

# **The U.S. DOE Methane Hydrate R&D Program**

**DOE Sponsored Student Researchers**

**Publications and Presentations of DOE  
Supported Methane Hydrate R&D 1999-2011**

January 2011



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## **Section I: Documentation of Support for Education**

### **Students contributing to and receiving support from DOE-funded Methane Hydrate projects: 2000-2009.**

#### *Alaska, Anchorage, The University of (in conjunction with the Maurer/Anadarko project)*

- Porhola, Stan, B.S.
- Ross, Zulimacristina, M.S.

#### *Alaska, Fairbanks, The University of (in conjunction with the BP-Alaska project)*

- Bhangale, Amit, M.S., 2007, Modeling
- Duffy, Ryan, B.S., 2010, Mechanical Engineering
- Gaglioti, Ben, MS, 2010, Biology
- Howe, Steven, M.S., 2004, Modeling and Economics
- Jaiswal, Namit, M.S., 2004, Petroleum Engineering
- Johnson, Andrew, M.S., 2009, Petroleum Engineering
- Kulkarni, Abhijeet, Ph.D., 2005
- Phale, Hemant, M.S., 2006
- Stone, Chris, M.S., 2006
- Tsunemori, Phillip, B.S., 2005
- Vajjha, Pavan, M.S., 2005
- Westervelt, Jason, M.S., 2004, Geology
- White, Aaron, M.S., 2003
- Singh, Praveen, M.S., in progress
- Kerkar, Prasad, M.S., 2005
- Banerjee, Sudiptya, M.S., 2005

#### *Arizona, The University of (in conjunction with the BP-Alaska project)*

- Arca, M. Serkan, Ph.D., in progress, Geophysics
- Barker, Margaret, B.S., in progress
- Gandler, Greg, B.S., 2004
- Geauner, Scott, M.S., in progress
- Hennes, Andrew, M.S., 2004, Structural Geology
- Hagbo, Casey, M.S., 2003, Geophysics
- Manuel, Justin, M.S., 2006, Geophysics
- Peyton, Lynn, Ph.D., in progress, Geophysics
- Zhoa, Bo, M.S., 2003, Geophysics

#### *Baylor University (seafloor electrical resistivity project)*

- Amidu, Sikiru, Ph.D., in progress, Geophysics

**California – Berkeley, University of** (in association with LBNL)

- Elsen, Heather, Ph.D., in progress, Chemistry
- Kowalsky, Michael, Ph.D., 2003
- Pruess, Jacob, B.S., Chemical Engineering
- Wu, Gordon, B.S., in progress, Molecular and Cellular Biology
- Holzman, Ran, Ph.D. Engineering, in progress, AGU Student award

**California – Santa Barbara, University of**

- Heintz, Monica, Ph.D., in progress, Earth Science (*NETL Methane Hydrate Research Fellow*)
- Paul, Blair, Ph.D., in progress, Marine Science
- Stubbs, Chris, Ph.D., in progress, Geological Oceanography (*in association with CMRET project*)

**Carnegie-Mellon University** (in association with NETL/ORD)

- Howard, Kris, B.S., 2002, Chemical Engineering

**Clarkson University** (*hydrate model development project*)

- Ji, Chuang, M.S., 2001
- White, Tim, M.S., 2003

**Columbia University** (in association with the GoM JIP)

- Cook, Ann, Ph.D., in progress, Geophysics
- Grabias, Bryan, B.S., in progress, Chemical Engineering (summer intern)

**Colorado, Boulder, University of**

- Craft, Julianne, B.S., 2009, Biochemistry
- Tzou, David, B.S., 2010, Chemical Engineering and Computer Science

**Colorado School of Mines** (in association with LBNL)

- Gupta, Arvind, Ph.D., in progress
- Walsh, Matt, Ph.D., in progress, Chemical Engineering
- Peters, David, M.S., 2001
- Ulrich, Shannon, M.S., 2010, Environmental Engineering and Science

**Colorado School of Mines** (in association with ORNL)

- Ulrich, Shannon, M.S., 2010, Environmental Engineering and Science

**Colorado State University**

- Bolton, Robert, B.S., in progress, Biology

**Delaware, University of**

- Christman, G., M.S., 2009, Marine Biosciences
- Yu, Liying, in progress

***Duquesne University (in association with NETL/ORD)***

- Thomas, Dick, Ph.D., in progress, Chemistry
- Thomas, Laura, B.S., 2005, Chemistry

***Florida State University (in association with CMRET project)***

- Lapham, Laura, Post-doctoral, in progress, Geochemistry (*NETL Methane Hydrate Research Fellow*)
- Peeler, Kelly, M.S., 2004
- Tazaz, Amanda, Ph.D., in progress, Geochemistry
- Rachel Wilson, Ph.D, 2010, Post-doctoral in progress

***Georgia Institute of Technology (in association with GoM JIP)***

- Cortes, Douglas, Ph.D., 2010
- Dai, Sheng, Ph.D., 2012
- Francisca, Franco, Post-doctoral, 2002-2004
- Lee, Changho, Post-doctoral, 2008
- Lee, Jong-Sub, Post-doctoral, 2004-2005
- Lee, Joo-Yong, Ph.D., 2007
- Martin, Ana Isabel, M.S., 2004
- Narsilio, Guillermo, Ph.D., 2005
- Yun, Tae-Sup, Ph.D., 2005, Post-doctoral until August 2007

***Georgia Institute of Technology (in association with the CMRET project)***

- Dobbs, Gary, Ph.D., 2007, Chemistry
- Hvozدارa, L., Post-doctoral 2001-2002, Chemistry
- Janotta, Markus, Ph.D., 2003, Chemistry
- Pennington, Neil, M.S., 2003, Chemistry
- Vogt, Frank, Post-doctoral 2002-2003, Chemistry

***Georgia Institute of Technology (DOE Contract DE-FC26-06NT42963: Methane Recovery from Hydrate-bearing Sediments)***

- Jung, Jongwon, Ph.D., in progress (experiments in the SPS - ORNL)
- Taboada-Serrano, Patricia, Post-doctorate
- Yun, Tae-Sup, Ph.D., 2005, Post-doctoral
- Jang, Jaewon, Ph.D., in progress (experiments in the SPS - ORNL)
- Espinoza, Nicolas, Ph.D., in progress
- Shin, Hosung, Ph.D., in progress

***University of Georgia (in association with CMRET project)***

- Yundan Pi: Visiting Master's , 2007
- Yige Zhang: M. S., in progress, Marine Science
- Bin Liu: Postdoc, in progress
- Bowles, Marshall, Ph.D., in progress, Microbiology/Biogeochemistry

***Houston, University of (in association with the Westport project)***

- Nanchary, Narender, M.S., 2003, Chemical Engineering
- Ogunlana, Damilola, Post-doctoral, Chemical Engineering
- Pitchumani, Ramanan, Post-doctoral, Chemical Engineering
- Sun, Xuefei, Ph.D., 2005, Chemical Engineering
- Phirani, Jyoti, Ph.D. in progress, Chemical Engineering

***Idaho, University of***

- Boyd, Stephanie, M.S., 2004, Environmental Science

***Louisiana State University (in association with CMRET project)***

- Hackworth, Matt, Ph.D., 2004, Geology and Geophysics

***Massachusetts Institute of Technology***

- Jain, Antone, M.S./Ph.D., in progress, Groundwater Hydrology
- MacMinn, Christopher, Ph.D., in progress, Mechanical Engineering

***Mississippi, University of (in association with CMRET project)***

- Caruso, Simona, MS, 2007-8, visiting scholar, Marine Geology
- Giacomini, Laura, 2004-5, post-graduate fellow, Marine Geology
- Geresi, Erika, 2001 – 3, visiting scholar, Geophysics
- Grover, Tarun, M.S., 2004
- Hodges, Tyler, M.S. 2003
- Ingrassia, Michela, visiting scholar, 2010, Marine Biology
- Kumar, Viren, M.S., 2003
- Macelloni, Giordano, 2007, post-graduate fellow, stratigraphy
- Macelloni, Leonardo, visiting scholar, Ph. D., 2007, Marine Geophysics
- Simonetti, Antonello, visiting scholar, 2008-9, Marine Geology
- Strack, Emily, M.S., Geological Engineering

***Mississippi State University (in association with CMRET project)***

- Dearman, Jennifer, Ph.D., 2007, Chemical Engineering
- Ding, Tao, M.S., 2004.
- Kothapalli, Chandra, M.S., 2002, Chemical Engineering
- Lee, May Shia, M.S., 2001, Chemical Engineering
- Radich, James, M.S., 2009, Chemical Engineering
- Woods, Charles, M.S., 2004, Chemical Engineering
- Xiong, Shangmin, M.S., 2008, Chemical Engineering
- Zhang, Guochang, Post-doctoral, Microbiology

***North Carolina, Chapel Hill, The University of (in association with CMRET project)***

- Ingram, Wes, Ph. D., in progress.
- Lapham, Laura, Ph.D., 2007, Marine Sciences.
- Lloyd, Karen, Ph.D., 2009, Marine Sciences
- Yang, Tingting, Ph. D., in progress, Marine Sciences

***Oklahoma, University of (in association with Maurer Hot Ice project)***

- Chikyala, Vikramaditya, M.S.
- Raghunathan, Ravi, Ph.D.
- Tran, Tung, Ph.D., in progress, Chemical Engineering

***Oklahoma, University of***

- Leeman, John, B.S.

***Oregon State University (in association with Idaho National Laboratory)***

- Biggs, Brandon, Ph.D., in progress, Interdisciplinary Studies (COAS)
- Carini, Paul, Ph.D., in progress, (summer lab assistant)
- Kannberg, Peter, M.S., 2009, Geophysics
- Powers, Katie, B.S., 2009, Microbiology
- Schwartz, Amanda, B.S., 2009, Microbiology

***Pennsylvania State University, The (in association with NETL/ORD)***

- Lekse, Jonathan, B.S., 2004, Chemistry

***Pittsburgh, University of (in association with NETL/ORD)***

- Rosenbaum, Eilis, M.S., 2004, Chemistry, (now supporting NETL R&D w/ Parsons)

***Prairie View A&M University***

- Tambe, Jacob, M.S. Engineering, withdrew.
- Williams, Meeckral, B.S. Chem. Eng., graduated 2008.
- Cox, Jarvis, B.S. Electrical Eng., graduated 2008.
- Harrison, Latoya, B.S. Chem. Eng., in progress.
- Jones, Ashley M., B.S. Computer Eng. Tech., in progress.

***Princeton University (in association with LBNL)***

- Reiter, Paul, B.S., 2005

***Rice University (in association with the Chevron JIP)***

- Bhatnagar, Gaurav, Ph.D, 2008, Chemical Engineering (now with Shell Oil Co.)
- Hubbard, L. Ashley, M.S. Earth Science, 2008
- O'Hayer, Walter, M.S. Earth Science, expected 2009
- Daigle, Hugh, Ph.D. Earth Science, in progress
- Stigall, Justin, M.S., Earth Science, in progress
- Jaiswal, Preyank, Ph.D , post-doc 2008
- Yu, Hua, Research Scientist, Earth Science, 2007
- Gu, Guangsheng, Ph.D. in progress, Chemical Engineering
- Chatterjee, Sayantan, Ph.D. in progress, Chemical Engineering
- Phirani, Jyoti , Ph.D. in progress, Chemical Engineering
- Hustoft, Steinar, visiting Ph.D. student 2008, University of Tromso, Norway

***San Diego State University (in association with the Chevron JIP)***

- Lindemann, Christie, M.S., 2005

***California – San Diego, University of (Scripps Institute of Oceanography: Scripps monitoring project, Chevron JIP\*, CMRET\*\* and others)***

- Brooks, Laura, Ph.D., in progress\*\*
- Fenwick, Rebecca, Ph.D., in progress, Geosciences Division\*
- Hangsterfer, Alexandra, Ph.D., in progress, Chemical Oceanography\*
- Solomon, Evan, Ph.D., Marine Geochemistry-Geosciences\*
- Solem, Christian, M.S., Marine Geochemistry
- Traer, James, Ph.D., in progress\*\*
- Yishai Weinstein, Post-doctoral Fellow

***South Carolina, University of***

- Battista, Brad, Post-doctoral, in progress, Geophysics
- Addison, Adrian, Ph.D., in progress, Geophysics
- Simonetti, Antonello, Ph.D., in progress, Geology

***South Florida, University of***

- Bell, Ryan, Ph.D., 2009

***Southern Mississippi, University of (in association with CMRET project)***

- Johnson, Jeff, M.S., 2003, Physical Oceanography
- Martin, Kevin, M.S., 2006, Geological Oceanography

***Stanford University***

- Bandyopadhyay, Kaushik, Ph.D., Seismic and Numerical modeling
- Sain, Ratnanabha, Ph.D., Seismic and Numerical modeling

***Stony Brook University, New York (in association with BNL)***

- Altraide, Ibibia, M.S., 2006, Materials Science
- Eaton, Michael, Ph.D., 2007.
- Fraczak, Timothy, B.E., in progress
- Horvat, Christine, B.S., in progress, Chemical and Molecular Engineering (also partially supported with DOE Office of Science Summer SULI program)
- Kaur, Harsimran, B.S., 2007, Chemical and Molecular Engineering
- Kerkar, Prasad, Ph.D., in progress, (also supported in MS program at UA-Fairbanks)
- Shi, Xai, B. 2007, Chemical and Molecular Engineering

***Texas A&M University (several projects)***

- De Beukelaer, Sophie, M.S.
- Grover, Tarun, Ph.D., expected August 2008, Petroleum Engineering
- Jung, Woodong, Ph.D. 2008, Geochemistry (*in association with CMRET project*)
- Milkov, Alexi, Ph.D., and Post-Doctoral Researcher, Geochemistry
- Oztgul, Ercin, M.S., 2002, Geochemistry
- Vardaro, Michael, M.S., Geophysics (*in association with CMRET project*)

***Texas A&M University – Corpus Christi***

- Garcia, Oscar, Ph.D., 2009, Remote Sensing, Ocean Features
- Shapiro, Rosalie, M.S., 2010, Marine Geochemistry, Carbonate Geology

***University of Texas, Austin***

- Alkin, Engin, M.S., 2007, Geophysics
- Christianson, Pete, B.S. 2008, Geophysics
- Hernandez, Jamie, M.S., 2008, Geophysics
- Behseresht, Javad, M.S. in progress, Petroleum and Geosystems Engineering
- Peng, Yao, Ph.D. in progress, Petroleum and Geosystems Engineering
- Prodanović, Maša, Post-doctoral in progress, Petroleum and Geosystems Engineering

***University of Victoria, British Columbia (in association with CMRET project)***

- Geresi, Erika, 2007, Ph.D., Geophysics
- Morley, Mike, 2007, M.S., Geophysics

***William and Mary, The College of (in association with the Naval Research Laboratory)***

- Pohlman, J. W., Ph.D., 2007, Geochemistry

***Woods Hole Oceanographic Institution (in association with CMRET project\* and other)***

- Cook, Mea, Post-doctoral,
- Camilli, Rich, Post-doctoral, 2006\*
- Pizzaro, Oscar, Post-doctoral, 2006\*

***Wyoming, The University of (in association with the Blake Ridge OBC seismic project)***

- Gorman, Andrew, Ph.D., 2003, Geophysics
- Hornbach, Matt, Ph.D., 2004, Geophysics
- Nealon, Jeffrey, Ph.D., in progress, Geophysics

***Yonsei University, Seoul, Korea***

- Moon, Ji-Won, Post-doctoral, 2003, Geology

**ADDITIONAL POST-DEGREE ASSIGNMENTS AT NATIONAL LABS**

***Brookhaven National Laboratory***

- Servio, Philip, 2003
- Eaton, Michael, 2006, doctoral student
- Kerkar, Prasad, 2006, doctoral student

***Lawrence Berkley National Laboratory***

- Reiter, Paul, 2005
- Walsh, Matthew, Ph.D., in progress, Colorado School of Mines, Experimental hydrology and geomechanics
- Gupta, Arvind, Ph.D., 2007, Colorado School of Mines, Experimental hydrology
- Moridis, Nefeli, undergraduate, University of Texas, Data reduction
- Grover, Tarun, Ph.D., expected August 2008, Petroleum Engineering
- Boulis, Anastassios, M.S., in progress

***National Energy Technology Lab***

- Hao, Jan, in progress
- Link, Dirk, 2001
- Shofield, Daniel, in progress

***Oak Ridge National Lab***

- Alford, Jonathan, Post-B.S., 2008, Biochemistry, Cellular, and Molecular Biology
- Jones, Camille, 2000, Materials Science
- Marshall, Simon, 2000-2001, Materials Science
- McCallum, Scott, M.S., post-M.S., 2003, Geology
- Peters, Philip
- Reistenberg, Dave, post-M.S., 2002-2005
- Szymick, Phillip, post-M.S., 2005-2007, Geology
- Taboada-Serrano, Patricia, post-doctoral 2004 – 2008, chemical engineering
- Ulrich, Shannon, post B.S., 2006-2007
- Zatsepina, Olga, 2003

***U.S. Geological Survey***

- Dugan, Brandon, 2003-2004 [USGS Mendenhall postdoc]
- Pohlman, John, 2007-2009 [USGS Mendenhall postdoc]

## Papers Authored by NETL Methane Hydrate Fellows

- Heintz, Monica B.; Mau, Susan; Valentine, David L.; Reed, Justin H., Hallam, Steven J.; Yang, Jinshu, 2008. Methane Consumption in Waters Overlying a Hydrate-Associated Mound in the Santa Monica Basin: A Project Synopsis. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Lapham, L., D. Albert, J. Chanton, and C. Martens, 2001, Light hydrocarbon distributions and sulfate reduction rates in sediment porewaters near exposed gas hydrates, American Society of Limnology and Oceanography Annual Meeting.
- Lapham, L., J. Chanton, C. Martens, H. Scheafer, R. Chapman, and J. Puhlman, 2003, Innovations in Sampling Pore Fluids From Deep-Sea Hydrate Sites, San Francisco, CA, EOS, Transaction, American Geophysical Union, Volume 84, Fall Meeting Supplement, Abstract OS52D-05, December 8-12.
- Lapham, L. L., Martens, C. S. and Coffin, R. B. 2003: Controls on the isotopic composition of dissolved methane in the pore waters of sediments containing disseminated gas hydrate off of Cascadia Margin. American Society of Limnology and Oceanography annual meeting program, p. 82.
- Lapham, L., J. Chanton, C. Martens, and H. Mendlovitz, 2004, Innovations in sampling pore fluids at deep sea hydrate sites, *in* B. J Thompson, *ed.*, Energy, Simulation-Training, Ocean Engineering and Instrumentation, *Research Papers of the Link Foundation Fellows*, Volume 3, p. 4.
- Lapham, L., J. Chanton, C. Martens, J. Pohlman, and R. Chapman, 2005, In-situ light hydrocarbon concentrations and stable carbon isotope values in hydrate-bearing sediments of Cascadia Margin, Vancouver Island, Vienna, Austria, Second General Assembly European Geosciences Union, April 24-29.
- Lapham, L.L., Chanton, J.P., Martens, C.S., Higley, P.D., Jannasch, H.W., Woolsey, J.R., 2006: Pore Fluid Array Construction and Deployment at Mississippi Canyon 118, Gulf of Mexico. Offshore Technology Conference, Houston, TX, #18170.
- Lapham, L., J. Chanton, C. Martens, P. Higley, H. Jannasch, J. Woolsey, and K. Sleeper, 2007, Biogeochemical sensors: design and applications of the Pore Fluid Array for the Mississippi Canyon 118 Gas Hydrate Seafloor Observatory, Oxford, MS, Mid-South Area Engineering and Sciences Conference, University of Mississippi, May 17-18.
- Lapham, L., J. Chanton, C. Martens, P. Higley, H. Jannasch and J. Woolsey, 2007, Monitoring long term hydrate stability: in situ methane and the Pore Fluid Array (PFA), Oxford, MS, Gulf of Mexico Hydrates Research Consortium Annual Meeting.

- Lapham, Laura, Jeff Chanton, Chris Martens, Ken Sleeper, and J. R. Woolsey, 2007, *Methane and biogeochemical gradients within acoustic wipe-out zones at a Gulf of Mexico cold seep*, presented by Lapham at the American Geophysical Union Meeting, San Francisco, CA.
- Lapham, L.L., J. Chanton, C.S. Martens, K Sleeper and J.R. Woolsey. 2007. Methane and biogeochemical gradients within acoustic wipe-out zones at a Gulf of Mexico cold seep. American Geophysical Union. Oral presentation. Acapulco, Mexico, May 22-25.
- Lapham, L., 2007, *In situ* measurements of methane cycling in cold seep sediments containing gas hydrates and brines. Ph.D. Thesis, University of North Carolina.
- Lapham, L., J. Chanton, C. Martens, K. Sleeper and J. Robert Woolsey, 2008, "Microbial activity in surficial sediments overlying acoustic wipeout zones at a Gulf of Mexico cold seep," *Geochemistry, Geophysics, Geosystems*, Volume 9, No. 6, June 4.
- Lapham, L. L., J. P. Chanton, Martens, C. S., Mendlovitz, H. P., Higley, P. D., Lutken, C. B., and Woolsey, J. R. (2008). Unique tools sample sediment pore water near seafloor hydrate mounds in the Gulf of Mexico. *Fire in the Ice, Methane Hydrate Newsletter*. Winter: 20pg.
- Lapham, L.L., J.P. Chanton, C.S. Martens, P. D. Higley, H. W. Jannasch and J.R. Woolsey (2008). Measuring long term changes in dissolved ion and gas concentrations and stable isotopes at a hydrate site: Mississippi Canyon 118, Gulf of Mexico. *Environmental Science and Technology*, 42, 7368-7373.
- Lapham, L.L., M.J. Alperin, J.P. Chanton, and C.S. Martens (2008). Upward advection rates and dissolved methane and sulfate concentrations at two Gulf of Mexico brine seeps. *Marine Chemistry*, 112, 65-71. <http://dx.doi.org/10.1016/j.marchem.2008.06.001>
- Lapham, L.L., J.P. Chanton, C.S. Martens, P. D. Higley, H. W. Jannasch and J.R. Woolsey. Temporal variability in pore-fluid chemistry at a Gulf of Mexico gas hydrate site. American Geophysical Union meeting, Dec 2008.
- Lapham, L.L., C.S. Martens, and J.P. Chanton. Controls on gas hydrate stability in methane-depleted sediments: Laboratory and field measurements, American Geophysical Union (AGU) fall meeting, San Francisco, CA, December, 17, 2009.
- Lapham, L. L., Chanton, J. P., Chapman, R. and Martens, C. S., (2010). Methane under-saturated fluids in deep-sea sediments: Implications for gas hydrate stability and rates of dissolution. *Earth and Planetary Science Letters* in press.
- Solomon, E.A., Spivack, A., Kastner, M., Torres, M., 2010. Biogeochemical cycling and methane generation in gas hydrate-bearing sediments offshore SE India, Gordon Research Conference on Gas Hydrates, Waterville, ME, USA, June 6-11, 2010.

- Solomon, E.A., Kastner, M., MacDonald, I.R., Leifer, I., 2009. Considerable methane fluxes to the atmosphere from hydrocarbon seeps in the Gulf of Mexico, *Nature Geoscience*, 2, 561-565.
- Solomon, E.A., Kastner, M., Leifer, I., 2009. Ethane and propane emissions to the ocean and atmosphere from 550-1200 m seeps in the Gulf of Mexico. American Geophysical Union, Fall Meeting. Supp., Abstract OS31A-1182.
- Solomon, E., M. Kastner, H. Jannasch, Y. Weinstein, G. Robertson, and A. Aubrey, 2004, Long-term continuous monitoring of fluid chemistry and flux at the Bush Hill gas hydrate field, Gulf of Mexico, using a new flowmeter, the MOSQUITO, American Geophysical Union, Fall Meeting, December 13-17.
- Solomon, E., M. Kastner, H. Jannasch, Y. Weinstein, and G. Robertson, 2005, Insights into the dynamics of in situ gas hydrate formation and dissociation at Bush Hill gas hydrate field, Gulf of Mexico, Trondheim, Norway, *Proceedings of the Fifth International Conference of Gas Hydrates*, Volume 3, p. 947-953.
- Solomon, E. A.; Spivack, A. J.; Kastner, M., Torres, M. ; Borole, D. V. ; Robertson, G. ; Das, H. C., 2008. Hydrogeochemical and Structural Controls on Heterogeneous Gas Hydrate Distribution in the K-G Basin Offshore SE India. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.

## Section II: Publications Related to the Program's Major Field Projects

*With private companies, state and local governments, universities, and research institutions*

### **Gulf of Mexico Gas Hydrates Joint Industry Project (DE-FC26-01NT41330)**

*Chevron, ConocoPhillips, Halliburton Energy Services, Japan National Oil Co., Reliance Industries, Schlumberger Oilfield Services, Total, Georgia Institute of Technology, Minerals Management Service, Naval Research Lab, Scripps Institute of Oceanography, United States Geological Survey*

#### **Peer-Reviewed Publications**

- Coffin, R., L. Hamdan, R. Plummer, J. Smith, J. Gardner, R. Hagen, W. Wood, in press, "Analysis of Methane and Sulfate Flux in Methane-Charged Sediments from the Mississippi Canyon, Gulf of Mexico," *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.014.
- Collett, T.S., Agena, W.F., Lee, M.W., Zyrianova, M.V., Bird, K.J., Charpentier, R.R., Cook, T., Houseknecht, D.W., Klett, T.R., Pollastro, R.M., and Schenk, C.J., 2008, Assessment of gas hydrate resources on the North Slope, Alaska, 2008: U.S. Geological Survey Fact Sheet 2008-3073, 4 p.
- Cook, A., D. Goldberg, R. L. Kleinberg, in press, "Fracture-controlled gas hydrate systems in the northern Gulf of Mexico," *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.013.
- Cooper, A., and P. Hart, 2003, High-resolution seismic-reflection investigation of the northern Gulf of Mexico gas-hydrate-stability zone, *Marine and Petroleum Geology*, Volume 19, p. 1275-1293.
- Dai, J., H. Xu, F. Snyder, and N. Dutta, 2004, Detection and estimation of gas hydrates using rock physics and seismic inversion: Examples from the northern deepwater Gulf of Mexico, in Taylor, C., and J. Kwan, eds., *Advances in the study of gas hydrates*, Kluwer Academic/Plenum Publishers, p.117-139.
- Dai, J., F. Snyder, D. Gillespie, A. Koesoemadinata, N. Dutta, in press, "Exploration for gas hydrates in the deepwater Northern Gulf of Mexico: Part I. A seismic approach based on geologic model, inversion, and rock physics principles," *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.02.006.
- Dai, J., N. Banik, D. Gillespie, N. Dutta, in press, "Exploration for gas hydrates in the deepwater, Northern Gulf of Mexico: Part II. Model validation by drilling," *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.02.005.

- Dai J., H., Xu, F., Snyder, and N., Dutta, 2004, Detection and estimation of gas hydrates using rock physics and seismic inversion: Examples from the northern deepwater Gulf of Mexico, *Leading Edge*, January.
- Ellis, M., R.L. Evans, D. Hutchinson, P. Hart, J. Gardner, R. Hagen, in press, "Electromagnetic Surveying of Seafloor Mounds in the Northern Gulf of Mexico," *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2007.12.006.
- Francisca, F., T. Yun, C. Ruppel, and J. Santamarina, 2005, Geophysical and geotechnical properties of near-surface sediments in the Northern Gulf of Mexico gas hydrate province, *Earth and Planetary Science Letters*, Volume 237, p. 924-939.
- Francisca, F., J. Santamarina, and C. Ruppel, 2003, Gas hydrate in porous sediments, Experimental evidence for interparticle cementation, *Geophysical Research Letters*.
- Hart, P., D. Hutchinson, J. Gardner, R. Carney, and D. Fornari, in press, A photographic and acoustic transect across two deep-water seafloor mounds, Mississippi Canyon, northern Gulf of Mexico, *Marine and Petroleum Geology*, vol. 25  
doi:10.1016/j.marpetgeo.2008.01.020.
- Hutchinson, D., P.E. Hart, C.D. Ruppel, F. Snyder, and B. Dugan, Seismic and thermal characterization of a bottom simulating reflector in the Northern Gulf of Mexico, in: T.S. Collett, A. Johnson, C. Knapp, and R. Boswell (Eds.), *Natural Gas Hydrates: Energy Resources and Potential and Associated Geologic Hazards*. AAPG Special Publication, in press, 2008.
- Hutchinson, D.R., Shelander, D., Dai, J., McConnell, D., Shedd, W., Frye, M, Ruppel, C., Boswell, R., Jones, E., Collett, T., Rose, K., Dugan, B., Wood, W., and Latham, T., in press, Site Selection for DOE/JIP Gas Hydrate Drilling in the Northern Gulf of Mexico: Sixth International Conference on Gas Hydrates, Vancouver, BC., 7-10 July, 2008.
- Hutchinson, D., C. Ruppel, H. Roberts, R. Carney, and M. Smith, 2005, in press, Gas hydrates in the Gulf of Mexico, in Holmes, C., ed., *Gulf of Mexico—Its Origin (History, Archaeology, and Geology)*, Volume 1, Texas A&M University Press.
- Hutchinson, D., P. Hart, T. Collett, K. Edwards, D. Twichell, and F. Snyder, 2008. Geologic framework of the 2005 Keathley Canyon gas hydrate research well, northern Gulf of Mexico, *Marine and Petroleum Geology*, 25, 906-918.
- Hutchinson, D.R., P.E. Hart, T.S. Collett, K.M. Edwards, D.C. Twichell, and F. Snyder, 2008, Geologic framework of the Keathley Canyon Gas Hydrate Research Well, Northern Gulf of Mexico, *Mar. Petr. Geology*, vol. 25, 906-918 (doi:10.1016/j.marpetgeo.2008.01.012).
- Kastner, M., G. Claypool, and G. Robertson, in press, "Geochemical constraints on the origin of the pore fluids and gas hydrate distribution at Atwater Valley and Keathley Canyon, northern Gulf of Mexico," *Marine and Petroleum Geology*, Elsevier Ltd.

- Lee, J.Y., J.C. Santamarina, C. Ruppel, in press, “Mechanical and electromagnetic properties of Northern Gulf of Mexico sediments with and without hydrates,” *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.019.
- Lee, J.Y., T.S. Yun, J.C. Santamarina, and C. Ruppel, Tetrahydrofuran (THF) as a proxy for methane hydrate in laboratory studies of porous sediments, *Geophysics, Geochemistry, Geosystems (G<sup>3</sup>)*, 8, Q06003, 2007. doi: 10.1029/2006GC001531.
- Lee, J., T. Yun, C. Santamarina, and C. Ruppel, in review, Tetrahydrofuran as a Proxy for Methane in Laboratory Studies of Gas Hydrate Bearing Sediments, *Journal of Physical Chemistry A*.
- Lee, M., Collett, T., 2008, Integrated analysis of well logs and seismic data to estimate gas hydrate concentrations at Keathley Canyon, northern Gulf of Mexico, *Mar. Petr. Geology*, vol. 25, 924-931. (doi:10.1016/j.marpetgeo.2007.09.002).
- Lorenson, T., G. Claypool, J. Dougherty, in press, Natural Gas Geochemistry of Sediments Drilled on the 2005 Gulf of Mexico JIP Cruise, *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.017.
- Pohlman, J., C. Ruppel, D.R. Hutchinson, R. Downer, R.B. Coffin, in press, Assessing sulfate reduction and methane cycling in a high salinity pore water system in the Northern Gulf of Mexico, *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.016.
- Ruppel, C., R. Boswell, E. Jones, 2008. Scientific results from Gulf of Mexico gas hydrates Joint Industry Project leg 1 drilling: introduction and overview, *Marine and Petroleum Geology*, vol. 25, 819-829.
- Ruppel, C., R. Boswell, E. Jones (Editors), in press, Special Volume on Scientific Results from 2005 Joint Industry Project Gulf of Mexico Methane Hydrates Drilling, *Marine and Petroleum Geology*, vol. 25.
- Santamarina, J.C. (2006), The Worldwide Energy Situation, *Anales Academia Nacional de Ingenieria.*, vol. II-06, pp. 79-98.
- Waite, W., C. Ruppel, and S. Kirby, 2006, Comment on “Thermal and visual time-series at a seafloor gas hydrate deposit on the Gulf of Mexico slope,” by I. MacDonald, L. Bender, M. Vardaro, B. Bernard, and J. Brooks [Earth Planet. Sci. Lett. 233 (2005) 49-59], *Earth and Planetary Science Letters*, 245, 481- 482, doi:10.1016/j.epsl.2005.11.062.
- Wood, W., P. Hart, D. Hutchinson, N. Dutta, F. Snyder, R. Coffin, J. Gettrust, in press, Gas and gas hydrate distribution around seafloor seeps in Mississippi Canyon, Northern Gulf of Mexico, using multi-resolution seismic imagery, *Marine and Petroleum Geology*, vol. 25, doi:10.1016/j.marpetgeo.2008.01.015.

- Yun, T., F. Francisca, J. Santamarina, and C. Ruppel, 2005, Compressional and shear wave velocities of uncemented sediment containing gas hydrate, *Geophysical Research Letters* 32, L10609, 2005. doi: 10.1029/2005GL022607.
- Yun, T., G. Narsilio, and J. Santamarina, 2006, Physical characterization of core samples recovered from Gulf of Mexico, *Marine and Petroleum Geology*, v. 23, pp. 893-900.
- Yun, T., G. Narsilio, J. Santamarina, and C. Ruppel, 2006, Instrumented pressure testing chamber for characterizing sediment cores recovered at *in situ* hydrostatic pressure, *Marine Geology*, v. 229, pp. 285-293, doi: 10.1016/j.margeo.2006.03.012.
- Yun, T., J. Santamarina, and C. Ruppel, 2007, Mechanical properties of sand, silt, and clay containing tetrahydrofuran hydrate, *Journal of Geophysical Research*, v. 112. B04106, doi: 10.1029/2006JB004484.
- Yun, T.S. and Santamarina J.C. (2005), Decementation, Softening, and Collapse: Changes in Small-Strain Shear Stiffness in  $k_0$  Loading, *ASCE Journal Geotechnical and Geoenvironmental Eng.*, vol. 131, no. 3, pp. 350-358.
- Yun, T.S. and Santamarina, J.C. (2008), Fundamental study of thermal conduction in dry soils, *Granular Matter*, Accepted for Publication, doi: 10.1007/s10035-007-0051-5.

### **Government Reports**

- Balczewski, J., 2010, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, U.S. DOE Semi-Annual Report, April 2010 – September 2010, available online.
- Boswell, R., Collett, T.S., Frye, M., Shedd, W., Mrozewski, S., Gilles, G., and Cook, A., 2009. The 2009 Gulf of Mexico Gas Hydrate Joint Industry Project — Leg II: Technical Summary: Proceedings of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project - Leg II, available online ([click here](#)).
- Coffin, R., J. Gardner, J. Pohlman, R. Downer, and W. Wood, 2004, Methane hydrate exploration, Atwater Valley, Texas-Louisiana shelf: geophysical and geochemical profiles, *Naval Research Laboratory Report*.
- Coffin, R., J. Pohlman, K. Grabowski, D. Knies, and R. Downer, 2004, Keathley Canyon, August 2003 Gulf of Mexico piston coring tested for prediction of hydrate exploration: *Naval Research Laboratory Report*.
- Collett, T., 2005, Cruise Report: ChevronTexaco Gulf of Mexico JIP drilling program: downhole logging program, *DOE-NETL Topical Report*.

- Collett, T.S., Boswell, R., Mrozewski, S., Guerin, G., Cook, A., Frye, M., Shedd, W., and McConnell, D., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Operational Summary: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Cook, A., Guerin, G., Mrozewski, S., Collett, T.S., Boswell, R., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Walker Ridge 313 LWD Operations and Results: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Evans, J., D. Fornari, L. Gilbert, M. Boyle, and J. Dougherty, 2005, Archive of raw bottom photographs collected during cruise P1-04-GM, northern Gulf of Mexico, June 21-24, *U.S. Geological Survey Open-File Report 2004-1285*, available online ([click here](#)).
- Frye, M., Shedd, W., Godfriaux, P., Collett, T.S., Lee, M., Boswell, R., Dufrene, R., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Alaminos Canyon 21 Site Summary: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Guerin, G., Cook, A., Mrozewski, S., Collett, T.S., Boswell, R., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Green Canyon 955 LWD Operations and Results: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Guerin, G., Cook, A., Mrozewski, S., Collett, T.S., Boswell, R., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Alaminos Canyon 21 LWD Operations and Results: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Hart, P., D. Hutchinson, and M. Lee, 2005, High-resolution seismic-reflection data acquired in the northern Gulf of Mexico, 2003, *U.S. Geological Survey Open-File Report 2005-1411*, available online ([click here](#)).
- Holditch, S., and E. Jones, 2004, Protocols for seismic data acquisition and processing to characterize natural gas hydrate deposits in deepwater, *U.S. DOE Topical Report*, Award Number DE-FC26-01NT41330, available online ([click here](#)).
- Holditch, S., and E. Jones, 2002, Results from the Data Collection Workshop, Modeling Workshop, and Drilling and Coring Methods Workshop as a part of the Joint Industry Participation (JIP) Project to characterize natural gas hydrates in the deepwater Gulf of Mexico, *U.S. DOE Topical Report*, Award Number DE-FC26-01NT41330.
- Hutchinson, D.R., and Hart, P.E., 2004, Cruise report for G1-03-GM USGS Gas Hydrates cruise, R/V *Gyre*, 1-14 May, 2003, Northern Gulf of Mexico: U.S. Geological Survey Open-File Report OF 03-474, 103 pp, <http://pubs.usgs.gov/of/2003/of03-474>.

- Hutchinson, D., Boswell, R., Collett, T.S., Dai, J., Dugan, B., Frye, M., Jones, E., McConnell, D., Rose, K., Ruppel, C., Shedd, W., Shelander, D., Wood, W., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Walker Ridge 313 Site Selection: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Hutchinson, D., Boswell, R., Collett, T.S., Dai, J., Dugan, B., Frye, M., Jones, E., McConnell, D., Rose, K., Ruppel, C., Shedd, W., Shelander, D., Wood, W., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Green Canyon 955 Site Selection: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Hutchinson, D., Boswell, R., Collett, T.S., Dai, J., Dugan, B., Frye, M., Jones, E., McConnell, D., Rose, K., Ruppel, C., Shedd, W., Shelander, D., Wood, W., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Green Canyon 781 Site Selection: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II available online ([click here](#)).
- Jones, E., 2009, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, U.S. DOE Semi-Annual Report, October 2008–March 2009, available online.
- Jones, E., 2008, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, U.S. DOE Semi-Annual Report, April 2008–September 2008, available online.
- Jones, E., 2007, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, U.S. DOE Semi-Annual Report, October 2006–March 2007, available online ([click here](#)).
- Jones, E., 2007, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, U.S. DOE Semi-Annual Report, April 2006–September 2006, available online ([click here](#)).
- Jones, E., 2006, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, *U.S. DOE Semi-Annual Report*, October 2005–March 2006, available online ([click here](#)).
- Jones, E., 2006, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico: Applications for Safe Exploration and Production Activities, *U.S. DOE Semi-Annual Report*, April 2005–September 2005, available online ([click here](#)).
- Jones, E., 2006, Characterizing Natural Gas Hydrates in the Deep Water Gulf of Mexico, Applications for Safe Exploration and Production Activities, *U.S. DOE Semi-Annual Report*, October 2004–March 2005, available online ([click here](#)).

- Kleinberg, R., and E. Jones, 2004, Measurements for assessment of hydrate related geohazards, *U.S. DOE Topical Report*, Award Number DE-FC26-01NT41330, ChevronTexaco Energy Technology Company, available online ([click here](#)).
- McConnell, D., Boswell, R., Collett, T.S., Frye, M., Shedd, W., Guerin, G., Cook, A., Mrozewski, S., Dufrene, R., and Godfriaux, P., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Walker Ridge 313 Site Summary: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- McConnell, D., Boswell, R., Collett, T.S., Frye, M., Shedd, W., Guerin, G., Cook, A., Mrozewski, S., Dufrene, R., and Godfriaux, P., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — Green Canyon 955 Site Summary: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Mrozewski, S., Guerin, G., Cook, A., Collett, T.S., Boswell, R., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — LWD Methods: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).
- Schlumberger, 2003, Theoretical modeling and analysis for gas hydrate quantification from pre-stack seismic data in the northern deepwater Gulf of Mexico, *U.S. DOE Topical Report*, Award Number DE-FC26-01NT41330, ChevronTexaco Energy Technology Company, 130 pp., available online ([click here](#)).
- Shipboard Science Party, 2006, Cruise Report for the Gulf of Mexico Gas Hydrate Joint Industry Project: Covering the cruise of the drilling vessel Uncle John Mobile, Alabama to Galveston, Texas Atwater Valley Blocks 13/14 and Keathley Canyon Block 151, 17 April to 22 May, available online ([click here](#)). Individual sections listed below alphabetically by author.
- Collett, T., Gulf of Mexico Gas Hydrate JIP Drilling Program Downhole Logging Program.
- Conte, A., and B. Bloys, Gulf of Mexico Gas Hydrates Joint Industry Project Operational Summary of 2005 Drilling and Coring Program.
- Dugan, B., Geomechanical Characteristics of Sediments from Atwater Valley and Keathley Canyon, Northern Gulf of Mexico.
- Hippe, F., Geotechnical Investigation, Chevron Gulf of Mexico Hydrates JIP, Results of Core Sample Analysis Standard and Advanced Laboratory Testing, Report No. 0201-5081, prepared by Fugro-McClelland Marine Sciences for Chevron Texaco Energy Technology Company.

Kastner, M., G. Claypool, and G. Robertson, Pore Water Geochemistry – 2005 Gulf of Mexico JIP Cruise.

Lorenson, T., J. Dougherty, and G. Claypool, Natural Gas Geochemistry – 2005 Gulf of Mexico JIP Cruise.

Ruppel, C., and J. Santamarina, Preliminary Results: Georgia Tech Instrumented Pressure Testing Chamber Deployed on JIP Gas Hydrate Drilling Program in Gulf of Mexico, April-May 2005.

Schultheiss, P., M. Holland, and J. Roberts, Gulf of Mexico Gas Hydrates Joint Industry Project Pressure Coring and Core Logging.

Shedd, W., Hutchinson, D., Boswell, R., Collett, T.S., Dai, J., Dugan, B., Frye, M., Jones, E., McConnell, D., Rose, K., Ruppel, C., Shelander, D., and Wood, W., 2009. Gulf of Mexico Gas Hydrate Joint Industry Project Leg II — East Breaks 991 and Alaminos Canyon 21 Site Selection: Proceedings of the Drilling and Scientific Results of the 2009 Gulf of Mexico Gas Hydrate Joint Industry Project Leg II, available online ([click here](#)).

Snyder, G., L. Hubbard, B. Dugan, and G. Dickens. Total iodine, bromine, and barium concentrations in pore waters from the Atwater Valley area, Gulf of Mexico: Preliminary results from the Gas Hydrates JIP Cruise.

Twichell, D.C., Cross, V.A., Paskevich, V.F., Hutchinson, D.R., Winters, W.J., and Hart, P.E., 2005, GIS of selected geophysical and core data in the northern Gulf of Mexico continental slope collected by the U.S. Geological Survey: USGS Open-File Report 2005-1071 (CD-ROM).

### **Theses/Dissertations**

Yun, T.S., *Mechanical and Thermal Study of Hydrate Bearing Sediments*, Ph.D. Thesis, Civil and Environmental Engineering, Georgia Tech, 179 pp., 2005.

Lee, J.Y., *Hydrate-Bearing Sediments: Formation And Geophysical Properties*, Civil and Environmental Engineering, Georgia Tech, 241 pp., 2007.

Martin, A.I., M.S. Thesis, *Hydrate Bearing Sediments - Thermal Conductivity*, Civil and Environmental Engineering, Georgia Tech, 151 pp., 2004.

### **Other Publications**

Claypool, G., 2005, Joint industry project (JIP) Gulf of Mexico gas hydrate coring update, *U.S. DOE-NETL Fire in the Ice Newsletter*, Summer, available online ([click here](#)).

Dai, J., H. Xu, F. Snyder, and N. Dutta, 2004, Detection and estimation of gas hydrates using rock physics and seismic inversion; eexamples from the northern deepwater Gulf of Mexico, *The Leading Edge*, Volume 23, p. 60-66.

Hart, P., D. Hutchinson, and B. Dugan, 2003, USGS conducts deepwater gas hydrate research cruise in the northern Gulf of Mexico, *U.S. DOE-NETL Fire in the Ice Newsletter*, Fall, available online ([click here](#)).

Jones, E., and S. Holditch, 2004, Characterizing natural gas hydrates in the deepwater Gulf of Mexico, Yokohama, Japan, *Proceedings, Fourth International Symposium on Methane Hydrates*.

Ruppel, C., 2007, Tapping methane hydrates for unconventional natural gas, *Elements*, 3 (3), 193-199.

Schultheiss, P., C. Santamarina, P. Kumar, and T. Collett, 2007, HYACINTH Pressure Cores from India: Analysis and Subsampling Reveals Detailed Methane Hydrate Structures, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2007 issue, available online ([click here](#)).

Smith, S, R. Boswell, T. Collett, M. Lee, and E. Jones, 2006, Alaminos Canyon Block 818: A Documented Example of Gas Hydrate Saturated Sand in the Gulf of Mexico, *U.S. DOE-NETL Fire in the Ice Newsletter*, Fall 2006 issue, available online ([click here](#)).

### **Presentations**

Birchwood, R., 2005, Wellbore Stability Model for Marine Sediments Containing Gas Hydrates, Houston, TX, American Association of Drilling Engineers National Drilling Technology Conference, April 5-7.

Boswell, R., 2006, U.S. DOE/Chevron Gulf of Mexico Gas Hydrates Joint Industry Project, Washington, DC, Meeting of the Methane Hydrates Federal Advisory Committee, November 8.

Boswell, R., 2006, U.S. DOE/Chevron Gulf of Mexico Gas Hydrates Joint Industry Project, Washington, DC, Meeting of the Methane Hydrates Federal Advisory Committee, April 24.

Boswell, R., Collett, T.S., McConnell, D., Frye, M., Shedd, W., Mrozewski, S., Guerin, G., Cook, A., Shelander, D., Dai, J., Godfriaux, P., Dufrene, R., Jones, E., Roy, R. "Gulf of Mexico Gas Hydrates Joint Industry Project: Overview of Leg II LWD Results." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20560

Coffin, R., J. Gardner, J. Pohlman, R. Downer, and W. Wood, 2005, Methane Hydrate Exploration, Atwater Valley, Texas-Louisiana Shelf: Geophysical and Geochemical Profiles, Victoria, BC, Canada, Fourth International Methane Hydrate Research and Development Workshop, May.

- Coffin, R., J. Pohlman, W. Wood, J. Gardner, R. Plummer, and J. Gettrust, 2005, Geochemical Evaluation of Piston Core Porewater on Atwater Valley, Gulf of Mexico, Variation in Vertical Methane Gradients, San Francisco, CA, EOS, American Geophysical Union, December 5-9.
- Collett, T., A. Conte, L. Loh, H. Hoong, D. Goldberg, 2005, Preliminary analysis of the downhole of Mexico Gas Hydrate JIP cruise, American Geophysical Union, Fall Meeting 2005, paper OS31D-02, San Francisco, CA, December 5-9.
- Collett, T.S., Boswell, R., Frye, M., Shedd, W., Godfriaux, P., Dufrene, R., McConnell, D., Mrozewski, S., Guerin, G., Cook, A., Jones, E., Roy, R. "Gulf of Mexico Gas Hydrates Joint Industry Project: Logging-While-Drilling Operations and Challenges." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20452
- Cook, A., D. Goldberg, and R. Kleinberg, 2006, Cohesive strength of gas hydrate-bearing marine sediments, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Dai, J. and N., Dutta, 2007, Exploration For Gas Hydrates In Deepwater Northern Gulf Of Mexico, Joint Assembly of American Geophysical Union, Acapulco, Mexico.
- Dai, J. and N., Dutta, 2007, Exploration for gas hydrates based on seismic information: with examples from northern Gulf of Mexico, 69<sup>th</sup> EAGE, London, UK, June.
- Dai, J., N. Dutta, and H. Xu, 2006, Gas hydrate estimation using rock physics modeling and seismic inversion, Baltimore, MD, American Geophysical Union Joint Assembly, May 23-26.
- Dai, J., R. Kleinberg, H. Xu, and N. Dutta, 2005, Rock physics models of gas hydrates and their implications in seismic detection, Houston, TX, Offshore Technology Conference, May 2-5.
- Dai, J., H. Xu, F. Snyder, and N. Dutta, 2004, Detection and quantification of gas hydrates in the Gulf of Mexico: An integrated five-step workflow, 66<sup>th</sup> European Association of Geoscientists & Engineers, Paris, France, June 7-10.
- Dai, J., H. Xu, F. Snyder, L. Muller, A. Koesoemadinata, D. Gillespie, G. Wool, and N. Dutta, 2004, Physical Rock Properties of Gas Hydrate Bearing Sediments, Geophysical Modeling, Inversion and Quantitative Volumetric Estimation in the Deepwater Gulf of Mexico, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- Dai, J., R. Kleinberg, H. Xu, and N. Dutta, 2004, Seismic Detection and Quantification of Gas Hydrates, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Conference, September 12-16.

- Dutta, N., 2004, Gas hydrates – detection and quantification for resource assessment and risk mitigation, Houston, TX, Global Energy Forum, Rice University, October 12.
- Dutta, N., 2005, Emerging technology application aimed at characterization of gas hydrates and free gas underneath BSR, Second International Congress on Geosciences in Petroleum Industry, AMGE, September 4-7.
- Dutta, N., 2006, Methane Hydrates Exploration Technology, Houston, TX, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Dutta, N., J. Dai, and X. Haibin, 2004, Seismic detection and quantification of gas hydrates in the Gulf of Mexico, Florence, Italy, 32<sup>nd</sup> International Geological Conference, August 23-27.
- Dutta, N., J. Dai, and H. Xu, 2004, Seismic detection and quantification of gas hydrates in the Gulf of Mexico, Florence, Italy, 32<sup>nd</sup> International Geological Conference, August 23-27.
- Dutta, N., R. Kleinberg, J. Dai, and H. Xu, 2005, Natural gas hydrates estimation using seismic inversion and rock physics, New Orleans, LA, American Geophysical Union Spring Meeting 2005, May 23-27.
- Dutta, N., H. Xu, and J. Dai, 2005, Seismic detection and quantification of gas hydrate using rock physics and inversion, New Delhi, India, PetroTech, January 15-19.
- Dutta, N., L. Muller, J. Dai, and R. Utech, 2003, Seismic detection of gas hydrates, The American Association of Petroleum Geologists International Conference, Barcelona, Spain, September 21-24.
- Frye, M., Shedd, W., Godfriaux, P., Dufrene, R., McConnell, D., Boswell, R., Collett, T.S., Mrozewski, S., Guerin, G., Cook, A., Shelander, D., Dai, J. “Gulf of Mexico Gas Hydrate Joint Industry Project Leg II: Initial Results From the Alaminos Canyon 21 site.” Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20552
- Gullapalli, Irene; Moridis, George J.; Silpngarmert, Suntichai; Reik, Barry; Kamal, Medhat; Jones, Emrys; Collett, Timothy S., 2008. Designing A Reservoir Flow Rate Experiment For The GOM Hydrate JIP Leg II LWD Drilling. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Hagen, R., J. Gardner, and W. Wood, 2004, Thermal Measurements Over Hydrate Mounds in Atwater Valley, Gulf of Mexico, San Francisco, CA, American Geophysical Union Annual Fall Meeting, December 13-17.

- Hangsterfer, Alexandra; Driscoll, Neal; Kastner, Miriam, 2008. Constraining Gas Hydrate Occurrence In The Norther Gulf Of Mexico Continental Slope: Fine Scale Analysis Of Grain-Size In Hydrate Bearing Sediments. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Hart, P., D. Hutchinson, G. Dugan, M. Fowler, W. Wood, F. Snyder, N. Dutta, R. Coffin, J. Gardner, R. Hagen, R. Evans, and D. Fornari, 2005, A multidisciplinary investigation of a deepwater gas hydrate mound, Atwater Valley, northern Gulf of Mexico, Victoria, BC, Canada, Fourth International Workshop on Methane Hydrate R&D, May 9-11.
- Holland, Melanie; Schultheiss, Peter; Roberts, John; Druce, Matthew. 2008. Observed Gas Hydrate Morphologies In Marine Sediments. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. ([click here](#)).
- Hutchinson, D., P. Hart, B. Dugan, E. Geresi, R. Sliter, and K. Newman, 2003, Subsurface gas hydrates in the northern Gulf of Mexico, Geological Society of America, Volume 34, n. 7, November 2-5.
- Hutchinson, Deborah R.; Shelander, Dianna; Dai, Jianchun; McConnel, Dan; Shedd, William; Frye, Matthew; Ruppel, Carolyn; Boswell, Ray; Jones, Emrys; Collett, Timothy S.; Rose, Kelly; Dugan, Brandon; Wood, Warren; Latham, Thomas. 2008. Site Selection For DOE/JIP Gas Hydrate Drilling In The Northern Gulf Of Mexico. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Hutchinson, D., P. Hart, F. Snyder, M. Lee, N. Dutta, L. Muller, B. Dugan, C. Ruppel, W. Wood, R. Coffin, R. Evans, and E. Jones, 2003, Evidence of subsurface gas hydrate in the northern Gulf of Mexico, American Geophysical Union Fall Meeting, San Francisco, CA, December 8-12.
- Hutchinson, D., C. Ruppel, J. Pohlman, P. Hart, B. Dugan, F. Snyder, and R. Coffin, 2004, An integrated geological, geophysical, and geochemical analyses of subsurface gas hydrates in the northern Gulf of Mexico, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Hutchinson, D., F. Snyder, P. Hart, C. Ruppel, J. Pohlman, W. Wood, R. Coffin, and M. Edwards, 2005, Geologic and site survey setting for JIP Gulf of Mexico gas hydrate drilling, San Francisco, CA, American Geophysical Union Fall Meeting, December 5-9.
- Hutchinson, D., C. Ruppel, J. Pohlman, P. Hart, F. Snyder, N. Dutta, B. Dugan, and R. Coffin, 2005, Geophysical and geochemical characterization of the hydrate stability zone in a region of active salt tectonics, Keathley Canyon, Northern Gulf of Mexico, Fourth International Workshop on Methane Hydrate Research and Development, Victoria, BC, Canada, May 2005, available online ([click here](#)).

