

JACOB E. ALLGEIER

Assistant Professor
Department of Ecology, Evolution, and Biology
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EDUCATION

2006 - 2013 Ph.D. Ecology University of Georgia, Athens, GA
1997 - 2001 B.S. Biology Centre College, Danville, KY

PROFESSIONAL APPOINTMENTS

2017 – present Assistant Professor, University of Michigan, Ecology and Evolutionary Biology
2016 – 2017 Postdoctoral Research Associate, University of California, Santa Barbara
(Advisor: Dr. Deron Burkepile)
2014 – 2016 National Science Foundation Postdoctoral Fellow in Biology, University of Washington
(Advisor: Dr. Daniel Schindler)
2013 – 2014 Postdoctoral Research Associate, North Carolina State University
(Advisor: Dr. Craig Layman)

NATIONAL AWARDS AND FUNDING

Ecological Society of America - Early Career Scientist 2020
National Science Foundation, “Using novel ecosystem-scale experiments to quantify drivers of reef productivity in a heavily impacted coastal ecosystem in Haiti” PI. 2020-2024 (\$675,164)
David and Lucile Packard Fellowship for Science & Engineering 2019-2024 (\$875,000)
National Science Foundation, Postdoctoral Fellowship: Integrating Mathematics and Biology. 2014-2016 (\$138,000)
National Science Foundation, “Fish aggregations and biogeochemical hot spots across regional environmental gradients” Non-PI co-author and sole collaborator with Dr. Craig Layman. 2013-2017 (\$657,000)
National Science Foundation, Doctoral Dissertation Improvement Grant (DDIG) 2010 (\$14,580)
Environmental Protection Agency, Science To Achieve Results (STAR) Fellowship 2010–2013 (\$111,000)

PUBLICATIONS

Publications from the lab use the first and last author positions as positions of emphasis

(# = students, ^ = postdocs, underline = undergraduates in the lab)

Munsterman, K.S. #, **Allgeier, J.E.**, Peters, J.R., Burkepile, D.E. *In Press*. A view from both ends: shifts in herbivore assemblages impact top-down and bottom-up processes on coral reefs. *Ecosystems*.
Layman, C.A., **Allgeier, J.E.**, Geary, S.T., 2020. Moving beyond semantics: Advancing restoration with food web approaches. *Food Webs*
Layman, C.A.* and **Allgeier, J.E.***. Artificial reefs viewed from the bottom-up: an ecosystem ecology perspective. *Journal of Applied Ecology*. *In press* (* = equal contribution)
Allgeier, J.E., Wenger, S.J., Layman, C.A. 2020. Taxonomic identity explain variation in body nutrient content in a diverse food web. *Scientific Reports*.
Allgeier, J.E., Andskog, M., Hensel, E., Appaldo, R., Layman, C.A., Kemp, D. 2020 Rewiring coral: anthropogenic nutrient shift coral-algal nutrient and energy pathways toward algal dominance. *Global Change Biology*. 00: 1–14
Schiettekatte, NMD, Barneche, DR, Villéger, S, **Allgeier, J.E.**, Burkepile, D.E., Brandl, S.E., Casey, J.E., Mercière, A., Munsterman, K.S. #, Morat, F., Parravicini, V. 2020 Nutrient limitation, bioenergetics and stoichiometry: A new model to predict elemental fluxes mediated by fishes. *Funct Ecol*. 00: 1– 13.
Allgeier, J.E., R. A. Wathen, ^Cline, T.W., Walsworth, T. N., Layman, C. A., and Schindler, D. S. 2020 Individual behavior drives ecosystem function. *Science Advances* 6:9
Allgeier, J.E., ^Cline. T.W., 2019 *Technical Comment*: Demographic dynamics of the smallest marine

