

## Elizabeth J. Wallace

Earth and Ocean Sciences  
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### *Education*

**Ph.D., Paleoceanography** 2020

Massachusetts Institute of Technology, Cambridge, MA  
Woods Hole Oceanographic Institution, Woods Hole, MA

*Dissertation title:* “High resolution sedimentary archives of past millennium hurricane activity in the Bahama Archipelago”

*Thesis Supervisor:* Jeffrey Donnelly (WHOI)

*Committee:* Kerry Emanuel (MIT), Sloan Coats (U. Hawaii), Caroline Ummenhofer (WHOI), Jon Woodruff (UMass Amherst)

**B.S. (with highest distinction), Civil Engineering and Philosophy** 2015

University of Virginia, Charlottesville, VA

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### *Research interests*

Hurricane activity over the past two millennia; paleoclimate data-model comparison; climate dynamics (decadal to centennial timescales); carbonate sediments and coastal geomorphology; climate extremes

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### *Appointments*

**Assistant Professor** 12/2022-present  
Old Dominion University, Department of Earth, and Ocean Sciences

**Postdoctoral Fellow** 09/2020-08/2022  
Rice University, Department of Earth, Environmental, and Planetary Sciences  
Advisor: Sylvia Dee (Rice)

**Graduate Research Assistant** 2015-2020  
Woods Hole Oceanographic Institution, Woods Hole, MA  
Advisor: Jeffrey Donnelly (WHOI)

**Research Experience for Undergraduates (REU) program** Summer 2014  
Virginia Institute of Marine Science, Gloucester, VA, USA  
Advisor: Donglai Gong (VIMS)

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### *Funding*

NSF Paleoclimate Perspectives on Climate Change (P2C2), Lead-PI, 2022-2024  
*Collaborative Research: Assessing climate and stochastic forcing of North Atlantic tropical cyclone activity over the past millennium* **\$313,387**

Pan Postdoctoral Fellowship, Rice University 2020-2022

Rice Academy Postdoctoral Fellowship, Rice University  
NSF Graduate Research Fellowship Program (GRFP)

2020-2021  
2015-2020

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*Publications*

(\* denotes undergraduate mentee publication)

**Wallace, E.**, Dee, S.: Tropical cyclone frequency: Turning paleoclimate into projections. *Environmental Research Climate*. Submitted.

Winkler, T., van Hengstum, P., Donnelly, J., **Wallace, E.**, D'Entremont, N., Hawkes, A., Sullivan, R., Woodruff, J., & Maio, C.: Oceanic passage of hurricanes across Cay Sal Bank in The Bahamas over the last 600 years. *Marine Geology*. 2021. <https://doi.org/10.1016/j.margeo.2021.106653>.

**Wallace, E.**, Dee, S., Emanuel, K.: Resolving long-term variations in North Atlantic tropical cyclone activity using a pseudo proxy paleotempestology network approach. *Geophysical Research Letters*, 2021, <https://doi.org/10.1029/2021GL094891>.

Goldstein, E., Buscombe, D., Lazarus, E., Mohanty, S., Rafique, S. N., Anarde, K., Ashton, A., Beuzen, T., Castagno, K., Cohn, N., Ellenson, A., Gillen, M., Hovenga, P., Over, J., Palermo, R., Ratliff, K., Reeves, I., Sanborn, L., Taylor, L., **Wallace, E.**, Wernette, P., Williams, H.: Labeling post-storm coastal imagery for machine learning: measurement of inter-rater agreement. *Earth and Space Science*, 2021, <https://doi.org/10.1029/2021EA001896>.

**Wallace, E.**, Donnelly, J., van Hengstum, P., Winkler, T., \*Dizon, C., \*LaBella, A., \*Lopez, I., d'Entremont, N., Sullivan, R., Woodruff, J., Hawkes, A., Maio, C.: Regional shifts in paleohurricane activity over the last 1500 years derived from blue hole sediments offshore of Middle Caicos Island, *Quaternary Science Reviews*, 2021, Invited. <https://doi.org/10.1016/j.quascirev.2021.107126>.

**Wallace, E.**, Donnelly, J., van Hengstum, P., Winkler, T., \*McKeon, K., Macdonald, D., d'Entremont, N., Sullivan, R., Woodruff, J., Hawkes, A., Maio, C.: 1050 years of hurricane strikes on Long Island in The Bahamas, *Paleoceanography & Paleoclimatology*, 2021, <https://doi.org/10.1029/2020PA004156>.

**Wallace, E.**, Coats, S., Emanuel, K., Donnelly, J.: Centennial-scale shifts in storm frequency captured in paleohurricane records from The Bahamas arise predominantly from random variability: *Geophysical Research Letters*, 2020, <https://doi.org/10.1029/2020GL091145>.

