Dr. Areidy Beltran-Peña, Ph.D.

areidy@berkeley.edu

SUMMARY

I am a hydroclimate and Earth system scientist with experience leading and executing projects on climate risks, climate dynamics, hydrology, water resources, agricultural risks, snowpack modeling, and development engineering. My work integrates mixed methods, including predictive modeling, high-resolution climate and earth system model outputs, geospatial data science, statistics, and integrative assessment modeling to address complex sustainability challenges.

EDUCATION

University of California, Berkeley

Ph.D., Environmental Science, Policy, and Management, *Designated Emphasis in Development Engineering* **2023**

M.A., Earth and Planetary Science, *Emphasis on Climate Solutions and Energy Systems* **2017**

B.A., Environmental Earth Science **2015**

Dartmouth College, Tuck School of Business

Certificate, Business Bridge **2017**

(Program taught by world-class MBA faculty providing an in-depth introduction to marketing, strategy, microeconomics, accounting, and finance)

RESEARCH EXPERIENCE

Stanford University, *Doerr School of Sustainability Dean's Postdoctoral Fellow,* Stanford, CA **2023 – 2025**

- Awarded the Dean's Postdoctoral Fellowship for excellence in STEM research and leadership.
- Applied high-resolution Earth System Models and CMIP climate models to assess hydroclimate variability and snowpack decline impacts on California's water resources; presented findings to state water managers and at three international conferences.

Lawrence Berkeley National Laboratory, *Affiliate Researcher,* Berkeley, CA **2022 – Present**

- Awarded the nationally competitive U.S. Department of Energy Office of Science Graduate Student Research Fellowship (1 of 78 recipients) to conduct Earth system dynamics research at LBNL.
- Compared the performance of hydroclimate modeling under climate change in the Sierra Nevada between the Energy Exascale Earth System Model (E3SM) and the Community Earth System Model (CESM).

Carnegie Institution for Science, *Visiting Scholar,* Stanford, CA **2022 – Present**

- Engaged in cross-institutional collaboration and scholarly exchange, strengthening academic partnerships and contributing to the institution's intellectual community through seminars and research.

University of California Berkeley, *Graduate Student Researcher and Instructor,* Berkeley, CA **2018 – 2023**

- Published five peer-reviewed publications (three as lead author) on climate risk modeling, gaining 650 citations. *Beltran-Peña et al. (2020)* garnered 36,000 downloads and was cited 49 times the field average.
- Delivered six invited talks at renowned global forums and organized/co-led climate-focused events, including a 2-hour side event for the Italian Ministry for the Environment at UN COP 25 and a 3-hour workshop at the International Mountain Conference.
- Taught ~100 undergraduate students foundational research methodologies through two UC Berkeley courses.

PROFESSIONAL EXPERIENCE

Boundless Impact Research & Analytics, *Life Cycle Assessment Expert Consultant,* Stanford, CA **2025**

- Consulted Boundless Impact Research & Analytics on an ISO-compliant environmental life cycle assessment report of Nitricity's organic fertilizer production and calcium ammonium nitrate fertilizer.

Environmental Resources Management, *Project Scientist, Consultant II,* San Francisco, CA **2018 - 2019**

- Managed Caltrain's Pollution Prevention Permit Compliance Program to ensure adherence to the California Water Resources Control Board's Phase II Small Municipal Separate Storm Sewer Systems Permit requirements.
- Conducted Phase I and Phase II environmental site assessments for multiple clients, identifying compliance gaps and developing corrective action plans aligned with federal, state, and local regulations.

University of California Office of the President, *Carbon Neutrality Initiative Fellow,* Oakland, CA **2016 - 2019**

- Supported projects aimed at achieving net-zero carbon emissions at UC campuses.
- Developed the first sustainability educational objectives for the University of California system, which served as a guiding framework for nine UC campuses in shaping their campus-wide sustainability learning outcomes and contributed to five campuses achieving a Gold rating and two earning the prestigious Platinum rating (the highest distinction) under the Association for the Advancement of Sustainability in Higher Education's Sustainability Tracking, Assessment, and Rating System.
- Designed and launched the Carbon Neutrality Fellows website, creating a platform for resource sharing and communication among fellows across universities to enhance collaboration and idea exchange.

