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EDUCATION

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

PROFESSIONAL EXPERIENCE

Applied Ocean Physics & Engineering, Woods Hole Oceanographic Institution, Woods Hole, MA <i>Associate scientist with tenure</i>	2015 – present
<i>Associate scientist</i>	2011 – 2015
<i>Assistant scientist</i>	2007 – 2011
<i>Postdoctoral scholar</i>	2005 – 2007
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 mechanics and scalar transport in estuaries and the coastal ocean, including estuarine exchange, dispersion, and residence time, sediment transport, stratified turbulence, bathymetric effects on shallow tidal flows, frontal processes, and physical-biological coupling.

PUBLICATIONS

Ralston, DK, S Talke, WR Geyer, H Al'Zubadaei, and CK Sommerfield, 2019. Bigger tides, less flooding: Effects of dredging on barotropic dynamics in a highly modified estuary, *J. Geophys. Res.*, doi: 10.1029/2018JC014313.

Chen, J-L, DK Ralston, WR Geyer, CK Sommerfield, and RJ Chant., 2019. Wave generation, dissipation, and disequilibrium in an embayment with complex bathymetry, *J. Geophys. Res.*, doi: 10.1029/2018JC014381.

Burchard, H., Schuttelaars, H. M., & Ralston, D. K., 2018. Sediment trapping in estuaries. *Annual review of marine science*, 10, 371-395.

Geyer WR and DK Ralston, 2018. A mobile pool of contaminated sediment in the Penobscot Estuary, Maine, USA, *Sci Total Environ.* 612: 694-707. doi: 10.1016/j.scitotenv.2017.07.195.

Ralston, DK, WR Geyer, 2017. Sediment transport time scales and trapping efficiency in a tidal river. *J. Geophys. Res. Earth Surface*, 122, 2042–2063. <https://doi.org/10.1002/2017JF004337>

Brosnahan, ML, DK Ralston, AD Fischer, AR Solow, DM Anderson, 2017. Bloom termination of the toxic dinoflagellate *Alexandrium catenella*: Vertical migration behavior, sediment infiltration, and benthic cyst yield. *Limnol. Oceanogr.*, 62: 2829–2849. doi:10.1002/lno.10664

- Geyer, WR, DK Ralston, RC Holleman, 2017. Hydraulics and mixing in a laterally divergent channel of a highly stratified estuary, 2017. *J. Geophys. Res. Oceans*, 122, 4743–4760, doi:10.1002/2016JC012455.
- Yellen, B, JD Woodruff, DK Ralston, DG MacDonald, DS Jones, 2017. Salt wedge dynamics lead to enhanced sediment trapping within side-embayments in high-energy estuaries. *J. Geophys. Res. Oceans*, 122, 2226–2242, doi:10.1002/2016JC012595.
- 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.
- Holleman, RC, WR Geyer, DK Ralston, 2016. Stratified turbulence and mixing efficiency in a salt wedge estuary. *J. Phys. Oceanogr.*, 46(6): 1769–1783, doi:10.1175/JPO-D-15-0193.1.
- 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>. PMID: PMC4841253
- Ganju, NK, MJ Brush, B Rashleigh, AL Aretxabaleta, P del Barrio, M Forsyth, JS Grear, LA Harris, SJ Lake, G McCardell, J O'Donnell, DK Ralston, RP Signell, JM Testa, and JMP Vaudrey, 2016. Progress and challenges in coupled hydrodynamic-ecological estuarine modeling. *Estuaries and Coasts*, 39(2):311–332, doi:10.1007/s12237-015-0011-y. PMID: PMC5053394
- Ralston, DK, ML Brosnahan, SE Fox, KD Lee, and DM Anderson, 2015. Temperature and residence time controls on an estuarine harmful algal bloom: Modeling hydrodynamics and *Alexandrium fundyense* in Nauset estuary. *Estuaries and Coasts*, 38(6):2240–2258, doi:10.1007/s12237-015-9949-z. PMID: PMC4675069
- Brosnahan, ML, L Velo-Suarez, DK Ralston, SE Fox, TR Sehein, A Shalapyonok, HM Sosik, RJ Olson, and DM Anderson, 2015. Rapid growth and concerted sexual transitions by a bloom of the harmful dinoflagellate *Alexandrium fundyense* (Dinophyceae). *Limnol. Oceanogr.* 60(6):2059–2078, doi: 10.1002/lno.10155. PMID: PMC5014212
- Halliday, E, DK Ralston, and R Gast, 2015. Contribution of sand-associated enterococci to dry weather water quality. *Environ. Sci. Tech.*, 49(1):451–458, doi:10.1021/es504908h. PMID: PMC4304835
- Geyer, WR, DK Ralston, 2015. Estuarine frontogenesis. *J. Phys. Oceanogr.*, 45(2): 546–561, doi:10.1175/JPO-D-14-0082.1.
- Ralston, DK, BA Keafer, ML Brosnahan, and DM Anderson, 2014. Temperature dependence of an estuarine harmful algal bloom: Resolving interannual variability in bloom dynamics using a degree day approach. *Limnol. Oceanogr.*, 59(4):1112–1126, doi:10.4319/lno.2014.59.4.1112. PMID: PMC4237216
- Ralston, DK, JC Warner, WR Geyer, and GR Wall, 2013. Sediment transport due to extreme events: the Hudson River estuary after Tropical Storms Irene and Lee. *Geophys. Res. Lett.*, 40(20):5451–5455, doi:10.1002/2013GL057906.
- Ralston, DK, H Jiang, and JT Farrar, 2013. Waves in the Red Sea: response to monsoonal and mountain gap winds. *Continental Shelf Res.*, 65:1–13, <http://dx.doi.org/10.1016/j.csr.2013.05.017>.

