

Education

B.A. Biochemistry and Cell Biology cum laude, University of California at San Diego, 1981.

Ph.D. Marine Chemistry, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program, 1986.

Professional Experience

- Lab Technician, Scripps Institute of Oceanography, part-time, Sept. 1980 to Aug. 1981.
- M.I.T. Research Assistantship, Massachusetts Institute of Technology, Fall 1981 to Spring 1983.
- Graduate Research Assistant, Woods Hole Oceanographic Institution, Spring 1983 to Fall 1986.
- Post-Doctoral Investigator, Woods Hole Oceanographic Institution, Sept. 1986 to Feb. 1987.
- Visiting Investigator, Woods Hole Oceanographic Institution, Feb. 1987 to Sept. 1988.
- Assistant Scientist, Woods Hole Oceanographic Institution, Sept. 1988 to Sept. 1992.
- Adjunct Associate Scientist, Bermuda Biological Station for Research, Jan. 1992 to Jan. 1996.
- Associate Scientist, Woods Hole Oceanographic Institution, Sept. 1992 to March 1996.
- Associate Program Director, National Science Foundation, Ocean Sciences Division/Chemical Oceanography Program, Sept. 1996 to Sept. 1998.
- Associate Scientist w/Tenure, Woods Hole Oceanographic Institution, March 1996 to Sept. 2000.
- Executive Scientist, US JGOFS Planning and Data Management Office, Dec. 1998 to Oct. 2005.
- Department Chair, Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, May 2003 to Sept. 2007.
- Senior Scientist, Woods Hole Oceanographic Institution, Sept. 2000 to present.
- Director, Center for Marine and Environmental Radioactivity, Jan. 2013 to present.

Professional Affiliations & Awards

- Member, Geochemical Society, 1982 to 1993.
- Editorial Board, Journal of Environmental Radioactivity, 1987 to 1993.
- Member, American Geophysical Union, 1984 to present.
- Member, The Oceanography Society, 1989 to present.
- Chair, Scientific Committee on Oceanic Research Working Group 116, Sediment Trap and 234Th Methods for Carbon Export Flux Determination, 2000 to 2007.
- Fellow, Ocean Life Institute, WHOI 2001 to 2003.
- Directors Award for Collaborative Integration, US NSF, 2007.
- Paul M. Fye Chair, WHOI, 2008 to 2013.
- Fellow, American Geophysical Union, 2009.

- Times Higher Education top cited scientist in Oceanography, 2000 to 2010.
- Foreign member of the Royal Netherlands Academy of Arts and Sciences, 2013 to present.
- Japan Society for the Promotion of Science Short term “S” Fellowship (highest level fellowship for overseas researchers), 2013.
- Co-Chair, Scientific Committee on Oceanic Research (SCOR) Working Group Radioactivity in the Ocean, 5 decades later (RiO5), with Minhan Dai of Xiamen University, China
- Elected a Fellow of the American Association for the Advancement of Science (AAAS), 2018.
- Awarded the 2019 John H. Martin Award with co-authors by Association for the Sciences of Limnology and Oceanography for Boyd et al., (2000). A mesoscale phytoplankton bloom in the polar Southern Ocean stimulated by iron fertilisation. *Nature*, 407, 695-702.
- 2021 NASA Robert H. Goddard Honor Award- EXPORTS team. D. Siegel & others, including K. Buesseler
- 2022 Geochemistry Fellow, Geochemical Society and the European Association of Geochemistry

Research Interests

- Upper-ocean biogeochemical cycles and fluxes of carbon and associated elements as part of the ocean biological pump.
- Improvement in methods to quantify and assess suspended and sinking particles abundances, sources and transport in the ocean.
- Use of man-made and naturally occurring radionuclides to study ocean processes.
- Assessment of radioactivity associated with the releases from Chernobyl, Fukushima, the Marshall Islands and other localized sources.
- Assessment of the ocean’s role in regulating climate and to what degree ocean carbon dioxide removal might be enhanced in a responsible, transparent and quantifiable way.
- Education of public audiences regarding radioactivity in the oceans and training of the next generation of ocean radiochemists

