

Marlon E. Cobos, Ph.D.

Postdoctoral Fellow

Ecology and Evolutionary Biology Department & Biodiversity Institute, University of Kansas

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Research Interests

My research centers on data integration and ecological modeling, with the overarching objective of comprehending ecological processes and biogeographic patterns in a changing world. My research focuses in three areas: (1) biogeography with emphasis on disease dynamics and risk mapping; (2) methods and tool development for predictive modeling; and (3) integration of evolutionary principles in predictive modeling.

Education

Ph.D. Ecology and Evolutionary Biology with Honors, University of Kansas, USA	2023
M.Sc. Zoology and Animal Ecology, Universidad de La Habana, Cuba	2016
B.Sc. Environmental engineering, Universidad Nacional de Loja, Ecuador	2012

Appointments and Professional Experience

Postdoctoral Fellow. <i>Department of Ecology and Evolutionary Biology & Biodiversity Institute. University of Kansas.</i>	2023–present Lawrence, KS, USA
Lecturer. <i>Facultad Agropecuaria y de Recursos Naturales Renovables. Universidad Nacional de Loja.</i>	2017 Loja, Loja, Ecuador
Environmental Consultant. <i>IMPROYAM Environmental Consulting Company.</i>	2013-2014 Zamora, ZCh, Ecuador
Technician of Planning and Land Management. <i>El Guismi Decentralized Autonomous Government.</i>	2012-2013 El Panguí, ZCh, Ecuador

Research Experience

Postdoctoral Researcher

Project: NSF PIPP-Predictive Intelligence for a Pandemic Prevention (2100955). Center for Emerging Pathogen Prediction and Integration. *Advisor: Jocelyn P. Colella, PhD. Department of Ecology and Evolutionary Biology & Biodiversity Institute, University of Kansas. 2023–present. Main Activities: fieldwork (mammal collections), lab work, data analysis, ecological modeling, grant-proposal development, and student mentoring.*

Graduate Research Assistant

Project: NSF EPSCOR (OIA-1920946). Marshaling Diverse Big Data Streams to Understand Risk of Tick-Borne Diseases in the Great Plains. *Advisor: A. Townsend Peterson, PhD. Biodiversity Institute, University of Kansas. 2020–2023. Main Activities: fieldwork (tick collections), data analysis, ecological modeling, AI implementations for automated identification of species, and student mentoring.*

Project: Bases for conservation of the most endangered Cuban toad, *Peltophryne florentinoi*. *Advisor: Roberto Alonso-Bosch, PhD. Museum of Natural History “Felipe Poey”, Universidad de La Habana. 2015–2017. Main Activities: fieldwork (surveying species populations and habitats), data analysis, and statistical modeling.*

Associated Researcher

Project: Ecological bases for restoration of degraded ecosystem biodiversity and functionality in southern Ecuador, in the face of potential global environmental changes. *Advisor: Nikolay Aguirre, PhD. Programa de Investigación de la Biodiversidad y Servicios Ecosistémicos, Universidad Nacional de Loja. 2016–2017. Main Activities: project design, data collection, data analysis, ecological modeling.*

Undergraduate Research Assistant

Project: Characterization, conservation and sustainable use of native animal species of South- Ecuadorian Amazon. *Advisor: Katusca Valarezo-Aguilar, PhD. Museum of Zoology “LOUNAZ”, Universidad Nacional de Loja. 2011. Main Activities: field work to record species and their habitats, data analysis, and mapping information.*

Project: Trophic niche overlap and disease transmission between the American Bullfrog (*Lithobates catesbeianus*) and native frogs of South-Ecuadorian Amazon. Advisor: Katusca Valarezo-Aguilar, PhD. Museum of Zoology "LOUNAZ", Universidad Nacional de Loja. 2011. Main Activities: field work and lab work to generate data.

Teaching Experience

Lecturer

Course: **Experimental Design.** Faculty of Agriculture and Renewable Natural Resources, Universidad Nacional de Loja. Loja, Ecuador. Spring 2017.

Course: **Inorganic Chemistry.** Faculty of Agriculture and Renewable Natural Resources, Universidad Nacional de Loja. Loja, Ecuador. Spring 2017.

Guest Lecturer

Course: **Environmental Sciences Seminar.** Lecture: "Ecological Models for Disease Risk Prediction". Department of Environmental Science, Haskell Indian Nations University. Lawrence, Kansas, USA. March 2024.

Course: **Multivariate Data Analysis.** "Guest co-lecturer for the entire course". Department of Ecology and Evolutionary Biology, University of Kansas. Lawrence, Kansas, USA. Fall 2023.

Graduate Teaching Assistant

Lab: **Human Anatomy, Dissection.** Department of Ecology and Evolutionary Biology, University of Kansas. Lawrence, Kansas, USA. 2019-2020.

Lab: **Human Anatomy, Observation.** Department of Ecology and Evolutionary Biology, University of Kansas. Lawrence, Kansas, USA. Fall 2018.

Lab: **Introductory Biology.** Department of Ecology and Evolutionary Biology, University of Kansas. Lawrence, Kansas, USA. Spring 2018.

Lab: **Chordate Zoology Lab.** Department of Animal and Human Biology, Universidad de La Habana. Havana, Cuba. Fall 2015.

Instructor

Course: **Ecological Niche Modeling: Introduction Course.** Lecture: "New approaches to ENM: characterizations of host, vector, and pathogen niches". Fundação Oswaldo Cruz (Fiocruz). (Online), Brazil. March 2024.

Workshop (Co-organizer): **Developing and Applying Educational Modules that link Museums, Biodiversity Literacy, and Emerging Diseases.** International Mammalogical Congress and American Society of Mammalogists Annual Meeting. Anchorage, Alaska, USA. July 2023.

Workshop (Organizer): **GitHub Essentials for Collaborative Research and Development.** Biodiversity Institute, University of Kansas. Lawrence, Kansas, USA. April 2023.

