

MARY KRISTEN DONOVAN

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Conservation Science
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EDUCATION

- PhD Zoology, University of Hawai'i at Mānoa (2017)
MSc Zoology, University of Hawai'i at Mānoa (2012)
BA Biology, College of Creative Studies, University of California Santa Barbara (2008)

ACADEMIC AND PROFESSIONAL APPOINTMENTS

- 2021- Assistant Professor, Center for Global Discovery and Conservation Science, School of Geographical Science and Urban Planning, Arizona State University
2021- Senior Global Futures Scientist, Julie Ann Wrigley Global Futures Laboratory, Arizona State University
2017- Principal Investigator, Hawai'i Monitoring and Reporting Collaborative
2018-2020 Postdoctoral Researcher, Marine Science Institute, University of California Santa Barbara
2017-2020 Postdoctoral Researcher, State of Hawai'i Division of Aquatic Resources & Hawai'i Institute of Marine Biology, University of Hawai'i at Mānoa
2015-2017 Population and Ecosystem Dynamics Fellow, National Marine Fisheries Service & University of Hawai'i Sea Grant
2013-2017 Graduate Research Assistant, Ocean Tipping Points Project, University of Hawai'i at Mānoa
2012-2015 Lead Analyst, Global Coral Reef Monitoring Network, International Union for the Conservation of Nature
2009-2012 Graduate Research Assistant, Hawai'i Cooperative Fisheries Research Unit, University of Hawai'i at Mānoa
2008-2012 Marine Ecology Specialist, NOAA Pacific Island Fisheries Science Center
2004-2008 Research Technician, Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) & Marine Science Institute, University of California Santa Barbara

PUBLICATIONS

- 36) Schmitt MH, Stears K, **Donovan MK**, Burkepille DE, Thompson DI (2022) Integrating herbivore assemblages and woody plant cover in an African savanna to reveal how herbivores respond to ecosystem management. *PLoS One* 17(8): e0273917
35) Winston W, Oliver T, Couch C, **Donovan MK**, Asner GP, Conklin E, Fuller L, Grady BW, Huntington B, Kageyama K, Kindinger TL, Kozar K, Kramer L, Martinez T, McCutcheon A, McKenna S, Rodgers K, Shayler CK, Vargas-Angel B, Zgliczynski B (2022) Coral taxonomy and

local stressors drive bleaching prevalence across the Hawaiian Archipelago in 2019. *PLoS One* 17(9): e0269068

