

# Christopher M. Free

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## Education

- 2013-2018 Ph.D. in Oceanography, Rutgers University. Dissertation: “Fisheries management in the face of capacity, data, and climate challenges” (Adviser: Dr. Olaf Jensen).
- 2006-2010 B.A. in Environmental Studies & Biology, Middlebury College. Senior Thesis: “Modeling big-leaf mahogany population dynamics: the importance of spatially explicit processes” (Adviser: Dr. R. Matthew Landis). High Honors, *Magna Cum Laude*.

## Professional experience

- 2023-pres. Lecturer, Bren School of Envi. Science & Management, UC Santa Barbara
- 2021-pres. Assistant Researcher, Bren School of Envi. Science & Management, UC Santa Barbara
- 2020-2021 Associate Specialist, Bren School of Envi. Science & Management, UC Santa Barbara
- 2018-2020 Postdoctoral Researcher, Environmental Markets Lab (emLab), UC Santa Barbara
- 2018 Postdoctoral Researcher, Department of Marine & Coastal Sciences, Rutgers University
- 2013-2018 Research Assistant, Department of Marine & Coastal Sciences, Rutgers University
- 2012 Fisheries Ecology Technician, Dauphin Island Sea Laboratory
- 2010-2013 Quantitative Ecologist, International Institute of Tropical Forestry
- 2010&2012 Conservation GIS Analyst, Audubon Alaska

## Awards and scholarships

- 2024 Blue Marine Foundation 2024 Science Ocean Award
- 2018 Rutgers Outstanding Doctoral Student Award – 4 awarded across 75 grad programs
- 2016 Rutgers Cooperative Extension Wilbur M. Runk Award
- 2016 MAC-AFS 2016 Meeting Best Student Presentation Award
- 2015 NJ Sea Grant Stew Tweed Fisheries & Aquaculture Scholarship
- 2014-2017 Manasquan River Marlin & Tuna Club Burlew Scholarship (5x)
- 2010-2018 Twelve student travel awards from nine organizations

## Grants and fellowships (\$4,201,912 total)

- Submitted Wellcome Trust Climate Impacts Award. “Shining the spotlight on hidden hunger in a warming world.” Beal T, Golden C, **Free CM**. \$223,379 of \$1,000,000 to UCSB.
- Submitted NOAA Social, Cultural and Economic Assessment of Harmful Algal Blooms Grant. “Adaptive Responses and Vulnerability to Chronic Disruptions from Harmful Algal Blooms in West Coast Fisheries.” Jardine S, Kling D, **Free CM**, Moore S. \$1,194,855.
- 2023-2025 Bureau of Ocean and Energy Management. “Facilitating resilience and adaptation in commercial fisheries in response to offshore renewable energy development and climate change.” **Free CM**, Gaines SD, Mangin T. \$1,100,000.

- 2023-2024 Waitt Foundation. “Sustainable ocean solutions through rights-based management, fisheries certification, marine protected areas, and aquaculture.” Lester S, Costello C, **Free CM**, Gaines SD. \$712,943.
- 2023-2024 Environmental Defense Fund. “Tactical and scalable approaches to setting ecosystem-wide catch limits that promote climate resilience.” **Free CM**. \$400,000.
- 2023-2024 The Nature Conservancy of California. “Climate-resilient fisheries management on the North American West Coast, Amendment 2.” **Free CM**, Gaines SD. \$25,000.
- 2023-2025 California Ocean Protection Council Prop 68 Grant. “Identifying the vulnerability of fishing communities and targeted species to climate change to optimize the role of MPAs in enhancing socio-ecological resilience.” Caselle J, **Free CM**, Giraldo Ospina A. \$608,084.
- 2022-2026 NOAA Multi-Stressor Grant. “Understanding and managing impacts of multiple climate stressors on the highly lucrative Dungeness crab fishery.” Barth J, Bednarsek N, Chan F, Feely R, **Free CM**, Kavanaugh M, MacCready P, Newton J, Oken K, Richerson K, Siedlecki S, Trainer V, Waddell J. \$552,213 of \$4.2 million to UCSB.
- 2022-2023 The Nature Conservancy of California. “Climate-resilient fisheries management on the North American West Coast, Amendment 1.” **Free CM**, Gaines SD. \$70,013.
- 2021-2022 The Nature Conservancy of California. “Climate-resilient fisheries management on the North American West Coast.” **Free CM**, Gaines SD. \$151,186.
- 2019-2021 NOAA COCA Sustainable Fisheries in Changing Climate Program. “Adapting to changes in fishing opportunity portfolios: abundance, availability, and access.” Ramenzoni V, Jensen OP, Wiedenmann J, Pinsky MP, **Free CM**. \$299,373.
- 2017-2019 SESYNC Graduate Student Pursuit & Fellowship. “Cross-scale exploitation patterns and marine population collapse in international seafood markets.” Elser LG, Oostdijk M, Girón-Nava A, **Free CM**, Quintana A. \$80,000.
- 2017-2018 University & Louis Bevier Dissertation Completion Fellowship. Rutgers University, Graduate School of New Brunswick. **Free CM**. \$25,000.
- 2017 American Center for Mongolian Studies Library Fellowship. “The history and future of fishing in Mongolia.” **Free CM**. \$4,000 (*offered but declined*).
- 2014 American Center for Mongolian Studies Research Grant. “Assessing the motivations and extent of illegal fishing in Mongolia and its potential impact on endangered Mongolian fish species.” **Free CM**. \$4,000.
- 2014 Grayling Research Trust Research Grant. “Assessing the extent of illegal fishing in Lake Hovsgol, Mongolia and its potential impact on the endemic and endangered Hovsgol grayling (*Thymallus nigrescens*).” **Free CM**. \$1,600.
- 2013-2016 NMFS-Sea Grant Population & Ecosystem Dynamics Fellowship. “An evaluation of data-poor stock assessment methods using data-rich stock assessments from the RAM Legacy Stock Assessment Database.” **Free CM**, Jensen OP. \$115,500.
- 2013-2014 SEBS Excellence Fellowship. Rutgers University, School of Environmental &