Intertek-Professional Service Industries, *Environmental and Geotechnical Staff Scientist,* Oakland, CA **2015 - 2016**

- Led environmental due diligence projects for diverse clients, including contamination assessments, remediation services, hazardous materials compliance permitting, and groundwater monitoring.
- Conducted geotechnical investigations (seismic hazard analysis, foundation evaluations, slope assessments) and independently managed a high-volume workload as the sole staff scientist on the team.

Fundación Cántaro Azul, *Pachamama Project Team Lead,* Chiapas, Mexico **2014**

- Collaborated with Fundación Cantaro Azul to identify and implement enhancements to an ultraviolet water filtration system aimed at improving access to clean water, sanitation, and hygiene in rural indigenous communities.

Community Water Center, *Engineering Intern,* Visalia, CA **2014**

- Led a team of four engineering undergraduate students on a project in collaboration with the nonprofit organization, Community Water Center, in the Central Valley. We tested and monitored the water quality (for nitrate contamination) of 40 households in Visalia, CA dependent on domestic wells for drinking water and provided residents with real-time evidence regarding their household water quality.

PEER-REVIEWED PUBLICATIONS

Beltran-Peña A, Rhoades A, Burakowski E, Girotto M, Michalak A, Diffenbaugh N, Inda-Diaz H, D'Odorico P (2025). Future implications of enhanced hydroclimate variability and reduced snowpack on California's water resources. *Environmental Research: Water.* https://doi.org/10.1088/3033-4942/ade7aa

Beltran-Peña A and D'Odorico P (2022). Future food security in Africa under climate change. *Earth's Future.* 10, e2022EF002651. https://doi.org/10.1029/2022EF002651. Featured in an EOS Research Spotlight.

Beltran-Peña A, Rosa L, D'Odorico P (2020). Global food self-sufficiency in the 21st century under sustainable intensification of agriculture. *Environmental Research Letters.* https://doi.org/10.1088/1748-9326/ab9388.

Rosa L, Chiarelli DD, Sangiorgio M, **Beltran-Peña A**, Rulli MC, D'Odorico P & Fung I (2020). Potential for sustainable irrigation expansion in a 3°C warmer climate. *Proceedings of the National Academy of Sciences.* Cited in the 2023 U.S. Economic Report of the President.

Jenkins W, Rosa L, Schmidt J, Band L, **Beltran-Peña A**, Clarens A, Doney S, Glassie A, Quinn J, Rulli MC, Shobe W, Szeptycki L, D'Odorico P (2021). Values-based scenarios of water security: rights to water, rights of water, and commercial water rights. *BioScience*, 20, pp. 1-14. https://doi.org/10.1093/biosci/biab088

Rhoades A, North J, Rudisill W, Hatchett B, Risser M, **Beltran-Peña A**, Chen X, Heggli A, Hotaling S, Huning L, LaPlante M, Mahesh A, Marshall A, McCrary R, McEnvoy D, McGinnis S, Rahimi S, Randall C, Srivastava A, Wehner M, Zhou Y, Jones A. Snow-eater heatwaves of western North America. Preprint. https://doi.org/10.21203/rs.3.rs-7576317/v1

SELECTED WORKSHOPS

National Center for Atmospheric Research, *Community Earth System Model Tutorial,* Boulder, CO **2023**

- Acquired comprehensive knowledge of the intricate mechanisms underlying CESM, encompassing the intricate processes involved in the creation and integration of atmospheric, terrestrial, oceanic, and sea ice models.
- Gained proficiency in executing CESM simulations, allowing for Earth system predictions across a range of resolutions.

