BRITTA M. VOSS
266 Woods Hole Road, MS 25
Woods Hole, MA, U.S.A. 02543
+1 508 289 2892
bvoss@whoi.edu

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

Quantification and characterization of terrestrial carbon transported to the sea by the Fraser River using organic and inorganic geochemical approaches.

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 concentration, bulk particulate 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 will attempt 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 Source: US National Science Foundation (OCE-0851015, EAR-1226818)

PREVIOUS RESEARCH ACTIVITIES

UW Chemical Oceanography Lab: September 2007 – June 2009. I used solid phase extraction and gas chromatography-mass spectrometry to analyze "spices" (lignin subunits such as natural and synthetic flavoring agents, perfumes, and home care products) in treated sewage water and natural water samples from Puget Sound. This research aimed to understand the environmental role of spices in the local ecosystem.

Advisor: Dr. Richard Keil

NOAA Hollings Scholarship Program: Summer 2008, paid research internship at the Hollings Marine Lab in Charleston, South Carolina. 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

German Academic Exchange Service – Research Internships in Science & Engineering (DAAD-RISE): Summer 2007, paid research internship at the Institute for Marine Science in Kiel, Germany. I studied CO_2 fluxes in the North Atlantic Ocean using various titration-based

instruments to quantify the parameters of the marine carbonate system. I also participated in a cruise on a container ship to collect samples for the project.
Advisors: Tobias Steinhoff and Dr. Arne Körtzinger

UW Microbiology Lab: February 2006 – June 2007. I researched the role of membrane proteins of the F plasmid in the process of bacterial conjugation in *E. coli*, investigating which other proteins work with TraI through crosslinking and PCR experiments.
Advisors: Rembrandt Haft (now at Univ. of Wisconsin-Madison) and Dr. Beth Traxler

CONFERENCE ABSTRACTS (*presenter)

SOM-5 Workshop (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*
"Organic matter export across landscapes: Understanding the rates and controls." T. I. Eglinton*, V. Galy, X. Feng, N. Drenzek, A. Dickens, C. Ponton, L. Giosan, E. Schefuss, **B. M. Voss**, J. Vonk, Ö. Gustafsson, D. B. Montluçon, Y. Wu.

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*
"Distribution and fate of lignin in dissolved organic matter in world's large river systems." Feng, X.*, V. Galy, J. E. Vonk, **B. M. Voss**, Y. Wu, B. Peucker-Ehrenbrink, R. M. Holmes, D. B. Montluçon, and T. I. Eglinton.

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*
"Tracing Molecular Proxy Signals from Biological Source to Sedimentary Sink." T. I. Eglinton*, V. Galy, X. Feng, **B. M. Voss**, B. Peucker-Ehrenbrink, C. Ponton, L. Giosan, E. Schefuss, D. Montluçon, P. Douglas, M. Pagani, Y. Wu, N. Drenzek.

Western Division of the Canadian Association of Geographers 2011 (Burnaby, B. C., Canada)
"Spatial variation of dissolved and particulate organic carbon levels along the Fraser River, British Columbia." J. Fanslau*, B. Downey, S. Marsh, S. L. Gillies, A. Janmaat, B. Peucker-Ehrenbrink,

B. M. Voss, E. Bulygina, G. Fiske, T. I. Eglinton, D. B. Montluçon, H. Fraser, G. Macklam-Harron, B. Wiebe, M. Martinec, C. Johnson, S. Birdwhistell. *Poster*

"Variability and sources of Dissolved Inorganic Carbon in the Fraser River, B.C. Canada using GIS watershed analysis." B. Downey*, J. Fanslau, S. Marsh, S. L. Gillies, A. Janmaat, B. Peucker-Ehrenbrink, **B. M. Voss**, Z. Wang, K. Hoering, T. I. Eglinton, D. B. Montluçon, H. Fraser, G. Macklam-Herron, B. Wiebe, M. Martinec, C. Johnson, and S. Birdwhistell. *Poster*

American Geophysical Union Chapman Conference: Source to Sink Systems 2011 (Oxnard, CA)

"Controls on the flux, age, and composition of terrestrial organic carbon exported by rivers to the ocean." B. Peucker-Ehrenbrink*, T. I. Eglinton, R. M. Holmes, V. Galy, **B. M. Voss**, P. Mann, R. Spencer, S. A. Soule, S. J. Goetz, N. Laporte, W. M. Wolheim, Z. A. Wang. *Poster*

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 (2009-2011, ~3 months total): Travel across lower British Columbia, Canada, collecting river water and sediments for laboratory analysis at WHOI; training undergraduate students at University of the Fraser Valley in Abbotsford, B.C., to collect time series samples. Coordinator: Bernhard Peucker-Ehrenbrink (WHOI).

Ganges-Brahmaputra River basin campaign (July 2010, 22 days): Travel throughout Bangladesh and Nepal collecting river water depth profiles, sediments, 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 (2006-2008). Activities included CTD casts, sediment coring, chlorophyll analysis, plankton tows, and sediment trap deployment.

AWARDS AND HONORS

Ocean Venture 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

OTHER ACTIVITIES

UW Oceanography Teaching Assistant: Winter 2009, "Ocean 102: The Changing Oceans." Supervised by Profs. Richard Strickland and Mikelle Nuwer.
UW Marine Chemistry Lab: laboratory assistance with nutrient, chlorophyll, TOC, and salinity analysis and data entry, 2006 – 2009
Falmouth Academy Science Fair Volunteer: 2010, poster competition judge
Falmouth Public Schools Science Fair Volunteer: 2011, poster competition judge
National Ocean Science Bowl Volunteer: 2007 – 2012
Women in Science and Engineering, Bay View Academy (Rhode Island): 2011, workshop leader
MIT/WHOI Joint Program Marine Chemistry dept. student representative: 2011-2012
Molecular Organic Biogeochemistry Short Course (Texel, Netherlands): 2012

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-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 chemistry, 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, climatic extremes, field marine biology, Honors capstone 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