

Stanford



Sally Benson

Director, Precourt Institute for Energy and Professor of Energy Resources Engineering and Senior Fellow at the Precourt Institute for Energy

CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Sally M. Benson, who joined Stanford University in 2007, is the co-director of Stanford's Precourt Institute. A Professor in the Department of Energy Resources Engineering in the School of Earth, Energy & Environmental Sciences; she studies technologies and pathways to reducing greenhouse gas emissions including geologic storage of CO₂ in deep underground formations and energy systems analysis for a low-carbon future. She also directs Stanford's Global Climate and Energy Project.

Prior to joining Stanford, Benson was Division Director for Earth Sciences, Associate Laboratory Director for Energy Sciences and Deputy Director at LBNL.

Professor Benson serves on the Board of Directors for the National Renewable Energy Laboratory and Climate Central. Currently she also serves on the Advisory Boards for Argonne National Laboratory and Pacific Northwest National Laboratory, Princeton's Carbon Mitigation Initiative, Princeton's Adlinger Center, Japan's Initiative for the Cool Earth Forum, and the Lahore University of Management Science in Pakistan. Over the past several years she participated in a number of National Academy of Sciences, Secretary of Energy, and National Petroleum Council research needs assessments related to carbon management. She also is on the Editorial Board for Energy and Environmental Sciences.

ACADEMIC APPOINTMENTS

- Professor, Energy Resources Engineering
- Co-Director, Precourt Institute for Energy
- Director, Global Climate and Energy Project
- Affiliate, Stanford Woods Institute for the Environment

ADMINISTRATIVE APPOINTMENTS

- Co-Director, Precourt Institute for Energy, Stanford University, (2014- present)
- Professor, Energy Resources Engineering Department, Stanford University, (2013- present)
- Acting Director, Precourt Institute for Energy, Stanford University, (2012-2013)
- Director, Global Climate and Energy Project, Stanford University, (2009- present)
- Professor (Research), Energy Resources Engineering Department, Stanford University, (2007-2013)

- Senior Fellow by Courtesy, Woods Institute for the Environment, Stanford University, (2007-2013)
- Executive Director, Global Climate & Energy Project, Stanford University, (2007-2009)
- Deputy Director for Operations, Lawrence Berkeley National Laboratory, (2001-2004)
- Associate Laboratory Director, Energy Sciences, Lawrence Berkeley National Laboratory, (1997-2001)
- Director, Earth Sciences Division, Lawrence Berkeley National Laboratory, (1993-2001)
- Visiting Professor, Earth Sciences Department, Clemson University, (1990-1998)
- Positions of growing responsibility to Senior Staff Scientist, Earth Sciences Division, Lawrence Berkeley National Laboratory, (1977-2006)

HONORS AND AWARDS

- Arthur D. Storke Lecturer, Columbia University (2018)
- Distinguished Lecture Tour, Peter Cook Center, University of Melbourne (2017)
- Honorary Degree, Smith College, Massachusetts (2015)
- Roslyn Silver '27 Science Lectureship, Barnard College (2015)
- Greenman Award, IEA Greenhouse Gas Control Programme (2012)
- Alberta Innovates Lecturer of 2011, Alberta Innovates - Energy and Environment Solutions (AI-EES) (2011)
- Stanford Fellow, Stanford University (2009-2011)
- ARCS 2009 American Pacesetter Award, Achievement Rewards for College Scientists (2009)
- Michel T. Halbouty Distinguished Lecture Award, Geological Society of America (2009)
- Contributed to the reports of the IPCC, which was awarded the Nobel Peace Prize in 2007, Norwegian Nobel Committee (2007)
- DOE Certificate of Appreciation, Department of Education (DOE) (1996)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Co-Lead for Geological Storage Section for NPC CCS Study, National Petroleum Council (2018 - present)
- Design Team Member for Long Range Planning -- Sustainability, Stanford University (2018 - present)
- Member, Advisory Board, Colorado School of Mines, Payne Institute (2018 - present)
- Member, Advisory Board, Princeton University, Andlinger Center (2018 - present)
- Member, Director's Scientific Advisory Board, Argonne National Laboratory (2018 - present)
- Member, NAS Study Panel on Carbon Dioxide Removal and Negative Emissions (2017 - 2018)
- Member, Secretary of Energy Advisory Board Task Force for on CO2 Utilization and Negative Emissions (2016 - 2017)
- Ambassador, Clean Energy, Education, and Empowerment Initiative (2015 - present)
- Chair, Witherspoon Mid-Career Award, American Geophysical Union (2015 - 2018)
- Advisory Board Member, Japan Initiative for the Cool Earth Forum (2014 - present)
- Member, Energy, Energy and Environment Advisory Board, Pacific Northwest National Laboratory (2014 - present)
- Chair, Advisory Board, Lahore University of Management Science, Pakistan (2014 - 2018)
- Chair, Energy, Climate and Infrastructure Advisory Board, Sandia National Laboratory (2014 - 2017)
- Member, Organizing Committee, 12th International Conference on Greenhouse Gas Control (2013 - 2018)
- Co-founding Editor, MRS Energy and Sustainability Journal (2013 - 2015)
- Member, Visiting Committee, Department of Environmental Engineering and Earth Sciences, Clemson University (2012 - present)
- Member, Energy, Climate and Infrastructure Advisory Board, Sandia National Laboratory, Albuquerque, NM (2012 - 2017)
- Member, Energy Systems Integration Technical Review Committee, National Renewable Energy Laboratory, Golden, Colorado (2012 - 2017)

