

Jennifer Linnea Irish

Charles P. Lunsford Professor

Civil & Environmental Engineering · Virginia Tech · Blacksburg, VA 24061

jirish@vt.edu · jennifer-irish.com · [Google Scholar](#)

BIOGRAPHY

Jennifer Irish is the Charles P. Lunsford Professor of coastal engineering at Virginia Tech and a globally recognized expert in storm surge dynamics, coastal hazard assessment, and nature-based coastal infrastructure. Before transitioning to academia in 2006, she served as a Coastal Engineering Regional Technical Specialist for the U.S. Army Corps of Engineers. With over 70 journal papers and 6,000 citations, Professor Irish has made impactful contributions to coastal engineering. Her research has driven advancements in storm surge physics and probabilistic hazard assessment, hazard mitigation using vegetation and barrier islands, the impacts of sea level rise, and airborne lidar bathymetry. She has led or co-led academic research projects totaling US\$25 million, with US\$4 million supporting her research program. Her achievements have earned her prestigious honors, including the U.S. Fulbright Senior Scholar Fellowship and the U.S. Department of the Army's Superior Civilian Service Award. She currently serves as Vice Chair of the Coastal Engineering Research Council and has previously served as Chair of the American Society of Civil Engineers' (ASCE) Committee on Technical Advancement and as Secretary of ASCE's Coasts, Oceans, Ports, and Rivers Institute Board of Governors. Professor Irish's leadership and scientific contributions have been recognized with election to the Virginia Academy of Science, Engineering, and Medicine and to Fellow of the American Society of Civil Engineers.

EDUCATION

University of Delaware

Ph.D. Civil Engineering, Coastal Engineering focus
05/2005

Lehigh University

M.S. Civil Engineering, Hydraulic Engineering focus
05/1994

B.S. Civil Engineering
05/1992

ACADEMIC AND PROFESSIONAL APPOINTMENTS

Virginia Tech

Blacksburg, VA USA

- Charles P. Lunsford Professor, Department of Civil and Environmental Engineering
08/2025 – present
- Coordinator, Environmental and Water Resources Engineering Program, Department of Civil and Environmental Engineering
08/2022 – present
- Faculty Athletics Representative (appointed by Virginia Tech's President)
08/2021 – present
- Professor, Department of Civil and Environmental Engineering
08/2016 – present
- Associate Professor, Department of Civil and Environmental Engineering
08/2011 – 08/2016

Texas A&M University

College Station, TX USA

- Assistant Professor, Department of Civil and Environmental Engineering
08/2006 – 08/2011

U.S. Army Corps of Engineers

- Coastal Engineering Regional Technical Specialist, North Atlantic Division and New York District
New York, NY USA
10/2001 – 07/2006
- Research Coastal Engineer, Coastal and Hydraulics Laboratory in residence at Mobile District
Mobile, AL USA
08/1998 – 09/2001¹
- Coastal Engineer, Coastal Engineering Research Center
Vicksburg, MS USA
07/1994 – 08/1997

¹ Gap to complete doctoral coursework from 8/1997 - 8/1998; dissertation completed while working full time

Visiting Appointments

- Visiting Scholar, University of Haifa in residence at Morris Kahn Marine Research Station
Caesarea, Israel
01/2019 – 05/2019
- Visiting Scholar, Taylor Engineering Research Institute, University of North Florida
Jacksonville, FL, USA
05/2017 – 07/2017

HONORS AND AWARDS

- Full Member (invited), Sigma Xi, The Scientific Research Honor Society (since 2025)
- Member (elected), Virginia Academy of Science, Engineering and Medicine (VASEM) (since 2019)
- 2018-2019 U.S. Fulbright Senior Scholar All-Disciplines Fellowship
- Fellow (elected), American Society of Civil Engineers (ASCE) (since 2017)
- 2015-2017 College of Engineering Faculty Fellow, Virginia Tech
- 2013 *Journal of Waterway, Port, Coastal, and Ocean Engineering* Outstanding Paper (for Irish and Resio, 2013)
- 2013 Scholar of the Week, Virginia Tech
- 2011 AGU Research Spotlight, American Geophysical Union (for Song et al., 2011)
- 2010 Civil Engineering Excellence in Research Award, Texas A&M University
- 2008 Zachry Department of Civil Engineering Award for Excellence, Texas A&M University
- 2008 Department of the Army Superior Civilian Service Award, U.S. Army Director of Civil Works
- 2006 Department of the Army Achievement Medal, U.S. Army Corps of Engineers
- 2006 Department of the Army Commander's Award for Civilian Service, U.S. Army Corps of Engineers, New York District
- 2006 Department of the Army Commander's Award for Civilian Service, U.S. Army Corps of Engineers, Mississippi Valley Division
- 2004 Commander's Outstanding Scientific Achievement Award, U.S. Army Corps of Engineers, New York District
- 1997 Gustav Willems Award, PIANC International (for Irish, 1997)
- 1997 Gustav Willems Award, U.S. Section PIANC (for Irish, 1997)

- 1996 Best of Conference, 2nd International Airborne Remote Sensing Conference, Environmental Research Institute of Michigan
- 1994 Elizabeth Major Nevius Award, Lehigh University
- 1990 and 1991 Edward Twigg Memorial Scholarship, Lehigh University
- Member, Chi Epsilon Honorary Society

PUBLICATION SUMMARY

Citation Statistics

- Number of journal and other refereed publications: 91
- Total citations (Google Scholar): 6,241
- h-index (Google Scholar): 35
- i10-index (Google Scholar): 70
- Eight papers in top 5% of most-cited papers in their respective journals (Web of Science)

Journal Citation Honors

- *Most Cited* (2nd) article published in *Journal of Waterway, Port, Coastal, and Ocean Engineering* between 2022-2025 (2025): Hoagland et al. (2023).
- *Top Cited* (4th) article published in *Coastal Engineering* between 2021-2024 (2024): Lee et al. (2021).
- *Top Cited* (4th) article published in *Coastal Engineering* between 2009-2014 (2014): Augustin et al. (2009).

Five Most Highly Cited Journal Papers

*indicates graduate student

1. Woodruff, J. D., Irish, J. L., Camargo, S. J., [Coastal flooding by tropical cyclones and sea level rise](#), *Nature*, 504, 44-52, 2013. In top 5% of most-cited articles published in *Nature* (Web of Science); 966 cites (Google Scholar).
2. Augustin*, L. N., Irish, J. L., Lynett, P. L., [Laboratory and numerical studies of wave damping by emergent and near-emergent wetland vegetation](#), *Coast Eng*, 56(3), 332-340, 2009. In top 1% of most-cited articles published in *Coastal Engineering* (Web of Science); 554 cites (Google Scholar).
3. Irish, J. L., Resio, D. T., Ratcliff, J. J., [The influence of storm size on hurricane surge](#), *J Phys Oceanogr*, 38, No. 9, 2003-2013, 2008. In top 1% of most-cited articles published in *Journal of Physical Oceanography* (Web of Science); 540 cites (Google Scholar).

4. Irish, J. L., Lillycrop, W. J., [Scanning laser mapping of the coastal zone: The SHOALS system](#), *ISPRS-J. Photogramm Remote Sens*, 54, 123-129, 1999. In top 5% of most-cited articles published in *ISPRS Journal of Photogrammetry and Remote Sensing* (Web of Science); 370 cites (Google Scholar).
5. Mousavi*, M. E., Irish, J. L., Frey*, A. E., Olivera, F., Edge, B. L., [Global warming and hurricanes: The potential impact of hurricane intensification and sea level rise on coastal flooding](#), *Clim Change*, 104(3-4), 575-597, 2011. In top 5% of most-cited articles published in *Climatic Change* (Web of Science); 361 cites (Google Scholar).

SIGNIFICANT PROFESSIONAL LEADERSHIP AND SERVICE

- Member, Planning Committee, U.S. National Academies and Virginia Academy of Science, Engineering and Medicine's Regional Flood Resilience Workshop
2025 - present
- Member, U.S. National Science Foundation's Natural Hazards Engineering Research Infrastructure (NHERI) DesignSafe Advisory Board
2024 - present
- Vice Chair (2021-present) and Member, Coastal Engineering Research Council (CERC)
2014 – present
- Associate Editor, *Journal of Waterway, Port, Coastal, and Ocean Engineering*
2014 – present
- Advisory Editorial Board, *Coastal Engineering*
2014 – present
- Co-Chair (2020) and Member, Weather Impact Study Board of the Virginia General Assembly's Joint Commission on Technology and the Science & Virginia Academy of Science, Engineering and Medicine
2020 – 2021
- Co-Chair, Organizing Committee, Virginia Academy of Science, Engineering and Medicine's 2018 Summit on Securing Prosperity in the Coastal Zone, Richmond
2018
- Member, U.S. National Academies' Committee on Long-term Coastal Zone Dynamics: Interactions and Feedbacks between Natural and Human Processes and their Implications for the U.S. Coastline
2017 – 2018
- Member, U.S. National Science Foundation's Natural Hazards Engineering Research Infrastructure (NHERI) Task Group: Five-Year Science Plan
2016 – 2022

- Past Chair (2017-2018), Chair (2016-2017), Vice Chair (2015-2016), and Executive Committee Member, American Society of Civil Engineers' (ASCE) standing Committee on Technical Advancement
2014 – 2018
- Secretary (2008-2012) and Member, ASCE Coasts, Oceans, Ports, and Rivers Institute's (COPRI) Coastal and Estuarine Hydrosience Committee
2005 – 2019
- Member, Board of Trustees, Academy of Coastal, Ocean, Port and Navigation Engineers
2012 – 2015
- Member, Strategic Sciences Group, Operational Group Sandy, U.S. Department of Interior
2013 – 2014
- Secretary, Board of Governors of ASCE COPRI
2008 – 2012

SIGNIFICANT EXPERT ADVISOR CONSULTANCY

- Chair, 2023 and 2029 Coastal Master Plan Predictive Models Technical Advisory Committees, Coastal Protection and Restoration Authority (CPRA) of Louisiana
2019 – present
- Expert panelist, Barriers to Problem Solving - Climate Adaptation and USACE, U.S. Army Corps of Engineers (via CDM Smith)
2023 - 2024
- Standing Member, External Review Board, Louisiana Center of Excellence (RESTORE Act), The Water Institute of the Gulf
2016 – 2019
- Expert advisor to U.S. Nuclear Regulatory Commission (via Taylor Engineering)
2015 – 2022
- Member, 2017 Coastal Master Plan Science and Engineering Board, Coastal Protection and Restoration Authority (CPRA) of Louisiana
2015 – 2017

SELECTED UNIVERSITY LEADERSHIP AND SERVICE

(excludes appointments listed previously)

- Chair (2025-present) and Member, Virginia Tech's University Athletics Committee.
2021 – present

- Founder and Faculty Advisor, Virginia Tech American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute (EWRI) – Coasts, Oceans, Ports, and Rivers Institute (COPRI) graduate student chapter
2011 – present
- Voting Member (elected), Civil and Environmental Engineering Promotion and Tenure Committee
2022 – 2025
- Associate Director, Center for Coastal Studies
2019 – 2023
- Chair (elected, 2017-2018), Vice Chair (elected, 2016-2017), and College of Engineering Representative (elected), Virginia Tech's Commission on Research
2014 – 2018
- Founder and Faculty Advisor, Inaugural ASCE COPRI graduate student chapter, founded at Texas A&M University
2010 – 2011

