HUNTER CAREY QUINTAL

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SUMMARY

Dedicated geoscientist with eleven years' experience studying environmental issues. Known for creative, solutions-oriented approach and ability to clearly communicate results. I am interested in geostatistics, extreme value analysis, spatiotemporal clustering, time series analysis, and predictive modeling.

EDUCATION

University of North Carolina at Chapel Hill	Geology	PhD	2026
University of North Carolina at Chapel Hill	Geology	MSc	2022
Brown University	Geology-Biology	BS	2018

SKILLS

Languages: R, MATLAB

H&H Models: VFlo, HEC-RAS, LISFLOOD

Hydrogeologic Models: Surfer, gINT

GIS: R, ArcPro, QGIS

Temporal GIS: Bayesian Maximum Entropy

Time Series Analysis: spectral analysis

Extreme Value Analysis: GEV

APPOINTMENTS

2020-2026 **Graduate Research Assistant**, Watershed Hydrology and Flood Hazards Lab, Department of Earth, Marine, and Environmental Sciences (EMES), University of North Carolina at Chapel Hill (UNC-CH) (NC) – Advisor: Dr. Antonia Sebastian

- PhD Ch. 2: Analysis of the Severe Storms Database: a comprehensive repository of labeled storms containing extreme precipitation across CONUS (2002-2025)
- PhD Ch. 1: Covariance-informed spatiotemporal clustering improves the detection of hazardous weather events
- MS Thesis: Modeling future hydrologic extremes, flood hazards, and exposure under a high emissions scenario in the Neuse River Watershed

2024-2024 **Visiting Researcher**, Department of Water and Climate Risk, Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam (Amsterdam, The Netherlands) – Advisors: Dr. Marleen de Ruiter & Dr. Wiebke Jäger

- Developed geostatistical methods to quantify hydroclimatic events in meteorological datasets

2022-2022 **Teaching Assistant**, *ENVR 324L Water in Our World*, EMES, UNC-CH (NC) – Advisors: Dr. Wayana Dolan & Dr. Tamlin Pavelsky

- Lectured during lab section, graded lab reports and homework

2021-2022 **Graduate Fellow**, Water Resources Research Institute – USGS 104(b) Competitive Grants Program (NC)

- Quantified the effects of projected extreme precipitation and land use / land cover change on probabilistic runoff and subsequent flooding

2018-2020 **Hydrogeologist I**, WSP USA Inc. (VA) – Advisors: Molly Long, P.G.; Dr. David Sarr, P.E. & Dr. Eric Johnson, P.G.

- Conducted Phase II environmental assessments involving investigation and remediation work for client properties impacted by contamination to ensure compliance with state & federal regulations
- Managed client meetings, represented client during state regulatory site visits & oversaw construction projects during the removal of contaminated sediments and hazardous materials
- Prepared Human Health Risk Assessments (HHRA) for construction projects to quantify project risks, public health risks, and environmental risks
- Analyzed geospatial trends in potentiometric surface, geologic & hydrogeologic units affected by contaminated plume migration at industrial sites across the US
- Subcontractor oversight: Surveyors, Utility Locators, General Contractors
- Drilling oversight: Direct Push, Sonic, Hollow-Stem Auger, Air Rotary and Mud Rotary

2016-2016 **Intern**, Preservation Green Lab, National Trust for Historic Preservation (DC) – Advisor: Margaret O'Neal

- Researched state and federal incentive programs targeting the reduction of construction material use and the reuse of existing building footprints to design environmentally-focused, walkable towns
- Produced case studies identifying the best practices in adaptive reuse projects nationwide

2015-2015 **Teaching Assistant**, *GEOL 0240 Earth: Evolution of a Habitable Planet*, Department of Earth, Environmental and Planetary Sciences (DEEPS), Brown University (RI) – Advisors: Dr. Rachel Lupien & Dr. Timothy Herbert

- Lectured during lab section, graded lab reports and homework, conducted review sections

2014-2018 **Research Assistant**, Planetary Geosciences Group, DEEPS, Brown University (RI) – Advisors: Dr. Ashley Palumbo; Dr. Jay Dickson & Dr. James Head III

- Characterized processes of cold-based glaciation within an Antarctic watershed using satellite image processing and analysis of meteorology using Python
- Developed methods using stream order classification to compare terrestrial geomorphologies with analogous features previously mapped on the surface of Mars using ArcGIS
- Described processes that may explain relationships between analogous planetary geomorphologies

PRODUCTS

Papers

1. **Quintal**, H. C., Sebastian, A., Tierney, G., Wright, D., Serre, M. L., and Dello, K: Analysis of the Severe Storms Database: a repository of labeled storms containing extreme precipitation across CONUS (2002-2025), *in prep*.
2. **Quintal**, H. C., Sebastian, A., Serre, M. L., Jäger, W. S., and de Ruiter, M. C.: Covariance-informed spatiotemporal clustering improves the detection of hazardous weather events, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-2870, 2025.

