DANIEL BEENE, M.S.

Phone: (505) 235-1089
Email: darbeene@salud.unm.edu
Website: https://dbeene.github.io

University of New Mexico
Community Environmental Health Program
College of Pharmacy
2502 Marble Ave. NE, Office B52
Albuquerque, NM 87106

EDUCATION

PhD	University of New Mexico	Expected 2024
	Major: Geography	
	Area: Social & environmental determinants of health disparities of Indigenous populations	
	Advisor: Dr. Yan Lin	
MS	University of New Mexico	May 2019
	Major: Geography (concentration: Geographic information science)	
	Thesis: "Adjudication and the Adaptive Capacity of Pecan Farmers in the Lower Rio Grande"	
	Advisor: Dr. Yan Lin	
BA	University of New Mexico,	May 2009
	Major: Psychology	
	Minor: Communications	
	Graduated Cum Laude	

HONORS AND AWARDS

Master's Thesis Distinction 2019

Outstanding Graduate Student Award 2019
UNM Department of Geography & Environmental Studies

Conrad Snead Scholarship 2019
UNM Department of Geography & Environmental Studies

Austrian Marshall Plan Scholarship 2017
Visiting Fellow, Carinthia University of Applied Sciences, Villach, AT

Student Poster Competition Winner 2017
GIS Day 2017, University of New Mexico

Articles in Refereed Journals

Lin, Y., Hoover, J., **Beene, D.**, Erdei, E., & Liu, Z. (2020). Environmental risk mapping potential for abandoned uranium mine contamination on the Navajo Nation, USA, using a GIS-based multi-criteria decision analysis approach. *Environmental Science and Pollution Research* 27: 30542-30557
https://doi.org/10.1007/s11356-020-09257-3

Ketai, L., Melendres, L. D., DuBroff, J., Lin, Y., & **Beene, D.** (2019). High Geographic Prevalence of Pulmonary Arterial Hypertension: Associations with Ethnicity, Drug Use and Altitude. *Pulmonary Circulation* 10 (1): 2045894019894534.
https://doi.org/10.1177%2F2045894019894534

Beene, D., Zhang, S. & Paulus, G. (2019). Workflow for hydrologic modelling with sUAS-acquired aerial imagery. *Geocarto International.*
https://doi.org/10.1080/10106049.2019.1648562

Book Chapters

Hoover, Joseph, Lin, Y., **Beene, D.**, & Liu, Z. (2020). Partnering with Indigenous Communities to Address the Environmental Health Legacy of Abandoned Mines in the Western United States. In Keables, M. J. (Ed.) *The Rocky Mountain West: A Compendium of Geographic Perspectives*. American Association of Geographers: Washington, D.C. 2020 March; :109-117.

Beene, D. R. & Lane, K. M. D. (2020). Unmappable Variables: GIS and the Complicated Historical Geography of Water in the Rio Grande Project. In Travis, C., Ludlow, F. M., & Ferenc, G. (Eds.) Historical Geography, GIScience, and Textual Analysis: Mapping the Landscapes of Time and Place. Berlin: Springer.

Works in Progress:

Nozadi, S., Li, L., **Beene, D.**, Lin, Y. (in preparation). Prevalence of developmental disabilities, age of diagnosis, and service utilization across ECHO cohorts: Roles of personal and environmental barriers restricting parents' utilization of service.

Beene, D., Lin, Y. (in preparation). Reimagining rurality: Rurality and isolation as indicators of social determinants of health on the Navajo Nation.

Lu, Y., Gong, X., **Beene, D.**, Lin, Y. (in preparation). Twitter analysis of attitudes toward fracking in the United States of America.

Erdei, E., Gonzales, M., Miller, C., **Beene, D.** (in preparation). Understanding the role of environmental metals exposures on COVID-19 severity in NM.

Beene, D., Camplain, R., Carroll, S., Chief, K., Hoover, J., Ingram, J., Lewis, J., Lin, Y., Potluru, M., Shuey, C., Yang, L. (in preparation). Water Quality at Unregulated Wells in the Navajo Nation: An Interactive Analysis and Visualization Web Map.

Lin, Y., Hoover, J., **Beene, D.**, Lippitt, C. (under review). Uncertainties from travel time to spatial accessibility modeling: a comparison of street sources. *Cartography and Geographic Information Science (under review)*.

