

# Timothy Meckel

## Professional Summary

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## Professional Preparation

### Academic Background

Ph.D. Institute for Geophysics and Department of Geological Sciences, The University of Texas at Austin, May 2003

M.S. Department of Geological Sciences, University of Montana, Missoula, MT, 1998

B.A., with Magna Cum Laude and Phi Beta Kappa, Department of Geology, Colby College, Waterville, ME, Summer 1995

### Professional Appointments

Senior Research Scientist, Bureau of Economic Geology (September 2018-Present)  
Lead researcher in Carbon Capture and Storage (CCS) and high-resolution 3D marine seismic imaging

Present Position: Research Scientist, Bureau of Economic Geology, The University of Texas at Austin (September 2011 - Present).

Research Associate, Bureau of Economic Geology, The University of Texas at Austin (July 2006 - September 2011).

Mendenhall Postdoctoral Research Fellow, U.S. Geological Survey (June 2004 - July 2006). Quantitative evaluation and numerical modeling of the geologic contributions to subsidence processes, Louisiana Coastal Plain; development of Fortran code for synthetic stochastic stratigraphic generation for numerical modeling and geostatistical analysis of compaction processes.

Assistant Professor, Colby College, Waterville, Maine (2003 - 2004). Structural geology and GIS/GPS applications in geosciences and introductory lectures for undergraduates.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Summer 2002). Organization of and assistance with instruction of 3-week geologic field course mapping structural complexities in the western U.S.

Exploration Geologist, ExxonMobil (May 2001 - September 2001). Interpretation of both time and depth-converted 3D MCS to identify near-field wildcat prospects in Mississippi Canyon; well sites proposed and resource potential quantified.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Spring 2001 - Summer 2001). Graduate-level laboratory course, Sequence Stratigraphy.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Fall 2000 - Spring 2001). Upper-level undergraduate laboratory course, Structural Geology.

Outreach Specialist, Dana Center, The University of Texas at Austin (Summer 2000 - Fall 2000). TEKS instruction.

Research Assistant, Institute for Geophysics, The University of Texas at Austin (Summer 2000 - Fall 2000). Collection and preprocessing of MCS and OBS seismic data aboard the R/V Maurice Ewing off the west coast of Nicaragua.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Fall 1999 - Spring 2000). Introductory undergraduate laboratory.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Summer 1999 - Fall 1999). Organization of and assistance with instruction of 3-week geologic field course mapping structural complexities in the western U.S.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Spring 1999 - Summer 1999). Introductory undergraduate laboratory.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Spring 1999 - Summer 1999). Introductory undergraduate laboratory.

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (Spring 1999 - Summer 1999). Introductory undergraduate laboratory.

Research Assistant, Department of Geology, The University of Montana (Summer 1998 - Fall 1998). Collection and interpretation of digital petrographic images of microscopic thin sections of sandstones to develop an algorithm to estimate porosity.

Teaching Assistant, Geology Department, The University of Montana (Fall 1996 - Spring 1998). Four introductory geology laboratory semester courses for undergraduates.

Research Assistant, Indiana University Geologic Field Station, southwest Montana (Summer 1997 - Fall 1997). Research with ground-penetrating radar and development of field curriculum.

Assistant Instructor, Indiana University Geologic Field Station, southwest Montana (Summer 1996 - Fall 1996). Organization of and assistance with instruction of 6-week geologic field course in western U.S.

## Theses

Assessing sedimentary architecture using ground-penetrating radar: the Cretaceous Bootlegger Member, central Montana

## Dissertations

Tectonics of the Hjort Region of the Macquarie Ridge Complex, Southernmost Australian-Pacific plate boundary, southwest Pacific Ocean

## Continuing Education Courses Taken

Decision Makers Conference: Bureau of Economic Geology, Jewett, Texas, May 2008

Petrel Training: Schlumberger Carbon Services, Austin, Texas, April 2008

Continuing Education Short Course on CO<sub>2</sub> Sequestration: SPE, Galveston, Texas, November 2005

Dead Sea Seismic Experiment: deployment and data acquisition during active source seismic field experiment investigation Dead Sea transform tectonics, Jordan: U.S. Geological Survey and The University of Texas at El Paso, Jordan, October 2004

Fractured Reservoir Characterization and Modeling: American Association of Petroleum Geologists Short Course, Salt Lake City, Utah, November 2003

## Areas of Expertise

### Areas of Expertise

Geologic carbon storage; carbon dioxide capture and sequestration (CCS)

High-resolution 3D marine seismic acquisition

Sequence stratigraphy

Structural geology

Tectonics

## Awards

### Awards and Honorary Societies

Bernold M. Hanson Excellence of Presentation Award, 2013 AAPG Annual Convention and Exhibition for "Determining seal effectiveness and potential buoyant fluid migration pathways using shallow high-resolution 3D seismic imaging: Application for CO<sub>2</sub> storage assessment on the inner Texas shelf"

2024 Tinker Family BEG Publication Award, Exemplary Publication of Scientific or Economic Impact, for timely and foundational work toward CO<sub>2</sub> storage security, 2024

Rainmaker 2023 - Bureau of Economic Geology, 2023

John C. Frye Memorial Award in Environmental Geology

The Geological Society of America

The Association of American State Geologists, 2018

Second Place, Gordon I. Atwater Best Poster Award, for the 2014 annual convention of the Gulf Coast Association of Geological Societies and Gulf Coast Section of SEPM, Lafayette, LA., 2014

Bruno Hanson Excellence of Presentation: AAPG Annual Convention and Exhibition, 2013

Best Presentation by Ph.D. Candidate, Department of Geological Sciences, The University of Texas at Austin, 2003

Gale White Fellowship, Institute for Geophysics, The University of Texas at Austin, 2001 - 2002

Banks Scholarship, Department of Geological Sciences, The University of Texas at Austin, 2002

Best Presentation by a Fellowship Recipient, Institute for Geophysics, The University of Texas at Austin, 2002

Research Grant, Geological Society of America, distinguished for exceptional merit in conception and presentation, 2000

Departmental Award for Academic Scholarship, Department of Geological Sciences, The University of Texas at Austin, 1999

Scholarship, Academic Excellence and Field Research, Billings Geophysical Society, Billings, Montana, 1997

## Service

### University Committees

Member, Candidate Search Committee for Associate Dean of Research, Jackson School of Geosciences, September 30, 2014-December 28, 2015

### External Committees Participation

Member, AAPG Research Committee, American Association of Petroleum Geologists, 2008

Texas Senate Committee on Natural Resources, Senator Kip Averett, Chair, Technical developments in carbon capture and storage in Texas, The Woodlands, Texas.

Member, Climate System Science Theme Hire Committee, Jackson School of Geosciences, 2007

Member, Lab Space Committee, Bureau of Economic Geology, 2007

Member, Publications Council, Bureau of Economic Geology, 2007

### Published Interviews

Ni, H., and Meckel, T., 2021, Experimental work on carbon dioxide migration and trapping under strongly gravity- and capillary-dominated flow regimes [exclusive video interview of Ni and Meckel]: Digital Rocks Portal Newsletter, issue for December 2021, <https://us16.campaign-archive.com/?u=5062e94dc37c7490120fe65ae&id=d5dd77a71c>.

### Outreach Activities

CO2 demonstrations for the classroom: presented at Texas Regional Collaborative Workshop, Austin, Texas, June 10, 2008.

### Proposal Review Panels Participation

Nature Geoscience (Article), 2009

Basin Research (Article), 2008

Geology (Article), 2007

Nature Geoscience (Article), 2007

### Teaching and Advising

#### University Courses Taught

Field Geology (GEO 660): presented to The University of Texas at Austin, field studies in Dillon, Montana, 2009-2015.

Advances in CO2 Injection and Storage in Geological Formations: presented at The University of Texas at Austin, 2010-2011.

Introduction to Field and Stratigraphic Methods (GEO 420K): The University of Texas at Austin, 2015-Present.

#### Continuing Education Courses Taught

Texas Geologic Carbon Repository: Short course on carbon sequestration presented to GCCC and TCEQ, Austin, Texas, February 2, 2009.

Monitoring design for large-scale CCS projects: summer short course presented at Research Experience in Carbon Sequestration (RECS), Albuquerque, NM, July 22, 2008.

Geologic issues for siting CCS projects: presented as Short Course on Carbon Sequestration (GCCC & TxCCSA, Austin, Texas, April 23, 2008.

Lessons learned from the FutureGen process and Frio Pilot injection in Texas: presented as AAPG Short Course on Geologic Carbon Sequestration, Atlanta, Georgia, April 19, 2008.

#### Student Committee Participation

Member, M.S. Thesis Committee, Nishanth Kalyanaraman, The University of Texas at Austin, 2008

### Presentations

#### Invited Presentations

Effects of flow pulsation on CO2 buoyant migration and capillary trapping: presented to Department of Civil and Environmental Engineering, University of Strathclyde, Glasgow, UK, February 8, 2023.

Partnership for Offshore Carbon Storage Resources and Technology Development in the Gulf of Mexico - "GoMCarb": presented to Gulf Basin Depositional Synthesis IA consortium, presented at

2021 Annual IA meeting, virtual (Microsoft Teams), January 14, 2021.

Growing experience with high-resolution 3D marine seismic in research and industry: presented to Marine Seismic Research Oversight Committee (MSROC), New Orleans, La., December 10, 2017.

Offshore geologic CO<sub>2</sub> storage: presented to US-Taiwan Geologic Storage Meeting, Taipei, Taiwan, December 9, 2016.

Transferring 20 years of learning at Sleipner: presented to 13th Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 16, 2016.

Overburden features: what do these represent and how do they affect risk?: presented to National Oceanography Centre, Southampton, UK, October 1, 2015.

High-resolution 3D from the Gulf of Mexico inner shelf: example of academic-industry partnership: presented to NSF Marine Seismic Data Workshop, San Francisco, Calif., December 12, 2014.

Overburden imaging using high-resolution 3D seismic: perspectives from 3 surveys in the Gulf of Mexico using

P-cable technology: presented to IEA-GHG Monitoring Network Meeting, Morgantown, Pa., August 4, 2014.

Role of CCS in diverse energy chain developments and the global significance of offshore storage: presented to U.S. Energy Agency (USEA), Washington, D.C., June 6, 2014.

On the origin, distribution, and size of natural CO<sub>2</sub> accumulations: implications for CH<sub>4</sub> exploration and development: presented to Society of Petroleum Engineers, presented at Advanced Technology Workshop, Penang, Malaysia, February 3, 2013.

Above-zone pressure monitoring at Cranfield, MS: presented to IEA-GHG, presented at Monitoring Network Meeting, Potsdam, Germany, June 7, 2011.

Summary of current regional carbon sequestration partnership activities, USA: presented to CCS Technical Workshop, Kyoto, Japan, December 9, 2010.

