David H. Klinges

• **Email:** dklinges9@gmail.com • **Site:** natureinparadise.github.io/ • **Code:** github.com/dklinges9 • Google Scholar

EDUCATION

2024 **University of Florida,** Gainesville, FL
PhD in Interdisciplinary Ecology; PI: Dr. Brett Scheffers

2017 **Dartmouth College**, Hanover, NH
A.B. in Biology (High Honors); Gamma Sigma Alpha National Honor Society

PROFESSIONAL APPOINTMENTS

2024 – **Yale University,** New Haven, CT
Postdoctoral Associate. PI: Dr. David Skelly (Yale School of the Environment)

2018 – 19 **Smithsonian Institution,** Edgewater, MD & Front Royal, VA
Database Manager
- Curator of community-sourced soil carbon database, doubled size of database within eight months
- Led R-coding and GitHub tutorials for ecologists, built mapping interfaces (https://goo.gl/jLSBd6)

2018 *GIS Technician*
- Spatial analysis to identify drivers of Myanmar forest loss; piloted UAVs (drone) for forest mapping

2017 **Alliance for a Sustainable Amazon,** Madre de Dios, Peru
Resident Naturalist
- Led herpetofaunal diversity monitoring; taught field skills; provided guidance for research projects

2016 **Louisiana Universities Marine Consortium**, Cocodrie, LA
Research Experience for Undergraduates (REU) Intern

GRANTS AND AWARDS (*total awarded to date: $376,538*)

2024 Wildlife Ecology and Conservation Outstanding Graduate Research Award (*one per year*)
2023 Smithsonian Institution Climate Change Postdoctoral Fellowship: $134,000 (*declined*)
2023 GoFundMe Crowdfunding Campaign: Randriambololona Memorial Film Fellowship: $4,076
2023 James Davidson Graduate Travel Scholarship: $300
2022 Tropical Conservation and Development Practitioner Grant: $1,000
2022 Robin E. Nadeau Graduate Research Award: $4,000
2022 Wildlife Ecology and Conservation Travel Grant: $400
2022 SE Climate Adaptation Science Center Research Mini-Grant: $1,000
2021 University of Florida International Center Research Abroad for Doctoral Students: $4,182
2021 School of Natural Resources and Environment Travel Grant: $250
2020 Explorers Club Fjällräven Field Grant: $5,000
2020 Tropical Conservation and Development Field Research Grant: $2,000
2020 GoFundMe Crowdfunding Campaign “Support Forest Climate Research in Madagascar”: $5,230
2019 Thad Owens Memorial Fund: $3,000
2019 National Science Foundation Graduate Research Fellowship: $141,000
2019 University of Florida Research Assistantship: $64,000
2019 University of Miami Dean’s Fellowship (*declined*)
2019 University of British Columbia Four-Year Fellowship (*declined*)
2019 Northwestern Medill School of Journalism Merit Scholarship (*declined*)
2017 Dartmouth Biological Sciences Thesis: High Honors
2016 NSF REU Award: $5,500
2015 Junior Research Scholarship, Dartmouth College: $800
2015 Sophomore Science Scholar, Dartmouth College: $800
2013 Nicholas J. Arcaro Scholar-Athlete Award (*awarded to one male and female per class*)

UNSUCCESSFUL GRANTS

2024 NSF Postdoctoral Research Fellowship in Biology (*PI Klinges: Highly Meritorious*) ($240,000)
2024 AI and Complex Computational Research (*PI Klinges*; $164,548)
2023 Yale Donnelley Fellowship (*PI Klinges*; $140,000)
2023 Washington Research Foundation Fellowship (*PI Klinges*; $225,000)
2021 Lewis and Clark Fund for Field Research (*PI Klinges*; $5,000)
2021 Association for Tropical Biology and Conservation Seed Grant (*PI Klinges*; $5,339)
2021 Sigma Xi Research Fund (*PI Klinges*; $1,000)