Research Publications (Most recent to oldest)

- 216 Karthäuser, C., Mass, A., Niimi, Y., Blanco-Bercial, L., Wankel, S.D., Buesseler, K.O., Sievert, S.M. (2026) Fecal pellet packaging enhances marine carbon sequestration. *Limnology and Oceanography*, 71(3), e70328. DOI: [10.1002/lno.70328](https://doi.org/10.1002/lno.70328)
- 215 Buesseler et al. (2026) The case for ocean iron fertilization field trials. *Dialogues on Climate Change*, online. DOI: [10.1177/29768659261420631](https://doi.org/10.1177/29768659261420631)
- 214 Siegel D.A. et al. (2025) Assessing marine snow dynamics during the demise of the North Atlantic spring bloom using in situ particle imagery. *Global Biogeochemical Cycles*, 39(11), e2025GB008676. DOI: doi.org/10.1029/2025GB008676
- 213 Song, Y., Omand, M., Durkin, C., Estapa, M., Buesseler, K. (2025) GelCam: Visualizing sinking particle flux via a polyacrylamide gel-based sediment trap. *Limnology and Oceanography*, preprint. DOI: doi.org/10.1002/lom3.10724.

- 212 Stephens, B.M., Roca-Martí, M., Maas, A., et al. (2025) An upper-mesolegic-zone carbon budget for the subarctic North Pacific. *Biogeosciences*, 22, 3301-3328. DOI: doi.org/10.5194/bg-22-3301-2025.
- 211 Traylor, S., Nicholson, D.P., Clevenger, S.J., Buesseler, K.O., D'Asaro, E., Lee, C.M. (2025) Autonomous observations enhance our ability to observe the biological carbon pump across diverse carbon export regimes. *Limnology and Oceanography*, 9999, 1-14. DOI: doi.org/10.1002/lno.70002.
- 210 Buesseler, K.O, Bianchi, D., Chai, F. et al (2024) Next steps for assessing ocean iron fertilization for marine carbon dioxide removal. *Frontiers: Climate*, 6:1430957. DOI: doi.org/10.3389/fclim.2024.1430957
- 209 Karthäuser, C., Fucile, P.D., Maas, A.E. et al. (2024) RotoBOD - quantifying oxygen consumption by suspended particles and organisms. *Environmental Science & Technology*, 50(20), 8760-8770. DOI: doi.org/10.1021/acs.est.4c03186
- 208 Taqieddin, A., Sarrouf, S., Ehsan, M.F., Buesseler, K., Alshawabkeh, A. (2024) Electrochemical ocean iron fertilization and alkalinity enhancement approach toward CO₂ sequestration. *npj Ocean Sustainability*, 3:28. DOI: doi.org/10.1038/s44183-024-00064-8
- 207 Clevenger, S.J., Benitez-Nelson, C.R., Roca-Martí, M., Bam, W., Estapa, M., Kenyon, J.A., Pike, S., Resplandy, L., Wyatt, A., Buesseler, K.O. (2024) Carbon and silica fluxes during a declining North Atlantic spring bloom as part of the EXPORTS program. *Marine Chemistry*, 258, 104346. DOI: 10.1016/j.marchem.2023.104346
- 206 Johnson et al. including K. Buesseler (2023) Assessment of oceanographic conditions during the North Atlantic Export Processes in the Ocean from RemoTe Sensing (EXPORTS) field campaign. *Progress in Oceanography*, 220, 103170. DOI: https://doi.org/10.1016/j.pocean.2023.103170
- 205 Graff et al. including Buesseler, K. (2023) Reconciliation of total particulate organic carbon and nitrogen measurements determined using contrasting methods in the North Pacific Ocean as part of the NASA EXPORTS field campaign. *Elementa*, 11(1), 00112. DOI: https://doi.org/10.1525/elementa.2022.00112
- 204 Wojtal P.K., Doherty, S.C., Shea, C.H., Popp, B.N., Benitez-Nelson, C.R., Buesseler, K.O., Estapa, M.L., Roca-Marti, M., Close, H.G. (2023) Deconvolving mechanisms of particle flux attenuation using nitrogen isotope analyses of amino acids. *Limnology and Oceanography*, 68:8, 1949-1963. DOI: https://doi.org/10.1002/lno.12398
- 203 Rypina, I., Macdonald, A., Yoshida, S., Manning, J., Gregory, M., Rozen, M., Buesseler, K. (2022) Spreading Pathways of Pilgrim Nuclear Power Station Wastewater in and around Cape Cod Bay: Estimates from Ocean Drifter Observations. *Journal of Environmental Radioactivity*, 255, 107039.
- 202 Buesseler, K., Leinen, M., Ramakrishna, K. (2022) Removing carbon dioxide: first, do not harm. *Nature Correspondence*, 606, 864. doi: https://doi.org/10.1038/d41586-022-01774-0
- 201 Ceballos-Romero, E., Buesseler, K.O., Villa-Alfageme, M., (2022) Revisiting five decades of ²³⁴Th data: a comprehensive global oceanic compilation. *Earth System Science Data Discussions*, 1-64. DOI: 10.5194/essd-2021-259.
- 200 Therrold, S. et al including K. Buesseler (2021) Twilight Zone Observation Network: A distributed observation network for sustained, real-time interrogation of the ocean's twilight zone. *Marine Technology Society Journal*, 55(3). DOI: 10.4031/MTSJ.55.3.46