JOURNAL PUBLICATIONS

*Indicates graduate student, **Indicates undergraduate student, †Indicates postdoctoral scholar

1. Jeffries*, C. R., Weiss, R., **Irish**, J. L., Mandli, K., [Impacts of barrier-island breaching on mainland flooding during storm events applied to Moriches, New York](#), *Nat Hazards Earth Syst Sci*, 25, 3125-3139, 2025.
2. Daramola*, S., Muñoz, P., **Irish**, J. L., Saksena, S., Muñoz, D. F. (senior author listed last), [Predicting the evolution of extreme water levels with long short-term memory station-based approximated models and transfer learning techniques](#), *Water Resour Res*, 61(3), e2024WR039054, 2025.
3. Bernier, N., et al. (21 authors including **Irish**), [Coastal flooding science: Review, establishment of model intercomparison and coordination of surge climate projection efforts \(SurgeMIP\)](#), *Weather Clim Extremes*, 45, 100689, 2024.
4. Chilton*, W. P., Weiss, R., **Irish**, J. L., [Historical analysis of tropical and non-tropical induced flooding within the James River basin, Virginia](#), *J Flood Risk Manage*, e12998, 2024.
5. Hoagland*, S. W. H., **Irish**, J. L., Weiss, R., [Morphodynamic and modeling insights from global sensitivity analysis of a barrier island evolution model](#), *Geomorphology*, 451, 109087, 2024.
6. **Irish**, J. L., Cheng, W., Weiss, R., Patch, S. M., Beever*, M., [Influence of belowground biomass on barrier-island evolution during storms: A computational parameter study](#), *J Waterw Port C-ASCE*, 150(3), 04024003, 2024.

7. Nourali*, Z., Shortridge, J. E., Bukvic, A., Shao, Y., **Irish**, J. L., [Simulation of flood-induced human migration at the municipal-scale: A stochastic agent-based model of relocation response to coastal flooding](#), *Water*, 16(2), 263, 2024.
8. Bukvic, A., Mitchell*, A., Shao, Y., **Irish**, J. L., [Spatiotemporal implications of flooding on relocation risk in rural and urban coastal municipalities](#), *Land Use Policy*, 132, 106754, 2023.
9. Hoagland*, S. W. H., Jeffries*, C. R., **Irish**, J. L., Weiss, R., Mandli, K., Vitousek, S., Johnson, C. R., Cialone, M. A., [Advances in understanding and modeling of barrier island evolution: A review](#), *J. Waterw Port C-ASCE*, 149(5), 03123001, 2023.
10. Lee*, J.-W., **Irish**, J. L., Weiss, R., [Real-time prediction of alongshore near-field tsunami runup distribution from heterogeneous earthquake slip distribution](#), *J Geophys Res*, 128(1), e2022JC018873, 2023.
11. Mitchell*, A., Bukvic, A., Shao, Y., **Irish**, J. L., McLaughlin, D., [Toward collaborative adaptation: Assessing impacts of coastal flooding at the watershed scale](#), *Envir Manage*, 71, 741–754, 2022.
12. Weiss, R., Dura, T., **Irish**, J. L., [Modeling coastal environmental change and the tsunami hazard](#), *Front Mar Sci*, 9, 871794, 2022.
13. Weiss, R., **Irish**, J. L., Goodman Tchernov, B., [Boulder dislodgement during coastal storms and tsunamis: Insights from a new ensemble model](#), *Geochem Geophys*, 23, e2021GC010266, 2022.
14. Allen, T., et al. (33 authors including **Irish**), [Anticipating and adapting to the future impacts of climate change on the health, security and welfare of Low Elevation Coastal Zone \(LECZ\) communities in Southeastern USA](#), *J Mar Sci Eng*, 9, 1196, 2021.
15. Lee*, J.-W., **Irish**, J. L., Bensi, M., Marcy, D., [Rapid prediction of peak storm surge from tropical cyclone track time series using machine learning](#), *Coast Eng*, 170, 104024, 2021.
16. Lee*, J.-W., **Irish**, J. L., Weiss, R., [Probabilistic near-field tsunami source and tsunami run-up distribution inferred from tsunami run-up records in northern Chile](#), *J Geophys Res*, 126(6), e2021JC017289, 2021.
17. Berman, J., Wartman, J., Olsen, M., **Irish**, J., Miles, S., Tanner, T., Gurley, K. R., Lowes, L., Bostrom, A., Dafni, J., Grilliot, M., Lyda, A., Peltier, J., [Natural hazards reconnaissance with the NHERI RAPID Facility](#), *Front Built Environ*, 6, 185, 2020.
18. Lee*, J.-W., **Irish**, J. L., Weiss, R., [Rapid prediction of alongshore run-up distribution from near-field tsunamis](#), *Nat Hazards*, 104(2), 1157–1180, 2020.
19. Wartman, J., Berman, J., Bostrom, A., Miles, S., Olsen, M., Gurley, K. R., Lowes, L., **Irish**, J., Tanner, T., Dafni, J., Grilliot, M., Lyda, A., Peltier, J., [Research needs, challenges, and strategic approaches for natural hazards and disaster reconnaissance](#), *Front Built Environ*, 6, 182, 2020.

20. Bilskie*, M. V., Hagen, S. C., **Irish**, J. L., [Development of return period stillwater floodplains for the northern Gulf of Mexico under the coastal dynamics of sea level rise](#), *J Waterw Port C-ASCE*, 145(2), 04019001, 2019.
21. Liu*, Y., Asher, T., **Irish**, J. L., [Physical drivers of changes in probabilistic surge hazard under sea level rise](#), *Earth's Future*, 7, 819-832, 2019.
22. Liu*, Y., **Irish**, J. L., [Characterization and prediction of tropical cyclone forerunner surge](#), *Coast Eng*, 147, 34-42, 2019.
23. von Holle, B., **Irish**, J. L., Spivy*, A., Weishampel, J., Meylan, A., Godfrey, M., Dodd, M., Schweitzer, S., Keyes, T., Sanders, F., Chaplin, M. K., Taylor*, N., [The effects of future sea level rise on coastal habitat](#), *J Wildl Manag*, 83, 694-704, 2019.
24. Hsu*, C.-H., Olivera, F., **Irish**, J. L., [A hurricane surge risk assessment framework using the joint probability method and surge response functions](#), *Nat Hazards*, 91(S1), 7-28, 2018.
25. Keeler, A. G., McNamara, D. E., **Irish**, J. L., [Responding to sea level rise: Does short-term risk reduction inhibit successful long-term adaptation?](#), *Earth's Future*, 6(4), 617-672, 2018.
26. Yang*, Y., **Irish**, J. L., [Evolution of wave spectra in mound-channel wetland systems](#), *Estuar Coast Shelf Sci*, 207, 444-456, 2018.
27. Zainali*, A., Marivela*, R., Weiss, R., **Irish**, J. L., Yang*, Y., [Numerical simulation of nonlinear long waves in the presence of discontinuous coastal vegetation](#), *Mar Geol*, 396, 142-149, 2018.
28. Resio, D. T., Asher, T., **Irish**, J. L., [The effects of natural structure on estimated tropical cyclone surge extremes](#), *Nat Hazards*, 88(3), 1609-1637, 2017.
29. Smallegan*, S. M., **Irish**, J. L., [Barrier island morphological change by bay side storm surge](#), *J Waterw Port C-ASCE*, 143(5), 143(5), 04017025, 2017.
30. Smallegan*, S. M., **Irish**, J. L., van Dongeren, A., [Developed barrier island adaptation strategies to hurricane forcing under rising sea levels](#), *Clim Change*, 143(1-2), 173-184, 2017.
31. Yang*, Y., **Irish**, J. L., Weiss, R., [Impact of patchy vegetation on tsunami dynamics](#), *J Waterw Port C-ASCE*, 143(4), 04017005, 2017.
32. Smallegan*, S. M., **Irish**, J. L., van Dongeren, A. R., den Bieman, J. P., [Morphological response of a sandy barrier island with a buried seawall during Hurricane Sandy](#), *Coast Eng*, 110, 102-110, 2016.
33. Resio, D.T., **Irish**, J. L., [Tropical cyclone storm surge risk](#), *Curr Clim Change Rep*, 1(2), 74-84, 2015.

34. Taylor*, N. R., **Irish**, J. L., Udoh*, I. E., Bilskie*, M. V., Hagen, S. C., [Development and uncertainty quantification of hurricane surge response functions for hazard assessment in coastal bays](#), *Nat Hazards*, 77, 1103-1123, 2015.
35. Truong*, M. K., Whilden*, K. A., Socolofsky, S. A., **Irish**, J. L., [Experimental study of wave dynamics in coastal wetlands](#), *Environ Fluid Mech*, 15(4), 851-880, 2015.
36. Yang*, Y., **Irish**, J. L., Socolofsky, S. A., [Numerical investigation of wave-induced flow in mound-channel wetland systems](#), *Coast Eng*, 102, 1-12, 2015.
37. Ferreira*, C., **Irish**, J. L., Olivera, F., [Quantifying the potential impact of land cover changes due to sea-level rise on storm surge on lower Texas coast bays](#), *Coast Eng*, 94, 102-111, 2014.
38. Ferreira*, C. M., **Irish**, J. L., Olivera, F., [Uncertainty in hurricane surge simulation due to land cover specification](#), *J Geophys Res*, 119, 1812-1827, 2014.
39. Ferreira*, C. M., Olivera, F., **Irish**, J. L., [Arc StormSurge: Integrating hurricane storm surge modeling and GIS](#), *J Am Water Resour As*, 50(1), 219-233, 2014.
40. **Irish**, J. L., Sleath, A., Cialone, M. A., Knutson, T. R., Jensen, R. E., [Simulations of Hurricane Katrina \(2005\) under sea level and climate conditions for 1900](#), *Clim Change*, 122(4), 635-649, 2014.
41. **Irish**, J. L., Weiss, R., Yang*, Y., Song*, Y. K., Zainali*, A., Marivela-Colmenarejo*, R., [Laboratory experiments of tsunami runup and withdrawal in patchy coastal forest on a steep beach](#), *Nat Hazards*, 74(3), 1933-1949, 2014.
42. Passeri*, D. L., Hagen, S. C., **Irish**, J. L., [Comparison of shoreline change rates along the South Atlantic Bight and Northern Gulf of Mexico coasts for better evaluation of future shoreline positions under sea level rise](#), *J Coastal Res*, 68, 20-26, 2014.
43. Whilden*, K. A., Socolofsky, S., Chang, K.-A., **Irish**, J. L., [Using surface drifter observations to measure tidal vortices and diffusion at Aransas Pass](#), Texas, *Environ Fluid Mech*, 14(5), 1147-1172, 2014.
44. Cox*, N., Dunkin*, L. M., **Irish**, J. L., [An empirical model for infragravity swash on barred beaches](#), *Coast Eng*, 81, 44-50, 2013.
45. Hagen, S. C., **Irish**, J. L., [Implications, planning, and design considerations for rising sea levels at the coast \(Introduction\)](#), *J Waterw Port C-ASCE* [Focus Issue: Implications, planning, and design considerations for rising sea levels at the coast, S. Hagen and J. Irish (eds.)], 139, 81-81, 2013.
46. **Irish**, J. L., Lynett, P. J., Weiss, R., Smallegan*, S. M., Cheng*, W., [Buried relic seawall mitigates Hurricane Sandy's impacts](#), *Coast Eng*, 80, 79-82, 2013.
47. **Irish**, J. L., Resio, D. T., [Method for estimating future hurricane flood probabilities and associated uncertainty](#), *J Waterw Port C-ASCE* [Focus Issue: Implications, planning, and design considerations for rising sea levels at the coast, S. Hagen and J. Irish (eds.)], 139, 126-134, 2013.

