

Katherine A. Castagno, Ph.D.

Contact	Center for Coastal Studies 5 Holway Ave Provincetown, MA 02657 kcastagno@coastalstudies.org katie.castagno.com ORCID ID: 0000-0003-4060-926X	
Education	Ph.D., Geological Oceanography Massachusetts Institute of Technology, Cambridge, MA Woods Hole Oceanographic Institution, Woods Hole, MA Advised by Dr. Jeffrey P. Donnelly	2014-2019
	M.A., Marine Affairs University of Rhode Island, Kingston, RI Advised by Dr. Richard Burroughs	2012-2014
	B.A., Environmental Geoscience <i>cum laude</i> with highest honors in the major Smith College, Northampton, MA Advised by Dr. Sara Pruss	2008-2012
Research Interests	Coastal surface processes; sediment transport in estuarine systems; hurricane impacts on various timescales; climate drivers of prehistoric storms Coastal resilience in the face of climate change; habitat restoration; shoreline stabilization techniques	
Research Positions	Director, Land-Sea Interaction Program Center for Coastal Studies, Provincetown, MA	2022-present
	Postdoctoral Researcher Center for Coastal Studies, Provincetown, MA	2021-2022
	Coastal Sustainability Postdoctoral Fellow Social-Ecological Sustainability Lab, Northeastern University, Nahant, MA The Nature Conservancy, Boston, MA	2019-2020
	Graduate Research Assistant Marine Geology and Geophysics, Woods Hole Oceanographic Institution, Woods Hole, MA	2014-2019
	Graduate Research Assistant Department of Marine Affairs, University of Rhode Island, Kingston, RI	2012-2014
	Summer Undergraduate Research Fellow Department of Geosciences, Smith College, Northampton, MA	2009, 2011
	Undergraduate Research Assistant Department of Earth and Planetary Sciences, Northwestern University, Evanston, IL	2010
	Student Research in Departments (STRIDE) Scholar Department of Geosciences, Smith College, Northampton, MA	2008-2010

Publications

Published

- [10] **Castagno, K.A.**, Ganju, N.K., Beck, M.W., Bowden, A., Scyphers, S. How Much Marsh Restoration Is Enough to Deliver Wave Attenuation Coastal Protection Benefits? 2022. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2021.756670>
- [9] Tomiczek, T., Wargula, A., LaVeck, V., O'Donnell, K., **Castagno, K.A.**, Scyphers, S. 2022. Vessel-generated wake attenuation by *Rhizophora mangle* in Key West, FL. *Journal of Waterway, Port, Coastal, and Ocean Engineering*. 148(3), [https://doi.org/10.1061/\(ASCE\)WW.1943-5460.0000704](https://doi.org/10.1061/(ASCE)WW.1943-5460.0000704)
- [8] **Castagno, K.A.**, Tomiczek, T., Shepard, C., Beck, M.W., Bowden, A., O'Donnell, K., Scyphers, S. 2021. Resistance, resilience, and recovery of salt marshes in the Florida Panhandle following Hurricane Michael. *Scientific Reports*. 11(20381), <https://doi.org/10.1038/s41598-021-99779-8>
- [7] Goldstein, E.B., Buscombe, D., Lazarus, E.D., Mohanty, S.D., Rafique, S.N., Anarde, K.A., Ashton, A.D., Beuzen, T., **Castagno, K.A.**, Cohn, N., Conlin, M.P., Ellenson, A., Gillen, M., Hovenga1, P.A., Over, J.R., Palermo, R.V., Ratliff, K.M., Reeves, I.R.B., Sanborn, L.H., Straub, J.A., Taylor, L.A., Wallace, E.J., Warrick, J., Wernette, P., Williams, H.E. 2021. Labeling post-storm coastal imagery for machine learning: measurement of inter-rater agreement. *Earth and Space Science*. 8(9), <https://doi.org/10.1029/2021EA001896>
- [6] **Castagno, K.A.**, Bowden, A., Roberts, E., Burns, S., Harlan, S.L., Senier, L., Scyphers, S. 2021. Conservation practice insights from a comparative case study of two shoreline stabilization projects in Boston Harbor, MA. *Conservation Science and Practice*. 3(8), <https://doi.org/10.1111/csp2.465>
- [5] **Castagno, K.A.**, Donnelly, J.P., and Woodruff, J.D. 2021. Grain-size analysis of hurricane-induced event beds in a New England salt marsh. *Journal of Coastal Research*. 37(2), 326-336. <https://doi.org/10.2112/JCOASTRES-D-19-00159.1>
- [4] **Castagno, K.A.**, Donnelly, J.P., and Woodruff, J.D. 2021. Storm processes and salt marsh dynamics, in *Marshes: Function, Dynamics and Stresses*, Eds. Fitzgerald, D. and Hughes, Z., Cambridge Univ. Press. <https://doi.org/10.1017/9781316888933>
- [3] **Castagno, K. A.**, 2018. Salt marsh restoration and the shellfishing industry: co-evaluation of success components. *Coastal Management*, 46 (4), 297-315. <https://doi.org/10.1080/08920753.2018.1474069>
- [2] **Castagno, K. A.**, Jiménez-Robles, A. M., Donnelly, J. P., Wiberg, P. L., Fenster, M. S., & Fagherazzi, S. 2018. Intense Storms Increase the Stability of Tidal Bays. *Geophysical Research Letters*, 45, 5491-5500. <https://doi.org/10.1029/2018GL078208>
- [1] Pruss, S. B., **Castagno, K. A.**, Fike, D. A., & Hurtgen, M. T., 2016. Carbon isotope ($\delta^{13}\text{C}_{\text{carb}}$) heterogeneity in deep-water Cambro-Ordovician carbonates, western Newfoundland. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 458, 52-62. <https://doi.org/10.1016/j.palaeo.2020.10.004>