International Mountain Conference, Innsbruck, Austria **2022**

- Designed and co-led a 3-hour synthesis workshop, *"Future Mountains with Low-to-No Snow and Ice (L2NS) – A Community Perspective,"* in collaboration with an international team of scientists. Facilitated discussions among researchers and stakeholders on the challenges of L2NS emergence, sharing regional successes and failures while addressing uncertainties in warming projections and time horizons.

United Nations Framework Convention on Climate Change Conference of Parties 25, Madrid, Spain **2019**

- Organized a 2-hour side-event for the Italian Ministry for the Environment, Land and Sea, engaging a diverse global audience on climate change challenges. Delivered a comprehensive presentation on "Climate Change and the Global Water-Energy-Food Nexus," fostering interdisciplinary dialogue.

NASA Jet Propulsion Laboratory, Center for Climate Science, Pasadena, CA **2019**

- Selected as one of 25 graduate students and postdocs worldwide to participate in NASA's Summer School on Satellite Observations and Climate Models, an intensive training program on integrating satellite observations with climate models.
- Gained expertise in global climate models, satellite remote sensing, and climate model diagnostics and evaluation.
- Conducted a case study on India's depleting water storage using GRACE satellite data, analyzing long-term trends and implications for water resource management.

INVITED TALKS AND SEMINARS (*UPCOMING)

*2025 University of Arizona – School of Geography, Development & Environment
2025 Yale University – School of Public Health
2024 U.S. Department of Energy Office of Science – A Framework for Improving Analysis and Modeling of Earth System and Intersectoral Dynamics at Regional Scales (HyperFACETS) seminar
2024 Arizona State University – Co-creating Useful and Usable Climate Intervention Simulations Workshop
2024 Stanford University – Hydrology Seminar Series
2022 Carnegie Institution for Science – Biosphere Sciences and Engineering Division
2019 United Nations Framework Convention on Climate Change Conference of Parties 25

SELECTED CONFERENCE PRESENTATIONS (*INVITED)

*2025 American Geophysical Union – Cryosphere Section, Climate and Snow: Past, Present, and Future
*2024 American Geophysical Union – Cryosphere Section, Quantifying Snowpack to Support Water Resources
*2023 American Geophysical Union – Global Environmental Change Section, Global-to-Local Solutions for Climate Mitigation and Adaptation in Agriculture
2023 World Climate Research Program Open Science Conference, Kigali, Rwanda (Poster)
2022 International Mountain Conference, Innsbruck, Austria (Talk)
2021 American Geophysical Union, virtual (Poster)
2019 American Geophysical Union, San Francisco, CA (Talk)
2019 NASA Jet Propulsion Laboratory Center for Climate Sciences – Climate Sciences Summer School, Pasadena, CA

SELECTED OUTREACH ACTIVITIES

2024 Stanford Doerr School of Sustainability – First-Generation Limited-Income College Celebration (Panelist)
2024 San Jose State University – MESA program campus visit to Stanford University (Panelist)
2022 University of California, Berkeley – Educational Opportunity Program STEM (Panelist)
2020 University of California, Berkeley – Cal New Experiences for Research and Diversity in the Sciences (Talk)
2020 Chicano Latino Youth Leadership Project, virtual (Panelist)
2017 University of California, Merced – Spring Northern California Forum for Diversity in Graduate Education (Talk)
2016 University of California, Berkeley – Chicanx Latinx Student Development Office and Alumni Association (Talk)

SKILLS AND INTERESTS

Technical Skills: Statistical analysis, data visualization, map design, climate modeling, geospatial data science, and inter-sectoral data-driven modeling. Proficient in Python, Unix/Linux shell scripting, ArcGIS Pro, Google Earth Engine, Microsoft Excel, PowerPoint, and Tableau.

Languages: English (native), Spanish (native), Italian (fluent, certified CELI 2 B1), French (elementary)

Interests: Passionate about world travel, hiking scenic trails, landscape photography, and language learning.