Biological Sciences (SEBS). **Free CM.** \$53,000 (*offered but declined*).

### Peer-reviewed publications (<sup>†</sup> indicates student mentee or employee in my lab)

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- Smith JG, Lopazanski CJ<sup>†</sup>, **Free CM**, Brun J, Anderson CR, Carr MH, Claudet J, Dugan JE, Eurich JG, Francis TB, Gill DA, Hamilton SL, Kaschner K, Mouillot D, Raimondi PT, Starr RM, Ziegler SL, Malone DP, Marraffini ML, Parsons-Field AB, Spiecker B, Yeager M, Nickols KJ, Caselle JE. Conservation benefits of a marine protected area network accrue across multiple coastal ecosystems. Submitted to *PNAS*.
- Passarelli S, **Free CM**, Shepon A, Beal T, Batis C, Golden CD. Global estimation of dietary micronutrient inadequacies. In first review at *The Lancet*.
- Feitosa LM<sup>†</sup>, Burgess MG, **Free CM**, Gaines SD. Price dynamics and technical interactions should enable open-access fisheries to easily cause extinction. In first revision at *Fish and Fisheries*.
- Viana DF, Gill D, Zvoleff A, Krueck NC, Zambroni-Mason J, **Free CM**, Shepon A, Mascia MB, Grieco D, Schmidhuber J, Golden CD. Sustainable-use marine protected areas can improve human nutrition. In second review at *Nature Communications*.
34. Gill DA, Lester SE, **Free CM**, Pfaff A, Iversen E, Reich BJ, Yang S, Ahmadi G, Andradi-Brown DA, Darling ES, Edgar GJ, Fox HE, Geldmann J, Trung Le D, Mascia MB, Mesa-Gutiérrez R, Mumby PJ, Veverka L, Warmuth LM (2024) A diverse portfolio of marine protected areas can better advance global conservation and equity. *PNAS* 121(10): e2313205121.
33. Eurich JG, Friedman WR, Kleisner KM, Zhao LZ, **Free CM**, Fletcher M, Mason JG, Tokunaga K, Aguion A, Dell'Apa A, Dickey-Collas M, Fujita R, Golden CD, Hollowed AB, Ishimura G, Karr KA, Kasperski S, Kisara Y, Lau JD, Mangubhai S, Osman L, Pecl GT, Schimdt JO, Allison EH, Sullivan PJ, Cinner JE, Griffis RB, McClanahan TR, Stedman RC, Mills KE (2024) Diverse pathways for climate resilience in marine fishery systems. *Fish and Fisheries* 25: 38-59.
32. Elsler LG, Oostdijk M, Gephart JA, **Free CM**, Zhao J, Tekwa EW, Bochniewicz EM, Giron-Nava A, Johnson AF (2023) Global trade network patterns are coupled to fisheries sustainability. *PNAS Nexus* 2(10): pgad301.
31. **Free CM**, Bellquist LF, Forney KA, Humberstone J, Kauer K, Lee Q, Liu OR, Samhoury JF, Wilson JR, Bradley D (2023) Static management presents a simple solution to a dynamic fishery and conservation challenge. *Biological Conservation* 285: 110249.
30. **Free CM**, Smith JG, Lopazanski CJ<sup>†</sup>, Brun J, Francis TB, Eurich JG, Claudet J, Dugan JE, Gill D, Hamilton SL, Kaschner K, Mouillot D, Ziegler SL, Caselle JE, Nickols KJ (2023). If you build it, they will come: coastal amenities facilitate human engagement in marine protected areas. *People and Nature* 5(5): 1592-1609.
29. Smith JG, **Free CM**, Lopazanski CJ<sup>†</sup>, Brun J, Anderson CR, Carr MH, Claudet J, Dugan JE, Eurich JG, Francis TB, Hamilton SL, Kaschner K, Mouillot D, Raimondi PT, Starr RM, Ziegler SL, Nickols KJ, Caselle JE (2023) A marine protected area network does not confer community structure resilience to a marine heatwave across coastal ecosystems. *Global Change Biology* 29(19): 5634-5651.

