HELENA M. GARCIA

Department of Geography · Dartmouth College
helena.garcia@dartmouth.edu · helenamgarcia.com

EDUCATION

Ph.D. University of North Carolina at Chapel Hill — May 2026
Environment, Ecology and Energy Program
Advisors: Dr. Miyuki Hino & Dr. Antonia Sebastian
Dissertation: Repetitive Flood Exposure, Residential Mobility, and Recovery Dynamics in North Carolina

M.S. University of Michigan — 2021
School for Environment and Sustainability
Concentration: Conservation Ecology - Aquatic Sciences

B.C.E. University of Delaware — 2018
Civil Engineering, Honors Program, *Magna Cum Laude*
Minors: Environmental Engineering & Spanish

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher, Dartmouth College — September 2026-present
Department of Geography

Postdoctoral Researcher, University of North Carolina at Chapel Hill — May 2026-August 2026
Department of Earth, Marine, and Environmental Sciences

Graduate Research Assistant, The University of North Carolina at Chapel Hill — 2021-May 2026
Environment, Ecology and Energy Program; Carolina Population Center; Coastal Resilience Center

Doctoral Economics Intern, Environmental Defense Fund — 2023
Climate Resilience Research Team

Graduate Research Assistant, University of Michigan — 2019-2021
School for Environment and Sustainability

Water Resources Designer I, McCormick Taylor, Inc. - Baltimore, MD — 2018-2019

RESEARCH INTERESTS

Climate-amplified hazards & human impacts; Adaptation & decision making; Social vulnerability & equity; Disaster recovery & mobility; Geospatial statistics; Machine learning

HONORS & AWARDS

Population Association of America 2026 Poster Winner, Migration Section — 2025
UNC Graduate School Impact Award — 2026
UNC SEEDS Climate Hero Award — 2026
UNC E3P STREAM (Service, Teaching, Research Excellence and Mentoring) Award — 2025
American Geophysical Union 2024 Outstanding Student Presentation Award, Natural Hazards Section — 2025
NSF Young Investigators Award*, 8th International Conference on Flood Management — 2022
**supporting attendance to workshop*
University of Michigan Dow Sustainability Fellow — 2020
University of Michigan School for Environment and Sustainability Jonathan Bulkley Water Prize — 2020
University of Michigan School for Environment and Sustainability Dean's Challenge Fellowship Recipient — 2019
RJN Foundation Civil and Environmental Engineering Award — 2018
W. David & W. Corder Teter Civil Engineering Scholarship — 2016, 2017
University of Delaware College of Engineering Student of Distinction — 2015, 2016

PUBLICATIONS

Published in peer reviewed journals

1. **Garcia, H.M.**, Sebastian, A., Fitzmaurice, K.P., Hino, M., Collins, E.L., Characklis, G.W. (2025). Reconstructing Repetitive Flood Exposure Across 78 Events From 1996 to 2020 in North Carolina, USA. *Earth's Future, 13,* e2025EF006026, https://doi.org/10.1029/2025EF006026.
2. Smiley, A.M.H., Grimley, L.E., **Garcia, H.M.**, Sebastian, A., Berke, P., Hino, M., Piehler, M.F. (2025). Coastal squeeze reduces nitrogen removal services provided by wetlands: insights from an interdisciplinary framework. *Environmental Research Letters, 20(11),* 114015, https://doi.org/10.1088/1748-9326/ae0cde.
3. Fitzmaurice K.P., **Garcia, H.M.**, Sebastian, A., Thomson, H., Zeff, H.B., Characklis, G.W. (2026). Flood impacts on the financial stability of residential mortgage borrowers: An integrated modeling approach. *Natural Hazard and Earth Systems Sciences* (Highlight Paper), *26,* 675-701, https://doi.org/10.5194/egusphere-2025-2049.
4. Gourevitch, J.D., Gold, A.C., **Garcia, H.M.** (2026). The value of wetlands in reducing flood losses in the USA. *Nature Water, 4,* 857-870, https://doi.org/10.1038/s44221-026-00656-3.
5. Jackson, B.E., Planey, A.M., **Garcia, H.M.**, Ranapurwala, S., Baggett, C.D., Evans-Strong, J., Lowman, A., Delameter, P., Butler, E.N., Wallace, J., Lund, J.L. (2026). Assessing the Effects of Hurricane Hazards on Hospitalization or Death Among Older Adults Using Electricity-Dependent Medical Devices. *Journal of the American Geriatrics Society,* 1-9, https://doi.org/10.1111/jgs.70757.

