

James B. Shope, Ph.D.

(848) 932-6731 office
James.Shope@rutgers.edu

Research Associate

Rutgers University, Department of Environmental Sciences
School of Environmental and Biological Sciences
14 College Farm Rd, New Brunswick, NJ 08901

SUMMARY

I am an earth and environmental scientist whose work addresses hazards due to climate change and sea-level rise. Over 9 years conducting applied, multidisciplinary research, my work has guided coastal risk reduction for more than 5,000 km of U.S. coastline and outlined climate hazards in New Jersey. My technical specialties include applied climatology, hydrodynamic modeling, statistical data analysis, scientific programming, and geospatial analysis. I am passionate about engaging with resiliency and management challenges facing government and community decision makers in light of climate change.

EDUCATION

- University of California Santa Cruz**, Santa Cruz, CA 2016
Ph.D., Earth and Planetary Sciences
Dissertation: *"Modeling Pacific atoll island shorelines' response to climate change"*
Advisor: Gary B. Griggs
- Emory University, College of Arts and Sciences**, Atlanta, GA 2011
B.Sc., Environmental Studies, Magna Cum Laude
Minor: English
Advisor: William B. Size
- Oxford College of Emory University**, Oxford, GA 2009
A.A.

PROFESSIONAL EXPERIENCE

- Research Associate** 2021–pres.
Department of Environmental Sciences, Climate Change Resource Center, Rutgers University,
New Brunswick, NJ
- Analyze climate data and climate projections for applications in multiple sectors (e.g., agriculture)
 - Educate and communicate with diverse stakeholders regarding climate change impacts in NJ
 - Collaborate with other NJ institutions on applied climate change research, education programs, and integration of research findings into state climate change adaptation, mitigation, and resilience efforts

Coastal Scientist 2019–2021
Jacobs Engineering, Philadelphia PA

- Developed technical proposals for coastal monitoring and flooding resilience
- Coordinated with clients and teammates to develop a report on climate change adaptation for ports
- Led the development, population, and management of a port infrastructure GIS database
- Designed a financial and sequencing tool to guide wharf reconstruction in New York and New Jersey

Postdoctoral Researcher 2017–2019
University of California Santa Cruz, Santa Cruz, CA & U.S. Geological Survey

- Led research to quantify overtopping risk and extreme water level recurrence along U.S. West Coast
- Ran numerical wave models to determine high water level impacts at 20,000 distinct locations
- Developed a methodology to process geospatial data and evaluate coastal overtopping risk; this method is the foundation for planned USGS projects quantifying nation-wide overtopping risk
- Generated data for the USGS Coastal Change Hazards Portal, an open-source reference for managers

Postdoctoral Researcher/Contractor 2017–2018
The Nature Conservancy, Santa Cruz, CA

- Team research quantifying the economic and social impact of flooding protection from all U.S. reefs
- Coordinated across organizations including USGS, The Nature Conservancy, and UC Santa Cruz
- Generated and managed numerical model results for 30,000 locations along U.S. reef-lined coasts
- These results are guiding multi-million-dollar FEMA post-hurricane reef restoration efforts in Puerto Rico

Independent Contractor January–August 2017
Revell Coastal, Santa Cruz, CA

- Coastal consulting re-evaluating FEMA flood data and processing erosion magnitudes from LiDAR data
- Assisted in coordinating with and presenting results to clients, including a municipal government
- Produced a technical review of applied methods to calculate base flood elevations and erosion

Graduate Student Researcher 2011–2016
University of California, Santa Cruz & USGS Pacific Coastal and Marine Sciences Center, Santa Cruz, CA
Advisors: Curt D. Storlazzi (USGS) and Gary B. Griggs (UCSC)

- Assessed how large wave events impact tropical Pacific islands due to sea-level rise and climate change
- Cultivated a deep understanding of physical processes underlying coastal flooding and erosion hazards
- Developed project proposals and secured \$130,000 in grant funding to support this work
- Communicated results and impacts at 7 professional conferences and through 5 scientific publications

Undergraduate Researcher 2010–2011
Emory University, Atlanta, GA

- Conducted field research, thin-section petrography, and data analysis

Long Term Ecological Research: Intern and Field Technician Summer 2010
Coweeta Hydrologic Laboratory, Otto, NC

- Field work including: water sampling, tree census, and field site maintenance; Water quality data analysis

PUBLICATIONS

Shope J., Polk D., Mansue Denson C., Rodriguez-Saona C. "The role of climate variation on the phenological shifts of a native and an invasive insect pest." *In prep.*

Menéndez P., B.G. Reguero, L.H. Erikson, and **J.B. Shope**. "Nearshore projections reveal future ENSO-like wave climate for coastal California." *In prep.*

Shope J.B., L.H. Erikson, P. Barnard, C.D. Storlazzi, K. Serafin, K.J. Doran, H.F. Stockdon, B.G. Reguero, F. Mendez, S. Castanedo, A. Cid, L. Cagigal, P. Ruggerio, 2022. "Characterizing Storm-Induced Coastal Change Hazards Along the United States West Coast." *Nature Scientific Data*, 9(224). <https://doi.org.proxy.libraries.rutgers.edu/10.1038/s41597-022-01313-6>.