28. **Free CM**, Anderson SC, Hellmers EA, Muhling BA, Navarro MO, Richerson K, Rogers LA, Satterthwaite WH, Thompson AR, Burt JM, Gaines SD, Marshall KN, White JW, Bellquist LF (2023) Impact of the 2014-16 marine heatwave on US and Canada West Coast fisheries: surprises and lessons from key case studies. *Fish and Fisheries* 24: 652-674.
27. Teneva L, **Free CM**, Hume A, Agostini VN, Klein CJ, Watson RA, Gaines SD (2023) Small island nations can achieve food security benefits through climate-adaptive blue food governance by 2050. *Marine Policy* 151: 105577.
26. **Free CM**, Mangin T, Wiedenmann J, McVeigh H<sup>†</sup>, Smith C<sup>†</sup>, Gaines SD (2023) Harvest control rules used in US federal fisheries management and implications for climate resilience. *Fish and Fisheries* 24(2): 248-262.
25. Passarelli S\*\*, **Free CM\*\***, Allen LH, Batis C, Beal T, Biloft-Jensen AP, Bromage S, Cao L, Castellanos-Gutiérrez A, Christensen T, Crispim SP, Dekkers A, De Ridder K, Kronsteiner-Gicevic S, Lee C, Li Y, Moursi M, Moyersoen I, Schmidhuber J, Shepon A, Viana DF, Golden CD (2022) Estimating national and subnational nutrient intake distributions of global diets. *The American Journal of Clinical Nutrition* 116(2): 551-560. **\*\* shared first authorship; Editor's Choice**
24. **Free CM**, Cabral RB, Froehlich HE, Battista W, Ojea E, O'Reilly E, Palardy JE, Garcia Molinos J, Siegel K, Arnason R, Juinio-Meñez MA, Fabricius K, Turley C, Gaines SD (2022) Expanding ocean food production under climate change. *Nature* 605(7910): 490-496.
23. **Free CM**, Moore SK, Trainer VL (2022) The value of monitoring in efficiently and adaptively managing biotoxin contamination in marine fisheries. *Harmful Algae* 114: 102226.
22. **Free CM**, Vargas Poulsen C<sup>†</sup>, Bellquist LF, Wassermann SN, Oken KL (2022) The CALFISH database: a century of California's non-confidential fisheries landings and participation data. *Ecological Informatics* 69: 101599.
21. Ovando D, **Free CM**, Jensen OP, Hilborn R (2022) A history and assessment of catch-only stock assessment models. *Fish and Fisheries* 23: 616-630.
20. Mason JG\*\*, Eurich JG\*\*, Lau JD\*\*, Battista W, **Free CM**, Mills KE, Tokunaga K, Zhao LZ, Dickey-Collas M, Valle M, Pecl GT, Cinner JE, McClanahan TR, Allison EH, Friedman WR, Silva C, Yáñez E, Barbieri MÁ, Kleisner KM (2021) Attributes of climate resilience in fisheries: from theory to practice. *Fish and Fisheries* 23: 522-544. **\*\* shared first authorship**
19. Golden CD\*\*, Koehn JZ\*\*, Shepon A\*\*, Passarelli S\*\*, **Free CM\*\***, Viana DF\*\*, Matthey H, Eurich JG, Gephart JA, Fluett-Chouinnard E, Nyboer EA, Lynch AJ, Kjelleve M, Bromage S, Charlebois P, Barange M, Vannuccini S, Cao L, Kleisner KM, Rimm EB, Danaei G, DeSisto C, Kelahan H, Fiorella KJ, Little DC, Allison EH, Fanzo J, Thilsted SH (2021) Aquatic foods to nourish nations. *Nature* 598: 315-320. **\*\* shared first authorship**
18. **Free CM**, Jensen OP, Hilborn R (2021) Evaluating impacts of forage fish abundance on marine predators. *Conservation Biology* 35(5): 1540-1551.
17. Safiq A<sup>†</sup>, **Free CM**, Caracappa J, Valenti J, Jensen OP (2021) Perceptions of ecosystem-based fisheries management among state natural resource agency scientists in the Northeastern United States. *Fisheries* 46(2) 66-75.

