Krista Longnecker

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Education

Ph.D. Oregon State University, 2004, Oceanography

M.Sc. Oregon State University, 2001, Oceanography

B.S. Yale University, 1993, Biology

Professional experience

Research Specialist. Woods Hole Oceanographic Institution, Marine Chemistry and Geochemistry (2011 to present)

Research Associate III. Woods Hole Oceanographic Institution, Marine Chemistry and Geochemistry (2009 to 2011)

Postdoctoral Investigator. Woods Hole Oceanographic Institution, Marine Chemistry and Geochemistry (2006 - 2009)

Research Associate (Postdoc). Oregon State University, College of Oceanic and Atmospheric Sciences (2004 - 2006)

Graduate Research Assistant. Oregon State University (1999 - 2004)

Graduate Research Assistant. Rutgers University, NJ. (1998)

Technology Manager. Gulf of Maine Aquarium, now known as the Gulf of Maine Research Institute (1993-1997)

Clam Flat Project Coordinator. Friends of Casco Bay. (1994-1997)

Undergraduate Researcher. Marine Biological Laboratory (Summer 1991,1993)

Workshop on Respiration and Planktonic Food Webs, Vigo Spain (2005)

Workshop on Molecular Evolution, Marine Biological Laboratory (2001)

Honors and awards

The W. M. Marquet Senior Technical Staff Award, for extraordinary accomplishments in engineering, instrument development, information systems or oceanography, and a demonstrated commitment to mentorship and partnership with junior technical staff members (2019)

WHOI Penzance Award, one of the Fye Senior Technical Staff, “for sustained exceptional performance, for outstanding representation of the WHOI spirit, and for major contributions to the personal and professional lives of our staff.” (2014)

Invited Participant. DIALOG VII Symposium, Dauphin Island Sea Lab (2005)

Top professor award, from Mortar Board - Oregon State University’s undergraduate senior honor society, to honor dedication to students and student success (2004)

First place in the oral presentation for Natural Sciences, Oregon State University Graduate Conference (2002)

NASA Space Grant Fellowship (2000-2001)

NSF REU Fellowship, Marine Biological Laboratory (Summer 1992)

Teaching and mentoring experience

Rutgers University:

Teaching assistant: General Biology, 1998.

Oregon State University:

Teaching assistant: Biological Oceanography, 2001

Guest lecturer: Biological Oceanography, "Applications of molecular techniques in biological oceanography", one lecture, 2001, 2002, and 2003

Guest lecturer: Marine Microbial Processes, "Molecular approaches to marine microbial ecology", two lectures, 2003 and 2005

Guest lecturer: Marine Zooplankton Ecology, "Zooplankton ecology: New approaches using molecular techniques", one lecture, 2004

Mentor to three undergraduates, 2004 to 2007

Woods Hole Oceanographic Institution:

Mentor to undergraduate student fellow, summer 2007

Communicating Ocean Sciences workshop, 2007

Mass spectrometry class, data analysis portion, 2014

Mass spectrometry class, lectures and hands-on data analysis activities, 2015

Service to the scientific community

Outreach: Invited and worked with two adult education teachers from the Science and Numeracy Special Collection project during RV *Wecoma* cruise, 2004

Outreach: 'On Location' researcher for the Gulf of Maine Aquarium, now known as the Gulf of Maine Research Institute, 1999

Volunteer: National Ocean Sciences Bowl – Oregon division, 2001, 2002, 2005, 2006

Student representative: College of Oceanic and Atmospheric Sciences computer committee, 2001-2003

Associate Editor: *Limnology and Oceanography: Methods* (2016-2018, 2020 - present)

Elected member, WHOI's Technical Staff Committee (2023-present)

Publications

Kujawinski, E. B., R. Braakman, **K. Longnecker**, J. W. Becker, S. W. Chisholm, K. Dooley, M. C. Kido Soule, G. J. Swarr and K. Halloran (2023). Metabolite diversity among representatives of divergent *Prochlorococcus* ecotypes. *mSystems*. DOI: 10.1128/msystems.01261-22