Beene, D., Collender, P., Cardenas, A., Harvey, C., Huhmann, L., Lin, Y., Lewis, J., Loiacono, N., Navas-Acien, A., Nigra, A., Steinmaus, C., van Geen, A. (in preparation). Using mass-balance to evaluate arsenic intake and excretion in different populations. Target journal: *Environmental Health Perspectives*.

Beene, D., Zhang, S., Lippitt, C., Bogus, S.M. (in preparation). Performance evaluation of multiple pan-sharpening techniques: a statistical perspective. Target journal: *Remote Sensing*.

PRESENTATIONS AND INVITED LECTURES

Presentations at Professional Meetings

Beene, D., Signes-Pastor, A., Kaeli, D., MacKenzie, D., Karagas, M., Feric, Z., Halchenko, Y., Powers, M., Manjourides, J., Lewis, J., Alshawabkeh, A., Bohm Agostini, N., Watkins, D. (2020). Data Harmonization across SRP Pregnancy and Birth Cohorts. *NIEHS External Use Case Committee*, virtual meeting, February 18, 2020.

Beene, D., van Geen, L., Navas-Acien, A., Nigra, A., LoIacono, N., Cardenas, A., Collender, P., Steinmaus, C., Lin, Y., Lewis, J. (2020). Arsenic Mass Balance: Integrating Environmental and Biomarker Data across Diverse Populations. *NIEHS External Use Case Committee*, virtual meeting, February 18, 2020.

Beene, D., Lin, Y., Hoover, J., Erdei, E., Liu, Z. (2020). Poster: Geospatial Modeling to Map Environmental Exposure to Abandoned Uranium Mine Waste on the Navajo Nation, USA. *2020 NIH/NIEHS Superfund Research Program Virtual Online Meeting, Hosted by Texas A&M University*. URL: https://bit.ly/3pRZZyi December 14-16, 2020.

Beene, D., Bohm Agostini, N., Halchenko, Y., Kaeli, D., Karagas, MR., Lewis, J., MacKenzie, D., Manjourides, J., Powers, M., Signes-Pastor, AJ., Watkins, D. (2020). Poster: Distributed Harmonization and Analysis Across Three SRP Cohorts. *2020 NIH/NIEHS Superfund Research Program Virtual Online Meeting, Hosted by Texas A&M University*. URL: https://bit.ly/3pRZZyi December 14-16, 2020.

Roman, C., Shuey, C., Begay, D., Hoover, J., **Beene, D.**, Quetawki, M., Rahman, R., Lewis, J., Campen, M., MacKenzie, D., Gonzales, M., (2020). Poster: University of New Mexico SRP Responds to COVID-19 in Tribal Communities. *2020 NIH/NIEHS Superfund Research Program Virtual Online Meeting, Hosted by Texas A&M University*. URL: https://bit.ly/3pRZZyi December 14-16, 2020.

Hoover, JH, Lin, Y., **Beene, D.**, Liu, Z., & Lewis JL. (2020). GPS Tracking Livestock to inform potential human exposure to abandoned uranium mine waste in an indigenous community in the southwestern United States. *2020 Geological Society of American Annual Meeting* (Virtual Conference), Montreal, October 26, 2020

Beene, D., Fuchs, E., Rinehart, A., Lin, Y. (2020). Feedbacks of irrigator decisions, hydrologic change and long-term water planning, Mesilla Valley, NM. *NGWA Water, Energy, and Policy in a Changing Climate*. Albuquerque, NM, February 24, 2020.

Beene, D., Lin, Y., Hoover, J., Liu, Z. (2019). Abandoned uranium mines in the Navajo Nation: How do we responsibly and ethically model risk? *Association of Pacific Coast Geographers Annual Meeting*. Flagstaff, AZ. October 16-19, 2019.

Lin, Y., **Beene, D.**, Liu, Z. (2019). Uncertainties in Spatial Accessibility: A comparison of Street Network Data. *The 82nd Annual Meeting of Association of Pacific Coast Geographers.* Flagstaff, AZ. October 16-19, 2019.

Liu, Z., Lin, Y., Hoover, J., **Beene, D.** (2019). Poster: Classifying livestock grazing behavior and GIS-modeling potential for exposure to Abandoned Uranium Mine Waste in the Cove Wash Watershed, Arizona, USA. *Southwest Division, American Association of Geographers Annual Meeting*, Fort Worth, TX, October 10-12, 2019.

Beene, D. (2019). Modeling irrigation and agrarian change in the Lower Rio Grande: Lessons Learned from Mixed Methods Research. *New Mexico Geographic Information Council (NMGIC) Annual Meeting*, Albuquerque, NM, April 26, 2019. *American Association of Geographers Annual Meeting*, Washington, D.C., April 3-7 2019.

