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Applied Ocean Physics & Engineering, MS #11
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EDUCATION

B.S. and B.A., Civil & Environmental Engineering, <i>summa cum laude</i>	1996
Rice University, Houston, TX	
M.S., Civil & Environmental Engineering	1998
Stanford University, Palo Alto, CA	
Ph.D., Civil & Environmental Engineering	2005
University of California, Berkeley, CA	

PROFESSIONAL EXPERIENCE

Woods Hole Oceanographic Institution, Woods Hole, MA	2005 – present
<i>Senior scientist (2023-), Associate scientist with tenure (2015–2023), Associate scientist (2011–2015), Assistant scientist (2007–2011), Postdoctoral scholar (2005–2007)</i>	
University of California, Berkeley, CA	
<i>Graduate researcher & instructor</i>	2000 – 2005
Defense Nuclear Facilities Safety Board, Washington, DC	
<i>Environmental engineer</i>	1996 – 2000

RESEARCH INTERESTS

Fluid dynamics and transport in estuaries and the coastal ocean, including estuarine exchange, sediment transport, and physical-biological coupling.

PUBLICATIONS

**Students advised or co-advised; ^Postdocs advised or co-advised*

- Li, M., R Najjar, S Kaushal, A Mejia, R Chant, DK Ralston, H Burchard, A Hadjimichael, A Lassiter, X Wang, 2025. The emerging global threat of salt contamination of water supplies in tidal rivers. *Env. Sci & Tech. Letters*, <https://pubs.acs.org/doi/10.1021/acs.estlett.5c00505> .
- Keogh, ME, DA Sutherland, EF Eidam, TD Souza, J Schmitt, A Helms, DK Ralston, 2025. Estuarine sediment dynamics and the importance of storms in moving (and removing) mud, *Estuaries and Coasts*, 48:104, <https://doi.org/10.1007/s12237-025-01524-1>.
- Kasaei, S, PM Orton, DK Ralston, JC Warner, 2025. Pluvial and compound flooding in a coupled coastal system modeling framework: New York City during post-tropical cyclone Ida (2021), *Hydrol. Earth Syst. Sci.*, 29, 2043–2058, <https://doi.org/10.5194/hess-29-2043-2025>.
- Wegman, TM, JD Pietrzak, AR Horner-Devine, HA Dijkstra, DK Ralston, 2025. Forcing mechanisms of salt intrusion in a low-lying river delta during a prolonged drought, *J. Geophys. Res.*, 130(1), e2024JC021655, <http://dx.doi.org/10.1029/2024JC021655>
- Ralston DK, WR Geyer, CC Wackerman, B Dzwonkowski, DA Honegger, MC Haller, 2024. Interacting influences of diurnal tides, winds, and river discharge on a large coastal plume, *J. Geophys. Res.*, 129(9): e2024JC021288, <https://doi.org/10.1029/2024JC021288>
- Bo, T*, DK Ralston, WR Geyer, JC McWilliams, 2024. Small estuaries as sinks of buoyant particles, *PNAS*, 121 (35) e2401498121, <https://doi.org/10.1073/pnas.2401498121>

