planned networking, social, and community service events.

2016-2017 **Founder & Vice President** **Cal Poly Marine Science Club**
Founded and co-lead the Cal Poly Marine Science Club. Organized, planned, and lead events and meetings; managed social media and outreach.

2014-2018 **Husbandry & Outreach Volunteer** **Central Coast Aquarium (Non-Profit)**
Assisted with husbandry tasks such as maintenance of tanks, acclimation of fishes, treatment of diseased fishes, curation of exhibits, preparation of diets, and training of new volunteers. Frequently gave talks and tours to the public, taught grade school programs, and participated in outreach and fund raising. **Over 800 hours volunteered.**

## FELLOWSHIPS, HONORS, & AWARDS

2022-2024 **Graduate Scholar** 50% Tuition & Salary support **Stanford Data Science**

2022 **Research Grant** $6,500 **Friends of Hopkins Marine Station**

—— **Research Grant** $1,800 **Myers Oceanographic & Marine Biology Trust**

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| 2021 | **Excellence in Teaching Award** | **Stanford Department of Biology** |
| —— | **Centennial Teaching Award** | **Stanford School of Humanities & Sciences** |
| 2019-2023 | **Graduate Research Fellowship** Tuition & Salary Support | **National Science Foundation** |
| 2014-2016 | **President's List** | **Cal Poly College of Science & Mathematics** |
| 2016 | **Summer Research Scholarship** $2,500 | **William & Linda Frost Foundation, Cal Poly SLO** |
| —— | **Undergraduate Research Grant** $500 | **CSU COAST** |

## INVITED PRESENTATIONS

2025 Are the impacts of species range shifts on species interactions and ecosystem dynamics predictable? University of Washington School of Aquatic and Fishery Sciences, Quantitative Seminar Series **Talk**

2024 Climate-driven species range shifts restructure predator-prey interactions at population scales. Florida State University, Ecology and Evolution Seminar Series. **Talk**

—— Incorporating local responses to regional change into Bering Sea range projections. Lowell Wakefield Fisheries Symposium. **Talk**

## CONTRIBUTED PRESENTATIONS

2025 Joint estimation of environmental effects and ecosystem dynamics with EcoState and dynamic structural equation models. Western Society of Naturalists. **Talk**

2024 Ecological impacts of climate-driven species range shifts: Inference from multiple methods in the Bering Sea. Stanford Sustainability Data Science. **Talk**

—— Climate Impacts on Predator-Prey Interactions: implications for Bering Sea fisheries. Stanford Resilient Pacific. **Talk**

—— Forecasting predator-prey overlap for climate-ready fisheries management in the Bering Sea. World Fisheries Congress. **Talk**

2023 Forecasting predator-prey overlap for climate-ready fisheries management in the Bering Sea. Western Society of Naturalists. **Talk**

—— Shifting fish distributions impact predator-prey interactions in the Eastern Bering sea. Alaska Marine Science Symposium. **Talk**

—— Global shark fin demand, small-scale fisheries, and reef sharks: A case study in the Northern Line Islands. Stanford Data Science Conference. **Talk**

2022 Shifting fish distributions impact predation intensity in a sub-Arctic ecosystem. Ocean Sciences Meeting. **Talk**

2021 International market demand drives a small-scale Central Pacific reef shark fishery towards collapse. Western Society of Naturalists. **Talk**

2020 Ecological consequences of climate induced changes in spatial overlap between Eastern Bering Sea walleye pollock and their predators. Western Society of Naturalists. **Talk**

2017 The Relationship Between Geographic Range Extent and Adult Traits in Coastal Temperate Fishes. Western Society of Naturalists. **Talk**

—— The Relationship Between Geographic Range Extent and Adult Traits in Coastal Temperate Fishes. Cal Poly Annual Student Research Symposium. **Talk**

—— Long–Term Monitoring of Sea Urchin Settlement Along the California Coast. Cal Poly Annual Student Research Symposium. Poster

—— The Relationship Between Geographic Range Extent and Adult Traits in Coastal Temperate Fishes. Central Coast Wildlife Society Annual Wildlife Symposium. Talk

2016 The Relationship Between Geographic Range Extent and Adult Traits in Coastal Temperate Fishes. Western Society of Naturalists. Poster

## FIELD RESEARCH

2023 **NOAA Alaska Fisheries Science Center** **Bering Sea Bottom Trawl Survey**
Volunteered on a three week survey leg sorting, sexing, and lengthing specimens as part of the annual Eastern Bering Sea bottom trawl survey which collects data needed for stock assessments and other management models. Lead stomach collection for food habits analysis.