Course: **Ecological Niche Modeling Applied to Fossil Data (short course).** Lecture: "Practical session: basic paleo niche modeling". Geological Society of America Annual Meeting. Denver, Colorado, USA. October 2022.

Course: **Ecological Niche Modeling for Zoonotic Diseases.** Lectures: "ENM using kuenm and Maxent", "ENM: variability and uncertainty", & "Practical sessions". American Society of Microbiology, and University of Kansas Biodiversity Institute. (Online), India. July 2020.

Course: **Ecological Niche Modeling.** Lectures: "ENM using kuenm and Maxent", "Ecological niche overlap: basic theory and methods", & "Practical and question and answer sessions". Biodiversity Institute, University of Kansas. Online. 2020.

Course: **Modelos de Nicho y de Distribución de Especies.** Lecture: "ENM using kuenm and Maxent". Instituto Nacional de Ecología. Jalapa, Veracruz, Mexico. June 2021.

Course (Co-lead instructor): **Curso Avanzado de Modelado de Nichos Ecológicos.** Lectures: "Áreas para la calibración para modelos de nicho ecológico", "Calibración de modelos de nicho ecológico", "Transferencia de modelos de nicho ecológico", & "Practical sessions". Instituto Nacional de Ecología. Jalapa, Veracruz, Mexico. June 2019.

Course: **Modelado de Nicho Ecológico.** Lecture: "Estimación y representación de la incertidumbre en modelos de nicho ecológico". Biodiversity Institute, University of Kansas. Lawrence, Kansas, USA. Online. 2018.

Course: **Conectividad de Hábitat.** Lecture: "Análisis de conectividad de hábitat". Instituto de Ecología y Sistemática. Havana, Cuba. Fall 2015.

Publications (48 peer-reviewed papers published - Google Scholar citations: 1,769; h-index: 15; i10-index: 26)Journal Articles

- 48 DeRaad, D., **Cobos, M. E.**, Hofmeister, N. R., DeCicco, L., Venkatraman, M. X., Nishiumi, I., McKay, B., Zou, F. S., Kawakami, K., Kim, C. H., Lin, R. S., Yao, C. T., Garrett, K. L., Aguilon, S. M., McCormack, J. E., Mays, H. L., Peterson, A. T., Moyle, R. G.R., & Schultz, A. 2024. On the brink of explosion? Identifying the source and potential spread of introduced *Zosterops* white-eyes in North America. *Biol. Invasions*. DOI: [10.1007/s10530-024-03268-8](https://doi.org/10.1007/s10530-024-03268-8)
- 47 Peterson, A. T., **Cobos, M. E.**, Sikes, B., Soberón, J., Osorio-Olvera, L., Bolick, L., & Emmett, A. 2024. Relationships among cost, citation, and access in journal publishing by an Ecology and Evolutionary Biology Department at a U.S. University. *PeerJ*. 12, e16514. DOI: [10.7717/peerj.16514](https://doi.org/10.7717/peerj.16514)
- 46 Bernardinis, G., **Cobos, M. E.**, Brum, F. T., Marques, M. C. M., Peterson, A. T., Carlucci, M. B., & Zwiener, V. P. 2023. Ecological restoration and protection of remnants are key to the survival of the critically endangered Araucaria tree under climate change. *Glob. Ecol. Conserv.* 47, e02668. DOI: [10.1016/j.gecco.2023.e02668](https://doi.org/10.1016/j.gecco.2023.e02668)
- 45 **Cobos, M. E.**, Nuñez-Penichet, C., Campbell, P. D., Cooper, J. A., Machado-Stredel, F., Barve, N., Ashraf, U., Alkische, A. A., Ng'eno, E., Raveendran, R. N., Atauchi, P. J., Adeboje, A., & Peterson, A. T. 2023. Effects of occurrence data density on conservation prioritization strategies. *Biol. Conserv.* 284, 110207. DOI: [10.1016/j.biocon.2023.110207](https://doi.org/10.1016/j.biocon.2023.110207)
- 44 **Cobos, M. E.**, & Peterson, A. T. 2023. Broad-scale factors shaping the ecological niche and geographic distribution of *Spirodela polyrhiza*. *PLoS ONE*. 18, e0276951. DOI: [10.1371/journal.pone.0276951](https://doi.org/10.1371/journal.pone.0276951)
- 43 Colella, J. P., **Cobos, M. E.**, Salinas, I., Cook, J. A., & The PICANTE Consortium. 2023. Advancing the central role of non-model biorepositories in predictive modeling of emerging pathogens. *PLoS Pathog.* 19, e1011410. DOI: [10.1371/journal.ppat.1011410](https://doi.org/10.1371/journal.ppat.1011410)
