

## ELIZABETH B. KUJAWINSKI

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### EDUCATION

**Ph.D. – Chemical Oceanography** (2000) MIT/WHOI Joint Program in Oceanography and Applied Ocean Sciences and Engineering, Woods Hole, MA, USA.

*Thesis Title:* The Effect of Protozoan Grazers on the Cycling of Polychlorinated Biphenyls (PCBs) in Marine Systems.

**S.B. - Chemistry** (1994) Massachusetts Institute of Technology, Cambridge, MA, USA.

**Other:** Microbial Diversity (2005) MBL Summer course

### RESEARCH EXPERIENCE / APPOINTMENTS

**January 2009-present:** Associate Scientist without Tenure, Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution (WHOI), Woods Hole, MA, USA.

**October 2007-present:** Director, FT-MS facility, Department of MC&G, WHOI, Woods Hole, MA, USA.

**August 2004-December 2008:** Assistant Scientist, Department of MC&G, WHOI, Woods Hole, MA, USA.

**January 2002-July 2004:** Assistant Professor of Environmental Science. Barnard College, New York, NY, USA.

**December 2002-July 2004:** Adjunct Associate Research Associate. Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, USA.

**July 2003-July 2004:** Affiliate member, Department of Earth and Environmental Sciences. Columbia University, New York, NY, USA.

**July 2000-December 2001:** Postdoctoral Research Associate. Supervisors: Drs Patrick G. Hatcher and Michael A. Freitas, in the Department of Chemistry, The Ohio State University, Columbus, OH, USA.

**September 1994-June 2000:** Doctoral Candidate. Advisors: Drs. James W. Moffett and John W. Farrington, in the Department of Marine Chemistry and Geochemistry, WHOI, Woods Hole, MA, USA.

**Summer 1993:** Intern developing bench procedures for EPA methods. Supervisor: Ms. Laurie Franklin at National Environmental Testing, Inc. in Bartlett, IL, USA.

**January 1992-December 1993:** Undergraduate Research Opportunities Program (UROP) participant, involved in three different projects. Advisors: Spring 1992 – Dr. John Edmond (MIT), Summer 1992 – Dr. Daniel Repeta (WHOI), Fall 1993 - Dr. Philip M. Gschwend (MIT).

### AWARDS

2004 – NSF CAREER Award

1994 – Undergraduate Teaching Award, Department of Chemistry, MIT

### PUBLICATIONS

29. Kujawinski, E. B., K. Longnecker<sup>+</sup>, K. A. Barott<sup>+</sup>, and M. C. Kido Soule<sup>+</sup>. Submitted (Oct 2012). Protozoan grazing simultaneously influences bacterial diversity and dissolved organic matter composition in seawater. *Proceedings of the National Academy of Sciences, USA*.

28. Bhatia, M. P.<sup>+</sup>, **E. B. Kujawinski**, S. B. Das, P. Henderson, C. Breier, and M. A. Charette. Submitted (Sept 2012). Iron export from the Greenland ice sheet. *Nature Geoscience*.
27. Longnecker, K.<sup>+</sup>, M. C. Kido Soule<sup>+</sup> and **E. B. Kujawinski**. Submitted (Sept 2012). Internal and external metabolites of the marine diatom *Thalassiosira pseudonana*. *Limnology & Oceanography*.
26. Bhatia, M. P.<sup>+</sup>, S. B. Das, L. Xu, M. A. Charette, J. L. Wadham, and **E. B. Kujawinski**. Submitted (May 2012; 1<sup>st</sup> revisions underway Sept 2012). Organic carbon export from the Greenland ice sheet. *Geochimica et Cosmochimica Acta*.
25. Banning, E. C.<sup>+</sup>, **E. B. Kujawinski**, and K. L. Casciotti. Submitted (Dec 2011; 1<sup>st</sup> revisions underway Mar 2012). Predatory marine flavobacteria colonize biofilms and affect nutrient regeneration. *Aquatic Microbial Ecology*.
24. Longnecker, K.<sup>+</sup> and **E. B. Kujawinski**. 2012. Using stable isotope probing to characterize differences between free-living and sediment-associated microorganisms in the subsurface. *Geomicrobiology Journal*. (online May 21)
23. Minor, E. C., C. J. Steinbring, K. Longnecker<sup>+</sup>, and **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.
22. Ryerson, T. B., R. Camilli, J. D. Kessler, **E. B. Kujawinski**, C. M. Reddy, D. L. Valentine, E. L. Atlas, D. R. Blake, J. A. de Gouw, S. Meinardi, D. D. Parrish, J. Peischl, J. S. Seewald and C. Warneke. 2012. Chemical composition measurements quantify *Deepwater Horizon* hydrocarbons in the marine environment. *Proceedings of the National Academy of Sciences, USA*. (online Jan 9)
21. Bhatia, M. P.<sup>+</sup>, S. B. Das, **E. B. Kujawinski**, P. Henderson, A. Burke, and M. A. Charette. 2011. Seasonal evolution of water source contributions to the subglacial outflow from a land-terminating Greenland ice sheet outlet glacier: Insights from a new isotope-mixing model. *Journal of Glaciology*. **57**: 929-941.
20. Longnecker, K.<sup>+</sup> and **E. B. Kujawinski**. 2011. Composition of dissolved organic matter in groundwater. *Geochimica et Cosmochimica Acta*. **75**: 2752-2761.
19. **Kujawinski, E. B.**, M. C. Kido Soule<sup>+</sup>, D. L. Valentine, A. K. Boysen<sup>+</sup>, K. Longnecker<sup>+</sup>, and M. C. Redmond. 2011. Fate of dispersants associated with the Deepwater Horizon oil spill. *Environmental Science & Technology*. **45**: 1298-1306.
18. **Kujawinski, E. B.** 2011. The impact of microbial metabolism on marine dissolved organic matter. *Annual Reviews of Marine Science* **3**: 567-599.
17. Kido Soule, M. C.<sup>+</sup>, K. Longnecker<sup>+</sup>, S. J. Giovannoni and **E. B. Kujawinski**. 2010. Impact of instrument and experiment parameters on reproducibility of ultrahigh resolution ESI FT-ICR mass spectra of natural organic matter. *Organic Geochemistry*. **41**: 725-733.
16. Banning, E. C.<sup>+</sup>, K. L. Casciotti and **E. B. Kujawinski**. 2010. Novel strains isolated from a coastal aquifer suggest a predatory role for flavobacteria. *FEMS Microbiology Ecology*. **73**: 254-270.
15. Bhatia, M. P.<sup>+</sup>, S. B. Das, M. A. Charette, K. Longnecker<sup>+</sup> and **E. B. Kujawinski**. 2010. Molecular characterization of dissolved organic matter associated with the Greenland ice sheet. *Geochimica et Cosmochimica Acta*. **74**: 3768-3784.
14. Longnecker, K.<sup>+</sup>, A. Da Costa<sup>+</sup>, M. Bhatia<sup>+</sup>, and **E. B. Kujawinski**. 2009. Effect of carbon addition and predation on acetate-assimilating bacterial cells in groundwater. *FEMS Microbiology Ecology*. **70**: 456-470.
13. **Kujawinski, E. B.**, K. Longnecker<sup>+</sup>, 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

