Hannah Baranes *(she/her)*

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Gulf of Maine Research Institute
350 Commercial Street
Portland, ME 04101

Education	**University of Massachusetts Amherst**	2017–Aug. 2021

Ph.D., Geosciences
Thesis Committee: Jonathan Woodruff (advisor), Robert DeConto, Raymond Bradley, and Elisabeth Hamin
Thesis: *Advances in assessing flood hazard and sediment dynamics at the coast*

University of Massachusetts Amherst 2013-15
M.S., Geosciences
Thesis Advisor: Jonathan Woodruff
Thesis: *Sedimentological records and numerical simulations of the C.E. 1707 Hōei tsunami in tsunami in southwestern Japan*

Dartmouth College 2008-12
B.A., Earth Science
Thesis Advisor: Meredith Kelly
Honors Thesis: *Surface exposure dating of the Huancané III moraines in Peru: A record of Quelccaya Ice Cap's maximum extent during the last glacial period*

Appointments   **Assistant Research Scientist** Mar. 2024—
Climate Center, Gulf of Maine Research Institute
Using observation and modeling-based methods to develop localized coastal flood hazard information for Maine; develop technical guidance and decision support tools to support rulemaking and adaptation around coastal flooding

Postdoctoral Researcher Jan. 2022–Feb. 2024
Climate Center, Gulf of Maine Research Institute
Mentor: David Reidmiller

Postdoctoral Researcher Sep. 2021-Jan. 2022
Department of Civil & Environmental Engineering, California Polytechnic State University
Advisor: Stefan Talke
Developed a suite of statistical/analytical tools to evaluate the spatially varying influences of sea level rise, vertical land motion, river flows, and tides on water levels in the Sacramento-San Joaquin Delta.

Graduate Researcher 2017-21
Department of Geosciences, University of Massachusetts Amherst

Insurance-Linked Securities Consultant 2016
AIR-Worldwide, Boston, MA
Developed earthquake and tropical cyclone hazard modeling procedures for insurance-linked securities triggered by modeled financial loss

Graduate Researcher and Teaching Assistant   2013-15
Department of Geosciences, University of Massachusetts Amherst

Member Leader   2013
AmeriCorps, Barnstable, MA
Coordinated and led projects for a 13-person team in natural resource
management, disaster preparedness & response, and environmental education

Publications [13] Sun, S., **Baranes, H.**, Loomis, E. & Brooks, C. (in review). Tremont Municipal
Climate Vulnerability Assessment.

[12] **Baranes, H.**, Slovinsky, P. & Whiteman, N. (in press). *Sea level rise, coastal
flooding, and landscape impacts.* In: Maine Climate Council (in press). *Scientific
Assessment of Climate Change and Its Effects in Maine.*

[11] **Baranes, H.**, Dykstra, S. L., Jay, D. A. & Talke, S.A. (2023). Sea level rise and
the rivers of daily water levels in the Sacramento-San Joaquin Delta. *Scientific
Reports,* 13(1), 22454, DOI: 10.1038/s41598-023-49204-z.

[10] Yellen, B., Woodruff, J. D., **Baranes, H.**, Engelhart, S., Geyer, W. R., Randall,
N., & Griswold, F. (2023), Salt marsh response to inlet switch-induced
increases in tidal inundation. *Journal of Geophysical Research: Earth Surface*, 128(1),
DOI: 10.1029/2022JF006815.

[9] Cho, A., Kashima, K., **Baranes, H.**, Ladlow, C., Katsuki, K., & Woodruff, J. D
(2023), Fossil diatom assemblage changes due to paleoenvironment change,
tsunami, and typhoon in southern Japan, *Island Arc,* 32(1).

[8] Cooke, M. L., **Baranes, H.**, Castañeda, I. S., Woodruff, J. D., & Boutt, D.
(2022), After GRExit: Reducing bias in geoscience graduate admissions, *Eos,*
103, DOI: 10.1029/2022EO220285.

[7] DeConto, R. M., **Baranes, H.**, Woodruff, J. D., Halberstat, A. R., & Kopp, R.
E. (2022), Sea Level Rise. In E. Douglas & P. Kirshen (Eds.). *Climate Change
Impacts and Projections for the Greater Boston Area* (pp. 67-99).

