

BRITTA M. VOSS
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EDUCATION

Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography: Ph.D. Chemical Oceanography, 2014

Thesis Title: Spatial and temporal dynamics of biogeochemical processes in the Fraser River, Canada: A coupled organic-inorganic perspective [[download](#)]

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

PROFESSIONAL EXPERIENCE

2014 – present Postdoctoral Fellow, U.S. Geological Survey, Boulder, CO

2009 – 2014 Graduate Research Assistant, Woods Hole Oceanographic Institution, Woods Hole, MA

RESEARCH INTERESTS

Transport and cycling of organic and inorganic carbon in freshwater ecosystems, Isotopic and molecular techniques of terrestrial organic matter characterization, Role of terrestrial aquatic ecosystem in the global carbon cycle. Current research project: Sources and cycling of carbon in the upper Mississippi River basin.

PEER-REVIEWED PUBLICATIONS

- Voss, B. M.**, Peucker-Ehrenbrink, B., Eglinton, T. I., Spencer, R. G. M., Bulygina, E., Galy, V., Lamborg, C. H., Ganguli, P. M., Montluçon, D. B., Marsh, S., Gillies, S. L., Fanslau, J., Epp, A., Luymes, R., 2015. Seasonal hydrology drives rapid shifts in the flux and composition of dissolved and particulate organic carbon and major and trace ions in the Fraser River, Canada. *Biogeosciences*. 12, 5597-5618. doi: [10.5194/bg-12-5597-2015](https://doi.org/10.5194/bg-12-5597-2015).
- 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](https://doi.org/10.1016/j.gca.2013.09.006).

AWARDS AND HONORS

U.S. Geological Survey Mendenhall Postdoctoral Fellowship, 2014.
Friends of Switzerland Stratton Fellowship, 2014.
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.
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, 2005. Award: 4 years full tuition for undergraduate study.

OUTREACH ACTIVITIES

Volunteer Organizer for Fossil Free MIT and MIT Alumni for Climate Action Leadership (mitacal.org): 2013 – present.
Geoethics Session Organizer at 2014 AGU Fall Meeting.
Scientific Contributor: Climate Feedback Project (climatefeedback.org): 2014 – present.
Scientific Consultant to Fraser River Discovery Centre (New Westminster, BC) for science-art exhibit and teacher resource kits: 2013 – 2014.
Workshop leader for Women in Science and Engineering Day (Bay View Academy, RI): 2011 – 2013.
Volunteer with Zephyr Education Foundation (Woods Hole, MA): 2012 – 2013.
Fraser River research blog (globalrivers.org/category/fraser): 2010 – 2013.
Volunteer for National Ocean Science Bowl regional competitions: 2007 – 2015.
Science Fair judge for Falmouth, MA, Secondary Schools: 2010 – 2014.
Volunteer at Cambridge, MA, Science Festival: 2011.

PREVIOUS RESEARCH ACTIVITIES

Graduate thesis research: September 2009 – August 2014

I used a combination of inorganic ($^{87}\text{Sr}/^{86}\text{Sr}$, major elements) and organic (^{13}C and ^{14}C , optical properties, biomarkers) geochemical tools to investigate processes of weathering and biogeochemical processing of dissolved and sedimentary material in the Fraser River basin, Canada, exploiting the natural diversity of bedrock lithology and vegetation types in the region. My research goal was to determine to what extent mineral weathering and biological activity influence the fate of terrestrial organic carbon en route to the coastal ocean.