Submitted to peer reviewed journals

1. Albulescu, A.C., de Ruiter, M.C., Trogrlić. R.S., ... **Garcia, H.M.**, et al. Review paper: The assessment of temporal vulnerability dynamics in single- and multi- natural hazard contexts. Under review at *Earth's Future.*
2. Blessing, R., Plough, J.P., Sebastian, A., **Garcia, H.M.**, Hino, M. Identifying Obstacles to Equitable Flood Mitigation Funding. Under review at *International Journal of Disaster Risk Reduction.* Preprint: https://papers.ssrn.com/sol3/papers.cfm?abstract$_id = 7560610$.
3. Schlumberger, J., Stolte, T., **Garcia, H.M.**, Sebastian, A., Jäger, W., Ward, P., de Ruiter, M., Šakić Trogrlić, R., Tijssen, A., Madruga de Brito, M. Exploring methods capturing vulnerability dynamics in the context of flood hazard research. Under review at *Natural Hazards and Earth System Sciences.* Preprint: https://egusphere.copernicus.org/preprints/2026/egusphere-2025-6132/.
4. Khanal, K., Kaza, N., Kittner, N., Bradbury, K., **Garcia, H.M.** Characterizing Small- and Large-Scale Solar PV Exposure to Flood Risk in Central and Coastal North Carolina. Under review at *Environmental Research: Energy.*

Working papers

1. **Garcia, H.M.**, Hino, M., Frankenberg, E., Kwass-Mason, I., Sebastian, A., Anarde, K. Flooding and Residential Mobility: Longitudinal Evidence from North Carolina. Planned submission Fall 2026.
2. Hino, M., Frankenberg, E., Anarde, K., Bhatia, A., **Garcia, H.M.**, Kwass-Mason, I., Yan, R. Impacts of sea level rise and storms on residential migration in North Carolina. Planned submission Fall 2026.
3. Kwass-Mason, I., Hino, M., **Garcia, H.M.**, Yan, R., Kayaleh, D. Who is driving demand for housing developments in North Carolina coastal floodplains? Planned submission Fall 2026.
4. **Garcia, H.M.**, French, K., Hino, M., Sebastian, A., Kousky, C.. National Flood Insurance Program Claims Outcomes: Denials, Payments, and Processing Times. Planned submission Spring 2027.

Datasets

1. **Garcia, H.M.**, Sebastian, A., Fitzmaurice, K.P., Hino, M., Collins, E.L., Characklis, G.W. (2024). NC Flood Extent Archive (NC-FLDEX): Flood Extent Rasters (30m) for 78 NC-FLDEX Events 1996-2020 [V5], UNC Dataverse, https://doi.org/10.15139/S3/DOKK16.

Reports

1. **Garcia, H.M.**, Murphy, L., Wendland, B., Wu, T. (2021). Assessing Equity and Environmental Justice in the Great Lakes Restoration Initiative, https://dx.doi.org/10.7302/971.

