

## **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 present.
- 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. (PDF) *Nature*, 407, 695-702.

### Research Interests

- Upper-ocean biogeochemical cycles and POC export fluxes.
- Studies of scavenging and particle cycling processes using man-made and naturally occurring radionuclides.
- Geochemical studies of the Black Sea using Chernobyl radiotracers. plutonium isotopes and the behavior of fallout Pu in seawater and groundwater.
- Use of radium isotopes and other tracers of submarine groundwater discharge.

### Research Publications (Most recent to oldest)

1. Roca-Martí, 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](https://doi.org/10.1525/elementa.2020.00166).
2. Estapa, M., Buesseler, K., Durkin, C.A., Omand, M., Benitez-Nelson, C.R., Roca-Martí, 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](https://doi.org/10.1525/elementa.2020.00122).
3. Clevenger, S.J., Benitez-Nelson, C.R., Drysdale, J., Pike, S., Puigcorb , V., Buesseler, K.O. (2021) Review of the analysis of <sup>234</sup>Th 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](https://doi.org/10.1007/s10967-021-07772-2)
4. Buesseler, K.O. (2020) Opening the floodgates at Fukushima. *Science*, 369(6504), 621-622. DOI: [10.1126/science.abc1507](https://doi.org/10.1126/science.abc1507).
5. Buesseler, K.O., Benitez-Nelson, C.R., Roca-Martí, 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](https://doi.org/10.1525/elementa.030)
6. Kenyon, J.A., Buesseler, K.O., Casacuberta, N., Castrillejo, M., Ootosaka, S., Masqu , P., Drysdale, J.A., Pike, S.M., Senial, V. (2020) Distribution and evolution of Fukushima Dai-ichi derived <sup>137</sup>Cs, <sup>90</sup>Sr, and <sup>129</sup>I in surface seawater off the coast of Japan. *Environmental Science and Technology*, 54(23), 15066-15075. DOI: [10.1021/acs.est.0c05321](https://doi.org/10.1021/acs.est.0c05321).
7. 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](https://doi.org/10.1038/d41586-020-00915-7)

8. 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>
9. 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>
10. 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](https://doi.org/10.1016/j.scitotenv.2020.141357)
11. 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
12. 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.
13. 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  $^{234}\text{Th}/^{238}\text{U}$  disequilibria. *ACS Earth and Space Chemistry*, 4(5), 795-801. DOI: 10.1021/acsearthspacechem.0c00055
14. 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
15. 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
16. 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
17. Black, E.E., Lam, P.J., Lee, J.-M., Buesseler, K.O. (2019) Insights from the  $^{238}\text{U}$ - $^{234}\text{Th}$  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.
18. 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.
19. 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.
20. 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.
21. Schlitzer, R., and others, including K.O. Buesseler (The GEOTRACES Group) (2018). The GEOTRACES Intermediate Data Product 2017. *Chemical Geology*, 493, 210-223.

