Gloria Alejandra Rodriguez Abaunza

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EDUCATION

Ph.D. (candidate) in Applied Earth Sciences 2022 - Present. *Anticipated May 2027*
Indiana University Indianapolis (IUI) Indianapolis, IN
Minor in Geography.
Ph. D. Dissertation: Hydroclimatic variability of the tropical Andes during the last 20,000 years.
Advisor: Dr. Broxton Bird

M. Sc. Marine Sciences and Limnology August 2021
Universidad Nacional Autónoma de México (UNAM) México City, México.
Master's thesis: Environmental History of Laguna Yalahau (Yucatán, Mexico) over the last 8,400 years
Advisor: Dr. Alexander Correa Metrio
Graduate Scholarship recipient: "Becas CONACYT Nacionales 2019", CONACYT, México.

B. Sc. Biology August 2016
Universidad Pedagógica y Tecnológica de Colombia (UPTC) Tunja, Colombia.
Undergraduate thesis: Late Holocene fossil ostracods from Laguna Blanca Grande (Buenos Aires, Argentina) and palaeoecological analysis.
Advisor: Dr. Javier Luque
Undergraduate Scholarship recipient: "Diego Mendoza Pérez". Government of Boyacá, Colombia.
Teaching Assistant Scholarship recipient, Biology Department, School of Science, UPTC.

RESEARCH EXPERIENCE

Graduate Research Assistant August 2022 - Present
PI: Dr. Broxton Bird.
Department of Earth and Environmental Sciences, IUI | Paleoclimatology and Sedimentology Lab.

- Dissertation research: Analyze sedimentological (grain size) and geochemical proxies (elemental concentrations and organic matter proxies) in lake sediments to reconstruct hydroclimate in the tropical Andes.
- Training in sample preparation and analytical techniques at facilities including Continental Scientific Drilling University of Minnesota), KCCAMS Radiocarbon Lab (UC Irvine), ICP Lab and Light Stable Isotope Mass Spectrometry Lab (University of Florida).
- Assist summer fieldwork campaigns in oxbow lakes in the Midwest (US) to determine the relationship between floodings and past climate changes.
- Mentor undergraduate students in XRF, grain size and water isotope analysis protocols as part of the Multidisciplinary Undergraduate Research Program (MURI) and1st Year Research Immersion Program (1RIP) at IUI.

Graduate Research Assistant February 2019 - May 2021
PI: Dr. Alexander Correa Metrio
Geosciences Institute, UNAM, Querétaro, México | Correa-Metrio's Lab.

- Master Thesis: Investigated variations in oxygen isotopes of ostracods, chlorophyll-a, and stable isotopes in organic matter to reconstruct the evolution of a karstic system.
- Summer fieldwork campaign in karstic lakes in the Yucatan Peninsula, Mexico.

Research Internship February 2018 – July 2018
PI: Dr. Carlos Jaramillo
Center for Tropical Paleoecology and Archaeology. Smithsonian Tropical Research Institute, Panamá.
- Assisted in curating fossil collections and managing the Geological Database.
- Participated in fieldwork campaigns for the "Biostratigraphy of the Neotropics" project.

Research Internship September 2017 – December 2017
PI: Dr. Francesc Mesquita-Joanes.
Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Spain | Ecology and biogeography of aquatic systems Lab.
- Conducted sediment and water sampling in Mediterranean temporary lakes.
- Sample preparation, picking, and taxonomic identification of ostracods in coastal lagoon sediments.
- Mounted and prepared microfossil specimens for high-resolution imaging using Scanning Electron Microscopy (SEM).

Research Internship May 2017 – August 2017
PI: Dr. Carlos Jaramillo
Center for Tropical Paleoecology and Archaeology. Smithsonian Tropical Research Institute, Panamá.
- Processing samples and taxonomic identification for fossil ostracods from Colombian and Chilean paleolakes.

