CURRICULUM VITAE

JEFFREY S. SEEWALD
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EDUCATION:

Ph.D., Geology, 1990, University of Minnesota, Minneapolis, MN
M.Sc., Geology, 1987, University of Minnesota, Minneapolis, MN
B.A., Geology, 1984, Colgate University, Hamilton, NY

PROFESSIONAL EXPERIENCE:

Chair, Marine Chemistry & Geochemistry Dept., WHOI, May 2010-present
Senior Scientist, Woods Hole Oceanographic Institution, 2008 to present
Associate Scientist with tenure, Woods Hole Oceanographic Institution, 2001 to 2008
Associate Scientist, Woods Hole Oceanographic Institution, 1996 to 2001
Assistant Scientist, Woods Hole Oceanographic Institution, 1992 to 1996
Postdoctoral Investigator, Woods Hole Oceanographic Institution, 1991 to 1992
Postdoctoral Scholar, Woods Hole Oceanographic Institution, 1990 to 1991

AWARDS:

Fellow, Hanse-Wissenschaftskolleg, 2009
Best Paper in Organic Geochemistry for 1994, Geochemical Society

PROFESSIONAL AFFILIATIONS:

Geochemical Society
American Geophysical Union
American Chemical Society

RESEARCH INTERESTS:

Organic-inorganic interactions during sediment diagenesis, carbon cycling ion subsurface environments, sediment and basalt alteration processes in submarine hydrothermal systems, petroleum geochemistry, application of experimental techniques to study naturally occurring geological processes

CRUISE PARTICIPATION:

RV *Cape Hatteras/Nereus*, Mid-Cayman Trough, October 2009
RV *Natsushima/Hyperdolphin*, South Chamorro Seamount, January 2009
RV *Atlantis/Alvin*, Guaymas Basin, October 2008.
RV *Revelle/Jason II*, Rainbow/Lucky Strike, Mid-Atlantic Ridge, July 2008.
RV *Melville/Jason II*, Manus Basin, August 2006.
RV *Melville/Jason II*, Lau Basin, April 2005.
RV *Atlantis/Alvin*, 9-10°N East Pacific Rise,, February 2004.
RV *Western Flyer/Tiburon*, Guaymas Basin, March 2003.
Chief Scientist-RV *Atlantis/Alvin*, Middle Valley and Main Endeavour Vent Field, July 2000.
RV *Atlantis/Alvin*, Main Endeavour Vent Field, Sept. 1999.
RV *Atlantis/Jason*, Jason IX Expedition to Guaymas Basin, April 1998.
RV *Atlantis II/Alvin*, ADVENTURE Cruise to 9-10°N East Pacific Rise, April 1991.

STUDENTS AND POSTDOCS ADVISED

Jill McDermott (Ph.D. in progress), Eoghan Reeves (Ph.D. 2010), Anna Cruse (Ph.D. 2004), Brian Nelson (M.S.), Karyn Rogers (Postdoc), Giora Proskurowski (Postdoc), Tom McCollom (Postdoc), David Darby (Postdoc), Peter Saccocia (Postdoc), Diane Carney (REU), Charles Labbe (REU), Yea-Ling Ong (REU), Nick Boekelheide (REU), Adam Schaen (RUI), Seth McFadyen (RUI), Jean Galluccio (RUI), Julia Moore (RUI), Jason MacLean (RUI), Meghan Wert (RUI), Daniel Desousa (RUI), Karen Hurley (RUI), Dane Percy (RUI), Hallie Marbet (RUI), Emily Walsh (RUI), Tom Neilsen (Guest Student).

PEER REVIEWED PUBLICATIONS

[#] indicates first author was a student or postdoc advised by JSS

Flores G.E., Shakya M., Meneghin J., Yang Z.K., Seewald J.S., Wheat C.G., Podar M., and Reysenbach A.-L. (2011) Microbial Community Structure of Six Hydrothermal Vent Fields Along the Eastern Lau Spreading Center, Southwestern Pacific. *ISME Journal* (submitted)

Ryerson T.B., Camilli R., Kessler J.D., Kujawinski E., Reddy C.M., Valentine D.L., Atlas E., Blake D., de Gouw J., Meinardi S., Oarrish D., Peischl J., Seewald J.S., and Warneke C. (2011) Chemical data quantify Deepwater Horizon hydrocarbon flow rate and environmental distribution. *Proc. Nat. Acad. Sci.* (submitted).

[#]Reeves E.P, Seewald J.S., and Sylva S. (2011) Hydrogen isotope exchange between n-alkanes and water under hydrothermal conditions. *Geochim. Cosmochim. Acta* (in press).