16. Costello C, Cao L, Gelcich S, Cisneros-Mata MÁ, **Free CM**, Froehlich HE, Golden CD, Ishimura G, Maier J, Macadam-Somer I, Mangin T, Melnychuk MC, Miyahara M, de Moor CL, Naylor R, Nøstbakken L, Ojea E, O'Reilly E, Parma AM, Plantinga AJ, Thilsted SH, Lubchenco J (2020) The future of food from the sea. *Nature* 588: 95-100.
15. **Free CM**, Mangin T, García Molinos J, Ojea E, Burden M, Costello C, Gaines SD (2020) Realistic fisheries management reforms could mitigate the impacts of climate change in most countries. *PLoS One* 15(3): e0224347.
14. **Free CM**, Jensen OP, Anderson SC, Gutierrez NL, Kleisner KM, Longo C, Minto C, Osio GC, Walsh JC (2020) Blood from a stone: performance of catch-only methods in estimating stock biomass status. *Fisheries Research* 223: 105452.
13. Golden A, **Free CM**, Jensen OP (2019) Angler preferences and satisfaction in a high-threshold bucket-list recreational fishery. *Fisheries Research* 220: 105364.
12. **Free CM**, Thorson JT, Pinsky ML, Oken KL, Wiedenmann J, Jensen OP (2019) Impacts of historical warming on marine fisheries production. *Science* 363(6430): 979-983.  
Selected media coverage: [NY Times](#), [Guardian](#), [HuffPost](#), [CNN](#), [Mother Jones](#), [NatGeo Perspective \(Plagányi\)](#), [Technical comment \(Szuwalski\)](#), [Response to comment \(Free et al.\)](#)
11. Wiedenmann J, **Free CM**, Jensen OP (2019) Evaluating the performance of data-limited methods for setting catch targets through application to data-rich stocks: A case study using Northeast U.S. fish stocks. *Fisheries Research* 209: 129-142.
10. **Free CM**, Jensen OP, Wiedenmann J, Deroba JJ (2017) The refined ORCS approach: a catch-based method for estimating stock status and catch limits for data-poor fish stocks. *Fisheries Research* 193: 60-70.
9. Gill DA, Mascia MB, Ahmadi GN, Glew L, Lester SE, Barnes M, Craigie I, Darling E, **Free CM**, Geldmann J, Holst S, Jensen OP, White AT, Basurto X, Coad L, Gates RD, Guannel G, Mumby PJ, Thomas H, Whitmee S, Woodley S, Fox HE (2017) Capacity shortfalls hinder the performance of marine protected areas globally. *Nature* 543: 665-669.
8. Tsogtsaikhan P, Mendsaikhan B, Jargalmaa G, Ganzorig B, Weidel BC, Filosa CM, **Free CM**, Young T, Jensen OP (2017) Age and growth comparisons of Hovsgol grayling (*Thymallus nigrescens* Dorogostaisky, 1923), Baikal grayling (*T. baicalensis* Dybowski, 1874), and lenok (*Brachymystax lenok* Pallas, 1773) in lentic and lotic habitats of Northern Mongolia. *Journal of Applied Ichthyology* 33(1): 108-115.
7. **Free CM**, Jensen OP, Mendsaikhan B (2015) A mixed-method approach for quantifying illegal fishing and its impact on an endangered fish species. *PLoS One* 10(12): e0143960.
6. Norghauer JM, **Free CM**, Landis RM, Grogan J, Malcolm JR, Thomas SC (2015) Herbivores limit the population size of big-leaf mahogany trees in an Amazonian forest. *Oikos* 125(1): 137-148.
5. **Free CM**, Jensen OP, Mason SA, Eriksen M, Williamson NJ, Boldgiv B (2014) High-levels of microplastic pollution in a large, remote, mountain lake. *Marine Pollution Bulletin* 85(1): 156-163.
4. **Free CM**, Landis RM, Grogan J, Schulze MD, Lentini M, Dünisch O (2014) Management implications of long-term tree growth and mortality rates: A modeling study of big-leaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon. *Forest Ecology & Management* 330: 46-54.

3. Smith MA, Walker NJ, **Free CM**, Kirchhoff MJ, Drew GS, Warnock ND, Stenhouse IJ (2014) Identifying marine Important Bird Areas using at-sea survey data. *Biological Conservation* 172: 180-189.
2. Grogan J, Landis RM, **Free CM**, Schulze MD, Lentini M, Ashton MS (2014) Big-leaf mahogany *Swietenia macrophylla* population dynamics and implications for sustainable management. *Journal of Applied Ecology* 51(3): 664-674. **\* June 2014 Editor's Choice.**
1. Powers SP, Hernandez FJ, Condon RH, Drymon JM, **Free CM** (2013) Novel pathways for injury from offshore oil spills: Direct, sublethal and indirect effects of the Deepwater Horizon oil spill on pelagic *Sargassum* communities. *PLoS One* 8(9): e74802.

