


# Stanford

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## Sally Benson

Precourt Family Professor, Professor of Energy Resources Engineering and Senior Fellow at the Precourt Institute for Energy and at the Woods Institute for the Environment

 Resume available Online

### CONTACT INFORMATION

#### • Administrative Contact

Thuy Nguyen - Sponsored Projects Administrator

**Email** [ttnguyen@stanford.edu](mailto:ttnguyen@stanford.edu)

**Tel** (650) 725-2725

### Bio

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#### BIO

Sally M. Benson, who joined Stanford University in 2007, is the Precourt Family 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 CO<sub>2</sub> in deep underground formations and energy systems analysis for a low-carbon future. She is the Co-Director of the Stanford Center for Carbon Storage and the Stanford Carbon Removal Initiative. She served as the Director and Co-Director of the Precourt Institute for Energy from 2013 to 2020. She also served as the Director of the Global Climate and Energy Project from 2009 to 2019.

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

Professor Benson currently serves on the Board of Directors for Climate Central and from 2008 to 2020 on the Board of Directors of the National Renewable Energy Laboratory. Currently she also serves on the Advisory Boards for Breakthrough Energy Ventures, 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, Climate Vault, 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
- Senior Fellow, Precourt Institute for Energy
- Senior Fellow, Stanford Woods Institute for the Environment
- 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, (2014-2020)

- 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**

- Engineers Health, Safety, and Environmental Award, Society Of Petroleum Engineers (2019)
- 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**

- Advisory Board, Climate Vault (2021 - present)
- Scientific Advisory Board, Breakthrough Energy Ventures (2021 - present)
- 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, Princeton University, Andlinger Center (2018 - present)
- Member, Advisory Board, Colorado School of Mines, Payne Institute (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, National Renewable Energy Laboratory (2008 - present)
- Board of Directors, Climate Central, Princeton, NJ (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/>
- Precourt Institute for Energy (PIE): <https://energy.stanford.edu>
- Stanford Woods Institute: <http://woods.stanford.edu/>
- Stanford Center for Carbon Storage: <https://scs.stanford.edu/>
- Google Scholar: Benson: <https://scholar.google.com/citations?user=t7GevjYAAAAJ&hl=en&oi=ao>

## Research & Scholarship

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### 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.

#### Teaching Activities

I team two courses regularly: Sustainable Energy for 9 Billion (ENERGY104) and Carbon Dioxide Capture and Storage (ENERGY153/253). In addition, I regularly teach research seminars related to decarbonizing the grid and increasing energy access for developing countries. I am currently teaching a Carbon Removal Seminar (Fall) and the Hydrogen Seminar (Winter).

#### 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

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### COURSES

#### 2020-21

- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Aut)
- Carbon Dioxide and Methane Removal, Utilization, and Sequestration: EARTHSYS 308, ENERGY 308, ENVRES 295, ESS 308, ME 308 (Aut)
- Energy Policy in California and the West: CEE 263G, ENERGY 73, POLISCI 73, PUBLPOL 73 (Spr)
- Hydrogen Economy: ENERGY 205 (Win)
- Sustainable Energy Interdisciplinary Graduate Seminar: ENERGY 309 (Aut, Win, Spr)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)

#### 2019-20

- Carbon Capture and Sequestration: ENERGY 153, ENERGY 253 (Aut)
- ERE Master's Graduate Seminar: ENERGY 351 (Aut)
- ERE PhD Graduate Seminar: ENERGY 352 (Aut)
- Energy Policy in California and the West: CEE 263G, POLISCI 73, PUBLPOL 73 (Spr)
- Hydrogen Economy: ENERGY 205 (Win)
- Sustainable Energy for 9 Billion: ENERGY 104 (Spr)