[6] **Baranes, H.**, Woodruff, J. D., Geyer, W. R., Yellen, B. C., Richardson, J. B., &
Griswold, F. (2022), Sources, mechanisms, and timescales of sediment delivery
to a New England Salt Marsh. Journal of Geophysical Research: Earth Surface,
DOI: 10.1029/2021JF006478.

[5] Enríquez, A. R., Wahl, T., **Baranes, H.**, Talke, S., Orton, P., Booth, J., &
Haigh, I. D. (2022), Predictable changes in extreme sea levels and coastal
flood risk due to long-term tidal cycles. *Journal of Geophysical Research: Oceans,*
DOI: 10.1029/2021JC018157.

[4] **Baranes, H.**, Woodruff, J. D., Talke, S. A., Kopp, R. E., Ray, R. D., &
DeConto, R. M. (2020). Tidally driven interannual variation in extreme sea level
frequencies in the Gulf of Maine. *Journal of Geophysical Research Letters: Oceans*,
DOI: 10.1029/2020JC016291.

[3] Ladlow, C., Woodruff, J. D., Cook, T. L., **Baranes, H.**, & Kanamaru, K. (2019). A fluvially derived flood deposit dating to the Kamikaze typhoons near Nagasaki, Japan. *Natural Hazards, 99(2)*, 827-841, DOI: 10.1007/s11069-019-03777-z.

[2] **Baranes, H.**, Woodruff, J. D., Loveless, J. P., and Hyodo, M. (2018), Interseismic coupling-based earthquake and tsunami scenarios for the Nankai Trough, *Geophysical Research Letters*, DOI: 10.1002/2018GL077329.

[1] **Baranes, H.**, Woodruff, J. D., Wallace, D. J., Kanamaru, K., and Cook, T. L. (2016), Sedimentological records of the C.E. 1707 Hōei tsunami and regional coastal flooding from the Bungo Channel, southwestern Japan, *Natural Hazards*, DOI: 10.1007/s11069-016-2498-3.

Grants

Active
National Science Foundation Civic Innovation Challenge, Stage 2   2023-24
Codeveloping local flood thresholds and high tide flooding predictions with community science and innovative technology ($1,000,000)
PI: David Reidmiller (GMRI); Co-I: Gayle Bowness (GMRI)
H. Baranes led project ideation, partnerships, and proposal development

Maine Department of Transportation (RFQ# T202204001)   2022-25
Maine Coastal Flood Risk Model ($35,305 subaward)
Project lead: Woods Hole Group; Project partners: **H. Baranes**, Kim Huguenard (UMaine), Kelly Cole (UMaine), Paul Kirshen (UMass Bos.), Tom Ballestero (UNH), Damian Brady (UMaine), CMA Engineers

National Fish and Wildlife Foundation – National Coastal Resilience Fund   2023-24
Bridging the science-action gap in Maine with a coastal flooding projections and education hub ($162,952)
PI: **H. Baranes**

Complete
National Science Foundation Civic Innovation Challenge, Stage 1 (Award ID: 2228587)   Oct. 2022-Mar. 2023
Codeveloping local flood thresholds and high tide flooding predictions with community science and innovative technology ($50,000)
PI: David Reidmiller (GMRI); Co-I: Gayle Bowness (GMRI)
H. Baranes led writing of project description and data management plan

Fellowships
Northeast Climate Adaptation Science Center Fellowship	2020-21
NASA Earth and Space Sciences Graduate Fellowship ($120,000)	2017-19
UMass Amherst University Fellowship	2013-14
Massachusetts Space Grant Summer Fellowship ($5,000)	2014
Steffanson Fellowship, field research grant, Dartmouth College ($4,000)	2011
John Lindsley Fund, field research grant, Dartmouth College ($4,000)	2011

Service	**Maine Climate Council, Scientific & Technical Subcommittee**	2023—

Serving among a group of scientists mandated by Maine Public Law Chapter 476 "to identify, monitor, study and report out to the [Maine Climate] Council and to the working groups… findings and recommendations related to climate change in the State and its effects on the State's climate, species, marine and coastal environments and natural landscapes and on the oceans and other bodies of water."