- 34) **Donovan MK**, Alves C, Burns J, Drury C, Meier OW, Ritson-Williams R, Cunning R, Dunn RP, Goodbody-Gringley G, Henderson LM, Knapp ISS, Levy J, Logan CA, Mudge L, Sullivan C, Gates RD, Asner GP (2022) From polyps to pixels: understanding coral reef resilience to local and global change across scales. *Landscape Ecology*
- 33) van Woesik R, Shlesinger T, Grottoli AG, Toonen RJ, Vega Thurber R, Warner M, Hulver AM, Chapron L, McLachlan RH, Albright R, Crandall E, DeCarlo TM, **Donovan MK**, Eirin-Lopez J, Harrison HB, Heron SF, Huang D, Humanes A, Krueger T, Madin JS, Manzello D, McManus LC, Matz M, Muller EM, Rodriguez-Lanetty M, Vega-Rodriguez M, Voolstra CR, Zaneveld J (2022) Coral-bleaching responses to climate change across biological scales. *Global Change Biology* 28(14): 4229-4250
- 32) Cramer KL, **Donovan MK**, Jackson JBC, Greenstein BJ, Korpanty CA, Cook, J, Pandolfi JM (2021) The transformation of Caribbean coral communities since humans. *Ecology and Evolution* 11(15): 10098-10118
- 31) **Donovan MK**, Burkepile DE, Kratochwill C, Shlesinger T, Sully S, Oliver TA, Hodgson G, Freiwald J, van Woesik R (2021) Local conditions magnify coral loss after marine heatwaves. *Science* 372(6545): 977-980 ***featured on the cover**
- 30) Christie AP, Abecasis D, Adjeroud M, ... **Donovan MK**, ... Sutherland WJ (2020) Quantifying and addressing the prevalence and bias of study designs in the environmental and social sciences. *Nature Communications* 11(6377)
- 29) Friedlander AM, **Donovan MK**, DeMartini EE, Bowen BW (2020) Dominance of endemics in the reef fish assemblages of the Hawaiian Archipelago. *Journal of Biogeography* 47: 2584-2596
- 28) Oleson KLL, Bagstad KJ, Fezzi C, Barnes MD, **Donovan MK**, Falinski KA, Gorospe KD, Htun Hla, Lecky J, Villa F, Wong T (2020) Linking land and sea through ecological-economic model of coral reef recreation. *Ecological Economics* 117(106788)
- 27) Lester SE, Rassweiler A, McCoy SJ, Dubel AK, **Donovan MK**, Miller MW, Miller SD, Ruttenberg BI, Samhoury JF, Hay ME (2020) Caribbean reefs of the Anthropocene: variance in ecosystem metrics indicate bright spots on coral depauperate reefs. *Global Change Biology* 26(9): 4785-4799
- 26) Burkepile DE, Schmitt MH, Stears K, **Donovan MK**, Thompson DI (2020) Shared insights across the ecology of coral reefs and African savannas: are parrotfish wet wildebeest? *BioScience*, biao063
- 25) **Donovan MK**, Adam TC, Shantz AA, Munsterman KS, Rice MM, Speare KE, Schmitt RJ, Holbrook SJ, Burkepile DE (2020) Nitrogen pollution interacts with heat stress to increase coral bleaching across the seascape. *Proceedings of the National Academy of Sciences* 117 (10) 5351-5357
- 24) Cramer KL, Greenstein BJ, **Donovan MK**, Jackson JBC, Korpanty CA, Pandolfi JM (2020) Widespread loss of Caribbean acroporid corals was underway before coral bleaching and disease outbreaks. *Science Advances* 6(17):eaax9395
- 23) Friedlander AM, **Donovan MK**, Koike H, Murakawa P, Goodell W (2019) Spatial and temporal patterns in Hawai'i's marine protected areas. *Aquatic Conservation* 29(S2):103-117
- 22) Chung AE, Wedding LM, Meadows A, Moritsch MM, **Donovan MK**, Gove J, Hunter C (2019) Prioritizing reef resilience through spatial planning following a mass coral bleaching event. *Coral Reefs* 38(4):837-850
- 21) Sully S, Burkepile DE, **Donovan MK**, Hodgson G, van Woesik R (2019) Coral bleaching: a global analysis of the past two decades. *Nature Communications* 10: 1264