## Mentoring and teaching experience

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### **Graduate students**

2022-pres. Yutian Fang, University of California, Santa Barbara, PhD thesis co-chair

### **Graduate committees**

2024-pres. Michael Montgomery, University of California, Santa Barbara, PhD thesis committee  
 2022-pres. Leonardo Feitosa, University of California, Santa Barbara, PhD thesis committee  
 2021-2022 Maggie Shaw, University of Wisconsin, Master's thesis committee  
 2021 Iratxe Rubio Benito del Valle, Universidade de Vigo, PhD thesis committee

### **Other graduate mentoring**

2024-2025 Kyle Burt, Jessica Copeland, Caroline Edmonds, Natalie Mayer, Shane O'Brian. UCSB Bren School Master's Group Project.  
 2023-2024 Eleanor Thomas, Ashley Cooper, Sydney Mayes, Chloe Swick, Bella Rothenberg. UCSB Bren School Master's Group Project.  
 2022-2023 Mukta Kelkar, Cali Pfleger, Chen Xing. UCSB Bren School Kuni Research Fellowship.  
 2022-2023 Sara Lam, Logan Ossentjuk, Meghna Rao, Cristina Robinson, Abigail Sanford. UCSB Bren School Master's Group Project.  
 2019-2020 Chase Brewster, Nathan Burola, Sara Orofino, Gracie White. UCSB Bren School Master's Group Project.  
 2019-2020 Vienna Saccomanno, Edaysi Bucio, Juliette Verstaen, Seleni Cruz, Valeria Tamayo. UCSB Bren School Master's Group Project.

### **Undergraduate mentoring**

2023-2024 Isabella Puchkova – Fisheries impacts of West Coast harmful algal blooms  
 2023-2024 Cristian Swift – Ecological drivers of West Coast harmful algal blooms  
 2022 Sophie Morgan – Open-source data in West Coast fisheries  
 2021 Mihir Takalkar – Climate-driven shifts in West Coast fisheries landings  
 2017-2018 Robert Jarrett – analysis of fish movement behavior and mapping MPA zones  
 2014 Andrew Lahr, Chelsey Nordstrom – mapping accessibility in a Mongolian national park  
 2014 Tom Hopper, Julia Gerdes, Rachael Sacatelli – mapping impacts of a hydropower dam  
 2013-2014 Leslie O'Hara – development and digitization of Mongolian GIS data

### **Course instruction**

2018 Intro to R for Fisheries Scientists, AFS Annual Meeting (co-instructor, 1 day)  
 2017 Advanced Ecological Data Analysis, Rutgers University (TA, full semester)  
 2016 Applied Population Ecology in R, Natl. University of Mongolia (co-instructor, 3 days)  
 2015 Ichthyology, Rutgers University (part-time lecturer, full semester)  
 2015-2016 Intro to Programming in R, Rutgers University (co-instructor, full semester)

2012 Intro to R for Fisheries Scientists, Dauphin Island Sea Lab (co-instructor, 2 days)

***Teaching assistant (while an undergraduate student)***

2011 Conservation Biology, Middlebury College  
 2009-2010 Vertebrate Natural History, Middlebury College  
 2008-2010 Geographic Information Systems, Middlebury College  
 2007-2010 Ecology and Evolution, Middlebury College

***Guest lectures***

2024 Ecosystem-Based Fisheries Management, University of Washington, Seattle  
 2022 Managing Tropical Fisheries, James Cook University, Townsville, Australia  
 2022 Coastal Marine Ecosystem Processes, University of California, Santa Barbara  
 2020 Introduction to Oceanography, University of California, Santa Barbara  
 2018 Intro to Fisheries Science for Stakeholders, Rutgers University Cooperative Extension  
 2017 Natural Resource Policy, Rutgers University  
 2016 Fisheries Science, Rutgers University  
 2016 Ecology of NJ's Rivers, Streams, Lakes, Ponds, Stony Brook-Millstone Watershed Assn.

## Technical reports, software, and datasets

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***Software***

NCEAS CRF Working Group (2023) Climate-Resilient Fisheries Planning Tool.  
 Available at: <https://climateresilientfisheries.net/>

***R packages***

**Free CM** et al. (2021) wcfish: U.S. West Coast fisheries data.  
 Available at: <https://github.com/cfree14/wcfish>

**Free CM** et al. (2021) nutriR: Nutritional intake functions for R.  
 Available at: <https://github.com/cfree14/nutriR>

**Free CM** (2018) datalimited2: More stock assessment methods for data-limited fisheries.  
 Available at: <https://github.com/cfree14/datalimited2>

**Free CM** (2017) freeR: Miscellaneous functions in R.  
 Available at: <https://github.com/cfree14/freeR>

***R Shiny web applications***

**Free CM** (2024) Nutritional Value Score (NVS) exploration tool. Available at:  
[https://cfree.shinyapps.io/nutritional\\_value\\_scores/](https://cfree.shinyapps.io/nutritional_value_scores/)