Rodysill, J., Donnelly, J., Sullivan, R., Lane, P., Toomey, M., Woodruff, J., Hawkes, A., Macdonald, D., D'Entremont, N., McKeon, K., **Wallace, E.**, van Hengstum, P.: Historically unprecedented Northern Gulf of Mexico hurricane activity from 650 to 1250 CE, *Scientific Reports*, 2020, <https://doi.org/10.1038/s41598-020-75874-0>

Winkler, T., van Hengstum, P., Donnelly, J., **Wallace, E.**, Sullivan, R., Macdonald, D., Albury, N.: Revising evidence of hurricane strikes on Abaco Island (The Bahamas) over the last 680 years, *Scientific Reports*, 10, 16556, 2020, <https://doi.org/10.1038/s41598-020-73132-x>.

**Wallace, E.**, Donnelly, J., van Hengstum, P., Wiman, C., Sullivan, R., Winkler, T., D'Entremont, N., Toomey, M., Albury, N.: Intense hurricane activity over the past 1500 years at South Andros Island, The Bahamas, *Paleoceanography & Paleoclimatology*, 34, 1761-1783, 2019, <https://doi.org/10.1029/2019PA003665>.

**Wallace, E.**, Looney, L., Gong, D.: Multi-Decadal Trends and Variability in Temperature and Salinity in the Mid-Atlantic Bight, Georges Bank, and Gulf of Maine, *Journal of Marine Research*, 76, 163–215, 2018, <https://doi.org/10.1357/002224018826473281>.

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### *Invited talks*

Texas A&M University. *Ibid.* Atmospheric Sciences Department Seminar. November 2022.  
 Old Dominion University. *Ibid.* Earth and Ocean Science Department Seminar. February 2022.  
 Virginia Tech. *Ibid.* Earth Science Department Seminar. October 2021.  
 Coastal Carolina University. *Ibid.* Marine Science Department Seminar. March 2021.  
 University of Texas Institute of Geophysics. *Ibid.* UTIG Seminar Series. February 2021.  
 University of Houston. *Ibid.* Earth and Atmospheric Sciences Department Seminar. December 2020.  
 Northeastern University. Marine Science Center (MSC) Colloquium. September 2020.  
 Princeton University. *Ibid.* Department Lecture Series (DLS). February 2020.  
 Lamont Doherty Earth Observatory. *Ibid.* Biology & Paleo Environmental Seminar. February 2020.  
 Rice University. *Ibid.* Earth, Environmental, and Planetary Sciences (EEPS Seminar). February 2020.  
 Yale University. *Past millennium hurricane strikes: Insights from models and blue hole sediment cores.*  
 Atmosphere Ocean Climate Dynamics (AOCD) Seminar Series. January 2020.

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### *Academic Service*

Reviewer – *Communication Earth & Environment, Environmental Research Letters, Quaternary Science Reviews, Proceedings of the National Academy of Sciences, Geophysical Research Letters, Paleoceanography & Paleoclimatology*

International Workshop on Tropical Cyclones (IWTC-10) Climate Change and TCs working group	2022
Convener. Climate of the Common Era. AGU.	2021
Women in Coastal Geoscience Unlearning Racism in the Geosciences Pod member	2021
Steering and planning committee member, Graduate Climate Conference, Woods Hole, MA	2019
President of MIT/WHOI Joint Program Student Representatives	2017-2018

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### *Relevant field experience*

The Bahamas, Turks & Caicos, Haiti – *R/V Alucia* – (April-May 2016)  
 Edgetech 3100 Chirp sub-bottom profiling; Rossfelder P-3 vibracoring in remote blue holes  
 Discovery Bay, Jamaica – *R/V Atlantis* – (August 2016)  
 Rossfelder P-3 vibracoring; Jumbo piston coring, Chirp sub-bottom survey  
 Fuik Bay, Curacao – (February 2017)  
 Rossfelder P-3 vibracoring on an inflatable raft platform; Chirp sub-bottom survey  
 Lake Carmi, VT & Fairfield Pond, VT – (June 2018)  
 Rossfelder P-3 vibracoring on an inflatable raft platform; Chirp sub-bottom survey  
 Drinkwater Sinkhole, Abaco Island, The Bahamas – (November 2018)  
 Rossfelder P-3 vibracoring on an inflatable raft platform; Chirp sub-bottom survey  
 Washing Pond and Ocean Hole, Turks & Caicos – (April and June 2019)  
 Post-Hurricane Irma drone survey, Rossfelder P-3 vibracoring on an inflatable raft platform,  
 Chirp sub-bottom survey