12. **Kujawinski, E. B.** and M. D. Behn. 2006. Automated analysis of electrospray ionization Fourier-transform ion cyclotron resonance mass spectra of natural organic matter. *Analytical Chemistry*. **78**: 4363-4373. (\*)
11. **Kujawinski, E. B.**, R. Del Vecchio, N. V. Blough, G. C. Klein, and A. G. Marshall. 2004. Probing molecular-level transformations of dissolved organic matter: Insights from electrospray ionization Fourier-transform ion cyclotron resonance mass spectrometry. *Marine Chemistry* **92**: 23-37. (\*\*)
10. Kramer, R. W., **E. B. Kujawinski**, and P. G. Hatcher. 2004. Identification of black carbon derived structures in a volcanic ash soil humic acid by Fourier transform ion cyclotron resonance mass spectrometry. *Environmental Science and Technology* **38**: 3387-3395 (\*\*)
9. Kim, S., A. J. Simpson, **E. B. Kujawinski**, M. A. Freitas, and P. G. Hatcher. 2003. High resolution electrospray ionization mass spectrometry and 2D solution NMR for the analysis of DOM extracted by C18 solid phase disk. *Organic Geochemistry*. **34**: 1325-1335 (\*\*)
8. **Kujawinski, E. B.** 2002. Electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry: Characterization of environmental samples. *Environmental Forensics*. **3**: 207-216. (\*)
7. **Kujawinski, E. B.**, J.W. Farrington, and J.W. Moffett. 2002. Evidence for grazing-mediated production of surface-active material by marine protists. *Marine Chemistry* **77**: 133-142
6. **Kujawinski, E. B.**, M. A. Freitas, X. Zang, P. G. Hatcher, K. B. Green-Church, and R. B. Jones. 2002. The application of electrospray ionization mass spectrometry to the structural characterization of natural organic matter. *Organic Geochemistry*. **33**: 171-180 (\*\*\*)
5. **Kujawinski, E. B.**, P. G. Hatcher, and M. A. Freitas. 2002. High-resolution Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR-MS) of humic and fulvic acids: Improvements and comparisons. *Analytical Chemistry* **74**: 413-419 (\*\*\*)
4. **Kujawinski, E. B.**, J.W. Farrington, and J.W. Moffett. 2001. Marine protozoa produce organic matter with a high affinity for PCBs during grazing. *Environmental Science and Technology* **35**: 4060-4065.
3. Barbeau, K.A., **E. B. Kujawinski**, and J.W. Moffett. 2001. Remineralization and recycling of iron, thorium and organic carbon by heterotrophic marine protists in laboratory culture. *Aquatic Microbial Ecology* **24**: 69-81
2. **Kujawinski, E. B.**, J.W. Farrington, and J.W. Moffett. 2000. The importance of passive diffusion in the uptake of PCBs by phagotrophic protozoa. *Applied and Environmental Microbiology* **66**: 1987-1993
1. Batey, R.T., M. Inada, **E. B. Kujawinski**, J.D. Puglisi, and J. R. Williamson. 1992. Preparation of isotopically labeled ribonucleotides for multidimensional NMR spectroscopy of RNA. *Nucleic Acids Research*. **20**: 4515-4523. (##)

<sup>+</sup>-member of Kujawinski research group; \* -  $\geq 25$  citations; # -  $\geq 100$  citations

## INVITED PRESENTATIONS:

- “Characterization of natural organic matter: The Deepwater Horizon oil spill”, Environmental Sciences: Water Gordon Research Conference, Holderness School, NH, June 25, 2012.
- “Microbe-organic matter interactions: Insights from disparate aquatic environments”, Ecosystems Seminar, Marine Biological Laboratory, Woods Hole, MA, March 5, 2011.
- “Organic Biogeochemistry: The intersection of microbes and molecules”, Biology Department Seminar series (WHOI), February 10, 2011.
- “Organic biogeochemistry: The intersection of microbes and molecules”, Special seminar, University of Southern California, Los Angeles, CA, February 4, 2011.
- “Organic biogeochemistry: The intersection of microbes and molecules”, Special seminar, Scripps Institute of Oceanography, La Jolla, CA, February 3, 2011.