PRESENTATIONS & POSTERS

** denotes primary presenter(s)*

Invited Talks & Panels

1. Characklis, G.W.*, **Garcia, H.M.***, Luettich, R.*, Snoeyink, J.* *When the waters rise: Using data science to prepare NC for future floods.* UNC Institute for the Environment & UNC School of Data Science and Society. Chapel Hill, NC. October 2025. (Panel)
2. Lowman, A.*, Lund, J.*, Baggett, J.*, **Garcia, H.M.***, Sebastian, A. *Understanding the effects of flooding exposures on health outcomes in North Carolina: Developing collaborations, data infrastructure, and preliminary findings.* UNC Gillings School of Public Health Institute for Environmental Health Solutions. Chapel Hill, NC. October 2025.
3. **Garcia, H.M.***, Sebastian, A., Hino, M., Fitzmaurice, K.P., Collins, E.L., Characklis, G.W. *Event-based approaches to understanding flood exposure and impacts in North Carolina.* NOAA Climate Adaptation Partnerships (CAP) monthly meeting. Virtual. May 2025.
4. **Garcia, H.M.***, & Smiley A.M.H.* *Incorporating Ecosystem Services into Flood Resilience Planning in New Bern, North Carolina.* North Carolina Sea Grant Advisory Board. Raleigh, NC. November 2022.
5. **Garcia, H.M.*** *Examining Social Equity in Great Lakes Restoration.* Great Lakes International Joint Commission 210th Water Quality Board Meeting. Virtual. October 2020.

Oral Conference Presentations

1. **Garcia, H.M.***, Hino, M., Frankenberg, E., Kwass-Mason, I., Anarde, K., Sebastian, A. Cumulative flood exposure and residential mobility in North Carolina. *2026 Association of American Geographers (AAG) Annual Meeting.* San Francisco, CA. March 2026.
2. **Garcia, H.M.***, Hino, M., Frankenberg, E., Anarde, K. Repetitive Flood Exposure and Residential Mobility Trends in Eastern North Carolina. *Columbia MR2025: Mobility, Adaptation, and Wellbeing in a Changing Climate.* New York City, NY. June 2025.
3. **Garcia, H.M.***, Fitzmaurice, K., Sebastian, A., Hino, M., Collins, E., Characklis, G.W. Risks from repetitivie flood exposure: Insights from the North Carolina Flood Extent Archive (1996-2020). *2025 Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference.* Durham, NC. May 2025.
4. **Garcia, H.M.***, Hino, M., Frankenberg, E., Anarde, K. Residential mobility patterns following repetitive food exposure in easter North Carolina, USA. *Population Association of America (PAA) Annual Conference.* Washington, DC. April 2025.
5. **Garcia, H.M.***, Sebastian, A., Fitzmaurice, K.P., Hino, M., Characklis, G.W., Collins, E. L. Mapping repetitive damage hotspots in North Carolina: Insights from 78 flood events (1996-2020). *2024 North Carolina Coastal Conference.* New Bern, NC. November 2024.
6. **Garcia, H.M.***, Fitzmaurice, K.P., Sebastian, A., Characklis, G.W. Validation of machine learning methods for reconstructing repetitive flood damage exposure in North Carolina, 1996-2020. *2024 NC Water Resource Research Institute (WRRI) Annual Conference.* Raleigh, NC. March 2024.
7. **Garcia, H.M.***, Fitzmaurice, K.P., Characklis, G.W., Zeff, H.B., Thomson, H., **Sebastian, A.** Validation of Machine Learning Methods for Reconstructing Repetitive Flood Damage Exposure in North Carolina, 1996-2020. *2023 American Geophysical Union (AGU) Fall Meeting.* San Francisco, CA. December 2023.
8. **Garcia, H.M.***, Sebastian, A., Thomson, H., Zeff, H.B, Characklis, G.W. Dynamic Vulnerability: Reconstructing Historical Flood Footprints and Exposure in Eastern North Carolina. *2022 American Geophysical Union (AGU) Fall Meeting.* Chicago, IL. December 2022.

