

MARGARET E. SWIFT

Cornell K. Lisa Yang Center for Wildlife Health
Cornell University
Ithaca, NY 14850

margaret.swift@cornell.edu
www.maggie.earth
github.com/margaret-swift

ACADEMIC INTERESTS

- How can management **facilitate wildlife movements** to adapt to a changing climate, while balancing the needs of humans that live and work in conservation areas?
- How does **global climate change** drive behavioral shifts in large African herbivores, from surface water use to great migrations? How will these patterns change in the near future?
- How can we as ecologists **decolonize our research**, lift up traditional ways of knowing and local expertise at all levels of science, and become better stewards of human knowledge?

EDUCATION & TRAINING

- 2023 – **Cornell University, Ithaca, NY, USA**
Cornell Atkinson Postdoctoral Fellow, *Cornell K. Lisa Yang Center for Wildlife Health*
Advisors: Steven A. Osofsky (Cornell), Robin Naidoo (WWF)
Project: “Simulating Sustainability through a One Health Lens: An application of predictive modeling to optimize land-use planning in support of southern African wildlife conservation and rural livestock keeping.”
- 2019 – 2023 **Duke University, Durham, NC, USA**
Ph.D. Environment, *Nicholas School of the Environment*
Advisors: James S. Clark, Susan C. Alberts
Dissertation: “The impacts of climate change and veterinary fencing on savanna ungulate populations, communities, and behaviors”
- 2013 – 2017 **The College of William & Mary, Williamsburg, VA, USA**
B.S. Computational and Applied Mathematics and Statistics, *magna cum laude*
Biology concentration, Russian and Post-Soviet Studies minor

PROFESSIONAL POSITIONS

- 2017 – 2019 **Data Science Consultant**, International Business Machines (IBM), *Washington, DC, USA*
Food and Drug Administration: Created automated data management notifications; designed and developed an internal webpage for a data management toolkit.
Teva Pharmaceutical: Developed workflow automation tools for API testing; analyzed mock patient smart-inhaler datasets; led UI team for user interface.
- 2015 – 2017 **Research Assistant**, The College of William & Mary, *Williamsburg, VA, USA*
Mathematical investigations of two-reef oyster system under Allee Effect: Deterministic analysis of marine populations under the Allee effect and dispersal.
Russian Movie Theater Project: Conducted, transcribed, and translated interviews; crafted user interface and webpage to assist researchers; analyzed topical trends.

GRANTS, FELLOWSHIPS, & AWARDS

- 2024 “Restoring Elephant Migrations Through Science Based Disease Risk Assessments”
Addendum, **World Wildlife Fund** (\$59,500)
- 2023 Cornell Atkinson Postdoctoral Fellowship, **Cornell University** (\$144,000)
- 2021 Graduate Research Fellowship, **National Science Foundation** (\$138,000)
- 2020, 2022 Data Expeditions, **Duke University** (\$5,000 total)
- 2019 James B. Duke Fellowship, **Duke University** (\$20,000)
- 2015 EXTREEMS-QED (REU), **National Science Foundation** (\$4,000)

Margaret Swift

SELECTED PUBLICATIONS

- Schaffer-Smith, D.S., **M. Swift**, A. Killea, A. Gamber, R. Naidoo, and J.J. Swenson. "Tracking a blue wave of ephemeral water across arid southern Africa." *Environmental Research Letters* 17: 114063. 2022. DOI: [10.1088/1748-9326/ac98d9](https://doi.org/10.1088/1748-9326/ac98d9)
- Collins, C., S. Elmendorf, J.G. Smith, L. Shoemaker, M. Szojka, **M. Swift**, and K. Suding. "Global change re-structures alpine plant communities through interacting abiotic and biotic effects." *Ecology Letters* 25(8):1813-1826. 2022. DOI: [10.1111/ele.14060](https://doi.org/10.1111/ele.14060)
- Clark, J. S., C. L. Scher, and **M. Swift**. The emergent interactions that govern biodiversity change. *PNAS* 117(29):17074-17083. 2020. DOI: [10.1073/pnas.2003852117](https://doi.org/10.1073/pnas.2003852117)

