

CURRICULUM VITAE

CURTIS M. OLDENBURG

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EDUCATION

1979-1983 University of California, Berkeley. A.B. in geology, Dec. 1983.
1984-1985 Princeton University, Ph.D. program in geology.
Transferred with advisor to U.C. Santa Barbara, fall 1985.
1985-1989 University of California, Santa Barbara. Ph.D. in geology, Sep. 1989.

PH.D. DISSERTATION

Numerical experiments of double-diffusive convection in magma bodies

RESEARCH INTERESTS

- Geologic Carbon Sequestration
 - Injection of CO₂ for carbon sequestration and enhanced gas recovery (CSEGR)
 - Near-surface leakage and seepage of CO₂
 - Risk assessment of geologic carbon sequestration sites
- Porous media compressed air energy storage (PM-CAES)
- Heat and mass transfer in geologic systems
- Dynamic behavior of subsurface systems where convection or gravity-driven flow processes occur (e.g., geothermal systems, gas reservoirs, magmatic systems, saturated and vadose zone hydrology, ferrofluid flow)
- Code development and applications
 - <http://esd1.lbl.gov/TOUGH2>
 - http://esd1.lbl.gov/FILES/research/projects/tough/licensing/TOUGH_EOS7C_flyer.pdf
 - <http://lnx.lbl.gov/GasEOS>

PROFESSIONAL EXPERIENCE

Geological Senior Scientist, LBNL, September 2013–present.
Geologic Carbon Sequestration Program Lead, LBNL, June 2008–present.
Staff Geological Scientist, LBNL, October 1994–August 2013.
Geologic Carbon Sequestration Program Deputy Lead, LBNL, April 2007–May 2008.
Hydrogeology Department Head, LBNL, May 2002–January 2006.
Geological Scientist, LBNL, July 1992–September 1994.
Post-doctoral Fellow, LBNL, October 1990–June 1992.
Post-doctoral researcher, U.C. Santa Barbara, October 1989– September 1990.
Research Assistant, U.C. Santa Barbara, July 1986–September 1989.
Teaching Assistant, U.C. Santa Barbara, October 1985–June 1986.
Assistant in Instruction, Princeton University, January–May 1985.
Assistant in Research, Princeton University, September–December 1984.
Assistant Field Geologist, Chevron Resources, March–August 1984.

PROFESSIONAL ACTIVITIES

Editor in Chief, *Greenhouse Gases: Science and Technology*, Wiley, January 2010 to present.
Guest Editor of Special Issue on Geologic Carbon Sequestration, six papers, *Greenhouse Gases: Science and Technology*, vol. 3(6), 425-540, 2013
Organizing Committee member, TOUGH Symposium, 2006, 2012.
Faculty Affiliate, Energy Resources Group, U.C. Berkeley, January 2010 to present.
Guest Editor of Special Issue on Geologic Carbon Sequestration, 15 papers, *Transport in Porous Media*, 82(1), 2010.
Co-Chair of Organizing Committee (with Hui Hai Liu) of the 2009 Philomathia Forum on Energy and Environment, Berkeley-Stanford-Beijing Workshop on CCS, held in Beijing, China, 11-12 November 2009.
Co-Convenor (with JP Nicot) of session at AGU Fall 2007 meeting, Monitoring and Modeling of CO₂ Migration Related to Geological Carbon Storage, December 2007.
Co-Guest Editor of *Energy Conversion and Management* Special Issue on TOUGH2 Applications in CO₂ Storage and CH₄-Hydrate Research, 2006.
Associate editor of *Carbon Dioxide Capture for Storage in Deep Geologic Formations*, Vol. 2, D.C. Thomas and S.M. Benson, eds., Elsevier, 2005.
Co-Guest Editor of *Vadose Zone Journal* Special Issue on TOUGH2 Applications in Hydrology, *Vadose Zone Journal*, 3, August 2004.
Guest Editor of *Transport in Porous Media* Special Issue on Strongly Coupled Density-Dependent Flow in Porous Media, *Transport in Porous Media*, 47(2), May 2002.

COMMITTEE SERVICE AND ADVISORY BOARDS

LBNL Earth Sciences Division Professional Staff Committee, July 1, 2014 to present.

LBNL Staff Committee, July 1, 2014 to present.

LBNL postdoc workshop, served on three-member panel for discussion on “Job Hunting at National Labs,” August 8, 2012.

GHGT-11, Kyoto, Japan, Expert Review Panel, 2012.

Advisory Board, ULTimateCO₂ Project, “Understanding the Long-Term fate of geologically stored CO₂,” BRGM, France, 2011-present.

LBNL Materials for Energy Applications (MEA) workshop, Claremont Hotel, January 31-February 1, 2012, led development of two posters on CCS research conducted at eight National Laboratories.

TOUGH Steering Committee, Earth Sciences Division, LBNL, 2011-present.

LBNL Carbon Cycle 2.0 Steering Committee, 2011-present

LBNL Earth Sciences Division, Center for Nanoscale Control of Geologic Carbon (NCGC) Advisory Committee, 2011-present

Annual Carbon Capture, Utilization, and Storage Conference, Pittsburgh, PA, Conference Advisor, 2011-present.

LBNL Information Technology Advisory Committee (ITAC), ESD representative 2006-2009.

INVITED TALKS

Sixth International Environmental Forum on CCS, Korea, July 21-23, 2015, Seoul, Korea.

American Chemical Society National Meeting and Exposition, Geochemistry Section, session on CO₂ Trapping and Enhanced Hydrocarbon Recovery, August 10-14, 2014, San Francisco, CA.
“Simulations of porous media compressed air energy storage (PM-CAES) with CO₂ as cushion gas.”

The 1st U.S. – Korea Clean Energy and Clean Tech Forum, Claremont Hotel, Berkeley, November 21, 2013, “Grid-scale porous media compressed air energy storage (PM-CAES).”

TOUGH Short Course, after-dinner speech, September 9, 2013.

IEAGHG Joint Network Meeting on Modeling and Risk Management, Trondheim, Norway, June 11, 2013, “Process Modeling of Wellbore Leakage for GCS Risk Assessment.”

Gordon Research Conference, Invited Plenary Speaker, Les Diablerets, Switzerland, June 28, 2012, “On Carbon Sequestration and Utilization: CO₂ as Cushion Gas for Energy Storage.”

Big Sky Carbon Sequestration Partnership Annual Meeting, Great Falls, MT, April 18-19, 2012, “Geologic Modeling and Flow Simulation.”

Stanford University, Energy Resources Engineering, seminar, April 10, 2012, “On the Utilization of CO₂ as a Cushion Gas for Compressed Air Energy Storage.”

U.C. Berkeley, Energy Resources Group, seminar, February 8, 2012, “Geologic Carbon Dioxide Sequestration: A Direct Approach to Reducing Point-Source CO₂ Emissions.”

U.S. DOE Saline Formation GCS R&D Needs Workshop, October 18-21, 2011, “Simulation.”

U.C. Irvine, ICEPAG (Int. Colloq. on Env. Preferred Adv. Power Gen.), February 10-12, 2011, Costa Mesa, CA., “Coupling Geologic Carbon Sequestration and Compressed Air Energy Storage.”

U.C. Berkeley, Civil and Environmental Engineering, seminar, October 15, 2010, “Reducing Fossil Fuel CO₂ Emissions by Geologic Carbon Sequestration and Compressed Air Energy Storage.”

Berkeley Lab Science at the Theater, “Just Say No to Carbon Emissions,” Berkeley Repertory Theater, April 26, 2010, “Understanding Geologic Carbon Sequestration.”

LBL Summer Lecture Series, seminar, July 21, 2009, “Geologic Carbon Sequestration: Mitigating Climate Change by Injecting CO₂ Underground.”

Stanford University, Environmental Fluid Mechanics and Hydrology, seminar, February 2, 2009, “Modeling CO₂ Leakage from Geologic Carbon Sequestration (GCS) Sites for Monitoring Design and Impact Assessment.”

U.C. Berkeley Institute of the Environment, seminar, November 13, 2008, “Geologic Carbon Sequestration: Near-Surface Challenges.”

U.C. Berkeley Energy Resources Collaborative (BERC) Conference, seminar, February 2008, “Challenges of Geologic Carbon Sequestration.”

Montana State University, Dept. of Chemistry/ZERT Project, seminar, April 11, 2007, “Near-Surface Dispersion of CO₂ Seepage from Geologic Storage Sites: Processes, Impacts, and Detection.”

Haas School of Business, March 6, 2007 “Geologic CO₂ storage: a safe and effective approach to reducing point-source CO₂ emissions.”

Energy INet Workshop, Calgary, January 26, 2006, “Migration Mechanisms and Potential Impacts of CO₂ Leakage and Seepage from CCS Projects.”

U.C. Davis, 2003, “Carbon Sequestration with Enhanced Gas Recovery.”

Stanford University, May 14, 2002, “CO₂ Injection for Carbon Sequestration with Enhanced Gas Recovery.”

TEACHING

U.C. Berkeley, Co-taught *The Berkeley Lectures on Energy: Carbon Capture and Storage* (Chm Eng C295Z), Fall 2011, Spring 2013, Spring 2014, Spring 2016.

Haas Professional School, geologic carbon sequestration, one lecture annually 2008-2014.

Haas School of Business class on Energy and Sustainability, one lecture, April 21, 2009.

Haas School of Business, one lecture, March 6, 2007.

PATENTS

Process for guidance, containment, treatment, and imaging in a subsurface environment utilizing ferrofluids, U.S. Patent No. 6,250,848 B1, June 26, 2001. Inventors: G.J. Moridis and C.M. Oldenburg.

AWARDS

2012 Editors' Citation for Excellence in Refereeing for *Water Resources Research*, July 12, 2013.

Lawrence Berkeley National Laboratory, 2012 Director's Award for Exceptional Achievement (for Tech Transfer related to the TOUGH codes).

DOE Secretary's Achievement Award 2011 for Deepwater Horizon Oil Spill Flow Rate Technical Group work, October 2011.

Geothermal Resources Council, Best paper award to Rutqvist, Oldenburg, Dobson, Garcia, and Walters, for "The northwest Geysers EGS demonstration project Phase 1: Pre-stimulation prediction coupled geomechanical modeling to guide stimulation and monitoring plans, 2010 GRC Annual Meeting, Sacramento, CA.

USGS Director's Award for Exemplary Service to the Nation, 2010 Deepwater Horizon Oil Spill Response.

Global Citizens Group Award at UN East Bay banquet on 10/24/08 at I-House. Honored for contribution to IPCC Special Report on Carbon Dioxide Capture and Storage.

Nobel Peace Prize 2007, IPCC shared with Al Gore, Jr., Contributing Author of the IPCC Special Report on Carbon Dioxide Capture and Storage.