- Co-organizer and teacher, Joint Stanford-SLAC-NREL Energy Summer School, Stanford University (2012 - 2012)
- Member, Gordon Conference Organizing Committee, Flow Through Porous Media (2012 - 2012)
- Sustainability Committee, Stanford University (2012 - 2012)
- Co-director, Stanford Center for Carbon Storage, Stanford University (2011 - present)
- Member, Organizing Committee, 11th International Conference on Greenhouse Gas Control Technologies, IEA Greenhouse Gas Programme (2011 - 2012)
- Co-organizer and teacher, Joint Stanford-SLAC-NREL Energy Summer School (2011 - 2011)
- Member, California Council on Science and Technology (2011 - 2011)
- Member, Committee on Emerging Workforce Trends in the U.S. Energy and Mining Industries, National Research Council (2011 - 2011)
- Member, Advisory Board, National Geographic Society, Great Energy Challenge (2010 - 2016)
- Member, BIGCCS Scientific Committee, Research Council of Norway (2010 - 2014)
- Board of Directors, Carbon Management Canada (2010 - 2013)
- Judge, Aspen Institute Energy and Environment Awards (2010 - 2010)
- Member, State of California, "Blue Ribbon" Panel on Carbon Dioxide Capture and Storage (2010 - 2010)
- Member, Advisory Board, MUSTANG Project on CCS (2009 - 2015)
- Member, Advisory Board, Lahore University of Management Science, Pakistan (2009 - 2014)
- Member and Chair, Environmental Subcommittee of the Advisory Panel on Investment Responsibility & Licensing (APIR-L) (2009 - 2013)
- Coordinating Lead Author, Global Energy Assessment (GEA), Chapter 13, Carbon Dioxide Capture and Storage (2009 - 2012)
- Member, Scientific Policy Board, SLAC National Laboratory (2009 - 2012)
- Member, World Resources International Project to Develop Guidelines for Carbon Dioxide Capture and Storage (2009 - 2011)
- Member, WRI Task Force on CCS in China (2009 - 2010)
- Member, Organizing Committee, 10th International Conference on Greenhouse Gas Control Technologies, IEA Greenhouse Gas Programme (2009 - 2010)
- Co-organizer and teacher, Joint Stanford-SLAC-NREL Energy Summer School (2009 - 2009)
- Judge, Aspen Institute Energy and Environment Awards (2009 - 2009)
- Board of Directors, Climate Central, Princeton, NJ (2008 - present)
- Board of Directors, National Renewable Energy Laboratory (2008 - present)
- Climate Change Committee Member, American Association of Petroleum Geologists (2008 - 2010)
- Instructor, Stanford Continuing Education: A Practical Guide to a Sustainable Energy Future (2008 - 2008)
- Participant, Arctic Expedition for Climate Action, sponsored by National Geographic, Linblad Expeditions and the Aspen Institute (2008 - 2008)
- Member, Organizing Committee, 9th International Conference on Greenhouse Gas Control Technologies, IEA Greenhouse Gas Programme (2007 - 2008)
- Task Force Member, Council on Foreign Relations, Climate Change Task Force (2007 - 2007)
- Member, Sleipner Risk Assessment Advisory Committee, Statoil (2006)
- Chair, Scientific Advisory Board, Atmospheric Radiation Measurement User Facility (2006 - 2008)
- Member, FutureGen Technical Advisory Board (2006 - 2008)
- Section Co-Chair for Carbon Sequestration, Assessment of Basic Research Needs in Earth Sciences, Commissioned by DOE Basic Energy Sciences (2006 - 2007)
- Co-Chair, Technical Review of the CO2CRC, Australia (2006 - 2006)
- Member, Technical Advisory Board for the In Salah CO2 Storage Project (2005 - 2013)
- Coordinating Lead Author, Intergovernmental Panel on Climate Change (IPCC) Special Report on CO2 Capture and Storage: Chapter on Geologic Storage of CO2 (2003 - 2005)
- Member, Carbon Mitigation Initiative (CMI) Advisory Board, Princeton University, NJ (2002 - present)
- Member, CO2 Capture Project (CCP) Technology Advisory Board (2002 - 2007)