AWARDS AND FELLOWSHIPS

Università per Stranieri di Perugia Certificato di Conoscenza della Lingua Italiana Livello B1 CELI 2	2025
Stanford Doerr School of Sustainability Dean's Postdoctoral Fellowship	2023 – 2025
U.S. Department of Energy Office of Science Graduate Student Research Program	2022 – 2023
National Academy of Science Ford Foundation Dissertation Fellowship.	2021 – 2022
Foreign Language and Area Studies (FLAS) Fellowship for Italian Language	2020 – 2021
UC Berkeley Institute of European Studies Grant for Italian Language and Culture Studies	2020 – 2021
NSF Innovations in Food Energy and Water Systems (InFEWS) Fellowship	2019 – 2020
The National GEM Consortium University Fellow	2018 – 2019
UC Berkeley Department of Environmental Science Policy and Management Starter Grant	2018 – 2019
University of California Office of the President Carbon Neutrality Initiative Fellow	2016 – 2019
University of California Berkeley Graduate Division GOP Master's Fellowship	2016 – 2017
Hispanic Scholarship Fund Scholar (four-time award winner)	2017, -21, -22, -23
U.S. Department of State Critical Language Scholarship - Bahasa Indonesia	2015
Educational Opportunity Program Achievement Award Scholarship Recipient	2015
Cal New Experiences for Research and Diversity in the Sciences (Cal NERDS) Fellow	2012 – 2015
UC Berkeley Rudd Family Foundation Big Ideas Third Place Contest	2014
IES Abroad Photo Contest 1st Place Winner	2014
Institute of International Education 5th Annual Photo Contest Winner	2014
U.S. Department of State Benjamin A. Gilman International Scholarship - India	2013
International Education Abroad Travel Scholarship Recipient	2013
University of California Education Abroad Program Scholarship Recipient	2013
Blum Center for Developing Economies Global Poverty and Practice Fellowship	2013
National Science Foundation California Alliance for Minority Participation Fellowship	2012 – 2013
UC Berkeley's Earth and Planetary Science Department -Charles H. Ramsden Scholarship	2012 – 2015
Award for Outstanding Participation and Service to the Community by The Native American Recruitment and Retention Center and The American Indian Science and Engineering Society	2012
Ronald McDonalds House of Charities HACER Scholarship Recipient	2010
President of the United States Award for Educational Excellence (signed by President Obama)	2010
U.S. Department of Treasury National Financial Capability Challenge Top Scorer Award	2010
California Scholarship Federation Life Membership and Highest Honor for Superior Scholarship and Service	2010
Academic Excellence First Honors Bishop Amat Memorial High School	2010
First Honors French 1, French 2, French 3, and IB French.	2010

SELECTED MEDIA COVERAGE

A. McDermott, Future winters promise less snow, more rain. Nobody's prepared, Proc. Natl. Acad. Sci. U.S.A. 122 (34) e2520764122, https://doi.org/10.1073/pnas.2520764122 (2025).

Featured in the book: Introduction to Development Engineering: A Framework with Applications from the Field, Springer Nature, 2023, p. 411. https://link.springer.com/book/10.1007/978-3-030-86065-3

Stanford University Doerr School of Sustainability. "New Cohort of Dean's Postdoctoral Fellows". November 29, 2023. https://sustainability.stanford.edu/news/new-cohort-deans-postdoctoral-fellows

UC Berkeley College of Natural Resources (2023). "Student Spotlight: Areidy Beltran-Peña". September 14, 2023

Sidder, A. “Food deficits in Africa will grow in a warmer world”, Eos, 103, Published on 5 October 2022. https://doi.org/10.1029/2022EO220482

The Daily Californian. “*UC Berkeley doctoral candidate awarded 2 national fellowships*”. June 8, 2021 https://www.dailycal.org/2021/06/08/uc-berkeley-doctoral-candidate-awarded-2-national-fellowships/

UC Berkeley Rausser College of Natural Resources. “*Areidy Beltran awarded two national fellowships*”. June 2, 2021

U.S. Department of Energy. “*DOE’s Office of Science Graduate Student Research (SCGSR) Program selects 78 outstanding U.S. graduate students*”. April 29. 2021