HUNTER CAREY QUINTAL

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SUMMARY

Dedicated geoscientist with 9 years' experience communicating risk and uncertainty in environmental systems. Known for creative, solutions-oriented approach and ability to clearly convey complex results.

EDUCATION

Doctor of Philosophy in Geological Sciences **Dec 2026**
University of North Carolina at Chapel Hill *Chapel Hill, NC*
Advisor: Antonia Sebastian
Dissertation: An event-based framework for quantifying extreme weather

Master of Science in Geological Sciences **Jul 2022**
University of North Carolina at Chapel Hill *Chapel Hill, NC*
Advisor: Antonia Sebastian
Thesis: Modeling Future Hydrologic Extremes, Flood Hazards, and Exposure Under a High Emissions Scenario in the Neuse River Watershed

Bachelor of Science in Geology-Biology **May 2018**
Brown University *Providence, RI*
Advisors: Julia Tullis, James Russell, James Head III
Senior Thesis: The Onyx River, McMurdo Dry Valleys: Exploring Antarctica as a Mars Analogue

APPOINTMENTS

Intern **Aug-Dec 2026**
ExxonMobil *Spring, TX*
Technology and Engineering Company
Advisors: Edward Susanto, Dario Harazim
Project: Guided Reservoir Ensemble Modeling for AI Training Data Generation (Guyana Subsurface)
- Advance technology producing probabilistic reservoir scenarios ($500M valuation).
- Explain the effect of geologic architecture on seismic-scale connectivity (4km x 4km x 0.3km) at sub-seismic resolution (25m x 25m x 1m).
- Evaluate 10k full-field seismic volumes (1TB) across Gen-AI training image, prior, and posterior samples.

Intern **Feb-May 2026**
Munich Re America Services, Inc. *Princeton, NJ*
Climate Insights and Advisory and *Applied Analytics*
Advisors: Raghuveer Vinukollu, Jay Rosario, Ali Farhadi, and Elena Watts
Project: Inland Flood Hazard Ensemble Model Evaluation (United States Mid-Atlantic Region)
- Advanced technology producing probabilistic risk scoring products for setting insurance premiums.
- Produced an effective flood depth by evaluating 1.6k flood depths (2TB) across eight return periods for two HUC-6 watersheds (100k km^2) at parcel resolution (30m x 30m).

Graduate Research Assistant **2022-2026**
University of North Carolina at Chapel Hill *Chapel Hill, NC*

Department of Earth, Marine, and Environmental Sciences
Watershed Hydrology and Flood Hazards Lab
Advisor: Antonia Sebastian
- Advanced understanding of extreme weather quantification, interactions, and forecasting across the US.

Graduate Teaching Assistant **Aug-Dec 2022**
University of North Carolina at Chapel Hill *Chapel Hill, NC*
Department of Earth, Marine, and Environmental Sciences
GEOL 324L Water in Our World: Introduction to Hydrologic Science and Environmental Problems
Advisors: Tamlin Pavelsky and Wayana Dolan
- Taught two lab sections (40 students), held office hours, graded lab reports, homework, and exams.

Graduate Research Assistant **2020-2022**
University of North Carolina at Chapel Hill *Chapel Hill, NC*
Department of Earth, Marine, and Environmental Sciences
Watershed Hydrology and Flood Hazards Lab
Advisor: Antonia Sebastian
- Modeled the effect of land use and precipitation changes on future flood hazards using a coupled hydrologic/hydraulic modeling framework in eastern North Carolina.

Hydrogeologist I **2018-2020**
WSP USA Inc. *Herndon, VA*
Earth and Environment Sector
Advisors: Eric Johnson, David Sarr, and Molly Long
- Conducted Phase II environmental assessments involving investigation and remediation work for client properties impacted by contamination to ensure compliance with state and federal regulations.
- Managed client meetings, state regulatory site visits, and construction projects during the removal of contaminated sediments and hazardous materials.
- Produced Human Health Risk Assessments to quantify public health and environmental risks.
- Analyzed geospatial trends in potentiometric surface, geologic and hydrogeologic units affected by contaminated plume migration at industrial sites across the United States.
- Oversaw subcontractors including surveyors, utility locators, drillers, and general contractors.
- Supervised drilling including direct push, sonic, hollow-stem auger, air rotary and mud rotary.

