# David H. Klinges

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

## EDUCATION

Aug 2024 **Ph.D. Interdisciplinary Ecology,** University of Florida, Gainesville, FL. *Advisor: Brett Scheffers*

2017 **A.B. Biology (High Honors);** Dartmouth College, Hanover, NH

## PROFESSIONAL EXPERIENCE

2024 – **Postdoctoral Associate,** Yale University, New Haven, CT. *Advisor: David Skelly*

2018 – 19 **GIS and Data Technician,** Smithsonian Institution, Edgewater, MD & Front Royal, VA

2017 **Resident Naturalist,** Alliance for a Sustainable Amazon, Madre de Dios, Peru

## RESEARCH INTERESTS

I am a global change biologist interested in **how climate change and land use change jointly impact biodiversity, from microhabitat to global scales**. I use a combination of mathematical models, empirical observations (especially in tropical systems), simulations, and experiments to understand how **organismal physiology and biogeography respond to dynamic environments**, integrating biological and meteorological theory and data. Throughout my work, I have also promoted diversity, equity, and inclusivity, and prioritized applying basic research to inform practical decision-making as we face global change.
**Key topics:** *Climate Change Ecology, Microclimate, Biodiversity across Scales, Tropical Ecology and Conservation, Remote Sensing*

## RECENT GRANTS AND AWARDS (*total awarded to date: $369,438*)

2024 Wildlife Ecology and Conservation Outstanding Graduate Research Award (*one per year*)
2023 Smithsonian Climate Change Postdoctoral Fellowship: $134,000 (*awarded, but declined offer*)
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 (*awarded, but declined offer*)
2019 University of British Columbia Four-Year Fellowship (*awarded, but declined offer*)
2019 Northwestern Medill School of Journalism Merit Scholarship (*awarded, but declined offer*)

## PEER-REVIEWED PUBLICATIONS

*Corresponding/senior author; ΨAvailable upon request; Indicates Undergraduate mentee; Graduate mentee
***Summary:*** *H-index:* ***12****; Total Citations:* ***1,503*** *(Google Scholar); 23 total papers; 6 first-author papers; 14 papers in journals with Impact Factor > 5; 7 papers in journals with Impact Factor > 10*

**2024** (23) **Klinges, D.H.*,** Maclean, I.M.D, Scheffers, B.R. Redrawing Köppen-Geiger classes with microclimate: implications for nature and society. ***Frontiers in Ecology and the Environment*** e2831 DOI: 10.1002/fee.2831

(22) **Klinges, D.H.*,** Randriambololona, T., Lange, Z., Laterza-Barbosa, J., Randrianandrasana, H., Scheffers, B.R. Vertical and diel niches modulate thermal selection by rainforest frogs. ***Proceedings of the Royal Society of London B: Biological Sciences****,* 291: 20241497. DOI: 10.1098/rspb.2024.1497 *Chosen for cover photo of issue 2035*

(21) De Frenne, P., Beugnon, R., **Klinges, D.H.** , Lenoir, J.…*et al., 26 total co-authors.* Ten practical guidelines for microclimate monitoring in terrestrial ecosystems. ***Methods in Ecology and the Environment.*** DOI: 10.1111/2041-210X.14476

(20) Randriamiharisoa, L., **Klinges, D.H.,** Razafindranaivo, S. Scheffers, B.R Community-sourced knowledge improves biodiversity monitoring in Madagascar's National Parks. ***Discover Conservation*** **1**, 1-14. DOI: 10.1007/s44353-024-00015-x

(19) **Klinges, D.H.*** Microclimate regulates when autumn leaves fall. ***Nature Climate Change****, 14, 1226-1227 Invited perspective* DOI: 10.1038/s41558-024-02154-4

(18) **Klinges, D.H.***, Baecher, J.A., Lembrechts, J.J., Maclean, I.M.D., Lenoir, J., Greiser, C., Ashcroft, M., Evans, L.J…. Scheffers, B.R. *30 total co-authors*. Proximal microclimate: Moving beyond spatiotemporal resolution improves ecological predictions. ***Global Ecology and Biogeography***, 33, e13884. DOI: 10.1111/geb.13884

(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 DOI: 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 DOI: 10.1111/geb.13834

(14) 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

**2023**

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

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

**2022**

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

(10) Rixen, C… **Klinges, D.H**… et al., *68 total co-authors.* 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**…Nijs, I. *272 total co-authors* 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. 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. Maintaining forest cover to enhance temperature buffering under future climate change. ***Science of The Total Environment*** 151338. DOI: 10.1016/j.scitotenv.2021.151338

**2021**

(6) Maclean, I.M.D., **Klinges, D.H.** 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. 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. Forest microclimates and climate change: Importance, drivers and future research agenda. ***Global Change Biology***, 27:2279-2297. DOI: 10.1111/gcb.15569

(3) **Klinges, D.H.*** & Scheffers, B.R. 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

**2020**

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

**2017**

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

**UNDER REVIEW**

**Klinges, D.H.*,** Lembrechts, J.J., Van de Vondel, S., Greenlee, E., Hayles-Cotton, K., Senior, R. A workflow for microclimate sensor networks: integrating geographic tools, statistics, and local knowledge. *In revision at* ***Ecological Indicators***$^{\Psi}$ *Preprint available*