Offshore storage capabilities - new research at the Gulf Coast Carbon Center: presented to Society of Petroleum Engineers, presented at Training Course: Storage of CO<sub>2</sub> in Geologic Formations, New Orleans, La., November 8, 2010.

Developing offshore CO<sub>2</sub> storage for Texas: presented to Texas Commission on Environmental Quality (TCEQ), Austin, Tex., May 4, 2010.

Developing offshore CO<sub>2</sub> storage for Texas: presented to Air & Waste Management Association, Austin, Tex., April 15, 2010.

Geological storage of CO<sub>2</sub> in Texas: presented to Texas Public Power Association, Austin, Tex., April 5, 2010.

Regional carbon sequestration partnership projects, USA: presented to Geoscience Australia, Canberra, Australia, January 20, 2010.

The Frio & Cranfield injection projects, USA: presented to China-Australia Geologic CO<sub>2</sub> Storage Partnership, Canberra, Australia, January 18, 2010.

The Texas Carbon Repository: presented to Texas Carbon Capture and Storage Association, presented at CO<sub>2</sub> Workshop & UT Law School Continuing Education, Austin, Tex., February 12, 2009.

Current topics in geologic carbon capture and storage with examples from pilot field injections: presented to Colorado School of Mines, presented at Van Tuyl Invited Lecture Series, Golden, Colo., May 1, 2008.

## Presentations

A laboratory and simulation study on the impact of small-scale heterogeneity on field-scale CO<sub>2</sub> plume migration and trapping (poster): presented at AGU Fall Meeting 2024, Washington, D.C., December 9-13, 2024.

The Impact of Capillary Heterogeneity Trapping on Field-Scale CO<sub>2</sub> Geologic Storage Simulations: presented at 40th Annual GCSSEPM Foundation Perkins-Rosen Research Conference, Houston, TX, December 2-4, 2024.

Impact of small-scale heterogeneity on field-scale CO<sub>2</sub> migration and trapping: presented at 17th International Conference on Greenhouse Gas Control Technologies (GHGT-17), Calgary, Canada, October 20-24, 2024.

Impact of Small-Scale Heterogeneity on Field-Scale Simulations of CO<sub>2</sub> Geologic Storage: presented at SPE-AAPG-SEG Carbon Capture, Utilization, and Storage (CCUS) Conference, Houston, TX, March 11-13, 2024.

Experimental Investigation and Modelling of the Impact of Small-Scale Heterogeneities in Geologic Carbon Storage (poster): presented at AGU Fall Meeting, San Francisco, Calif., December 11-15, 2023.

Using multiphase sand tank experiments to investigate the effect of heterogeneities on CO<sub>2</sub> capillary trapping (eLightening): presented at AGU Fall Meeting, San Francisco, Calif., December 11-15, 2023.

Experimental Investigation of CO<sub>2</sub> Buoyant Flow Saturation in Ripple Bedforms: presented at SPE/AAPG/SEG Carbon Capture, Utilization, and Storage (CCUS) Conference, Houston, Tex., April 25-27, 2023.

Sandbox model results & implications for CO<sub>2</sub> migration and trapping: presented at 2023 Joint Annual GoMCarb - SECARB Offshore Partnerships' Meeting, Austin, Tex., April 5-7, 2023.

Laboratory experiments and modeling to accurately evaluate critical CO<sub>2</sub> saturation for geologic carbon storage: presented at 2022-2023 Energy Seed Grant Program Presentations, UT Energy Week 2023, Austin, Tex., March 28, 2023.

Experimental investigation of CO<sub>2</sub> buoyant flow saturation in ripple bedforms (poster): presented at 12th Annual Jackson School Student Research Symposium, Austin, Tex., February 11, 2023.

Predicting CO<sub>2</sub> gravity-driven drainage saturation using machine learning (poster): presented at AAPG's Carbon Capture, Utilization, and Storage (CCUS) Conference, Houston, Tex., March 29-31, 2022.

Characterizing CO<sub>2</sub> flow and trapping through sand tank experiments: presented at University of Texas Sixth Conference on Carbon Capture and Storage (UTCCS-6), Austin, Tex., January 25-27, 2022.

Predicting CO<sub>2</sub> saturation for heterogeneous domains using machine learning: presented at University of Texas Sixth Conference on Carbon Capture and Storage (UTCCS-6), Austin, Tex., January 25-27, 2022.

Predicting CO<sub>2</sub> gravity-driven drainage saturation using machine learning: presented at AGU Fall Meeting, New Orleans, La., December 13-17, 2021.

What Offshore CCS Will Look Like in the Gulf of Mexico--Perspectives from Texas: presented at Offshore Technology Conference 2019, Houston, Tex., May 9, 2019.

Carbon Capture and Sequestration (Storage) - CCS: A Climate Change Mitigation Strategy for the Near-Offshore Northwestern Gulf of Mexico: presented at American Shore and Beach Preservation Association, Texas Chapter, 2019 Symposium, Harte Research Institute, Texas A&M University, Corpus Christi, April 16, 2019.

High-Level Technical Evaluation of Sub-Basinal Storage: presented to The University of Texas at Austin, presented at 4th Conference on Carbon Capture and Storage, Austin, Tex., January 30, 2018.

Advances in HR3D seismic in academic research and industry: presented to Marine Seismic Research Oversight Committee (MSROC), presented at University-National Oceanographic Laboratory System (UNOLS) Committee Meeting, New Orleans, La., December 10, 2017.

Quantifying saturations from buoyant fluid flow in heterogeneous clastic materials at multiple scales through numerical simulation and laboratory experiments: presented to 5th Annual Bureau of Economic Geology Research Symposium, Austin, Tex., November 15, 2017.

Advances in understanding buoyancy-dominated flow in heterogeneous geologic systems: presented to Center for Subsurface Energy Security Annual Meeting, Washington, D.C., July 24, 2017.

Integrated CO<sub>2</sub> capture, transport, and storage for the Gulf Coast: presented to Second International Offshore CO<sub>2</sub> Storage Workshop, Beaumont, Tex., June 21, 2017.

Saturations of migrating buoyant fluids from invasion percolation flow simulation using small-scale, high-resolution geologic models with realistic heterogeneity: presented to AAPG Annual Meeting, Houston, Tex., April 3, 2017.

CarbonSAFE pre-feasibility study: presented to CarbonSAFE project stakeholder meeting, Houston, Tex., February 28, 2017.

Experimentally tested invasion percolation modeling of buoyancy-driven flow: presented to Center for Subsurface Energy Security, Austin, Tex., February 17, 2017.

High-resolution 3D seismic experience and potential for collaboration: presented to RITE, Tokyo, Japan, February 15, 2017.

Applications of short-offset high-resolution 3D seismic technology: Quaternary studies, gas migration systems, and carbon dioxide storage: presented to Annual P-Cable Users Meeting, Oslo, Norway, February 8, 2017.

Applications of short-offset high-resolution 3D seismic technology: Quaternary studies, gas migration systems, and carbon dioxide storage: presented to U.S. Geological Survey, Marine Science Center, Santa Cruz, Calif., January 18, 2017.

Offshore geologic carbon dioxide storage: presented to US-Taiwan Geological Storage Technology Symposium, Taipei, Taiwan, December 9, 2016.

Offshore geologic carbon dioxide storage: presented to Bureau of Energy, Taipei, Taiwan, December 8, 2016.

Offshore geologic CO<sub>2</sub> storage & SECARB Cranfield Project: presented to Industrial Technology Research Institute, Taipei, Taiwan, December 8, 2016.

Current engineering and geologic challenges for achieving giga-ton scale carbon storage: presented to Center for Petroleum and Geosystems Engineering, Austin, Tex., October 24, 2016.

High-resolution marine seismic imaging: presented to Earth Science Week Career Day, presented at The University of Texas at Austin, October 7, 2016.

Applications of short-offset high-resolution 3D seismic technology: Quaternary studies, gas migration systems, and carbon dioxide storage: presented to U.S. Geological Survey, Woods Hole Science Center, Woods Hole, Mass., September 15, 2016.

Offshore CO<sub>2</sub> storage resource assessment of the northern Gulf of Mexico (upper Texas-western Louisiana coastal areas): presented to National Energy Technology Laboratory,

presented at Mastering the Subsurface through Technology, Innovation and Collaboration: Carbon Storage and Oil and Natural Gas Technologies Review Meeting, Pittsburgh, Pa., August 16, 2016.

Offshore CCS: presented to Secretary Ernest Moniz, presented at Mission Innovation Roundtable, Austin, Tex., May 9, 2016.

Geologic storage & utilization of CO<sub>2</sub>: GCCC experience & leadership: presented to ExxonMobil, Austin, Tex., May 3, 2016.

High-resolution 3D Seismic (P-Cable) in the Gulf of Mexico: presented to ONEGulf Meeting, Houston, Tex., April 21, 2016.

Global opportunities for offshore CCS: assessing offshore storage on continental shelves: presented to 1st International Offshore CO<sub>2</sub> Storage Workshop, Austin, Tex., April 19, 2016.

High-resolution 3D seismic (P-Cable) from the Gulf of Mexico inner shelf: presented to Bureau of Ocean Energy Management, Austin, Tex., April 6, 2016.

Experimentally tested invasion percolation modeling of buoyancy-driven flow: presented to Center for Subsurface Energy Security, Washington, D.C., March 3, 2016.

Experimentally tested invasion percolation modeling of buoyancy-driven flow: presented to Center for Subsurface Energy Security, Austin, Tex., February 17, 2016.

Integration of P-Cable HR3D seismic and shallow sediment coring for understanding gas migration, inner shelf, Gulf of Mexico: presented to Annual P-Cable Users Meeting, Oslo, Norway, February 2, 2016.

Summary of active offshore CO<sub>2</sub> storage assessments in the USA: presented to Offshore CO<sub>2</sub> Storage Roundtable, Beijing, China, January 13, 2016.

Understanding CO<sub>2</sub> storage capacity limitations: presented to ExxonMobil, Houston, Tex., January 7, 2016.

Global opportunities for offshore CCS on continental shelves: presented to AIChE Carbon Management Technology Conference, Houston, Tex., November 18, 2015.

Offshore CO<sub>2</sub> storage resource assessment of the northern Gulf of Mexico (upper Texas-western Louisiana coastal areas): presented to National Energy Technology Laboratory, Pittsburgh, Pa., November 10, 2015.

Constraining the influence of meso-scale heterogeneity on CO<sub>2</sub> saturation resulting from buoyant flow: presented to Center for Frontiers in Subsurface Energy Security, Albuquerque, NM, October 27, 2015.

SaskCO<sub>2</sub> update on fluid migration modeling: presented to Petroleum Technology Research Council, Austin, Tex., June 4, 2015.

Offshore Texas Miocene CO<sub>2</sub> Storage Project: presented to Austin Geological Society, presented at Annual Poster Session, University of Texas at Austin, Bureau of Economic Geology, May 4, 2015.

Accelerating sustainability of diverse future clean energy developments through CCUS: presented to National Energy Technology Laboratory, Pittsburgh, Pa., April 30, 2015.