Intern **Jun-Jul 2016**
National Trust for Historic Preservation *Washington, DC*
Preservation Green Lab
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 projections nationwide.

Undergraduate Teaching Assistant **Jan-May 2015**
Brown University *Providence, RI*
Department of Earth, Environmental and Planetary Sciences
GEOL 0240 Earth: Evolution of a Habitable Planet
Advisors: Rachel Lupien and Timothy Herbert
- Lectured during one lab section, graded lab reports and homework, and conducted review sections.

Undergraduate Research Assistant **2014-2018**

Brown University *Providence, RI*
Department of Earth, Environmental and Planetary Sciences
Planetary Geosciences Group
Advisors: Ashley Palumbo, Jay Dickson, and James Head III
- Characterized glacial processes in an Antarctic watershed using remote sensing and weather gages.
- Classified stream order of Martian Valley Networks to compare terrestrial and Martian fluvial geomorphologies.

PRODUCTS

Peer-reviewed Publications
Quintal, Carruthers, Sebastian, Davies, Lee, and Fowler. Higher probability of extreme precipitation events following transition from Greenland High to Pacific Ridge. *(In preparation)*

Quintal, Sebastian, Tierney, Serre, Jäger, and de Ruiter. Extreme precipitation event characteristics are amplified when preconditioned by humid heat waves. *(In preparation)*

Quintal, Sebastian, Tierney, Wright, Serre, and Henny. Increasing frequency of high intensity, short duration storms across US revealed in Extreme Precipitation Event Catalog. *(Submitted to Journal of Hydrometeorology)*

Lucchese, Gardner, **Quintal**, Gleason, and Sebastian. River suspended sediment response to tropical cyclone precipitation in the Eastern United States. *(Submitted to Nature Communications Earth & Environment)*

Quintal, Sebastian, Serre, Jäger, and de Ruiter. Covariance-informed spatiotemporal clustering improves the detection of hazardous weather events, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-2870, 2025.

Datasets
Quintal, Sebastian, Henny, Tierney, Wright, Serre, and Dello (2026). *Extreme Precipitation Event Catalog (EPEC)*. DesignSafe-CI. https://doi.org/10.17603/ds2-22ce-n609

Additional Publications
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

PRESENTATIONS

"Recent trends in humid heat waves and extreme precipitation events in the United States" Jun 2026
Climate Co-Centre for Climate + Biodiversity + Water, Research Ireland, Northern Ireland's Department of Agriculture, Environment and Rural Affairs, and UK Research and Innovation

"An event-based framework for delineating extreme weather events from gridded observations" Jun 2026
Water and Geospatial Group, Department of Civil Engineering, Newcastle University, Newcastle-Upon-Tyne, UK

"Recovering a signal from the noise: designing an effective flood depth from probabilistic models" May 2026
Corporate Underwriting, Munich Re America Services, Inc., Princeton, NJ

"Compound Events: Quantifying the intensity, duration, and frequency of severe convective storms preconditioned by heat waves across CONUS." Jan 2026
American Meteorological Society Annual Meeting, Houston, TX

"The resolution of risk: covariance-informed spatiotemporal clustering improves the detection of hazardous weather events." Dec 2025
American Geophysical Union Fall Meeting, Washington, DC

"Improving heat wave detection across the Southeast." Apr 2025
North Carolina State Climate Office and Duke Heat Innovation Policy Hub Heat Retreat, Raleigh, NC

"Quantification of consecutive humid heat – extreme precipitation hazards across the Southeast since 1940." Mar 2025
North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC

"Understanding covariance-informed spatiotemporal clustering for event reconstruction." Mar 2025
Disasters, Health, and Diseases Working Group, Institute for Environmental Studies, Vrije Universiteit Amsterdam, Amsterdam, Netherlands

"A Methodology for Quantifying Consecutive Multi-Hazards with Temporal Dependence: an Application to Hot and Wet Hazards." Dec 2024
American Geophysical Union Fall Meeting, Washington, DC

"Assessing trends in heatwaves and rainstorms across the Southeastern United States." Nov 2024
Urban Heat Research Group, Rosenstiel School of Marine, Atmospheric, and Earth Science, University of Miami and Florida International University, FL