Ch. 600 Marine Oil Terminal Natural Hazard Risk Assessment Work Group 2024—

Developing technical guidance for marine oil terminal owners to incorporate sea level rise into Natural Hazard Risk Assessments mandated by Ch. 600 state regulations that are part of the licensing process.

Diversity, Equity, Inclusion, Justice & Accessibility Staff Advisory Group, Gulf of Maine Research Institute 2024—

Support the management team and board of directors in translating broad diversity, equity, inclusion, justice, and accessibility goals into specific objectives and plans of action.

Fifth National Climate Assessment Review Editor 2023

Worked with the Coastal Effects chapter authors to ensure that all public and peer review comments were addressed in the assessment's Fourth Order Draft

Greater-Boston Research Advisory Group 2019-22

Developing state-of-the-art coastal flood projections for the City of Boston by combining probabilistic sea level projections with joint tide-surge statistics; co-authoring the sea level rise and coastal flooding chapter for a final report aimed at policymakers and practitioners in the greater-Boston area

BRiDGE Committee Member 2020-21

Co-coordinator for lecture series that brings early-career scientists from underrepresented minority groups to the UMass campus for informal mentorship sessions, research talks, and broader impacts talks, with the mission of combatting attrition of students from underrepresented minority groups in STEM

UMass Geosciences Graduate Application Co-Author 2020

Worked with department faculty to co-write an application supplement that promotes holistic review and inclusion in the graduate application process

Cryosphere Pavilion at COP-25 2019

Presented on coastal hazards to climate negotiators, NGO representatives, researchers, and media at the COP-25 United Nations Climate Change Conference; served as a volunteer organizing logistics at the International Cryosphere and Climate Change Initiative's Cryosphere Pavilion

Massachusetts State Representative Climate Briefing 2019

Gave an oral and written briefing on coastal flooding and erosion hazards in Massachusetts to State Representative Michael J. Finn, chair of the Massachusetts House Committee on Global Warming and Climate Change

Mentorship	**Gulf of Maine Research Institute**	
	▪ Connor Brooks, Research Technician (2023-4)	
	▪ Rachael Smith, Masters Thesis Committee, University of Maine (2024—)	
	▪ Coastal Measures (startup company), Blue w(AI)ve Accelerator scientific mentor (2023-4)	
	▪ Dakota Williams, National Science Foundation Research Experience for Undergraduates (NSF REU; 2024)	
	▪ Chelsea Moody, NSF REU (2023)	
	▪ Erica Loomis, Colby/Buck Lab Internship (2023)	
	▪ Connor Brooks, NSF REU (2022)	

UMass Amherst Geosciences (co-advising)
- Honors project: *Sediment delivery to New England salt marshes* (2018-20)
- Honors project: *Sedimentological flood archives in southwestern Japan* (2014)
- Senior honors thesis co-advisor*: Sedimentological signatures of regional seismicity in western Shikoku and eastern Kyushu, Japan* (2014)

University Teaching	**Guest Lecturer,** University of New England	2022
	Geographic Information Systems (1 class): intro to sea level rise	
	Guest Lecturer, Geosciences, UMass Amherst	2019-20
	Integrative Experience (1 class): science communication	
	Coastal Processes (4 classes): sea level rise, storm surge, tides, flood statistics	
	Natural Hazards (2 classes): coastal erosional hazards, earthquakes, tsunamis	
	Teaching Assistant, Geosciences, UMass Amherst	2014-15
	Sedimentology and Sedimentology Lab	
	Sedimentology Honors Colloquium	
	Introductory Oceanography	

Awards	Capitol Hill Scholar	2019
	University Corporation for Atmospheric Research, Washington, DC	
	Outstanding Geosciences Teaching Assistant	2015
	Department of Geosciences, UMass Amherst	
	John Ebers Prize, Most Outstanding Earth Science Undergraduate	2012
	Department of Earth Science, Dartmouth College	
	Upham Geology Prize, Most Outstanding Senior Honors Thesis	2012
	Department of Earth Science, Dartmouth College	
	Sigma Xi science, math, and engineering research competition, first place	2012
	Dartmouth College	

Fieldwork	*Maine U.S.* – Tide gauge installation	2022–
	Northeastern U.S. – Assessment of sediment supply to tidal marshes	2018-21
	Shikoku and Kyushu, Japan – Paleotsunami reconstructions	2013-14
	Quelccaya Ice Cap, Peru – Tropical terrestrial climate change records	2011
Selected	USA Under-24 National Team Assistant Coach (USA Ultimate)	2020–