- 199 Ceballos-Romero, Elena; Buesseler, Ken O; Muñoz-Nevado, Carlos; Villa-Alfageme, María (2021): More than 50 years of Th-234 data: a comprehensive global oceanic compilation. *PANGAEA*, <https://doi.pangaea.de/10.1594/PANGAEA.918125>.
- 198 National Academies of Sciences, Engineering, and Medicine. *Authors: Doney, S.C., Buck, H., Buesseler, K., Iglesias-Rodriguez, M.D., Moran, K., Oschlies, A., Renforth, P., Roman, J., Sant, G.N., Siegel, D.A., Webb, R., White, A.* (2021) A Research Strategy for Ocean-based Carbon Dioxide Removal and Sequestration. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26278>.
- 197 Durkin, C. Buesseler, K.O., Cetinic, I., Estapa, M., Kelly, R.P., Omand, M. (2021) A visual tour of carbon export by sinking particles. *Global Biogeochemical Cycles*, 35, e2021GB006985. DOI: 10.1029/2021GB006985.
- 196 Siegel, D., et al including Buesseler, K.O. (2021) An operational overview of the EXport Processes in the Ocean from RemoTe Sensing (EXPORTS) Northeast Pacific Field Deployment. *Elementa*, 9(1), 00107. DOI: 10.1525/elementa.2020.00107.
- 195 Roca-Marti, M., Benitez-Nelson, C.R., Umhau, B.P., Wyatt, A.M., Clevenger, S.J., Pike, S., Horner, T.J., Estapa, M.L., Resplandy, L., Buesseler, K.O. (2021) Concentrations, ratios and sinking fluxes of major bioelements at Ocean Station Papa (pdf). *Elementa*, 9(1), 00166. DOI: 10.1525/elementa.2020.00166.
- 194 Estapa, M., Buesseler, K., Durkin, C.A., Omand, M., Benitez-Nelson, C.R., Roca-Marti, M., Breves, E., Kelly, R.P., Pike, S. (2021) Biogenic sinking particle fluxes and sediment trap collection efficiency at Ocean Station Papa (pdf). *Elementa*, 9(1), 00122. DOI: 10.1525/elementa.2020.00122.
- 193 Clevenger, S.J., Benitez-Nelson, C.R., Drysdale, J., Pike, S., Puigcorbé, V., Buesseler, K.O. (2021) Review of the analysis of ²³⁴Th in small volume (2-4 L) seawater samples: improvements and recommendations. *Journal of Radioanalytical and Nuclear Chemistry*, 329, 1-13. DOI: 10.1007/s10967-021-07772-2
- 192 Buesseler, K.O. (2020) Opening the floodgates at Fukushima. *Science*, 369(6504), 621-622. DOI: 10.1126/science.abc1507.
- 191 Buesseler, K.O., Benitez-Nelson, C.R., Roca-Marti, M., Wyatt, A.M., Resplandy, L., Clevenger, S.J., Drysdale, J.A., Estapa, M.L., Pike, S., Umhau, B.P. (2020) High resolution spatial and temporal measurements of particulate organic carbon flux using thorium-234 in the northeast Pacific Ocean during the EXport Processes in the Ocean from RemoTe Sensing field campaign. *Elementa*, 8(1), 030. DOI: 10.1525/elementa.030
- 190 Kenyon, J.A., Buesseler, K.O., Casacuberta, N., Castrillejo, M., Otsuka, S., Masqué, P., Drysdale, J.A., Pike, S.M., Senial, V. (2020) Distribution and evolution of Fukushima Dai-ichi derived ¹³⁷Cs, ⁹⁰Sr, and ¹²⁹I in surface seawater off the coast of Japan. *Environmental Science and Technology*, 54(23), 15066-15075. DOI: 10.1021/acs.est.0c05321.
- 189 Martin, A., Boyd, P., Buesseler, K. et al. (2020) The ocean's twilight zone must be studied now, before it is too late (pdf). *Nature Comments*, 508, 26-28. DOI: 10.1038/d41586-020-00915-7
- 188 Black, E.E., Kienast, S.S., Lemaitre, N., Lam, P.J., Anderson, R.F., Planquette, H., Planchon, F., Buesseler, K.O. (2020) Ironing out the question of Fe residence time in the dynamic upper ocean. *Global Biogeochemical Cycles*, 34(9), e2020GB006592. DOI: <https://doi.org/10.1029/2020GB006592>