"Compounding humid heat and precipitation hazards in Southeastern USA." Jul 2024
Floods and Multi-Risk Seminar, Department of Water and Climate Risk, Institute for Environmental Studies, Vrije Universiteit Amsterdam, Amsterdam, Netherlands

"Assessing Spatiotemporal Covariance in Precipitation and WBGT across the Carolinas." Mar 2024
North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC

"Mapping Spatially Compounding Hazards across a North Carolina County using Random Forest." Dec 2023
American Geophysical Union Fall Meeting, San Francisco, CA

"Flood Evolution under Anthropogenic Change: Non-Uniform Flood Hazard Increases across Three Tributaries within an Eastern North Carolina City by End of Century." Dec 2022
American Geophysical Union Fall Meeting, Chicago, IL

"Staggered Hazards: Outdated Floodplain Maps Underestimate Extreme Flooding Under Future Climate and Land Use Land Cover Change." Mar 2022
North Carolina Water Resources Research Institute Annual Conference, Raleigh, NC

POSTER ABSTRACTS

Quintal, Sebastian, Tierney, Henny, Serre, and Dello. “Increasing frequency of high intensity, short duration storms across the US.” Flood Insurance Workshop, Institute for Risk Management and Insurance Innovation, University of North Carolina at Chapel Hill, Chapel Hill, NC. Apr 2026.

Quintal, Sebastian, Tierney, Henny, Serre, and Dello. “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, New Orleans, LA. Dec 2025.

Lucchese, **Quintal**, Sebastian, Gardner, and Gleason. “Quantifying Riverine Sediment Transport due to Tropical Cyclones in the Eastern United States.” American Geophysical Union Fall Meeting, New Orleans, LA. Dec 2025.

Quintal, Sebastian, and Serre. “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, NL. Jun 2024.

Quintal, Garcia, Cawley, and Sebastian. “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. Mar 2023.

Quintal, Sebastian, and Dello. "Risky Business: How Humans Will Shape Floodplain Landscapes Over the 21st Century." American Geophysical Union Fall Meeting, New Orleans, LA. Dec 2021.

Quintal, Palumbo, Dickson, and Head. “The Onyx River, McMurdo Dry Valleys: Exploring Antarctica as a Mars Analogue.” 49th Lunar and Planetary Science Conference, Houston, TX. Mar 2018. https://www.hou.usra.edu/meetings/lpsc2018/pdf/2627.pdf

Quintal, Palumbo, Dickson, and Head. “McMurdo Dry Valleys: Exploring Antarctica as a Mars Analog.” 8th Moscow Solar System Symposium, Moscow, RU. Oct 2017.

MEDIA

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/

North Carolina State Climate Office. *"November workshop: Building collaborative approaches to complex climate hazards."* Sophie Mallinson, December 5, 2024. https://climate.ncsu.edu/blog/2024/12/c3he-workshop-carolina-climate-hazards/

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/

The Daily Tar Heel. *"UNC students cast their ballots in municipal elections."* Emmy Martin, November 3, 2021. https://s3.amazonaws.com/snwceomedia/dth/9dee2c3e-acb9-47d2-b1dd-b2529a78bb73.original.pdf

Minnesota Ground Water Association. *"Notes from the Hydrogeology Field Camp and the Pfannkuch-Alexander Fund"*. Scott Alexander, March 2018. https://www.mgwa.org/newsletter/mgwa2018-1.pdf

SKILLS

Languages	**Geographic Information Systems (GIS)**	**Hydrologic Models**
R, Python, MATLAB	ArcPro, ArcGIS, QGIS	VFlo®, HEC-HMS
Hydraulic Models	**Temporal GIS**	**Hydrogeologic Models**
HEC-RAS, LISFLOOD	Bayesian Maximum Entropy	Surfer, gINT
Supervised Machine Learning	**Unsupervised Machine Learning**	**Time Series Analysis**
Regression, Classification	DBSCAN	Extreme Value Analysis,
Data Engineering	**Petrology Models**	Spectral Analysis,
Microsoft Azure, Databricks, HPC Longleaf, Globus, GitHub, Mobaxterm	Petrel	Event Coincidence Analysis

