Michael Hutnak

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Education

2000-2007	Ph. D., Earth Sciences University of California, Santa Cruz Focus: Fluid and Heat Transport in Seafloor Hydrothermal Systems Primary Advisor: Andrew Fisher
1994-96	B.S. Oceanography Oceanography Department, University of Washington Focus: Marine Geology and Geophysics
1986-1989	B.S. Student Washington State University

Positions Held

2007- present	NRC Postdoctoral Associate	Volcano Hazards, U.S. Geological Survey
2000-2007	Graduate Student Researcher	Department of Earth Sciences, UCSC
2001-03	Teaching Assistant	Department of Earth Sciences, UCSC
1997-00	Oceanographer	Oceanography Department, University of Washington
1995-97	Research Assistant	Oceanography Department, University of Washington

Honors and Affiliations

2004	Young Fellow, Institute for Geophysics and Planetary Physics, UCSC
2003-2004	Schlanger Fellow, Ocean Drilling Program
1994-1996	Dean's List, School of Oceanography, University of Washington
1989	Honor Role and President's Honor Roll, Washington State University
1996-present	American Geophysical Union
2007-present	Geological Society of America

Research Experience

Participant on 19 oceanographic (geophysical, geological, geochemical) expeditions, including IODP Expedition 301
Scientific observer on 3 Alvin dives
Supervised scientific ROV operations on 3 cruises
Proficient in swathmap data processing and display using MB System and GMT
Proficient in using groundwater flow models (MODFLOW, TOUGH2, FEHM)
Proficient in seismic data processing and display using Promax, SeisWorks, Kingdomsuite
Designed and constructed sophisticated oceanographic instrumentation, including fluid samplers, flow meters, and heat flux sensors
Conducted rock paleomagnetic and rock magnetism experiments
Accomplished MATLAB programmer: coded open-source fluid and heat transport software (*JGR*, 112, B12101, 2007*)*

Peer-Reviewed Publications

Hutnak, M., A. T. Fisher, et al., Enormous power output and fluid fluxes driven through a few mid-plate outcrops, *Nature Geosciences,* submitted, 2008

Hutnak, M. and A. T. Fisher, The influence of sedimentation, local and regional hydrothermal circulation, and thermal rebound on measurements of seafloor heat flux, *JGR, 112,* B12101, doi:10.1029/2007JB005022, 2007

Hutnak, M., A. T. Fisher, et al., Hydrothermal recharge and discharge guided by basement outcrops on 0.2-3.6 Ma seafloor east of the Juan de Fuca Ridge: observations and numerical models, *Geochemistry, Geophysics, Geosystems,* 7, Q07O02, doi:10.1029/2006GC001242, 2006.

Hutnak, M., A. T. Fisher, et al., The thermal state of 18-24 Ma upper lithospere subducting below the Nicoya Peninsula, northern Costa Rica margin, in *Interplate Subduction Zone Seismogenesis*, edited by T. Dixon, C. Moore, Columbia University Press, New York, *2007.*

Zuehlsdorff, L., M. Hutnak, A.T. Fisher, V. Spiess, E.E. Davis, M. Nedimovic, S. Carbotte, H. Villinger, and K. Becker Site surveys related to IODP Expedition 301: ImageFlux (SO149) and RetroFlux (TN116) expeditions and earlier studies, *Proceedings of the Integrated Ocean Drilling Program*, Volume 301: College Station Tx (Integrated Ocean Drilling Program Management International, Inc.). 2004.

Silver, E., P. Costa Pisani, M. Hutnak, A. Fisher, H. DeShon, and Barrie Taylor, An 8-10 Ma tectonic event on the Cocos Plate offshore Costa Rica: Result of Cocos Ridge collision?, *Geophys. Res. Lett., Vol 31,* 2004.

Fisher, A. T., C. A. Stein, R. N. Harris, K. Wang, E. A. Silver, M. Pfender, M. Hutnak, et al., Abrupt thermal transition reveals hydrothermal boundary and role of seamounts within the Cocos Plate, *Geophys. Res. Lett, Vol* **30**(11): 1550, doi:10.1029/2002GL016766, 2004

Cowen, J.P., S. Giovannoni, F. Kenig, H.P. Johnson, D. Butterfield, M. Rappe, M. Hutnak, and P. Lam, Fluids from aging ocean crust that support microbial life, *Science*, *299,* 120-123, 2003.

Fisher, A.T., E. Davis, M. Hutnak, et al., Hydrothermal circulation across 50 km on a young ridge flank: the role of seamounts in guiding recharge and discharge at a crustal scale, *Nature*, *421*, 618-621, 2003.