TEACHING AND MENTORING

Students Mentored

2024 – Thomas Kelly, University of Florida (*PhD Committee*)
2022 – Mikoja Rambinintsoa, University of Antananarivo (*serving on PhD Committee, paper in prep*)
2022 – Lydia Soifer, University of Florida (*informal advisory to younger student, paper in prep*)
2021 – Fiona Price, Dartmouth College (*Price et al. 2024, Klinges senior author)*
2019 – Herizo Randrianandrasana (Masters), University of Fianarantsoa

Natural Resource Ecology (WIS3404), *University of Florida*
2023 *Teaching Assistant (1 semester)*

Species on the Move 2023 Workshop Leader
2023 *Using microclimate data and models for ecological applications*

Invited Lecturer
2022 *Linear Mixed Effects Models, Coding4Conservation*
2021 *Global Change Biology, University of Florida*
2021 *Reptiles and Amphibians of the Southeast, University of Florida*

Wildlands Studies Peru Project
2017 *Peru Project Teaching Assistant (1 semester)*

- Lectured students on experiment design & scientific writing; led hands-on conservation activities.

Dartmouth College
2016 *Tutor, Foundation Course – Ecology*

PUBLICATIONS

H-index: ***11****; Total Citations:* ***1139****;* †Undergraduate mentee; *Corresponding/senior author

(18) Klinges, D.H., Baecher, J.A., Lembrechts, J.J., Maclean, I.M.D., Lenoir, J., Greiser, C., Ashcroft, M., Evans, L.J…. 30 total co-authors (2024) Proximal microclimate: Moving beyond spatiotemporal resolution improves ecological predictions. Global Ecology and Biogeography, n/a, e13884. *DOI: 10.1111/geb.13884*

- Demonstrated via a global synthesis that relevant "microclimate" has more to do with representing the proximal microhabitats for a species than the spatial or temporal resolution of climate data.

(17) Trew, B.T., Edwards, D.P., Lees, A.C., **Klinges, D.H.,** Early, R., Svátek, M., Plichta, R., Matula, R., Okello, J., Niessner, A., Barthel, M., Six, J., Maclean, I. M. D. Novel climates are already widespread beneath the world's tropical forest canopies. *Nature Climate Change, 14, 753–759. DOI: 10.1038/s41558-024-02031-0*

(16) Malmborg, C., Willson, A.M., Beatty, M., Bradley, L. M., **Klinges, D.H.,** Lewis, A.S.L., Oshinubi, K., Woelmer, W., Koren, G. Defining Model Complexity: An Ecological Perspective. *Meteorological Applications* 31, e2202 https://doi.org/10.1002/met.2202

(15) Kemppinen, Julia… **Klinges, D.H**… et al., *98 total co-authors.* Microclimate, an inseparable part of ecology and biogeography. *Global Ecology and Biogeography* e13834 https://doi.org/10.1111/geb.13834

(14) Price, F.†, Randriamiharisoa, L., **Klinges, D.H.*** (2023) Enhancing demographic diversity of scientist-community collaborations improves wildlife monitoring in Madagascar. *Biological Conservation 288:110377.* DOI: 10.1016/j.biocon.2023.110377

- In several years of community and scientist observations across six parks in Madagascar, we show that 1) women perform better than men at biodiversity surveys, and 2) amount of formal education is not a strong predictor of success. We discuss how to co-design projects with diverse community partners in an effort towards decoloniality. *Klinges senior author.*

(13) Holmquist, J.R., **Klinges, D.H.…**Megonigal, J.P. *20 total co-authors.* The Coastal Carbon Library and Atlas: Open Source Soil Data and Tools Supporting Blue Carbon Research and Policy. *Global Change Biology* 30:e17098. DOI: 10.1111/gcb.17098

(12) Basham, E.W., Baecher, J.A., **Klinges, D.H.,** Scheffers, B.R. (2023) Vertical stratification patterns of tropical forest vertebrates: a meta-analysis. *Biological Reviews* 98:99-114. DOI: 10.1111/brv.12896

(11) **Klinges, D.H.*,** Duffy. J., Kearney, M.R., Maclean, I.M.D. (2022) mcera5: driving microclimate models with ERA5 global gridded climate data. *Methods in Ecology and Evolution* 13:1402–1411 DOI: 10.1111/2041-210X.13877

- Motivation, description, & validation of R package to download and process ERA5 data for ecology.

