

# Christie A. Hegermiller, PhD

*Assistant Professor*

Civil and Environmental Engineering  
University of Washington  
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## RESEARCH INTERESTS

Ocean, coastal, and estuarine processes; numerical modeling; ocean waves; sediment transport; coastal change.

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## EDUCATION

2017	<b>PhD Ocean Sciences</b>	<i>University of California, Santa Cruz, CA</i>
2011	<b>BS Environmental Geosciences</b>	<i>Boston College, MA</i>
2009	<b>Sea Education Association</b>	

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## RESEARCH

2023-Present	<b>Assistant Professor</b>	<i>Civil and Environmental Engineering, University of Washington</i>
2021-2023	<b>Senior Research Scientist</b>	<i>Sofar Ocean Technologies</i>
2019-2021	<b>Mendenhall Postdoctoral Fellow</b>	<i>Woods Hole Coastal and Marine Science Center United States Geological Survey</i>
2017-2019	<b>Postdoctoral Scholar</b>	<i>Coastal Ocean Fluid Dynamics Laboratory Woods Hole Oceanographic Institution</i>  <i>Woods Hole Coastal and Marine Science Center United States Geological Survey</i>
2012-2017	<b>Doctoral Researcher</b>	<i>Pacific Coastal and Marine Science Center United States Geological Survey</i>
2010-2011	<b>Research Assistant</b>	<i>Coastal Systems Group Coastal Ocean Fluid Dynamics Laboratory Woods Hole Oceanographic Institution</i>
2008-2011	<b>Research Assistant</b>	<i>Coastal Processes Lab Boston College</i>

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## TEACHING

2015	<b>Teaching Assistant</b>	Ocean Sciences, <i>University of California, Santa Cruz</i> OCEA90: Fundamentals of Climate.
2014, 2015	<b>Teaching Assistant</b>	Ocean Sciences, <i>University of California, Santa Cruz</i> OCEA130/230: Biological Oceanography.
2013	<b>Teaching Assistant</b>	Ocean Sciences, <i>University of California, Santa Cruz</i> OCEA80B: Our Changing Planet.

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## PUBLICATIONS

- C. Dorsay, G. Egan, I. Houghton, **C.A. Hegermiller**, and P.B. Smit, in revision. Proxy observations of surface wind from a globally distributed network of wave buoys. *Journal of Atmospheric and Oceanic Technology*.
- M. Olabarrieta, J.C. Warner, and **C.A. Hegermiller**, 2023. Development and application of an Infragravity Wave (InWave) driver to simulate nearshore processes. *Journal of Advances in Modeling Earth Systems*. doi:10.1029/2022MS003205
- Houghton, I. A., S.G. Penny, **C.A. Hegermiller**, M. Cesaretti, C. Teicheira, and P.B. Smit, 2023. Ensemble-based data assimilation of significant wave height from Sofar Spotters and satellite altimeters with a global operational wave model. *Ocean Modeling*. doi:10.1016/j.ocemod.2023.102200
- Hsu, C., **C.A. Hegermiller**, J.C. Warner, and M. Olabarrieta, 2023. Ocean surface gravity wave evolution during three along-shelf propagating tropical cyclones: Model's performance of wind-sea and swell. *Journal of Marine Science and Engineering*. doi:10.3390/jmse11061152
- Sherwood, C.R., and others, 2023. Sound-Side Inundation and Seaward Erosion of a Barrier Island During Hurricane Landfall. *Journal of Geophysical Research: Earth Surface*. doi:10.1029/2022JF006934
- Bao, D., Xue, Z. G., Warner, J. C., Moulton, M., Yin, D., **Hegermiller, C. A.**, and others, 2022. A numerical investigation of Hurricane Florence-induced compound flooding in the Cape Fear Estuary using a dynamically coupled hydrological-ocean model. *Journal of Advances in Modeling Earth Systems*, 14, e2022MS003131. doi:10.1029/2022MS003131
- Hegermiller, C.A.**, J.C. Warner, M. Olabarrieta, C.R. Sherwood, and T.S. Kalra, 2022. Barrier island breach dynamics during Hurricanes Sandy and Matthew. *Journal of Geophysical Research: Earth Surface*. doi.org/10.1029/2021JF006307
- Houghton, I. A., **C.A. Hegermiller**, C. Teicheira, and P.B. Smit, 2022. Operational assimilation of spectral wave data from the Sofar Spotter network. *Geophysical Research Letters*, 49, e2022GL098973. https://doi.org/10.1029/2022GL098973
- Sherwood, C.R., A. Van Dongeren, J. Doyle, **C.A. Hegermiller**, and others, 2021. Modeling the morphodynamics of coastal responses to extreme events: What shape are we in? *Annual Review of Marine Sciences*. doi: 10.1146/annurev-marine-032221-090215
- Over, J.R., J.A. Brown, C.R. Sherwood, **C.A. Hegermiller**, P.A. Wernette, A.C. Ritchie, and J.A. Warrick, 2021. A survey of storm-induced seaward-transport features observed during the 2019 and 2020 hurricane seasons. *Shore and Beach*. doi: 10.31223/X5DP69
- Zambon, J.B., R. He, J.C. Warner, and **CA. Hegermiller**, 2021. Impact of SST and surface waves on Hurricane Florence (2018): A coupled modeling investigation. *Weather and Forecasting*. doi: 10.1175/WAF-D-20-0171.1