- 42 Ashraf, U., Peterson, A. T., Chaudhry, M. N., & **Cobos, M. E.** 2023. Global ecological niche conservatism and evolution in *Olea* species. *Saudi J. Biol. Sci.* 30(1), 103500. DOI: [10.1016/j.sjbs.2022.103500](https://doi.org/10.1016/j.sjbs.2022.103500)
- 41 Alkische, A., **Cobos, M. E.**, Osorio-Olvera, L., & Peterson, A. T. 2022. Ecological niche and potential geographic distributions of *Dermacentor marginatus* and *Dermacentor reticulatus* (Acari: Ixodidae) under current and future climate conditions. *Web Ecol.* 22(2), 33–45. DOI: [10.5194/we-22-33-2022](https://doi.org/10.5194/we-22-33-2022)
- 40 Busby, W. H., Barve, N., **Cobos, M. E.**, & Peterson, A. T. 2022. Effects of landscape history on current geographic distributions of four species of reptiles and amphibians in Kansas. *Southwest. Nat.* 66(2), 157–165. DOI: [10.1894/0038-4909-66.2.157](https://doi.org/10.1894/0038-4909-66.2.157)
- 39 **Cobos, M. E.**, Barve, V., Barve, N., Jiménez-Valverde, A., & Nuñez-Penichet, C. 2022. rangemap: An R package to explore species' geographic ranges. *Biodiv. Inform.* 17, 59–66. DOI: [10.17161/bi.v17i.16271](https://doi.org/10.17161/bi.v17i.16271)
- 38 **Cobos, M. E.**, & Peterson, A. T. 2022. Detecting signals of species' ecological niches in results of studies with defined sampling protocols: Example application to pathogen niches. *Biodiv. Inform.* 17, 50–58. DOI: [10.17161/bi.v17i.15985](https://doi.org/10.17161/bi.v17i.15985)
- 37 Contreras-Díaz, R. G., Falconi, M., Osorio-Olvera, L., **Cobos, M. E.**, Soberón, J., Townsend Peterson, A., Lira-Noriega, A., Álvarez-Loayza, P., Luis Gonçalves, A., Hurtado-Astaiza, J., Gonzáles, R. del P. R., Zubileta, I. S., Spironello, W. R., & Vásquez-Martínez, R. 2022. On the relationship between environmental suitability and habitat use for three neotropical mammals. *J Mammal.* 103(2), 425–439. DOI: [10.1093/jmammal/gyab152](https://doi.org/10.1093/jmammal/gyab152)
- 36 Machado-Stredel, F., Freeman, B., Jiménez-García, D., **Cobos, M. E.**, Nuñez-Penichet, C., Jiménez, L., Komp, E., Perktas, U., Khalighifar, A., Ingenloff, K., Tapondjou, W., de Silva, T., Fernando, S., Osorio-Olvera, L., & Peterson, A. T. 2022. On the potential of documenting decadal-scale avifaunal change from before-and-after comparisons of museum and observational data across North America. *Avian Res.* 13, 100005. DOI: [10.1016/j.avrs.2022.100005](https://doi.org/10.1016/j.avrs.2022.100005)
- 35 Peterson, A. T., Aiello-Lammens, M., Amatulli, G., Anderson, R., **Cobos, M. E.**, Diniz-Filho, J. A., Escobar, L., Feng, X., Franklin, J., Gadelha, L., Georges, D., Guéguen, M., Gueta, T., Ingenloff, K., Jarvie, S., Jiménez, L., Karger, D., Kass, J., Kearney, M., Loyola, R., Machado-Stredel, F., Martínez-Meyer, E., Merow, C., Modelli, M. L., Moratara, S., Myers, C., Naimi, B., Noesgaard, D., Ondo, I., Osorio-Olvera, L., Owens, H., Pearson, R., Pinilla-Buitrago, G., Sánchez-Tapia, A., Saupe, E., Thuiller, W., Varela, S., Warren, D., Wiczorek, J., Yates, K., Zhu, G., Zuquim, G., Zurell, D. 2022. ENM2020: A free online course and set of resources on modeling species' niches and distributions. *Biodiv. Inform.* 17, 1–9. DOI: [10.17161/bi.v17i.15016](https://doi.org/10.17161/bi.v17i.15016)
- 34 Nuñez-Penichet, C., **Cobos, M. E.**, Soberón, J., Gueta, T., Barve, N., Barve, V., Navarro-Sigüenza, A. G., & Peterson, A. T. 2022. Selection of sampling sites for biodiversity inventory: Effects of environmental and geographical considerations. *Methods Ecol. Evol.* 13, 1595–1607. DOI: [10.1111/2041-210X.13869](https://doi.org/10.1111/2041-210X.13869)
- 33 Banks, W. E., Moncel, M.-H., Raynal, J.-P., **Cobos, M. E.**, Romero-Alvarez, D., Woillez, M.-N., Faivre, J.-P., Gravina, B., d'Errico, F., Locht, J.-L., & Santos, F. 2021. An ecological niche shift for Neanderthal populations in Western Europe 70,000 years ago. *Sci. Rep.* 11(1), 5346. DOI: [10.1038/s41598-021-84805-6](https://doi.org/10.1038/s41598-021-84805-6)