In preparation

- Castagno, K.A.**, Ruehr, S. A., Donnelly, J. P., Woodruff, J. D. (expected 2023). Spatial reconstruction of hurricane-induced event beds in a coastal New England pond. *In prep.*
- Castagno, K.A.**, Donnelly, J. P., McKeon, K.M. (expected 2024). Impacts of hurricane events on form and function of a Connecticut salt marsh. *In prep.*

Data & theses

- [4] Goldstein, E. B., Buscombe, D., Lazarus, E. D., Anarde, K., Ashton, A. D., Beuzen, T., **Castagno, K. A.**, Cohn, N., Ellenson, A., Gillen, M. N., Hovenga, P. A., Over, J. R., Palermo, R. V., Ratliff, K. M., Reeves, I., Sanborn, L. H., Taylor, L., Wallace, E., Wernette, P. A., Williams, H. E. 2021. Labels for Emergency Response Imagery from Hurricane Florence, Hurricane Michael, and Hurricane Isaias (Version 1.2) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.4694325>

- [3] **Castagno, K.A.** 2019. *Storm signatures in coastal ponds and marshes over the late Holocene*. PhD dissertation, MIT/WHOI Joint Program in Oceanography, Cambridge, MA. <https://dspace.mit.edu/handle/1721.1/123734>
- [2] **Castagno, K.A.** 2014. *Co-evaluation of success components in salt marsh restoration and the shellfish industry on outer Cape Cod, MA*. Master's thesis. University of Rhode Island, Kingston, RI. <https://doi.org/10.23860/thesis-castagno-katherine-2014>
- [1] **Castagno, K.A.** 2012. *Geochemical analysis of Cambro-Ordovician Cow Head Group carbonates in Western Newfoundland, Canada*. Undergraduate honors thesis. Smith College, Northampton, MA. <https://scholarworks.smith.edu/theses/88>

