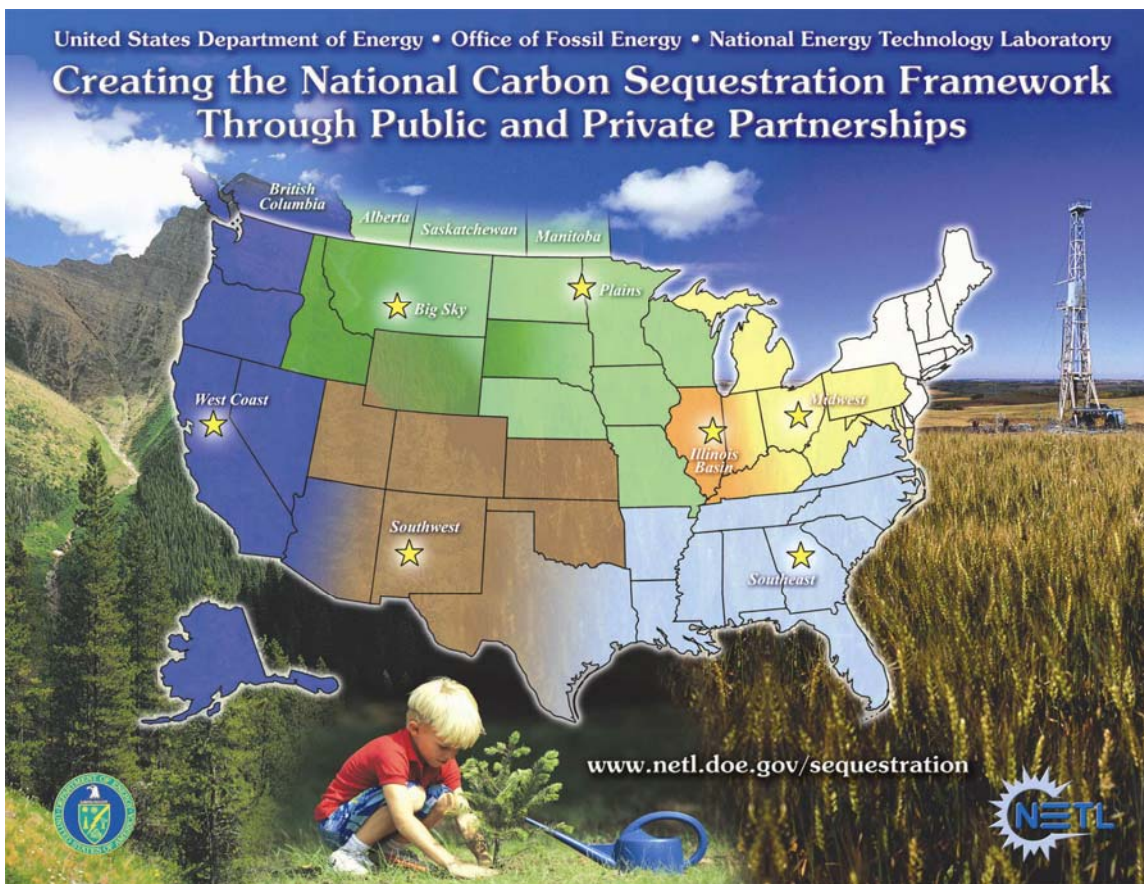


Regional Carbon Sequestration Partnerships Phase I Accomplishments





Executive Summary

The United States Department of Energy (DOE) initiated seven Regional Sequestration Partnerships in September of 2003 with the goal of developing an infrastructure to support and enable future carbon sequestration field tests and deployments. This infrastructure consists of facilities, capabilities, regulatory frameworks, and other assets peripheral to the core sequestration technology but needed for commercial success. The partnerships themselves are infrastructure, coalitions of professionals and companies, predominantly local to their regions, that will serve as a core driving force and advocacy group for future carbon sequestration projects.

The first phase of the Regional Sequestration Partnerships will end in June of 2005 as a clear success. Together the partnerships have:

1. Established a national network of companies and professionals working to support sequestration deployments
2. Created a carbon sequestration atlas for the United States
3. Obtained an improved understanding of the permitting requirements that future sequestration deployments will need to meet
4. Raised awareness and support for carbon sequestration as a greenhouse gas mitigation option, both within industry and the general public
5. Identified and vetted priority opportunities for sequestration field tests
6. Established a series of protocols for project implementation, accounting, and contracts

This document describes these Phase I accomplishments toward a goal of consolidating progress achieved thus far and looking forward to further success in Phase II.

“One of the cornerstones of our carbon sequestration program, a national network of regional partnerships, will continue its important work in FY 2006. This Secretarial initiative has brought together the federal government, state agencies, universities, and private industry to determine which options for capturing and storing greenhouse gases are most practical for specific areas of the country.”

Mark Maddox
Principal Deputy Assistant Secretary for
Fossil Energy
March 16, 2005