Accelerating sustainability of diverse future clean energy developments through carbon capture, utilization, and storage: presented at Annual CCUS Conference, Pittsburgh, Pennsylvania, April 29, 2015.

Regional characterization of the Miocene interval offshore Texas, Gulf of Mexico: presented at Annual CCUS Meeting, Pittsburgh, Pennsylvania, April 29, 2015.

Invasion percolation and meter-scale experiments: presented to Center for Frontiers of

Subsurface Security, Austin, Texas, April 9, 2015.

Applying a petroleum systems approach to CCS: presented to Center for Frontiers of Subsurface Energy Security, Austin, March 26, 2015.

High-resolution 3D from the Gulf of Mexico inner shelf: current applications for fluid systems and CCS: presented to Annual P-Cable User Meeting, Oslo, Norway, January 28, 2015.

Buoyancy-driven multi-phase flow: presented to Center for Subsurface Energy Security, Austin, Tex., January 14, 2015.

Fluid system analysis strategy using HR3D seismic: presented to TDI Brooks, Int., College Station, Tex., December 16, 2014.

High-resolution 3D from the Gulf of Mexico inner shelf: example of academic-industry partnership: presented at National Science Foundation Marine Seismic Data Workshop, San Francisco, California, December 12, 2014.

Buoyancy-driven flow in heterogeneous materials: presented at Greenhouse Gas Control Technologies conference (GHGT-12), Austin, Texas, October 8, 2014.

High-resolution 3D seismic investigations of the overburden above potential CCS sites of the inner Texas shelf, Gulf of Mexico, USA: presented at Greenhouse Gas Control Technologies conference (GHGT-12), Austin, Texas, October 6, 2014.

Opportunities for high-resolution 3D marine seismic acquisition: presented to Annual Bureau of Economic Geology Research Symposium, Austin, Tex., September 12, 2014.

Role of CCS in diverse energy chain developments and the global significance of offshore storage: presented to IEA-GHG Summer School, Austin, Tex., July 7, 2014.

Role of CCS in diverse energy chain developments and the global significance of offshore storage: presented to United States Energy Association, Washington, DC, June 10, 2014.

Role of CCS in diverse energy chain developments and the global significance of offshore storage: presented to BHP-Billiton, Austin, Tex., June 3, 2014.

Carbon capture and offshore storage in the Gulf of Mexico: presented at Coastal Resilience: The Environment, Infrastructure, and Human Systems, technical conference, New Orleans, Louisiana, May 23, 2014.

Texas Offshore Miocene Project: acquisition of high-resolution 3D seismic data: presented to Advisory Council, Jackson School of Geosciences, Austin, Tex., April 25, 2014.

Results from the second high-resolution 3D seismic survey from the inner Texas shelf: presented to Bureau of Economic Geology, Austin, Texas, March 7, 2014.

P-Cable deployments in the Gulf of Mexico: presented at Annual P-Cable Users Meeting, Oslo, Norway, February 3, 2014.

Role of subsea geologic carbon storage in the U.S. and worldwide: presented at The University of Texas Conference on Carbon Capture and Storage (UTCCS-2), Austin, Texas, January 29, 2014.

New capabilities for high-resolution 3D marine seismic acquisition (P-cable technology) and recent applications in the Gulf of Mexico: presented to Statoil, Austin, Texas, January 23, 2014.

Monitoring technologies employed by the SECARB Partnership at Cranfield: presented to Joint US-Norway Workshop on CO<sub>2</sub> Storage Demonstration Projects, Pittsburgh, Pa., August 19, 2013.

CO<sub>2</sub> storage assessment on the Inner Texas Shelf: presented to TDI Brooks, Int., College Station, Tex., June 6, 2013.

Determining seal effectiveness and potential fluid migration pathways using HR3D seismic data:

presented to AAPG Annual Meeting, Pittsburgh, Pa., May 22, 2013.

Geologic carbon sequestration: presented to Center for Petroleum and Geosystems Engineering, Austin, Tex., April 8, 2013.

Offshore CCS: presented to Geological Society of America, South-Central Section Regional Meeting, Austin, Tex., April 3, 2013.

High-resolution 3D seismic acquisition on the inner Texas shelf: P-Cable capabilities and applications: presented to Bureau of Economic Geology weekly research seminar, Austin, Tex., February 22, 2013.

CO2 site characterization Gulf of Mexico Miocene: presented to annual P-Cable users meeting, Oslo, Norway, February 7, 2013.

Offshore Gulf of Mexico CCS summary: presented to Environmental Protection Agency, Austin, Tex., November 27, 2012.

On the origin, distribution, and size of natural CO2 accumulations: implications for CH4 exploration and development: presented to Gulf Coast Association of Geological Societies, Austin, Tex., October 24, 2012.

CO2 storage capacity estimation: presented to GCCC Sponsors, Houston, Tex., January 25, 2012.

Structural compartmentalization and CCS: presented to Gulf Coast Carbon Center, Austin, Tex., January 14, 2012.

Overview of CCS research at Gulf Coast Carbon Center: presented to University of Texas at Austin CCS Meeting, Austin, Tex., December 3, 2011.

Offshore CO2 storage in the Gulf of Mexico: presented to National Energy Technology Laboratory, Morgantown, Pa., November 15, 2011.

Above-zone pressure monitoring as a surveillance tool for carbon sequestration projects: presented to Society of Petroleum Engineers CO2 Conference, New Orleans, La., November 9, 2011.

Geological sequestration for greenhouse gas emission reductions: presented to Texas Railroad Commission, Austin, Tex., June 15, 2011.

Offshore CCS in the Gulf of Mexico and risks posed by existing wells: presented to National Energy Technology Laboratory, Morgantown, Pa., May 4, 2011.

Microseismic monitoring of carbon sequestration: presented to RITE, Austin, Tex., April 29, 2011.

Research at the Gulf Coast Carbon Center: presented to Seismic Exchange, Inc., Houston, Tex., April 27, 2011.

Gulf of Mexico Miocene CO2 site characterization: presented to Petrobras, Houston, Tex., April 18, 2011.

Carbon capture and storage: presented to West Lake High School, Austin, Tex., April 5, 2011.

Buoyant fluid migration within heterogeneous geologic media: presented to Bureau of Economic Geology, Austin, Tex., March 25, 2011.

Put it back: geologic sequestration for greenhouse gas emissions reductions: presented to Austin Forum, Austin, Tex., March 1, 2011.

Southern Louisiana's subsidence and the Mississippi River: geologic processes and anthropogenic aspects: presented to Environmental Science Symposium, New Orleans, La., February 25, 2011.

Gulf Coast Carbon Center field experiments: presented to Advanced Energy Consortium, Austin, Tex., February 16, 2011.

Gulf of Mexico Miocene CO<sub>2</sub> site characterization: presented to Texas Carbon Capture and Storage Association, Austin, Tex., February 8, 2011.

Pore to continuum scale processes in CCS: presented to GCCC Sponsors, Austin, Tex., January 27, 2011.

Gulf of Mexico Miocene mega-transect CO<sub>2</sub> site characterization: presented to GCCC Sponsors, Austin, Tex., November 16, 2010.

Gulf of Mexico Miocene mega-transect CO<sub>2</sub> site characterization: presented to National Energy Technology Laboratory, Pittsburgh, Pa., November 7, 2010.

Above-zone pressure monitoring as a surveillance tool for carbon sequestration projects: presented to BP, Austin, Tex., October 28, 2010.

Texas offshore Miocene characterization project: presented to CGAGS Short Course, San Antonio, Tex., October 11, 2010.

Geological storage of CO<sub>2</sub> in Texas: presented to Texas Public Power Association, Austin, Tex., July 19, 2010.

Preparing astronauts for lunar and Martian geologic field work: NASA training exercise in the Valles Caldera deposits of New Mexico: presented to Bureau of Economic Geology, Austin, Tex., July 16, 2010.

Developing offshore CO<sub>2</sub> storage for Texas: presented to Texas Commission on Environmental Quality (TCEQ), Austin, Tex., May 4, 2010.

Developing offshore CO<sub>2</sub> storage for Texas: presented to Central Texas Chapter Air and Waste Management Association, Austin, Tex., April 15, 2010.

Monitoring of carbon sequestration: presented to AAPG Annual Meeting, New Orleans, La., April 13, 2010.

Monitoring CCS: presented to GCCC Sponsors, Houston, Tex., January 21, 2010.

Offshore CCS in the Gulf of Mexico: presented to GCCC Sponsors, Houston, Tex., January 21, 2010.

Developing offshore storage for Texas: presented to UK-TX CCS Workshop, Houston, Tex., December 7, 2009.

CCS at Cranfield Project, MS, USA: presented to Society of Petroleum Engineers, Vancouver, B.C., October 6, 2009.

Monitoring of Pilot Brine Injection Projects: presented to Environmental Protection Agency, Region VI, Austin, Tex., October 4, 2009.

Monitoring of carbon sequestration: presented to Institute for Geophysics, presented at The University of Texas at Austin, Austin, Tex., September 11, 2009.

CO<sub>2</sub> considerations for LCRA: presented to Lower Colorado River Authority, Austin, Tex., May 1, 2009.

CCS on Texas offshore State lands: presented to GCCC Sponsors, Houston, Tex., January 14, 2009.

Field demonstration projects led by GCCC: presented at UK-Texas Carbon Capture & Storage Technical Workshop, Houston, Texas, December 8, 2008.

Comparing carbon sequestration in an oil reservoir to sequestration in a brine formation- field study: presented at the GHGT-9 (Green House Gas Technology) Conference, Washington,

D.C., November 16-20, 2008.

Continuous pressure monitoring for large volume CO<sub>2</sub> injections: presented at the GHGT-9 (Green House Gas Technology) Conference, Washington, D.C., November 16-20, 2008.

SECARB Pilot Demonstration Project: presented at Southern Company Open House, Escatawpa, Mississippi, October 15, 2008.

Integrated monitoring design for a large volume commercial injection: presented at 7th Annual Conference on Carbon Capture and Sequestration, Pittsburgh, Pennsylvania, May 6, 2008.

An attempt to reconcile subsidence rates determined from various techniques: presented at Colorado School of Mines-AAPG Student Chapter Luncheon, Golden, Colorado, May 2, 2008.

Current topics in geologic carbon capture and storage with examples from pilot field injections-numerical constraints and stratigraphic influences: presented at Colorado School of Mines-AAPG Student Chapter Luncheon, Golden, Colorado, May 2, 2008.

Current topics in geologic carbon capture and storage with examples from pilot field injections: presented as Colorado School of Mines Van Tuyl Invited Lecture, Austin, Texas, May 1, 2008.

Optimizing CO<sub>2</sub> injections for both seal integrity and economic return: presented at the AAPG Annual Convention, San Antonio, Texas, April 2008.