- vertebrates fuel coral reef ecosystem functioning. *Science* 366: 6472
- Hensel, E., **Allgeier, J.E.**, Layman, C.A., 2019. Effects of predator presence and habitat complexity on reef fish communities in The Bahamas. *Marine Biology* 166:136
- Wathen, G*, **Allgeier, J.E.***, Bouwes, N., Pollock, M.M., Schindler, D.E., and Jordan, C.E. 2019. Beaver activity increases habitat complexity and spatial partitioning of steelhead trout. *Canadian Journal of Fisheries and Aquatic Sciences*. 76(7): 1086-1095. (* = equal contribution)
- Lyon, R.P, Eggleston, D.L., Bohnenstiehl, D.R., Layman, C.A., Ricci, S.W., **Allgeier, J.E.** 2019. Fish community structure, habitat complexity, and soundscape characteristics of patch reefs in a tropical, back-reef system. *Marine Ecology Progress Series* 609:33-48
- Vandermeer, J., Agaii, A., **Allgeier, J.E.**, Badgley, C., Baucom, R., Blesh, J., Fink Shapiro, L, Jones, A., Hoey, L., Jain, M., Perfecto, I., Wilson, M. 2018. Feeding Prometheus: An interdisciplinary approach for solving the global food crisis. *Frontiers in Sustainable Food Systems* 2:39
- Allgeier, J.E.**, Speare, K.E., Burkepile, D.E. 2018. Estimates of fish and coral larvae as nutrient subsidies to coral reef ecosystems. *Ecosphere* 10:1002
- Allgeier, J.E.**, Layman, C.A., Montana, C.G., Buhler, S.B., Appaldo, R., Rosemond, A.D. 2018. Anthropogenic versus fish-derived nutrient effects on seagrass community structure and function. *Ecology* 99:1792-1801
- Allgeier, J.E.**, Adam, T.C., Burkepile, D.E. 2017 The importance of individual and species-level traits for trophic niches among herbivorous coral reef fishes. *Proceedings of the Royal Society B* 284: 1856
- Allgeier, J.E.**, Layman, C.A. Burkepile, D.E. 2017. Animal pee in the sea: consumer-mediated nutrient dynamics in the world’s changing oceans. *Global Change Biology* 23:2166–2178
- Allgeier, J.E.**, Valdivia, A., Cox, C.S., Layman, C.A. 2016. Fishing down nutrients on coral reefs. *Nature Communications* 7:1246 - covered by over 40 news outlets including *National Geographic*.
- Layman, C.A., **Allgeier, J.E.**, Montana, C. 2016. The attraction-production debate viewed from the bottom-up: mechanistic evidence of enhanced production. *Ecological Engineering* 95: 574-579
- Streicker, D.G. and **Allgeier, J.E.** Variability in individual dietary specialization across a resource gradient in common vampire bats. 2016. *Journal of Applied Ecology* 53:1280-1288.
- Allgeier, J.E.**, Wenger, S.J., Schindler, D.E., Layman, C.A., Rosemond, A.D. 2015. Metabolic theory and taxonomic identity predict nutrient cycling in a diverse food web. *Proceedings of the National Academy of Sciences of the USA* 112 (20): 2640-26437 - received write-up in *PNAS*
- Allgeier, J.E.**, Layman, C.A., Mumby, P.J., Rosemond, A.D. 2015. Biogeochemical implications of regional biodiversity loss across coastal marine ecosystems. *Ecological Monographs* 85: 117:132
- Archer, S.K., **Allgeier J.E.**, Semmens, B.X., Heppell, S.A., Pattengill-Semmens, C.V., Rosemond, A.D., Bush, P., McCoy, C.M., Johnson, C.B., and Layman, C.A., 2015. Hot moments in spawning aggregations: implications for ecosystem-scale nutrient cycling. *Coral Reefs* 34: 19-23
- Allgeier, J.E.**, Layman, C.A., Mumby, P.J., Rosemond, A.D. 2014. Consistent nutrient storage and supply mediated by diverse fish communities in coral reef ecosystems. *Global Change Biology* 20: 2459-2472
- Hammerschlag-Peyer, C.M., **Allgeier, J.E.**, Layman, C.A. 2013. Predator effects on faunal community composition in shallow seagrass beds of The Bahamas. *Journal of Experimental Biology and Marine Ecology* 446: 282-290
- Burkepile, D.E., **Allgeier, J.E.**, Shantz, A., Pritchard, C., Lemoine, N., Bhatti, L., Layman, C.A. 2013. Nutrient supply from fishes facilitates macroalgae and suppresses corals in a Caribbean coral reef ecosystem. *Scientific Reports* 3: 1493
- Allgeier, J.E.**, Yeager, L.A., Layman, C.A. 2013 Consumers alter nutrient limitation regimes and enhance primary production. *Ecology* 94: 521-529.
- Layman, C.A., **Allgeier, J.E.**, Yeager, L.A., Stoner, E.B. 2013 Thresholds of ecosystem response to nutrient enrichment from fish aggregations. *Ecology* 94: 530-536
- Layman, C.A. and **Allgeier, J.E.** 2012. Characterizing trophic ecology of generalist consumers: a case study on the invasive lionfish *Pterois volitans* in The Bahamas. *Marine Ecology Progress Series* 448:131-14
- Allgeier, J.E.**, Rosemond, A.D., Layman, C.A. 2011. Small-scale variation in nutrient limitation and seagrass