- “Finding the ‘active ingredient’ of dissolved organic matter”, IGPMS seminar, University of California – Santa Barbara, Santa Barbara, CA, February 1, 2011.
- “Molecular-level characterization of dissolved organic matter in aqueous environments”, AOP&E Department Seminar series (WHOI). August 4, 2010.
- “Organic Biogeochemistry: From molecules to microbes to global change”. Special seminar, University of Maryland. June 25, 2010.
- “Organic Biogeochemistry: From molecules to microbes to global change”. Special seminar, Geophysical Laboratory, Carnegie Institution of Washington. May 3, 2010.
- “Organic Biogeochemistry: From molecules to microbes to global change”. Graduate School of Oceanography seminar series, University of Rhode Island. April 23, 2010.
- “Organic Biogeochemistry: From molecules to microbes”. Senior seminar in Chemistry, Mt. Holyoke College. March 4, 2010.
- “Organic Biogeochemistry: From molecules to microbes to global change”. NRC workshop on Ocean Infrastructure Strategy for U.S. Ocean Research in 2030, Washington DC. February 2-4, 2010.
- “Molecular-level resolution of natural organic matter in aquatic environments by ultrahigh resolution mass spectrometry”. Annual meeting of CoSMoS, Society of Small Molecule Science, Boston MA. August 5, 2009.
- “Environmental metabolomics: The impact of the microbial loop on DOM composition”. SAR11 workshop, Oregon State University. July 28, 2009.
- “Needles in a haystack: Unraveling molecular interactions between marine microbes and dissolved organic matter”. Pacific Northwest National Laboratory, July 24, 2009.
- “Sources of variability in ultrahigh resolution mass spectra of natural organic matter”. 7<sup>th</sup> North American FT-MS Conference, Key West FL. April 21, 2009.
- “Needles in a haystack: Unraveling molecular interactions between marine microbes and dissolved organic matter”. Dept. of Marine Sciences, University of North Carolina. March 25, 2009.
- “Sources of variability in ultrahigh resolution mass spectra of natural organic matter – and their impact on comparative analyses”. Humic Sciences & Technology XII, Northeastern University. March 18, 2009.
- “Unraveling molecular interactions between marine microbes and dissolved organic matter”. Chemical Oceanography seminar series, MIT. February 27, 2009.
- “Unraveling molecular interactions between marine microbes and dissolved organic matter”. Biogeochemistry Brown Bag seminar, University of Hawaii. October 17, 2008.
- “The interdependence of microbes and dissolved organic matter”. Microbial Diversity course, Marine Biological Laboratory. July 23, 2008.
- “Needles in a haystack: Finding new molecular markers in aquatic dissolved organic matter.” Biogeochemistry Seminar Series. College of Oceanic and Atmospheric Sciences, Oregon State University. May 1, 2008.
- “The interdependence of microbes and dissolved organic matter”. Microbial Diversity course, Marine Biological Laboratory. July 26, 2007.
- “The Forest vs. the Trees: Automated analysis of NOM mass spectra acquired by ESI FT-ICR MS”. Institute Seminar Series. Institute of Marine and Coastal Sciences, Rutgers University. April 23, 2007.
- “Analysis of electrospray ionization Fourier-transform ion cyclotron resonance mass spectra of natural organic matter”. Humic Sciences & Technology X, Boston MA. March 22, 2007.
- “Detection and identification of biomolecules within marine dissolved organic matter: Use of electrospray ionization Fourier transform ion cyclotron resonance MS”. FACSS 2006, Orlando FL. September 26, 2006.

- “The intersection of analytical chemistry and microbial ecology and its implications for carbon cycling”. Biology Department seminar series. WHOI. October 27, 2005.
- “Molecular-level characterization of natural organic matter”. E34 Chemical Oceanography Seminar Series. MIT. October 29, 2004.
- “Establishing a link between microbial community composition and organic matter transformations in aquifer sediments”. Biology & Paleoenvironment Seminar Series, Lamont-Doherty Earth Observatory. May 7, 2004.
- “Probing Molecular-Level Transformations of Natural Organic Matter”. College of Marine Sciences, University of Connecticut. April 2, 2004.
- “Probing Molecular-Level Transformations of Dissolved Organic Matter: Insights from ESI FT-ICR MS”. Friday Harbor Laboratory Centennial Symposium: New Approaches in Marine Organic Biogeochemistry. University of Washington. August 28, 2003.
- “The structure of natural organic matter: Insights from electrospray ionization mass spectrometry”. Institute Seminar Series. Institute of Marine and Coastal Sciences, Rutgers University. March 17, 2003.
- “Molecular-level characterization of natural organic matter: Use of ESI FT-ICR mass spectrometry”. Analytical Chemistry Seminar Series, Department of Chemistry, University of Maryland. April 26, 2002.