CONTRIBUTED TALKS, ABSTRACTS, AND POSTERS

- 2025 **Savanna Science Network Meeting, Skukuza, Kruger National Park, South Africa** (talk)
Swift, M.; R. Naidoo. "The present and future of ephemeral freshwater in the Kavango-Zambezi Transfrontier Conservation Area"
- 2024 **Cornell Department of Natural Resources Seminar, Ithaca, NY, USA** (talk)
Swift, M.; R. Naidoo. "Water for elephants: Mapping ephemeral waterholes to inform models of African savanna elephant movements"
- 2024 **Cornell Tropical Biology Seminar, Ithaca, NY, USA** (talk)
"What is good enough? The challenges of using simple models to represent complex tropical systems"
- 2024 **Cornell Tropical Biology Symposium, Ithaca, NY, USA** (talk)
"Forecasting savanna elephant movements on a fenced and drying landscape."
- 2024 **Cornell K. Lisa Yang Center for Wildlife Health Symposium, Ithaca, NY, USA** (talk)
"Advanced computer modeling to inform conservation planning."
- 2024 **Savanna Science Network Meeting, Skukuza, Kruger National Park, South Africa** (talk)
Swift, M.; R. Naidoo; P. Beytell. "Forecasting savanna elephant (*Loxodonta africana*) movements on a fenced and drying landscape using Agent Based Modeling."
<<https://youtu.be/xjj0FW0ZkhM>>
- 2024 **Department of Natural Resources Winter Symposium, Ithaca, NY, USA** (talk)
Swift, M.; R. Naidoo; P. Beytell. "Simulating savanna elephant movements on a fenced and drying southern African landscape".
- 2023 **Savanna Science Network Meeting, Skukuza, Kruger National Park, South Africa** (talk)
Swift, M.; C. Coetsee; S. Ferreira; I.P.J. Smit; S. MacFadyen; J. Botha; G. Hempson; J.S. Clark. "Declines in rare antelope populations since the 1980s are partially explained by environmental drivers." <<https://youtu.be/6xQjHhkr90>>
- 2022 **GRADx, Durham, NC, USA** (TED-style public talk)
"Stronger together: How a network of seasonal waterholes unlocks animal movement across a dry African savanna." <<https://youtu.be/PA9DIUspUqQ>>
- 2021 **Population Biology Seminar, Durham, NC, USA** (talk)
"Diet-driven: How food and water availability influence population movement across two African savanna systems."
- 2020 **Ecological Society of America Annual Meeting, virtual** (talk)
"Understanding the diverse responses of savanna communities to climate change."
- 2019 **Dynamic Species Distribution Modeling Workshop, Grenoble, France** (talk)
"Dynamic Generalized Joint Attribute Modeling (GJAM) Tutorial."
- 2019 **Mathematics Homecoming Alumni Panel, Williamsburg, VA, USA** (panel)
- 2016 **Joint Mathematics Meetings, Seattle, WA, USA** (talk)
"Dispersal-induced global extinction in a two-patch model under the Allee effect."
- 2015 **Young Mathematicians Conference, Columbus, OH, USA** (poster), *title as above*.
- 2015 **Shenandoah Undergrad. Math. & Stats., Harrisonburg, VA USA** (talk), *title as above*.

TEACHING

EXPERIENCE

- 2021, 2023 Field Teaching Assistant, **Skukuza Science Leadership Institute**, *South Africa*
Aided in field ecology courses at the Kruger National Park, South Africa. Helped students develop scientific questions and projects, and taught field skills and safety.
- 2019 – 2021 Teaching Assistant, **Duke University**, *Durham NC*
ENV 710: Applied Data Analysis for Environmental Science
Wrote and taught lab material for two years in a graduate-level statistics course. Focused primarily on environmental data, probability, regression, & statistical analysis in R. Prepared and implemented weekly lesson plans for computational labs and held extensive office hours. In 2020, adapted materials for online instruction (COVID-19).
ENV 665: Bayesian Inference for Environmental Models
Advised students in applying Bayesian inference and modeling (Gibbs sampling through JAGS, MCMC techniques) to their research projects.
ENV 89S: Environmental Change in the Big-Data Era
ENV 832: Environmental Decision Analysis
- 2014 – 2017 High School Mathematics Tutor, **William & Mary**, *Williamsburg VA*