AWARDS AND HONORS

UNC Graduate School Gap Funding	2025
UNC Martin Supplemental Research Fellowship	2024
WRRI-USGS 104(b) Grant	2021-2022
Hans-Olaf Pfannkuch & E. Calvin Alexander, Jr. Hydrogeology Field Camp Award	2017
NASA Rhode Island Space Grant	2016-2018

LEADERSHIP AND COMMUNITY SERVICE

Natural Hazards & Earth Systems Science 2025
Reviewer

American Geophysical Union Fall Meeting, Washington, DC 2024
"Analysis of Urban Hazard Inequalities Across Scales: Connecting Regional to Local Urban Dynamics and Policy"
Early Career Convener

ENEC 698 Environmental Capstone, University of North Carolina at Chapel Hill 2024
Guest Lecturer

Environmental Research Letters 2024
Reviewer

Graduate and Professional Student Government, University of North Carolina at Chapel Hill 2022-2024
Senator

Head of the Charles Regatta 2022
Sustainability Volunteer

Science Policy Advocacy Group, University of North Carolina at Chapel Hill 2021-2022
Vice President

North Carolina Science and Engineering Fair 2021
Host

American Collegiate Rowing Association Regatta 2021
Operations Volunteer

North Carolina Science Festival SciMatch Program 2021
Virtual Teacher

Eno River Association 2021
Volunteer

Geology Club, University of North Carolina at Chapel Hill 2020-2021
Treasurer

Technology Student Association Tests of Engineering Aptitude, Mathematics, and Science Apr 2019
Judge

Potomac Conservancy 2018-2020
Volunteer Coordinator

Brown Club of DC, Brown University 2018-2020
Young Alumni Chair

Department Undergraduate Group, Brown University 2017-2018
Co-President

Department of Earth, Environmental, and Planetary Sciences, Brown University 2017-2018
Head of Fundraising

Hugh O'Brian Youth Leadership Seminar Jun 2015
Junior Facilitator

Ocmulgee National Monument 2013-2014
Volunteer

Stratford Intramural Soccer League 2013-2014
Volunteer Coach

Keep Warner Robins Beautiful 2012-2013
Youth Advisory Board Member

ADVISING

Undergraduate Senior Honors Thesis – Max Van Fleet 2025-2026
University of North Carolina at Chapel Hill
Department of Statistics and Operations Research (STOR 691)
"Data Driven Approaches for Temporal Distributions of Design Storms"

Master of Econometrics and Operational Research Thesis – Koen de Jonge 2025
Vrije Universiteit Amsterdam
School of Business and Economics
"Optimizing Rapid Response Team Deployment for Cholera in the Horn of Africa: A Location-Allocation Approach"

Master of Econometrics and Operational Research Thesis – Roos Piersma 2025
Vrije Universiteit Amsterdam
Department of Water and Climate Risk
"Event Coincidence Analysis of Floods, Droughts, and Cholera Outbreaks in Africa"

Master of Geospatial Information Science and Technology Capstone – Tara Mitchell 2024
North Carolina State University
College of Natural Resources
"Durham County ShelterScape: Multi-Hazard and Disadvantaged Population Hotspot Analysis"

Undergraduate Senior Honors Thesis – Connor Bassett 2023-2024
University of North Carolina at Chapel Hill
Department of Earth, Marine, and Environmental Science (EMES 691H)
"Modeling the Impact of Green Infrastructure in the Carolina North Satellite Campus on Flooding in Chapel Hill's Little Creek Watershed"

Undergraduate Research Project – Anna Keener 2022
University of North Carolina at Chapel Hill
Department of Environment and Ecology (ENEC 395)
"A How-To Guide for Creating a LISFLOOD Model in Durham, North Carolina"

TRAINING

Visiting Researcher Jun 2026
Newcastle University, Newcastle upon Tyne, United Kingdom
School of Engineering, Water Resource System Engineering Group
Advisors: Hayley Fowler and James Carruthers

Nov 2025

ExxonMobil Short Course
University of Georgia, Athens, Georgia
Franklin College of Arts and Sciences, Department of Geology
Subsurface Geology and Fluid Flow: Application in Basic Geologic Modeling
Advisors: Stacie Gibbins, Virginia Marcon, and Becky Simon