Advisors: Dr. Bernhard Peucker-Ehrenbrink (WHOI) & Prof. Timothy Eglinton (ETH-Zürich)

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: Prof. 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 and Prof. Beth Traxler

INVITED PRESENTATIONS

Indian Institute of Technology (Kanpur, India): September 2014

Earth Science Dept. Seminar: "Spatial and temporal dynamics of biogeochemical processes in the Fraser River, Canada"

Isotope Geochemistry Graduate Course Lecture: "Application of radiocarbon to river research"

University of the Fraser Valley (Abbotsford, B.C., Canada): April 2013

Geography Dept. Discovery Seminar: "Geochemistry of the Fraser River: A coupled organic-inorganic approach"

Climate Undergraduate Course Lecture: "Rivers and the global carbon cycle"

Swiss Federal Institute of Science [ETH] (Zürich, Switzerland): March 2012

Biogeosciences Group Seminar: "Integrating organic and inorganic geochemistry of the Fraser River"

CONFERENCE ABSTRACTS

American Geophysical Union Fall Meeting 2014 (San Francisco, CA)

"Seasonal dynamics of organic carbon cycling in the Fraser River, Canada." **B. M. Voss**, T. I. Eglinton, B. Peucker-Ehrenbrink, R. G. M. Spencer, V. Galy, Z. A. Wang. *Poster*

Goldschmidt Conference 2014 (Sacramento, CA)

"Residence time of sedimentary organic matter in the Fraser River basin, B.C., Canada." **B. M. Voss**, T. I. Eglinton, B. Peucker-Ehrenbrink, V. Galy, J. G. Venditti, D. Haught. *Oral Presentation*

American Geophysical Union 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 $^{87}\text{Sr}/^{86}\text{Sr}$: 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*

OTHER PUBLICATIONS

- Gunderson, L., Geissman, J., Goldman, G., Mogk, D., Schnepf, N., **Voss, B.**, and Townsend, R. 2014. Spotlight on scientific integrity and geoethics at the 2014 AGU Fall Meeting. *Eos Trans. AGU*, 95(49), 465, doi:10.1002/2014EO490010. <http://bit.ly/1Dbr01i>.
- Voss, B.**, 2014. Of the River and Time: Flowing waters run deep with clues to Earth's mountains and climate. *Oceanus*. <http://www.whoi.edu/oceanus/feature/voss-fraser>.
- Voss, B.**, 2013. Opinion: The day after tomorrow, today. *The Tech*, 133(43). <http://tech.mit.edu/V133/N43/voss.html>.
- Voss, B.**, 2013. Opinion: When a leader should follow. *The Tech*, 133(36). <http://tech.mit.edu/V133/N36/voss.html>.
- Voss, B.**, 2008. Organic pollutants ignored by current regulations. *Northwest Science & Technology*, Winter 2008. <http://bit.ly/1jV1x6h>.

FIELD EXPERIENCE

Upper Mississippi River campaigns (2014-2015, ~2 months total): Water and gas flux sampling of Chippewa and Mississippi rivers in Wisconsin and Minnesota; small powerboat operation. Coordinators: Kimberly Wickland, Rob Striegl, Ted Stets (USGS Boulder).

Ganga River campaign (August 2014, 1 week): Water and sediment sampling of Bhagirathi headwaters in Uttarkhand, India. Coordinator: Indra Sen (Indian Institute of Technology, Kanpur).

Fraser River basin campaigns (2009-2014, ~4 months total): Travel across lower British Columbia, Canada, collecting river water and sediment samples; training undergraduate students at University of the Fraser Valley (Abbotsford, B.C.) to collect time series samples; solo sampling of spring freshet (2013); suspended sediment depth profile sampling with SFU and Water Survey Canada (2013-2014). Coordinators: Bernhard Peucker-Ehrenbrink (WHOI), Jeremy Venditti (Simon Fraser Univ.).

Ganges-Brahmaputra River basin campaign (July 2010, 3 weeks): 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.

OTHER ACTIVITIES

Reviewer: Journal of Hydrology, Hydrobiologia.

Molecular Organic Biogeochemistry Short Course (Texel, Netherlands): 2012.

MIT/WHOI Marine Chemistry Dept. student representative: 2011-2012.

UW Teaching Assistant for "Ocean 102: The Changing Oceans" (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)

Science communication for improving awareness of climate change and connections between humans and the environment

Science outreach, particularly to young women