- 187 Macdonald, A., S. Yoshida, S. Pike, K. Buesseler, I. Rypina, S. Jayne, V. Rossi, J. Kenyon, J.A. Drysdale (2020). A Fukushima Tracer Perspective on Four Years of North Pacific Mode Water Evolution. *Deep-Sea Research Part I*, 166, 103379. DOI: <https://doi.org/10.1016/j.dsr.2020.103379>
- 186 Jin, D., Hoagland, P., Buesseler, K. (2020) The value of scientific research on the ocean's biological carbon pump (pdf). *Science of the Total Environment*, 749, 141357. DOI: doi.org/10.1016/j.scitotenv.2020.141357
- 185 Buesseler, K.O., Boyd, P.W., Black, E.E., Siegel, D.A. (2020) Metrics that matter for assessing the ocean biological carbon pump. *PNAS Perspective*, 117(18), 9679-9687. DOI: 10.1073/pnas.1918114117
- 184 Nagao, S., Terasaki, S., Ochiai, S., Fukushi, K., Tomihara, S., Charette, M.A., Buesseler, K.O. (2020) Desorption behavior of Fukushima-derived radiocesium in sand collected from Yotsukura Beach in Fukushima prefecture. *Analytical Sciences*, 36, 569-575.
- 183 Onrubia, J.A., Petrova, M.V., Puicorbé, V., Black, E.E., Valk, O., Dufour, A., Hamelin, B., Buesseler, K.O., Masqué, P., Le Moigne, F.A.C, Sonke, J.E., van der Loeff, M.R., Heimbürger-Boavida, L.-E. (2020) Mercury export flux in the Arctic Ocean estimated from ²³⁴Th/²³⁸U disequilibria. *ACS Earth and Space Chemistry*, 4(5), 795-801. DOI: 10.1021/acsearthspacechem.0c00055
- 182 Estapa, M., Valdes, J., Tradd, K., Sugar, J., Omand, M., Buesseler, K. (2020) The neutrally buoyant sediment trap: two decades of progress. *Journal of Atmospheric and Oceanic Technology*, 37, 957-973. DOI: 10.1175/JTECH-D-19-0118.1
- 181 Baker, C., Estapa, M., Iversen, M., Lampitt, R., Buesseler, K. (2020) Are all sediment traps created equal? An intercomparison study of carbon export methodologies at the PAP-SO site. *Progress in Oceanography*, 184, Art102317. DOI: 10.1016/j.pocean.2020.102317
- 180 Drysdale, J.A. & Buesseler, K.O. (2020) Uranium adsorption behaviour of amidoximated fibers under coastal ocean conditions. *Progress in Nuclear Energy*, 119, Art 103170. DOI: 10.1016/j.pnucene.2019.103170
- 179 Black, E.E., Lam, P.J., Lee, J.-M., Buesseler, K.O. (2019) Insights from the ²³⁸U-²³⁴Th method into the coupling of biological export and the cycling of cadmium, cobalt, and manganese in the southeast Pacific Ocean. *Global Biogeochemical Cycles*, 33 (1), 15-36.
- 178 Haji, M.N, Drysdale, J.A., Buesseler, K.O., Slocum, A.H. (2019) Results of an Ocean Trial of the Symbiotic Machine for Ocean uRanium Extraction. *Environmental Science and Technology*, 53 (4), 2229-2237.
- 177 Hayes, C.T., Black, E.E., Anderson, R.F., Barkaran, M., Buesseler, K.O., Charette, M.A. et al. (2018) Flux of particulate elements in the North Atlantic Ocean constrained by multiple radionuclides. *Global Biogeochemical Cycles*, 32 (12), 1738-1758.
- 176 Bisson, K.M., Siegel, D.A., DeVries, T., Cael, B.B., Buesseler, K.O. (2018) How data set characteristics influence ocean carbon export models. *Global Biogeochemical Cycles*, 32 (9), 1312-1328.
- 175 Schlitzer, R., and others, including K.O. Buesseler (The GEOTRACES Group) (2018). The GEOTRACES Intermediate Data Product 2017. *Chemical Geology*, 493, 210-223.
- 174 Buesseler, K., M.A. Charette, S. Pike, P. Henderson, and L. Kipp (2018). Lingering radioactivity at the Bikini and Enewetak Atolls. *Science of the Total Environment*, 621, 1185-1198.