9. **Garcia, H.M.***, Smiley A.M.H.*, Grimley, L.E., Sebastian, A., Hino, M., Berke, P. An interdisciplinary approach to quantifying flood mitigating ecosystems services and identifying beneficiaries in New Bern, North Carolina. *2022 North Carolina Coastal Conference.* Raleigh, NC. November 2022.
10. **Garcia, H.M.***, Grimley, L.E., Smiley, A.M.H., Ruiz, J., Berke, P., Hino, M., Sebastian, A. Integrating Ecosystem Services into Flood Resilience Planning in New Bern, NC. *NSF 8th International Flood Conference on Management (NSF-ICFM8).* Iowa City, IA. August 2022.
11. Smiley, A.M.H.*, Grimley, L.E., **Garcia, H.M.**, Ruiz, J., Berke, P., Hino, M., Piehler, M., Sebastian, A. Integrating Ecosystem Services into Flood Resilience Planning in New Bern, NC. *Joint Aquatic Sciences Meeting.* Grand Rapids, MI. May 2022.

Poster Conference Presentations

1. **Garcia, H.M.***, Hino, M., Kwass-Mason, I., Frankenberg, E., Anarde, K., Sebastian, A. Flooding and Residential Mobility: Longitudinal Evidence from North Carolina. *2026 Population Association of America (PAA) Annual Meeting.* St. Louis, MO. May 2026. **Poster Winner Migration Session**
2. **Garcia, H.M.***, Sebastian, A., Fitzmaurice, K.P., Characklis, G.W., Collins, E.L. Event-based Flood Exposure Mapping in North Carolina, 1996-2020. *2024 American Geophysical Union (AGU) Fall Meeting.* Washington, DC. December 2024. **2024 Outstanding Student Presentation Award (OSPA) (Natural Hazards Section)**
3. **Garcia, H.M.***, Berke, P. How resilience planning threatens poor and vulnerable communities: A case study of New Bern, North Carolina. *Association of Collegiate Schools of Planning (ACSP) Annual Conference.* Toronto, ON. November 2022.
4. **Garcia, H.M.***, Brines, S., Do, H.X., Anderson, E., Gronewold, A. Coastal water level variability, inundation, and impacts on nearshore infrastructure. *2020 American Geophysical Union (AGU) Fall Meeting. *Virtual due to COVID-19.* December 2020.
5. **Garcia, H.M.***, Brines, S., Wong, B., Brown, C., Gronewold, A. Incorporating remote-sensing data to impce conceptual floodplain modeling in Southeast Michigan *International Association for Great Lake Resaerch (IAGLR) Conference. *Virtual due to COVID-19.* June 2020.

TEACHING & MENTORSHIP

Undergraduate Student Research Mentor 2023-present
Advising four undergraduate students working on research projects using geospatial data related to flood exposure, with a focus on teaching GIS skills and R for data cleaning, analysis, and visualization.

Guest Lecture on Repetitive Flooding and Impacts in North Carolina Fall 2025
Department of Geography and Environment, University of North Carolina, Chapel Hill, NC
GEOG 141: Geography for Future Leaders

Guest Lecture on Climate Adaptation in North Carolina Spring 2025
Environment, Ecology and Energy Program, University of North Carolina, Chapel Hill, NC
ENEC/PLCY 373: Confronting Climate Change in the Anthropocene: Science to Policy Solutions

Graduate Teaching Assistant Spring 2024
Environment, Ecology and Energy Program, University of North Carolina, Chapel Hill, NC
ENEC 201: Environment & Society; 2 sections with 18 and 13 students

GRANTS & FELLOWSHIPS

1. NC Sea Grant Coastal Resilience Team Competition. *Incorporating Ecosystem Services into Flood Resilience Planning in New Bern, North Carolina* (01/01/2022-12/31/2023; $20,000). Student Team: Anne Smiley (PhD), Lauren Grimley (PhD), Helena Garcia (PhD), Jacqueline Ruiz (BA).
2. University of Michigan Dow Sustainability Master's Fellowship. *Championing Community Stormwater Solutions* (01/01/2020-12/31/2020; $20,000). Student Team: Madeeha Ayub (MUD), Helena Garcia (MS), Collin Knauss (MBA, MS), Clare Kucera (MS, MURP), Jeremy Nyitrai (MS, MSE), Eva Roos (MLA, MS).