Teaching

Guest Lecturer, Marine Ecology, Stonehill College (Easton, MA)	
Topic: Salt marsh ecosystems	2022
Instructor of Record, Northeastern University (Boston, MA)	
Conservation Biology (EEMB 3460; 39 students)	2020
Guest Lecturer, Sustainable Development, Northeastern University (Boston, MA)	
Topic: Environmental impacts of hurricanes	2019
Science Educator, Community School at Legacy Farm (West Barnstable, MA)	
Weekly science educator for children aged 4 to 11 years.	2018-2019
Graduate Teaching Assistant, University of Rhode Island (Kingston, RI)	
Introductory Geology	2014
GIS Applications in Coastal and Marine Management	2013-2014
Human Use and Management of the Marine Environment	2012
New England and the Sea	2012
Naturalist, Mass Audubon Wellfleet Bay Wildlife Sanctuary (Wellfleet, MA)	
Natural History Day Camp Instructor for children aged 4 to 5 years.	2012-2013
Jacobson Center Peer Writing Tutor, Smith College (Northampton, MA)	
Certified Level II Tutor by the College Reading and Learning Association	2010-2012

Mentoring

Eliza Fitzgerald (Scientist in Parks Fellow, Cape Cod National Seashore)	2021-2022
Kiera O'Donnell (Ph.D. anticipated 2022, Northeastern University)	2019-2020
Dissertation: <i>Assessing role of nature-based and hardened shoreline with hurricane impacts and recovery</i>	
Sophie Ruehr (B.S. 2018, Yale University), WHOI Summer Student Fellow	2017
Final Research Paper: <i>Newfound aspects of ancient hurricanes</i>	
Kelly McKeon (B.S. 2017 Northeastern University), Northeastern Co-op	2016
Senior Capstone: <i>Reconstructing hurricane activity in Long Island, Bahamas</i>	
Michelle O'Donnell (B.S. 2016 Northeastern University), Northeastern Co-op	2015
Senior Capstone: <i>A comparison of hurricane records in sediment cores from two New England ponds</i>	

Outreach

Service	
Reviewer: <i>Journal of Coastal Research, Ecological Engineering</i> , National Science Marine Geology and Geophysics Program, Wisconsin Sea Grant, Oregon Sea Grant	2019-present
Co-Chair, Center for Coastal Studies DEI Committee	2022-present
Member, Herring River Stakeholder Group	2022-present
Board Member, Massachusetts Marine Educators	2023-present
Lead, Northeastern Marine Science Center D&I LGBTQ+ Subgroup	2019-2020
Workshop Leader, High School Marine Science Symposium, Boston, MA	2020
Assistant Facilitator, TNC New England Climate Adaptation Strategy Team	2019-2020
Workshop Leader, Boston Harbor Educators Conference, Boston, MA	2019
Salt Marsh Restoration Volunteer, Safe Harbor Environmental (Wellfleet, MA)	2013

Guest Lecturer

Invited to teach classes, give lectures, and lead field trips about extreme weather events, coastal geology, and women in STEM for:

UMass Boston Nantucket Field Station Short Course, Nantucket, MA	2023
Center for Coastal Studies Volunteer Conference, Provincetown, MA	2023
World Ocean Day, Devil's Purse Brewing Company, South Dennis, MA	2023
Provincetown Business Guild Camp Provincetown "Marsh March"	2023
Stonehill College Marine Ecosystems Class, Easton, MA	2022
Alzheimer's Family Support Center, Brewster, MA	2022
Fine Arts Work Center, Provincetown, MA	2022
Friends of the Sippewissett Marsh & Beaches, Falmouth, MA	2022
Massachusetts Rivers Alliance, Cambridge, MA	2022
Center for Coastal Studies Board of Directors, Provincetown, MA	2022
Children's School of Science, Woods Hole, MA	2018-2021
Center for Coastal Studies Climate Change Working Group, Provincetown, MA	2021
University of Connecticut Geology Graduate Students, Storrs, CT	2021
PS 205 Middle School Science Club, Brooklyn, NY	2020
East Falmouth Elementary School, East Falmouth, MA	2015-2019
Dedham Middle School, Dedham, MA	2019
The Berkeley Carroll School, Brooklyn, NY	2019
The Rivers School, Weston, MA	2018
Wellesley College, Wellesley, MA	2018
Marguerite E. Small Elementary School, West Yarmouth, MA	2017
Waquoit Bay Summer Science School, Waquoit, MA	2017
Stonehill College, Easton, MA	2017
Parley's Park Elementary School, Park City, UT	2013