PEER-REVIEWED JOURNAL ARTICLES

1. Oldenburg, C.M., S. Mukhopadhyay, and A. Cihan, On the use of Darcy's law and invasion percolation approaches for modeling large-scale geologic carbon sequestration, *Greenhouse Gases Science and Technology*, 5:19–33 (2016).
2. Birkholzer, J., C.M. Oldenburg, and Q. Zhou, CO₂ Migration and Pressure Evolution in Deep Saline Aquifers, *Int. J. Greenhouse Gas Control*, 40, 203-220, 2015.
3. Oldenburg, C.M., and N. Spycher, Will mercury impurities impact CO₂ injectivity in deep sedimentary formations? I. Condensation and net porosity reduction, *Greenhouse Gases: Sci. Tech.*, 2015.
4. Spycher, N., and C.M. Oldenburg, Will mercury impurities impact CO₂ injectivity in deep sedimentary formations? II. Mineral dissolution and precipitation, *Greenhouse Gases: Sci. Tech.*, 2015.

5. Pan, L., and C.M. Oldenburg. "T2Well—An integrated wellbore–reservoir simulator." *Computers & Geosciences* 65 (2014), 46-55.
6. Oldenburg, C.M., C. Doughty, and N. Spycher, The role of CO₂ in CH₄ exsolution from deep brine: Implications for geologic carbon sequestration, *Greenhouse Gases: Sci. Tech.*, 3(5), 359-377, 2013. *LBNL-6513E*.
7. Rutqvist, J., P.F. Dobson, J. Garcia, C. Hartline, P. Jeanne, C.M. Oldenburg, D.W. Vasco, and M. Walters, The Northwest Geysers EGS Demonstration Project, California: pre-stimulation modeling and interpretation of the stimulation, *Mathematical Geosciences*, 47(1) 3-29, 2015.
8. Birkholzer, J.T., J.-P. Nicot, C.M. Oldenburg, Q. Zhou, S. Kraemer, and K. Bandilla. "Reply to comments by Schnaar et al. on 'Brine flow up a well caused by pressure perturbation from geologic carbon sequestration: Static and dynamic evaluations' by Birkholzer et al." (2011). *International Journal of Greenhouse Gas Control*, 17, 544-545, 2013.
9. Vasco, D.W., J. Rutqvist, A. Ferretti, A. Rucci, F. Bellotti, P.F. Dobson, C.M. Oldenburg, J. Garcia, M. Walters, and C. Hartline, Monitoring deformation at The Geysers geothermal field, California, using C-band and X-band Interferometric Synthetic Aperture Radar, *Geophys. Res. Letts.*, 40, no. 11 (2013): 2567-2572.
10. Jordan, P.D., C.M. Oldenburg, and JP Nicot, Measuring and modeling fault density for CO₂ storage plume-fault encounter probability estimation, *AAPG Bulletin*, 97(4), 597-618, 2013.
11. Oldenburg, C.M., and L. Pan, Utilization of CO₂ as cushion gas for porous media compressed air energy storage, *Greenhouse Gases: Sci. Tech.*, 3(2), 124-135, 2013. *LBNL-6375E*.
12. Breunig, H.M., J.T. Birkholzer, A. Borgia, C.M. Oldenburg, P.N. Price, and T.E. McKone, Region evaluation of brine management for geologic carbon sequestration, *Int. J. Greenhouse Gas Control*, 14, 39-48, 2013.
13. Oldenburg, C.M., and L. Pan, Porous Media Compressed-Air Energy Storage (PM-CAES): Theory and Simulation of the Coupled Wellbore–Reservoir System, *Transport in Porous Media*, 97(2) 201-221, 2013. *LBNL-6529E*.
14. Mazzoldi, A., D. Picard, P.G. Sriram, and C.M. Oldenburg. Simulation-based estimates of safety distances for pipeline transportation of carbon dioxide, *Greenhouse Gases: Sci. Tech.*, 3(1), 66-83, 2013.
15. Nicot, J.-P., C.M. Oldenburg, J.E. Houseworth, and J.-W. Choi, Analysis of potential leakage pathways at the Cranfield, MS, USA, CO₂ sequestration site, *Int. J. Greenhouse Gas Control*, 18, 388-400, 2013.
16. Borgia, A., K. Pruess, T.J. Kneafsey, C.M. Oldenburg, and L. Pan, Numerical simulation of salt precipitation in the fractures of a CO₂-enhanced geothermal system, *Geothermics*, 44, 13-22, 2012. *LBNL-5709E*.
17. Oldenburg, C.M., C. Doughty, C.A. Peters, and P.F. Dobson, Simulations of long-column flow experiments related to geologic carbon sequestration: Effects of outer wall boundary condition

- on upward flow and formation of liquid CO₂, *Greenhouse Gases: Sci. and Tech.*, 2(4), 279–303, 2012. *LBNL-5811E*.
18. De Lary, L., A. Loschetter, O. Bouc, J. Rohmer, and C.M. Oldenburg, Assessing health impacts of CO₂ leakage from a geological storage site into buildings: Role of attenuation in the unsaturated zone and building foundation, *Int. J. Greenhouse Gas Control*, 9, 322-333, 2012.
 19. Pan, L., S.W. Webb, and C.M. Oldenburg, Analytical solution for two-phase flow in a wellbore using the drift-flux model, *Adv. Water Resour.*, 34(12), 1656-1665, 2011. *LBNL-5326E*.
 20. Oldenburg, C.M., B.M. Freifeld, K. Pruess, L. Pan, S. Finsterle, and G.J. Moridis. Numerical simulations of the Macondo well blowout reveal strong control of oil flow by reservoir permeability and exsolution of gas. *Proceedings of the National Academy of Sciences* 109, no. 50 (2012): 20254-20259, *LBNL-5302E*.
 21. Jordan, P.D., C.M. Oldenburg, and J.-P. Nicot (2011), Estimating the probability of carbon dioxide plumes encountering faults. *Greenhouse Gases: Sci. and Tech.*, 1(2), 160–174, 2011. *LBNL-5284E*.
 22. Pan, L., C.M. Oldenburg, Y.-S. Wu, and K. Pruess, Transient CO₂ leakage and injection in wellbore-reservoir systems for geologic carbon sequestration, *Greenhouse Gases: Sci. and Tech.*, 1(4), 335-350, 2011. *LBNL-5248E*.
 23. Birkholzer, J.T., J.-P. Nicot, C.M. Oldenburg, Q. Zhou, and S. Kraemer, Brine flow up a well caused by pressure perturbation from CO₂ storage: static and dynamic evaluations, *Int. J. Greenhouse Gas Control*, 5, 850-861, 2011. *LBNL-4864E*.
 24. Oldenburg, C.M. and A.P. Rinaldi, Buoyancy effects on upward brine displacement caused by CO₂ injection, *Transport in Porous Media*, 87(2), 525-540, 2011. *LBNL-4116E*.
 25. Oldenburg, C.M., and C. Doughty, Injection, Flow, and mixing of CO₂ in porous media with residual gas, *Transport in Porous Media*, 90, 201-218, 2011. *LBNL-4115E*.
 26. Mathias, S.A., J.G. Gluyas, C.M. Oldenburg, and C.-F. Tsang, Analytical solution for Joule–Thomson cooling during CO₂ geo-sequestration in depleted oil and gas reservoirs, *Int. J. Greenhouse Gas Control*, 4(5), 806-810, 2010. *LBNL-3660E*.
 27. Spangler, L.H., L.M. Dobeck, K.S. Repasky, A.R. Nehrir, S.D. Humphries, J.L. Barr, C.J. Keith, J.A. Shaw, J.H. Rouse, A.B. Cunningham, S.M. Benson, C.M. Oldenburg, J.L. Lewicki, A.W. Wells, J.R. Diehl, B.R. Strazisar, J.E. Fessenden, T.A. Rahn, J.E. Amonette, J.L. Barr, W.L. Pickles, J.D. Jacobson, E.A. Silver, E.J. Male, H.W. Rauch, K.S. Gullickson, R. Trautz, Y. Kharaka, J.T. Birkholzer, L. Wielopolski, (2010). A shallow subsurface controlled release facility in Bozeman, Montana, USA, for testing near surface CO₂ detection techniques and transport models. *LBNL-3079E. Environmental Earth Sciences*, 60(2), 227-239.
 28. Oldenburg, C.M., J.L. Lewicki, L. Pan, L. Dobeck, and L. Spangler, Origin of the patchy emission pattern at the ZERT CO₂ release test, *Env. Earth Sci.*, 60(2), 241-250, 2010. *LBNL-3063E*.

29. Pan, L., J.L. Lewicki, C.M. Oldenburg, and M.L. Fisher, Time-windows-based filtering method for near-surface detection of leakage from geologic carbon sequestration sites, *Env. Earth Sci.*, 60(2), 359-369, 2010. *LBNL-3349E*.
30. Cortis, A., and C.M. Oldenburg, Short-range atmospheric dispersion of carbon dioxide, *Boundary-Layer Meteorology*, 133, 17-34, 2009. *LBNL-2964E*.
31. Oldenburg, C.M., J.L. Lewicki, L. Dobeck, and L. Spangler, Modeling gas transport in the shallow subsurface during the ZERT CO₂ release test, *Transport in Porous Media*, 82(1), 77-92, 2010. *LBNL-1529E*.
32. Price, P.N. and C.M. Oldenburg, The consequences of failure should be considered in siting geologic carbon sequestration projects, *Int. J. Greenhouse Gas Control*, 3(5), 658-663, 2009. *LBNL-2051E*.
33. Oldenburg, C.M., S.L. Bryant, and J.-P. Nicot, Certification framework based on effective trapping for geologic carbon sequestration, *Int. J. Greenhouse Gas Control*, 3, 444-457, 2009. *LBNL-1549E*.
34. Lewicki, J.L., G.E. Hilley, M.L. Fischer, L. Pan, C.M. Oldenburg, L. Dobeck, and L. Spangler, Eddy covariance observations of surface leakage during shallow subsurface CO₂ releases, *J. Geophys. Res.*, 114, D12302, 2009. *LBNL-1879E*.
35. Zhang, Y., C.M. Oldenburg, and S. Finsterle, Percolation-theory and fuzzy rule-based probability estimation of fault leakage at geologic carbon sequestration sites, *Env. Earth Sci.*, 59(7), 1447-1459, 2009. *LBNL-2172E*.
36. Gu, C., F. Maggi, W.J. Riley, G.M. Hornberger, T. Xu, C.M. Oldenburg, N. Spycher, N.L. Miller, R.T. Venterea, and C. Steefel, Aqueous and gaseous nitrogen losses induced by fertilizer application, *J. Geophys. Res. Biogeosci.*, 114, G01006, 2008. *LBNL-1689E*.
37. Cortis, A., C.M. Oldenburg, and S.M. Benson, The role of optimality in characterizing CO₂ seepage from geologic carbon sequestration sites, *Int. J. Greenhouse Gas Control*, 2, 640-652, 2008. *LBNL-1417E*.
38. Maggi, F., C. Gu, W.J. Riley, G.M. Hornberger, R.T. Venterea, T. Xu, N. Spycher, C. Steefel, N.L. Miller, and C.M. Oldenburg, A mechanistic treatment of the dominant soil nitrogen cycling processes: Model development, testing, and application, *J. Geophys. Res. Biogeosci.*, 113, G02016, 2008. *LBNL-486E*.
39. Lewicki, J.L., C.M. Oldenburg, L. Dobeck, and L. Spangler, Surface CO₂ leakage during two shallow subsurface CO₂ releases, *Geophys. Res. Lett.*, 34, L24402, 2007. *LBNL-63528*.
40. Oldenburg, C.M., Screening and ranking framework for geologic CO₂ storage site selection on the basis of health, safety, and environmental risk, *Environmental Geology*, 54, 1687-1694, 2008. *LBNL-63306*.
41. Oldenburg, C.M., Joule-Thomson cooling due to CO₂ injection into natural gas reservoirs, *Energy Conversion and Management*, 48, 1808-1815, 2007. *LBNL-60158*.