48. Resio, D. T., **Irish**, J. L., Westerink, J. J., Powell, N., [The effect of uncertainty on estimates of hurricane surge hazards](#), *Nat Hazards* [Special Issue: Storm Surges, H. Kremer (ed.)], 66(3), 1443-1459, 2013.
49. Woodruff, J. D., **Irish**, J. L., Camargo, S. J., [Coastal flooding by tropical cyclones and sea level rise](#), *Nature*, 504, 44-52, 2013.
50. **Irish**, J.L., Ewing, L.C., Jones, C.P., [Observations from the 2009 Samoa Tsunami: Damage potential in coastal communities](#), *J Waterw Port C-ASCE*, 138(2), 131-141, 2012.
51. Song*, Y. K., **Irish**, J. L., Udoh*, I. E., [Regional attributes of hurricane surge response functions for hazard assessment](#), *Nat Hazards*, 64(2), 1475-1490, 2012.
52. **Irish**, J.L., Resio, D.T., Divoky, D., [Statistical properties of hurricane surge along a coast](#), *J Geophys Res*, 116, C10007, 2011.
53. **Irish**, J. L., Song*, Y. K., Chang, K.-A., [Probabilistic hurricane surge forecasting using parameterized surge response functions](#), *Geophys Res Lett*, 38, L03606, 2011. (featured in *Eos* 92(12), 108)
54. Feagin, R., **Irish**, J. L., Möller, I., Williams*, A., Colón-Rivera, R. J., Mousavi*, M. E., [Short communication: Engineering properties of wetland plants with application to wave attenuation](#), *Coast Eng*, 58(3), 251-255, 2011.
55. Mousavi*, M. E., **Irish**, J. L., Frey*, A. E., Olivera, F., Edge, B. L., [Global warming and hurricanes: The potential impact of hurricane intensification and sea level rise on coastal flooding](#), *Clim Change*, 104(3-4), 575-597, 2011.
56. Frey*, A. E., Olivera, F., **Irish**, J. L., Dunkin*, L. M., Kaihatu, J. M., Ferreira*, C. M., Edge, B. L., [Potential impact of climate change on hurricane flooding inundation, population affected, and property damages in Corpus Christi](#), *J Am Water Resour As*, 46(5), 1049-1059, 2010.
57. **Irish**, J. L., Frey*, A. E., Rosati, J. D., Olivera, F., Dunkin*, L. M., Kaihatu, J. M., Ferreira*, C. M., Edge, B. L., [Potential implications of global warming and barrier island degradation on future hurricane inundation, property damages, and population impacted](#), *Ocean Coast Manage*, 53, 645-657, 2010.
58. **Irish**, J. L., Resio, D. T., [Reply to Discussion of 'A hydrodynamics-based surge scale for hurricanes'](#), *Ocean Eng*, 37(11-12), 1085-1088, 2010.
59. **Irish**, J. L., Resio, D. T., [A hydrodynamics-based surge scale for hurricanes](#), *Ocean Eng* [Special Issue, Interagency Performance Evaluation TaskForce (Hurricane Katrina), Z. Demerbilik, (ed.)], 37(1), 69-81, 2010.
60. Augustin*, L. N., **Irish**, J. L., Lynett, P. L., [Laboratory and numerical studies of wave damping by emergent and near-emergent wetland vegetation](#), *Coast Eng*, 56(3), 332-340, 2009.

61. Humbyrd**, C.J., **Irish**, J.L., Rahoy, D.S., Alpern, R.L., Rackmales, D.N., [Variable-height bulkhead design concept for storm flood protection](#), *J Waterw Port C-ASCE*, 135(6), 296-300, 2009.
62. **Irish**, J. L., and Cañizares, R., [Storm wave flow through tidal inlets and its influence on bay flooding](#), *J Waterw Port C-ASCE*, 135(2), 52-60, 2009.
63. **Irish**, J. L., Resio, D. T., Cialone, M. C., [A surge response function approach to coastal hazard assessment. Part 2: Quantification of spatial attributes of response functions](#), *Nat Hazards* [Special Issue, Numerical modelling of storm surges, the latest developments, V. Swail (ed.)], 51(1), 183-205, 2009.
64. Loder*, N. L., **Irish**, J. L., Cialone, M. A., Wamsley, T. V., [Sensitivity of hurricane surge to morphological parameters of coastal wetlands](#), *Estuar Coast Shelf Sci*, 84, 625-636, 2009.
65. Resio, D. T., **Irish**, J. L., Cialone, M. C., [A surge response function approach to coastal hazard assessment. Part 1: Basic concepts](#), *Nat Hazards* [Special Issue, Numerical modelling of storm surges - the latest developments, V. Swail (ed.)], 51(1), 163-182, 2009.
66. Cañizares, R., **Irish**, J. L., [Simulation of storm-induced barrier-island morphodynamics and flooding](#), *Coast Eng*, 55(12), 1089-1101, 2008.
67. **Irish**, J. L., Augustin*, L. N., Balsmeier*, G. E., Kaihatu, J. M., Wave dynamics in coastal wetlands: A state-of-knowledge review with emphasis on wetland functionality for storm damage reduction, *Shore and Beach*, 76(3), 52-56, 2008.
68. **Irish**, J. L., Resio, D. T., Ratcliff, J. J., [The influence of storm size on hurricane surge](#), *J Phys Oceanogr*, 38(9), 2003-2013, 2008.
69. **Irish**, J. L., Wozencraft, J. M., Cunningham, A. G., Giroud, C., [Nonintrusive measurement of waves: Lidar wave gage](#), *J Atmos Ocean Tech*, 23(11), 1559-1572, 2006.
70. **Irish**, J. L., McClung, J. K., Lillycrop, W. J., Airborne lidar bathymetry: The SHOALS system, *PIANC Bulletin*, 103-2000, 43-53, 2000.
71. Lillycrop, W. J., **Irish**, J. L., Pope, R. W., West, G. R., GPS sends in the Marines: Rapid Environmental Assessment with lidar, *GPS World*, 11(11), 12-28, 2000.
72. **Irish**, J. L., Lillycrop, W. J., [Scanning laser mapping of the coastal zone: The SHOALS system](#), *ISPRS-J Photogramm Remote Sens*, 54, 123-129, 1999.
73. **Irish**, J. L., White, T. E., [Coastal engineering applications of high-resolution lidar bathymetry](#), *Coast Eng*, 35(1-2), 47-71, 1998.
74. **Irish**, J. L., Sensitivity of channel sedimentation prediction to wave-field characterization, *PIANC Bulletin*, 95-1997, 5-20, 1997.
75. **Irish**, J. L., Lillycrop, W. J., [Monitoring New Pass, Florida with high density lidar bathymetry](#), *J Coastal Res*, 13(4), 1130-1140, 1997.

76. Lillycrop, W. J., **Irish**, J. L., Parson, L. E., SHOALS system, *Sea Technology*, 38(6), 17-25, 1997.
77. Estep, L., Oriol, S., Parson, L., **Irish**, J., Lillycrop, J., Arnone, R., Lanier, K., An optical database for planning Airborne Lidar Hydrographic (ALH) missions, *Hydrographic Journal*, 80, 25-28, 1996.

REFEREED BOOK CHAPTERS

*Indicates graduate student

1. Hoagland*, S. W. H., Jeffries*, C. R., **Irish**, J. L., Weiss, R., Mandli, K., Vitousek, S., Johnson, C. R., Cialone, M. A., Advances in understanding and modeling of barrier island evolution: A review (Reprinted from *J Waterw Port C-ASCE*, 149(5), 03123001, 2023), *Book Series on Coastal Disasters*, Y. Kim, eds., World Scientific, in press.
2. Resio, D. T., **Irish**, J. L., Tropical cyclone storm surge risk (Reprinted from *Curr Clim Change Rep*, 1(2), 74-84, 2015), *Handbook of Coastal Engineering* 2nd Edition, Y. Kim, eds., World Scientific, 2018.
3. **Irish**, J. L., Weiss, R., Resio, D. T., Physical characteristics of coastal hazards, *Springer Handbook of Ocean Engineering*, M. Dhanak and N. Xiros, eds., Springer, 2016.
4. Resio, D. T., Tumeo, M., **Irish**, J. L., Foundations for hazard/risk assessment in coastal areas, *Springer Handbook of Ocean Engineering*, M. Dhanak and N. Xiros, eds., Springer, 2016.

OTHER REFEREED PUBLICATIONS

*Indicates graduate student, †Indicates postdoctoral scholar

1. Kim*, K., Lee †, J.-W., **Irish**, J. L., Probabilistic tropical cyclone surge hazard under future sea-level rise scenarios: A case study in the Chesapeake Bay region, USA (paper competition), 2023 World Environmental & Water Resources Congress, Henderson, NV, 2023.
2. Naurath*, B., **Irish**, J. L., Shao, Y., Using an urban growth model framework to project the impacts of climate change on coastal populations (paper competition), 2023 World Environmental & Water Resources Congress, Henderson, NV, 2023.
3. Mosuela*, K., **Irish**, J. L., Slope and bottom friction impacts on wave attenuation from living shorelines, 2022 World Environmental and Water Resources Congress, Atlanta, GA, 2022.
4. Haque*, A., Pamukçu*, D., Xie*, R., Zaker Esteghamati*, M., Cowell, M., **Irish**, J., Cascading effects of mass gatherings on COVID-19 infections from a multi-hazard

perspective: A case study of New York City, Proc. Information Systems for Crisis Response and Management 2021 Conference, Blacksburg, VA, 2021.