nutrient content in Bahamian mangrove wetlands. *Journal of Experimental Marine Biology and Ecology* 407: 330-336

Yeager, L.A., **Allgeier, J.E.**, Layman, C.A. 2011. Experimental test of how patch- and landscape-scale variables affect fish community assembly. *Oecologia* 167: 157-168

Awarded top graduate student paper 2011, Florida International University

Allgeier, J.E., Rosemond, A.D., Layman, C.A. 2011. The frequency and magnitude of non-additive responses to multiple nutrient enrichment. *Journal of Applied Ecology* 48: 96-101

Recommended F1000 and Awarded top graduate student paper 2011, Odum School of Ecology, UGA

Layman, C.A.*, **Allgeier, J.E.***, Rosemond, A.R., Dahlgren, C.P., Yeager, L. 2011. Marine fishery declines viewed from the bottom-up. *Ecological Applications* 21(2): 343-349 (* = equal contribution);

Recommended F1000

Allgeier, J.E., Mehring, A.S., Rosemond, A.D., Layman, C.A. 2010. Significant nutrient co-limitation across a gradient of fragmentation in sub-tropical mangrove-dominated estuaries. *Limnology and Oceanography* 55(66): 2660-2668

Layman, C.A., Montaña, C.G., **Allgeier, J.E.** 2010. Linking community assembly and rates of water level change in river littoral habitats. *Aquatic Ecology* 44: 269-273

Layman, C.A., Quattrochi, J.P., Peyer, C.M., **Allgeier, J.E.** 2007. Niche width collapse in a resilient predator following ecosystem fragmentation. *Ecology Letters* 10:937-944

Submitted Manuscripts

Schiettekatte, N.M.D., plus 22 other authors including **Allgeier, J.E.**, *In review: Nature Ecology and Evolution*. Trade-offs redefine the vulnerability of reef fish functions

Allgeier, J.E., Schiettekatte, NMD, Villéger, S, Burkepile, D.E., Munsterman, K.S. #, Parravicini, V. *In review: Nature Communications*. Phylogenetic conservatism determines nutrient dynamics of coral reef fishes.