- Chair, School of Earth Sciences Advisory Board, Stanford University (2002 - 2004)
- Member, Society of Petroleum Engineers (2000 - present)
- Member, American Geophysical Union (2000 - present)

PROFESSIONAL EDUCATION

- Ph.D, University of California, Berkeley , Material Science & Mineral Engineering (1988)
- M.Sc., University of California, Berkeley , Material Science & Mineral Engineering (1984)
- B.A., Barnard College, Columbia University , Geology (1977)

LINKS

- Benson Lab: <http://pangea.stanford.edu/research/bensonlab/>
- Global Climate and Energy Project (GCEP): <http://gcep.stanford.edu>
- Precourt Institute for Energy (PIE): <https://energy.stanford.edu>
- Stanford Woods Institute: <http://woods.stanford.edu/>
- Stanford Center for Carbon Storage: <https://sccs.stanford.edu/>
- Google Scholar: Benson: <https://scholar.google.com/citations?user=t7GevjYAAAAJ&hl=en&oi=ao>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research Activities

For the past 15 years, I have focused on reducing greenhouse gas emissions from energy production. My research activities cover two different but complementary areas: (1) energy systems analysis to help guide decision-making about the best options for providing plentiful energy supplies while reducing greenhouse gas emissions, and (2) sequestering carbon dioxide in deep underground formations. As the Director of GCEP, I work with faculty and students across the campus.

Teaching Activities

I teach courses on carbon dioxide capture and storage, pathways for a successful transition to a low greenhouse gas energy system, laboratory measurements on rocks and a weekly Energy Seminar. I also teach the Energy Resources Engineering Senior Project.

Professional Activities

Board Member, National Renewable Energy Lab and Climate Central. Member of American Geophysical Union, Society of Petroleum Engineers, and American Association for the Advancement of Science. Advisory Board Member for National Geographic's Great Energy Challenge, Sandia National Laboratory and Pacific Northwest National laboratory.

Teaching

COURSES

2018-19

- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Aut)
- Energy Policy in California and the West: CEE 263G, POLISCI 73, PUBLPOL 73 (Spr)

- Energy in Hawaii: Forefront of Clean Energy Technology and Policy: ENERGY 13SC (Sum)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)

2017-18

- Achieving Universal Energy Access by 2030: Can it be done?: ENERGY 204 (Spr)
- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Aut)
- Laboratory Measurement of Reservoir Rock Properties: ENERGY 201 (Win)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)

2016-17

- Achieving Universal Energy Access by 2030: Can it be done?: ENERGY 204 (Spr)
- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Aut)
- Research Seminar: Energy Development in the Emerging Economy: ENERGY 217 (Aut)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)
- Water and Power in the Pacific Northwest: The Columbia River: CEE 17SC, EARTHSYS 16SC, ENERGY 12SC, POLISCI 14SC (Sum)

2015-16

- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Win)
- Laboratory Measurement of Reservoir Rock Properties: ENERGY 201 (Win)
- Senior Project and Seminar in Energy Resources: ENERGY 199 (Spr)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Holger Teichgraeber, Yuran Zhang