Camilli R., Di Iorio D., Bowen A., Reddy C.M., Techet A.H., Yoerger D.R., Whitcomb L.L., Seewald J.S., Sylva S.P., and Fenwick J. (2011) Acoustic measurement of the Deepwater Horizon Macondo well flow rate. *Proc. Nat. Acad. Sci.*, doi/10.1073/pnas.1100385108.

Reddy C.M., Arey J.S., Seewald J.S. Sylva S.P., Lemkau K.L., Nelson R.K., Carmichael C.A., McIntyre C.P., Fenwick J., Ventura G.T., Van Mooy B.A.S., Camilli R. (2011) Composition and fate of gas and oil released to the water column during the Deepwater Horizon oil spill. *Proc. Nat. Acad. Sci.*, doi: 10.1073/pnas.1101242108.

Flores G.E., Campbell J.H., Kirshtein J.D., Meneghin J., Podar M., Steinberg J.I., Seewald J.S., Tivey M.K., Voytek M.A., Yang Z.K. and Reysenbach A.-L. (2011) Microbial community structure of hydrothermal deposits from geochemically different vent fields along the Mid-Atlantic Ridge. *Environmental Microbiology* doi:10.1111/j.1462-2920.2011.02463.x

[#]Reeves E.P, Seewald J.S., Saccocia P., Walsh E., Bach W., Craddock P., Shank W.C. III, Sylva S.P., Pichler, Rosner (2011) Geochemistry of hydrothermal fluids from the PACMANUS, Northeast Pual and Vienna Woods vent fields, Manus Basin, Papua New Guinea. *Geochim. Cosmochim Acta* **75**, 1088-1123.

Mottl M.J., Seewald J.S., Wheat C.G., Tivey M.K., Proskurowski G., Reeves E., Sharkey J., McCollom T.M., You C.-F., Chan L.H., Pichler T, and Michael P. (2011) Chemistry of hot springs along the Eastern Lau Spreading Center. Geochim. Cosmochim. Acta **75**, 1013-1038.

Lizarralde D.S., Soule A., Seewald J.S., and Proskurowski G. (2011) Carbon release by off-axis magmatism in a young sedimented spreading centre. *Nature Geosci.* **4**, 50-54.

Ertefai T.S, Heuer V.B., Prieto-Mollar X., Vogt C., Sylva S. P., Seewald J.S., Hinrichs K. U. (2010) The biogeochemistry of sorbed methane in marine sediments. *Geochim. Cosmochim. Acta* **74**, 6033-6048

[#]Cruse A.M. and Seewald J.S. (2010) Low-Molecular Weight Hydrocarbons in Vent Fluids from the Main Endeavour Field, northern Juan de Fuca Ridge. *Geochim. Cosmochim. Acta* **74**, 6126-6140.

[#]Craddock P.R., Bach W., Seewald J.S., Rouxel O.J. Reeves E., and Tivey M.K. (2010) Sub–seafloor Processes Controlling Rare Earth Element Abundances in Hydrothermal Fluids from the Manus Basin, Papua New Guinea. .*Geochim. Cosmochim. Acta* **74**, 5494-5513.

German C.R., Bowen A., Coleman M.L., Honig D.L., Huber J.A., Jakuba M.V., Kinsey J.C., Kurz M.D., Leroy S., McDermott J.M., Mercier de Lépinay B., Nakamura K., Seewald J.S., Smith J., Sylva

S.P., Van Dover C.L., Whitcomb L.L., and Yoerger D.R. (2010) Diverse styles of submarine venting on the ultra-slow spreading Mid-Cayman Rise. *Proc. Nat. Acad. Sci.* **107**, 14020-14025.

McCollom T.M., Sherwood Lollar B., Lacrampe-Couloume G., Seewald J.S. (2010) The influence of carbon source on abiotic organic synthesis and carbon isotope fractionation under hydrothermal conditions. *Geochim. Cosmochim. Acta* **74**, 2717–2740.

Saccocia P.J., Seewald J.S., and Shanks W.C., III (2009) Oxygen and hydrogen isotope fractionation in the serpentine-water and talc-water systems from 250 to 450°C. *Geochim. Cosmochim. Acta* **73**, 6789-704.

#Cruse A.M., Seewald J.S., Saccocia P.J., and Zierenberg R., (2008) Hydrothermal Fluid Composition at Middle Valley, northern Juan de Fuca Ridge: Temporal and Spatial Variability. *AGU Monograph, Modeling Hydrothermal Processes at Oceanic Spreading Centers: Magma to Microbe* (eds. R. Lowell, J. Seewald, A. Metaxis, and M. Perfit), pp. 145-166.