Becker, C. C., L. Weber, B. Zgliczynski, C. Sullivan, S. Sandin, E. Muller, A. S. Clark, M. C. Kido Soule, **K. Longnecker**, E. B. Kujawinski and A. Apprill (2023). Microorganisms and dissolved metabolites distinguish Florida's coral reef habitats. *PNAS Nexus* 2(9): pgad287. DOI: 10.1093/pnasnexus/pgad287

Freeman, D. H., S. F. Niles, R. P. Rodgers, D. P. French-McCay, **K. Longnecker**, C. M. Reddy and C. P. Ward (2023). Hot and cold: Photochemical weathering mediates oil properties and fate differently depending on seawater temperature. *Environmental Science & Technology*. DOI: 10.1021/acs.est.3c02962.

Capovilla, G., R. Braakman, G. Fournier, T. Hackl, J. Schwartzman, X. Lu, A. Yelton, **K. Longnecker**, M. Kido Soule, E. Thomas, G. Swarr, A. Mongera, J. Payette, J. Waldbauer, E. B. Kujawinski, O. X. Cordero and S. W. Chisholm (2023). Chitin utilization by marine picocyanobacteria and the evolution of a planktonic lifestyle. *Proc Natl Acad Sci U.S.A.* 120(20): e2213271120

Catipovic, L., **K. Longnecker**, S.R. Okkonen, D. Koestner, and S.R. Laney (2023) Optical insight into riverine influences on dissolved and particulate organic carbon in a coastal Arctic lagoon system. *Journal of Geophysical Research – Oceans*. 128(4): e2022JC019453.

Johnson, W. M., M. C. Kido Soule, **K. Longnecker**, M. P. Bhatia, S. J. Hallam, M. W. Lomas and E. B. Kujawinski (2023). Particulate and dissolved metabolite distributions along a latitudinal transect of the western Atlantic Ocean. *Limnology and Oceanography* 68(2): 377-393

Weber, L., M. Kido Soule, **K. Longnecker**, C. C. Becker, N. Huntley, E. B. Kujawinski and A. Apprill (2022). Benthic exometabolites and their ecological significance on threatened Caribbean coral reefs. *ISME Communications* 2(2): 101

Cavaco, M. A., M. P. Bhatia, A. K. Hawley, M. Torres-Beltrán, W. M. Johnson, **K. Longnecker**, K. Konwar, E. B. Kujawinski and S. J. Hallam (2022). Pathway-centric analysis of microbial metabolic potential and expression along nutrient and energy gradients in the western Atlantic Ocean. *Frontiers in Marine Science* DOI:10.3389/fmars.2022.867310

Liu, S., **K. Longnecker**, E. B. Kujawinski, K. Vergin, L. M. Bolaños, S. J. Giovannoni, R. Parsons, K. Opalk, E. Halewood, D. A. Hansell, R. Johnson, R. Curry and C. A. Carlson (2022). Linkages among dissolved organic matter export, dissolved metabolites, and associated microbial community structure response in the northwestern Sargasso Sea on a seasonal scale. *Frontiers in Microbiology*. DOI:10.3389/fmicb.2022.833252

Weber, L., M. Armenteros, M. Kido Soule, **K. Longnecker**, E.B. Kujawinski, A. Apprill (2020). Extracellular reef metabolites across the protected Jardines de la Reina, Cuba reef-system. *Frontiers in Marine Science*. 7:1063

Longnecker, K. and E.B. Kujawinski (2020) Intracellular metabolites in marine microorganisms during an experiment evaluating microbial mortality. *Metabolites* 10(3):105

Longnecker, K., L. Oswald, M.C. Kido Soule, G.A. Cutter, E.B. Kujawinski (2020) Organic sulfur: a spatially variable and understudied component of marine organic matter. *Limnology & Oceanography Letters* 5:305-312