(10) Rixen, C… **Klinges, D. H**… et al., *68 total co-authors* (2022). Winters are changing: snow effects on Arctic and alpine tundra. *Arctic Science*, 8:572–608. DOI: 10.1139/as-2020-0058

(9) Lembrechts, J. J., van den Hoogen, J., Aalto, J., Ashcroft, M. B., De Frenne, P., Kemppinen, J., Kopecký, M., Luoto, M., Maclean, I. M. D., Crowther, T. W., Bailey, J. J., Haesen, S., **Klinges, D. H***…et al.*, *272 total co-authors* (2022) Global maps of soil temperature. *Global Change Biology* 00:1-35. DOI: 10.1111/gcb.16060

(8) Todd-Brown, K.E.O., Abromoff, R.Z., Beem-Miller, J., Blair, H.K., Earl, S., Frederick, K.J., Fuka, D.R., Santamaria, M.G., Harden, J.W., Heckman, K., Heran, L.J., Holmquist, J.R., Hoyt, A.M., **Klinges, D.H.,** LeBauer, D.S., Malhotra, A., McClelland, S.C., Nave, L.E., Rocci, K.S., Schaeffer, S.M., Stoner, S., Nvan Gestel, N., von Fromm, S.F., and Younger, M.L. (2022). Reviews and syntheses: The promise of big diverse soil data, moving current practices towards future potential. *Biogeosciences* 19:3505–3522. DOI: 10.5194/bg-19-3505-2022

(7) De Lombaerde, E., Vangansbeke, P., Lenoir, J., Van Meerbeek, K., Lembrechts, J., Rodríguez-Sánchez, F., Luoto, M., Scheffers, B., Haesen, S., Aalto, J., Christiansen, D.M., De Pauw, K., Depauw, L., Govaert, S., Greiser, C., Hampe, A., Hylander, K., **Klinges, D. H.,** Koelemeijer, I., Meeussen, C., Ogée, J., Sanczuk, P., Vanneste, T., Zellweger, F., Baeten, L. & De Frenne, P. (2022) Maintaining forest cover to enhance temperature buffering under future climate change. *Science of The Total Environment* 151338. DOI: 10.1016/j.scitotenv.2021.151338

(6) Maclean, I.M.D., **Klinges, D. H.** (2021) Microclimc: an R package for estimating above, below and within-canopy microclimate. *Ecological Modelling* 451:109567. DOI: 10.1016/j.ecolmodel.2021.109567

(5) Woelmer, W.M., Bradley, L.M., Haber, L.T., **Klinges, D.H.,** Lewis, A.S.L., Mohr, E.J., Torrens, C.L., Wheeler, K.I. & Willson, A.M. (2021) Ten simple rules for training yourself in an emerging field. *PLOS Computational Biology*, **17**:e1009440. DOI: 10.1371/journal.pcbi.1009440

(4) Frenne, P.D., Lenoir, J., Luoto, M., Scheffers, B.R., Zellweger, F., Aalto, J., Ashcroft, M.B., Christiansen, D.M., Decocq, G., Pauw, K.D., Govaert, S., Greiser, C., Gril, E., Hampe, A., Jucker, T., **Klinges, D.H.**, Koelemeijer, I.A., Lembrechts, J.J., Marrec, R., Meeussen, C., Ogée, J., Tyystjärvi, V., Vangansbeke, P. & Hylander, K. (2021) Forest microclimates and climate change: Importance, drivers and future research agenda. *Global Change Biology*, 00:1–19. DOI: https://doi.org/10.1111/gcb.15569