#### 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)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

TALAL AL SHAFLOOT, Laura Froute

#### Doctoral Dissertation Advisor (AC)

Fola Ayoola, Jihan Zhuang

#### Doctoral Dissertation Co-Advisor (AC)

Anela Arifi

#### Doctoral (Program)

Justin Bracci, Catherine Callas, Nora Hennessy, Aman Raizada, Gege Wen

## Publications

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### PUBLICATIONS

- **Anisotropic rate-dependent saturation functions for compositional simulation of sandstone composites** *JOURNAL OF PETROLEUM SCIENCE AND ENGINEERING*  
Boon, M., Matthai, S. K., Shao, Q., Youssef, A. A., Mishra, A., Benson, S. M.  
2022; 209
- **California's approach to decarbonizing the electricity sector and the role of dispatchable, low-carbon technologies** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Baik, E., Siala, K., Hamacher, T., Benson, S. M.  
2022; 113
- **U-FNO—An enhanced Fourier neural operator-based deep-learning model for multiphase flow** *Advances in Water Resources*  
Wen, G., Li, Z., Azizzadenesheli, K., Anandkumar, A., Benson, S. M.  
2022; 163
- **A physics-informed data reconciliation framework for real-time electricity and emissions tracking** *APPLIED ENERGY*  
de Chalendar, J. A., Benson, S. M.  
2021; 304
- **Long-Term Redistribution of Residual Gas Due to Non-convective Transport in the Aqueous Phase** *TRANSPORT IN POROUS MEDIA*  
Li, Y., Orr, F. M., Benson, S. M.  
2021
- **Quantifying CO<sub>2</sub> capillary heterogeneity trapping through macroscopic percolation simulation** *ADVANCES IN WATER RESOURCES*  
Ni, H., Moyner, O., Kurtev, K. D., Benson, S. M.  
2021; 155
- **Opportunities for large-scale CO<sub>2</sub> disposal in coastal marine volcanic basins based on the geology of northeast Hawaii** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
DePaolo, D. J., Thomas, D. M., Christensen, J. N., Zhang, S., Orr, F. M., Maher, K., Benson, S. M., Lautze, N., Xue, Z., Mito, S.  
2021; 110
- **CCSNet: A deep learning modeling suite for CO<sub>2</sub> storage** *ADVANCES IN WATER RESOURCES*  
Wen, G., Hay, C., Benson, S. M.  
2021; 155
- **A physics-based model to predict the impact of horizontal lamination on CO<sub>2</sub> plume migration** *ADVANCES IN WATER RESOURCES*  
Boon, M., Benson, S. M.  
2021; 150
- **Seismic Wave Attenuation and Dispersion Due to Partial Fluid Saturation: Direct Measurements and Numerical Simulations Based on X-Ray CT** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*  
Chapman, S., Borgomano, J. M., Quintal, B., Benson, S. M., Fortin, J.  
2021; 126 (4)
- **Extreme capillary heterogeneities and in situ fluid compartmentalization due to clusters of deformation bands in sandstones** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Romano, C. R., Garing, C., Minto, J. M., Benson, S. M., Shipton, Z. K., Lunn, R. J.  
2021; 106
- **Reliability of Relative Permeability Measurements for Heterogeneous Rocks Using Horizontal Core Flood Experiments** *SUSTAINABILITY*  
Kuo, C., Benson, S. M.  
2021; 13 (5)
- **An improved procedure for sub-core property characterization using data from multiple coreflooding experiments** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Anto-Darkwah, E., Benson, S. M., Rabinovich, A.