Gulf Coast Stacked Storage SECARB Phase II Test #1: presented at SECARB Stakeholders Meeting, Atlanta, Georgia, March 18, 2008.

Hydrologic and geochemical considerations for large volume geologic storage of carbon dioxide: presented to the Hydrogeology Brown Bag Seminar, Austin, Texas, February 22, 2008.

Public perception of CCS in Texas: presented to Texas Carbon Capture and Storage Association, Austin, Texas, February 14, 2008.

Sediment compaction rates and subsidence in deltaic plains--numerical constraints and stratigraphic influences: presented at the Louisiana Geological Survey Subsidence Symposium, Austin, Texas, January 24, 2008.

Subsidence rates from fluid withdrawal and potential impact in southern Louisiana: presented at the Louisiana Geological Survey Subsidence Symposium, Austin, Texas, January 24, 2008.

Pressure as a limiting factor influencing long-term sequestration capacity: presented at the Gulf Coast Carbon Center Annual Sponsor Meeting, Austin, Texas, January 9, 2008.

The influence of seal thickness and rate of pressure buildup on CO<sub>2</sub> migration and sequestration: presented to the American Geophysical Union, Austin, Texas, December 10, 2007.

Pressure evolution and capillary seal performance during CO<sub>2</sub> injections: presented to the Austin Geological Society, Austin, Texas, November 5, 2007.

Gulf Coast stacked storage field test: presented at Sixth Annual Conference on Carbon Capture & Sequestration: Expediting deployment of industrial scale systems: Can it be done? How? Concerns to be addressed, Pittsburgh, Pennsylvania, May 9, 2007.

Gulf Coast Stacked Storage Field Test: presented at the NETL 6th Annual Carbon Capture & Sequestration Conference, Austin, Texas, May 9, 2007.

Update on demonstration projects of the Gulf Coast Carbon Center: presented to the Society of Petroleum Engineers--CO<sub>2</sub> Conference, Austin, Texas, December 4, 2006.

Overview of Gulf Coast Carbon Center: presented to the Interstate Oil & Gas Compact Commission, Austin, Texas, October 17, 2006.

Sediment compaction in deltaic plains--numerically modeled compaction rates, stratigraphic influences, and potential consequences for lateral and vertical facies successions: presented to

the JSG Soft Rock Seminar, Austin, Texas, October 16, 2006.

Southern Louisiana's subsidence problem: geologic contributions and post-Katrina geophysical research opportunities: presented to the UT Institute for Geophysics, Austin, Texas, October 6, 2006.

Stacked Storage Field Project: presented to the Department of Energy Annual Review of Regional Sequestration Partnerships, Austin, Texas, October 4, 2006.

## Activities of a Professional Nature

### Professional Societies

American Association of Petroleum Geologists

American Geophysical Union

Geological Society of America

Society of Petroleum Engineers

## Funding

### Research Support

Co-PI: USGS-Gulf Coast Carbon Center Collaboration on Carbon Sequestration Capacity Evaluation, U.S. Geological Survey (October 1, 2017-September 30, 2020; \$150,000).

PI: Exxon Mobil Energy Scholars Program, ExxonMobil (April 1, 2017-May 31, 2020; \$131,771).

Co-PI: Offshore Gulf of Mexico Partnership for Carbon Storage--Resources and Technology Development, Department of Energy - NETL (February 1, 2018-January 31, 2020; \$4,000,000).

PI: Validation of MVA Tools for Offshore CCS: Novel Ultra-High-Resolution 3D Marine Seismic Technology Integrated with Coring and Geochemistry, Department of Energy - NETL (SubTER) (October 1, 2016-September 30, 2019; \$2,498,654).

Co-PI: Southeast Regional Carbon Sequestration Partnership, Phase 3, Department of Energy - NETL (October 1, 2007-July 30, 2019; \$31,447,977).

PI: Offshore Storage Resource Assessment of the Northern Gulf of Mexico (TXLA), Department of Energy - NETL (September 1, 2015-August 31, 2018; \$3,285,885).

PI: GCCC support for ACORN Project, North Sea, University of Edinburgh (January 31-August 30, 2018; \$22,989).

Co-PI: Center for Frontiers of Subsurface Energy (CFSES EFRC), Department of Energy - NETL (August 1, 2009-July 31, 2018; \$10,918,413).

PI: CarbonSAFE Phase I: Pre-Feasibility Study - Northwest Gulf of Mexico CO2 Storage Complex, Department of Energy - NETL (July 1, 2017-July 30, 2018; \$1,094,583).

PI: Atlantic Offshore CO2 Storage Resource Assessment, Battelle (February 1, 2016-March 31, 2018; \$22,015).

Co-PI: BEG Support to DOE FE Climate Change Working Group (China), Department of Energy - HQ (April 1, 2015-May 15, 2016; \$37,933).

Co-PI: Offshore Carbon Sequestration on Texas State Lands, Texas General Land Office (January 25, 2010-September 30, 2015; \$1,200,000).

Co-PI: Minimum Dataset Requirements and Development of a Modeling Workflow for CO2 Migration, Petroleum Technology Research Centre (PTRC) (July 14, 2014-May 4, 2015; \$183,233).

Co-PI: Characterization of Offshore Texas State Lands for Carbon Sequestration, Department of Energy - NETL (December 8, 2009-September 30, 2014; \$9,263,897).

Co-PI: Sub-Seabed Geologic Carbon Dioxide Sequestration Best Management Practices, Department of Interior, Bureau of Ocean Energy Management (BOEM) (October 1, 2010-September 30, 2013; \$496,367).

Co-PI: Southeast Regional Carbon Sequestration Partnership, Phase 2, DOE-NETL (October 1, 2005-September 30, 2010; \$4,634,563).

PI: Fayette Power Plant CCS Study, Lower Colorado River Authority (July 1, 2009-June 30, 2010; \$63,659).

## Publications

### Peer Reviewed Journal Articles

Ni, H., Li, B., Darraj, N., Ren, B., Harris, C., Krishnamurthy, P. G., Bukar, I., Berg, S., Snippe, J., Ringrose, P., Meckel, T. A., Krevor, S., and Benson, S., 2025, The impact of capillary heterogeneity on CO<sub>2</sub> flow and trapping across scales: *Earth-Science Reviews*, v. 270, no. 105257, 28 p., <http://doi.org/10.1016/j.earscirev.2025.105257>.

Ubillus, J. E., Bakhshian, S., Ni, H., DiCarlo, D., and Meckel, T., 2025, Informing field-scale CO<sub>2</sub> storage simulations with sandbox experiments: the effect of small-scale heterogeneities: *International Journal of Greenhouse Gas Control*, v. 141, no. 104318, 10 p., <http://doi.org/10.1016/j.ijggc.2025.104318>.

Ubillus, J. E., Ni, H., DiCarlo, D., and Meckel, T., 2025, Experimental investigation of buoyant flow in realistic bedforms with heterogeneous wettability: *Society of Petroleum Engineers Journal*, v. 30, no. 3, article no. SPE-224402-PA, p. 1538-1548, <http://doi.org/10.2118/224402-PA>.

Leng, J., Bump, A., Hosseini, S. A., Meckel, T. A., Wang, Z., and Wang, H., 2024, A comprehensive review of efficient capacity estimation for large-scale CO<sub>2</sub> geological storage: *Gas Science and Engineering*, v. 126, no. 205339, 19 p., <http://doi.org/10.1016/j.jgsce.2024.205339>.

Bump, A. P., Bakhshian, S., Ni, H., Hovorka, S. D., Olariu, M. I., Dunlap, D., Hosseini, S. A., and Meckel, T. A., 2023, Composite confining systems: Rethinking geologic seals for permanent CO<sub>2</sub> sequestration: *International Journal of Greenhouse Gas Control*, v. 126, no. 103908, 12 p., <http://doi.org/10.1016/j.ijggc.2023.103908>.

Meckel, T. A., and Beckham, E. C., 2023, High-resolution geologic modeling and CO<sub>2</sub> flow simulation of a realistic clastic deltaic 3D model derived from a laboratory flume tank experiment: *International Journal of Greenhouse Gas Control*, v. 125, no. 103892, 16 p., <http://doi.org/10.1016/j.ijggc.2023.103892>, Graduate student co-author.

Meckel, T. A., Treviño, R. H., Hovorka, S. D., and Bump, A. P., 2023, Mapping existing wellbore locations to compare technical risks between onshore and offshore CCS activities in Texas: *Greenhouse Gases: Science and Technology*, v. 13, no. 3, p. 493-504, <http://doi.org/10.1002/ghg.2220>.

Ni, H., Bakhshian, S., and Meckel, T. A., 2023, Effects of grain size and small-scale bedform architecture on CO<sub>2</sub> saturation from buoyancy-driven flow: *Scientific Reports*, v. 13, no. 2474, 13 p., <http://doi.org/10.1038/s41598-023-29360-y>.

Ye, J., Afifi, A., Rowaihy, F., Baby, G., De Santiago, A., Tasianas, A., Hamieh, A., Khodayeva, A., Al-Juaied, M., Meckel, T. A., and Hoteit, H., 2023, Evaluation of geological CO<sub>2</sub> storage potential in Saudi Arabian sedimentary basins: *Earth-Science Reviews*, v. 244, no. 104539, 29 p., <http://doi.org/10.1016/j.earscirev.2023.104539>.

Bump, A. P., Hovorka, S. D., and Meckel, T. A., 2021, Common risk segment mapping: streamlining exploration for carbon storage sites, with application to coastal Texas and Louisiana: *International Journal of Greenhouse Gas Control*, v. 111, no. 103457, 13 p., <http://doi.org/10.1016/j.ijggc.2021.103457>.