Postdoctoral Faculty Sponsor

Maartje Boon, Michael Machala

Doctoral Dissertation Advisor (AC)

Hailun Ni, Jacques de Chalendar

Master's Program Advisor

Fola Ayoola, Austin Park

Doctoral (Program)

Nora Hennessy, Yaxin Li

Publications

PUBLICATIONS

- **The energetic implications of introducing lithium-ion batteries into distributed photovoltaic systems** *SUSTAINABLE ENERGY & FUELS*
Kurland, S., Benson, S.
2019; 3 (5): 1182–90
- **Positron emission tomography in water resources and subsurface energy resources engineering research** *ADVANCES IN WATER RESOURCES*
Zahasky, C., Kurotori, T., Pini, R., Benson, S. M.
2019; 127: 39–52

- **Measuring, imaging and modelling solute transport in a microporous limestone** *CHEMICAL ENGINEERING SCIENCE*
Kurotori, T., Zahasky, C., Hejazi, S., Shah, S. M., Benson, S. M., Pini, R.
2019; 196: 366–83
- **CO₂ Wettability of Sandstones: Addressing Conflicting Capillary Behaviors** *GEOPHYSICAL RESEARCH LETTERS*
Garing, C., Benson, S. M.
2019; 46 (2): 776–82
- **Multimodal imaging and stochastic percolation simulation for improved quantification of effective porosity and surface area in vesicular basalt** *ADVANCES IN WATER RESOURCES*
Zahasky, C., Thomas, D., Matter, J., Maher, K., Benson, S. M.
2018; 121: 235–44
- **Calculating Trajectories Associated With Solute Transport in a Heterogeneous Medium** *WATER RESOURCES RESEARCH*
Vasco, D. W., Pride, S. R., Zahasky, C., Benson, S. M.
2018; 54 (9): 6890–6908
- **Residual trapping of carbon dioxide during geological storage-Insight gained through a pore-network modeling approach** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Rasmusson, K., Rasmusson, M., Tsang, Y., Benson, S., Hingerl, F., Fagedund, F., Niemi, A.
2018; 74: 62–78
- **Net-zero emissions energy systems** *SCIENCE*
Davis, S. J., Lewis, N. S., Shaner, M., Aggarwal, S., Arent, D., Azevedo, I. L., Benson, S. M., Bradley, T., Brouwer, J., Chiang, Y., Clack, C. M., Cohen, A., Doig, et al
2018; 360 (6396): 1419–+
- **Micro-positron emission tomography for measuring sub-core scale single and multiphase transport parameters in porous media** *ADVANCES IN WATER RESOURCES*
Zahasky, C., Benson, S. M.
2018; 115: 1–16
- **The global overlap of bioenergy and carbon sequestration potential** *CLIMATIC CHANGE*
Turner, P. A., Mach, K. J., Lobell, D. B., Benson, S. M., Baik, E., Sanchez, D. L., Field, C. B.
2018; 148 (1-2): 1–10
- **Pore-scale modelling of Ostwald ripening** *JOURNAL OF FLUID MECHANICS*
de Chalendar, J. A., Garing, C., Benson, S. M.
2018; 835: 363–92
- **Geospatial analysis of near-term potential for carbon-negative bioenergy in the United States.** *Proceedings of the National Academy of Sciences of the United States of America*
Baik, E., Sanchez, D. L., Turner, P. A., Mach, K. J., Field, C. B., Benson, S. M.
2018; 115 (13): 3290–95
- **Commemorating Dr. Gudmundur "Bo" Bodvarsson (1951-2006), a Leader of the Deep Unsaturated Flow and Transport Investigations** *WATER*
Tsang, C., Lippmann, M., Dobson, P., Tsang, Y., Faybishenko, B., Benson, S., Birkholzer, J., Finsterle, S., Hawkes, D., Hubbard, S., Kneafsey, T., Liu, H., Oldenburg, et al
2018; 10 (1)
- **Capillary pressure heterogeneity and hysteresis for the supercritical CO₂/water system in a sandstone** *ADVANCES IN WATER RESOURCES*
Pini, R., Benson, S. M.
2017; 108: 277–92
- **Advancing clean energy** *ISSUES IN SCIENCE AND TECHNOLOGY*
Benson, S. M., Majumdar, A.
2017; 33 (3): 11–12
- **Pore-scale capillary pressure analysis using multi-scale X-ray micromotography** *Advances in Water Resources*
Garing, C., de Chalendar, J. A., Voltolini, M., Ajo-Franklin, J. B., Benson, S. M.