42. Zhang, Y., C.M. Oldenburg, S. Finsterle, and G.S. Bodvarsson, System-level modeling for economic evaluation of geological CO₂ storage in gas reservoirs, *Energy Conversion and Management*, 48, 1827-1833, 2007. *LBNL-62617*.
43. Oldenburg, C.M. and J.L. Lewicki, On leakage and seepage of CO₂ from geologic storage sites into surface water, *Env. Geol.*, 50(5), 691-705, 2006. *LBNL-59225*.
44. Lewicki, J.L., G.E. Hilley, and C.M. Oldenburg, An improved strategy to detect CO₂ leakage for verification of geologic carbon sequestration, *Geophys. Res. Letts.*, 32, L19403, 2005. *LBNL-57414*.
45. Su, G.W., B.M. Freifeld, C.M. Oldenburg, P.D. Jordan, and P.F. Daley, Interpreting Velocities from Heat-Based Flow Sensors by Numerical Simulation, *Ground Water*, 44(3), 386-393, 2005. *LBNL-57975*.
46. Oldenburg, C.M. and A.J.A. Unger, Coupled vadose zone and atmospheric surface-layer transport of CO₂ from geologic carbon sequestration sites, *Vadose Zone Journal*, 3, 848-857, 2004. *LBNL-55510*.
47. Zhang, Y., C.M. Oldenburg, and S.M. Benson, Vadose zone remediation of carbon dioxide leakage from geologic carbon dioxide sequestration sites, *Vadose Zone Journal*, 3, 858-866, 2004. *LBNL-54680*.
48. Oldenburg, C.M., S.W. Webb, K. Pruess, and G.J. Moridis, Mixing of stably stratified gases in subsurface reservoirs: a comparison of diffusion models, *Trans. Porous Med.*, 54(3), 323-334, 2004. *LBNL-51545*.
49. Borglin, S.E., T.C. Hazen, C.M. Oldenburg, and P.T. Zawislanski, Comparison of aerobic and anaerobic biotreatment of municipal solid waste, *J. Air and Waste Management Assoc.*, 54, 815-822, 2004. *LBNL-50576*.
50. Todesco, M., J. Rutqvist, G. Chiodini, K. Pruess, and C.M. Oldenburg, Modeling of recent volcanic episodes at Phlegrean Fields (Italy): Geochemical variations and ground deformation. *Geothermics*, 33(4), 531-537, 2004. *LBNL-53603*.
51. Oldenburg, C.M., S.H. Stevens, and S.M. Benson, Economic feasibility of carbon sequestration with enhanced gas recovery (CSEGR), *Energy*, 29, 1413-1422, 2004. *LBNL-49762*.
52. Pruess, K, J. Garcia, T. Kavscek, C. Oldenburg, J. Rutqvist, C. Steefel, and T. Xu, Code intercomparison builds confidence in numerical simulation models for geologic disposal of CO₂, *Energy*, 29, 1431-1444, 2004. *LBNL-52211*.
53. Oldenburg, C.M. and A.J.A. Unger, On leakage and seepage from geologic carbon sequestration sites: unsaturated zone attenuation, *Vadose Zone Journal*, 2(3), 287-296, 2003. *LBNL-51928*.

54. Salve, R., C.M. Oldenburg and J.S.Y. Wang, In situ flow experiments in nonwelded tuff: conceptual models and implications for flow in the PTn., *J. Contam. Hydrol.*, 62-63, 269-286, 2003. *LBNL-48869*.
55. Oldenburg, C.M., Carbon dioxide as cushion gas for natural gas storage, *Energy & Fuels*, 17, 240-246, 2003. *LBNL-51053*.
56. Zhou, Q.L., H.-H. Liu, G.S. Bodvarsson, and C.M. Oldenburg, Flow and transport in unsaturated fractured rock: effects of multiscale heterogeneity of hydrogeologic properties, *J. Contam. Hydrol.*, 60, 1-30, 2003. *LBNL-50503*.
57. Salve, R. and C.M. Oldenburg, Water flow within a fault in altered nonwelded tuff, *Water Resour. Res.*, 37(12), 3043-3056, 2001. *LBNL-45844*.
58. Oldenburg, C.M., K. Pruess, and S.M. Benson, Process modeling of CO₂ injection into natural gas reservoirs for carbon sequestration and enhanced gas recovery, *Energy & Fuels*, 15, 293-298, 2001. *LBNL-45820*.
59. Oldenburg, C.M. and K. Pruess, Simulation of propagating fronts in geothermal reservoirs with the implicit Leonard total variation diminishing scheme, *Geothermics*, 29, 1-25, 2000. *LBNL-42620*.
60. Oldenburg, C.M., S.E. Borglin, and G.J. Moridis, Numerical simulation of ferrofluid flow for subsurface environmental engineering applications, *Trans. Porous Med.*, 38, 319-344, 2000. *LBNL-40146*.
61. Borglin, S.E., G.J. Moridis, and C.M. Oldenburg, Experimental studies of the flow of ferrofluid in porous media, *Trans. Porous Med.*, 41, 61-80, 2000. *LBNL-40126*.
62. Freifeld, B.M. and C.M. Oldenburg, The restricted interval Guelph permeameter: theory and application, *Water Resour. Res.*, 36(6), 1373-1380, 2000. *LBNL-42135*.
63. Oldenburg, C.M. and K. Pruess, Plume separation by transient thermohaline convection in porous media, *Geophys. Res. Lett.*, 26(19), 2997-3000, 1999. *LBNL-43133*.
64. Oldenburg, C.M. and K. Pruess, Layered thermohaline convection in hypersaline geothermal systems, *Trans. Porous Med.*, 33, 26-63, 1998. *LBNL-39350*.
65. Bennett, D.H., A.L. James, T.E. McKone, and C.M. Oldenburg, On uncertainty in remediation analysis: variance propagation from subsurface transport to exposure modeling, *Reliability Engineering and System Safety*, 62, 117-129, 1998. *LBNL-41335*.
66. Pruess, K., S. Finsterle, G. Moridis, C. Oldenburg, and Y.-S. Wu, General-Purpose Reservoir Simulators: The TOUGH2 Family, *GRC Bulletin*, 26(2), 53-57, both *LBNL-39927*, *LBNL-40140*, 1997.
67. James, A.L. and C.M. Oldenburg, Linear and Monte Carlo uncertainty analysis for subsurface contaminant transport simulation, *Water Resour. Res.*, 33(11), 2495-2508, 1997. *LBL-38507*.

68. Oldenburg, C.M., K. Pruess, and B.J. Travis, Reply to Comment on “Dispersive transport dynamics in a strongly coupled groundwater brine flow system,” *Water Resour. Res.*, 32(11), 3411–3412, 1996.
69. Oldenburg, C.M. and K. Pruess, Mixing with first-order decay in variable velocity porous media flow, *Trans. Porous Med.*, 22, 161–180, 1996. *LBL-35735*.
70. Spera, F.J., C.M. Oldenburg, C. Christensen, and M. Todesco, Simulations of convection with crystallization in the system $\text{KAlSi}_2\text{O}_6\text{-CaMgSi}_2\text{O}_6$: Implications for compositionally zoned magma bodies, *Am. Mineralogist*, 80, 1188–1207, 1995.
71. Oldenburg, C.M. and K. Pruess, Dispersive transport dynamics in a strongly coupled groundwater brine flow system, *Water Resour. Res.*, 31(2), 289–302, 1995. *LBL-34487*.
72. Oldenburg, C.M. and K. Pruess, On numerical modeling of capillary barriers, *Water Resour. Res.*, 29(4), 1045–1056, 1993. *LBL-32229*.
73. Oldenburg, C.M. and F.J. Spera, Hybrid model for solidification and convection, *Num. Heat Trans. B*, 21, 217–229, 1992. *LBL-29899*.
74. Oldenburg, C.M. and F.J. Spera, Modeling transport processes in nonlinear systems: The example of solidification and convection, in Chaotic Processes in the Geological Sciences, *The IMA Volumes in Mathematics and its Applications*, 41, D.A. Yuen, ed., Springer, 317 pp., 1992.
75. Oldenburg, C.M. and F.J. Spera, Numerical modeling of solidification and convection in a viscous pure binary eutectic system, *Int. J. Heat and Mass Trans.*, 34, 2107–2121, 1991.
76. Oldenburg, C.M., F.J. Spera, and D.A. Yuen, Self-organization in convective magma mixing, *Earth Sci. Revs.*, 29, 331–348, 1990.
77. Oldenburg, C.M., F.J. Spera, D.A. Yuen, and G. Sewell, Dynamic mixing in magma bodies: theory, simulations, and implications, *J. of Geophys. Res.*, 94(B7), 9215–9236, 1989.
78. Spera, F.J., C.M. Oldenburg, and D.A. Yuen, Magma Zonation: Effects of chemical buoyancy and diffusion, *Geophys. Res. Lett.*, 16, 1387–1390, 1989.

OTHER ARTICLES PUBLISHED IN JOURNALS

Editorials

1. Oldenburg, Curtis M., “Which comes first, CCUS or commercial viability of CCUS?” *Greenhouse Gases: Sci. and Tech.*, 4(3), 257-258, June 2014.
2. Oldenburg, Curtis M., and N. Spycher, Introduction to the Special Issue on Simulation of Geologic Carbon Sequestration with the TOUGH codes, *Greenhouse Gases: Science and Technology*, 3(6), 425-426, December 2013.

3. Oldenburg, Curtis M. “Selected papers from the 11th US annual conference on Carbon Capture, Utilization, and Sequestration.” *Greenhouse Gases: Science and Technology*, 3(1), 1-2, 2013.
4. Oldenburg, C.M., The risk of induced seismicity: Is cap rock integrity on shaky ground? *Greenhouse Gases: Sci. and Tech.*, 2(4), 217-218, 2012. *LBNL-6210E*.
5. Oldenburg, C.M., Why we need the “and” in CO₂ utilization and storage, *Greenhouse Gases: Sci. and Tech.*, 2(1), 1–2, 2012, *LBNL-5526E*.
6. Oldenburg, C.M., Improved understanding of geologic CO₂ storage processes requires risk-driven field experiments, *Greenhouse Gases: Sci. and Tech.*, 1(3), 191-193, 2011. *LBNL- 5131E*.
7. Oldenburg, C.M., and Maroto-Valer, M., Welcome, *Greenhouse Gases: Sci. and Tech.*, 1(1), 1-2, 2011. *LBNL-5287E*.