Beene, D. (2019). Adjudication and the Adaptive Capacity of Farmers in the Lower Rio Grande. *Second Biennial Population and Public Policy Conference*, Albuquerque, NM, February 8-9 2019.

Lin, Y., Hoover, J., Erdei, E., **Beene, D.** (2018). Poster: Novel Geospatial Modeling to Inform Risk Assessment for Metal Contamination Research on Tribal Lands, NIH P50 (Native Environmental Health Equity Research Center 2018 Pilot Project). *The 10th Conference on Metal Toxicity & Carcinogenesis*, Albuquerque, NM, October 28-31, 2018.

Beene, D. (2018). Complicating Water Management Binaries in the Rincon and Mesilla Valleys by Coupling Grounded Theory and Geospatial Modeling**.** *Southwest Division, American Association of Geographers Annual Meeting*, Baton Rouge, LA, October 4-6, 2018.

Beene, D. (2017). Water Use, Delivery and the River: Modeling the Effect of Irrigation on the Rio Grande's Efficiency. *UNM GIS Day*, Albuquerque, NM, November 14, 2017.

Invited Talks

Lewis, J., Begay, D., Shuey, C., Luo, L., **Beene, D.** (2020). Report from UNM regarding data on COVID-19 data collection. Requested report to Health, Education, and Human Services Committee of the 24th Navajo Nation Council, teleconference, May 13, 2020.

Lin, Y., **Beene, D.**, Lewis, J. (2020). Integrating Environmental and Biomonitoring Datasets from the UNM METALS Superfund Center. Columbia University Mailman School of Public Health Mini – Symposium, Columbia University Mailman School of Public Health, New York City, NY, February 21, 2020.

Hoover, J., Lin, Y., **Beene, D**. (2020). Cove Livestock Project Progress Report. Navajo Nation Cove Chapter meeting, Cove Chapter, Navajo Nation, February 11, 2020.

Lin, Y., Lewis, J., **Beene, D**., Ong, J. (2020). Home Dust Uranium, Environmental Exposure Risk Factors, and Biomonitoring Uranium Concentration among NBCS Participants. Navajo EPA Meeting (Virtual), University of New Mexico, Albuquerque, NM, March 19, 2020.

Lin, Y., **Beene, D**., Hoover, J., Erdei, E. (2020). Geospatial Modeling to Inform Environmental Exposure Assessment for Metal Contamination Research on Tribal Lands. University of New Mexico Superfund Research Center Monthly Meeting (Virtual), University of New Mexico, Albuquerque, NM, April 16, 2020.

EMPLOYMENT AND RESEARCH EXPERIENCE

Community Environmental Health Program, University of New Mexico College of Pharmacy
Data Manager, Supervisor: Dr. Johnnye Lewis (UNM-HSC)   2019-present

- Development of data management protocol for all publication-ready datasets generated under Superfund Research Project and Navajo Birth Cohort Study/ECHO Project to navigate the requirements of FAIR data management and sensitive Tribal information
- Coordination with PIs and research scientists to acquire and publish data and metadata in machine-readable format
- Implementing database management systems (DBMS) for different permission levels at three sites across UNM
- Authored intellectual property statement with project and Tribal leaders for sensitive data
- Developing active DBMS for Cove Livestock Project with PI, Dr. Joe Hoover
- Member of statistics working group
- Participation in NIMHD P50 grant application, November 2019

Agnese Nelms Haury Program in Environment and Social Justice, University of Arizona
Co-Investigator, PI: Dr. Karletta Chief (UofA)   2020-present

- Project Aim: Transdisciplinary research group with participants from University of Arizona, Northern Arizona University, University of Montana – Billings, University of California – Los Angeles, and Southwest Research and Information Center, with specific aim of addressing urgent need of clean water access for the Navajo Nation during the COVID-19 pandemic
- Tracked daily COVID-19 infection rates and corrected total caseloads of neighboring states for detailed statistical analysis of potential infection correlates
- Developed fuzzy inference model of COVID-19 correlates at the chapter and agency level
- Developed interactive web mapping and analysis tool of water quality at unregulated sources across the Navajo Nation

NIH P50 Center for Native American Environmental Health Equity Research
Co-Investigator, PIs: Dr. Johnnye Lewis, Joseph Hoover, and Debra MacKenzie   2020 – 2025