2017; 104: 223-241

- **X-ray CT and multiphase flow characterization of a ‘bio-grouted’ sandstone core: The effect of dissolution on seal longevity** *International Journal of Greenhouse Gas Control*
Minto, J. M., Hingerl, F. F., Benson, S. M., Lunn, R. J.
2017; 64: 152-162
- **Pore-scale multiphase flow modeling and imaging of CO₂ exsolution in Sandstone** *Journal of Petroleum Science and Engineering*
Zuo, L., Ajo-Franklin, J. B., Voltolini, M., Geller, J. T., Benson, S. M.
2017; 155: 63-77
- **Evaluating co-benefits of battery and fuel cell vehicles in a community in California** *ENERGY*
Felgenhauer, M. F., Pellow, M. A., Benson, S. M., Hamacher, T.
2016; 114: 360-368
- **Translating risk assessment to contingency planning for CO₂ geologic storage: A methodological framework** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Farhat, K., Benson, S. M.
2016; 52: 410-431
- **Use of above-zone pressure data to locate and quantify leaks during carbon storage operations** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Cameron, D. A., Durlafsky, L. J., Benson, S. M.
2016; 52: 32-43
- **Experimental Investigation of Stress-Dependency of Relative Permeability in Rock Fractures** *TRANSPORT IN POROUS MEDIA*
Huo, D., Benson, S. M.
2016; 113 (3): 567-590
- **Quantifying solute spreading and mixing in reservoir rocks using 3-D PET imaging** *JOURNAL OF FLUID MECHANICS*
Pini, R., Vandehey, N. T., Druhan, J., O’Neil, J. P., Benson, S. M.
2016; 796
- **Heletz experimental site overview, characterization and data analysis for CO₂ injection and geological storage** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Niemi, A., Bensabat, J., Shtivelman, V., Edlmann, K., Gouze, P., Luquot, L., Hingerl, F., Benson, S. M., Pezard, P. A., Rasmusson, K., Liang, T., Fagerlund, F., Gendler, et al
2016; 48: 3-23
- **Characterization of heterogeneity in the Heletz sandstone from core to pore scale and quantification of its impact on multi-phase flow** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Hingerl, F. F., Yang, F., Pini, R., Xiao, X., Toney, M. F., Liu, Y., Benson, S. M.
2016; 48: 69-83
- **Evaluation of hydraulic controls for leakage intervention in carbon storage reservoirs** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Zahasky, C., Benson, S. M.
2016; 47: 86-100
- **A calibration-free approach for measuring fracture aperture distributions using X-ray computed tomography** *GEOSPHERE*
Huo, D., Pini, R., Benson, S. M.
2016; 12 (2): 558-571
- **Simulating stress-dependent fluid flow in a fractured core sample using real-time X-ray CT data** *SOLID EARTH*
Kling, T., Huo, D., Schwarz, J., Enzmann, F., Benson, S., Blum, P.
2016; 7 (4): 1109-1124
- **Economic and environmental prospects of battery and fuel cell vehicles for the energy transition in German communities.** *10TH INTERNATIONAL RENEWABLE ENERGY STORAGE CONFERENCE, IRES 2016*
Felgenhauer, M. F., Pellow, M. A., Benson, S. M., Hamacher, T.
2016; 99: 380-391

