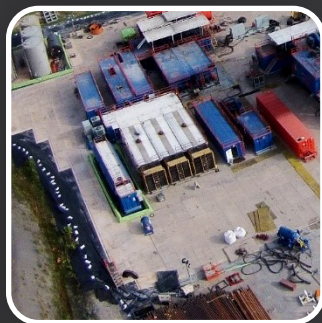
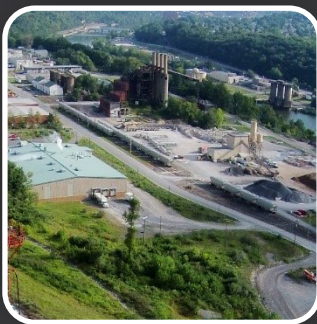
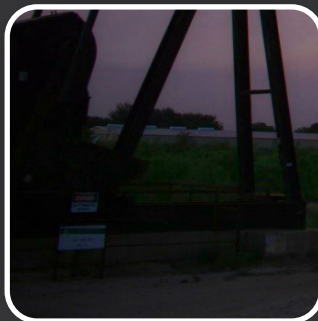


# MASTERING THE SUBSURFACE THROUGH TECHNOLOGY INNOVATION, PARTNERSHIPS & COLLABORATION

CARBON STORAGE AND OIL & NATURAL GAS TECHNOLOGIES  
REVIEW MEETING

AUGUST 13–16, 2018  
SHERATON STATION SQUARE  
PITTSBURGH, PA



U.S. DEPARTMENT OF  
**ENERGY**



NATIONAL  
ENERGY  
TECHNOLOGY  
LABORATORY

# DIRECTOR'S MESSAGE



## Welcome to Pittsburgh

This city has many nicknames – “Steel City,” “City of Champions,” “City of Bridges,” or just plain old “The Burgh.” But maybe it should have a nickname that recognizes the key role it has played in providing energy-related innovations that helped build a great and powerful nation.

Ever since 18<sup>th</sup> century entrepreneurs chiseled coal from the cliffs of Mount Washington and then transported it across the river in canoes to keep the troops warm in Fort Pitt, Pittsburgh has been at the forefront of innovations that provide America with energy. That legacy continues today, and that’s why this seems like an appropriate place to conduct a technology review meeting that covers so many vital energy-related topics.

The 2018 Mastering the Subsurface Through Technology Innovation, Partnerships and Collaboration Technology Review Meeting brings together some of America’s most productive researchers in the field of carbon storage and oil and natural gas technologies to present, discuss, and collaborate for tomorrow’s energy breakthroughs. We hope you are inspired by some of the innovative technologies that will be reviewed during our meetings.

The National Energy Technology Laboratory (NETL) and Pittsburgh are happy you are here and energized about the insights the next few days will provide. We hope you will enjoy the city and find the review meeting stimulating and worthwhile.

Sincerely,

**Sean I. Plasynski, Ph. D.**

Director (Acting)

National Energy Technology Laboratory





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**MONDAY, AUGUST 13, 2018****GRAND STATION BALLROOM**

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11:30 a.m.	<b>Meeting Registration</b>
1:00 p.m.	<b>Welcome and Introduction</b> <i>Jared Ciferno</i> , National Energy Technology Laboratory, Onshore Oil and Gas Technology Manager; <i>Sean Plasynski Ph.D.</i> , National Energy Technology Laboratory, Director (Acting)
1:10 p.m.	<b>Keynote Speaker</b> <i>Steven Winberg</i> , U.S. Department of Energy, Assistant Secretary for Fossil Energy
1:40 p.m.	<b>Session Preview and Introduction</b> <i>Traci Rodosta</i> , National Energy Technology Laboratory, Carbon Storage Technology Manager
1:50 p.m.	<b>Cranfield Project, Southeast Regional Carbon Sequestration Partnership</b> <i>Susan Hovorka</i> , University of Texas at Austin, Bureau of Economic Geology
2:20 p.m.	<b>Citronelle Project, Southeast Regional Carbon Sequestration Partnership</b> <i>Robert Trautz</i> (EPRI), <i>Anne Oudinot</i> (ARI) and <i>David Riestenberg</i> (ARI)
2:50 p.m.	<b>BREAK</b>
3:05 p.m.	<b>Tuscaloosa Marine Shale Virtual Laboratory</b> <i>Mehdi Mokhtari</i> , University of Louisiana at Lafayette
3:35 p.m.	<b>CarbonSAFE: Establishing an Early CO<sub>2</sub> Storage Complex in Kemper County, Mississippi: Project ECO2S</b> <i>David Riestenberg</i> , Southern States Energy Board
4:05 p.m.	<b>Southeast Regional Carbon Storage Partnership: Offshore Gulf of Mexico</b> <i>George Koperna</i> (ARI), Southern States Energy Board
4:35 p.m.	<b>Offshore Gulf of Mexico Partnership for Carbon Storage - Resources and Technology Development GoMCarb</b> <i>Susan Hovorka</i> , University of Texas at Austin, Bureau of Economic Geology
5:05 p.m.	<b>National Risk Assessment Partnership Users Meeting</b> - Fountainview Room, Second Floor