#Proskurowski, G., Lilley, M.D., Seewald, J.S., Olson, E.J., Früh-Green, G.L., Lupton, J.E., Sylva, S.P., Kelley, D.S. (2008) Abiogenic Hydrogen and Hydrocarbon Production at the Lost City Hydrothermal Field. *Science* **319**, 604-607.

McCollom T.M. and Seewald J.S. (2007) Abiotic synthesis of organic compounds in deep-sea hydrothermal environments. *Chemical Reviews* **107**, 382-401.

Seewald J.S., Zolotov M., and McCollom T.M. (2006) Experimental investigation of carbon speciation under hydrothermal conditions, *Geochim. Cosmochim. Acta* **70**, 446-460.

#McCollom T.M. and Seewald J.S. (2006) Carbon isotope composition of hydrocarbons produced by abiotic organic synthesis under hydrothermal conditions, *Earth Planet. Sci Lett* **243**, 74-84.

#Cruse A.M. and Seewald J.S. (2006) Geochemistry of low-molecular weight hydrocarbons in hydrothermal fluids from Middle Valley, northern Juan de Fuca Ridge, *Geochim. Cosmochim. Acta* **70**, 2073-2092.

Pearson A., Seewald J. S., and Eglinton T. I., (2005) Bacterial incorporation of relict carbon in the hydrothermal environment of Guaymas Basin, *Geochim. Cosmochim. Acta* **69**, 5477-5486

Seewald J.S., Cruse A., Saccocia P.J. (2003) Aqueous volatiles in hydrothermal fluids from the Main Endeavour Field, northern Juan de Fuca ridge: temporal variability following earthquake activity. *Earth Planet. Sci. Lett.* **216**, 575-590.

Seewald J.S. (2003) Organic-inorganic interactions during the generation and chemical evolution of petroleum. *Nature*. **426**, 327-333.

Seyfried W.E. Jr., Seewald J.S., Berndt M.E., Ding K., and Foustoukos D. (2003) Chemistry of hydrothermal vent fluids from the Main Endeavour Field, Northern Juan de Fuca Eidge: Geochemical controls in the aftermath of the June 1999 seismic events. *Journal of Geophysical Research* **108**, 2429-2452.

#McCollom T.M. and Seewald, J.S. (2003a) Experimental constraints on the hydrothermal reactivity of organic acids and acid anions: I. formic acid and formate. *Geochim. Cosmochim. Acta* **67**, 3625-3644.

#McCollom T.M. and Seewald, J.S. (2003b) Experimental Study of the Hydrothermal Reactivity of Organic Acids and Acid Anions: II. Acetic Acid, Acetate, and Valeric Acid. *Geochim. Cosmochim. Acta* **67**, 3645-3664.

Seewald, J.S., Doherty K.W., Hammar T.R. and Liberatore S.P. (2002). A new gas-tight isobaric sampler for hydrothermal fluids, *Deep-Sea Research* **49**, 189-196.

Seewald, J.S. (2001). A model for the origin of carboxylic acids in basinal brines. *Geochim. Cosmochim. Acta* **65**, 3779-3789.

Seewald J.S. (2001) Aqueous geochemistry of low molecular weight hydrocarbons at Elevated temperatures and pressures: constraints from mineral buffered laboratory experiments. *Geochim. Cosmochim. Acta* **65**, 1641-1644.

#McCollom, T.M. and Seewald, J.S. (2001). A reassessment of the potential for reduction of dissolved CO_2 to hydrocarbons during serpentinization of olivine. *Geochim. Cosmochim. Acta* **65,** 3769-3778.

#Cruse A.M. and Seewald J.S. (2001) Metal mobility in sediment-covered ridge-crest hydrothermal systems: Experimental and theoretical constraints. *Geochim. Cosmochim. Acta* **65**, 3233-3247.

#McCollom T.M., Seewald J.S., and Simoneit B.R.T. (2001) Reactivity of monocyclic aromatic compounds under hydrothermal conditions. *Geochim. Cosmochim. Acta* **65**, 455-468.

Seewald J.S., Eglinton L.B., and Ong Y.L. (2000) An experimental study of organic-inorganic interactions during vitrinite maturation. *Geochim. Cosmochim. Acta* **64**, 1577-1591.

Seewald J.S. and Eglinton (1999) T.I. Laboratory Simulations of Organic Matter Thermal Maturation. *The Encyclopedia of Geochemistry: Earth Science Encyclopedia Series* (C.P. Marshall, ed.) Kluwer, The Netherlands.

Seewald J.S., Nelson B.C. and Whelan J.K. (1998) Laboratory and theoretical constraints on the origin and composition of natural gas. *Geochim. Cosmochim. Acta* **62**, 1599-1617.