**Free CM** (2023) Subnational nutrient intake inadequacies. Available at: [https://emlab-ucsb.shinyapps.io/global\\_intake\\_inadequacies/](https://emlab-ucsb.shinyapps.io/global_intake_inadequacies/)

**Free CM** (2022) nutriR: Subnational nutrient intake explorer.  
 Available at: <https://emlab-ucsb.shinyapps.io/nutriR/>

**Free CM, Millage KD** (2021) NutriCast: A web-based tool to explore forecasted nutritional gains from marine fisheries and mariculture reforms under climate change.  
 Available at: <https://emlab-ucsb.shinyapps.io/nutricast/>



**Free CM** (2020) FishCast: Impact of climate change and management reforms on marine fishers. Available at: <https://emlab-ucsb.shinyapps.io/fishcast2/>

**Free CM** (2019) RAM Legacy Stock Boundary Database Viewer. Available at: [https://cfree.shinyapps.io/ramlsb\\_viewer/](https://cfree.shinyapps.io/ramlsb_viewer/)

**Free CM** (2017) Refined ORCS Approach. Available at: [https://cfree.shinyapps.io/refined\\_orcs\\_approach/](https://cfree.shinyapps.io/refined_orcs_approach/)

### ***Technical reports***

Caselle JE, Nickols KJ, Smith JG, Lopazanski C, Brun J, **Free CM**, Anderson C, Carr M, Claudet J, Dugan J, Eurich J, Francis T, Gill D, Hamilton S, Kaschner K, Mouillot D, Raimondi P, Starr R, Ziegler S (2022) A synthesis of ecological and social outcomes from the California Marine Protected Area (MPA) network. NCEAS Working Group Final Report to the CA Ocean Protection Council and the CA Department of Fish and Wildlife. Santa Barbara, CA.

**Free CM** (2022) Assessment of associated landed species and bycatch discards in the California halibut gill net and trawl fisheries. California Department of Fish & Wildlife, Sacramento, CA.

**Free CM**, Mangin T, McVeigh H, Smith C, Gaines SD (2022) Harvest control rules used in U.S. federal fisheries and implications for climate resilience. Environmental Defense Fund, Boston.

Gaines S, Cabral R, **Free CM**, Golbuu Y, et al. (2019) The expected impacts of climate change on the ocean economy. World Resources Institute, Washington, D.C.

Costello C, Cao L, Gelcich S, et al. (2019) The future of food from the sea. World Resources Institute, Washington, D.C.

Jensen OP, **Free CM** (2018) Development and testing of superensemble and two-stage catch-only models for estimation of stock status. UN Food & Agriculture Organization, Rome, Italy.

Jensen OP, **Free CM** (2017) Testing and comparison of data-limited assessment models for estimating global and regional stock status. UN Food & Agriculture Organization, Rome, Italy.

**Free CM**, Grogan J, Schulze MD, Landis RM, Brienens RJW (2017) Current Brazilian forest management guidelines are unsustainable for *Swietenia*, *Cedrela*, *Amburana*, and *Copaifera*: A response to da Cunha and colleagues. *Forest Ecology and Management* 386: 81-83.

Grogan J, Schulze M, Paz Pires I, **Free CM**, Landis RM, Pinelo Morales G, Johnson A (2016) How sustainable is mahogany management? *ITTO Tropical Forest Update* 25(1): 5-9.

Hernandez M, **Free CM** (2015) Digital Atlas of Mongolian Fish. Available at: <http://marine.rutgers.edu/~cfree/atlas-of-mongolian-fish/>

Grogan J, **Free CM**, Johnson A, Pinelo Morales G, Alegria R (2014) Assessment of the conservation status of big-leaf mahogany, Spanish cedar, and three secondary timber species populations in the forestry concessions of the Maya Biosphere Reserve, Petén, Guatemala. CATIE-Finnfor. \* **Featured in the November 25, 2015 [NY Times](#).**

**Also published in Spanish:** Estado de conservación de las poblaciones de cinco especies maderables en concesiones forestales de la Reserva de la Biosfera Maya, Guatemala: *Swietenia macrophylla*, *Cedrela odorata*, *Lonchocarpus castilloi*, *Bucida buceras*, *Calophyllum brasiliense*



Grogan J, Schulze M, Lentini M, Zweede J, Landis RM, **Free CM** (2013) Managing big-leaf mahogany in natural forests. *ITTO Tropical Forest Update* 22(1): 12-19.

Smith MA, Walker N, **Free CM**, Kirchhoff M, Warnock N, Weinstein A, Distler T, Stenhouse IJ (2012) Marine Important Bird Areas in Alaska: Identifying globally significant sites using colony and at-sea survey data. National Audubon Society, Audubon Alaska, Anchorage, AK.

**Free CM**, Landis RM, Grogan J (2011) User Manual for the Big-Leaf Mahogany Growth and Yield Model. US Forest Service, International Institute of Tropical Forestry.