Selected Additional Outreach Experience

Smith College Geology Alumnae Panel, Northampton, MA	2022
Wade Institute Coastal Geological Processes Workshop Facilitator	2021
Northeastern Marine Science Center Science Café: Science Around Massachusetts (<i>Invited Panelist</i>)	2021
The Nature Conservancy Nature Connects Webinar (<i>Invited Panelist</i>)	2021
Northeastern Open Classroom: Climate Change, Boston, MA (<i>Invited Panelist</i>)	2020
Broader Impacts Group Outreach Symposium, Woods Hole, MA	2019
Kenneth C. Combs School STEM Night, Mashpee, MA	2018
Bourne Elementary School Science Expo, Bourne, MA	2017
Science & Technology Education Partnership Family Night, Woods Hole, MA	2016
Wild Weather Weekend, Boston Museum of Science, Boston, MA (<i>Invited Panelist</i>)	2016
WHOI Associate's Afternoon of Science, Woods Hole, MA (<i>Invited Presenter</i>)	2015
Native Use In Science, Mashpee Wompanoag Summer Camp, Falmouth, MA	2015
MIT Patron's Circle, Cambridge, MA (<i>Invited Presenter</i>)	2015

Invited Talks

- Castagno, K.A.**, Fitzgerald, E.J., Legare, B., Nichols, O.C., Smith, T.P., Borrelli, M. 2022. Monitoring sediment dynamics and aquaculture in advance of marsh restoration. American Geophysical Union Fall Meeting. Oral presentation. (Chicago, IL)
- Castagno, K.A.** 2022. Monitoring sediment dynamics in advance of the Herring River Restoration Project. Cape Cod National Seashore Science in the Seashore Symposium. (Eastham, MA)
- Castagno, K.A.**, Tomiczek, T., Shepard, C., Beck, M.W., Bowden, A., O'Donnell, K., Scyphers, S. 2022. Resistance, resilience, and recovery of salt marshes in the Florida Panhandle following Hurricane Michael. Joint Aquatic Science Meeting. (Grand Rapids, MI)

- Castagno, K.A.** Field and modeling approaches to understanding and maximizing ecosystem services in salt marshes. 2022. Lamont Doherty Earth Observatory Biology and Paleo Environment Seminar. (Virtual)
- Castagno, K.A.** 2021. Pre-restoration sediment monitoring for the Herring River Restoration Project. State of Wellfleet Harbor Conference. (Virtual)
- Castagno, K.A., Ganju, N.K., Beck, M.W., Bowden, A., Scyphers, S.** 2021. Determining marsh restoration benchmarks to maximize coastal protection benefits. Coastal and Estuarine Research Federation Biennial Conference. (Virtual)
- Castagno, K.A.** Field and modeling approaches to maximizing ecosystem services with salt marsh restoration. 2021. Cornell University Biogeochemistry, Environmental Science, and Sustainability Seminar. (Virtual)
- Castagno, K. A., Donnelly, J. P., Woodruff, J.D.** 2020. Applications and caveats of inverse modeling to reconstruct tropical cyclones. Joint Southeastern / Northeastern Geological Society of America Section Meeting. (Reston, VA)