22. 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.
23. Black, Erin, Ken Buesseler, Steven Pike, and Phoebe Lam (2018). <sup>234</sup>Th as a tracer of particulate export and remineralization in the Southeastern Tropical Pacific. *Marine Chemistry*, 201, 35-50.
24. 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.
25. Casacuberta, N., M. Christl, K.O. Buesseler, Y. Lau, M. Castrillejo, H.-A. Syna, I and P. Masque (2017). Potential releases of I-129, U-236, and Pu isotopes from the Fukushima Dai-ichi nuclear power plants to the ocean from 2013 to 2015. *Environmental Science and Technology*, 51(17), 9826-9835.
26. Lerner, P., O. Marchal, P. Lam, K. Buesseler, and M. Charette (2017). Kinetics of thorium and particle cycling along the U.S. GEOTRACES North Atlantic Transect. *Deep-Sea Research I*, 125, 106-128.
27. Fassbender, A.F., H.I. Palevsky, T.R. Martz, A.E. Ingalls, Martha Gledhill, S.E. Fawcett, J.A. Brandes, L.I. Aluwihare, the participants of COME ABOARD (includes K. Buesseler), and DISCO XXV (2017). Perspectives on Chemical Oceanography in the 21st century: Participants of the COME ABOARD Meeting examine aspects of the field in the context of 40 years of DISCO. *Marine Chemistry*, 196, 181-190, doi.org/10.1016/j.marchem.2017.09.002.
28. Smith, John, Vincent Rossi, Ken Buesseler, Jay Cullen, Jack Cornett, Richard Nelson, Alison Macdonald, Marie Robert, and Jonathan Kellogg (2017). Time series measurements of the transport of the Fukushima radioactivity plume through the northeast Pacific Ocean. *Environmental Science & Technology*, 51, 10494-10502. DOI: 10.1021/acs.est.7b02712.
29. Sanial, Virginie, Ken O. Buesseler, Matthew A. Charette, and Seiya Nagao (2017). Unexpected source of Fukushima derived radiocesium to the coastal ocean of Japan. *PNAS*, 11(42), 11092-11096.
30. 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.
31. Lerner, P., O. Marchal, P.J. Lam, K. Buesseler and M. Charette (2017). Kinetics of thorium and particle cycling along the U.S. GEOTRACES North Atlantic Transect. *Deep-Sea Research I*, 125, 106-128.
32. Buesseler, K., M. Dai, M. Aoyama, C. Benitez-Nelson, S. Charmasson, K. Higley, V. Maderich, P. Masqué, P.J. Morris, D. Oughton, and J.N. Smith (2017). Fukushima Daiichi-Derived Radionuclides in the Ocean: Transport, Fate, and Impacts. *Annual Review of Marine Science*, 9, 173-203. DOI: 10.1146/annurev-marine-010816-060733.
33. Zhou, Kuanbo, Kanchan Maiti, Minhan Dai, Shuh-Ji Kao, and Ken Buesseler (2016). Does adsorption of dissolved organic carbon and thorium onto membrane filters affect the carbon to thorium ratios, a primary parameter in estimating export carbon flux? *Marine Chemistry*, 184, 1-10.