- 32 **Cobos, M. E.**, Cheng, Y., Song, G., Lei, F., & Peterson, A. T. 2021. New distributional opportunities with niche innovation in Eurasian snowfinches. *J. Avian Biol.* 52(12), e02868. DOI: [10.1111/jav.02868](https://doi.org/10.1111/jav.02868)
- 31 Deraad, D. A., **Cobos, M. E.**, Alkische, A., Ashraf, U., Ahadji-Dabla, K. M., Nuñez-Penichet, C., & Peterson, A. T. 2021. Genome-environment association methods comparison supports omnigenic adaptation to ecological niche in malaria vector mosquitoes. *Mol. Ecol.* 30(23), 6468–6485. DOI: [10.1111/mec.16094](https://doi.org/10.1111/mec.16094)
- 30 Gonzalez, V. H., Cobos, M. E., Jaramillo, J., & Ospina, R. 2021. Climate change will reduce the potential distribution ranges of Colombia's most valuable pollinators. *Perspect. Ecol. Conserv.* 19(2), 195–206. DOI: [10.1016/j.pecon.2021.02.010](https://doi.org/10.1016/j.pecon.2021.02.010)
- 29 Machado-Stredel, F., **Cobos, M. E.**, & Peterson, A. T. 2021. A simulation-based method for identifying accessible areas as calibration areas for ecological niche models and species distribution models. *Front. Biogeogr.* 13(4), e48814. DOI: [10.21425/F5FBG48814](https://doi.org/10.21425/F5FBG48814)
- 28 Nuñez-Penichet, C., **Cobos, M. E.**, Checa, M. F., Quinde, J. D., Aguirre, Z., & Aguirre, N. 2021. High diversity of diurnal Lepidoptera associated with landscape heterogeneity in semi-urban areas of Loja City, southern Ecuador. *Urban Ecosyst.* 24(6), 1155–1164. DOI: [10.1007/s11252-021-01110-w](https://doi.org/10.1007/s11252-021-01110-w)
- 27 Nuñez-Penichet, C., **Cobos, M. E.**, & Soberón, J. 2021. Non-overlapping climatic niches and biogeographic barriers explain disjunct distributions of continental *Urania* moths. *Front. Biogeogr.* 13(2), e52142. DOI: [10.21425/F5FBG52142](https://doi.org/10.21425/F5FBG52142)
- 26 Nuñez-Penichet, C., Osorio-Olvera, L., Gonzalez, V. H., **Cobos, M. E.**, Jiménez, L., Deraad, D. A., Alkische, A., Contreras-Díaz, R. G., Nava-Bolaños, A., Utsumi, K., Ashraf, U., Adeboje, A., Peterson, A. T., & Soberon, J. 2021. Geographic potential of the world's largest hornet, *Vespa mandarinia* Smith (Hymenoptera: Vespidae), worldwide and particularly in North America. *PeerJ*, 9, e10690. DOI: [10.7717/peerj.10690](https://doi.org/10.7717/peerj.10690)
- 25 Raghavan, R. K., Koestel, Z., Ierardi, R., Peterson, A. T., & **Cobos, M. E.** 2021. Climatic suitability of the eastern paralysis tick, *Ixodes holocyclus*, and its likely geographic distribution in the year 2050. *Sci. Rep.* 11(1), 15330. DOI: [10.1038/s41598-021-94793-2](https://doi.org/10.1038/s41598-021-94793-2)
- 24 Simões, M. V. P., Saeedi, H., **Cobos, M. E.**, & Brandt, A. 2021. Environmental matching reveals non-uniform range-shift patterns in benthic marine Crustacea. *Clim. Change.* 168(3), 31. DOI: [10.1007/s10584-021-03240-8](https://doi.org/10.1007/s10584-021-03240-8)
- 23 Soberón, J., **Cobos, M. E.**, & Nuñez-Penichet, C. 2021. Visualizing species richness and site similarity from presence-absence matrices. *Biodiv. Inform.* 16, 20–27. DOI: [10.17161/bi.v16i1.14782](https://doi.org/10.17161/bi.v16i1.14782)
- 22 Vignoles, A., Banks, W. E., Klaric, L., Kageyama, M., **Cobos, M. E.**, & Romero-Alvarez, D. 2021. Investigating relationships between technological variability and ecology in the Middle Gravettian (ca. 32–28 ky cal. BP) in France. *Quat. Sci. Rev.* 253, 106766. DOI: [10.1016/j.quascirev.2020.106766](https://doi.org/10.1016/j.quascirev.2020.106766)
- 21 Alkische, A., **Cobos, M. E.**, Peterson, A. T., Samy, A. M. 2020. Recognizing sources of uncertainty in disease vector ecological niche models: An example with the tick *Rhipicephalus sanguineus sensu lato*. *Perspect. Ecol. Conserv.* 18(2), 91–102. DOI: [10.1016/j.pecon.2020.03.002](https://doi.org/10.1016/j.pecon.2020.03.002)
- 20 Mazón, M., Nuñez-Penichet, C., **Cobos, M. E.** 2020. Relationship between body mass and forewing length in Neotropical Ichneumonidae (Insecta: Hymenoptera). *Neotrop. Entomol.* 49, 713–721. DOI: [10.1007/s13744-020-00784-9](https://doi.org/10.1007/s13744-020-00784-9)
- 19 Owens, H. L., Ribeiro, V., Saupe, E. E., **Cobos, M. E.**, Hosner, P. A., Cooper, J. C., Samy, A. M., Barve, V., Barve, N., Muñoz-R, C. J., Peterson, A. T. 2020. Acknowledging uncertainty in evolutionary reconstructions of ecological niches. *Ecol. Evol.*, 10(14), 6967–6977. DOI: [10.1002/ece3.6359](https://doi.org/10.1002/ece3.6359)
- 18 Simões, M., Romero-Alvarez, D., Nuñez-Penichet, C., Jiménez, L., **Cobos, M. E.** 2020. General theory and good practices in ecological niche modeling: A basic guide. *Biodiv. Inform.* 15(2), 67–68. DOI: [10.17161/bi.v15i2.13376](https://doi.org/10.17161/bi.v15i2.13376)
- 17 **Cobos, M. E.**, Peterson, A. T., Osorio-Olvera, L., Jiménez-García, D. 2019. An exhaustive analysis of heuristic methods for variable selection in ecological niche modeling and species distribution modeling. *Ecol. Inform.* 53, 100983. DOI: [10.1016/j.ecoinf.2019.100983](https://doi.org/10.1016/j.ecoinf.2019.100983)
- 16 **Cobos, M. E.**, Peterson, A. T., Barve, N., Osorio-Olvera, L. 2019. kuenm: An R package for detailed development of ecological niche models using Maxent. *PeerJ*, 7, e6281. DOI: [10.7717/peerj.6281](https://doi.org/10.7717/peerj.6281)
- 15 Nuñez-Penichet, C., **Cobos, M. E.**, Barro, A., Soberón, J. 2019. Potential migratory routes of *Urania boisduvalii* (Lepidoptera: Uraniidae) among host plant populations. *Divers. Distrib.* 25(3), 478–488. DOI: [10.1111/ddi.12881](https://doi.org/10.1111/ddi.12881)
- 14 Peterson, A. T., Anderson, R. P., **Cobos, M. E.**, Cuahutle, M., Cuervo-robayo, A. P., Escobar, L. E., Fernández, M., Jiménez-García, D., Lira-Noriega, A., Lobo, J. M., Machado-Stredel, F., Martínez-Meyer, E., Nuñez-Penichet, C., Nori, J., Osorio-Olvera, L., Rodríguez, M. T., Rojas-Soto, O., Romero-Álvarez, D., Soberón, J., Varela, S., Yañez-Arenas, C. 2019. Curso modelado de nicho ecológico, version 1.0. *Biodiv. Inform.* 14, 1–7. DOI: [10.17161/bi.v14i0.8189](https://doi.org/10.17161/bi.v14i0.8189)