- **Accurate determination of characteristic relative permeability curves** *ADVANCES IN WATER RESOURCES*
Krause, M. H., Benson, S. M.
2015; 83: 376-388
- **Capillary trapping for geologic carbon dioxide storage - From pore scale physics to field scale implications** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Krevor, S., Blunt, M. J., Benson, S. M., Pentland, C. H., Reynolds, C., Al-Menhali, A., Niu, B.
2015; 40: 221-237
- **Influence of small-scale heterogeneity on upward CO₂ plume migration in storage aquifers** *ADVANCES IN WATER RESOURCES*
Li, B., Benson, S. M.
2015; 83: 389-404
- **Extraction of pore-morphology and capillary pressure curves of porous media from synchrotron-based tomography data** *SCIENTIFIC REPORTS*
Yang, F., Hingerl, F. F., Xiao, X., Liu, Y., Wu, Z., Benson, S. M., Toney, M. F.
2015; 5
- **Numerical and analytical study of effects of small scale heterogeneity on CO₂/brine multiphase flow system in horizontal corefloods** *ADVANCES IN WATER RESOURCES*
Kuo, C., Benson, S. M.
2015; 79: 1-17
- **Sustainability assessment of catalysis for energy storage in hydrogen: Comparative net energy analysis of fuel cell and electrolyzer technologies**
Pellow, M., Sridhar, S., Emmott, C., Benson, S.
AMER CHEMICAL SOC.2015
- **Registration of the rotation axis in X-ray tomography** *Journal of synchrotron radiation*
Yang, Y., Hingerl, F., Xiao, F., Liu, Y., Wu, Z., Benson, S., Pianetta, P.
2015; 22 (2): 452-457
- **An Experimental Investigation of Stress-Dependent Permeability and Permeability Hysteresis Behavior in Rock Fractures** *DYNAMICS OF FLUIDS AND TRANSPORT IN COMPLEX FRACTURED-POROUS SYSTEMS*
Huo, D., Benson, S. M., Faybishenko, B., Benson, S. M., Gale, J. E.
2015; 210: 99-114
- **A Complex Systems Approach to Describing Flow and Transport in Fractured-Porous Media** *DYNAMICS OF FLUIDS AND TRANSPORT IN COMPLEX FRACTURED-POROUS SYSTEMS*
Faybishenko, B., Benson, S. M., Gale, J. E., Molz, F., Faybishenko, B., Benson, S. M., Gale, J. E.
2015; 210: 5-17
- **Dynamics of Fluids and Transport in Complex Fractured-Porous Systems PREFACE** *DYNAMICS OF FLUIDS AND TRANSPORT IN COMPLEX FRACTURED-POROUS SYSTEMS*
Faybishenko, B., Benson, S., Gale, J., Faybishenko, B., Benson, S. M., Gale, J. E.
2015; 210: IX-X
- **Hydrogen or batteries for grid storage? A net energy analysis** *ENERGY & ENVIRONMENTAL SCIENCE*
Pellow, M. A., Emmott, C. J., Barnhart, C. J., Benson, S. M.
2015; 8 (7): 1938-1952
- **Sustainability assessment of regenerative hydrogen fuel cells for energy storage**
Pellow, M. A., Emmott, C. M., Benson, S. M.
AMER CHEMICAL SOC.2014
- **Hysteretic trapping and relative permeability of CO₂ in sandstone at reservoir conditions** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Ruprecht, C., Pini, R., Falta, R., Benson, S., Murdoch, L.
2014; 27: 15-27
- **Can we afford storage ? A dynamic net energy analysis of renewable electricity generation supported by energy storage** *ENERGY & ENVIRONMENTAL SCIENCE*
Carbajales-Dale, M., Barnhart, C. J., Benson, S. M.