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**TUESDAY, AUGUST 14, 2018****GRAND STATION BALLROOM**

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7:00 a.m.	<b>Continental Breakfast</b>
8:00 a.m.	<b>Welcome and Introduction</b> <i>Traci Rodosta</i> , National Energy Technology Laboratory, Carbon Storage Technology Manager; <i>Darin Damiani</i> , U.S. Department of Energy, Carbon Storage Program Manager, Office of Fossil Energy
8:05 a.m.	<b>Keynote Speaker</b> <i>Mark Ackiewicz</i> , U.S. Department of Energy, Director, Division of Emissions Control and CCUS R&D, Office of Fossil Energy
8:35 a.m.	<b>Session Preview and Introduction</b> <i>Darin Damiani</i> , U.S. Department of Energy, Carbon Storage Program Manager, Office of Fossil Energy
8:45 a.m.	<b>Marcellus Shale Energy and Environment Laboratory (MSEEL)</b> <i>Tim Carr</i> , West Virginia University
9:15 a.m.	<b>Midwest Regional Carbon Sequestration Partnership, Modeling and Monitoring 1 Million Tons of Associated CO<sub>2</sub> Storage</b> <i>Neeraj Gupta</i> , Battelle Memorial Institute
9:45 a.m.	<b>POSTER SESSION and BREAK</b>

- 11:15 a.m. **Field Laboratory for Emerging Stacked Unconventional Plays in Central Appalachia (ESUP)**  
*Nino Ripepi*, Virginia Polytechnic Institute
- 11:45 a.m. **Midwest Geological Sequestration Consortium**  
*Sallie Greenberg*, Illinois State Geological Survey, Associate Director, Energy Research and Development
- 12:15 p.m. **CarbonSAFE: Illinois Macon County**  
*Steve Whittaker*, University of Illinois
- 12:45 p.m. **LUNCH**
- 1:30 p.m. **PARALLEL SESSIONS**

