

Helena Garcia

University of North Carolina at Chapel Hill • hmgarcia@unc.edu
July 2025

Education

University of North Carolina, Chapel Hill, NC May 2026 (anticipated)
PhD Environment, Ecology, and Energy Program (E3P)
Dissertation: *Repetitive Flood Exposure, Vulnerability, and Risk Mitigation Strategies*
Dissertation Advisors: Miyuki Hino & Antonia Sebastian

University of Michigan, Ann Arbor, MI May 2021
MS Environment and Sustainability, Conservation Ecology (Aquatic Sciences)
Overall GPA: 4.00

University of Delaware, Newark, DE May 2018
Honors Bachelor of Civil Engineering
Minors: Environmental Engineering, Spanish
Overall GPA: 3.85 | Engineering GPA: 3.81 | Magna Cum Laude

Professional Experience

Graduate Research Assistant August 2021-present
Environment, Ecology and Energy Program, University of North Carolina, Chapel Hill, NC
Research Advisors: Miyuki Hino, Antonia Sebastian, Philip Berke

Doctoral Economics Intern, Climate Resilience Research Team June 2023-August 2023
Environmental Defense Fund, New York, NY
Internship Advisors: Karina French, Jesse Gourevitch, Carolyn Kousky, Adam Gold

Graduate Research Assistant August 2019-July 2021
School for Environment and Sustainability, University of Michigan, Ann Arbor, MI

Water Resources Designer I June 2018-August 2019
McCormick & Taylor, Baltimore, MD

Research Interests

Flood exposure, natural hazard and climate impacts, social vulnerability, community resilience and recovery, risk mitigation, mobility and migration

Grants and Fellowships

1. NC Sea Grant Coastal Resilience Team Competition. *Incorporating Ecosystem Services into Flood Resilience Planning in New Bern, North Carolina*. (January 2022 – December 2023; \$20,000). Student Team: Anne Smiley (PhD), Helena Garcia (PhD), Lauren Grimley (PhD), Jacqueline Ruiz (BA).
2. University of Michigan Dow Sustainability Master's Fellow. *Championing Community Stormwater Solutions*. (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).

Publications

Published

1. **Garcia, H.M.**, Fitzmaurice K.P., Sebastian, A., Hino, M., Collins, E.L., Characklis, G.W. (2025). Reconstructing repetitive flood exposure across 78 events from 1996-2020 in North Carolina, USA. *Earth's Future*, 13, e2025EF006026. <https://doi.org/10.1029/2025EF006026>

Submitted to peer reviewed journals

2. Fitzmaurice K.P., **Garcia, H.M.**, Sebastian, A., Thomson, H., Zeff, H.B., Characklis, G.W. (2025). Flood impacts on the financial stability of residential mortgage borrowers: An integrated modeling approach. Submitted to *Natural Hazard and Earth Systems Sciences*.
3. Khanal, K., Kaza, N., Kittner, N., Bradbury, K., **Garcia, H.M.** (2025). Characterizing solar PV exposure to flood risk in Central and Coastal North Carolina. Submitted to *Journal of Environmental Management*.
4. 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. (2025). Stocktaking of methods for assessing dynamic vulnerability in

the context of flood hazard research. Under review at *Natural Hazards and Earth System Sciences*. DOI: 10.5194/egusphere-2025-850

5. Smiley, A.M.H., Grimley, L.E., **Garcia, H.M.**, Sebastian, A., Berke, P., Hino, M., Piehler, M.F. (2025). Coastal squeeze reduces ecosystem services and drives flooding: Applying an interdisciplinary framework to model impacts of future land use decisions. Submitted to *Environmental Research Letters*.

Working papers

6. Gourevitch, J.D., Gold, A.C., **Garcia, H.M.** (2025). The value of wetlands in reducing flood losses. Planned submission July 2025.
7. Plough, J.P., Hino, M., Sebastian, A., **Garcia, H.M.**, Klass-Warch, H. (2025). Identifying Obstacles to Equitable Flood Mitigation Funding. Planned submission September 2025.

Awards and Honors

UNC E3P STREAM (Service, Teaching, Research Excellence and Mentoring) Award	2025
AGU 2024 Outstanding Student Presentation Award, Natural Hazards Section	2025
NSF-ICFM8 Young Investigators Award <i>*supporting attendance to workshop</i>	2022
University of Michigan SEAS Jonathan Bulkley Water Prize	2020
SEAS 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

Presentations (as primary presenter)

Invited Talks

1. Garcia, H.M., Sebastian A., Hino, M., Fitzmaurice, K.P., Collins, E.L., Characklis G.W. (2025). *Event-based approaches to understanding flood exposure and impacts in North Carolina*. Presented to the NOAA Climate Adaptation Partnerships Program May 2025 meeting.
2. Garcia, H.M. & Smiley A.M.H. (2022). *Incorporating Ecosystem Services into Flood Resilience Planning in New Bern, North Carolina*. Presented to the North Carolina Sea Grant Advisory Board.
3. Garcia, H.M. (2020). Examining Social Equity in Great Lakes Restoration. *Presented to the Great Lakes International Joint Commission 210th Water Quality Board Meeting on behalf of project team*.