34. Durkin, C., B. Van Mooy, S. Dyhrman and K. Buesseler (2016). Sinking phytoplankton associated with carbon flux in the Atlantic Ocean. *Limnology and Oceanography*. DOI: 10.1002/lno.10253.
35. Lerner, P., P.J. Lam, O. Marchal, R.F. Anderson, K. Buesseler, M. Charette, R.L. Edwards, C.T. Hayes, K.F. Huang, Y. Lu and L.F. Robinson (2016). Testing models of thorium and particle cycling in the ocean using data from station GT11-22 of the U.S. GEOTRACES North Atlantic Section. *Deep-Sea Research I*, 113, 57-79.
36. Siegel, David, Ken Buesseler, Mike Behrenfeld, Claudia Benitez-Nelson, Emmanuel Boss, Mark Brzezinski, Adrian Burd, Craig Carlson, Eric D'Asaro, Scott Doney, Mary Jane Perry, Rachel Stanley and Deborah Steinberg (2016). Prediction of the Export and Fate of Global Ocean Net Primary Production: The EXPORTS Science Plan. *Frontiers in Marine Science*, 3, 22. DOI: 10.3389/fmars.2016.00022.
37. Gill, G., L.-J. Kuo, C. Janke, J. Park, R. Jeters, G. Bonheyo, H.-B. Pan, C. Wai, T. Khangaonkar, L. Bianucci, J. Wood, M.G. Warner, S. Peterson, D. Abrecht, R. Mayes, C. Tsouris, Y. Oyola, J. Strivens, N. Schlafer, R.S. Addleman, W. Chouyok, S. Das, J. Kim, K. Buesseler, C. Breier, and E. D'Alessandro (2016). The Uranium from Seawater Program at PNNL: Overview of Marine Testing, Adsorbent Characterization, Adsorbent Durability, Adsorbent Toxicity, and Deployment Studies. *Industrial & Engineering Chemistry Research*, 55(15), 4264-4277. DOI: 10.1021/acs.iecr.5b03649.
38. Castrillejo, M., N. Casacuberta, C. Breier, S. Pike, P. Masque and K. Buesseler (2016). Reassessment of <sup>90</sup>Sr, <sup>137</sup>Cs and <sup>134</sup>Cs in the coast off Japan derived from the Fukushima Dai-ichi nuclear accident. *Environmental Science and Technology*, 50, 173–180. DOI: 10.1021/acs.est.5b03903.
39. Estapa, M.L., D.A. Siegel, K.O. Buesseler, R.H.R. Stanley, M.W. Lomas, and N.B. Nelson (2015). Decoupling of net community production and export production at submesoscales in the Sargasso Sea. *Global Biogeochemical Cycles*, 29, 1266–1282. DOI: 10.1002/2014GB004913.
40. Yoshida, S., A.M. Macdonald, S.R. Jayne, I.I. Rypina and K. Buesseler (2015). Observed eastward progression of the Fukushima <sup>134</sup>Cs signal across the North Pacific. *Geophysical Research Letters*, 42, 7139–7147. DOI: 10.1002/2015GL065259.
41. Maiti, K., M.A. Charette, K.O. Buesseler, K. Zhou, P. Henderson, W.S. Moore, P. Morris, and L. Kipp (2015). Determination of particulate and dissolved <sup>228</sup>Th in seawater using a delayed coincidence counter. *Marine Chemistry*, 177(1), 196-202.
42. Schlitzer, R., and others, including K.O. Buesseler (The GEOTRACES Group) (2015). The GEOTRACES Intermediate Data Product 2014. *Marine Chemistry*, 177(1), 1-8.
43. Breier, C.A.F., S.M. Pike, F. Sebesta, K. Tradd; J.A. Breier and K.O. Buesseler (2015). New applications of KNiFC-PAN resin for broad scale monitoring of radiocesium following the Fukushima Dai-ichi nuclear disaster. *Journal of Radioanalytical and Nuclear Chemistry*, 307(3), 2193-2200. DOI: 10.1007/s10967-015-4421-x.
44. Baumann, Z., N.S. Fisher, C.J. Gobler, K.O. Buesseler, J.A. George, C. F. Breier and J. Nishikawa (2015). Fukushima <sup>137</sup>Cs at the base of planktonic food webs off Japan. *Deep-Sea Research II*, 106, 9-16.
45. Pike, S., A.S Adekola, J. Colaresi, G. Ilie, W.F. Mueller, K.M. Yocum and K.O. Buesseler (2015). Improved Gamma-Spectroscopy of marine samples via low background Small Anode Germanium (SAGe) Well Detector. *Journal of Radioanalytical and Nuclear Chemistry*, 307(2), 2369-2364. DOI: 10.1007/s10967.