#### **ABSTRACTS - ORAL PRESENTATIONS (presenter in bold):**

- K. Longnecker**, E. B. Kujawinski. 2012. New analysis tools for ultrahigh resolution mass spectrometry data. Summer 2012 ASLO meeting. Lake Biwa, Japan.
- E. B. Kujawinski**, K. Longnecker, M. C. Kido Soule. 2011. Comparison of internal and external metabolites produced by a diatom. 2011 Goldschmidt conference, Prague, Czech Republic.
- M. P. Bhatia**, S. B. Das, M. A. Charette, L. Xu, E. B. Kujawinski. 2011. Seasonal shifts in concentration, age, and lability of carbon exported from the Greenland ice sheet (GrIS). 2011 Goldschmidt conference, Prague, Czech Republic.
- E. B. Kujawinski**, K. Longnecker. 2011. Molecular-level characterization of deep-ocean DOM. Spring 2011 ASLO meeting, Puerto Rico, USA.
- E. B. Kujawinski**, M. C. Kido Soule, A. K. Boysen, K. Longnecker, and D. L. Valentine. 2010. Temporal and spatial variability in composition of polar components of oil and dispersants during and after the Deepwater Horizon oil spill. Fall 2010 AGU meeting. San Francisco, CA, USA.
- M. P. Bhatia**, S. B. Das, M. A. Charette, L. Xu, and E. B. Kujawinski. 2010. Seasonal hydrological cycle control on age, abundance and lability of carbon exported from the Greenland ice sheet. Fall 2010 AGU meeting. San Francisco, CA, USA.
- M. P. Bhatia**, S. B. Das, E. B. Kujawinski, P. Henderson and M. A. Charette. 2010. Seasonal evolution of water source contributions to the subglacial outflow from a land-terminating Greenland ice sheet outlet glacier: Insight from a new isotope mixing model. Fall 2010 AGU meeting. San Francisco, CA, USA.
- M. P. Bhatia**, S. Das, K. Longnecker, M. A. Charette and E. Kujawinski. 2010. A microbial imprint on molecular-level composition of dissolved organic matter associated with the Greenland ice sheet. International Society of Microbial Ecology (ISME), 13<sup>th</sup> International Meeting, Seattle WA, USA.
- E. Banning**, K. Casciotti and E. B. Kujawinski. 2010. Predatory flavobacteria colonize biofilms and accelerate macronutrient regeneration. International Society of Microbial Ecology (ISME), 13<sup>th</sup> International Meeting, Seattle, WA, USA.
- M. P. Bhatia**, S. B. Das, E. B. Kujawinski, P. Henderson and M. A. Charette. 2010. Seasonal evolution of water source contributions to the subglacial outflow from a land-terminating

- Greenland ice sheet outlet glacier: Insight from a new isotope mixing model. International Glaciology Society (IGS) meeting. Columbus, OH, USA.
- C. J. Steinbring**, E. B. Kujawinski, E. Minor. 2010. Ultra-high resolution mass spectroscopy for molecular level characterization of dissolved natural organic matter in the Lake Superior watershed. 2010 Summer ASLO meeting, Santa Fe, NM, USA.
- J. Ma, E. Boyle, N. Allen, K. Longnecker, E. Kujawinski, R. Del Vecchio, **N. V. Blough**. 2010. Effect of borohydride reduction on the optical properties and ultrahigh resolution mass spectra of humic substances. Spring 2010 ACS meeting, San Francisco, CA, USA.
- E. Kujawinski**, N. V. Blough, R. Del Vecchio, K. Longnecker. 2008. Identification of terrestrial and microbial indicator compounds within ultrahigh resolution mass spectra of aquatic dissolved organic matter. 2008 AGU/ASLO/TOS Ocean Sciences meeting, Orlando, FL, USA.
- K. Longnecker**, E. Kujawinski. 2008. Effect of interactions between grazers and bacteria on organic carbon cycling in groundwater. 2008 AGU/ASLO/TOS Ocean Sciences meeting, Orlando, FL, USA.
- E. Kujawinski**, L. Morrison. 2007. The link between DOM composition and microbial activity in three marine environments. Spring 2007 ASLO meeting, Santa Fe, NM, USA.
- S. J. Giovannoni**, E. B. Kujawinski, C. A. Carlson, J. B. Kitner. 2006. Measuring microbial interactions with dissolved organic matter by electrospray ionization Fourier-transform ion cyclotron resonance mass spectrometry. 2006 AGU/ASLO/TOS Ocean Sciences meeting, Honolulu, HI, USA.
- E. Kujawinski**, M. Behn. 2005. Application of ESI FT-ICR MS to molecular-level characterization of NOM: A progress report on data analysis and interpretation. 230<sup>th</sup> ACS National Meeting, Washington, DC, USA.
- A. Keimowitz**, B. J. Mailloux, P. Cole, H. J. Simpson, M. Stute, S. N. Chillrud, E. B. Kujawinski and Y. Zheng. 2004. Arsenic mobility under sulfate-reducing conditions. Fall 2004 AGU National Meeting, San Francisco, CA, USA.
- E. Kujawinski**, B. Mailloux and L. Morrison. 2003. The link between microbial community composition and organic matter transformations in a laboratory system. Fall 2003 AGU National Meeting, San Francisco, CA, USA.
- E. Kujawinski**, E. Kaiser and M.A. Freitas. 2002. Compositional assessment of photochemical modifications of riverine dissolved organic matter using electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry. 224<sup>th</sup> ACS National Meeting, Boston, MA USA.
- E. Kujawinski**, E. Kaiser, M.A. Freitas and P.G. Hatcher. 2002. Application of Fourier transform ion cyclotron resonance mass spectrometry to the structural characterization of aquatic organic matter. 2002 AGU/ASLO Ocean Sciences meeting, Honolulu, HI, USA.
- E. Kujawinski**, M. A. Freitas, and P. G. Hatcher. 2001. Application of Fourier transform ion cyclotron resonance mass spectrometry to the structural characterization of terrestrial organic material. 222<sup>nd</sup> ACS National Meeting, San Diego, CA, USA.
- E. Kujawinski**, J. Farrington, and J. Moffett. 2000. Production of surface-active organic matter during protozoan grazing. 2000 AGU/ASLO Ocean Sciences meeting, San Antonio, TX, USA.
- E. Kujawinski**, J. Farrington, and J. Moffett. 1998. The importance of passive diffusion in the uptake of PCBs by phagotrophic protozoans. 1998 SETAC-Europe conference sponsored by the European Society of Environmental Toxicology and Chemistry, Bordeaux, France.