- Madugula, A. C. S., Sachde, D., Hovorka, S. D., Meckel, T. A., and Benson, T. J., 2021, Estimation of CO<sub>2</sub> emissions from petroleum refineries based on the total operable capacity for carbon capture applications: *Chemical Engineering Journal Advances*, v. 8, no. 100162, 9 p., <http://doi.org/10.1016/j.cej.2021.100162>.
- Madugula, A. C. S., Sachde, D., Hovorka, S. D., Meckel, T. A., and Benson, T. J., 2021, Estimation of CO<sub>2</sub> emissions from petroleum refineries based on the total operable capacity for carbon capture applications: *Chemical Engineering Journal Advances*, v. 8, no. 100162, 9 p., <http://doi.org/10.1016/j.cej.2021.100162>.
- Meckel, T. A., Bump, A. P., Hovorka, S. D., and Treviño, R. H., 2021, Carbon capture, utilization, and storage hub development on the Gulf Coast: *Greenhouse Gases: Science and Technology*, v. 11, no. 4, p. 619-632, <http://doi.org/10.1002/ghg.2082>.
- Ni, H., and Meckel, T. A., 2021, Characterizing the effect of capillary heterogeneity on multiphase flow pulsation in an intermediate-scale beadpack experiment using time series clustering and frequency analysis: *Water Resources Research*, v. 57, no. 11, article no. e2021WR030876, 17 p., <http://doi.org/10.1029/2021WR030876>.
- Tavassoli, S., Krishnamurthy, P., Beckham, E., Meckel, T., and Sepehrnoori, K., 2021, Carbon dioxide storage in deltaic saline aquifers: invasion percolation and compositional simulation: *Society of Petroleum Engineers Reservoir Evaluation & Engineering*, v. 24, no. 3, article no. SPE-196723-PA, 13 p., <http://doi.org/10.2118/196723-PA>.
- Mehana, M., Hosseini, S. A., Meckel, T. A., and Viswanathan, H., 2020, Modeling CO<sub>2</sub> plume migration using an invasion-percolation approach that includes dissolution: *Greenhouse Gases: Science and Technology*, v. 10, no. 2, p. 283-295, <http://doi.org/10.1002/ghg.1976>.
- Alfi, M., Vasco, D. W., Hosseini, S. A., Meckel, T., and Hovorka, S. D., 2019, Validating compositional fluid flow simulations using 4D seismic interpretation and vice versa in the SECARB Early Test--a critical review: *International Journal of Greenhouse Gas Control*, v. 82, p. 162-174, <http://doi.org/10.1016/j.ijggc.2019.01.003>.
- DeAngelo, M. V., Fifariz, R., Meckel, T., and Treviño, R. H., 2019, A seismic-based CO<sub>2</sub>-sequestration regional assessment of the Miocene section, northern Gulf of Mexico, Texas and Louisiana: *International Journal of Greenhouse Gas Control*, v. 81, p. 29-37, <http://doi.org/10.1016/j.ijggc.2018.12.009>.
- Goudarzi, A., Meckel, T., Hosseini, S. A., and Treviño, R. H., 2019, Statistical analysis of historic hydrocarbon production data from Gulf of Mexico oil and gas fields and application to dynamic capacity assessment in CO<sub>2</sub> storage: *International Journal of Greenhouse Gas Control*, v. 80, p. 96-102, <http://doi.org/10.1016/j.ijggc.2018.11.014>.
- Krishnamurthy, P. G., Meckel, T. A., and Dicarolo, D., 2019, Mimicking geologic depositional fabrics for multiphase flow experiments: *Water Resources Research*, v. 55, p. 9623-9638, <http://doi.org/10.1029/2019WR025664>.
- Meckel, T., Feng, Y. E., Treviño, R. H., and Sava, D., 2019, High-resolution 3D marine seismic acquisition in the overburden at the Tomakomai CO<sub>2</sub> storage project, offshore Hokkaido, Japan: *International Journal of Greenhouse Gas Control*, v. 88, p. 124-133, <http://doi.org/10.1016/j.ijggc.2019.05.034>.
- Ringrose, P. S., and Meckel, T. A., 2019, Maturing global CO<sub>2</sub> storage resources on offshore continental margins to achieve 2DS emissions reductions: *Scientific Reports*, v. 9, no. 17994, <http://doi.org/10.1038/s41598-019-54363-z>.
- Anderson, J. S., Romanak, K. D., and Meckel, T., 2018, Assessment of shallow subsea hydrocarbons as a proxy for leakage at offshore geologic CO<sub>2</sub> storage sites: *International Journal of Greenhouse Gas Control*, v. 74, p. 19-27, <http://doi.org/10.1016/j.ijggc.2018.04.010>.
- Klokov, A., Meckel, T., and Treviño, R. H., 2018, Confining system integrity assessment by

detection of natural gas migration using seismic diffractions: *International Journal of Greenhouse Gas Control*, v. 75, p. 32-40, <http://doi.org/10.1016/j.ijggc.2018.05.001>.

Klokov, A., Treviño, R. H., and Meckel, T., 2017, Diffraction imaging for seal evaluation using ultra high resolution 3D seismic data: *Marine and Petroleum Geology*, v. 82, p. 85-96, <http://doi.org/10.1016/j.marpetgeo.2017.02.002>.

Krishnamurthy, P. G., Senthilnathan, S., Yoon, H., Thomassen, D., Meckel, T., and DiCarlo, D., 2017, Comparison of Darcy's law and invasion percolation simulations with buoyancy-driven CO<sub>2</sub>-brine multiphase flow in a heterogeneous sandstone core: *Journal of Petroleum Science and Engineering*, v. 155, p. 54-62, <http://doi.org/10.1016/j.petrol.2016.10.022>.

Meckel, T. A., Trevisan, L., and Krishnamurthy, P. G., 2017, A method to generate small-scale, high-resolution sedimentary bedform architecture models representing realistic geologic facies: *Scientific Reports*, v. 7, no. 9238, 9 p., <http://doi.org/10.1038/s41598-017-09065-9>.

Trevisan, L., Illangasekare, T. H., and Meckel, T., 2017, Modelling plume behavior through a heterogeneous sand pack using a commercial invasion percolation model: *Geomechanics and Geophysics for Geo-Energy and Geo-Resources*, v. 3, no. 3, p. 327-337, <http://doi.org/10.1007/s40948-017-0055-5>.

Trevisan, L., Krishnamurthy, P. G., and Meckel, T., 2017, Impact of 3D capillary heterogeneity and bedform architecture at the sub-meter scale on CO<sub>2</sub> saturation for buoyant flow in clastic aquifers: *International Journal of Greenhouse Gas Control*, v. 56, p. 237-249, <http://doi.org/10.1016/j.ijggc.2016.12.001>.

Islam, A., Meckel, T., Sun, A. Y., and Krishnamurthy, P. G., 2016, Numerical experiments of density driven CO<sub>2</sub> saturated brine migration in heterogeneous two-dimensional geologic fabric materials: *International Communications in Heat and Mass Transfer*, v. 71, p. 148-156, <http://doi.org/10.1016/j.icheatmasstransfer.2015.12.019>.

Meckel, T., and Mulcahy, F., 2016, Use of novel high-resolution 3D marine seismic technology to evaluate Quaternary fluvial valley development and geologic controls on shallow gas distribution, inner shelf, Gulf of Mexico: *Interpretation*, v. 4, no. 1, p. SC35-SC49, <http://doi.org/10.1190/INT-2015-0092.1>.

Meckel, T., Bryant, S. L., and Ravi Ganesh, P., 2015, Characterization and prediction of CO<sub>2</sub> saturation resulting from modeling buoyant fluid migration in 2D heterogeneous geologic fabrics: *International Journal of Greenhouse Gas Control*, v. 34, p. 85-96, <http://doi.org/10.1016/j.ijggc.2014.12.010>.

Wallace, K. J., Meckel, T., Carr, D. L., Treviño, R. H., and Yang, C., 2014, Regional CO<sub>2</sub> sequestration capacity assessment for the coastal and offshore Texas Miocene interval: *Greenhouse Gases Science and Technology*, v. 4, p. 53-65, <http://doi.org/10.1002/ghg.1380>

Ditkof, J., Caspari, E., Pevzner, R., Urosevic, M., Meckel, T., and Hovorka, S. D., 2013, Time-lapse seismic signal analysis for enhanced oil recovery at Cranfield CO<sub>2</sub> sequestration site, Cranfield field, Mississippi: *Interpretation*, v. 1, no. 2, p. T157-T166, <http://doi.org/10.1190/INT-2013-0056.1>, graduate student first author.

Hovorka, S. D., Meckel, Timothy, and Treviño, R. H., 2013, Monitoring a large-volume injection at Cranfield, Mississippi--Project design and recommendations: *International Journal of Greenhouse Gas Control*, v. 18, p. 345-360.

Lu, Jiemin, Kordi, M., Hovorka, S. D., Meckel, Timothy, and Christopher, Charles, 2013, Reservoir characterization and complications for trapping mechanisms at Cranfield CO<sub>2</sub> injection site: *International Journal of Greenhouse Gas Control*, v. 18, p. 361-374.

Meckel, Timothy, 2013, Digital rendering of sedimentary-relief peels: Implications for clastic facies characterization and fluid flow: *Journal of Sedimentary Research*, v. 83, no. 6, p. 495-501, doi: <http://dx.doi.org/10.2110/jsr.2013.43>.

Meckel, Timothy, Zeidouni, M., Hovorka, S. D., and Hosseini, S. A., 2013, Assessing sensitivity to well leakage from three years of continuous reservoir pressure monitoring during CO<sub>2</sub> injection at Cranfield, MS, USA: *International Journal of Greenhouse Gas Control*, v. 18, p. 439-448.

Tao, Q., Bryant, Steve, and Meckel, Timothy, 2013, Modeling above-zone measurements of pressure and temperature for monitoring CCS sites: *International Journal of Greenhouse Gas Control*, v. 18, p. 523-530.

Middleton, R. S., Keating, G. N., Stauffer, P. H., Jordan, A. B., Viswanathan, H. S., Kang, Q. J., Carey, J. W., Mulkey, M. L., Sullivan, E. J., Chu, S. P. P., Esposito, R., and Meckel, T. A., 2012, The cross-scale science of CO<sub>2</sub> capture and storage: from pore scale to regional scale: *Energy & Environmental Science*, v. 5, no. 6, p. 2328-7345.

Meckel, T. A., 2008, An attempt to reconcile subsidence rates determined from various techniques in southern Louisiana: *Quaternary Science Reviews*, v. 27, p. 1517-1522.

Meckel, T. A., ten Brink, U., and Williams, S. J., 2007, Sediment compaction rates in deltaic plains: numerical constraints and stratigraphic influences: *Basin Research*, v. 19, p. 19-31, doi: 10.1111/j.1365-2117.2006.00310.x

Meckel, T. A., ten Brink, U., and Williams, S. J., 2006, Current subsidence rates due to compaction of Holocene sediments in southern Louisiana: *Geophysical Research Letters*, v. 33, L11403, doi:10.1029/2006GL026300.

Daczko, N., Mosher, S., Coffin, M., and Meckel, T. A., 2005, Tectonic implications of fault-scarp-derived volcanoclastic deposits on Macquarie Island; sedimentation at a fossil ridge-transform intersection? *Geological Society of America Bulletin*, v. 117, no. 1/2, p. 18-31.

Meckel, T. A., Mann, P., Mosher, S., and Coffin, M., 2005, Influence of cumulative convergence on lithospheric thrust fault development and topography along the Australian-Pacific plate boundary south of New Zealand: *Geochemistry, Geophysics, Geosystems*, v. 6, no. 9, p. 1-20.

Daczko, N., Wertz, K., Mosher, S., Coffin, M., and Meckel, T. A., 2003, Extension along the Australian-Pacific transpressional transform plate boundary near Macquarie Island: *Geochemistry, Geophysics, Geosystems*, v. 4, no. 9, p. 1-22.

Meckel, T. A., Coffin, M., Mosher, S., Symonds, G., Bernardel, G., and Mann, P., 2003, Underthrusting at the Hjort Trench, Australian-Pacific plate boundary: incipient subduction? *Geochemistry, Geophysics, Geosystems*, v. 4, no. 12, p. 1-30.