5. Mosuela*, K. A., **Irish**, J. L., Wave attenuation from living shorelines: A parameter study, Proc. 10th International Conference on Scour and Erosion, virtual, Rice, J., Liu, X., McIlroy, M., Sasanakul, I., and Xiao, M. (Eds), 2021.
6. Wartman, J., Berman, J. W., Olsen, M., **Irish**, J., Gurley, K., Miles, S. Lowes, L., Tanner, T., Bostrom, A., Grilliot, M., Lyda, A., Peltier, J., Capturing geotechnical extreme event performance with the NHERI RAPID, Proc. Geo-Extreme 2021: Case Histories and Best Practices, Savannah, GA, 2021.
7. Kennedy, A., Cox, D, **Irish**, J. Kaihatu, J., Lynett, P., Tomiczek, T., [Envisioning the Future Coast: Coastal Engineering Research in the Coming Decades. A report from the Coastal Engineering Research Framework Workshop, November 13-14, 2018, Arlington, VA](#), DesignSafe-C, 2020.
8. Deters*, J., Paretti, M., Zobel, C., Cowell, M., **Irish**, J. L., Assessing interdisciplinary competency in the Disaster Resilience and Risk Management graduate program using concept maps, Proc. American Society for Engineering Education's 126th Annual Conference and Exposition, Tampa, FL, Paper ID #25796, 2019.
9. National Academies of Sciences, Engineering, and Medicine (**Irish** a committee member), [Understanding the Long-term Evolution of the Coupled Natural-Human Coastal System. The Future of the U.S. Gulf Coast](#), The National Academies Press, Washington, DC, 2018.
10. Flint, M. M., Dhulipala*, L.N.S., Shahtaheri*, Y., Tahir*, H., Ladipo*, T., Eatherton, M. R., **Irish**, J. L., Olgun, C.G., Reichard, G., Rodriguez-Marek, A., Zobel, C., Developing a decision framework for multi-hazard design of resilient, sustainable buildings, Proc. 1st Int. Conf. on Natural Hazards and Infrastructure 2016 of the Earthquake Engineering Research Institute (EERI), El Cerrito, CA, 2016.
11. Guikema, S. D., Udoh*, I., **Irish**, J., Nateghi*, R., The effects of hurricane surge in power system outage risk models, Proc. Probabilistic Safety Assessment and Management 2012, Helsinki, Finland, 2012.
12. Lillycrop, W. J., Parson, L. E., **Irish**, J. L., Development and operation of the SHOALS airborne lidar hydrographic system, SPIE – CIS Selected Papers: Laser Remote Sensing of Natural Waters: From Theory to Practice, St.Petersburg, Russian Federation (V. I. Feigels, Y. I. Kopilevich [eds.]), 2964, 26-37, 1996.

CONFERENCE PAPERS (NON-REFEREED)

*Indicates graduate student, **Indicates undergraduate student

1. Najarkolaie*, K. F., **Irish**, J. L., Zhao, Y., Modarres, M., Bensi, M. (senior author listed last), Challenges in developing a risk-informed decision-making framework to address the

impacts of evolving conditions on advanced nuclear facilities, SMiRT 28, Toronto, Canada, in press.

2. Najarkolaie*, K. F., Zhao, Y., **Irish**, J. L., Modarres, M., Bensi, M. (senior author listed last), External hazard probabilistic risk assessment of advanced nuclear power technologies under evolving climate conditions, 19th International Conference on Probabilistic Safety Assessment and Analysis (PSA 2025), Chicago, IL, 2025.
3. Beever*, M., **Irish**, J. L., Weiss, R., Mandli, K. T., Jeffries*, C. R., A sensitivity analysis of barrier island breaching, Coastal Sediments 2023, New Orleans, LA, 2023.
4. Hoagland*, S.W.H., **Irish**, J.L. Weiss, R., Barrier island modeling insights from applied global sensitivity analyses, Coastal Sediments 2023, New Orleans, LA, 2023.
5. Liu*, Y., **Irish**, J. L., Predicting tropical cyclone forerunner surge, Proc. Coastal Dynamics 2017, Helsingor, Denmark, 2017.
6. Smallegan*, S. M., **Irish**, J. L., den Bieman, J. P., van Dongeren, A. R., Numerical investigation of developed and undeveloped barrier island response to Hurricane Sandy, Proc. Solutions to Coastal Disasters 2015, Boston, MA, 2015.
7. **Irish**, J. L., Ferreira*, C. M., Resio, D. T., Olivera, F., Hsu*, C. H., Hurricane hazard assessment: Considerations for sea-level rise and climate change, Proc. International Conference on Coastal Engineering 2012, Santander, Spain, 2013.
8. Rooney*, E. A., **Irish**, J. L., Weiss, R., Dalrymple, R. A., Hérault, A., Bilotta, G., Testing accuracy and convergence of GPUSPH for free-surface flows, Proc. 6th SPHERIC SPH-Workshop, Hamburg, Germany, 2011.
9. Udoh*, I. E., **Irish**, J. L., Improvements in hurricane surge response functions: Incorporating the effects of forward speed, approach angle, and sea level rise, Proc. 1st International Conference on Vulnerability and Risk Analysis and Management, College Park, MD, 2011.
10. **Irish**, J. L., Ferreira*, C. M., Song*, Y. K., Udoh*, I., Olivera, F., Chang, K.-A., Rapid probabilistic hurricane surge and damage forecasting using hydrodynamics-based surge response functions, Proc. International Conference on Coastal Engineering 2010, Shanghai, China, No. 32(2010), Paper # currents.20, 2011.
11. Song*, Y. K., **Irish**, J. L., Vittone**, C., Barkdull**, M., Tsunami-like long wave inundation in forested regions: Laboratory observations of bore propagation through discontinuous macro-roughness, 2011 CMMI Grantee Conference, Atlanta, GA, 2011.
12. Augustin*, L. N., Balsmeier*, G., **Irish**, J., Kaihatu, J., Laboratory measurements of wave attenuation and wave setup by vegetation, Proc. International Conference on Coastal Engineering 2008, Hamburg, Germany, 1, 324-330, 2009.
13. **Irish**, J. L., Frey*, A. E., Mousavi*, M. E., Olivera, F., Edge, B. L., Kaihatu, J., Dunkin*, L. M., Song*, Y. K., Predicting the influence of climate change on hurricane flooding, Proc.

International Conference on Coastal Engineering 2008, Hamburg, Germany, 2, 1050-1059, 2009.

14. Loder*, N. M., Cialone, M. A., **Irish**, J. L., Sleath, A., Reducing storm impacts through marshland restoration along the Gulf of Mexico, Proc. International Conference on Coastal Engineering 2008, Hamburg, Germany, 2, 1024-1036, 2009.
15. **Irish**, J. L., Mousavi*, M. E., Frey*, A., Edge, B., Olivera, F., Quantification of climate change impacts on hurricane flooding, ASCE Texas Chapter Annual Meeting, Corpus Christi, TX, 2008.
16. Resio, D. T., **Irish**, J., Hurricane characteristics along the northern US Gulf of Mexico coast for surge prediction, Proc. Solutions to Coastal Disasters 2008, Oahu, HI, 170-184, 2008.
17. **Irish**, J. L., Cañizares, R., The role of wave setup in predicting back-bay storm water levels: Long Island, New York, USA, Proc. International Conference on Coastal Engineering 2006, San Diego, CA, 2, 1395-1406, 2007.
18. **Irish**, J. L., Williams, B. P., Militello, A., Mark, D. J., Regional-scale storm-surge modeling of Long Island, New York, USA, Proc. International Conference on Coastal Engineering 2004, Lisbon, Portugal, 2, 1565-1577, 2005.
19. **Irish**, J. L., Cañizares, R., Grosskopf, W. G., The effect of hindcasted waves on coastal storm water levels during the blizzard of 2003, Proc. 8th International Workshop on Wave Hindcasting and Forecasting, Oahu, HI, O3, 2004.
20. Cañizares, R., Alfageme, S., **Irish**, J. L., Modeling of morphological changes at Shinnecock Inlet, New York, USA, Proc. Coastal Sediments 2003, Clearwater Beach, FL, IV-B-5, 2003.
21. Pope, J., Curtis, W., Morang, A., **Irish**, J., Natale, L., Regional shore processes and sediment management along a heavily modified coastline: Lessons from Calabria, Italy, Proc. Coastal Sediments 2003, Clearwater Beach, FL, II-C-2, 2003.
22. **Irish**, J. L., Lillycrop, W. J., Pope, R. W., Support for rapid environmental assessment using airborne lidar technology, Proc. 22nd Army Science Conference, Baltimore, MD, CD (E), 2001.
23. **Irish**, J. L., Wozencraft, J. M., Cunningham, A. G., Water wave measurement with lidar from a fixed platform, Proc. Coastal Dynamics 2001, Lund, Sweden, 998-1006, 2001.
24. Wozencraft, J. M., **Irish**, J. L., Lillycrop, L. S., Sand volumes and transport pathways for Gulf of Mexico regional sediment management, Proc. Coastal Dynamics 2001, Lund, Sweden, 693-702, 2001.
25. **Irish**, J. L., An introduction to coastal zone mapping with airborne lidar: The SHOALS system, Proc. 21 Corso di Aggiornamento in: Tecniche per la Difesa dall'inquinamento, Cosenza, Italy, 2000.

26. **Irish**, J. L., Wozencraft, J. M., Cunningham, A. G., Lidar sensor for measuring directional-spectral characteristics of water waves, Proc. 2000 EARSeL: Lidar Remote Sensing of Land and Sea, Dresden, Germany, Paper 2-2, 2000.
27. Smith, R. A., **Irish**, J. L., Smith, M. Q., Airborne lidar and airborne hyperspectral imagery: a fusion of two proven sensors for improved hydrographic surveying, Proc. Canadian Hydrographic Conference 2000, Montreal, Canada, on CD-ROM, 2000.
28. Wozencraft, J. M., **Irish**, J. L., Airborne lidar surveys and regional sediment management, Proc. 2000 EARSeL: Lidar Remote Sensing of Land and Sea, Dresden, Germany, Paper 1-2, 2000.
29. Wozencraft, J. M., **Irish**, J. L., SHOALS Surveys and Carbonate Beaches, Proc. Carbonate Beaches 2000, Key Largo, FL, 24-37, 2000.
30. Wozencraft, J. M., **Irish**, J. L., Wiggins, C. E., Stuppelbeen, H., Chavez, P. S., Regional mapping for coastal management, Maui and Kauai, Hawaii, Proc. National Beach Preservation Conference 2000, Maui, HI, on CD-ROM, 2000.
31. **Irish**, J. L., Lillycrop, W. J., Parson, L. E., Accuracy of sand volumes as a function of survey density, Proc. International Conference on Coastal Engineering 1996, Orlando, FL, 3, 3736-3749, 1997.
32. **Irish**, J. L., Truitt, C. L., Lillycrop, W. J., Using high-resolution bathymetry to determine sediment budgets: New Pass, Florida, Proc. 1997 National Conference on Beach Preservation Technology, St. Petersburg, FL, 183-198, 1997.
33. **Irish**, J. L., Thomas, E. J., Parson, L. E., Lillycrop, W. J., Monitoring storm response with high density lidar bathymetry: the effects of Hurricane Opal on Florida's panhandle, Proc. 2nd International Airborne Remote Sensing Conference and Exhibition, San Francisco, CA, III, 723-732, 1996.
34. Lillycrop, W. J., Parson, L. E., **Irish**, J. L., Brooks, M. W., Hydrographic surveying with an airborne lidar survey system, Proc. 2nd International Airborne Remote Sensing Conference and Exhibition, San Francisco, CA, I, 279-285, 1996.
35. Morang, A., **Irish**, J. L., and Pope, J., Hurricane Opal morphodynamic impacts on East Pass, Florida: Preliminary findings, Proc. 1996 National Conference on Beach Preservation Technology, St. Petersburg, FL, 192-208, 1996.
36. Parson, L. E., Lillycrop W. J., **Irish**, J. L., Surveying Florida Bay using airborne lidar technology, Proc. 2nd International Airborne Remote Sensing Conference and Exhibition, San Francisco, CA, 1996.
37. **Irish**, J. L., Parson, L. E., Lillycrop, W. J., Detailed bathymetry of four Florida inlets, Proc. 1995 National Conference on Beach Preservation Technology, St. Petersburg, FL, 243-258, 1995.