GUEST LECTURES & TUTORIALS

- 2022 **Remote Sensing using Google Earth Engine** *Duke University*
- 2022 **Data Expeditions: Cleaning up Ellerbe Creek Data** *Duke University*
A lesson plan created for the Duke Bass Connections Ellerbe Creek Project with colleague Jonathan Behrens. Teaches data cleaning, exploratory data analysis, and challenges specific to messy field-collected data. [Rpubs](#), [GitHub](#)
- 2021 **Data Expeditions: Do hurricanes affect bird biodiversity?** *Duke University*
A lesson plan created for the course “Big Data for Biodiversity and Climate Change” with colleague Lane Scher. Teaches linear modeling, exploratory data analysis, and challenges specific to Big Data. [Rpubs](#), [GitHub](#)
- 2020 **Introduction to R** *Tutorial*. Three modules teaching basic R and RStudio. [Rpubs](#)
- 2020 **GJAMTime** *Tutorial*. Teaches [dynamic addition](#) to the R package ‘gjam’ using data from the Kruger National Park, South Africa. [GitHub](#)

SERVICE

ACADEMIC

- 2020 – 2022 Ecology Seminar Co-Coordinator *Duke University Program in Ecology (UPE)*
- 2019 – 2020 Recruitment Committee, *Duke UPE*
- 2019 – 2020 Website Manager, *Duke UPE*
- 2019 – 2020 Resource Directory Developer, *Duke Graduate & Professional Student Council*

DIVERSITY, EQUITY, INCLUSION, & DECOLONIZATION

- 2022 Coordinator, *Decolonizing Ecology Workshop (Dr. Madhusudan Katti, NC State)*
- 2021 – 2022 Planning Committee, *People & Nature Symposium* [\[site\]](#) [\[talk link\]](#)
- 2020 – 2022 Human History & Erasure Subgroup, *Unearthing Duke Forest Project* [\[site\]](#)

COMMUNITY AND SCIENTIFIC OUTREACH

- 2022 – 2023 Virtual Visiting Scientist, Skype a Scientist, *virtual*
- 2022 Tutor, Teachers Supporting Black Lives, *virtual*
- 2020 Phone Banking Volunteer, Vote Save America, *North Carolina*.
- 2018 – 2019 Tree Inventory Volunteer Team Lead, Casey Trees, *Washington, DC*

Margaret Swift

PROFESSIONAL MEMBERSHIPS & HONORS

2023 –	Cornell Atkinson Postdoctoral Fellow, <i>Cornell University</i>
2022 –	Ecological Society of America (Statistical Ecology Section)
2021 – 2023	NSF Graduate Research Fellow, <i>Duke University</i>
2019 – 2023	Society of Duke Fellows, <i>Duke University</i>
2019 – 2021	Environmental Impact Fellow, <i>Duke University</i>
2019 – 2020	oSTEM (Out in STEM) , <i>Duke University</i>
2017	Post-Secondary Russian Scholar, <i>American Council of Teachers of Russian</i>
2016 – 2017	Dobro Slovo Slavic Honors Society, <i>William & Mary</i>
2015 – 2017	Pi Mu Epsilon Mathematics Honors Society, <i>William & Mary</i>

RELEVANT COURSEWORK & WORKSHOPS

ECOLOGY	Field Skills in Plant Ecology (Kruger NP); Remote Sensing; LiDAR; Functional Ecology of Plants; Individuals to Communities; Animal Behavior; Population Ecology; Food Web Theory; Random Walks in Biology; Mathematical Biology
MATH, DATA & STATISTICS	Theory of Statistical Inference; Bayesian Inference; Statistical Data Analysis; Probability; Computational Problem Solving; Data Structures; Ordinary Differential Equations; Partial Differential Equations; Nonlinear Dynamics & Chaos
SCI-COMM	Challenge of Science Leadership (Barefoot Thinking Company, 2020); Science Communication

MENTORING

Graduate	Naa-Kwarley Quartey (Texas A&M), Lauren Jenkins (Duke), Hannah Zonneville (Cornell), Julie Peeling (Cornell)
Undergraduate	Lia Brussolo Cremona (Florida Atlantic Univ.)

CERTIFICATIONS & SKILLS

CERTIFICATION	SOLO Wilderness First Responder (~70 hours instruction, 2020); CPR/First Aid Certification; PADI Open Water Diver
COMPUTATION	R, C++, Python, MATLAB, VBA, Bash, AppleScript, Mathematica
GEOSPATIAL	Google Earth Engine, ArcGIS, ArcMap, ENVI
DEVELOPMENT	RStudio, Jupyter Notebook, Eclipse, Spring Tool Suite, ReadyAPI
WEB & MISC	Angular JS & 2+, HTML/CSS/JS, Apache NiFi, LaTeX, NLTK
LINGUISTIC	English, Russian, Spanish, French, American Sign Language