Features

1. Oldenburg, C.M., Health, safety, and environmental risks from energy production: A year-long reality check, *Greenhouse Gases: Sci. and Tech.*, 1(2), 102-104, 2011. *LBNL-5132E*.
2. Oldenburg, C.M., On carbon footprints and growing energy use, *Greenhouse Gases: Sci. and Tech.*, 1(1), 5-7, 2011. *LBNL-5130E*.

Forewords

1. Oldenburg, C.M., and N. Spycher, Introduction to the Special Issue on Simulation of Geologic Carbon Sequestration with the TOUGH codes (pages 425–426), *Greenhouse Gases Science and Technology*, 3(6), 2013.
2. Oldenburg, C.M., March 2010, Transport in Geologic CO₂ Storage Systems, Foreword to *Trans. in Por. Med.* Special Issue, DOI: 10.1007/s11242-009-9526-7, March 2010.
3. Oldenburg, C.M., Kneafsey, T.J. and Rutqvist, J., June 2007, Foreword to the Special Issue containing research results generated using the TOUGH codes, *Energy Conversion and Management*, 48(6), 1759, 2007.
4. Oldenburg, Curtis M. “Foreword to the Special Issue containing research results generated using the TOUGH codes-Dedication.” (2007): 1760-1760.
5. Finsterle, S. and C.M. Oldenburg, August 2005, (Preface) Research advances in vadose zone hydrology through simulations with the TOUGH codes: Preface from the guest editors, *Vadose Zone Journal*, 3(3), 737, 2005. *LBNL-55814*.
6. Oldenburg, C.M., Foreword to the special issue on strongly coupled density-dependent flow in porous media, *Trans. Porous Med.*, 47(2), 123-124, 2002. *LBNL-49076*.

BOOKS

1. Smit, B., J.A. Reimer, C.M. Oldenburg, and I.C. Bourg (2014), *Introduction to Carbon Capture and Sequestration*, Imperial College Press, London, 580 pp.

BOOK CHAPTERS

1. Pan, L. and C.M. Oldenburg, Rigorous process simulation of compressed air energy storage (CAES) in porous media systems, in *Computational Models for CO₂ Sequestration and Compressed Air Energy Storage*, Rafid al Khoury, and Jochen Bundschuh, editors, Taylor and Francis/CRC Press, April 21, 2014, 574 pp.
2. Oldenburg, C.M., Geologic Carbon Sequestration: Sustainability and Environmental Risk, *Encyclopedia of Sustainability Science and Technology*, Springer Science+Business Media, LLC, 2011, *LBNL-4893E*.
3. Oldenburg, C. and J.T. Birkholzer (2011), Comparative assessment of status and opportunities for geologic carbon sequestration and nuclear waste disposal in North America. In: F. Toth (ed.), IAEA, Vienna, Austria, *Geological Disposal of CO₂ and Radioactive Waste: A Comparative Assessment, Advances in Global Change Research*, 44(2) 367-393, 2011. *LBNL-3492E*.
4. Audigane, P., J. Lions, I. Gaus, C. Robelin, P. Durst, V. van der Meer, K. Geel, C. Oldenburg, and T. Xu, Geochemical modeling of CO₂ injection into a methane gas reservoir at the K12-B field, North Sea, in M. Grobe, J.C. Pashin, and R.L. Dodge, eds., *Carbon dioxide sequestration in geological media—State of the science: AAPG Studies in Geology*, 59, 499-519, 2009.
5. Oldenburg, Curtis M., Steven L. Bryant, Jean-Philippe Nicot, Navanit Kumar, Yingqi Zhang, Preston Jordan, Lehua Pan, Patrick Granvold, Fotini K. Chow, Model Components of the Certification Framework for Geologic Carbon Sequestration Risk Assessment, in *Carbon Dioxide Capture for Storage in Deep Geological Formations, Volume 3*, L.I. Eide (Ed.), CPL Press and BP, 2009. *LBNL-2038E*.
6. Oldenburg, C.M., Geologic carbon sequestration: CO₂ transport in depleted gas reservoirs, 419-425, Chap. 26, in Ho, C.K., and S.W. Webb, eds., *Gas Transport in Porous Media*, Springer, part of the series *Theory and Applications of Transport in Porous Media*, Jacob Bear, Series Editor, vol. 20, Dordrecht, The Netherlands, 2006. *LBNL-63337*.
7. Oldenburg, Curtis M., Migration mechanisms and potential impacts of CO₂ leakage and seepage, in Wilson and Gerard, editors, *Carbon Capture and Sequestration Integrating Technology, Monitoring, and Regulation*, pp 127-146, Blackwell Publishing, 2007. *LBNL-58872*.
8. Oldenburg, C.M., Modeling of near-surface leakage and seepage of CO₂ for risk characterization, in *Carbon Dioxide Capture for Storage in Deep Geologic Formations, Vol. 2*, D.C. Thomas and S.M. Benson, eds., pp 1205–1216, Elsevier, 2005. *LBNL-55493*.
9. Intergovernmental Panel on Climate Change, (IPCC) *Special Report on CO₂ Capture and Storage*, Chap. 5, S.M. Benson and P.J. Cook (Eds.), contributing author, (Bert Metz, Ogunlade Davidson,

Heleen de Coninck, Manuela Loos and Leo Meyer (Eds.)), Cambridge University Press, UK. pp 431, 2005.

10. Bodvarsson, G., S. Finsterle, H.H. Liu, C.M. Oldenburg, K. Pruess, E.L. Sonnenthal, and Y.-S. Wu, Flow and transport modeling of the vadose zone, *Vadose Zone Science and Technology Solutions, Vols. I and II*, 591-827, 2000.

COMPUTER USER GUIDES

1. Oldenburg, C.M., EOS7CA Version 1.0: TOUGH2 module for gas migration in shallow subsurface porous media systems, Lawrence Berkeley National Laboratory Report, *LBL-175204*, March 2015.
2. Pan, L., C.M. Oldenburg, Y. Wu, and K. Pruess, [*T2Well/ECO2N Version 1.0: Multiphase and Non-Isothermal Model for Coupled Wellbore-Reservoir Flow of Carbon Dioxide and Variable Salinity Water*](#), Lawrence Berkeley National Laboratory Report *LBL-4291E*, 2011.
3. Pruess, K., C.M. Oldenburg, and G.J. Moridis. TOUGH2 User's Guide Version 2. E. O. Lawrence Berkeley National Laboratory Report *LBL-43134*, 1999; and *LBL-43134* (revised), 2012.
4. Oldenburg, Curtis M., Atmospheric Dispersion Capability for T2VOC, Lawrence Berkeley National Laboratory Report *LBL-58870*, August 2005.
5. Oldenburg, C.M., G.J. Moridis, N. Spycher, and K. Pruess, EOS7C Version 1.0: TOUGH2 Module for Carbon Dioxide or Nitrogen in Natural Gas (Methane) Reservoirs, Lawrence Berkeley National Laboratory Report *LBL-56589*, March 2004.
6. Oldenburg, Curtis M., T2LBM: Landfill Bioreactor Model for TOUGH2 Version 1.0, Lawrence Berkeley National Laboratory Report *LBL-47961*, April 2001.
7. Oldenburg, Curtis M. and Karsten Pruess. EOS7R: Radionuclide Transport for TOUGH2, Lawrence Berkeley Laboratory Report *LBL-34868*, 1995.
8. Oldenburg, Curtis M. and K. Pruess. A Two-Dimensional Dispersion Module for the TOUGH2 Simulator, Lawrence Berkeley Laboratory Report *LBL-32505*, 1993.

SELECTED REPORTS

1. Spycher, N., and C.M. Oldenburg, Modeling CO₂-Brine-Rock Interaction Including Mercury and H₂S Impurities in the Context of CO₂ Geologic Storage, Lawrence Berkeley National Laboratory Report *LBL-6586E*, January 2014.
2. Zhou, Q., C.M. Oldenburg, N. Spycher, L. Pan, and A. Cihan (2013), Milestone Report: Summary of Site Characterization, Data Collection and Review, Development of Static Geologic Model, and Preliminary Multiphase Flow and Reactive Transport Modeling Activities. LBNL Deliverable to the Big Sky Carbon Sequestration Partnership. LBNL Report *LBL-6519E*, 2013.

3. Breunig, H.M., J.T. Birkholzer, A. Borgia, C.M. Oldenburg, P.N. Price, and T.E. McKone, Assessment of Brine Management for Geologic Carbon Sequestration, Lawrence Berkeley National Laboratory Report *LBL-6361E*, August 2013.
4. Jordan, P.D., C.M. Oldenburg, and J.-P. Nicot, Measuring and modeling fault density for plume-fault encounter probability estimation. Lawrence Berkeley Laboratory Report *LBL-4538E*, 2011.
5. Houseworth, J.E., C.M. Oldenburg, A. Mazzoldi, A.K. Gupta, J.-P. Nicot, and S.L. Bryant, Leakage Risk Assessment for a Potential CO₂ Storage Project in Saskatchewan, Canada. Lawrence Berkeley Laboratory Report *LBL-4915E*, 2011.
6. Nicot, Jean-Philippe, James E. Houseworth, Curtis M. Oldenburg, Jong-Won Choi, Hamid Reza Lashgari, Stuart Coleman, Timothy A. Meckel, Preston Jordan, Alberto Mazzoldi, (2011) Certification Framework: Case Study V, Leakage Risk Assessment for the SECARB Phase III CO₂ Storage Project at a Mississippi EOR Site.
7. Zhang, Y. and C. Oldenburg, A Simplified 1-D Model for Calculating CO₂ Leakage through Conduits, Lawrence Berkeley National Laboratory Report *LBL-3266E*, 2011.
8. Kennedy, B.M., E.L. Majer, D. Vasco, C. Oldenburg, J. Rutqvist, K. Pruess, and T. Kneafsey, Development of Fluid Injection Strategies for Optimizing Steam Production at The Geysers Geothermal Field, California, Lawrence Berkeley National Laboratory, *PIR-04-002*, Final Report – Draft 2, June 2010.
9. Oldenburg, C.M., K. Pruess, J.T. Birkholzer, and C. Doughty, Comments on Economides and Ehlig-Economides, “Sequestering carbon dioxide in a closed underground volume,” SPE 124430, October 2009, Lawrence Berkeley National Laboratory Report *LBL-3532E*, October 22, 2009.
10. Oldenburg, C.M., S.L. Bryant, J.-P. Nicot, M.J. Coombs, C. Doughty, P.D. Jordan, N. Kumar, and J. Wagoner, Preliminary risk assessment for WESTCARB's Phase 3 CO₂ injection at the Kimberlina Power Plant, San Joaquin Valley, California, Lawrence Berkeley National Laboratory, Internal Report, April, 2008.
11. Oldenburg, C.M., M.S. Torn, K.M. DeAngelis, J.B. Ajo-Franklin, R.G. Amundson, C.J. Bernacchi, G.M. Bond, E.L. Brodie, M. Carrera, J.N. Christensen, A.B. Cunningham, B. Fouke, T.C. Hazen, A.K. Jain, M. Kleber, K.G. Knauss, S. Nakagawa, K.L. O'Hara, W.J. Parton, W.L. Silver, J.W. Six, W.I. Stringfellow, T.K. Tokunaga, T. Xu, and D. Zilberman (2008). Biologically Enhanced Carbon Sequestration: Research Needs and Opportunities. Report on the Energy Biosciences Institute Workshop on Biologically Enhanced Carbon Sequestration, October 29, 2007, Lawrence Berkeley Laboratory Report *LBL-713E*.
12. Oldenburg, Curtis M., Health, Safety, and Environmental Screening and Ranking Framework for Geologic CO₂ Storage Site Selection, Lawrence Berkeley National Laboratory Report *LBL-58873*, September 2005.
13. Rebscher, D. and C.M. Oldenburg, Sequestration of Carbon Dioxide with Enhanced Gas Recovery—Case Study Altmark, North German Basin, Lawrence Berkeley National Laboratory Report *LBL-59033*, December 2005.