Talks

3. **Quintal**, Hunter; Sebastian, Antonia; Tierney, Greg; Dello, Kathie; Jäger, Wiebke; de Ruiter, Marleen; Serre, Marc. "*Compound Events: Quantifying the intensity, duration, and frequency of severe convective storms preconditioned by heat waves across CONUS.*" American Meteorological Society Annual Meeting, Houston, TX. January X, 2026.
4. **Quintal**, Hunter; Sebastian, Antonia; Serre, Marc; Jäger, Wiebke; de Ruiter, Marleen. "*The resolution of risk: covariance-informed spatiotemporal clustering improves the detection of hazardous weather events*." American Geophysical Union Fall Meeting, Washington, DC. December 15, 2025
5. **Quintal**, Hunter; Sebastian, Antonia; Jäger, Wiebke; Serre, Marc; de Ruiter, Marleen. *"Improving heat wave detection across the Southeast."* North Carolina State Climate Office (NCSCO) & Duke Heat Innovation Policy Hub Heat Retreat, Raleigh, NC. April 11, 2025
6. **Quintal**, Hunter; Sebastian, Antonia; Jäger, Wiebke; Serre, Marc; de Ruiter, Marleen. *"Quantification of consecutive humid heat – extreme precipitation hazards across the Southeast since 1940."* North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC. March 19, 2025
7. **Quintal**, Hunter; Sebastian, Antonia; Serre, Marc; Jäger, Wiebke; de Ruiter, Marleen. *"Understanding covariance-informed spatiotemporal clustering for event reconstruction."* IVM Water and Climate Risk (WCR) Disasters, Health, and Diseases Working Group, Amsterdam, Netherlands. March 5, 2025
8. **Quintal**, Hunter; Sebastian, Antonia; Jäger, Wiebke; Serre, Marc; de Ruiter, Marleen. *"A Methodology for Quantifying Consecutive Multi-Hazards with Temporal Dependence: an Application to Hot and Wet Hazards."* American Geophysical Union Fall Meeting, Washington, DC. December 13, 2024
9. **Quintal**, Hunter; Sebastian, Antonia; Jäger, Wiebke; Serre, Marc; de Ruiter, Marleen. *"Assessing trends in heatwaves and rainstorms across the Southeastern United States."* Urban Heat Research Group (UHRG) University of Miami and Florida International University, FL. November 20, 2024
10. **Quintal**, Hunter; Sebastian, Antonia; de Ruiter, Marleen; Jäger, Wiebke. *"Compounding humid heat and precipitation hazards in Southeastern USA."* IVM Water and Climate Risk (WCR) Floods & Multi-Risk Seminar, Amsterdam, Netherlands. July 15, 2024
11. **Quintal**, Hunter; Sebastian, Antonia; Serre, Marc. *"Assessing Spatiotemporal Covariance in Precipitation and WBGT across the Carolinas."* North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC. March 20, 2024 (Lightning Talk)
12. **Quintal**, Hunter; Garcia, Helena; Cawley, Max; Sebastian, Antonia. *"Mapping Spatially Compounding Hazards across a North Carolina County using Random Forest."* American Geophysical Union Fall Meeting, San Francisco, CA. December 15, 2023
13. **Quintal**, Hunter; Sebastian, Antonia; Dello, Kathie. *"Flood Evolution under Anthropogenic Change: Non-Uniform Flood Hazard Increases across Three Tributaries within an Eastern North Carolina City by End of Century."* American Geophysical Union Fall Meeting, Chicago, IL. December 13, 2022
14. **Quintal**, Hunter; Sebastian, Antonia; Dello, Kathie. *"Staggered Hazards: Outdated Floodplain Maps Underestimate Extreme Flooding Under Future Climate and Land Use Land Cover Change."* North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC. March 23, 2022

