A Modular Curriculum for Training University Students in Industry Standard CO_2 Sequestration and Enhanced Oil Recovery Methodologies

Background

Increased attention is being placed on research into technologies that capture and store carbon dioxide (CO_2). Carbon capture and storage (CCS) technologies offer great potential for reducing CO_2 emissions and, in turn, mitigating global climate change without adversely influencing energy use or hindering economic growth.

Deploying these technologies in commercial-scale applications requires a significantly expanded workforce trained in various CCS specialties that are currently under-represented in the United States. Education and training activities are needed to develop a future generation of geologists, scientists, and engineers who possess the skills required for implementing and deploying CCS technologies.

The U.S. Department of Energy's (DOE) National Energy Technology Laboratory (NETL) has selected 43 projects to receive more than $12.7 million in funding, the majority of which is provided by the American Recovery and Reinvestment Act (ARRA) of 2009, to conduct geologic sequestration training and support fundamental research projects for graduate and undergraduate students throughout the United States. These projects will include such critical topics as simulation and risk assessment; monitoring, verification, and accounting (MVA); geological related analytical tools; methods to interpret geophysical models; well completion and integrity for long-term CO_2 storage; and CO_2 capture.

Project Description

NETL is partnering with the University of Texas of the Permian Basin (UTPB) to create training modules for senior-level undergraduate and graduate students to prepare them to participate in future industry-level CO_2 injection projects. CO_2 relevant training of this scope and state-of-the-art detail is currently not available at the university level. Industry CO_2 sequestration experts endorse this training as a way to improve students' awareness and understanding of the different aspects of

CONTACTS

Sean Plasynski
Sequestration Technology Manager
National Energy Technology Laboratory
626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA 15236
412-386-4867
sean.plasynski@netl.doe.gov

Bruce M. Brown
Project Manager
National Energy Technology Laboratory
626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA 15236-0940
412-386-5534
bruce.brown@netl.doe.gov

Emily Stoudt
Principal Investigator
University of Texas of the Permian Basin
4901 E. University Boulevard
Odessa, TX 79762
432-552-2244
Fax: 432-552-2125
stoudt_e@utpb.edu

NATIONAL ENERGY TECHNOLOGY LABORATORY

Albany, OR • Fairbanks, AK • Morgantown, WV • Pittsburgh, PA • Sugar Land, TX

Website: www.netl.doe.gov

Customer Service: 1-800-553-7681

U.S. DEPARTMENT OF
ENERGY

CO_2 sequestration and enhanced oil recovery (EOR) prior to employment. This curriculum is designed to introduce students to various CO_2-EOR professionals as well as to expose them to relevant technical data, and will aid in developing a new generation of experts in the field of CO_2 engineering and geosciences.

The project's educational module will consist of an introductory manual for the faculty, and numerous handouts—such as real-world examples of well log sets, production data sets, core photos and core reports, and water chemistry data—will be available to students studying geosciences, engineering, and land management. Field trips to analogs of CO_2 sequestration, EOR, and residual oil zone (ROZ) EOR targets will be taken, and sequestration reservoir core study sets and related special topic modules will be used to supplement classroom modules to document how outcrop data is combined with industry exploration and production techniques to provide a multi-disciplinary perspective. Students will also be exposed to case studies of Permian Basin reservoirs presently under CO_2-EOR in both the main productive intervals and the ROZ.

Goals/Objectives

The primary objective of the project is to create a modular CO_2 and EOR sequestration curriculum at the university level. The curriculum will be used in petroleum geoscience, engineering, and land management senior-undergraduate and graduate level classes, symposia, and field seminars to develop the critical skill sets needed to prepare students for future careers in CO_2 sequestration and related industries.

Benefits

Overall the project will make a vital contribution to the scientific, technical, and institutional knowledge necessary to establish the trained workforce needed for commercial-scale CCS. The expected outcome of this project is to provide students with relevant skills set prior to employment in the EOR or CO_2 sequestration fields. These skill sets will enable students to reduce the time, training, and effort necessary to effectively contribute to and independently manage CO_2 projects with a minimum of supervision.