Allgeier, J.E. Nutrient Stoichiometry of fishes and invertebrates in Caribbean coastal ecosystems. *In review: Ecology*

Cline, T. W.^*, and **Allgeier, J.E.***. *Submitted*. Weak evidence for fish community control of coral reef resilience. (*draft available on request*) (* = equal contribution)

Brines, E. #, A. Andskog#, K. S. Munsterman#, and **Allgeier, J. E.** *Submitted*. Fish fertilization of seagrass across a gradient of eutrophication in Haiti. (*draft available on request*)

Manuscripts in advanced stages

Esquivel, K. #* , Hasselbarth, M.H. ^, and **Allgeier, J. E. *** *In prep*. The potential for fish production via bottom-up pathways on tropical artificial reefs. (*draft available on request*)

Andskog, M. A. #, E. Brines#, K. S. Munsterman#, K. Esquivel#, C. A. Layman, and **Allgeier, J. E.** *In prep*. Primary production regimes across a gradient of fishing pressure and nutrient enrichment on artificial reefs in the Caribbean (* = equal contribution)

Allgeier, J.E., Schiettekatte, NMD, Villéger, S, Burkepile, D.E., Munsterman, K.S. #, Parravicini, V. The nutrient niche of coral reef fishes.

Technical Reports

Allgeier, J.E., Layman, C.A., The Conservation of Eagle Bay. 2014. Report to Bahamas National Trust and The Nature Conservancy

Layman, C.A., and **Allgeier, J.E.** Scientific regional evaluation of habitat for proposed marine protected area in southern Haiti. 2012. Report for The Nature Conservancy

Allgeier, J.E. Temporal variation and vertical migration of zooplankton in the upper 90 meters of the pelagic zone in Lake Tanganyika. 2001. Proc. Nyanza Project Lake Tanganyika

SELECTED ADDITIONAL AWARDS AND GRANTS

NSF Sponsored *Coastlines and People* Workshop Invitee – September 2018

The Ecosystem Center, Woods Hole Postdoctoral Fellowship 2014 – 3 year offer (declined for NSF Fellowship)
Financial Assistance Grant: International Coral Reefs Symposium - 2012 (\$750)
Odum Endowment Graduate Student Research Grant - 2011 (\$1,400)
Odum School of Ecology Graduate Student Symposium Presentation Award: 2nd place - 2011
Odum School of Ecology Graduate Student Symposium Presentation Award: 3rd place - 2010
University of Georgia – Dissertation Completion Award - 2010 (Award declined for EPA STAR - \$39,000)
Odum Endowment Research Grant - 2009 (\$1,200)
Odum Endowment Research Grant - 2008 (\$800)
Sigma Xi Research In Aide Grant - 2008 (\$400)
Society of Wetland Scientist Research Award - 2008 (\$1000)
Tinker Award – Research Travel Grant - 2008 (\$600)
Robert A. Sheldon Research Travel Award - 2007 (\$400)
Latin-American and Caribbean Studies Institute Travel Award - 2007 (\$500)
University Recruitment Fellowship – University of Georgia Graduate School - 2006-2008 (\$34,000)
Undergraduate Research Fellowship, University of Arizona, Nyanza Tanzania Project - 2001
Faculty Scholarship, Centre College, - 1997-2001 (\$68,000)

TEACHING AND MENTORING

Courses Taught

Ecosystem Ecology (co-taught with Don Zak) Winter 2018, 2019 – University of Michigan
Coastal Ecology and Sustainability Fall 2017, 2019 – University of Michigan

Guest Lecturer Graduate/undergraduate level: Biology of Fishes. University of Michigan, December 2018;
Limnology, University of Georgia. August 2012; Ecosystem Ecology: Introduction to Stable Isotopes;
University of Georgia. March 2012; Limnology, University of Georgia; October 2011; Limnology, University of
Georgia. November 2009

Graduate Students and Postdocs

Current: Bridget Shayka (PhD Student: 2018-present), Katrina Munsterman (PhD Student: 2019-present),
Samantha Iliff (PhD Student: 2019-present), Anji Shakya (MS Student: 2019-present), Maxwell Hasselbarth
(Postdoctoral Fellow: 2020 – present)

Graduated: Kenzo Esquivel (MS Student: 2018-2019), Timothy Cline (Postdoctoral Fellow: 2018-2019),