2014; 7 (5): 1538-1544

- **Process-dependent residual trapping of CO₂ in sandstone** *GEOPHYSICAL RESEARCH LETTERS*
Zuo, L., Benson, S. M.
2014; 41 (8): 2820-2826
- **In search of clean, affordable energy** *Oilfield Review*
Bao, Z., Benson, S. M., Cui, Y., Dionne, J. A., Maher, K., Maher, W., Halpin, C., Nelson, R., Nichols, D., Ralph, J., Ramakrishnan, T. S.
2014; 26 (1): 4-15
- **Small-scale Heterogeneities and Buoyancy-driven CO₂ Migration in Geological Storage**
Li, B., Benson, S. M., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 3608-15
- **Rapid surface detection of CO₂ leaks from geologic sequestration sites**
Moriarty, D., Dobeck, L., Benson, S., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 3975-83
- **Development and Testing of a New Fiber Optic System for Monitoring CO₂ Solubility in Aqueous High-Pressure Geological Systems**
Hingerl, F. F., Marpu, S., Guzman, N., Benson, S. M., Delgado-Alonso, J., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 4134-44
- **CO₂ Plume Tracking and History Matching Using Multilevel Pressure Monitoring at the Illinois Basin - Decatur Project**
Strandli, C. W., Mehnert, E., Benson, S. M., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 4473-84
- **Evaluation of the Effectiveness of Injection Termination and Hydraulic Controls for Leakage Containment** *Energy Procedia*
Zahasky, C., Benson, S. M.
2014; 63: 4666-4676
- **A reactive transport model for geochemical mitigation of CO₂ leaking into a confined aquifer**
Druhan, J. L., Vialle, S., Maher, K., Benson, S., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 4620-29
- **A Simple Approximate Semi-analytical Solution for Estimating Leakage of Carbon Dioxide Through Faults** *Energy Procedia*
Zahasky, C., Benson, S. M.
2014; 63: 4861-4874
- **CO₂ Exsolution - Challenges and Opportunities in Subsurface Flow Management**
Zuo, L., Benson, S. M., Dixon, T., Herzog, H., Twinning, S.
ELSEVIER SCIENCE BV.2014: 5664-70
- **Carbon Dioxide Capture and Storage: Issues and Prospects** *ANNUAL REVIEW OF ENVIRONMENT AND RESOURCES, VOL 39*
de Coninck, H., Benson, S. M.
2014; 39: 243-270
- **Negative-emissions insurance.** *Science (New York, N.Y.)*
Benson, S. M.
2014; 344 (6191): 1431
- **Investigating Aperture-Based Stress-Dependent Permeability and Capillary Pressure in Rock Fractures** *SPE Annual Technical Conference and Exhibition*
Huo, D., Li, B., Benson, S.
2014
- **Carbon Capture, Utilization, and Storage** *Spring Issue of The Bridge on Emerging Issues in Earth Resources Engineering*
Benson, S., Friedmann, S.
2014; 44 (1)
- **A better currency for investing in a sustainable future** *Nature Climate Change*
Carbajales-Dale, M., Barnhart, C. J., Brandt, A. R., Benson, S. M.

2014; 4 (7): 524-527

- **Ensuring benefits from North American shale gas development: Towards a research agenda** *Journal of Unconventional Oil and Gas Resources*
Bazilian, M., Brandt, A. R., Billman, L., Heath, G., Logan, J., Mann, M., Melaina, M., Statwick, P., Arent, D., Benson, S. M.
2014; 7: 71-74
- **Negative-emissions insurance** *Science*
Benson, S. M.
2014; 344 (6191): 1431
- **Migration of exsolved CO₂ following depressurization of saturated brines** *GREENHOUSE GASES-SCIENCE AND TECHNOLOGY*
Falta, R. W., Zuo, L., Benson, S. M.
2013; 3 (6): 503-515
- **Influence of capillary-pressure models on CO₂ solubility trapping** *ADVANCES IN WATER RESOURCES*
Li, B., Tchelepi, H. A., Benson, S. M.
2013; 62: 488-498
- **The energetic implications of curtailing versus storing solar- and wind-generated electricity** *ENERGY & ENVIRONMENTAL SCIENCE*
Barnhart, C. J., Dale, M., Brandt, A. R., Benson, S. M.
2013; 6 (10): 2804-2810
- **Characterization and scaling of mesoscale heterogeneities in sandstones** *GEOPHYSICAL RESEARCH LETTERS*
Pini, R., Benson, S. M.
2013; 40 (15): 3903-3908
- **Analytical Study of Effects of Flow Rate, Capillarity, and Gravity on CO₂/Brine Multiphase-Flow System in Horizontal Corefloods** *SPE Western North American Regional Meeting*
Kuo, C., Benson, S. M.
SOC PETROLEUM ENG.2013: 708-20
- **A technical assessment of CO₂ Interim Storage in deep saline aquifers** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
Farhat, K., Benson, S. M.
2013; 15: 200-212
- **A Procedure for the Accurate Determination of Sub-Core Scale Permeability Distributions with Error Quantification** *TRANSPORT IN POROUS MEDIA*
Krause, M., Krevor, S., Benson, S. M.
2013; 98 (3): 565-588
- **Simultaneous determination of capillary pressure and relative permeability curves from core-flooding experiments with various fluid pairs** *WATER RESOURCES RESEARCH*
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