38. **Irish**, J. L., Truitt, C. L., Beach fill storm response at Longboat Key, Florida, Proc. 1995 National Conference on Beach Preservation Technology, St. Petersburg, FL, 103-117, 1995.
39. **Irish**, J. L., Lillycrop, W. J., Parson, L. E., Brooks, M. W., SHOALS system capabilities for hydrographic surveying, Proc. 2nd International Conference on Dredging and Dredged Material Placement, Lake Buena Vista, FL, 1, 314-321, 1994.

PUBLICATIONS IN POPULAR MEDIA

1. Keeler, A. G., McNamara, D., **Irish**, J. L., [Far-sighted adaptation to rising seas is blocked by just fixing eroded beaches](#), *The Conversation*, 27 August 2018. Article republished by *Chicago Tribune*, *Houston Chronicle*, *Idaho Press-Tribune*, *Los Angeles Times*, *San Antonio Express-News*, *San Francisco Chronicle*, among others.

INVITED CONFERENCE PRESENTATIONS

1. Marine transportation resilience in Hampton Roads: Sea level rise and flood risk mitigation (invited panelist), *2023 National Academies of Sciences, Engineering, and Medicine Marine Board Meeting*, Norfolk, VA, 2023.
2. Opportunities and challenges: Coastal inundation hazards (invited keynote), *NHERI GSC Mini-Symposium*, virtual, 2023.
3. Recent advances and future challenges in coastal storm inundation (invited keynote), *Coastal Dynamics 2021*, virtual and in-person, Delft, The Netherlands, 2021.
4. Cross-sectoral collaboration in responding to disasters (invited panelist), *12th Annual International Science of Team Science (SciTS) Conference*, virtual, 2021.
5. Hurricane surge characterization (invited), *2020 National Academy of Engineering Annual Meeting*, virtual, 2020.
6. Using physical insights in spatial decomposition approaches to surge hazard assessment (invited), *Probabilistic Flood Hazard Assessment (PFHA) Research Workshop*, Rockville, MD, 2020.
7. Using physical insights to minimize error and maximize efficiency in spatial decomposition approaches to surge hazard assessment (invited), *American Geophysical Union Fall Meeting*, San Francisco, CA, 2019.
8. Error characterization in spatial-decomposition-based response functions for storm surge hazard assessment (invited), *American Geophysical Union Fall Meeting*, Washington, DC, 2018.
9. Hurricane surge hazard assessment (invited), *Clifford Lectures*, Tulane University, New Orleans, LA, 2017.

10. Optimization of computational simulation set for quantification of hurricane surge extreme-value statistics (invited), *SIAM Conference on Computational Science and Engineering 2015*, Salt Lake City, UT, 2015.
11. Implications of climate change in coastal areas (invited), *Building Climate Solutions—14th National Conference and Global Forum on Science, Policy, and the Environment*, Washington, DC, 2014.
12. Coastal inundation risk assessment (invited), *Workshop on Probabilistic Flood Hazard Assessment (PFHA)*, Rockville, MD, 2013.
13. Physical attributes of hurricane surges and their role in hazard assessment (invited), *American Geophysical Union 2012 Fall Meeting*, San Francisco, CA, 2012.
14. Treatment of climate change and sea-level rise in hurricane flood statistics (invited), *American Geophysical Union 2011 Fall Meeting*, San Francisco, CA, 2011.
15. Integrating sea level rise with flood level statistics (invited), *International Conference on Sea Level Rise in the Gulf of Mexico*, Corpus Christi, TX, 2010.
16. Integrating sea level rise and climate change with flood level statistics in estuarine environments (invited), *Mini-symposium on Sea Level Rise at the 11th International Conference on Estuarine and Coastal Modeling*, Seattle, WA, 2009.
17. ADCIRC applications: Development of surge response functions for hurricane flood probability assessment (invited), *ISEC/NEES/NSF Workshop*, Corvallis, OR, 2009.
18. Application of surge response functions for coastal flood risk assessment (invited). *Coastal Cities Summit*, St. Petersburg, FL, 2008.
19. Wave attenuation and breaking in wetland vegetation (invited). *Florida Shore and Beach Preservation Association Estuarine Design and Research Needs Workshop*, Sarasota, FL, 2008.
20. Hurricane surge classification for the northern Gulf of Mexico coastline (invited). *Galveston Bay Estuary Program's 8th State of the Bay Symposium*, Galveston, TX, 2007.
21. Hurricane surge parameterization (invited). *Workshop on Modeling Relevant Physics of Sedimentation in Three Dimensions (MORPHOS)*, Vicksburg, MS, 2006.
22. Parameterization of hurricane surge for risk assessment (invited). *Louisiana Coastal Protection and Restoration Risk Assessment Group Workshop*, Asheville, NC, 2006.
23. An introduction to coastal zone mapping with airborne lidar (invited). *Corso di Aggiornamento in: Tecniche per la Difesa Dall'inquinamento*, Cosenza, Italy, 2000.
24. Airborne lidar bathymetry (invited). *American Congress on Surveying and Mapping - American Society for Photogrammetry Annual Meeting*, Baltimore, MD, 1996.

RECENT CONFERENCE ABSTRACTS (OF >100)

(excludes those listed previously)

*Indicates graduate student, [◊]Indicates postdoctoral scholar, **Indicates undergraduate student

1. **Irish**, J. L., Bensi, M. T., Shao, Y., Carr, M., Evaluating storm selection for machine learning-based storm surge surrogate models, *4th International Workshop on Waves, Storm Surges, and Coastal Hazards*, Santander, Spain, 2025.
2. Alipour*, A., Beever*, M. A., **Irish**, J. L., Evaluating barrier island evolution across various hydrodynamic and morphodynamic scenarios, *American Geophysical Union Fall Meeting 2024*, Washington, DC, 2024.
3. Beever*, M. A., Alipour*, A., **Irish**, J. L., An investigation of barrier island breaching through morphologic parameters, *American Geophysical Union Fall Meeting 2024*, Washington, DC, 2024.
4. Chilton*, P., Saksena, S., Weiss, R., **Irish**, J., Compound flood prediction and visualization via anthropogenic land use change in the James River basin, Virginia USA, *American Geophysical Union Fall Meeting 2024*, Washington, DC, 2024.
5. Miller**, E., Cetiner[◊], B., Berman, J., Wartman, J., Dedinsky, K., Lowes, L., **Irish**, J. L., Using street-level hurricane damage datasets to advance AI-supported damage detection and characterization, *American Geophysical Union Fall Meeting 2024*, Washington, DC, 2024.
6. Najarkolaie*, K. F., Bensi, M. T., Modarres, M., **Irish**, J. L., Work towards a framework for external hazard probabilistic risk assessment of advanced nuclear power technologies under change in climate, *DOE-NRC Natural Phenomena Hazard Workshop*, Rockville, MD, 2024.
7. **Irish**, J. L., Noe**, E., Bender, C. J., Gharagozlou, A., Bensi, M. T., Lee, J.-W., Computational simulation set selection for storm surge surrogate modeling, *International Conference on Coastal Engineering 2024*, Rome, Italy, 2024.
8. Lee[◊], J.-W., Zamora, N., **Irish**, J. L., Weiss, R., Catalan, P., Advancing tsunami hazard assessment: Machine learning-based rapid inundation prediction, *Ocean Sciences Meeting 2024*, New Orleans, LA, 2024.
9. Daramola*, S., Muñoz, D. F., **Irish**, J. L., Characterizing the evolution of extreme water level over the United States with LSTM-station-based approximated models and transfer learning techniques, *American Geophysical Union Fall Meeting 2023*, San Francisco, CA, 2023.
10. **Irish**, J. L., Patch, S. M., Jeffries*, C. R., Weiss, R., Mandli, K., Beever*, M., Alipour*, A., Hoagland*, S. W. H., Parameter studies of the impact of storms on barrier islands, and vice versa, *3rd International Workshop on Waves, Storm Surges, and Coastal Hazards*, South Bend, IN, 2023.

11. Lee[♦], J.-W., **Irish**, J. L., Weiss, R., TRRF-FF: A data-driven model for real-time alongshore tsunami runup prediction from earthquake slip distributions, *American Geophysical Union Fall Meeting 2023*, San Francisco, CA, 2023.
12. Nourali*, Shortridge, J. E., Bukvic, A., Shao, Y., **Irish**, J. L., Navigating the tides of change: Understanding the impact of socio-demographic heterogeneity in flood-induced relocation behavior under sea-level rise using a spatial agent-based modeling approach, *American Geophysical Union Fall Meeting 2023*, San Francisco, CA, 2023.
13. Hoagland*, S. W. H., **Irish**, J. L., Coastal resource valuation in a barrier island system, *2022 UCOWR/NIWR Annual Water Resources Conference*, Greenville, SC, 2022.
14. **Irish**, J. L., Weiss, R., Dura, T., Monte Carlo simulation of barrier-island systems and tsunami hazards, *International Conference on Coastal Engineering 2022*, Sydney, Australia, 2022.
15. Jeffries*, C., Weiss, R., **Irish**, J. L., Mandli, K. T., Impacts of barrier-island breaching on mainland flooding during storm events, *American Geophysical Union Fall Meeting 2022*, Chicago, IL, 2022.
16. Hoagland*, S. W. H., **Irish**, J. L., Weiss, R., Insights from a long-term morphodynamic model into barrier system sensitivities, *American Geophysical Union Fall Meeting 2021*, New Orleans, LA (and virtual), 2021.
17. Lee[♦], J.-W., **Irish**, J. L., Weiss, R., Inferring tsunami source and run-up distribution from run-up observations: A tsunami inversion model, *American Geophysical Union Fall Meeting 2021*, New Orleans, LA (and virtual), 2021.
18. Lee*, J.-W., **Irish**, J. L., Bensi, M. T., Marcy D., Modeling of peak storm surges in coastal Virginia using machine learning, *Coastal Dynamics 2021*, Delft, The Netherlands (and virtual), 2021.
19. Mosuela*, K., **Irish**, J. L., Wave attenuation from living shorelines: A parameter study, *World Environmental and Water Resources Congress 2021* (postponed from 2020), Milwaukee, WI, 2021.
20. Nourali*, Z., Shortridge, J. E., Bukvic, A., Shao, Y., Mitchell, A., **Irish**, J. L., Assessing the impact of flood-induced relocation on municipal viability across the rural-urban spectrum: An agent-based model of coastal Virginia under sea level rise, *American Geophysical Union Fall Meeting 2021*, New Orleans, LA (and virtual), 2021.
21. Wang*, Q., Cousins*, T., Lightner*, T., Cowell, M., **Irish**, J. L., Not everyone can social distance, *46th Annual Natural Hazards Research and Applications Workshop*, Bloomfield, IL, 2021.
22. Asher*, T. G., Luettich, R. A., **Irish**, J. L., Ma, P., Bensi, M. T., Resio, D. T., Addressing needs in observed and simulated storm surge data for uncertainty quantification, *Ocean Sciences 2020*, San Diego, CA, 2020.