- Project Title: Evaluating Cumulative Environmental Exposure to Metals and Non-metals and Community-level Health Using Geospatial Modeling and Personal Exposure Assessment (PI: Dr. Yan Lin & Dr. Joe Hoover)
- Awarding agency: National Institutes on Minority Health and Health Disparities (NIMHD)
- Project Aim: Leverage geospatial tools and modeling with community engagement to address cumulative exposures of diverse environmental toxicants from mine waste and trash disposal, and their impact on human health among Indigenous populations in the Navajo Nation, Crow Nation, and Cheyenne River Sioux Tribe
- Refined environmental exposure model to estimate transport of toxicants
- Developed novel approach to classify landforms across varied terrain using digital elevation models
- Provide data management oversight and ensure data integrity among multiple project partners

Admin Supplement to Superfund Research Program (SRP) Center, NIH/NIEHS
Co-Investigator, PI: Dr.Johnnye Lewis   2019-2020

- Project Title: Arsenic Mass Balance: Integrating Environmental Biomarker Data across Diverse Populations
- Project Aim: SRP External Use Case (EUC) between UNM, Columbia University, and UC Berkeley that leverages arsenic mass balance modeling to estimate additional sources of arsenic contamination beyond drinking water
- Provided data management, establish common analytical code repository, identified and utilized defined data ontologies
- Contributed to manuscript (in process) – wrote contextual background of Navajo Nation arsenic exposures, field data collection protocols, and harmonized final data plots
- Led project update presentation to NIEHS and other EUCs (February 2021)

Admin Supplement to Superfund Research Program (SRP) Center, NIH/NIEHS
Co-Investigator, PI: Dr. David Kaeli (Northeastern University)   2019-2020

- Project Title: Data Harmonization Across SRP Pregnancy & Birth Cohorts
- Project Aim: EUC between UNM, Northeastern University, and Dartmouth College to harmonize biomonitoring and other birth cohort survey data and extend statistical power in predicting birth outcomes as a function of in utero metals exposure
- Coordinated data transfer and use agreements between three universities in a way that acknowledges Indigenous data sovereignty and enhanced security protocols
- Established secure Linux server to host website for analysis of secure harmonized datasets
- Developed data dictionary and machine-readable metadata
- Led project update presentation to NIEHS and other EUCs (February 2021)

University of New Mexico, Earth Data Analysis Center
Co-Investigator, PI: Dr. Su Zhang (UNM)   2019 -present

- Project Title: Effect of Pan Sharpening Algorithms on Local Uncertainty of Vegetation Indices
- Normalized differential vegetation indices are generated from systematic comparison of four pan sharpening algorithms on Landsat 8 and proprietary QuickBird imagery of five cities worldwide
- Developing new quality assessment that is fusion of cumulative distribution functions of local quality (Q4) and NDVI values
- Generating recommended workflow for vegetation monitoring using fused imagery

University of New Mexico, Department of Geography & Environmental Studies
Staff Research Assistant, PIs: Dr. Joe Hoover (MSUB) and Dr. Yan Lin (UNM) 2019-2022

- Project Title: GPS Tracking Livestock Movement and Exposure to Abandoned Uranium Mine Waste in Cove Watershed United States Environmental Protection Agency (USEPA)
- Project Aim: Community-driven research project to understand the effect of abandoned uranium mine waste on livestock and potential human health risks from consuming meat from livestock that graze in mining-impacted watersheds
- Coordinated big data management of geospatial, environmental sampling, and laboratory analysis datasets in a PostgreSQL relational database
- Met with fellow researchers and community members in person throughout 2019 to discuss research agendas and specific community concerns
- Equipped livestock with GPS collars and tracked their movement during spring and summer 2019.
- Participated in traditional Navajo butchering of livestock led by community members
- Refined potential uranium contaminant exposure model with *in situ* data and more sophisticated hydrological modeling

University of New Mexico, Department of Geography & Environmental Studies
Research Assistant, PIs: Dr. Joe Hoover and Dr. Yan Lin   2018 – 2019

- Project Title: Novel Geospatial Modeling to Inform Risk Assessment for Metal Contamination Research on Tribal Lands (P50 Native Environmental Health Equity Research Center 2018 Pilot Project)
- Project Aim: To develop Navajo Nation-wide multicriteria decision analysis (MCDA) geospatial model of potential exposure to environmentally borne uranium with abandoned uranium mines (AUMs) as point sources and the following as transportation criteria: proximity to AUMs, roads, and downslope drainages; topographic wind exposure, wind index, landforms, vegetative robustness, and groundwater contamination
- Developed analytical hierarchy process (AHP) framework to weight and overlay criteria layers