- 13 Peterson, A. T., Anderson, R. P., Beger, M., Bolliger, J., Brotons, L., Burrridge, C. P., **Cobos, M. E.**, Cuervo-robayo, A. P., Minin, E. D., Diez, J., Elith, J., Embling, C. B., Escobar, L. E., Essl, F., Feeley, K. J., Hawkes, L., Jiménez-García, D., Jimenez, L., Green, D. M., Knop, E., Kühn, I., Lahoz-Monfort, J. J., Lira-Noriega, A., Lobo, J. M., Loyola, R., Nally, R.M., Machado-Stredel, F., Martínez-Meyer, E., McCarthy, M., Merow, C., Nori, J., Nuñez-Penichet, C., Osorio-Olvera, L., Pyšek, P., rejmánek, M., ricciardi, A., robertson, M., Rojas-Soto, O., Romero-Alvarez, D., Roura- Pascual, N., Santini, L., Schoeman, D.S., Schröder, B., Soberón, J., Strubbe, D., Thuiller, W., Traveset, A., Trembl, E.A., Václavík, T., Varela, S., Watson, J.E.M., Wiersma, Y., Wintle, B., Yanez- Arenas, C., Zurell, D. 2019. Open access solutions for biodiversity journals: Do not replace one problem with another. *Divers. Distrib.* 25(1), 5–8. DOI: [10.1111/ddi.12885](https://doi.org/10.1111/ddi.12885)
- 12 Raghavan, R. K., Barker, S. C., **Cobos, M. E.**, Barker, D., Teo, E. J. M., Foley, D. H., Nakao, R., Lawrence, K., Heath, A. C. G., Peterson, A. T. 2019. Potential spatial distribution of the newly introduced Long-horned tick, *Haemaphysalis longicornis* in North America. *Sci. Rep.* 9(1), 498. DOI: [10.1038/s41598-018-37205-2](https://doi.org/10.1038/s41598-018-37205-2)
- 11 Raghavan, Ram K., Peterson, A. T., **Cobos, M. E.**, Ganta, R., Foley, D. 2019. Current and future distribution of the Lone Star Tick, *Amblyomma americanum* (L.) (Acari: Ixodidae) in North America. *PLoS ONE.* 14(1), e0209082. DOI: [10.1371/journal.pone.0209082](https://doi.org/10.1371/journal.pone.0209082)
- 10 Ramírez-Gil, J. G., **Cobos, M. E.**, Jiménez-García, D., Morales-Osorio, J. G., Peterson, A. T. 2019. Current and potential future distributions of Hass avocados in the face of climate change across the Americas. *Crop Pasture Sci.* 70(8), 694–708. DOI: [10.1071/CP19094](https://doi.org/10.1071/CP19094)
- 9 **Cobos, M. E.**, Alonso Bosch, R. 2018. Breeding sites of a narrowly distributed amphibian, a key element in its conservation in the face of global change. *Aquatic Conserv. Mar. Freshw. Ecosyst.* 28, 1089–1098. DOI: [10.1002/aqc.2967](https://doi.org/10.1002/aqc.2967)
- 8 **Cobos, M. E.**, Jiménez, L., Nuñez-Penichet, C., Romero-Alvarez, D., Simoes, M. 2018. Sample data and training modules for cleaning biodiversity information. *Biodiv. Inform.* 13, 49–50. DOI: [10.17161/bi.v13i0.7600](https://doi.org/10.17161/bi.v13i0.7600)
- 7 Peterson, A. T., **Cobos, M. E.**, Jiménez-García, D. 2018. Major challenges for correlational ecological niche model projections to future climate conditions. *Ann. N. Y. Acad. Sci.* 1429(1), 66–77. DOI: [10.1111/nyas.13873](https://doi.org/10.1111/nyas.13873)
- 6 Torres-Porras, J., **Cobos, M. E.**, Seoane, J. M., Aguirre, N. 2017. Large and medium-sized mammals of Buenaventura reserve, southwestern Ecuador. *Check List.* 13(4), 35–45. DOI: [10.15560/13.4.35](https://doi.org/10.15560/13.4.35)
- 5 **Cobos, M. E.**, Alonso Bosch, R. 2016. Recent and future threats to the Endangered Cuban toad *Peltophryne longinasus*: Potential additive impacts of climate change and habitat loss. *Oryx.* DOI: [10.1017/S0030605316000612](https://doi.org/10.1017/S0030605316000612)
- 4 **Cobos, M. E.**, Cruz, D. D., Hernández, M. 2016. Análisis multitemporal del Índice Normalizado de Diferencia de Vegetación (NDVI) en Cuba. *Rev. Jard. Bot. Nac.* 37, 15–18.
- 3 Alonso Bosch, R., **Cobos, M. E.** 2016. A rapid survey of the critically endangered Zapata toad, *Peltophryne florentinoi* (Anura: Bufonidae), in Cuba: New locality and conservation approaches. *Rept. Amphib.* 23(1), 46–48. DOI: [10.17161/randa.v23i1.14086](https://doi.org/10.17161/randa.v23i1.14086)
- 2 Nuñez-Penichet, C., **Cobos, M. E.**, Gutiérrez, J. E., Barro, A. 2016. Distribución potencial del género *Omphalea* (Euphorbiaceae) en Cuba: Aproximación a su distribución real. *Rev. Jard. Bot. Nac.* 37, 165–175.
- 1 **Cobos, M. E.**, Nuñez-Penichet, C., Valarezo-Aguilar, K. 2015. First record of an American Bullfrog (*Lithobates catesbeianus*) population in Loja, Ecuador. *Rept. Amphib.*, 22(1), 46–48. DOI: [10.17161/randa.v22i1.14041](https://doi.org/10.17161/randa.v22i1.14041)