14. Oldenburg, C.M. and J.L. Lewicki, Leakage and seepage of CO₂ from geologic carbon sequestration sites: CO₂ migration into surface water, Lawrence Berkeley National Laboratory Report *LBL-57768*, June 2005.
15. Jordan, P.D., C.M. Oldenburg, and G.W. Su, Analysis of aquifer response, groundwater flow, and plume evolution at Site OU 1, former Fort Ord, California, Lawrence Berkeley National Laboratory Report *LBL-57251*, February 2005.
16. Su, G.W., B.M. Freifeld, C.M. Oldenburg, P.D. Jordan, and P.F. Daley, Simulation of in-situ permeable flow sensors for measuring groundwater flow velocity, Lawrence Berkeley National Laboratory Report *LBL-57084*, February 2005.
17. Benson, S.M., L.R. Myer, C.M. Oldenburg, and entire GEO-SEQ team, GEO-SEQ Best Practices Manual. Geologic Carbon Dioxide Sequestration: Site Evaluation to Implementation, Lawrence Berkeley National Laboratory Report *LBL-56623*, 2004.
18. Lewicki, J.L. and C.M. Oldenburg, Strategies for Detecting Hidden Geothermal Systems by Near-Surface Gas Monitoring, Lawrence Berkeley National Laboratory Report *LBL-56895*, December 2004.
19. Oldenburg, C.M., A.J. Unger, Y. Zhang, J.L. Lewicki, and P.D. Jordan, HSE risk assessment of deep geological storage sites, Final Report, *LBL-54411*, 12/12/2003.
20. Oldenburg, C.M., Y. Zhang, J.L. Lewicki, and P.D. Jordan, Preliminary application of a coupled modeling framework for CO₂ leakage and seepage at the Rio Vista gas field, Task 5 Report, *LBL-54051*, 10/31/2003.
21. Oldenburg, C.M., J.L. Lewicki, and R.P. Hepple, Near-surface monitoring strategies for geologic carbon dioxide storage verification, Lawrence Berkeley National Laboratory Report *LBL-54089*, October 2003.
22. Oldenburg, C.M. and A.J.A. Unger, Coupled Modeling Framework for CO₂ Leakage and Seepage Risk Assessment, Task 4 Report, *LBL-53009*, June 2003.
23. Oldenburg, C.M., A.J.A. Unger, and R.P. Hepple, On Atmospheric Dispersion of CO₂ Seepage from Geologic Carbon Sequestration Sites, Task 3 Report, *LBL-51734*, November 2002.
24. Pruess, K, J. Garcia, T. Kavscek, C. Oldenburg, J. Rutqvist, C. Steefel, and T. Xu, Intercomparison of numerical simulation codes for geologic disposal of CO₂, Lawrence Berkeley National Laboratory Report *LBL-51813*, 11/27/2002.
25. Oldenburg, C.M., T.E. McKone, R.P. Hepple, and A.J.A. Unger, Health Risks from Leakage and Seepage of CO₂ Sequestered in the Subsurface: Requirements and Design of a Coupled Model for Risk Assessment, Task 2 Report, *LBL-51131*, July 2002.
26. Oldenburg, C.M., A.J.A. Unger, R.P. Hepple, and P.D. Jordan, On Leakage and Seepage from Geologic Carbon Sequestration Sites, Task 1 Report, *LBL-51130*, July 2002.

27. Oldenburg, C.M., P.F. Daley, B.M. Freifeld, J. Hinds, and P.D. Jordan, Three-dimensional groundwater flow, aquifer response, and treatment system monitoring at site OU 1, Former Fort Ord, California, Lawrence Berkeley National Laboratory Report *LBNL-49586*, February 2002.
28. Kneafsey, T.J., C.M. Oldenburg, and R. Salve, The effect of clay swelling on fracture flow in the paintbrush nonwelded unit of the Topopah spring tuff, Lawrence Berkeley National Laboratory Report *LBNL-48125*, 2001.
29. Zawislanski, P.T., C.M. Oldenburg, C.A. Doughty, and B.M. Freifeld, Application of the vadose zone monitoring system at a TCE-contaminated site: Field data and modeling summary, E. O. Lawrence Berkeley National Laboratory Report *LBNL-44325*, September 1999.
30. Doughty, C., C.M. Oldenburg and A.L. James, Site S-7 VOC Transport modeling for the Vadose Zone Monitoring System (VZMS), McClellan AFB - 1999 Semi-Annual Report, *LBNL-43526*, 1999.
31. James, A.L. and C.M. Oldenburg. Site S-7 Representative Model and Application for the Vadose Zone Monitoring System (VZMS) McClellan AFB - 1998 Semi-Annual Report, *LBNL-42643*, 1998.
32. Borglin, S., G. Moridis and C. Oldenburg, "On magnetic fluid emplacement: Laboratory Experiments of Ferrofluid Flow," Lawrence Berkeley National Laboratory Report *LBNL-42203*, 1997.
33. James, A.L., and C.M. Oldenburg, Enhanced data analysis for the VZMS: Conceptual Model Design and Initial Application for the Vadose Zone Monitoring System (VZMS), McClellan AFB. 1998 Semi-Annual Report, *LBNL-41909*, 1998.
34. Moridis, G.J., S.E. Borglin, C.M. Oldenburg, and A. Becker. FY1997 Annual Report: Theoretical and Experimental Investigations of Ferrofluids for Guiding and Detecting Liquids in the Subsurface, Lawrence Berkeley National Laboratory Report *LBNL-41069*, 1998.
35. Zawislanski, P.T. and C.M. Oldenburg. Data analysis for preliminary conceptual model design, Vadose Zone monitoring system (VZMS), McClellan AFB. 1997 Annual Report, *LBNL-41262*, 1998.
36. Oldenburg, Curtis. Comparison of scale analysis and Numerical Simulation for Saturated Zone convective mixing processes, Lawrence Berkeley National Laboratory Report *LBNL-40365*, 1998.
37. Moridis, G., P. Persoff, J. Apps, A. James, C. Oldenburg, A. McGrath, L. Myer, L. Pellerin, and K. Pruess, A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site Using the Viscous Liquid Barrier Technology, *LBNL-38920*, 1996.
38. Oldenburg, C.M. and K. Pruess, Application of TOUGH2/EOS7R to Modeling of Radionuclide Release from a Low/Intermediate Level Repository under Two-Phase Conditions, Lawrence Berkeley Laboratory Report *LBNL-38837*, 1996.

39. Oldenburg, C.M. and K. Pruess, Numerical Simulation of Coupled Flow and Transport with TOUGH2: A Verification Study, Lawrence Berkeley National Laboratory Report *LBL-35273*, 1994.
40. Oldenburg, C.M., J.C.S. Long, J.S. Jacobsen, A.L. James, A.R. Kavscek, and H.S. Mountford, Onshore Oil Spill Impact: Data Assessment, Physical Processes, and Preliminary recommendations, Lawrence Berkeley Laboratory Report *LBNL-39256*, 1996.

SELECTED CONFERENCE PROCEEDINGS

1. Oldenburg, C.M., A. Cihan, Q. Zhou, S. Fairweather, and L.H. Spangler, Delineating area of review in a system with pre-injection relative overpressure, Proceedings of GHGT-12, Austin, Texas, 5-9 October, 2014, and *Energy Procedia 63* (2014), 3715-3722.
2. Nicot, J.-P., T.A. Meckel, D.A. Carr, and C.M. Oldenburg, Impact of induced seismic events on seal integrity, Texas Gulf Coast, Proceedings of GHGT-12, Austin, Texas, 5-9 October, 2014, and *Energy Procedia 63* (2014), 4807-4815.
3. Webb, S.W., and C.M. Oldenburg, EOS7C-ECBM: Modification of EOS7C to include enhanced coalbed methane and the dusty gas model, Proceedings, TOUGH Symposium 2012, Lawrence Berkeley National Laboratory, Berkeley, California, September 17-19, 2012.
-
4. Oldenburg, C.M., C. Doughty, C.A. Peters, and P.F. Dobson, Simulations of upward leakage of CO₂ in long-column flow experiments: effect of lateral boundary condition, Proceedings of GHGT-11, Kyoto Japan, 18-22 November, 2012.
5. Borgia, A., K. Pruess, T.J. Kneafsey, L. Pan, and C.M. Oldenburg, CO₂ utilization for enhanced geothermal energy recovery: effects of salt precipitation in a fractured reservoir (2013), Proceedings of GHGT-11, Kyoto Japan, 18-22 November, 2012, *Energy Procedia 37*, 6617-6624.
6. Oldenburg, C.M., and L. Pan, Utilization of CO₂ as cushion gas for compressed air energy storage, Proceedings of GHGT-11, Kyoto Japan, 18-22 November, 2012.
7. Pawar, R., G. Bromhal, R. Dilmore, B. Foxall, E. Jones, C. Oldenburg, P. Stauffer, S. Unwin, G. Guthrie, Quantification of Risk Profiles and Impacts of Uncertainties as part of US DOE's National Risk Assessment Partnership (NRAP), Proceedings of GHGT-11, Kyoto Japan, 18-22 November, 2012, *Energy Procedia 37* (2013), 4765-4773,.
8. Borgia, A., K. Pruess, T.J. Kneafsey, C.M. Oldenburg, and L. Pan, Simulation of CO₂-EGS in a fractured reservoir with salt precipitation, Proceedings of the Thirty-Seventh Workshop on Geothermal Reservoir Engineering, Stanford University, Stanford, California, January 30-February 1, 2012.
9. Saripalli, Prasad, Curt Oldenburg, Ben Walters, and N. Radheshyam. "Implementation and usability evaluation of a cloud platform for scientific computing as a service (scaas)." In Utility and cloud computing (ucc), 2011 fourth IEEE international conference on, pp. 345-354. IEEE, 2011.