Coaching & Athletic Achievements	Founding athlete, Portland Rising (Maine professional ultimate team)	2020–
	Silver Medalist, World Ultimate Championships	2018
	Head Coach and Program Director, Amherst High School Ultimate	2017-21
	National Champion, USA Ultimate Mixed Division	2016
	Coach, Harvard University Ultimate	2015-16
	Coach, National Ultimate Training Camp	2015-16

Invited Talks & Community Presentations

[32] Evaluating coastal flood hazard; Maine and New Hampshire Port Safety Forum; April 9, 2024

[31] Evaluating coastal flood hazard; Maine and New Hampshire spill response committee meeting (hosted by US Coast Guard); March 28, 2024

[30] Sea Changes: Understanding and Preparing for Coastal Maine's Extreme Weather Events; Chebeague Cumberland Land Trust; February 13, 2024

[29] Coastal Flooding on January 10 and 13; Waterfront Alliance; February 13, 2024

[28] Drivers, Monitoring, and Impacts of Coastal Flooding in the Gulf of Maine; Saint George Resiliency Committee; February 7, 2024

[27] Gulf of Maine Flood Hazard; USGS Northeast Climate Adaptation Science Center Review; February 6, 2024

[26] February High Tides: Gathering Scientific Data; Coastal Maine middle school students; January 31, 2024

[25] Climate Vulnerability in Tremont; Community vulnerability assessment readout; January 23, 2024

[24] Sea level rise in the Sacramento San Joaquin Delta; Presentation to California State Senator Laird; December 11, 2023

[23] Portland "Influencers"; King Middle School; November 14, 2023

[22] Climate and Coastal Hazards; Semester by the Sea; October 30, 2023

[21] Coastal flooding science; NSF Civic Innovation Challenge Teacher Institute; October 27, 2023

[20] Rising seas and warming waters: Climate stresses to Gulf of Maine marine species; Western Maine Audubon Society; October 11, 2023

[19] Communicating about sea level rise; Seguinland Institute; October 4, 2023

[18] Sea level rise and coastal flooding; SOS Saco Bay Annual Meeting; September 27, 2023

[17] Climate and Coastal Hazards; Fulbright Teachers; August 8, 2023

[16] Rise Up! Portland; Sea level rise panel with Halcyon string quarter; May 4, 2023

[15] Gulf of Maine Flood Hazard: From Theoretical to Community-Collaborative Research, Northeast Climate Adaptation Science Center, March 29, 2023

[14] Sea Level Rise Science, Coastal Flood Risk, and Resilience Measures, Lincolnville Conservation Commission, February 9, 2023

[13] Coastal Climate Risks; Freeport Sustainability Board, February 6, 2023

[12] Saint George Students and Sea Level Rise; Saint George Middle School, February 1, 2023

[11] Building Stronger Communities – Sea Level Rise: From Understanding to Action; Governor's Office of Policy Innovation & the Future Community Resilience Partnership webinar series; November 21, 2022

[10] Climate change impacts to parks, Maine Recreation & Park Association Fall Workshop, October 14, 2022

[9] Demystifying Sea Level Rise and Coastal Flooding Projections, SOS Saco Bay Coastal Conference, September 27, 2022

[8] Massive Tides, Warming Waters, and Rising Seas: The Gulf of Maine Explained, Mount Washington Observatory Science in the Mountains Lecture Series, September 13, 2022

[7] Preparing Communities for Sea Level Rise, King Middle School, June 1, 2022

[6] Demystifying Sea Level Rise and Flooding Projections, Maine Department of Environmental Protection Webinar Series, April 26, 2022.

[5] Preparing Coastal Communities for Sea Level Rise and Flooding, Biddeford Climate Task Force monthly meeting, April 25, 2022.

[4] Preparing Coastal Communities for Sea Level Rise and Flooding, Rockport Conservation Commission monthly meeting, April 13, 2022.

[3] Global to Local Projections of Sea Level Rise for the Town of Falmouth, Falmouth Town Meeting, March 9, 2022.

