Nicole A. Raineault, Ph.D.

Director, Inner Space Center
University of Rhode Island - Graduate School of Oceanography

☎ 401-874-3010 ✉ nraineault@uri.edu

EDUCATION

Ph.D. Geological Sciences; University of Delaware, Newark, DE
M.S. Oceanography; Rutgers University, New Brunswick, NJ
B.S. Marine Sciences, University of Maine, Orono, ME

EXPERIENCE

Director, Inner Space Center 09/2025-present
University of Rhode Island Graduate School of Oceanography

Associate Director of Research & Technology *03/2024-08/2025*
Florida Institute of Oceanography

Chief Scientist *10/2021-03/2024*
Florida Institute of Oceanography

Chief Scientist & Vice President of Exploration & Science Operations *01/2017-11/2021*
Ocean Exploration Trust

Director of Science Operations *02/2014-01/2017*
Ocean Exploration Trust

Post-Doctoral Research Assistant *06/2012-02/2014*
University of Rhode Island, Graduate School of Oceanography

Research Assistant *09/2008-06/2012*
University of Delaware, Coastal Sediment, Hydrodynamics, and Engineering Lab

Graduate Assistant *09/2006-09/2008*
Rutgers University, Institute of Marine and Coastal Sciences

Research Assistant *05-08/2005*
Maine Geological Survey

Research Assistant *09/2003-06/2006*
University of Maine, School of Marine Sciences

PUBLICATIONS

Balbas, A., H. Paradis, K. Konrad, V. Finlayson, C. Kelley, **N.A. Raineault**, B. Orcutt, In review. The age and composition of the Voyager Seamounts: Evidence for long-lived mantle source geology. Geochemistry, Geophysics, and Geosystems.

Raineault, N.A. and Z. Mirmalek, Remote Science at Sea with Remotely Operated Vehicles, 2024.

