Dr. Ken O. Buesseler, *Senior Scientist*
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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)

206 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

205 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

204 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

203 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

202 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.

201 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

200 Ceballos-Romero, E., Buesseler, K.O., Villa-Alfageme, M., (2022) Revisiting five decades of ^{234}Th data: a comprehensive global oceanic compilation. *Earth System Science Data Discussions,* 1-64. DOI: 10.5194/essd-2021-259.

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

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188 Black, E.E., Kienast, S.S., Lemaitre, N., Lam, P.J., Anderson, R.F., Planquette, H., Planchon, F., Buesseler, K.O. (2020) Ironing our 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

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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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167 Benitez-Nelson, C.R., Charmasson, S., Buesseler, K., Dai, M., Aoyama, M., Casacuberta, N., Godoy, J.M., Johnson, A., Maderich, V., Masqué, P., Metian, M., Moore, W., Morris, P.J., Smith, J.N. (2018) Radioactivity in the marine environment: Understanding the basics of radioecology. ASLO e-Lectures, vol. 8 (1), 114-169. DOI: 10.1002/loe2.10007

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161 Estapa, M., C. Durkin, K. Buesseler, R. Johnson and M. Feen (2017). Carbon flux from bio-optical profiling floats: calibrating transmissometers for use as optical sediment traps. *Deep-Sea Research I*, 120, 100-111.

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