Reguero B.G., C.D. Storlazzi, A.E. Gibbs, **J.B. Shope**, A.D. Cole, K.A. Cumming, M.W. Beck, 2021. "The value of US coral reefs for flood risk reduction." *Nature Sustainability*. <https://doi.org/10.1038/s41893-021-00706-6>

Shope J.B. and C.D. Storlazzi, 2019. "Assessing morphologic controls on atoll island alongshore sediment transport gradients due to future sea-level rise." *Frontiers in Marine Science*, 6(245). <https://doi.org/10.3389/fmars.2019.00245>

Shope J.B., C.D. Storlazzi, R.K. Hoeke, 2017. "Projected atoll shoreline and run-up changes in response to sea-level rise and varying large wave conditions at Wake and Midway Atolls, Northwestern Hawaiian Islands." *Geomorphology*, 295: 537–550. <https://doi.org/10.1016/j.geomorph.2017.08.002>

Shope J.B., C.D. Storlazzi, L.H. Erikson, C.A. Hegermiller, 2016. "Changes to extreme wave climates of islands within the Western Tropical Pacific throughout the 21st century under RCP 4.5 and RCP 8.5, with implications for island vulnerability and sustainability." *Global and Planetary Change*, 141. <https://doi.org/10.1016/j.gloplacha.2016.03.009>

Shope, J.B., Storlazzi, C.D., Erikson, L.H., Hegermiller, C.A., 2015. "Modeled Changes in Extreme Wave Climates of the Tropical Pacific over the 21st Century: Implications for U.S. and U.S.-Affiliated Atoll Islands" in Wang, P., Rosati, J.D., and Cheng, J., eds., *Proceedings of the Coastal Sediments 2015*, v. 1: Hackensack, N.J., World Scientific Publishing, 13 p. doi: 10.1142/9789814689977_0247

Peer-reviewed scientific reports:

Shope J., Broccoli A., Frei B., Gerbush M., Herb J., Kaplan M., Langer E., Marxen L., Robinson D. 2022. "State of the Climate: New Jersey 2021." Rutgers, The State University of New Jersey, New Brunswick, NJ.

Storlazzi C.D., B.G. Reguero, K.A. Cumming, A.D. Cole, **J.B. Shope**, C.L. Gaido, T.S. Viehman, B.A. Nickel, M.W. Beck, 2021. "Rigorously valuing the coastal hazard risks reduction provided by coral reef restoration in Florida and Puerto Rico." U.S. Geological Survey Open-File Report. <https://doi.org/10.3133/ofr20211054>

Storlazzi C.D., B.G. Reguero, T.S. Viehman, K.A. Cumming, A.D. Cole, **J.B. Shope**, S.H. Groves, C.L. Gaido, B.A. Nickel, M.W. Beck, 2021. "Rigorously valuing the impact of Hurricanes Irma and Maria on coastal hazard risks in Florida and Puerto Rico." U.S. Geological Survey Open-File Report. <https://doi.org/10.3133/ofr20211056>

Storlazzi C.D., B.G. Reguero, K.K. Yates, K.A. Cumming, A.D. Cole, **J.B. Shope**, C.L. Gaido, D.G. Zawada, S.R. Arsenault, Z.W. Fehr, B.A. Nickel, M.W. Beck, 2021. "Rigorously Valuing the Impact of Coral Reef Degradation on Coastal Hazard Risk in Florida." U.S. Geological Survey Open-File Report <https://doi.org/10.3133/ofr20211055>

Storlazzi C.D., B.G. Reguero, A.D. Cole, E. Lowe, **J.B. Shope**, A.E. Gibbs, B.A. Nickel, R.T. McCall, A.R. van Dongeren, M.W. Beck, 2019. "Rigorously valuing the role of U.S. coral reefs in coastal hazard risk reduction" U.S. Geological Survey Open-File Report 2019–1027. <https://doi.org/10.3133/ofr20191027>