- Hegermiller, C.A.**, J.C. Warner, M. Olabarrieta, and C.R. Sherwood, 2019. Wave-current interaction between Hurricane Matthew wave fields and the Gulf Stream. *Journal of Physical Oceanography*. doi: 10.1175/JPO-D-19-0124.1
- Erikson, L.H., A. Espejo, P.L. Barnard, K.A. Serafin, **C.A. Hegermiller**, A. O'Neill, P. Ruggiero, and P. Limber, 2018. Identification of storm events and contiguous coastal sections for deterministic modeling of extreme coastal flood events in response to climate change. *Coastal Engineering*. doi: 10.1016/j.coastaleng.2018.08.003
- Hegermiller, C.A.**, A. Rueda, L.H. Erikson, P.L. Barnard, J.A.A. Antolinez, and F.J. Mendez, 2017. Controls of multimodal wave conditions in a complex coastal setting. *Geophysical Research Letters*, 44, doi: 10.1002/2017GL075272
- A. Rueda, **C.A. Hegermiller**, J.A.A. Antolinez, P. Camus, S. Vitousek, P. Ruggiero, P.L. Barnard, L.H. Erikson, A. Tomas, and F.J. Mendez, 2017. Multiscale Climate Emulator of Multi-peaked Spectra: MUSCLE-spectra. *Journal of Geophysical Research: Oceans*. doi: 10.1002/2016JC011957
- Hegermiller, C.A.**, J.A.A. Antolinez, A. Rueda, P. Camus, J. Perez, L.H. Erikson, P.L. Barnard, and F.J. Mendez, 2016. A wave spectrum-based approach to defining the predictor for statistical downscaling of local wave climate. *Journal of Physical Oceanography*, 47, doi: 10.1175/JPO-D-16-0191.1
- Shope, J.B., Storlazzi, C.D., L.H. Erikson, and **C.A. Hegermiller**, 2016. Changes to extreme wave climates of islands within the Western Tropical Pacific throughout the 21<sup>st</sup> century under RCP 4.5 and RCP 8.5, with implications for island vulnerability and sustainability. *Global and Planetary Change*, 141, 25-38, doi: 10.1016/j.gloplacha.2016.03.009
- Erikson, L.H., **C.A. Hegermiller**, P.L. Barnard, P. Ruggiero, and M. van Ormondt, 2015. Projected wave conditions in the Eastern North Pacific under the influence of two CMIP5 climate scenarios. *Ocean Modelling*, 96(1): 171-185, doi: 10.1016/j.ocemod.2015.07.004

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## NON-REFEREED PUBLICATIONS