## Peer Reviewed Book Chapters

Osmond, J. L., and Meckel, T. A., 2020, Enhancing trap and fault seal analyses by integrating observations from HR3D seismic data with well logs and conventional 3D seismic data, Texas inner shelf, in Ogilvie, S. R., Dee, S. J., Wilson, R. W., and Bailey, W. R., eds., *Integrated fault seal analysis*: London, Geological Society, London, Special Publications, v. 496, no. 496, p. 253-279, <http://doi.org/10.1144/SP496-2018-142>.

Meckel, T. A., and Rhatigan, J.-L. T., 2017, Chapter 2: Implications of Miocene petroleum systems for geologic CO<sub>2</sub> sequestration beneath Texas offshore lands, in Treviño, R. H., and Meckel, T. A., eds., *Geological CO<sub>2</sub> sequestration atlas for Miocene strata offshore Texas state waters*: The University of Texas at Austin, Bureau of Economic Geology Report of Investigations No. 283, p. 7-13, <http://doi.org/10.23867/RI0283D>.

Meckel, T. A., Nicholson, A. J., and Treviño, R. H., 2017, Chapter 4: Capillary aspects of fault-seal capacity for CO<sub>2</sub> storage, lower Miocene, Texas Gulf of Mexico, in Treviño, R. H., and Meckel, T. A., eds., *Geological CO<sub>2</sub> sequestration atlas for Miocene strata, offshore Texas state waters*: Austin, Texas, The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations, no. 283, p. 26-35, <http://doi.org/10.23867/RI0283D>.

Wallace, K. J., Rhatigan, C. H., Treviño, R. H., and Meckel, T. A., 2017, Chapter 7: Estimating

CO<sub>2</sub> storage capacity in a saline aquifer using 3D flow models, lower Miocene, Texas Gulf of Mexico, in Treviño, R. H., and Meckel, T. A., eds., Geological CO<sub>2</sub> sequestration atlas of Miocene strata, offshore Texas state waters: Austin, Texas, The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations, no. 283, p. 57-61, <http://doi.org/10.23867/RI0283D>.

Oldenburg, C. M., Nicot, J.-P., Jordan, P. D., Zhang, Y., Pan, L., Houseworth, J. E., Meckel, T., Carr, D. L., and Bryant, S. L., 2015, Chapter 32: Health, safety, and environmental risk assessment of geologic carbon sequestration: Overview of the certification framework, example application, and selected special studies 2010-2014, in Karl F. Gerdes, ed., Carbon dioxide capture for storage in deep geologic formations--Results from the CO<sub>2</sub> Capture Project, Volume 4: CCS Technology Development and Demonstration Results (2009-2014): UK, CPL Press, p. 569-592.

Meckel, T., 2010, Chapter 7. Capillary seals for trapping carbon dioxide (CO<sub>2</sub>) in underground reservoirs, in Maroto-Valer, M. M., ed., Developments and innovation in carbon dioxide (CO<sub>2</sub>) capture and storage technology: Woodhead Publishing Series in Energy: Number 16, Volume 2: Carbon dioxide (CO<sub>2</sub>) storage and utilisation, p. 185-202.

### Edited Books

Treviño, R. H., and Meckel, T., eds., 2017, Geological CO<sub>2</sub> sequestration atlas of Miocene strata, offshore Texas state waters: Bureau of Economic Geology Report of Investigations No. 283, 80 p.

### Non Peer Reviewed Journal Articles

Ubillus, J.E., Ni, H., DiCarlo, D., and Meckel, T., 2025, Experimental investigation of buoyant flow in realistic bedforms with heterogeneous wettability: Society of Petroleum Engineers Journal, v. 30, no. 3, p. 1538, <http://doi.org/10.2118/224402-PA>, SPE-224402-PA.

Meckel, T., and Broberg, D., 2024, CO<sub>2</sub> Sequestration by the Seashore: 34 p., <https://bipartisanpolicy.org/wp-content/uploads/2024/09/Sequestration-by-the-Seashore-FINAL.pdf>.

Bump, A., Bakhshian, S., Ni, H., Hovorka, S. D., Dunlap, D. B., Olariu, M. I., Hosseini, S. A., and Meckel, T., 2022, Composite confining systems: rethinking geologic seals for permanent CO<sub>2</sub> sequestration: 16th Greenhouse Gas Control Technologies Conference, 23-27 October, Lyon, France, <http://doi.org/10.2139/ssrn.4286411>.

Ni, H., and Meckel, T., 2022, Effects of flow pulsation on CO<sub>2</sub> buoyant migration and capillary trapping: 16th Greenhouse Gas Control Technologies Conference, 23-27 October, Lyon, France, <http://doi.org/10.2139/ssrn.4273191>.

Ni, H., Braganca, R., Tisato, N., and Meckel, T., 2022, Monitoring CO<sub>2</sub> plume migration with lab-scale ultrasonic experimental setup: 16th Greenhouse Gas Control Technologies Conference, 23-27 October, Lyon, France, <http://doi.org/10.2139/ssrn.4273218>.

Bump, A. P., Hovorka, S. D., Meckel, T. J., Nuñez-López, V., Olariu, M. I., and Treviño, R. H., 2020, Carbon capture and storage potential in southern Louisiana: a new business opportunity: GeoGulf Transactions, v. 70, p. 73-84.

Merzlikin, D., Meckel, T., Fomel, S., and Sripanich, Y., 2017, Diffraction imaging of high-resolution 3D P-cable data from the Gulf of Mexico using azimuthal plane-wave destruction: First Break, v. 35, no. 2, p. 35-41, <http://doi.org/10.3997/1365-2397.2017002>.

Meckel, T. A., and Bryant, S. L., 2014, Buoyancy-driven flow in heterogeneous materials: Energy Procedia, Proceedings of 12th International Conference on Greenhouse Gas Control Technologies GHGT12, v. 63, p. 5495-5502, <http://doi.org/10.1016/j.egypro.2014.11.582>.

Meckel, T. A., and Treviño, R. H., 2014, High-resolution 3D seismic investigations of the overburden above potential CCS sites of the inner Texas shelf, Gulf of Mexico, U.S.A.: Energy

Procedia, Proceedings of 12th International Conference on Greenhouse Gas Control Technologies GHGT12, v. 63, p. 5010-5014, <http://doi.org/10.1016/j.egypro.2014.11.530>.

Meckel, T. A., Hovorka, S. D., Treviño, R. H., Smyth, R. C., and Romanak, K. D., 2014, Toward an international program for offshore storage of CO<sub>2</sub>: international Initiative for CCS sub-sea (iCCSc): Energy Procedia, Proceedings of 12th International Conference on Greenhouse Gas Control Technologies GHGT12, v. 63, p. 5015-5020, <http://doi.org/10.1016/j.egypro.2014.11.531>.

Nicot, J.-P., Meckel, T., Carr, D. A., and Oldenburg, C.M., 2014, Impact of induced seismic events on seal integrity, Texas Gulf Coast: Energy Procedia, 12th International Conference on Greenhouse Gas Control Technologies, v. 63, p. 4807-4815, <http://doi.org/10.1016/j.egypro.2014.11.511>.

Ditkof, J., Caspari, E., Pevzner, R., Urosevic, M., Meckel, T., and Hovorka, S. D., 2013, Time-lapse seismic signal analysis for enhanced oil recovery at Cranfield sequestration site, Cranfield field: Geoscience World, v. 1, no. 2, p. T157-T166, <http://doi.org/10.1190/INT-2013-0056.1>.

Tao, Q., Bryant, S. L., and Meckel, T., 2013, Leakage fingerprints during storage: Modeling above-zone measurements of pressure and temper: Energy Procedia, 11th International Conference on Greenhouse Gas Control Technologies, v. 37, p. 4310-4316, <http://doi.org/10.1016/j.egypro.2013.06.334>.

Ganesh, P., Bryant, S. L., and Meckel, T., 2012, Characterizing small-scale migration behavior of sequestered CO<sub>2</sub> in a realistic geologic fabric: Energy Procedia, v. 37, p. 5258-5266, <http://doi.org/10.1016/j.egypro.2013.06.442>.

Meckel, T., Treviño, R. H., Carr, D. L., Nicholson, A. J., and Wallace, K., 2012, Offshore CCS in the northern Gulf of Mexico and the significance of regional structural compartmentalization: Energy Procedia, 11th International Conference on Greenhouse Gas Control Technologies, v. 37, p. 4526-4532, <http://doi.org/10.1016/j.egypro.2013.06.359>.

Choi, Jong-Won, Nicot, J. -P., Meckel, Timothy, and Hovorka, S. D., 2011, Numerical modeling of CO<sub>2</sub> injection into a typical U.S. Gulf Coast anticline structure, in Energy Procedia, v. 4, Proceedings of 10th International Conference on Greenhouse Gas Control Technologies GHGT10, September 19-23, Amsterdam, The Netherlands, p. 3486-3493.

Hovorka, S. D., Meckel, Timothy, Treviño, R. H., Lu, Jiemin, Nicot, J. -P., Choi, Jong-Won, Freeman, D., Cook, P. G., Daley, Tom, Ajo-Franklin, J., Freifeld, Barry, Doughty, C. A., Carrigan, C. R., La Brecque, D., Kharaka, Yousif, Thordsen, J. J., Phelps, Tommy, Yang, Changbing, Romanak, Katherine, Zhang, Tongwei, Holt, R. M., Lindler, J. S., and Butsch, R. J., 2011, Monitoring a large volume CO<sub>2</sub> injection: year two results from SECARB project at Denbury's Cranfield, Mississippi, USA, in Energy Procedia, v. 4, Proceedings of 10th International Conference on Greenhouse Gas Control Technologies GHGT10, September 19-23, Amsterdam, The Netherlands, p. 3478-3485.

Meckel, T., Hovorka, S. D., and Ambrose, W. A., 2011, Geologic factors controlling CO<sub>2</sub> storage capacity and permanence: Exploration and Production, v. 8, no. 2, p. 22 and 24.

Hovorka, S. D., Choi, J. -W., Meckel, T. A., Treviño, R. H., Zeng, H., Kordi, M., Wang, F. P., and Nicot, J. -P., 2009, Comparing carbon sequestration in an oil reservoir to sequestration in a brine formation--field study, in Energy Procedia (v. 1, no. 1), Proceedings of 9th International Conference on Greenhouse Gas Control Technologies GHGT9, November 16-20, Washington D.C., p. 2051-2056.

Meckel, Timothy, 2009, Gulf Coast storms, in Laubach, S. E., and Tinker, S. W., eds., 2009, Earth's art: celebrating the Centennial of the Bureau of Economic Geology, 1909-2009: The University of Texas at Austin, Bureau of Economic Geology, p. 92-93.