## PARALLEL SESSIONS

	<b>Room - Ellwood</b> <b>Hydraulic Fracturing/Simulation Diagnostics</b> <b>Moderator - Joe Renk</b>	<b>Room - Haselton</b> <b>Intelligent Monitoring Systems/Integration 1</b> <b>Moderator - Andrea McNemar</b>	<b>Room - Brighton 1-2</b> <b>Modeling for CO<sub>2</sub> Storage</b> <b>Moderator - Kylee Rice</b>
1:30 p.m.	<b>P1</b> A Low Frequency Electrode Array Tool for Fracture Diagnostics in Steel-Cased Wellbores - E-Spectrum Technologies, Inc. - <i>David Glowka</i>	<b>P1</b> Intelligent Monitoring Systems and Advanced Well Integrity and Mitigation - Archer Daniels Midland Corporation - <i>Scott McDonald</i>	<b>P1</b> Multiscale Modeling of Carbon Dioxide Migration and Trapping in Fractured Reservoirs with Validation by Model Comparison and Real-Site Applications - Princeton University - <i>Karl Bandilla</i>
1:50 p.m.	<b>P2</b> Fracture Diagnostics Using Low Frequency Electromagnetic Induction and Electrically Conductive Proppants - University of Texas at Austin - <i>Mukul Sharma</i>	<b>P2</b> Fundamental Reservoir Properties for High Priority Depositional Environments Targeted for CO <sub>2</sub> Storage - National Energy Technology Laboratory - <i>Dustin Crandall</i>	<b>P2</b> Quantitative Characterization of Impacts of Coupled Geomechanics and Flow on Safe Permanent Geological Storage of Carbon Dioxide (CO <sub>2</sub> ) in Fractured Reservoirs - Colorado School of Mines - <i>Philip Winterfeld</i>
2:10 p.m.	<b>P3</b> Meta Material Proppant/Smart Cement - Oceanit - <i>Vinod Veedu</i>	<b>P3</b> Joint Inversion of Time-Lapse Seismic Data - University of North Dakota Energy & Environmental Research Center - <i>Cesar Barajas-Olade</i>	<b>P3</b> Cost Analysis Associated with Capture, Transport, Utilization and Storage (CTUS) of CO <sub>2</sub> - National Energy Technology Laboratory - <i>Tim Grant</i>
2:30 p.m.	<b>P4</b> Cost Effective Optical Seismic System for Hydraulic Fracture Diagnostics - MagiQ Technologies, Inc. - <i>Caleb Christensen</i>	<b>P4</b> Development of a Framework for Data Integration, Assimilation, and Learning for Geological Carbon Sequestration - University of Texas at Austin - <i>Alexander Sun</i>	<b>P4</b> Characterizing Shales as Seals for CO <sub>2</sub> Containment and Shales as Reservoirs for Geologic Storage of CO <sub>2</sub> - National Energy Technology Laboratory - <i>Dustin Crandall</i>
2:50 p.m.		<b>P5</b> Development of Intelligent Monitoring System (IMS) Modules for the Aquistore CO <sub>2</sub> Storage Project - University of North Dakota Energy & Environmental Research Center - <i>Nick Azzolina</i>	<b>P5</b> Integrated Characterization of CO <sub>2</sub> Storage Reservoirs on the Rock Springs Uplift Combining Geomechanics, Geochemistry, and Flow Modeling University of Wyoming - <i>John Kaszuba</i>
3:10 p.m.	<b>BREAK</b>		