**Also published in Spanish:** Manual del Usuario para el Modelo de Crecimiento y Rendimiento de la Caoba

## Invited talks and conference presentations

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### *Invited talks*

- 2023 UCSB Interdepartmental Graduate Program in Marine Science (IGPMS), Santa Barbara, CA
- 2023 University of Washington, School of Aquatic & Fishery Sciences, Seattle, WA
- 2022 IFFO Marine Ingredients Organization Members' Meeting, Lima, Peru
- 2022 Moss Landing Marine Laboratory, San José State University, Moss Landing, CA
- 2021 AFS Oregon Chapter keynote speaker (remote)
- 2020 IFFO Marine Ingredients Organization Members' Meeting (remote)
- 2020 Catalyzing Adaptive and Resilient Food Systems Conference, UC Davis (remote)
- 2020 Goldschmidt Conference, Honolulu, HI (remote)
- 2020 University of Georgia, Department of Marine Sciences, Athens, GA (remote)
- 2020 Scottish Seafood Summit, Aberdeen, Scotland (cancelled)
- 2020 IFOP International Symposium Pre-Blue COP 25, Valparaíso, Chile (cancelled)
- 2020 Santa Barbara Maritime Museum, Santa Barbara, CA
- 2019 University of Alaska-Fairbanks, College of Fisheries & Ocean Sciences, Fairbanks, AK
- 2019 IFFO Marine Ingredients Organization Members' Meeting, Madrid, Spain
- 2019 University of California-San Diego, Scripps Institution of Oceanography, San Diego, CA
- 2017 University of Washington, School of Aquatic & Fishery Sciences, Seattle, WA
- 2016 American Center for Mongolian Studies, Ulaanbaatar, Mongolia
- 2016 New Jersey Sea Grant, Sandy Hook, NJ
- 2015 Kean University, Department of Biology, Union, NJ
- 2014 American Center for Mongolia Studies, Philadelphia, PA

### *Contributed talks*

- 2022 Western Society of Naturalists, Oxnard, CA
- 2021 Global Science Gathering, The Nature Conservancy (remote)
- 2020 Eastern Pacific Ocean Conference (EPOC) Current Events Roundtable (remote)
- 2020 West Coast Entanglement Science Workshop (remote)
- 2019 Species on the Move, Kruger National Park, South Africa
- 2018 American Fisheries Society Annual Meeting, Atlantic City, NJ
- 2017 American Fisheries Society Mid-Atlantic Chapter Meeting, Dover, DE
- 2017 ICES Annual Science Meeting, Fort Lauderdale, FL
- 2016 American Fisheries Society Mid-Atlantic Chapter Meeting, Bordentown, NJ
- 2016 International Society of Limnology Congress, Torino, Italy
- 2015 American Fisheries Society Annual Meeting, Portland, OR
- 2014 American Fisheries Society Mid-Atlantic Chapter Meeting, Cape Henlopen, DE
- 2014 Wild Trout Symposium, West Yellowstone, MT

- 2014 Ocean Sciences Meeting, Honolulu, HI
- 2012 MASGC Bays & Bayous Symposium, Biloxi, MS
- 2011 Student Conference on Conservation Science, New York, NY
- 2010 Northeast Arc Users Group Conference, Newport, RI
- 2010 Student Conference on Conservation Science, New York, NY

## Contract employment

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- 2024 GAIN Health. “Development of an R Shiny web application for interactively exploring nutritional value scores.” **Free CM.**
- 2023 Environmental Defense Fund. “Catch allocation structures used in US federal fisheries management and implications for climate resilience.” **Free CM.**
- 2023 Resources Legacy Fund. “Analysis of the management strategies described in select California Enhanced Status Reports (ESRs).” **Free CM.**
- 2022 Peruvian Sociedad Nacional de Pesquería (National Society of Fisheries). Santa Barbara, CA. “Review of the Peruvian anchoveta stock assessment and ecosystem model.” **Free CM.**
- 2022 SFP FishSource. Santa Barbara, CA. “UNDP OIC areas database.” **Free CM.**
- 2022 Marine Stewardship Council. Santa Barbara, CA. “Fish in Space: developing a global database of fisheries management areas.” **Free CM.**
- 2021 Resources Legacy Fund, California Department of Fish & Wildlife, Sacramento, CA. “Characteristics of bycatch in California halibut trawl and gillnet fisheries.” **Free CM.**
- 2021 Environmental Defense Fund. Santa Barbara, CA. “Increasing the climate resilience of federal fisheries management in the United States.” **Free CM,** Gaines SD, Mangin T.
- 2019 Ocean Conservancy / MRAG Americas. Santa Barbara, CA. “Fishery management indicators for fourteen California fisheries.” **Free CM,** Wiedenmann J.
- 2017 UN FAO. Rome, Italy. “Development and testing of superensemble and two-stage catch-only models for estimation of stock status.” Jensen OP, **Free CM.**
- 2017 UN FAO. Rome, Italy. “Testing and comparison of data-limited assessment models for estimating global and regional stock status.” Jensen OP, **Free CM.**
- 2016 Haskin Shellfish Research Lab. Bivalve, NJ. “Status and trends of hard clam, *Mercuraria mercenaria*, shellfish populations in Barnegat Bay, New Jersey.” **Free CM.**
- 2014 CATIE-Finnfor Project. Petén, Guatemala. “Conservation status of big-leaf mahogany (*Swietenia macrophylla*) and other lesser-known species of the forestry concessions in the Maya Biosphere Reserve, Petén, Guatemala.” **Free CM,** Grogan J.
- 2013 The Forestland Group, LLC. Chapel Hill, NC. “The sustainable management of big-leaf mahogany (*Swietenia macrophylla*) in natural forests.” Grogan J, **Free CM.**
- 2012 Audubon California. Sonora, CA. “Developing a Python program to automate the submission of Important Bird Areas into the National Audubon database.” **Free CM.**