Fredston, A.L., Tingley, M.W., Neate-Clegg, M.H.C., Evans, L.J., Antão, L.H., Ban, N.C., Chen, I.C., Chen, Y.W., Comte, L., Edwards, D.P., Evengard, B., Fadrique, B., Falkeis, S.H., Guralnick, R., **Klinges, D.H.**, Lembrechts, J.J., Lenoir, J., Palacios-Abrantes, J., Pauchard, A., Pecl, G., Pinsky, M.L., Senior, R.A., Smith, J.E., Soifer, L.D., Sunday, J.M., Tape, K.D., Washam, P., Scheffers, B.R. Reimagining species on the move across space and time. *In review at* ***Trends in Ecology and Evolution***$^{\Psi}$ *Preprint available*

**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 revision at* ***PeerJ***$^{\Psi}$ *Preprint available*

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 review at* ***Biological Conservation***$^{\Psi}$ *Preprint available*

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 revision at* ***Journal of Applied Ecology***$^{\Psi}$ *Preprint available*

Greenlee, E., Cabral., A., **Klinges, D.H.,** Zegura, E., Hester, J. Opportunities and insights on sensor-based technology for biodiversity conservation in Madagascar. *In review at* ***Computer Supported Cooperative Work***$^{\Psi}$

Holmquist, J., Belshe, E. F., Boyd, B…..**Klinges, D.H.,** et al. *29 total co-authors.* Probabilistic forecasting of coastal wetland soil carbon response to sea-level rise. *In review at* ***Ecological Monographs***

## SOFTWARE

2024 **Microclimate sensor networks:** optimal selection of sensor locations for any landscape. **Klinges, D.H.,** Van de Vondel, S. https://github.com/dklinges9/Microclimate-Sensor-Networks

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

- 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

## TEACHING AND MENTORING

**Students Mentored**

*PhD students are formally under a separate primary supervisor*

2024 – Thomas Kelly (PhD), University of Florida (*serving on PhD Committee*)
2024 – Eric Greenlee (PhD), Georgia Institute of Technology
2022 – Mikoja Rambinintsoa (PhD), University of Antananarivo (*serving on PhD Committee*)
2022 – Lydia Soifer (PhD), University of Florida
2021 – 24 Fiona Price (Undergraduate), Dartmouth College (*Price et al. 2023, Klinges senior author)*
2019 – 23 Herizo Randrianandrasana (Masters), University of Fianarantsoa
2019 – 22 Tsitohaina Randriambololona (PhD), University of Antananarivo (*deceased*)

**Teaching Certifications**

2023 Preparing Future Faculty Course**,** *University of Florida*
2019 Certified Data Carpentries Instructor*, The Carpentries*

**Teaching Assistant**

2024 Biodiversity Conservation: Global Perspectives (WIS 2552)**,** *University of Florida*
2024 Wildlife Issues in a Changing World (WIS 2040)**,** *University of Florida*
2023 Natural Resource Ecology (WIS3404)**,** *University of Florida*
2017 Peru Project Semester-Long Field Course *(TA & Lecturer*)*, Wildlands Studies*

**Workshop Designer/Leader**

2025 Spatial Biophysics and Microclimate Tools. *International Biogeography Society, invited*

2025 Modeling physiologically-relevant microclimate variables anywhere on Earth. *ICCB 2025, invited*
2024 Data Analysis and Visualization in R for Ecologists. *Carpentries Workshop, University of Florida*
2023 Microclimate Data and Models for Ecological Applications. *Species on the Move 2023, invited*
2022 Analyser les Données pour la Gestion du Parc. *Madagascar National Parks, in French*
2020 – 22 Ecological Forecasting Initiative Student Association Workshop (3 consecutive years)
2020 Managing and Analyzing Geospatial Data in R. *Carpentries Workshop, University of Florida*
2019 Exploring Data with R Tidyverse and Git Version control. *Carpentries Workshop, Smithsonian*
2019 Measuring and Modeling Wetlands Soil Carbon. *Smithsonian Environmental Research Center*

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

## DEI, SERVICE AND OUTREACH

2021 – **DEI Database Manager,** *Ecological Forecasting Initiative*
- Developed DEI database quantifying EFI's membership demographics to evaluate what initiatives increase diversity over time. Database used to inform EFI outreach

2021– **Steering Committee Member,** *Microclimate Ecology and Biogeography Consortium*
2021 – 22 **Early Career Steering Committee Member**, *Ecological Forecasting Initiative*
2019 – 23 **Student Association Co-Chair,** *Ecological Forecasting Initiative*
- One of three inaugural chairs; organized monthly networking, training opportunities, and 3 workshops; composed Student Association's Operating Principles and Procedures

2019 – **Pro Bono Data Analyst,** *Madagascar National Parks (MNP)*
2019 – **Board Member/Scientific Advisor***, Alliance for a Sustainable Amazon, Madre de Dios, Peru*
2019 – 21 **Expert Network Member,** *Constructing a Digital Environment, NERC, London, UK*
2018 **Museum Sleepover Series Volunteer and Video Producer** *Smithsonian Institution*

**Invited Peer Referee:** *Nature Climate Change, Global Change Biology, Ecology Letters, Methods in Ecology and Evolution, 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)*

## 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/

## 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; 9 published articles online: 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 social media posts, and annual report.

**Dartmouth College**, Hanover, NH
2015 *Digital Arts Lab Manager*
- Administered daily open hours; designed and taught workshops on film and photo editing.

## INVITED SEMINARS

2025 University of Wisconsin-Madison
2024 Brown University
2024 University of Florida

## SELECT RECENT 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. Modeling and mapping wetlands carbon as a community resource. *Chesapeake Sentinel Site Cooperative Marsh Resilience Summit 2018*, 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)

## HIGHLIGHTED SCIENTIFIC SKILLS

| **Expertise** | **Example Software** |
|---|---|
| *Version Control and Program Dev* | Git, GitHub, Bash, SLURM |
| *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 |

**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