- 20) Jouffray JB, Wedding LM, Norström AV, **Donovan MK**, Williams GJ, Crowder LB, Friedlander AM, Erickson A, Graham NAJ, Gove JM, Kappel CV, Kittinger JN, Lecky J, Oleson KL, Selkoe KA, White C, Williams ID, Nyström M (2019) Parsing human and biophysical drivers of coral reef regimes. *Proceedings of the Royal Society – Biology* 286(1896)
- 19) **Donovan MK**, Friedlander AM, Lecky J, Jouffray JB, Williams GJ, Wedding LM, Crowder LB, Erickson A, Graham NAJ, Gove JM, Kappel CV, Karr K, Kittinger JN, Norström AV, Nyström M, Oleson KL, Stamoulis KA, White C, Williams ID, Selkoe KA (2018) Combining fish and benthic communities into multiple regimes reveals complex reef dynamics. *Scientific Reports* 8: 16943
- 18) Weijerman M, Veazey L, Delevaux J, **Donovan MK**, Falinski K, Lecky J, Vache K, Yee S, Oleson KLL (2018) Managing local stressors for coral reef condition and ecosystem services delivery under climate scenarios. *Frontiers in Marine Science*. DOI: 10.3389/fmars.2018.00425
- 17) Stamoulis KA, Delevaux JMS, Williams ID, Poti M, Lecky J, Costa B, Kendall MS, Pittman SJ, **Donovan MK**, Wedding LM, Friedlander AM (2018) Seascape models reveal places to focus coral reef fisheries management. *Ecological Applications* 28(4): 910-925
- 16) Wedding LM, Lecky J, Gove JM, Walecka HR, **Donovan MK**, Williams GJ, Jouffray JB, Crowder LB, Erickson A, Falinski K, Friedlander AM, Kappel CV, Kittinger JN, McCoy K, AV Norström, M Nyström, Oleson KLL, Stamoulis K, White C, Selkoe KA (2018) Advancing the integration of spatial data to map human and natural drivers on coral reefs. *PLoS One*. 13(3): e0189792
- 15) DeMartini EE, Howard KG, Andrews AH, Taylor BM, Lou DC, **Donovan MK** (2017) Comparative growth rates, longevity, and ages at maturity and sex change for parrotfishes of Hawaii, with bomb radiocarbon validation for two species. *Canadian Journal of Fisheries and Aquatic Sciences* 75 (4), 580-589
- 14) Friedlander AM, **Donovan MK**, Stamoulis KA, Williams ID, Brown EK, Conklin EJ, DeMartini EE, Rodgers KS, Sparks RT, Walsh WJ (2017) Human-induced gradients of reef fish declines in the Hawaiian Archipelago viewed through the lens of traditional management. *Aquatic Conservation* DOI: 10.1002/aqc.2832
- 13) Schemmel E, **Donovan MK**, Wiggins C, Anzivino M, Friedlander AM (2016) Reproductive life history of *roi*, the introduced peacock grouper (*Cephalopholis argus*, Bloch and Schneider 1801), in Hawaii. *Journal of Fish Biology* 89(2): 1271-1284
- 12) **Donovan MK**, Friedlander AM, Usseglio P, Goodell W, Iglesias I, Schemmel E, Stamoulis K, Filous A, Giddens J, Kamikawa K, Koike H, McCoy K, Wall C (2016) Effects of gear restriction on the abundance of juvenile fishes along sandy beaches in Hawai'i. *PLoS ONE* 11(5): e0155221.
- 11) Salinas de León P, Acuña-Marrero D, Rastoin E, Friedlander AM, **Donovan MK**, Sala E (2016) Largest global shark biomass found in the northern Galápagos Islands of Darwin and Wolf. *PeerJ* 4:e1911
- 10) Selkoe K, Gaggiotti O, Treml E, Wren J, **Donovan MK**, Hawaii Reef Connectivity Consortium, Toonen R (2016) The DNA of coral reef biodiversity – predicting and protecting genetic diversity of reef assemblages. *Proceedings of the Royal Society – Biology* 283: 20160354
- 9) **Donovan MK**, Friedlander AM, Harding KK, Schemmel E, Filous A, Kamikawa K, Torkelson N (2015) Ecology and niche partitioning of two bonefish species in Hawai'i. *Environmental Biology of Fishes* 98(11): 2159-2171
- 8) Kamikawa K, Friedlander AM, Harding KK, Filous A, **Donovan MK**, Schemmel E (2015) Bonefishes in Hawai'i and the importance of angler-based data to inform fisheries management. *Environmental Biology of Fishes* 98(11): 2147-2157
- 7) Jackson JBC, **Donovan MK**, Cramer KL, Lam VV (editors) (2014) Status and Trends of Caribbean Coral Reefs: 1970-2012. Global Coral Reef Monitoring Network. IUCN, Switzerland, 306 p.

- 6) Giddens J, Friedlander AM, Conklin E, Wiggins C, Stamoulis K, **Donovan MK** (2014) Experimental removal of the introduced predatory grouper, roi (*Cephalopholis argus*) in Puako, Hawaii: methods for assessing and managing marine invasive species. *Marine Ecology Progress Series* 511: 209-221.
- 5) **Donovan MK**, AM Friedlander, EE DeMartini, MJ Donahue, ID Williams (2013) Demographic patterns in the peacock grouper (*Cephalopholis argus*), an introduced Hawaiian reef fish. *Environmental Biology of Fishes* 96: 981-994.
- 4) Walsh SM, Hamilton SL, Ruttenburg BI, **Donovan MK**, Sandin SA (2012) Fishing top predators indirectly affects condition and reproduction in a reef fish community. *Journal of Fish Biology* 80(3): 519-537
- 3) Ruttenburg BI, Hamilton SL, Walsh SM, **Donovan MK**, Friedlander AM, DeMartini EE, Sandin SA (2011) Predator-induced demographic shifts in coral reef fish communities. *PLoS One* 6(6): e21062. *Top 25% most cited articles in *PLoS One*
- 2) Merritt D, **Donovan MK**, Kelley C, Waterhouse L, Parke M, Wong K, Drazen JC (2011) BotCam: A baited camera system for non-extractive monitoring of bottomfish species. *Fishery Bulletin* 109(1): 56-67.
- 1) Vermeij MJA, Dailer ML, Walsh SM, **Donovan MK**, Smith CM (2010) The effects of trophic interactions and spatial competition on algal community composition on Hawaiian coral reefs. *Marine Ecology* 31(2): 291-199.