Seewald J.S. (1997) Mineral redox buffers and the stability of organic compounds under hydrothermal conditions. Materials Research Society Symposium Proceedings **432**, 317-331.

#Saccocia P.J., Seewald J.S., and Shanks W.C. III (1996) Hydrogen and oxygen isotope fractionation between brucite and aqueous NaCl solutions from 250-450°C. *Geochim. Cosmochim. Acta* **62**, 485-492.

#Nelson, B.C., Eglinton T.I., Seewald J.S., Vairavamurthy A., and Miknis F.P. (1995). Transformations in organic sulfur speciation during maturation of Monterey shale: Constraints from laboratory experiments. In: *Geochemical Transformations of Sedimentary Sulfur: ACS Symposium Series 612* (M.A. Vairavamurthy and M.A.A. Schoonen, eds.) 138-166. American Chemical Society, Washington, DC.

Seewald, J.S. (1994). Evidence for metastable equilibrium between hydrocarbons under hydrothermal conditions. *Nature,* **370**, 285-287.

Seewald, J.S., Seyfried W.E. Jr., and Shanks W.C. III (1994). Variations in the chemical and stable isotope composition of carbon and sulfur species during organic-rich sediment alteration: An experimental and theoretical study of hydrothermal activity at Guaymas Basin, Gulf of California. *Geochim. Cosmochim. Acta* **58**, 5065-5082.

Whelan, J. K., Seewald J.S., Eglinton L.B., and Miknis F. (1994). Time-temperature histories of kerogen and mineral ammonia from ODP Leg 139 (Middle Valley) sediments. In: *Proceedings of the Ocean Drilling Program, Scientific Results* (Mottl, M.J., Davis, E.E., Fisher, A.T. and Stack, J.F., eds.), **139**, 485-494.

Seewald, J.S. and Seyfried W.E. Jr. (1991). Experimental determination of portlandite solubility in H_2O and acetate solutions at 100°-350°C and 500 bars: constraints on calcium hydroxide and calcium acetate complex stability. *Geochim. Cosmochim. Acta* **55**, 659-669.

Seewald, J.S., Seyfried W.E. Jr., and Thornton E.C. (1990). Organic-rich sediment alteration: An experimental and theoretical study at elevated temperatures and pressures. *Applied Geochemistry,* **5**, 193-209.

Seewald, J.S. and Seyfried W.E. Jr. (1990). The effect of temperature on heavy and base metal mobility in subseafloor hydrothermal systems: constraints from basalt alteration experiments and field studies. *Earth Planet. Sci. Lett.,* **101**, 388-403.

Seyfried, W. E., Jr., Berndt M.E., and Seewald J.S. (1988). Hydrothermal alteration processes at mid-ocean ridges: constraints from diabase alteration experiments, hot-spring fluids and composition of the oceanic crust. *Can. J. Earth Sci.,* **26**, 787-804.

OTHER PUBLICATIONS

Lowell R.P., Seewald J.S., Metaxas A., and Perfit M.R. (2008) Modeling hydrothermal processes at ocean spreading centers: magma to microbe—overview. *AGU Monograph, Modeling Hydrothermal Processes at Oceanic Spreading Centers: Magma to Microbe* (eds. R. Lowell, J. Seewald, A. Metaxis, and M. Perfit) pp. 1-13.

Seewald J. and Michael P. (2008) Studies at the Lau Basin. *Ridge Events* **3**, 25-27.

Michael P. and Seewald J. (2007) Focus On: Studies at the Lau Basin. *Ridge Events* **2**, 11-21.

Whelan, J.K., L.B. Eglinton, J. Seewald, P. Meulbroek, J. Sosha, L.M. Cathles, D. Darby, & J.M. Hunt. (1998). Sedimentary hydrocarbon and asphalt gradients through the top of overpressure – organic geochemical evidence for dynamic creation and maintenance of pressure seals. Proceedings of workshop on: Overpressures in Petroleum Exploration, Pau, France, March 1998, 10pp.

Seewald J.S. (1997) Sulfur greases the wheels. *Nature* **391**, 128-129.

Seewald J.S., How do high temperature & pressure affect organic compounds at vents? *Woods Hole Oceanographic Institution 2000 Annual Report.*

Seewald J.S., Water May Provide Reactive Hydrogen for Hydrocarbon Formation, *Woods Hole Oceanographic Institution 1994 Annual Report.*

Saccocia, P.J., Ding K., Berndt M.E., Seewald J.S., and Seyfried W.E. Jr. (1994). Experimental and theoretical perspectives on crustal alteration at mid-ocean ridges. In: *Alteration and Alteration Processes Associated with Ore-forming Systems: Geological Association of Canada, Short Course Notes* (D.R. Lentz, ed.) **11**, 403-431.