Professional Presentations

- Castagno, K.A., Fitzgerald, E.J., Legare, B., Nichols, O.C., Zuniga, P.** 2022. Oyster recruitment and sedimentation in Wellfleet Harbor in advance of the Herring River restoration project. Wellfleet Harbor Conference. Poster presentation. (Wellfleet, MA)
- Castagno, K.A.** 2022. How much marsh restoration is enough to deliver coastal protection benefits? Martha's Vineyard Coastal Conference. Oral presentation. (Vineyard Haven, MA)
- Castagno, K.A., Fitzgerald, E.J., Borrelli, M., Smith, T.,** 2022. An analysis of washover fan deposits resulting from perigean spring tides in Wellfleet, Massachusetts. Oral presentation. (Salem, MA)
- Castagno, K.A., Fitzgerald, E.J., Smith, T., Borrelli, M.** 2021. Drivers of stability in a tidally-restricted estuary in advance of restoration. American Geophysical Union Fall Meeting. Oral presentation. (New Orleans, LA)
- Borrelli, M., Castagno, K.A., Smith, T., Peri, F.** 2021. Preliminary results from pre-restoration estuarine sedimentation monitoring for the Herring River Restoration Project, Cape Cod, MA. Coastal and Estuarine Research Federation Biennial Conference. Oral presentation. (Virtual)
- Bowden, A., Castagno, K.A.** 2021. Bridging the gap between academia and application in coastal sustainability through collaborative research. Coastal and Estuarine Research Federation Biennial Conference. Oral presentation. (Virtual)
- Castagno, K. A., Borrelli, M., Smith, T., Peri, F.** 2021. Estuarine sedimentation monitoring protocols for the Herring River Restoration Project, Cape Cod, MA. New England Estuarine Research Society and Atlantic Estuarine Research Society Joint Meeting. Oral presentation. (Virtual)
- Castagno, K. A., Ganju, N. K., Scyphers, S., Beck, M. W., Bowden, A.** 2020. How much marsh restoration is enough to deliver coastal protection benefits. American Geophysical Union Fall Meeting. Oral presentation. (Virtual)
- Castagno, K. A., Donnelly, J. P., McKeon, K.** 2020. Investigating widespread historic erosion in a Connecticut salt marsh. New England Estuarine Research Society Fall Conference. Oral presentation. (Virtual)
- Castagno, K. A., Tomiczek, T., Scyphers, S., Shepard, C.** 2020. Quantification of salt marsh damage in the Florida Panhandle from Hurricane Michael: Implications for recovery and resilience. American Shore & Beach Preservation Association National Coastal Conference. Oral presentation. (Virtual)
- Castagno, K. A., Donnelly, J. P.** 2019. Impacts of hurricane events on form and function of a Connecticut salt marsh. Coastal & Estuarine Research Federation Biennial Conference. Oral presentation. (Mobile, AL)

- Castagno, K. A.,** Ruehr, S. A., Donnelly, J. P., Woodruff, J. D. 2018. Grain-size distribution and patterns in storm-induced event beds in a coastal pond. American Geophysical Union Fall Meeting. (Washington, D.C.)
- Fagherazzi, S., Kearney, W. S., Jiménez-Robles, A. M., Hopkinson, C., **Castagno, K. A.,** Ganju, N. K. 2018. Assessing salt marsh resilience with sediment fluxes: the critical role of marine sediment inputs. American Geophysical Union Fall Meeting. (Washington, D.C.)
- Castagno, K.A.,** Ruehr, S. A., Donnelly, J. P., Woodruff, J. D. 2018. Grain-size distribution as a metric for hurricane intensity from storm-induced event beds. Graduate Climate Conference. (Seattle, WA)
- Castagno, K. A.,** Donnelly, J. P. 2018. Grain-size analysis of hurricane-induced event beds in a New England salt marsh. New England Estuarine Research Society Annual Meeting. Oral presentation. (New Bedford, MA)
- Castagno, K.A.,** Ruehr, S. A., Donnelly, J. P., Woodruff, J. D. 2017. Grain-size distribution as a metric for hurricane intensity based on analysis of event beds in a coastal New England pond. American Geophysical Union Fall Meeting. Oral presentation. (New Orleans, LA)
- Castagno, K. A.,** Donnelly, J. P. 2017. Grain-size analysis of hurricane-induced event beds in a New England salt marsh. Association of American Geographers Annual Meeting. (Boston, MA)
- Castagno, K. A.,** Jiménez-Robles, A. M., Fagherazzi, S., Donnelly, J. P. 2016. Impacts of storm events on salt marsh sediment dynamics. American Geophysical Union Fall Meeting. Oral presentation. (San Francisco, CA)
- Castagno, K. A.,** Donnelly, J. P. 2015. Inverse modeling of storm intensity based on grain-size analysis of hurricane-induced event beds. American Geophysical Union Fall Meeting. (San Francisco, CA)
- Pruss, S. B., Fike, D., **Castagno, K. A.,** and Hurtgen, M. T., 2013, Carbon isotope analysis in conglomerates of the Cambro-Ordovician Cow Head Group, western Newfoundland as a proxy for the origin of carbonate cements, *Mineralogical Magazine*, v. 77, n. 5, p. 2001. (Florence, Italy)
- Castagno, K. A.,** Pruss, S. B., and Hurtgen, M. T., 2011, Geochemical analysis of the Cambro-Ordovician Cow Head Group, western Newfoundland, *Annual Geological Society of America Meeting Abstracts with Programs*, v. 43, n. 5, p. 96. (Minneapolis, MN)
- Castagno, K. A.,** Pruss, S. B., and Hurtgen, M. T., 2011, Geochemical analysis of the Cambro-Ordovician Cow Head Group, western Newfoundland, *Northeast Geological Society of America Meeting Abstracts with Programs*, v. 43, n. 1, p. 90. (Pittsburgh, PA)
- Castagno, K. A.,** Pruss, S. B., and Hurtgen, M. T., 2011, Geochemical analysis of the Cambro-Ordovician Cow Head Group, western Newfoundland, *Five College Undergraduate Geology Symposium*, Amherst College. (Amherst, MA)
- Castagno, K. A.,** Pruss, S. B., 2010, Geochemical Examination of the Cambro-Ordovician Cow Head Group Carbonates in Western Newfoundland, *Smith College Celebrating Collaborations Program*, p. 5. (Northampton, MA)
- Beyer, M., **Castagno, K. A.,** Glumac, B., and Curran, H. A., 2010, Carbonate Black Pebbles in the Paleosol at the Pleistocene/Holocene Boundary at Bamboo Point, San Salvador, Bahamas, *Smith College Celebrating Collaborations Program*, p. 4. (Northampton, MA)
- Castagno, K. A.,** Pruss, S. B., 2009, Snowball Earth: What's Wrapped Up in Namibian Roll-Up Structures?, *Five College Undergraduate Geology Symposium*, Amherst College. (Amherst, MA)