- 173 Black, Erin, Ken Buesseler, Steven Pike, and Phoebe Lam (2018). ²³⁴Th as a tracer of particulate export and remineralization in the Southeastern Tropical Pacific. *Marine Chemistry*, 201, 35-50.
- 172 Vives i Battle, J., M. Aoyama, C. Bradshaw, J. Brown, K. Buesseler, N. Casacuberta Arola, M. Christl, C. Duffa, N. Impens, M. Iosjpe, P. Masqué, and J. Nishikawa (2018). Marine radioecology after the Fukushima Dai-ichi nuclear accident: Are we better positioned to understand the impact of radionuclides in marine ecosystems? *Science of the Total Environment*, 618, 80-92.
- 171 Haji, M.N., Gonzalez, J., Drysdale, J., Buesseler, K., Slocum, A.H. (2018) Effects of protective shell enclosures on uranium adsorbing polymers. *Industrial & Engineering Chemistry Research*, 57 (45), 15534-15541. DOI: 10.1021/acs.iecr.8b03583
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- 169 Benitez-Nelson, C.R., Buesseler, K., Dai, M., Aoyama, M., Casacuberta, N., Charmasson, S., Johnson, A., Godoy, J.M., Maderich, V., Masqué, P., Moore, W., Morris, P.J., van der Loeff, M.R., Smith, J.N. (2018) Radioactivity in the marine environment: Uranium-Thorium Decay Series. ASLO e-Lectures, vol. 8 (1), 59-113. DOI: 10.1002/loe2.10009
- 168 Benitez-Nelson, C.R., Buesseler, K., Dai, M., Aoyama, M., Casacuberta, N., Charmasson, S., Godoy, J.M., Johnson, A., Maderich, V., Masqué, P., Moore, W., Morris, P.J., Smith, J.N. (2018) Radioactivity in the marine environment: Cosmogenic and anthropogenic radionuclides. ASLO e-Lectures, vol. 8 (1), 114-169. DOI: 10.1002/loe2.10008
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Reports

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