- Hutchinson, D., P. Hart, C. Ruppel, F. Snyder, N. Dutta, W. Wood, J. Pohlman, B. Dugan, M. Fowler, R. Evans, D. Fornari, and R. Coffin, 2005, Multidisciplinary studies contrasting gas hydrate occurrence at two sites in the northern Gulf of Mexico, Offshore Technology Conference, May 2-5.
- Hutchinson, D., 2006, Heterogeneity and dynamics in gas hydrate occurrence: lessons learned from the northern Gulf of Mexico, Kauai, HI, Engineering Conferences International, Science and Technology Issues in Methane Hydrates R&D, March 5-9, Abstracts volume is unpaginated, program at <http://www.engconfintl.org/pastconf/06aqfin.pdf>.
- Hutchinson, D., C. Ruppel, T. Collett, J. Pohlman, P. Hart, and F. Snyder, 2006, Minibasins and subsurface gas hydrate in the Gulf of Mexico, Fukuoka, Japan, 17<sup>th</sup> International Sedimentological Congress, August 27-September 1, v. B, p. 6.
- Hutchinson, D.R., Hart, P.E., Collett, T.S., Edwards, K.M., Twichell, D.C., and Snyder, F., 2007, Geologic Framework of the 2005 Keathley Canyon Gas Hydrate Research Well, Northern Gulf of Mexico, EOS, Trans. American Geophysical Union, 88(23), Jt. Assemb. Suppl., Abstract NS54A-03.
- Jones, E., 2006, Overview of GOM JIP Leg 1 Drilling, Kauai, HI, ECI Science and Technology Issues in Methane Hydrate R&D, March 5-9.
- Jones, E., 2006, Technology Needs for Commercial Production of Hydrates, Houston, TX, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Jones, E., 2005, Pre-cruise Estimates of Sediment Properties for the 2005 ChevronTexaco Gulf of Mexico Gas Hydrate Research Coring Project, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Jones, E., and S. Holditch, 2005, Pre-cruise Estimates of Sediment Properties for the 2005 ChevronTexaco Gulf of Mexico Gas Hydrate Research Coring Project, Houston, TX, Offshore Technology Conference, May 2-5.
- Kleinberg, R., and J. Dai, 2005, Estimation of the Mechanical Properties of Natural Gas Hydrate Deposits from Petrophysical Measurements, Offshore Technology Conference, Houston, Texas.
- Latham, Thomas; Shelander, Dianna; Boswell, Ray; Collett, Timothy S.; Lee, Myung, 2008. Subsurface Characterization Of The Hydrate Bearing Sediments Near Alaminos Canyon 818. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Lorenson, T., J. Dougherty, G. Claypool, 2005, Preliminary results from the ChevronTexaco Gulf of Mexico Gas Hydrates JIP: Hydrocarbon Gases in Sediments, paper OS42A-04, American Geophysical Union Fall Meeting 2005, December 5-9.

- McConnell, D., Collett, T.S., Boswell, R., Frye, M., Shedd, W., Dufrene, R., Godfriaux, P., Mrozewski, S., Guerin, G., Cook, A., Jones, E. "Gulf of Mexico Gas Hydrate Joint Industry Project Leg II: Initial Results From the Green Canyon 955 Site." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20801
- Mrozewski, S., Cook, A., Guerin, G., Goldberg, D., Collett, T.S., Boswell, R., Jones, E., Roy, R., 2010. Gulf of Mexico Gas Hydrates Joint Industry Project: LWD Logging Program Design, Data Acquisition and Evaluation." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 21023
- Pohlman, J., C. Ruppel, D. Hutchinson, P. Hart, R. Plummer, D. Kniew, K. Grabowski, and R. Coffin, 2005, The effects of mass deposition, gas flux and salt diapirs on surface sediment geochemistry in Keathley Canyon (northern Gulf of Mexico), American Geophysical Union Fall Meeting, December 5-9.
- Pohlman, J., W. Wood, T. Boyd, R. Coffin, C. Ruppel, D. Hutchinson, P. Hart, and B. Dugan, 2004, Interstitial sulfate gradients as indicators of gas hydrates: How reliable are they?, Florence, Italy, International Geological Conference, August 20-28.
- Ruppel, C., D. Hutchinson, B. Dugan, and P. Hart, 2004, Predicting the subsurface distribution of gas hydrate in the Northern Gulf of Mexico, The American Association of Petroleum Geologists Annual Meeting, Dallas, TX, April 18-21.
- Santamarina, J. C.; Ruppel, Carolyn, 2008. The Impact of Hydrate Saturation on the Mechanical, Electrical, and Thermal Properties of Hydrate-Bearing Sand, Silts, and Clay. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Santamarina, J., T. Yun, J. Lee, A. Martin, F. Francisca, and C. Ruppel, 2005, Mechanical, thermal and electromagnetic properties of hydrate-bearing clay, silt, and sand at various confining pressures, American Geophysical Union Fall Meeting, December 5-9.
- Santamarina, J., F. Francisca, T. Yun, J. Lee, A. Martin, and C. Ruppel, 2004, Mechanical, thermal, and electrical properties of hydrate-bearing sediments, The American Association of Petroleum Geologists Hedberg Research Conference, Vancouver, BC, Canada, September 12-16.
- Shedd, W., Frye, M., Godfriaux, P., Dufrene, R., McConnell, D., Boswell, R., Collett, T.S., Mrozewski, S., Guerin, G., Cook, A., Shelander, D., Dai, J. "Gulf of Mexico Gas Hydrate Joint Industry Project Leg II: Initial Results From the Walker Ridge 313 site." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20806
- Smith, M., 2004, Seismic Prediction and Operational Results for Gulf of Mexico Wells in Gas-Hydrate Areas, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.

- Smith, M., and W. Shedd, 2004, Effects of Gas Hydrate on Seafloor and Borehole Stability in the Deepwater Gulf of Mexico – Seismic Prediction and Drilling Results, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.
- Smith, M., W. Shedd, and J. Hunt, 2003, Identification of Deepwater Gulf of Mexico Gas Hydrates – From Seismic Prediction to Joint Industry Project Drilling and Coring, Barcelona, Spain, The American Association of Petroleum Geologists International Conference, September 21-24.
- Smith, M., W. Kou, A. Ahmed, and R. Kuzela, 2005, The Significance of Gas Hydrate as a Geohazard in Gulf of Mexico Exploration and Production, Houston, TX, Offshore Technology Conference, May 3.
- Snyder, F., L. Muller, N. Dutta, D. Hutchinson, P. Hart, M. Lee, B. Dugan, C. Ruppel, W. Wood, R. Coffin, R. Evans, and E. Jones, 2004, Seismic analysis and characterization of gas hydrates in the northern deepwater Gulf of Mexico, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.
- Snyder, F., 2005, Seismic analysis and characterization of gas hydrates in the northern deepwater Gulf of Mexico, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.
- Subramanian, S., E. Jones, 2007, Comparison of Pre-Cruise Predictions to Ground Truth Measurements for Leg 1 of the GOM Hydrate JIP, New Delhi, India, Petrotech 2007, January 14-16.
- Sun, K., D. Omeragic, C. Minh, J. Rasmus, J. Yang, A. Davydychev, T. Habashy, R. Griffiths, G. Reaper, Q. Li, 2010 Evaluation of Resistivity Anisotropy and Formation Dip from Directional Electromagnetic Tools While Drilling, SPWLA 51<sup>st</sup> Annual logging Symposium, June 19-23, 2010.
- Winters, W., W. Waite, I. Pecher, D. Mason, D. Hutchinson, L. Gilbert, R. Birchwood, S. Noeth, and E. Jones, 2004, Comparison of methane gas hydrate formation on physical properties of fine- and coarse-grained sediments, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Wood, W., P. Hart, R. Coffin, J. Gardner, and J. Gettrust, J., 2005, High Resolution Seismic Images of the Gulf of Mexico Joint Industry Program Drilling Transect, San Francisco, CA, American Geophysical Union, December 5-9.
- Wood, W., D. Hutchinson, P. Hart, F. Snyder, C. Voss, N. Dutta, L. Muller, M. Lee, J. Gardner, B. Dugan, C. Ruppel, R. Coffin, R. Evans, and E. Jones, 2003, Constraints on Subsurface gas and gas Hydrate Distribution in a Gulf of Mexico Mound, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.

Wood, W., J. Gardner, R. Hagen, R. Coffin, J. Pohlmann, P. Hart, and D. Hutchinson, 2004, Modeling heat and fluid flux of seafloor mounds in the Gulf of Mexico, Transactions, San Francisco, CA, American Geophysical Union Fall Meeting, December 13-17.

Yun, T., G. Narsilio, J. Lee, J. Santamarina, and C. Ruppel, 2005, Physical properties of a Keathley Canyon pressure core maintained at *in situ* pressure and measured in a new instrumented pressure testing chamber, San Francisco, CA, American Geophysical Union Fall Meeting, December 5-9.

Zhang, Z., McConnell, D. "Seismic Modeling Analysis and Characterization for a Gas Hydrate and Free Gas Mixed System in Green Canyon, Gulf of Mexico." Houston, Texas: Offshore Technology Conference, May 3-6, 2010. OTC 20659

## **Alaska North Slope Gas Hydrate Reservoir Characterization (DE-FC26-01NT41332)**

*BP Exploration Alaska, Inc., U. S. Geological Survey, U. Alaska-Fairbanks, U. Arizona*

### **Peer-Reviewed Publications**

Inks, T., M. Lee, W. Agena, D. Taylor, T. Collett, and R. Hunter, in review, Seismic prospecting for gas hydrates and sub-hydrate free gas in the Milne Point area of Northern Alaska, *in* Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.

Jaiswal, N., A. Dandekar, S. Patil, R. Hunter, and T. Collett, in review, Relative permeability measurements of gas-water-hydrate systems, *in* Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.

Lee, M., T. Collett, and T. Inks, in review, Seismic attribute analysis for gas-hydrate and free-gas prospects on the North Slope of Alaska, *in* Collett, T., A. Johnson, C. Knapp, and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.

### **Theses/Dissertations**

Casavant, R., 2001, Morphotectonic Investigation of the Arctic Alaska Terrane: Implications to Basement Architecture, Basin Evolution, Neotectonics and Natural Resource Management, Ph.D. Thesis, University of Arizona.

Geauner, S., 2006, Fault analysis, seismic facies modeling and volumetric reassessment of gas hydrates in the Milne Point Unit, North Slope, Alaska, MGE Masters Thesis, University of Arizona.

- Hagbo, C., 2003, Characterization of Gas Hydrate Occurrences Using 3D Seismic Data and Seismic Attributes, Milne Point, North Slope, Alaska, M.S. Thesis, Dept. of Geosciences, University of Arizona.
- Hennes, A., 2004, Structural Constraints on Gas-hydrate Formation and Distribution in the Milne Point, North Slope of Alaska, M.S. Thesis, Dept. of Geosciences, University of Arizona.
- Howe, S., 2004, Production modeling and economic evaluation of a potential gas hydrate pilot production program on the North Slope of Alaska, M.S. Thesis, University of Alaska Fairbanks.
- Jaiswal, N., 2004, Measurement of gas-water relative permeabilities in hydrate systems, M.S. Thesis, University of Alaska Fairbanks.
- Manuel, J., 2006, A chronostratigraphic framework of the Sagavanirktok Formation, North Slope Alaska: Incorporating facies characterization, reservoir continuity and dimensions in relation to gas hydrate and associated free-gas resources, MGE Masters Thesis, University of Arizona.
- Westervelt, J., 2004, Determination of methane hydrate stability zones in the Prudhoe Bay, Kuparuk River, and Milne Point units on the North Slope of Alaska, M.S. Thesis, University of Alaska Fairbanks.
- Zhoa, B., 2003, Classifying Seismic Attributes in the Milne Point Unit, North Slope of Alaska, M.S. Thesis, Dept. of Mining and Geological Engineering, University of Arizona.

### **Government Reports**

- Hunter, R. and T. Collett, 2006, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay - Kuparuk River Area on the North Slope of Alaska, *December 2006 Quarterly Technical Report, Seventeenth Technical Quarterly Report*, inclusive of October 2006 - December 2006, Cooperative Agreement Award Number DE-FC26-01NT41332, November 6, available online ([click here](#)).
- Hunter, R., S. Patil, R. Casavant, and T. Collett, 2006, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay - Kuparuk River Area on the North Slope of Alaska, *September 2006 Quarterly Technical Report, Sixteenth Technical Quarterly Report*, inclusive of July 2006 - September 2006, Cooperative Agreement Award Number DE-FC26-01NT41332, November 6, available online ([click here](#)).
- Hunter, R., S. Patil, R. Casavant, and T. Collett, 2006, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay - Kuparuk River Area on the North Slope of Alaska, *June 2006 Quarterly Technical Report, Fifteenth Technical Quarterly Report*, inclusive of January 2005 - June 2006 (Technical Quarterly Reports ten through fourteen waived) Cooperative Agreement Award Number DE-FC26-01NT41332, July 31, available online ([click here](#)).

Hunter, R., S. Patil, R. Casavant, and T. Collett, 2005, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay - Kuparuk River Area on the North Slope of Alaska, *December 2004 Quarterly Technical Report Eighth and Ninth Quarterly Report*, July 2004 - December 2004, Cooperative Agreement Award Number DE-FC26-01NT41332, July 25, available online ([click here](#)).

Hunter, R., S. Patil, R. Casavant, and T. Collett, 2005, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay – Kuparuk River Area on the North Slope of Alaska Drilling and Data Acquisition Planning, *U.S. DOE-NETL Topical Report*, available online ([click here](#))

Lee, M., 2005, Well Log Analysis to Assist the Interpretation of 3-D Seismic Data at Milne Point, North Slope of Alaska, *U. S. Geological Survey Scientific Investigations Report*, 2005-5048, available online ([click here](#)).

### **Other Publications**

Mt. Elbert Science Party, 2007, Alaska North Slope Well Successfully Cores. Logs, and Tests Gas-Hydrate-Bearing Reservoirs, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2007 issue, available online ([click here](#)).

### **Presentations**

Anderson, Brian J.; Wilder, Joseph W.; Kurihara, Masanori; White, Mark D.; Moridis, George J.; Wilson, Scott J.; Pooladi-Darvish, Mehran; Masuda, Yoshihiro; Collett, Timothy S.; Hunter, Robert B.; Narita, Hideo; Rose, Kelly; Boswell, Ray, 2008. Analysis Of Modular Dynamic Formation Test Results From The Mount Elbert-01 Stratigraphic Test Well, Milne Point Unit, North Slope Alaska. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10.

Boswell, R., 2006, Status of U.S. DOE/BP Gas Hydrate Resource Characterization, Milne Point, Alaska North Slope, Kauai, HI, ECI Science and Technology Issues in Methane Hydrate R&D, March 5-9.

Boswell, Ray; Hunter, Robert; Collett, Timothy; Digert, Scott; Hancock, Steve; Weeks, Micaela; Mount Ebert Science Team. 2008. Investigation of Gas Hydrate-Bearing Sandstone Reservoirs at The "Mount Elbert" Stratigraphic Test Well, Milne Point, Alaska. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10. ([click here](#)).

Boswell, R., T. Collett, R. Hunter, S. Hancock and the Mount Elbert Science Party. "Gas hydrate investigations at the 2007 Mount Elbert test site, Milne Point area, Alaska North Slope." AGU Fall Meeting, San Francisco, CA, December 10-14, 2007.

- Casavant, R., 2002, Tectonic geomorphic characterization of a transcurrent fault zone, Western Brooks Range, Alaska (linkage of shallow hydrocarbons with basement deformation), Anchorage, AK, SPE-AAPG Western Region-Pacific Section Joint Technical Conference Proceedings, May 18-23.
- Casavant, R., 2004, Reservoir-Fluid Characterization and Reservoir Modeling of Potential Gas Hydrate Resources, Alaska North Slope, Calgary, AB, Canada, Canadian Society of Petroleum Geologists Technical Conference, June 1.
- Casavant, R., A. Hennes, R. Johnson, and T. Collett, 2004, Structural analysis of a proposed pull-apart basin: Implications for gas hydrate and associated free-gas emplacement, Milne Point Unit, Arctic Alaska, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Digert, S., 2005, Perspective on ANS methane gas hydrate, Anchorage, AK, Alaska Division of Natural Resources Alaska Gas Workshop, August 17-18.
- Gandler, G., R. Casavant, R. Johnson, K. Glass, and T. Collett, 2004, Preliminary Spatial Analysis of Faulting and Gas Hydrates-Free Gas Occurrence, Milne Point Unit, Arctic Alaska, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Geauner, S., J. Manuel, R. Casavant, C. Glass, and K. Mallon, 2004, Well Log Normalization and Comparative Volumetric Analysis of Gas Hydrate and Free-Gas Resources, Central North Slope, Alaska, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Geauner, S., J. Manuel, and R. Casavant, 2003, Preliminary subsurface characterization and modeling of gas hydrate resources, North Slope, Alaska, AAPG-SEG Student Expo, Houston, TX, October 5-6.
- Hagbo, C., and R. Johnson, 2003, Use of seismic attributes in identifying and interpreting onshore gas-hydrate occurrences, North Slope, Alaska, San Francisco, California, EOS Transaction, American Geophysical Union, Volume 84, Fall Meeting Supplement, Abstract OS42B-06, December 8-12.
- Hennes, M., R. Johnson, and R. Casavant, 2004, Seismic Characterization of a Shallow Gas-Hydrate-Bearing Reservoir on the North Slope of Alaska, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Howe, S., N. Nanchary, S. Patil, S. Ogbe, G. Chukwu, R. Hunter, and S. Wilson, 2004, Economic Analysis and Feasibility Study of Gas Production from Alaska North Slope Gas Hydrate Resources, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.

- Hunter, R., S. Digert, R. Boswell, 2007. *Alaska Gas Hydrate Research and Stratigraphic Test Preliminary Results*, Arctic Energy Summit, Anchorage, AK, October 15-18.
- Hunter, R. B., K. Osadetz, 2007. *Alaska Gas Hydrate Research Results and Future Opportunities*, 9<sup>th</sup> Annual Far North Oil & Gas Forum, Calgary, AB, November 27.
- Hunter, R., S. Digert, T. Collett, R. Boswell, 2008, "Gas Hydrate Research and Stratigraphic Test Results, Milne Point Unit, Alaska North Slope," AAPG National Meeting, San Antonio, TX.
- Hunter, R., 2005, Evaluation and modeling of Alaska North Slope gas hydrate resource potential, Anchorage, AK, Alaska Division of Natural Resources, Alaska Gas Workshop, August 17-18.
- Hunter, R., 2003, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay – Kuparuk River Area on the North Slope of Alaska, Geophysical Society of Alaska Lecture Series, May.
- Hunter, R., 2002, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay – Kuparuk River Area on the North Slope of Alaska, Anchorage, AK, Society of Petroleum Engineers –The American Association of Petroleum Geologists Western Region – Pacific Section Conference, May 18-23.
- Hunter, R., 2003, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations Prudhoe Bay – Kuparuk River Area, North Slope of Alaska, Salt Lake City, UT, The American Association of Petroleum Geologists Annual Meeting, May 11-14.
- Hunter, R., 2006, BP-DOE Alaska Gas Hydrate Update, Houston, Texas, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Hunter, R., R. Casavant, R. Johnson, M. Poulton, G. Moridis, S. Wilson, S. Geauner, J. Manuel, C. Hagbo, C. Glass, K. Mallon, S. Patil, A. Dandekar, and T. Collett, 2004, Reservoir-Fluid Characterization and Reservoir Modeling of Potential Gas Hydrate Resources, Alaska North Slope, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.
- Hunter, R., T. Collett, S. Patil, R. Casavant, and T. Mroz, 2004, Characterization, Appraisal and Economic Viability of Alaska North Slope Gas Hydrate Accumulations, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Hunter, R., and T. Collett, 2004, Gas hydrate prospect development and production modeling, Alaska North Slope, Geophysical Society of Alaska Lecture Series, December.

- Hunter, R., T. Collett, S. Wilson, T. Inks, R. Casavant, R. Johnson, M. Poulton, K. Mallon, S. Patil, and A. Dandekar, 2005, Gas Hydrate Prospect Development and Production Modeling, Alaska North Slope, Calgary, AB, Canada, The American Association of Petroleum Geologists Annual Meeting, June 19-22.
- Hunter, R., S. Digert, R. Casavant, R. Johnson, M. Poulton, C. Glass, K. Mallon, S. Patil, A. Dandekar, and T. Collett, 2003, Resource Characterization and Quantification of Natural Gas-Hydrate and Associated Free-Gas Accumulations in the Prudhoe Bay – Kuparuk River Area, North Slope of Alaska, Poster Session at The American Association of Petroleum Geologists Annual Meeting, Salt Lake City, UT, May 11-14. Poster received EMD, President’s Certificate for Excellence in Presentation.
- Hunter, R., Digert, S.A., Wilson, S., Collett, T., Boswell, R., 2007, Gas Hydrate Resource Potential, Alaska North Slope, The American Association of Petroleum Geologists Annual Meeting, Long Beach, CA, April 3.
- Hunter, R., Wilson, S. J., Digert, S.A., 2006, Gas Hydrate Resource and Regional Development Potential, Alaska North Slope, The American Association of Petroleum Geologists Pacific Section – Joint Meeting with Cordilleran Section, GSA, and West Region, SPE, Anchorage, Alaska, May 8-10.
- Inks, T., T. Collett, D. Taylor, W. Agena, and M. Lee, 2004, Prospecting for Gas Hydrate Accumulations using 2D and 3D seismic data, Milne Point, North Slope, Alaska, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Inks, T., T. Collett, D. Taylor, W. Agena, M. Lee, and R. Hunter, 2006, Prospecting for Gas Hydrate Accumulations using 2D and 3D seismic data, Milne Point, North Slope, Alaska, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Jaiswal, N., J. Westervelt, S. Patil, A. Dandekar, N. Nanchary, P. Tsunemori, and R. Hunter, 2004, Phase Behavior and Relative Permeability of Gas-Water-Hydrate System: Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Jaiswal, N., 2003, Measurement of Relative Permeability for Gas Hydrate Production, Fairbanks, AK, 5<sup>th</sup> Arctic Science Conference, American Association for the Advancement of Science, Arctic Division, September 22-24.
- Jaiswal, N.J., Kerkar, P.B., Patil, S.L., Dandekar, A.Y., Chukwu, G.A., Hunter, R.B., Collett, T.S. and Khataniar, S. 2007, Core Flooding Studies in Support of Potential Natural Gas Production from Hydrate Accumulations on Alaska North Slope, presented at the 7th International Oil & Gas Conference and Exhibition, Petrotech 2007, January 15-19, New Delhi, India. *Also presented as invited talk at Sharm-Al-Sheikh, Egypt.*

- Kurihara, Masanori; Masuda, Yoshihiro; Yamamoto, Koji; Narita, Hideo; Dallimore, Scott R.; Collett, Timothy S.; Hancock, Steve H., 2008. Analyses Of Production Tests And Mdt Tests Conducted In Malli And Alaska Methane Hydrate Reservoirs: What Can We Learn From These Well Tests? Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Lorenson, Thomas D.; Collett, Timothy S.; Hunter, Robert B., 2008. Preliminary Assessment Of Hydrocarbon Gas Sources From The Mt. Elbert No. 1 Gas Hydrate Test Well, Milne Pt. Alaska. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Mitchell, K., R. Casavant, and J. Manuel, 2003, Regional characterization of the Cretaceous Nanushuk Group: Preliminary assessment for coal-bed methane potential in arctic Alaska, The American Association of Petroleum Geologists-SEG Student Expo, Houston, TX, October 5-6.
- Nanchary, N., S. Patil, A. Dandekar, and R. Hunter, 2004, Numerical Modeling of Gas Dissociation from Gas Hydrate in Porous Media, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Patil, S.L. and Dandekar, A.Y. 2007, Natural Gas Hydrates: Energy Resource Potential and Review of Production Techniques, Presented at International Symposium on Application of Computers and Operations Research in the Mineral Industry—APCOM, April 24-27, 2007, Santiago, Chile.
- Poulton, M., R. Casavant, C. Glass, and B. Zhao, 2004, Model Testing of Methane Hydrate Formation on the North Slope of Alaska With Artificial Neural Networks, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Rutqvist, Jonny; Moridis, George J.; Grover, Tarun; Collett, Timothy S., 2008. Geomechanical Response Of Known Permafrost Hydrate Deposits To Depressurization-Induced Production. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Taylor, D., T. Collett, and M. Lee, 2003, Imaging gas-hydrate-bearing zones using 3-D seismic data, Milne Point, North Slope, Alaska, Denver, CO, Proceedings of the Ninth Annual RMAG-DGS 3D Seismic Symposium, February 28.
- Tsunemori, P., 2003, Determination of Gas Hydrate Stability Zones in Prudhoe Bay, Kuparuk River, and Milne Point Units for Production of Natural Gas from Gas Hydrates, Fairbanks, AK, Fifth Arctic Science Conference, American Association for the Advancement of Science, Arctic Division, September 22-24.

## Gas Hydrate Production Trial (DE-NT0006553)

*ConocoPhillips Company*

### Government Reports

Farrell, H., Boswell, R., Howard, J., Baker, R., CO<sub>2</sub>-CH<sub>4</sub> Exchange in Natural Gas Hydrate Reservoirs: Potential and Challenges. *U.S. DOE-NETL Fire in the Ice Newsletter*, March 2010, available online ([click here](#)).

Howard, J., Effect of Carbon Dioxide Hydrate Formation on Reservoir Permeability. *Progress Report, 3<sup>rd</sup> Quarter, 2009*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. November 12, 2009, available online ([click here](#)).

Howard, J., 2009. Role of Free Water in Hydrate Reformation & Permeability. *Progress Report, 2<sup>nd</sup> Quarter, 2009*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. August 28, 2009, available online ([click here](#)).

Lankston, R., Predicting Methane Hydrate Saturation with the Stanford University Rock Physics Lab Code. *Progress Report, 2<sup>nd</sup> Quarter, 2009*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. August 28, 2009, available online ([click here](#)).

Mailloux, J., Petrophysical Evaluation of Potential Hydrate-Bearing Wells on the North Slope of Alaska. *Progress Report, 2<sup>nd</sup> Quarter, 2009*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. August 28, 2009, available online ([click here](#)).

Scheihing, M., Geocellular Model for Evaluation of Gas Hydrate Production Mechanism in Selected Sands of the Sagavanirktok Formation. *Semi-Annual Progress Report, 2010*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. September 30, 2010, available online ([click here](#)).

Silpngarmlert, S., Heat of Hydration Effects. *Semi-Annual Progress Report, 2010*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. September 30, 2010, available online ([click here](#)).

Silpngarmlert, S., Thermal Effects of Hot Fluid Production/Injection in Existing Wells. *Semi-Annual Progress Report, 2010*, ConocoPhillips Gas Hydrate Production Test. DOE Award No.: DE-NT0006553. September 30, 2010, available online ([click here](#)).

### Presentations

Farrell, H., Howard, J., Experimental Basis CO<sub>2</sub>-CH<sub>4</sub> Exchange for Production from Hydrate Reservoirs: Field-Test Plans, National Research Council, Washington, DC, March 5, 2009.

Schoderbek, D., ConocoPhillips North Slope CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial. Alaska Department of Natural Resources, Division of Oil and Gas, January 19, 2010.

Schoderbek, D., Howard, J., Silpngarmert, S., CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial Overview & Update. NETL Gas Hydrates Meeting, Georgia Tech, Atlanta, GA, January, 2010.

Schoderbek, D., CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial Overview & Update. Methane Hydrates Advisory Committee, Atlanta, Georgia, January 28, 2010.

Schoderbek, D., ConocoPhillips North Slope CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial, Presentation to the Alaska Industry Support Alliance, September 24, 2009.

Schoderbek, D., Lankston, R., CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial North Slope, Alaska. DOE Site Selection Workshop, ConocoPhillips Gas Hydrate Production Test DOE Award No.: DE-NT0006553, Houston, TX, April 3, 2009.

Ireland, M., CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial North Slope, Alaska, Presentation to the Alaska Department of Natural Resources. February 24, 2009.

Schoderbek, D., Howard, J., Farrell, H., CO<sub>2</sub>-CH<sub>4</sub> Exchange Field Trial North Slope, Alaska. Kickoff Meeting, National Energy Technologies Laboratory, Morgantown, West Virginia, January 22, 2009.

### **Methane Hydrate Production from Alaskan Permafrost (DE-FC26-01NT41331)**

***Maurer Technology, Inc/Noble Corporation, U. Oklahoma, U. Alaska-Anchorage, U.S. Geological Survey***

#### **Peer-Reviewed Publications**

Circone, S., L. Stern, and S. Kirby, 2003, The Role of Water in Hydrate Dissociation, *Journal of Physical Chemistry*, Volume 108, n. 18, p. 5747-5755.

Ebanks, W. Jr., W. Zogg, R. Sigal, C. Rai, C. Sondergeld, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 1: Geology of the Ugnu and West Sak Sands, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.

Millheim, K., J. Kwan, T. Williams, W. Maurer, W. MacDonald, A. Kadaster, T. Thompson, R. Sigal, D. Copeland, D. McGuire, S. Runyon, and B. Liddell, 2005, A project update of methane hydrate production from Alaskan permafrost, in Taylor, C. and J. Kwan, eds., *Advances in the Studies of Gas Hydrates*, New York, Kluwer Academic/Plenum Publishers, p. 75-85.

- Newsham, K., R. Sigal, and J. Kwan, 2005, An Application Used For Correcting Thermal Gradients Below Permafrost Using an Empirical Diffusion Model; Anadarko's Hot Ice #1 Gas Hydrates Case Study, in Taylor, C. and J. Kwan, eds., *Advances in the Studies of Gas Hydrates*, New York, Kluwer Academic/Plenum Publishers, p. 59-72.
- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks Jr., W. Zogg, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 2: Porosity, Permeability, Grain Density, and Bulk Modulus Reservoir Properties, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks Jr., W. Zogg, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 3: Resistivity Reservoir Properties, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks Jr., W. Zogg, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 4: Reservoir Acoustic Velocities, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks Jr., W. Zogg, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 5: Nuclear Magnetic Resonance (NMR) Reservoir Properties, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks Jr., W. Zogg, N. Emery, G. McCardle, W. McLoed, R. Schweizer, and J. Van Eerde, in review, Characterization of potential hydrate bearing reservoirs in the Ugnu and West Sak formations of Alaska's North Slope, Part 6: Gas Hydrate Stability Calculations, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2001, Anomalous Preservation of Pure Methane Hydrate at 1 atm, *Journal of Physical Chemistry*, Volume 105, p. 1756-1762.

Stern, L., S. Circone, S. Kirby, and W. Durham, 2001, Reply to Comments on “Anomalous Preservation of Pure Methane Hydrate at 1 atm,” *Journal of Physical Chemistry*, Volume 106, n. 1, p. 228-230.

Stern, L., S. Circone, S. Kirby, and W. Durham, 2003, Temperature, Pressure, and Compositional Effects on Anomalous or “Self” Preservation of Gas Hydrates, *Canadian Journal of Physics*, Volume 81, p. 271-283.

### **Government Reports**

Barker, C., 2003, Methane hydrate production form Alaskan permafrost – Coalbed Methane Studies at Hot Ice #1 Gas Hydrate Well, *U.S. DOE Topical Report*, Contract No. DE-FC26-01NT41331, 7 pp.

Cohen, J., and T. Williams, 2002, Hydrate Core Drilling Tests, *Maurer Technology Topical Report*, November.

Kadaster, A., B. Liddel, T. Thompson, T. Williams, and M. Nidermayr, 2005, Methane hydrate production form Alaskan permafrost – drilling and coring operations, *U.S. DOE-NETL Topical Report*, 258 pp., available online ([click here](#)).

Kirby, S., S. Circone, and L. Stern, 2003, Methane hydrate production form Alaskan permafrost – Dissociation Rates of Methane Hydrate at Elevated Pressures and of a Quartz Sand-Methane Hydrate Mixture at 0.1 MPa, *U.S. DOE-NETL Topical Report*, 26 pp.

Kleinberg, R., D. Griffin, and R. Sigal, 2004, Methane hydrate production form Alaskan permafrost – NMR measurements of permafrost: unfrozen water assay, growth habit of ice, and hydraulic permeability of sediments, *U.S. DOE-NETL Topical Report*, 26 pp.

McGuire, D., S. Runyon, R. Sigal, B. Liddel, T. Williams, and G. Moridis, 2005, Methane hydrate production form Alaskan permafrost – Hydrate reservoir characterization and modeling, *U.S. DOE-NETL Topical Report*, 20 pp., available online ([click here](#)).

McGuire, D., T. Williams, B. Paulsson, and A. Goertz, 2005, Methane hydrate production form Alaskan permafrost – 3D vertical seismic profile survey, *U.S. DOE-NETL Topical Report*, 30 pp., available online ([click here](#)).

Runyon, S., M. Globe, K. Newsham, R. Kleinberg, and D. Griffin, 2005, Methane hydrate production form Alaskan permafrost – logging operations, *U.S. DOE-NETL Topical Report*, 22 pp., available online ([click here](#)).

Sigal, R., K. Newsham, T. Williams, B. Friefeld, T. Kneafsey, C. Sondegard, S. Rai, J. Kwan, S. Kirby, R. Kleinberg, and D. Griffin, 2005, Methane hydrate production form Alaskan permafrost – core and fluid analysis, *U.S. DOE-NETL Topical Report*, 225 pp., available online ([click here](#)).

Sigal, R., 2004, Methane hydrate production from Alaskan permafrost – Hydrate reservoir characterization and modeling – X-ray and Density Log data from the Hot Ice #1 well, *U.S. DOE-NETL Topical Report*, 6 pp.

Williams, T., K. Millheim, and B. Liddel, 2005, Methane hydrate production from Alaskan permafrost, *U.S. DOE-NETL Final Report*, Contract No. DE-FC26-01NT41331, available online ([click here](#)).

### **Other Publications**

Kirby, S., S. Circone, L. Stern, and J. Pinkston, 2004, Self-regulating effects of gas hydrate decomposition relevant to natural gas production models, *U.S. DOE-NETL Fire in the Ice Newsletter*, Summer, available on line ([click here](#)).

Kirby, S., L. Stern, S. Circone, and J. Pinkston, 2004, Hydrate decomposition under scrutiny: *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, available on line ([click here](#)).

### **Presentations**

Barker, C., J. Clough, S. Roberts, A. Clark, and B. Fisk, 2003, Physical Limitations on Coalbed Gas Content of Low Rank Coals, North Slope, Alaska, An Apparent Widespread Depletion of Coalbed Gas in Permafrost, Billings, MT, 18<sup>th</sup> International Low-Rank Fuels Symposium, June 24-26.

Kadaster, A., K. Millheim, and T. Thompson, 2005, The Planning and Drilling of Hot Ice #1 – Gas Hydrate Exploration Well in the Alaskan Arctic, Amsterdam, The Netherlands, SPE/IADC Drilling Conference & Exhibition, February 23-25.

Kadaster, A., and K. Millheim, 2004, Onshore Mobile Platform: A Modular Platform for Drilling and Production Operations in Remote and Environmentally Sensitive Areas, Dallas, TX, IADC/SPE Drilling Conference, March 2-4.

McGuire, D., S. Runyon, T. Williams, B. Paulsson, A. Goertz, and M. Karrenbach, 2004, Gas Hydrate Exploration with 3D VSP Technology, North Slope, Alaska, Denver, CO, Society of Exploration Geophysicists 74th Annual Meeting, October 11-15.

McGuire, D., S. Runyon, T. Williams, and R. Sigal, 2004, Integration of VSP Seismic Data with Core and Well Log Data to Investigate Lateral Variations of Potential Hydrate-Bearing Sands, Alaska North Slope, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.

Millheim, K., J. Kwan, and B. Maurer, 2002, A Field Oriented Natural Gas Hydrate Research Project for the Alaska North Slope – Resource Evaluation and Possible Testing, Orlando, FL, 223rd American Chemical Society National Meeting, April 9.

Millheim, K., 2002, Methane Hydrate Production from Alaska Permafrost, Houston, TX, The American Association of Petroleum Geologists Hydrate Meeting, March 12.

- Sigal, R., C. Rai, C. Sondergeld, W. Ebanks, W. Zogg, and R. Kleinberg, 2004, Characterization of Potential Hydrate Bearing Reservoirs in the Ugnu and West Sak Formations of Alaska's North Slope, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2002, New insights into the phenomenon of anomalous or "self" preservation of gas hydrates, Newfoundland, Canada, International Symposium on the Physics and Chemistry of Ice, July 14-19.
- Stern, Laura A.; Kirby, Stephen H. 2008. Natural Gas Hydrates Up Close: A Comparison Of Grain Characteristics Of Samples From Marine And Permafrost Environments As Revealed By Cryogenic Sem. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. [\(click here\)](#).
- Williams, T., B. Liddell, A. Kadaster, and T. Thompson, 2004, Hot Ice Well No. 1 – Well Planning, Operations and Results of the First Dedicated Gas Hydrate Well in the Alaskan Arctic, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Williams, T., 2003, Methane Hydrate Production – Application of Arctic Hydrate Research to Deep Water, Houston, TX, American Association of Drilling Engineers, Deep Water Quarterly Forum, February 11.

## Section III: Publications Related to the Program's Efforts with Universities and Other Research Institutions

### Gulf of Mexico Sea Floor Stability and Gas Hydrates Monitoring Project (DE-FC26 -00NT40920; DE-FC26-02NT41628; DE-FC26 -06NT42877)

*University of Mississippi Center for Marine Resources and Environmental Technology*

#### Peer-Reviewed Publications

- Abrams, M., and J. Whelan, 2005, eds., Marine and Petroleum Geology, Special issue on Near-Surface Hydrocarbon Migration, Mechanisms and Seepage Rates, Volume 22, p. 456-596.
- Addison, A. D., B. M. Battista, and C. C. Knapp, 2009, Improved Hydrogeophysical Parameter Estimation from Empirical Mode Decomposition Processed Ground Penetrating Radar Data, *Journal of Environmental and Engineering Geophysics* vol. 14, no. 4, pp. 171-178.
- Battista, B. M., A. D. Addison, and C. C. Knapp, 2009, Empirical Mode Decomposition Operator for Dewowing GPR Data, *Journal of Environmental and Engineering Geophysics*, vol. 14, no. 4, pp.163-169.
- Battista, Bradley, Camelia Knapp, Tom McGee and Vaughn Goebel, 2007: Application of the Empirical Mode Decomposition and Hilbert-Huang Transform to seismic reflection data. *Geophysics*, 72(2), p. H29-H37.
- Battista, B. M., L. Macelloni, Camelia C. Knapp, and T. McGee, A Band-Modulated Empirical Mode Decomposition Operator for use with High-Resolution Seismic Reflection Data, *IEEE Transactions on Geoscience and Remote Sensing (in review)*.
- Brooks, Laura A, Peter Gerstoft (2009), Green's function approximation from cross-correlation of active sources in the ocean, *J Acoust. Soc. Am.*, 126, 46-55.
- Brooks, Laura A, Peter Gerstoft, and David P Knobles (2008), Multichannel array diagnosis using noise cross-correlation, *J Acoust. Soc. Am* EL,124,EL203-EL209, DOI:10.1121/1.2960937.
- Brooks, Laura A, Peter Gerstoft (2009), Green's function approximation from cross-correlations of 20–100 Hz noise during a tropical storm, *Journal of Acoust. Soc. Am* 125, p.723-734 (PDF).
- Camilli, R.; Bowen, A.; Farr, N., 2010, "Bright Blue: Advanced Technologies for Marine Environmental Monitoring and Offshore Energy" *Oceans 2010*. pp 1-7.
- Chen, D., L. Cathles, and H. Roberts, 2004, The geochemical signatures of variable gas venting at gas hydrate sites, *Marine and Petroleum Geology*, Volume 21, p. 317-326.

- Dearman, J., W. Wilson, R. Rogers, and G. Zhang, 2009, Gas hydrate promotion by smectite-bioproduct interactions, *Marine Chemistry*, accepted for publication and in press.
- Dobbs, G., and B. Mizaikoff, 2006, Shining New Light on Old Principles: Localization of Evanescent Field Interactions at Infrared-Attenuated Total Reflection Sensing Interfaces, *Applied Spectroscopy*, Volume 60, n. 6, p. 573-583.
- Geresi, E., Lutken, C., McGee, T., and Lowrie, A., 2002: Complex geology and gas hydrate dynamics characterize Mississippi Canyon Block 798 on the upper continental slope of the northern Gulf of Mexico. *GCAGS Transactions*, 52, p. 309-321.
- Geresi, E., R. Chapman, T. McGee, B. Woolsey, 2009, Monitoring seafloor instability caused by the presence of gas hydrate using ocean acoustical and geophysical techniques in the Northern Gulf of Mexico, *in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication.*
- Hardage, B., H. Roberts, P. Murray, R. Remington, D. Sava, W. Shedd, J. Hunt Jr., 2009, Multicomponent seismic technology assessment of fluid-gas expulsion geology and gas hydrate systems: Gulf of Mexico, *in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication.*
- Hvozdar, L., N. Pennington, M. Kraft, M. Karlowatz, and B. Mizaikoff, 2002, Quantum Cascade Lasers for Mid-Infrared Spectroscopy, *Vibrational Spectroscopy*, Volume 30, p. 53-58.
- Janotta, M., A. Katzir, and B. Mizaikoff, 2003, Sol-gel Coated Mid-Infrared Fiberoptic Sensors, *Applied Spectroscopy*, Volume 57, p. 823-828.
- Janotta, M., 2004, Analysis of Corrosion Processes at DLC Protected ZnSe Waveguide Surfaces, *Langmuir*, Volume 20, p. 8634-8640.
- Janotta, M., 2004, Direct Analysis of Oxidizing Agents in Aqueous Solution with Attenuated Total Reflectance Mid-Infrared Spectroscopy and DLC Protected Waveguides, *Analytical Chemistry*, Volume 76, p. 384-391.
- Karlowatz, M., M. Kraft, and B. Mizaikoff, 2004, Simultaneous Quantitative Determination of Benzene, Toluene and Xylenes in Water with Mid-Infrared Evanescent Field Spectroscopy, *Analytical Chemistry*, Volume 76, p. 2643-2648.
- Kelleher, B., A. Simpson, R. Rogers, J. Dearman, and W. Kingery, 2007, Effects of natural organic matter from sediments on the growth of marine gas hydrates, *Marine Chemistry*, Volume 103, p. 237- 249.

- Lapham, L., J. Chanton, C. Martens, and H. Mendlovitz, 2004, Innovations in sampling pore fluids at deep sea hydrate sites, *in* B. J Thompson, *ed.*, Energy, Simulation-Training, Ocean Engineering and Instrumentation, *Research Papers of the Link Foundation Fellows*, Volume 3, p. 4.
- Lapham, L., J. Chanton, C. Martens, K. Sleeper and J. Robert Woolsey, 2008, “Microbial activity in surficial sediments overlying acoustic wipeout zones at a Gulf of Mexico cold seep,” *Geochemistry, Geophysics, Geosystems*, Volume 9, No. 6, June 4.
- Lapham, L.L., J.P. Chanton, C.S. Martens, P. D. Higley, H. W. Jannasch and J.R. Woolsey (2008). Measuring long term changes in dissolved ion and gas concentrations and stable isotopes at a hydrate site: Mississippi Canyon 118, Gulf of Mexico. *Environmental Science and Technology*, 42, p. 7368-7373.
- Lapham, L.L., M.J. Alperin, J.P. Chanton, and C.S. Martens (2008). Upward advection rates and dissolved methane and sulfate concentrations at two Gulf of Mexico brine seeps. *Marine Chemistry*, 112, 65-71. <http://dx.doi.org/10.1016/j.marchem.2008.06.001>
- Lapham, L. L., Chanton, J. P., Chapman, R. and Martens, C. S., (2010). Methane under-saturated fluids in deep-sea sediments: Implications for gas hydrate stability and rates of dissolution. *Earth and Planetary Science Letters* in press.
- Lloyd, K., L. Lapham, and A. Teske, 2006, An Anaerobic Methane Oxidizing Community of ANME-1b archaea in Hypersaline Gulf of Mexico Sediments, *Applied and Environmental Microbiology*, Volume 72, p. 7218-7230.
- Lloyd, K. G., Albert, D. B., Biddle, J. F., Chanton, J., Pizarro, O. and Teske, A., 2009, Spatial structure and activity of sedimentary microbial communities underlying a *Beggiatoa spp.* mat in a Gulf of Mexico hydrocarbon seep. *PLoS Biology*.
- Lloyd, K. G., D. Albert, J. F. Biddle, J. Chanton, O. Pizarro, and A. Teske. 2010. Spatial structure and activity of sedimentary microbial communities underlying a *Beggiatoa spp.* mat in a Gulf of Mexico hydrocarbon seep. *PLoS One*, 5(1): e8738.
- Lloyd, K. G., B. J. MacGregor, and A. Teske. 2010. Quantitative PCR methods for RNA and DNA in marine sediments: Maximizing yield while overcoming inhibition. *FEMS Microbiology Ecology*. 72: 143-151.
- Lowrie, A., C. Lutken, E. Geresi, R. Bennett, R. Faas, and T. McGee, 2002, Natural Gas Hydrates: Permanent Earth Constituents Impacting Sediment Strength and Continental Margin Evolution, *Canadian Recorder, Natural Gas Hydrates*, Volume 27, n. 8, p. 13-27.
- Lowrie, Allen and Lutken, Carol, 2005: Free gas exploitation within the northern Gulf of Mexico; a viable potential? Transactions of the 55th Annual Meeting of the GCAGS, New Orleans, LA, p. 456-461.

- Lutken, Carol, Allen Lowrie, Erika Geresi, Richard Bennett, Richard Faas, Bradley Battista, and Tom McGee, 2003: Interpretation of high resolution seismic data from a geologically complex continental margin, northern Gulf of Mexico, GCAGS/GCSSEPM Transactions Volume 53, p. 504-516.
- McGee, T., C. Lutken, R. Rogers, C. Brunner, J. Dearman, F. Lynch, and J. Woolsey, 2009, Can fractures in soft sediments host significant quantities of gas hydrates?, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.
- McGee, T., 2000, A single-channel seismic reflection method for quantifying lateral variations in BSR reflectivity, *Marine Geology*, Volume 164, p. 29-35.
- McGee, T., 2000, Pushing the limits of high resolution in marine seismic profiling, *Journal of Environmental and Engineering Geophysics*, Volume 5, p. 43-53.
- McGee, T.M., 2000: High-resolution seismic profiling on water. Majorana Center of Scientific Culture School of Applied Geophysics, 10th Course: Development of Geophysical Methods with Application to Shallow Targets, *Annali di Geofisica*, 43, p. 1045-1073.
- McGee, T.M., and Woolsey, J.R., 2000: A remote station to monitor gas hydrate outcrops in the Gulf of Mexico. *Annals of the New York Academy of Science*, 912, p. 527-532.
- McGee, T., L. Macelloni, A. Bosman, C. Lutken, C. Brunner, R. Rogers, J. Dearman, K. Sleeper and J. R. Woolsey, 2008, Hydrocarbon gas hydrates in sediments of the Mississippi Canyon area, northern Gulf of Mexico. In Special Publication of the Geological Society of London, *Sediment-hosted gas hydrates: New insights on natural and synthetic systems*, D. Long (ed.)
- McGee, T, J. R. Woolsey, L. Macelloni, B. Battista, S. Caruso, L. Lapham, V. Goebel and J. Carroll, 2008, *Progress toward a sea-floor observatory at a carbonate/hydrate mound in the northern Gulf of Mexico*, US/EU Baltic 2008 International Symposium Tallin, Estonia May 27-29
- Mizaikoff, B., 2003, Infrared Optical Sensors for Water Quality Monitoring, *Water Science & Technology*, Volume 47, n. 2, p. 35-42.
- Mizaikoff, B., 2003, Mid-Infrared Fiberoptic Sensors, *Analytical Chemistry*, Volume 75, p. 258-267.
- Morley, M.G., Dosso, S.E. and Chapman, N.R., 2009, *Array element localization using ship noise*, J. Acoust. Soc. Am. Volume 125, Issue 3, pp. 1403-1409.

- Radich, J., R.E. Rogers, W.T. French, and G. Zhang, 2009, Biochemical reaction and diffusion in seafloor gas hydrate capillaries: Implications for gas hydrate stability, *Chemical Engineering Science* 64, p 4278-4285.
- Roberts, H., 2001, Fluid and gas expulsion on the northern Gulf of Mexico continental slope: Mud-prone to mineral-prone responses, in C. Paull and W. Dillon, eds., *Natural Gas Hydrates: Occurrence, distribution, and detection*, American Geophysical Union, Geophysical Monograph, Volume 124, p. 145-161.
- Rogers, R., C. Kothapalli, M. Lee, and R. Woolsey, 2003, Catalysis of Gas Hydrates by Biosurfactants in Seawater-Saturated Sand/Clay, *The Canadian Journal of Chemical Engineering*, Volume 81, n. 5, p. 973-980.
- Rogers, R., G. Zhang, J. Dearman, and C. Woods, Investigation into surfactant/gas-hydrate relationship, 2007, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, March.
- Sassen, R., H. Roberts, W. Jung, B. Phaneuf, A. Milkov, C. Lutken, D. DeFreitas, S. Sweet, and N. Guinasso, in review, Geologic and geochemical setting of the Mississippi Canyon 118 gas hydrate site, Gulf of Mexico: significance to hydrate volume, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Sassen, R., S. Losh, L. Cathles III, H. Roberts, J. Whelan, A. Milkov, S. Sweet, and D. DeFreitas, 2001, Massive vein-filling gas hydrate: relation to ongoing gas migration from the deep subsurface in the Gulf of Mexico, *Marine Petroleum Geology*, Volume 18, p. 551-560.
- Sassen, R., S. Sweet, A. Milkov, D. DeFreitas, M. Kennicutt II, and H. Roberts, 2001, Stability of thermogenic gas hydrate in the Gulf of Mexico: Constraints on models of climate change, in C. Paull and W. Dillon, eds., *Natural Gas Hydrates: Occurrence, Distribution, and Detection*, American Geophysical Union, Geophysical Monograph, Volume 124, p. 131-143.
- Sassen, R., A. Milkov, H. Roberts, S. Sweet, and D. DeFreitas, 2003, Geochemical evidence of rapid hydrocarbon venting from a seafloor-piercing mud diapir, Gulf of Mexico continental shelf, *Marine Geology*, Volume 198, p. 319-329.
- Sassen, R., A. Milkov, E. Ozgul, H. Roberts, J. Hunt, M. Beeunas, J. Chanton, D. DeFreitas, and S. Sweet, 2003, Gas venting and subsurface charge in the Green Canyon area, Gulf of Mexico continental slope: evidence of a deep bacterial methane source?, *Organic Geochemistry*, Volume 34, n. 10, p. 1555-1464.

- Sassen, R., H. Roberts, R. Carney, A. Milkov, D. DeFreitas, B. Lanoil, and C. Zhang, 2004, Free hydrocarbon gas, gas hydrate, and authigenic minerals in chemosynthetic communities of the northern Gulf of Mexico continental slope: relation to microbial processes, *Chemical Geology*, Volume 205, p. 195-217.
- Teske, A. 2009. Sulfate-reducing and methanogenic hydrocarbon-oxidizing microbial communities in the marine environment. Chapter 104. In K. Timmis (ed.), *Handbook of Hydrocarbon Microbiology*, Springer.
- Traer, James, Peter Gerstoft, Peter D Bromirski, WS Hodgkiss, and Laura A Brooks (2008), Shallow-water seismo-acoustic noise generation by Tropical Storms Ernesto and Florence, *J Acoust. Soc. Am* EL, 124, EL170-EL176, DOI:10.1121/1.2968296 (PDF).
- Vogt, F., 2004, Chemometric Correction of Drift Effects in Optical Spectra, *Applied Spectroscopy*, Volume 58, p. 683-692.
- Vogt, F., and B. Mizaikoff, 2004, Fault Tolerant Spectroscopic Data Evaluation Based on Extended Principal Component Regression Correcting for Spectral Drifts and Uncalibrated Spectral Features, *Journal of Chemometrics*, Volume 17, p. 660-665.
- Vogt, F., M. Karlowatz, M. Jakusch, and B. Mizaikoff, 2003, An Automated Sample Preparation System MixMaster for Investigation of Volatile Organic Compounds with Mid-Infrared Evanescent Wave Spectroscopy, *The Analyst*, Volume 128, n. 4, p. 397-403.
- Vogt, F., and B. Mizaikoff, 2003, Introduction and Application of Secured Principal Component Regression (SPCR) for Analysis of Uncalibrated Spectral Features: Optical Spectroscopy and Chemical Sensing, *Analytical Chemistry*, Volume 75, p. 3050-3058.
- Vogt, F., and B. Mizaikoff, 2003, Secured PCR (SPCR) for Detection, Correction, and Characterization of PCR Calibration Model Failures Induced by Uncalibrated Spectral Features, *Journal of Chemometrics*, Volume 17, p. 225-236.
- Vogt, F., M. Kraft, and B. Mizaikoff, 2002, First Results on Infrared Attenuated Total Reflection Spectroscopy for Quantitative Analysis of Salt Ions in Seawater, *Applied Spectroscopy*, Volume 56, p. 1376-1380.
- Whelan, J., 2004, When seafloor meets ocean, the chemistry is amazing: in more and more places, scientists are finding vast amounts of natural gas on the ocean bottom, *Oceanus*, Volume 42, n. 2, p. 66-71.
- Whelan, J., L. Eglinton, L. Cathles III, S. Los, and H. Roberts, 2005, Surface and Subsurface Manifestations of Gas Movement Through a N-S Transect of the Gulf of Mexico, *Marine and Petroleum Geology*, p. 479-497.
- Zhang, G., R. Rogers, W. French, and W. Lao, 2007, Investigation of microbial influences on seafloor gas-hydrate formations, *Marine Chemistry*, Volume 103, p. 359- 369.

Zhang, Jian, Gerstoft, Peter and Bromirski, Peter D. (2010), Pelagic and coastal sources of P-wave microseisms: Generation under tropical cyclones , *Geophys. Res. Lett.*, doi:10.1029/2010GL044288.

Zhong, Y., and R. Rogers, 2000, Surfactant Effects on Gas Hydrate Formation, *Chemical Engineering Science*, Volume 55, n. 19, p. 4175-4187.

### **Theses/Dissertations**

Battista, Bradley M., 2008, Advanced Nonlinear Signal Processing Tools for use with High-Resolution Seismic Reflection and Ground-Penetrating Radar Data, PhD Thesis, University of South Carolina.

Dearman, J.L., 2007, Gas hydrate formation in Gulf of Mexico sediments. Ph.D. Dissertation, Mississippi State University.

Geresi, Erika, 2007: Ph.D. dissertation: Vertical line array performance in gas hydrate bearing sediment in the northern Gulf of Mexico. University of Victoria, B.C.

Johnson, Jeff, M.S., 2003, Passive microwave remote sensing of sea surface salinity : application of the scanning low frequency microwave radiometer in a coastal zone environment, M.S. thesis, University of Southern Mississippi.

Kothapalli, C.R., 2002, Catalysis of gas hydrates by biosurfactants in seawater-saturated sand/clay. M.S. Thesis, Mississippi State University.

Lapham, L., 2007, *In situ* measurements of methane cycling in cold seep sediments containing gas hydrates and brines. Ph.D. Thesis, University of North Carolina.

Lee, M.S., 2001, The effects of biosurfactants on gas hydrate formation in ocean sediments. M.S. Thesis, Mississippi State University.

Lloyd, K.G., 2009, Microbially driven methane and sulfur cycling in a Gulf of Mexico methane seep and the White Oak River estuary, Ph.D. thesis, University of North Carolina.

Macelloni, Leonardo, 2005: Ph.D. dissertation, High-resolution marine digital seismic method: theoretical constraints, digital processing, new developments. University of Rome La Sapienza.

Martin, Kevin, M.S., 2006, Development of a technique to quantify the volume of bubbles released from hydrocarbon seeps, using an inductive conductivity cell, M.S. thesis, University of Southern Mississippi.

Radich, J.G., 2009, Laboratory and theoretical investigations of direct and indirect microbial influences on seafloor gas hydrates. M.S. Thesis, Mississippi State University.

Woods, C.E., Jr., 2004, Examination of the effects of biosurfactant concentration on natural gas hydrate formation in seafloor porous media. M.S. Thesis, Mississippi State University.

Xiong, Shangmin, 2009, Microbially induced and disrupted memory phenomena during gas-hydrate occurrences in seafloor sediments, M.S. Thesis, Mississippi State University.

### **Other Publications**

Backus, M. M., Murray, Paul, Hardage, B. A., and Graebner, R. J., 2006: High-resolution multicomponent seismic imaging of deepwater gas-hydrate systems. *The Leading Edge*, v. 25, no. 5, p. 578– 598.