# ABSTRACTS - POSTER PRESENTATIONS (presenter in bold):

- K. Longnecker**, M C. Kido Soule, E.B. Kujawinski. 2012. Untargeted assessment of metabolites produced by a marine diatom. Gordon Research Conference, Marine Microbes, Italy
- M. Bhatia**, E. B. Kujawinski, S. B. Das, R. Allen, C. Breier, M. Gonnea, and M.A. Charette. 2011. Iron export from the Greenland ice sheet. Fall 2011 AGU meeting, San Francisco, CA, USA.
- A. Boysen** and E. B. Kujawinski. 2010. Mass spectral analysis of water column samples from a single depth profile near the Deepwater Horizon oil spill. Fall 2010 AGU meeting. San Francisco, CA, USA.
- E. Kujawinski**, M. C. Kido Soule, A. Boysen, K. Longnecker, M. Redmond, and D. Valentine. 2010. Detection and quantification of dispersants in seawater. Symposium for DWH RAPID PP's, St. Petersburg, FL, USA.
- E. Kujawinski**, S. J. Giovannoni, K. Longnecker, J. R. MacDonald, J. B. Kitner. 2010. The role of SAR11 bacteria in controlling the molecular-level composition of marine dissolved organic matter. International Society of Microbial Ecology (ISME), 13<sup>th</sup> International Meeting, Seattle WA, USA.
- Longnecker, K.**, M. C. Kido Soule and E. Kujawinski. 2010. Composition of dissolved organic matter released by photosynthetic organisms. International Society of Microbial Ecology (ISME), 13<sup>th</sup> International Meeting, Seattle WA, USA.
- E. Kujawinski**, M. C. Kido Soule. 2010. Organic material released by coastal microbial consortia upon incubation with glucose: Preliminary identification of novel biomarkers and implications for marine dissolved organic matter. 2010 ASMS national meeting. Salt Lake City, UT, USA.
- C. J. Steinbring**, E. B. Kujawinski, E. Minor. 2010. Source of dissolved natural organic matter in Lake Superior by molecular level characterization of dissolved organic carbon in the Lake Superior watershed. Ecology of Lake Superior: Integrated Approaches & Challenges in the 21<sup>st</sup> Century, Duluth, MN, USA.
- E. Kujawinski**, K. Barott, K. Longnecker, M. C. Kido Soule. 2009. Changes in microbial diversity and DOM composition after uniformly-13C-labeled glucose addition to a coastal microbial consortium. 2009 ASLO Aquatic Sciences meeting, Nice, France.
- K. Longnecker**, and E. Kujawinski. 2008. Connecting bacterial activity and organic matter composition using ultrahigh resolution mass spectrometry and bacterial community fingerprinting. International Society of Microbial Ecology (ISME), 12<sup>th</sup> International meeting, Cairns, Australia.
- E. Kujawinski**, K. Barott, and K. Longnecker. 2008. A marine microbial community makes complex organic matter from a simple organic substrate. International Society of Microbial Ecology (ISME), 12<sup>th</sup> international meeting, Cairns, Australia.
- E. Banning**, K. Casciotti, and E. Kujawinski. 2008. Novel predatory Flavobacteriaceae cultured from a coastal aquifer. International Society of Microbial Ecology (ISME), 12<sup>th</sup> international meeting, Cairns, Australia.
- M. Bhatia**, S. B. Das, E. B. Kujawinski. 2008. Molecular-level studies of microbiological communities and organic carbon composition on the surface of the Greenland Ice Sheet. 2008 AGU/ASLO/TOS Ocean Sciences meeting. Orlando, FL, USA.
- A. Da Costa**, E. B. Kujawinski, K. Longnecker. 2008. Effects of protozoan grazers and periodic substrate addition on groundwater microorganisms. 2008 AGU/ASLO/TOS Ocean Sciences meeting. Orlando, FL, USA.
- R. Del Vecchio**, T. Pisano, L. Heigthon, J. Yang, Q. Zhu, N. Guerriero, A. Thiallet, E. B. Kujawinski, N. V. Blough. 2008. Optical properties of terrestrial CDOM: relation to lignin. 2008 AGU/ASLO/TOS Ocean Sciences meeting, Orlando FL, USA.