- Eidam, EF, T Souza, M Keogh, DA Sutherland, DK Ralston, J Schmitt, A Helms, 2024. Spatial and temporal variability of century-scale sediment accumulation in an active-margin estuary, *Estuaries and Coasts*, <https://doi.org/10.1007/s12237-024-01407-x>
- Deitrick, AR*, DK Ralston, MM Baustian, CR Esposito, M Beltran-Burgos, AJ Courtois, H Nepf, 2024. Vegetation-generated turbulence does not impact the erosion of natural cohesive sediment, *Geophys. Res. Lett.*, 51(4), e2024GL109730, <http://dx.doi.org/10.1029/2024GL109730>.
- Honegger, DA, DK Ralston, J Jurisa, WR Geyer, MC Haller, 2024. Kinematics of an ebb plume front controlled by a tidal crossflow *J. Geophys. Res.*, 129, e2023JC020550, <https://doi.org/10.1029/2023JC020550>
- Wang, A*, DK Ralston, N Bi, X Wu, C Wang, P Yuan, H Wang, 2024. Sediment resuspension and transport due to synoptic winter winds in the Bohai Sea, *Geomorph.*, 456:109211, <https://doi.org/10.1016/j.geomorph.2024.109211>
- Bo, T*, DK Ralston, AMP Garcia^, WR Geyer, 2024. Tidal intrusion fronts, surface convergence, and mixing in an estuary with complex topography, *J. Phys. Oceanogr.*, 54(3):653-677 <https://doi.org/10.1175/JPO-D-23-0131.1>
- Geyer, WR, DK Ralston, MC Haller, C Bassett, DA Honegger, 2024. The Structure and Dynamics of an Estuarine Tidal Intrusion Front, *J. Geophys. Res.*, 129(2): e2023JC020371 <https://doi.org/10.1029/2023JC020371>
- Bassett, C, AC Lavery, DK Ralston, WR Geyer, JT Jurisa, J Thomson, DA Honegger, A Simpson, ME Scully, MC Haller, 2023. Acoustic backscattering at a tidal intrusion front, *Prog. Oceanogr.*, 219, 103167, <https://doi.org/10.1016/j.pocean.2023.103167>
- Deitrick, AR*, EH Hovendon, DK Ralston, HM Nepf, 2023, Sediment deposition reduced by vegetation-generated turbulence within a model array of mangrove roots, *Front. Mar. Sci.*, 10: 1266241, <https://doi.org/10.3389/fmars.2023.1266241>
- Bo, T*, DK Ralston, WR Geyer, 2023. Sources of drag in estuarine meanders: momentum redistribution, bottom stress enhancement, and bend-scale form drag. *J. Phys. Oceanogr.*, 53(7):1629-1650 <https://doi.org/10.1175/JPO-D-22-0211.1>
- Orton, P, DK Ralston, B van Prooijen, D Secor, N Ganju, Z Chen, S Fernald, B Brooks, K Marcell, 2023. Increased Utilization of Storm Surge Barriers: A Research Agenda on Estuary Impacts, *Earth's Future*, 11(3): e2022EF002991. <https://doi.org/10.1029/2022EF002991>
- Ralston, DK, 2023. Changes in estuarine sediment dynamics with a storm surge barrier, *Estuaries and Coasts*, 46, 678–696, <https://doi.org/10.1007/s12237-023-01172-3>
- Wang, A*, X Wu, N Bi, DK Ralston, C Wang, H Wang, 2022. Combined effects of waves and tides on bottom sediment resuspension in the southern Yellow Sea, *Mar. Geol.*, 452, 106892, <https://doi.org/10.1016/j.margeo.2022.106892>
- Bo, T*, and DK Ralston, 2022. Frontogenesis, mixing, and stratification in estuarine channels with curvature, *J. Physical Oceanogr.*, 52: 1333–1350, <https://doi.org/10.1175/JPO-D-21-0298.1>
- Ralston, DK, 2022. Impacts of storm surge barriers on drag, mixing, and exchange flow in a partially mixed estuary, *J. Geophys. Res.*, 127(4):e2021JC018246, <https://doi.org/10.1029/2021JC018246>
- Clark, S*, KA Hubbard, DK Ralston, DJ McGillicuddy, C Stock, MA Alexander, E Curchitser, 2022. Projected effects of climate change on *Pseudo-nitzschia* bloom dynamics in the Gulf of Maine, *J. Mar. Sys.*, 230:103737, <https://doi.org/10.1016/j.jmarsys.2022.103737>
- Bo, T*, DK Ralston, WM Kranenburg, WR Geyer, P Traykovski, 2021. High and variable drag in a sinuous estuary with intermittent stratification, *JGR-Oceans*, <https://doi.org/10.1029/2021JC017327>