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### *Technical Skills*

**Computational:** MATLAB, R, GeoChronR, ESRI ArcGIS, Adobe Creative Suite, Microsoft Office Suite  
**Field/Laboratory:** Terrestrial and ocean sediment coring (Rossfelder vibracore, push core), Edgetech 3100 Chirp sub-bottom profiling and data processing, Radiometric dating ( $^{137}\text{Cs}$ ,  $^{210}\text{Pb}$ ,  $^{14}\text{C}$ ) and chronology building, X-ray fluorescence (XRF) spectroscopy and radiography, Particle-size analysis, YSI Castaway CTD deployment, Tiltmeter & Onset HOBO data logger deployment and data processing, Total station surveying

### *Teaching experience and outreach*

#### **Guest Lecturer**

Invited to teach lessons on sediments, paleoclimate, waves, coastal geology, and extreme weather at:

University of Southern Mississippi	2021
<i>MAR418: Oceans and Climate</i> (1 lecture)	
Coastal Carolina University, Conway, SC	2021
<i>MSCI 304: Marine Geology</i> (1 lecture)	
Rice University, Houston, TX	2020-2022
<i>ESCI 220, Introduction to Computation in the Earth Sciences</i> – (1 module – 2 lectures/2 labs)	
<i>ESCI 434-634, Climate of the Common Era.</i> (1 lecture)	
<i>ESCI 422-622: Climate Dynamics</i> (1 lecture)	
<i>ESCI 201: The Science of Climate Change</i> (1 lecture)	
<i>ESCI 114: Discoveries in Earth, Environmental &amp; Planetary Sciences</i> (2 lectures)	
Sea Education Association (SEA), Woods Hole, MA	2020-2021
<i>SEA Semester: Oceans and Climate Program</i> (2 lectures)	
Bridgewater State University, Bridgewater, MA	2019
<i>GEOL 210 –Introduction to Oceanography</i> (1 lecture)	
Mullen Hall Elementary School, Falmouth, MA (4 classes)	2019
Children’s School of Science, Woods Hole, MA (2 classes)	2018

#### **Selected Outreach Experience**

Communities Responding to Extreme Weather, Houston, TX, Guest speaker	2021
Girl Scouts of New England Leadership Conference, Workshop leader	2021
Kenneth C. Combs School STEM Night, Mashpee, MA	2018
Woods Hole Science & Technology Education Partnership Family Night, Woods Hole, MA	2016
Wild Weather Weekend, Boston Museum of Science, Boston, MA	2016

#### **Teaching Assistant**

ENGR 1621: Introduction to Engineering Lab	2014
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#### **Mentoring**

Lucian Bennett-Brandt, Rice University undergraduate research	Spring 2022
Briana Alison, Women in Coastal Geoscience mentoring network	2021
Isabella Lopez, Northeastern University Co-op Internship	Fall 2019
Charmille Dizon, Northeastern University Co-op Internship	Spring 2018
Alexandra LaBella, Northeastern University Co-op Internship	Spring 2017
Kelly McKeon, Northeastern University Co-op Internship	Fall 2016
Patrick Orenstein, Semester at WHOI (SAW) student	Fall 2016

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*Media Coverage*

Williams, M.: Nature's archive reveals Atlantic tempests through time, *Rice News*, 2021, <https://news.rice.edu/2021/09/07/natures-archive-reveals-atlantic-tempests-through-time/>.

Gramling, C.: Hurricanes may not be becoming more frequent, but they're still more dangerous, *Science News*, 2021, <https://www.sciencenews.org/article/hurricanes-frequency-danger-climate-change-atlantic>.

Sidder, A.: Untangling Drivers of Ancient Hurricane Activity, *AGU Eos*, 2021, <https://eos.org/research-spotlights/untangling-drivers-of-ancient-hurricane-activity>.

Supriya, Lakshmi.: Sea Caves Hold Clues to Ancient Storms, *AGU Eos*, 2019, <https://eos.org/articles/sea-caves-hold-clues-to-ancient-storms>.

Andrews, R.: The ghosts of ancient hurricanes live in Caribbean blue holes, *National Geographic*, 2019, <https://www.nationalgeographic.com/science/2019/11/ghosts-ancient-hurricanes-caribbean-blue-holes/>.

Kornei, K.: In the Blue Holes of the Bahamas, Secrets of Hurricanes Past, *New York Times*, 2019, <https://www.nytimes.com/2019/11/01/science/blue-holes-hurricanes.html>.

Lubofsky, E.: Hurricane Clues from a Caribbean Blue Hole, *WHOI News-Insights*, 2019, <https://www.whoi.edu/news-insights/content/irma-and-the-blue-hole/>.

Featured on *Down to Earth: Cornell Conversations about AGU Centennial Meeting* podcast, January 2019, <https://www.stitcher.com/podcast/anchor-podcasts/down-to-earth-cornell-conversations-about/e/58094287>.