Fisher, A.T., C.A. Stein, R.N. Harris, K. Wang, E.A. Silver, M. Pfender, M. Hutnak, A. Cherkaoui, R. Bodzin, and H. Villinger, Abrupt thermal transitions reveal hydrothermal boundary and role of seamounts within the Cocos Plate, *Geophys. Res. Lett.*, *vol. 30, 11,* 2003.

Bennett, R.H., M. Hulbert, C. Curry, H.P. Johnson, M. Hutnak, and K.J. Curry, In-Situ Permeabilities of Selected Coastal Marine Sediments, *IEEE J. Oceanic Eng.,* vol. 27, no. 3, pp. 571-580, 2002.

Johnson, H.P., M. Hutnak, et al., Earthquake-induced changes in a hydrothermal system at the Endeavour Segment; Juan de Fuca Ridge, *Nature, 407*, 174-177, 2000.

Johnson, H.P. and M. Hutnak, Conductive Heat Loss in Recent Eruptions at Mid-Ocean Ridges, *Geophys. Res. Lett.,* 3089-3092, 1997.

Johnson, H.P. and M. Hutnak, Conductive Heat Flow Measured in Unsedimented Regions of the Seafloor, *EOS Trans. Amer. Geophys. Union, 77,* 321-324, 1996.

Abstracts and Other Publications

Hutnak, M., S. Hurwitz, P.A. Hsieh, S. Ingebritsen, Numerical simulations of multi-phase, multi-component hydrothermal fluid flow: Implications for heat and mass transport and deformation of the Yellowstone Caldera, *EOS Transactions, AGU, 2007,* oral presentation.

Hutnak, M., A.T. Fisher, et al., Enormous power output and fluid fluxes driven through a few mid-plate outcrops, *EOS Transactions, AGU, 2007,* oral presentation.

Hutnak, M., A.T. Fisher, The influence of sedimentation, local and regional hydrothermal circulation, and thermal rebound on measurements of seafloor heat flux, *Workshop on The Futre of Marine Heat Flow*, University of Utah, UT., September, 2007.

Hutnak, M., A.T. Fisher, Numerical Models Generate Episodic hydrothermal fluid recharge and discharge guided by basement outcrops, *Ridge 2000 Theoretical Institute Workshop*, Mammoth Lakes CA., June, 2006.

Hutnak, M., A.T. Fisher, et al., Numerical Models Generate Transient (Periodic) Hydrothermal Discharge Through a Seamount, *Seamount Biogeosciences Workshop*, Scripps Institution of Oceanography, March, 2006.

Hutnak, M., A.T. Fisher, et al., Hydrothermal circulation within and between basement outcrops on a young ridge flank: numerical models and thermal constraints, *EOS Transactions, AGU, 2005,* oral presentation.

Hutnak, M., A.T. Fisher, et al., Evidence for along-strike hydrothermal circulation within young oceanic crust on the Eastern Flank of the Endevour Axis, Juan de Fuca Ridge, *EOS Transactions, AGU, 2004.*

Hutnak, M., A.T. Fisher, et al., Thermal constraints on upper basement permeability near a venting seamount, *EOS Transactions, AGU,* 2003.

Hutnak, M., A.T. Fisher, et al., Seamounts as conduits for hydrothermal fluid discharge and recharge between the lithosphere and overlying ocean: examples from the eastern flank of the Juan de Fuca Ridge, Cascadia Basin, *EOS Transactions, AGU,* 2002.

Johnson, H.P., M. Hutnak, et al., Disturbances in oceanic crustal fluid circulation: Response of the Endeavour/Juan de Fuca hydrothermal system to a magnitude 4.5 earthquake, *Eos Transactions, AGU,* 2000.

Hutnak, M., M.E. Torres, H.P. Johnson, and R.W. Collier, Periodic Negative Heat Flow on Southern Hydrate Ridge: Implications for the Destabilization of Gas Hydrate, *EOS Transactions, AGU,* 1999.

Hutnak, M. and H.P. Johnson, On Obtaining a Hydrological Seal with the Seafloor: A Concrete Example from Axial Seamount, *Ridge Newsletter*, July 1999.

Hutnak, M. and H.P. Johnson, Tidal Modulation of Hydrothermal Fluid Circulation; Bare Rock Heat Flow from the Summit of Baby Bare Seamount, Juan de Fuca Ridge, *EOS Transactions, AGU,* 1998.

Johnson, H.P. and M. Hutnak, Measuring Conductive Heat Flow, *Sea Technology, v39,* 23-28, 1998.

Hutnak, M., Turbidity Currents in Puget Sound: A Major Mechanism for Transporting Sediment to the Main Basin of Puget Sound, Senior Research Project, University of Washington, 1996.