(3) **Klinges, D.H.*** & Scheffers, B.R. (2021) Microgeography, not just latitude, drives climate overlap on mountains from tropical to polar ecosystems. *The American Naturalist*, 197:75–92. Top 4 Most Read Articles of Autumn 2020. DOI: 10.1086/711873

- Revised Janzen (1967)'s classic "Mountain Passes" hypothesis with a global synthesis (29 mountains) and showed that a mountain's latitude (tropical vs. temperate) was not important for determining its strength as a climatic barrier; rather local vegetation, snow, and microhabitats were more important.

(2) Lembrechts, J.J., … **Klinges, D. H***…et al., 179 total co-authors* (2020) SoilTemp: a global database of near-surface temperature. *Global Change Biology*, 00:1–14. DOI: 10.1111/gcb.15123

(1) Reinke, B. A., **Klinges, D. H.** (2017) *Chelydra serpentina* (Snapping Turtle) behavior. *Herpetological Review* Natural History Notes 48(2):423. Full text available here.

MANUSCRIPTS IN REVISION, IN REVIEW AND IN PREP

*Corresponding/senior author ΨAvailable upon request

Manuscripts in Review

(1) **Klinges, D.H.*,** Maclean, I.M.D, Scheffers, B.R. Re-drawing Köppen-Geiger classes using microclimate impacts agriculture, the environment and society. *In review at Frontiers in Ecology and the Environment*Ψ

- Predicted Köppen-Geiger climate class from microclimate globally to show that conventional macroclimate classes are misguided (e.g. "tropical" classes at 50° latitude). *Preprint available.*

(2) **Klinges, D. H.*,** Randriambololona, T., Lange, Z., Laterza-Barbosa, J., Randrianandrasana, H., Scheffers, B.R. Vertical and diel niches modulate the thermal preferences of rainforest frogs. *In review at Journal of Animal Ecology* Ψ

- Unpacked how both spatial and temporal niches drive thermal preference for 37 amphibian species.

(3) Baecher, J.A., **Klinges, D.H.,** Evans, L.J., Romagosa, C.M., Fletcher Jr., R.J., Scheffers, B.R. Jointly evaluating management, climate, and land use shows diffuse spread of an invading predatory snake. *In review at Journal of Applied Ecology.* Ψ*Preprint available.*

(4) Randriamiharisoa, L., **Klinges, D.H.,** Razafindranaivo, S. Scheffers, B.R Community-sourced knowledge improves biodiversity monitoring in Madagascar's National Parks. *In review at Discover Conservation*Ψ

Manuscripts in Prep

(1) **Klinges, D.H.*,** Basham, E.W., Baecher, J.A., Randriambololona, T., Solo, J., Acevedo, M., Scheffers, B.R. Dynamic multi-species occupancy modeling demonstrates amphibian vertical stratification. *In prep for Biotropica*Ψ

- Bayesian multispecies hierarchical modeling to estimate amphibian vertical niches in Madagascar.

(2) **Klinges, D.H.,** Martin, C.W., Roberts, B.J**.** Ecological associations of the coastal marsh periwinkle *Littoraria irrorata*: field and laboratory evidence of vegetation habitat preferences. *In prep for PeerJ*Ψ

- Preference experiments showed that an abundant salt marsh snail may have a broad dietary niche.