Wallace, E.: Unearthing Long-Gone Hurricanes: A hunt for scientific buried treasure, *Oceanus Magazine*, 53, 2018, <https://www.whoi.edu/oceanus/feature/unearthing-long-gone-hurricanes/>.

Levin, D.: Blue Holes and Hurricanes: Geological marvels are gold mines for climate history, *Oceanus Magazine*, 52, 2017. <https://www.whoi.edu/oceanus/feature/blue-holes-and-hurricanes/>.

Featured on *National Geographic Channel Years of Living Dangerously*, Season 2, Episode 2: "Storms of the Future." Aired October 2016.

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*Selected Professional Presentations*

Palermo, R., **Wallace, E.**, Joshi, S., Anarde, K., Ashton, A., Brideau, L., Cortes, I., Evans, R., Gillen, M., Goldstein, E., Gostic, M., Housego, R., Kinsman, N: Anti-Racism in Women in Coastal Geoscience and Engineering, AGU Fall Meeting, New Orleans, LA, December 2021.

**Wallace, E.**, Dee, S., Emanuel, K.: Resolving long-term variations in North Atlantic hurricane activity using a pseudo proxy network approach, AGU Fall Meeting, New Orleans, LA, December 2021.

**Wallace, E.**, Donnelly, J., van Hengstum, P., Winkler, T., Dizon, C., LaBella, A., Lopez, I., d'Entremont, N., Sullivan, R., Woodruff, J., Hawkes, A., Maio, C.: Regional shifts in paleohurricane activity over the past 1500 years reconstructed from blue hole sediment records in the Bahama Archipelago, AGU Fall Meeting, Virtual, December 2020.

**Wallace, E.**, Coats, S., Emanuel, K., Donnelly, J. P.: Investigating the significance of centennial timescale paleohurricane activity using modeled hurricane climatology over the past millennium, AGU Fall Meeting, San Francisco, CA, December 2019.

**Wallace, E.**, Donnelly, J. P., van Hengstum, P. J., McKeon, K., Woodruff, J. D., Winkler, T. S., Sullivan, R., Hawkes, A., Maio, C., Dizon, C.: Regional Shifts in Paleohurricane Activity over the Past Millennium Reconstructed from Blue Holes in the Tropical Atlantic, AGU Fall Meeting, Washington, D.C., December 2018.

**Wallace, E.**, Donnelly, J. P., van Hengstum, P. J., Wiman, C., McKeon, K., Woodruff, J. D., Winkler, T. S., Sullivan, R., Hawkes, A., Maio, C., Dizon, C.: Sedimentary Reconstructions of Tropical Cyclone Activity over the Past 1500 Years from Blue Holes in the Caribbean. Graduate Climate Conference, Seattle, WA, November 2018.

**Wallace, E.**, Donnelly, J. P., van Hengstum, P. J., Wiman, C., Winkler, T. S., Sullivan, R.: Blue Hole Reconstructions of Intense Hurricane Activity over the past 1500 Years at South Andros Island, The Bahamas, Joint Meeting of the Canadian and American Quaternary Associations, Ottawa, Ontario, Canada, August 2018.

**Wallace, E.**, Donnelly, J. P., van Hengstum, P. J., Wiman, C., McKeon, K., LaBella, A., Woodruff, J. D., Winkler, T. S., Sullivan, R., Hawkes, A., Maio, C.: Sedimentary Reconstructions of Tropical Cyclone Activity over the Past 1500 Years from Blue Holes in the Caribbean, AGU Fall Meeting, New Orleans, LA, December 2017.

**Wallace, E.**, Donnelly, J. P., van Hengstum, P. J., Wiman, C., Winkler, T. S., Sullivan, R.: Paleohurricane activity over the past millennium in the Bahamas, Graduate Climate Conference, Woods Hole, MA, November 2017.

**Wallace, E.**, Donnelly, J. P., Emanuel, K., van Hengstum, P. J., Wiman, C., Winkler, T. S., Sullivan, R.: Assessing a 1500-year record of Atlantic hurricane activity from South Andros Island, the Bahamas, using modeled hurricane climatology, AGU Fall Meeting, San Francisco, CA, December 2016.

**Wallace, E.**, Donnelly, J. P., Wiman, C., Cashman, M.: Sedimentary Records of the Paleohurricane Activity in the Bahamas, AGU Fall Meeting, San Francisco, CA, December 2015.

**Wallace, E.**, Gong, D.: Interannual and Decadal Variability in Temperature, Salinity, and Shelf Water Volume in the Mid-Atlantic Bight and Georges Bank from 1977 to 2013, ASLO Annual Meeting, Granada, Spain, February 2015.