	<b>Room - Ellwood</b> <b>Offshore CO<sub>2</sub> Storage Resource Assessments</b> <b>Moderator - Bill O'Dowd</b>	<b>Room - Haselton</b> <b>Associated CO<sub>2</sub> Storage</b> <b>Moderator - Josh Hull</b>	<b>Room - Brighton 1-2</b> <b>Well Integrity and Zonal Isolation</b> <b>Moderator - Robert Vagnetti</b>
3:30 p.m.	<b>P1</b> Southeast Offshore Storage Resource Assessment - Southern States Energy Board - <i>Jack Pashin and James Knapp</i>	<b>P1</b> Subtask 1.1: Advanced Characterization of Unconventional Oil and Gas Reservoirs to Enhance CO <sub>2</sub> Storage Resource Estimates - University of North Dakota Energy & Environmental Research Center - <i>Bethany Kurz</i>	<b>P1</b> Nonlinear Acoustic Methods for the Detection and Monitoring of CO <sub>2</sub> /Brine Leakage Pathways in Wellbore Systems - Los Alamos National Laboratory - <i>Carly Donahue</i>
3:50 p.m.	<b>P2</b> Mid-Atlantic U.S. Offshore Carbon Storage Resource Assessment Project - Battelle Memorial Institute - <i>Neeraj Gupta</i>	<b>P2</b> Carbon Life Cycle Analysis of CO <sub>2</sub> -EOR for Net Carbon Negative Oil (NCNO) Classification - University of Texas at Austin - <i>Ramon Gil</i>	<b>P2</b> High-Resolution 3D Acoustic Borehole Integrity Monitoring System - Los Alamos National Laboratory - <i>Cristian Pantea</i>
4:10 p.m.	<b>P3</b> Offshore CO <sub>2</sub> Storage Resource Assessment of the Northern Gulf of Mexico - University of Texas at Austin - <i>Ramon Trevino</i>	<b>P3</b> A Nonconventional CO <sub>2</sub> -Enhanced Oil Recovery Target in the Illinois Basin: Oil Reservoirs of the Thick Cypress Sandstone - University of Illinois - <i>Nathan Webb</i>	<b>P3</b> Embedded Sensor Technology Suite for Wellbore Integrity Monitoring - National Energy Technology Laboratory - <i>Paul Ohodnicki</i>
4:30 p.m.	<b>Geologic CO<sub>2</sub> Storage</b> <b>P1</b> Developing and Validating Pressure Management and Plume Control Strategies in the Williston Basin Through a Brine Extraction and Storage Test (BEST) - University of North Dakota Energy & Environmental Research Center - <i>John Hamling</i>	<b>P4</b> Development of Swelling-Rate-Controllable Particle Gels to Enhance CO <sub>2</sub> Flooding Sweep Efficiency and Storage Efficiency - Missouri University of Science and Technology - <i>Baojun Bai</i>	<b>P4</b> Methods to Enhance Wellbore Cement Integrity with Microbially-Induced Calcite Precipitation - Montana State University - <i>Adrienne Phillips</i>
4:50 p.m.	<b>P2</b> Phase II Field Demonstration at Plant Smith Generating Station Assessment of Opportunities for Optimal Reservoir Pressure Control, Plume Management and Produced Water Strategies - Electric Power Research Institute - <i>Robert Trautz</i>	<b>P5</b> Optimizing CO <sub>2</sub> Sweep Based on Geochemical and Reservoir Characterization of the Residual Oil Zone of Hess Seminole Unit - University of Texas at Austin - <i>Ian Duncan</i>	<b>P5</b> Wellbore Leakage Mitigation Using Advanced Mineral Precipitation Strategies - Montana State University - <i>Adrienne Phillips</i>
5:10 p.m.	<b>P3</b> Task 1: CO <sub>2</sub> Storage in Carbonate Reservoirs: Validation of Permeability Model - from the Lab Scale to the Meter Scale - Lawrence Livermore National Laboratory - <i>Susan Carroll</i>	<b>P6</b> Task 3: CO <sub>2</sub> Storage and Trapping in Multi-Phase Systems Containing Brine and Hydrocarbon - Los Alamos National Laboratory - <i>Rajesh Pawar</i>	<b>P6</b> Autonomous Monitoring of Wellbore Integrity Applying Time Reverse Nonlinear Elastic Wave Spectroscopy (TR NEWS) and Fiber Optic Sensing and Communication - Los Alamos National Laboratory - <i>Carly Donahue</i>
5:30 p.m.	<b>P4</b> Impacts of CO <sub>2</sub> Exposed Microbial Ecology on Reservoir Performance - National Energy Technology Laboratory - <i>Djuna Gulliver</i>	<b>P7</b> Targeted Mineral Carbonation to Enhance Wellbore Integrity - University of Virginia - <i>Catherine Peters</i>	<b>P7</b> Nanoparticle Injection Technology for Remediating Leaks of CO <sub>2</sub> Storage Formation - University of Colorado - <i>Yunping Xi</i>
5:50 p.m.	<b>END OF DAY</b>		

7:00 a.m.	<b>Continental Breakfast</b>
8:00 a.m.	<b>Welcome and Introduction</b> <i>Jared Ciferno</i> , National Energy Technology Laboratory, Onshore Oil and Gas Technology Manager; <i>Elena Melchert</i> , U.S. Department of Energy, Director, Upstream Research Division, Office of Oil and Gas, Office of Fossil Energy
8:05 a.m.	<b>Keynote Speaker</b> <b>Topic: The Importance of Integration and Collaboration</b> <i>Dr. Alan Cohen</i> , U.S. Department of Energy, Director, Office of Research, Office of Oil and Natural Gas
8:35 a.m.	<b>Session Preview and Introduction</b> <i>Elena Melchert</i> , U.S. Department of Energy, Director, Upstream Research Division, Office of Oil and Gas, Office of Fossil Energy
8:45 a.m.	<b>Hydraulic Fracturing Test Site I, Midland Basin, West Texas</b> <i>Jordan Ciezobka</i> , Gas Technology Institute
9:15 a.m.	<b>Hydraulic Fracturing Test Site II, Delaware Basin, West Texas</b> <i>Jordan Ciezobka</i> , Gas Technology Institute
9:45 a.m.	<b>POSTER SESSION and BREAK</b>
11:15 a.m.	<b>Southwest Regional Partnership on Carbon Sequestration</b> <i>Robert Balch</i> , New Mexico Institute of Mining & Technology, University of Utah
11:45 a.m.	<b>Eagle Ford Shale Laboratory (EFSL) South Texas</b> <i>Dan Hill</i> , Texas A&M University
12:15 p.m.	<b>LUNCH</b>
1:15 p.m.	<b>PARALLEL SESSIONS</b>