Posters

15. **Quintal**, Hunter; Sebastian, Antonia; Tierney, Greg; Serre, Marc; Dello, Kathie. "*Evidence of increasing storm intensity, duration and frequency derived from a novel CONUS-wide database of severe convective storms defined by their discrete space time footprints.*" American Geophysical Union Fall Meeting, Washington, DC. December 18, 2025
16. **Quintal**, Hunter; Sebastian, Antonia; Serre, Marc. "*Wet Hot American Summer: Defining Temporally Compounding Hazards using Covariance Modeling and Event Coincidence Analysis.*" Natural Hazards and Risks in a Changing World 3rd International Conference, Amsterdam, Netherlands. June 12, 2024

17. **Quintal**, Hunter; Garcia, Helena; Cawley, Max; Sebastian, Antonia. *"Evaluating spatial overlaps in heat and flood hazards using Random Forest: the case study of Durham, NC."* North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC. March 22, 2023
18. **Quintal**, Hunter; Sebastian, Antonia; Dello, Kathie. *"Risky Business: How Humans Will Shape Floodplain Landscapes Over the 21st Century."* American Geophysical Union Fall Meeting, New Orleans, LA. December 15, 2021
19. **Quintal**, Hunter; Palumbo, Ashley; Dickson, Jay; Head, James III. *"The Onyx River, McMurdo Dry Valleys: Exploring Antarctica as a Mars Analogue."* 49th Lunar and Planetary Science Conference, Houston, TX. March 21, 2018
20. **Quintal**, Hunter; Palumbo, Ashley; Dickson, Jay; Head, James III. *"McMurdo Dry Valleys: Exploring Antarctica as a Mars Analog."* 8th Moscow Solar System Symposium, Moscow, RU. October 10, 2017
21. **Quintal**, Hunter; Palumbo, Ashley; Dickson, Jay; Head, James III. *"McMurdo Dry Valleys: Exploring Antarctica as a Mars Analog."* Brown Summer Research Symposium 2017, Providence, RI. August 3, 2017

Related Products

22. Preservation Green Lab. *"Untapped Potential: Strategies for Revitalization and Reuse."* Preservation Leadership Forum, National Trust for Historic Preservation. October 24, 2017. https://cdn.savingplaces.org/2023/07/20/15/05/56/177/ULI_NationalReport_Web_10.24.2017.pdf

Media

23. The Graduate School at the University of North Carolina at Chapel Hill. *"Graduate School emergency funding keeps vital climate research afloat."* Ethan Quinn, July 16, 2025. https://gradschoolmagazine.unc.edu/2025/07/graduate-school-emergency-funding-keeps-vital-climate-research-afloat/
24. North Carolina Water Resources Research Institute. *"Modeling Future Climate Impacts on NC Flooding with Hunter Quintal."* Justin Lindemann, December 15, 2021. https://wrri.ncsu.edu/modeling-climate-impacts-with-hunter-quintal/
25. Minnesota Groundwater Association. *"Notes from the Hydrogeology Field Camp and the Pfannkuch-Alexander Fund"*. Scott Alexander, March 2018. https://www.mgwa.org/newsletter/mgwa2018-1.pdf

SYNERGISTIC ACTIVITES

- **Leadership**
  - Co-Advisor – Extreme Weather / Hospital Capacity Working Group, Institute for Risk Management and Insurance Innovation, Department of Environmental Sciences and Engineering, UNC-CH (2025)
    - Tanisha Golla – *Demographic trends across Hospitalsheds*
    - Sanjita Suryadevara – *Effects of extreme weather on hospital patient flow*
    - Julia Rose Rodgerson Bauer – *Hospital financial response and recovery to extreme weather*
  - Co-Advisor – Master of Econometrics and Operational Research Thesis, Department of Water and Climate Risk, IVM, Vrije Universiteit Amsterdam (2025)
    - Roos Piersna – *Event Coincidence Analysis of Floods, Droughts, and Cholera Outbreaks in Africa*
    - Koen de Jonge – *Optimal placement of emergency healthcare stations for disease outbreaks*
  - Co-Advisor – Master of Geospatial Information Science and Technology Capstone Project, Center for Geospatial Analytics, North Carolina State University (NCSU) (2024)
    - Tara Mitchell – *Durham County ShelterScape: Multi-Hazard and Disadvantaged Population Hotspot Analysis*