Grant Participation as Student Researcher

- NSF Human-Environment and Geographic Sciences – *The effects of chronic flooding on coastal migration* (Grant No. BCS-2215195)

- DHS Coastal Resilience Center – *Identifying obstacles to equitable flood mitigation funding* (Grant No. 15STCRC00001-07-01)
- NOAA RISA Program – *Innovating a community-based resilience model on climate and health equity in the Carolinas* (NOAA-OAR-CPO-2021-2006677)
- DHS Coastal Resilience Center – *A landscape study of social equity data needs and its access and availability to support the disaster resileince of marginalized communities* (Grant No. 15STCRC00001-07-01)
- NSF Growing Convergence Research – *Climate resilience in the coastal zone* (Grant No. OIA-2021086)
- North Carolina Policy Collaboratory – *Strengthening flood resilience in Eastern North Carolina* (Session Law 2019-224)

PROFESSIONAL SERVICE

Manuscript reviewer: *JAPA, Nature Water, NHESS, npj Natural Hazards, npj Urban Sustainability*

Michigan Sea Grant Research Proposal Reviewer	Fall 2025
American Geophysical Union (AGU) Student Convener Session NH43C	Fall Meeting 2024
North Carolina Coastal Conference Session Convener	November 2024
Environment, Ecology and Energy Program (E3P) Seminar Series Organizer	2024
Graduate School Interest Advising for Undergraduates at UNC	2021-2022

SKILLS

Communication: Spanish (heritage speaker with some professional use)
Software: ArcGIS, ArcGIS Pro, GitHub, Jupyter Notebooks, Overleaf, R Markdown, Quarto
Programming: R, Python, MATLAB, Bash scripting, high-performance computing workflows (Slurm)
Hydraulic & Hydrologic Models: HEC-HMS, HEC-RAS

MEDIA APPEARANCES

2026

PBS SCI NC, Flooding is getting worse. Most people don't know the risks.
Eos, Calculating the Costs of Wetland Loss

2025

North Carolina State Climate Office, One year after Hurricane Helene, new perspectives on our worst storms
UNC News, Hurricane season has been busy. So have Carolina researchers
CBS17 News, Homebuyers urged to assess flood risks and insurance costs amid turbulent weather in North Carolina
WRAL News, UNC study: 43% of flooded NC buildings were outside of FEMA's hazard zones
UNC News, New study reveals widespread and overlooked flooding across NC
WPTF Afternoon News, Helena Garcia, Ph.D. candidate at UNC-Chapel Hill, discusses extreme rainfall and inland flooding in North Carolina
WBTV, UNC study reveals widespread, overlooked flooding
Spectrum News 1, New study finds flaws in FEMA's North Carolina Flood Maps
The News & Observer, UNC study sees flooding outside NC high-risk areas. Can AI reveal blind spots?
NBC News, New study targets past flooding as key to helping property owners assess climate threats
WECT, New study reveals widespread flooding across NC is more common than previously thought
NC Health News, From flooded basements to smarter planning: What NC storm survivors can teach us
WRAL News, Record rainfall in Chapel Hill reveals growing inland flood risks
CoastalReview, UNC study: Repeat flooding more widespread than thought
WUNC, FEMA floodplains determine who must get insurance. NC's are insufficient

2022

NC Sea Grant, NC Sea Grant Announces Winners of the Coastal Resilience Team Competition
UNC Institute for the Environment, UNC-Chapel student team wins inaugural North Carolina Sea Grant's Coastal Resilience Team Competition