Liu, S., R. Parsons, K. Opalk, N. Baetge, S. Giovannoni, L. Bolanos, E.B. Kujawinski, **K. Longnecker**, Y. Lu, E. Halewood, C.A. Carlson (2020) Different carboxyl-rich alicyclic molecules (CRAM) proxy compounds select distinct bacterioplankton for oxidation of DOM in the mesopelagic Sargasso Sea. *Limnology and Oceanography* 65:1532-1553

Saw, J. H. W., T. Nunoura, M. Hirai, Y. Takaki, R. Parsons, M. Michelsen, **K. Longnecker**, E. B. Kujawinski, R. Stepanauskas, Z. Landry, C. A. Carlson and S. J. Giovannoni (2020). Pangenomics analysis reveals diversification of enzyme families and niche specification in globally abundant SAR202 bacteria. *mBio* 11: e02975-02919

Johnson, W.M., **K. Longnecker**, M.C. Kido Soule, W.A. Arnold, M.P. Bhatia, S.J. Hallam, B.A.S. Van Mooy, E.B. Kujawinski (2020). Metabolite composition of sinking particles differs from surface suspended particles across a latitudinal transect in the South Atlantic. *Limnology and Oceanography* 65:111-127

Glazer, L., M.C. Kido Soule, **K. Longnecker**, E.B. Kujawinski, N. Aluru (2018). Hepatic metabolite profiling of polychlorinated biphenyl (PCB)-resistant and sensitive populations of Atlantic killifish (*Fundulus heteroclitus*). *Aquatic Toxicology* 205: 114-122.

Longnecker, K., Sievert, S.M., Sylva, S.P., Seewald, J.S., and Kujawinski, E.B. (2018). Dissolved organic carbon compounds in deep-sea hydrothermal vent fluids from the East Pacific Rise at 9º50'N. *Organic Geochemistry* 125: 41-49.

Brooker, M.R., **K. Longnecker**, E.B. Kujawinski, M.H. Evert, P.J. Mouser (2018). Discrete organic phosphorus signatures are evident in pollutant sources within a Lake Erie tributary. *Environmental Science & Technology* 52:6771-6779.

Collins, J. R., H. F. Fredricks, J. S. Bowman, C. P. Ward, C. Moreno, **K. Longnecker**, A. Marchetti, C. M. Hansel, H. W. Ducklow and B. A. S. Van Mooy (2018). The molecular products and biogeochemical significance of lipid photooxidation in West Antarctic surface waters. *Geochimica et Cosmochimica Acta* 232: 244-264.

Götz, F., **K. Longnecker**, M. C. K. Soule, K. W. Becker, J. McNichol, E. B. Kujawinski and S. M. Sievert (2018). Targeted metabolomics reveals proline as a major osmolyte in the chemolithoautotroph *Sulfurimonas denitrificans. Microbiology Open*. 7:e586

Tolić, N., Y. Liu, A. Liyu, Y. Shen, M. M. Tfaily, E. B. Kujawinski, **K. Longnecker**, L.-J. Kuo, E. W. Robinson, L. Paša-Tolić and N. J. Hess (2017). Formularity: Software for automated formula assignment of natural and other organic matter from ultrahigh-resolution mass spectra. *Analytical Chemistry*. 89: 12659-12665.

Kujawinski, E.B., **K. Longnecker**, H. Alexander, S.T. Dyhrman, C.L. Fiore, S.T. Haley, and W.M. Johnson (2017). Phosphorus availability regulates intracellular nucleotides in marine eukaryotic phytoplankton. *Limnology and Oceanography Letters* 2: 119-129.

Longnecker, K. and E. B. Kujawinski (2017). Mining mass spectrometry data: Using new computational tools to find novel organic compounds in complex environmental mixtures. *Organic Geochemistry* 110: 92-99.

Longnecker, K. and E. B. Kujawinski (2016). Using network analysis to discern compositional patterns in ultrahigh resolution mass spectrometry data of dissolved organic matter. *Rapid Communications in Mass Spectrometry* 30: 2388-2394.