PhD and MS Student Committees

Scott Jackson (PhD; SEAS), Zachary Hajian-Forooshani (PhD; EEB), Alex Merciere (PhD; SEAS), Morgan
Lindback (PhD; EEB), Joyah Watkins (MS; EEB), Ye Yuan (MS; EEB), Katrina Munsterman* (2019 MS: UC
Santa Barbara), Teal Harrison* (2018 MS; EEB)

* = *students with whom I worked substantially*

Undergraduate Students

Adrian Gonzalez Fall 2019-Spring 2020, Gigi Broyles Fall 2019- Spring 2020, Lily Matlof; Fall 2018 - Spring
2020, Arin Yu Spring 2019 - Spring 2020, Brianna Westmoreland - Fall 2017

Independent Research Course:

Kaylee Prichard Fall 2019 (in collaboration with NOAA), Patrick Lewis Fall 2018-Spring 2019, Emily Brines
Fall 2018-Present, Brandon Nee Spring 2017

SERVICE

Departmental Committees

Executive Committee 2020-2021

Search Committee for Collegiate Fellow 2020

Search Committee for UMBS Biological Station 2019
Early Career Scientist Symposium – departmental organizer
Undergraduate Affairs Committee 2016-present, Social Committee 206-2018

Journals and Funding Agencies Reviewed for (113 total):

National Science Foundation (11), Aquatic Conservation (1), Biologica Tropical (1), Biological Conservation (3), Biology Letters (2), Continental Shelf Research (1), Diversity and Distributions (1), eLife (1), Ecology (8), Ecological Applications (7), Ecology Letters (5), Ecology and Evolution (1), Ecological Engineering (1), Ecosphere (1), Ecosystems (3), eLife (1), Environmental Science and Technology (2), Freshwater Biology (4), Freshwater Science (3), Frontiers in Earth Science (1), Functional Ecology (7), Global Change Biology (5), Journal of Applied Ecology (1), Journal of Animal Ecology (2), Limnology and Oceanography (1), Marine Biology (3), Marine Ecology Progress Series (7), Marine Environmental Research (3), Marine Freshwater Behavior and Physiology (1), Nature (3), Nature Ecology and Evolution (5), Neotropical Ichthyology (1), Oecologia (6), Oikos (1), PLoS One (1), Proceedings of the Royal Society B (2), Science Advances (6), Transactions of the American Fisheries Society (1), Trends in Ecology and Evolution (3)

Journal Editorial Board

Food Webs 2016-current

SYNERGISTIC ACTIVITIES

Sustainable Food Systems Initiative Faculty (University of Michigan) 2016-present
Institute for Global Change Biology (University of Michigan) 2019-present

Scientific advisor for The United Nations Environmental Program in Haiti and The Nature Conservancy. Our recommendations informed the delineation of the first marine national park in Haiti.

Working in partnership with fishers and local stakeholders in Ile A Vache, Haiti, to develop small-scale no-take management areas around clusters of artificial reefs.

Development of an educational outreach program in Haiti involving hundreds of students and local community members. We provide presentations (>25 in the past three years) to schools, communities, and government officials about the basic ecology of their local ecosystems including the design and dissemination of educational posters written in English and Haitian Creole. This outreach is in coordination with much of our ongoing artificial reef research there.

Collaborator at the Mo'orea Coral Reef LTER and Centre de Recherches Insulaires et Observatoire de l'Environnement (CRIOBE, Mo'orea) with on-going research on consumer-mediated nutrient dynamics in coral reef ecosystems.

Ongoing collaboration with Loggerhead Productions Inc. on conservation films. To date we have produced three: two education videos about our [on-going research in Haiti](#), one in English and [one in Haitian Creole](#) that is being distributed throughout the island where we work. The third is a conservation documentary that recently showed that the Cucalorus Film Festival (Wilmington, NC) and has been submitted to the Full Frame Film Festival (Durham, NC). A fourth full-length documentary is close to [completion](#).