[2] The Greenland and Antarctic Ice Sheets: Sea Level Implications and the South Pacific, 25th Conference of Parties, Madrid, Spain, December 12, 2019.

[1] Big Tides and Rising Sea: Estimating Flood Hazard in a Changing World, 25th Conference of Parties, Madrid, Spain, December 2, 2019.

Media Interviews

[7] Feb 15, 2024; Associated Press (Print and Film); It's time for Northeast to prep for floods like those that hit this winter. Climate change is why. February 15, 2024; WCBS Newsradio 880 (Television); January Coastal Storms

[6] Feb 14, 2024; CBC Montreal (Television); Lacôte du Maine dévastée par les tempêtes

[5] Jan 28, 2024; Boston Globe (Print); January storms nearly wiped out Maine's lobster industry. Now comes the hard part

[4] Jan 26, 2024; CNN (Television); Watch back-to-back storms wreak havoc in New England

[3] October 23, 2023; News Center Maine (Television); Gulf of Maine Research Institute study seeks to improve flood resiliency in coastal communities by tracking water levels

[2] 2023; Documentary; We are destroyed

[1] Nov 11, 2022; New Center Maine (Television); Maine scientists use new tools to help improve flood preparedness

Conference Presentations

[23] *Talk:* Brooks, C. & **Baranes, H.** (Mar. 2024), Developing a coastal flood risk assessment framework to support climate-smart working waterfronts in Maine, *GSA Northeastern Section Annual Meeting*

[22] *Poster:* **Barnes, H.**, Talke, S. A., Dykstra, S. L., & Jay, D. (Dec. 2023), Drivers of daily water levels and sea level rise in the Sacramento-San Joaquin Delta, San Francisco Bay, *American Geophysical Union Annual Meeting*

[21] *Poster:* **Baranes, H.**, Bowness, G., Bursk, C., Carter, J., Fisher, A., Glazer, B., Harvey, M., Johnson, T., Lea, R., Long, A., Reidmiller, D. & Young Morse, R. (Dec. 2023), Leveraging Community Science and low-cost water level sensors for building local flood resilience, *American Geophysical Union Annual Meeting*

[20] *Talk:* S.A. Talke, N. McGuire, S. Dykstra, **H. Baranes**, S. Lee (Apr. 2023), Is flood risk in the Sacramento-San Joaquin Delta increasing? *California State Universities Water Conference*

[19] *Talk:* Woodruff, J., Autery, M., **Baranes, H.,** Cook, T., Griswold, F., Hansen, L., & Yellen, B. (Apr. 24-28, 2023), Controls on Sediment Delivery to New England Salt Marshes and Resulting Limits on Future Resilience, *EGU General Assembly*

[18] *Talk:* Talke, S., McGuire, N., Dykstra, S., **Baranes, H.,** Lee, S. (Apr., 2023), Is flood risk in the Sacramento-San Joaquin Delta increasing? *California State Universities Water Conference.*

[18] *Talk:* Dykstra, S., **Baranes, H.**, Talke, S., & Jay, D. (Oct. 24-28, 2022), The many factors influencing sea level trends and variability in deltas, *Physics of Estuaries and Coasts Conference.*

[17] *Talk:* Steinke, C. & **Baranes, H.** (Sep. 16, 2022), A data-based approach to building a coastal flood adaptation strategy for Portland's Union Wharf, *Island Institute Climate Symposium.*

[16] *Talk:* Kirshen, P., **Baranes, H.,** Pagsuyoin, S., Hamin Infield, E., Kahl, K., & Thiagarajan Sharman, K. (Jul. 19-21, 2022), Northeast Center for Coastal Resilience, *National Working Waterfront Network Conference.*

[15] *Talk:* Griswold, F., Woodruff, J. D., Yellen, B. C., **Baranes, H.,** Cook, T., Autery, M., Hansen, O., & Wenczel, S. (Mar. 20-22, 2022), Sediment sourcing and accumulation on New England marshes, *GSA Northeastern Section Annual Meeting.*

[14] *Poster:* Autery, Molly, Cook, T., Woodruff, J. D., Yellen, B. C., Griswold, F., **Baranes, H.,** & Hansen, O. (Mar. 20-22, 2022), Regional variability of accretion rates in northeastern USA salt marshes in relation to unvegetated to vegetated ratio (UVVR), *GSA Northeastern Section Annual Meeting.*