23. Haque*, A., **Irish**, J. L., Zhang, Y., Interdependencies between physical and social vulnerability in a storm risk assessment framework applied to Hampton Roads, Virginia, *International Conference on Coastal Engineering 2020*, virtual, 2020.
24. Haque*, A., **Irish**, J. L., Zhang, Y., An idealized post-disaster recovery study of a coastal community to storm hazards, *45th Annual Natural Hazards Workshop*, Boulder, CO, 2020.
25. Hoagland*, S. W. H., **Irish**, J. L., Weiss, R., Uncertainty in long-term projections of barrier island morphology considering impacts of coastal restoration practices, *American Geophysical Union Fall Meeting 2020*, virtual, 2020.
26. **Irish**, J. L., Weiss, R., Goodman-Tchernov, B., A Monte-Carlo model for caisson overturning by tsunamis, *International Conference on Coastal Engineering 2020*, virtual, 2020.
27. Lee*, J.-W., **Irish**, J. L., Marcy, D., Development of a neural network model to estimate the maximum elevation of storm surge in coastal Virginia, *American Geophysical Union Fall Meeting 2020*, virtual, 2020.
28. Lee*, J.-W., **Irish**, J. L., Weiss, R., Near-field tsunami forecasting based on tsunami run-up response function, *International Conference on Coastal Engineering 2020*, virtual, 2020.
29. Mosuela*, K., **Irish**, J. L., Generalizing wave attenuation from living shorelines, *16th Annual Maryland Association of Floodplain and Stormwater Managers Conference*, virtual, 2020.
30. Mosuela*, K., **Irish**, J. L., Assessing living shorelines: Using friction to estimate wave attenuation, *American Shore and Beach Preservation Association 2020 National Coastal Conference*, virtual, 2020.

ACADEMIC GRANTS

Total funding of US\$25 million, with US\$4 million for Irish (since 2006)

1. *Physically informed, equitable, and efficient hurricane surge characterization*, **U.S. Coastal Research Program** (with funding from U.S. Army Corps of Engineers), September 2024 - September 2026, PI: J. Irish, Co-PIs: S. Bensi (University of Maryland), Y. Shao, \$500,000 (\$250,000 for J. Irish).
2. *Use of hybrid tools to model risks of advanced nuclear power reactor technologies under a changing climate*, **U.S. Nuclear Regulatory Commission**, March 2024 - March 2027, PI: M. Bensi (University of Maryland [UMD]), Co-PIs: M. Modarres (UMD), J. Irish, \$500,000 (\$74,781 for J. Irish).
3. *Stakeholder co-development of a machine learning model for tidal inlet evolution* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, August 2023 - August 2025, PI: J. Irish, Student: M. Beever, \$80,000.

4. *Natural Hazards Engineering Research Infrastructure: Natural Hazard and Disaster Reconnaissance (RAPID) Facility* (renewal), **U.S. National Science Foundation**, September 2021 - September 2026, PI: J. Wartman (University of Washington [UW]), Co-PIs: J. Berman (UW), N. Errett (UW), J. Irish, M. Olsen (Oregon State University), \$8,919,982 as a Cooperative Agreement (most funding supports equipment acquisition and operations staff; \$83,600 for J. Irish).
5. *Coupling barrier island evolution with coastal restoration practices and socioeconomic impacts* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, September 2021 - October 2023, PI: J. Irish, Student: S. Hoagland, \$80,000.
6. *Academic Research Study: Impact of coastal restoration on barrier-island evolution and future flooding, Topic 6*, **U.S. Coastal Research Program** (with funding from U.S. Army Corps of Engineers), December 2019 - December 2023, PI: Irish, CoPIs: R. Weiss, K. Mandli (Columbia University), \$250,000 (\$125,000 for J. Irish).
7. *Assessing the impacts of coastal flood-induced relocation on local jurisdictions*, **U.S. National Science Foundation**, July 2019 - August 2023, PI: A. Bukvic, Co-PIs: J. Irish, J. Shortridge, C. Zobel, \$325,000 (\$79,112 for J. Irish).
8. *Robust storm surge forecast and hazard assessment in coastal Virginia with application to sea level rise* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, August 2019 - August 2021, PI: J. Irish, Student: J.-W. Lee, \$80,000.
9. *Workshop: Coastal engineering research framework*, **U.S. National Science Foundation**, July 2018 - June 2019, PI: A. Kennedy (University of Notre Dame), Co-PIs: Daniel Cox (Oregon State University), J. Irish, P. Lynett (University of Southern California), Tori Tomiczek (U.S. Naval Academy), \$50,000 in participant support.
10. *NRT: Disaster Resilience and Risk Management (DRRM) - Creating quantitative decision making frameworks for multi-dimensional and multi-scale analysis of hazard impact*, **U.S. National Science Foundation**, September 2017 - August 2023, PI: R. Weiss, Co-PIs: M. Paretti, J. Irish, C. Zobel, Y. Zhang, M. Cowell, G. Olgun, \$3,175,730 (\$444,600 for J. Irish).
11. *Natural Hazards Engineering Research Infrastructure (NHERI): Post-disaster, rapid response research (RAPID) facility*, **U.S. National Science Foundation**, September 2016 - August 2021, PI: J. Wartman (University of Washington [UW]), Co-PIs: J. Berman [UW], J. Irish, S. Miles [UW], M. Olsen (Oregon State University), \$5,853,000 as a Cooperative Agreement (most funding supports equipment acquisition and operations staff; \$109,785 for J. Irish).
12. *Collaborative research: Tsunami and tropical storm sediment dynamics and products*, **U.S. National Science Foundation**, August 2016 - August 2022, PI: R. Weiss, Co-PIs: J. Irish, J. Woodruff (University of Massachusetts-Amherst), \$498,932 (\$159,318 for J. Irish).

13. *Predicting the timing and magnitude of hurricane surge forerunners in coastal Virginia* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, August 2016 - August 2018, PI: J. Irish, Student: Y. Liu, \$40,000.
14. *Frequency-dependent wave dissipation within wetland mound-channel systems* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, August 2015 - August 2017, PI: J. Irish, Student: Y. Yang, \$80,000.
15. *RSB: Performance based decision support system for resilient and sustainable multi-hazard building design*, **U.S. National Science Foundation**, February 2015 – September 2021, PI: M. Flint, Co-PIs: J. de la Garza, M. Eatherton, J. Irish, R. Leon, C. Olgun, G. Reichard, A. Rodriguez-Marek, \$1,260,000 (\$138,600 for J. Irish).
16. *The role of shoreline and bottom type dynamics in understanding barrier island vulnerability and resiliency—Phase 1: Episodic events*, **Joint Airborne Lidar Bathymetry Technical Center of Expertise** (U.S. Army Corps of Engineers) via Northrup Grumman, September 2014 – August 2016, PI: J. Irish, Co-PI: R. Weiss. \$132,467 (\$100,499 for J. Irish).
17. *Barrier island response to Hurricane Sandy's impacts* (student fellowship), **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, August 2014 - August 2016, PI: J. Irish, Student: S. Smallegan, \$80,000.
18. *RAPID: Observations of physical impacts following Hurricane Sandy*, **U.S. National Science Foundation**, April 2013 – March 2014, PI: R. Weiss, Co-PI: J. Irish. \$27,910 (\$7,000 for J. Irish).
19. *NEESR: Tsunami runup and withdrawal dynamics on a sloping beach with discontinuous macro-roughness*, **U.S. National Science Foundation**, August 2012 – July 2018, PI: J. Irish, Co-PI: R. Weiss. \$658,373 plus \$28,000 as REU supplement (\$368,010 for J. Irish).
20. *Development of a Web-Based Hurricane Hazard Communication Document with Interactive Tools for Texas Planners*, **State of Texas Department of Public Safety**, January 2012 – August 2014, PI: J. Irish, Co-PI: S. Quiring, \$80,000 (\$40,000 for J. Irish).
21. *Investigation of the effects of sea level rise on sea turtle, shorebird, seabird, and beach mouse nesting distribution within the South Atlantic Landscape Conservation Cooperative region*, **South Atlantic Landscape Conservation Cooperative**, September 2011- August 2014, PI: B. Von Holle (University of Central Florida [UCF]), Co-PIs: A. Bard (UCF), J. Brush (UCF), J. DeVivo (UCF), M. Dodd (UCF), L. Ehrhart (UCF), M. Godfrey (UCF), S. Hagen (UCF), J. Irish, T. Keyes (UCF), K. Madani (UCF), F. Sanders (UCF), J. Stiner (UCF), J. Stout (UCF), J. Weishampel (UCF). \$150,000 (\$40,661 for J. Irish).
22. *A parameterized climate change projection model for hurricane flooding, wave action, economic damages, and population dynamics*, **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, July 2010 – August 2014. PI: J. Irish. Co-PIs: C. Giusti, J. Kaihatu, F. Olivera, D. Jourdan (University of Florida). \$600,000 (\$200,000 in cost-sharing; \$97,736 of Sea Grant funds for J. Irish).

23. *Wave hydrodynamics in segmented wetlands with application to hurricane damage reduction and wetlands restoration*, **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, July 2010 – August 2014. PI: J. Irish. Co-PI: S. Socolofsky. \$300,000 (\$100,000 in cost-sharing; \$100,000 of Sea Grant funds for J. Irish).
24. *Quantification of hurricane surge damage in coastal bays as a function of dune and wetland characteristics with application to restoration and climate change*, **Coastal Management Program of Texas General Land Office**, November 2009 – June 2011. PI: J. Irish. Co-PI: F. Olivera. \$131,921 (\$52,772 in cost-sharing; \$39,575 of TXGLO funds for J. Irish).
25. *NEESR Payload: Dissipation of Long-Wave Energy by Discontinuous Macro-Roughness Representing Forested Areas*, **U.S. National Science Foundation**, August 2009 – July 2011. PI: J. Irish. \$100,000 plus \$6,678 as Research Experience for Undergraduates (REU) supplement.
26. *Collaborative proposal: Climate-induced changes in hurricane winds, surge, and risk to electric power systems*, **U.S. Department of Energy**, December 2008 – August 2012. PIs: J. Irish and S. Guikema (Johns Hopkins University). Co-PI: S. Quiring (Texas A&M University). \$450,000 (\$150,000 for J. Irish).
27. *Predicting beach and barrier island vulnerability as a function of three-dimensional bathymetric conditions*, **Joint Airborne Lidar Bathymetry Technical Center of Expertise** (U.S. Army Corps of Engineers, U.S. Naval Meteorology and Oceanography Command, National Oceanic and Atmospheric Administration, U.S. Geological Survey) via 3001 Inc., August 2008 – December 2011. PI: J. Irish. \$270,478.
28. *Quantification of hurricane flooding reduction by vegetation along the Texas coast*, **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, June 2008 – January 2011. PI: J. Irish. Co-PI: R. Feagin. \$307,765 (\$102,655 in cost-sharing; \$114,905 of Sea Grant funds for J. Irish).
29. *Field and numerical investigations of tidal vortices for exchange flows through inlets on the Texas coast*, **National Oceanic and Atmospheric Administration's Sea Grant (U.S.)**, June 2008 – January 2011. PI: S. Socolofsky. Co-PIs: K.-A. Chang, J. Irish, and P. Lynett. \$294,706 (\$98,238 in cost-sharing; \$8,127 of Sea Grant funds for J. Irish).
30. *Double-wall impact protection levee project: Laboratory and numerical testing of levee performance under wave action at varying flood levels*, **SZS Consultants, Inc.**, July 2008 – May 2009. PI: J. Irish. Co-PIs: G. Biscontin, B. Edge.
31. *Parameterization of hurricane surge for the State of Texas coastline*, **Coastal Management Program of Texas General Land Office**, April 2008 – September 2009. PI: J. Irish. \$97,954 (\$39,183 in cost-sharing).
32. *Development of near-maximum hurricane conditions for risk assessment*, **Moffatt & Nichol**, November 2007 – April 2008. PI: J. Irish.
33. *Storm surge modeling investigations for hurricane surge risk assessment*, **U.S. Army Corps of Engineers**, September 2007 – March 2011. PI: J. Irish. \$266,878.