GRANTS AND AWARDS

- 2026. Inclusive Excellence Dissertation Fellowship. Indiana University Indianapolis, United States.
- 2025. E-an Zen Fund for Geoscience Outreach Grant. The Geological Society of America, United States.
- 2025. ASLO Global Outreach Initiative. The Association for the Sciences of Limnology and Oceanography, United States. https://www.aslo.org/2025-global-outreach-initiative-awards/
- 2025. Graduate Student Research Grants. The Geological Society of America, United States.
- 2024. International Enhancement Grant. Indiana University Indianapolis, United States.
- 2023. CSD Facility Visiting Graduate Student Program Travel Grant. Continental Scientific Drilling Facility. University of Minnesota, United States.
- 2022. Visiting Scholar Fellowship. Center for Tropical Paleoecology and Archaeology. Smithsonian Tropical Research Institute, Panamá.
- 2017. Young Researchers Scholarship. University of Valencia, Spain.
- 2017. STRI Short-Term Fellowship. Center for Tropical Paleoecology and Archaeology. Smithsonian Tropical Research Institute, Panamá.

TEACHING AND MENTORING

Graduate Teaching Assistant. Earth and our Environment Lab (G-117) Fall 2025 – Spring 2026
School of Science, IUI, Indianapolis.
- Collaborate with the course instructor to develop and implement laboratory lesson plans aligned with course learning objectives.
- Facilitated student learning by preparing experiments, demonstrating laboratory techniques, and supporting students during hands-on activities.
- Evaluated and graded laboratory assignments, providing constructive feedback to support student learning.

Undergrad Teaching Assistant, *Invertebrate Zoology* Fall 2014 - Spring 2016
Biology Department, UPTC, Tunja, Colombia.
- Assisted in the instruction of undergraduate courses in Invertebrate Zoology.
- Supported laboratory sessions by preparing materials, guiding students in laboratory techniques, and addressing course-related questions.

Online Mentor: 1st GeoLatinas Mentoring Program Spring 2022
- Provided mentorship and guidance to an early-career geoscientist through the GeoLatinas Mentoring Program.

PUBLICATIONS

▪ Rodriguez-Abaunza A, Bird BW, Escobar J, Steinman BA, Konecky B, Fernández A, Mauceri A, Underhill A, Shapley M, Kamenov G, Lund S, Fonseca H. (Under Review) Late Quaternary lithostratigraphy, geochemistry, and geochronology of Lago de Tota (Colombia) Journal of Quaternary Science.

▪ León S, Montes C, Mora-Rojas L, Cárdenas A, Luque J, Buchs DM, Trejos-Tamayo R, Vallejo-Hincapié F, Rodríguez-Abaunza A, Marulanda S, Jaramillo C. 2026. Miocene biostratigraphic framework and paleogeography of Barro Colorado Island, Isthmus of Panama. Palaeogeography, Palaeoclimatology, Palaeoecology https://doi.org/10.1016/j.palaeo.2026.114168

▪ Trejos-Tamayo R, Garzon-Oyola D, Rodriguez-Abaunza A, Frontalini, F, Betancur JP, Gallego, F, Pardo-Trujillo A, Flores JA. 2025. Late Eocene-Early Miocene paleoenvironmental shifts in the NW south American margin: Tectonic and climatic drivers inferred from benthic foraminifera. Global and Planetary Change 248: 104744

▪ Gibson D, Obrist-Farner J, Correa-Metrio A, Rodriguez-Abaunza A, Castañeda-Posadas C. 2024. Geochemical evidence of drying during the 4.2 ka event in sediment cores from the Yucatán Peninsula, Mexico. Palaeogeography, Palaeoclimatology, Palaeoecology 655 (1): 112527 https://doi.org/10.1016/j.palaeo.2024.112527

▪ López-Blanco C, Rodríguez-Abaunza A, Seitz C, Pérez L, Cuña-Rodríguez C, Fontana SL. 2021. A 700-year multiproxy reconstruction on the Argentinian Pampas inferred from the sediments of Laguna Blanca Grande. Journal of South American Earth Sciences, 105: 103000. https://doi.org/10.1016/j.jsames.2020.103000

▪ Luque J, Cortés D, Rodríguez-Abaunza A, Cárdenas-Nieto D, Parra J. 2020. Orithopsid crabs from the Lower Cretaceous Paja Formation in Boyacá (Colombia) and the earliest record of parasitic isopod traces in Raninoida. Cretaceous Research, 116: 104602. https://doi.org/10.1016/j.cretres.2020.104602

