BRITTA M. VOSS
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EDUCATION

Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography: Chemical Oceanography Ph.D. program begun 2009

University of Washington: B.S. magna cum laude in Oceanography with College Honors and a minor in Chemistry, 2009

CURRENT RESEARCH

Tracing riverine matter from source to sink: implications for carbon burial and the dynamics of land–ocean–atmosphere coupling

My work is part of a multi-PI project aiming to constrain the flux and age of organic carbon carried by major rivers around the world through comprehensive measurements of chemical constituents in dissolved, suspended, and bed material, complemented by time series sampling near the deltas. My work focuses on the Fraser River in Canada, an ideal system for making high-resolution spatial and temporal characterizations of organic and mineral sources to the riverine chemical load. I make measurements of suspended sediment bulk organic properties (carbon and nitrogen content, $\delta^{13}C$, $\Delta^{14}C$) and terrestrial biomarkers, as well as radiogenic $^{87}Sr/^{86}Sr$, particle grain size distribution, and mineral surface area. The combination of inorganic radioisotopes, bulk isotopic and molecular organic composition, and physical particle properties aims to link sources and transformation processes of organic matter and mineral particles between headwaters and the estuary.

Advisors: Bernhard Peucker-Ehrenbrink (WHOI) and Timothy Eglinton (ETH Zürich)

Funding Sources: US National Science Foundation (OCE-0851015, EAR-1226818), WHOI Academic Programs Office, WHOI Coastal Ocean Institute

PUBLICATIONS

Voss, B. M., Peucker-Ehrenbrink, B., Eglinton, T. I., Fiske, G., Montluçon, D. B., LeCroy, C., Pal, S., Marsh, S., Gillies, S. L., Janmaat, A., Bennett, M., Downey, B., Fanslau, J., Fraser, H., Macklam-Harron, G., Martinec, M., 2014. Tracing river chemistry in space and time: dissolved inorganic constituents of the Fraser River, Canada. *Geochim. Cosmochim. Acta.* **124,** 283-308. doi: 10.1016/j.gca.2013.09.006.

PREVIOUS RESEARCH ACTIVITIES

Undergraduate Research Assistant (Oceanography): September 2007 – June 2009

I analyzed "spices" (lignin subunits such as natural and synthetic flavoring agents, perfumes, and home care products) as novel tracers of anthropogenic inputs to Puget Sound.

Advisor: Dr. Richard Keil

NOAA Hollings Scholar: Summer 2008 (Hollings Marine Lab, Charleston, SC)
I used liquid chromatography-mass spectrometry and nuclear magnetic resonance to isolate, purify, and characterize the structures of novel toxins and pigments from marine and freshwater algae.
Advisor: Dr. Peter Moeller

DAAD-RISE Intern: Summer 2007 (GEOMAR Institute for Marine Science, Kiel, Germany)
I analyzed DIC and alkalinity distributions in the North Atlantic Ocean from samples I collected during a cruise on a container ship.
Advisors: Tobias Steinhoff and Dr. Arne Körtzinger

Undergraduate Research Assistant (Microbiology): February 2006 – June 2007
I researched the role of F plasmid membrane proteins in bacterial conjugation of *E. coli* using crosslinking and PCR experiments.
Advisors: Rembrandt Haft (now at Univ. of Wisconsin-Madison) and Dr. Beth Traxler

CONFERENCE ABSTRACTS

AGU Fall Meeting 2013 (San Francisco, CA)
"Towards quantitative flux and provenance assessments of riverine suspended sediments: a geochemical investigation of the Fraser River, Canada." **B. M. Voss**, B. Peucker-Ehrenbrink, J. G. Venditti. *Oral Presentation*

ASLO Aquatic Sciences Meeting 2013 (New Orleans, LA)
"Tracing riverine organic matter with inorganic radioisotopes." **B. M. Voss**, T. I. Eglinton, B. Peucker-Ehrenbrink, V. Galy. *Oral Presentation*

SOM-5 Workshop 2012 (Ascona, Switzerland)
"Organic carbon–particle association of suspended and bank sediments in the Fraser River basin, Canada." **B. M. Voss**, T. I. Eglinton, B. Peucker-Ehrenbrink, V. Galy. *Poster*

Goldschmidt Conference 2012 (Montréal, Canada)
"Prediction and observation of dissolved geochemistry of the Fraser River, British Columbia." **B. M. Voss**, B. Peucker-Ehrenbrink, T. I. Eglinton, S. Marsh, S. L. Gillies, G. Fiske, W. Wollheim, R. Stewart, M. Alamwala, M. Bennett, B. Downey, J. Fanslau, H. Fraser, J. Herbert, G. Macklam-Harron, B. Wiebe. *Oral Presentation*

European Geosciences Union Meeting 2012 (Vienna, Austria)
"Do different components of terrestrial sources contribute to the riverine suspended load?" **B. M. Voss**, B. Peucker-Ehrenbrink, T. I. Eglinton, V. Galy. *Poster*

International Meeting on Organic Geochemistry 2011 (Interlaken, Switzerland)
"Exploiting isotopic, organic, and inorganic geochemical tracers of terrestrial matter in suspended particles of the Fraser River, British Columbia." **B. M. Voss**, B. Peucker-Ehrenbrink, T. I. Eglinton, V. Galy, D. B. Montluçon, E. Bulygina, R. M. Holmes, G. Fiske, L. Xu, S. L. Gillies, S. Marsh, A. Janmaat, B. Downey, J. Fanslau, H. Fraser, G. Macklam-Harron. *Poster*