## PARALLEL SESSIONS

	<b>Room - Ellwood</b> <b>CarbonSAFE 1</b> <b>Moderator - Bill Aljoe</b>	<b>Room - Haselton</b> <b>Geophysics for CO<sub>2</sub> Storage 1</b> <b>Moderator - Jerry Carr</b>	<b>Room - Brighton 1-2</b> <b>Oil and Gas Fundamental Science 1</b> <b>Moderator - Steve Henry</b>
	<b>P1</b>	<b>P1</b>	<b>P1</b>
1:15 p.m.	Integrated Commercial Carbon Capture and Storage Pre-Feasibility Study at Dry Fork Station, Wyoming - University of Wyoming - <i>Scott Quillinan</i>	Task 5: U.S. - Japan Collaboration on Fiber-Optic Technology - Lawrence Berkeley National Laboratory - <i>Pierre Jeanne</i>	Experimental Study of In Situ Fracture Generation and Fluid Migration in Shale - Los Alamos National Laboratory - <i>Bill Carey</i>
	<b>P2</b>	<b>P2</b>	<b>P2</b>
1:35 p.m.	CarbonSAFE Rocky Mountain Phase I: Ensuring Safe Subsurface Storage of Carbon Dioxide in the Intermountain West - University of Utah - <i>Brian McPherson</i>	Task 2: 2nd Generation SOV-DAS - Lawrence Berkeley National Laboratory - <i>Barry Freifeld</i>	Understanding Basic Mechanisms in Natural Gas Production Using Reservoir-Scale Modeling - Los Alamos National Laboratory - <i>Satish Karra</i>
	<b>P3</b>	<b>P3</b>	<b>P3</b>
1:55 p.m.	Integrated Carbon Capture and Storage in the Louisiana Chemical Corridor - Louisiana State University - <i>David Dismukes</i>	Development of High Sensitivity Engineered Optical Fiber for Distributed Acoustic Sensing - Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory - <i>Barry Freifeld</i>	Probing Hydrocarbon Fluid Behavior in Nanoporous Formations to Maximize Unconventional Oil/Gas Recovery - Los Alamos National Laboratory - <i>Hongwu Xu</i>