- Hegermiller, C.A.**, L.H. Erikson, and P.L. Barnard, 2016. Nearshore waves in southern California: hindcast, and modeled historical and 21<sup>st</sup>-century projected time series. U.S. Geological Survey summary of methods to accompany data release. doi: 10.5066/F7N29V2V.
- Erikson, L.H., **C.A. Hegermiller**, P.L. Barnard, and C. Storlazzi, 2016. Wave projections for United States mainland coasts. U.S. Geological Survey summary of methods to accompany data release. doi: 10.5066/F7D798GR.
- Storlazzi, C.D., J.B. Shope, L.H. Erikson, **C.A. Hegermiller**, and 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. doi: 10.3133/ofr20151001.

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## HONORS AND AWARDS

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| 2019 | Mendenhall Research Fellowship, USGS   |
| 2017 | Postdoctoral Scholarship, WHOI   |
| 2016 | Wells Fargo Coastal Sustainability Fellowship<br>President's Dissertation Quarter Fellowship, UCSC |
| 2015 | Robert L. Wiegand Scholarship for Coastal Studies, CSBPA   |

2014 Global Oceans Student Research Award, Seymour Center and Friends of LML  
 2011 Departmental Honors, Boston College, Earth and Environmental Science

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#### NATIONAL CONFERENCE PRESENTATIONS (*presenter only*)

2021 **Recovery of erosional features following Hurricane Dorian.** *Poster*, Coastal Dynamics. Virtual.

2020 **Sound-side inundation and erosion of North Core Banks during Hurricane Dorian (2019).** *Oral Presentation*, AGU Fall Meeting. Virtual.  
**Nearshore circulation and sediment transport at a barrier island breach during Hurricane Matthew (2016).** *Poster*, Ocean Sciences Meeting. San Diego, CA.

2019 **Wave-current interaction between Hurricane Matthew and the Gulf Stream.** *Poster*, Gordon Research Conference on Coastal Ocean Dynamics. Manchester, NH.

2018 **Response of coastal waves and surge to interaction between Hurricane Matthew and the Gulf Stream.** *Oral Presentation*, AGU Fall Meeting. Washington, D.C.  
**Tidally-driven circulation of an idealized small, shallow estuarine embayment.** *Oral Presentation*, Ocean Sciences Meeting. Portland, OR.

2017 **Future wave climate of the U.S. Pacific Islands.** *Oral Presentation*, Geological Society of America, Cordilleran Section. Honolulu, HI.

2016 **Southern California coastal response to CMIP5 projected 21<sup>st</sup> century wave conditions.** *Poster*, Ocean Sciences Meeting. New Orleans, LA.

2015 **Offshore to onshore: projection of 21<sup>st</sup> century deep-water waves and coastal response along the California coast.** *Oral Presentation*, CSBPA Coastal Future Conditions Workshop. San Francisco, CA.

2014 **Projected migration of Pacific basin extreme wave generation regions and future wave climate of the U.S. West Coast.** *Oral Presentation*, Ocean Sciences Meeting. Honolulu, HI.

2012 **Projected wave climate along San Francisco outer coast.** *Oral Presentation*, ASBPA Rising to the Challenge Conference. San Diego, CA.

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#### WORKSHOP AND ACADEMIC PRESENTATIONS (*presenter only*)

2021 **Sound-side inundation and erosion during Hurricane Dorian.** *Seminar*, Coastal Change Hazards Seminar. US Geological Survey. Virtual.  
**Sound-side inundation and erosion during Hurricane Dorian.** *Seminar*, Coastal Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution. Virtual.  
**Coupled modeling of oceanic, atmospheric, and sediment dynamics across spatial scales with COAWST.** *\*Invited Seminar*. USGS Community for Data Integration Workshop, Integrated Modeling. Virtual.  
**InWave.** *\*Invited Seminar*. Coupled Ocean-Atmosphere-Wave-Sediment Transport Modeling System training. Virtual.