Books

- 1 Aguirre, N., Mazón, M., and **Cobos, M. E.** 2019. *Comunicar y divulgar la ciencia. Redacción y publicación de trabajos científicos y divulgativos.* EDILOJA. Loja, Ecuador.

Other Publications

- 3 **Cobos, M. E.** 2023. Integrating Multiple Approaches for Comprehensive Correlative Ecological Niche Modeling. Doctoral Thesis. University of Kansas.
- 2 **Cobos, M. E.** 2016. Posibles implicaciones del cambio climático sobre la distribución de las especies del género *Peltophryne* (Anura: Bufonidae) en Cuba. *Master's Thesis.* Universidad de La Habana.
- 1 **Cobos, M. E.** 2012. Distribución potencial de la rana toro (*Lithobates catesbeiana*, Anfibia: Anura) y su relación con la fragmentación de hábitats en Zamora Chinchipe, Ecuador. *Bachelor's Thesis.* Universidad Nacional de Loja.

Articles In Prep., Pre-prints, In Review, and In Press (mentees: * undergraduate, ** graduate)

- 16 **Cobos, M. E.**, Augusto, F., Wearing, H., Cook, J. A., Peterson, A. T. & Colella, J. P. In prep. Simulating spatio-temporal dynamics in host-pathogen interactions: Hantavirus and its wildlife hosts.

- 15 **Cobos, M. E.**, Ibañez IV, D.**, Hey, A. D.**, & Colella, J. P. In prep. Spatio-temporal suitability dynamics for major Hantavirus strains and their mammal reservoirs in Panama.
- 14 Trindade, W.**, Peterson, A. T., & **Cobos, M. E.** In prep. Testing Akaike information criterion implementations for machine learning ecological niche models.
- 13 Yumiseva, C., Villasis, J. F.*, Aguayo, S.*, **Cobos, M. E.**, Colella, J. P., & Villacis, A. G. In prep. Current and future potential distribution of the Chagas disease vector *Rhodnius ecuadoriensis*.
- 12 Haddock, J. B.**, Nuñez-Penichet, C., **Cobos, M. E.**, & Colella, J. P. In prep. Leveraging historical occurrence data to assess change in mammal diversity across space and time.
- 11 **Cobos, M. E.**, Krejsa, D. M., DeCicco, L. H., Wiens, B. J., Peterson, A. T., & Colella, J. P. In prep. Bridging data gaps in disease biogeography: The crucial role of natural history museums.
- 10 **Cobos, M. E.**, Winters, T.*, Martinez, I.*, Yao, Y., Xiao, X., Ghosh, A., Sundstrom, K., Duncan, K., Little, S. E., Brennan, R. E. & Peterson, A. T. In review. Time-specific ecological niche models to assess spatio-temporal activity of *Amblyomma americanum* in the central Great Plains. *PLoS ONE*.
- 9 Arias-Giraldo, L. F.** & **Cobos, M. E.** In review. enmpa: An R package for ecological niche modeling using presence-absence data and generalized linear models. *Biodiv. Inform.*
- 8 Arias-Giraldo, L. F.**, **Cobos, M. E.**, Peterson, A. T., Landa, B., & Navas-Cortes, J. A. In review. *Verticillium dahliae* in southern Spain: Unraveling plant pathogen niche signals in a Mediterranean landscape. *Plant Dis.*
- 7 Barve, N., Ashraf, U., Barve, V., **Cobos, M. E.**, Nuñez-Penichet, C., & Peterson, A. T. In review. Revisiting plant hardiness zones to include multiple climatic stress dimensions. *iScience*.
- 6 Peterson, A. T., Yao, Y., **Cobos, M. E.**, & Xiao, X. In review. Correlative ecological niche model applications to predicting landscape-scale woody plant encroachment in Kansas tallgrass prairie systems. *PLoS ONE*.
- 5 **Cobos, M. E.**, Owens, H. L., Soberón, J., & Peterson, A. T. In review. Detailed characterizations of non-analogous conditions in multivariate environmental comparisons via the Mobility Oriented Parity metric. *Front. Biogeogr.*
- 4 Ng'eno, E., Alkische, A., Romero-Alvarez, D., Sundstrom, K., **Cobos, M. E.**, ..., & Peterson, A. T. In press. Complex phenology of five tick species in the central Great Plains. *PLoS ONE*.
- 3 Machado-Stredel, F., Atauchi, P. J., Nuñez-Penichet, C., **Cobos, M. E.**, Osorio-Olvera, L., Khalighifar, A., Peterson, A. T., Fletcher, R. J. In press. The Roles of Abiotic and Biotic Factors in Driving Range Shifts: An Invasive Pomacea Snail Facilitates Snail Kite Northward Range Expansion. *Ornithology*.
- 2 Alkische, A., **Cobos, M. E.**, & Peterson, A. T. In press. Broad-scale ecological niches of pathogens vectored by the ticks *Ixodes scapularis* and *Amblyomma americanum* in North America. *PeerJ*
- 1 **Cobos, M. E.**, Osorio-Olvera, L., & Peterson, A. T. 2019. Assessment and representation of variability in ecological niche model predictions. *BioRxiv*. DOI: [10.1101/603100](https://doi.org/10.1101/603100)

Scientific Presentations (only listed those as presenter; * invited)

- 18 **Cobos, M. E.** Biorepositories as catalysts for advancing ecological modeling. *MEPA: Museums and Emerging Pathogens in the Americas*; (Online), USA. October 2023.*
- 17 **Cobos, M. E.**, J. L. Dunnum, B. Armién, P. Gonzalez, E. Juarez, J. Salazar, J. A. Cook, and J. P. Colella. Environmental and geographic considerations for comprehensive sampling: An example with Panamanian rodents and their pathogens. *International Mammalogical Congress and American Society of Mammalogists Annual Meeting*; Anchorage, AK, USA. July 2023.
- 16 **Cobos, M. E.**, C. Nuñez-Penichet, J. Soberón, T. Gueta, N. Barve, V. Barve, A. G. Navarro- Sigüenza, and A. T. Peterson. Selection of sampling sites for biodiversity inventory: Effects of environmental and geographical considerations. *International Biogeography Society-10th Biennial Conference*. (Online), Canada. June 2022.
- 15 **Cobos, M. E.** Conservación de especies y cambio del clima. *Seminario Internacional Biodiversidad y Cambio Global*. (Online), Ecuador. June 2022.*
- 14 **Cobos, M. E.** Diseño de sistemas de monitoreo de la biodiversidad: consideraciones para lograr muestreos más efectivos. *II Seminario de Calidad Ambiental y Biodiversidad*. (Online), Ecuador. February 2022.*
- 13 **Cobos, M. E.** Ecological niche models and climate change: considering variability in data and results. *Congreso Internacional de Variabilidad y Cambio Climático*. (Online), Colombia. March 2021.*
- 12 **Cobos, M. E.** A. T. Peterson, C. Nuñez-Penichet, J. Soberón, L. Osorio-Olvera, S. Goodman, and A. P. Raselimanana. Models and simulations to understand biological invasions: the case of *Duttaphrynus melanostictus* invasion in Madagascar. *IBS 2019 Humboldt Meeting and 2nd Latin American Biogeography Meeting*. Quito, Ecuador. August, 2019.
- 10 **Cobos, M. E.** and R. Alonso Bosch. Multiscale analyses reveal the importance of breeding sites for conservation of a critically endangered Cuban toad in the face of global change. *Joint Meeting of Ichthyologists and Herpetologists*. Rochester, New York, USA. July 2018.