Maiti, K., S. Bosu, E. D'Sa, P.L. Adhikari, M. Sutor, and **K. Longnecker** (2016). Export fluxes in Northern Gulf of Mexico – comparative evaluation of direct, indirect and satellite-based estimates. *Marine Chemistry* 184:60-77.

Kujawinski, E. B., **K. Longnecker**, K. L. Barott, R. J. M. Weber and M. C. Kido Soule (2016). Microbial community structure affects marine dissolved organic matter composition. *Frontiers in Marine Science* 3:45

Moran, M. A., E. B. Kujawinski, A. Stubbins, R. Fatland, L. I. Aluwihare, A. Buchan, B. C. Crump, P. C. Dorrestein, S. T. Dyhrman, N. Hess, B. Howe, **K. Longnecker**, P. M. Medeiros, J. Niggemann, I. Obernosterer, D. J. Repeta and J. Waldbauer (2016). Deciphering ocean carbon in a changing world. *Proceedings of the National Academy of Sciences, USA* 113: 3143-3151.

Longnecker, K., J. Futrelle, E. Coburn, M. C. Kido Soule and E. B. Kujawinski (2015). Environmental metabolomics: databases and tools for data analysis. *Marine Chemistry* 177, Part 2: 366-373.

Kido Soule, M. C., **K. Longnecker**, W.M. Johnson, and E. B. Kujawinski (2015). Environmental metabolomics: analytical strategies. *Marine Chemistry* 177, Part 2: 374-387.

Pedler Sherwood, B., E. A. Shaffer, K. Reyes, **K. Longnecker**, L. I. Aluwihare and F. Azam (2015). Metabolic characterization of a model bacterial strain capable of significant chemical alteration of marine dissolved organic matter. *Marine Chemistry* 177, Part 2: 357-365.

Fiore, C. L., **K. Longnecker**, M. C. Kido Soule and E. B. Kujawinski (2015). Release of ecologically relevant metabolites by the cyanobacterium, *Synechococcus elongatus* CCMP 1631. *Environmental Microbiology* 17:3949-3963.

Longnecker, K. (2015). Dissolved organic matter in newly formed sea ice and surface seawater. *Geochimica et Cosmochimica Acta* 171: 39-49.

Longnecker, K., Kido Soule, M. C., Kujawinski, E. B. (2015). Dissolved organic matter produced by *Thalasiossira pseudonana*. *Marine Chemistry* 168: 114-123.

Arnold, W.A., **K. Longnecker**, K.D. Kroeger, E.B. Kujawinski (2014). Molecular signature of organic nitrogen in septic-impacted groundwater. *Environmental Science: Processes & Impacts* 16: 2400-2407.

Longnecker, K. and E.B. Kujawinski (2013). Using stable isotope probing to characterize differences between free-living and sediment-associated microorganisms in the subsurface. *Geomicrobiology Journal* 30: 362-370.

Minor, E. C., C. J. Steinbring, **K. Longnecker**, E. B. Kujawinski (2012). Characterization of dissolved organic matter in Lake Superior and its watershed using ultrahigh resolution mass spectrometry. *Organic Geochemistry* 43: 1-11.

Edwards, B.R., C.M. Reddy, R. Camilli, C.A. Carmichael, **K. Longnecker**, B.A.S. Van Mooy (2011). Rapid microbial respiration of oil from the Deepwater Horizon spill in offshore surface waters of the Gulf of Mexico. *Environmental Research Letters* 6:035301.

Longnecker, K. and E.B. Kujawinski (2011). Composition of dissolved organic matter in groundwater. *Geochimica et Cosmochimica Acta* 75: 2752-2761.

Kujawinski, E.B., M.C. Kido Soule, D.L. Valentine, A.K. Boysen, **K. Longnecker**, M.C. Redmond (2011). Fate of dispersants associated with the Deepwater Horizon oil spill. *Environmental Science & Technology* 45: 1298-1306.

del Giorgio P.A., R. Condon, T. Bouvier, **K. Longnecker**, C. Bouvier, E.B. Sherr, J.M. Gasol (2011). Coherent patterns in bacterial growth, growth efficiency, and leucine metabolism along a northeastern Pacific inshore-offshore transect. *Limnology and Oceanography* 56: 1-16.