- Coded and performed one-at-a-time (OAT) sensitivity analysis of input criteria weights (code available here: https://github.com/dbeene/OATsensitivity)
- Co-authored final manuscript, project poster, helped grant proposal writing

Master's Thesis, University of New Mexico   2019
Advisor: Dr. Yan Lin

- Mixed methodology with GIScience modeling and semi-structured interviews
- Big data mining, organizational management, Python and SQL programming
- Computational univariate and multivariate regression models
- Extensive field work with research participants
- UNM Office of the Institutional Review Board approval
- Passed with distinctions

University of New Mexico, Department of Geography & Environmental Studies
Research Assistant, PI: Dr. Tema Milstein (UNM)   2018

- Edited "Make love not war?: Representational risks and opportunities in no-compromise direct environmental action", in *Local Environment* (under review)
- Edited "Routledge Handbook of Ecocultural Identity" by Milstein, T. & Castro-Sotomayor, J. (Eds.) (under contract for 2019 publication). London, UK: Routledge.

Carinthia University of Applied Sciences (CUAS/FH-Kärnten), Villach, AT
Visiting Fellow, Co-PI: Dr. Gernot Paulus (CUAS)   2018

- Developed a methodology for conducting complex hydrological modeling using small unmanned aerial systems (sUAS)
- Compiled and maintained multiple terabytes of aerial and LiDAR imagery
- Statistical sensitivity analysis of multiple model inputs to baseline model
- Completed project report for Austrian Marshall Plan Foundation

TEACHING EXPERIENCE

University of New Mexico, Department of Geography & Environmental Studies:
- GEOG 195 – Introduction to Environmental Studies, University of New Mexico. Fall 2018. Teaching assistant.
- GEOG 364 – Law & Geography: Law, Control, Human Environment, University of New Mexico. Fall 2018. Teaching assistant.

PROFESSIONAL TRAINING

Seminar or Workshop
UNM Libraries & Data Carpentries
Data Carpentry for Ecological Data   2019

UNM Organization, Information and Learning Sciences (OILS)
Project Data Management Workshop with Dr. Karl Benedict   2018

UNM Health Sciences Center
- Collaborative Institutional Training Initiative (CITI),
  Group I Biomedical Research Investigator   2018
- Ethics: A Framework for Ethical Decision Making   2018
- Financial Conflicts of Interest Training   2018

Python Scripting for Map Automation, ESRI   2018
Python for Everyone, ESRI   2018
3D Analysis of Surfaces and Features Using ArcGIS, ESRI   2017
Regression Analysis Using ArcGIS, ESRI   2017
Go Deeper with Data Analytics Using ArcGIS Pro and R, ESRI   2017
Building Models for GIS Analysis Using ArcGIS, ESRI   2017
Address Geocoding with ArcGIS, ESRI   2016
Using Raster Data for Site Selection, ESRI   2015
Learning ArcGIS Desktop, ESRI   2015
Creating, Editing and Managing Geodatabases, ESRI   2015

PROFESSIONAL AFFILIATIONS

American Association of Geographers, 2018-Present
Association of Pacific Coast Geographers, 2019-Present
Southwest Division, American Association of Geographers, 2018-Present
New Mexico Geographic Information Council, 2015-Present

PROFESSIONAL SERVICE

Reviewer
Cogent Social Sciences Journal, Taylor & Francis, 2020

Session Chair, Health Geographies. Association of Pacific Coast Geographers Annual
Meeting, Flagstaff, AZ, October 2019.

Lightning Talk Organizer
GIS Day, University of New Mexico, 2019

Symposium Co-Organizer
GIS Day, University of New Mexico, 2018

Student Association of Geography & Environmental Studies
President, 2017-2018

Central New Mexico Community College GIS Student Organization
Authored official charter grant, 2016

COMPUTER SKILLS

Programming: Python, R, JavaScript, HTML, CSS, SQL, XML

Applications: ESRI ArcGIS Suite, Adobe Creative Suite, Microsoft Office, SPSS, R Studio, Autodesk AutoCad & Civil 3D, Erdas Imagine, TerrSet, ENVI, HEC-RAS, QGIS, PostgreSQL, PostGIS, Matlab

PRESS INTERVIEWS

"Daniel Beene – University of New Mexico," G[Insight], FH-Kärnten, issue 2018/2019.
"Water use, delivery and the river," UNM Newsroom Front Page, January 29, 2018.