(3) Soifer, L., **Klinges, D.H.,** Randriamiharisoa, L., Scheffers, B.R. Quantifying the values of community-based biodiversity monitoring in Madagascar using structured-decision analysis. *In prep for Biological Conservation*Ψ

SOFTWARE

2023 **microclimf:** fast spatial microclimate modeling anywhere on earth. Maclean, I.M.D., **Klinges, D. H.** https://github.com/ilyamaclean/microclimf

2022 **mcera5:** driving microclimate models with ERA5 global gridded climate data. **Klinges, D.H.,** Duffy. J., Kearney, M.R., Maclean, I.M.D. https://github.com/dklinges9/mcera5

- Lead author and R package maintainer, 12 stars on GitHub, >45 users assisted over email/GitHub

2021 **microclimc:** estimating above, below and within-canopy microclimate. Maclean, I.M.D., **Klinges, D. H.** https://github.com/ilyamaclean/microclimc

NON-REFEREED PUBLICATIONS

Peters, J., Sjodin, A., Torres, R., McLachlan, J., Willson, A., **Klinges, D. H.,** Brown, C., Dalbotten, D., Bueno Watts, N., Kowalski, C. (2024) The EFI DEI Strategic Plan: What Have We Learned in 4 Years? Ecological Forecasting Initiative Blog Post. https://ecoforecast.org/blog/#DEIJ

Michonneau, J. F., Teal, T., Fournier, A., Seok, B., Obeng, A., Pawlik, A. N., Conrado, A. C., Woo, K., Lijnzaad, P., Hart, T., White, E. P., Marwick, B., Bolker, B., Jordan, K. L., Ashander, J., Dashnow H., Hertweck, K., Cuesta, S. M., Becker, E. A., Guillou, S., Shiklomanov, A., **Klinges, D. H.**, Odom, G. J. (2019) "datacarpentry/R-ecology-lesson: Data Carpentry: Data Analysis and Visualization in R for Ecologists, June 2019." https://datacarpentry.org/R-ecology-lesson/

DEI, SERVICE AND OUTREACH

Ecological Forecasting Initiative

2021 – *DEI Database Manager*

- Developed DEI database quantifying EFI's membership demographics to evaluate what initiatives increase diversity over time. Database in use for informing EFI outreach and community-building

2021 – 22 *Steering Committee Member*

2019 – 23 *Student Association Co-Chair*

- One of three inaugural chairs; organized monthly networking, training opportunities, and 3 workshops; drafted original documentation of Student Association's Operating Principles and Procedures

2020 – 22 *Student Association Networking Workshop:* organized and led workshop for three years

Madagascar National Parks (MNP)

2022 *Data Management, Analysis, and Visualization for Protected Area Conservation*

- Funded, designed, and led (in French) a week-long workshop for MNP staff
- 1st R training to MNP staff of all 43 parks; staff self-reported +246% interest in R post-workshop

2019 – *Analysis of local community member demographics for MNP park management*

- Conducts analyses to update priorities on integrating more diverse workforce in MNP staff

SoilTemp Consortium

2021– *Steering Committee Member*

Data Carpentries, Washington DC & Gainesville, FL

2019– *Certified Carpentries Instructor; have led and assisted with multiple Carpentries workshops*

Alliance for a Sustainable Amazon, Madre de Dios, Peru

2019– *Board Member/Scientific Advisor*

Constructing a Digital Environment, NERC, London, UK

2019 – 21 *Expert Network Member*

Smithsonian Institution, Washington, DC

2018 *Museum Sleepover Series Volunteer and Video Producer*

- Engaged K-8 students with exhibits at Smithsonian museums; produced video promotional.

Invited Peer Referee: *Nature Climate Change, Methods in Ecology and Evolution, Global Change Biology, Ecography, Global Ecology and Biogeography, Integrative and Comparative Biology, Ecosphere, Theoretical and Applied Climatology, Environmental Monitoring and Assessment, Forest Ecology and Management, Herpetology Notes (~12 reviews per year)*

SCIENCE COMMUNICATION AND MULTIMEDIA

Mongabay Environmental News, Washington, DC

2018 – 19 *Wildtech Journalism Intern, Freelancer-in-Residence*

- Reported on conservation tech to publicly communicate science; published work: https://goo.gl/KfHEK2

RESET (Raising Excitement for Science, Engineering and Technology)
2018 – 19 *Volunteer Science Presenter*
- Educated hundreds of children with interactive exhibits on soil horizons, ecosystems, & adaptations.