10. Oldenburg, C.M., P.D. Jordan, J.-P. Nicot, A. Mazzoldi, A.K. Gupta, and S.L. Bryant, Leakage risk assessment of the In Salah CO₂ storage project: Applying the Certification Framework in a dynamic context. *LBNL-4278E. Energy Procedia*, 2, Elsevier, GHGT-10, Amsterdam, The Netherlands, Sept. 19–23, 2010.
11. Peters, C.A., P.F. Dobson, C.M. Oldenburg, J. S. Y. Wang, T.C. Onstott, G.W. Scherer, B.M. Freifeld, T.S. Ramakrishnan, E.L. Stabinski, K. Liang, and S. Verma (2010), LUCI: A facility at DUSEL for large-scale experimental study of geologic carbon sequestration. *LBNL-3983E. Energy Procedia*, 2, Elsevier, GHGT-10, Amsterdam, The Netherlands, Sept. 19–23, 2010.
12. Rutqvist, J., C.M. Oldenburg, and P.F. Dobson (2010), Predicting the spatial extent of injection-induced zones of enhanced permeability at the Northwest Geysers EGS Demonstration Project. *LBNL-3347E*. Presented at the 44th U.S. Rock Mechanics Symposium and 5th U.S.-Canada Rock Mechanics Symposium, Salt Lake City, Utah, June 27–30, 2010.
13. C.M. Oldenburg, J.L. Lewicki, L. Pan, and B.M. Freifeld, CO₂ Flow and mixing in the shallow subsurface and in depleted gas reservoirs, in TOUGH Symposium 2009 proceedings, *LBNL-2790E*, 2009.
14. Oldenburg, C.M., P. Jordan, Y. Zhang, J.-P. Nicot, and S.L. Bryant, Risk assessment framework for geologic carbon sequestration sites. *LBNL-3161E*. Paper Presented at 10th International Probabilistic Safety Assessment and Management Conference, Seattle, Washington, June 7–11, 2010, *LBNL-3161E*.
15. Nicot, Jean-Philippe, Curtis M. Oldenburg, Steven L. Bryant and Susan D. Hovorka, Pressure perturbations from geologic carbon sequestration: Area-of-review boundaries and borehole leakage driving forces, *Energy Procedia*, 1(1), 47-54, February 2009, *LBNL-3064E*.
16. Oldenburg, C.M., J.-P. Nicot, and S.L. Bryant, Case studies of the application of the Certification Framework to two geologic carbon sequestration sites, *Energy Procedia*, GHGT9 conference, Nov. 16-20, 2008, Washington DC. *LBNL-1421E*.
17. Pan, L., C.M. Oldenburg, Y.-S. Wu, and K. Pruess, Wellbore flow model for carbon dioxide and brine, *Energy Procedia*, GHGT9 conference, Nov. 16-20, 2008, Washington DC. *LBNL-1416E*.
18. Zhang, Y., C.M. Oldenburg, P.D. Jordan, S. Finsterle, and K. Zhang, Fuzzy Rule-Based Probability Estimation of Fault Leakage at Geologic Carbon Sequestration Sites, *Energy Procedia*, GHGT9 conference, Nov. 16-20, 2008, Washington DC. *LBNL-1415E*.
19. Lewicki, J.L, G.E. Hilley, M.L. Fischer, L. Pan, C.M. Oldenburg, L. Dobeck, and L. Spangler, 2008, Detection of CO₂ leakage by eddy covariance during the ZERT project's CO₂ release experiments, GHGT-9, Washington D.C., November 16-20, 2008.
20. Myer, L., T. Surles, C. Oldenburg, C. Doughty, and J. Wagoner, WESTCARB Large Volume CCS Test, presented at GHGT-9 Conference, Washington D.C., November 16-20, 2008.
21. Chow, F.K., P.W. Granvold, and C.M. Oldenburg, Modeling the effects of topography and wind on atmospheric dispersion of CO₂ surface leakage at geologic carbon sequestration sites, *Energy Procedia*, presented at GHGT9 Conference, Nov. 16-20, 2008, Washington DC., *LBNL-1420E*.

22. Doughty, C., L.R. Myer, and C.M. Oldenburg, Predictions of long-term behavior of a large-volume pilot test for CO₂ geological storage in a saline formation in the Central Valley, California, *Energy Procedia*, 1(1), 3291-3298, February 2009, GHGT9 conference, Nov. 16-20, 2008, Washington DC, *LBNL-1440E*.
23. Jordan, P.D., C.M. Oldenburg, and J.-P. Nicot, Characterizing fault-plume intersection probability for geologic carbon sequestration leakage risk assessment, *Energy Procedia*, GHGT9 conference, Nov. 16-20, 2008, Washington DC, *LBNL-1522E*.
24. Rutqvist J. and Oldenburg CM. Analysis of injection-induced micro-earthquakes in a geothermal steam reservoir, Geysers Geothermal Field, California. 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. 151. (2008). *LBNL-468E*.
25. J. Rutqvist, E. Majer, C. Oldenburg, P.J. and D.W. Vasco, Integrated modeling and field study of potential mechanisms for induced seismicity at The Geysers Geothermal Field, California, Geothermal Resources Council Annual Meeting 2006, Geothermal Resources Council, California, San Diego, CA, 10-13 September 2006, *LBNL-60939*.
26. Oldenburg, C.M., Screening and ranking framework for geologic CO₂ storage site selection, GHGT-8 June 19-22, 2006, Trondheim, Norway, *LBNL-63306 Conf*.
27. Lewicki, Jennifer L., Hilley, George E., Oldenburg, Curtis M., An improved strategy to detect carbon dioxide leakage for verification of geologic carbon sequestration, GHGT-8 June 19-22, 2006, Trondheim, Norway, *LBNL-58885 Conf*.
28. Lewicki, J.L., and C.M. Oldenburg, "Near-Surface CO₂ Monitoring And Analysis To Detect Hidden Geothermal Systems." In Proceedings, Thirtieth Workshop on Geothermal Reservoir Engineering, January 31-February 2, 2005, Stanford University, CA, *LBNL-56900*.
29. Oldenburg, C. M., and J.L. Lewicki, Leakage and Seepage in the Near-Surface Environment: An Integrated Approach to Monitoring and Detection, 7th International conference on Greenhouse Gas Control Technologies (GHGT-7), Vancouver, Canada, September 5-9, 2004, *LBNL-54283 Abs*.
30. Lewicki, J.L., and C.M. Oldenburg, Integrated near-surface monitoring and analysis for CO₂ storage verification, American Chemical Society National Meeting, Anaheim, CA, March 28-April 1, 2004, *LBNL-54076*.
31. Finsterle, Stefan; Moridis, George J.; Oldenburg, Curt M.; Wu, Yu-Shu, TOUGH Symposium 2003, Proceedings 2.0 (CD-ROM), TOUGH Symposium 2003, Berkeley Lab, May 12-14, 2003, *LBNL-52494*.
32. Oldenburg, Curtis M.; Unger, Andre A.J., Coupled subsurface-surface layer gas transport and dispersion for geologic carbon sequestration seepage simulation, TOUGH Symposium 2003, Berkeley, CA, May 12-14, 2003, *LBNL-52477*.
33. Oldenburg, Curtis M., Carbon sequestration in natural gas reservoirs: Enhanced gas recovery and natural gas storage, TOUGH Symposium 2003, Berkeley, CA, May 12-14, 2003, *LBNL-52476*.

34. Oldenburg, C.M., D.H.-S. Law, Y. LeGallo, and S.P. White, Mixing of CO₂ and CH₄ in gas reservoirs: code comparison studies, in *Greenhouse Gas Control Technologies*, vol. 1, 443–448, J. Gale and Y. Kaya (Eds.), Proceedings of the 6th International conference on greenhouse gas control technologies, Elsevier, August 2003, *LBNL-49763*.
35. Oldenburg, Curtis M. and Sally M. Benson. “CO₂ injection for enhanced gas production and carbon sequestration.” In *SPE IPCEM 2002*, Villa Hermosa, Mexico, Feb. 10-12, 2002, *LBNL-49232*.
36. Oldenburg, C.M. and S.M. Benson. “Carbon sequestration with enhanced gas recovery: Identifying candidate sites for pilot study.” In *First National Conference on Carbon Sequestration*; Washington, D.C.; May 14-17, 2001. *LBNL-47580*.
37. Pruess, Karsten, Chin-Fu Tsang, David Law, and Curt Oldenburg. Intercomparison of simulation models for CO₂ disposal in underground storage reservoirs. In *First National Conference on Carbon Sequestration*, May 2001, E. O. Lawrence Berkeley National Laboratory Report *LBNL-47353*.
38. Oldenburg, C.M., and K. Pruess, Thermohaline convective mixing at a brine interface, in *Proceedings of the 25th Stanford Geothermal Workshop*, Stanford, Jan. 24–26, 2000, *LBNL-45131*.
39. Oldenburg, C., S. Benson, K. Pruess, J. Daisey, N. Brown, L. Gold, and J. Macfarlane, The SELECT environmental remedy selection tool: a platform for multiphase transport modeling, *Proceedings of the 1995 ASME/AIChE National Heat Transfer Conference*, Portland OR, Aug. 5–9, 1995, *AIChE Symposium Series*, 91, 38–43, 1995, *LBNL-36634*.
40. Oldenburg, Curtis and Karsten Pruess. “Higher-order differencing for phase-front propagation in geothermal systems.” In *Proceedings of the 23rd Workshop on Geothermal Reservoir Engineering*, 127–134, Stanford University; January 26-28, 1998, *LBNL-41268*.
41. Cohen, Andrew J.B., C.M. Oldenburg, A.M. Simmons, Anil K. Mishra, and J. Hinds. “S4Z: Sub-Site-Scale Saturated Zone Model for Yucca Mountain.” In *International High-Level Waste Management Conference & Exposition*; Las Vegas, NV; May 11-14, 1998. *LBNL-41773*.
42. Oldenburg, Curtis and George Moridis. “Ferrofluid flow for TOUGH2.” In *TOUGH Workshop*; Berkeley, CA; May 21-23, 1998, *LBNL-41608*.
43. Oldenburg, Curtis and Karsten Pruess. “Higher-order differencing for front propagation in geothermal systems.” In *TOUGH Workshop*; Berkeley, CA; May 21-23, 1998, *LBNL-41607*.
44. Cohen, Andrew J.B. and C.M. Oldenburg. “Effects of Faulted Stratigraphy on Saturated Zone Flow Beneath Yucca Mountain, Nevada.” In *TOUGH Workshop 98*; Berkeley, CA; May 4-6, 1998, *LBNL-41774*.