46. McDonnell, A.M.P., P.W. Boyd, K.O. Buesseler (2015). Effects of sinking velocities and microbial respiration rates on the attenuation of particulate carbon fluxes through the mesopelagic zone. *Global Biogeochemical Cycles*, 29 (2), 175-193. DOI: 10.1002/2014GB004935.
47. Buesseler, K.O., C.R. German, M.C. Honda, S. Otsuka, E.E. Black, H. Kawakami, S.J. Manganini, and S.M. Pike (2015). Tracking the Fate of Particle Associated Fukushima Daiichi Cesium in the Ocean off Japan. *Environ. Sci. Technol.*, 2015, 49 (16), 9807-9816. DOI: 10.1021/acs.est.5b02635.
48. Durkin, C., M.L. Estapa, and K.O. Buesseler (2015). Observations of carbon export by small sinking particles in the upper mesopelagic. *Marine Chemistry*, 175, 72-81.
49. Owens, S.A., S. Pike and K.O. Buesseler (2015). Thorium-234 as a tracer of particle dynamics and upper ocean export in the Atlantic Ocean. *Deep Sea Research-II*, 116, 42-59.
50. McDonnell, A.M.P., P.J. Lam, C.H. Lamborg, K.O. Buesseler, R. Sanders, J.S. Riley, C. Marsay, H.E.K. Smith, E.C. Sargent, R.S. Lampitt and J.K.B. Bishop (2015). The oceanographic toolbox for the collection of sinking and suspended marine particles. *Progress in Oceanography*, 13, 17-31.
51. Rypina, I.I., S.R. Jayne, S. Yoshida, A.M. Macdonald, and K. Buesseler (2014). Drifter-based estimate of the 5-year dispersal of Fukushima-derived radionuclides. *Journal of Geophysical Research: Oceans*, 119, 8177–8193. DOI: 10.1002/2014JC010306.
52. Dulaquais, G., M. Boye, R. Middag, S. Owens, V. Puigcorbe, K. Buesseler, P. Masqué, H. de Baar and X. Carton (2014). Contrasting biogeochemical cycles of cobalt in the surface western Atlantic Ocean. *Global Biogeochemical Cycles*, 28 (12), 1387–1412. DOI: 10.1002/2014GB004903.
53. Buesseler, Ken O. (2014). Fukushima and Ocean Radioactivity. *Oceanography*, 27(1), 92–105. DOI: 10.5670/oceanog.2014.02.
54. Black, E.E., and K.O. Buesseler (2014). Spatial variability and the fate of cesium in coastal sediments near Fukushima, Japan. *Biogeosciences*, 11, 5123-5137. DOI: 10.5194/bg-11-5123-2014.
55. Guilderson, T.P. S.J. Tumey, T.A. Brown, and K.O. Buesseler (2014). The 129-iodine content of subtropical Pacific waters: impact of Fukushima and other anthropogenic 129-iodine sources. *Biogeosciences*, 11, 4839-4852. DOI: 10.5194/bg-11-4839-2014.
56. Siegel, D.A., K.O. Buesseler, S.C. Doney, S.F. Sailley, M.J. Behrenfeld and P.W. Boyd (2014). Global assessment of ocean carbon export by combining satellite observations and food-web models, *Global Biogeochemical Cycles*, 181-196. DOI: 10.1002/2013GB004743.
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58. Povinec, P.P., M. Aoyama, D. Biddulph, R. Breier, K. Buesseler, C.C. Chang, R. Golser, X.L. Hou, M. Jeřkovský, A.J.T. Jull, J. Kaizer, M. Nakano, H. Nies, L. Palcsu, L. Papp, M.K. Pham, P. Steier and L.Y. Zhang (2013). Cesium, iodine and tritium in NW Pacific waters – a comparison of the Fukushima impact with global fallout. *Biogeosciences*, 10, 6377–6416. DOI: 10.5194/bgd-10-6377-2013.

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61. Casacuberta, N., P. Masqué, J. Garcia-Orellana, R. García-Tenorio and K.O. Buesseler (2013). <sup>90</sup>Sr and <sup>89</sup>Sr in seawater off Japan as a consequence of the Fukushima Dai-ichi nuclear accident. *Biogeosciences*, 10, 3649-3659. DOI: 10.5194/bg-10-3649-2013.
62. Maiti, K., M.A. Charette, K.O. Buesseler and M. Kahru (2013). An inverse relationship between production and export in the Southern Ocean. *Geophysical Research Letters*, 40, 1-5. DOI: 10.1002/grl.50219.
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65. Tumey, S.J., T.P. Guilderson, T.A. Brown, T. Broek, K.O. Buesseler (2012). Input of I-129 into the Western Pacific Ocean Resulting from the Fukushima Nuclear Event. *Journal of Radioanalytical and Nuclear Chemistry*, 296, 957-962. DOI: 10.1007/s10967-012-2217-9.
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69. Buesseler, K.O., S.R. Jayne, N.S. Fisher, I.I. Rypina, H. Baumann, Z. Baumann, C.F. Breier, E.M. Douglass, J. George, A.M. Macdonald, H. Miyamoto, J. Nishikawa, S.M. Pike and S. Yoshida (2012). Fukushima-derived radionuclides in the ocean and biota off Japan. *PNAS*, 109(16), 5984-5988. DOI: 10.1073/pnas.1120794109.
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