2019-2023 **Stanford Hopkins Marine Station** **Various Projects**
**Palumbi lab:** Assisted on field projects in Palau (collecting corals and running heat stress experiments, transplanting corals for common garden experiments) and the California central coast (collecting samples via boat on SCUBA, processing samples). **Other:** Various dives to conduct kelp forest ecological surveys and deploy instrumentation for graduate student projects.

2014-2018 **Cal Poly San Luis Obispo** **Ruttenberg & O'Leary Labs**
**Ruttenberg lab:** Collection of coral reef ecological survey data via SCUBA (see Work Experience section), and surveys of Pismo Clam populations on California coastal beaches from Port San Luis to San Diego. **O'Leary lab:** Monthly collection of cobbles via SCUBA for monitoring recruitment of abalone, surveys of eelgrass and associated fish communities via beach seines and monitoring of permanent plots.

### SCUBA Experience & Certifications

**AAUS** Scientific Diver, 60 ft **2015 - Present**
**PADI** Divemaster Now Inactive **2017 - Present**
**DAN** Diving First Aid for Professional Divers **2015 - Present**
**400+** Total Dives **200+** Scientific Dives

## MENTORSHIP

2019, 2022 **REEFS Undergraduate Internship** **Stanford University**
**2022:** Mentored two undergraduate students in building out a control system for conducting multiple stressor experiments in aquaria, developing protocols as part of a pilot study, and analyzing data. Students prepared and presented poster to researchers and other students at Hopkins. **2019:** Mentored an undergraduate student in applying machine learning and statistical approaches to model harmful algal bloom incidence in California.

2016-2018 **Undergraduate research mentor** **Cal Poly SLO**
Established and led a biweekly sea urchin recruitment monitoring program at Port San Luis as part of the larger Santa Barbara Coastal LTER project. Trained several undergraduates in deploying collection media and sorting and identifying specimens.

## PRESS

2025 **Press Release**, Fishing bans help kelp forests withstand marine heatwaves, *Stanford Report*.

2024 **Press Release**, Some Fish and Crab May Shift Further North in Alaskan Waters Than Previously Predicted, *NOAA Fisheries*.

—— **Profile**, Diving into Ocean Ecology: Data Science and Marine Conservation Converge. Stanford Data Science

2023 **Article**, Changing tides: Three Stanford graduate students share what led them to study the oceans, and why the next generation of ocean scholars must define the field more broadly than ever before. *Stanford Report*.

2022 **Press Release**, Scientists take a deep dive into how sharks use the ocean, *Stanford Report*.

2020 **Press Release**, Warm waters threaten abalone recovery, *California Sea Grant*.

## TECHNICAL SKILLS

### Scientific Computing

R, R Markdown, & RStudio, Stan, GIS (QGIS, R sf & stars packages), git & github

### Statistical Methodology

Bayesian and frequentist linear, nonlinear, and dynamical models; hierarchical, time-series, and spatial models; R statistics packages (rstan, RTMB, brms, mgcv, glmmTMB, nlme, lme4, VAST, sdmTMB, etc.)

### Software Development

**R Shiny web apps**

ACLIM2 SDMs explorer: mgoodman.shinyapps.io/aclim2_sdms_explorer
Probability distributions lab: mgoodman.shinyapps.io/distributions-lab

**Reproducible Scientific Code Repositories**

Goodman et al. 2025 Fish & Fisheries: github.com/mcgoodman/EBS_range_projections
Faiad et al. 2023: github.com/wood-lab/Faiad_et_al_2023_PLoS_One
Goodman et al. 2022: github.com/mcgoodman/Goodman-et-al_2022_Ecography
Andrzejaczek et al. 2022: github.com/mcgoodman/shark-vertical-overlap
O'Leary et al. 2020: github.com/mcgoodman/OLeary-et-al_2020_ESCO

**R Packages**

BeringSeaData: github.com/mcgoodman/BeringSeaData
geomViolinDiscrete: github.com/mcgoodman/geomViolinDiscrete

## SCHOLARLY REVIEWS

2025 Fisheries Research (2), Scientific Reports, Marine Ecology Progress Series, ICES Journal of Marine Science, Marine Ecology

2024 Progress in Oceanography, Marine Ecology Progress Series, ICES Journal of Marine Science, Fisheries Research, NOAA Internal Review (2)

2023 Fisheries Research, Marine Ecology Progress Series, PLoS One

2022 Progress in Oceanography, Animal Biotelemetry, NOAA Internal Review

2021 ICES Journal of Marine Science

2020 Nature Scientific Reports