Nicot, J. -P., Choi, Jong-Won, Meckel, Timothy, Chang, C. Y., Hovorka, S. D., and Solano,

Silvia, 2009, Results of numerical investigations at SECARB Cranfield, MS field test site, in Eighth Annual Conference on Carbon Capture and Sequestration: DOE/NETL, May 4-7, Pittsburgh, Pennsylvania, 11 p.

Wong, Corinne, Hovorka, Sue, and Meckel, Tip, 2007, Evaluating the mobilization of cations from aquifer rocks exposed to high CO<sub>2</sub> levels: Gulf Coast Association of Geological Societies Transactions, v. 57, p. 797-808.

## Conference Proceedings

Tavassoli, S., Krishnamurthy, P., Beckham, E., Meckel, T., and Sepehrnoori, K., 2019, Carbon dioxide storage in deltaic saline aquifers: invasion percolation and compositional simulation, SPE Reservoir Characterisation and Simulation Conference and Exhibition, Abu Dhabi, UAE, September 17-19, no. SPE-196723-MS, 17 p.

## Contract Reports

Meckel, T., and Treviño, R. H., 2024, Final Report: Field Validation of MVA Technology for Offshore CCS: Novel Ultra-HighResolution 3D Marine Seismic Technology (P-Cable): Final Report prepared for Department of Energy, under contract no. DE-FE0028193, 20 p.

Treviño, R. H., and Meckel, T., 2019, Offshore CO<sub>2</sub> storage resource assessment of the northern Gulf of Mexico (Texas-Louisiana): final report prepared for U.S. Department of Energy National Energy Technology Laboratory, under contract no. DE-FE0026083, 151 p.

Treviño, R. H., Meckel, T., and Hovorka, S. D., 2018, Final Research Performance Progress Report: CarbonSAFE Phase I: Integrated CCS Pre-Feasibility - Northwest Gulf of Mexico: Final Report prepared for U.S. Dept. of Energy, National Energy Technology Laboratory, under contract no. DE-FE0029487, 83 p.

Nicot, J.-P., Gao, S. R., Sun, A. Y., Meckel, T., Lashgari, H. R., and Trevisan, L., 2015, Minimum dataset requirements and development of a modeling workflow for CO<sub>2</sub> migration during post-EOR storage: Case of Weyburn, SK: The University of Texas at Austin, Bureau of Economic Geology, Contract Report prepared for Petroleum Technology Research Centre (PTRC), Regina, Saskatchewan, 87 p.

Treviño, R. H., Meckel, T., Carr, D. L., Yang, C., Lu, J., Mickler, P., Wallace, K. J., Nicholson, A. J., Bangs, N. L., Hornbach, M. J., Mulcahy, F. J., and Martinez, N., 2015, Gulf of Mexico Miocene CO<sub>2</sub> site characterization mega transect: Final report (revised) prepared for U.S. Department of Energy National Energy Technology Laboratory and Texas General Land Office, under contract no. DE-FE0001941 and GLO contract no. 10-205-000-4100, 583 p.

Meckel, T., and Treviño, R. H., 2014, Gulf of Mexico CO<sub>2</sub> site characterization mega-transect: The University of Texas, Bureau of Economic Geology, Final Technical Report prepared for U.S. Department of Energy National Energy Technology Laboratory, under contract no. DE-FE0001941; OSP 200902306-001, 583 p.

Nicot, J. -P., Meckel, T. A., Carr, D. L., Costley, R., Zeidouni, M., Oldenburg, C. M., Fifariz, R., and Osmond, J., 2013, Critical Topics in Geologic Carbon Sequestration. Topic 1.1.1: Induced Seismicity and Topic 2.1.1: Storage Capacity: The University of Texas at Austin, Bureau of Economic Geology, contract report prepared for CO<sub>2</sub> Capture Project (CCP) Phase III, 35 p.

Carr, D. L., Treviño, R. H., Meckel, T., Breton, C., Yang, C., and Miller, Erin, 2011, Secarb "early" test, task 15: evaluation of offshore transport and storage of CO<sub>2</sub>: unpublished preliminary report prepared for U.S. Dept. of Energy, National Energy Technology Lab, under contract no. DE-FC26-05NT42590, 19 p.

Clift, S. J., Hosseini, S. A., Hovorka, S. D., and Meckel, T., 2011, CO<sub>2</sub> injection and recycle: The University of Texas at Austin, Bureau of Economic Geology, contract report prepared for U.S. Department of Energy, under DOE Award Number DE-FC26-05NT42590 (Southeast Regional Carbon Sequestration Partnership), Phase III 7.1.b, 18p.

Choi, J. -W., Nicot, J. -P., Chang, K. -W., and Meckel, T. A., 2010, SECARB Phase II numerical modeling, Cranfield oilfield, MS: The University of Texas at Austin, Bureau of Economic Geology, milestone report prepared for Department of Energy Southeast Regional Carbon Sequestration Partnership Phase II, Task 1.5, 159 p.

Smyth, R. C., Hovorka, S. D., Meckel, T. A., Breton, C. A., Paine, J. G., and Hill, G. R., 2007, Potential sinks for geologic storage of CO<sub>2</sub> generated in the Carolinas: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Southern States Energy Board and Electric Power Research Institute ([http://www.beg.utexas.edu/environqly/co2seq/pubs\\_presentations/CarolinasSummary\\_16April07.pdf](http://www.beg.utexas.edu/environqly/co2seq/pubs_presentations/CarolinasSummary_16April07.pdf)), 14 p.

## Published Reports

Dixon, T. E., Romanak, K. D., Hovorka, S. D., and Meckel, T., 2016, International Workshop on Offshore Geologic CO<sub>2</sub> Storage: IEAGHG, Report 2016/TR2, 42 p.

Meckel, T., Hovorka, S. D., Romanak, K. D., Treviño, R. H., Smyth, R. C., and CSLF Task Force on Offshore Storage, 2015, Technical Barriers and R&D Opportunities for Offshore, Sub-seabed Geologic Storage of Carbon Dioxide: Carbon Sequestration Leadership Forum, 128 p.

## Published Abstracts

Beckham, E. C., Meckel, T., and Flaig, P. P., 2018, Investigating deltaic architecture and reservoir connectivity for CO<sub>2</sub> storage and migration: integrated perspectives from physical flume experiments, outcrop analogs, and subsurface mapping (abs.): Greenhouse Gas Technologies Convention, Melbourne, Australia.

Feng, Y., and Meckel, T., 2018, Shallow marine high-resolution 3D seismics for above-zone CO<sub>2</sub> monitoring: a case study in offshore Japan (abs.): AGU Annual Meeting, Washington, D.C.

Feng, Y., and Meckel, T., 2018, Shallow marine high-resolution 3D seismics for above-zone CO<sub>2</sub> monitoring: a case study in offshore Japan (abs.): Geological Society of America Annual Meeting, Indianapolis, Ind.

Krishnamurthy, P., Trevisan, L., Meckel, T., and DiCarlo, D., 2018, Understanding the influence of small scale geological heterogeneity on capillary trapping of CO<sub>2</sub> using engineered beadpacks (abs.): Interpore 10th Annual Meeting, New Orleans, La.

Meckel, T., Feng, Y., and Treviño, R. H., 2018, High-resolution 3D seismic acquisition at the Tomakomai CO<sub>2</sub> storage project, offshore Hokkaido, Japan (ext. abs.): 14th International Conference on Greenhouse Gas Control Technologies (GHGT-14), 6 p., Melbourne, Australia.

Treviño, R. H., Meckel, T., Olariu, M. I., Dunlap, D. B., DeAngelo, M., Lu, J., Sabbagh, R., and Klovov, A., 2018, Offshore CO<sub>2</sub> storage resource assessment of the northwest Gulf of Mexico Inner Continental Shelf, upper Texas - western Louisiana coast (ext. abs.): AAPG Datapages Search and Discovery, no. 80630, 27 p.

Meckel, T., Trevisan, L., and Krishnamurthy, P., 2017, Saturations of migrating buoyant fluids from invasion percolation flow simulation using small-scale, high-resolution geologic models with realistic heterogeneity (abs.): AAPG Annual Convention and Exhibition, Search and Discovery Article #51409.

Trevisan, L., Illangasekare, T., and Meckel, T., 2017, Application of invasion percolation simulations to predict plume behavior through a heterogeneous intermediate-scale sand tank (ext. abs.): Energy Procedia, v. 114, p. 3582-3587, <http://doi.org/10.1016/j.egypro.2017.03.1489>.

Krishnamurthy, P., Trevisan, L., and Meckel, T., 2016, Investigating the influence of geological heterogeneity on capillary trapping of buoyant CO<sub>2</sub> using transmitted-light flow visualization experiments (abs.): 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), SwissTech Convention Center, Lausanne, Switzerland.

Krishnamurthy, P., Trevisan, L., and Meckel, T., 2016, Understanding the effects of small scale heterogeneity on buoyancy driven CO<sub>2</sub> migration for capillary trapped storage capacity estimation (abs.): 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), SwissTech Convention Center, Lausanne, Switzerland.

Trevisan, L., and Meckel, T., 2016, Application of invasion percolation simulations to predict plume behavior through a heterogeneous intermediate-scale sand tank (abs.): 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), SwissTech Convention Center, Lausanne, Switzerland.

Yang, C., Meckel, T., Hovorka, S. D., Treviño, R. H., Zou, Y., and Delgado, J., 2015, Probability assessment of pressure and geochemical monitoring for CO<sub>2</sub> leakage detection in the above zones at geological carbon sequestration sites (abs.): Program with AGU Fall meeting, San Francisco, December 14-18, 2015.

Meckel, T., and Bryant, S. L., 2014, Buoyancy-driven flow in heterogeneous materials (ext. abs.): Energy Procedia, v. 63, p. 5495-5502, <http://doi.org/10.1016/j.egypro.2014.11.582>.

Meckel, T., Hovorka, S. D., Treviño, R. H., Smyth, R. C., and Romanak, K. D., 2014, Toward an international program for offshore storage of CO<sub>2</sub>: international Initiative for CCS sub-sea (iCCSc) (ext. abs.): Energy Procedia, v. 63, p. 5015-5020, <http://doi.org/10.1016/j.egypro.2014.11.531>.

Jordan-Leigh, T., Carr, D. L., Meckel, Timothy, and Treviño, R. H., 2013, The Miocene petroleum system, northern Gulf of Mexico Basin: Implications for CO<sub>2</sub> sequestration in offshore Texas State Waters (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Luo, Z., Bryant, S. L., and Meckel, T., 2013, Application of improved injection well temperature model to Cranfield measurements (ext. abs.): Energy Procedia, v. 37, p. 4128-4135.

Meckel, T., Treviño, R. H., Carr, D. L., Nicholson, A., and Wallace, K., 2013, Offshore CCS in the northern Gulf of Mexico and the significance of regional structural compartmentalization (ext. abs.): Energy Procedia, v. 37, p. 4526-4532, <http://doi.org/10.1016/j.egypro.2013.06.359>.