Frontiers in Robotics and AI Field Robotics. 11:1454923. DOI: 10.3389/frobt.2024.1454923
Ardor Bellucci, L., A.R. Thurber, S. Seabrook, **N.A. Raineault**, A. Demopolous, K. McPhail, In prep. Diversity and distribution of Fungi and Actinobacteria in deep-sea methane seep sediments. Deep Sea Research II.
Sotomayor, A., A. Balbas, K. Konrad, A.A.P. Koppers, J.G. Konter, V.D. Wanless, T.F. Hourigan, C. Kelley, **N. Raineault**, 2023. New insights into the age and origin of two small cretaceous seamount chains proximal to the northwestern Hawaiian Island Ridge. Geospheres. DOI: https://doi.org/10.1130/GES02580.1
Cummings, M.E., L.M. Ardor Bellucci, S. Seabrook, **N.A. Raineault**, K.L. McPhail, A.R. Thurber, 2023. Variations and gradients between methane seep and off-seep microbial communities in a submarine canyon system in the Northeast Pacific. Peer J.
Merle, S.G. R.W. Embley, H.P. Johnson, T.-K. Lau, B.J. Phrampus, **N.A. Raineault**, and L.J. Gee, 2021. Distribution of Methane Plumes on Cascadia Margin and Implications for the Landward Limit of Methane Hydrate Stability. Frontiers in Earth Science. 9(531714), DOI: https://doi.org/10.3389/feart.2021.531714.
Salinas-de-Leon, P., P. Martí-Puig, S. Buglass, C. Arnés-Urgellés, E. Rastoin, M. Creemens, S. Cairns, C. Fisher, T. O'Hara, B. Ott, **N.A. Raineault,** H. Reiswig, G. Rouse, S. Rowle, T.M. Shank, J. Suarez, L. Watling, M.K. Wicksten, L. Marsh, 2020. Deep sea benthic invertebrate megafauna of the Galapagos. Nature: Scientific Reports. DOI: https://doi.org/10.1038/s41598-020-70744-1.
Carey, S., R. Sparks, M. Tucker, L. Tao, L. Robinson, S. Watt, M. Gee, A. Hastie, A. Stinton, M. Leng, **N. Raineault**, R. Ballard, 2019. The polygenetic Kahouanne Seamounts in the Northern Lesser Antilles Island Arc: Evidence for large-scale volcanic island subsidence. Marine Geology, 419. DOI: https://doi.org/10.1016/j.margeo.2019.106046.
Dziak, R.P., H. Matsumoto, R.W. Embley, S.G. Merle, T-K Lau, T. Baumberger, S.R. Hammond, **N. Raineault,** 2018. Passive acoustic records of seafloor methane bubble plumes on the Oregon continental margin. Deep Sea Research II: Telepresence Results, 150. DOI: https://doi.org/10.1016/j.dsr2.2018.04.001.
Williams, E.F., C.M. Castillo, S.L. Klemperer, **N. Raineault**, L. Gee, 2018. Sycamore Knoll: A wave-planed pop-up structure in a sinistral-oblique thrust system, California Continental Borderland. Deep Sea Research II: Telepresence Results, 150. DOI: https://doi.org/10.1016/j.dsr2.2018.03.002.
Seabrook, S. A. Thurber, F. De Leo, T. Baumberger, **N. Raineault**, 2018. Heterogeneity of methane seep microbiomes in the North East Pacific. Deep Sea Research II: Telepresence Results, 150, DOI: https://doi.org/10.1016/j.dsr2.2017.10.016.
Lubetkin, M., S. Carey, K.A. Kelly, G, Robert, W. Cornell, **N. Raineault,** J. Balcanoff, R.D. Ballard, P. Salina-de-Leon, 2018. Deep Sea Research II: Telepresence Results. 150, DOI: https://doi.org/10.1016/j.dsr2.2017.09.017
Gobin, J., D.J. Amon, C.L. Van Dover, L. Levin, L. Marsh, N**. Raineault,** 2017. Characterization of methane-seep communities in a deep-sea area designated for oil and natural gas exploitation off Trinidad and Tobago. Frontiers in Marine Science Special Issue: Anthropogenic Disturbances in Deep Sea. DOI: https://doi.org/10.3389/fmars.2017.00342.
Bell, K.L.C., M.L. Brennan, M.H. Cormier, M. Legg, J.E. Conrad, C.M. Castillo, **N. Raineault**, M. Lubetkin, J.Marlow, C. Caldow, 2018. Initial Observations of Telepresence-enabled Exploration of the Southern California Borderland. From the Mountains to the Abyss: The California Borderland as an Archive of Southern California Geologic Evolution. SEPM/PS-SEPM.
Talas, E., M. Duman, F. Küçüksezgin, M. Brennan, **N. Raineault**, 2015. Sedimentology And Geochemistry of Mud Volcanoes in Anaximander Mountain Region From the eastern Mediterranean Sea. Marine Pollution Bulletin. DOI: https://doi.org/10.1016/j.marpolbul.2015.04.042.
Raineault, N.A., A.C. Trembanis, D.C. Miller, V. Capone, 2013. Interannual changes in seafloor surficial geology at an artificial reef site on the inner continental shelf. *Continental Shelf Research*. 58: 67-78. DOI: https://doi.org/10.1016/j.csr.2013.03.008.

Forrest, A.L., M.E. Wittman, V. Schmidt, **N.A. Raineault**, A. Hamilton, W. Pike, S.G. Schladow, J.E. Reuter, B.E. Laval, A.C. Trembanis, 2012. Quantitative assessment of invasive species in lacustrine environments through benthic imagery analysis. *Limnology and Oceanography: Methods*, 10: 65-74.

Raineault, N.A., A.C. Trembanis, D.C. Miller, 2011. Mapping benthic habitats in Delaware Bay and the coastal Atlantic: acoustic techniques provide greater coverage and high resolution in complex, shallow-water environments. *Estuaries and Coasts*. 35: 682-699. DOI: https://doi.org/10.1007/s12237-011-9457-8.

Lim, S.S. D., et al., **N.A. Raineault**, 2011. A historical overview of the Pavilion Lake Research Project—Analog science and exploration in an underwater environment, *in* Garry, W.B., and Bleacher, J.E., eds., Analogs for Planetary Exploration: The Geological Society of America. Special Paper 483. p. 85–116, doi:10.1130/2011.2483(07).