2021; 105

- **Towards a predictor for CO<sub>2</sub> plume migration using deep neural networks** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Wen, G., Tang, M., Benson, S. M.  
2021; 105
- **Description of Chemical Transport in Laboratory Rock Cores Using the Continuous Random Walk Formalism** *WATER RESOURCES RESEARCH*  
Kurotori, T., Zahasky, C., Benson, S. M., Pini, R.  
2020; 56 (9)
- **Using Unsupervised Machine Learning to Characterize Capillary Flow and Residual Trapping** *WATER RESOURCES RESEARCH*  
Ni, H., Benson, S. M.  
2020; 56 (8)
- **A continuum-scale representation of Ostwald ripening in heterogeneous porous media** *JOURNAL OF FLUID MECHANICS*  
Li, Y., Garing, C., Benson, S. M.  
2020; 889
- **Subcore Scale Fluid Flow Behavior in a Sandstone With Cataclastic Deformation Bands** *WATER RESOURCES RESEARCH*  
Romano, C. R., Zahasky, C., Garing, C., Minto, J. M., Benson, S. M., Shipton, Z. K., Lunn, R. J.  
2020; 56 (4)
- **Tracking emissions in the US electricity system.** *Proceedings of the National Academy of Sciences of the United States of America*  
de Chalendar, J. A., Taggart, J., Benson, S. M.  
2019
- **Spatial and Temporal Quantification of Spontaneous Imbibition** *GEOPHYSICAL RESEARCH LETTERS*  
Zahasky, C., Benson, S. M.  
2019
- **Macro-Energy Systems: Toward a New Discipline** *JOULE*  
Levi, P. J., Kurland, S., Carbajales-Dale, M., Weyant, J. P., Brandt, A. R., Benson, S. M.  
2019; 3 (10): 2282–86
- **CO<sub>2</sub> plume migration and dissolution in layered reservoirs** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Wen, G., Benson, S. M.  
2019; 87: 66–79
- **Predicting CO<sub>2</sub> residual trapping ability based on experimental petrophysical properties for different sandstone types** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Ni, H., Boon, M., Garing, C., Benson, S. M.  
2019; 86: 158–76
- **Why 100% Renewable Energy Is Not Enough** *JOULE*  
de Chalendar, J. A., Benson, S. M.  
2019; 3 (6): 1389–93
- **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
- **City-scale decarbonization experiments with integrated energy systems** *ENERGY & ENVIRONMENTAL SCIENCE*  
de Chalendar, J. A., Glynn, P. W., Benson, S. M.  
2019; 12 (5): 1695–1707
- **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

- **CO<sub>2</sub> Wettability of Sandstones: Addressing Conflicting Capillary Behaviors** *GEOPHYSICAL RESEARCH LETTERS*  
Garing, C., Benson, S. M.  
2019; 46 (2): 776–82
- **Carbon Mineralization of CO<sub>2</sub>** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 247–318
- **Coreflooding data on nine sandstone cores to measure CO<sub>2</sub> residual trapping.** *Data in brief*  
Ni, H. n., Boon, M. n., Garing, C. n., Benson, S. M.  
2019; 25: 104249
- **Synthesis** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 351–401
- **Bioenergy with Carbon Capture and Sequestration** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 137–88
- **Terrestrial Carbon Removal and Sequestration** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 87–135
- **Direct Air Capture** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 189–246
- **Negative Emissions Technologies and Reliable Sequestration A Research Agenda Introduction** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 23–44
- **Sequestration of Supercritical CO<sub>2</sub> in Deep Sedimentary Geological Formations** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 319–49
- **YCoastal Blue Carbon** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: 45–86
- **Negative Emissions Technologies and Reliable Sequestration A Research Agenda Preface** *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA*  
Pacala, S., Al-Kaisi, M., Barteau, M. A., Belmont, E., Benson, S. M., Birdsey, R., Boysen, D., Duren, R., Hopkinson, C., Jones, C., Kelemen, P., Levasseur, A., Paustian, et al  
2019: XI+
- **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. n., Sanchez, D. L., Turner, P. A., Mach, K. J., Field, C. B., Benson, S. M.  
2018; 115 (13): 3290–95
- **In situ carbon mineralization in ultramafic rocks: Natural processes and possible engineered methods**  
Kelemen, P. B., Aines, R., Bennett, E., Benson, S. M., Carter, E., Coggon, J. A., de Obeso, J. C., Evans, O., Gadikota, G., Dipple, G. M., Godard, M., Harris, M., Higgins, et al  
ELSEVIER SCIENCE BV.2018: 92–102
- **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 CO<sub>2</sub>/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 CO<sub>2</sub> 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 CO<sub>2</sub> geologic storage: A methodological framework** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Farhat, K., Benson, S. M.  
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