- Ralston, DK, WR Geyer, PA Traykovski, and NJ Nidzicko, 2013. Effects of estuarine and fluvial processes on sediment transport over deltaic tidal flats, *Continental Shelf Res.*, 60, S40-S57, doi:10.1016/j.csr.2012.02.004.
- Raubenheimer, B., DK Ralston, S Elgar, D Giffen, and R Signell, 2013. Winds on the Skagit tidal flats, *Continental Shelf Research*, 60, S13-S21, doi:10.1016/j.csr.2012.02.001.
- 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.
- Nidzicko, NJ, and DK Ralston, 2012. Tidal asymmetry and velocity skew over tidal flats and shallow channels within a macrotidal river delta. *J. Geophys. Res.*, 117, C03001, 17 pp, doi:10.1029/2011JC007384.
- Chen S-N, WR Geyer, DK Ralston, and JA Lerczak, 2012. Estuarine exchange flow quantified with isohaline coordinates: contrasting long and short estuaries, *J. Phys. Oceanogr.*, 42, 748-763, doi: 10.1175/JPO-D-11-086.1.
- Crespo, B.G., B.A. Keafer, D.K. Ralston, H. Lind, D. Farber, and D.M. Anderson, 2011. Dynamics of *Alexandrium fundyense* blooms and shellfish toxicity in the Nauset Marsh System of Cape Cod (Massachusetts, USA). *Harmful Algae*, 12: 26-38, doi: 10.1016/j.hal.2011.08.009.
- Levinton, JS, M Doall, DK Ralston, A Starke, and B Allam, 2011. Climate change, precipitation and impacts on an estuarine refuge from disease. *PLOS ONE*, 6(4): e18849. doi:10.1371/journal.pone.0018849. PMID: PMC3084236
- Geyer, WR and DK Ralston, 2011. The dynamics of strongly stratified estuaries. In: *Treatise on Estuarine and Coastal Science*, E. Wolanski and DS McLusky, Eds., vol. 2:37-51. Waltham: Academic Press.
- Ralston, DK, WR Geyer, JA Lerczak, and M Scully, 2010b. Turbulent mixing in a strongly forced salt wedge estuary. *J. Geophys. Res.*, 115, C12024, doi:10.1029/2009JC006061.
- Chen S-N, WR Geyer, CR Sherwood, and DK Ralston, 2010. Sediment transport and deposition on a river-dominated tidal flat: An idealized model study. *J. Geophys. Res.*, 115, C10040, doi:10.1029/2010JC006248.
- Ralston, DK, WR Geyer, and JA Lerczak, 2010a. Structure, variability, and salt flux in a strongly forced salt wedge estuary. *J. Geophys. Res.*, 115, C06005, doi:10.1029/2009JC005806.
- Ralston, DK and WR Geyer, 2009. Episodic and long-term sediment transport in the Hudson River estuary. *Estuaries and Coasts*, 32, 1130–1151, doi: 10.1007/s12237-009-9206-4.
- Chen, S-N, LP Sanford, and DK Ralston, 2009. Lateral circulation and sediment transport driven by axial winds in an idealized, partially mixed estuary. *J. Geophys. Res.*, 114, C12006, doi:10.1029/2008JC005014.
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- Geyer, WR, ME Scully, and DK Ralston, 2008. Quantifying vertical mixing in estuaries. *Environ. Fluid Mech.*, 8, 495-509, doi:10.1007/s10652-008-9107-2.
- 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.