Longnecker, K., M.W. Lomas, and B.A.S. Van Mooy (2010). Abundance and diversity of heterotrophic bacterial cells assimilating phosphate in the subtropical North Atlantic Ocean. *Environmental Microbiology* 12: 2773-2782.

Kido Soule, M.C., **K. Longnecker**, S.J. Giovannoni, and E.B. Kujawinski (2010). Impact of instrument and experiment parameters on reproducibility and repeatability of peaks within ultrahigh resolution ESI FT-ICR mass spectra of natural organic matter. *Organic Geochemistry* 41: 725-733.

Bhatia, M.P., S.B. Das, **K. Longnecker**, M.A. Charette, and E.B. Kujawinski (2010). Molecular characterization of dissolved organic matter associated with the Greenland ice sheet. *Geochimica et Cosmochimica Acta*. 74: 3768-3784.

Longnecker, K., M.J. Wilson, E.B. Sherr, and B.F. Sherr (2010). Effect of top-down control on cell-specific activity and diversity of active marine bacterioplankton. *Aquatic Microbial Ecology*. 58:153-165.

Longnecker, K., A. Da Costa, M. Bhatia, and E.B. Kujawinski (2009). Effect of carbon addition and predation on acetate-assimilating bacterial cells in groundwater. *FEMS Microbiology Ecology*. 70: 456-470.

Kujawinski, E.B., **K. Longnecker**, N.V. Blough, R. Del Vecchio, L. Finlay, J.B. Kitner, and S.J. Giovannoni (2009). Identification of possible source markers in marine dissolved organic matter using ultrahigh resolution mass spectrometry. *Geochimica et Cosmochimica Acta*. 73: 4384-4399.

Longnecker, K., B.F. Sherr, and E.B. Sherr (2006). Variation in cell-specific rates of leucine and thymidine incorporation by high and low nucleic acid content marine bacteria off the Oregon coast. *Aquatic Microbial Ecology*. 43: 113-125.

Longnecker, K., D.S. Homen, E.B. Sherr and B.F. Sherr (2006). Similar community structure of biosynthetically active prokaryotes across a range of ecosystem trophic states. *Aquatic Microbial Ecology*. 42: 265-276.

Morris, R.M., **K. Longnecker** and S.J. Giovannoni (2006). *Pirellula* and OM43 are among the dominant lineages identified in an Oregon coast diatom bloom. *Environmental Microbiology*. 8: 1361-1370.

Sherr, E.B., B. F. Sherr, and **K. Longnecker** (2006). Distribution of bacterial abundance and cell-specific nucleic acid content in the Northeast Pacific Ocean. *Deep-Sea Research I*. 53: 713-725.

Longnecker, K., B. F. Sherr and E. B. Sherr (2005). Activity and phylogenetic diversity of bacterial cells with high and low nucleic acid content and electron transport system activity in an upwelling ecosystem. *Applied and Environmental Microbiology*. 71: 7737-7749.

Longnecker, K. and A.-L. Reysenbach (2001). Expansion of the geographic distribution of a novel lineage of ε-Proteobacteria to a hydrothermal vent site on the Southern East Pacific Rise. *FEMS Microbiology Ecology*. 35: 287-293.

Reysenbach, A.-L., **K. Longnecker** and J. Kirshtein (2000). Novel bacterial and archaeal lineages from an in situ growth chamber deployed at a Mid-Atlantic Ridge hydrothermal vent. *Applied and Environmental Microbiology*. 66: 3798-3797.

Van Winkle, D.H., **K. Longnecker** and N.W. Blackstone (2000). The effects of hermit crabs on hydractiniid hydroids. *Marine Ecology*. 21: 55-67.