

Daniel Lauer

Ph.D., Quantitative Biosciences

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Education

- 2018 – 2023 **Ph.D. in Quantitative Biosciences**
Georgia Institute of Technology, Atlanta, GA
Minor: Environmental Data Science
Cumulative GPA: 3.920
Advisor: Jenny L. McGuire
Dissertation: Responses of African mammals and ecosystems to environmental change across space and time
- 2016 – 2017 **Bachelor of Science in Environmental Science and Policy**
University of Maryland, College Park, MD
Concentration: Biodiversity and Conservation Biology
Cumulative GPA: 3.958
- 2013 – 2016 **Coursework in Biology**
Brandeis University, Waltham, MA
Minor: Environmental Studies
Cumulative GPA: 3.901

Experience: Scientific Research

- 2018 – 2023 **Graduate Research Assistant**
Interdisciplinary Graduate Program in Quantitative Biosciences and School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Advisor: Jenny L. McGuire
Laboratory: Spatial Ecology and Paleontology Lab
- 2016 – 2018 **Undergraduate Research Assistant**
Department of Biology, University of Maryland, College Park, MD
Advisor: Marjorie L. Reaka
- 2016 **Summer Research Volunteer**
Song Saa Foundation, Koh Rong, Cambodia

Advisor: Filippo Carli
Program: Tropical Marine Conservation Programme

2015 **Summer Laboratory Volunteer**
Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD
Advisor: Christopher D. Heaney
Laboratory: Environmental Health Microbiology and Immunology Laboratory

2014 **Summer Laboratory Volunteer**
School of Medicine, Johns Hopkins University, Baltimore, MD
Advisor: Charlotte A. Gaydos
Laboratory: Johns Hopkins University International STI, Respiratory Diseases,
and Biothreat Research Laboratory

Experience: Teaching

2021 **Graduate Teaching Assistant**
School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Instructor: Emily G. Weigel
Course: General Ecology Laboratory

2021 **Graduate Teaching Assistant**
School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Instructor: Annalise B. Paaby
Course: Experimental Design & Statistical Methods

2019 **Graduate Teaching Assistant**
School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Instructors: Emily G. Weigel and Colin Harrison
Course: Principles of Biology

2018 **Graduate Teaching Assistant**
School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA
Instructor: Emily G. Weigel
Course: General Ecology Laboratory

2018 **Undergraduate Teaching Assistant**
Department of Biology, University of Maryland, College Park, MD
Instructor: Marjorie L. Reaka
Course: Marine Ecology

Experience: Leadership

2015 – 2016 **Music Director**
Brandeis University, Waltham, MA

Director for: Manginah (premiere co-educational Jewish a-cappella group at the university)

- 2014 **Student Club Treasurer**
Brandeis University, Waltham, MA
Treasurer for: Brandeis Orthodox Organization (Jewish cultural group, and the largest student club at the university)

Experience: Volunteering

- 2019 **Science Night Volunteer**
Marietta High School, Marietta, GA
- 2019 **Science Night Volunteer**
Lockheed Elementary School, Marietta, GA
- 2019 **Research Conference Volunteer**
The Ecological Society of America Annual Meeting, Louisville, KY
- 2019 **Research Conference Volunteer**
Evolution of Complex Life Conference, Atlanta, GA
- 2013 **VolunteerFest Volunteer**
Brandeis University, Waltham, MA

Experience: Other

- 2017 **Student Collaborator**
Montgomery County Department of Parks, Silver Spring, MD
- 2012 – 2015 **Summer Camp Counselor**
Camp Stone, Sugar Grove, PA

Primary Literature Publications

- 2023 **Lauer, D. A.**, Lawing, A. M., Short, R. A., Manthi, F. K., Müller, J., Head, J. J., & McGuire, J. L. (2023). Disruption of trait-environment relationships in African megafauna occurred in the middle Pleistocene. *Nature Communications*, 14(1), 4016. [doi:10.1038/s41467-023-39480-8](https://doi.org/10.1038/s41467-023-39480-8)
- 2023 **Lauer, D. A.**, & McGuire, J. L. (2023). Africa's ecosystems exhibit a tradeoff between resistance and stability following disturbances. *Environmental Research Letters*, 18(7), 074029. [doi:10.1088/1748-9326/acde90](https://doi.org/10.1088/1748-9326/acde90)

- 2023 **Lauer, D. A.**, Shipley, B. R., & McGuire, J. L. (2023). Habitat and not topographic heterogeneity constrains the range sizes of African mammals. *Journal of Biogeography*, 50(5), 846-857. [doi:10.1111/jbi.14576](https://doi.org/10.1111/jbi.14576)
- 2022 **Lauer, D. A.**, & Reaka, M. L. (2022). Depth distributions of benthic and pelagic species highlight the potential of mesophotic and deep habitats to serve as marine refugia. *Marine Ecology Progress Series*, 700, 39-52. [doi:10.3354/meps14180](https://doi.org/10.3354/meps14180)
- 2020 McGuire, J. L., & **Lauer, D. A.** (2020). Linking patterns of intraspecific morphology to changing climates. *Journal of Biogeography*, 47(11), 2417-2425. [doi:10.1111/jbi.13954](https://doi.org/10.1111/jbi.13954)
- 2020 Wang, Y., Shipley, B. R., **Lauer, D. A.**, Pineau, R. M., & McGuire, J. L. (2020). Plant biomes demonstrate that landscape resilience today is the lowest it has been since end-Pleistocene megafaunal extinctions. *Global Change Biology*, 26(10), 5914-5927. [doi:10.1111/gcb.15299](https://doi.org/10.1111/gcb.15299)