Thesis and technical

- Chung A, Meadows A, **Donovan MK**, Most R, Shea A, Delaney D, McGuire G, Davidson K (2019) Roadmap to 30x30: Achieving effective management in 30% of Hawai'i's nearshore waters by 2030. Hawai'i Division of Aquatic Resources and University of Hawai'i, Hawai'i Coral Reef Initiative.
- Maynard J, Gove J, Tracey D, Johnson J, Lecky J, Conklin E, van Hooidek R, **Donovan M**, Kleiber D, Brainard R, Williams I, Swanson D, Oliver T, Walsh W, Wiggins C, Kramer L (2019) Coral reefs vulnerability to climate change in West Hawai'i. NOAA Technical Report
- Donovan MK** (2017) A synthesis of coral reef community structure in Hawai'i and the Caribbean. Dissertation. University of Hawai'i at Mānoa.
- Stamoulis KA, Poti M, Delevaux JMS, **Donovan MK**, Friedlander A, Kendall MS. (2016) Chapter 4: Fishes - Reef Fish. pp. 156-196. In: Costa BM, Kendall MS (eds.), Marine Biogeographic Assessment of the Main Hawaiian Islands. Bureau of Ocean Energy Management and National Oceanic and Atmospheric Administration. OCS Study BOEM 2016-035 and NOAA Technical Memorandum NOS NCCOS 214. 359 pp.
- Donovan MK** (2012) Demographic patterns in the peacock grouper, *Cephalopholis argus*, an introduced Hawaiian reef fish. MS Thesis. University of Hawai'i at Mānoa.
- Brainard RE, Asher J, Blyth-Skyrme V, Coccagna EF, Dennis K, **Donovan MK**, et al. (2012) Coral reef ecosystem monitoring report of the Mariana Archipelago: 2003–2007. NOAA Fisheries, Pacific Islands Fisheries Science Center, PIFSC Special Publication, SP-12-01, 1019 p.
- Parke M, C Kelley, A Ramirez, **MK Donovan**, H Wang, J Rooney (2011) Review of scientific information for the EFH and HAPC designations for the Federal Fishery Management Unit species in the Pacific Islands Region. Pacific Islands Fisheries Science Center Administrative Report.
- Donovan MK**, Williams ID, Friedlander AM, Longnecker K, Beets JP, Bowen BW, Franklin EC (2011) Catalog of coral reef life history specimens for the Hawaiian Islands. Pacific Islands Fisheries Science Center Administrative Report, H-11-05, 13 p.

TEACHING

- 2022 **Instructor**, “Global Change” School of Geographical Sciences and Urban Planning, Arizona State University (undergraduate, 235 students, full semester)
- 2021, 2022 **Instructor**, “Introduction to Statistics,” School of Geographical Sciences and Urban Planning, Arizona State University (undergraduate, 30-40 students, full semester)
- 2021 **Instructor**, “Bayesian Statistical Modeling,” School of Geographical Sciences and Urban Planning, Arizona State University (graduate, 12 students, full semester)
- 2019-2020 **Lead Instructor**, University of California Santa Barbara Software Carpentry, five 2-day workshops per quarter on data science using unix shell, git, and R
- 2019 **Lead Instructor**, University of California Santa Barbara Eco-Data-Science, workshop on high performance computing
- 2019 **Certified Instructor**, The Carpentries
- 2017 **Instructor**, “Ocean Tipping Points: Building a Community of Practice” (3-days), National Center for Ecological Analysis and Synthesis, UC Santa Barbara
- 2016 **Co-Instructor** (with Dr. Anna Neuheimer), “Introduction to programming and statistics,” (graduate level-full semester) Department of Oceanography, University of Hawaii
- 2005, 2006, 2007 **Undergraduate Teaching Assistant**- “Biology of Fishes” University of California Santa Barbara