- 9 Nuñez-Penichet, C., **M. E. Cobos**, A. Barro, and J. Soberón. Potential migratory routes of *Urania boisduvalii* (Lepidoptera: Uraniidae) among the populations of its host (*Omphalea* spp.). *VI Meeting of Neotropical Lepidoptera*. Concepción, Chile. January 2018.
- 8 **Cobos, M. E.**, R. Alonso-Bosch. Vulnerabilidad de los bufónidos cubanos al cambio climático: Una evaluación basada en características ecológicas y geográficas de su nicho. Quito, Ecuador. July 2017.
- 7 Mendoza, C., K. Valarezo-Aguilar, and **M. E. Cobos**. Distribución potencial del Perico Pechi- blanco (*Pyrrhura albipectus*): factores climáticos que determinan su presencia. *V Encuentro Ornitológico Ecuatoriano*. Zamora, Ecuador. August 2016.
- 6 **Cobos, M. E.**, C. Nuñez-Penichet, C. Mendoza, and K. Valarezo-Aguilar. Impacto del cambio climático en la distribución potencial del Perico Pechiblanco (*Pyrrhura albipectus*). *V Encuentro Ornitológico Ecuatoriano*. Zamora, Ecuador. August 2016.
- 5 **Cobos, M. E.** & C. Nuñez-Penichet. Pérdidas forestales y cambio climático: búsqueda de posibles sinergias para identificar áreas prioritarias de restauración. *I Congreso Ecuatoriano de Restauración del Paisaje*. Loja, Ecuador. April 2016.
- 4 **Cobos, M. E.** Avances en métodos para el estudio de la distribución de especies. *Reunión para la Conservación de la Biodiversidad en Cuba-2015*. Havana, Cuba. November 2015
- 3 Nuñez Penichet, C., **M. E. Cobos**, and A. Barro. Rutas migratorias potenciales de *Urania boisduvalii* (Lepidoptera: Uranidae) en Cuba: conectividad y conservación. *Reunión para la Conservación de la Biodiversidad en Cuba-2015*. Havana, Cuba. November 2015
- 2 **Cobos, M. E.** and R. Alonso. Efectos aditivos del cambio climático y la pérdida de hábitat en el rango de distribución de un sapo cubano amenazado. *X Convenio Internacional sobre Medio Ambiente y Desarrollo: V Congreso sobre Gestión de Ecosistemas y Medio Ambiente de Biodiversidad*. Havana, Cuba. July 2015
- 1 **Cobos, M. E.** and R. Alonso. Un hábitat vulnerable para un sapo cubano amenazado. *Reunión para la Conservación de la Biodiversidad en Cuba-2014*. Havana, Cuba. November 2014

Mentorship (^{URM} under-represented minority, ^{INT} international, ^{ONL} online, * co-authored manuscripts)

Weverton Trindade ^{INT}	PhD student at Universidade Federal do Paraná, Brazil. (2023-present) <i>Routines for ecological niche modeling using machine learning algorithms.</i>
Luis F. Arias-Giraldo ^{*INT}	PhD student at the Spanish National Research Council. (2023-present) <i>Innovative methods to model and map risks from pathogens.</i>
Abby Perkins	University of Kansas (KU) Master's student. (2023-present) <i>Statistical approaches to deal with spatial autocorrelation in ENM.</i>
Daniel Ibañez IV ^{*URM}	KU Master's student. (2023-present) <i>Time-specific ENM for a hantavirus host in Panama.</i>
Alexander Hey*	KU Master's student. (2023-present) <i>Time-specific ENM for a hantavirus host in Panama.</i>
Shubert Aguayo ^{*INT, ONL}	Undergraduate student at Pontificia Universidad Católica del Ecuador. (2023-2024) <i>ENM for a Chagas disease vector in Ecuador and Peru.</i>
Francisco Villacis ^{*INT, ONL}	Undergraduate student at Pontificia Universidad Católica del Ecuador. (2023-2024) <i>ENM for a Chagas disease vector in Ecuador and Peru.</i>
Ismari Martinez ^{*URM}	KU Undergraduate student. (2023) <i>Time-specific ENM of tick activity in the great plains.</i>
Janey Bryce ^{*URM}	KU Post-bachelor. (2022-2023) <i>Assessment of mammal community change in Kansas.</i>
Taylor Winters*	KU Undergraduate student. (2022-2023) <i>Time-specific ENM for tick pathogens in the great plains.</i>
Anushka Gupta ^{INT, ONL}	Student in the Google Summer of Code Program. (2022) <i>Second phase of rsqLiteAdmin: A GUI to Manage SQLite Databases.</i>
Pablo Castillo ^{INT, ONL}	Undergraduate student at Universidad Nacional de Loja, Ecuador. (2021-2022) <i>ENM and conservation area prioritization for an endangered bird in Ecuador.</i>
Divyansh Chawla ^{INT, ONL}	Student in the Google Summer of Code Program. (2021) <i>rsqLiteAdmin: A GUI to Manage SQLite Databases</i>
Yaneliz Marrero ^{INT}	Undergraduate student at Universidad de La Habana, Cuba. (2014) <i>Climate change risks for the distribution of an endemic bird in Cuba.</i>