Visiting Researcher Jun 2024
Vrije Universiteit Amsterdam, Amsterdam, the Netherlands
Department of Water and Climate Risk, Institute for Environmental Studies
Advisors: Marleen de Ruiter and Wiebke Jäger

Geologist in Training License 2019
State of Virginia

Erosion and Sediment Control Certification 2019
State of Maryland

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
HAZWOPER

First Aid with CPR AED Training 2018-2020
Heartsaver

Hazardous Materials Training 2018
US Department of Transportation

Field Hydrogeology Course Jun 2017
University of Minnesota-Twin Cities
College of Science and Engineering
School of Earth and Environmental Sciences (ESci 4971/5971W-Hydrogeology)
Advisors: Robert Tipping and Scott Alexander

COURSEWORK

Course	Professor	University / Course #
Advanced Coastal Environmental Change	Laura Moore	UNC / GEOL 710
Age of Augustus	Margaret Andrews	Brown / CLAS 1120T
Brown Environmental Leadership Lab	Marian Thorpe	Brown / BELL RI 2011
Brown Environmental Leadership Lab	Marian Thorpe, Sybil Gotsch	Brown / BELL Costa Rica 2013
Conservation Biology	Dov Sax	Brown / BIOL 1470
Criminal Minds: Psychology and the Law		Duke / TIP 2011
Data Analysis	Jonathan Lees	UNC / GEOL 520
Death from Medieval Relics to Forensic Science	Wanda Henry	Brown / HIST 1280
Earth: Evolution of a Habitable Planet	Timothy Herbert	Brown / GEOL 0240
Environmental Geochemistry	Yongsong Huang	Brown / GEOL 1370
Environmental Science in a Changing World	Stephen Porter	Brown / ENVR 0490
Foundation of Living Systems	Casey Dunn	Brown / BIOL 0200
Foundations of Mechanics		Brown / PHYS 0050
Geochemistry: Earth and Planetary Materials and Processes	Stephen Parman	Brown / GEOL 0230
Global Hydrology	Tamlin Pavelsky	UNC / GEOL 508
Gold: The Culture of a Barbarous Relic	Ian Straughn	Brown / ANTH 0250
Hydrogeology Field Course	Scott Alexander, Robert Tipping	UMN / GEO4971W/5971
International Relations		Duke / TIP 2012
Introductory Calculus, Part I	Daniel Katz	Brown / MATH 0090
Introductory Calculus, Part II	Daniel Katz	Brown / MATH 0100
Introduction to Egyptian Archaeology	Laurel Bestock	Brown / ARCH 0150
Introduction to Geographic Information Systems	Lynn Carlson	Brown / GEOL 1320
Introduction to Python	Rosa Cuppari	UNC / ENVR 860
Invertebrate Zoology	Casey Dunn	Brown / BIOL 0410
Limnology: The Study of Lakes	James Russell	Brown / GEOL 1150
Physical Hydrology	Christopher Huber	Brown / GEOL 1960B
Physical Processes in Geology	Julia Tullis, Karen Fisher	Brown / GEOL 0220
Principles of Ecology	Jon Witman	Brown / BIOL 0420
Principles of Economics	Rachel Friedberg	Brown / ECON 0110
Proposal Writing	Donna Surge	UNC / GEOL 709
Rivers and Floods	Antonia Sebastian	UNC / GEOL 590
Statistical Analysis of Biological Data	Sohini Ramachandran	Brown / BIOL 0495
Stratigraphy and Sedimentation	James Russell	Brown / GEOL 1240
Structural Geology	Julia Tullis, Dr. Greg Hirth	Brown / GEOL 1450
Studio Foundation		Brown / VISA 0100
Sustainable Design in the Built Environment	Kurt Teichert	Brown / ENVS 1400
Temporal GIS and Geostatistics	Marc Serre	UNC / ENVR 468
Terrestrial Biogeochemistry and the Functioning of Ecosystems	Stephen Porder	Brown / BIOL 1480
The Other Side of Rome: Daily Life in the Roman Empire	Margaret Andrews	Brown / ARCH 0525
Time Series Analysis	Harvey Seim	UNC / EMES 561
Transcending Transportation Impacts	Kurt Teichert	Brown / ENVS 0070C