2:15 p.m.	<b>P4</b> CarbonSAFE Illinois East Basin - University of Illinois - <i>Hannes Leetaru</i>	<b>P4</b> Integration of Seismic-Pressure-Petrophysics Inversion of Continuous Active-Seismic Monitoring Data for Monitoring and Quantifying CO <sub>2</sub> Plume - <i>Tieyuan Zhu</i>	<b>P4</b> Shale Microbial Ecology Affecting Reservoir Performance - National Energy Technology Laboratory - <i>Djuna Gulliver</i>
2:35 p.m.			<b>P5</b> Treatment Approaches for Produced Water Re-Use and Surface Discharge - National Energy Technology Laboratory - <i>Nicholas Siefert</i>
2:55 p.m.	<b>BREAK</b>		
	<b>Room - Ellwood</b> <b>CarbonSAFE 2</b> <b>Moderator - Venkat Venkataraman</b>	<b>Room - Haselton</b> <b>Geophysics for CO<sub>2</sub> Storage 2</b> <b>Moderator - Dave Cercone</b>	<b>Room - Brighton 1-2</b> <b>Oil and Gas Fundamental Science 2</b> <b>Moderator - Bruce Brown</b>
3:15 p.m.	<b>P1</b> Integrated Pre-Feasibility Study of a Commercial-Scale CCS Project in Formations of the Rock Springs Uplift, Wyoming - University of Wyoming - <i>Fred McLaughlin</i>	<b>P1</b> Development of Pressure Reservoir Forecasting Tool - Lawrence Livermore National Laboratory - <i>Josh White</i>	<b>P1</b> Laboratory and Numerical Investigation of Hydraulic Fracture Propagation and Permeability Evolution in Heterogeneous and Anisotropic Shale and Sustainability of Hydraulic Fracture Conductivity in Ductile and Expanding Shales - Lawrence Berkeley National Laboratory - <i>Seiji Nakagawa</i>
3:35 p.m.	<b>P2</b> Northern Michigan Basin CarbonSAFE Integrated Pre-Feasibility Project - Battelle Memorial Institute - <i>Neeraj Gupta</i>	<b>P2</b> A Coupled Geomechanical, Acoustic, Transport and Sorption Study of Caprock Integrity in Carbon Dioxide (CO <sub>2</sub> ) Sequestration - Colorado School of Mines - <i>Manika Prasad</i>	<b>P2</b> Full Immersion Pulse Decay Technique for Accurately Measuring Shale Permeability - National Energy Technology Laboratory - <i>Michael Hannon</i>
3:55 p.m.	<b>P3</b> CAB-CS: Central Appalachian Basin CarbonSAFE Integrated Pre-Feasibility Project - Battelle Memorial Institute - <i>Lydia Cumming</i>	<b>P3</b> National Risk Assessment Partnership - Induced Seismicity Risk - Lawrence Livermore National Laboratory - <i>Josh White</i>	<b>P3</b> Understanding Water Controls on Shale Gas Mobilization into Fractures - Lawrence Berkeley National Laboratory - <i>Tetsu Tokunaga</i>
4:15 p.m.	<b>P4</b> Integrated Mid-Continent Stacked Carbon Storage Hub - Battelle Memorial Institute - <i>Andrew Duguid</i>	<b>P4</b> Charged Wellbore Casing Controlled Source Electromagnetics (CWC-CSEM) for Reservoir Imaging and Monitoring - Colorado School of Mines - <i>Yaoguo Li</i>	<b>P4</b> Resource Analysis to Improve Recovery of Unconventional Oil and Gas - National Energy Technology Laboratory - <i>Donald Remson</i>
4:35 p.m.	<b>P5</b> Integrated CCS for Kansas (ICKan) - University of Kansas Center for Research, Inc. - <i>Tandis Bidgoli</i>	<b>P5</b> Field Demonstration of the Krauklis Seismic Wave in a Novel MVA Method for Geologic CO <sub>2</sub> Storage - University of North Dakota Energy & Environmental Research Center - <i>Saughn Burnison</i>	<b>P5</b> Chemical Control of Fluid Flow and Contaminant Release in Shale Microfractures - SLAC National Accelerator Laboratory - <i>John Bargar</i>
4:55 p.m.	<b>P6</b> National Risk Assessment Partnership - Application of Risk Assessment Tools and Methodologies to Synthetic and Field Data - Pacific Northwest National Laboratory - <i>Diana Bacon</i>	<b>P6</b> Task 3: Assessment of Leakage Pathways Using Joint EM-Seismic, Borehole and Surface Technologies - Lawrence Berkeley National Laboratory - <i>Pierpaolo Marchesini</i>	<b>P6</b> Fundamental Understanding of Methane-Carbon Dioxide-Water (CH <sub>4</sub> -CO <sub>2</sub> -H <sub>2</sub> O) Interactions in Shale Nanopores Under Reservoir Conditions - Sandia National Laboratories - <i>Yifeng Wang</i>
5:15 p.m.	<b>BREAK</b>		
5:30 p.m.	<b>Demonstrating DOE FE's Knowledge Management (KM) Tool for Shale R&amp;D Community</b> <i>Kelly Rose</i> , National Energy Technology Laboratory, Ellwood room		
6:30 p.m.	<b>END OF DAY</b>		