- E. Kujawinski** and K. Longnecker. 2007. Techniques for comparative analysis of ESI FT-ICR MS data. Gordon Research Conference in Chemical Oceanography. Tilton, NH, USA.
- L. Morrison**, E. B. Kujawinski. 2006. Conversion of glucose into complex dissolved organic matter by a coastal microbial community. 2006 AGU/ASLO/TOS Ocean Sciences meeting. Honolulu, HI, USA.
- E. Kujawinski and **P. Vlahos**. 2006. Probing molecular-level transformations of dissolved organic matter along the Canadian Archipelago. 2006 AGU/ASLO/TOS Ocean Sciences meeting. Honolulu, HI, USA.
- E. Kujawinski**, B. J. Mailloux and L. Morrison. 2005. Identification of biologically-produced organic matter using stable isotope labeling and ultrahigh resolution mass spectrometry. Spring 2005 ASLO National Meeting, Salt Lake City, UT, USA.
- E. Kujawinski**, B. J. Mailloux and L. Morrison. 2004. Identification of biologically-produced organic matter in an aquifer system using stable isotope labeling. Fall 2004 AGU National Meeting, San Francisco, CA, USA.
- L. Morrison**, B. J. Mailloux and E. B. Kujawinski. 2004. Microbial community evolution as evidenced by isotopic incorporation into phospholipids fatty acids in a model aquifer system. Fall 2004 AGU National Meeting, San Francisco, CA, USA.
- K. Nguyen**, E. B. Kujawinski and B. J. Mailloux. 2004. Simulation of a hyporheic environment to determine the microbial effects in estuarine groundwater systems. Fall 2004 AGU National Meeting, San Francisco, CA, USA.
- E. Kujawinski**, Y.-P. Chin and M. A. Freitas. 2001. The Use of Polyacrylic Acid as a Proxy for Humic Acids: Implications for Electrospray Ionization Mass Spectrometry. 17<sup>th</sup> Annual Asilomar Conference in Mass Spectrometry, Pacific Grove, CA, USA.
- J. Green**, E. Kujawinski, and M.A. Freitas. 2001. Comparison of NaOH vs. NH<sub>4</sub>OH as an Extraction Solvent for Humic Acids: Implications for Electrospray Ionization Mass Spectrometry. 17<sup>th</sup> Annual Asilomar Conference in Mass Spectrometry, Pacific Grove, CA, USA.
- E. Kujawinski**, P. G. Hatcher and M. A. Freitas. 2001. Application of Fourier transform ion cyclotron resonance mass spectrometry to the study of natural organic matter. 3<sup>rd</sup> Annual North American FT-ICR MS Conference, Austin, TX, USA.
- E. Kujawinski**, J. Farrington and J. Moffett. 2000. Production of organic matter during protozoan grazing with an exceptionally high affinity for PCBs. 2000 Environmental Sciences: Water Gordon Research Conference, Holderness, NH, USA.
- E. Kujawinski**, K. Barbeau, and J. W. Moffett. 1996. Effects of protozoan grazing on particle-reactive contaminants. 1996 Gordon Research Conference in Environmental Chemistry, NH, USA.

### **TEACHING EXPERIENCE**

#### **MIT:**

12.097 – Special Problems in Chemical Oceanography: The environmental chemistry of Boston Harbor – January 2005, 2006 (Independent Activities Period)

#### **BARNARD COLLEGE / COLUMBIA UNIVERSITY:**

CHEM BC1602 – General Chemistry II - Spring 2002, 2003, 2004

EESC BC3016 - Environmental Measurements - Fall 2003

EESC BC3200 / EEEB W4200 – Ecotoxicology (undergraduate / graduate) - Fall 2002, 2003



**MIT:**

Teaching Assistant for Organic Chemistry II (5.13) – Spring 1994

Teaching Assistant for Organic Chemistry I (5.12) – Fall 1993

**SEA / FIELD EXPERIENCE**

**May 2012:** Scientist on GEOMICS cruise along Line P. Collected bulk and molecular-level organic carbon samples for ESI FT-ICR MS and metabolomics. Chief scientist: Prof. E. V. Armbrust

**October, August 2009:** Scientist on RV Tioga (Vineyard Sound). Collected DOM and POM samples for ESI FT-ICR MS and metabolomics. Chief scientist: Dr. H. Sosik.

**October 2009:** Co-PI for NELHA DOM/POM sampling expedition. Collected POM and metabolite samples from Pacific Ocean off Hawaii (Kona, Hawaii). Chief scientist: Dr. A. Stubbins

**May 2008:** Expedition participant on Greenland Ice Sheet (in collaboration with M. Charette and S. Das). Examined carbon cycle of GrIS and surrounding waters.

**September 2005:** Scientist on RV Cape Henlopen (Chesapeake River Estuary). Collected DOM samples for ESI FT-ICR MS analysis and conducted incubations to elucidate carbon cycling by marine microbes. Chief scientist: Dr. N. Blough

**June 2003:** Scientist on RV Oceanus (Hudson River Estuary). Collected DOM samples for ESI FT-ICR MS analysis. Chief scientist: Dr. R. Chen

**May/June 2001:** Scientist on RV New Horizon (Northern Pacific Ocean). Participated in sediment core deployment, retrieval, sectioning and storage. Chief scientist: Dr. T. Eglinton

**May/June 2000:** Research assistant on RV Melville (Equatorial Pacific Ocean). Participated in all aspects of sediment core deployment, retrieval, description and storage. Chief scientist: Dr. N. Pisias

**April 1993:** Research assistant on RV Oceanus (Gulf of Maine). Chief scientist: Dr. D. Repeta

**OTHER PROFESSIONAL ACTIVITIES****PROFESSIONAL SERVICE:**

Co-organizer of session at 2011 Spring ASLO meeting, “Microbe-DOM interactions in aquatic environments” – February 2011

Co-organizer of session at 2010 Fall AGU meeting, “Organic GEOTRACES: Toward an understanding of the distribution of organic matter in the oceans” – December 2010

Co-founder (and organizer) of WHOI Biogeochemistry Group meetings (cross-cutting interdepartmental seminars) – 2005-2008

Chair of session at Humic Substances & Technology X meeting – March 2007

Co-organizer of session at 2006 AGU/ASLO/TOS Ocean Sciences meeting, “Mass Spectrometry and Bio/Chemical Oceanography” – February 2006

Co-organizer of symposium in honor of John W. Farrington, “Advances in Coastal Organic Biogeochemistry” – November 2005

