James B. Shope, Ph.D.

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Research Associate
Rutgers University, Department of Environmental Sciences
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SUMMARY

I am a coastal geologist and environmental scientist whose work has addressed flooding and erosion hazards due to climate change and sea-level rise. Over 8 years conducting applied, multidisciplinary research with USGS and The Nature Conservancy, my work has guided coastal risk reduction for more than 5,000 km of U.S. coastline. My technical specialties include modeling nearshore hydrodynamics, statistical data analysis, scientific programming, and geospatial analysis. I am passionate about engaging with resiliency and management challenges facing government and community decision makers.

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

- Analyzing climate data and climate projections for applications in multiple sectors (e.g., agriculture)
- Educating and communicating with diverse stakeholders regarding climate change impacts in NJ
- Collaborating 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.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, 2021. "Characterizing Storm-Induced Coastal Change Hazards Along the United States West Coast." *In revision*.

Menéndez P., B.G. Reguero, L.H. Erikson, and **J.B. Shope**, 2021. "Nearshore projections reveal future ENSO-like wave climate for coastal California." *Scientific Reports*. *In prep*.

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*:**

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. *In internal review*.

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. *In internal review*.

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. *In internal review*.

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 change resilience, numerical modeling, sea-level rise, climate change, oceanographic and coastal processes, 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

> *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.*

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

SELECTED ABSTRACTS & PRESENTATIONS

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)*.

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*.

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