7:00 a.m.	<b>Continental Breakfast</b>
8:00 a.m.	<b>Welcome and Introduction</b> <i>Traci Rodosta</i> , National Energy Technology Laboratory, Carbon Storage Technology Manager
8:05 a.m.	<b>Panel Discussion: Future of Data Analytics and Machine Learning for the Subsurface</b> Moderator: <i>Grant Bromhal</i> , National Energy Technology Laboratory, Senior Research Fellow for Geological and Environmental Systems; Panel Members: <i>George Guthrie</i> , Los Alamos National Laboratory; <i>Dr. Alan Cohen</i> , Director of Research, Office of Oil and Gas, DOE; <i>Shahab Mohaghegh</i> , West Virginia University
8:50 a.m.	<b>Session Preview and Introduction</b> <i>Jared Ciferno</i> , National Energy Technology Laboratory, Onshore Oil and Gas Technology Manager
9:00 a.m.	<b>Plains CO<sub>2</sub> Reduction Partnership (PCOR)</b> <i>Charles Gorecki</i> , University of North Dakota Energy & Environmental Research Center
9:30 a.m.	<b>CarbonSAFE-North Dakota Integrated Carbon Storage Complex Feasibility Study</b> <i>Wesley Peck</i> , University of North Dakota Energy & Environmental Research Center
10:00 a.m.	<b>BREAK</b>
10:15 a.m.	<b>Big Sky Regional Carbon Sequestration Partnership (BSCSP)</b> <i>Lee Spangler</i> , Energy Research Institute, Montana State University
10:45 a.m.	<b>Alaska North Slope Field Laboratory - EOR Polymer Flood</b> <i>John Barnes</i> , HILCORP Alaska
11:15 a.m.	<b>Bakken Rich Gas Enhanced Oil Recovery</b> <i>Jim Sorenson</i> , University of North Dakota Energy & Environmental Research Center
11:45 a.m.	<b>Frontier Observatory for Research in Geothermal Energy (FORGE)</b> <i>Robert Vagnetti</i> , National Energy Technology Laboratory
12:15 p.m.	<b>LUNCH</b>
1:00 p.m.	<b>PARALLEL SESSIONS</b>

## PARALLEL SESSIONS

	Room - Ellwood Geomechanics for CO <sub>2</sub> Storage 1 Moderator - Josh Hull	Room - Haselton Associated CO <sub>2</sub> Storage/Oil and Gas Shale Moderator - Mary Sullivan	Room - Brighton 1-2 Monitoring for CO <sub>2</sub> Storage 1 Moderator - Bruce Brown
1:00 p.m.	<b>P1</b> Monitoring for Faults at a Critical State of Stress - Los Alamos National Laboratory - <i>Ting Chen</i>	<b>P1</b> Subtask 1.4: Techno-Economic Assessment of Regional Carbon Utilization Scenarios and Attendant Monitoring Technology - University of North Dakota Energy & Environmental Research Center - <i>Wes Peck</i>	<b>P1</b> Pressure-Based Inversion and Data Assimilation System (PIDAS) for CO <sub>2</sub> Leakage Detection - University of Texas at Austin - <i>Alexander Sun</i>
1:20 p.m.	<b>P2</b> Geophysical and Mineralogical Controls on the Rheology of Fracture Slip and Seal Breaching - Pennsylvania State University - <i>Derek Elsworth</i>	<b>P2</b> Subtask 1.3: Integrated Carbon Capture and Storage for North Dakota Ethanol Production - University of North Dakota Energy & Environmental Research Center - <i>Charles Gorecki</i>	<b>P2</b> Monitoring of Geological CO <sub>2</sub> Sequestration Using Isotopes and PF Tracers - Oak Ridge National Laboratory - <i>David Graham</i>