2020 **New understanding of barrier island breaching during hurricanes.** *Seminar*, Mendenhall Seminar Series. US Geological Survey. Virtual.  
**Barrier island breaching dynamics during Hurricanes Sandy and Matthew.** *Seminar*, Coastal Change Hazards Seminar. US Geological Survey. Virtual.

- 2019 **Hurricane waves in the coastal ocean: Interaction across scales.** *\*Invited Seminar*, Atmosphere, Ocean, and Climate Seminar Series. MIT. Cambridge, MA.  
**The COAWST Toolbox.** *\*Invited Seminar*, Coupled Ocean-Atmosphere-Wave-Sediment Transport Modeling System training. University of North Carolina.  
**Ocean-atmosphere-wave coupling: sensitivity to bulk flux formulations.** *\*Invited Seminar*, Coupled Ocean-Atmosphere-Wave-Sediment Transport Modeling System training. University of North Carolina.  
**Response of coastal waves during Hurricane Matthew to wave-current interaction over the Gulf Stream.** *Seminar*, Coastal Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution. Woods Hole, MA.
- 2018 **Surf's up – statistical and dynamical projection of changing wave conditions and coastal response.** *\*Invited Seminar*, Department of Earth and Environmental Sciences, Boston College. Chestnut Hill, MA.  
**Interaction between Hurricane Matthew and the Gulf Stream.** *Oral Presentation*, Woods Hole Oceanographic Institution Postdoctoral Symposium. Woods Hole, MA.  
**Towards simulating extreme coastal morphological change using coupled models: Challenges in modeling waves and hydrodynamics.** *\*Invited Oral Presentation*, NSF Workshop on Coastal and Estuarine Modeling. Raleigh, NC.  
**Regional wave modeling of Hurricane Matthew on the E.F.L. Shelf.** *Oral Presentation*, ONR Littoral Geosciences Review. Monterey, CA.
- 2017 **Tidal circulation of an idealized small, shallow estuarine bay.** *Poster*, Woods Hole Oceanographic Institution Postdoctoral Symposium. Woods Hole, MA.  
**Modeling of coastal wave and estuarine processes, with application to California.** *Defense*, University of California at Santa Cruz. Santa Cruz, CA.  
**Large-scale controls on Southern California wave climate.** *\*Invited Seminar*, Southern California Coastal Water Research Project. Los Angeles, CA.  
**Large-scale atmospheric controls of multi peaked directional wave spectra along the Southern California coast.** *\*Invited Seminar*, Coastal Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution. Woods Hole, MA.  
**Large-scale atmospheric controls of multi peaked directional wave spectra along the Southern California coast.** *Seminar*, Pacific Coastal and Marine Science Center, United States Geological Survey. Santa Cruz, CA.

## OUTREACH AND MENTORSHIP

- 2017 - **Skype-a-Scientist.** Connections with 25+ K-12 classrooms around the country.  
Present
- 2021 **Science education.** Sea Education Association girls program.
- 2019 **Teach** local 3<sup>rd</sup> grade classes on weather and climate.  
WHOI Annual Fund Donors event.
- 2018 **Science booth.** Woods Hole Science and Technology Education Partnership Liaison Dinner.  
**Science education** program with middle school girls.  
**Seminar.** *Surf's Up, Probably: Statistical and dynamical predictions of changing wave conditions.* WHOI Summer Student Fellow Lecture Series.
- 2017 **Science education** brainstorming session with 6<sup>th</sup> grade teachers at Morse Pond School.