34. *Predicting the influence of climate change on hurricane flooding*, **National Commission on Energy Policy (U.S.)**, August 2007 – August 2008. PI: J. Irish. Co-PIs: B. Edge, F. Olivera. \$99,918 (\$80,114 for J. Irish).
35. *Boussinesq modeling of directional spectra and surge overtopping of levees*, **U.S. Army Corps of Engineers**, October 2006 – August 2007. PI: P. Lynett. Co-PI: J. Irish. \$75,339 (\$20,793 for J. Irish).

TEACHING

Average course evaluation of 5.53 out of 6.00

Courses Taught

- Virginia Tech:
 - CEE 3304, Fluid Mechanics for Civil and Environmental Engineers (undergraduate)
 - CEE 4384, Coastal Engineering (undergraduate)
 - CEE 5844/AOE 5844, Ocean and Coastal Wave Mechanics (graduate)
 - CEE 5854G, Advanced Coastal Engineering (graduate, taught with CEE 4384)
 - CEE 5984, Advanced Coastal Engineering (graduate, different from CEE 5854G)
 - CEE 5944, Environmental and Water Resources Seminar (graduate)
 - CEE 6844, Current Topics in Coastal Engineering (graduate)
 - GRAD 5134, Principles of Disaster Resilience and Risk Management (graduate, interdisciplinary team taught)
 - GRAD 5984, Transdisciplinary Thinking Seminar (graduate, interdisciplinary team taught)
- Texas A&M University:
 - CVEN 311, Fluid Dynamics (undergraduate)
 - OCEN 400, Basic Coastal Engineering (undergraduate)
 - OCEN 410, Ocean Engineering Laboratory (undergraduate)
 - OCEN 481/681, Ocean Engineering Seminar (undergraduate and graduate)
 - OCEN 672, Coastal Engineering (graduate)
 - OCEN 683, Estuary Hydrodynamics (graduate)

Institutions Using Developed Education Materials

- Jackson State University, OCEN 672 (Coastal Engineering [graduate])
- Texas A&M University at Galveston, CVEN 311 (Fluid Dynamics [undergraduate])
- Texas A&M University at Galveston, OCEN 410 (Ocean Engineering Laboratory [undergraduate])
- University of New Hampshire, OCEN 672 (Coastal Engineering [graduate])
- University of South Alabama, OCEN 672 (Coastal Engineering [graduate])
- University of South Alabama, CEE 3304 (Fluid Dynamics [undergraduate])
- University of Tennessee, CEE 3304 (Fluid Dynamics [undergraduate])
- University of Texas at Austin, CEE 4384 and CEE5854G (Coastal Engineering [undergraduate and graduate])

ACADEMIC RESEARCH ADVISING

Postdoctoral Scholars

1. Jun-Whan Lee, Ph.D. (2021 – 2022)
2. Wei Cheng, Ph.D. (2016)
3. Stephanie Smallegan, Ph.D. (2016)

Doctoral Students

1. Atefeh Alipour (Ph.D., estimated 2026). Thesis: To be determined.
2. Megan Beever (Ph.D., estimated 2026). Thesis: To be determined.
3. Celso Ferreira (Ph.D., 2012). Co-advised with F. Olivera. Thesis: Quantification of hurricane surge damage in coastal bays as a function of dune and wetland characteristics with application to climate change. ***Current position: Associate Professor, George Mason University.***
4. Steven Hoagland (Ph.D., 2024). Thesis: Barrier island morphodynamic insights from applied global sensitivity analysis and decadal exploratory modeling. Current position: Research Assistant Professor, University of Tennessee.
5. Jun-Whan Lee (Ph.D., 2021). Virginia Sea Grant Graduate Research Fellow. Thesis: Rapid prediction of tsunamis and storm surges using machine learning. ***Current position: Assistant Professor, University of Texas at Austin.***
6. Yi Liu (Ph.D., 2018). Mid-Atlantic Sea Grant Graduate Research Fellow. Thesis: Investigation of the spatiotemporal evolution of tropical cyclone storm surge under sea level rise. Current position: Flood Data Scientist, One Concern.

7. Stephanie Smallegan (now Patch) (Ph.D., 2016). Virginia Sea Grant Graduate Research Fellow. Thesis: Morphological change of a developed barrier island due to hurricane forcing. **Current position: Associate Professor, University of South Alabama.**
8. Youn Kyung Song (Ph.D., 2013). Co-advised with K.A. Chang. Thesis topic: Long wave dynamics in the presence of macro-roughness. Current position: Research Assistant Professor, Texas A&M University-Galveston.
9. Ikpoto Udoh (Ph.D., 2012). Thesis: Robust hurricane surge response functions. Current position: President & CEO, Bimaclaxx Solutions, LLC.
10. Yongqian Yang (Ph.D., 2016). Virginia Sea Grant Graduate Research Fellow. Thesis: Impact of patchy vegetation on wave and runup dynamics. Current position: Senior Software Engineer, Meta.

Master's Students

1. Megan Goulden (M.S., scheduled spring 2027). Project and Report: To be determined.
2. Sarah Adams (M.S., scheduled fall 2026). Project and Report: To be determined.
3. Mary Anderson (M.S., 2010). Thesis: Numerical and experimental investigations to understand the effects of coastal vegetation of wave propagation. Current position: Research coastal engineer, U.S. Army Engineer Coastal and Hydraulics Laboratory.
4. Lauren Augustin (M.S., 2007). Co-advised with P. Lynett. Thesis: Laboratory experiments and numerical modeling of wave attenuation through artificial vegetation. Last position: Coastal engineer, HDR Shiner Moseley (deceased).
5. Gregory Balsmeier (M.E., 2007). Co-advised with J. Kaihatu. Research Report: Physical model of wave damping by vegetation following wave breaking. Current position: Project Director, U.S. Department of Energy.
6. Nicholas Cox (M.S., 2011). Thesis: The influence of nearshore bars on infragravity energy at the shoreline. Current position: Coastal engineer, Moffatt and Nichol.
7. Lauren McNeill Dunkin (M.S., 2010). Thesis: Variability in long wave runup as a function of nearshore bathymetric features. Current position: Branch Chief, U.S. Army Engineer Coastal and Hydraulics Laboratory.
8. Jad El-Rafey (M.S., 2025). Thesis: An economics-based methodology for analysis of the inequitable distribution of flooding risk.
9. Ashley Frey (M.S., 2009). Thesis: The impact of climate change on hurricane flooding, inundation, property damages, and population affected. Current position: Division Chief, U.S. Army Engineer Coastal and Hydraulics Laboratory.
10. Anmol Haque (M.S., 2021). Thesis: Impact of interdependent physical and social characteristics on housing recovery following tropical cyclones. Current position: Management consultant, Arcadis.

11. Emma Helfrich (M.S., 2020). Project and Report: Nondimensional storm surge response functions for bypassing hurricanes along the U.S. North Atlantic coast. Current position: Water resources engineer, Nitsch.
12. Harrison Jaehn (M.S., 2023). Project and Report: Optimizing black box algorithms for storm surge prediction: A global sensitivity analysis and optimization of the C1PKNet model. Current position: Water engineer, Arcadis.
13. Rajat Katyal (M.S., 2009). Thesis: Development of parameterized surge response functions for coastal bays. Current position: Lead engineer, North Oil Company.
14. Kyutae Kim (M.S., 2023). Thesis: Probabilistic tropical cyclone surge hazard under future sea-level rise scenarios: A case study in the Chesapeake Bay region, USA. Current position: Coastal associate, Moffatt & Nichol.
15. Nicholas Loder (M.S., 2008). Thesis: An evaluation of the potential of coastal wetlands for hurricane surge and wave attenuation reduction. Current position: Associate Vice President; Reynolds, Smith, and Hills.
16. Kristine Mosuela (M.S., 2021). Thesis: A parameterized approach to estimating wave attenuation from living shorelines. Current position: Water resources engineer, WSP.
17. Mir Emad Mousavi (M.E., 2009). Research Report: Wave dynamics in random cylinder arrays analogous to wetland vegetation. Current position: Entrepreneur.
18. Rebecca Naurath (M.S., 2023). Thesis: Using an urban growth model framework to project the impacts of future flooding on coastal populations. Current position: Coastal Engineer, Taylor Engineering.
19. Erin Rooney (M.S., 2011). Thesis topic: Testing accuracy and convergence of GPUSPH (Graphical Processing Unit Smoothed Particle Hydrodynamics) for free surface flows. Current position: Mid-Atlantic Coastal Lead, HDR.
20. Diane Severs (M.S., 2025). Project and Report: Storm surge clustering in Tampa Bay.
21. Abhishek Sharma (M.S. [Texas A&M University at Galveston], 2010). Co-advised with V. Panchang. Thesis: Comparison of different radiation stress forcing formulations and their effect on wave-induced circulation. Current position: Ph.D. student of Maritime Systems Engineering at Texas A&M University at Galveston.
22. Youn Kyung Song (M.S., 2009). Co-advised with K.-A. Chang. Thesis: Storm surge assessment at Texas coastal bridges with improved surge response functions. Current position: Research Assistant Professor, Texas A&M University-Galveston.
23. Nicholas Taylor (M.S., 2014). Thesis: Development and uncertainty quantification of hurricane surge response functions and sea-level rise adjustments for coastal bays. Current position: Project engineer, CDM Smith.