MENTORING (*NSF-GRFP Recipient, **NSF Postdoctoral Fellow Recipient)

- 2022-2021- Postdoctoral scholar: Kelly Speare**
Postdoctoral scholars: Steven Mana‘oakamai Johnson, Shannon Hennessey
PhD students: Rachel Layko*, Morgan Winston
Undergraduate students: Jeida Ostrowski, Veronika Pearson
- 2020-2021 Undergraduate honors thesis: Kiana Heimlich
- 2009-2011 Undergraduate student research: Barrett Wolfe, Victoria Scarborough, Sam Ciarcia, Natalie Torkelson, Emilie Richards, Troy Wooton, Billy Roehl, Mary Le

WORKING GROUPS

- 2021-2022 Selected participant, Arizona State University Global Futures Laboratory Research Accelerator program
- 2021-2022 Participate, Coral Bleaching Research Coordination Network – ‘Approaches to coral bleaching assimilation’, National Science Foundation
- 2019-2020 Participant, Spatio-temporal variability of coral reefs at the global scale: causalities, idiosyncrasies and implications for ecological indicators, Center the Synthesis and Analysis of Biodiversity (CESAB), Montpellier, France
- 2019-2020 Technical co-Lead, Global Coral Reef Monitoring Network, Global reporting on coral reef status and trends for SDG-14 and CBD-Aichi-10
- 2018 Visiting Scholar, Mote Marine Biology Working Group – ‘Caribbean reefs of the Anthropocene: bright spots among coral depauperate reefs’, Florida State University

- 2018 Participant, 'Advanced Tools and Data Integration for Coral Reef Research', EarthCube, CRESCYNT, National Center for Ecological Analysis and Synthesis
- 2013-2017 Participant, Ocean Tipping Points Project, National Center for Ecological Analysis and Synthesis & Stanford Center for Ocean Solutions, 34 participants from 13 organizations
- 2012-2014 Co-Lead with Jeremy Jackson, Global Coral Reef Monitoring Network Caribbean node, 196 participants from 34 countries and countless organizations

PRESENTATIONS (*invited)

- 2022 International Coral Reef Symposium, Bremen, Germany
- *2022 Seminar, Hawai'i Pacific University, Kaneohe, HI
- *2022 Hawai'i Fishers Working Group, Hawai'i Division of Aquatic Resources (February)
- *2021 Hawai'i Fishers Working Group, Hawai'i Division of Aquatic Resources (November)
- *2021 Hawai'i Fishers Working Group, Hawai'i Division of Aquatic Resources (October)
- *2020 Seminar, Australian Center for Excellence in Coral Reef Studies
- *2020 Departmental Seminar, Department of Biology, California State University, Northridge
- *2019 Interview Seminar, School of Geographical Sciences and Urban Planning, Arizona State University, Tempe, Arizona
- *2019 Departmental Seminar, Ecology Evolution & Marine Biology, UCSB, Santa Barbara, CA
- 2019 Moorea LTER All Investigators Meeting, Santa Barbara, CA
- *2019 Guest Lecture, Florida Institute of Technology, Melbourne, FL
- 2018 Moorea LTER All Investigators Meeting, Santa Barbara, CA
- 2018 Western Society of Naturalists, Tacoma, WA
- *2018 Florida State University, Invited Seminar, Tallahassee, FL
- 2018 NMFS-Sea Grant Population Ecosystem Dynamics Fellow Meeting, Seattle, WA
- *2018 Hanauma Bay Community Lecture Series, Honolulu, HI
- *2017 NOAA Inouye Regional Center Seminar Series, Honolulu, HI
- 2017 Symposium on West Hawai'i's Marine Ecosystem, Kona, HI
- 2017 Western Society of Naturalists, Pasadena, CA
- *2017 Departmental Seminar, Oceanography, University of Hawai'i, Honolulu, HI
- *2017 Hawaii Department of Health, Honolulu, HI
- 2017 Hawaii Conservation Congress, Honolulu, HI
- 2017 NMFS-Sea Grant Population Ecosystem Dynamics Fellow Meeting, Beaufort, NC
- *2017 Biology 404, University of Hawai'i at Mānoa, Honolulu, HI
- 2016 Western Society of Naturalists, Monterey, CA
- 2016 International Marine Conservation Congress, St. John's, Newfoundland
- 2016 Sea Grant Population Ecosystem Dynamics Fellow Meeting, Santa Cruz, CA
- 2016 International Coral Reef Symposium, Honolulu, HI
- *2016 State of Hawai'i, Division of Aquatic Resources, Honolulu, HI
- 2015 Western Society of Naturalists, Sacramento, CA
- 2015 Hawai'i Conservation Congress, Hilo, HI
- 2014 Western Society of Naturalists, Vancouver, WA
- 2014 Hawai'i Conservation Congress, Honolulu, HI
- 2013 Indo-Pacific Fish Conference, Okinawa, Japan
- *2013 Biology 403, University of Hawai'i at Mānoa, Honolulu, HI
- *2012 NOAA Scientist and Fisherman Exchange, Honolulu, HI
- 2012 Western Society of Naturalists, Seaside, CA
- 2012 International Coral Reef Symposium, Cairns, Australia
- 2012 Tester Symposium, University of Hawai'i at Mānoa, Honolulu, HI (Awarded Best Talk)
- 2011 Western Society of Naturalists, Vancouver, WA