Bernabini, M., F-L. Chiocci, F. Mele, L. Orlando, A. Bosman, L. Macelloni, 2005, *Rilievo batimetrico multibeam e sismico dell'alveo del Fiume Tevere*. Atti del XXIV Convegno Nazionale GNGTS, Rome, Italy, November, 15-18 2005.

Camilli, R., and A. Duryea. "Characterizing marine hydrocarbons with in-situ mass spectrometry." In *Proceeding of MTS/IEEE OCEANS 2007*, Vancouver, Canada 2007. doi:10.1109/OCEANS.2007.4449412

Camilli, R., C. Martens, J. Whelan, O. Pizarro, N. Farr, J. Goudreau, H. Mendlovitz, V. Ferrini. "Coordinated mapping and characterization of ocean floor methane sources with manned submersibles, AUVs and modular observatory arrays." In *EOS: Trans. Amer. Geophysical Union Fall Meeting Supplement*, 2006, Abstract.

Camilli, R., B. Bingham, M. Jakuba, H. Singh, and J. Whelan, 2004; Integrating In-situ Chemical Sampling with AUV Control Systems, In *Collected papers for 2004 Oceans Conference*, 9 pp. From 2004 Oceans conference in Victoria, B.C., Sept 2004.

Chapman, R., J. Pohlman, R. Coffin, J. Chanton, and L. Lapham, 2004; Thermogenic gas hydrates in the Northern Cascadia Margin, *Eos Trans. AGU*, 85 (38), p. 361.

Dobbs, Gary T., Balamurali Balu, Christina Young, Christine Kranz, Dennis W. Hess, and Boris Mizaikoff, 2007, *Mid-Infrared Chemical Sensors Utilizing Plasma-Deposited Fluorocarbon Membranes*, *Anal. Chem.*, 79(24), p. 9566-9571.

Gallager, S. and J. Whelan, 2004, The Next Generation of in situ Biological and Chemical Sensors in the Ocean, Workshop report and Executive summary of workshop held at Woods Hole Oceanographic Institution, Sept 2003, 18pp.

Geresi, E., C. Lutken, and T. McGee, 2002, Complex geology and gas hydrate dynamics characterize Mississippi Canyon Block 798 on the upper continental slope of the northern Gulf of Mexico, *Proceedings Gulf Coast Association of Geological Societies*, Volume 52, p. 309-321.

- Geresi, Erika, Ross Chapman, Tom McGee and J. R. Woolsey, 2004: Seismic calibration of the proposed DOE/JIP drill site in Atwater Valley 14. AAPG Annual Convention, Dallas, TX, Abstracts Volume, pA51.
- Hardage, B. A., DeAngelo, Michael, Sava, Diana, and Remington, Randy, 2006: Technology can avoid the fizzles. AAPG Explorer, Geophysical Corner, March, p. 28–29.
- Hardage, B. A., and Murray, Paul, 2006: High resolution P-P imaging of deepwater near-seafloor geology. AAPG Explorer, v. 27, no. 7, p. 30.
- Hardage, B. A., and Murray, P. E., 2006: Detailed imaging of deepwater hydrate geology with horizontal arrays of seafloor sensors. Offshore Technology Conference, paper 17929, 3 p.
- Hardage, B. A., Murray, Paul, Sava, Diana, Backus, M. M., Remington, R. L., Graebner, R. J., and Roberts, H. H., 2006: Evaluation of deepwater gas-hydrate systems. The Leading Edge, v. 25, no. 5, p. 572– 577.
- Hardage, B. A., Remington, R. L., and Roberts, H. H., 2006: Gas hydrate--a source of shallow water flow? The Leading Edge, v. 25, no. 5, p. 634– 636.
- Hardage, B. A., and Roberts, H. H., 2006: Gas hydrate in the Gulf of Mexico: what and where is the seismic target? The Leading Edge, v. 25, no. 5, p. 566– 571.
- Hardage, B. A., 2007: Gas hydrate and LNG tankers. AAPG Explorer, v. 28, no. 5, Geophysical Corner, p. 36.
- Hardage, B. A., Sava, Diana, DeAngelo, Michael, and Remington, R. L., 2007: Which seismic wave mode is best? AAPG Explorer, v. 28, no. 4, Geophysical Corner, p. 32.
- Higley, Paul, 2007: New Concepts in Robotic Operated Vehicle (ROV) Design. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC 10071.
- Ingram, Wesley, Meyers, S., Brunner, C., and Martens, C., 2008, Centennial millennial scale stability of a large gas hydrate field in the northern Gulf of Mexico, The Geological Society of America, Southeastern Section, 57th Annual Meeting, 10 -11 April, Abstracts and Program, v. 40, no. 4.
- Knapp, James H., Camelia C. Knapp, Leonardo Macelloni, Antonello Simonetti, Carol Lutken, 2010, *Subsurface Structure and Stratigraphy of a Transient, Fault-Controlled Thermogenic Hydrate System at MC-118, Gulf of Mexico* AAPG 2010 Annual Convention Oral Presentation, Abstracts Volume, p.134.
- Knapp, Camelia C., James H., Knapp, Adrian Addison, Leonardo Macelloni, Michael Waddell, 2010, *Geophysical Baseline Characterization of Subsurface Gas Hydrates at MC-118, Gulf of Mexico*, AAPG 2010 Annual Convention Poster Presentation, Abstracts Volume, p.134.

- Lapham, L. L., J. P. Chanton, Martens, C. S., Mendlovitz, H. P., Higley, P. D., Lutken, C. B., and Woolsey, J. R. (2008). Unique tools sample sediment pore water near seafloor hydrate mounds in the Gulf of Mexico. *Fire in the Ice Methane Hydrate Newsletter*. Winter: 20pg.
- Lapham, Laura, Jeffery Chanton, Robert Woolsey, Kenneth Sleeper, 2007: Biogeochemical Sensors: Design and Applications of the Pore Fluid Array for the Mississippi Canyon 118, Gas Hydrate Seafloor Observatory. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC 10075.
- Lapham, L.L., Chanton, J.P., Martens, C.S., Higley, P.D., Jannasch, H.W., Woolsey, J.R., 2006: Pore Fluid Array Construction and Deployment at Mississippi Canyon 118, Gulf of Mexico. Offshore Technology Conference, Houston, TX, #18170.
- Lloyd, K.G., L. Lapham, and A. Teske. 2006. An anaerobic methane-oxidizing community of ANME-1 archaea in hypersaline Gulf of Mexico sediments. *Applied and Environmental Microbiology*. Volume 72, p. 7218-7230.
- Lapham, L. L., Martens, C. S. and Coffin, R. B. 2003: Controls on the isotopic composition of dissolved methane in the pore waters of sediments containing disseminated gas hydrate off of Cascadia Margin. American Society of Limnology and Oceanography annual meeting program, p. 82.
- Lowrie, A., and T. McGee, 2002, Sediment Strength and Hydrates Along the Northern Gulf of Mexico, Houston, TX, *Proceedings of the 2002 Offshore Technology Conference*, p. 401-407.
- Lowrie, A., T. McGee, and I. Lerche, 2002, Natural Gas Hydrates: Geologic Constituents from the Birth of Planet Earth to the Present, Houston, TX, *Proceedings of the 2002 Offshore Technology Conference*, p. 359-366.
- Lowrie, A., and C. Lutken, 2005, Free gas exploitation within the northern Gulf of Mexico; a viable potential?, New Orleans, LA, *Transactions of the 55<sup>th</sup> Annual Meeting of the GCAGS*, p. 456-461.
- Lowrie, A., C. Lutken, and T. McGee, 2004, Multiple Outer Shelf Deltas and Downslope Massive Mass-Wastings Characterize the Mississippi Canyon, Northern Gulf of Mexico, *GCAGS/GCSSEPM Transactions*, Volume 54, p. 383-392.
- Lowrie, A., P. Dean, and C. Lutken, 2004, Within five years, hydrate exploitation can be a reality in the northern Gulf of Mexico, *GCAGS/GCSSEPM Transactions*, Volume 54, p. 371-382.
- Lowrie, A., Dean, P.A., Lutken, Carol Blanton, Geresi, Erika, and McGee, Tom, 2004: The lower Mississippi Canyon: Possible Loci of Multiple Mass-Wasting Events. AAPG Annual Convention, Dallas, TX, Abstracts Volume, pA88.

- Lowrie, A., Dean, P.A., Lutken, Carol Blanton, Geresi, Erika, and McGee, Tom, 2004: Hydrate Exploration and Exploitation within Five Years in the Northern Gulf of Mexico, AAPG Annual Convention, Dallas, TX, Abstracts volume, pA87.
- Lutken, C.B., Brunner, C.A., Lapham, L., Chanton, J., Rogers, R., Sassen, R., Dearman, J., Lynch, L., Kuykendall, J., Lowrie, A., 2006: Analyses of Core Samples from Mississippi Canyon 118. Offshore Technology Conference, Houston, TX, #18208.
- Lutken, C., 2005, Mississippi Canyon Block 118 Seafloor Monitoring Station Update, *U.S. DOE-NETL Fire in the Ice Newsletter*, Spring, available on line ([click here](#)).
- Lutken, C., A. Lowrie, E. Geresi, R. Bennett, R. Faas, B. Battista and T. McGee, 2003, Interpretation of high resolution seismic data from a geologically complex continental margin, northern Gulf of Mexico, *GCAGS/GCSSEPM Transactions*, Volume 53, p. 504-516.
- Lutken, C., T. McGee, A. Lowrie, C. Brunner, R. Rogers, L. Macelloni, A. Bosman, K. Sleeper, J. Dearman, J. Woolsey, and L. Lynch, 2006, Comparison of Two Gas Hydrates Sites for Sea Floor Monitoring, *Transactions of the 56<sup>th</sup> Annual Meeting of the GCAGS*, Lafayette, LA, p.515-526.
- Lutken, C., and T. McGee, 2004, Remote Observatory to Provide Detailed Data on Near-Sea-Floor Fluid Dynamics, *U.S. DOE-NETL Fire in the Ice Newsletter*, Summer, available online ([click here](#)).
- Lutken, Carol Blanton, Geresi, Erika, McGee, Tom, Wood, Warren T., and Lowrie, A., 2004: Complex Geology Creates Difficult Interpretational Scenarios in Hydrated Areas Along Western Flank of Mississippi Canyon, Northern Gulf of Mexico, AAPG Annual Convention, Dallas, TX, Abstracts Volume, pA89.
- Lutken, C. B. and J. R. Woolsey, 2007: A Sea Floor Observatory for Real -Time Investigation of Gas Hydrates. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC 10070.
- Lutken, C., 2008: In Memorium: J. Robert Woolsey, Jr., *Fire in the Ice Newsletter*, Fall, p. 22-24.
- Macelloni, L., 2007: AUV Multibeam Sonar: Survey, Mapping Application and Relevant Data Processing. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC 10078.
- Martens, Christopher, Howard Mendlovitz, Rich Camilli, Norman Farr, J. Robert Woolsey, Kenneth Sleeper, 2007: Design and application of the Chimney Sampler and Benthic Boundary Layer Arrays for the Mississippi Canyon 118, Gas hydrate seafloor observatory. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC10074.

- McGee, T., C. Lutken, L. Macelloni, J. R. Woolsey, L. Lapham, R. Kleinberg, B. Battista, C. Knapp, S. Caruso, V. Goebel, R. Chapman, P. Gerstoft , 2009, A multidisciplinary sea-floor observatory in the northern Gulf of Mexico, Oceans 2009 in Biloxi, MS.
- McGee, T.; J. R. Woolsey, L. Lapham, R. Kleinberg, L. Macelloni, B. L Battista, C. Knapp, S. Caruso, V. Goebel, R. Chapman, P. Gerstoft, 2009, A Multidisciplinary Sea-Floor Observatory in the Northern Gulf of Mexico. Proceedings of the Virtual Institute of Scientific Users of Deep-Sea Observatories, Tromsø, Norway, June 11-12
- McGee, Thomas, 2007: Implementation of Shallow-Source/Deep-Receiver Technology to Obtain High Seismic Resolution of Sub-bottom Sediment in Deep Water. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC10062.
- McGee, Thomas, 2007: Geophysical Sensors: Design and Applications of the Acoustic Water-column Line Array and Seismic Sea-floor Line Arrays for the Gulf of Mexico Sea-floor Observatory. Mid-South Area Science and Engineering Conference, Oxford, MS, MAESC10063.
- McGee, T., and Lowrie, A., 2000: Impact of hydrates on planetary evolution. Proceedings of the 31st International Geological Congress, Rio de Janeiro, Brazil.
- McGee, T., 2006, A seafloor observatory to monitor gas hydrates in the Gulf of Mexico, *The Leading Edge*, Volume 25, n. 5, p. 644-647.
- McGee, T. and J. Woolsey, 2000, A Remote Station to Monitor Gas Hydrate outcrops in the Gulf of Mexico, *Annals of the New York Academy of Science*, Volume 912, p. 527-532.
- McGee, Tom, and Hardage, B. A., 2006: Hydrate system to be monitored: AAPG Explorer, Geophysical Corner, May, p. 24.
- McGee, Tom, and Leonardo Macelloni, 2006: Overview of observatory development and the site selection process. OTC Paper No. 18204, Houston, 3 May.
- McGee, T., Chapman, R., Knapp, C., Geresi, E., Battista, B., Morley, M. and Woolsey, R., 2004: An integrated seismic study of the proposed DOE/JIP drill site in Atwater Valley Block 14. AAPG Annual Convention, Dallas, TX, Abstracts Volume, pA94.
- Morley, Mike, Chapman, Ross, McGee, Tom, and Woolsey, J.R., 2004: Estimation of Seismic Velocities in the Hydrate Stability Zone Using Ship Noise at a Vertical Hydrophone Array, AAPG Annual Convention, Dallas, TX, Abstracts Volume, pA99. .
- Pizarro, O., N. Farr, R. Camilli, J. Whelan, C. Martens, J. Goudreau, H. Mendlovitz, L. Camilli. "In-situ Optical Characterization of Methane Seeps and Bubble Plumes." In EOS: Trans. Amer. Geophysical Union Fall Meeting Supplement, 2006, Abstract.

- Roberts, H., 2002, Surficial gas hydrates, part of the fluid and gas expulsion response spectrum: Identification from 3D seismic data, *Proceedings of the 2002 Offshore Technology Conference*.
- Roberts, H., J. Coleman, J. Hunt, Jr., and W. Shedd, 2000, Improving interpretation of sea floor geology, biology from remote sensing, *Offshore*, Volume 25, n. 9, p. 126-128.
- Roberts, H. H., Hardage, B. A., Shedd, W. W., and Hunt, J., Jr., 2006: Seafloor reflectivity--an important seismic property for interpreting fluid/gas expulsion geology and the presence of gas hydrate. *The Leading Edge*, v. 25, no. 5, p. 620– 628.
- Rogers, R., J. Dearman, and H. Roberts, 2003, Enhancement of Gas Hydrate Formation in Gulf of Mexico Sediments, Houston, TX, *Proceedings of the 2003 Offshore Technology Conference*, paper 15393.
- Rogers, R., C. Kothapalli, and M. Lee, 2002, Influence of microbes on gas hydrate formation in porous media, *Proceedings of the Fourth International Conference on Gas Hydrates*, Yokohama, Japan, p. 547- 552.
- Sassen, R., 2002, Gas venting and gas hydrate stability in the northwestern Gulf of Mexico: Significance to sediment deformation, *Proceedings of the 2002 Offshore Technology Conference*.
- Sassen, R., H. Roberts, W. Jung, C. Lutken, D. DeFreitas, S. Sweet, and N. Guinasso, Jr., 2006, The Mississippi Canyon 118 gas hydrate site: a complex natural system, *Proceedings, 38<sup>th</sup> Offshore Technology Conference*, paper 18132.
- Sassen, R., S. T. Sweet, A. V. Milkov, D. A. DeFreitas, G. G. Salata, and E. C. McDade, 2007, Geology and Geochemistry of Gas Hydrates, Central Gulf of Mexico Continental Slope, *Corpus Christi Geological Society Bulletin*, January.
- Sava, Diana, and Hardage, B. A., 2006: Rock physics characterization of hydrate-bearing deepwater sediments. *The Leading Edge*, v. 25, no. 5, p. 616– 619.
- Sleeper, K., A. Lowrie, A. Bosman, L. Macelloni, and C. Swann, 2006, Bathymetric mapping and high resolution seismic profiling by AUV in MC118 (Gulf of Mexico), *Proceedings 38<sup>th</sup> Offshore Technology Conference*, Paper No. 18133.
- Wang X.-C., R. F. Chen, J. Whelan and L. Eglinton, 2001: Contribution of "old" carbon from natural marine hydrocarbon seeps to sedimentary and dissolved organic carbon pools in the Gulf of Mexico. *Geophysical Research Letters*, 28, p. 3313-3316.
- Woolsey, J.R., T. McGee, C. Lutken, and P. Higley, 2005, Gas Hydrates Seafloor Observatory--- First Stage Deployment and Test Set for 2005, *Proceedings of the 2005 Offshore Technology Conference*, paper 17571.

Zhang C. L., J. Noakes. 2006. Sea-floor Observatory in the Gulf of Mexico: Tracing the Carbon Flow in Gas-Hydrate Environments. OTC publication. Paper number: OTC 17804-pp.

Zhang C.L. and Noakes J. 2006, Hydrates As An Energy Source: Lipid Biomarkers And Carbon-Isotope Signatures For Tracing The Carbon-and-Energy Flow In The Gulf of Mexico Gas-Hydrate Systems. Ocean Technology Conference, May 2006. Houston, TX.

### **Presentations**

Abrams, M., and J. Whelan, 2002, Near-Surface Hydrocarbon Migration: Mechanisms and Seepage Rates, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, April 7-10.

Baena, A., G. Dobbs, and B. Mizaikoff, 2004, Investigating Polymer Coatings for Infrared Methane Sensing Applications in the Deep Sea, Research Triangle Park, NC, Southeast Meeting of the American Chemical Society, November.

Battista, B., Camelia C. Knapp, E. Geresi, T. McGee, R. Chapman, A. Lowrie, J. R. Woolsey, 2004, Gas Hydrates of the Northern Gulf of Mexico from Standard Processing of Vertical Line Array and Deep-towed Data: Structural Control on Seafloor Deformation and Slope Destabilization, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.

Battista, Bradley , A. Addison, Camelia Knapp, T. McGee, Application of the Empirical Mode Decomposition to Seismic Reflection and Ground Penetrating Radar Data, AGU Fall Meeting, Dec. 2007.

Battista, B. M. and Camelia Knapp, Using the Hilbert-Huang Transform to Improve Seismic Profiling of Gas Hydrates in the Gulf of Mexico, AGU, Dec. 2004.

Bell, R. J., S. K. Toler, R. T. Short, In Situ Chemical Analyses by Underwater Mass Spectrometry (oral), Goldschmidt Conference on Earth, Energy and the Environment in Knoxville, TN (2010).

Bell, R. J., S. K. Toler, R. T. Short, R. H. Byrne, In Situ Mass Spectrometry for Chemical Measurements in the Water Column and on the Sea Floor (poster), OceanObs '09 meeting in Venice, Italy (2009).

Biddle, J.F., S.M. Huse, M.L. Sogin, K.G. Lloyd, A. Ramette, A. Boetius, and A. Teske, 2009, Microbial Census of Marine Microbes at Methane Seeps: Initial results. Marine Biological Laboratory, Woods Hole, MA, ICOMM User workshop, April 6-9.

Bowles, M.W., and S.B. Joye (2009) A geochemical and microbiological analysis of nitrate reduction at a hydrothermal vent and a cold seep. 19th Annual V. M. Goldschmidt Conference, Davos, Switzerland, June.

- Bowles, M.W., and S.B. Joye (2008) Nitrate reduction pathways in sediments from a Gulf of Mexico cold seep. Denitrification RCN Meeting, Cambridge Maryland, May.
- Bowles, M.W., V.A. Samarkin, and S.B. Joye. (2008) Activity, diversity and relative abundance of sulfate reducing bacteria in oil-rich sediments from a lower continental slope Gulf of Mexico cold seep. ASLO-AGU-ERF-TOS Ocean Sciences, Orlando Florida, March.
- Camilli, R., L. Macelloni, V. Asper, M. Woolsey, J. Williams, A. Diercks, C.B. Lutken, K. Sleeper, 2009, Discovery and characterization of cold seeps using a mass spectrometer operating aboard an autonomous underwater vehicle, AGU fall meeting, San Francisco, CA, December, 17, 2009.
- Camilli, R., A. Duryea. "Characterizing marine hydrocarbons with in-situ mass spectrometry." In *Proceeding of MTS/IEEE OCEANS 2007*, Vancouver, Canada 2007. doi:10.1109/OCEANS.2007.4449412
- Cathles, L., C. Dofu, and H. Roberts, 2002, Estimation of the hydrate gas content of the Bush Hill vent site, Green Canyon Block 185, Gulf of Mexico, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, March 10-13.
- Chanton, J. P., L. L. Lapham, C. S. Martens, P. D. Higley, and J. R. Woolsey. 2007. Gulf of Mexico Hydrate Research Consortium Geochemistry Overview. Geochemistry Department of Energy-National Energy Technology Laboratory Merit Review Board Meeting. Oral presentation. Golden, Colorado. September 17-21.
- Dobbs, G., 2002, Mid-IR Sensing of Marine Pollutants in a Simulated Subsea Environment: Charleston, SC, SERMACS, November 13-16.
- Dobbs, Gary T., An Nguyen, Yulia Luzinova, Yosef Raichlin, Christine Kranz, Abraham Katzir, Roger Sassen, and Boris Mizaikoff, 2007, *Infrared Spectroscopy for Exploring Complex Oceanic Gas Hydrate Ecosystems*, FACSS, 10-07, Memphis, TN.
- Dobbs, G. and B. Mizaikoff , 2006: In-situ monitoring of gas hydrate formation/dissociation with mid-IR fiber-optic evanescent field spectroscopy. Europt(r)ode VIII, Tuebingen, Germany, April 2-5.
- Dobbs, G., Y. Raichlin, A. Katzir, B. Mizaikoff, 2006: Mid-Infrared Fiberoptic Evanescent Field Spectroscopy on the Nucleation of Gas Hydrates. Eastern Analytical Symposium, Somerset, NJ, November 13-16.
- Dobbs, G., and B. Mizaikoff, 2005, IR-ATR Deep-Sea Sensing Interfaces: Optimizing Probe Designs through Experimental and Spectral Ray Tracing Analysis of Evanescent Field Interactions, Atlanta, GA, Optics in the Southeast, October.

- Dobbs, G., P. Boezerooij, N. Pennington, F. Vogt, and B. Mizaikoff, 2004, IR-ATR Spectroscopy for Underwater Sensing Applications, Seventh European Conference on Optical Chemical Sensors and Biosensors [Europt(r)odeVII], Madrid, Spain, April.
- Dobbs, G., N. Pennington, F. Vogt, and B. Mizaikoff, 2003, Investigating the Influence of Pressure on IR-ATR Spectroscopy for Underwater Spectroscopic Sensing Applications, Atlanta, GA, Southeast Meeting of the American Chemical Society, November.
- Dobbs, G., B. Balu, C. Young, A. Sinha, D. Hess, and B. Mizaikoff, 2006, Plasma-Assisted Deposition of Fluorocarbon Films for Molecular Recognition Layers in Mid-IR ATR Chemical Sensors, Lake Buena Vista, FL, Federation of Analytical Chemistry & Spectroscopy Societies National Conference, September.
- Geresi, E., 2005, Gas Hydrate Geohazard Assessment in the Northern Gulf of Mexico Using a Vertical Line Array, Calgary, AB, Canada, The American Association of Petroleum Geologists Annual Meeting, June 19-22.
- Geresi, E., D. Hutchinson, P. Hart, and T. McGee, 2003, Using multiple attenuation to image geologic structures beneath the gas hydrate stability zone in the northern Gulf of Mexico, Seattle, WA, Geological Society of America Annual Meeting, Volume 35, n. 7, November.
- Geresi, E. and T. McGee, 2003, Seismic Imaging of the Base of the Hydrate Stability Zone in the Northern Gulf of Mexico, Nice, France, EGU-AGU Joint Conference, April.
- Geresi, E., 2002, Seismic Images of Geological Structures associated with Gas Hydrates near the Sea floor in the Mississippi Canyon Blocks, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, March.
- Gerstoft, P., LA Brooks, S Fried, B Kuperman, K Sabra, 2007, *Ocean acoustic interferometry using noise and active sources*, invited paper presented by Peter Gerstoft at the American Geophysical Union Meeting, San Francisco, CA.
- Haacke, R., M. Riedel, J. Pohlman, K. Rose, L. Lapham, T. Hamilton, R. Enkin, G.D. Spence, and R.D. Hyndman. Investigations on the role of gas hydrate in wide-spread slope failures at frontal ridges of the accretionary wedge of the northern Cascadia margin. American Geophysical Union meeting, Dec 2008.
- Hardage, B., 2006, Detailed imaging of deepwater hydrate geology with horizontal arrays of seafloor sensors, Houston, TX, Offshore Technology Conference, May.
- Hardage, B., 2006, Seismic estimation of gas hydrate concentrations in deepwater environments: assumptions and limitations, Houston, TX, The American Association of Petroleum Geologists Annual Convention, April.

- Hardage, B., 2005, Assessing deep water gas hydrate systems and seafloor stability, AGU-NABS-SEG-SPD/AAS Joint Assembly, New Orleans, LA, May 23–27.
- Hutchinson, Deborah R., Hart, Patrick E., Dugan, Brandon, Geresi, Erika, Sliter, Ray, and Newman, Kori, 2003: Subsurface Gas Hydrates in the Northern Gulf of Mexico. Annual Meeting of the Geological Society of America, Seattle, Washington. p.533
- Hvozدارa, L., 2001, Long-term Observation in the Marine Environment using Mid-Infrared Spectroscopic Techniques and Quantum Cascade Lasers, Montpellier, France, Fourth International Conference on Mid-Infrared Optoelectronics Materials and Devices, April 2-4.
- Hvozدارa, L., 2001, Quantum Cascade Lasers in Mid-Infrared Spectroscopy, Turku, Finland, 1<sup>st</sup> International Conference on Advanced Vibrational Spectroscopy, August 19-24.
- Ingram, Wesley, Meyers, S., Brunner, C., and Martens, C., 2008, Centennial millennial scale stability of a large gas hydrate field in the northern Gulf of Mexico, The Geological Society of America, Southeastern Section, 57th Annual Meeting, 10 -11 April, Abstracts and Program, v. 40, no. 4.
- Ingram, W.C., Meyers, S.M., Brunner, C., and Martens, C., Centennial-Millennial scale stability of a large Gas Hydrate field in the Northern Gulf of Mexico, Abstract. Presented at the Society of Exploration Geophysics Meeting on Unconventional Resources, Vancouver, British Columbia, Canada, Sept. 2008.
- Janotta, M., and B. Mizaikoff, 2003, Sol-gel Based Mid-Infrared Evanescent Wave Sensors for Detection of Nitro-Compounds in Aqueous Solution, Orlando, FL, The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), March 9-14.
- Janotta, M., and B. Mizaikoff, 2002, Novel Recognition Layers for Mid-Infrared Evanescent Wave Sensors based on Organically Modified Sol-gels, Southeastern Regional Meeting of the American Chemical Society, Charleston, SC, November 13-16.
- Janotta, M., and B. Mizaikoff, 2001, Organically Modified Sol-Gels – Novel Recognition Layers for Infrared Optical Sensors, Blarney, Ireland, Fifth Euroconference on Environmental Analytical Chemistry: The Impact of Biosensors and Bioanalytical Techniques on Environmental Monitoring, September 8-12.
- Karlowatz, M., 2002, Recent Developments in the Field of Mid-Infrared Fiberoptic Sensors for the Marine Environment, The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), New Orleans, LA, March 17-22.

- Karlowatz, M., F. Vogt, and B. Mizaikoff, 2003, An Automated Sample Preparation System for Volatile Organic Compounds applied for IR Evanescent Wave Sensor Calibration, The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 9-14.
- Karlowatz, M., F. Vogt, and B. Mizaikoff, 2002, An Automated Sample Preparation System for Volatile Compounds Applied for Infrared Evanescent Wave Sensor Calibration, Southeastern Regional Meeting of the American Chemical Society, Charleston, SC, November 13-16.
- Knapp, James H., Camelia C. Knapp, Leonardo Macelloni, Antonello Simonetti, Carol Lutken, 2010, *Subsurface Structure and Stratigraphy of a Transient, Fault-Controlled Thermogenic Hydrate System at MC-118, Gulf of Mexico* AAPG 2010 Annual Convention Oral Presentation, Abstracts Volume, p.134.
- Knapp, Camelia C., James H., Knapp, Adrian Addison, Leonardo Macelloni, Michael Waddell, 2010, *Geophysical Baseline Characterization of Subsurface Gas Hydrates at MC-118, Gulf of Mexico*, AAPG 2010 Annual Convention Poster Presentation, Abstracts Volume, p.134.
- Lapham, L.L., C.S. Martens, and J.P. Chanton. Controls on gas hydrate stability in methane-depleted sediments: Laboratory and field measurements, American Geophysical Union (AGU) fall meeting, San Francisco, CA, December, 17, 2009.
- Lapham, L., J. Chanton, C. Martens, P. Higley, H. Jannasch, J. Woolsey, and K. Sleeper, 2007, Biogeochemical sensors: design and applications of the Pore Fluid Array for the Mississippi Canyon 118 Gas Hydrate Seafloor Observatory, Oxford, MS, Mid-South Area Engineering and Sciences Conference, University of Mississippi, May 17-18.
- Lapham, L., J. Chanton, C. Martens, P. Higley, H. Jannasch and J. Woolsey, 2007, Monitoring long term hydrate stability: in situ methane and the Pore Fluid Array (PFA), Oxford, MS, Gulf of Mexico Hydrates Research Consortium Annual Meeting.
- Lapham, L., D. Albert, J. Chanton, and C. Martens, 2001, Light hydrocarbon distributions and sulfate reduction rates in sediment porewaters near exposed gas hydrates, American Society of Limnology and Oceanography Annual Meeting.
- Lapham, L., J. Chanton, C. Martens, H. Scheafer, R. Chapman, and J. Puhlman, 2003, Innovations in Sampling Pore Fluids From Deep-Sea Hydrate Sites, San Francisco, CA, EOS, Transaction, American Geophysical Union, Volume 84, Fall Meeting Supplement, Abstract OS52D-05, December 8-12.
- Lapham, L., J. Chanton, C. Martens, J. Pohlman, and R. Chapman, 2005, In-situ light hydrocarbon concentrations and stable carbon isotope values in hydrate-bearing sediments of Cascadia Margin, Vancouver Island, Vienna, Austria, Second General Assembly European Geosciences Union, April 24-29.

- Lapham, Laura, Jeff Chanton, Chris Martens, Ken Sleeper, and J. R. Woolsey, 2007, *Methane and biogeochemical gradients within acoustic wipe-out zones at a Gulf of Mexico cold seep*, presented by Lapham at the American Geophysical Union Meeting, San Francisco, CA.
- Lapham, L.L., J. Chanton, C.S. Martens, K Sleeper and J.R. Woolsey. 2007. Methane and biogeochemical gradients within acoustic wipe-out zones at a Gulf of Mexico cold seep. American Geophysical Union. Oral presentation. Acapulco, Mexico, May 22-25.
- Lapham, L. L., J. P. Chanton, C. S. Martens, K. Sleeper and J. R. Woolsey. 2007. Spatial variability in microbial activity associated with acoustic wipe-out zones in the northern Gulf of Mexico. Abstract. American Geophysical Union, Acapulco, Mexico, May 22-25.
- Lapham, L.L., J.P. Chanton, C.S. Martens, P. D. Higley, H. W. Jannasch and J.R. Woolsey. Temporal variability in pore-fluid chemistry at a Gulf of Mexico gas hydrate site. American Geophysical Union meeting, Dec. 2008.
- Lloyd, K.G., MacGregor, B.J., and A. Teske, 2008, Quantification of archaeal RNA and DNA in marine sediments with qPCR and qRT-PCR. Cairns, Australia, 12<sup>th</sup> Meeting of the International Society for Microbial Ecology (ISME), August 11-15.
- Lloyd, K.G., 2009, Spatial structure and activity of shallow microbial communities in a Gulf of Mexico methane seep. Goldschmidt Conference, Davos, Switzerland, June 21-26.
- Lowrie, A., P. Dean, and C. Lutken, 2004, Within five years, hydrate exploitation can be a reality in the northern Gulf of Mexico, San Antonio, TX, Gulf Coast Association of Geological Societies, Fourth Annual Convention, October 10-12.
- Lowrie, A., C. Lutken, and T. McGee, 2004, Multiple Outer Shelf Deltas and Downslope Massive Mass-Wastings Characterize the Mississippi Canyon, Northern Gulf of Mexico, San Antonio, TX, Gulf Coast Association of Geological Societies, Fourth Annual Convention, October 10-12.
- Lowrie, A., and T. McGee, 2002, Sediment Strength and Hydrates Along the Northern Gulf of Mexico, Houston, TX, Offshore Technology Conference, May 6-9.
- Lowrie, A., T. McGee, and I. Lerche, 2002, Natural Gas Hydrates: Geologic Constituents from the Birth of Planet Earth to the Present, Houston, TX, Proceedings, Offshore Technology Conference, May 6-9.
- Lutken, C., T. McGee, A. Lowrie, C. Brunner, R. Rogers, L. Macelloni, A. Bosman, K. Sleeper, J. Dearman, R. Woolsey, L. Lynch, 2006, Comparison of Two Gas Hydrates Sites for Sea Floor Monitoring, Lafayette, LA, 56<sup>th</sup> Annual Meeting of the Gulf Coast Association of Geological Societies, September 25-27.

- Lutken, C., T. McGee, and R. Woolsey, 2006, Gulf of Mexico Gas Hydrates Monitoring Station and Sea-floor Observatory: A Status Report, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Lutken, C., T. McGee, A. Lowrie, C. Brunner, R. Rogers, L. Macelloni, A. Bosman, K. Sleeper, J. Dearman, R. Woolsey, L. Lynch, 2006, Comparison Of Two Candidate Sites For Gas Hydrates Sea Floor Monitoring, Vicksburg, MS, Mississippi Academy of Sciences' Annual Meeting, February 21-22.
- Lutken, C., T. McGee, and R. Woolsey, 2006, Gulf of Mexico Gas Hydrates Monitoring Station and Sea-floor Observatory: Status Report, Houston, TX, The American Association of Petroleum Geologists Annual Convention, April 9-12.
- Lutken, C., T. McGee, R. Rogers, J. Dearman, F. Lynch, C. Brunner, J. Kuykendall, and R. Woolsey, 2005, Can Fractures in Soft Sediments Host Significant Quantities of Gas Hydrates?, Oxford, MS, Mississippi Academy of Sciences' Annual Meeting, February 17-18.
- Lutken, C., 2004, Complex geology creates difficult interpretational scenarios along western flank of Mississippi Canyon, northern Gulf of Mexico, Dallas, TX., The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- Lutken, C., R. Woolsey, T. McGee, and E. Geresi, 2003, Geologic interpretation of the shallow subsurface within the gas hydrate stability zone, northern Gulf of Mexico, Nice, France, European Geophysical Union-American Geophysical Union Joint Conference, April 6-11.
- Lutken, C., A. Lowrie, E. Geresi, R. Bennett, R. Faas, B. Battista, and T. McGee, 2003, Interpretation of High Resolution Seismic Data from a Geologically Complex Continental Margin, Northern Gulf of Mexico, Baton Rouge, LA, Gulf Coast Association of Geological Societies, 53<sup>rd</sup> Annual Convention, October 22-24.
- Lutken, C., 2003, Unexplained Geologic Features within the Hydrate Stability Zone, Upper Slope Mississippi Canyon, Northern Gulf of Mexico, Seattle, WA, Geological Society of America Annual Meeting, November 2-5.
- Lutken, C.B., 2007, *Gulf of Mexico Gas Hydrates Research Consortium and Sea-floor Observatory*, Report to the Department of Energy's Methane Hydrate Merit Review, Golden, Colorado September 20.
- Lutken, C.B., 2007, *Gulf of Mexico Gas Hydrates Research Consortium and Sea-floor Observatory* Report to the Department of Energy's Methane Hydrate Advisory Committee, Golden, CO, April 24 – 25.

- Lutken, Carol B., Leonardo Macelloni, Laura Lapham, Simona Caruso, Mariangela Lodi, Richard Camilli, Vernon Asper, Arne Diercks, Camelia Knapp, Jim Knapp, 2010, *Monitoring Seafloor Morpho-Geological Evolution of the MC118 Hydrate/Carbonate Mound via Multiple AUV Missions*, AAPG 2010 Annual Convention Poster Presentation, Abstracts Volume, p.155.
- Macelloni, L., S. Caruso, T. M. McGee, C. B. Lutken, A. Bosman, K. Sleeper and J.R. Woolsey Jr., 2007: Mississippi Canyon Block 118 Hydrates Mound: a complex hydrates structure in the Northern Gulf of Mexico. Oral Presentation, Sesto Forum Italiano di Scienze della Terra - Geoitalia 2007, Rimini, September, 12-14.
- Macelloni, Leonardo, Bradley M. Battista, Thomas M. McGee and Vaughn Goebel, 2008, *A Band-Modulated Hilbert-Huang Transform For Seismic Attribute Analysis In Shallow, Hydrate-Bearing Sediments*, IEEE/OES Chile-US Workshop on Ocean Observation Systems, Working Group on Observation and Assessment of Gas Hydrates in the Coastal Ocean, Viña Del Mar, Chile, 4-7 Nov., 2008.
- McGee, T. 2009, Geologic structures associated with the carbonate/hydrate mound in Mississippi Canyon Block 118, Gulf of Mexico, AGU fall meeting, San Francisco, CA, December, 17, 2009.
- McGee, T.M., 2007: Using ambient noise for subsurface imaging. Underwater noise workshop, International Association of Oil and Gas Producers, Burlington, Massachusetts, 4-5 June.
- McGee, Tom, Peter Gerstoft, and Ross Chapman, 2007: Using ambient noise to image the interior of a carbonate/hydrate mound. Gas-Hydrate Observatories Workshop, Portland, Oregon, 18-20 July.
- McGee, T., C. Lutken, R. Rogers, C. Brunner, P. Verdugo and J. R. Woolsey, 2007: Why and how hydrates fill fractures in soft sediments. Gas-Hydrate Observatories Workshop, Portland, Oregon, 18-20 July.
- McGee, T. M., L. Macelloni, Vaughn Goebel, 2007, Seismo-acoustic imagery of a carbonate/hydrate mound in the Gulf of Mexico. In McKay, M. and J. Nides (eds) 2007, *Proceedings: Twenty-third Gulf of Mexico information transfer meeting*, January 2007. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, La. OCS Study MMS 2007-066. 612 pp.
- McGee, T.; Woolsey, J.R.; Lapham, L.; Kleinberg, R.; Macelloni, L.; Battista, B.; Knapp, C.; Caruso, S.; Goebel, V.; Chapman, R.; Gerstoft, P. 2008. Structure Of A Carbonate/Hydrate Mound In The Northern Gulf Of Mexico. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. [\(click here\)](#).

- McGee, T., 2006, A Seafloor Observatory to Monitor a Cold Seep in the Gulf of Mexico, Oceanography Division of the Institute of Electrical and Electronic Engineers, US-EU Baltic International Symposium, Klaipeda, Lithuania, May 23-25.
- McGee, T., C. Lutken, R. Sassen, C. Brunner, R. Rogers, L. Macelloni, A. Bosman, K. Sleeper, J. Dearman, R. Woolsey, L. Lynch, 2006, Preliminary results at a hydrate/carbonate mound in the northern Gulf of Mexico, Edinburgh, Scotland, 5<sup>th</sup> International Workshop on Methane Hydrate Research and Development, October 9-12.
- McGee, T., 2005, Can Fractures in Soft Sediments Host Significant Quantities of Gas Hydrates?, Victoria, BC, Canada, Fourth International Methane Hydrates Workshop, May 9-11.
- McGee, T., C. Lutken, R. Woolsey, R. Rogers, J. Dearman, F. Lynch, and C. Brunner, 2005, Can Fractures in Soft Sediments Host Significant Quantities of Gas Hydrates?, Calgary, AB, Canada, The American Association of Petroleum Geologists Annual Meeting, June 19-22.
- McGee, T., C. Lutken, R. Rogers, C. Brunner, J. Dearman, F. Lynch, and R. Woolsey, 2004, Can Fractures in Soft Sediments Host Significant Quantities of Gas Hydrates?, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 9-12.
- McGee, T., C. Lutken, and R. Woolsey, 2002, Seismic Images of Structures Associated with Gas Hydrates near the Sea Floor: Initial Results, Biloxi, MS, Mississippi Academy of Sciences 66<sup>th</sup> Annual Meeting, February 21-22.
- McGee, T., L. Macelloni, A. Bosman, C. Lutken, C. Brunner, R. Rogers, J. Dearman, K. Sleeper, and R. Woolsey, 2006, Hydrocarbon Gas Hydrates In Sediments of the Gulf of Mexico, Sediment-hosted Gas Hydrates, New Insights on Natural and Synthetic Systems, January.
- McGee, T., L. Macelloni, A. Bosman, C. Lutken, C. Brunner, R. Rogers, J. Dearman, K. Sleeper, and J. Woolsey, 2006, Hydrocarbon gas hydrates in sediments of the Gulf of Mexico, Burlington House, Piccadilly, U.K., Geological Society of London, January.
- McGee, T., R. Woolsey, and C. Lutken, 2005, A New Method for Improving the Resolution of Shallow Sub-bottom Seismic Reflections in Deep Water, New Orleans, LA, Society of Exploration Geophysicists and the American Geophysical Union Joint Assembly Meeting, May 23-27.
- McGee, T., 2004, An Integrated Seismic Study of the Proposed U.S. DOE/JIP Drill Site in Atwater Valley Block 14, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- McGee, T., C. Lutken, V. Goebel, and R. Woolsey, 2001, Seismic images of structures associated with gas hydrates near the sea floor, Amsterdam, The Netherlands, 63<sup>rd</sup> Conference of the European Association of Geoscientists and Engineers, June 11-15.

- McGee, T., and R. Woolsey, 2001, Pushing the limits of seismic resolution in deep water, Stavanger, Norway, 11th International Offshore and Polar Engineering Conference, June 17-22.
- McGee, T., 2002, Report on Activities During FY2002 of the Gulf of Mexico Gas Hydrate Monitoring Station Project, Washington, DC, The Second Workshop of the International Committee on Methane Hydrates, October 28-31.
- McGee, T., E. Geresi, and A. Gossett, 2003, Imaging the hydrate stability zone using a vertical array: First results, Houston, TX, Offshore Technology Conference, May 5-8.
- McGee, T., V. Goebel, and E. Geresi, 2003, Closing the Gap Between the Hydrate Stability Zone and Production Reservoirs, Seattle, WA, Annual Meeting of the Geological Society of America, November 2-5.
- McGee, T. and R. Rogers, 2008, Biogeophysics in the context of natural gas hydrates: Northern Gulf of Mexico, Portland, ME, American Geophysical Union, AGU Chapman Conference on Biogeophysics, Portland, Maine, October.
- McGee, T., P. Higley, and R. Woolsey, 2003, A vertical hydrophone array for imaging the hydrate stability zone, Nice, France, EGU-AGU Joint Conference, April 6-11.
- McGee, T., P. Higley, and R. Woolsey, 2003, A vertical hydrophone array for imaging the hydrate stability zone, Salt Lake City, UT, The American Association of Petroleum Geologists Annual Meeting, May 9-14.
- McGee, Thomas M., Carol B. Lutken, Vaughn S. Goebel and J. Robert Woolsey, 2002, Seismic Images of Structures Associated with Gas Hydrates near the Sea Floor: Initial Results. Proceedings of the AAPG Annual Meeting Houston, TX, V.11, A117.
- McGee, T. M., J. R. Woolsey, P. D. Higley, N. R. Chapman, 2004: Toward understanding the migration of hydrocarbons and brines through the gas hydrate stability zone of the northern Gulf of Mexico. 32nd International Geological Congress, Florence, Italy.
- McGee, T.; J. R. Woolsey, L. Lapham, R. Kleinberg, L. Macelloni, B. L Battista, C. Knapp, S. Caruso, V. Goebel, R. Chapman, P. Gerstoft, 2009, A Multidisciplinary Sea-Floor Observatory in the Northern Gulf of Mexico. Proceedings of the Virtual Institute of Scientific Users of Deep-Sea Observatories, Tromsø, Norway, June 11-12.
- McGee, T., L. Macelloni and V. Goebel, 2006: Seismo-acoustic imagery of a carbonate/hydrate mound in the Gulf of Mexico. AGU Fall Meeting, San Francisco, CA, 11-15 December.
- McGee, T., V. Goebel, A. Bosman and L. Macelloni, 2008: Recent techniques for acquiring and processing ultra-high-resolution images of the sea floor and shallow sub-bottom in deep water. Proceedings of IEEE/OES Chile-US Workshop on Ocean Observing Systems, Valparaiso, Chile, 3-6 November.

- McGee, T., J. R. Woolsey, L. Lapham, R. Kleinberg, L. Macelloni, B. Battista, C. Knapp, S. Caruso, V. Goebel, R. Chapman and P. Gerstoft, 2008: Structure of a carbonate/hydrate mound in the northern Gulf of Mexico and possible hydrate distribution within it. Proceedings of IEEE/OES Chile-US Workshop on Ocean Observing Systems, Valparaiso, Chile, 3-6 November.
- McGee, T.; J. R. Woolsey, L. Lapham, R. Kleinberg, L. Macelloni, B. L Battista, C. Knapp, S. Caruso, V. Goebel, R. Chapman, P. Gerstoft, 2009, A Multidisciplinary Sea-Floor Observatory in the Northern Gulf of Mexico. Proceedings of the Virtual Institute of Scientific Users of Deep-Sea Observatories, Tromsø, Norway, June 11-12
- Mizaikoff, B., 2006: Mid-Infrared Chemical Sensors based on Quantum Cascade Lasers: The Next Generation. International Symposium on Spectral Sensing Research, Bar Harbor, ME, May 29-June 2.
- Mizaikoff, B., 2006: Environmental Analysis with Optical Sensors - Quo Vadis? Invited Presentation, Europt(r)ode VIII, Tuebingen/Germany, April 2-5.
- Mizaikoff, B., 2006: Next-Generation Mid-Infrared Sensors in Harsh Environments. Invited Presentation, ACS Fall Meeting, San Francisco/CA, September 10-14.
- Mizaikoff, B., 2006: A New Frontier: Mid-Infrared Chemical Sensors Based on Single-Mode Waveguides. Invited Presentation, SPIE Optics East, Boston, MA, October 1-4.
- Mizaikoff, B., 2005: From Chemical Sensors to Multifunctional Analytical Platforms. Invited Oral Presentation as Recipient of the Pittsburgh Conference Achievement Award, PITTCON, Orlando, FL, February 27-March 4.
- Mizaikoff, B., 2005: Spectroscopic Sensors in Marine Environments. Invited Presentation, MarTech 2005, Bremen, Germany, October 9-12.
- Mizaikoff, B., 2004, Mid-Infrared Sensor Technology – From the Lab into the Field?, Santa Fe, NM, American Chemical Society ProSpective Conference on Emerging Opportunities in Chemical Sensing and Biosensing, May 16-19.
- Mizaikoff, B., 2003, Mid-Infrared Sensor Technology - Potential and Perspectives for Process Monitoring, New York, NY, American Chemical Society Fall National Meeting, September 7-11.
- Mizaikoff, B., N. Pennington, and F. Vogt, 2003, Mid-Infrared Spectroscopic Sensors for In-Situ Monitoring of Methane Dissolved in Sea Water, Houston, TX, Ocean Technology Conference, May 5-8.
- Mizaikoff, B., 2002, Mid-Infrared Sensor Technology for Liquid Phase Analysis, Annapolis, MD, Fifth International Conference on Mid-Infrared Optoelectronics Materials and Devices, September 8-11.

- Mizaikoff, B., 2002, Optical Sensor Technology, Minneapolis, MN, Technology Awareness Forum, March 14.
- Mizaikoff, B., 2002, Recent Advances and New Challenges For Infrared Sensors, Manchester, England, Europt(r)ode Conference, April 7-11.
- Mizaikoff, B., 2001, Mid-Infrared Fiberoptic Chemical Sensors – From the Lab into the Field, Blarney, Ireland, 5<sup>th</sup> EurocMonference on Environmental Analytical Chemistry, The Impact of Biosensors and Bioanalytical Techniques on Environmental Monitoring, September 8-12.
- Mizaikoff, B., 2007: Good Vibrations - Infrared Spectroscopy and Sensing in Extreme Environments. Invited Presentation, ANAKON 2007, Jena, Germany, March 27-30.
- Mizaikoff, B. and C. Kranz, 2007: From Infrared Chemical Sensors to Multifunctional Scanning Probes - Research at the Applied Sensors Laboratory, Friedrich Schiller Universität Jena, Jena, Germany, March 29.
- Morley, M., 2004, Estimation of Seismic Velocities in the Hydrate Stability Zone Using Ship Noise at a Vertical Hydrophone Array, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting 2004, April 16-21.
- Murray, P.E., C. Zala and M. Dunham-Wilkie, 2006: Storage and Distribution of Digital Data from the Gulf of Mexico Seafloor Observatory. Proceedings of the Houston, TX, Offshore Technology Conference (OTC 17962), May 1-4.
- Pi Y., Li S., Pearson A., Noakes J., Culp R., and Zhang C. L. Effects of gas hydrates on archaeal community structure and carbon cycle in the Gulf of Mexico. American Geophysical Union Annual Meeting. December 10-16, 2006. San Francisco.
- Pizarro, O., N. Farr, R. Camilli, J. Whelan, C. Martens, J. Goudreau, H. Mendlovitz, L. Camilli. "In-situ Optical Characterization of Methane Seeps and Bubble Plumes." In EOS: Trans. Amer. Geophysical Union Fall Meeting Supplement, 2006, Abstract.
- Radich, J., R. Rogers, W. French, and G. Zhang, 2008, Microbial and sediment effects on kinetics of gas hydrate formation," Philadelphia, PA, American Chemical Society National Meeting & Exposition, August.
- Rawn, Claudia J., Roger Sassen, Shannon M. Ulrich, Tommy J. Phelps, Bryan C. Chakoumakos, E. Andrew Payzant, 2008, *Low temperature x-ray diffraction studies of natural gas hydrate samples from the Gulf of Mexico*, Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10.

- Roberts, H., J. Coleman, J. Hunt, W. Shedd, R. Sassen, and A. Milkov, 2002, Gas hydrate deposits in a complex geologic setting, northern Gulf of Mexico Slope, Gulf Coast Association of Geological Societies Annual Meeting, October 30-November 1.
- Roberts, H., R. Sassen, and A. Milkov, 2001, Seafloor expression of fluid and gas expulsion from deep petroleum systems, continental slope of the northern Gulf of Mexico, Houston, TX, GCSSEPM Research Foundation 21<sup>st</sup> Annual Research Conference, Petroleum Systems of Deep-Water Basins, December 2-5.
- Roberts, H., 2002, Geologic and biologic responses to varying rates of fluid and gas expulsion – Northern Gulf of Mexico, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, April 7-10.
- Roberts, H., 2002, Surficial gas hydrates, part of the fluid and gas expulsion response spectrum: Identification from 3D seismic data, Houston, TX, 2002 Offshore Technology Conference, May 6-9.
- Rogers, R., Zhang, G., Kothapalli, C., and French, W.T., 2004, Laboratory Evidence of Microbial-Sediment-Gas Hydrate Synergistic Interactions in Ocean Sediments, Toulon, France, Offshore and Polar Engineering Conference, May 23- 28.
- Rogers, R., J. Dearman, and H. Roberts, 2003, Enhancement of Gas Hydrate Formation in Gulf of Mexico Sediments, Houston, TX, Proceedings, 2003 Offshore Technology Conference, May 5-8.
- Rogers, R., 2002, Biosurfactants: the link between microbes and gas hydrates, Washington, DC, 2<sup>nd</sup> International Workshop on Methane Hydrates R&D, October 30.
- Rogers, R., C. Woods, T. Ding, G. Zhang, J. Dearman, and B. Kelleher, 2004, Gas Hydrate Catalysis from Biosurfactants- Bentonite Interactions that Impact Sediment Stability, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- Rogers, R., C. Kothapalli, and M. Lee, 2002, Influence of Microbes on Gas Hydrate Formation in Porous Media, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19- 23.
- Rogers, R., 2001, Biomolecules' Effects on Gas Hydrate Formation at Sand/Clay Interfaces, Reno, NV, American Institute of Chemical Engineers Annual National Meeting, November 4-7.
- Rogers, R.E., Lee, M.S., and Kothapalli, C.R., 2001, Biomolecules' Effects on Gas Hydrate Formation at Sand/Clay Interfaces, Reno, NV, American Institute of Chemical Engineers Annual National Meeting, November 4-9.

- Rogers, R., and Lee, M.S., 2001, Biosurfactant from Microbial Activity in Ocean Sediments Enhances Gas Hydrate Formation, Edinburgh, Scotland, GSA-GSL Earth System Processes Meeting, June 25.
- Rogers, R., G. Zhang, J. Dearman, and W. Wilson, 2008, Laboratory Tests of Hydrate Formation in Porous Media Influenced by Bioproducts, Orlando, FL, Annual Ocean Sciences Meeting, March 30-April 3.
- Rogers, R., J. Dearman, G. Zhang, W. Wilson, and Lutken, C.B., 2008, Gulf of Mexico sediment evaluations for microbial-mineral-hydrate associations, San Antonio, TX, AAPG Annual Convention and Exhibition, April.
- Rogers, R., G. Zhang, J. Radich, and S. Xiong, 2008, Role of microbe-mineral interactions in seafloor gas hydrate accumulations, Oxford, MS, 38<sup>th</sup> Annual Underwater Mining Institute, November.
- Rogers, R., R. Sassen, J. Dearman, and G. Zhang, 2006, Factors prompting seafloor experiments to investigate microbial/hydrate relationships, San Francisco, CA, The Sixteenth International Offshore and Polar Engineering Conference & Exhibition, May.
- Rogers, R., J. Dearman, and G. Zhang, Interactions of bioagents and fine mineral particles to promote gas hydrates, 2005, Vancouver, Island, B.C., MMS Workshop on Marine Gels and Polygonal Fault Systems, July.
- Rogers, R., G. Zhang, J. Dearman, and C. Woods, 2005, Investigations into surfactant/gas-hydrate relationship, San Diego, CA, American Chemical Society, March.
- Rogers, R., and M. Lee, Micellar solutions promote gas-hydrate formation, 2000, Los Angeles, CA, Annual Meeting of American Institute of Chemical Engineers, Nov.
- Sassen, R., 2003, Evidence of a deep source of bacterial methane in the Gulf of Mexico continental slope, New Orleans, LA, American Chemical Society Meeting, September 7-11.
- Sassen, R., 2002, Gas venting and gas hydrate stability in the northwestern Gulf of Mexico: Significance to sediment deformation, Houston, TX, 2002 Offshore Technology Conference, May 6-9.
- Sassen, R., 2001, Seafloor vents, seeps, gas hydrate: Relation to flux rate from the deep Gulf of Mexico petroleum system, Houston, TX, GCSSEPM Research Foundation, 21<sup>st</sup> Annual Research Conference, December 2-5.
- Short, R. T., R. J. Bell, A. Chaudhary, S. K. Toler, F. H.; W. van Amerom, In Situ Mass Spectrometry for Marine Applications: Present and Future (oral), 57<sup>th</sup> American Society of Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, in Philadelphia, PA (2009).