Wildlands Studies, remote & Madre de Dios, Peru
2017 – 18 *Video Coordinator and Producer*
- Produced films on ecological field studies to be used in campus presentations (https://goo.gl/ebsJXq).

Amazon Conservation Association, Washington, DC
2018 *Communications and Social Media Intern*
- Managed photo archive, produced video content for newsletters, social media posts, and annual report.

Dartmouth College, Hanover, NH
2015 *Digital Arts Lab Manager*
- Administered daily open hours; designed and taught workshops on Adobe Photoshop & Premier Pro.

The Fund for the Public Interest, New Brunswick, NJ
2013 – 14 *Field Manager/Canvasser*
- Fundraised ~$20,000 for environmental campaigns ($300/day, $120 above office daily average).

INVITED PRESENTATIONS

Klinges, D. H., Holmquist, J., Megonigal, P. Modeling and mapping wetlands carbon as a community resource. *Chesapeake Sentinel Site Cooperative Marsh Resilience Summit*, Williamsburg VA (oral)

Klinges, D. H., Holmquist, J., Megonigal, P. A network for coastal carbon: soil data archival as a community resource and to reduce uncertainties in modeling and mapping. *ESIP* 2018, Washington DC (oral)

SELECT OTHER PRESENTATIONS

Klinges, D. H., co-authors. Climate Variability And Change Across Scales Using A Novel Global Microclimate Database. *Species on the Move 2023* (oral)

Klinges, D. H., co-authors. Spatial and temporal resolution versus incorporating microclimate: how to improve climate data for ecological models. *Microclimate Ecology and Biogeography 2022* (oral)

Klinges, D. H., Scheffers, B. Are mountain passes higher in the tropics? Revisiting the climate variability hypothesis suggests microgeography more important than latitude. *Ecological Society of America 2021* (oral)

Klinges, D. H., Holmquist, J., Megonigal, P., Ramos, J, Brown, L., Todd-Brown, K. Town hall panelist: updates from the CCRCN, data clearinghouse overview. *AGU 2018*, Washington DC. (oral)

Klinges, D. H., Incorporation over Deforestation: Cacao Agroforestry as an Alternative to Papaya Monocrop in Madre de Dios, Peru. *International Society of Tropical Foresters Annual Meeting*, New Haven, CT (poster).

Klinges, D. H., Haser, P. The abundance and size distribution of queen conch in protected and open harvest zones surrounding Little Cayman Island. *CTEC 12th Annual Symposium*, Keene, NH. (oral).

SCIENTIFIC SKILLS

Expertise	**Example Software**
Version Control	Git, GitHub
Data curation & visualization	tidyverse (e.g. tidyr, dplyr), lubridate
Spatiotemporal processing	raster, terra, IDE, FRK, gstat, gDistance

Statistics & Modeling	RJAGS, MuMin, lme4, AICcmodavg
Visualization & Web development	ggplot2, RShiny
Thermal Ecology	microclima, NicheMapR, mcera5 (developer), microclimc (developer), microclimf (developer)
Program Development & Management	Bash, SLURM, Linux/Windows/OS X systems

Other Software Programs: ArcGIS, Google Earth Engine, Bash, JAGS, Python, JavaScript, VBA, GitHub
Modeling: Bayesian Hierarchical Models, Spatial statistics, Structured decision making
Film: Canon DSLR cameras, Adobe Premiere Pro and Photoshop, Final Cut Pro, DJI Mavic Pro, ImageJ
Certifications: PADI scuba certified, FAA sUAS Remote Pilot License, Data Carpentries instructor
Wilderness: Navigation (compass and GPS), 4WD, manual transmission, CPR and First Aid certification
Languages: English (native), French (fluent)
Hobbies: Distance running, skiing, kayaking, scuba, backpacking