Stanford
School of Earth, Energy & Environmental Resources

Stanford Center For Carbon Storage

July 2021

Greetings!

We hope that our summer newsletter finds you all well. Stanford University has been slowly opening up with a plan to return to normal operations by Fall 2021. The Stanford Center for Carbon Storage (SCCS) is busier than ever with project work in a multitude of locations (California, Illinois, the GOM, and Australia), as well as modeling and laboratory analysis. We look forward to sharing the results of our research activities at our **2021 Annual Affiliates Meeting** which is tentatively scheduled for **Nov 16 & 17.** We plan to hold this meeting in person at Stanford with an option for remote participation.

Membership in SCCS continues to grow. Please join us in welcoming new SCCS affiliate members Aemetis Carbon Capture, Inc., Aera, and Saudi Aramco, who join continuing members Chevron, Shell, ExxonMobil, Energy Futures Initiative, and DOE. These additional memberships will help us to expand our research activities on projects in California and into new areas including geologic storage of hydrogen.

Thanks to everyone for your continued support of our program. A summary of recent and upcoming activities can be found below.

Sarah Saltzer, Managing Director

Recent Events

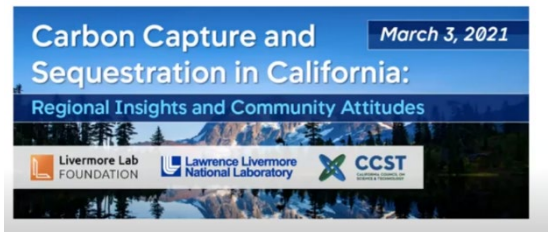
Sally Benson was featured on the May 13 OGCI Talking Transition podcast where she discussed the potential for scaling up carbon capture and the realities of storing CO2 safely and permanently. Link to podcast here

Stanford hosted a Carbon Management Workshop on June 8-10 on **Engineered and Hybrid Solutions for Carbon.** CCS featured prominently in many sessions including:

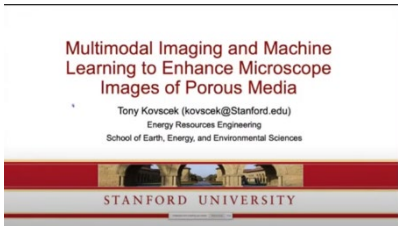
- Day 1: Carbon to Value
- Day 2: DAC and BECCS
- Day 3: Entire session

Link to videos and presentations

Brad Page, CEO of the Global CCS Institute, was the featured speaker at the Mar 29, 2021 Precourt Energy Seminar at Stanford. His presentation was entitled “Why CCS matters in a net zero emissions world”. Link to Presentation



Sarah Saltzer participated in a panel discussion at Lawrence Livermore National Laboratory on March 3, 2021 on Carbon Capture and Sequestration in California: Regional Insights and Community Attitudes. Link to Webinar



Tony Kovscek gave at talk entitled “Multimodal Imaging and Machine Learning to Enhance Microscope Images of Porous Media,” to the GeoScience & GeoEnergy Webinar, Delft University, on April 8, 2021. Although not CCS-specific, some of the findings have implications for future CCS projects. Link to Webinar

Upcoming Events

Mark Zoback, Professor Emeritus and former co-director of SCCS is a SEG 2021 North America SEG Honorary Lecturer. He will be presenting a talk on "Geomechanical Issues Affecting Long-Term Storage of CO2" on Sept 14 (10-11 Central) and Nov 4 (3-4 Central). The virtual webinar is free. Register Here.

Recent Publications

Al Shafloot, T., Kim, T. W., et al., (2021). **Investigating fracture propagation characteristics in shale using sc-CO2 and water with the aid of X-ray Computed Tomography**. *Journal of Natural Gas Science and Engineering,* 92, 103736. doi: 10.1016/j.jngse.2020.103736

Baik, E., Chawla, K. P., et al. (2021). **What is different about different net-zero carbon electricity systems?** *Energy and Climate Change,* 100046. doi: 10.1016/j.egycc.2021.100046

Benali, B., Føyen, T.L., et al., (2021). **Pore-scale Bubble Population Dynamics of CO2-Foam at Reservoir Pressure**. *Earth and Space Science Open Archive.* doi: 10.1002/essoar.10506876.1

Chapman, S., Borgomano, J. V. M., et al., (2021). **Seismic Wave Attenuation and Dispersion Due to Partial Fluid Saturation: Direct Measurements and Numerical Simulations Based on X-Ray CT**. *JGR Solid Earth,* 126, 4, e2021JB021643. doi: 10.1029/2021JB021643

DePaolo, D. J., Thomas, D. M., et al., (2021). **Opportunities for large-scale CO2 disposal in coastal marine volcanic basins based on the geology of northeast Hawaii**. *International Journal of Greenhouse Gas Control,* 10, 103396. doi: 10.1016/j.ijggc.2021.103396

Kuo., C.-W. & Benson, S. M., (2021). **Reliability of Relative Permeability Measurements for Heterogeneous Rocks Using Horizontal Core Flood Experiments**. *Sustainability,* 13(5):2744. doi: 10.3390/su13052744

Ni, H., Møyner., O., et al., (2021). **Quantifying CO2 capillary heterogeneity trapping through macroscopic percolation simulation**. *Advances in Water Resources,* 155, 103990. doi: 10.1016/j.advwatres.2021.103990

Wen, G., Hay, C., et al., (2021). **CCSNet: a deep learning modeling suite for CO2 storage**. arXiv:2104.01795v1

Wen, G., Tang, M., et al., (2021). **Towards a predictor for CO2 plume migration using deep neural networks**. *International Journal of Greenhouse Gas Control,* 105, 103223. doi: 10.1016/j.ijggc.2020.103223