Storlazzi C.D., **J.B. Shope**, L.H. Erikson, C.A. Hegermiller, P.L. Barnard, 2015. "Future wave and wind projections for United States and United States-affiliated Pacific Islands." U.S. Geological Survey Open-File Report 2015–1001. <https://dx.doi.org/10.3133/ofr20151001>

EXPERTISE AND INTERESTS

Coastal hazards, climate hazards, climate change resilience, numerical modeling, sea-level rise, climate change, data visualization, communication of hazards and scientific findings

TECHNICAL SKILLS

Software: Matlab, Delft3D Hydrodynamical and Wave Modeling (SWAN), ArcGIS, Python, Adobe Illustrator, and Microsoft Office (including Visual Basic for Applications)

Modeling: data visualization, grid design, parameterization, model validation, statistical data analysis, data management

Other relevant skills: scientific writing (peer-reviewed papers and technical reports), technical proposal development, project management, collaboration across institutions, public speaking, lecturing, curriculum design

PROFESSIONAL TRAINING

Introduction to Living Shorelines Training, DNREC 2020
12-hour course introducing living shoreline design and construction approaches. Includes physical and ecological considerations, materials usage and planting, and navigating permitting in Delaware.

Facilitating Change in Coastal Science and Policy 2016
Skills-based, ten-week training in effective leadership; broad communication with media, policy makers, and the public; stakeholder engagement; conflict resolution; team building; and project management

California Environmental Quality Act (CEQA) Workshop 2016
One-day course on the application of CEQA in environmental planning and management. Course taught at California State University, Monterey Bay

SELECTED HONORS AND AWARDS

Wells Fargo Coastal Sustainability Fellowship 2016

Dr. Earl H. Myers & Ethel M. Myers Oceanographic & Marine Biology Trust 2016

Advanced to candidacy with honors	2013
Eugene Cota-Robles Fellowship	2011
<i>The Cota-Robles Fellowship is a merit-based fellowship awarded by the University of California on a competitive basis to first-year graduate students who have overcome significant social or educational obstacles to achieve a college education.</i>	
Inducted into Phi Beta Kappa honor society	2011
Magna cum laude distinction in Environmental Studies	2011

PROFESSIONAL AFFILIATIONS

New Jersey Coastal Resilience Collaborative	2021–pres.
American Geophysical Union: Member	2013–2018

PRESENTATIONS & OUTREACH

- Shope, J.B.** 2022. Climate Change and Hurricanes: New Jersey. New Jersey Hurricane Season - a Virtual Panel on Impacts, Costs, and Cost Recovery. Leaders for Climate Accountability. *Panelist (invited).*
- Shope, J.B.** 2022. The State of the Climate: New Jersey 2022. American Council of Engineering Companies of New Jersey, 2nd Annual Climate Change Summit. Keynote Speaker. *Talk (invited).*
- Shope, J.,** Broccoli A, Robinson D. 2022. State of the Climate: New Jersey 2021. New Jersey Climate Change Resource Center – Climate Academy. *Webinar.*
- Shope, J.B.** 2022. The State of the Climate in 2022. USDA – Natural Resources Conservation Service, Technical Tuesday. *Talk (invited).*
- Shope, J.B.** 2022. Sea-Level Rise and New Jersey. Sierra Club New Jersey Chapter, Jersey Shore Group Science Monday meeting. *Talk (invited).*
- Shope, J.B.** 2022. The State of the Climate in 2022. Suburban Woman’s Club of South Plainfield monthly meeting. *Talk (invited).*
- Shope, J.B.** 2021. Climate Change in New Jersey and Action by 2030. New Jersey Higher Education Partnership for Sustainability. *Talk (invited).*
- Shope, J.B.** 2021. Climate Change in New Jersey and Classroom Resources. New Jersey Association of Independent Schools. *Talk and Panel Discussion (invited).*
- Shope, J.B.** 2021. The State of the Climate in 2021. Sierra Club New Jersey Chapter monthly meeting. *Talk (invited).*
- Shope, J.B.** 2021. Soil health and climate change. NJAES/NRCS Soil and Health Field Day. Rutgers New Jersey Agricultural Experiment station. *Talk (invited).*
- Shope, J.B.** 2019. Rigorously valuing the role of U.S. coral reefs in coastal hazard risk reduction. Temple Earth & Environmental Science Department Seminar, Philadelphia, PA. *Talk (invited).*

CONFERENCE ABSTRACTS & PRESENTATIONS

- Shope, J.B.** and Storlazzi, C.D., 2017. “Assessing morphologic controls on atoll island shoreline stability due to sea-level rise” Geological Society of America, Cordilleran Section Meeting. *Poster.*

Shope, J.B., Storlazzi, C.D., Hoeke, R.K., 2016. "Modeled atoll shoreline and run-up changes in response to sea-level rise and varying large wave conditions at Wake and Midway Atolls, Northwestern Hawaiian Islands" American Geophysical Union Fall 2016 Meeting. *Poster*.