- Clark, S*, K Hubbard, DJ McGillicuddy, Jr., DK Ralston, S Shankar, 2021. Investigating *Pseudo-nitzschia australis* introduction to the Gulf of Maine with observations and models, *Continental Shelf Res.*, 228:104493, <https://doi.org/10.1016/j.csr.2021.104493>
- Eidam, EF, DA Sutherland, DK Ralston, T Conroy, B Dye, 2021. Shifting sediment dynamics in the Coos Bay Estuary in response to 150 years of modification, *J. Geophys. Res.*, 126(1): e2020JC016771, <http://dx.doi.org/10.1029/2020JC016771>
- Ralston, DK, B Yellen, and JD Woodruff. 2021. Watershed sediment supply and potential impacts of dam removals for an estuary. *Estuaries and Coasts*, 44:1195–1215, <https://doi.org/10.1007/s12237-020-00873-3>
- Chant, RJ, DK Ralston, NK Ganju, C Pianca, AE Simonson, and RA Cartwright, 2021. Sediment budget estimates for a highly impacted embayment with extensive wetland loss, *Estuaries and Coasts*, 44: 608–626, <https://doi.org/10.1007/s12237-020-00784-3>
- Yellen, B, JD Woodruff, C Ladlow, DK Ralston, S Fernald, and W Lau, 2021. Rapid Tidal Marsh Development in Anthropogenic Backwaters., *Earth Surf. Proc. Landforms*, 46(3): 554-572, <https://doi.org/10.1002/esp.5045>
- Bo, T*, DK Ralston, Flow Separation and Increased Drag Coefficient in Estuarine Channels with Curvature, 2020, *JGR-Oceans*, 125(10): e2020JC016267, <http://dx.doi.org/10.1029/2020JC016267>
- Eidam, EF, DA Sutherland, D.K. Ralston, B Dye, T Conroy, J Schmitt, P Ruggiero, J Wood, 2020. Impacts of 150 years of shoreline and bathymetric change in the Coos Estuary, Oregon, USA, *Estuaries and Coasts*, <https://doi.org/10.1007/s12237-020-00732-1>
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- Geyer, WR, J-L Chen, DK Ralston, 2020. Mechanisms of exchange flow in an estuary with a narrow, deep channel and wide, shallow shoals, *JGR-Oceans*, 125, e2020JC016092, <http://dx.doi.org/10.1029/2020JC016092>
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- Hoagland, P, A Beet, DK Ralston, GR Parsons, YA Shirazi, and EW Carr, 2020. Salinity Intrusion in a Modified River-Estuary System: A Framework for Integrated Source-to-Sea Management, *Frontiers in Marine Science*, 7:425, <https://doi.org/10.3389/fmars.2020.00425>
- Conroy, T, DA Sutherland, DK Ralston, 2020. Estuarine exchange flow variability in a seasonal, segmented estuary, *J. Phys. Oceanogr.*, 50: 595-613, <https://doi.org/10.1175/JPO-D-19-0108.1>
- Ralston, DK and SK Moore, 2020. Modeling harmful algal blooms in a changing climate, *Harmful Algae*, 91:101729, <https://doi.org/10.1016/j.hal.2019.101729>
- Fringer, O, C Dawson, R He, DK Ralston, Y Zhang, 2019. The future of coastal and estuarine modeling: Findings from a workshop, *Ocean Modelling*, 143:101458, <https://doi.org/10.1016/j.ocemod.2019.101458>
- Clark S*, K Hubbard, DM Anderson, DJ McGillicuddy, Jr., DK Ralston, D Townsend, 2019. *Pseudo-nitzschia* Bloom Dynamics in the Gulf of Maine: 2012-2016, *Harmful Algae*, 88:101656. <https://doi.org/10.1016/j.hal.2019.101656>