- Short R. T., R. J. Bell, S. K. Toler, F. H. W. van Amerom, *Recent Developments and In Situ Measurements of Underwater Mass Spectrometers* (poster), 58<sup>th</sup> ASMS Conference on Mass Spectrometry and Allied Topics in Salt Lake City, UT (2010).
- Short, R. T., R. J. Bell, A. M. Cardenas, A. Chaudhary, S. K. Toler, F. H. W. van Amerom, *Miniature Ion Trap Mass Spectrometers and Applications for In Situ Analysis of Seawater* (invited oral), Annual meeting of the Center for Analytical Instrumentation Development at Purdue University in West Lafayette, (2010).
- Short, R. T., R. J. Bell and S. K. Toler, 2010, *In situ characterization of distributions of dissolved gases, volatile organics, and light hydrocarbons using underwater membrane introduction mass spectrometry*, American Chemical Society meeting in Boston, MA, oral presentation, August 24.
- Sobecky, P., H. Mills, and R. Martinez, 2003, *The Microbial Ecology of Gas Hydrates*, Seattle, WA, Geological Society of America Annual Meeting, November 5.
- Strack, E., and J. Kuszmaul, 2003, *Describing the Spatial Continuity of Gas Hydrate Deposits Using Indicator Variography*, Abstract OS51B-0863, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.
- Teske, A, 2007, *Active Methane-oxidizing archaea in MC118 sediments: Evidence from ribosomal RNA and mRNA analysis*. Gulf of Mexico Hydrate Consortium Meeting, Univ. of Mississippi, Oxford, MS. February 28.
- Teske, A, 2008, *Deep subsurface archaea – Diversity and Detection*. Institute for the Chemistry and Biology of the Oceans, Oldenburg University, Germany. March 5.
- Toler, S. K., R. J. Bell, R. T. Short, *Underwater Mass Spectrometry: Developments and Deployments* (poster), 7th Harsh-Environment Mass Spectrometry Workshop, in Santa Barbara, CA (2009).
- Vogt, F., 2002, *Chemometric Data Evaluation for Improved Seawater Monitoring of Chlorinated Hydrocarbons by Mid-Infrared Evanescent Wave Sensors*, New Orleans, LA, The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), March 17-22.
- Vogt, F., M. Kraft, and B. Mizaikoff, 2003, *Mid-Infrared Attenuated Total Reflection (ATR) Spectroscopy for Quantitative Analysis of Salt Ions in Seawater*, Orlando, FL, The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), March 9-14.
- Woolsey, R., T. McGee, C. Lutken, and P. Higley, 2005, *Gas Hydrates Sea Floor Observatory – First Stage Deployment and Test Set for 2005*, Houston, TX, 2005 Offshore Technology Conference, May 2-5.

- Woolsey, R., T. McGee, C. Lutken, and E. Geresi, 2003, A Sea Floor Observatory for Studying the Hydrocarbon System within the Gas Hydrate Stability Zone of the Northern Gulf of Mexico, Nice, France, European Geophysical Union-American Geophysical Union Joint Conference, April 6-11.
- Wang F., Wang S., Jiang L., Ye G., Xiao X., Noakes J., Zhang C. L., 2006, Community structure and population dynamics of bacteria and Archaea at hydrocarbon seeps/gas hydrates in the Gulf of Mexico. American Geophysical Union Annual Meeting. December 10-16, San Francisco.
- Woolsey, J. R., L. Macelloni, T. M. McGee, C. B. Lutken, K. Sleeper and P. Higley, 2007: A Deep Sea Floor Observing System For Real-Time Observation In The Northern Gulf Of Mexico. Poster, Sesto Forum Italiano di Scienze della Terra - Geoitalia 2007, Rimini September, 12-14.
- Winters, W., W. Waite, D. Mason, I. Novosel, O. Boldina, S. Dallimore, T. Collett, T. Lorenson, C. Paull, R. Rogers, W. Bryant, and T. McGee, 2003, Physical properties of sediment containing natural and laboratory-formed gas hydrate, Salt Lake City, UT, American Association of Petroleum Geologists Annual Conference, May.
- Zhang, G., R. Rogers, and T. French, 2008, Laboratory tests to determine role of bioproducts in seafloor gas hydrate accumulations, San Antonio, TX, AAPG Annual Convention and Exhibition, April.
- Zhang C. L., Yan T., Ye Q., Pancost R. D., and Noakes J. Lipid Biomarkers, Isotope Signatures, and Genomics of Gas Hydrates and Hydrocarbon Seeps in the Gulf of Mexico. Environmental Systems Microbiology Symposium. March 29-31, 2006. GaTech, Atlanta.

## **Characterizing Marine Gas Hydrate Reservoirs Using 3D Seismic Data and 4C OBS Data (DE-FC26-00NT41024) and (DE-FC26-06NT42667)**

*University of Texas at Austin Bureau of Economic Geology*

### **Peer-Reviewed Publications**

DeAngelo, M. V., Murray, P. E., Hardage, B. A., and Remington, R. L., 2008, Integrated 2D 4-C OBC velocity analysis of near-seafloor sediments, Green Canyon, Gulf of Mexico: *Geophysics*, v. 73, no. 6, p. B109–B115.

DeAngelo, M. V., D. Sava, B. Hardage, and P. E. Murray, in review, Integrated 2D 4-C OBC analysis for estimating hydrate concentrations, Green Canyon, Gulf of Mexico, *Geophysics*.

Hardage, B., H. Roberts, P. Murray, R. Remington, D. Sava, W. Shedd, and J. Hunt, Jr., in press, Multicomponent seismic assessment of fluid-gas expulsion geology: Gulf of Mexico, in Collett, T., A. Johnson, C. Knapp, and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, The American Association of Petroleum Geologists Hedberg Special Publication.

Sava, D., and B. Hardage, in press, Rock-physics models for gas-hydrate systems associated with unconsolidated marine sediments, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, The American Association of Petroleum Geologists Hedberg Special Publication.

Sava, D. C., B. A. Hardage, P. Murray, and M. DeAngelo, in review, Rock-physics joint inversion of electrical resistivity and seismic velocities for gas-hydrate characterization, *Journal of Geophysical Research*.

### **Theses/Dissertations**

Alkan, E., 2007, Multi-dimensional seismic land data acquisition techniques and the random survey design, Masters Thesis, The University of Texas at Austin, May, 2007.

### **Government Reports**

Hardage, B., M. Backus, M. DeAngelo, S. Fomel, R. Graebner, P. Murray, and L. Wood, 2002, Characterizing Marine Gas-Hydrate Reservoirs and Determining Mechanical Properties of Marine Gas-Hydrate Strata with 4-Component Ocean-Bottom-Cable Seismic Data, *Final Report*, DOE Contract No. DE-FC26-00NT41024.

Hardage, B., P. Murray, D. Sava, M. Backus, M. DeAngelo, R. Graebner, and D. Wagner, 2009, Combining Multicomponent Seismic Attributes, New Rock Physics Models, and In Situ Data to Estimate Gas-Hydrate Concentrations in Deep-Water, Near-Seafloor Strata of the Gulf of Mexico, *Final Report*, DOE Contract No. DE-FC26-05NT42667.

## Other Publications

- Alkan, E., and B. Hardage, 2007, Randomness in 3D seismic design: The American Association of Petroleum Geologists, *Geophysical Corner*, v. 28, n. 10, p. 29.
- Alkan, E., and B. Hardage, 2007, Randomness in 3D seismic design: Expanded Abstracts of 77th Annual Meeting of the Society of Exploration Geophysicists, v. 26.
- Backus, M., P. Murray, B. Hardage, and R. Graebner, 2006, High-resolution multi-component seismic imaging of deepwater gas hydrate systems, *The Leading Edge*, Volume 25, n. 5, p. 578-596.
- Backus, M. M., Murray, Paul, Graebner, R. J., and Hardage, B. A., 2007, OBC sensor response and calibrated reflectivity (abs.), in SEG/San Antonio Annual Meeting, p. 1044–1048.
- DeAngelo, M., M. Backus, B. Hardage, P. Murray, and S. Knapp, 2003, Depth registration of P-wave and C-wave seismic data for shallow marine sediment characterization, Gulf of Mexico, *The Leading Edge*, Volume 22, n. 2, p. 96-105.
- Hardage, B. A., Sava, Diana, Remington, R. L., and DeAngelo, Michael, 2008, Rocks-physics theory a help: AAPG Explorer, *Geophysical Corner*, v. 29, no. 1, p. 34.
- Hardage, B. A., DeAngelo, Michael, and Remington, R. L., 2008, Going super-deep with P-P, P-SV data: AAPG Explorer, *Geophysical Corner*, v. 29, no. 2, p. 32.
- Hardage, B., 2007, Gas hydrate and LNG tankers, The American Association of Petroleum Geologists Explorer, *Geophysical Corner*, v. 28, n. 5, p. 27.
- Hardage, B., and P. Murray, 2006, Detailed imaging of deepwater hydrate geology with horizontal arrays of seafloor sensors, *Proceedings of the Offshore Technology Conference*, paper 17929.
- Hardage, B., and P. Murray, 2006, High-resolution P-P imaging of deepwater near-seafloor geology, *The American Association of Petroleum Geologists Explorer, Geophysical Corner*, Volume 27, n. 7, p. 30.
- Hardage, B., and P. Murray, 2006, P-SV data most impressive image, *The American Association of Petroleum Geologists Explorer, Geophysical Corner*, Volume 27, n. 8, p. 30.
- Hardage, B., R. Remington, and H. Roberts, 2006, Gas hydrate--a source of shallow water flow?, *The Leading Edge*, Volume 25, n. 5, p. 634–636.
- Hardage, B., and H. Roberts, 2006, Gas hydrate in the Gulf of Mexico: what and where is the seismic target, *The Leading Edge*, Volume 25, n. 5, p. 566-571.
- Hardage, B., and H. Roberts, 2006, Evaluation of deepwater gas-hydrate systems, *The Leading Edge*, Volume 25, n. 5, p. 572-577.

- McGee, T., and B. Hardage, 2006, Hydrate system to be monitored, *The American Association of Petroleum Geologists Explorer, Geophysical Corner*, Volume 27, n. 5, p. 24.
- Roberts, H., B. Hardage, W. Shedd, and J. Hunt Jr., 2006, Seafloor reflectivity—an important seismic property for interpreting fluid/gas expulsion geology and the presence of gas hydrate, *The Leading Edge*, Volume 25, n. 5, p. 620–628.
- Roberts, H., B. Hardage, W. Shedd, and J. Hunt, Jr., 2006, Seafloor reflectivity: an important seismic property for interpreting fluid/gas expulsion geology and the presence of shallow gas hydrate (abs.): Gulf Coast Association of Geological Societies Transactions, v. 56, p. 725.
- Sava, D., and B. Hardage, 2006, Rock physics characterization of hydrate-bearing deepwater sediments, *The Leading Edge*, Volume 25, n. 5, p. 616-619.
- Sava, D. C. and B. A. Hardage, 2006, Rock physics models of gas hydrates from deep water, unconsolidated sediments (exp. abs.), 76<sup>th</sup> Annual Meeting of the Society of Exploration Geophysicists, Expanded Abstracts Volume 25.
- Sava, D. C. and B. A. Hardage, 2007, Gas-hydrate concentration and uncertainty estimation from electrical-resistivity logs: Examples from Green Canyon, Gulf of Mexico (exp. abs.), Society of Exploration Geophysicists Expanded Abstracts, pp. 1579-1583, September 23-28, San Antonio.
- Sava, D., and Hardage, B., 2007, Gas hydrate and seismic attributes, *The American Association of Petroleum Geologists Explorer, Geophysical Corner*, v. 28.
- Sava, Diana, and Hardage, B. A., 2007, Diving into gas hydrate systems: AAPG Explorer, Geophysical Corner, v. 28, no. 8, p. 44.
- Sava, D. C., Hardage, B. A., Murray, P., and DeAngelo, M., 2008, Rock-physics joint inversion of resistivity log and seismic velocity for hydrate-characterization (exp. abs.), in Society of Exploration Geophysicists Expanded Abstracts, November 9–14, Las Vegas.
- Sava, D. C., and Hardage, B. A., 2008, Estimating uncertainty associated with gas-hydrate characterization from electrical resistivity logs (abs.), in SEG D&P Forum on Uncertainty and Upscaling Issues in Reservoir Characterization, July 27–31, Austin.
- Sava, D. C., Hardage, B. A., Murray, P., and DeAngelo, M., 2008, Quantitative integration of electrical resistivity logs and seismic velocities for reducing the uncertainty in evaluating deep-water gas-hydrate systems (abs.), in SEG D&P Forum on Uncertainty and Upscaling Issues in Reservoir Characterization, July 27–31, Austin.

## **Presentations**

- Alkan, E., and Hardage, B., 2007, Randomness in 3D seismic design: Poster session, 77th Annual Meeting of the Society of Exploration Geophysicists, San Antonio, TX.
- Backus, M., P. Murray, B. Hardage, and R. Graebner, 2005, Enhanced PS-wave images of deep-water, near-seafloor geology from 2-D 4-C OBC data in the Gulf of Mexico, 75<sup>th</sup> Annual International Meeting of the SEG, Houston, TX, November 6-11.
- Backus, M., Murray, P., Graebner, R., and Hardage, B., 2007, OBC sensor response and calibrated reflectivity: Poster session, 77th Annual Meeting of the Society of Exploration Geophysicists, San Antonio, TX.
- Christianson, P., and Murray, P., 2007, Investigating active deepwater sedimentation near a gas hydrate system with high-resolution seismic data, Poster session, 77th Annual Meeting of the Society of Exploration Geophysicists, San Antonio, TX.
- Fomel, S. B., Backus, M. M., DeAngelo, Michael, Murray, Paul, and Hardage, B. A., 2003, Multicomponent seismic data registration for subsurface characterization in the shallow Gulf of Mexico, Houston, TX, Offshore Technology Conference, OTC Paper No. 15117.
- Hardage, B., 2005, P and S image registration: the challenge confronting all who use multicomponent seismic technology: invited lecture presented at the Sercel Technical Forum, Houston, Texas, April 21, 2005.
- Hardage, R., 2006, Methane Hydrates: Geoscience Challenges, Houston, Texas, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Hardage, B., and D. Sava, 2006, Seismic estimation of Gas Hydrate Concentrations in Deepwater Environments: Assumptions and Limitations, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12. (Winner of President's Certificate for Excellence)
- Hardage, B., 2006, Detailed imaging of deepwater hydrate geology with horizontal arrays of seafloor sensors, Houston, TX, Offshore Technology Conference, May 3.
- Hardage, B., 2005, Assessing deep water gas hydrate systems and seafloor stability, invited lecture, New Orleans, LA, AGU, NABS, SEG, SPD/AAS Joint Assembly, May 23-27.
- Hardage, B., and P. Murray, 2006, Detailed imaging of deepwater hydrate geology with horizontal arrays of seafloor sensors, paper 17929, 2006 Offshore Technology Conference, Houston, TX, May 1-4.
- Hardage, Bob A.; Roberts, Harry H.; Sava, Diana C.; Murray, Paul E.; DeAngelo, Michael V.; Backus, Milo M.; Graebner, Robert J., 2008. Assessing Fluid-Gas Expulsion Geology And Gas Hydrate Deposits Across The Gulf of Mexico With Multicomponent And Multifrequency Seismic Data. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.

Murray, P., M. DeAngelo, B. Hardage, M. Backus, R. Graebner, and S. Fomel, 2005, Interpreting multicomponent seismic data in the Gulf of Mexico for shallow sedimentary properties: methodology and case history, Houston, TX, 2005 Offshore Technology Conference, May 2-5.

Murray, P., M. Backus, M. DeAngelo, S. Fomel, R. Graebner, B. Hardage, and L. Wood, 2004, Evaluating marine gas hydrates with 4-C OBC seismic data, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.

Sava, D., and B. Hardage, 2006, Rock physics models of gas hydrates from deep water, unconsolidated sediments, 76th Annual Meeting of the Society of Exploration Geophysicists, New Orleans, Louisiana, October 1-6.

## **Sampling and Monitoring Hydrate Mounds in the Gulf of Mexico (DE-AF26-01NT00394)**

*Texas A&M University*

### **Peer-Reviewed Publications**

De Beukelaer S., I. MacDonald, N. Guinasso, and J. Murray, 2003, Distinct side-scan sonar, RADARSAT SAR, and acoustic profiler signatures of gas and oil seeps on the Gulf of Mexico slope, *Geo-Marine Letters* 23(3-4), p. 177-186.

Liefer, I., and I. MacDonald, 2003, Dynamics of the gas flux from shallow gas hydrate deposits: interaction between oily hydrate bubbles and the oceanic environment, *Earth and Planetary Science Letters* 21(3-4), p. 411-424.

MacDonald, I., L. Bender, M. Vardaro, B. Bernard, and J. Brooks, 2005, Thermal and Visual Time-Series at a Seafloor Gas Hydrate Deposit on the Gulf of Mexico Slope, *Earth and Planetary Science Letters*, 233, p. 45-59.

MacDonald, I., G. Bohrmann, E. Escobar, F. Abegg, P. Blanchon, V. Blinova, W. Brückmann, M. Drews, A. Eisenhauer, X. Han, K. Heeschen, F. Meier, C. Mortera, T. Naehr, B. Orcutt, B. Bernard, J. Brooks, and M. De Faragó, 2004, Asphalt volcanism and chemosynthetic life, Campeche Knolls, Gulf of Mexico, *Science*, Vol. 304, No. 5673, pp. 999-1002.

MacDonald, I., I. Liefer, R. Sassen, P. Stine, R. Mitchell, and N. Guinasso, 2002, Transfer of hydrocarbons from natural seeps to the water column and atmosphere, *Geofluids*, Volume 5, p. 95-107.

MacDonald, I., W. Sager, and M. Peccini, 2003, Association of Gas Hydrate and Chemosynthetic Fauna in Mounded Bathymetry at Mid-Slope Hydrocarbon Seeps: Northern Gulf of Mexico, *Marine Geology*, Volume 198, p.133-158.

### **Theses/Dissertations**

De Beukelaer, S., 2003, Remote sensing analysis of natural oil and gas seeps on the continental slope of the northern Gulf of Mexico, 2003, Master's Thesis, Department of Oceanography, Texas A&M University, August.

Vardaro, M., 2004, Deep-sea time-lapse camera observations: Temporal changes in gas hydrate mound topography and ecology, Master's Thesis, Department of Oceanography, Texas A&M University, May.

### **Other Publications**

MacDonald, I., M. Vardaro, and L. Bender, 2003, A Temperature and Photographic Time-Series from a Seafloor Gas Hydrate Deposit on the Gulf of Mexico Slope, *Geophysical Research Abstracts*, Volume 5, 12714.

### **Presentations**

MacDonald, I., M. Kastner, and I. Leifer, 2005, Estimates of natural hydrocarbon flux in the Gulf of Mexico basin from remote sensing data, European Union of Geosciences Meeting, Vienna, Austria, April 24-29.

MacDonald, I., P. Sobecky, J. Montoya, and S. Joye, 2003, Research issues in the Hydrocarbon Seep System in the northern Gulf of Mexico, American Society of Limnology and Oceanography Meeting, Salt Lake City, UT, February 10-14.

MacDonald, I., and I. Leifer, 2002, Constraining rates of carbon flux from natural seeps on northern Gulf of Mexico slope, Azerbaijan, NATO workshop on gas hydrates, October.

MacDonald, I., D. Power, I. Leifer, K. Lane, and J. Youden, 2002, The remote sensing signature of hydrocarbon seeps and implications for carbon flux, Honolulu, HI, American Geophysical Union Ocean Sciences Meeting, February 11-15.

MacDonald, I., P. Sobecky, J. Montoya, and S. Joye, 2001, Deposits of gas hydrate on the Gulf of Mexico slope: A natural laboratory for hydrate research, Brest, France, Second International Symposium for Deep-Sea Hydrothermal Vent Biology, October 8-12.

## **Investigation of 3D Structure and Physical Properties of Methane Hydrate Deposits at Blake Ridge (DE-FC26-00NT40921)**

*University of Wyoming*

### **Peer-Reviewed Publications**

Gorman, A., W. Holbrook, M. Hornbach, K. Hackwith, D. Lizarralde, and I. Pecher, 2002, Migration of methane gas through the hydrate stability zone in a low-flux hydrate province, *Geology*, Volume 30, p. 327-330.

Holbrook, W., D. Lizarralde, I. Pecher, A. Gorman, K. Hackwith, M. Hornbach, and D. Saffer, 2002, Escape of methane gas through sediment waves in a large methane hydrate province, *Geology*, Volume 30, p. 467-470.

Hornbach, M., W. Holbrook, R. Gorman, K. Hackwith, D. Lizarralde, and I. Pecher, 2003, Direct seismic detection of methane hydrate and the Blake Ridge, *Geophysics*, Volume 68, n. 1, p. 92-100.

Hornbach, M., C. Ruppel, D. Saffer, C. Dover, and W. Holbrook, 2005, Coupled geophysical constraints on heat flow and fluid flux at a salt diapir; *Geophysical Research Letters*, v. 32, L24617.

Hornbach, M., D. Saffer, and W. Holbrook, 2004, Critically Pressured Free-Gas Reservoirs Below Gas Hydrate Provinces, *Letters to Nature*, Volume 427, p. 142-144.

### **Other Publications**

Holbrook, W., A. Gorman, M. Hornbach, K. Hackwith, J. Nealon, D. Lizarralde, and I. Pecher, 2002, Seismic detection of marine methane hydrate, *The Leading Edge*, Volume 21, p. 686-689.

## **Rock-Physics Modeling of Hydrate-Bearing Sediments (DE-FC26-05NT42663)**

*Stanford University*

### **Peer-Reviewed Publications**

Cordon, I., J. Dvorkin, and G. Mavko, in press, Seismic Reflections of Gas Hydrate Perturbational Forward Modeling, *Geophysics*.

### **Other Publications**

Dvorkin, J., and R. Uden, 2006, The challenge of scale in seismic mapping of hydrate and solutions, *The Leading Edge*, Volume 25, n. 5, p. 637-642.

## **Investigation of Natural Gas Species Flows from Hydrate Dissociation (DE-FC26-00NT40916)**

*Clarkson University*

### **Peer-Reviewed Publications**

- Ahmadi, G., C. Ji, and D. Smith, 2000, A Simple Model for Natural Gas Production from Hydrate Decomposition, in Holder, G., and P. Bishnoi, eds., *Gas Hydrates: Challenges for the Future*, *Annals of the New York Academy of Sciences*, Volume 912, p. 420-27.
- Ahmadi, G., C. Ji, and D. Smith, 2004, Numerical Simulation of Natural Gas Production from Methane Hydrate Dissociation, *Journal of Petroleum Science and Engineering*, Volume 41, p. 269-285.
- Ji, C., G. Ahmadi, and D. Smith, 2003, Constant Rate Natural Gas Production from a Well in a Hydrate Reservoir, *Energy Conversion and Management*, Volume 44, p. 2403-2423.
- Ji, C., G. Ahmadi, and D. Smith, 2001, Natural Gas Production from Hydrate Decomposition by Depressurization, *Chemical Engineering Science*, Volume 56, p. 5801-5814.

### **Presentations**

- Ji, C., G. Ahmadi, W. Zhang, and D. Smith, 2002, Natural Gas Production from Hydrate Dissociation: A Comparison of Axisymmetric Models, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Ji, C., G. Ahmadi, and D. Smith, 2000, Computational Simulation for Natural Gas Production from Hydrate Decomposition, Lake Placid, NY, Annual Technical Meeting of the Center for Advanced Material Processing, May 23-25.
- Nazridoust, K., T. White, C. Ji, G. Ahmadi, D. Smith, and M. Dean, 2002, Natural Gas Production from Hydrate Dissociation, Saratoga Springs, NY, Annual Technical Meeting of the Center for Advanced Material Processing, May 13-15.

## **Investigations into the Geomechanical Performance of Hydrate-Bearing Sediments in Offshore Environments (DE-FC26-05NT42664)**

*Texas Engineering Experiment Station of Texas A&M University, University of California at Berkeley and Lawrence Berkeley National Laboratory*

### **Government Reports**

- Holditch, S., T. Patzek, G. Moridis, and R. Plumb, 2005, Geomechanical Performance of Hydrate-Bearing Sediments in Offshore Environments, *U.S. DOE-NETL Semi-Annual Report*, October 1, 2005 through March 31, 2006, DE-FC26-05NT42664 CFDA Number: 81.089 (Fossil Energy Research and Development), July, available online ([click here](#)) and Appendix ([here](#)).

## **Presentations**

Holtzman, R., D. Silin, T. Patzek, 2006, The Strength of Hydrate-Bearing Sediments: A Grain-Scale Approach, AGU Fall Meeting, San Francisco, CA, December 15.

Rutqvist, J., and G. Moridis, 2007, "Numerical Studies of Geomechanical Stability of Hydrate-Bearing Sediments," presented at the Offshore Technology Conference, Houston, Texas, April 30- May 3.

## **Evaluating the Controls on Gas Hydrate Formation and Dissociation in the Gulf of Mexico (DE-FC26-02NT41328)**

*Scripps Institution of Oceanography, University of California, San Diego*

## **Other Publications**

Allen, E.E, and J. F. Banfield. 2005, Community genomics in microbial ecology and evolution. Nat Rev Microbiol. 2005 Jun;3(6):489-98. Review.

Allen, E. E, G. W. Tyson, R. J. Whitaker, J. C. Detter, P. M. Richardson, and J. F. Banfield,. 2007, Genome dynamics in a natural archaeal population. Proc Natl Acad Sci U S A. 2007 Feb 6;104(6):1883-8. Epub 2007 Jan 31.

Baker, B. J, G. W, Tyson, R. I. Webb, J. Flanagan, P. Hugenholtz, E. E.Allen, and J. F.Banfield., 2006, Lineages of acidophilic archaea revealed by community genomic analysis. Science. 2006 Dec 22;314(5807):1933-5.

Kastner, M., D. Bartlett, I. MacDonald, and E. Solomon, 2005, CH<sub>4</sub> fluxes across the seafloor at three distinct gas hydrate fields: impacts on ocean and atmosphere chemistry, Trondheim, Norway, *Proceedings of the Fifth International Conference on Gas Hydrates*, Volume 3, p. 709-714.

Lo I, V.J. Deneff, N.C. Verberkmoes, M.B. Shah, D. Goltsman, G. DiBartolo, G.W. Tyson, E. E. Allen, R.J. Ram, J.C. Detter, P. Richardson, M.P. Thelen, R.L. Hettich, and J. F. Banfield. 2007, Strain-resolved community proteomics reveals recombining genomes of acidophilic bacteria. Nature. 2007 Mar 29;446(7135):537-41. Epub 2007 Mar 7.

Solomon, E., M. Kastner, H. Jannasch, Y. Weinstein, and G. Robertson, 2005, Insights into the dynamics of in situ gas hydrate formation and dissociation at Bush Hill gas hydrate field, Gulf of Mexico, Trondheim, Norway, *Proceedings of the Fifth International Conference of Gas Hydrates*, Volume 3, p. 947-953.

Stansfield S.H., E.E. Allen, D.M. Dinnis, A. J. Racher, J. R. Birch, and D. C. James. 2007 Dynamic analysis of GS-NS0 cells producing a recombinant monoclonal antibody during fed-batch culture. Biotechnol Bioeng. 2007 Jun 1;97(2):410-24.

Tyson, G.W, I. Lo, B.J. Baker, E.E. Allen, P. Hugenholtz, and J. F. Banfield. 2005, Genome-directed isolation of the key nitrogen fixer *Leptospirillum ferrodiazotrophum* sp. nov. from an acidophilic microbial community. Appl Environ Microbiol. 2005 Oct;71(10):6319-24.

Tyson, G.W, J. Chapman, P. Hugenholtz, E.E. Allen, R.J. Ram, P. M. Richardson, V.V. Solovyev, E.M. Rubin, D.S. Rokhsar, and J. F. Banfield. 2004, Community structure and metabolism through reconstruction of microbial genomes from the environment. Nature. 2004 Mar 4;428(6978):37-43. Epub 2004 Feb 1.

### **Presentations**

Kastner, M., D. Bartlett, I. MacDonald, and E. Solomon, 2005, CH<sub>4</sub> fluxes across the seafloor at three distinct gas hydrate fields: impacts on ocean and atmosphere chemistry, Trondheim, Norway, Fifth International Conference on Gas Hydrates, June 13-16.

Kastner, M., C. Solem, D. Bartlett, I. MacDonald, and D. Valentine, 2003, The extent of CH<sub>4</sub> emission and oxidation in thermogenic and biogenic gas hydrate environments, American Geophysical Union Fall Meeting, December 8-12.

Solomon, E., M. Kastner, H. Jannasch, Y. Weinstein, G. Robertson, and A. Aubrey, 2004, Long-term continuous monitoring of fluid chemistry and flux at the Bush Hill gas hydrate field, Gulf of Mexico, using a new flowmeter, the MOSQUITO, American Geophysical Union, Fall Meeting, December 13-17.

Solomon, E., M. Kastner, H. Jannasch, Y. Weinstein, and G. Robertson, 2005, Insights into the dynamics of in situ gas hydrate formation and dissociation at Bush Hill gas hydrate field, Gulf of Mexico, Trondheim, Norway, Fifth International Conference of Gas Hydrates, June 13-16.

Weinstein, Y., M. Kastner, and H. Jannasch, 2003, The MOSQUITO: a new sampler for monitoring fluid and solute fluxes between the sediment and the ocean, EGS-AGU-EUG Joint Assembly Meeting, Nice, France, April 6-11.

Investigation of Gas Hydrate Instability in the Southeastern Bering Sea  
(DE-FC26-05NT42665)

*Woods Hole Oceanographic Institute*

### **Presentations**

Cook, M., 2006, Gas Hydrate Instability in the Southeast Bering Sea, invited talk at Dalhousie University, Halifax Nova Scotia, Canada, April 4.

Cook, M., and L. Keigwin, 2005, Evidence of Methane Outgassing During MIS3 in the Bering Sea, American Geophysical Union Fall Meeting, San Francisco, CA, December 5-9.

### **In Situ Sampling and Characterization of Naturally Occurring Methane Hydrate During IODP legs 204 and 311 (DE-FC26-01NT41329)**

*Joint Oceanographic Institution (the National Science Foundation was the primary U.S. funder of these programs, but DOE contributed slightly more than \$2 million to further hydrate-related field analysis technologies).*

### **Peer-Reviewed Publications**

Akiba, F., Inoue, Y., Saito-Kato, M., Pohlman, J., 2009. Data Report: diatom and foraminiferal assemblages in Pleistocene turbidite sediments from the Cascadia margin (IODP Expedition 311) northeast Pacific. In: Riedel, M., Collett, T.S., Malone, M.J. and the Expedition 311 Scientists (Eds.) Proceedings of the Integrated Ocean Drilling Program, Volume 311. doi:10.2204/iodp.proc.311.211.2009.

Bangs, N., R. Musgrave, and A. Tréhu, 2005, Upward shifts in the southern Hydrate Ridge gas hydrate stability zone following postglacial warming, offshore Oregon, *Journal of Geophysical Research*, Vol. 110, B03102, doi:10.1029/2004JB003293.

Collett, T., Lee, M., Goldberg, D., Rack, F., and Williams, T., 2006, Ocean Drilling Program Leg 204 nuclear magnetic resonance logging while-drilling: in Trehu, A.M., Bohrmann, G., Torres, M.E., and Colwell, F.S. (eds.), *Proceedings of the Ocean Drilling Program Scientific Results*, v. 204, 25 p. (online) [[http://www-odp.tamu.edu/publications/204\\_SR/103/103.htm](http://www-odp.tamu.edu/publications/204_SR/103/103.htm)]

Janik, A., D. Goldberg, G. Guerin, and T. Collett, in review, Estimation of gas hydrate concentration and heterogeneity on Cascadia Margin from ODP 204 logging while drilling (LWD) measurements, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, The American Association of Petroleum Geologists Hedberg Special Publication.

Johnson, J., C. Goldfinger, N. Bangs, A. Trehu, and J. Chevallier, in review, Structural vergence variation and clockwise block rotation in the Cascadia accretionary wedge, offshore Oregon, *Tectonics*.

- Kim, D., T. Uhm, H. Lee, Y. Lee, B. Ryu, and J. Kim, in review, Compositional and structural identification of natural gas hydrates collected at Site 1249 on ODP Leg 204, *Korean Journal of Chemical Engineering*.
- Liu, X., and P. Flemings, 2006, Passing gas through the hydrate stability zone at southern Hydrate Ridge, offshore Oregon, *Earth and Planetary Science Letters*, 241, p. 211-226.
- Liu, X., and P. Flemings, in review, Dynamic multi-phase flow model of hydrate formation in marine sediments, *Journal Geophysical Research*.
- Long, H., P. Flemings, and J. Germaine, in review, Interpreting in-situ pressure and hydraulic properties with borehole penetrometers in ocean drilling: DVTTP and piezoprobe deployments at southern Hydrate Ridge, offshore Oregon, *Journal Geophysical Research*.
- Lorenson, T., F. Colwell, M. Delwiche, and J. Dougherty, 2006, Data report: Acetate and hydrogen concentrations in pore fluids associated with a large gas hydrate reservoir, southern Hydrate Ridge, offshore Oregon, USA, in Trehu, A., M. Torres, G. Bohrmann, and F. Colwell, eds., *Proc. ODP, Sci. Results, Ocean Drilling Program*, Texas A&M University, College Station, TX, Volume 204, available online ([click here](#)).
- Milkov, A., G. Claypool, Y. Lee, and R. Sassen, 2005, Gas hydrate systems at Hydrate Ridge offshore Oregon inferred from molecular and isotopic properties of hydrate-bound and void gases, *Geochim. Cosmochim. Acta*, Volume 69, p. 1007-1026.
- Milkov, A., G. Claypool, Y. Lee, M. Torres, W. Borowski, H. Tomaru, R. Sassen, P. Long, and the ODP Leg 204 Scientific Party, 2004, Subsurface gases indicate gas hydrate occurrence in marine sediments at southern Hydrate Ridge offshore Oregon, *Org. Geochem.*, Volume 35, p. 1067-1080.
- Milkov, A., G. Claypool, Y. Lee, W. Xu, G. Dickens, W. Borowski, and the ODP Leg 204 Scientific Party, 2003, In situ methane concentrations at Hydrate Ridge offshore Oregon: new constraints on the global gas hydrate inventory from an active margin, *Geology*, Volume 31, p. 833-836.
- Milkov, A., G. Dickens, G. Claypool, Y. Lee, W. Borowski, M. Torres, W. Xu, H. Tomaru, A. Tréhu, and P. Schultheiss, 2004, Co-existence of gas hydrate, free gas, and brine within the regional gas hydrate stability zone at Hydrate Ridge (Oregon Margin): evidence from prolonged degassing of a pressurized core, *Earth and Planetary Science Letters*, Volume 222, p. 829-843.
- Musgrave, R., N. Bangs, J. Larrasoána, E. Gràcia, J. Hollamby, and M. Vega, 2006, Rise of the base of the gas hydrate zone since the last glacial recorded by rock magnetism, *Geology*, 34, p. 117-120.

- Riedel, M., P. Long, and T. Collett, 2006, Estimates of in situ gas hydrate concentration from resistivity monitoring of gas hydrate bearing sediments during temperature equilibration, *Marine Geology*, Volume 227, p. 215-225.
- Riedel, M., T. Collett, M. Malone, and the IODP Expedition 311 Scientists, 2006. *Proc. IODP, 311*, Washington, DC (Integrated Ocean Drilling Program Management International, Inc.), doi:10.2204/iodp.proc.311.
- Riedel, M., T. Collett, M. Malone, and the IODP Expedition 311 Scientists, 2006, Stages of gas-hydrate evolution on the northern Cascadia margin, *Scientific Drilling Journal*, Vol. 3, pp.18-24, doi:10.2204/iodp.sd.3.04.
- Riedel, M., P. Long, C. Liu, P. Schultheiss, T. Collett, and ODP Leg 204 Shipboard Scientific Party, 2006, Physical properties of near-surface sediments at southern Hydrate Ridge: results from ODP Leg 204, in Tréhu, A., Bohrmann, G., Torres, M., and Colwell, F. eds., *Proceedings of ODP, Scientific Results*, Vol. 204, pp.1-29, doi:10.2973/odp.proc.sr.204.104.
- Riedel, M., E. Willoughby, R. Hyndman, G. Spence, N. Chapman, R. Edwards, I. Novosel, and K. Schwalenberg, in review, Gas hydrates at the Northern Cascadia Margin, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Riedel, M., E. Willoughby, M. Chen, T. He, I. Novosel, K. Schwalenberg, R. Hyndman, G. Spence, in review, Gas hydrate on the Northern Cascadia Margin: regional geophysics and structural framework, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Teichert, B., G. Bohrmann, and E. Suess, 2005, Chemoherms on Hydrate Ridge—Unique microbially-mediated carbonate build-ups growing into the water column, *Palaeogeogr., Palaeoclim, Palaeoecol.*, Volume 227, p. 67-85.
- Teichert, B., M. Torres, G. Bohrmann, and A. Eisenhauer, 2005, Fluid sources, fluid pathways and diagenetic reactions across an accretionary prism revealed by Sr and B geochemistry, *Earth and Planetary Science Letters*, Volume 239, p. 106-121.
- Torres, M., A. Tréhu, N. Cespedes, M. Kastner, U.G. Wortmann, J.-H. Kim, P. Long, A. Malinverno, J.W. Pohlman, M. Riedel, T. Collett, 2008, Methane hydrate formation in turbidite sediments of northern Cascadia, IODP Expedition 311, *Earth and Planetary Science Letters*, V. 271 p. 170-180.

- Torres, M., B. Teichert, A. Tréhu, W. Borowski, and H. Tomaru, 2004, Relationship of pore water freshening to accretionary processes in the Cascadia margin: Fluid sources and gas hydrate abundance, *Geophysical Research Letters*, Vol. 31, L22305, doi:10.1029/2004GL021219.
- Torres, M., K. Wallmann, A. Tréhu, G. Bohrmann, W. Borowski, and H. Tomaru, 2004, Gas hydrate growth, methane transport, and chloride enrichment at the southern summit of Hydrate Ridge, Cascadia Margin off Oregon, *Earth and Planetary Science Letters*, Volume 226, p. 225-241.
- Tréhu, A., G. Bohrmann, F. Rack, M. Torres, and the ODP Leg 204 Scientific Party, 2003, ODP Leg 204: gas hydrate distribution and dynamics beneath southern Hydrate Ridge, *JOIDES Journal*, Volume 29(2), p. 5-8.
- Tréhu, A., P. Flemings, N. Bangs, J. Chevallier, E. Gràcia, J. Johnson, C. Liu, X. Liu, M. Riedel, and M. Torres, 2004, Feeding methane vents and gas hydrate deposits at south Hydrate Ridge, *Geophysical Research Letters*, Vol. 31, L23310, doi:10.1029/2004GL021286.
- Tréhu, A., P. Long, M. Torres, G. Bohrmann, F. Rack, T. Collett, D. Goldberg, A. Milkov, M. Riedel, P. Schultheiss, N. Bangs, S. Barr, W. Borowski, G. Claypool, M. Delwiche, G. Dickens, E. Gràcia, G. Guerin, M. Holland, J. Johnson, Y. Lee, C. Liu, X. Su, B. Teichert, H. Tomaru, M. Vanneste, M. Watanabe, and J. Weinberger, 2004, Three-dimensional distribution of gas hydrate beneath southern Hydrate Ridge: constraints from ODP Leg 204, *Earth and Planetary Science Letters*, Volume 222, p.845-862.
- Trehu, A., C. Ruppel, M. Holland, G. Dickens, M. Torres, T. Collett, D. Goldberg, M. Riedel, and P. Schultheiss, 2006, Gas Hydrates in marine sediments - lessons from ocean drilling, *Oceanography*, v. 19, n. 4., pp. 124-142.
- Weinberger, J., K. Brown, and P. Long, 2005, Painting a picture of gas hydrate distribution with thermal images, *Geophysical Research Letters*, Vol. 32, L04609, doi:10.1029/2004GL021437.

### **Other Publications**

- Collett, T., S. Barr, D. Goldberg, and G. Guerin, 2003, Downhole logging, in Trehu, A., G. Bormann, and R. Colwell, eds., *Initial Reports—Gas hydrate beneath the seafloor of Hydrate Ridge: Proceedings of the Ocean Drilling Program*, Ocean Drilling Program, Texas A&M University, College Station, TX, Volume 204, available online ([click here](#)).
- Riedel, M., T. Collett, M. Malone, and the IODP Expedition 311 Scientists, 2006, Proceedings of the Integrated Ocean Drilling Program Expedition 311, Cascadia Margin Gas Hydrates, IODP Management International, Inc., Texas A&M University, available online ([click here](#)).

Riedel, M., T. Collett, M. Malone, F. Akiba, M. Blanc-Valleron, M. Ellis, G. Guerin, Y. Hashimoto, V. Heuer, Y. Higashi, M. Holland, P. Jackson, M. Kaneko, M. Kastner, J. Kim, H. Kitajima, P. Long, A. Malinverno, G. Myers, L. Palekar, J. Pohlman, P. Schultheiss, B. Teichert, M. Torres, A. Tréhu, J. Wang, U. Wortmann, and H. Yoshioka, 2006, Gas hydrate transect across northern Cascadia Margin, *Eos*, Volume 87, N. 33, p. 325-332.

Shipboard Scientific Party, 2005, Integrated Ocean Drilling Program, Expedition 311 Preliminary Report, Cascadia Margin Gas Hydrates, available online ([click here](#)).

Tréhu, A., G. Bohrmann, F. Rack, M. Torres, *et al.*, 2003, *Initial Reports—Gas hydrate beneath the seafloor of Hydrate Ridge: Proceedings of the Ocean Drilling Program*, Ocean Drilling Program, Texas A&M University, College Station, TX, Volume 204, available online ([click here](#)).

Trehu, A., M. Torres, G. Bohrmann, and F. Colwell, 2006, Leg 204 synthesis: Gas hydrate distribution and dynamics in the central Cascadia accretionary complex, *in* Trehu, A., M. Torres, G. Bohrmann, and F. Colwell, eds., *Proc. ODP, Sci. Results, Ocean Drilling Program*, Texas A&M University, College Station, TX, Volume 204, available online ([click here](#)).

Winters, W., W. Waite, D. Mason, L. Gilbert, 2006, Physical properties of repressurized sediment from Hydrate Ridge, *in* Tréhu, A., G. Bohrmann, M. Torres, F. Colwell, eds., *Proc. ODP, Sci. Results, 204: College Station, TX (Ocean Drilling Program)*, 1–19. doi:10.2973/odp.proc.sr.204.119.2006, available online ([click here](#)).

## **Presentations**

Cespedes, N., A. Trehu, and M. Torres, 2006, Grain size variation of sediments from Expedition 311, paper OS33B-1714, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Collett, T., M. Riedel, and M. Malone, 2006, Gas Hydrate Research Coring and Downhole Logging Operational Protocol, paper OS11E-02, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Collett, T., D. Goldberg, A. Janik, and G. Guerin, 2004, Occurrence of Gas Hydrate and Associated Free-Gas Accumulations on Hydrate Ridge, Offshore Oregon, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.

Cook, A., and D. Goldberg, 2006, Strength of Gas Hydrate-bearing Sediments from IODP Expedition 311, Cascadia Margin, paper OS33B-1700, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Enkin, R., J. Baker, L. Esteban, A. Mullin, B. Paterson, T. Hamilton, and M. Riedel, 2006, Magnetic Properties of Sediments from IODP Expedition 311 - Cascadia Margin Gas Hydrates: Records of Fossil Sulphate Methane Interface?, paper OS33B-1692, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

- Francis, T., 2004, The HYACINTH Project - Pressurized Samples from the Seabed for Continental Margin Research, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- Goldberg, D., G. Guerin, A. Malinverno, K. Tagbor, and J. Alford, 2006, Formation Vp Derived From LWD Sonic Data at IODP Sites U1325-U1329, Cascadia Margin, paper OS33B-1713, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Guerin, G., and D. Goldberg, 2006, Analysis of Multimode Acoustic Waveforms in Gas Hydrate Bearing Sediments, IODP Expedition 311, Cascadia Margin, paper OS33B-1701, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Holland, M., P. Schultheiss, J. Roberts, and M. Druce, 2006, Gas Hydrate-Sediment Morphologies Revealed by Pressure Core Analysis, paper OS33B-1689, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Lu, H., I. Moudrakovski, J. Schicks, J. Ripmeester, and M. Zhang, 2006, The characteristics of gas hydrates recovered from Northern Cascadia margin by IODP Expedition 311, paper OS11E-08, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Lu, Z., 2006, Iodine and bromine concentrations in pore waters from two gas hydrate fields: IODP 311 and ODP 204, paper OS11E-07, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Malinverno, A., M. Kastner, M. Torres, and U. Wortmann, 2006, Gas Hydrate Saturations and Their Uncertainties From Chlorinity and Well Log Data at IODP Site U1325 (Exp. 311, Cascadia Margin), paper OS11E-04, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Pasteris, J., 2003, Development of In-Situ, Real-Time Raman Analysis of Clathrate Hydrates on the Sea Floor, Seattle, WA, Geological Society of America Annual Meeting, November 2-5.
- Paulson, M., J. Merrill, K. Moran, C. Baxter, and J. Ressler, 2006, Predicting Sediment Strength in Accretionary Complexes Using Geophysical Logs, paper T21A-0388, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Pinero, E., F. Martinez-Ruiz, E. Gracia, J. Larrasoana, and J. Danobeitia, 2006, Gas Hydrates-bearing Sediments from Southern Hydrate Ridge (ODP Leg 204): Geochemical and Mineralogical Approach, paper OS33B-1694, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

- Pohlman, J., M. Kaneko, V. Heuer, R. Plummer, and R. Coffin, 2006, Molecular and Isotopic Characterization of Gases from IODP Expedition 311: Source and Gas Hydrate Related Controls, paper OS11E-06, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Riedel, M., T. Collett, M. Malone, R. Hyndman, E. Willoughby, G. Spence, R. Chapman, N. Edwards, and K. Schwalenberg, 2006, IODP Expedition 311 – A review of gas hydrate research on the Northern Cascadia Margin, paper OS11E-01, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Riedel, M., T. Collett, M. Malone, and Expedition 311 Scientific Party, 2005, Integrated Ocean Drilling Program Expedition 311— Cascadia Margin Gas Hydrates, San Francisco, CA, American Geophysical Union Fall Meeting, December 5-9.
- Riedel, M., T. Collett, M. Malone, and Expedition 311 Scientific Party, 2006, Integrated Ocean Drilling Program Expedition 311—Cascadia Margin Gas Hydrates, International Conference on Sediment-hosted gas hydrates: new insights on natural and synthetic systems, Geological Society of London, January 25-26.
- Schicks, J., M. Ziemann, R. Naumann, and J. Erzinger, 2006, Characterization of Gas Hydrate Samples from IODP 311 using High Resolution Raman Spectroscopy, X-ray Diffraction and Differential Scanning Calorimetry, paper OS33B-1698, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Stern, L., and S. Kirby, 2006, Natural gas hydrate in sediments imaged by cryogenic SEM: Insights from lab experiments on synthetic hydrates as interpretive guides, paper OS33B-1699, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Teichert, B., G. Bohrmann, E. Gràcia, J. Johnson, X. Su, J. Weinberger, and ODP Leg 204 Shipboard Scientific Party, 2003, Authigenic carbonates from Hydrate Ridge (ODP Leg 204), formation processes and evidence of fluid pathways, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.
- Teichert, B., G. Bohrmann, E. Gràcia, J. Johnson, X. Su, J. Weinberger, and ODP Leg 204 Shipboard Scientific Party, 2003, Authigenic carbonates from Hydrate Ridge (ODP Leg 204), IODP-ICDP, Mainz, Germany, March 26-28.
- Teichert, B., G. Bohrmann, M. Torres, and A. Eisenhauer, 2004, Fluid pathways influencing gas hydrate occurrence at Hydrate Ridge, Bremen, Germany, Euro-Forum for Scientific Earth Drilling, March 17-19.
- Teichert, B., M. Torres, G. Bohrmann, and A. Eisenhauer, 2005, Fluid sources, fluid pathways and diagenetic reactions across an accretionary prism revealed by Sr and B geochemistry, Potsdam, Germany, ICDP-IODP meeting, March 14-16.

Trehu, A., 2006, Heat flow in the outer Cascadia accretionary complex from boreholes and BSRs, OS33B-1715, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Villinger, H., M. Heesemann, A. Fisher, A. Trehu, and S. Witte, 2006, Deployment and Testing of the Third-generation Tool to Determine In-situ Temperatures While Piston Coring During Scientific Ocean Drilling, OS31D-1664, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Wang, J., 2006, The Lithological Constraint to Gas Hydrate Formation: Evidence of Grain Size of Sediments from IODP 311 on Cascadia Margin, OS33B-1708, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

Xu, W., 2006, The Role of Natural Gas Hydrates in Shaping the Global Continental Slopes, OS12C-07, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

## **Comparative Assessment of Advanced Gas Hydrate Production Methods (DE-FC26-06NT42666)**

*Battelle Pacific Northwest Division, University of Alaska – Fairbanks*

### **Publications**

Bhangale, A., T. Zhu, B. McGrail, and M. White, 2006, A model to predict hydrate equilibrium and hydrate saturation inside porous media including mixed CH<sub>4</sub>-CO<sub>2</sub> hydrates, paper SPE 99759, proceedings of the SPE-Improved Oil Recovery Symposium.

McGrail, B., T. Zhu, and B. Hunter, 2005, New Method May Hold Promise for Gas Hydrate Production and Carbon Sequestration, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, available online ([click here](#)).

McGrail B.P., S. Ahmed, H.T. Schaef, A.T. Owen, P.F. Martin, and T. Zhu, 2007. Gas Hydrate Property Measurements in Porous Sediments with Resonant Ultrasound Spectroscopy. *Journal of Geophysical Research - Solid Earth* 112(B05202).

Phale H., T. Zhu, M. White, and B. McGrail, 2006, Simulation Study on Injection of CO<sub>2</sub>-microemulsion for Methane Recovery from Gas-Hydrate Reservoirs, paper SPE 100541, proceedings of the SPE Gas Technology Symposium.

Zhu, T., B. McGrail, A. Kulkarni, M. White, H. Phale, S. Patil, and D. Ogbe, 2005, Development of a Thermodynamic Model and Reservoir Simulator for the CH<sub>4</sub>, CO<sub>2</sub>, and CH<sub>4</sub>-CO<sub>2</sub> Gas Hydrate System, paper SPE 93976, proceedings of the AAPG/SPE Western Regional.

## **Presentations**

- Bhangale, A., T. Zhu, B. McGrail, and M. White, 2006, A model to predict hydrate equilibrium and hydrate saturation inside porous media including mixed CH<sub>4</sub>-CO<sub>2</sub> hydrates, Tulsa, OK, SPE-Improved Oil Recovery Symposium, April 22-26.
- McGrail, B., H. Schaef, M. White, A. Owen, T. Zhu, and R. Hunter, 2005, Enhanced Gas Hydrate Recovery with CO<sub>2</sub> Sequestration, Calgary, AB, Canada, The American Association of Petroleum Geologists Annual Convention, June 20.
- McGrail, B., T. Zhu, R. Hunter, M. White, S. Patil, and A. Kulkarni, 2004, A New Method for Enhanced Production of Gas Hydrates with CO<sub>2</sub>, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- White M. D, and B. P. McGrail, 2008. "Designing a Pilot-Scale Experiment for the Production of Natural Gas Hydrates and Sequestration of CO<sub>2</sub> in Class 1 Hydrate Accumulations." In Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies, PNWD-SA-8374, Battelle - Pacific Northwest Division, Richland, WA.
- Phale H., T. Zhu, M. White, and B. McGrail, 2006, Simulation Study on Injection of CO<sub>2</sub>-microemulsion for Methane Recovery from Gas-Hydrate Reservoirs, Calgary, AB, Canada, SPE Gas Technology Symposium, May 15-18.
- White, M., and B. McGrail, 2008, "Numerical Simulation of Methane Hydrate Production from Geologic Formations via Carbon Dioxide Injection," Special Session on Gas Production From Hydrates, 2008 Offshore Technology Conference, Houston, Texas, May 5-8.
- Zhu, T., B. McGrail, A. Kulkarni, M. White, H. Phale, S. Patil, and D. Ogbe, 2005, Development of a Thermodynamic Model and Reservoir Simulator for the CH<sub>4</sub>, CO<sub>2</sub>, and CH<sub>4</sub>-CO<sub>2</sub> Gas Hydrate System, Irvine, CA, AAPG/SPE Western Reg. Meeting, March 30-April 1.

## **Seismic Gas Hydrate Quantification by Cumulative Attributes (DE-FC26-06NT42961)**

### ***Rock Solid Images***

## **Presentations**

- Walls, J., 2006, Hydrate Resource Identification and Characterization from Well Logs and 3D Seismic, Houston, Texas, Hart Energy Publ. Methane Hydrates Conference, Dec. 5-6.

## **Petrophysical Characterization and Reservoir Simulator for Methane Gas Production from Gulf of Mexico Hydrates (DE-FC26-02NT41327)**

*Westport Technology Center International, University of Houston*

### **Peer-Reviewed Publications**

Sun, X., and K. Mohanty, 2006., Kinetic Simulation of Methane Hydrate Formation and Dissociation in Porous Media, *Chem. Eng. Sci.*, 61, 3476-3495.

### **Presentations**

Sun, X., K. Mohanty, 2005, Simulation of Methane Hydrate Reservoirs, Woodlands, TX, paper SPE 93015, SPE Reservoir Simulation Symposium, Jan. 31-Feb. 2.

## **Detection and Production of Methane Hydrates (DE-FC26-06NT42960)**

*Rice University, University of Houston*

### **Peer-Reviewed Publications**

Bhatnagar, G., W. Chapman, G. Dickens, B. Dugan, G. Hirasaki, 2007, Generalization of Gas Hydrate Distribution and Saturation in Marine Sediments by Scaling of Thermodynamic and Transport Processes, *American Journal of Science*, Vol. 307, June, p. 861-900.

Bhatnagar, G., W. Chapman, G. Dickens, B. Dugan, and G. Hirasaki, 2008, "Sulfate-methane transition as a proxy for average methane hydrate saturation in marine sediments," *Geophysical Research Letters*, Vol. 35, February.

Dugan, B., in press, "Fluid Flow in the Keathley Canyon 151 Mini-Basin, Northern Gulf of Mexico," *Marine and Petroleum Geology*, 25, 919-923, doi:10.1016/j.marpetgeo.2007.12.005.

Jaiswal, P., C.A. Zelt, R. Dasgupta, and K. K. Nath, "Seismic imaging of the Naga Thrust using multiscale waveform inversion," *Geophysics*, accepted.

Snyder, G.T., A. Hiruta, R. Matsumoto, G.R. Dickens, H. Tomaru, R. Takeuchi, J. Komatsubara, Y. Ishida and H. Yu, 2007, "Pore water profiles and authigenic mineralization in shallow marine sediments above the methane charged system on Umitaka Spur, Japan Sea," *Deep-Sea Research (II)*, Vol. 54, p.1216-1239.

Winters, W.J., B. Dugan, T.S. Collett, in press, "Physical Properties of Sediments from Keathley Canyon and Atwater Valley, JIP Gulf of Mexico Gas Hydrate Drilling Program," *Marine and Petroleum Geology*, 25, 896-905, doi:10.1016/j.marpetgeo.2008.01.018.

## **Other Publications**

Dickens, G.R., Snyder, G.T., 2009, "Interpreting Upward Methane Flux from Pore Water Profiles," *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, available online (click here).

## **Presentations**

Bhatnagar, G., Chapman, W.G., Dickens, G.R., Dugan, B., Hirasaki, G.J., 2008, "Effects of Overpressure on Gas Hydrate Distribution," Sixth International Conference on Gas Hydrates, Vancouver, British Columbia, Canada, to be presented July 6-10.