NON-PEER-REVIEWED PUBLICATIONS

▪ **Rodríguez-Abaunza A**, and Correa-Metrio A. 2023. Environmental history of the northern Maya Lowlands: Evidence from a karstic lake. Past Global Changes Magazine, 31(1): 12-13. https://doi.org/10.22498/pages.31.1.12

▪ Kulkarni C, Jara IA, Chevalier M, Benito X., and **pSESYNTH participants.** 2023. pSESYNTH project: Community mobilization for a multidisciplinary paleo database of the Global South Past Global Changes Magazine, 31(1): 30-31. https://doi.org/10.22498/pages.31.1.30

▪ **Rodríguez-Abaunza A**. Maria Fernanda Mora looks for life on other planets. Trailbrazers 2024. C&EN Magazine, 102 (29). https://cen.acs.org/analytical-chemistry/Maria-Fernanda-Mora-looks-for-life-on-other-planets/102/i29

CONFERENCE ABSTRACTS

Oral Presentations

- Rodriguez Abaunza A, Bird B, Escobar J, Steinman B, Konecky B, Mauceri M, Gammon A, Fonseca H. 2025. Hydrological changes from Lake Tota (Colombia) during the last 20,000 years and its paleoclimatic implications. AGU Fall Meeting 2025, New Orleans, LA.
- Rodríguez-Abaunza A, Correa-Metrio A, Escobar J, Curtis J, Smol JP, Grooms C. 2022. Ontogeny of a karstic lake from the Northern Neotropics during the Holocene. PAGES-INQUA ECR Workshop "Past Socio-Environmental Systems". La Serena, Chile.

Poster Presentations

- Rodriguez Abaunza A, Bird B, Escobar J, Steinman B, Konecky B, Velasco F, Plazas-Jiménez D. 2025. Variability of isotopic composition and moisture sources in the Tota basin (Colombia), Northern Tropical Andes. AGU Fall Meeting 2025, New Orleans, LA.
- Rodriguez Abaunza A, Bird B, Escobar J, Steinman B, Konecky B, Mauceri M, Curtis J, Underhill A, Brewer M, Gammon A, Fonseca H. 2024. Tropical Andean Hydroclimate Variability During the Holocene: Initial Results from Lake Tota, Colombia. AGU Fall Meeting 2024, Washington DC.
- Rodriguez-Abaunza A, Broxton BW, Escobar J, Steinman BA, Konecky BL, Fernandez A, Mauceri A, Underhill A, Brewer M, Shapley M, Fonseca H. 2023. The Late Quaternary Record from Lake Tota (Colombia): Evidence from geochemistry and lithostratigraphy. AGU Fall Meeting 2023, San Francisco, CA.

LEADERSHIP, SERVICE AND TEAMWORK EXPERIENCE

Outreach and Community Involvement

Project Lead & Educational Outreach Contributor: "A Cloud Journey from the Amazon to the Andean Sky Islands: Empowering Aquatic Sciences and Climate Education in Colombia". Fall 2025 - Present

- Develop virtual science content for 20 K–12 educators working in rural communities close to our research field sites, focusing on water science and environmental education.
- Create instructional materials, including worksheets and hands-on activities, to support inquiry-based learning.
- Co-design of an educational board game and science kit to enhance science communication and experiential learning.
- Design surveys and assessment tools to evaluate participant engagement and learning outcomes.

Eclipse Stars: Outreach activity. **St. Anthony Catholic School, Indianapolis** April 2024

- Participated in the ASP Eclipse Stars program workshop, organized by the Astronomical Society of the Pacific (ASP).
- Coordinated an educational experience for high school students from the Latin community, engaging the public ahead of the total solar eclipse on April 8, 2024.

COLEVOL. Colombian Association of Evolutionary Biology. Contributor 2015–2019

- Authored the *Recommended Papers on Paleontology* for seven editions of the *Boletín Colombiano de Biología Evolutiva.* https://colevol.github.io/boletin/
- Co-organized the *IV Latin American School of Evolution* and the *V National Symposium of the Colombian Network of Evolutionary Biology* (Armenia, Colombia, July 28–August 7, 2015).