45. Cohen, Andrew J.B. and Curtis M. Oldenburg. "Effects of faulted stratigraphy on Saturated Zone Flow Beneath Yucca Mountain, Nevada." In Field Testing and Associated Modeling of Potential High-Level Nuclear Waste Geologic Disposal Sites (FTAM) Conference; Berkeley, CA; December 15-16, 1997, *LBNL-41419*.
46. Pruess, Karsten, Curt Oldenburg, George Moridis, and Stefan Finsterle. "Water injection into vapor- and liquid-dominated reservoirs: Modeling of Heat Transfer and Mass Transport." In Geothermal Program Review 15; San Francisco, CA; March 25-26, 1997, *LBNL-40120*.
47. Oldenburg, Curtis M. and K. Pruess. "Higher-Order Differencing for Geothermal Reservoir Simulation." In Twenty-Second Workshop on Geothermal Reservoir Engineering; Stanford, CA; January 27-29, 1997, *LBNL-39870*.
48. Cohen, Andrew J.B. and Curtis M. Oldenburg. "Effects of faulted stratigraphy on Saturated Zone Flow Beneath Yucca Mountain, Nevada." In Field Testing and Associated Modeling of Potential High-Level Nuclear Waste Geologic Disposal Sites (FTAM) Conference; Berkeley, CA; December 15-16, 1997, *LBNL-41419*.
49. Finsterle, S., Curtis M. Oldenburg, A.L. James, K. Pruess, and G.J. Moridis. "Mathematical Modeling of Permeation Grouting and Subsurface Barrier Performance." In 1997 International Containment & Technology Conference & Exhibition; St. Petersburg, FL; February 9-12, 1997, *LBNL-39419*.
50. Moridis, G.J., A. James and Curtis M. Oldenburg. "Development of a Design Package for a Viscous Barrier at the Savannah River Site". In 1997 International Containment Technology Conference & Exhibition; St. Petersburg, FL; February 9-12, 1996, *LBNL-39487*.
51. Pruess, K., S. Finsterle, G.J. Moridis, Curtis M. Oldenburg, E. Antunez, and Y.S. Wu. "Advances in the TOUGH2 Family of General-Purpose Reservoir Simulators". In Geothermal Program Review XIV; Berkeley, CA; April 8-10, 1996, 63-69, *LBL-38573*.
52. Oldenburg, C.M., K. Pruess, and M.J. Lippmann, "Heat and Mass Transfer in Hypersaline Geothermal Systems". In Proceedings of the World Geothermal Congress, Florence Italy, 18-31 May 1995, 1647-1652, *LBL-35085*.
53. Oldenburg, C.M., R.L. Hinkins, G.J. Moridis, and K. Pruess, "On the Development of MP-TOUGH2". In Proceedings of the TOUGH Workshop 1995, 252-258, Berkeley, California; March 20-22, 1995. *LBL-36944*.
54. Oldenburg, Curtis M. and K. Pruess (editor). "Strongly Coupled Single-Phase Flow Problems: Effects of Density Variation, Hydrodynamic Dispersion, and First Order Decay". In TOUGH Workshop 1995; Berkeley, California; March 20-22, 1995. *LBL-36928*.
55. Oldenburg, Curtis M. "Double-diffusive Convection in Liquid-dominated Geothermal Systems with High-salinity Brines". 19th Annual Stanford Geothermal Workshop, Stanford, CA, and Lawrence Berkeley National Laboratory, January 1994. *LBL-35039*.

56. Oldenburg, C.M., and F.J. Spera, Simulation of phase change and convection in magma bodies, in *Heat Transfer in Earth Science Studies*, (ASME-HTD vol. 149), C. Carrigan and T.Y. Chu (eds.), 35–42, 1990, Proceedings of the ASME Heat Transfer Conference, Dallas, TX, 1990.

ABSTRACTS

1. Oldenburg, C.M., C. Doughty, and N. Spycher, Methane exsolution caused by CO₂ dissolution in brine: Numerical simulation studies, Eleventh Annual Conference on Carbon Capture, Utilization, and Storage, Pittsburgh, PA, May 13-17, 2013.
2. Oldenburg, C.M., and L. Pan, On the Utilization of CO₂ as a Cushion Gas, Tenth Annual Conference on Carbon Capture, Utilization, and Storage, Pittsburgh, PA, April 30-May 3, 2012.
3. Mazzoldi, A., D. Picard, P.G. Sriram, and C.M. Oldenburg, Safety issues for pipeline transportation of carbon dioxide within GCS projects, Tenth Annual Conference on Carbon Capture, Utilization, and Storage, Pittsburgh, PA, April 30-May 3, 2012.
4. Oldenburg, C.M., C. Doughty, C.A. Peters, and P.F. Dobson, The Impact of boundary conditions on long-column flow experiments related to geologic CO₂ storage, Transactions of the American Geophysical Union EOS, Fall Meeting, San Francisco, CA, December 5-9, 2011.
5. C.M. Oldenburg, C. Doughty, P.F. Dobson, C.A. Peters, Y.B. Altundas, N. Chugunov, E. Stabinski, T.S. Ramakrishnan, S. Verma, 2011. Simulations for design of very large-scale laboratory experiments of upward CO₂ flow with geophysical imaging, 10th Annual Conference on Carbon Capture and Sequestration, May 2-5, 2011, Pittsburgh, PA.
6. Oldenburg, C.M., and L. Pan, Utilization of CO₂ as a Cushion Gas for Compressed Air Energy Storage, 10th Annual Conference on Carbon Capture and Sequestration, May 2-5, 2011, Pittsburgh, PA.
7. A. Loschetter, A., L. De Lary, J. Rohmer, O. Bouc, C. M. Oldenburg, Modular toolbox for assessing the impacts of CO₂ leaking from a geological storage reservoir into a building, 10th Annual Conference on Carbon Capture and Sequestration, May 2-5, 2011, Pittsburgh, PA.
8. C.M. Oldenburg, C.A. Peters, P.F. Dobson, C. Doughty, Upward flow of supercritical CO₂ with transition to gaseous conditions: Simulations for design of large-scale CO₂ flow experiments at LUCI, Trans. American Geophysical Union EOS, Fall Meeting, San Francisco, CA, December 13-17, 2010.
9. Oldenburg, C.M., and A.P. Rinaldi, Dynamics of upward brine displacement caused by CO₂ injection, 9th Annual Conference on Carbon Capture and Sequestration, May 10-13, 2010, Pittsburgh, PA.
10. Oldenburg, C.M. and C. Doughty, Injection, Flow, and Mixing of CO₂ in Porous Media with Residual Gas, 9th Annual Conference on Carbon Capture and Sequestration, May 10-13, 2010, Pittsburgh, PA.

11. C.M. Oldenburg, S.L. Bryant, JP Nicot, Application of the Certification Framework for Geologic Carbon Sequestration Risk Assessment, Eighth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 4-7 May 2009.
12. C.M. Oldenburg, J.L. Lewicki, L. Pan, L. Dobeck, and L. Spangler, Modeling Near-Surface Migration of CO₂ for the ZERT CO₂ Shallow-Release Test, Eighth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 4-7 May 2009.
13. C.M. Oldenburg, S.L. Bryant, JP Nicot, The Certification Framework: Risk Assessment for Safety and Effectiveness of Geologic Carbon Sequestration, American Geophys. Union Fall Meeting, San Francisco, CA, December 2008.
14. C.M. Oldenburg, S.L. Bryant, JP Nicot, Framework for Evaluating Effective Trapping for Certification of Geologic CO₂ Storage Sites, 33rd International Geological Congress, Oslo, Norway, 8-17 August 2008.
15. Oldenburg, C.M., J.L. Lewicki, L. Dobeck, and L. Spangler, On Modeling Near-Surface Migration of CO₂ from a Shallow-Release Test: Results from the Vadose and Saturated Zones, Computational Methods in Water Resources XVII, July 6-10, 2008, San Francisco, CA.
16. Oldenburg, C.M., S.L. Bryant, JP Nicot, N. Kumar, and Y. Zhang, Certification Framework Based on Effective Trapping for Geologic Carbon Sequestration, Seventh Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 5-8 May 2008.
17. Oldenburg, C.M., J.L. Lewicki, A. Cortis, L. Dobeck, and L. Spangler, ZERT CO₂ Shallow-Release Test: Predictions and Analysis of Near-Surface Migration of CO₂, Seventh Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 5-8 May 2008.
18. Oldenburg, C.M., J.L. Lewicki, L. Dobeck, and L. Spangler, Modeling Near-Surface Carbon Dioxide Migration from a Shallow Horizontal Well, American Geophys. Union Fall Meeting, San Francisco, CA, December 2007.
19. Oldenburg, C.M., and S.L. Bryant, Certification framework for geologic CO₂ storage Sixth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 8-10 May 2007, *LBNL-63395 Abs.*
20. Cortis, A., C.M. Oldenburg, and S.M. Benson, On the optimality of above-ground monitoring networks for carbon capture and storage, Sixth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, PA, 8-10 May 2007, *LBNL-62512 Abs.*
21. Oldenburg, C.M., A. Cortis, and S.M. Benson, Near-Surface Dispersion of CO₂ Seepage from Geologic Storage Sites: Interplay of Process and Detection Strategy, American Geophys. Union Fall Meeting, San Francisco, CA, December 2006, *LBNL-62875 Abs.*
22. Trautz, R.C., L.R. Myer, S.M. Benson, C.M. Oldenburg, A combined saline formation and gas reservoir CO₂ injection pilot in Northern California, GHGT-8 June 19-22, 2006, Trondheim, Norway, *LBNL-60169.*

23. Lewicki, Jennifer L., Hilley, George E., Oldenburg, Curtis M., An improved strategy to detect carbon dioxide leakage for verification of geologic carbon sequestration, American Geophys. Union Fall Meeting, San Francisco, CA, Dec. 2005, *LBNL-58885 Abs.*
24. Lewicki, J.L., and C.M. Oldenburg, Measurement, Modeling, and Analysis of CO₂ in the Near-Surface Environment for Geologic Carbon Sequestration Verification, Fourth Annual Conference On Carbon Capture & Sequestration, Alexandria, VA, May 2-5, 2005, *LBNL-57279 Abs.*
25. Rebscher, D., F. May, and C.M. Oldenburg, Numerical Simulations of CO₂ Injection in the Altmark Natural Gas Field, Germany, Fourth Annual Conference On Carbon Capture & Sequestration, Alexandria, VA, May 2-5, 2005, *LBNL-57282 Abs.*
26. Oldenburg, C. M., HSE Screening Risk Assessment for Geologic CO₂ Storage Sites, Fourth Annual Conference On Carbon Capture & Sequestration, Alexandria, VA, May 2-5, 2005, *LBNL-57280 Abs.*
27. Lewicki, J.L., and C.M. Oldenburg, Near-Surface Gas Monitoring and Analysis to Detect Hidden Geothermal Systems, 30th Stanford University Workshop, Geothermal Reservoir Engineering, Stanford, CA, January 31 - February 2, 2005, *LBNL-56484 Abs.*
28. Freifeld, B.M.;Su, G.W.;Jordan, P.D.;Oldenburg, C.M.;Daley, P.F., Data Analysis and Simulation of In-Situ Permeable Flow Sensors for Measuring Groundwater Velocity, American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 13-17, 2004, *LBNL-56322 Abs.*
29. Oldenburg, C. M., and J.L. Lewicki, Leakage and Seepage in the Near-Surface Environment: An Integrated Approach to Monitoring and Detection, 7th International conference on Greenhouse Gas Control Technologies (GHGT-7, Vancouver, Canada, September 5-9, 2004, *LBNL-54283 Abs.*
30. Zhang, Y., C.M. Oldenburg, and S.M. Benson, Simulating remediation of CO₂ leakage from geological storage sites, *EOS Trans. AGU*, 84(46), Fall Meet. Supp., F677, 2003, *LBNL-53677 Abs.*
31. Oldenburg, C.M.;Lewicki, J.L.;Zhang, Yingqi, Simulating CO₂ leakage and seepage from geologic carbon sequestration sites: Implications for near-surface monitoring, *EOS Trans. AGU*, 84(46), Fall Meet. Supp., F677, 2003, *LBNL-53678 Abs.*
32. Oldenburg, Curtis M.;Unger, Andre A.J., Transport and dispersion processes for CO₂ in the unsaturated zone and surface layer, Second Annual Conference on Carbon Sequestration, Alexandria, Virginia, May 5-8, 2003, *LBNL-52158 Abs.*
33. Oldenburg, C.M., S.E. Borglin, T.C. Hazen, Simulations of flow, transport, and biodegradation in landfills, *EOS Trans. AGU*, 83(47), Fall Meet. Supp., F196, 2002, *LBNL-51441 Abs.*
34. Borglin, S.E., T.C. Hazen, and C.M. Oldenburg, Comparison of leachate quality from aerobic and anaerobic municipal solid waste bioreactors, *EOS Trans. AGU*, 83(47), Fall Meet. Supp., F196, 2002.