**PROFESSIONAL SOCIETY MEMBERSHIPS:**

American Chemical Society

American Geophysical Union

American Society of Limnology and Oceanography

American Society of Mass Spectrometry

American Society of Microbiology

International Society for Microbial Ecology

The Metabolomics Society

## COMMITTEES:

**September 2010 – present:** Joint Committee on Chemical Oceanography, MIT/WHOI Joint Program

**December 2009 – present:** Joint Program Alumni Mentoring Committee

**September 2009 – June 2010:** 2<sup>nd</sup> year student advisor (7 students total)

**June 2005 – December 2007:** WHOI Gender Equity Program Advisory Committee

**Spring 2005 – 2007:** WHOI Summer Student Fellow / Minority Fellow Admissions Committee

**September 2002 – May 2004:** Committee to Review the Tenure Process, Barnard College

**September 1997 - September 1999:** Student Representative to WHOI Women's Committee, Woods Hole Oceanographic Institution

**September 1996 - September 1997:** Representative for the Department of Marine Chemistry and Geochemistry, MIT/WHOI Joint Program Student Committee.

## REVIEWER:

**Associate Editor:** *Marine Chemistry* (2011-present)

**Funding Agencies:** ACS Petroleum Research Fund, NOAA Global Carbon Program, NSF Arctic Natural Sciences Program, NSF Biological Oceanography Program, NSF Biological Sciences Program, NSF Chemical Oceanography Program, NSF EAR Instrumentation and Facilities Program, NSF Ecosystem Studies Program, NSF Hydrological Sciences Program, Ohio Sea Grant

**Member:** External Review Panel: National ICR Users' Program at Florida State University (2010-present), Environmental Molecular Sciences Laboratory at Pacific Northwest National Laboratory (2012-present)

**Journals:** *Analytical Chemistry; Aquatic Microbial Ecology; Atmospheric Chemistry & Physics; Biogeochemistry; Environmental Science & Technology; Estuarine, Coastal, & Shelf Sciences; Geobiology; Geochimica et Cosmochimica Acta; Geophysical Research Letters; International Journal of Mass Spectrometry; Journal of Environmental Quality; Journal of Mass Spectrometry; Limnology & Oceanography; Limnology & Oceanography - Methods; Marine Chemistry; Marine Environmental Research; Marine Pollution Bulletin; Nature Geoscience; Organic Geochemistry; Proceedings of the National Academy of Sciences, USA; Rapid Communications in Mass Spectrometry; Soil Science Association Journal; Talanta*

**Science Fair:** Falmouth Academy (2005, 2007, 2008, 2009)

## PUBLIC OUTREACH:

*Polar research:*

Presentation and Q&A sessions, "Polar Science" at Cape Cod Children's Museum, Mashpee MA, and at Woods Hole Day Care Cooperative, Woods Hole MA, January 2010.

*Dispersants in Gulf of Mexico:*

Interviews: (media) Associated Press, The Boston Globe, Chemical & Engineering News, CNN, Discover Magazine, Discovery Radio Canada, FOX News (video), German Public Radio, Greenwire, The Los Angeles Times, McClatchy Newspapers, Mother Jones, MSNBC (online blog), The New York Times, Nature news section, News Radio WXTK Cape Cod (on air), Public Broadcasting (Miami TV, WPBT2, Southern California Public Radio), Science News, The Sydney Morning Herald, The Times Picayune, The Wall Street Journal; (other) The Boston Museum of Science, Energy Intelligence Group, Natural Resources Defense Council, U. S. Environmental Protection Agency

Presentations: “Dispersants in the Deepwater Horizon Oil Spill”, MIT panel on the DWH oil spill, sponsored by the Earth, Atmospheric and Planetary Sciences Dept., September 2010; Boston College Environmental Minors’ Seminar, March 2011; Metcalf Institute Workshop on the Impacts of the Deepwater Horizon Oil Spill, April 2011.

Publications: *Oceanus* magazine on-line

## **GROUP MEMBERS**

### **Current:**

**Graduate student:** Winifred Johnson (2011 – present)

**Thesis committee member for:** David Griffith (MIT/WHOI Joint Program, 2010 – present)

**Technical staff:** Crystal Breier (2012-present; research technician); Krista Longnecker (2009-present; Lab manager & FT-MS bioinformaticist); Melissa Kido Soule (2007-present; FT-MS facility manager)

### **Past: (Current affiliation provided where known)**

**Postdoctoral associates (2 total):** Krista Longnecker (2006-09 – *WHOI*); Brian Mailloux (2003-04 – *Barnard College*)

**Graduate students (3 total):** Erin Banning (MIT/WHOI JP ’10 – *MBL*); Maya Bhatia (MIT/WHOI JP ’11 – *Univ of British Columbia*); Karin Lemkau (2006-07)

**Research technicians (2 total):** Katie Barott (2006-07 – *Scripps Institute of Oceanography*); Louisa Morrison (2004-06 – *HS Teacher, Wellesley MA*)

**Thesis committee member for (3 total):** Karin Lemkau (MIT/WHOI JP ’12 – *WHOI*); Desiree Plata (MIT/WHOI JP ’09 – *Duke University*); Jacob Waldbauer (MIT/WHOI JP ’10 – *University of Chicago*)

**Sabbatical guest:** Dr. Huixiang Xie, University of Quebec (2010- 11)

**Senior undergraduate thesis students (3 total):** Nella Green (Barnard College ’04 – *Northwestern Univ. Medical School*); Katherine Nguyen (BC ’05 – *Thomas Jefferson Medical College*); Rebecca Shell (BC ’03 – library thesis)