- Ralston, DK and WR Geyer, 2019. Response to channel deepening of the salinity intrusion, estuarine circulation, and stratification in an urbanized estuary, *J. Geophys. Res.*, 124 (7): 4784-4802, <https://doi.org/10.1029/2019JC015006>
- Kranenburg WM, WR Geyer, AMP Garcia, and DK Ralston, 2019. Reversed lateral circulation in a sharp estuarine bend with weak stratification, *J. Phys. Oceanogr.*, 49, 1619–1637, <https://doi.org/10.1175/JPO-D-18-0175.1>
- Wang, A*, DK Ralston, N Bi, Z Cheng, X Wu, H Wang, 2019. Seasonal variation in sediment transport and deposition associated with an Omega-shaped clinoform in the Yellow Sea, *Continental Shelf Res.*, 179, 37-51, <https://doi.org/10.1016/j.csr.2019.04.009>
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- Chen, J-L^, DK Ralston, WR Geyer, CK Sommerfield, and RJ Chant, 2018. Wave generation, dissipation, and disequilibrium in an embayment with complex bathymetry, *J. Geophys. Res.*, 123 (11): 7856-7876, doi: 10.1029/2018JC014381.
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- Ralston, DK, GC Cowles, WR Geyer, RC Holleman^, 2017. Turbulent and numerical mixing in a salt wedge estuary: dependence on grid resolution, bottom roughness, and turbulence closure. *J. Geophys. Res. Oceans*, 122, 692–712, doi:10.1002/2016JC011738.
- Rodenberg, LA and DK Ralston, 2017. Historical sources of polychlorinated biphenyls to the sediment of the New York/New Jersey Harbor. *Chemosphere*, 169: 450–459, doi:10.1016/j.chemosphere.2016.11.096.

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- Pineda, J, W Cho, V Starczak, AF Govindarajan, HM Guzman, Y Girdhar, RC Holleman[^], J Churchill, H Singh, DK Ralston, 2016. A crab swarm at an ecological hotspot: patchiness and population density from AUV observations at a coastal, tropical seamount. *PeerJ*, 4:e1770
https://doi.org/10.7717/peerj.1770. PMCID: PMC4841253
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- Geyer, WR, DK Ralston, 2015. Estuarine frontogenesis. *J. Phys. Oceanogr.*, 45(2): 546-561, doi:10.1175/JPO-D-14-0082.1.
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- Ralston, DK, WR Geyer, and JC Warner, 2012. Bathymetric controls on sediment transport in the Hudson River estuary: lateral asymmetry and frontal trapping. *J. Geophys. Res.*, 117, C10013, doi:10.1029/2012JC008124.
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- Ralston, DK, WR Geyer, and JA Lerczak, 2008. Subtidal salinity and velocity in the Hudson River estuary: observations and modeling. *J. Physical Oceanogr.*, 38(4), 753-770.
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- Ralston, DK and MT Stacey, 2006. Shear and turbulence production across subtidal channels. *J. Marine Res.*, 64(1), 147-171, doi:10.1357/002224006776412359.
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Stacey, MT and DK Ralston, 2005. The scaling and structure of the estuarine bottom boundary layer. *J. Physical Oceanogr.*, 35(1), 55-71.

Submitted

Garcia, AM[^], T Bo, WR Geyer, DK Ralston, Topographically induced dispersion in a salt marsh estuary, *J. Phys. Oceanogr.*, submitted Dec 2024

Yin, D[^], DK Ralston, JC Warner, NK Ganju, CK Harris, Wind pumping induced salt transport in a weakly-tidal estuary, *J. Geophys. Res.*, submitted Mar 2025

Kasaei, S, PM Orton, T Wahl, DK Ralston, JC Warner, Compounding of 100-year coastal floods by rainfall in an urban environment, *Env. Res. Letters*, submitted Jun 2025.

Non-refereed publications

Reeder, DB, D Honegger, J Joseph, C McNeil, T Rago, & D Ralston, 2018. Acoustic propagation at low-to-mid-frequencies in the Connecticut River. In *Proceedings of Meetings on Acoustics 175ASA* (Vol. 33, No. 1, p. 005001). ASA.

HONORS AND AWARDS

Outstanding Reviewer for JGR: Oceans (2024)

Outstanding Associate Editor for *Estuaries and Coasts* (2021)

Pritchard Award, Coastal and Estuarine Research Federation (2017)

Office of Naval Research Young Investigator Award (2008)

Woods Hole Oceanographic Institution Postdoctoral Scholar Fellowship (2005)

Phi Beta Kappa, Tau Beta Pi, and Chi Epsilon honor societies

PROFESSIONAL AFFILIATIONS

American Geophysical Union, Coastal and Estuarine Research Federation

Professional Engineer, California