Other Publications and Creative Products

- 2023 **Lauer, D. A.**, Shipley, B. R., & McGuire, J. L. (2023). A tale of two types of landscape heterogeneity. *Journal of Biogeography*. <https://journalofbiogeographynews.org/2023/04/18/tale-of-two-types/>
- 2020 **Lauer, D. A.**, Weigel, E. G. (2020). Island biogeography. *Make Teaching with R in Undergraduate Biology Less Excruciating, QUBES Educational Resources*. [doi:10.25334/ABY7-GQ05](https://doi.org/10.25334/ABY7-GQ05)
- 2019 **Lauer, D. A.**, & McGuire, J. L. (2019). Geometric morphometric analyses uncover features of climate-linked intraspecific variation in *Microtus californicus* dentition [version 1; not peer reviewed]. *F1000Research*, 8, 1455 (poster). [doi:10.7490/f1000research.1117364.1](https://doi.org/10.7490/f1000research.1117364.1)
- 2018 Reaka, M. L., & **Lauer, D. A.** (2018). Understanding peaks of diversity and endemism of Crustacea in the Gulf of Mexico. *9th International Crustacean Congress, Abstract Book*, 56. [doi:10.13140/RG.2.2.32808.32000](https://doi.org/10.13140/RG.2.2.32808.32000)
- 2017 Dagnachew, B., Feigenbaum, T., Kadin, S., **Lauer, D.**, Matson, C., Nickerson, N., & Stanard, I. (2017). Creating connections between environmental and human health and messaging a call to pro-environmental action. *Partnership for Action Learning in Sustainability (PALS)*. [doi:10.13016/M2P55DK9D](https://doi.org/10.13016/M2P55DK9D)

Presentations

- 2023 **Lauer, D. A.**, Lawing, A. M., Short, R. A., Manthi, F. K., Müller, J., Head, J. J., & McGuire, J. L. (2023, July). Disruption of trait-environment relationships in African megafauna occurred in the middle Pleistocene. *Talk presented at the XXI Congress of the International Union for Quaternary Sciences, Rome, Italy.*
- 2023 **Lauer, D. A.**, Lawing, A. M., Short, R. A., Manthi, F. K., Müller, J., Head, J. J., & McGuire, J. L. (2023, February). Pleistocene disruption of trait-environment relationships informs the future conservation of African megafauna. *Talk presented at the 2nd Conservation Paleobiology Symposium of the Conservation Paleobiology Network, Gainesville, FL.*
- 2022 **Lauer, D. A.**, Lawing, A. M., Short, R. A., Manthi, F. K., Müller, J., Head, J. J., & McGuire, J. L. (2022, November). Disruption of trait-environment relationships in African megafauna coincident with hominin emergence. *Talk presented at the Society of Vertebrate Paleontology Annual Meeting, Toronto, Canada.*
- 2022 **Lauer, D. A.**, & McGuire, J. L. (2022, March and April). Resistance-resilience tradeoff in Africa's protected area ecosystems. *Talk presented at the Quantitative Biosciences Seminar Series, Atlanta, GA, and at the International Association for Landscape Ecology – North American Regional Chapter Annual Meeting (Fully Online).*
- 2021 – 2022 **Lauer, D. A.**, Shipley, B. R., & McGuire, J. L. (2021, August and 2022, June). Habitat but not topographic heterogeneity constrains the range sizes of African mammals. *Talk presented at The Ecological Society of America Annual Meeting (Fully Online), and at the International Biogeography Society 10th Biennial Conference, Vancouver, Canada (Delivered Online).*
- 2020 **Lauer, D. A.**, & McGuire, J. L. (2020, October). African herbivore biodiversity change over time: a multidimensional view. *Talk presented at the Georgia Institute of Technology Global Climate Action Symposium, Atlanta, GA.*
- 2020 **Lauer, D. A.**, & McGuire, J. L. (2020, March and August). Distinct dimensions of African herbivore biodiversity exhibited unique responses to past climatic and anthropogenic changes. *Talk presented at the Georgia Institute of Technology Graduate and Postdoc Seminar Series, Atlanta, GA, and at The Ecological Society of America Annual Meeting (Fully Online).*
- 2019 **Lauer, D. A.**, & McGuire, J. L. (2019, May, August, and October). Geometric morphometric analyses uncover features of climate-linked intraspecific variation in *Microtus californicus* dentition. *Poster presented at the Georgia Institute of Technology Evolution of Complex Life Conference, Atlanta, GA, at The Ecological Society of America Annual Meeting, Louisville, KY, and at the Emory University France-Atlanta Biodiversity Symposium, Atlanta, GA.*