35. Webb, S.W., C.M. Oldenburg, K. Pruess, and G.J. Moridis, Diffusive mixing of stably stratified gases in subsurface reservoirs, *EOS Trans. AGU*, 83(47), Fall Meet. Supp., F585, 2002, *LBNL-51443 Abs.*
36. Oldenburg, Curtis M., Sharon E. Borglin and Terry C. Hazen. Process modeling of flow, transport, and biodegradation in landfill bioreactors, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., 2001. *LBNL-48904 Abs.*
37. Greenberg, M.R., T.C. Hazen, S.E. Borglin, and C.M. Oldenburg, Factors controlling concentration of metals in the leachate from aerobic and anaerobic laboratory landfill bioreactors, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., F209, 2001, *LBNL-48928 Abs.*
38. Borglin, Sharon E., Terry C. Hazen, Curt M. Oldenburg, and Peter T. Zawislanski. Mesoscale laboratory models of the biodegradation of municipal landfill materials, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., F209, 2001. *LBNL-48884 Abs.*
39. Pruess, K., C.M. Oldenburg, G.J. Moridis, and S.W. Webb. Vertical mixing of CO₂ and CH₄ with gravity effects, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., F485, 2001. *LBNL-48922 Abs.*
40. Kneafsey, T.J., C.M. Oldenburg, and R. Salve, Clay swelling and particle redistribution in a saw-cut fracture in the Paintbrush nonwelded unit of the Topopah Spring Tuff, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., F496, 2001.
41. Zhou, Q., G.S. Bodvarsson, H.-H. Liu, and C.M. Oldenburg, Calibration of spatial variability of hydrogeologic properties in the unsaturated fractured rock at Yucca Mountain, Nevada, *EOS Trans. AGU*, 82(47), Fall Meet. Supp., F420, 2001.
42. Oldenburg, Curtis M., Sally M. Benson and Karsten Pruess. On CO₂ injection into depleted natural gas reservoirs for carbon sequestration and enhanced gas recovery, *Trans. Am. Geophys. Union EOS*, 81(48), Fall Meet. Supp., F271, Nov. 282, 2000. *LBNL-46550 Abs.*
43. Oldenburg, Curtis M., S.M. Benson and Karsten Pruess. Effects of reservoir heterogeneity on carbon dioxide injection into depleted natural gas reservoirs, in Proceedings of the 2000 Annual Meeting of the Geol. Soc. America, Reno, NV, Nov. 9–18, 2000. *LBNL-46549 Abs.*
44. Salve, R. and Curtis M. Oldenburg. Conceptual models of flow in unsaturated fractured rocks developed from in situ field experiments, *Trans. Am. Geophys. Union EOS*, 80(46), Fall Meet. Supp., F477, Nov. 12, 1999. *LBNL-44452 Abs.*
45. Oldenburg, C.M. and K. Pruess. Brine segregation in horizontal transient flow in porous media, *Trans. Am. Geophys. Union EOS*, 80(46), Fall Meet. Supp., F382, Nov. 12, 1999. *LBNL-46392 Abs.*
46. Oldenburg, C.M., R. Salve, J. Hinds, and J.S.Y. Wang. Flow testing and modeling in the PTn at Alcove 4. 1998. *LBNL-44897 Abs.*
47. Borglin, S.E., G.J. Moridis, and C.M. Oldenburg, On magnetic fluid emplacement: laboratory experiments of ferrofluid flow, *Trans. Am. Geophys. Union EOS*, 79(45), Fall Meet. Supp., F267, Nov. 10, 1998.

48. James, A.L. and C.M. Oldenburg. Enhanced data analysis of VOC plume movement in a thick vadose zone, *Trans. Am. Geophys. Union EOS*, 79(45), Fall Meet. Supp., F392, Nov. 10, 1998. *LBNL-42234 Abs.*
49. Salve, R., C.M. Oldenburg and J.S.Y. Wang. Spatial and temporal flow variability in the paintbrush nonwelded Tuff Unit at Yucca Mountain. 1999. *LBNL-43053 Abs.*
50. Doughty, Christine and C. Oldenburg. "Data fusion and inverse modeling for Select AFOSR Grant Number FQ8674-96-0-1169". In Air Force Office of Scientific Research Annual Review; Snowbird, Utah; May 19-21, 1998. 1998. *LBNL-41930.*
51. Oldenburg, C.M., G.J. Moridis, and S.E. Borglin, Modeling miscible and immiscible ferrofluid flow in porous media, *Trans. Am. Geophys. Union EOS*, 79(45), Fall Meet. Supp., F308, Nov. 10, 1998.
52. Cohen, A.J.B. and C.M. Oldenburg. Effects of Faulted stratigraphy on saturated zone flow beneath Yucca Mountain, Nevada. 1997. *LBNL-41138 Abs.*
53. Borglin, S.E., C.M. Oldenburg, and G.J. Moridis, Laboratory evaluation of the potential use of ferrofluids in subsurface environments, *Trans. Am. Geophys. Union EOS*, 78(46), Fall Meet. Supp., F324, Nov. 18, 1997.
54. Oldenburg, C., G. Moridis and S. and Borglin. Numerical simulation of ferrofluid flow and transport in porous media, *Trans. Am. Geophys. Union EOS*, 78(46), Fall Meet. Supp., F316, Nov. 18, 1997. *LBNL-40776 Abs.*
55. Oldenburg, C.M. and K. Pruess, Convective mixing in liquid-dominated geothermal systems, in *Proceedings of the 1997 Annual Meeting of the Geol. Soc. of America*, Oct. 20–23, Salt Lake City, UT, 1997, Abs.
56. James, A., Oldenburg C.M. and S. and Finsterle. Analysis of uncertainty for 2-D fracture Flow and Seepage into an Excavated Niche, *Trans. Am. Geophys. Union EOS*, 78(46), Fall Meet. Supp., F296, Nov. 18, 1997. *LBNL-40756 Abs.*
57. Moridis, G.J., A. James, Curtis M. Oldenburg, and K. Pruess. A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site, *Trans. Am. Geophys. Union EOS*, 77(46), Fall Meet. Supp., F261, Nov. 12, 1996. *LBNL-39436 Abs.*
58. Oldenburg, C.M., and K. Pruess, Layered thermohaline convection in hypersaline geothermal systems, *Trans. Am. Geophys. Union EOS*, 77(46), Fall Meet. Supp., F208, Nov. 12, 1996.
59. Hall, D., A.L. James, Curtis M. Oldenburg, and T.E. McKone. Variance Propagation from Subsurface Transport to Exposure Modeling, *EOS Trans. AGU* 77(46), Fall Meet. Supp., F244, 1996. *LBNL-39345 Abs.*
60. James, A.L. and Curtis M. Oldenburg. "Error Analysis for Large Scale Subsurface Transport Simulation," *EOS Trans. AGU*, 76, Fall Meet. Supp., F188, 1995. *LBL-37704.*

61. Oldenburg, Curtis M. and K. Pruess. Mixing with First-Order Decay in Variable-Velocity Porous Media Flow, *Trans. Am. Geophys. Union EOS*, 75, Fall Meet. Supp., 267, Nov. 1, 1994. *LBL-36090 Abs.*
62. Hinkins, R.L., C.M. Oldenburg, G.J. Moridis, and K. Pruess, MP-TOUGH2: A General Purpose Simulator for Subsurface Multiphase and Multicomponent Transport for Massively Parallel Computers. *EOS Trans. AGU*, 74(43), 307, 1994, *LBL-35456 Abs.*
63. Pruess (editor), K. and Curtis M. Oldenburg. On Numerical Modeling of Capillary Barriers, *Trans. Am. Geophys. Union EOS*, 73, 229, Dec. 1992. *LBL-33329 Abs.*
64. Oldenburg, Curtis M. and F.J. Spera. Melting from Below in a Binary Eutectic System: Numerical Experiments of Magma Body Formation, *Trans. Am. Geophys. Union EOS*, 73, 640, Dec. 1992. *LBL-33335 Abs.*
65. Oldenburg, Curtis M. and F.J. Spera. The Coupled Problem in MOR Magma Bodies: Phase Change and Convection, RIDGE Theoretical Institute, Tucson, AZ, January 1992. *LBL-31591 Abs.*
66. Oldenburg, Curtis M., M. Todesco and F.J. Spera. "The Effects of Bulk Composition on Solidification and Convection in Magma". *Trans. Am. Geophys. Union EOS*, 72, 517, Fall Meeting; San Francisco, CA; December 9-11, 1991, *LBL-31282.*
67. Spera, F.J., C.M. Oldenburg, and D.A. Yuen, Numerical experiments of the effects of chemical buoyancy and diffusion on magmatic box filling, *Trans. Am. Geophys. Union EOS*, 70, 1406, Fall Meeting; San Francisco, CA, December 1989.
68. Oldenburg, C.M., F.J. Spera, and D.A. Yuen, Toward a numerical solution to the magmatic crystallization-convection problem, *Trans. Am. Geophys. Union EOS*, 70, 1407, Fall Meeting, San Francisco, December 1989.
69. Oldenburg, C.M., F.J. Spera, and D.A. Yuen, Composition effects on thermally driven convective magma mixing, *Trans. Am. Geophys. Union EOS*, 69, 1486, Fall Meeting, San Francisco, CA, December 1988.
70. Oldenburg, C.M., F.J. Spera, D.A. Yuen, and G. Sewell, Dynamic mixing in magma bodies: theory, simulations, and implications, *Trans. Am. Geophys. Union EOS*, 69, 525, Fall Meeting, San Francisco, CA, Dec. 1988.
71. Oldenburg, C.M., F.J. Spera, D.A. Yuen, and G. Sewell, Double-diffusive convection in irregularly shaped regions: implications for horizontal zonation in magma changes, *Trans. Am. Geophys. Union EOS*, 68, 414, Spring Meeting, Baltimore, MD, April 1987.
72. Oldenburg, C.M., F.J. Spera, D.A. Yuen, and G. Sewell, Two-dimensional double-diffusive convection, *Trans. Am. Geophys. Union EOS*, 66, 1124, Fall Meeting, San Francisco, CA, December 1985.

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