2010 Western Society of Naturalists, San Diego, CA
2009 Western Society of Naturalists, Monterey, CA
2008 International Coral Reef Symposium, Ft. Lauderdale, FL

SERVICE

Professional Service

Journal Reviewer Science Advances, Conservation Biology, PLoS One, Marine Ecology Progress Series, Coral Reefs, Fish & Fisheries, Diversity and Distributions, PeerJ, Ecological Applications, Proceedings of the Royal Society – Biology, Ecosphere, Ecography, Scientific Data, Scientific Reports, Global Change Biology

Grant Reviewer NOAA Marine Fisheries Initiative, Sea Grant Hawai‘i

Society Member Western Society of Naturalists, Society of Conservation Biology (Marine Section), International Coral Reef Society, Graduate Women in Science, Ecological Society of America

Committees West Maui Ridge 2 Reef Initiative planning and informational participant; Hawaii Fisheries Local Action Strategy Committee; Sustainable Hawaii Initiative Marine Steering Committee

University Service – Arizona State University

Unit - School of Geographical Sciences and Urban Planning

Colloquium committee (2021-2023) (chair 2021-2022)
Center for Global Discovery and Conservation Science – Seminar planning committee (2021)

University

Diving Safety Board (2021-ongoing)

OUTREACH AND MEDIA COVERAGE (selected)

“How we can help coral and seabirds survive a warming world” *National Geographic* (May 2021)

“Reducing nutrient pollution helps coral resist bleaching” *Science Daily* (February 2020)

“Coral reefs near equator less affected by ocean warming: Research based on analysis of field observations from 20-year global coral survey” *Science Daily* (March 2019)

“How Big Data and Team Science Are Helping Hawaii Navigate toward Sustainable Oceans” *Open Channels* (February 2019)

Promise to Pae‘aina, a Mālama Honua Declaration, Participant (2017-2018)

“Scientists deliver alarming message about future of Hawaii’s coral reefs” *Hawai‘i News Now* (November 2017)

“Overfishing is jeopardizing reefs, study finds” *Honolulu Star Advertiser* (September 2017)

Ridge to Reef event, Kahekili Herbivore Management Area, Kaanapali, Maui (October 2017, 2018)

Panel participant for screening of *Chasing Corals*, Kaanapali, Maui (October 2017)

“Inner Workings: Coral reefs at a tipping point” PNAS News (May 2016)

“Hit by slime, Caribbean corals could vanish in two decades: report” Reuters (July 2014)

“Report Sees a Glimmer of Hope for Coral Reefs” TIME (July 2014)

“Protecting Parrotfish on the Path to a Caribbean Reef Revival” New York Times (July 2014)

“Oio Tagging Project” Hawai‘i Fishing News (May 2013)