***BIEVEP,* Evolutionary Biology Club, UPTC,** Organizer and Regional Representative 2013–2016

- Led a discussion group (10+ members) on current topics in evolutionary biology.
- Collaborated with undergraduate students from COLEVOL as a Regional Representative.
- Co-organized the first Workshop on Evolutionary Biology, Ecology, and Environmental Sciences at UPTC (Tunja, Colombia, October 7–9, 2015).

Media Coverage

- *"A biologist's journey into volcanology"*, Indiana University News (2024). https://news.iu.edu/live/news/45475-a-biologists-journey-into-the-field-of-volcanology
- *"What can 8,000-year-old lake shells tell us about climate change?"*, Forbes (2021). https://www.forbes.com/sites/andrewwight/2021/02/17/what-can-8000-year-old-lake-shells-tell-us-about-climate-change/?sh=1c7d9ffa2aca

Featured guest in "Lagos de hielo bajo el sol tropical" (2026). Craneo *Podcast, Cumbre Kids*. https://youtu.be/qJ0-tfV1xnM?si=u0HR3jZshIfbPv3k

INVITED TALKS

- "La Memoria de las Lagunas: Una Perspectiva Paleolimnológica", invited presentation at the Geolatinas Online Seminar (March 30th, 2021). https://www.youtube.com/watch?v=pYpVsEceWs4
- "¿Qué historias nos pueden contar los ostrácodos?", invited online presentation at the Entomology class, Biology Department, UPTC, Tunja, Colombia (September 11th, 2020). https://www.youtube.com/watch?v=oHa96TpPiE0&t=7s
- "Fósiles Emblemáticos en la Historia de la Tierra", invited presentation at the Workshop: 'Investigaciones Paleontológicas en Panamá' (Ciudad de Panamá, Panamá, July 10th, 2017).

FIELDWORK EXPERIENCE

Summer School, paleoCAMP, Paleoclimate Training in Climate Archives, Models, and Proxies.
Sierra Nevada Aquatic Research Laboratory, CA Summer 2026

- Conducted field-based training in paleoclimate reconstruction, including tephrochronology, carbonates in lacustrine systems, and dendrochronology.
- Developed skills in age modeling, climate data analysis, and model–proxy integration.

Summer School, International Field Course in Volcanology
Universidad de Caldas, Manizales, Colombia Summer 2025

- Field training in volcanic systems of the Northern Andes.
- Conducted field observations and analysis of volcanic deposits, stratigraphy, and eruptive processes in active and inactive volcanic systems.
- Gained hands-on experience in volcanic hazard assessment, interpretation of volcanic structures, and characterization of magmatic and pyroclastic materials.

SINERGIA LATINA Workshop.
University of Mar del Plata, Argentina Winter 2014

- Training in Quaternary Paleoecology methods, focusing on biological proxies for paleoenvironmental reconstructions and fieldwork in lake sediment coring.
- Conducted a collaborative multiproxy research project with four women scientists from Latin America using sedimentary sequences from Argentina's Pampean plain.

Undergraduate Research Volunteer. *Integrated Ecosystem and Biodiversity Management Lab.*
UPTC, Tunja, Colombia Spring 2011- Spring 2012

- Conducted extensive fieldwork in high-Andean lakes of Colombia, collecting benthos, phytoplankton, and zooplankton samples.

INDUSTRY EXPERIENCE

Research Assistant July 2021- July 2022

Stratigraphy Research Institute (IIES). University of Caldas, Colombia | Micropaleontology Lab.

- Sample preparation, picking, and taxonomic identification of ostracods and other calcareous microfossils to evaluate potential biostratigraphic markers and to refine paleobiogeographical reconstructions.
- Assist in a Geological study in the Magdalena Valley (Colombia) basin in order to update geological evolution model, to define oil systems and to evaluate the prospectivity of oil and gas.

Research Assistant August 2018 – January 2019

Stratigraphy Research Institute (IIES). University of Caldas, Colombia | Micropaleontology Lab.

- Sample preparation, picking, and taxonomic identification of ostracods, and foraminifera to evaluate potential biostratigraphic markers and to refine paleobiogeographical reconstructions.
- Mounted and prepared microfossil specimens for high-resolution imaging using Scanning Electron Microscopy (SEM).