Bhatnagar, G., Chapman, W.G., Dickens, G.R., Dugan, B., Hirasaki, G.J., 2008, "Relating Gas Hydrate Saturation to Depth of Sulfate-Methane Transition, Sixth International Conference on Gas Hydrates," Vancouver, British Columbia, Canada, to be presented July 6-10.

Chatterjee, S., Bhatnagar, G., Chapman, W.G., Dickens, G.R., Dugan, B., Hirasaki, G.J., 2008, "Effect of Lithologic Heterogeneities on Gas Hydrate Distribution", American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19

Daigle, H., B. Dugan, 2008, "Nuclear magnetic resonance permeability estimation in fine-grained sediments," Processes in Porous Media Consortium Meeting, Rice University, Houston, TX, March 26.

Daigle, H., B. Dugan, 2008, "Consolidation, permeability, and pore structures of fine-grained sediments," ExxonMobil-Harvard-Rice Consortium Meeting, Harvard University, Cambridge, MA, May 19.

Dickens, G.R., 2008, "The Global Carbon Cycle with Seafloor Methane," Department of Geosciences, Virginia Tech University, Blacksburg, VA, October 1. (Part of the AAPG 2008-2009 Distinguished Lecturer tour).

Dickens, G.R., 2009, "The Global Carbon Cycle with Seafloor Methane," Department of Geosciences, University of Tulsa, Tulsa, OK, February 10. (Part of the AAPG 2008-2009 Distinguished Lecturer tour).

Dickens, G.R., 2009, "The Global Carbon Cycle with Seafloor Methane," Department of Geological Sciences, Brigham Young University, Provo, UT, February 12. (Part of the AAPG 2008-2009 Distinguished Lecturer tour).

Dugan, B., W.G. Chapman, G.R. Dickens, G.Hirasaki, K. Mohanty, C. Zelt, 2008, "Detection and Production of Methane Hydrate," Shell International Exploration and Production Inc., Houston, TX, July 22.

Gu, G., Jaiswal, P., Chapman, W.G., Zelt, C., Hirasaki, G.J., 2008, "Compositional Effect on Hydrate/Free Gas Transition and BSR", American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19.

Gu, G., G. Bhatnager, G. Dickens, W. Chapman, G. J. Hirasaki, 2007, "Effects of Seafloor Temperature on the Distribution of Methane Hydrate," American Geological Union, Fall Meeting, San Francisco, December 10-14.

Hirasaki, G., 2008, "Effect of Overpressure on Gas Hydrate Distribution," 6th International Conference on Gas Hydrate, Vancouver, BC, July 6-10.

Hirasaki, G., 2008, "Relating Gas Hydrate Saturation to Depth of Sulfate-Methane Transition," 6th International Conference on Gas Hydrate, Vancouver, BC, July 6-10.

Jaiswal, P., C. A. Zelt, R. Dasgupta. "Towards a Unified Imaging Procedure for 2-D Land Multichannel Seismic Data," 70<sup>th</sup> European Association of Geoscientists and Engineers (EAGE) Conference and Exhibition, Rome, Italy, June 11-14, 2008.

Jaiswal, P., C.A. Zelt, P. Dewangan, and T. Ramprasad, "Gas hydrate in the Krishna-Godavari Basin", 71st European Association of Geoscientists and Engineers (EAGE) Conference and Exhibition, Amsterdam, June 8-11, 2009, submitted.

Jones, E., T. Latham, D. McConnell, M. Frye, J. Hunt Jr., W. Shedd, D. Shelander, R. Boswell, K. Rose, C. Ruppel, D. Hutchinson, T. Collett, B. Dugan, W. Wood, 2008, "Scientific Objectives of the Gulf of Mexico Gas Hydrate JIP Leg II Drilling," Paper OTC 19501, Offshore Technology Conference, Houston TX, May 5-8.

Phirani, J., K. Mohanty, 2008, "Production Strategies for Marine Hydrate Reservoirs," 6th International Conference on Gas Hydrates 2008, Vancouver, British Columbia, July 6-10.

Phirani, J., G. J. Hirasaki, K. K. Mohanty, 2008, "Gas Production from Unconfined Hydrate reservoirs ," American Geological Union, Fall Meeting, San Francisco, December 15-20.

### **Theses/Dissertations**

Bhatnagar, G., 2008, Accumulation of gas hydrates in marine sediments, Ph.D. Disseratation, Rice University.

Hubbard, L.A., 2008, Fluid Relationships in the Northern Gulf of Mexico Using Dissolved Ion Concentrations and Strontium Isotopes, M.S. Thesis, Rice University.

### **Government Reports**

Hirasaki, G., W. Chapman, G. Dickens, C. Zelt, B. Dugan, and K. Mohanty, 2008, "Detection and Production of methane Hydrate: End of Phase 2 Topical Report (Reporting Period June 2007-June 2008), DOE Contract No. DE-FC26-06NT42960, June, 381 pages, available online ([click here](#)).

## **Characterization and Qualification of the Methane Hydrate Resource Potential Associated with the Barrow Gas Fields (DE-FC26-06NT42962)**

*North Slope Borough, University of Alaska - Fairbanks*

### **Other Publications**

Walsh, T., and P. Stokes, 2007, Characterization and Quantification of the Methane Hydrate Resource Potential Associated with the Barrow Gas Fields, *U.S. DOE-NETL Fire in the Ice Newsletter*, Spring/Summer 2007, available online ([click here](#)).

### **Presentations**

Walsh, T., S. MacRae, P. Stokes, S. Patil, and P. Singh, 2007, Methane Hydrate Resource Potential Associated with the Barrow Gas Fields, presented at the Arctic Energy Summit, William Egan Convention Center, Anchorage, Alaska, October 16.

Walsh, T., P. Stokes, M. Panda, T. Morahan, D. Greet, S. MacRae, P. Singh, S. Patil, 2008, "Characterization and quantification of the methane hydrate resource potential associated with the Barrow Gas Field," International Conference on Gas Hydrates, Vancouver, Canada, July 7-10.

## **Mechanisms Leading to Co-existence of Gas and Hydrate in Ocean Sediments (DE-FC26-06NT43067)**

*University of Texas at Austin*

### **Presentations**

Behseresht, J., S. Bryant, and K. Seperhnoori, 2007, "Infinite-Acting Physically Representative Networks for Capillarity-Controlled Displacements," SPE110581, *Proceedings of the 2007 SPE Annual Technical Conference and Exhibition*, Anaheim, California, U.S.A., November 11-14.

Behseresht, J., M. Prodanović and S. Bryant, 2007, "Pore Scale Mechanistic Study of the Preferential Mode of Hydrate Formation in Sediments: Fluid Flow Aspects," AGU Fall Meeting, Abstract OS22A-04, December 11.

Behseresht, J., M. Prodanović and S. Bryant, 2008, "Grain scale study of hydrate formation in sediments from methane gas: Role of capillarity," International Conference on Gas Hydrates, Vancouver, BC Canada, July 7-10.

Behseresht, J., Y. Peng, M. Prodanovic, S. Bryant, A. Jain and R. Juanes, 2008, "Mechanisms by Which Methane Gas and Methane Hydrate Coexist In Ocean Sediments," OTC 19332, Offshore Technology Conference, Houston, TX, May.

- Prodanović, M. and S. Bryant, in press, “Capillarity-controlled displacements in sediments with moveable grains: Implications for growth of methane hydrates,” SPE Annual Technical Conference and Exhibition, Denver, Colorado, September 21-24, 2008.
- Prodanović, M. and S. L. Bryant, 2008, “A level set method for non-zero contact angle drainage and imbibition in realistic porous media,” presentation at Computational Methods in Water Resources 2008, San Francisco, CA, July 6-10.
- Prodanović, M., J. Behseresht, Y. Peng, S. Bryant, A. Jain and R. Juanes, 2008, “Mechanisms by Which Methane Gas and Methane Hydrate Coexist in Ocean Sediments,” 2008 Offshore Technology Conference, Houston, Texas, May 5-8.
- Prodanović, M. and S. Bryant, 2007, “Drainage and Imbibition Simulations in Realistic Porous Media Based on the Level Set Method,” American Geophysical Union Fall Meeting, Abstract OS22A-04, December 13.
- Prodanović, M. and S. Bryant, 2007, “Investigating spontaneous capillarity-controlled events via the level set method,” International Conference on Industrial and Applied Mathematics 2007 (ICIAM 2007), Zurich, Switzerland, July 16-20.
- Prodanović, M. and S. Bryant, 2007, “A level set method method for determining critical curvatures for drainage and imbibition,” Workshop on Modeling, Analysis and Simulation of Multiscale Nonlinear Systems, Oregon State University, Corvallis, OR, June 25-29.
- Prodanović, M. and S. Bryant, 2007, “Physics-Driven Interface Modeling for Drainage and Imbibition in Fractures,” SPE110448, *Proceedings of the 2007 SPE Annual Technical Conference and Exhibition* Anaheim, California, U.S.A., November 11-14.
- Jain, A., and R. Juanes, 2008, “Pore scale mechanistic study of the preferential mode of hydrate formation in sediments: Coupling of fluid flow and sediment mechanics,” International Conference on Gas Hydrates, Vancouver, BC Canada, July 7-10.
- Jain, A. and R. Juanes, 2008, “Grain scale modeling of coupled flow and mechanics: implications for methane hydrate in ocean sediments,” World Congress on Computational Mechanics (WCCM8) – European Congress on Computational Methods in Applied Sciences and Engineering, Venice, Italy, June 30-July 4.
- Jain, A. K. and R. Juanes, 2008, “Conditions Under Which Gaseous Methane Will Fracture Ocean Sediments and Penetrate Through the Hydrate Stability Zone: Modeling Multiphase Flow and Sediment Mechanics at the Pore Scale,” AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.
- Juanes, R. and A. K. Jain, 2008, “A Grain-Scale Coupled Model of Multiphase Fluid Flow and Sediment Mechanics – Application to Methane Hydrates in Natural Systems,” AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.

## **Gas Hydrates Research Database and Web Dissemination Channel (DE-AI26-06NT42938)**

*National Institute of Standards and Technology (NIST)*

### **Presentations**

Kroenlein K., R. Löwner, W. Wang, V. Diky, T. Smith, C. D. Muzny, R.D. Chirico, A. Kazakov, E. D. Sloan, and M. Frenkel, Standardization and Software Infrastructure for Gas Hydrate Data Communications. Proc. 6th International Conference on Gas Hydrates, Vancouver, 2008.

## **Methane Recovery from Hydrate-bearing Sediments (DE-FC26-06NT42963)**

*Georgia Institute of Technology*

### **Peer-Reviewed Publications**

Kwon, T., G. Cho, J. Santamarina, 2008, "Hydrate Dissociation in Sediments: Pressure-Temperature Evolution," *Geochemistry, Geophysics, Geosystems*, AGU and Geochemical Society, Vol. 9, No. 3, March 22.

### **Presentations**

Taboada-Serrano, P., and C. Tsouris, 2007, "Methane Hydrate Dissociation on a Mineral Surface," presented at the American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, November 4 to 9.

## **Remote Sensing and Sea-Truth Measurements of Methane Flux to the Atmosphere (HYFLUX project) (DE-NT0005638 )**

*Texas A&M University – Corpus Christi*

### **Peer-Reviewed Publications**

Hu, L., Yvon-Lewis, S.A., Kessler, J.D., and MacDonald, I., 2009, Air-Sea Flux of Methane from Selected Marine Hydrate/Seep Sites in the Northern Gulf of Mexico During HYFLUX: *Eos Trans. AGU*, 90(52), p. OS23B-04.

MacDonald, I.R., Garcia-Pineda, O.G., Chanton, J., Kastner, M., Solomon, E.A., Leifer, I., Naehr, T.H., Yvon-Lewis, S.A., and Kessler, J.D., 2009, HYFLUX: Satellite Inventory and Sea-Truth for Gulf of Mexico Gas Hydrate System: *Eos Trans. AGU*, 90(52), p. OS23B-03.

## Presentations

- Garcia-Pineda, O.G., MacDonald, I.R., Shedd, W., and Zimmer, B., 2009, HYFLUX: Satellite Exploration of Natural Hydrocarbon Seeps and Discovery of a Methane Hydrate Mound at GC600: Eos Trans. AGU, 90(52), p. OS31A-1185 Poster.
- Shapiro, R.A., Naehr, T.H., MacDonald, I., Kastner, M., Robertson, G., and Solomon, E.A., 2009, Pore Water Data From Three Gas Hydrate Sites in the Gulf of Mexico: First Results from the HyFlux Project: Eos Trans. AGU, 90(52), p. OS31A-1186 Poster.
- Solomon, E.A., Kastner, M., and Leifer, I., 2009, Ethane and Propane Emissions to the Ocean and Atmosphere from 550-1200 m Seeps in the Gulf of Mexico: Eos Trans. AGU, 90(52), p. OS31A-1182 Poster.
- MacDonald, I.R., Leifer, I., Kastner, M., Yvon-Lewis, S., Asper, V., 2008, HYFLUX: A program preview, Gulf of Mexico Hydrates Research Consortium Meeting, University of Mississippi, Oxford MS, October 14, 2008.
- MacDonald, I. R., Asper, V., Garcia, O., Kastner, M., Leifer, I., Naehr, T.H., Solomon, E., Yvon-Lewis, S., and Zimmer, B., 2008, HYFLUX - Part I: Regional modeling of methane flux from near-seafloor gas hydrate deposits on continental margins, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.
- Naehr, T.H., Asper, V., Garcia, O., Kastner, M., Leifer, I., MacDonald, I.R., Solomon, E., Yvon-Lewis, S., and Zimmer, B., 2008, HYFLUX - Part II: Subsurface sequestration of methane-derived carbon in gas-hydrate-bearing marine sediments, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.
- MacDonald, I.R., Leifer, I., Kastner, M., Yvon-Lewis, S., Asper, V., 2008, HYFLUX: A program preview, Gulf of Mexico Hydrates Research Consortium Meeting, University of Mississippi, Oxford MS, October 14, 2008.
- MacDonald, I. R., Asper, V., Garcia, O., Kastner, M., Leifer, I., Naehr, T.H., Solomon, E., Yvon-Lewis, S., and Zimmer, B., 2008, HYFLUX - Part I: Regional modeling of methane flux from near-seafloor gas hydrate deposits on continental margins, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.
- Naehr, T.H., Asper, V., Garcia, O., Kastner, M., Leifer, I., MacDonald, I.R., Solomon, E., Yvon-Lewis, S., and Zimmer, B., 2008, HYFLUX - Part II: Subsurface sequestration of methane-derived carbon in gas-hydrate-bearing marine sediments, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.

## Section IV: Publications Resulting from Work with the Dept. of Energy's National Labs

*Additional publications produced by the National Labs in association with the Program's major filed projects are included within Section I.*

### *Brookhaven National Laboratory*

#### **Peer-Reviewed Publications**

- Eaton, M., K. Jones, and D. Mahajan, in review, Methane hydrate formation/decomposition in depleted Sediments, *Proceedings of the Geological Society (London)*.
- Eaton, M., D. Mahajan and R. Flood, 2007, A novel high-pressure apparatus to study hydrate-sediment interactions, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 101-107, March.
- Jones, K., P. Kerkar, D. Mahajan, W. Lindquist, and H. Feng, in review, Microstructure of Natural Hydrate Host Sediments, *Nuclear Instruments and Methods in Physics Research: Section B*.
- Jones, K., H. Feng, S. Tomov, W. Winters, M. Prodanović and D. Mahajan, 2007, Characterization of methane hydrate host sediments using synchrotron-computed microtomography (CMT), *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 136-145, March.
- Jones, K., H. Feng, A. Lanzirrooti, and D. Mahajan, 2005, Synchrotron X-ray Microprobe and Computed Microtomography for Characterization of Nanocatalysts, *Nuclear Instruments and Methods in Physics Research: Section B*, Volume 241, p. 331-334.
- Mahajan, D., P. Servio, K. Jones, H. Feng, and W. Winters, 2004, Methane Hydrate Studies; Delineating Properties of Host Sediments to Establish Reproducible Decomposition Kinetics, in Taylor, C., and J. Kwan, eds., *Recent Advances in the Study of Gas Hydrates*, NY, American Institute of Chemical Engineers and Kluwer Academic/Plenum Publishers, p. 239-250.
- Servio, P., M. Eaton, D. Mahajan, and W. Winters, 2005, Fundamental Challenges to Methane Recovery from Gas Hydrates, *Topics in Catalysis*, Volume 32, n. 3-4, p. 101-104.
- Zheng, L., H. Zhang, M. Zhang, P. Kerkar, and D. Mahajan, in review, Modeling methane hydrate formation in marine sediments, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.

## Other Publications

Mahajan, D., T. Koztle, W. Klooster, L. Brammer, R. McMullan, and A. Goland, 2000, Crystal Growth, Structure Characterization, and Schemes for Economical Transport: An Integrated Approach to the Study of Natural Gas Hydrates, *Annals of the New York Academy of Sciences*, Volume 912, p. 940-949.

## Presentations

Eaton, M. and D. Mahajan, 2006, Methane Hydrate Kinetics in Depleted Host Sediments using the FISH unit, Kauai, HI, International Workshop on Science & Technology Issues in Methane Hydrates R&D, Engineering Conference International, March 5-9.

Eaton, M., D. Mahajan, R. Flood, T. Koga, and M. Rafailovich, 2005, Hydrate-Sediment Interactions in a Novel High-Pressure Apparatus, San Diego, CA, Symposium on Gas Hydrates and Clathrates, 229th American Chemical Society National Meeting, March 13-17.

Jones, K., H. Feng, S. Tomov, W. Winters, M. Eaton, and D. Mahajan, 2005, Morphology of methane hydrate host sediments, San Diego, CA, Symposium on Gas Hydrates and Clathrates, 229th American Chemical Society National Meeting, March 13-17.

Kerker, P., K. Jones, H. Feng, and D. Mahajan, 2006, Spectroscopic Characterization of Host Sediments, Kauai, HI, International Workshop on Science & Technology Issues in Methane Hydrates R&D, Engineering Conference International, March 5-9.

Mahajan, D., 2006, Mimicking natural systems in the FISH unit: Methane hydrate formation/decomposition in depleted Sediments, London, UK, New Insights on Natural and Synthetic Systems, Sediment-Hosted Gas Hydrates, The Geological Society, January 25-26.

Mahajan, D., 2004, Technical Challenges to Mining Methane Hydrates: The next Energy Frontier, New York, NY, Marine Sciences and Atmospheric Sciences Colloquium Series, February 6.

Mahajan, D., K. Jones, H. Feng, and W. Winters, 2003, Methane Hydrate Studies: Delineating Properties of Sediments Using Synchrotron Computed Microtomography (CMT), New Orleans, LA, Symposium on Gas Hydrates, American Institute of Chemical Engineering Spring National Meeting, March 30-April 3.

Mahajan, D., T. Koetzle, L. Brammer, W. Klooster, R. McGraw, R. McMullan, and G. Senum, 2002, Structure Characterization and Sono-Stimulated Kinetic Study with Tracers in Pressure Vessels: An Integrated Approach to the Study of Gas Hydrates, Seattle, WA, Symposium on the Fundamentals of Advanced Materials for Energy Conversion, Session on Gas Clathrate Hydrates, TMS Annual Meeting, February 17-21.

Mahajan, D., 2001, Update of results from National Laboratories, Woods Hole, MA, Methane Hydrate Advisory Committee Meeting, Office of Fossil Energy, U. S. Department of Energy, May 17-18.

Servio, P. and D. Mahajan, 2003, Kinetic Reproducibility of Methane Production from Methane Hydrates, New York, NY, Symposium on Synthetic Clean Fuels from Natural Gas and Coal-bed Methane: 30 Years Since the First Oil Crisis, 226th American Chemical Society National Meeting, September 7-11.

Yoon, S., K. Jones, H. Feng, W. Winters, and D. Mahajan, 2003, Methane hydrate studies: delineating properties of sediments by computed microtomography (CMT), New Orleans, LA, AIChE Spring National Meeting, March 30-April 3.

### **Theses/Dissertations**

Eaton, M., 2007, Mimicking Marine-based Natural Systems: A Study of Sediment-Hydrate Interactions Under *In Situ* Conditions, Ph.D. Dissertation, Stony Brook University.

## *Pacific Northwest National Laboratory*

### **Peer-Reviewed Publications**

Long, P. E., M. Holland, P. Schultheiss, M. Riedel, J. L. Weinberger, A. M. Trehu, and H. T. Schaefer. 2010. "Infrared (IR) Imaging of Gas Hydrate-Bearing Cores: State-of-the-Art and Future Prospect." In *Geophysical Characterization of Gas Hydrates*, edited by Michael Riedel, Ele Willoughby, and Satinder Chopra Society of Exploration Geophysicists Special Publication (In press).

Long, P.E., K.K. Rose, H. T. Schaefer, M.E. Torres, E.S. Solomon, M. Kastner, J.E. Johnson, L. Giosan, W.J. Winters, S. Dewri and P. Kumar, 2009. "Gas hydrate occurrence in marine sediments and volcanic ash of the Andaman Arc: Results from NGHP Expedition 01, Site 17". Prepr. Pap.-Am. Chem. Soc., Div. Fuel Chem. 2009, 54 (1), p. 135-136

McGrail, B. P., S. Ahmed, H. T. Schaefer, A. T. Owen, P. F. Martin, and T. Zhu. 2007. "Gas Hydrate Property Measurements in Porous Sediments with Resonant Ultrasound Spectroscopy." *J. Geophys. Res.* 112 (B05202), doi:10.1029/2005JB004084.

McGrail, B., S. Ahmed, A. Owen, P. Martin, and T. Zhu, in press, Gas Hydrate Property Measurements in Porous Sediments With Resonant Ultrasound Spectroscopy, *Journal of Geophysical Research*.

- McGrail, B., J. Young, P. Martin, and M. Alexander, 2005, *in* Dallimore, S., and T. Collett, eds., Scientific Results from Mallik 2000 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada, *Geological Survey of Canada Bulletin* 585, p.110.
- Milkov, A. V., G. E. Claypool, Y. J. Lee, M. E. Torres, W. S. Borowski, H. Tomaru, R. Sassen, and P. E. Long. 2004. "Ethane Enrichment and Propane Depletion in Subsurface Gases Indicate Gas Hydrate Occurrence in Marine Sediments at Southern Hydrate Ridge Offshore Oregon." *Org. Geochem.* 35(9):1067-1080, 10.1016/j.orggeochem.2004.04.003.
- Riedel, M., P. E. Long, and T. S. Collett. 2006. "Estimates of in Situ Gas Hydrate Concentration from Resistivity Monitoring of Gas Hydrate Bearing Sediments During Temperature Equilibration." *Marine Geology* 227(3-4):215-225, 10.1016/j.margeo.2005.10.007.
- Schaef, H.T., B. P. McGrail, A. T. Owen, and P. E. Long. 2009. "Characterization of NGHP-01 Hydrate Samples by In Situ High-Pressure X-Ray Diffraction Coupled with Residual Gas Analysis." *Marine Geology* (In Review).
- Torres, M. E., Tréhu, A. M., Cespedes, N., Kastner, M., Wortmann, U.G., Kim, J.-H., Long, P. E., A. Malinverno, A., Pohlman, J. W., Riedel, M., Collett, T. 2008. "Methane hydrate formation in turbidite sediments of northern Cascadia, IODP Expedition 311." *Earth and Planetary Science Letters* 271, 170–180.
- Trehu, A. M., P. E. Long, M. E. Torres, G. Bohrmann, F. R. Rack, T. S. Collett, D. S. Goldberg, A. V. Milkov, M. Riedel, P. Schultheiss, N. L. Bangs, S. R. Barr, W. S. Borowski, G. E. Claypool, M. E. Delwiche, G. R. Dickens, E. Gracia, G. Guerin, M. Holland, J. E. Johnson, Y. J. Lee, C. S. Liu, X. Su, B. Teichert, H. Tomaru, M. Vanneste, M. Watanabe, and J. L. Weinberger. 2004a. "Three-Dimensional Distribution of Gas Hydrate beneath Southern Hydrate Ridge: Constraints from ODP Leg 204." *Earth Planet. Sci. Lett.* 222(3-4):845-862, 10.1016/j.epsl.2004.03.035.
- Trehu, A. M., M. E. Torres, P. E. Long, G. Bohrmann, F. R. Rack, T. S. Collett, D. S. Goldberg, A. V. Milkov, M. Riedel, P. Schultheiss, N. L. Bangs, S. R. Barr, W. S. Borowski, G. E. Claypool, M. E. Delwiche, G. R. Dickens, E. Gracia, G. Guerin, M. Holland, J. E. Johnson, Y. J. Lee, C. S. Liu, X. Su, B. Teichert, H. Tomaru, M. Vanneste, M. Watanabe, and J. L. Weinberger. 2004. "Three-Dimensional Distribution of Gas Hydrate beneath Southern Hydrate Ridge: Constraints from ODP Leg 204 (Vol 222, Pg 845, 2004)." *Earth Planet. Sci. Lett.* 227(3-4):557-558, 10.1016/j.epsl.2004.09.016.
- Weinberger, J., K. Brown and P. Long, 2005, Painting a Picture of Gas Hydrate Distribution with Thermal Images, *Geophysical Research Letters*, Volume 32, article no. L04609.

## **Presentations**

- Ahmed S., and B. McGrail, 2005, Theoretical Considerations in the Application of Resonant Ultrasound to Determine Amount of Gas Hydrate/Ice in Berea Sandstone, Beijing, China, World Congress on Ultrasonics/Ultrasonics International, August 28 - September 1.
- Anderson, B. J., J. W. Wilder, M. Kurihara, M. D. White, G. J. Moridis, S. J. Wilson, M. Pooladi-Darvish, Y. Masuda, T. Collett, and R. Hunter. 2008. "Analysis of modular dynamic formation test results from the 'Mount Elbert' stratigraphic test well, Milne Point, Alaska," In Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, Canada, July 6-10, 2008.
- Long, P., 2008, "Infrared (IR) Imaging results from Indian National Gas Hydrate Program, Expedition 01: Implications for gas hydrate abundance and correlation to physical properties and pore water chemistry," NGHP Gas Hydrate Conference, New Delhi, India, February 6-8.
- Long, P.E. 2007. "Quantification of Gas Hydrate Abundance Using IR Images of Core From Expedition 311." Presented by Philip E. Long (Invited Speaker) at Second Post-cruise meeting for Expedition 311, Paris, France on April 23, 2007.
- McGrail BP, S Ahmed, AT Owen, and PF Martin. 2006. "Resonant Ultrasound Spectroscopy: A New Technique for Measurement of Gas Hydrate Properties in Porous Sediments." Presented at 11th International Conference on the Physics and Chemistry of Ice, Bremerhaven, Germany on July 25, 2006.
- McGrail, B., P. Martin, M. White, A. Ahmed, A. Owen, T. Schaefer, S. Young, and M. Alexander, 2006, Gas Hydrate Science at Pacific Northwest National Laboratory, Denver, CO, U.S. DOE-NETL Gas Hydrates Program Review, January 18.
- McGrail, B., T. Schaefer, M. White, A. Owen, P. Martin, and P. Long, 2006, PNNL Gas Hydrate Research Capabilities, Golden, CO, Inter-Laboratory Hydrate Workshop, Colorado School of Mines.
- McGrail, B. P., M. L. Alexander, J. S. Young, and P. F. Martin. 2004. "Gas Hydrate Formation and Dissociation in the Environmental Scanning Electron Microscope." Presented at Goldschmidt Geochemistry Conference, Copenhagen, Denmark on June 9, 2004.
- McGrail, B., 2005, Gas Hydrate Equilibria Measurements in Porous Sediments With Resonant Ultrasound Spectroscopy, San Diego, CA, 229<sup>th</sup> American Chemical Society National Meeting, March 13-17.
- McGrail, B., J. Young, and P. Martin, 2003, Preliminary Results of X-ray Microtomography, Resonant Ultrasound, and Environmental Electron Microscopy Analyses of Mallik 5L-38 Core Samples, Whistler, BC, Canada, Workshop on the Mallik 5L-38 Gas Hydrate Research Well, January 23.

McGrail, B., P. Martin, J. Young, A. Owen, and M. Alexander, 2003, Analyses of Mallik 5L-38 Core Samples with Environmental Scanning Electron Microscopy and Resonant Ultrasound Spectroscopy, Makuhari, Japan, Mallik 2002 Gas Hydrate Production Research Well Symposium, December 9.

Schaef, T., 2008, "High pressure X-ray diffraction (HXRDX) coupled with residual gas analyses (RGA) of gas hydrate bearing sediment samples from the Indian National Gas Hydrate Program, Expedition 01" NGHP Gas Hydrate Conference, New Delhi, India, Feb. 6-8.

White, M. D., and B. P. McGrail, 2006, STOMP-HYD: A New Numerical Simulator for Analysis of Methane Hydrate Production from Geologic Formations, in Proceedings of 2<sup>nd</sup> International Symposium on Gas Hydrate Technology, 1-2 November 2006, KIGAM, Daejeon, Korea.

White, M. D., and B. P. McGrail, *in press*, Numerical Simulation of Methane Hydrate Production from Geologic Formations via Carbon Dioxide Injection, Submitted for Special Session on Gas Production from Hydrates for the 2008 Offshore Technology Conference, May 5-8, 2008, Houston, Texas.

Wilder, J. W., G. J. Moridis, S. J. Wilson, M. Kurihara, M. D. White, Y. Masuda, and B. J. Anderson. 2008. "An international effort to compare gas hydrate reservoir simulators," In Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, Canada, July 6-10, 2008.

### *Lawrence Berkeley National Laboratory*

#### **Peer-Reviewed Publications**

Alp, D., M. Parlaktuna, G. Moridis, 2007, Geologic Carbon Sequestration and Methane Hydrates Research from the TOUGH Symposium 2006: Gas production by depressurization from hypothetical Class 1G and Class 1W hydrate reservoirs in J. C. Denton, C.M. Oldenburg, T.J. Kneafsey and J. Rutqvist, eds., Energy Conversion and Management, Vol. 48, Issue 6, pp. 1864-1879, June.

Boswell, R., Shelander, D., Lee, M., Latham, T., Collett, T., Geurin, G., Moridis, G., Reagan, M., and D. Goldberg, "Occurrence of gas hydrate in Oligocene Frio sand: Alaminos Canyon Block 818: northern Gulf of Mexico," *Marine and Petroleum Geology*, *in press*, 2009.

Elliott, S. M., Reagan, M.T. Moridis, G. J., Cameron-Smith, P. J., 2010. "Geochemistry of Clathrate-Derived Methane in Arctic Ocean Waters," *Geophys. Res. Lett.*, 37, L12607, doi: 10.1029/2010GL043369.

Elliott, S., M. Maltrud, M. Reagan, G. Moridis, and P. Cameron-Smith (2011), Marine methane cycle simulations for the period of early global warming, *J. Geophys. Res.*, 116, G01010, doi:10.1029/2010JG001300.

- Freifeld, B., T. Kneafsey, and F. Rack, 2006, On-site geologic core analysis using a portable X-ray computed tomographic system, in R. Rothwell, ed., *New Techniques in Sediment Core Analysis*, Special Publication, 267, pp.165-178, 0305-8719/06/, The Geological Society of London, LBNL-55698.
- Freifeld, B.M. and T.J. Kneafsey. 2004. "Investigating methane hydrate in sediments using X-ray computed tomography". In *Advances in the Study of Gas Hydrates*. Kluwer Academic/Plenum Press, 2004. p. 227-238.
- Gupta, A., T. Kneafsey, G. Moridis, Y. Seol, M. Kowalsky, and E. Sloan Jr., 2006, Methane hydrate thermal conductivity in a large heterogeneous porous sample, *Journal of Physical Chemistry B*, ASAP Web Release Date August 2, 2006, DOI: 10.1021/jp0619639LBNL-59088.
- Gupta, A., G. Moridis, T. Kneafsey, and E. D. Sloan, 2009, Modeling Pure Methane Hydrate Dissociation Using a Numerical Simulator from a Novel Combination of X-ray Computed Tomography and Macroscopic Data, *Energy & Fuels*, ACS Web Release Date October 19, 2009, DOI: 10.1021/ef9006565.
- Li, G., Moridis, G. J., Zhang, K., Li, X. S., 2010. "Evaluation of Gas Production Potential from Marine Gas Hydrate Deposits in Shenhu Area of South China Sea." *Energy Fuels* 2010, 24, 6018-6033. DOI: 10.1021/ef100930m
- Kneafsey, T.J., H. Liu, W. Winters, R. Boswell, R. Hunter, and T.S. Collett, 2009. "Analysis of core samples from the BPXA-DOE-USGS Mount Elbert gas hydrate stratigraphic test well: Insights into core disturbance and handling", *Marine and Petroleum Geology*, doi:10.1016/j.marpetgeo.2009.10.009 October, 2009.
- Kneafsey, T.J., Y. Seol, A. Gupta, L. Tomutsa, 2010 "Permeability of Laboratory-Formed Methane-Hydrate-Bearing Sand", accepted, *SPE Journal*.
- Kneafsey, T.J., Y. Seol, G.J. Moridis, L. Tomutsa, B.M. Freifeld, 2009 "Laboratory measurements on core-scale sediment and hydrate samples to predict reservoir behavior", in T. Collett, A. Johnson, C. Knapp, and R. Boswell, eds., *Natural gas hydrates—Energy resource potential and associated geologic hazards: AAPG Memoir 89*, p. 705–713.
- Kneafsey, T., L. Tomutsa, G. Moridis, Y. Seol, B. Freifeld, C. Taylor and A. Gupta, 2007, Methane hydrate formation and dissociation in a partially saturated core-scale sand sample, in D. Mahajan, C. Taylor and G. Ali Mansoori, eds., *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate*, Elsevier Publishers, Volume 56, Issues 1-3, p. 108-126, March.
- Kneafsey, T., L. Tomutsa, C. Taylor, A. Gupta, G. Moridis, B. Freifeld, and Y. Seol, 2004, Methane hydrate formation and dissociation in a partially-saturated sand, *Papers of the American Chemical Society*, Volume. 49.

- Kowalsky, M.B., S. Nakagawa, and G.J. Moridis, 2010 “Feasibility of monitoring gas hydrate production with time-lapse vertical seismic profiling,” *SPE Journal*, SPE-132508-PA, doi: 10.2118/132508-PA.
- Kowalsky, M., and G. Moridis, 2007, Comparison of Kinetic and Equilibrium Reaction Models in the Simulation of the Behavior of Gas Hydrates in Porous Media, *Journal of Energy Conversion and Management*, 48(6), p. 1850-1863.
- Moridis, G.J., Silpngarmert, S., Reagan, M.T., Collett, T., and K. Zhang, “Gas Production From a Cold, Stratigraphically Bounded Hydrate Deposit at the Mount Elbert Site, North Slope, Alaska,” LBNL-3005E, *Marine & Petroleum Geology*, doi: 10.1016/j.marpetgeo.2010.01.005, 2010.
- Moridis, G.J., Collett, T.S., Boswell, R., Kurihara, M., Reagan, M.T., Sloan, E.D., and C. Koh, “Toward Production From Gas Hydrates: Assessment of Resources, Technology, and Potential” LBNL-00161E, SPE 114163, *SPE Journal*, *SPE Journal*, **12**(5), 745-771, 2009.
- Moridis, G.J., and M.T. Reagan, “Gas Production From Class 2 Hydrate Accumulations in the Permafrost,” LBNL-01615E, SPE 110858, *SPE Journal*, *in press*, 2009.
- Moridis, G., M. Reagan, S. Kim, Y. Seol and K. Zhang, *in press*, “Evaluation of the Gas Production Potential of Marine Hydrate Deposits in the Ulleung Basin of the Korean East Sea,” LBNL-63812, SPE 110859, *SPE Journal*, *SPE Journal*, **14**(4), 759-781, doi:10.2118/110859-PA., 2009.
- Moridis, G.J., M.B. Kowalsky, 2007, Response of Oceanic Hydrate-Bearing Sediments to Thermal Stresses, *Society of Petroleum Engineers Journal*, Volume 12, Number 2, June, pp. 253-268.
- Moridis, G. and E. Dendy Sloan, 2007, Geologic Carbon Sequestration and Methane Hydrates Research from the TOUGH Symposium 2006: Gas production potential of disperse low-saturation hydrate accumulations in oceanic sediments, in J. C. Denton, C.M. Oldenburg, T.J. Kneafsey and J. Rutqvist, eds., *Energy Conversion and Management*, Vol. 48, Issue 6, pp. 1834-1849, June.
- Moridis, G., M. Kowalsky, K. Pruess, 2007, Depressurization-Induced Gas Production from Class 1 Hydrate Deposits, *SPE Reservoir Evaluation and Engineering*, Vol. 10, No. 5, p.458-481.
- Moridis, G., and M. Kowalsky, 2005, Gas Production from Unconfined Class 2 Hydrate Accumulations in the Oceanic Subsurface (Lawrence Berkeley National Laboratory, Report No. 57299), in Max, M., A. Johnson, W. Dillon and T. Collett, eds., *Economic Geology of Natural Gas Hydrates*, Kluwer Academic/Plenum Publishers.

- Moridis, G., 2004, Numerical Studies of Gas Production from Class 2 and Class 3 Hydrate Accumulations at the Mallik Site, Mackenzie Delta, Canada, *SPE Reservoir Evaluation and Engineering*, Volume 7, n.3, p. 175-183.
- Moridis, G., 2003, Numerical Studies of Gas Production from Methane Hydrates, *Society of Petroleum Engineers Journal*, Volume 32, n. 8, p. 359-370.
- Moridis, G., and M. Reagan, in review, Similarity Solution for Gas Production from Dissociating Hydrates in Geologic Media, *Transport in Porous Media*.
- Moridis, G., T. Collett, S. Dallimore, T. Satoh, S. Hancock, and B. Weatherhill, 2004, Numerical Studies Of Gas Production From Several Methane Hydrate Zones at the Mallik Site, Mackenzie Delta, Canada, *Journal of Petroleum Science and Engineering*, Volume 43, p. 219-239.
- Moridis, G., T. Collett, S. Dallimore, T. Inoue, and T. Mroz, 2005, Analysis and Interpretation of the Thermal Test of Gas Hydrate Dissociation in the JAPEX/JNOC/GSC Mallik 5L-38 Gas Hydrate Production Research Well (Lawrence Berkeley National Laboratory, Report No.57296), in Dallimore, S. and T. Collett, eds., *Scientific results from the Mallik 2002 gas hydrate production well program*, Geological Survey of Canada, Bulletin 585.
- Moridis, G. and T. Collett, 2004, Gas Production from Class 1 Hydrate Accumulations, in C. Taylor and J. Qwan, eds., *Recent Advances in the Study of Gas Hydrates*, American Institute of Chemical Engineers and Kluwer Academic/Plenum Publishers, p. 75-88.
- Reagan, M., and G. Moridis, 2007, "Oceanic Gas Hydrate Instability and Dissociation Under Climate Change Scenarios," *Geophysical Research Letters*, 34, L22709, 2007 – doi:10.1029/2007GL031671
- Reagan, M. and G. Moridis, 2008. "The dynamic response of oceanic hydrate deposits to ocean temperature change," *Journal of Geophysical Research: Oceans*, 113, C12023, 2008 – doi:10.1029/2008JC004938
- Reagan, M.T. and G. J. Moridis (2009), "Large-scale simulation of methane hydrate dissociation along the West Spitsbergen Margin," *Geophysical Research Letters*, 36, L23612, doi: 1029/2009GL041332
- Rutqvist J., Moridis G.J., Grover T., and Collett T. Geomechanical response of permafrost-associated hydrate deposits to depressurization-induced gas production. *Journal of Petroleum Science and Engineering* 67 (2009) 1–12.
- Seol, Y. and T.J. Kneafsey, "X-ray computed-tomography observations of water flow through anisotropic methane hydrate-bearing sand, *Journal of Petroleum Science and Engineering* 66 (2009) 121–132, doi:10.1016/j.petrol.2009.01.008.

Waite, W. F., T. J. Kneafsey, W. J. Winters, and D. H. Mason (2008), Physical property changes in hydrate-bearing sediment due to depressurization and subsequent repressurization, *J. Geophys. Res.*, 113, B07102, doi:10.1029/2007JB005351, LBNL-664E.

### **Government Reports**

Kneafsey, T., S. Nakagawa, and G. Moridis, 2007, Approach to Forming Hydrate Bearing Samples in Fine-Grained Material, Topical Report, related to FWP ESD05-036 and DOE Contract No. DE-FC26-05NT42664, available online ([click here](#)).

Moridis, G., T. Collett, S. Dallimore, T. Satoh, S. Hancock, B. Weatherill, 2002, Numerical Studies of Gas Production from Several CH<sub>4</sub>-Hydrate Zones at the Mallik Site, Mackenzie Delta, Canada, Topical Report, LBNL-50257, available online ([click here](#)).

Moridis, G. and D. Sloan, 2006, Gas Production Potential of Disperse Low-Saturation Hydrate Accumulations in Oceanic Sediments, LBNL-61446, Project Report, available online ([click here](#)).

Moridis, G.J., Kneafsey, T., Kowalsky, M., and M.T. Reagan, "Numerical, Laboratory And Field Studies of Gas Production From Natural Hydrate Accumulations in Geologic Media," OSTI Report 918665 (Dec. 2007).

Moridis, G., 2009. "Interrelation of Global Climate and the Response of Oceanic Hydrate Accumulations." *U.S. DOE Annual Report, Fiscal Year 2009*.

Moridis, G., 2009. "Characterization of Recoverable Resources from Methane Hydrate Deposits: Year End Report." *U.S. DOE Annual Report, Fiscal Year 2009*.

Moridis, G., 2009. "Laboratory Studies in Support of Characterization of Recoverable Resources from Methane Hydrate Deposits" *U.S. DOE Annual Report, Fiscal Year 2009*. ESD05-048

Rutqvist J., and Moridis J.T. 2008. "A Numerical Model for Analysis of the Geomechanical Performance of Hydrate-Bearing Sediments," Earth Sciences Division Research Summaries 2006-2007, LBNL-771E, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

### **Other Publications**

Jones, E., T. Latham, D. McConnell, M. Frye, J. Hunt, W. Shedd, D. Shelander, R. Boswell, K. Rose, C. Ruppel, D. Hutchinson, T. Collett, B. Dugan, and W. Wood, 2008, Scientific objectives of the Gulf of Mexico gas hydrate JIP II drilling, Proc. Offshore Technology Conference, OTC 19501.

Hutchinson, D., D. Shelander, J. Dai, D. McConnell, W. Shedd, M. Frye, C. Ruppel, R. Boswell, E. Jones, K. Rose, B. Dugan, W. Wood, and T. Latham, 2008 (in press), Site selection for DOE/JIP gas hydrate drilling in the Northern Gulf of Mexico, Proc. 6<sup>th</sup> International Conf. Gas Hydrates.

- Kneafsey, T., Y. Seol, A. Gupta, L. Tomutsa, and G.J. Moridis, 2007, Relative Permeability of Gas Hydrate Bearing Sediments, *Eos Trans. AGU*, /88/(23), Jt. Assem. Suppl., Abstract NS51B-02.
- Kneafsey, T.J., Moridis, G., Freifeld, B., Tomutsa, L., Seol, Y. and Taylor, C.E., 2005. Understanding Methane Hydrate Behavior Using X-ray Computed Tomography, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, available online ([click here](#)).
- Kowalsky, M. and G. Moridis, 2007, "Comparison of kinetic and equilibrium reaction models in simulating gas hydrate behavior in porous media," *Proceedings of the TOUGH Symposium 2006*, May 15-17, 2006.
- Moridis, G.J., and Reagan, M.T., "Evaluation of Two North Slope, Alaska, Deposits for a Potential Long-Term Test of Gas Production From Hydrates," SPE 133601, 2010 SPE Western North American Regional Meeting, Anaheim, California, 27-29 May 2010.
- Moridis, G.J., Collett, T.S., Pooladi-Darwish, M., Hancock, S., Santamarina, C., Boswell, R., Kneafsey, T., Rutqvist, J., Kowalsky, M.J., Reagan, M.T., Sloan, E.D., Sum, A.K., and Koh, C., "Challenges, Uncertainties and Issues Facing Gas Production From Hydrate Deposits in Geologic Systems," SPE-131792A, Proc. SPE Unconventional Gas Conference, Pittsburgh, Pennsylvania, USA, 23–25 February 2010.
- Moridis, G., M. Reagan, K. Boyle, and K. Zhang, 2009, Evaluation of the gas production potential of challenging hydrate deposits, *Proceedings of the TOUGH Symposium 2009*, September 14-16, 2009.
- Moridis, G.J., Reagan, M.T, Zhang, K., "The Use of Horizontal Wells in Gas Production from Hydrate Accumulations," Proc. of the 6<sup>th</sup> International Conference on Gas Hydrates, Vancouver, BC, July 6-10, 2008.
- Moridis, G.J, Reagan, M.T., and K. Zhang, "Field-Scale Studies on the Enhanced Performance of Class 2 and Class 3 Hydrate Deposits Through Co-Production With Conventional Gas" OTC 19435, 2008 Offshore Technology Conference, Houston, Texas, USA, 5-8 May 2008.
- Moridis, G.J. and Reagan, M.T., "Strategies for Gas Production From Oceanic Class 3 Hydrate Accumulations," LBNL-62758, OTC 18865, 2007 Offshore Technology Conference, Houston, Texas, USA, 30 April - 3 May 2007.
- Moridis, G.J. and Reagan, M.T., "Gas Production From Oceanic Class 2 Hydrate Accumulations," LBNL-62757, OTC 18866, 2007 Offshore Technology Conference, Houston, Texas, USA, 30 April - 3 May 2007.
- Moridis, G., and M. Kowalsky, 2006, Geomechanical implications of thermal stresses on hydrate-bearing sediments, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, available online ([click here](#)).

- Moridis, G., and M. Kowalsky, 2006, Response of Oceanic Hydrate-Bearing Sediments to Thermal Stresses, *Proceedings of the SPE Offshore Technology Conference*, paper 18193, May.
- Moridis, G., Y. Seol and T. Kneafsey, 2005, Studies of Reaction Kinetics of Methane Hydrate Dissociation in Porous Media, Trondheim, Norway, *Proceedings of the 5th International Conference on Gas Hydrates*, June 13-16, p. 21-30.
- Reagan, M.T, Moridis, G.J., Zhang, K., “Modeling of Gas Hydrate Instability and Methane Release in Response to Climate Change,” LBNL-00712E, Proc. of the 6<sup>th</sup> International Conference on Gas Hydrates, Vancouver, BC, July 6-10, 2008.
- Reagan, M.T., Moridis, G.J., and K. Zhang, “Sensitivity Analysis of Gas Production from Class 2 and Class 3 Hydrate Deposits,” LBNL-01657E, OTC 19554, 2008 Offshore Technology Conference, Houston, Texas, USA, 5-8 May 2008
- Reagan, M., G. Moridis, and K. Zhang, 2009, Large-scale simulation of oceanic gas hydrate dissociation in response to climate change, *Proceedings of the TOUGH Symposium 2009*, September 14-16, 2009.
- Reagan, M.T., Kowalsky, M.B., Moridis, G.J., Silpngarm, S., “The Effect of Reservoir Heterogeneity on Gas Production From Hydrate Accumulations in the Permafrost,” SPE 132649, 2010 SPE Western North American Regional Meeting, Anaheim, California, 27-29 May 2010.
- Reagan, M.T., Moridis, G.J., Elliott, S.M., Maltrud, M., “Dissociation of Oceanic Hydrates in Response to Climate Change and the Biogeochemical Consequences,” *Fire in the Ice*, DOE Methane Hydrates Program.
- Rutqvist J., and Moridis G.J. A modeling study of geomechanical performance of sloping oceanic hydrate deposits subjected to production activities. OTC-21048. Paper presentation at the 2010 Offshore Technology Conference held in Houston, Texas, U.S.A., 3–6 May, 2010.
- Rutqvist J., Moridis G., Grover T., and Collet T. Geomechanical response of known permafrost hydrate deposits to depressurization-induced production. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, (2008).
- Rutqvist J. and Moridis G. Development of a Numerical Simulator for Analyzing the Geomechanical Performance of Hydrate-Bearing Sediments. Proceedings of the 42th U.S. Rock Mechanics Symposium, San Francisco, California, USA, June 29-July 2, 2008: American Rock Mechanics Association ARMA, Paper No. 139. (2008).

Rutqvist J., Grover T. and Moridis G. Coupled Hydrological, Thermal and Geomechanical Analysis of Wellbore Stability in Hydrate-Bearing Sediments. OTC-19572. 2008 Offshore Technology Conference held in Houston, Texas, U.S.A., 4–8 May 2008.

Rutqvist J. and Moridis G. Numerical Studies on the Geomechanical Stability of Hydrate-Bearing Sediments. OTC-18860. 2007 Offshore Technology Conference held in Houston, Texas, U.S.A., 30 April–3 May 2007.

Santamarina, J.C., and C. Ruppel, 2008 (in press), The impact of hydrate saturation on the mechanical, electrical, and thermal properties of hydrate-bearing sand, silts, and clay, Proc. 6<sup>th</sup> International Conf. Gas Hydrates.

Tomutsa, L., B. Freifeld, T. Kneafsey, and L. Stern, 2002, X-ray Computed Tomography observation of methane hydrate dissociation, paper SPE 75533, *Proceedings, Society of Petroleum Engineers Gas Technology Symposium*.

### **Presentations**

Chiaramonte L., Kowalsky M.B., Rutqvist J., and Moridis G.J. “Design of a potential long-term test of gas production from a hydrate deposit at the PBU-L106 site in North Slope, Alaska: Geomechanical system response and seismic monitoring.” AGU Fall Meeting 2009, San Francisco, CA, 14-18 December 2009.

Elliott, S., 2009, "Arctic Marine Methane Cycle Simulations for the Period of Global Warming," AGU Fall Meeting 2009, San Francisco, CA, 14-18 December 2009.

Freifeld, B., T. Kneafsey, L. Tomutsa, and J. Pruess, 2003, Development of a Portable X-ray Computed Tomographic Imaging System for Drill-Site Investigation of Recovered Core, Pau, France, 2003 International Symposium of the Society of Core Analysts, September 21–24.

Freifeld, B., T. Kneafsey, L. Tomutsa, L. Stern, and S. Kirby, 2002, Use of X-Ray Computed Tomographic Data for Analyzing the Thermodynamics of a Dissociating Porous Sand/Hydrate Mixture. Yokohama, Japan, 4<sup>th</sup> International Conference on Gas Hydrates, May 19-23.

Freifeld, B., T. Kneafsey, J. Pruess, and L. Tomutsa, 2003, Field Characterization of Hydrate-Bearing Core Using X-Ray Computed Tomography: Gas Hydrate in the Natural Environment and Implications for Energy Resources, Seafloor Stability, Climate, and the Biology of the Deep Sea, Seattle, WA, Geological Society of America Annual Meeting, November 5.

Ghezzehei, T.A. and T.J. Kneafsey, 2010 “Measurements of the Capillary Pressure-Saturation Relationship of Methane Hydrate Bearing Sediments”, OTC-20550, 2010 Offshore Technology Conference held in Houston, Texas, USA, 3–6 May 2010,

- Grover, T., G.J. Moridis and S. Holditch, 2008, Analysis of Reservoir Performance of Messoyakha Gas Hydrate Field, Paper ISOPE-2008-TPC-622, 18th (2008) International Offshore and Polar Engineering, Vancouver, Canada, July 6-11.
- Grover, T., G.J. Moridis and S. Holditch, in press, Analysis of Reservoir Performance of the Messoyakha Hydrate Reservoir, Paper SPE 114375, presented at the 2008 SPE Annual Technical Conference and Exhibition, Denver, Colorado, September 21-24, 2008.
- Gullapalli, I., G.J. Moridis, S. Silpngarm, B. Reik, M. Kamal, E. Jones and T. Collett, 2008, Designing a Reservoir Flow Rate Experiment for the GOM Hydrate JIP Leg II LWD Drilling, 6th International Conference on Gas Hydrates, Vancouver, British Columbia, Canada, July 6-10.
- Gupta, A., T. Kneafsey, G. Moridis, Y. Seol, M. Kowalsky, E. Sloan, Jr., 2006, Estimation of Composite Thermal Conductivity of a Heterogeneous Methane Hydrate Sample Using ITOUGH2, Berkeley, CA, TOUGH Symposium, May 15-17.
- Gupta, A., E. Sloan, T. Kneafsey, L. Tomutsa, and G. Moridis, 2005, Modeling Methane Hydrate Dissociation X-Ray CT Data Using a Heat Transfer Model, Trondheim, Norway, Fifth International Conference on Gas Hydrates, June 13-16.
- Hancock, S., T. Collett, S. Dallimore, T. Satoh, T. Inoue, B. Weatherill, G. Moridis, E. Huenges, J. Hennings, and D. Carle, 2004, Overview of Production Test Results from the Japex/JNOC/GSC Mallik 5L-38 Gas Hydrate Research Well, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Hancock, S., T. Collett, M. Pooladi-Darvish, S. Gerami, G. Moridis, T. Okazawa, K. Osadetz, S. Dallimore, and B. Weatherill, 2004, A Preliminary Investigation on the Economics of Onshore Gas Hydrate Production Based on the Mallik Field Discovery, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Kneafsey, T.J. and Y. Seol, 2010. "Macroscale X-ray Computed Tomography Imaging of Hydrate-Bearing Sediments: Seeing Hydrate-Related Process", Gordon Research Conference, Natural Gas Hydrate Systems - Hydrate-Sediment-Fluid Interactions At Pore To Regional Scale, Colby College, Waterville ME, June 6-11, 2010
- Kneafsey, T.J., H. Lu, W.J. Winters, R.B. Hunte, 2009, "Effects of core retrieval, handling, and preservation on hydrate-bearing samples," AGU Fall Meeting 2009, San Francisco, CA, 14-18 December 2009.
- Kneafsey, T.J., H. Lu, W. Winters, Ray Boswell, R. Hunter, T. Collett, G. Moridis, W. Waite and M. Walker, 2009 "Hydrate-Bearing Sample Alteration from Core Retrieval, Handling, and Preservation", American Association of Petroleum Geologists, Annual Convention & Exhibition, 7-10 June 2009, Colorado.

- Kneafsey, T. J., A. Gupta, Y. Seol, and L. Tomutsa, 2008, Permeability of Laboratory-Formed Methane Hydrate-Bearing Sand, OTC-19536-PP, SPE Offshore Technology Conference, Houston, TX, May 7.
- Kneafsey, T.J., and L. Tomutsa, 2008 “CT Scanning, Analysis, and Production Test - Mt Elbert Core Samples,” presented at BP-DOE Mount Elbert-01 Gas Hydrate Stratigraphic Test Data Analyses/Interpretation & Production Test Design Workshop, March 2008
- Kneafsey, T., L. Tomutsa, 2008, “X-ray Computed Tomography Scanning of NGHP Core Samples,” presented at the National Gas Hydrate Program Gas Hydrate Conference 2008, New Delhi, India, February 6-8.
- Kneafsey, T., 2006, Gas Production from Hydrates: An Idea Whose Time Has Come, Houston, Texas, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Kneafsey, T., B. Freifeld, L. Tomutsa, Y. Seol, and H. Elsen, 2004, Measurements on Laboratory Core-Scale Sediment/Hydrate Samples to Predict Reservoir Behavior, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Kneafsey, T., Y. Seol, A. Gupta, L. Tomutsa, and G. Moridis, 2007, Relative Permeability of Gas Hydrate Bearing Sediments, Eos Trans. AGU, /88/(23), Joint Assembly Supplement, Abstract NS51B-02, AGU Joint Assembly, Acapulco, Mexico, May 22-25.
- Kneafsey, T., L. Tomutsa, G. Moridis, Y. Seol, B. Freifeld, C. Taylor, and A. Gupta, 2005, Methane Hydrate Formation and Dissociation in Partially Saturated Sand – Measurements and Observations, Trondheim, Norway, Fifth International Conference on Gas Hydrates, June 13-16.
- Kneafsey, T.J., G.J. Moridis, and M.B. Kowalsky, 2005 “Engineering Models: The TOUGH-Fx/Hydrate Simulator,” Integration of Modeling and USGS Hydrate Laboratory Research, Denver CO, August 2-3 2005.
- Kneafsey, T.J., L. Tomutsa, C.E. Taylor, A. Gupta, G.J. Moridis, B.M.Freifeld, Y. Seol, “Methane Hydrate Formation and Dissociation in a Partially Saturated Sand,” CSM Hydrate Consortium Meeting, Golden CO, March 24-25, 2005.
- Kneafsey, T., L. Tomutsa, Y. Seol and G. Moridis, 2006, Relative Permeability Measurements of Hydrate-Bearing Sediments, Kauai, HI, ECI Science and Technology Issues in Methane Hydrate R&D, March 5-9.
- Kneafsey, T., L. Tomutsa, Y. Seol, G. Moridis, 2005, On relative permeability of hydrate-bearing sediments, American Geophysical Union Fall Meeting, San Francisco, CA, December 5-9.