Awards and Honors

Coastal and Estuarine Research Federation Early Career Travel Award	2023
Coastal and Estuarine Research Federation #CERFhaiku Winner	2019
Coastal and Estuarine Research Federation Early Career Travel Award	2019
Buck Ketchum Prize for Best Graduate Student Oral Presentation at Annual Meeting of the New England Estuarine Research Society	2018
Olav Slaymaker Award for Best Student Oral Presentation at Annual Meeting of the Canadian and American Quaternary Associations	2018
Norman C. Rasmussen Fellowship	2014-2015
University of Rhode Island Dean's List	2012-2014
Cum Laude with Highest Honors in Geoscience	2012
Smith College Dean's List	2008-2012
Smith College First Group Scholar	2008-2012
Association for Women Geoscientists Sand Travel Award	2011
Smith College Summer Undergraduate Research Fellow	2009, 2011
Smith College International Experience Grant	2009, 2011
Smith College Student Research in Departments (STRIDE) Scholar	2008-2010
Bausch and Lomb Honorary Science Award	2007

Affiliations

American Geophysical Union (AGU)
 Coastal and Estuarine Research Federation (CERF)
 Geological Society of America (GSA)
 Massachusetts Marine Educators (MME)
 New England Estuarine Research Society (NEERS)

Technical Skills

Software: MATLAB, ESRI ArcGIS, QGIS, Adobe Creative Suite, Microsoft Office Suite, Google Earth, HTML, CSS, PHP

Modeling: Sea, Lake, and Overland Surges from Hurricanes (SLOSH); Simulating Waves Nearshore (SWAN); Delft3D

Field/Laboratory: Marsh and pond sediment coring (hand auger, push, Russian, vibracore), marsh plant identification, RTK-GPS, Conductivity-Temperature-Depth (CTD) casts, accelerometer deployment, altimeter deployment, Acoustic Doppler current profiler deployment, Chirp system seafloor mapping, tree coring and dendrochronologic sample collection, radiometric dating (^{137}Cs , ^{210}Pb , ^{14}C) and chronology building, x-ray fluorescence (XRF) spectroscopy and radiography, particle-size analysis (Beckmann Coulter, Camsizer, hand sieving), loss-on-ignition, stable isotopes ($\delta^{13}\text{C}$)