[13] *Talk:* Yellen, B. C., Woodruff, J. D., **Baranes, H.,** Engelhart, S., Geyer, W. R., & Randall, N. (Dec 13-17, 2021), Salt marsh response to rapid sea level rise after barrier breach, *AGU Fall Meeting.*

[12] *Poster:* McKeon, K., Allen, J., **Baranes, H.,** Boutt, D., Bowlick, F. J., Brown, L. L., Cooke, M. L., Fattaruso, L., Griswold, F., Hatch, C. E., Lehnigk, K., Sadai, S., Smith, R. A., & UMass Geosciences URGE Pod (Dec 13-17, 2021), Initiating new efforts to track and improve DEI within the Department of Geosciences at UMass Amherst, *AGU Fall Meeting.*

[11] *Talk:* **Baranes, H.,** Woodruff, J. D., Geyer, W. R., Yellen, B. C., & Richardson, J. B. (Nov 4, 2021), Mechanisms and timescales of sediment delivery to a New England salt marsh, *Coastal and Estuarine Research Federation Biennial Conference.*

[10] *Talk:* **Baranes, H.,** Woodruff, J. D., Talke, Kopp, R. E., S. A., Ray, R. D., & DeConto, R. M. (Feb 16-21, 2020), Tidally-driven interannual variation in extreme sea level probabilities in the Gulf of Maine, *AGU Ocean Sciences.*

[9] *Talk:* **Baranes, H.,** Woodruff, J. D., Talke, S. A., Ray, & R. D. (Mar 17-19, 2019), Interannual variation in extreme water level probabilities in the Gulf of Maine, *GSA Northeastern Section Annual Meeting.*

[8] *Talk:* Ladlow, C., Woodruff, J. D., Cook, T. L., **Baranes, H**., & Kanamaru, K. (Mar 17-19, 2019), A fluvially-derived flood deposit dating to the Kamikaze typhoons in Kawahara, Japan, *GSA NE Section Annual Meeting.*

[7] *Poster:* **Baranes, H.,** Woodruff, J. D., Talke, S. A., & Ray, R. D. (Dec 10-14, 2020), The influence of tidal variation on flood risk in the Gulf of Maine, *AGU Fall Meeting.*

[6] *Talk:* Ladlow, C., Woodruff, J. D., **Baranes, H**., Kanamaru, K., & Cook, T. L. (Dec 10-14, 2018), Evidence of fluvially-derived sediment during the Kamikaze typhoons near Nagasaki, Japan, *AGU Fall Meeting.*

[5] *Talk:* **Baranes, H.,** Woodruff, J. D., Loveless, J. P., & Hyodo, M. (May 20-24, 2018), Intersiesmic coupling-based earthquake and tsunami scenarios for the Nankai Trough, *Japan Geoscience Union Annual Meeting.*

[4] *Talk:* **Baranes, H.,** Woodruff, J. D. Loveless, J. P., Cheng, W., Weiss, R., & Kanamaru, K. (Dec 14-18, 2015), Using present-day patterns of interseismic coupling to model the C.E. 1707 Hōei earthquake and simulate tsunami inundation of Lake Ryuuoo, in the Bungo Channel, southwestern Japan, *AGU Fall Meeting.*

[3] *Talk:* **Baranes, H.,** Woodruff, J. D., Wallace, D. J., Kanamaru, K., & Cook, T. L. (Oct 19-22, 2014), Sedimentological records of the 1707 AD Hōei tsunami from the Bungo Channel, Japan, *GSA Annual Meeting.*

[2] *Talk:* **Baranes, H.,** Woodruff, J. D., Wallace, D. J., Kanamaru, K., & Cook, T. L. (Jul 28-Aug 1, 2014), A 1000-year sedimentary reconstruction of extreme coastal flooding for the Bungo Channel of Japan, *Asia Oceania Geosciences Society Annual Meeting.*

[1] *Talk:* **Baranes, H.,** Woodruff, J. D., Wallace, D. J., Kanamaru, K., & Cook, T. L. (Mar 23-25, 2014), Sedimentological impacts of large scale inundation events: Records of tsunami and typhoon flooding from Lake Ryuuoo, Japan, *GSA Northeastern Section Annual Meeting.*