REPORTS

Raineault, N.A., ed. 2024. Results and Impacts of the First Decade of the Florida RESTORE Act Centers of Excellence Program, 51 pp., DOI: https://zenodo.org/doi/10.5281/zenodo.10735728.

Raineault, N.A., J. Flanders, and E. Niiler, eds. 2021. New frontiers in ocean exploration: The E/V *Nautilus*, NOAA Ship *Okeanos Explorer*, and R/V *Falkor* 2020 field season. Oceanography 34(1), supplement, 78 pp., DOI: https://doi.org/10.5670/oceanog.2021.supplement.01.

Raineault, N.A., and J. Flanders, eds. 2020. New frontiers in ocean exploration: The E/V *Nautilus*, NOAA Ship *Okeanos Explorer*, and R/V *Falkor* 2019 field season. *Oceanography* 33(1), supplement, 122 pp., DOI: https://doi.org/10.5670/oceanog.2020.supplement.01.

Raineault, N.A, and J. Flanders, eds. 2019. New frontiers in ocean exploration: The E/V *Nautilus*, NOAA Ship Okeanos Explorer, and R/V Falkor 2018 field season. Oceanography 32(1), supplement, 150 pp., DOI: https://doi.org/10.5670/oceanog.2019.supplement.01.

Raineault, N.A, J. Flanders, and A. Bowman, eds. 2018. New frontiers in ocean exploration: The E/V *Nautilus*, NOAA Ship *Okeanos Explorer*, and R/V *Falkor* 2017 field season. *Oceanography* 31(1), supplement, 126 pp., DOI: https://doi.org/ 10.5670/ oceanog.2018.supplement.01.

Bell, K.L.C., J. Flanders, A. Bowman, and **N.A. Raineault**, eds. 2017. New frontiers in ocean exploration: The E/V *Nautilus*, NOAA Ship Okeanos Explorer, and R/V Falkor 2016 field season. Oceanography 30(1), supplement, 94 pp., DOI: https://doi.org/10.5670/oceanog.2017.supplement.01.

Bell, K.L.C., M.L. Brennan, J. Flanders, **N.A. Raineault**, K. Wagner, eds. 2016. New Frontiers in Ocean Exploration: The E/V *Nautilus* and NOAA Ship Okeanos Explorer 2015 Field Season. Oceanography 29(1), supplement, 84 pp., DOI: http://dx.doi.org/10.5670/oceanog.2016.supplement.01.

Bell, K.L.C., M.L. Brennan, and **N.A. Raineault**, eds. 2015. New frontiers in ocean exploration: The E/V *Nautilus* 2014 Gulf of Mexico and Caribbean field season. Oceanography 28(1), supplement, 60 pp., DOI: http://dx.doi.org/10.5670/oceanog.2015.supplement.01.

Bell, K.L.C., M.L. Brennan, and **N.A. Raineault,** eds. 2014. New frontiers in ocean exploration: The E/V *Nautilus* 2013 Gulf of Mexico and Caribbean field season. Oceanography 27(1), supplement, 52 pp., DOI: http://dx.doi.org/10.5670/oceanog.2014.supplement.01.

Nordstrom, K.F., N.L. Jackson, N.A. Raineault, 2007. Investigation of Bayside Erosion at Fire Island National Seashore. National Park Service.

SELECT PRESENTATIONS

Raineault, N.A. and Z. Mirmalek, Remote Science to increase ocean exploration and characterization inclusivity and capacity. Ocean Sciences Meeting. New Orleans, LA. February 23, 2024.

Raineault, N.A., C. Ainsworth, J. Graham, B. Rosenheim, H. Greening, W. Graham, Restoration Science to improve future restoration project outcomes in the Gulf of Mexico. Gulf of Mexico Conference. Tampa, FL. February 20, 2024.

Raineault, N.A., Peerside: developing the new blue economy workforce. St. Petersburg Innovation

District "State of Science." **Invited Talk**. St. Petersburg, FL. January 23, 2024.