Leader of Conservation Initiative “Ampil Poison” to implement small-scale no-take fisheries areas in Haiti

PRESENTATIONS

Society Meetings

Ecological Society of America 2019; International Coral Reef Symposium 2016; Abaco Science Conference 2016; Ecological Society of America 2015; International Coral Reef Symposium 2012; Graduate Student Symposium, UGA 2011; Ecological Society of America 2010; Student Symposium, UGA 2009; North American Benthological Society 2009; Student Symposium, UGA 2008; Student Symposium, UGA 2007.

Invited Presentations

Department Seminar, University of The Bahamas 2020; Conservation Lightning Talk School of the Environment and Sustainability, UM 2019; Department Seminar, Leibniz-Institute of Freshwater Ecology and Inland Fisheries 2018; Department Seminar, Scripps Institute of Oceanography 2017; Department Seminar, Ecology and Evolutionary Biology, University of Michigan 2016; Department Seminar, School of Marine and Atmospheric Sciences, Stony Brook University 2016; Department Seminar, Marine Sciences University of California Santa Barbara 2016; Department Seminar, Biology, Georgia Tech University 2016; Quantitative Seminar, School of Aquatic and Fisheries Science, University of Washington 2015; Presentation of Research for Bahamas Department of Marine Resources, The Bahamas 2011; Guest Seminar, Am. Fisheries Society University of Georgia Chapter 2010; Keynote Speaker: Lionfish Awareness Event, The Bahamas 2010

OUTREACH

Editor of “Teachers Resource Guide to the Natural History of The Bahamas” – an educational document distributed to teachers throughout the entire country

Participant in elementary “Enrichment Clusters” – periodically host science lab fieldtrips 2007-2012

Student Mentor for Northwest Association of Biomedical Research BioExpo Program, Seattle, WA. 2014-2015

Guest Lecturer Elementary-High school for 30+ classes in Haiti, The Bahamas and USA 2006-present

Select Popular Press (see website for details)

Invited blog post for AAAS – “At the nexus of people and basic science – and argument for community engagement” <https://www.aaas.org/programs/center-public-engagement-science-and-technology/reflections/nexus-people-and-basic-science>

“This Side of the Zanskar” – authored article about globalization influence on remote cultures. *submitted*
Article in [Oceana](#) about research on fish-mediated nutrient dynamics

[Interview](#) on Canadian Broadcasting Company’s “Quarks and Quirks” radio show for coral reef research

Article on fish excretion on coral reefs featured in [National Geographic](#) and over 40 other news outlets

Educational film (in Haitian Creole) developed for Haitian students about local research and conservation: <https://vimeo.com/183383529> (also see personal website)

Film featuring artificial reef research in Haiti: <http://www.jacoballgeier.com/outreach>

Frequent blogger for *The Abaco Scientist*, <http://appliedecology.cals.ncsu.edu/absci/>

ScienceDaily.com: press release on articles on metabolic theory and consumer recycling (PNAS 2015; <http://www.sciencedaily.com/releases/2015/04/150416132634.htm>)

ScienceDaily.com: press release on articles on fish nutrient cycling (Ecology, 2013; <http://www.sciencedaily.com/releases/2012/12/121211163545.htm>)

UGA Research Magazine, press release on articles on fish nutrient cycling (Ecology 2013). Spring 2013

“Haiti – a glimmer of hope in a sea of despair” - article in The Abaconian – local newspaper on Abaco, The Bahamas. October 2012

"Abaco Creek Restoration: Where We Have Been and Where We are Going" article in The Abaconian – local newspaper on Abaco, The Bahamas. October 2011

Global Reef Expedition - article about artificial reefs research. <http://www.livingoceansfoundation.org>

UGA Research Magazine, press release article on overfishing manuscript (Ecological Applications 2011). Summer 2011

UGA Columns, press release article on overfishing manuscript (Eco. Applications 2011). Spring 2011

“Sustainable Seafood” – article printed in The Flagpole, local newspaper, Athens GA. November 2008

Frequent highlights in newspaper *Abaconian* for restoration, outreach work in Bahamas

Abaco Life Magazine article about tidal creek restoration and outreach. December 2007