Fellowships, Grants, and Awards

Funded

2022	Biodiversity Institute, University of Kansas. <i>Panorama Grant</i> . \$1,000
2021	Biodiversity Institute, University of Kansas. <i>Division of Ornithology Grant</i> . \$1,000
2021	Biodiversity Institute, University of Kansas. <i>Panorama Grant</i> . \$1,000
2019	EEB Department. University of Kansas. <i>Summer research scholarship</i> . \$2,000
2018	University of Kansas. <i>Graduate scholarly presentation travel fund</i> . \$500 .
2018	EEB Department. University of Kansas. <i>Summer research scholarship</i> . \$3,000
2017	University of Kansas. <i>Fellowship for graduate studies (Fall semester)</i> . \$9,370
2014-2016	Ecuadorian National Secretary of Superior Education Science and Technology (SENESCYT). <i>Scholarship for international graduate studies (M.Sc.)</i> . \$33,297

Outreach Experience

Microbes on the move

Kansas, USA.

July, 2022

Activities: Review Spanish translations of outreach materials; Spanish translations of social media posts; Facilitate activities with visitors including speaking and engaging in Spanish and English.

Scope: Three cities in the state of Kansas.

Institution: Biodiversity Institute, University of Kansas.

Battery disposal awareness

campaign

Zamora Chinchipe, Ecuador.

2012-2013

Activities: Design of content and teaching materials for primary schools; Presentation of contents and educational activities in primary schools with the involvement of teachers and students.

Scope: Ten rural schools.

Institution: El Guismi Decentralized Autonomous Government.

Plastic bottle recycling campaign

Zamora Chinchipe, Ecuador.

2012-2013

Activities: Design of content and teaching materials for primary schools; Presentation of contents and educational activities in primary schools with the involvement of authorities, teachers, and students. Design of mechanisms to collect, store, and recycle collected materials.

Scope: Ten rural schools.

Institution: El Guismi Decentralized Autonomous Government.

Professional Membership

Ecological Society of America

2024-present

Society for the Study of Evolution

2022-present

International Biogeography Society

2018-present

Society for the Study of Amphibians and Reptiles

2018

Service

Committees

Diversity, Equity, Inclusion, and Belonging. Biodiversity Institute. University of Kansas. 2021-present.

Reviewer for Scientific Journals

Aquatic Conservation: Marine and Freshwater Ecosystems (3), Biological Conservation (2), Copeia (1), Ecological Modelling (1), Ecography (2), Ecology and Evolution (1), Global Ecology and Biogeography (1), Hydrobiologia (2), Journal of Animal Ecology (1), Journal of Biogeography (3), Journal of Forestry Research (4), Journal of Medical Entomology (1), Mammalian Biology (2), Methods in Ecology and Evolution (1), Nordic Journal of Botany (1), Ornithological Applications (1), Oryx (1), PeerJ (2), Perspectives in Ecology and Conservation (2), Plant Ecology (1), PLoS ONE (7), Progress in Oceanography (2), Tropical Medicine & International Health (1), Waterbird (1)

Fieldwork

2024	Kansas, USA	Monthly rodent-pathogen surveys at KU Field Station, Field lead
2023	Kansas, USA	Small mammal survey at KU Field Station, Field co-lead
2021-2022	Kansas, USA	Small mammal and tick surveys in Kansas Public Lands, Field co-lead
2021	Kansas, USA	Greater Duckweed sampling across the state of Kansas, Field lead
2020-2022	Kansas, USA	Tick and tick-pathogen survey in Kansas Public Lands, Field co-lead
2015	Cuba	Survey of new localities for an endangered toad, Field assistant
2012	Ecuador	Biodiversity survey for strategic planning, Field lead
2011	Ecuador	Invasive Bullfrog surveys in the Amazon region, Field assistant
2011	Ecuador	Surveys of animal species in the Amazon region, Field assistant

Open Source Software

<u>enmpa</u>	<i>Ecological Niche Modeling using Presence-Absence Data.</i> <u>Contributor.</u>
R package	https://CRAN.R-project.org/package=enmpa
<u>mop</u>	<i>Mobility Oriented-Parity Metric.</i> <u>Creator.</u>
R package	https://CRAN.R-project.org/package=mop
<u>biosurvey</u>	<i>Tools for Biological Survey Planning.</i> <u>Co-creator.</u>
R package	https://github.com/claununez/biosurvey
<u>nichevol</u>	<i>Tools for Ecological Niche Evolution Assessment Considering Uncertainty.</i> <u>Creator.</u>
R package	https://CRAN.r-project.org/package=nichevol
<u>grinnell</u>	<i>Dispersal simulations based on ecological niches.</i> <u>Co-creator.</u>
R package	https://github.com/fmachados/grinnell
<u>ellipsenm</u>	<i>Ecological niche's characterization using ellipsoids.</i> <u>Creator.</u>
R package	https://github.com/marloncobos/ellipsenm
<u>kuenm</u>	<i>An R Package for Detailed Development of Ecological Niche Models Using Maxent.</i> <u>Creator.</u>
R package	https://github.com/marloncobos/kuenm
<u>rangemap</u>	<i>Simple Tools for Defining Species ranges.</i> <u>Creator.</u>
R package	https://github.com/marloncobos/rangemap

Professional References

<u>A. Townsend Peterson, PhD</u> <i>PhD Advisor</i>	University Distinguished Professor & Curator of Ornithology Biodiversity Institute Department of Ecology and Evolutionary Biology University of Kansas 1345 Jayhawk Blvd, Lawrence, KS 66045, USA Phone: +1 (785) 312-4909 Email: town@ku.edu
<i>Reference for: Research, Mentoring, and DEIB</i>	
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<i>Reference for: Research, Teaching and DEIB</i>	
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<i>Reference for: Research, Mentoring, and DEIB</i>	

William E. Banks, PhD

*Reference for:
Research*

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