Raineault, N.A. Beyond the Maps: Partnerships & technology development for mission success. **Invited keynote.** Lakebed 2030. Virtual. September 2021.

Raineault, N.A., J. Fahy, R. Ballard, L. Mayer, K. Broad, E. Heffron, K. Krasnosky, C. Roman, V. Schmidt, A. McLeod, J. Bursek. Correlating sea level rise still-stands to marine terraces and undiscovered submerged shoreline features in the Channel Islands (USA) using autonomous and remotely operated systems. American Geophysical Union New Orleans, LA. December 2017.

Raineault, N.A., E/V *Nautilus* Mapping Program: Filling in the Blank Spots on the Map with Telepresence Cruises. GEBCO Symposium: Map the Gaps. Busan, South Korea. **Invited Talk.** November 2017.

Raineault, N.A., Deep-Sea Exploration with the E/V *Nautilus*: 2016 Season Highlights and Upcoming Opportunities. University of New Hampshire Center for Coastal and Ocean Mapping. **Invited Seminar.** February 2017.

Raineault, N.A., Deep-Sea Exploration with the E/V *Nautilus*: 2015 Season Highlights and Upcoming Opportunities. University of New Hampshire Center for Coastal and Ocean Mapping. **Invited Seminar.** November 2015.

Raineault, N.A., Deep-Sea Exploration with the E/V *Nautilus*: Program Overview, Highlights, and Opportunities. University of New Hampshire Center for Coastal and Ocean Mapping. **Invited seminar.** February 2014.

Raineault, N.A., Combined Technologies to Study Seafloor Morphology at an Artificial Reef. University of Rhode Island, Graduate School of Oceanography, **Invited Seminar**, November 2012.

Raineault, N.A., Ocean Exploration: From Shallow Habitat Mapping to Deep Sea Mud Volcanoes. TUBITAK (Turkish Science Foundation). **Invited Seminar**. September 2012.

Raineault, N.A., A.C. Trembanis, D.C. Miller. Effects of Artificial Reef Structures on the Geology and Biology of the Seafloor. Coastal Estuarine Research Federation Biennial Conference, Daytona Beach, FL. November 2011.

Raineault, N.A., A.C. Trembanis, D.C. Miller. Illuminating the Abyss: Mapping the deep, dark, or murky geology and habitats of Delaware Bay and the coastal Atlantic. VIMS Department of Physical Sciences. **Invited Seminar.** October 2011.

Raineault, N.A., A.C. Trembanis, D.C. Miller. Small-Scale Hard-Bottom Benthic Diversity in Delaware Bay. Delaware Estuary Science and Environmental Summit, January 2011.

Raineault, N.A., A.C. Trembanis, D.C. Miller. Hydrodynamics and Inferred Sediment Dynamics at Hard-bottom Benthic Habitats in the Delaware Bay. Geological Society of America, Northeastern/Southeastern Regional Meeting, March 2010.

Raineault, N.A.. K.F. Nordstrom, N.L. Jackson. "Effects of Bulkheads on Estuarine Beach Swash Zone Processes and Beach Characteristics. Delaware Estuary Science & Environmental Summit, Cape May, New Jersey, January 2009.

Raineault, N.A., K.F. Nordstrom, N.L. Jackson. "Effects of Bulkheads on Estuarine Beach Processes and Characteristics." American Society of Limnology and Oceanography, Orlando, FL, 4 March 2008.

Raineault, N.A. 2007. "Bulkhead Effects on Swash Processes on an Estuarine Shoreline." IMCS Seminar, Rutgers University, September 10, 2007.

GRA NT FUNDING

2022-2025, Office of Naval Research, Defense University Research Instrumentation Program (DURIP), Principal Investigator/Project Director

2022-2025, National Science Foundation GeoPATHS, Principal Investigator/Project Director

2022-2025, Florida RESTORE Act Centers of Excellence Program, Principal Investigator/Project Director

2022-2025, NOAA Center for Ocean Mapping and Innovative Technologies (COMIT), Co-Investigator

2017-2020, NASA PSTAR, Co-Investigator