Goldschmidt Conference 2011 (Prague, Czech Republic)
"Constraining subannual variability in river chemistry and hydrology with $^{87}Sr/^{86}Sr$: A case study in the Fraser River basin, Canada." **B. M. Voss**, B. Peucker-Ehrenbrink, T. I. Eglinton, S. L. Gillies, S. Marsh, A. Janmaat, B. Downey, J. Fanslau, H. Fraser, G. Macklam-Harron. *Oral Presentation*

American Geophysical Union Fall Meeting 2010 (San Francisco, CA)
"Seasonal variability of river geochemistry in the Fraser River, British Columbia." **B. M. Voss**, B. Peucker-Ehrenbrink, T.I. Eglinton, D. B. Montluçon, S. L. Gillies, S. Marsh, A. Janmaat, B. Downey, J. Fanslau, H. Fraser, G. Macklam-Harron. *Poster*

Goldschmidt Conference 2010 (Knoxville, TN)
"Land-sea transport of terrestrial carbon in the Fraser River, British Columbia." **B. M. Voss**, D. B. Montluçon, T. I. Eglinton, S. Pal, and B. Peucker-Ehrenbrink. *Poster*

University of Washington Undergraduate Research Symposia
2009: "Environmental spices and citizen science." **B. M. Voss**, A. Meyers-Pigg, R. G. Keil, J. Neibauer, and B. Kimball. *Oral Presentation*
2008: "Environmental spices in Puget Sound." **B. M. Voss**, R. G. Keil, and J. Neibauer. *Oral Presentation*
2007: "Assembly of a conjugative apparatus in *Escherichia coli*." **B. M. Voss**, R. Haft, E. Gachelet, and B. Traxler. *Poster*

FIELD EXPERIENCE

Fraser River basin campaigns (2009-2013, ~4 months total): Travel across lower British Columbia, Canada, collecting river water and sediment samples; training undergraduate students at University of the Fraser Valley in Abbotsford, B.C., to collect time series samples; solo sampling of spring freshet (2013). Co-coordinators: Bernhard Peucker-Ehrenbrink (WHOI), Jeremy Venditti (Simon Fraser Univ.).

Ganges-Brahmaputra River basin campaign (July 2010, 22 days): Travel throughout Bangladesh and Nepal collecting river water and sediment depth profiles, ADCP transects, and large-volume filtration of suspended particles. Coordinators: Valier Galy (WHOI), Christian France-Lanord (CRPG Nancy, France).

R/V Thompson North Pacific hydrographic survey (August 2008, 23 days): Research cruise studying upper ocean carbon dynamics through chemical proxies of biological productivity and satellite observations; field component of UW undergraduate thesis. Chief Scientists: Steven Emerson, Paul Quay (UW).

R/V Barnes day cruises in Puget Sound, WA, and Clayoquot Sound, British Columbia, with Richard Keil's organic geochemistry group at the UW and undergraduate class trips. Activities included CTD casts, sediment coring, chlorophyll and nutrient analysis, plankton tows, and sediment trap deployment.

AWARDS AND HONORS

AGU Outstanding Student Presentation (Earth & Planetary Surface Processes Section), 2013.
Student Research Award: WHOI Coastal Ocean Institute, 2013. Award: $1,470.
Ocean Ventures Fund: WHOI Academic Programs Office, 2012. Award: $10,000.
"Tracking the evolution and composition of DOC released during the Fraser River spring freshet"
L. M. Backus Scholarship: UW Dept. of Oceanography, 2008
NOAA Ernest F. Hollings Undergraduate Scholarship, 2007
Mary Gates Undergraduate Research Scholarships, 2006 and 2007
Washington Scholarship: 4-year full tuition scholarship for undergraduate study, 2005

OUTREACH ACTIVITIES

Women in Science and Engineering Day workshop leader, Bay View Academy (East Providence, RI): 2011 – 2013
Zephyr Education Foundation volunteer (Woods Hole, MA): 2012 – 2013
National Ocean Science Bowl volunteer (regional competitions): 2007 – 2013
Falmouth Secondary Schools Science Fair judge: 2010 – 2013
Cambridge Science Festival C-MORE volunteer (Cambridge, MA): 2011

OTHER ACTIVITIES

Molecular Organic Biogeochemistry Short Course (Texel, Netherlands): 2012
MIT/WHOI Joint Program Marine Chemistry Dept. student representative: 2011-2012
UW Teaching Assistant for "Ocean 102: The Changing Oceans" (Supervised by Profs. Richard Strickland and Mikelle Nuwer): 2009
UW Marine Chemistry Lab (nutrient, chlorophyll, TOC, and salinity analysis): 2006 – 2009

SPECIAL SKILLS & INTERESTS

Languages: English (native), German (proficient conversational and written), Spanish (basic conversational and written)
Communication of scientific research as a platform for improving local and ecosystem-scale awareness of connections between humans and the environment
Science outreach, particularly to young women

COURSEWORK

Graduate
- Lecture courses: marine chemistry, aquatic chemistry, marine isotope geochemistry, marine organic geochemistry, sediment geochemistry, geochemical modeling (with MATLAB), marine bioinorganic chemistry, environmental organic chemistry, paleoceanography
- Seminars: river geodynamics, hot topics in chemical oceanography, classic papers in chemical oceanography

Undergraduate
- Oceanography: introductory chemical oceanography, physical oceanography, biological oceanography, marine geology & geophysics, ocean circulation, geochemical cycles, paleoceanography, field marine biology, Honors thesis project

Chemistry: organic chemistry, thermodynamics, atmospheric chemistry
Mathematics: differential equations, linear algebra, probability & statistics
Biology: marine biology, aquatic microbiology
Other: introductory chemistry (honors), physics, and biology; climate science; geochemistry; science journalism