- Kneafsey, T., L. Tomutsa, C. Taylor, A. Gupta, G. Moridis, B. Freifeld, and Y. Seol, 2005, Methane hydrate formation and dissociation in a partially saturated sand, LBNL-56933 Ext. Abs., San Diego, CA, The 229th ACS National Meeting, March 13-17.
- Kneafsey, T.J., L. Tomutsa, G.J. Moridis, C.E. Taylor, and A. Gupta, "Methane Hydrate Formation and Dissociation in a Partially Saturated Sand – Measurements and Observations", Fifth International Conference on Gas Hydrates, Trondheim, Norway, June 2005, LBNL 56379 Abs.
- Kowalsky, M., S. Nakagawa, and G. Moridis, 2008, "Feasibility of Monitoring Gas Hydrate Production with Geophysical Methods," OTC 19489, 2008 Offshore Technology Conference, Houston, Texas, May 5-8.
- Kowalsky, M. and G. Moridis, 2006, Comparison of Kinetic and Equilibrium Reaction Models in the Simulation of Gas Hydrates in Porous Media, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Li, G., Moridis, G.J., Zhang, K., Li, X., "Evaluation of Gas Production Potential from Marine Gas Hydrate Deposits in the Shenhu Area of the South China Sea: Depressurization and Thermal Stimulation Methods," 2010 Offshore Technology Conference, Houston, TX, May 2010.
- Moridis G., 2006, Hydrates — Technology at the Moment, Keystone, CO, Society of Petroleum Engineers Advanced Technology Workshop on Unconventional Gas Resources, April 20.
- Moridis, G., 2006, Unconventional Oil and Gas Resources, Beijing, China, Society of Petroleum Engineers International Oil and Gas Conference and Exhibition in China (IOGCEC), December 5-7.
- Moridis, G., 2006, Depressurization-induced Gas Production from Class 1 and Class 2 Hydrate Deposits, Kauai, HI, ECI Science and Technology Issues in Methane Hydrate R&D, March 5-9.
- Moridis, G., 2004, Numerical Studies of Gas Production from Oceanic Hydrate Accumulations: Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Moridis, G., 2002, Numerical Studies of Gas Production from Methane Hydrates, Calgary, AB, Canada, Society Petroleum Engineers Gas Technology Symposium, April 29-May 2.
- Moridis, G., 2002, Numerical Simulation Studies of Thermally-Induced Gas Production From Hydrate Accumulations With No Free Gas Zones at the Mallik Site, Mackenzie Delta, Canada, Melbourne, Australia, Asia Pacific Oil and Gas Conference and Exhibition, October 8-10.

- Moridis, G., and M. Kowalsky, 2006, Sensitivity Analysis of Depressurization-induced Long-term Production from Class 1 Hydrate Deposits, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Moridis, G., M. Kowalsky, and K. Pruess, 2005, Depressurization-Induced Gas Production From Class-1 Hydrate Deposits, Dallas, TX, Society of Petroleum Engineering Annual Technical Conference and Exhibition, October 9-12.
- Moridis, G., Y. Seol, and T. Kneafsey, 2005, Numerical Study of Hydrate Preservation during Core Recovery, San Francisco, CA, American Geophysical Union Fall Meeting, December 5-9.
- Moridis, G., Y. Seol, T. Collett, S. Dallimore, T. Inoue, T. Mroz, and J. Henningses, 2003, Thermal Properties of Hydrates from Temperature Data Analysis of an Isolated Formation Interval in the 5L-28 Mallik Research Well, Chiba, Japan, Mallik Consortium Scientific Meeting, December 8-10.
- Moridis, G., Y. Seol, and T. Kneafsey, 2005, Studies of reaction kinetics of methane hydrate dissociation in porous media, Trondheim, Norway, Fifth International Conference on Gas Hydrates (ICGH 5), LBNL-57298.
- Moridis, G., T. Collett, S. Dallimore, T. Satoh, S. Hancock, and B. Weatherhill, 2002, Numerical Studies Of Gas Production Scenarios Hydrate Accumulations at the Mallik Site, Mackenzie Delta, Canada, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Moridis, G., and M. Reagan, 2007, Gas Production From Oceanic Class-2 Hydrate Accumulations, paper 18866 (LBNL-62757), Offshore Technology Conference, Houston, TX, April 30-May 3.
- Moridis, G., and M. Reagan, 2007, Strategies for Gas Production From Oceanic Class-3 Hydrate Accumulations, paper 18865 (LBNL-62758), Offshore Technology Conference, Houston, TX, April 30-May 3.
- Moridis, G., and J. Rutqvist, 2007, Numerical Studies of Geomechanical Stability of Hydrate-Bearing Sediments, paper 18860, Offshore Technology Conference, Houston, TX, April 30-May 3.
- Moridis, G., T. Collett, R. Boswell, M. Kurihara, M. Reagan, C. Koh and E. Dendy Sloan, 2008, "Toward Production from Gas Hydrates: Current Status, Assessment of Resources, and Simulation-Based Evaluation of Technology and Potential, SPE Unconventional Reservoirs Conference, Keystone, Colorado, February 11-12.
- Moridis, G., 2008, "Modeling Studies of Gas Production From Hydrate Deposits and of the Corresponding Geomechanical System Response," National Gas Hydrate Program Gas Hydrate Conference 2008, New Delhi, India, February 6-8.

- Moridis, G., M. Reagan, and K. Zhang, 2008, "The Use of Horizontal Wells in Gas Production from Hydrate Accumulations," 6th International Conference on Gas Hydrates 2008, Vancouver, British Columbia, July 9-12.
- Moridis, G., M. Reagan, and K. Zhang, 2008, "On the Performance of Class 2 and Class 3 Hydrate Deposits During Co-Production With Conventional Gas (OTC 19435)," 2008 Offshore Technology Conference, Houston, Texas, May 5-8.
- Moridis, G. J., and M. T. Reagan, S. Silpngarnlert, K. Zhang, 2008, "Gas Production of Class 3 Hydrate Deposit at the Mount Elbert Site, North Slope, Alaska," AGU Fall Meeting, San Francisco, CA, December 15-19.
- Moridis, G.J., 2009. "Differences between gas production from oceanic and permafrost-associated hydrates," Research Center of Statoil (the national oil company of Norway), Oslo, Norway. March.
- Moridis, G.J., 2009. "Numerical, laboratory and field studies of gas production from hydrates," China University of Geosciences, Wuhan, China. March.
- Moridis, G.J., 2009. "Promises and challenges of gas production from hydrates," Guangzhou Center for Gas Hydrate Research, Guangzhou Institute for Energy Conversion, Chinese Academy of Sciences, Guangzhou, China. March.
- Moridis, G. J., 2009. "Promises and challenges of gas production from hydrates", 2009 SPE Western Regional Meeting, San Jose, CA, March 24-26.
- Moridis, G.J., 2009. "Limitations and special challenges of gas production from oceanic hydrate deposits," National Research Center of the Chinese National Offshore Oil Company, Beijing, China. March.
- Moridis, G.J., 2009. "Numerical, laboratory and field studies of gas production from hydrates," Colorado School of Mines, Golden, Colorado. April.
- Moridis, G.J., 2009. "Promises and challenges of gas production from hydrates," Sacramento Petroleum Association, Sacramento, California. May.
- Moridis, G. 2009, "Interrelationship of dissociating oceanic hydrates and global climate: Methane hydrate response to rising water temperatures," 2009 Goldschmidt Conference, Davos, Switzerland, 21-26 June 2009.
- Nakagawa, S., T.J. Kneafsey, G. J. Moridis, 2008, Mechanical strength and seismic property measurements of hydrate-bearing sediments (HBS) during hydrate formation and loading tests, OTC 19559, SPE Offshore Technology Conference, Houston, TX, May 8.

- Reagan, M., 2010, "Oceanic Hydrates, Methane, Ocean Chemistry, and Climate," Gordon Research Conference on Natural Gas Hydrates, Colby College, Waterville, ME, 6-10 June 2010.
- Reagan, M., 2010, "Climate Change and the Response of Oceanic Hydrate Accumulations," (invited) European Geosciences Union General Assembly, Vienna, Austria, 7 May 2010.
- Reagan, M., 2010, "The Effect of Reservoir Heterogeneity on Gas Production From Hydrate Accumulations in the Permafrost," SPE 132649, 2010 SPE Western North American Regional Meeting, Anaheim, California, 27-29 May 2010.
- Reagan, M., 2010, "Arctic Methane, Hydrates, and Global Climate," (invited) DOE Laboratory Energy R&D Working Group (LERDWG) Meeting, Washington, DC, 17 Feb 2010.
- Reagan, M., 2010, Moridis, G.J., Elliott, S.M., Maltrud, M., Jones, P. 2010 "LBNL Research Program on Gas Production from Hydrates: Numerical Simulation Studies," NETL Methane Hydrates Program Symposium, Atlanta, GA, 25-29 January 2010.
- Reagan, M., Elliott, S., 2010, Moridis, G.J., Maltrud, M., Jones, P. 2010 "Interrelation of Global Climate and the Response of Oceanic Hydrate Accumulations," NETL Methane Hydrates Program Symposium, Atlanta, GA, 25-29 January 2010.
- Reagan, M.T., Moridis, G.J., 2009 "Large-Scale Simulation of Oceanic Gas Hydrate Dissociation in Response to Climate Change," AGU Fall Meeting 2009, San Francisco, CA, 14-18 December 2009.
- Reagan, M., Moridis, G.J., Zhang, K. 2009 "Regional Simulation of Oceanic Gas Hydrate Dissociation in Response to Climate Change," (poster) TOUGH Symposium 2009, Berkeley, CA, 14 September 2009.
- Reagan, M., G. Moridis, 2008. "Dynamic Response Of Oceanic Hydrate Deposits To Ocean Temperature Change," USGS Methane and Climate Symposium, MIT, Cambridge, MA, 25-26 February 2008.
- Reagan, M., G. Moridis, and K. Zhang, 2008, "Sensitivity Analysis of Gas Production from Class 2 and Class 3 Hydrate Deposits (OTC 19554)," 2008 Offshore Technology Conference, Houston, Texas, May 5-8.
- Reagan, M., G. Moridis, 2008, "Reactive transport modeling of oceanic gas hydrate instability and dissociation in response to climate change," 6th International Conference on Gas Hydrates 2008, Vancouver, British Columbia, July 9-12.
- Reagan, M. T., G. J. Moridis, 2008, "Oceanic gas hydrate dissociation in response to climate change and the fate of hydrate-derived methane," AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.

- Reagan, M.T., Moridis, G.J., “Oceanic Gas Hydrate Instability And Dissociation In Response To Climate Change” AGU Fall Meeting 2007, San Francisco, CA, 9-14 December 2007.
- Reagan, M.T., Moridis, G.J., “Strategies for Gas Production From Oceanic Class 3 Hydrate Accumulations,” OTC 18665, 2007 Offshore Technology Conference, Houston, Texas, U.S.A., 1-3 May 2007.
- Rutqvist, J., G. Moridis, 2008, “Development of a Numerical Simulator for Analyzing the Geomechanical Performance of Hydrate-Bearing Sediments,” 42nd U.S. Rock Mechanics Symposium and 2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, California, June 29-July 2.
- Rutqvist J. and Moridis G. “Numerical Studies on the Geomechanical Stability of Hydrate-Bearing Sediments.” 2007 Offshore Technology Conference held in Houston, Texas, U.S.A., 30 April–3 May 2007.
- Moridis, G., M. Reagan, S. Kim, Y. Seol and K. Zhang, 2007, Evaluation of the Gas Production Potential of Marine Hydrate Deposits in the Ulleung Basin of the Korean East Sea,” 2007 SPE Asia Pacific Oil & Gas Conference and Exhibition, Jakarta, Indonesia, 30 October–1 November.
- Rutqvist, J., and G. Moridis, 2007, Numerical Studies of Geomechanical Stability of Hydrate-Bearing Sediments, OTC-18860, Offshore Technology Conference, Houston, Texas, April 30 -May 3, (LBNL-62759, in Review, for publication in the SPE Journal).
- Rutqvist, J., and G. Moridis, submitted, Coupled Hydrologic, Thermal and Geomechanical Analysis of Well Bore Stability in Known Oceanic Hydrate-Bearing Sediments, submitted paper, OTC-19572, 2008 Offshore Technology Conference, Houston, TX.
- Rutqvist, J., G. Moridis, T. Collett, 2008, Geomechanical Response of Known Permafrost Hydrate Deposits to Depressurization and Thermal Loading, 6<sup>th</sup> International Conference on Gas Hydrates, Vancouver, British Columbia, July 9-12.
- Seol, Y., T. Kneafsey, L. Tomutsa and G. Moridis, 2006, Preliminary Relative Permeability Estimates of Methane Hydrate-Bearing Sand, LBNL-60368, Berkeley, CA, TOUGH Symposium, May 15-17.
- Seol, Y, T.J. Kneafsey, and G.J. Moridis, 2007, Numerical simulation of hydrate formation morphology in cylindrical experimental sand columns, Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract OS23A-1037
- Seol, Y. and T.J. Kneafsey, 2008, Fluid flow through heterogeneous methane-hydrate bearing sand: observations using x-ray CT scanning, Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, Canada, July 6-10.

- Su, Z., Moridis, G.J., Zhang, K., Wu, N., “Numerical Investigation of Gas Production Strategies for the Hydrate Deposits in the Shenhu Area,” 2010 Offshore Technology Conference, Houston, TX, May 2010.
- Tomutsa, L., L. Stern, T. Kneafsey, and B. Freifeld, 2002, Use of computed X-ray tomography in measurement of synthetic hydrates and hydrate/sand mixtures during dissociation, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-24.
- Tomutsa, L., B. Freifeld, T. Kneafsey, and L. Stern, 2002, X-ray Computed Tomography Observation of Methane Hydrate Dissociation, SPE 75533, LBNL 49580, SPE Gas Technology Symposium, Calgary, Alberta, Canada, April 30-May 2.
- Waite, W.F., T.J. Kneafsey, J.C. Santamarina, W.J. Winters, T-S Yun, D.H. Mason, C. Ruppel, “Physical Property Changes in Hydrate-Bearing Sediment Samples due to Depressurization/ Repressurization,” American Geophysical Union, San Francisco CA, Dec. 11-15, 2006
- Zhang K., and G. Moridis, 2008, “A Domain Decomposition Approach for Large-Scale Simulations of Coupled Processes in Hydrate-Bearing Geologic Media,” 6th International Conference on Gas Hydrates, Vancouver, British Columbia, Canada, July 6-10.

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**Peer-Reviewed Publications**

- Circone, S., L. Stern, S. Kirby, J. Pinkston, and W. Durham, 2000, Pure methane hydrate dissociation rates at 0.1 MPa and temperatures above 272 K, In: *Gas hydrates: Challenges for the Future*, Ed by G. Holder and P. Bishnoi, Annals of the New York Academy of Sciences, vol. 912, pp. 544-556.
- Circone, S., L. Stern, S. Kirby, W. Durham, B. Chakoumakos, C. Rawn, and A. Rondinone, 2003, CO<sub>2</sub> hydrate: synthesis, composition, dissociation behavior, and a comparison to structure I CH<sub>4</sub> hydrate. *J. Physical Chemistry B.*, 107 (23), pp. 5529-5539.
- Circone, S., L. Stern, S. Kirby, J. Pinkston, and W. Durham, Methane hydrate dissociation rates at 0.1 MPa and temperatures above 272 K, *Gas Hydrates: Challenges for the Future*, edited by G. D. Holder and P. R. Bishnoi, New York Academy of Sciences, New York, pp. 544-555, 2000.
- Durham, W., L. Stern, and S. Kirby, 2003a, Ductile Flow of Methane Hydrate, *Canadian Journal of Physics*, Volume 81, p. 373-380.
- Durham, W., L. Stern, S. Kirby, and S. Circone, 2005, Rheological comparisons and structural imaging of sI and sII end-member gas hydrates and hydrate/sediment aggregates. *Proceedings of the 5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005, vol. 2, p. 607-614.

- Durham, W., S. Kirby, L. Stern, and W. Zhang, 2003, The strength and rheology of methane clathrate hydrate, *J. Geophys. Res.*, vol. 108 (B4), pp. 2182-2193.
- Durham, W., L. Stern, S. Kirby, and S. Circone (2005), Rheological comparisons and structural imaging of sI and sII endmember gas hydrates and hydrate/sediment aggregates, Proceedings of the 5th International Conference on Gas Hydrates, Trondheim, Norway.
- Durham, W., S. Kirby, L. Stern, and W. Zhang, 2003, The Strength and Rheology of Methane Clathrate Hydrate, *Journal Geophysical Research*, Volume 108, p. 2182-2193.
- Rehder, G., S. Kirby, W. Durham, L. Stern, E. Peltzer, J. Pinkston, and P. Brewer, 2004, Dissolution rates of pure methane hydrate and carbon dioxide hydrate in undersaturated seawater at 1000 m depth, *Geochim, Cosmochim. Acta.* vol. 68 (2), pp. 285-292.
- Rehder, G., S. Kirby, W. Durham, L. Stern, E. Peltzer, J. Pinkston, and P. Brewer, Dissolution rates of pure methane hydrate and carbon dioxide hydrate in undersaturated seawater at 1000 m depth, *Geochim. Cosmochim. Acta*, 68, 285-292, 10.1016/j.gca.2003.07.001, 2004.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2001, Anomalous preservation of pure methane hydrate at 1 atm. *J. Phys. Chem. B*, v. 105 (9) p. 1756-1762.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2002, New insights into the phenomenon of anomalous or “self” preservation of gas hydrates. Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates, Yokohama Japan, 2002, pp. 673-677.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2001, Preservation of methane hydrate at 1 atm, *Energy & Fuels*, vol. 15 (2), p.499-501.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2004, Scanning Electron Microscopy (SEM) investigations of laboratory-grown gas hydrates formed from melting ice, and comparison to natural hydrates. *American Mineralogist*, vol. 89 (8-9), 1162-1175.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2005. SEM imaging of gas hydrate formation processes and growth textures, and comparison to natural hydrates of marine and permafrost origin. *Proceedings of the 5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005, vol. 1, p. 300-309.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2003, Temperature, pressure, and compositional effects on anomalous or “self” preservation of gas hydrates. *Can. Journ. Phys*, 81 (1-2), pp. 271-283.
- Stern, L., S. Kirby, and W. Durham, 2005. SEM imaging of grain structure and phase distribution within hydrate-bearing intervals from Mallik well 5L-38: What can we learn from comparisons with laboratory-synthesized samples? Geological Survey of Canada, Bulletin 585 (paper 31).

Stern, L., S. Kirby, and W. Durham (2005), Scanning electron microscopy imaging of grain structure and phase distribution within gas-hydrate-bearing intervals from JAPEX/JNOC/GSC et al. Mallik 5L-38: What can we learn from comparisons with laboratory-synthesized samples?, in *Scientific Results from the eMallik 2002 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada*, ed. by S. R. Dallimore and T. S. Collett, Geological Survey of Canada, Bulletin 585, 19 pp.

Stern, L., S. Kirby, W. Durham, S. Circone, and W. Waite, 2000, Synthesis of pure methane hydrate suitable for measurement of physical properties and decomposition behavior, Chapter 25 in: *Natural Gas Hydrate: In Oceanic and Permafrost Environments*, M.D. Max, ed., Kluwer publ., Dordrecht, p.323-349. (*Invited contribution*)

Waite, W., J. Pinkston, L. Stern, M. Helgerud, A. Nur, and W. Durham, Laboratory measurements of compressional and shear wave speeds through methane hydrate, *Gas Hydrates: Challenges for the Future*, edited by G. D. Holder and P. R. Bishnoi, New York Academy of Sciences, New York, pp. 1003-1010, 2000.

Waite, W., M. Helgerud, A. Nur, J. Pinkston, L. Stern, S. Kirby, and W. Durham, 2000, Laboratory measurements of compressional and shear wave speeds through pure methane hydrate. In: *Gas hydrates: Challenges for the Future*, Ed by G. Holder and P. Bishnoi, *Annals of the New York Academy of Sciences*, vol. 912, pp. 1003-1011.

### **Presentations**

Durham, W., S. Kirby, L. Stern, 2006, Constraining the flow and fracture of planetary ices through laboratory experiments. *AGU Eos Trans.*, 87(52) Fall Meeting Supplement, abstract P42B-02.

Durham, W., S. McDaniel, L. Stern, and S. Kirby, Ice rheology in the planetary context, *American Geophysical Union 2003 Spring Meeting*, Nice, France, April 2003.

Durham, W., L. Stern, and S. Kirby, Ductile flow of methane hydrate. *International Symposium on the Physics and Chemistry of Ice*, Newfoundland, July 14-19, 2002.

Durham, W., L. Stern, and S. Kirby, 2003b, The rheology of clathrate hydrates and its relationship to planetary ice, Miami, FL, *The Study of Matter under Extreme Conditions Conference*, March 24-28.

Durham, W., L. Stern, S. Kirby, and S. Circone, Laboratory studies of sI and sII gas hydrates: physical properties and thermodynamic stability, *Science & Technology issues in Methane Hydrate R&D Conference*, Kauai, HI, March 5-9, 2006.

Durham, W., L. Stern, S. Kirby, and S. Circone, Rheology and structural imaging of sI and sII end-member gas hydrates and hydrate/sand aggregates. *5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005.

- Kirby, S., L. Stern, and W. Durham, 2000, Synthesis and physical properties of pure methane hydrate: challenges, new developments, and trends. *Abstracts of the Western Pacific Geophysical Meeting, 2000, Tokyo, Japan.*
- Kirby, S., L. Stern, P. Brewer, S. Circone, and W. Durham, Laboratory and seafloor experiments in support of the science of hydrate hydrocarbon clathrate hydrates in nature, AGU Fall 2003 meeting, San Francisco, CA December 2003.
- Stern, L., S. Circone, S. Kirby, and W. Durham, New insights into the phenomenon of anomalous or “self” preservation of gas hydrates, International Symposium on the Physics and Chemistry of Ice, Newfoundland, July 14-19, 2002.
- Stern, L., W. Durham, S. Kirby, S. Circone, and M. Helgerud, Experimental observations pertinent to the mechanical and thermal stability of sI methane hydrate/sand aggregates, AAPG 2004 National Meeting, Dallas Texas, April 2004.
- Stern, L., W. Durham, S. Kirby, C. McCarthy, T. Kubo, K. Rieck, and A. Pathare, Planetary ices up close: imaging by cryogenic SEM. American Geophysical Union 2007 Fall Meeting.
- Stern, L., S. Kirby, S. Circone, W. Waite, M. Helgerud, J. Pinkston, and W. Durham, Laboratory investigations of gas hydrate physical properties and phase stability. 4<sup>th</sup> International Conference on Gas Hydrates, Yokohama, Japan, May 19-24 2002.
- Stern, L., S. Kirby, S. Circone, and W. Durham, Scanning Electron Microscopy (SEM) imaging of laboratory-grown gas hydrates, and comparisons with recovered samples from marine and permafrost origin. *AAPG Hedberg Research Conference* (“Natural Gas Hydrates: Energy Resource Potential and Associated Geologic Hazards”), Vancouver BC, Canada, September 2004.
- Stern, L., S. Kirby, S. Circone, and W. Durham, SEM imaging of gas hydrate formation processes and growth textures, and comparison to natural hydrate of marine and permafrost origin. *5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005.
- Stern, L., S. Kirby, S. Circone, and W. Durham, Synthesis of Gas Hydrates for Measurement of Physical Properties and Phase Stability, American Crystallographic Association 2001 Annual Meeting, Los Angeles CA.
- Stern, L., E. Peltzer, W. Durham, S. Kirby, P. Brewer, S. Circone, and G. Rehder, Dissolution of Hydrocarbon Hydrates in Seawater at 1030-m; Effects of Porosity, Structure, and Compositional Variation as Determined by Video and SEM Imaging. *EOS, Transactions of the American Geophysical Union*, 83 (47) p. F777, 2002.

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### **Peer-Reviewed Publications**

- Chakoumakos, B., C. Rawn, A. Rondinone, L. Stern, S. Circone, S. Kirby, Y. Ishii, C. Jones, B. Toby, and D. Dender, 2003, Temperature Dependence of Polyhedral Cage Volumes in Clathrate Hydrates, *Canadian Journal of Physics*, Volume 81, p. 183-189.
- Circone, S., L. Stern, S. Kirby, W. Durham, B. Chakoumakos, C. Rawn, A. Rondinone, and Y. Ishii, 2003, CO<sub>2</sub> Hydrate: Synthesis, Composition, Structure, Dissociation Behavior, and a Comparison to Structure I CH<sub>4</sub> Hydrate, *Journal of Physical Chemistry B*, 107, p. 5529-5539.
- Colwell, F., S. Boyd, M. Delwiche, D. Reed, T. Phelps, and D. Newby, 2008, Estimates of biogenic methane production rates in deep marine sediments at Hydrate Ridge, Cascadia Margin, *Applied and Environmental Microbiology*, 74, p. 3444-3452.
- Elwood Madden, M., S. Ulrich, P. Szymcek, S. McCallum, T. Phelps, 2009, "Experimental formation of massive hydrate deposits from accumulation of CH<sub>4</sub> gas bubbles within synthetic and natural sediments," *Marine and Petroleum Geology*, 26, 369-378.
- Elwood Madden, M., S. Ulrich, T. Onstott, and T. Phelps. 2007, Salinity-induced hydrate dissociation: a mechanism for recent CH<sub>4</sub> release on Mars, *Geophysical Research Letters*, 34 L11202.
- Jones, C., S. Marshall, B. Chakoumakos, C. Rawn, and Y. Ishii, 2003, Structure and thermal expansivity of tetrahydrofuran deuterate determined by neutron powder diffraction, *Journal of Physical Chemistry B*, 107, p. 2026-6031.
- McCallum, S., D. Riestenberg, O. Zatsepina and T. Phelps, 2007, Effect of pressure vessel size on the formation of gas hydrates, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 54-64, March.
- Phelps, T., D. Peters, S. Marshall, O. West, L. Liang, V. Alexiades, G. Jacobs, J. Blencoe, M. Naney, and J. Heck, 2001, A new experimental facility for investigating the formation and properties of gas hydrates under simulated seafloor conditions, *Review of Scientific Instruments*, Volume 72, p.1514-1521.
- Rawn, C., A. Rondinone, B. Chakoumakos, S. Circone, L. Stern, S. Kirby, and Y. Ishii, 2003, Neutron Powder Diffraction Studies as a Function of Temperature of Structure II Hydrate Formed from Propane, *Canadian Journal of Physics*, Volume 81, p. 431-438.
- Riestenberg, D., O. West, S. Lee, S. McCallum, and T. Phelps, 2003, Sediment Surface Effects on Methane Hydrate Formation and Dissociation, *Marine Geology*, Volume 198, p. 181-190.

Rondinone A., B. Chakoumakos, C. Rawn, and Y. Ishii, 2003, Neutron Diffraction Study of Structure I and Structure II Trimethylene Oxide Clathrate Deuterate, *Journal of Physical Chemistry B*, 107, p. 6046-6050.

Rondinone, A., C. Jones, S. Marshall, B. Chakoumakos, C. Rawn, and E. Lara-Curizo, 2003, A Single-Crystal Sapphire Cell for in situ Neutron Diffraction Study of Gas-Hydrate, *Canadian Journal of Physics*, Volume 81, p.381-385.

Subramaniam, S. M. Lance, C. Rawn, B. Chakoumakos, and A. Rondinone, 2005, Raman Spectroscopic Studies on Structure I and Structure II Trimethylene Oxide Hydrate, *Can. J. Phys.*, **83**, 941-949.

Zatsepina, O., D. Riestenberg, S. McCallum, M. Gborigi, C. Brandt, B. Buffett, and T. Phelps, 2004, Influence of water thermal history and overpressure on CO<sub>2</sub>-hydrate nucleation and morphology, *American Mineralogist*, Volume 89, p. 1254-1259.

### **Government Reports**

Elwood Madden, M., T. Phelps, C. Rawn, S. McCallum, P. Szymcek, S. Ulrich, C. Taylor, 2006, Hydrate Formation and Dissociation via Depressurization in Simulated and Field Samples, Interim Report, available online ([click here](#)).

### **Other Publications**

Chakoumakos, B., C. Rawn, A. Rondinone, S. Marshall, L. Stern, S. Circone, S. Kirby, C. Jones, B. Toby, and Y. Ishii, "The Use of Rigid Body Constraints in Rietveld Refinements of Neutron Diffraction Data of Clathrate Hydrates", *Proceedings of the Fourth International Conference on Gas Hydrates*, (2002) p.655.

Madden, M., 2007, New Sensing Technology at Oak Ridge National Lab Expands Capabilities for Meso-Scale Hydrate Research, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2007 issue, available online ([click here](#)).

C.J. Rawn, R. Sassen, S.M. Ulrich, T.J. Phelps, B.C. Chakoumakos, and E.A. Payzant, "Low Temperature X-ray Diffraction Studies of Natural Gas Hydrate Samples from the Gulf of Mexico", *Proceedings of the 6<sup>th</sup> International Conference on Gas Hydrate (ICGH 2008)*, CD (2008).

Rawn, C., and T. Phelps, 2004, Oak Ridge facilities for studying natural gas hydrates are well suited for graduate education and collaborations, *U.S. DOE-NETL Fire in the Ice Newsletter*, Fall 2004 issue, available online ([click here](#)).

Rawn, C., A.J. Rondinone, B.C. Chakoumakos, S.L. Marshall, L.A. Stern, S. Circone, S.H. Kirby, C.Y. Jones, B.H. Toby, and Y. Ishii, "Neutron Powder Diffraction Studies as a Function of Temperature of Structure II Hydrate Formed from a Methane + Ethane Gas Mixture", *Proceedings of the Fourth International Conference on Gas Hydrates*, (2002) p. 595.

Rondinone, A., B.C. Chakoumakos, C.J. Rawn, and Y. Ishii, “Neutron Diffraction Study of Structure I and Structure II Trimethylene Oxide Clathrate Deuterate”, *Proceedings of the Fourth International Conference on Gas Hydrates*, (2002) p. 625.

Madden, M., 2007, New Sensing Technology at Oak Ridge National Lab Expands Capabilities for Meso-Scale Hydrate Research, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2007 issue, available online ([click here](#)).

S.M. Ulrich, M.E. Elwood-Madden, C.J. Rawn, P. Szymcek, and T.J. Phelps, “Application of Fiber Optic Temperature and Strain Sensing Technology to Gas Hydrates”, *Proceedings of the 6<sup>th</sup> International Conference on Gas Hydrate (ICGH 2008)*, CD (2008).

### **Presentations**

Chakoumakos, B., C. Rawn, A. Rondinone, S. Marshall, L. Stern, S. Circone, S. Kirby, C. Jones, B. Toby, and Y. Ishii, 2002, The use of rigid body constraints in Rietveld refinements of neutron diffraction data of clathrate hydrates, Yokohama, Japan, *4<sup>th</sup> International Conference on Gas Hydrates*, May 19-23.

Madden, M. Elwood, 2007, “Experimental formation of massive hydrate deposits from accumulation of CH<sub>4</sub> gas bubbles within synthetic and natural sediments” submitted to *Marine and Petroleum Geology*, presentation given by S. Ulrich at the 2007 American Geophysical Union Fall Meeting, San Francisco, California, December 11.

Madden, M. Elwood, S.M. Ulrich, and T.J. Phelps, 2007, “Impacts, Salinity, and Climate Change: Global-Scale Triggers for Hydrate Dissociation on Earth and Mars,” American Geophysical Union Fall Meeting in San Francisco, California, December.

Madden M. Elwood, 2006, Just add Salt: Salinity-Induced Hydrate Dissociation as a Possible Source for Atmospheric Methan on Mars, American Geophysical Union Fall Meeting, San Francisco, CA, December

McCallum, S., D. Riestenberg, C. Rawn, and T. Phelps, 2005, Mesoscale research of gas hydrates, San Diego, CA, 229<sup>th</sup> American Chemical Society National Meeting, March 13-17.

Rawn, C.J. 2008, “Fire in the Ice: Harvesting Methane from Oceans and Permafrost”, Chemistry Department Seminar, Spelman College, Atlanta, GA, March 31.

Rawn, C.J. 2008, “Fire in the Ice: Harvesting Methane from Oceans and Permafrost”, Biological and Environmental Sciences Brown Bag Lunch Seminar, Oak Ridge National Laboratory, Oak Ridge, TN, February 27.

Rawn, C.J. 2009, “Fire in the Ice: Harvesting Methane from Oceans and Permafrost”, Smoky Mountain Chapter of the American Meteorological Society, Knoxville, TN, January 26.

- Rawn, C.J. 2008, "Fire in the Ice: Harvesting Methane from Oceans and Permafrost" University of Tennessee Science Forum, Knoxville, TN, November 21.
- Rawn, C., R. Sassen, S.M. Ulrich, E.A. Payzant, B.C. Chakoumakos, and T.J. Phelps, "Low Temperature X-ray Diffraction Study of Natural Gas Hydrate Samples from the Gulf of Mexico," 2008, 6<sup>th</sup> International Conference on Gas Hydrates, Vancouver, Canada, July 7-10.
- Rawn, C., A. Rondinone, B. Chakoumakos, S. Marshall, L. Stern, S. Circone, S. Kirby, C. Jones, B. Toby, and Y. Ishii, 2002, Neutron powder diffraction studies as a function of temperature of structure II hydrate formed from a methane + ethane gas mixture, Yokohama, Japan, 4<sup>th</sup> *International Conference on Gas Hydrates*, May 19-23.
- Riestenberg, D., T. Phelps, S. Lee, O. West, and C. Tsouris, 2002, SPS investigations of the formation and stability of gas hydrates, Washington, DC, Methane Hydrates Interagency R&D Conference, March.
- Riestenberg, D., O. West, L. Liang, and T. Phelps, 2000, Effects of particle size and mineralogy on methane hydrate nucleation and dissociation pressures, San Francisco, CA, American Geophysical Union Fall Meeting, December 15-19.
- Riestenberg, D., O. Zatsepina, and T. Phelps, 2004, Gas Hydrate Nucleation Processes, San Francisco, CA, American Geophysical Union Meeting, December 8-12.
- Ulrich, S., M. Elwood Madden, P. Szymcek, S. McCallum, T.J. Phelps, 2007, "Formation of Massive Hydrate From the Accumulation of Free CH<sub>4</sub> gas in Sediments," American Geophysical Union Fall Meeting in San Francisco, California, December.
- Ulrich, S.; Elwood Madden, M.; Rawn, Claudia J.; Szymcek, P.; Phelps, T. J., 2008. Application of Fiber Optic Temperature and Strain Sensing Technology To Gas Hydrates. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- West, O., D. Riestenberg and T. Phelps, 2002, Seafloor Process Simulator for laboratory examination of natural gas hydrate sediments, Houston, TX, Naturally Occurring Gas Hydrates Data Collection Workshop, March.
- West, O., and T. Phelps, 2002, Methane and carbon dioxide hydrate investigations using a 70-L high pressure vessel, Seattle, WA, TMS 2002 Annual meeting.

## *Idaho National Laboratory*

### **Peer-Reviewed Publications**

- Colwell F., S. Boyd, M. Delwiche, *et al.*, *in press*, “Estimates of biogenic methane production rates in deep marine sediments at Hydrate Ridge, Cascadia Margin,” *Applied and Environmental Microbiology*.
- Colwell, F., T. Nunoura, M. Delwiche, S. Boyd, R. Bolton, D. Reed, K. Takai, R. Lehman, K. Horikoshi, D. Elias, and T. Phelps, 2005, Evidence of minimal methanogenic numbers and activity in sediments collected from the JAPEX/JNOC/GSC, *et al.* Mallik 5L-38 gas hydrate production research well in Dallimore, S. and T. Collett, *eds.*, *Scientific Results from the Mallik 2002 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada, Geological Survey of Canada Bulletin*, Bulletin 585, p. 102.
- Colwell, F., and R. Smith, 2004, Unifying principles of the deep terrestrial and deep marine biospheres, in Wilcock, W., E. Delong, D. Kelley, J. Baross, and S. Cary, *eds.*, *Subseafloor Biosphere at Mid-Ocean Ridges*, Geophysical Monograph Series, Volume 104. American Geophysical Union, p. 355-367.
- Colwell, F., M. Delwiche, D. Blackwelder, M. Wilson, R. Lehman, and T. Uchida, 1999, Microbial communities from core intervals, JAPEX/JNOC/GSC Mallik 2L-38 gas hydrate research well in Dallimore, S., T. Uchida, and T. Collett, *eds.*, *Scientific Results from JAPEX/JNOC/GSC Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Northwest Territories, Canada*, Geological Survey of Canada, Bulletin 544, p. 189-195.
- Colwell, F., R. Matsumoto, and D. Reed, 2004, A review of the gas hydrates, geology and biology of the Nankai Trough, *Chemical Geology*, Volume 205, p. 391-404.
- Mikucki, J., Y. Liu, M. Delwiche, F. Colwell, and D. Boone, 2003, Isolation of a Methanogen from deep marine sediments that contain methane hydrates, and description of *Methanoculleus submarinus* sp. nov., *Applied and Environmental Microbiology*, Volume 69, p. 3311-3316.
- Reed, D., Y. Fujita, M. Delwiche, D. Blackwelder, P. Sheridan, T. Uchida, and F. Colwell, 2002, Microbial communities from methane hydrate-bearing deep marine sediments in a forearc basin, *Applied and Environmental Microbiology*, Volume 68, p. 3759-3770.

### **Other Publications**

- Colwell, F., W. Ussler, and G. Dickens, 2006, Methanogenesis in hydrate-bearing sediments: integration of experimental and theoretical approaches, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2006 issue, available online ([click here](#)).

Colwell, F., M. Delwiche, D. Blackwelder, R. Cherry, J. Mikucki, Y. Liu, D. Boone, and T. Uchida, 2002, Evidence of broad thermal tolerance of methanogens in sediments containing gas hydrates, Yokohama, Japan, *Proceedings of the 4th International Conference on Gas Hydrates*, p. 19-24.

Inagaki, F., T. Nunoura, S. Nakagawa, A. Teske, M. Lever, A. Lauer, M. Suzuki, K. Takai, M. Delwiche, F. Colwell, K. Nealson, K. Horikoshi, S. D'Hondt, and B. Jørgensen, 2006, Biogeographical distribution and diversity of microbes in methane hydrate-bearing deep marine sediments on the Pacific Ocean Margin. *Proceedings of the National Academy of Sciences*, Volume 103, p. 2815-2820.

### **Presentations**

Briggs, B., A. Hangsterfer, E. Brodie, R. Daly, M. Holland, P. Carini, M. Torres, M. Kastner, P. Long, H. Schaef, M. Delwiche, W. Winters, M. Riedel, F. Colwell, 2008, "Distribution of the dominant microbial communities in marine sediments containing high concentrations of gas hydrates," 6th International Conference on Gas Hydrates 2008, Vancouver, British Columbia, July 6-9.

Boyd, S., *et al.*, 2004, Determination of methanogen biomass in hydrate-bearing sediments by quantitative PCR, 104th General Meeting of the American Society for Microbiology, New Orleans, LA, May 23-27.

Colwell, F., A. Hangsterfer, E. Brodie, R. Daly, M. Holland, B. Briggs, P. Carini, M. Torres, M. Kastner, P. Long, H. Schaef, M. Delwiche, W. Winters, 2007, "Fine scale control of microbial communities in deep marine sediments that contain hydrates and high concentrations of methane," American Geophysical Union, Fall Meeting, Moscone Center, San Francisco, CA, December 10-14.

Colwell, F., S. Boyd, M. Delwiche, and D. Reed, 2005, Rates of biological methane production in sediments, Victoria, BC, Canada, 4<sup>th</sup> International Workshop on Gas Hydrates.

Colwell, F., T. Lorenson, S. Boyd, M. Delwiche, D. Reed, and D. Newby, 2005, Experimentally determined rates of methanogenesis in methane-bearing sediments, Salt Lake City, UT, Geological Society of America Annual Meeting, October 16-19.

Colwell, F., S. Boyd, M. Delwiche, and D. Reed, 2004, Realistic Rates of Biological Methane Production in Hydrate Bearing Sediments, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.

Colwell, F., M. Delwiche, D. Reed, S. Boyd, T. Nunoura, K. Takai, and the ODP Leg 204 Shipboard Scientific Party, 2003, Microbiology of hydrates: searching for the methane source term, Kurashiki, Japan, Goldschmidt Conference, September 7-12.

Colwell, F., *et al.*, 2003, Microorganisms of methane hydrates: Down but not out, Denver, CO. Annual Meeting of the American Association for the Advancement of Science, February 13-18.

Colwell, F., M. Delwiche, D. Reed, S. Boyd, T. Nunoura, F. Inagaki, and K. Takai, 2003, Geomicrobiology and methanogenesis in accretionary complexes, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.

Colwell, F., *et al.*, 2003, Microorganisms of methane hydrates: Down but not out, Kurashiki, Japan, Keynote Address, Goldschmidt Conference, September 7-12.

Colwell, F., D. Reed, Y. Fujita, M. Delwiche, D. Blackwelder, T. Uchida, T. Fujii, and H. Lu, 2001, Deep-subsurface marine methane hydrate microbial communities: Who's there and what are they doing?, San Francisco, CA, American Geophysical Union Fall Meeting, December 10-14.

Colwell, F., M. Dewiche, D. Blackwelder, Y. Fujita, and T. Uchida, 2000, Microbial methane production and biomass in the Nankai Trough, Tokyo, Japan, Western Pacific Geophysics Meeting, June 27-30.

Colwell, F., 1999, Subsurface microbial communities in sediments bearing methane hydrates, Engineering Foundation Conference - Gas Hydrates and Challenges for the Future, Salt Lake City, UT, July 18-22.

Inagaki, F., T. Nunoura, M. Suzuki, K. Takai, K. Nealson, K. Horikoshi, M. Delwiche, F. Colwell, and B. Jorgensen, 2003, Microbial community structures in methane hydrate bearing deep marine sediments from the Peru Margin (ODP Leg 201) and the Cascadia Margin (ODP Leg 204), San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.

Nunoura, T., K. Takai, K. Nealson, K. Horikoshi, M. Delwiche, F. Colwell, and ODP Leg 204 Shipboard Scientific Party, 2003, The microbial community structure of methane hydrate bearing deep seafloor sediments in Cascadia Margin (ODP Leg204), Kurashiki, Japan, Goldschmidt Conference, September 7-12.

### *National Energy Technology Laboratory*

#### **Peer-Reviewed Publications**

Gaddipati, M., Nyayapathi, L., Anderson, B.J., "Sensitivity Analysis of Methane Hydrate Reservoirs: Effects of Reservoir Parameters on Gas Productivity and Economics", American Geophysical Union Fall Conference, San Fransisco, CA, December 15-19, 2008.

Holder, G., L. Mokka, and R. Warzinski, 2001, Formation of Gas Hydrates from Single-Phase Aqueous Solutions, *Chemical Engineering Science*, Volume 56, p. 6897-6903.

Kono, H., S. Narasimhan, F. Song, and D. Smith, 2002, Synthesis of Methane Gas Hydrate in Porous Sediments and Its Dissociation by Depressurization, *Powder Technology*, Volume 122, p. 239-246.

- Lekse, J., C. Taylor and E. Ladner, 2007, Effect of bubble size and density on methane conversion to hydrate, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 97-100, March.
- Link, D., E. Ladner, H. Elsen, and C. Taylor, 2003, Formation and Dissociation Studies for Optimizing the Uptake of Methane by Methane Hydrates, *Fluid Phase Equilibrium*, Volume 211, p. 1-10.
- Link, D., C. Taylor, and E. Ladner, 2001, Novel Techniques for the Conversion of Methane Hydrates, Studies, *Surface Science and Catalysis*, Volume 136, p. 543-548.
- Seshadri, K., J. Wilder, and D. Smith, 2001, Measurements of Equilibrium Pressures and Temperatures for Propane Hydrate in Silica Gels with Different Pore-Size Distributions, *Journal of Physical Chemistry*, Volume 105, p. 2627-2631.
- Siriwardane, H. and D. Smith, 2002, Synthesis and Homogeneity of Methane Hydrate in Unconsolidated Media, *Journal of Testing and Evaluation*, Volume 30, p. 1-7.
- Smith, D., J. Wilder, and K. Seshadri, 2002, Methane Hydrate Equilibria in Silica Gels with Broad Pore-Size Distributions, *American Institute of Chemical Engineers Journal*, Volume 48, p. 393-400.
- Smith, D., J. Wilder, and K. Seshadri, 2002, Thermodynamics of Carbon Dioxide Hydrate Formation in Media with Broad Pore-Size Distributions, *Environmental Science and Technology*, Volume 36, p. 5192-5198.
- Taylor, C., J. Lekse, N. English, in review, NETL's methane hydrate research, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.
- Taylor, C., D. Link and N. English, 2007, Methane hydrate research at NETL: Research to make methane production from hydrates a reality, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, p. 186-191, Issues 1-3, March.
- Warzinski, R., R. Lynn, D. Shaw and E. Rosenbaum, in review, Thermal property measurements of gas hydrates using a transient plane source technique, in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.
- Wilder, J., and D. Smith, 2002, Comments on 'Anomalous Preservation of Pure Methane Hydrate at 1 atm', *Journal of Physical Chemistry*, Volume 106, p. 226-27.

- Wilder, J., and D. Smith, 2002, Dependencies of Clathrate Hydrate Dissociation Fugacities on the Inverse Temperature and Inverse Pore Radius, *Industrial Engineering Chemical Research*, Volume 41, p. 2819-2825.
- Wilder, J., and D. Smith, 2002, Upper Limits on the Rates of Dissociation of Clathrate Hydrates to Ice and Free Gas, *Journal Physical Chemistry*, Volume 106, p. 6298-6302.
- Wilder, J., K. Seshadri, and D. Smith, 2001, Resolving Apparent Contradictions in Equilibrium Measurements for Clathrate Hydrates in Porous Media, *Journal of Physical Chemistry*, Volume 105, p. 9970-9972.
- Velaga, S., Anderson, B.J. "Phase equilibrium and cage occupancy calculations of CO<sub>2</sub> hydrates using an ab initio intermolecular potential", ACS National Meeting, Salt Lake City, UT, March 24, 2009.
- Zhang, M., Anderson, B.J., Warzinski, R.P., Holder, G.D., "Molecular dynamics simulation of hydrate lattice distortion", ACS National Meeting, Salt Lake City, UT, March 24, 2009.
- Zhang, W., J. Wilder, and D. Smith, 2002, Interpretation of Methane Hydrate Equilibrium Data for Porous Media Involving Ice-Hydrate Equilibria, *American Institute of Chemical Engineering Journal*, Volume 48, p. 2324-2331.

#### **Other Publications**

- Anderson, B.J., Boswell, R., Gaddipati, M., Wilder, J., Collett, T., Hunter, R., Kurihara, M., Masuda, Y., McGrail, P., Moridis, G., Narita, H., Pooladi-Darvish, M., White, M., Rose, K., Wilson, S., "Effects of Reservoir Heterogeneity on Productivity of Gas Hydrate Reservoirs", *Fire in the Ice*, Fall 2008.
- Wilder, J., D. Smith and K. Seshadri, 2002, Thermodynamics of the Sequestration of Carbon Dioxide in Methane Hydrates in Porous Media, American Chemical Society, Fuel Chemistry Division, Volume 47, n.1, p. 17-19.

#### **Presentations**

- Anderson, B.J., "Predictions of Gas Production from Hydrate Reservoirs: The Results of the International Methane Hydrate Reservoir Simulator Code Comparison Project and Connections to Molecular-Scale Modeling" Eni-MIT Seminar Series on Energy Production from Methane Hydrates, MIT, Cambridge, MA, October 2, 2008.
- Anderson, Brian J.; Wilder, Joseph W.; Kurihara, Masanori; White, Mark D.; Moridis, George J.; Wilson, Scott J.; Pooladi-Darvish, Mehran; Masuda, Yoshihiro; Collett, Timothy S.; Hunter, Robert B.; Narita, Hideo; Rose, Kelly; Boswell, Ray, 2008. Analysis Of Modular Dynamic Formation Test Results From The Mount Elbert-01 Stratigraphic Test Well, Milne Point Unit, North Slope Alaska. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.

- Collett, Timothy S.; Riedel, M.; Cochran, J.R.; Boswell, R.; Kumar, P.; Sathe, A.V. 2008. Indian Continental Margin Gas Hydrate Prospects: Results Of The Indian National Gas Hydrate Program (Nghp) Expedition 01. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. ([click here](#)).
- English, N., C. Taylor, R. Warzinski, and E. Rosenbaum, 2005, Molecular Dynamics Simulation of Methane Hydrates at NETL, 229th ACS National Meeting, San Diego, CA, March 13-17.
- Holder, G., L. Mokka, and R. Warzinski, 2001, Hydrate Formation from Single-Phase Aqueous Solutions, Spring 2001 National Meeting of American Chemical Society, Division of Fuel Chemistry, San Diego, CA, April 1-5.
- Hughes, R., F. Civan, M. Gonzalez, and C. Taylor, 2003, Equilibrium and Non-equilibrium Models Applied to Hydrate Formation and Dissociation Experiments, New Orleans, LA, Third Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 30-April 3.
- Hutchinson, Deborah R.; Shelander, Dianna; Dai, Jianchun; McConnel, Dan; Shedd, William; Frye, Matthew; Ruppel, Carolyn; Boswell, Ray; Jones, Emrys; Collett, Timothy S.; Rose, Kelly; Dugan, Brandon; Wood, Warren; Latham, Thomas. 2008. Site Selection For DOE/JIP Gas Hydrate Drilling In The Northern Gulf Of Mexico. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. ([click here](#)).
- Kono, H., B. Bdhijanto, F. Song, D. Smith, and S. Narasimhan, 2002, Formation Rates of Methane Gas Hydrate within Porous Sediments, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Link, D., C. Taylor, H. Elsen, and E. Ladner, 2003, Enhancement in the Storage of Methane in Hydrates, New Orleans, LA, Third Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 30-April 3.
- Rosenbaum, E., D. Shaw, R. Lynn, G. Holder, and R. Warzinski, 2003, Thermal Properties and Characterization of Gas Hydrates, New Orleans, LA, Third Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 30-April 3.
- Seol, Y. and T.J. Kneafsey, 2008, Fluid flow through heterogeneous methane-hydrate bearing sand: observations using x-ray CT scanning, Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, Canada, July 6-10.

- Smith, D., C. Ji, and G. Ahmadi, 2002, A Model for Natural Gas Production, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Smith, D., J. Wilder, K. Seshadri, and W. Zhang, 2002, Equilibrium Pressures and Temperatures for Equilibria Involving sI or sII Hydrate, Liquid Water, and Free Gas in Porous Media, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Smith, D., J. Wilder, and K. Seshadri, 2001, Thermodynamics of Sequestration of Carbon Dioxide in Natural Gas Hydrates in Porous Media, San Francisco, CA, ECCS/IEA Meeting, September 30-October 5.
- Smith, D., K. Seshadri, and J. Wilder, 2001, Assessing the Thermodynamic Feasibility of the Conversion of Methane Hydrate in Porous Media, Washington, DC, First National Conference on Carbon Sequestration, May 15-17.
- Smith, D., and K. Seshadri, 2000, Thermodynamics of Conversion of Methane Clathrate Hydrate to Carbon Dioxide Hydrate Within Porous Media, Washington, DC, 220<sup>th</sup> National Meeting of the American Chemical Society, August 20-24.
- Taylor, C., 2001, Photocatalytic Methane Hydrate Conversion, Amsterdam, The Netherlands, International Gas Research Conference, November 5-8.
- Taylor, C., 2002, Methane Conversion via Photocatalytic Reactions, New Orleans, LA, Second Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 10-14.
- Taylor, C., D. Link, and H. Elsen, 2002, Methane Hydrate Conversion Using Photocatalysts, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Taylor, C., 2001, Photocatalytic Methane Hydrate Conversion, Amsterdam, The Netherlands, International Gas Research Conference, November 5-8.
- Walsh, Matt; Hancock, Steve; Wilson, Scott; Patil, Shirish; Moridis, George; Boswell, Ray; Collett, Timothy S.; Koh, Carolyn A.; Sloan, E. Dendy. 2008. Preliminary Report on the Economics of Gas Production from Natural Gas Hydrates. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. [\(click here\)](#).
- Warzinski, Robert P.; Gamwo, Isaac K.; Rosenbaum, Eilis J.; Myshakin, Evgeniy M.; Jiang, Hao; Jordan, Kenneth D.; English, Niall J.; Shaw, David W. 2008. Thermal Properties of Methane Hydrate by Experiment and Modeling and Impacts upon Technology. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008. [\(click here\)](#).

- Wilder, Joseph W.; Moridis, George J.; Wilson, Scott J.; Kurihara, Masanori; White, Mark D.; Masuda, Yoshihiro; Anderson, Brian J.; Collett, Timothy S.; Hunter, Robert B.; Narita, Hideo; Pooladi-Darvish, Mehran; Rose, Kelly; Boswell, Ray, 2008. An International Effort To Compare Gas Hydrate Reservoir Simulators. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Yang, Shengxiong; Zhang, Haiqi; Wu, Nengyou; Su, Xin; Schultheiss, Peter; Holland, Melanie; Zhang, Guangxue; Liang, Jinqiang; Lu, Jing'an; Rose, Kelly. 2008. High Concentration Hydrate In Disseminated Forms Obtained In Shenhu Area, North Slope Of South China Sea. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Zhang, Y., G. Holder, and R. Warzinski, 2003, Formation of Hydrate from Single-Phase Aqueous Solutions, New Orleans, LA, Third Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 30-April 3.
- Zhang, Y., J. Wilder, and D. Smith, 2003, Interpretation of Methane Hydrate Equilibrium Data for Porous Media Involving Hydrate-Ice Equilibria, New Orleans, LA, Third Topical Conference on Natural Gas Utilization, Spring National Meeting of the American Institute of Chemical Engineers, March 30-April 3.
- Zhang, W. and D. Smith, 2002, Conflict and Solution in Constructing Thermodynamic Equations for Different Integration Paths, Yokohama, Japan, Fourth International Conference on Gas Hydrates, May 19-23.
- Zhang, W., J. Wilder, and D. Smith, 2002, Equilibrium Pressures and Temperatures for Equilibria Involving Hydrate, Ice, and Free Gas in Porous Media, Yokohama, Japan, Fourth International Conference on Gas Hydrates, Yokohama, May 19-23.

## Section V: Publications Resulting from Interagency Agreements

*Additional publications by agencies are included under major field projects where appropriate.*

### Department of Defense, Office of Naval Research, Naval Research Lab

#### Peer-Reviewed Publications

Coffin, R., J. Pohlman, J. Gardner, R. Downer, W. Wood, J. Gettrust and J. Diaz, in press, Methane Hydrate Exploration at the Mid Chilean Coast: A Geophysical and Geochemical Survey, *American Chemical Society, Division of Petroleum Chemistry*.