1:40 p.m.	<b>P3</b> Robust In Situ Strain Measurements to Monitor Carbon Dioxide (CO <sub>2</sub> ) Storage - Clemson University - <i>Larry Murdoch</i>	<b>P3</b> Task 2: CO <sub>2</sub> Utilization in Unconventional Reservoirs - Pacific Northwest National Laboratory - <i>Pete McGrail</i>	<b>P3</b> Field Tools for Direct Monitoring of CO <sub>2</sub> and Brine Impacts in Groundwater Systems - National Energy Technology Laboratory - <i>Paul Ohodnicki</i>
2:00 p.m.	<b>P4</b> Characterizing and Interpreting the In Situ Strain Tensor During CO <sub>2</sub> Injection - Clemson University - <i>Larry Murdoch</i>	<b>P4</b> Bakken CO <sub>2</sub> Storage and Enhanced Recovery Program - Phase II - University of North Dakota Energy and Environmental Research Center - <i>Jim Sorensen</i>	<b>P4</b> Task 1: Enhanced Contrast Agents for CO <sub>2</sub> Monitoring - Pacific Northwest National Laboratory - <i>Pete McGrail</i>
2:20 p.m.	<b>P5</b> On the Relationship between Fault Reactivation and Leakage Potential: Controlled Injection Experiments at Mont Terri - Lawrence Berkeley National Laboratory - <i>Jens Birkholzer</i>	<b>P5</b> Numerical and Laboratory Investigations for Maximization of Production from Tight/Shale Oil Reservoirs: From Fundamental Studies to Technology Development and Evaluation - Lawrence Berkeley National Laboratory - <i>Matt Reagan</i>	<b>P5</b> Task 5: Advances in Large N Seismic Measurements to Monitor Reservoir Behavior - Lawrence Livermore National Laboratory - <i>Susan Carroll</i>
2:40 p.m.	<b>BREAK</b>		
	<b>Room - Ellwood</b> <b>Methane Hydrates</b> <b>Moderator - Rick Baker</b>	<b>Room - Haselton</b> <b>Wellbore Integrity and Mitigation</b> <b>Moderator - Kylee Rice</b>	<b>Room - Brighton 1-2</b> <b>Monitoring for CO<sub>2</sub> Storage 2</b> <b>Moderator - Mary Sullivan</b>
3:00 p.m.	<b>P1</b> Numerical Studies for the Characterization of Recoverable Resources from Methane Hydrate Deposits - Lawrence Berkeley National Laboratory - <i>Matthew Reagan</i>	<b>P1</b> Integrated Wellbore Integrity Analysis Program for CO <sub>2</sub> Storage Applications - Battelle Memorial Institute - <i>Joel Sminchak</i>	<b>P1</b> Task 4: Monitoring Technology for Deep CO <sub>2</sub> Injection - Lawrence Berkeley National Laboratory - <i>Michelle Robertson</i>
3:20 p.m.	<b>P2</b> Deepwater Methane Hydrate Characterization and Scientific Assessment - University of Texas at Austin - <i>Peter Flemings</i>	<b>P2</b> Long-Term Wellbore and Seal Integrity - Los Alamos National Laboratory - <i>Bill Carey</i>	<b>P2</b> Field Validation of MVA Technology for Offshore CCS: Novel Ultra-High-Resolution 3D Marine Seismic Technology (P-Cable) - Environmental Monitoring Efforts at the Tomakomai, Japan Marine Injection Site - University of Texas at Austin - <i>Tip Meckel</i>
3:40 p.m.	<b>P3</b> A Multi-Scale Experimental Investigation of Flow Properties in Coarse-Grained Hydrate Reservoirs During Production - University of Texas at Austin - <i>Steve Phillips</i>	<b>P3</b> Programmable Sealant-Loaded Mesoporous Nanoparticles for Gas/Liquid Leakage Mitigation - C-Crete Technologies, LLC - <i>Rouzbeh Shahsavari</i>	<b>P3</b> National Risk Assessment Partnership - Strategic Monitoring for Uncertainty Reduction - Lawrence Berkeley National Laboratory - <i>Erika Gasperikova</i>
4:00 p.m.	<b>P4</b> Advanced Simulation and Experiments of Strongly-Coupled Geomechanics and Flow for Gas Hydrate Deposits - Texas A&M - <i>Jihoon Kim</i>	<b>P4</b> National Risk Assessment Partnership Task 2: Containment Assurance - Los Alamos National Laboratory - <i>Dylan Harp</i>	<b>P4</b> Novel Methods to Detect Small Leaks over Large Areas - Los Alamos National Laboratory - <i>Youzuo Lin</i>
4:20 p.m.	<b>P5</b> Kinetic Parameters for the Exchange of Hydrate Formers - Pacific Northwest National Laboratory - <i>Mark White</i>	<b>P5</b> National Risk Assessment Partnership - Task 6: Risk Based Approach to Post Injection Site Closure - National Energy Technology Laboratory - <i>Nick Huerta</i>	<b>P5</b> Real-Time In-Situ Carbon Dioxide Monitoring Network for Sensitive Subsurface Areas in Carbon Capture and Storage - Intelligent Optical Systems Inc. - <i>Jesus Delgado</i>
4:40 p.m.	<b>END OF DAY</b>		

## NOTES



**PITTSBURGH, PA**

626 Cochran's Mill Road  
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