Shope, J.B., Storlazzi, C.D., Hoeke, R.K., 2016. "Modeled Atoll Shoreline and Run-up Changes in Response to Sea-level Rise and Changing Wave Directions under Large Wave Conditions: Wake and Midway Atolls, Northwestern Hawaiian Islands" Ocean Sciences 2016 Meeting. *Poster*.

Shope, J.B., Storlazzi, C.D., Erikson, L.H., Hegermiller, C.A., 2015. "Modeled Changes in Extreme Wave Climates of the Tropical Pacific over the 21st Century: Implications for U.S. and U.S.-Affiliated Atoll Islands" Coastal Sediments 2015 Meeting. *Talk*.

Shope, J.B., Storlazzi, C.D., Erikson, L.H., Hegermiller, C.A., 2015. "Modeled changes in extreme wave climates in the Pacific Ocean during the 21st century and implications for low-lying U.S. and U.S.-affiliated atoll islands" American Geophysical Union 2014 Fall Meeting. *Poster*.

Shope, J.B., Storlazzi, C.D., Erikson, L.H., Hegermiller, C.A., 2014. "Modeled changes in extreme wave climate and run-up for US and US-affiliated Pacific Islands during the 21st century" 2014 Ocean Sciences Meeting. *Poster*.

Shope, J.B., Storlazzi, C.D., Erikson, L.H., Hegermiller, C.A., 2013. "Modeled changes in extreme wave climate for US and US-affiliated Pacific Islands during the 21st century" American Geophysical Union 2013 Fall Meeting. *Poster*.

RUTGERS UNIVERSITY SERVICE

Rutgers Day – Rutgers Climate Institute and New Jersey Climate Change Research Center 2022
Help organize and lead day of activities on "How Is the Climate Changing?"

Assist with timesheet approval for Rutgers Climate Institute Interns and Students Apr 2022

PRESS & MEDIA RELATIONS

Interviewed by Susan Phillips, reporter for PBS WHYY, Philadelphia 2022
Regarding the release of the State of the Climate: New Jersey 2021

Quoted in Rutgers Today (*press release*) 2022
Title: New Jersey's Temperatures Rise by 4 Degrees Fahrenheit, Twice the Global Average Since 1900

Interviewed by Lucy Albright from SUNY Purchase for senior project on climate change (*podcast*) 2022

Featured in the South Plainfield Observer (*newspaper*) 2022
Story regarding presentation to Suburban Woman's Club of South Plainfield

TEACHING EXPERIENCE

Lecturer, UC Santa Cruz, Santa Cruz, CA 2017–2018
University of California Santa Cruz, Santa Cruz, CA

- Designed and instructed 8 classes, teaching > 120 under-served students how to succeed in STEM fields
- Focused on applicable skills such as time management, studying, and problem solving
- Presented material in a framework of metacognition, neuroplasticity, and growth mindset
- Developed an interactive online version of the course to be taught during summer sessions

Teaching Assistant, UC Santa Cruz, Santa Cruz, CA

- Assisted professors in grading tests and assignments; acted as a guest lecturer on multiple occasions

- Responsible for coordinating and conducting weekly laboratory sessions; held office hours for students

Grader , EART140: Geomorphology with Lab	Winter 2017
Teaching Assistant , EART146: Groundwater with Lab	Spring 2016
Teaching Assistant , EART5: California Geology with Lab	Fall 2015
Teaching Assistant , EART105: Coastal Geology with Lab	Winter 2016, Spring 2015
Guest Lecturer , EART1: Oceanography	Spring 2015, 2016
Teaching Assistant and Guest Lecturer , EART3: Geology of National Parks	Winter 2014
Teaching Assistant and Guest Lecturer , EART9: Earth History and Global Change	Fall 2012
Teaching Assistant , Physical Geology, Oxford College of Emory University	Fall 2008

TOOLS & DATA DEVELOPMENT

NJADAPT – Extreme Rainfall

Future extreme rainfall magnitude and frequency change by municipality tool; in development

NJADAPT – HealthADAPT

Heat vulnerability data and tools in development

NJADAPT – Climate Dashboard

QA/QC and technical documentation; in development

NJADAPT – Hazard Tools for NJ Office of Emergency Management

Developed NJ heatwave projections and provided technical guidance; in development

Shope, J.B. et al. 2021. "Modeled extreme total water levels along the U.S. west coast." U.S. Geological Survey data release, <https://doi.org/10.5066/P95FBGZ1>.