Coffin, R., K. Grabowski and J. Chanton, 2000, The Role of Methane Hydrate in Ocean Carbon Chemistry and Biogeochemical Cycling: in Max, M. ed., *Natural Gas Hydrate in Oceanic and Permafrost Environments*, Kluwer Academic Publishers, p. 77-90.

Chapman, R., R. Walia, J. Gettrust, W. Wood, D. Hannay, G. Spencer, R. Hyndman, R. Macdonald, and A. Rosenberger, 2002, High Resolution deep-towed multi-channel seismic survey of deep sea gas hydrates off western Canada, *Geophysics*, Volume 67, p. 1038-1047.

Grabowski, K., D. Knies, S. Tumey, J. Pohlman, C. Mitchell, and R. Coffin, 2004, Carbon Pool Analysis of Methane Hydrate Regions in the Sea Floor by Accelerator Mass Spectrometry, *Nuclear Instruments and Methods in Physics Research Section B*, Volume 223-224, p. 435-440.

Pohlman, J., E. Canuel, N. Chapman, G. Spence, M. Whiticar and R. Coffin, 2005, The origin of thermogenic gas hydrates on the northern Cascadia Margin as inferred from isotopic ( $^{13}\text{C}/^{12}\text{C}$  and D/H) and molecular composition of hydrate and vent gas, *Organic Geochemistry*, Volume 36, p. 703-716.

Pohlman, J., K. Grabowski, D. Knies, T. DeTurck, D. Treacy, Jr., and R. Coffin, 2000, Sample Distillation/Graphitization Apparatus for Carbon Pool Analysis by Accelerator Mass Spectrometry (AMS), *Nuclear Instruments and Methods in Physics Research Section B*, Volume 172, p. 428-433.

Yousuf, M., S. Qadri, D. Knies, K. Grabowski, R. Coffin, and J. Pohlman, 2004, Novel Results on Structural Investigations of Natural Minerals of Clathrate Hydrates, *Applied Physics A*, Volume 78, n. 6, p. 925-939.

#### Government Reports

Coffin, R., 2002, Field Evaluation of Sediment Structure and Content, Relative to Associated Hydrates, *Naval Research Laboratory Technical Report 6110-03-8647*.

Coffin, R., and S. Masutani, 2003, Fiery Ice from the Seas, The Second Workshop of the International Committee on Methane Hydrates, *Naval Research Laboratory Memorandum Report 6114-03-8696*.

Gardner, J. and Shipboard Science Party, 2005, Atwater Valley Deep-Towed Sidescan Sonar Imagery and Bathymetric Survey, R/V Pelican Cruise 14 Feb-18Feb 2005, Final Cruise Report, DOE Award Number DE-AT26-97FT34344, available online ([click here](#)).

Lamontagne, R., S. Rose-Pehrsson, K. Grabowski, and D. Knies, 2001, Response of METS Sensor to Methane Concentrations Found on the Texas-Louisiana Shelf in the Gulf of Mexico, *Naval Research Laboratory Memorandum Report 6110-01-8584*.

Megnin, C., W. Wood, D. Lindwall, and J. Gettrust, 2003, A Procedure to Edit Deep-Towed Navigation Data, *Naval Research Laboratory Memorandum Report 7430-03-8294*.

Spence, G. and R. Coffin, 2002, VENTFLUX 2: Single Channel Seismics, Piston Coring and CTD Casts Associated with Gas Hydrates Offshore Vancouver Island, *Naval Research Laboratory Technical Report 6110-03-8648*.

Wood, W., K. Grabowski, R. Coffin, D. Lindwall, S. Theophanis, and J. Gettrust, 2003, Methane Hydrates DTAGS and Coring Cruise off the Carolina Coast, *Naval Research Laboratory Memorandum Report 7430-03-8296*.

### **Other Publications**

Gettrust, J., S. Spychalski, and W. Wood, 2004, High-resolution MCS in deepwater, *The Leading Edge*, Volume 23, p. 374-377.

Wood, W., J. Gettrust, and S. Spychalski, 2003, A New Deep-Towed, Multi-Channel Seismic System, *Sea Technology*, Volume 44, n. 9, p. 44-49.

### **Presentations**

Coffin, R., K. Grabowski, J. Linton, V. Thieu, Y. Halpern, P. Montano, and R. Doctor, 2000, Variation in Methane Hydrate Structure and Composition, Offshore Technology Conference, May 1-4.

Coffin, R., J. Gettrust, and S. Masutani, 2005, International Methane Hydrate Exploration: Abundant Energy, National Hydrogen Association Annual Hydrogen Conference, March 29-April 1.

Gardner, J., R. Hagen, P. Hart, M. Czarnecki, C. Nishimura, and D. Hutchinson, 2005, High resolution seafloor environmental characterization of methane seeps in the Mississippi Canyon near Atwater Valley 13/14, Gulf of Mexico, paper OS43A-0618E, American Geophysical Union Fall Meeting, December 5-9.

- Gardner, J., J. Diaz-Naveas, J. Pohlman, R. Coffin, W. Wood, and R. Hagen, 2004, Methane Hydrates and Fluid Flow along the Chilean Margin, San Francisco, CA, American Geophysical Union Fall meeting, December 13-17.
- Gettrust, J., R. Coffin, B. Rath, and W. Wood, 2004, High Resolution Investigations of the Properties of Hydrated Sediments, Florence, Italy, Second International Geological Congress, August 20-28.
- Gettrust, J., 2004, High-Resolution Investigations of the Properties of Hydrated Sediments: ExCel Centre, London, England, Oceanology International, March 16-19.
- Gettrust, J., and W. Wood, 2003, Coordinated Studies of High-Resolution Marine Methane Hydrates, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.
- Gettrust, J., and W. Wood, 2003, High-Resolution, Deep-Tow Seismic Systems for Geotechnical/Geohazard Studies in Deep Water, Houston, TX, Offshore Technology Conference, November 5.
- Pecher, I., S. Henrys, R. Coffin, A. Gorman, N. Kukowski, G. Crutchley, M. Fohrmann, J. Kilner, K. Senger, W. Wood, S. Chriswell, and R. Herzer, 2006, 2006 Gas Hydrates Survey on the Hikurangi Margin, New Zealand: First Results from Seismic and Related Data, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.
- Pohlman, J., 2004, Interstitial Sulfate Gradients as Indicators of Gas Hydrates: How Reliable Are They?, Florence, Italy, Second International Geological Congress, August 20-28.
- Pohlman, J., 2003, Evidence for Anaerobic Methane Oxidation in Gas Hydrate Rich Sediments on the Northern Cascadia Margin Offshore Vancouver Island, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.
- Pohlman, J., R. Chapman, G. Spence, M. Whiticar, D. Knies, and R. Coffin, 2003, Thermogenic and Biogenic Gas Hydrates on the Northern Cascadia Margin: A Molecular, Isotopic and Geochemical Comparison, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.
- Pohlman, J., E. Canuel, L. Lapham, J. Chanton, R. Chapman, and R. Coffin, 2005, The Biogeochemical Cycling of Methane in Sediments Overlying Gas Hydrates in Barkley Canyon: Fatty Acid and Pore Water Geochemical Evidence, Victoria, BC, Canada, 4<sup>th</sup> International Methane Hydrate Research and Development Workshop, May 9-11.
- Wood, W., 2004, High Resolution Deep-Towed Seismic Investigation of Fluid Expulsion Sites in the Gas Hydrate Province off Vancouver Island, Canada, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.

Wood, W., 2002, High Resolution Seismic Studies of the Distribution of Gas Hydrates, Washington, DC, Fiery Ice from the Seas, The Second Workshop of the International Committee on Methane Hydrates, October 30.

Wood, W., D. Lindwall, C. Vaughn, and J. Gettrust, 2002, High Resolution Seismic Images of the Blake Ridge Diapir Methane Hydrate Stability Zone, San Francisco, CA, EOS, Transaction, American Geophysical Union, Volume 83, Fall Meeting Supplement, December 9.

Wood, W., R. Hagan, R. Coffin, N. Kukowski, and I. Pecher, 2006, Geothermal Structure of the Methane Hydrate Stability Zone on the Hikurangi Margin off New Zealand, San Francisco, CA, American Geophysical Union Fall Meeting, December 11-15.

## **The United States Geological Survey (DE-A126-05NT42496 / DE-AT26-97FT34343)**

### **Peer-Reviewed Publications**

Chakoumakos, B.C., Rawn, C.J., Rondinone, A.H., Stern, L.A., Circone, S., Kirby, S.H., Ishii, Y., Jones, C.Y., Toby, B.H., and Dender, D.C., 2003, Temperature dependence of polyhedral cage volumes in clathrate hydrates, *Can. Journ. Phys.*, 81 (1-2), pp. 183-189.

Chand, S., T. Minshull, J. Priest, A. Best, C. Clayton, and W. Waite, 2006, An effective medium inversion algorithm for gas hydrate quantification and its application to laboratory and borehole measurements of gas hydrate-bearing sediments, *Geophysical Journal International*, 166, doi: 10.1111/j.1365-246X.2006.03038.x, p. 543-552.

Chou, I-M., Sharma, A., Burress, R. C., Shu, J., Mao, H-k., Hemley, R. J., Goncharov, A. F., Stern, L. A., and Kirby, S. H., 2001, Transformations in Methane Hydrates. *Proceedings of the Nat'l Academy of Science*, vol. 97 (25), p. 13484-13487.

Chou, I-M., Sharma, A., Burress, R. C., Hemley, R. J., Goncharov, A. F., Stern, L. A., and Kirby, S. H., 2001, Diamond anvil cell observations of a new methane hydrate phase in the 100 MPa pressure range, *J. Phys. Chem. A*, v. 105 (19), 4664-4668.

Circone, S., S. Kirby, J. Pinkston, and L. Stern, 2001, Measurement of gas yields and flow rates using a custom flow meter, *Review of Scientific Instruments*, Volume 72, n. 6. p. 2709-2716.

Circone, S., Kirby, S. H., and Stern, L.A. 2005 Direct measurement of methane hydrate composition along the hydrate equilibrium boundary. *J. Physical Chemistry B*, vol. 109, no. 19, p. 9468-9475.

- Circone, S., S. Kirby, and L. Stern, 2006, Thermodynamic calculations of the system CH<sub>4</sub>-H<sub>2</sub>O and methane hydrate phase equilibria, *Journal of Physical Chemistry B*, Volume 110, p. 8232-8239.
- Circone, S., Stern, L.A., and Kirby, S.H., 2005. Thermal regulation of methane hydrate dissociation – Implications for gas production models. *Energy & Fuels*, vol. 19, p. 2357-2363, doi: 10.1021/ef0500437..
- Circone, S., L. Stern, and S. Kirby, 2004a, The role of water in hydrate dissociation, *Journal of Physical Chemistry B*, Volume 108, p. 5747-5755.
- Circone, S., L. Stern, and S. Kirby, 2004b, Effect of Elevated Methane Pressure on Methane Hydrate Dissociation Behavior, *American Mineralogist*, Volume 89, p. 1192-1201.
- Circone, S., L. Stern, S. Kirby, W. Durham, B. Chakoumakos, C. Rawn, A. Rondinone, and Y. Ishii, 2003, CO<sub>2</sub> hydrate: synthesis, composition, dissociation Behavior, and a Comparison to Structure I CH<sub>4</sub> hydrate, *Journal of Physical Chemistry B*, Volume 107, n. 23, p. 5529-5539.
- Clennell, M.B., Hovland, M., Booth, J.S., Henry, P. and Winters, W.J., 1999, Formation of natural gas hydrates in marine sediments, part 1--conceptual model of gas hydrate growth conditioned by host sediment properties: *Journal of Geophysical Research*, v. 104, no. B10, p. 22985-23003.
- Clennell, M.B., Henry, P., Hovland, M., Booth, J.S., Winters, W.J., and Thomas, M., 2000, Formation of natural gas hydrates in marine sediments: in Holder, G.D. and Bishnoi, P.R. (Eds.), *Gas Hydrates Challenges for the Future*, *Annals of the New York Academy of Sciences*, v. 912, p. 887-896.
- Collett, T.S., and Dallimore, S.R., 1999, Hydrocarbon gases associated with permafrost in the Mackenzie Delta, Northwest Territories, Canada: *Journal of Applied Geochemistry*, v. 14, p. 607-620.
- Collett, T., 2000, Permafrost-associated gas hydrate, in Max, M.D., ed., *Natural Gas Hydrate in Oceanic and Permafrost Environments*, Kluwer Academic Publishers, The Netherlands, p. 43-60.
- Collett, T.S., and Ladd, John, 2000, Detection of gas hydrate with downhole logs and assessment of gas hydrate concentrations (saturations) and gas volumes on the Blake Ridge with electrical resistivity log data, in Paull, C.K., Matsumoto, R., Wallace, P.J., and Dillon, W.P., eds., *Proceedings of the Ocean Drilling Program, Scientific Results*, v. 164, p. 179-191.

- Collett, T.S., and Wendlandt, R.F., 2000, Formation evaluation of gas-hydrate-bearing marine sediments on the Blake Ridge with downhole geochemical log measurements, in Paull, C.K., Matsumoto, R., Wallace, P.J., and Dillon, W.P., eds., *Proceedings of the Ocean Drilling Program, Scientific Results*, v. 164, p. 199-215.
- Collett, T.S., 2001, A review of well-log analysis techniques used to assess gas-hydrate-bearing reservoirs: In *Natural Gas Hydrates: Occurrence, Distribution, and Detection*, American Geophysical Union, Geophysical Monograph 124, p. 189-210.
- Collett, T.S., 2002, Energy resource potential of natural gas hydrates: *American Association of Petroleum Geologists Bulletin*, v. 86, no. 11, p. 1971-1992.
- Collett, T.S., and Dallimore, S.R., 2002, Integrated well log and reflection seismic analysis of gas hydrate accumulations on Richards Island in the Mackenzie Delta, N.W.T., Canada: *Recorder*, v. 27, p. 28-41.
- Collett, T.S., 2005, Results at Mallik highlight progress in gas hydrate energy resource research and development: *Petrophysics*, v. 46, no. 3, p. 237-243.
- Collett, T.S. and Lee, M., 2005, Electrical resistivity well-log analysis of gas hydrate saturations in the JAPEx/JNOC/GSC et al. Mallik 5L-38 well, *in* *Scientific Results from the Mallik 2002 Gas Hydrate Production Research Well Program*, Mackenzie Delta, Northwest Territories, Canada, S.R. Dallimore and T.S. Collett, eds, Geological Survey of Canada, Bulletin 585, two CD-Rom set.
- Collett, T.S., Lewis, R.E., and Dallimore, S.R., 2005, JAPEx/JNOC/GSC et al. Mallik 5L-38 gas hydrate production research well downhole well-log and core montages, *in* *Scientific Results from the Mallik 2002 Gas Hydrate Production Research Well Program*, Mackenzie Delta, Northwest Territories, Canada, S.R. Dallimore and T.S. Collett, eds, Geological Survey of Canada, Bulletin 585, two CD-Rom set.
- Collett, T., R. Lewis, S. Dallimore, M. Lee, T. Mroz, and T. Uchida, 1999, Detailed evaluation of gas hydrate reservoir properties using JAPEx/JNOC/GSC Mallik 2L-38 gas hydrate research well downhole well log displays *in* Dallimore, S., T. Uchida, and T. Collett, eds., *Scientific Results from JAPEx/JNOC/GSC Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Northwest Territories, Canada*, Geological Survey of Canada Bulletin 544, p. 295-311.
- Collett, T., Riedel, M., Cochran, J., Boswell, R., Presley, J., Kumar, P., Sathe, A., Sethi, A., Lall, M., Siball, V., and the NGHP Expedition 01 Scientific Party, 2008, Indian National Gas Hydrate Program Expedition 01 Initial Report: Prepared by the U.S. Geological Survey and Published by the Directorate General of Hydrocarbons, Ministry of Petroleum & Natural Gas (India), 1 DVD.

- Collett, T., Lee, M., Goldberg, D., Rack, F., and Williams, T., 2006, Ocean Drilling Program Leg 204 nuclear magnetic resonance logging while-drilling: in Trehu, A.M., Bohrmann, G., Torres, M.E., and Colwell, F.S. (eds.), *Proceedings of the Ocean Drilling Program Scientific Results*, v. 204, 25 p. (online) [[http://www-odp.tamu.edu/publications/204\\_SR/103/103.htm](http://www-odp.tamu.edu/publications/204_SR/103/103.htm)]
- Collett, T.S., Agena, W.F., Lee, M.W., Zyrianova, M.V., Bird, K.J., Charpentier, R.R., Cook, T., Houseknecht, D.W., Klett, T.R., Pollastro, R.M., and Schenk, C.J., 2008, Assessment of gas hydrate resources on the North Slope, Alaska, 2008: U.S. Geological Survey Fact Sheet 2008–3073, 4 p.
- Collett, T., Johnson, A., Knapp, C., and Boswell, R., (in press), Gas hydrates: A review, in Collett, T., Johnson, A., Knapp, C., Boswell, R., eds, *Natural Gas Hydrates -- Energy Resource Potential and Associated Geologic Hazards: American Association of Petroleum Geologists Memoir 89*, 175 p., 65 figures, 4 tables.
- Cortes, D., A.I. Martin, T.S. Yun, F.M. Francisca, J.C. Santamarina, and C. Ruppel (2009), The thermal conductivity of hydrate-bearing sediments, *J. Geophys. Res.*, in press.
- Cortes, D.D., Martin, A.I., Yun, T.S., Francisca, F.M., Santamarina, J.C., and C. Ruppel, The thermal conductivity of hydrate-bearing sediments, *J. Geophys. Res.*, submitted.
- Dallimore, S.R., and Collett, T.S., eds., 2005, Scientific results from the Mallik 2002 gas hydrate production research well program, Mackenzie Delta, Northwest Territories, Canada: Geological Survey of Canada Bulletin 585, two CD-Rom set.
- Dillon, W., J. Nealon, M. Taylor, M. Lee, M. Drury, and C. Anton, 2001, Seafloor collapse and methane venting associated with gas hydrate on the Blake Ridge; causes and implications to sea-floor stability and methane release in Paull, C., and W. Dillon, eds., *Natural Gas Hydrates: Occurrence, Distribution, and Detection*, Washington D.C., American Geophysical Union, p. 211-233.
- Durham, W. B., Kirby, S. H., Stern, L. A., and Zhang, W., 2003, The strength and rheology of methane clathrate hydrate, *J. Geophys. Res.*, vol. 108 (B4), pp. 2182-2193.
- Durham, W. B., Stern, L. A., and Kirby, S. H., 2001, The rheology of ice I at low stress and elevated confining pressure, *J. Geophys. Res. (Solid Earth)*, vol. 106 (B6), p. 11,031-11,042.
- Durham, W. B., Stern, L.A., and Kirby, S. H., 2003, Ductile flow of methane hydrate, *Can. Journ. Phys.*, 81 (1-2), pp. 373-380.
- Dvorkin, J., M. Helgerud, W. Waite, S. Kirby, and A. Nur, 2000, Introduction to Physical Properties and Elasticity Models, Chapter 20, in Max, M.D., ed., *Natural Gas Hydrate in Oceanic and Permafrost Environments*, Kluwer Academic Publishers, Netherlands, p. 245-260.

- Ellis, M., R. Evans, D. Hutchinson, P. Hart, J. Gardner, R. Hagen, 2008, Electromagnetic surveying of seafloor mounds in the Gulf of Mexico, *Mar. Petr. Geology*, vol. 25, 960-968 (doi:10.1016/j.marpetgeo.2007.12.006).
- Flemings, P., X. Liu, and W. Winters, 2003, Critical Pressure and Multiphase Flow in Blake Ridge Gas Hydrates, *Geology*, Volume 31, n. 12, p. 1057-1060.
- Hamdan, L.J., Gillevet, P.M., Sikaroodi, M., Pohlman, J.W., Plummer, R.E., Coffin, R.B., 2008, Geomicrobial characterization of gas hydrate-bearing sediment along the mid-Chilean margin. *FEMS Microbiol Ecol.* 65:15-30.
- Hart, P., D.R. Hutchinson, J. Gardner, R.S. Carney, and D. Fornari, 2008, A photographic and acoustic transect across two deep-water seafloor mounds, *Mar. Petr. Geology*, vol. 25, 969-976 (doi:10.1016/j.marpetgeo.2008.01.020).
- Helgerud, M., W. Waite, S. Kirby, and A. Nur, 2003a, Measured Temperature and Pressure Dependence of Vp and Vs in Compacted, Polycrystalline Ice 1h, *Canadian Journal of Physics*, Volume 81, p. 81-87.
- Helgerud, M., W. Waite, S. Kirby, and A. Nur, 2003b, Measured Temperature and Pressure Dependence of Vp and Vs in Compacted, Polycrystalline sI Methane and sII Methane-ethane Hydrate, *Canadian Journal of Physics*, Volume 81, p. 47-53.
- Heuer, V., Pohlman, J.W., Torres, M., Elvert, M., Hinrichs, K. The stable carbon isotope biogeochemistry of acetate and other dissolved carbon species in deep subseafloor sediments at the northern Cascadia margin. *Geochimica et Cosmochimica Acta.* 73: 3323-3336.
- Hornbach, M., L. Lavier, and C. Ruppel, 2007, Triggering mechanism and tsunamogenic potential of the Cape Fear Slide complex, U.S. Atlantic coastal margin, *Geochem. Geophys. Geosyst.* 8, Q12008, (doi:10.1029/2007GC001722).
- Hutchinson, D.R., P.E. Hart, T.S. Collett, K.M. Edwards, D.C. Twichell, and F. Snyder, 2008, Geologic framework of the Keathley Canyon Gas Hydrate Research Well, Northern Gulf of Mexico, *Mar. Petr. Geology*, vol. 25, 906-918 (doi:10.1016/j.marpetgeo.2008.01.012).
- Hutchinson, D., P.E. Hart, C.D. Ruppel, F. Snyder, and B. Dugan, Seismic and thermal characterization of a bottom simulating reflector in the Northern Gulf of Mexico, in: T.S. Collett, A. Johnson, C. Knapp, and R. Boswell (Eds.), *Natural Gas Hydrates: Energy Resources and Potential and Associated Geologic Hazards*. AAPG Special Publication, in press, 2008.

- Hutchinson, D.R., Shelander, D., Dai, J., McConnell, D., Shedd, W., Frye, M., Ruppel, C., Boswell, R., Jones, E., Collett, T., Rose, K., Dugan, B., Wood, W., and Latham, T., in press, Site Selection for DOE/JIP Gas Hydrate Drilling in the Northern Gulf of Mexico: Sixth International Conference on Gas Hydrates, Vancouver, BC., 7-10 July, 2008.
- Hutchinson, D., C. Ruppel, H. Roberts, R. Carney, and M. Smith, 2005, in press, Gas hydrates in the Gulf of Mexico, in Holmes, C., ed., *Gulf of Mexico—Its Origin (History, Archaeology, and Geology)*, Volume 1, Texas A&M University Press.
- Hutchinson, D., P. Hart, T. Collett, K. Edwards, D. Twichell, and F. Snyder, in press, Geologic framework of the 2005 Keathley Canyon gas hydrate research well, northern Gulf of Mexico, *Marine and Petroleum Geology*, vol. 25 (doi:10.1016/j.marpetgeo.2008.01.012).
- Kaneko, M., Shingai, H., Pohlman, J.W., Naraoka, H., Chemical and isotopic signature of bulk organic matter and hydrocarbon biomarkers within mid-slope accretionary sediments of the northern Cascadia margin gas hydrate system. *Marine Geology*. (Submitted)
- Lee, J. Y., T. Yun, J. C. Santamarina, and C. Ruppel (2007), Observations related to tetrahydrofuran and methane hydrates for laboratory studies of hydrate-bearing sediments, *Geochem. Geophys. Geosyst.*, 8, doi:10.1029/2006GC001531.
- Lee, J.Y., J.C. Santamarina, and C. Ruppel, 2008, Mechanical and electromagnetic properties of northern Gulf of Mexico sediments with and without THF hydrates, *Mar. Petr. Geology*, vol. 25 (doi:10.1016/j.marpetgeo.2008.01.019).
- Lee, J.Y., J.C. Santamarina, and C. Ruppel, Volume change associated with formation and dissociation of hydrate in sediment, submitted to *Geochem. Geophys. Geosyst*, submitted June 2009.
- Lee, J.Y., J.C. Santamarina, and C. Ruppel (2009a), Parametric study of the physical properties of hydrate-bearing sand, silt, and clay, Part I: Electromagnetic properties, submitted to *J. Geophys. Res.*, submitted June 2009.
- Lee, J.Y., F.M. Francisca, J.C. Santamarina, and C. Ruppel (2009b), Parametric study of the physical properties of hydrate-bearing sand, silt, and clay, Part II: Small-strain mechanical properties, submitted to *J. Geophys. Res.*, submitted June 2009.
- Lee, M.W., 2000, Gas hydrate amount estimated from acoustic logs at the Blake Ridge, Sites 994, 995, and 997: in Paul and others (eds.), *Proceedings of the Ocean Drilling Program Scientific Results*, v.164, p. 193-198.
- Lee, M. W., 2002, Biot-Gassmann theory for velocities of gas-hydrate-bearing sediments: *Geophysics*, v. 67, no. 6, p. 1711-1719.
- Lee, M.W., 2002, Modified Biot-Gassmann theory for calculating elastic velocities of unconsolidated and consolidated sediments: *Marine Geophysical Researches*, v. 23, no. 5-6, p. 403-412.

- Lee, M. W., 2004, Elastic velocities of partially gas-saturated unconsolidated sediments: *Marine and Petroleum Geology*, v. 21, no. 6, p. 641-650.
- Lee, M.W., 2006, Explicit use of the Biot coefficient in predicting shear-wave velocity: *Geophysical Prospecting*, v. 54, p. 177-185.
- Lee, M.W., 2006, A simple method of predicting S-wave velocity: *Geophysics*, v. 71, p. F161-F164.
- Lee, M. W. and Collett, T.S., 2001, Comparison of elastic velocity models for gas-hydrate-bearing sediments, *in* Paull, C.K. and Dillon, W.P., editors, Natural Gas Hydrate: Occurrence, Distribution, and Detection: Am. Geophys. Union, Geophys. Monogr. 124, p. 179-187.
- Lee, M. W. and Collett, T.S., 2001, Elastic properties of gas-hydrate-bearing sediments: *Geophysics*, v. 66, no. 3, p. 763-771.
- Lee, M. W., and Collett, T. S., 2005, Assessments of gas hydrate concentrations estimated from sonic logs in the JAPEx/JNOC/GSC et al. Mallik 5L-38 gas hydrate production research well: *in* S.R. Dallimore and T.S. Collett, (eds.), Scientific Results from the Mallik 2002 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada: Geological Survey of Canada, Bulletin 585, 10 p.
- Lee, M. W., and Collett, T. S., 2005, Assessments of gas hydrate concentrations estimated from sonic logs in the JAPEx/JNOC/GSC et al. Mallik 5L-38 gas hydrate production research well: *in* S.R. Dallimore and T.S. Collett, (eds.), Scientific Results from the Mallik 2002 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada: Geological Survey of Canada, Bulletin 585, 10 p.
- Lee, M. W., and Collett, T. S., 2006, Gas hydrate and free gas saturations estimated from velocity logs on Hydrate Ridge, offshore Oregon, U. S. A., *in* Trehu, A.M., Bohrmann, G., Torres, M.E., and Colwell, F.S. (eds.), Proceedings of the Ocean Drilling Program Scientific Results, v. 204, 25 p. (online) [[http://www-odp.tamu.edu/publications/204\\_SR/103/103.htm](http://www-odp.tamu.edu/publications/204_SR/103/103.htm)]
- Lee, M.W., and Waite, W.F., 2008, Estimating pore-space gas hydrate saturations from well-log acoustic data: *Geochemistry, Geophysics, Geosystems*, v. 9, Q07008, doi:10.1029/2008GC002.
- Lee, M.W., and Collett, T.S., 2009, Unique problems associated with seismic analysis of partially gas-saturated unconsolidated sediments: *Marine and Petroleum Geology*, v. 26, p. 775-781.
- Lee, M.W., and Collett, T.S., in press, Gas hydrate saturations estimated from fractured reservoir at Site NGHP-01-10, Krishna-Godavari Basin, India: *Journal of Geophysical Research*,

- Lee, M., T. Collett, in press, Integration of vertical seismic, surface seismic and well log data at the Mallik 2L-38 gas hydrate research well, Mackenzie Delta, Canada, *in* Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.
- Lee, M.W., Collett, T.S., and Agena, W.F., (in press), Integration of vertical seismic, surface seismic, and well log data at the Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Canada, *in* Collett, T., Johnson, A., Knapp, C., Boswell, R., eds, *Natural Gas Hydrates -- Energy Resource Potential and Associated Geologic Hazards: American Association of Petroleum Geologists Memoir 89*.
- Lee, M.W., Collett, T.S., and Inks, T.L., (in press), Seismic attribute analysis for gas-hydrate and free-gas prospects on the North Slope of Alaska, *in* Collett, T., Johnson, A., Knapp, C., Boswell, R., eds, *Natural Gas Hydrates -- Energy Resource Potential and Associated Geologic Hazards: American Association of Petroleum Geologists Memoir 89*.
- Lee, M.W., Collett, T.S., and Agena, W.F., in press, Integration of vertical seismic, surface seismic, and well log data at the Mallik 2L-38 gas hydrate research well, Mackenzie Delta, Canada, *in* Collett, T.S., Johnson, Art, Knapp, Camelia, and Boswell, Ray, (eds.), *Natural Gas Hydrates; Energy Resource Potential and Associated Geologic Hazards: AAPG Special Publication*.
- Lee, M., Collett, T., 2008, Integrated analysis of well logs and seismic data to estimate gas hydrate concentrations at Keathley Canyon, northern Gulf of Mexico, *Mar. Petr. Geology*, vol. 25, 924-931. (doi:10.1016/j.marpetgeo.2007.09.002).
- Lee, M. W. and Dillon, W.P., 2001, Amplitude blanking related to the pore-filling of gas hydrate in sediments: *Marine Geophysical Researches*, v. 22, no. 2, p. 101-109.
- Lee, M., W. Waite, 2007, Amplitude loss of seismic waveform due to source coupling to the medium, *Geophysical Research Letters*, 34, L05303, doi: 10.1029/2006GL029015.
- Lee, M. W., and W. F. Waite, in press, Estimating pore-space gas hydrate saturations from well log acoustic data, *Geochem. Geophys. Geosyst.*, doi:10.1029/2008GC002081
- Lee, J.Y., J.C. Santamarina, and C. Ruppel, 2008, Mechanical and electromagnetic properties of northern Gulf of Mexico sediments with and without THF hydrates, *Mar. Petr. Geology*, vol. 25 (doi:10.1016/j.marpetgeo.2008.01.019).
- Lorenson, T., T. Collett, M. Whiticar, in press, Hydrocarbon gas composition and origin of gas hydrate from Alaska North Slope, USA, *in* Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards, The American Association of Petroleum Geologists Hedberg Special Publication*.

- Lorenson, T.D., Winters, W., Hart, P.E., and Paull, C.K., 2002, Gas Hydrate Occurrence in the Northern Gulf of Mexico Studied with Giant Piston Cores: EOS, Transactions, American Geophysical Union, v. 83, n. 51, Dec., p. 601, 607-608.
- Lorenson, T.D., Collett, T.S., and Whiticar, M.J., (in press), Hydrocarbon gas composition and origin of gas hydrate from the Alaska North Slope, USA, in Collett, T., Johnson, A., Knapp, C., Boswell, R., eds, Natural Gas Hydrates -- Energy Resource Potential and Associated Geologic Hazards: American Association of Petroleum Geologists Memoir 89.
- Lorenson, T.D., G.E. Claypool, and J. Dougherty, 2008, Natural gas geochemistry of sediments drilled on the 2005 Gulf of Mexico JIP cruise, Mar. Pet. Geol., vol. 25.
- Mahajan, Devinder, Servio, Phillip, Jones, Keith W., Feng, Huan, and Winters, William J., 2004, Methane hydrate studies: delineating properties of host sediments to establish reproducible decomposition kinetics: Chapter 16 in Taylor, C.E. and Kwan, J.T. (Eds.) Advances in the Study of Gas Hydrates, New York, NY, Kluwer Academic/Plenum Publishers, p. 239-250.
- Paull, C., W. Ussler, T. Lorenson, W. Winters, and J. Dougherty, 2005, Geochemical constraints on the distribution of gas hydrates in the Gulf of Mexico, *Geo-marine Letters*, Volume 25, p. 273-280.
- Pecher, I., W. Holbrook, M. Sen, D. Lizarralde, W. Wood, D. Hutchinson, W. Dillon, H. Hoskins, and R. Stephen, 2003, Seismic anisotropy in gas-hydrate and gas-bearing sediments on the Blake Ridge, from a walkaway vertical seismic profile, *Geophysical Research Letters*, Volume 30, p. 1733.
- Pohlman, J.W., C. Ruppel, D. Hutchinson, R.Z. Downer, R.B. Coffin, 2008, Assessing sulfate reduction and methane cycling in a high salinity pore water system in the Northern Gulf of Mexico, Mar. Petr. Geology, vol. 25, 942-951. (doi:10.1016/j.marpetgeo.2008.01.016).
- Pohlman, J.W., Bauer, J.E., Canuel, E.A., Grabowski, K.S., Knies, D.L., Mitchell, C.S., Whiticar, M.J., Coffin, R.B., Sources and fluxes of methane in gas hydrate cold-seep systems: Evidence from radiocarbon and stable isotopic signatures. Marine Chemistry, in press.
- Pohlman, J.W., Kaneko, M., Heuer, V., Coffin, R., Whiticar, M., Methane sources and production in the northern Cascadia margin gas hydrate system. Earth and Planetary Science Letters, in revision.
- Rawn, C.J., Rondinone, A.J., Chakoumakos, B.C., Circone, S., Stern, L.A., Kirby, S.H., and Ishii, Y., 2003, Neutron powder diffraction studies as a function of temperature of structure II hydrate formed from propane, *Can. Journ. Phys*, 81 (1-2), pp. 431-438.

- Rehder, G., S. Kirby, W. Durham, P. Brewer, L. Stern, E. Peltzer, and J. Pinkston, 2004, Dissolution Rates of Pure Methane Hydrate and Carbon Dioxide Hydrate in Undersaturated Seawater at 1000 M Depth, *Geochemistry et Cosmochimica Acta*, Volume 68, p. 285-292.
- Ruppel, C., Boswell, R., and E. Jones, 2008, Scientific results from Gulf of Mexico gas hydrates joint industry project Leg 1 drilling: Introduction and overview, *Mar. Petr. Geology*, vol. 25, 819-829 (doi:10.1016/j.marpetgeo.2008.02.007)
- Ruppel, C. and J.W. Pohlman, 2008, Climate change and carbon cycle: Perspectives and opportunities, *Fire in Ice*, DOE/National Energy Technology Lab Gas Hydrates Newsletter, pp. 5-8, January 2008.
- Shedd, B., P. Godfriaux, M. Frye, R. Boswell, and D. Hutchinson, Occurrence and variety in seismic expression of the base of gas hydrate stability in the Gulf of Mexico, USA, DOE-NETL Newsletter, *Fire in the Ice*, submitted.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2001, Preservation of methane hydrate at 1 atm', *Energy & Fuels*, Volume 15, n. 2, p. 499-501.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2002, Reply to "Comments on anomalous preservation of pure methane hydrate at 1 atm", *Journal of Physical Chemistry*, Volume 106, p. 228-230.
- Stern, L., S. Kirby, S. Circone, and W. Durham, 2004, Scanning Electron Microscopy (SEM) Investigations of Laboratory-Grown Gas Hydrates from Melting Ice, and Comparison to Natural Hydrates, *American Mineralogist*, Volume 89, p. 1162-1175.
- Stern, L. A., Kirby, S.H., and Durham, W. B., 1998, Polycrystalline methane hydrate: synthesis from superheated ice, and low-temperature mechanical properties, *Energy & Fuels*, 12 (2) 201-211.
- Stern, L., S. Kirby, and W. Durham, 2001, Comment to the Moudrakovski Letter, Hydrate layers on ice particles and superheated ice; a 1H NMR microimaging study, *Journal Physical Chemistry A*, Volume 105, n. 7, p. 1223-1224.
- Stern, L., S. Kirby, and W. Durham, 2005, Scanning electron microscope imaging of grain structure and phase distribution within gas-hydrate-bearing intervals from JAPEX/JNOC/GSC *et al.*, Mallik 5L-38: what can we learn from comparisons with laboratory synthesized samples?, *Geological Survey of Canada Bulletin* 585.
- Taylor, M., W. Dillon, and I. Pecher, 2000, Trapping and migration of methane associated with the gas hydrate stability zone at the Blake Ridge Diapir: new insights from seismic data: *Marine Geology*, Volume 164, n. 1-2, p. 79-89.

- Tomaru, H., Matsumoto, R., Coffin, R.B., Pohlman, J.W., Spence, G.D. 2007, Geochemical relation between gas hydrates and water venting in the seismic blanking zone on the northern Cascadia continental margin offshore Vancouver Island, Canada. *J. Geochem Explor.* 95:40-47.
- Torres, M.E., Trehu, A.M., Cespedes, N., Kastner, M., Wortmann, U.G., Kim, J.-H., Long, P., Malinverno, A., Pohlman, J.W., Riedel, M., Collett, T., 2008, Methane hydrate formation in turbidite sediment of northern Cascadia, IODP Expedition 311. *Earth and Planetary Science Letters.* 271: 170-180.
- Trehu, A., C. Ruppel, M. Holland, G. Dickens, M. Torres, T. Collett, D. Goldberg, M. Riedel, and P. Schultheiss, 2006, Gas Hydrates in marine sediments - lessons from ocean drilling, *Oceanography*, v. 19, n. 4., pp. 124-142.
- Waite, W.,B. deMartin, S. Kirby, J. Pinkston, and C. Ruppel, 2002, Thermal Conductivity Measurements in Porous Mixtures of Methane Hydrate and Quartz Sand, *Geophysical Research Letters*, vol. 29, no. 24, 2229, doi:10.1029/2002GL015988, pp. 82(1)-82(4).
- Waite, W., M. Helgerud, A. Nur, J. Pinkston, L. Stern, S. Kirby, and W. Durham, 2000, Laboratory measurements of compressional and shear wave speed through methane hydrate in Holder, G., and R. Bishnoi, eds., *Gas Hydrates: Challenges for the Future*, Annals of the New York Academy of Sciences, Volume 912, p. 1003-1011.
- Waite, W., L. Gilbert, W. Winters, and D. Mason, 2006, Estimating thermal diffusivity and specific heat from needle probe thermal conductivity data, *Review of Scientific Instruments*, 77, 044904, doi:10.1063/1.2194481.
- Waite, W.F., Kneafsey, T.J., Winters, W.J. and Mason, D.H., 2008, Physical property changes in hydrate-bearing sediment due to depressurization and subsequent repressurization, *Journal of Geophysical Research*, 113, 12 pages, B07102, doi:10.1029/2007JB005351.
- Waite, W., C. Ruppel, and S. Kirby, 2006, Comment on “Thermal and visual time-series at a seafloor gas hydrate deposit on the Gulf of Mexico slope,” by MacDonald, I., L. Bender, M. Vardaro, B. Bernard, and J. Brooks [Earth Planet. Sci. Lett. 233 (2005) 49-59], *Earth and Planetary Science Letters*, 245, 481- 482.
- Waite, W., L. Stern, S. Kirby, W. Winters, D. Mason, 2007, Simultaneous determination of thermal conductivity, thermal diffusivity and specific heat in sl methane hydrate, *Geophysical Journal International*, 169, doi: 10.1111/j.1365-246X.2007.03382.x, p. 767-774.
- Waite, W., W. Winters, and D. Mason, 2004, Methane Hydrate Formation in Partially Water-Saturated Ottawa Sand, *American Mineralogist*, Volume 89, p. 1202-1207.

- Waite, W.F., Santamarina, J.C., Cortes, D.D., Dugan, B., Espinoza, D.N., Germaine, J., Jang, J., Jung, J., Kneafsey, T., Shin, H.S., Soga, K., Winters, W., Yun, T-S., 2009, Physical properties of hydrate-bearing sediments, *Reviews of Geophysics*, submitted.
- Wilson, A. and C. Ruppel, 2007, Salt tectonics and shallow subseafloor fluid convection: Models of coupled fluid-heat-salt transport, *Geofluids* 7(4), 377-38. (doi: 10.1111/j.1468-8123.2007.00191.x).
- Winters, W., 2000, Stress history and geotechnical properties of sediment from the Cape Fear Diapir, Blake Ridge Diapir, and Blake Ridge in Paull, C., R. Matsumoto, P. Wallace, and W. Dillon, eds., *Proceedings Ocean Drilling Program Scientific Results*, College Station, Texas, Volume 164, p. 421-429.
- Winters, W.J., Dallimore, S.R., Collett, T.S., Jenner, K.A., Katsube, J.T., Cranston, R.E., Wright, J.F., Nixon, F.M., and Uchida, T., 2000, Relation between gas hydrate and physical properties at the Mallik 2L-38 research well in the Mackenzie Delta: *in* Holder, G.D. and Bishnoi, P.R. (Eds.), *Gas Hydrates Challenges for the Future*, *Annals of the New York Academy of Sciences*, v. 912, p. 94-100.
- Winters, W., 2000, Effects of drying methods and temperatures on water content and porosity of sediment from the Blake Ridge in Paull, C., R. Matsumoto, P. Wallace, and W. Dillon, eds., *Proceedings Ocean Drilling Program Scientific Results*, College Station, Texas, Volume 164, p. 431-434.
- Winters, W., W. Waite, and D. Mason, in review, Effects of methane hydrate on the physical properties of sediment in Collett, T., A. Johnson, C. Knapp and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.
- Winters, W., W. Waite, D. Mason, L. Gilbert and I. Pecher, 2007, Methane gas hydrate effect on sediment acoustic and strength properties, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 127-135, March.
- Winters, W., W. Waite, and D. Mason, 2004, Strength and Acoustic Properties of Ottawa Sand Containing Laboratory-Formed Methane Gas Hydrate in Taylor, C., and J. Kwan, eds., *Recent Advances in the Study of Gas Hydrates*, American Institute of Chemical Engineers and Kluwer Academic/Plenum Publishers, p. 213-226.
- Winters, W., I. Pecher, W. Waite, and D. Mason, 2004, Physical Properties and Rock Physics Models of Sediment Containing Natural and Laboratory-Formed Methane Gas Hydrate, *American Mineralogist*, Volume 89, p. 1221-1227.

- Winters, W., S. Dallimore, T. Collett, B. Medioli, R. Matsumoto, J. Katsube, and P. Brennan-Alpert, 2005, Relationships of Sediment Physical Properties from the JAPEX/JNOC/GSC Mallik 5L-38 Gas Hydrate Production Research Well in Dallimore, S. and T. Collett, eds., *Scientific Results from Mallik 2002 Gas Hydrate Production Research Well Program, Mackenzie Delta, Northwest Territories, Canada*, Geological Survey of Canada Bulletin 585.
- Winters, W., W. Dillon, I. Pecher, and D. Mason, 2000, GHASTLI-determining physical properties of sediment containing natural and laboratory-formed gas hydrate in Max, M., ed., *Natural Gas Hydrate in Oceanic and Permafrost Environments*, Dordrecht, Netherlands, Kluwer Academic Publishers, p. 311-322.
- Winters, W.J., Waite, W.F., Mason, D.H., and Kumar, P., in press, Physical properties of repressurized samples recovered during the 2006 National Gas Hydrate Program expedition offshore India: Proceedings of the Sixth International Conference on Gas Hydrates, Vancouver, B.C., July 6-10, 2008.
- Winters, W.J., B. Dugan, and T. Collett, Physical properties of sediments from Keathley Canyon and Atwater Valley, JIP Gulf of Mexico Gas Hydrate Drilling Program, Mar. Petr. Geology, vol. 25, 896-905, (doi:10.1016/j.marpetgeo.2008.01.018).
- Wood, W.T., P.E. Hart, D.R. Hutchinson, N. Dutta, F. Snyder, R.B. Coffin, and J.F. Gettrust, 2008, Gas and gas hydrate distribution around seafloor seeps in Mississippi Canyon, Northern Gulf of Mexico, using multi-resolution seismic imagery, Mar. Petr. Geology, vol. 25, 952-959 (doi:10.1016/j.marpetgeo.2008.01.015).

### Government Reports

- Bout-Roumazeilles, V. and Trentesaux, A., 2007, Sedimentologic Analysis of Cores Recovered from the RV *Marion Dufresne* Cruise in the Gulf of Mexico, 2-18 July 2002: chapter 5 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Brunner, C.A., Qualitative Planktonic Foraminiferal Biostratigraphy of a Latest Quaternary Core, MD02-2570, from the Northern Gulf of Mexico: chapter 11 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Chen, Y., Matsumoto, R., Ussler, W. III, Methane-Derived Authigenic Carbonates from the IMAGES VIII/PAGE 127 Gas Hydrate and Paleoclimate Cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002: chapter 14 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.

- Collett, T., 2004, Alaska North Slope gas hydrate energy resources, *U.S. Geological Survey Open-File Report 2004-1454*, available online ([click here](#)).
- Cooper, A., T. McGee, P. Hart, and I. Pecher, 1999, Seismic investigation of gas hydrates in the Mississippi Canyon region, northern Gulf of Mexico -- Cruise M1-98-GM, *U. S. Geological Survey Open-File Report 98-506*, available online ([click here](#)).
- Cooper, A., D. Twitchell, and P. Hart, 1999, A seismic-reflection investigation of gas hydrates and sea-floor features of the upper continental slope of the Garden Banks and Green Canyon regions, northern Gulf of Mexico, Report for Cruise G1-99-GM (99002), *U.S. Geological Survey Open-File Report 99-570*, available online ([click here](#)).
- Flocks, J. and Swarzenski, P., Cruise Report: Sediment Collection from Orca and Pigmy Basins, Gulf of Mexico, and Analyses for Texture and Trace-Metal Concentrations, July 2002, 127 PAGE Campaign: chapter 13 *in* Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Hallam, S.J., DeLong, E.F., William Ussler, W. III, and Paull, C.K., Methanogenic and Methanotrophic Archaeal Diversity in Northern Gulf of Mexico Sediments: chapter 10 *in* Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Hart, P., A. Cooper, D. Twitchell, M. Lee, and W. Agena, 2002, High-Resolution Multichannel Seismic-Reflection Data Acquired in the Northern Gulf of Mexico, 1998-99, *U. S. Geological Survey Open-File Report 02-386*.
- Hutchinson, D., and P. Hart, 2003, Cruise Report for G1-03-GM USGS Gas Hydrates cruise, R/V Gyre, 1-14 May, 2003, Northern Gulf of Mexico, *U. S. Geological Survey Open-File Report 03-474*, available online ([click here](#)).
- Hutchinson, D., 2005, Final Technical Report to the Department of Energy, National Energy Technology Lab Interagency Agreement, Task DE-AT26-97FT34343, September 8, 1997- April 30, 2005, available online ([click here](#)).
- Labails C., Géli, L., Sultan, N., Novosel, I., Winters, W., 2007, Thermal measurements from the Gulf of Mexico continental slope: results from the PAGE cruise: chapter 6 *in* Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Lee, M.W. and Collett, T.S., 2001, Gas hydrate estimation error associated with uncertainties of measurements and parameters: U.S. Geological Survey Bulletin 2182, 8 p. [<http://geology.cr.usgs.gov/pub/bulletins/b2182>]

- Lee, M. W., 2002, Joint inversion of acoustic and resistivity data for the estimation of gas hydrate concentration: U.S. Geological Survey Bulletin 2190, 11 p. <http://geology.cr.usgs.gov/pub/bulletins/b2190>].
- Lee, M. W., 2005, Well log analysis to assist the interpretation of 3-D seismic data at the Milne Point, North Slope of Alaska: U.S. Geological Survey Scientific Investigations Report 2005-5048, 18p. [<http://pubs.usgs.gov/sir/2005/5048/>]
- Lee, M., and T. Collett, 2005, Controls on the Physical Properties of Gas-Hydrate-Bearing Sediments Because of the Interaction between Gas Hydrate and Porous Media, *U. S. Geological Survey Scientific Investigations Report 2005-5143*, available online ([click here](#)).
- Lee, M.W., 2006, Is amplitude loss of sonic waveforms due to inelastic attenuation or source coupling to the medium?: U.S. Geological Survey Scientific Investigations Report 2006-5120, 13 p. [<http://pubs.usgs.gov/sir/2006/5120>]
- Lee, M.W., and Collett, T.S., 2006, A method of shaly sand correction for estimating gas-hydrate saturations using downhole electrical resistivity log data: U. S. Geological Survey Scientific Investigation Report 2006-5121, 10 p. [<http://pubs.usgs.gov/sir/2006/5121>].
- Lee, M.W., 2006, An effective method for inversion of elastic impedance for shallow sediments and its application to gas-hydrate-bearing sediments: U. S. Geological Survey Scientific Investigations Report 2006-5297, 11 p. [<http://pubs.usgs.gov/sir/2006/5297>].
- Lee, M.W., 2006, Is amplitude loss of sonic waveforms due to inelastic attenuation or source coupling to the medium?: U.S. Geological Survey Scientific Investigations Report 2006-5120, 13 p. [<http://pubs.usgs.gov/sir/2006/5120>]
- Lee, M.W., 2007, Amplitude variation of bottom simulating reflection with respect to frequency-Transitional base or attenuation?: U.S. Geological Survey Scientific Investigations Report 2007-5091, 12 p.
- Lee, M.W., 2007, Velocities and attenuations of gas hydrate-bearing sediments: U.S. Geological Survey Scientific Investigations Report 2007-5264, 11 p.
- Lee, M.W., 2008, Models for gas hydrate-bearing sediments inferred from hydraulic permeability and elastic velocities: U.S. Geological Survey Scientific Investigations Report 2008-5219, 15p.
- Lee, M.W., Collett, T.S., and Agena, W.F., 2008, Assessing gas hydrate prospects on North Slope of Alaska-Theoretical considerations: U.S. Geological Survey Investigations Report 2008-5175, 28 p.
- Lee, M.W., in press, Anisotropic velocities of gas hydrate-bearing sediments in fractured reservoirs: U.S. Geological Survey Scientific Investigations Report 2009.

- Lee, M.W., and Waite, W.F., in press, High-frequency normal mode propagation in aluminum cylinders: U.S. Geological Survey Scientific Investigations Report 2009.
- Lorenson, T.D., Cooper, A.K., Hart, P.E., and Winters, W.J., 2007, Geologic Setting and Context of Cores Taken During the IMAGES VIII /PAGE 127 Cruise of the RV *Marion Dufresne* in the Northern Gulf of Mexico: chapter 2 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Lorenson, T.D., Dougherty, J.A., and Flocks, J.G., Hydrocarbon Gases from Giant Piston Cores in the Northern Gulf of Mexico: Results from the IMAGES VIII/PAGE 127 Cruise of the RV *Marion Dufresne*, July, 2002: chapter 9 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Novosel, I., Winters, W.J., Boldina, O.M., Labails, C., Géli, L., 2007, Thermal Conductivity of Sediment Recovered from the IMAGES VIII/PAGE 127 Gas Hydrate and Paleoclimate Cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002: chapter 7 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Stern, L.A. and Kirby, S.H., Grain and Pore Structure Imaging of Gas Hydrate From Core MD02-2569 (Mississippi Canyon, Gulf of Mexico): A First Look by SEM: chapter 12 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Twichell, D., V. Cross, V. Paskevich, D. Hutchinson, W. Winters, and P. Hart, 2005, GIS of selected geophysical and core data in the northern Gulf of Mexico continental slope collected by the U.S. Geological Survey: U.S. Geological Survey Open-File Report 2005-1071, DVD-ROM.
- Ussler, W. III and Paull, C.K., Pore Water Gradients in Giant Piston Cores from the Northern Gulf of Mexico: chapter 8 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV *Marion Dufresne* in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Waite, W.F., 2007. Thermal properties of methane gas hydrate, *USGS Fact Sheet 2007-3041* (July, 2007).

- Winters, W., T. Lorenson, and C. Paull, eds., 2007, Initial report of the IMAGES VIII/PAGE 127 Gas Hydrate and Paleoclimate Cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July, 2002, *U.S. Geological Survey Open File Report 2004-1358*.
- Winters, W.J., Lorenson, T.D., and Paull, C.K., 2007, IMAGES VIII/PAGE 127 Gas Hydrate and Paleoclimate Cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002: Introduction: chapter 1 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Winters, W.J., Lorenson, T.D., Paull, C.K., and Balut, Y., 2007, Coring and gas hydrate related operations during the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002: chapter 3 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Winters, W.J., Novosel, I., Boldina, O., Waite, W.F., Kelsey, S.A., and Hallett, B.W., 2007, Physical Properties of Sediment Obtained During the IMAGES VIII/PAGE 127 Gas Hydrate and Paleoclimate Cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002: chapter 4 in Winters, W.J., Lorenson, T.D., and Paull, C.K., eds., Initial report of the IMAGES VIII/PAGE 127 gas hydrate and paleoclimate cruise on the RV Marion Dufresne in the Gulf of Mexico, 2-18 July 2002, U.S. Geological Survey Open-File Report 2004-1358.
- Winters, W.J., Dallimore, S.R., Collett, T.S., Katsube, T.J., Jenner, K.A., Cranston, R.E., Wright, J.F., Nixon, F.M., and Uchida, T., 1999, Physical properties of sediments from the JAPEX/JNOC/GSC Mallik 2L-38 gas hydrate research well: in Dallimore, S.R., Uchida, T., and Collett, T.S., eds., *Scientific Results from JAPEX/JNOC/GSC Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Northwest Territories, Canada*, Geological Survey of Canada Bulletin 544, p. 95-100.
- Winters, W.J., Pecher, I.A., Booth, J.S., Mason, D.H., Relle, M.K., and Dillon, W.P., 1999, Properties of samples containing natural gas hydrate from the JAPEX/JNOC/GSC Mallik 2L-38 gas hydrate research well, determined using Gas Hydrate And Sediment Test Laboratory Instrument (GHASTLI): in Dallimore, S.R., Uchida, T., and Collett, T.S., eds., *Scientific Results from JAPEX/JNOC/GSC Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Northwest Territories, Canada*, Geological Survey of Canada Bulletin 544, p. 241-250.

Winters, W.J., Collett, T.S., Cranston, R.E., Dallimore, S.R., and Jenner, K.A., 1999, Physical properties of sediment from Mallik 2L-38 gas hydrate research well: in Dallimore, S.R., Laframboise, R.R., Fotiou, M.J., and Medioli, B.E., compilers, JAPEX/JNOC/GSC Mallik 2L-38 Gas Hydrate Research Well, Mackenzie Delta, Northwest Territories, Canada: Interactive Data Viewer, Geological Survey of Canada Open File D3726, CD-ROM.

### **Other Publications**

2008-007-PGC On-board Science Team (includes Pohlman, J.W.). 2008, Investigation Gas Hydrate as a Factor in Accretionary Margin Frontal Ridge Slope Failures and Cold Seep Biogeochemistry. Fire in the Ice DOE-NETL Newsletter, Fall Issue, pp. 9-12.

Bailey, A., 2007, North Slope gas hydrate well hits target – BP-operated Mount Elbert well confirms presence of gas hydrate accumulation and enables coring and testing of gas hydrate zone, *Petroleum News*, February 25.

Barth, G.A., Scholl, D.W., and Childs, J.R., 2006, Possible deep-water gas hydrate accumulations in the Bering Sea: Fire in the Ice, fall issue, p. 10-11 [URL [\(click here\)](#)].