- Co-Advisor – EMES 691H Undergraduate Senior Honors Thesis, EMES, UNC-CH (2023-2024)
  - Connor Bassett – *Modeling the Impact of Green Infrastructure in the Carolina North Satellite Campus on Flooding in Chapel Hill's Little Creek Watershed*
- Co-Advisor – ENEC 395 Undergraduate Research Project, EMES, UNC-CH (2022)
  - Anna Keener – *A How-To Guide for Creating a LISFLOOD Model in Durham, North Carolina*
- Senator – Graduate and Professional Student Government, UNC-CH (2022-2024)
- Mentor – 9th Grade Science Fair Project, Army Education Outreach Program: Junior Science and Humanities Symposium's Virtual Mentor Program (2021-2022)
- Vice President – UNC Science Policy Advocacy Group, UNC-CH (2021-2022)
- Treasurer – UNC Geology Club (2020-2021)
- Co-Chair of Young Alumni – Brown Club of DC (2018-2020)
- Co-Chair – DEEPS Diversity and Inclusivity Plan, Brown University (2018)
- Co-President – DEEPS Department Undergraduate Group, Brown University (2017-2018)
- Head of Fundraising – DEEPS, Brown University (2017-2018)

- **Training**
  - Geologist in Training State of Virginia Certified Professional Geologist (2019)
  - State of Maryland Erosion and Sediment Control Certification (2019)
  - HAZWOPER 40 Hour Hazardous Waste Operations and Emergency Response Training (2018)
  - HAZWOPER 8 Hour Training in Hazard Communication, Hazardous Waste Operations and Emergency Response and Permit Required Operations (2018-2020)
  - CPR AED Heartsaver First Aid with CPR AED Training (2018-2020)
  - US Department of Transportation Hazardous Materials Training (2018)
  - University of Minnesota Field Hydrogeology Course (2017)

- **Community Engagement and Service**
  - Reviewer – Natural Hazards & Earth Systems Science (2025)
  - Early Career Convener – *"Analysis of Urban Hazard Inequalities Across Scales: Connecting Regional to Local Urban Dynamics and Policy"* American Geophysical Union Fall Meeting, Washington, DC (2024)
  - Guest Lecturer, *ENEC 698 Environmental Capstone*, EMES, UNC-CH (2024)
  - Reviewer – Environmental Research Letters (2024)
  - Volunteer – Head of the Charles Regatta (2022)
  - Host – North Carolina Science and Engineering Fair (2021)
  - Volunteer – American Collegiate Rowing Association Regatta (2021)
  - Visiting Scientist – North Carolina Science Festival SciMatch Program (2021)
  - Volunteer – Eno River Association (2021)

- Judge – Technology Student Association Tests of Engineering Aptitude, Mathematics, and Science (2019)
- Volunteer Coordinator, Potomac Conservancy (2018-2020)
- Junior Facilitator – Hugh O'Brian Youth Leadership Seminar (2015)
- Volunteer – Ocmulgee National Monument (2012-2014)
- Youth Advisory Board Member – Keep Warner Robins Beautiful (2012-2013)

- **Relevant Coursework**

Brown University (2014-2018)

BIOL 0495	Biostatistics	Dr. Sohini Ramachandran
BIOL 1480	Biogeochemistry	Dr. Stephen Porder
GEOL 0230	Inorganic Geochemistry	Dr. Stephen Parman
GEOL 1150	Limnology	Dr. James Russell
GEOL 1240	Sedimentation & Stratigraphy	Dr. James Russell
GEOL 1350	Weather & Climate	Dr. Meredith Hastings
GEOL 1370	Environmental Geochemistry	Dr. Yongsong Huang
GEOL 1450	Structural Geology	Dr. Julia Tullis & Dr. Greg Hirth
GEOL 1960B	Physical Hydrology	Dr. Christopher Huber

University of Minnesota-Twin Cities (2017)

GEO4971W/5971	Hydrogeology Field Camp	Dr. Scott Alexander & Dr. Robert Tipping

University of North Carolina at Chapel Hill (2020-2026)

EMES 561	Time Series Analysis	Dr. Harvey Siem
ENVR 468	Temporal GIS & Geostatistics	Dr. Marc Serre
GEOL 508	Global Hydrology	Dr. Tamlin Pavelsky
GEOL 520	Data Analysis	Dr. Jonathan Lees
GEOL 590	Rivers and Floods	Dr. Antonia Sebastian

- **Awards**
  - UNC Martin Supplemental Research Fellowship (2024)
  - WRRI-USGS 104(b) Grant FY 2021-2022
  - Research at Brown Grant (2018)
  - Hans-Olaf Pfannkuch & E. Calvin Alexander, Jr. Hydrogeology Field Camp Award (2017)
  - Karen T. Romer Undergraduate Teaching and Research Award (2017)
  - Baxter International Achievers Award in Science Scholarship (2017)

- NASA Rhode Island Space Grant (2016-2018)
- Brown University Scholarship (2014-2018)