- Ralston, DK, DJ McGillicuddy, and DW Townsend, 2007. Asynchronous vertical migration and bimodal distribution of motile phytoplankton. *J. Plankton Res.*, 29(9), 803-821, doi:10.1093/plankt/fbm061.
- Ralston, DK and MT Stacey, 2007. Tidal and meteorological forcing of sediment transport in tributary mudflat channels. *Continental Shelf Res.*, 27(10-11), 1510-1527, doi:10.1016/j.csr.2007.01.010. PMID: PMC3076693
- Ralston, DK and MT Stacey, 2006. Shear and turbulence production across subtidal channels. *J. Marine Res.*, 64(1), 147-171, doi:10.1357/002224006776412359.
- Ralston, DK and MT Stacey, 2005b. Longitudinal dispersion and lateral circulation in the intertidal zone. *J. Geophys. Res.*, 110(C7), C07015, doi:10.1029/2005JC002888.
- Ralston, DK and MT Stacey, 2005a. Stratification and turbulence in subtidal channels through intertidal mudflats. *J. Geophys. Res.*, 110(C8), C08009, doi:10.1029/2004JC002650.
- Stacey, MT and DK Ralston, 2005. The scaling and structure of the estuarine bottom boundary layer. *J. Physical Oceanogr.*, 35(1), 55-71.

In press

- Pareja-Roman, LF, RJ Chant, DK Ralston, 2019. Wind generated waves and their role in the momentum budget and subtidal exchange of a coastal embayment, *JGR-Oceans*, in press.

Submitted

- Y.A. Shirazi, E. W. Carr, G. R. Parsons, P. Hoagland, D. K. Ralston and J. Chen; Increased operational costs of electricity generation from salinity increases due to sea level rise and a deepened channel, *Journal of Environmental Management*, submitted 7/2018
- Kranenburg WM, WR Geyer, AMP Garcia, and DK Ralston, Reversed lateral circulation in a sharp estuarine bend with weak stratification, *J. Phys. Oceanogr.*, submitted 8/2018
- Wang, A, DK Ralston, N Bi, Z Cheng, X Wu, H Wang, Seasonal variation in sediment transport and deposition associated with an Omega-shaped clinoform in the Yellow Sea, *Continental Shelf Res.*, submitted 8/2018
- Chant, RJ, DK Ralston, NK Ganju, C Pianca, AE Simonson, and RA Cartwright., Sediment budget estimates for a highly impacted embayment with extensive wetland loss, *Estuaries and Coasts*, submitted 12/2018.
- Ralston, DK and WR Geyer, Response to channel deepening of the salinity intrusion, estuarine circulation, and stratification in an urbanized estuary, *J. Geophys. Res.*, submitted 1/2019.

HONORS AND AWARDS

- Pritchard Award, Coastal and Estuarine Research Federation (2017)
- Office of Naval Research Young Investigator Award (2008)
- Woods Hole Oceanographic Institution Postdoctoral Scholar Fellowship (2005)

PROFESSIONAL AFFILIATIONS

- American Geophysical Union, Coastal and Estuarine Research Federation, Association for the Sciences of Limnology and Oceanography
- Professional Engineer, California