- 2018 Reaka, M. L., & Lauer, D. A. (2018, June). Patterns of biodiversity on mesophotic reefs and their implications for conservation and management. *Talk presented by Dr. Reaka at the Mesophotic Coral Reef Ecosystems Gordon Research Conference, Lewiston, ME.*
- 2016 Lauer, D. A. (2016, April). Citizen science research on the phenology of trees: seeing the bigger trends in the smaller picture. *Poster presented at the Brandeis University Experiential Learning Symposium, Waltham, MA.*

Awards and Honors

- 2022 **Distinguished Paper in Ecology, Evolution and Population Biology**
Interdisciplinary Graduate Program in Quantitative Biosciences, Georgia Institute of Technology, Atlanta, GA
- 2021 **NSFDEB-NERC Grant (Role: Graduate Research Assistant)**
National Science Foundation Division of Environmental Biology and Natural Environment Research Council, Atlanta, GA
- 2020 **Distinguished Paper in Ecology and Evolution**
Interdisciplinary Graduate Program in Quantitative Biosciences, Georgia Institute of Technology, Atlanta, GA
- 2019 **Sigma Xi, The Scientific Research Honor Society**
Georgia Institute of Technology, Atlanta, GA
- 2018 **Herbert P. Haley Fellowship**
Interdisciplinary Graduate Program in Quantitative Biosciences, Georgia Institute of Technology, Atlanta, GA
- 2017 **Global Business Simulation Strategy Game Global Top-100 Performance**
University of Maryland, College Park, MD
- 2017 **National Collegiate Jewish A-Cappella Championship Champion**
University of Maryland, College Park, MD
- 2017 **Tau Sigma National Honor Society**
University of Maryland, College Park, MD
- 2016 – 2017 **Academic Honors**
University of Maryland, College Park, MD
- 2013 – 2016 **Dean's List**
Brandeis University, Waltham, MA

2013 – 2016 **Lerman-Neubauer Fellowship**
Brandeis University, Waltham, MA

2014 **National Society of Collegiate Scholars**
Brandeis University, Waltham, MA

Media Coverage

2020 *Daily Mail*. 31 August. “[Declining resilience of North America's plant biomes may be a sign of a mass extinction last seen nearly 13,000 years ago, experts warn.](#)” By Stacy Liberatore.

2020 *Environmental News Network*. 25 August. “[North American Biomes Are Losing Their Resilience, With Risks for Mass Extinctions.](#)” By Yale Environment 360.

2020 *Science Magazine*. 23 August. “[Fossil pollen record suggests vulnerability to mass extinction ahead.](#)” By John Toon.

Workshops

2020 **Big Data and Machine Learning**
Extreme Science and Engineering Discovery Environment (XSEDE) and Pittsburgh Supercomputing Center, Pittsburgh, PA
Role: Workshop participant

2019 **QBioS Hands-On Modeling Workshop on Microbial Games**
Interdisciplinary Graduate Program in Quantitative Biosciences, Georgia Institute of Technology, Atlanta, GA
Role: Workshop facilitator/volunteer

Professional Organization Memberships

- Sigma Xi, The Scientific Research Honor Society (Georgia Institute of Technology)
- Tau Sigma National Honor Society (University of Maryland, College Park)
- Lerman-Neubauer Fellowship program (Brandeis University)
- National Society of Collegiate Scholars (Brandeis University)

Student Club Memberships

- Rak Shalom (University of Maryland, College Park)
- Kedma (University of Maryland, College Park)
- Brandeis Juggling Society (Brandeis University)
- Manginah (Brandeis University)

- Brandeis Eruv Committee and Brandeis Orthodox Organization (Brandeis University)

Technical Skills

- **Data analytical tools** – R, Python, SQL, Microsoft Excel, MATLAB, Julia, GitHub, Google Earth, GIS, NoSQL (including MongoDB and Cassandra), Tableau, Power BI, Microsoft Azure (including ML Studio), Shell, Spark (including PySpark), Hadoop, AWS, GCP, D3 (including HTML, Javascript, and CSS), Plotly, Pig, Scala, Java, Gephi, OpenRefine
- **Other** – Advanced Open Water SCUBA Diving (certified by the Professional Association of Diving Instructors and Scuba Schools International)

References

Jenny L. McGuire, Ph.D.

Assistant Professor

Georgia Institute of Technology

Interdisciplinary Graduate Program in Quantitative Biosciences

School of Biological Sciences

School of Earth and Atmospheric Sciences

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Atlanta, GA 30332

E-mail: jenny.mcguire@biology.gatech.edu

A. Michelle Lawing, Ph.D.

Associate Professor

Texas A&M University

Department of Ecology and Conservation Biology

322 Wildlife, Fisheries, and Ecological Sciences Building

College Station, TX 77843

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Senior Academic Professional

Georgia Institute of Technology

School of Biological Sciences

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