Oral Conference Presentations

4. Garcia, H.M., Fitzmaurice, K.P., Sebastian, A., Hino, M., Characklis G.W., Collins, E.L., Zeff, H.B., Thomson, H. (2025). *Financial risks from repetitive flood exposure: Insights from the North Carolina Flood Extent Archive (1996-2020)*. Oral presentation at the 2025 Association of Environmental Engineering and Science Professors (AEESP) meeting.
5. Garcia, H.M., Hino, M., Frankenberg, E., Anarde, K. (2025). *Residential mobility patterns following repetitive flood exposure in eastern North Carolina, USA*. Oral presentation at the 2025 Population Association of American (PAA) annual meeting.
6. Garcia, H.M., Sebastian, A., Fitzmaurice, K.P., Hino, M., Characklis, G.W., Collins, E. L. (2024). *Mapping repetitive damage hotspots in North Carolina: Insights from 78 flood events (1996-2020)*. Oral presentation at the 2024 North Carolina Coastal conference.
7. Garcia, H.M., Fitzmaurice, K.P., Characklis, G.W., Zeff, H.B., Thomson, H., Sebastian, A. (2023). *Validation of machine learning methods for reconstructing repetitive flood damage exposure in North Carolina, 1996-2020*. Oral presentation at the 2023 American Geophysical Union (AGU) fall meeting.
8. Garcia, H.M., Sebastian, A., Fitzpatrick, K.P., Zeff, H.B., Thomson, H., & Characklis, G.W. (2022). *Dynamic vulnerability: Reconstructing historical flooding footprints and exposure in Eastern North Carolina*. Oral presentation at the 2022 American Geophysical Union (AGU) fall meeting.
9. Garcia, H.M. & Smiley A.M.H (2022). *An interdisciplinary approach to quantifying flood mitigating ecosystems services and identifying beneficiaries in New Bern, North Carolina*. Oral presentation at the 2022 North Carolina Coastal conference.
10. Garcia, H.M. & Berke, P. (2022). *How resilience planning threatens poor and vulnerable communities: A case study of New Bern, North Carolina U.S.* Poster at the Association of Collegiate Schools of Planning (ACSP) fall meeting.

11. Garcia, H.M., Grimley, L.E. & Smiley, A.M.H. (2022, August). *Integrating ecosystem services into flood resilience planning in New Bern, North Carolina*. Oral presentation at the University of Iowa Lowering Flood Risk by Increasing Resilience: Next Generation Vision for Flood Science and Action NSF Young Professional Workshop.

Poster Conference Presentations

12. Garcia, H.M., Sebastian, A., Fitzmaurice, K.P., Hino, M., Characklis, G.W., Collins, E. L. (2024). *Event-based flood exposure mapping in North Carolina (1996-2020)*. Poster presentation at the 2024 American Geophysical Union (AGU) fall meeting.
13. Garcia, H.M., Brines, S., Do, H. X., Anderson, E., & Gronewold, A. (2020). *Coastal water level variability, inundation, and impacts on nearshore infrastructure*. Poster presentation at the 2020 American Geophysical Union (AGU) fall meeting. **virtual due to COVID-19*
14. Garcia, H.M., Brines, S., Wong, B., Brown, C., & Gronewold, A. (2020). *Incorporating remote-sensing data to improve conceptual floodplain modeling in Southeast Michigan*. Poster presentation at the 2020 International Association for Great Lakes Research (IAGLR) conference. **virtual due to COVID-19*

Teaching and Mentoring

Undergraduate Student Research Mentor

Spring 2024-present

Advising two undergraduate students working on small 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 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

Professional Service

AGU Student Convener Session NH43C

Fall Meeting 2024

North Carolina Coastal Conference Session Convener

November 2024

Environment, Ecology and Energy (E3P) Seminar Series Organizer

2024

Graduate School Interest Advising for Undergraduates at UNC

2022

Manuscript reviewer: *NHESS*, *NPJ Natural Hazards*, *Nature Water*, *npj natural hazards*

Skills

Communication: Spanish (heritage speaker with some professional use)

Software: ArcGIS, ArcGIS Pro, GitHub, Jupyter Notebooks, Overleaf, R Markdown

Programming: R, Python, MATLAB, Shell

Hydraulic & Hydrologic Models: HEC-HMS, HEC-RAS

Selected Coursework

Analysis of Water Resource Systems, Econometrics and Machine Learning, Demography, Migration Seminar in Sociology, Planning Theory, Python for Environmental Research, Regression Models, Research Design, Statistics in Political Science