## Professional service and outreach

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### Science advisory service:

- 2024-pres. NOAA Marine Mammal Scientific Review Group member
- 2023-2024 OPC/OST California's 30x30 Initiative Expert Panel member
- 2022-pres. Pacific Fishery Management Council Scientific and Statistical Committee member

### Grant reviewer:

- South Carolina Sea Grant, Oregon Sea Grant, Lewis & Clark Fund for Exploration and Field Research (3x)

### Manuscript reviewer:

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|---|--|
| Aqua. Cons: Marine & Fresh. Ecosystems  | ICES Journal of Marine Science (4x)      |
| Aquatic Living Resources                | Journal of Applied Ecology               |
| Arctic Science                          | Journal of Great Lakes Research          |
| Current Opinion in Envi. Sustainability | Marine & Coastal Fisheries (2x)          |
| Earth System Science Data               | Marine Policy (2x)                       |
| Ecography                               | Marine Pollution Bulletin                |
| Ecological Applications (3x)            | Nature Climate Change                    |
| Ecology & Evolution                     | Nature Communications                    |
| Ecology & Society                       | Ocean & Coastal Management (2x)          |
| Ecology Letters (2x)                    | Ocean & Coastal Research                 |
| Environmental Earth Sciences            | Palgrave Communications                  |
| Environmental Pollution (2x)            | PloS Climate                             |
| Erdkunde–Archive for Sci. Geography     | PLoS One (2x)                            |
| Fish & Fisheries (4x)                   | PNAS                                     |
| Fisheries Management & Ecology (4x)     | Proceedings of the Royal Society B       |
| Fisheries Research (7x)                 | Regional Studies in Marine Science       |
| Frontiers in Ecology & the Environment  | Reviews in Fish Biology & Fisheries (3x) |
| Frontiers in Marine Science (2x)        | Science                                  |
| Global Ecology & Biogeography           | Scientific Data                          |
| Harmful Algae                           | Scientific Reports (2x)                  |

**Supervised students in manuscript reviews:** Abigail Golden, Lee Qi, Phoebe Racine, Liliana Sierra Castillo, Claire Gonzales, Ignacia Rivera, Mary McElroy, Erin Winslow, Leonardo Feitosa, Cori Lopazanski, Zoë Kitchel

### Outreach and additional service:

#### *Community outreach:*

- 2022 Science & Engineering Council of Santa Barbara lunch speaker
- 2020 SBMM Sustainable Seafood Recipe Contest local expert
- 2020 Delco Retirees lunch speaker

#### *Outreach at primary schools:*

- 2021-2023 Jersey Shore Junior Science Symposium reviewer
- 2018 New Jersey Science Education Workshop speaker
- 2016 James Rhoads Elementary School science fair judge
- 2016-2018 Monmouth Junior Science Symposium judge
- 2014 New Jersey Science Teacher's Convention speaker
- 2014 Strath Haven Middle School Career Day speaker

2014 Englewood High School Senior Research panelist  
2013-2016 Malvern Prep High School marine biology mentor

*Outreach at universities:*

2022 WSN conference student mentor  
2022 WSN conference student presentation and poster judge  
2017 RIOS undergraduate intern supervisor  
2016 Rutgers Summer Science Program volunteer  
2015-2016 Climate Change Teen Summit moderator  
2014-2017 Aresty Program poster judge  
2014-2017 Rutgers Day volunteer  
2014-2016 Shorebowl volunteer  
2013-2015 Undergraduate research mentor

*Other outreach*

2015 Made interpretative panels on fish and pollution for Lake Hovsgol Visitor Center

*Rutgers Oceanography Graduate Student Association:*

2013-2016 Vice-President (2014-16, 2 years), Social Chair (2013-17, 4 years), Student Seminar Organizer (2013-14, 1 year), Distinguished Speaker Organizer (2016-17, 1 year)