	<b>Feature.</b> USGS Coastal and Ocean Science, Women in Science.
	<b>Media.</b> <i>Where the river meets the sea.</i> Coastal Sustainability Blog, < <a href="https://tinyurl.com/n4bnscsq">https://tinyurl.com/n4bnscsq</a> >.
	<b>Public lecture.</b> <i>Waves, coasts, and climate change.</i> UCSC Osher Life Long Learners.
2016	<b>Radio Interview.</b> KSCO, Good Morning Monterey Bay.
	<b>Science advisor</b> to high school students. Monterey Bay Marine Space Station, < <a href="http://www.marinespacestation.org">http://www.marinespacestation.org</a> >.
	<b>Public lecture.</b> <i>Waves, coasts, and climate change.</i> Santa Cruz Walnut Commons Cohousing, Seminar Series.
	<b>Lecture.</b> <i>Waves, coasts, and climate change.</i> Scotts Valley High School, Marine Biology.
	<b>Public lecture.</b> <i>Surf's Up, Probably: Predicting the Future of California's Waves.</i> Santa Cruz Yacht Club, Winter Informational Series.
	<b>Media.</b> <i>Changing wave conditions: the other coastal threat.</i> Coastal Sustainability Blog, < <a href="http://tinyurl.com/zjkawwq">http://tinyurl.com/zjkawwq</a> >.
	<b>Media.</b> UCSC Coastal Sustainability e-Newsletter.
2015	<b>Lecture.</b> <i>Surf's Up, Probably: Statistical Methods for Projecting 21<sup>st</sup> Century California Waves.</i> UCSC STEM Graduate Series Seminar.
2012	<b>Science booth.</b> First Friday: Coastal Cleanup. Museum of Art and History, Santa Cruz, CA.

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## SERVICE

2020-2021	<b>Hiring Committee</b> , Postdoc, WHCMSC, USGS
2019-2020	<b>Hiring Committee</b> , Oceanographer, WHCMSC, USGS
2019-2020	<b>Co-convener</b> , Nearshore Processes Session, Ocean Sciences Meeting 2020
2018-2019	<b>Secretary</b> , Postdoctoral Association, Woods Hole Oceanographic Institution
2018	<b>Planning Committee</b> , Fall Symposium, Society for Women in Marine Sciences
2017-2018	<b>President</b> , Postdoctoral Association, Woods Hole Oceanographic Institution
2017-	<b>Reviewer</b>
Present	Estuaries and Coasts; Journal of Geophysical Research; Journal of Marine Science and Engineering; Ocean Modelling; Journal of Atmospheric and Oceanic Technology; Atmosphere; Applied Ocean Research; Geophysical Research Letters; Journal of Physical Oceanography; Estuarine and Coastal Shelf Science

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## WORKSHOPS AND TRAINING

2021	Unlearning Racism in Geosciences. Virtual.
2020	Bias and Bystander Intervention Training, USGS. Virtual.
2019	Pattullo Conference, MPOWIR. VA.
2017	Communicating Coastal Sustainability Science. University of California, Santa Cruz.
2014	Coordinated Ocean Wave Climate Project Workshop. Paris, France.
2011	Our Changing Oceans, National Council for Science and the Environment. Washington, D.C.

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## FIELD EXPERIENCE

2018-2019 Multiscale bedforms in a dynamic tidal inlet. PIs. D.K. Ralston, P. Traykovski, WHOI.

2014-2017 Shoreline change along the California Coast. PI: P.L. Barnard, USGS.

2014 Wave attenuation in Corte Madera Bay and marsh, PI: J.R. Lacy, USGS.

2011 *R/V T.G. Thompson* (48 days). A deep-AUV magnetic and seismic study of the Hawaiian Jurassic crust –the global significance of Jurassic magnetic anomalies, PI: M. Tominaga and M. Tivey, WHOI.

2011 Hydrodynamics and particle transport in Penobscot River and Bay, PI: W.R. Geyer, WHOI.

2010 *SSV Corwith Cramer* (30 days). Jake Peirson MIT/WHOI JP Student Cruise and Science at SEA, Sea Education Association.

2010 Hydrodynamics and particle transport in Penobscot River and Bay, PI: W.R. Geyer, WHOI.

2010 Mechanisms of fluid mud interactions under waves, PI: G.C. Kineke, MURI.

2009 *SSV Corwith Cramer* (36 days). SEA Semester, Sea Education Association, Chief Scientist: J. Schell.

2008 Fluid mud in energetic systems, PI: G.C. Kineke, BC.