**High school student:** Emily Nelson (2006)

**Undergraduate research assistants (12 total):** Nasreen Bakht (BC ’05 – 2002/03, Fall 2003); Angela Boysen (Stanford University ’11 – 2010 WHOI Summer Student Fellow – *Oregon Museum of Science & Technology*); Lauren Brin (St. Catherine’s College ’10 – 2009 WHOI ORE Intern); Karen Chang (BC ’04 – Summer 2003); Andreia Da Costa (Rutgers University ’08 – 2007 WHOI Summer Student Fellow – *University of Washington*); Ritu Gupta (BC ’07 – Summer 2004 – *Columbia University*); Ruth Kang (BC ’04 – 2002/03; 2002 Howard Hughes Medical Institute Summer Fellow); Jessica Leber (Columbia University ’04 – Spring 2003 – *Columbia School of Journalism*); Liam Macleod (formerly: Louise Macleod; BC ’04 – 2002/03; 2002 HHMI Summer Fellow, M.P.H, Columbia University – *UC-San Francisco Medical School*); DeAnna McCadney (University of Western Kentucky ’08 – 2006 WHOI Minority Summer Fellow – *US Peace Corps*); Louisa Morrison (BC ’04 – 2003/04; 2003 HHMI Summer Fellow); Lydia Roach (CU ’04 – 2002-04 – *Scripps Institute of Oceanography*).

## **GRANTS**

21. “Weathering of petroleum and dispersant components in the aftermath of the Deepwater Horizon oil spill”, Gulf of Mexico Research Initiative, 2012-14, \$674,766 (Kujawinski portion). co-PI: Helen White (Haverford College).

20. “Interactions between microbes and dissolved organic matter at hydrothermal vents”, WHOI Deep Ocean Exploration Institute, 2012-14, \$65,459. co-PI: Stefan Sievert (WHOI).

19. "A metabolomics-based approach to determine the effects of chronic exposure to toxicants in Atlantic Killifish, *Fundulus heteroclitus*", WHOI Interdisciplinary Award, 2012-14, \$96,760. PI: Neel Aluru (WHOI).
18. "Marine Metabolomics: Identification and quantification of new biomarkers for key microbial species", Gordon & Betty Moore Foundation, 2012-15, \$883,441.
17. "Dissolved organic matter composition in the deep Atlantic Ocean", NSF Chemical Oceanography Program, 2012-15, \$932,099. co-PI: Krista Longnecker (WHOI).
16. "Healthy coastal ecosystems: Are sewage-derived steroidal estrogens a problem in Massachusetts Bay?", WHOI Coastal Ocean Institute, 2010-12. \$52,775. co-PI: David Griffith (JP student).
15. "MRI/RAPID: Acquisition of a triple-quad mass spectrometer for quantitative identification of dispersants and water-soluble oil in the Gulf of Mexico", NSF Major Research Instrumentation Program, 2010-11, \$200,000.
14. "RAPID: Mass spectral characterization of the water-soluble component of the Deepwater Horizon oil spill", NSF Chemical Oceanography Program, 2010-11, \$37,681.
13. "Dissolved organic matter export from the Greenland Ice Sheet: Quantity, source and age", WHOI Arctic Research Initiative, 2010-12, \$100,000.
12. "Exploring the Microbial Imprint on Deep-Ocean DOM", WHOI Deep Ocean Exploration Institute, 2010-12, \$74,243.
11. "Microbial metabolites in marine DOM", NSF Chemical Oceanography Program, 2009-12, \$485,046.
10. "Collaborative Research: The impact of *Pelagibacter* on DOM composition under light and dark conditions", NSF Chemical Oceanography Program, 2008-11, \$303,650; co-PI's: Stephen Giovannoni (Oregon State Univ), Neil Blough and Rossana Del Vecchio (Univ of Maryland).
9. "Laboratory instrumentation for microbial biogeochemistry", Gordon & Betty Moore Foundation, 2006-07, \$500,000; co-PI's: Daniel Repeta, Makoto Saito, Christopher Reddy (WHOI).
8. "Impact of a warming Arctic on hydrological flow routing and carbon transport from glaciated environments to the ocean", WHOI Arctic Research Initiative, 2007-09, \$249,307; co-PI's: Sarah Das, Matthew Charette (WHOI).
7. "The Role of Protozoa in the Carbon Cycle of a Subterranean Estuary", NSF Biogeosciences Program, 2005-08, \$383,470.
6. "MRI: The Acquisition of a FT-ICR Mass Spectrometer for the Structural Characterization of Natural Organic Matter", NSF Ocean Sciences MRI Program, 2006-09, \$1,037,891; co-PI: Christopher Reddy (WHOI).
5. "Combined Structural and Isotopic Molecular-Level Characterization of Marine Dissolved Organic Nitrogen", WHOI Independent Study Award, 2005-07, \$49,500.
4. "CAREER: Biologically-Mediated Molecular-Level Transformations of Marine Organic Matter", NSF Chemical Oceanography Program, 2004-09, \$434,816.
3. "Collaborative Research: Defining the Structural Basis of the Optical Properties of Chromophoric Dissolved Organic Matter", NSF Chemical Oceanography Program, 2004-07, \$150,346; co-PI's: Neil V. Blough, Rossana Del Vecchio (Univ of Maryland).
2. "An Examination of the Dissolved Organic Matter Produced by Protozoan Grazers Isolated from the Hudson River", ACS Petroleum Research Fund, 2003-05, \$35,000.
1. "RUI: A High Resolution GC/MS/FID for Undergraduate Research in Chemistry", NSF Chemistry MRI Program, 2003-06, \$90,049; co-PI: Dina Merrer (Barnard College).