Undergraduate Research Advisees

1. Liam McDermott (Fall 2024 - present). Research topic: Geospatial data analyses of sea level rise and storm surge hazard impacts.
2. Nicole Abramson (Summer 2012 – Fall 2012). Research topic: Dynamics of vegetated islands.
3. Charles Babbitt (Spring 2008 – Spring 2010). Research topic: Wave damping by vegetation.
4. Mallory Barkdull (Summer 2010; NSF Research Experience for Undergraduates). Research topic: Long wave runup in discontinuous macro-roughness.
5. Megan Beever (Fall 2018 - Fall 2020). Research topic: Impact of barrier-island breaching on back-bay flooding.
6. Philip Blackmar (Fall 2010 – Spring 2011). Research topic: Sea level rise and hurricane flooding.
7. Brock Bosack (Fall 2015). Research topic: Storm surge timing in Houston/Galveston, TX.
8. Michael Brown (Spring 2009; NSF Louis Stokes Alliance for Minority Participation). Research topic: Hurricane surge prediction.
9. Haley Canham (Summer 2015; NSF Research Experience for Undergraduates). Research topic: Barrier island response to storms and tsunamis.
10. Brandon Cooper (Fall 2013 – Spring 2014). Research topic: Development of a still-camera remote sensing tool for measuring coastal features.
11. Rachel Corrigan (Fall 2013; NSF Research Experience for Undergraduates). Research topic: Tsunami bore front velocities in patchy forest on a sloping beach.
12. Samuel Dellinger (Spring 2012 – Spring 2013). Research topic: Future shoreline vulnerability.
13. Jose DeLuna (Fall 2009 – Spring 2010; NSF Louis Stokes Alliance for Minority Participation). Research topic: Impact of climate change on hurricane surge.
14. Sunil Divikar (Spring 2017 - Spring 2018). Research topic: Risk assessment for bridge damage during hurricanes.
15. Adi Fine (Spring 2015). Research topic: Tsunami inundation in vegetation.
16. Sean Finn (Summer 2008 – Fall 2008). Research topic: Climate change and coastal flooding.
17. Kelli Gallt (Summer 2015 – Fall 2015; NSF Research Experience for Undergraduates). Research topic: Overwash and breaching of a vegetated dune.
18. Kathryn Hagan (Fall 2007). Research topic: Climate change and coastal flooding.
19. Jacob Heisey (Spring 2012 – Spring 2013). Research topic: Future shoreline vulnerability.

20. Emma Helfrich (Fall 2017 - 2018). Research topic: Storm surge from bypassing hurricanes.
21. Chelsea Humbyrd (Spring 2008). Research topic: Evaluation of variable height bulkhead.
22. Harrison Jaehn (Spring 2020 - Fall 2021). Research topic: Tsunami inundation hazard characterization.
23. Steven Keith (Summer 2014; NSF Research Experience for Undergraduates). Research topic: Simulation of barrier-island response to storms and tsunamis.
24. Will McHugh (Spring 2015). Research topic: Forecasting storm surge timing.
25. Ryan Mieras (Fall 2010 – Spring 2011). Research topic: Sea level rise and hurricane flooding.
26. Edan Miller (Summer 2024; team advised). Research topic: Hurricane damage detection and classification from street view imagery.
27. Joseph Mullenax (Fall 2008 – Spring 2009). Research topic: Field velocity profile measurements.
28. Robert Noble (Fall 2008). Research topic: Wave damping by vegetation.
29. Drake Oaks (Summer 2008). Research topic: Post Hurricane Dolly beach assessment.
30. Evan Pearce (Fall 2013 – Spring 2014). Research topic: Storm surge features in coastal Alabama.
31. David Piazza (Spring 2007). Research topic: Experiments of wave attenuation by vegetation.
32. Leah Potts (Spring 2014; NSF Research Experience for Undergraduates). Research topic: Analysis of tsunami inundation in vegetation.
33. Benjamin Roston (Fall 2018). Research topic: Role of waterborne debris in damage during coastal hazards.
34. Adrian Santiago Tate (Fall 2013 – Summer 2016). Research topic: Tsunami inundation in vegetation.
35. Nancy Streu (Summer 2013; NSF Research Experience for Undergraduates). Research topic: Development of a still-camera remote sensing tool for measuring coastal features.
36. Jordan Schaefer (Summer 2009 – Spring 2011). Research topic: Beach response during hurricanes.
37. Cynthia Vittone (Fall 2008 – Spring 2011; NSF Research Experience for Undergraduates). Research topic: Long and short wave dynamics in vegetation.
38. Nicholas Zinck (Fall 2013 – Spring 2015; NSF Research Experience for Undergraduates). Research topic: Numerical simulations of tsunami inundation.

PROFESSIONAL SERVICE

(Excludes positions listed previously, unless noted)

Professional Affiliations

- Full Member (invited), Sigma Xi, The Scientific Honor Society (listed previously)
- Member (elected), Virginia Academy of Science, Engineering and Medicine (VASEM) (listed previously)
- Fellow (elected), American Society of Civil Engineers (ASCE) (listed previously)
- Member, American Association for the Advancement of Science
- Member, ASCE Coasts, Oceans, Ports, and Rivers Institute (COPRI)
- Member, American Geophysical Union
- Member, Engineers Without Borders

Book and Special Issue Editorships

- Part Editor, Springer Handbook of Ocean Engineering, Part C: Coastal Design
2011 – 2016
- Guest Editor, Focus Issue on “Implications, planning, and design considerations for rising sea levels at the coast”, *Journal of Waterway, Port, Coastal, and Ocean Engineering*
2011 – 2013

Technical Committees

- Member, Sustainability Committee of the American Society of Civil Engineers’ Coasts, Oceans, Ports, and Rivers Institute
2012 – 2016
- Member, American Society of Civil Engineers’ Samoan Tsunami Assessment Team
2009 – 2010

Awards Committees

- Member, International Coastal Engineering Award committee (as Coastal Engineering Research Council member)
2014 - present
- Member, American Society of Civil Engineers’ (ASCE) Committee on Technical Advancement Awards Subcommittee:
 - Member, ASCE Excellence in Journalism Award Committee
2015 - 2016

- Member (Chair 2016-2017), ASCE Paper Review Committee
2014 - 2017
- Member (Chair 2016-2017), ASCE Torrens Award and ASCE Associate Editor
Award Committee
2014 - 2018
- Member (Chair 2016-2018), ASCE Huber Prize Committee
2014 - 2018
- Judge, American Society of Civil Engineers' John G. Moffatt–Frank E. Nichol Harbor and
Coastal Engineering Award
2013 – 2018

Conference Committees, Session Organizer or Chair

1. Session Chair, Compound Coastal Flooding, International Conference on Coastal Engineering, Rome, Italy, 2024.
2. Session Chair, Case Studies, 3rd International Workshop on Waves, Storm Surges, and Coastal Hazards & 17th International Workshop on Wave Hindcasting and Forecasting, South Bend, IN, 2023.
3. Session Chair, Sand Bypassing and Nourishment, International Conference on Coastal Engineering, Sydney, Australia, 2022.
4. Member, Competition Advisory Committee, Coastal and Estuarine Research Federation (CERF) 2021 Design Competition: Coastal Virginia, virtual, 2021.
5. Local Organizing Committee, International Conference on Coastal Engineering, Baltimore, MD, 2018.
6. Session Chair, Tsunami Inundation Modeling, International Conference on Coastal Engineering, Baltimore, MD, 2018.
7. Session Chair, Extreme Water Levels at the Coast session, 1st Workshop on Waves, Storm Surges, and Coastal Hazards & 15th International Workshop on Wave Hindcasting and Forecasting, Liverpool, United Kingdom, 2017.
8. Technical Committee, Coastal Structures / Solutions to Coastal Disasters, Boston, MA, 2015.
9. Co-organizer, Living shorelines session, 14th International Workshop on Wave Hindcasting and Forecasting and 5th Coastal Hazards Symposium, Key West, FL, 2015.
10. Co-organizer, Coastal inundation and its impacts in a changing climate, CERF 2015 Conference, Portland, OR, 2015.
11. Co-organizer, Sustainability Short Course, Ports 2013, Seattle, WA, 2013.

12. Co-organizer, Climate Change and Storm Surge session at the International Offshore and Polar Engineering Conference in Rhodes, Greece, 2012.
13. Co-convenor, Nearshore Processes session (7 oral sessions plus 1 poster session totaling 107 presentations) at Ocean Sciences in Salt Lake City, UT, 2012.
14. Session chair, Wave-Vegetation Interaction at International Conference on Coastal Engineering in Santander, Spain, 2012.
15. Session organizer, Risk at 12th International Workshop on Wave Hindcasting and Forecasting and 3rd Coastal Hazards Symposium in Waikoloa, HI in 2011.
16. Session chair, Waves and Surges at 12th International Workshop on Wave Hindcasting and Forecasting and 3rd Coastal Hazards Symposium in Waikoloa, HI in 2011.
17. Organizer, Grant Writing Workshop at ASCE COPRI Congress in Memphis, TN, 2010.
18. Co-organizer, Research Needs in Coastal, Ocean, Port, and Navigation Engineering at ASCE COPRI Congress in Memphis, TN, 2010.
19. Co-organizer, Water Resources Policies & Authorities Incorporating Sea Level Change Considerations in Civil Works Programs at ASCE COPRI Congress in Memphis, TN, 2010.
20. Session chair, Tropical Cyclone Waves at International Conference on Coastal Engineering in Shanghai, China, 2010.
21. Co-organizer, Mini Symposium on Sea Level Rise at 11th International Conference on Estuarine and Coastal Modeling in Seattle, WA, 2009.
22. Co-organizer, Environmental Impacts of Hurricane Ike on the Western Gulf Coast at Coastal and Estuarine Research Federation Conference in Portland, OR, 2009.
23. Session chair, Nearshore and Coastal Waves 1 at 11th International Workshop on Wave Hindcasting and Forecasting and 2nd Coastal Hazards Symposium in Halifax, Canada, 2009.

Journal, Proposal, and Technical Report Reviews

- *Bulletin of the American Meteorological Society*
- *Climatic Change*
- *Coastal Engineering*
- *Coastal Engineering Journal*
- *Environmental Modeling and Software*
- *Estuarine, Coastal, and Shelf Science*
- *Geophysical Research Letters*
- *GeoResJ*
- *International Society of Offshore and Polar Engineers*

- *Journal of Applied Meteorology and Climatology*
- *Journal of Coastal Research*
- *Journal of Engineering Mechanics*
- *Journal of Geophysical Research*
- *Journal of Hydraulic Engineering*
- *Journal of Physical Oceanography*
- *Journal of Waterway, Port, Coastal, and Ocean Engineering*
- *Monthly Weather Review*
- *Natural Hazards*
- *Natural Hazards and Earth System Sciences*
- *Nature Climate Change*
- *Ocean and Coastal Management*
- *Ocean Engineering*
- *Photogrammetric Engineering and Remote Sensing*
- *Quarterly Journal of the Royal Meteorological Society*
- *Risk Analysis*
- *Weather, Climate, and Society*
- American Association of University Women (AAUW)
- National Oceanic and Atmospheric Administration (NOAA) (U.S.)
- National Research Council of the National Academies (U.S.)
- Natural Sciences and Engineering Research Council of Canada
- NOAA Sea Grant
- Romanian National Research Council
- Technology Foundation STW, The Netherlands
- U.S. Army Corps of Engineers
- U.S. Department of Energy
- U.S. Department of Homeland Security
- U.S. Geological Survey
- U.S. National Science Foundation
- U.S. Naval Research Laboratory
- U.S. Nuclear Regulatory Commission

LICENSES AND CERTIFICATIONS

- Licensed Professional Engineer
 - Virginia, License Number 0402056974
2016 – present
 - New York, License Number 16-082488
2005 – 2018
- Diplome of Coastal Engineering, Academy of Coastal, Port, Ocean, and Navigation Engineers (ACOPNE), Number D.CE 69
2011 – present