Chakoumakos, B.C., Rawn, C.J., Rondinone, A.J., Marshall, S.L., Stern, L.A., Circone, S., Kirby, S.H., Jones, C.Y., Toby, B.H., and Ishii, Y., 2002, The use of rigid body constraints in Rietveld refinements of neutron diffraction data of clathrate hydrates. Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates, Yokohama Japan, 2002, pp.655-658.

Collett, T.S., Lewis, R.E., and Uchida, T., 2000, Growing interest in gas hydrates: Oilfield Review, Published by Schlumberger, v. 12, no. 2, p.42-57.

Collett, T.S., Scott, A.R., and Allison, E., 2000, Hydrates getting more attention: American Association of Petroleum Geologists Explorer, v. 21, no. 2, p. 37-38.

Collett, T.S., 2001, Natural-gas hydrates: resource of the twenty-first century? In M.W. Downey, J.C. Treet, and W.A. Morgan eds., *Petroleum Provinces of the Twenty-First Century: American Association of Petroleum Geologists Memoir 74*, p. 85-108.

Collett, T.S., and Dallimore, S.R., 2002, Detailed Analysis of Gas Hydrate Induced Drilling and Production Hazards, Proceedings of the Fourth International Conference on Gas Hydrates, Yokohama, Japan, May 19-23, 2002, p. 47-52.

Collett, T.S., 2003, Gas hydrate energy resource potential: Proceedings of the Fifth International Petroleum Conference and Exhibition (Petrotech-2003), New Delhi, India, January 9-12, 2003, 11 p.

Collett, T.S., 2004, Gas hydrates: Encyclopedia of Energy, v. 2, Published by Elsevier Inc., p. 815-820.

- Collett, T.S., 2004, Gas hydrates as a future energy resource: *Geotimes*, November 2004, v. 49, no. 11, p. 24-27.
- Collett, T.S., 2004, Arctic gas hydrate resources: Proceedings of the conference on arctic Geologic, Resources, and Environmental Challenges, Tromso, Norway, May 24-26, 2004, 4 p. [Available on the www at <http://www.geologi.no/>]
- Collett, T.S., 2005, Gas hydrate energy resource assessment and production: Proceedings of PETROTECH 2005, January 15-19, 2005, New Delhi, India, 10 p (on CD-ROM).
- Collett, T.S., 2005, Gulf of Mexico Gas Hydrate JIP Drilling Program downhole logging program, 65 p. <http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/reports/GOMJIPCruise05.pdf>
- Collett, T.S., and Mount Elbert Scientific Team, 2007, Alaska North Slope successfully cores, logs, tests gas hydrate bearing reservoirs, in DOE-NETL Fire In the Ice Methane Hydrate Newsletter, Winter, 2007, p. 1-4. <http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/Newsletter/HMNewsWinter07.pdf#page=1>
- Collett, T.S., 2005, Geologic and engineering controls on the economic production of gas hydrates: Proceedings of the Korean International Symposium on Gas Hydrate Technology, November 10-11, 2005, Seoul, Korea, p. 93-97.
- Collett, T.S., Riedel, M., Malone, M.J., and the Expedition 311 Project Team, 2005. Cascadia margin hydrates: IODP Scientific Prospectus, v. 311. [doi:10.2204/iodp.sp.311.2005](https://doi.org/10.2204/iodp.sp.311.2005)
- Collett, T.S., Swenson, R.F., and Pierce, B., 2005, Alaska gas hydrate planning workshop proceedings: Anchorage, Alaska, August 17-18, 2005: Alaska Division of Geological & Geophysical Surveys Miscellaneous Publication 135, 39 p.
- Collett, T., Riedel, M., Cochran, J., Boswell, R., Presley, J., Kumar, P., Sathe, A., Sethi, A., Lall, M., Sibal, V., and the NGHP Expedition 01 Scientists, 2007, Indian National Gas Hydrate Program 2007-Expedition 01 Initial Reports, Mumbai, India to Chennai, India; Sites NGHP-01-01 through NGHP-01-21; 28 April 2006 – 19 August 2006, Published by Directorate General of Hydrocarbons, Ministry of Petroleum and Natural Gas (India), Prepared by The United States Geological Survey (1 DVD).
- Collett, T.S., 2007, IODP Expedition 311 – Cascadia Margin Gas Hydrates: Proceedings of PETROTECH 2007, January 15-20, 2007, New Delhi, India, 6 p (on CD-ROM).
- Collett, T.S., 2007, Arctic gas hydrate energy assessment studies: Proceedings of The Arctic Energy Summit, October 15-18, 2007, Anchorage, Alaska, USA, 12 p.

- Collett, T.S., 2008, Geologic Controls on the Occurrence of Permafrost-Associated Natural Gas Hydrates: Proceedings of the 9th International Conference on Permafrost, June 29 – July 3, 2008, Fairbanks, Alaska, Published by the University of Alaska, USA, 6 p (on CD-ROM).
- Collett, T.S., 2008, Geologic and engineering controls on the production of permafrost-associated gas hydrate accumulations: Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), July 6-10, 2008, Vancouver, British Columbia, Canada, 12 p.
- Collett, T.S., 2008, Geology of marine gas hydrates and their global distribution: Proceedings of the 2008 Offshore Technology Conference, May 5-8, 2008, Houston, Texas, USA, Paper Number OTC 19241, 10 p.
- Collett, T.S., Riedel, M., Boswell, R., Cochran, J.R., Kumar, P., Sethi, A.K., Sathe, A.V., and NGHP Expedition-01 Scientific Party, 2006, International Team Completes Landmark Gas Hydrate Expedition in the Offshore of India, “Fire in the Ice”, NETL newsletter, Fall 2006 issue, available online at: <http://www.netl.doe.gov>.
- Collett, T.S., 2008, Geologic Controls on the Occurrence of Permafrost-Associated Natural Gas Hydrates: Proceedings of the 9th International Conference on Permafrost, June 29 – July 3, 2008, Fairbanks, Alaska, Published by the University of Alaska, USA, 6 p (on CD-ROM).
- Collett, T.S., 2007, Geologic controls on the energy resource potential of natural gas hydrates: Proceedings of the International Conference on Gas Hydrate, October 3-4, 2007, Taipei, Taiwan, 10 p., <http://140.112.68.2/ghc/index.files/page0002.htm>.
- Collett, T.S., Riedel, M., J.R., Cochran, Boswell, R., Kumar, P., Sathe, A.V., and the NGHP Expedition 01 Scientific Party, 2008, Indian continental margin gas hydrate prospects: results of the Indian National Gas Hydrate Program (NGHP) Expedition 01: Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), July 6-10, 2008, Vancouver, British Columbia, Canada, 10 p.
- Durham, W.B., Stern, L.A., Kirby, S.H., and Circone, S., 2005, Rheological comparisons and structural imaging of sI and sII end-member gas hydrates and hydrate/sediment aggregates. *Proceedings of the 5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005, vol. 2, p. 607-614 (paper #2030).
- Friefeld, B.M., Kneafsey, T.J., Tomutsa, L., Stern, L.A., and Kirby, S.H., 2002, Use of computed x-ray tomographic data for analyzing the thermodynamics of a dissociating porous sand/hydrate mixture. Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates, Yokohama Japan, 2002, pp.750-755.

- Hein, J.R., Normark, W.R., McIntyre, B.R., Lorenson, T.D., Polwell II, C.L., 2006, Methanogenic calcite,  $^{13}\text{C}$ -depleted bivalve shells, and gas hydrate from a mud volcano offshore southern California: *Geology*, v. 34, p. 108-112.
- Helgerud, M.B., Circone, S., Stern, L.A., Kirby, S.H., and Lorenson, T.D., 2002, Measured temperature and pressure dependence of compressional and shear wave speeds in compacted, polycrystalline sII methane-ethane hydrate. *Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates*, Yokohama Japan, 2002, pp. 716-721.
- Hutchinson, D.R., and Collett, T.S., 2007, Integration of Modeling and USGS hydrate laboratory research: workshop report, in Mahajan, D. and Somasundaran, P., eds., *Science and Technology Issues in Methane Hydrate R&D*, Workshop Summary and Recommendations: [http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/reports/MH\\_Kauai\\_Workshop\\_Report.pdf](http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/reports/MH_Kauai_Workshop_Report.pdf), p. 90-92.
- Mount Elbert Science Team, 2007, Alaska North Slope well successfully cores, logs, and tests gas-hydrate-bearing reservoirs, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter, 2007, available online.
- Pohlman, J.W., Riedel, M., Waite, W., Rose, K., Lapham, L. 2008, Application of Rhizone Samplers to Obtain High-Resolution Pore Fluid Records during Geochemical Investigations of Gas Hydrate Systems. *Fire in the Ice DOE-NETL Newsletter*, Fall Issue, pp 17-18.
- Rawn, C.J., Rondinone, A.J., Chakoumakos, B.C., Marshall, S.L., Stern, L.A., Kirby, S.H., Jones, C.Y., Toby, B.H., and Ishii, Y., 2002, Neutron powder diffraction studies as a function of temperature of structure II hydrate formed from a methane + ethane gas mixture. *Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates*, Yokohama Japan, 2002, pp. 595-598.
- Ruppel, C. and J.W. Pohlman, 2008, Climate change and carbon cycle: Perspectives and opportunities, *Fire in Ice*, DOE/National Energy Technology Lab Gas Hydrates Newsletter, pp. 5-8, January 2008.
- Shedd, W.W., and Hutchinson, D.R., 2006, Gas hydrate potential of the mid-Atlantic outer continental shelf: *Fire in the Ice Newsletter* Fall, 2006, <http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/Newsletter/HMNewsFall06.pdf>, p. 8-9.
- Solem, R.C., Kastner, M., Stern, L.A., Kirby, S.H., Vollmer, M., and Paytan, A., 2002, Synthesis of a  $\text{CH}_4$ -CFC hydrate, and an exchange experiment between a  $\text{CH}_4$ -CFC gas and pure methane hydrate. *Proceedings of the 4<sup>th</sup> International Conference on Gas Hydrates*, Yokohama Japan, 2002, pp. 565-570.

- Stern, L. A., 2000, Book Review of *Clathrate Hydrates of Natural Gases, 2<sup>nd</sup> Edition* by E. D. Sloan, Jr., for Chemical Industries Reference Books and Textbooks Series. *Energy & Fuels*, 14 (5), 1123-1124.
- Stern, L., S. Circone, S. Kirby, and W. Durham, 2002, New insights into the phenomenon of anomalous or “self” preservation of gas hydrate, Yokohama, Japan, *Proceedings, Fourth International Conference on Gas Hydrates*, May 19-23, p. 673-677.
- Stern, L.A., and Kirby, S.H., 2008. Natural gas hydrates up close: a comparison of grain characteristics of samples from marine and permafrost environments as revealed by cryogenic SEM. *Proceedings of the 6<sup>th</sup> International Conference on Gas Hydrates (ICGH 2008)*, Vancouver, Canada, July 2008.
- Stern, L., S. Kirby, W. Durham, S. Circone, and W. Waite, 2000, Laboratory synthesis of pure methane hydrate suitable for measurement of physical properties and decomposition behavior in Max, M., *ed.*, *Natural Gas Hydrate: In Oceanic and Permafrost Environments*, Kluwer Publishers, Dordrecht, Netherlands.
- Stern, L.A., Kirby, S.H., and Circone, S., 2002, Interagency group “zooms in” on methane hydrate pore structures. In, *Fire in the Ice*, The National Energy Technology Laboratory Methane Hydrate Newsletter, Summer 2002.
- Tait, K., Zhao, Y., Downs, R., Kirby, S., and Stern, L. 2005. Investigations into the stability, morphology, and the crystal structure of structure I and structure II methane-ethane clathrate hydrates. *Proceedings of the 5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005, vol. 2, p. 541-544 (paper #2021).
- Tomutsa, L. Freifeld, B., Kneafsey, T., and Stern, L.A., 2002, X-ray computed tomography observation of methane-hydrate dissociation. *Proceedings of the SPE Gas Technology Symposium*, Calgary, 2002, paper # SPE 75533.
- Waite W.F., J.P. Osegovic, W.J. Winters, M.D. Max, D.H. Mason, 2008, Seeding hydrate formation in water-saturated sand with dissolved-phase methane obtained from hydrate dissolution: A progress report, 6<sup>th</sup> International Conference on Gas Hydrates, July 6-10.

### **Presentations**

- Barth, G.A., Scholl, D.W., and J.R. Childs, 2003, Concentrated accumulations of natural gas and hydrate in the Aleutian Basin of the Bering Sea: Studies based on interval time anomalies, *GSA Abs. w Programs*, paper 258-1
- Barth, G.A., Scholl, D.W., and J.R. Childs, 2008, Focused accumulations of methane hydrate above deeply-buried basement highs in the deep-water Bering Sea Basins, *AAPG Ann. Mtg.*

- Barth, G.A., Scholl, D.W., and J.R. Childs, 2007, Evidence for focused accumulations of methane hydrate with possible resource implications for the deep water Bering Sea Basins, AGU Spring Mtg, NS54A-06.
- Birchwood, R., Noeth, S., Hooyman, P., Winters, W., and Jones, E., 2005, Wellbore stability model for marine sediments containing gas hydrates: Proceedings, American Association of Drilling Engineers National Conference and Exhibition, Houston, TX, April 5-7, 2005, Paper No. AADE-05-NTCE-13.
- Boswell, Ray; Hunter, Robert; Collett, Timothy; Digert, Scott; Hancock, Steve; Weeks, Micaela; Mount Ebert Science Team. 2008. Investigation Of Gas Hydrate-Bearing Sandstone Reservoirs At The "Mount Elbert" Stratigraphic Test Well, Milne Point, Alaska. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Chuvilin, E., E. Kozlova, O. Boldina, and W. Winters, 2004, Stability of methane gas hydrate formed in marine sediment from the northern Gulf of Mexico, St. Petersburg, Russia, Minerals of the Ocean – Integrated Strategies, April 25-30.
- Clennell, M.B., Booth, J.S., and Winters, W.J., 1999, Gas hydrates in marine sediments facts, models and conjecture: EOS Supplement, 1999 Spring Meeting, Boston, Trans. American Geophysical Union, v. 80, no. 17, p. S332.
- Clennell, M.B., Henry, P., Hovland, M., Booth, J.S., Winters, W.J., and Thomas, M., 1999, Formation of natural gas hydrates in marine sediments, gas hydrate growth and stability conditioned by host sediment properties: Third International Conference on Gas Hydrates, Program and Abstracts, Salt Lake City, Utah, July 18-22, 1999.
- Coffin, R.B., Hamdan, L. Wood, W., Pohlman, J.W., Smith, J., Pecher, I., 2007, Estimates of vertical methane fluxes in Poranghau Ridge sediment on the Hikurangi Margin, New Zealand. American Geophysical Union, Dec 10-14, San Francisco, CA.
- Collett, T., M. Riedel, R. Boswell, J. Cochran, P. Kumar, A. Sathe, M. Lall, V. Sibal, and the NGHP Expedition 01 Scientific Party, 2008, Offshore India Gas Hydrate Prospects – Results of the Indian National Gas Hydrate Program (NGHP) Expedition 01, presented at the National Gas Hydrate Program (NGHP) Gas Hydrate Conference, New Delhi, India, Feb. 6-8.
- Collett, Timothy S.; Riedel, M.; Cochran, J.R.; Boswell, R.; Kumar, P.; Sathe, A.V., 2008. Indian Continental Margin Gas Hydrate Prospects: Results Of The Indian National Gas Hydrate Program (NGHP) Expedition 01. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).

- Collett, T., 2008, Geologic Controls on the Occurrence of Gas Hydrates in the Indian Continental Margin: Results of the Indian National Gas Hydrate Program (NGHP) Expedition 01, 2008 American Association of Petroleum Geologists Annual Meeting, San Antonio, Texas, April 20-23.
- Collett, T.S., 2007, Geologic controls on the occurrence of permafrost-associated natural gas hydrates, 9th International Conference on Permafrost, Fairbanks, Alaska, June 29-July 3.
- Collett, T., 2008, "Geology of Marine Gas Hydrates and Their Global Distribution," 2008 Offshore Technology Conference held in Houston, Texas, U.S.A., May 5-8.
- Collett, Timothy S. 2008. Geologic And Engineering Controls On The Production Of Permafrost-Associated Gas Hydrate Accumulations. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Collett, T., 2004, Arctic gas hydrate resources, Tromso, Norway, Proceedings of the Conference on Arctic Geologic, Resources, and Environmental Challenges, May 24-26.
- Collett, T., T. Uchida, S. Dallimore, T. Mroz, and M. Lee, 1998, Downhole well log evaluation of gas hydrates in the Mallik 2L-38 well, Mackenzie Delta, N.W.T., Canada, Chiba City, Japan, International Symposium on Methane Hydrates, JNOC-TRC, October 20-22.
- Collett, T.S., 2008, Assessment of gas hydrate energy resources: December 2, 2008, MIT (Cambridge, MA). Presentation in the MIT/USGS ENI Methane Hydrate Seminar Series.
- Collett, T.S., Agena, W.F., Lee, M.W., Zyrianova, M.V., Bird, K.J., Charpentier, R.R., Cook, T., Houseknecht, D.W., Klett, T.R., Pollastro, R.M., and Schenk, C.J., 2008, Assessment of gas hydrate resources on the North Slope, Alaska, 2008: Series of Power Point Presentations prepared for Department of Interior and Congressional briefings presented in Washington DC, November 17-21, 2008, (hard copy and on CD-ROM).
- Collett, T.S., Agena, W.F., Lee, M.W., Zyrianova, M.V., Bird, K.J., Charpentier, R.R., Cook, T., Houseknecht, D.W., Klett, T.R., Pollastro, R.M., and Schenk, C.J., 2008, Assessment of gas hydrate resources on the North Slope, Alaska: Fall Meeting of the American Geophysical Union, December 15-19, 2008, San Francisco, California, Proceedings, Abstract OS43F-08.
- Collett, T.S., Dallimore, S.R., and Paull, C., 2008, Fate of methane released on the Arctic Shelf from thawing permafrost and decomposing gas hydrate: Proceedings of the IODP Arctic Ocean History Workshop, from speculation to reality, November 3-5, 2008, Bremerhaven, Germany, 2 p., (abstract, presentation).
- Collett, T.S., *et al.*, 2008, U.S. Geological Survey gas hydrate energy resource studies: Proceedings of the NRC Committee reviewing the activities authorized under the Methane Hydrate research Development Act (renewal) of 2005, 38 p. (presentation only)

- Colwell, F., Hangsterfer, A., Brodie, E., Daly, R., Holland, M., Briggs, B., Carini, P., Torres, M., Kastner, M., Long, P., Schaef, H., Delwiche, M., Winters, B., and the NGHP Expedition-01 Scientific Party, 2008, Fine scale control of microbial communities in deep marine sediments that contain hydrates and high concentrations of methane: Results from NGHP Expedition 01: International Conference on Gas Hydrates, Noida, India, Feb. 6-8, 2008, p. 44-45.
- Cooper, A., and P. Hart, 2002, Seismic studies of the gas-hydrate stability zone, northern Gulf of Mexico, Yokohama, Japan, 4<sup>th</sup> International Conference on Gas Hydrates, May 19-23.
- Dillon, W., and M. Max, 2001, Gas hydrate in sea-floor sediments: impact on future resources and drilling safety, Houston, TX, Offshore Technology Conference, April 30-May 3.
- Dugan, B., J. Germaine, W. Winters, and P. Flemings, 2003, Near-seafloor overpressure in the Deep water Gulf of Mexico interpreted from laboratory experiments, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.
- Dugan, B., J. Germaine, W. Winters, and P. Flemings, 2004, Laboratory constraints and models of pressure, hydrate, and stability in shallow Mississippi Canyon sediments (MC 855), deepwater Gulf of Mexico, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 18-21.
- Ellis, M., R. Evans, D. Hutchinson, and P. Hart, 2005, An electromagnetic survey of the JIP drill sites in Atwater Valley, paper OS31D-07, American Geophysical Union Fall Meeting, December 5-9.
- Gilbert, L., W. Waite, W. Winters, and D. Mason, 2004, Characterization of Gulf of Mexico sediment in hydrate and non-hydrate bearing cores using specific surface area, San Francisco, CA, American Geophysical Union Fall Meeting, December 13-17.
- Haacke, R., M. Riedel, J. Pohlman, K. Rose, L. Lapham, T.S. Hamilton, R. Enkin, G.D. Spence, and R.D. Hyndman, 2008, A recent investigation of gas hydrate as a factor in northern Cascadia accretionary margin frontal ridge slope failures and cold seep biogeochemistry. American Geophysical Union, Dec 15-19, San Francisco, CA.
- Hart, P., T. Lorenson, A. Grantz, B. Herman, 2006, Gas hydrate and associated free gas across the Alaskan Beaufort Sea outer continental margin (abs.), Edinburgh, Scotland, 5<sup>th</sup> International Workshop on Methane Hydrate Research and Development, October 9-12 – submitted.
- Helgerud, M., S. Circone, L. Stern, S. Kirby, and T. Lorenson, 2002, Measured temperature and pressure dependence of compressional and shear wave speeds in compacted, polycrystalline sII methane-ethane hydrate, Yokohama, Japan, 4<sup>th</sup> International Conference on Gas Hydrates, May 19-23

- Helgerud, M., W. Waite, S. Kirby, and A. Nur, 2002, Measured Temperature and Pressure Dependence of Compressional and Shear Wave Speeds in Polycrystalline sI Methane Hydrate and Polycrystalline Ice Ih, Yokohama, Japan, 4<sup>th</sup> Fourth International Conference on Gas Hydrates, May 19-23.
- Helgerud, M., W. Waite, L. Stern, and S. Kirby, 2005, Effects of fracture and crack healing in sI methane and sII methane-ethane hydrate, paper OS43A-0605, American Geophysical Union Fall Meeting, December 5-9.
- Heuer, V.B., Lorenson, T., Pohlman, J.W., Lever, M.A., Yoshinaga, M., Elvert, M., Hinrichs, K., 2009, The stable carbon isotope biogeochemistry of acetate in sediments from the NE Pacific: a synthesis. International Meeting on Organic Geochemistry, Sept 9-13, Bremen, Germany.
- Heuer, V., Pohlman, J., Elvert, M., Hinrichs, K., 2007, Biogeochemistry of acetate in the deep marine biosphere – new insights from stable carbon isotopic investigations. GV International Conference, October 1-5, Bremen Germany.
- Heuer, V., Pohlman, J.W., Elvert, M., Hinrichs, K., 2007, Molecular-isotopic studies of subsurface carbon turnover in hydrate-bearing sediments at the Cascadia Margin (IODP Expedition 311). IODP-ICDP-Kolloquium, March 19-21, Potsdam Germany.
- Heuer, V.B., Lorenson, T., Pohlman, J.W., Lever, M.A., Yoshinaga, M., Elvert, M., Hinrichs, K., 2009, The stable carbon isotope biogeochemistry of acetate in sediments from the NE Pacific: a synthesis. International Meeting on Organic Geochemistry, Sept 9-13, Bremen, Germany.
- Heuer, V.B., Pohlman, J.W., Torres, M.E., Lever, M.A., Elvert, M., Hinrichs, K.-U., 2009, The stable carbon isotope biogeochemistry of acetate in sediments from the NE Pacific: a synthesis. IODP-ICDP-Kolloquium, March 19-21, Potsdam Germany.
- Hunter, R., S. Digert, S. Wilson, T. Collett, and R. Boswell, 2007, Gas hydrate resource potential, AAPG Annual Meeting, Long Beach, CA., April, 2007.
- Hutchinson, D., P. Hart, B. Dugan, E. Geresi, R. Sliter, and K. Newman, 2003, Subsurface gas hydrates in the northern Gulf of Mexico, Geological Society of America, Volume 34, n. 7, November 2-5.
- Hutchinson, D., P. Hart, F. Snyder, M. Lee, N. Dutta, L. Muller, B. Dugan, C. Ruppel, W. Wood, R. Coffin, R. Evans, and E. Jones, 2003, Evidence of subsurface gas hydrate in the northern Gulf of Mexico, American Geophysical Union Fall Meeting, San Francisco, CA, December 8-12.

- Hutchinson, D., C. Ruppel, J. Pohlman, P. Hart, B. Dugan, F. Snyder, and R. Coffin, 2004, An integrated geological, geophysical, and geochemical analyses of subsurface gas hydrates in the northern Gulf of Mexico, Vancouver, BC, Canada, The American Association of Petroleum Geologists Hedberg Research Conference, September 12-16.
- Hutchinson, D., F. Snyder, P. Hart, C. Ruppel, J. Pohlman, W. Wood, R. Coffin, and M. Edwards, 2005, Geologic and site survey setting for JIP Gulf of Mexico gas hydrate drilling, San Francisco, CA, American Geophysical Union Fall Meeting, December 5-9.
- Hutchinson, D., C. Ruppel, J. Pohlman, P. Hart, F. Snyder, N. Dutta, B. Dugan, and R. Coffin, 2005, Geophysical and geochemical characterization of the hydrate stability zone in a region of active salt tectonics, Keathley Canyon, Northern Gulf of Mexico, Fourth International Workshop on Methane Hydrate Research and Development, Victoria, BC, Canada, May 2005, [http://web.uvic.ca/ceor/hydrates/2005/workshop\\_2005-8\\_Hutchinson.pdf](http://web.uvic.ca/ceor/hydrates/2005/workshop_2005-8_Hutchinson.pdf).
- Hutchinson, D., P. Hart, C. Ruppel, F. Snyder, N. Dutta, W. Wood, J. Pohlman, B. Dugan, M. Fowler, R. Evans, D. Fornari, and R. Coffin, 2005, Multidisciplinary studies contrasting gas hydrate occurrence at two sites in the northern Gulf of Mexico, Offshore Technology Conference, May 2-5.
- Hutchinson, D., 2006, Heterogeneity and dynamics in gas hydrate occurrence: lessons learned from the northern Gulf of Mexico, Kauai, HI, Engineering Conferences International, Science and Technology Issues in Methane Hydrates R&D, March 5-9., Abstracts volume is unpaginated, program at <http://www.engconfintl.org/pastconf/06aqfin.pdf>.
- Hutchinson, D., C. Ruppel, T. Collett, J. Pohlman, P. Hart, and F. Snyder, 2006, Minibasins and subsurface gas hydrate in the Gulf of Mexico, Fukuoka, Japan, 17<sup>th</sup> International Sedimentological Congress, August 27-September 1, v. B, p. 6.
- Hutchinson, D.R., Hart, P.E., Collett, T.S., Edwards, K.M., Twichell, D.C., and Snyder, F., 2007, Geologic Framework of the 2005 Keathley Canyon Gas Hydrate Research Well, Northern Gulf of Mexico, EOS, Trans. American Geophysical Union, 88(23), Jt. Assemb. Suppl., Abstract NS54A-03.
- Hutchinson, Deborah R.; Shelander, Dianna; Dai, Jianchun; McConnel, Dan; Shedd, William; Frye, Matthew; Ruppel, Carolyn; Boswell, Ray; Jones, Emrys; Collett, Timothy S.; Rose, Kelly; Dugan, Brandon; Wood, Warren; Latham, Thomas. 2008. Site Selection For DOE/JIP Gas Hydrate Drilling In The Northern Gulf Of Mexico. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Jones, Keith W., Feng, Huan, Tomov, Stanmire, Winters, William J., Eaton, Michael, and Mahajan, Devinder, 2005, Characterization of methane hydrate host sediments using synchrotron-computed microtomography (CMT): Preprints, American Chemical Society national meeting, San Diego, CA, March 13-17, 2005.

- Kastner, M. ; Spivack, A. J. ; Torres, M. ; Solomon, E. A. ; Borole, D. V. ; Robertson, G. ; Das, H. C., 2008. Gas Hydrates in Three Indian Ocean Regions, A Comparative Study of Occurrence and Subsurface Hydrology. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Katsube, T.J., Dallimore, S.R., Uchida, T., Jenner, K.A., Winters, W., and Collett, T., 1999, Petrophysical characteristics of formations hosting gas-hydrates at the Mallik 2L-38 well site, N.W.T., Canada: Third International Conference on Gas Hydrates, Program and Abstracts, Salt Lake City, Utah, July 18-22, 1999.
- Long, P.E., Schaef, H.T., Torres, M.E., Holland, M., Schultheiss, P., Kastner, M., Solomon, E., Winters, W.J., and the NGHP Expedition-01 Scientific Party, 2008, Infrared (IR) imaging results from NGHP Expedition 01: Implications for gas hydrate abundance and correlation to physical properties and pore-water chemistry: International Conference on Gas Hydrates, Noida, India, Feb. 6-8, 2008, p.38-39.
- Kaneko, M, Shingai H., Pohlman J.W., Naraoka, H., 2007, Bulk organic matter and hydrocarbon biomarker compositions within accretionary sediments at the northern Cascadia margin gas hydrate system (IODP EXP311). American Geophysical Union, Dec 10-14, San Francisco, CA.
- Lorenson, T., 2008, "Geochemistry of Hydrocarbon Gases and Volatile Organic Acids from Sediments; Results from the India NGHP Expedition 01," National Gas Hydrate Program (NGHP) Gas Hydrate Conference, New Delhi, India, Feb. 6-8.
- Lorenson, T., W. Winters, P. Hart, and C. Paull, 2002, Gas hydrate occurrence in the Northern Gulf of Mexico studied with giant piston cores, American Geophysical Union Fall Meeting, December 6-10.
- Lorenson, T., W. Winters, C. Paull, and W. Ussler, 2003, Gas hydrate occurrence in the northern Gulf of Mexico studies with giant piston cores from sea-floor vents to minibasins, Seattle, WA, The American Association of Petroleum Geologists Annual Meeting, November 2-5.
- Lorenson, T., W. Winters, C. Paull, W. Ussler, and J. Dougherty, 2003, Modeling gas hydrate occurrences in the northern Gulf of Mexico from giant piston cores, Seattle, WA, Geological Society of America Annual Meeting, November 2-5.
- Lorenson, T., W. Winters, C. Paull, and W. Ussler, 2003, Gas hydrate occurrence in the northern Gulf of Mexico studies with giant piston cores from sea-floor vents to minibasins, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.

- Lorenson, T., W. Winters, C. Paull, W. Ussler, and the Shipboard Scientific Party, 2003, Gas hydrate occurrence in the northern Gulf of Mexico: new insights learned from giant piston coring, Salt Lake City, UT, The American Association of Petroleum Geologists Annual Meeting.
- Lorenson, T., W. Winters, C. Paull, and W. Ussler, 2006, Is gas hydrate and the Storegga Slide offshore Norway connected to an active petroleum system?, Houston, TX, The American Association of Petroleum Geologists Annual Meeting, April 9-12.
- Paull, C., W. Ussler, W. Winters, and T. Lorenson, 2003, Constraints on the distribution of gas hydrates in the Gulf of Mexico, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.
- Paull, C.K., Ussler, W.I. III, Keaton, R., Holbrook, W.S., Hill, T., Mieneri, J., Halflidison, H., Johnson, J., Winters, W.J., Lorenson, T.D., and Aiello, I., 2006, Assessing methane release from the colossal Storegga submarine landslide: Eos, Transactions, American Geophysical Union, Fall Meeting Supplement, San Francisco, CA, December 11-15, 2006.
- Pecher, I.A., Booth, J.S., Winters, W.J., Mason, D.H., Relle, M.K., and Dillon, W.P., 1999, Gas hydrate distribution in sands – results from seismic laboratory studies: EOS Supplement, 1999 Spring Meeting, Boston, Trans. American Geophysical Union, v. 80, no. 17, p. S338.
- Pohlman, J.W., Bauer, J.E., Osburn, C.L., Coffin, R.B., 2007, Carbon isotope evidence ( $^{13}\text{C}$  and  $^{14}\text{C}$ ) for fossil methane-derived dissolved organic carbon from gas hydrate bearing cold seeps. Goldschmidt Conference, August 19-24, Cologne, Germany.
- Pohlman, J.W., Kaneko, M., Heuer, V., Coffin, R.B, Whiticar, M., 2007, Gas source characterization of the gas hydrate bearing northern Cascadia margin accretionary system: biogeochemical controls. IODP Expedition Post-Cruise Meeting, April 22-23, Paris, France
- Pohlman, J.W., Elvert, M., Rossel, P., Hinrichs, K., 2009, Distribution of polar and apolar lipids within biogeochemical regimes of a gas hydrate-bearing hydrocarbon cold seep. International Meeting on Organic Geochemistry, Sept 9-13, Bremen, Germany
- Pohlman, J.W., M. Riedel, W. Waite, K. Rose, L. Lapham, T.S. Hamilton, R. Enkin, G.D. Spence, R.D. Hyndman and R. Haacke, 2008, Geochemical Investigation of Slope Failure on the Northern Cascadia Margin Frontal Ridge. American Geophysical Union, Dec 15-19, San Francisco, CA.
- Rehder, G., S. Kirby, W. Durham, P. Brewer, L. Stern, E. Peltzer, and J. Pinkston, 2001, Dissolution rates of synthetic methane hydrate and carbon dioxide hydrate in undersaturated seawater at 1000m depth, San Francisco, CA, American Geophysical Union Fall Meeting, December 10-14.

- Riedel, M.; Mair, Stephanie; Collett, Timothy S.; Kumar, P.; Sathe, A.V., 2008. Seismic Mapping Of Gas Hydrate Deposits In The Krishna-Godavari Basin Offshore India. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Riedel, M., Yu, P., Collett, T., Lorenson, T., Paull, C., Collett, T., and Dallimore, S., 2008, Methane seepage from the Arctic Shelf; 20 Years of research on the Beaufort Sea Margin: Fall Meeting of the American Geophysical Union, December 15-19, 2008, San Francisco, California, Proceedings, Abstract U23D-0086.
- Ruppel, C., 2008, State of the art in climate change-gas hydrates research, presented to the DOE Methane Hydrates Federal Advisory Committee, La Jolla, CA, spring meeting.
- Ruppel, C., 2008, "Methane Hydrates and Methane Seeps: The Potential of Biogeophysical Measurements for Identifying Microbial Hotspots", AGU Chapman Conference on Biogeophysics, Portland, ME, October 2008.
- Ruppel, C., 2008, "Before Production...The Challenges of Finding and Evaluating Gas Hydrates," October, 2008, MIT (Cambridge, MA). Presentation in the MIT/USGS ENI Methane Hydrate Seminar Series.
- Ruppel, C., 2008, Arctic Ocean Drilling to Study the Impact of Climate Change on Shallow Shelf Methane Hydrates, Arctic Ocean History Drilling Workshop, Bremerhaven, November, 2008.
- Ruppel, C., (Invited) 2008, Multiscale heterogeneity in methane flux regimes between and within major marine gas hydrate provinces, EOS Trans. AGU, 89(53), Fall Mtg Supplement, Abstract OS31D-02.
- Ruppel., C., Walter, K., Pohlman, J., and M. Wooller, Gas Hydrates and Perturbed Permafrost: Can Thermokarst Lakes Leak Hydrate-Derived Methane?, EOS Trans. AGU, 89(53), Fall Mtg Supplement, Abstract U23D-0084.
- Santamarina, J., C. Ruppel, J. Lee, and T. Yun, 2007, Making the Case for *In Situ* Characterization of Gas Hydrate-Bearing Sediments at Observatories: Laboratory and Catwalk Results Testing the Impact of Core Retrieval, presented at the JOI Gas-Hydrate Observatories Workshop, July 18-20.
- Scholl, D.W., Barth, G.A., and Childs, J.R., Evidence that acoustic VAMP structures in the deep water Bering Sea basin represent large accumulations of methane hydrate with matching resource implications [abs.]: Geophysical Society of Alaska meeting, Anchorage, January 11, 2007.

- Solomon, E. A.; Spivack, A. J.; Kastner, M., Torres, M. ; Borole, D. V. ; Robertson, G. ; Das, H. C., 2008. Hydrogeochemical and Structural Controls on Heterogeneous Gas Hydrate Distribution in the K-G Basin Offshore SE India. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008.
- Stern, L., 2006, Gas hydrates: an overview of our 10+ years of laboratory research on these unusual compounds, U.S. Geological Survey Earthquake Hazards Team seminar, January 25.
- Stern, L., W. Durham, S. Kirby, S. Circone, and M. Helgerud, 2004, Experimental Observations Pertinent to the Mechanical and Thermal Stability of sI Methane Hydrate/Sand Aggregates, Dallas, TX, The American Association of Petroleum Geologists Annual Meeting, April 16-21.
- Stern, L., and S. Kirby, 2006, Gas hydrates in sediments imaged by cryogenic SEM (CSEM): Insights from lab experiments on synthetic hydrates as interpretive guides (abs.), Bremerhaven, Germany, Physics and Chemistry of Ice (PCI) Conference, July 23-28.
- Ussler, W., C. Paull, Y. Chen, R. Matsumoto, T. Lorenson, and W. Winters, 2005, The consequences of methane oxidation at the sulfate-methane interface in a methane-rich core from the northern Gulf of Mexico, Trondheim, Norway, Fifth International Conference on Gas Hydrates, June 12-16.
- Ussler, W., C. Paull, S. Hallam, E. Delong, Y. Chen, R. Matsumoto, T. Lorenson, and W. Winters, 2003, The anatomy of the sulfate-methane interface in a methane-rich core from the Gulf of Mexico, Seattle, WA, Geological Society of America Annual Meeting, November 2-5.
- Waite, W., L. Gilbert, W. Winters, and D. Mason, 2005, Thermal property measurements in Tetrahydrofuran (THF) hydrate and hydrate-bearing sediment between -25 and +4C and their application to methane hydrate, 5<sup>th</sup> International Conference on Gas Hydrates, June 12-16.
- Waite, W., L. Stern, W. Winters, and D. Mason, 2006, Simultaneous determination of thermal conductivity, thermal diffusivity and specific heat in sI methane hydrate, American Geophysical Union Conference Fall Meeting, December 11-15.
- Waite, W., T. Kneafsey, J. Santamarina, W. Winters, T. Yun, D. Mason, and C. Ruppel, 2006, Physical property changes in hydrate-bearing sediment samples due to depressurization/repressurization, American Geophysical Union Fall Meeting, December 11-15.
- Waite, W., J. Pinkston, and S. Kirby, 2002, Preliminary laboratory thermal conductivity measurements in pure methane hydrate and methane hydrate-sediment mixtures, Yokohama, Japan, 4<sup>th</sup> International Conference on Gas Hydrates, May 19-23.

- Waite, W., W. Winters, and D. Mason, 2003, Hydrate formation and compressional wave development in partially saturated Ottawa sand, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.
- Waite, W., W. Winters, and D. Mason, 2003, Thermal conductivity of THF hydrate between -25C and +4C, San Francisco, CA, American Geophysical Union Fall Meeting, December 8-12.
- Waite, W., L. Gilbert, W. Winters, and D. Mason, 2004, Thermal property measurements in Tetrahydrofuran (THF) hydrate between -25 and +4C and their application to methane hydrate, San Francisco, CA, American Geophysical Union Fall Meeting, December 13-17.
- Waite, W.F.; Osegovic, J.P.; Winters, W.J.; Max, M.D.; Mason, D.H. 2008. Seeding Hydrate Formation In Water-Saturated Sand With Dissolved-Phase Methane Obtained From Hydrate Dissolution: A Progress Report. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Winters, W., 2008, "Triaxial strength and acoustic properties of repressurized samples from the 2006 National Gas Hydrate Program of India Expedition," National Gas Hydrate Program (NGHP) Gas Hydrate Conference, New Delhi, India, Feb. 6-8.
- Winters, W., M. Gomes, L. Giosan, J. Johnson, M. Kastner, M. Torres, P. Long, H. Schaef, K. Rose, and the NGHP-01 Shipboard Scientific Party, 2008, Physical properties of sediment from the 2006 National Gas Hydrate Program expedition offshore India, National Gas Hydrate Program (NGHP) Gas Hydrate Conference, New Delhi, India, Feb. 6-8.
- Winters, W., W. Waite, D. Mason, W. Dillon, and I. Pecher, 2002, Sediment properties associated with gas hydrate formation, Yokohama, Japan, 4<sup>th</sup> International Conference on Gas Hydrates, May 19-23.
- Winters, W., W. Waite, and D. Mason, 2006, Grain size effects on acoustic and strength behavior of sediments containing natural- and laboratory-formed methane gas hydrate, Kauai, HI, Workshop on Science and Technology Issues in Methane Hydrate Research and Development, March 5-9.
- Winters, W., W. Waite, and D. Mason, 2005, Effects of Methane gas hydrate formation on pore pressure response, shear strength, and acoustic properties of sediment, paper OS43A-0607, American Geophysical Union Fall Meeting, December 5-9.
- Winters, W., W. Waite, B. Dugan, D. Mason, and I. Pecher, 2004, Strength and physical properties of sediment containing laboratory-formed and natural gas hydrate, Dallas, TX, The American Association of Petroleum Geologists Annual Convention, April 18-21.

- Winters, W., S. Dallimore, T. Collett, B. Medioli, R. Matsumoto, P. Brennan-Alpert, and J. Katsube, 2003, Physical property relationships of sediments from the JAPEX/JNOC/GSC et al Mallik 5L-38 gas hydrate production research well, MacKenzie delta, NWT, Chiba City, Japan, Mallik International Symposium, December 8-10.
- Winters, W., W. Waite, W. Dillon, D. Mason, and I. Pecher, 2001, Relationships between frozen and gas hydrate containing sediment, Moscow, Russia, 2<sup>nd</sup> Russian Conference on Geocryology, Moscow, June 6-8.
- Winters, W., W. Waite, I. Pecher, D. Mason, B. Dugan, S. Dallimore, T. Collett, T. Lorenson, and C. Paull, 2003, The relation of laboratory physical property measurements to the presence and behavior of natural gas hydrates, Seattle, WA, Geological Society of America Annual Meeting, November 2-5.
- Winters, W., W. Waite, D. Mason, I. Novosel, O. Boldina, T. Lorenson, and C. Paull, 2003, Field and laboratory studies of sediment containing natural and synthetic gas hydrate, Qingdao, China, Symposium on Gas Hydrate, a Potential New Energy Source for the New Millennium, October 15-17.
- Winters, W., W. Waite, D. Mason, T. Lorenson, C. Paull, I. Novosel, O. Boldina, S. Dallimore, and T. Collett, 2003, Physical properties of northern Gulf of Mexico sediment and laboratory samples containing natural and synthetic methane gas hydrate, Nice, France, EGS-AGU-EUG Joint Assembly, April 6-11.
- Winters, W., W. Waite, D. Mason, I. Novosel, O. Boldina, S. Dallimore, T. Collett, T. Lorenson, C. Paull, R. Rogers, W. Bryant, and T. McGee, 2003, Physical Properties of Sediment Containing Natural and Laboratory-Formed Gas Hydrate, Salt Lake City, UT, The American Association of Petroleum Geologists Annual Meeting, May 11-14.
- Winters, W., I. Novosel, O. Boldina, W. Waite, T. Lorenson, C. Paull, and W. Bryant, 2002, Physical properties of sediment related to gas hydrate in the northern Gulf of Mexico, San Francisco, CA, American Geophysical Union Fall Meeting, December 6-10.
- Winters, W., I. Novosel, O. Boldina, W. Waite, T. Lorenson, C. Paull, and W. Bryant, 2002, Physical properties of sediment related to gas hydrate in the Northern Gulf of Mexico, San Francisco, CA, EOS Transactions, American Geophysical Union, Volume 83, n. 47, December 6-10.
- Winters, W., W. Waite, D. Mason, W. Dillon, and D. Hutchinson, 2002, Acoustic, Pore Pressure, and Strength Properties of Sediment Containing Gas Hydrate, St. Petersburg, Russia, Proceedings of the Minerals of the Ocean International Conference, Ministry of Natural Resources, Russian Academy of Sciences, April 20-25, p. 161-164.
- Winters, W., W. Waite, W. Dillon, D. Mason, and I. Pecher, 2001, Relationships between frozen and gas hydrate-containing sediment, Moscow, Russia, Second Russian Conference on Geocryology, Volume 3, June 6-8, p.314-320.

- Winters, W., I. Pecher, W. Waite, J. Wright, S. Dallimore, T. Collett, D. Mason, K. Jenner, W. Dillon, and T. Uchida, 2001, Laboratory test program and physical properties of samples containing gas hydrate from the MacKenzie delta, NWT, Calgary, AB, Canada, Canadian Society of Petroleum Geologists Annual Convention, June 18-22.
- Winters, W., W. Waite, I. Pecher, D. Mason, and W. Dillon, 2001, Sediment property changes caused by gas hydrate formation and pore water freezing, Pushino, Russia, Russian Academy of Sciences International Conference, Conservation and Transformation of Matter and Energy in the Earth Cryosphere, June 1-5.
- Winters, W., I. Pecher, W. Dillon, and D. Mason, 2000, Comparison of physical properties of sediment containing natural and laboratory formed gas hydrate and ice, Reno, NV, Geological Society of America Annual Meeting, November 9-18.
- Winters, W., I. Pecher, D. Mason, J. Booth, and W. Dillon, 2000, Physical properties of sediment containing natural and laboratory-formed gas hydrate, New Orleans, LA, American Association of Petroleum Geologist Annual Meeting, April 16-19.
- Winters, W., I. Pecher, D. Mason, and W. Dillon, 2000, Acoustic and strength properties of sediment containing water, ice, and laboratory-formed gas hydrate and natural gas hydrate, St. Petersburg, Russia, Sixth International Conference on Gas in Marine Sediments, September 5-9.
- Winters, W.J., Dallimore, S.R., Collett, T.S., Taylor, A.E., Medioli, B., Matsumoto, R., Katsube, J.T., Wright, J.F., Nixon, F.M., Ethier, A. and Uchida, T., 2003, Physical properties of sediments from the 2002 Mallik 5L-38 gas hydrate production research well, NWT, Canada: Abstracts, Mallik 5L-38 Post-Field Workshop, Whistler, B.C., 22-24 January 2003, unpagged.
- Winters, W.J., Hutchinson, D.R., Waite, W.F., and Mason, D.H., 2006, Behavior of sediment containing synthetic and natural gas hydrate: Keynote address at 2006 Taiwan Gas Hydrate Workshop, Proceedings, Taipei, Taiwan, March 14-17, 2006, p. 3-4.
- Winters, W.J., Katsube, J., Dallimore, S.R., Uchida, T., Jenner, K.A., Collett, T.S., Cranston, R., Wright, J.F., and Nixon, F.M., 1999, Physical and petrophysical properties of sediments and their relation to gas hydrate occurrence, JAPEX/JNOC/GSC Mallik 2L-38 research well, Mackenzie Delta, N.W.T., Canada: Third International Conference on Gas Hydrates, Program and Abstracts, Salt Lake City, Utah, July 18-22, 1999, unpagged.
- Winters, W.J., Pecher, I.A., Mason, D.H., Waite, W.F., and Dillon, W.P., 2001, Physical properties and preservation of samples containing natural gas hydrate from the Mackenzie Delta, NWT, Canada: Abstracts, Methane Hydrates Open Session, Japan National Oil Corporation, Chiba, Japan, April 26, p. 10-11.

- Winters, W.J., Waite, W.F., Mason, D.H., and Gilbert, L.Y., 2005, Physical properties of sediment containing methane gas hydrate: Preprints, American Chemical Society national meeting, San Diego, CA, March 13-17, 2005.
- Winters, W.J., Waite, W.F., Mason, D.H., Gilbert, L.Y., and Hutchinson, D.R., 2005, Determination of in situ methane gas hydrate stability and properties: Abstract supplement, National Gas Hydrate Program of India Workshop, Petrotech-2005, New Delhi, India, Jan. 15-19, 2005, unpagued.
- Winters, W.J., Waite, W.F., Mason, D.H., Gilbert, L.Y., Hutchinson, D.R., Pecher, I.A., Chuvilin, E.M., and Boldina, O.M., 2005, Comparison of natural gas hydrate, laboratory-formed methane gas hydrate, and frozen sediment: Abstracts, Third Russian Conference on Geocryology, Moscow, Russia, May 31-June 3, 2005, unpagued.
- Winters, W.J., Waite, W.F., Mason, D.H., Kumar, P., 2008, Triaxial strength and acoustic properties of repressurized samples from the Indian National Gas Hydrate Program (NGHP) Expedition 01: International Conference on Gas Hydrates, Noida, India, Feb. 6-8, 2008, p. 72-73.
- Winters, W.J., Wright, J.F., Booth, J.S., Dallimore, S.R., Pecher, I.A., Mason, D.H., Relle, M.K., and Dillon, W.P., 1999, Laboratory tests of gas hydrate samples from the Mackenzie Delta: EOS Supplement, 1999 Spring Meeting, Boston, Trans. American Geophysical Union, v. 80, no. 17, p. S338.
- Winters, William J., Waite, William F., Mason, David H., Gilbert, Lauren Y., and Pecher, Ingo A., 2005, Effect of grain size and pore pressure on acoustic and strength behavior of sediments containing methane gas hydrate: Proceedings of the Fifth International Conference on Gas Hydrates, v. 2, paper 2017, Trondheim, Norway, June 13-16, 2005, p. 507-516.
- Winters, W.J.; Waite, W.F.; Mason, D.H.; Kumar, P. 2008. Physical Properties Of Repressurized Samples Recovered During The 2006 National Gas Hydrate Program Expedition Offshore India. Proceedings of the 6th International Conference on Gas Hydrates (ICGH 2008), Vancouver, British Columbia, CANADA, July 6-10, 2008 ([click here](#)).
- Wooller, M.J., Leigh, M., Pohlman J.W., Ruppel C. and Walter, K., 2009, Source characterization and temporal variation of methane seepage from thermokarst lakes on the Alaska North Slope in response to Arctic climate change. Developing Long Term International Collaboration on Methane Hydrate Research and Monitoring in the Arctic Region, February 18-20, Texel, The Netherlands.
- Yoon, S., Jones, K.W., Feng, H., Winters, W.J. and Mahajan, D., 2003, Methane hydrate studies; delineating properties of sediments by computed microtomography (CMT): Abstracts, 2003 AIChE Spring National Meeting, Symposium on Gas Hydrates, New Orleans, La., 30 March-3 April 2003, p 66.

## Section VI: Programmatic Reports

### Peer-Reviewed Publications

Allison, E., and R. Boswell, in review, Overview of the Department of Energy's gas hydrate R&D program: 2000 to 2005 *in* Collett, T., A. Johnson, C. Knapp, and R. Boswell, eds., *Natural Gas Hydrates: Energy Resource and Associated Geologic Hazards*, *The American Association of Petroleum Geologists Hedberg Special Publication*.

Allison, E., 2000, Department of Energy methane hydrate research and development program: an update: *in* Holder, G., and P. Bishnoi, eds., *Gas Hydrates: Challenges for the Future*, *Annals of the New York Academy of Sciences*, Volume 912, pp. 437-440.

Boswell, R., 2007, Resource potential of methane hydrate coming into focus, *Journal of Petroleum Science and Engineering – Natural Gas Hydrate/Clathrate* (Elsevier), edited by D. Mahajan, C. Taylor and G. Ali Mansoori, Volume 56, Issues 1-3, p. 9-13, March.

### Government Reports

Engineering Conferences International, 2007, Science and Technology Issues in Methane Hydrate R&D, Summary and Recommendations of Workshop held in Kauai, Hawaii, March 5-9, 2006, 95 pages, available online ([click here](#)).

Gas Hydrates Technical Coordination Team, 2006, An interagency roadmap for methane hydrates research and development, DOE Office of Fossil Energy, 36 pages, available online ([click here](#)).

Gas Hydrates Technical Coordination Team, 2007, Interagency Coordination in methane hydrates R&D, DOE Office of Fossil Energy, 28 pages, available online ([click here](#)).

National Research Council, 2004, Charting the Future of Methane Hydrate Research in the United States, Washington, DC, The National Academies Press.

Federal Methane Hydrate Advisory Committee, 2007, "An Assessment of the Methane Hydrate Research Program and An Assessment of the 5-Year Research Plan of the Department of Energy," June, available here ([click here](#))

### Other Publications

Boswell, R. and T. Collett, 2006, The Gas Hydrates Resource Pyramid, *U.S. DOE-NETL Fire in the Ice Newsletter*, Fall 2006 issue, available online ([click here](#))

Boswell, R., 2005, Buried Treasure, *Power and Energy*, American Society of Mechanical Engineers, February, Volume 2, n. 1.

- Boswell, R., D. Hutchinson, and P. Ray, 2005, Changing perspectives on the resource potential of methane hydrates, *U.S. DOE-NETL Fire in the Ice Newsletter*, Summer 2005 issue, available online ([click here](#)).
- Collett, T., R. Hunter, M. Kurihara, Y. Masuda, P. McGrail, G. Moridis, H. Narita, M. White, J. Wilder, and S. Wilson, 2005, An international effort to compare methane hydrate reservoir simulators, *U.S. DOE-NETL Fire in the Ice Newsletter*, Summer 2005 issue, available online ([click here](#)).
- Collett, T., M. Riedel, R. Boswell, J. Cochran, P. Kumar, A. Sethi, A. Sathe, 2006, International Team Completes Landmark Gas Hydrate Expedition in the Offshore of India, *U.S. DOE-NETL Fire in the Ice Newsletter*, Fall 2006 issue, available online ([click here](#)).
- Gas Hydrate Simulator Comparison Team, 2007, International Methane Hydrate Code Comparison Project Simulates Relevant Problems, *U.S. DOE-NETL Fire in the Ice Newsletter*, Winter 2007 issue, available online ([click here](#)).
- Tomer, B., H. Guthrie, T. Mroz, and R. Boswell, 2001, A Collaborative Approach to Methane Hydrate R&D Activities, *Proceedings of the 2001 Offshore Technology Conference*, paper SPE 13038.

### **Presentations**

- Allison, E., 2006, U.S. Department of Energy Methane Hydrate Research: Progress and Potential, Kauai, Hawaii, Engineering Conferences International, Science and technology issues in methane hydrate R&D, March 5-9.
- Boswell, R., 2006, Progress and Implications of DOE-BP-USGS Gas Hydrates Research at Milne Point, Alaska North Slope, Kauai, Hawaii, Engineering Conferences International, Science and technology issues in methane hydrate R&D, March 5-9.
- Boswell, R., 2006, Remaining Challenges in Commercializing Gas Hydrate, Hart Energy Publishing Methane Hydrates Conference, Dec. 5-6.
- Boswell, R., 2006, U.S. DOE's Program in Gas Hydrates, Washington, DC, Meeting of the Methane Hydrates Federal Advisory Committee, April 24.
- Boswell, R., 2006, Draft Interagency Long-Term R&D Roadmap, Washington, DC, Meeting of the Methane Hydrates Federal Advisory Committee, April 24.
- Boswell, R., 2005, U.S. DOE's program in natural gas hydrates, Anchorage, AK, Alaska Division of Natural Resources, Alaska Gas Hydrate Planning Workshop, August 16-17.
- Boswell, R., 2005, Gas hydrates: potential future source of energy? Durham, NC, American Public Gas Association Annual Meeting, May 4-5.

- Boswell, R., 2005, U.S. DOE methane hydrate R&D program, San Diego, CA, American Chemical Society Annual Meeting, March 11-15.
- Lawson, W., 2005, Gas hydrate R&D opportunities in Alaska, Anchorage, AK, ACI Arctic Gas Symposium, September.
- Mroz, T., 2005, Gas hydrates, prospects for future production, Washington, DC, Natural Gas Vehicles Technologies Forum, August 2-4.
- Tomer, B., 2002, Status of research into naturally-occurring methane hydrates in the United States, International Hydrates R&D Conference, October 29.
- Tomer, B. 2008, "Methane Hydrate Challenges and Future," Offshore Technology Conference, Houston, Texas, May 8.

*NOTE: This document contains a listing of all published reports and professional presentations relating to work supported by DOE's Methane Hydrates R&D program. While many of these reports are "shared" publications, with support being obtained from several funding sources, we have endeavored to include only those reports in which the DOE's contribution was meaningful and substantial.*