Meckel, Timothy, Bangs, N. L., and Treviño, R. H., 2013, Determining seal effectiveness and potential buoyant fluid migration pathways using shallow high-resolution 3D seismic imaging: Application for CO<sub>2</sub> storage assessment on the inner Texas shelf (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Ravi Ganesh, P., Bryant, S. L., and Meckel, T., 2013, Characterizing small-scale migration behavior of sequestered CO<sub>2</sub> in a realistic geologic fabric (ext. abs.): Energy Procedia, v. 37, p. 5258-5266, <http://doi.org/10.1016/j.egypro.2013.06.442>.

Tao, Q., Bryant, S. L., and Meckel, T., 2013, Leakage fingerprints during storage: modeling above-zone measurements of pressure and temperature (ext. abs.): Energy Procedia, v. 37, p. 4310-4316, <http://doi.org/10.1016/j.egypro.2013.06.334>.

Wallace, K., Meckel, Timothy, Miller, E., Carr, D. L., and Treviño, R. H., 2013, Use of 3-dimensional dynamic modeling of CO<sub>2</sub> injection for comparison to regional static capacity assessments of Miocene sandstone reservoirs in the Texas State Waters, Gulf of Mexico (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Meckel, Timothy, and Meckel, L. D., III, 2012, On the origin, distribution, and size of natural CO<sub>2</sub> accumulations and implications for CH<sub>4</sub> exploration and development on continental margins (abs.): Gulf Coast Association of Geological Societies Transactions, v. 62, p. 759.

Tao, Q., Bryant, S. L., Meckel, T., and Luo, Z., 2012, Wellbore leakage model for above-zone monitoring at Cranfield, MS (ext. abs.): Society of Petroleum Engineers Carbon Management

Technology Conference, 7-9 February, Orlando, Fla., 13 p., <http://doi.org/10.7122/151516-MS>, CMTC-151516-MS.

Lu, J., Meckel, T. A., and Treviño, R. H., 2011, Seal characterization for Miocene-age rocks of Texas Gulf of Mexico (abs.), in AGU Fall Meeting, December 5-9, San Francisco, California.

Meckel, T., Treviño, R. H., Carr, D. L., and Young, M. H., 2011, Gulf of Mexico Miocene CO<sub>2</sub> site characterization mega transect (abs.): presented at the Association of American State Geologists National Meeting, Dubuque, Iowa.

Nicot, J. -P., Meckel, Timothy, and Treviño, R. H., 2011, Carbon storage options for the power industry in the Texas Gulf Coast area (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition Abstracts Volume, v. 20, p. 131.

Chang, K-W., Meckel, T., Hesse, M., and Nicot, J.-P., 2010, Across-fault pressure perturbation induced by CO<sub>2</sub> injection (abs.): American Association of Petroleum Geologists Annual Convention and Exhibition, v. 19, p. 43.

Chang, K.-W., Meckel, Timothy, Hesse, M. A., and Nicot, J. -P., 2010, Across-fault pressure perturbation induced by CO<sub>2</sub> injection (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition, v. 19, p. 43.

Choi, J. -W., Nicot, J. -P., Meckel, T. A., and Hovorka, S. D., 2010, Numerical modeling of CO<sub>2</sub> injection into a typical U.S. Gulf Coast anticline structure (abs.), in Greenhouse Gas Control Technologies 10, Proceedings of the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-10), 19-23 September, Amsterdam, Netherlands.

Choi, J.-W., Nicot, J.-P., Meckel, T., and Hovorka, S. D., 2010, Numerical modeling of CO<sub>2</sub> injection into a typical U.S. Gulf Coast anticline structure (ext. abs.): 10th International Conference on Greenhouse Gas Control Technologies, v. 4, p. 3486-3493, <http://doi.org/10.1016/j.egypro.2011.02.275>.

Hovorka, S. D., and Meckel, T., 2010, Monitoring a large volume CO<sub>2</sub> injection: Year Two results from SECARB project at Denbury's Cranfield, Mississippi, USA (abs.): Proceedings of the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-10).

Lu, J., Reed, R. M., Milliken, K., Meckel, T., and Hovorka, S. D., 2010, Seal characterization for Cranfield CO<sub>2</sub> injection site, Mississippi, USA (abs.). in Global Climate and Energy Project and U.S. Geological Survey, Caprocks and Seals for Geologic Carbon Sequestration, January, Monterey, CA.

Meckel, T., and Hovorka, S. D., 2010, Above-zone pressure monitoring as a surveillance tool for carbon sequestration projects (ext. abs.): SPE International Conference on CO<sub>2</sub> Capture, Storage, and Utilization, 10-12 November, New Orleans, 7 p., <http://doi.org/10.2118/139720-MS>, SPE-139720-MS.

Meckel, T., Hovorka, S. D., Ajo-Franklin, J., and Reiter, D., 2010, Downhole passive microseismic observations during continuous CO<sub>2</sub> injection at Cranfield, Mississippi (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition, v. 19, p. 169.

Meckel, Timothy, Carr, D. L., and Treviño, R. H., 2010, An offshore carbon repository in Miocene strata under Texas State Waters, Gulf of Mexico Basin: initial results (abs.): Gulf Coast Association of Geological Societies Transactions, v. 60, p. 815.

Miller, E., Meckel, T., and Treviño, R. H., 2010, Deciding on capacity calculation methodology for the Texas Submerged Lands Capacity Assessment (abs.): Geological Society of America Annual Meeting.

Collins, D., Freeman, D., Stehle, D., and Meckel, T., 2009, Design of research well instrumentation for a long-duration CO<sub>2</sub> flood - SECARB Phase 3, DAS Cranfield Project (abs.): 9th Annual NETL CCS Conference.

Hovorka, S. D., Choi, J-W., and Meckel, T., 2009, Comparing carbon sequestration in an oil reservoir to sequestration in a brine formation - field study (abs.): Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), Washington, D.C.

Meckel, T., and Hovorka, S. D., 2009, Results from continuous downhole monitoring (PDG) at a field-scale CO<sub>2</sub> demonstration project, Cranfield, MS (ext. abs.): SPE International Conference on CO<sub>2</sub> Capture, Storage, and Utilization, 2-4 November, San Diego, Calif., 8 p., <http://doi.org/10.2118/127087-MS>.

Meckel, Tip, 2009, A Texas geologic carbon repository concept beneath submerged State lands (abs.): American Association of Petroleum Geologists Annual Convention, v. 18, p. 141.

Meckel, Tip, Hovorka, S. D., and Treviño, R. H., 2009, Continuous real-time pressure monitoring during a CO<sub>2</sub>-EOR project from Cranfield, MS, and relevance for geologic sequestration (abs.): American Association of Petroleum Geologists Annual Convention, v. 18, p. 141.

Treviño, R. H., Ambrose, W. A., Meckel, Tip, Lu, Jiemin, Zeng, Hongliu, and Kordi, M., 2009, Sequence stratigraphy of the Tuscaloosa from Cranfield field, Mississippi--a carbon sequestration study from enhanced oil recovery operation (abs.): American Association of Petroleum Geologists Annual Convention, v. 18, p. 217.

Zeng, H., and Meckel, T., 2009, Connectivity of a CO<sub>2</sub> injection reservoir verified by integration of continuous fluid-pressure monitoring and 3D seismic survey (abs.): Hedberg Conference - Geological Carbon Sequestration: Prediction and Verification, Vancouver, B.C., Canada.

Choi, J.-W., Nicot, J. -P., Meckel, T. A., Chang, K.-W., and Hovorka, S. D., 2008, Preliminary results of numerical investigations at SECARB Cranfield, MS, field test site (abs.): Eos, v. 89, no. 53, Fall Meeting Supplement, Abstract U41C-22.

Meckel, T., and Hovorka, S. D., 2008, Integrated monitoring design for a large volume commercial injection (abs.): 7th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pa.

Meckel, T., ten Brink, U., and Williams, S. J., 2008, Subsidence rates from fluid withdrawal and potential impact in southern Louisiana (abs.): Baton Rouge Geological Society Symposium: Natural and Anthropogenic Subsidence Impact on Louisiana Coasts, Baton Rouge, La.

Meckel, Timothy, 2008, Sediment compaction rates and subsidence in deltaic plains--numerical constraints and stratigraphic influences (abs.), in The 39th Annual Binghamton Geomorphology Symposium, Austin, Texas, October 9-11, p. 24.

Meckel, Timothy, and Kalyanaraman, Nishanth, 2008, Optimizing CO<sub>2</sub> injections for both seal integrity and economic return (abs.): AAPG 2008 Annual Convention and Exhibition Abstracts Volume, v. 17, p. 138.

Smyth, R. C., Hovorka, S. D., Romanak, K. D., Partin, J. W., Meckel, Timothy, Wong, Corinne, Nicot, J. -P., and Holt, R. M., 2008, Assessing risk to fresh water resources from long term CO<sub>2</sub> injection--laboratory and field studies (abs.), in 9th International Conference on Greenhouse Gas Technologies, November 16-20, Washington, D.C.

Treviño, R. H., Hovorka, S. D., Ambrose, W. A., and Meckel, T. A., 2008, Sequence stratigraphy and reservoir characterization of Cranfield field, Mississippi--an enhanced oil recovery and carbon sequestration study (abs.): Geological Society of America Abstracts with Programs, v. 40.

Meckel, T., and Kalyanaraman, N., 2007, The influence of seal thickness and rate of pressure buildup on CO<sub>2</sub> migration and sequestration (abs.): American Geophysical Union, v. 88, p. 52, Fall Meeting, Abstract No. H12D-03.

Meckel, Tip, and Hovorka, S. D., 2007, Gulf Coast stacked storage field test (abs.), in Sixth Annual Conference on Carbon Capture & Sequestration: Expediting deployment of industrial

scale systems: Can it be done? How? Concerns to be addressed, May 7-10, Pittsburgh, Abstract #085.

Smyth, R. C., Hovorka, S. D., and Meckel, T. A., 2007, Potential saline reservoir sinks for storage of CO<sub>2</sub> generated in North and South Carolina (abs.), in Sixth Annual Conference on Carbon Capture & Sequestration: Expediting deployment of industrial scale systems: Can it be done? How? Concerns to be addressed, May 7-10, Pittsburgh, Abstract #138.

Wong, C., Hovorka, S. D., and Meckel, T., 2007, Evaluating the mobilization of cations from aquifer rocks exposed to high CO<sub>2</sub> levels (abs.): GCAGS, San Antonio, Tex.

Meckel, T., ten Brink, U., and Williams, S. J., 2005, Numerical constraints of current rates of surface elevation change due to compaction of Holocene sediments in the Louisiana delta plain (abs.): GCAGS Transactions, v. 55, p. 531, <http://archives.datapages.com/data/gcags/data/055/055001/pdfs/925.pdf>.

### Published Datasets

Ni, H., and Meckel, T., 2021, Drainage experiment in an intermediate-scale beadpack: Digital Rocks Portal, <http://doi.org/10.17612/QXXK-WE31>.