Partnerships at-a-glance

	Lead Organization/ Webpage	Highlights
	California Energy Commission http://www.westcarb.org/	<ul style="list-style-type: none"> • Identified candidate enhanced coal bed methane and enhanced oil recovery projects • Detailed assessment of terrestrial ecosystem fire management and biofuel opportunities
	New Mexico Institute of Mining and Technology http://www.southwestcarbonpartnership.org/	<ul style="list-style-type: none"> • Resource-rich region with two CO₂ pipelines • Identified seven candidate sites for field testing • Conducted web-based "town hall" meetings
	Montana State University http://www.bigskyco2.org/	<ul style="list-style-type: none"> • Large storage potential in basalt formations • Focus on agriculture and forestry project protocols to increase salability of credits • Close interaction with state governments
	University of North Dakota, Energy & Environmental Research Center http://www.undeerc.org/pcqr/	<ul style="list-style-type: none"> • Region rich in value-added geologic sequestration options • Wetlands a unique regional opportunity • Half-hour sequestration documentary aired on Prairie Public Television
	University of Illinois, Illinois State Geological Survey http://www.sequestration.org/	<ul style="list-style-type: none"> • Efforts centered on a CO₂ pipeline "fairway" within a focused region • Transportation plans highly developed • Link to agriculture interests through ethanol
	Battelle Memorial Institute http://198.87.0.58/default.aspx	<ul style="list-style-type: none"> • Strong analysis and cost-supply curves for CO₂ sequestration • Region accounts for >20% of GHG emissions in the U.S. • Interactive website as outreach tool
	Southern States Energy Board http://www.secarbon.org/	<ul style="list-style-type: none"> • Electricity supply, industry, and governor-level participation • Carbon offset program, a web-based portal for advertising sequestration opportunities



Background

DOE's Carbon Sequestration Program was begun in 1997 with the goal of defining the technology pathways for carbon dioxide (CO₂) capture, storage, and conversion and obtaining an understanding of the underlying science. The core program has made great progress toward these objectives and carbon sequestration is now established as an important greenhouse gas (GHG) mitigation option. Today technology developments are focused on reducing the energy penalty and cost of CO₂ capture and transport and increasing the capacity and permanence of CO₂ storage in geologic formations. The core program is also pursuing efforts in the areas of non-CO₂ GHG mitigation, carbon sequestration in terrestrial ecosystems, and breakthrough concepts.

Two sequestration options - CO₂ capture and storage in geologic formations and enhanced carbon uptake in terrestrial ecosystems - have risen up from the core R&D portfolio as priorities for near term deployments. The opportunities for each are different in different geographic regions of the country. For instance, different regions are underlain by different types of rock, with different structures, different permeabilities, and varied opportunities for enhanced recovery of fossil fuels. Also, different areas of the country have different industrial bases and capital assets that could support new sequestration-directed industries. The differences regarding terrestrial sequestration opportunities are obvious in the varying amounts of rainfall, average temperature, topography, and a host of other factors. Early on in the program, it was realized that a robust technology development effort, one that could enable sequestration to play a major role in any future GHG mitigation efforts, would need to embrace region-specific considerations.

DOE decided to address these regional and local infrastructure needs through a network of partnerships, each centered in a different geographic region of the country. Underlying the partnership approach is the belief that people local to an area would bring much more information, both institutional and technical, to bear on the task of characterizing the region, and could perform the work better and more efficiently than a centralized group. The partnership project was partitioned into two phases. Phase I was structured to be a scoping, assessment, and screening effort lasting two years. In phase II, which is being implemented through a separate, open competitive solicitation, the partnerships will progress to the deployment of sequestration field validations.

“When the Regional Carbon Sequestration Partnership program was initiated two years ago, these regionally-focused efforts were envisioned as the centerpiece of our carbon sequestration program. This new [phase II] solicitation says they have lived up to their promise by helping us determine the technologies, permitting requirements, and infrastructure best suited for specific regions of the country.”

Former Secretary of Energy
Spencer Abraham
December 14, 2004



Accomplishments

The Phase 1 Regional Sequestration Partnerships achieved the following key accomplishments.

1. Established a national network of companies and professionals working to support sequestration deployments
2. Created a carbon sequestration atlas for the United States
3. Obtained an improved understanding of the permitting requirements that future sequestration deployments will need to meet
4. Raised awareness and support for carbon sequestration as a GHG mitigation option, both within industry and the general public
5. Identified and vetted priority opportunities for sequestration field tests
6. Established a series of protocols for project implementation, accounting, and contracts

Each is described below.

Accomplishment 1. Established a national network of companies and professionals working to support sequestration deployments

The regional partnerships have brought an enormous amount of capability and experience to bear on the challenge of infrastructure development. For a two-year investment of \$19.9 million, including \$6.9 million of cost share, DOE has achieved the active participation of over 500 individuals representing over 240 industrial companies, engineering firms, state agencies, non-governmental organizations (NGO's), and other organizations. The table to the right shows the number of partners in each of several categories. All the partners are listed on following pages.

The involvement of professionals from diverse fields was for a purpose, and persons from different organizations settled into productive and efficient roles within the partnerships. Geologists from state surveys knew where to find existing core data and how to interpret it. Chemical engineers from design firms knew the likely cost of CO₂ capture and transport. Officials from state governments understood the body of environmental regulations and how they might apply to sequestration projects. Many executives from industry partners served a useful role as reviewers and shepherded the partnerships toward concepts with commercial potential. Participating environmental NGOs were focused mainly on the role of terrestrial sequestration. All brought capabilities to the partnerships, and all learned from the other partners.

Phase I Regional Sequestration Partnerships Participant Categories and Representation	
State and Local Agency	52
Universities and academic institutions	37
Electric Utility	36
Engineering & Research	26
Industry trade group	21
Oil & Gas	15
Environmental NGO	8
National Laboratories	7
Coal Mining	7
Chemical processing	6
Foreign government agency	5
Media / outreach	5
U.S. Federal Agency	3
Indian Nation	3
CO ₂ trading	2
CO ₂ Pipeline	1
Total	234

Phase I Partners

U.S. Federal Agency

U.S. Department of Agriculture
U.S. EPA - Region 9
U.S. Geological Survey

Foreign Government Agency

Alberta Department of Environment
Alberta Energy & Utilities Board
Alberta Energy Research Institute
British Columbia Ministry of Energy and Mines
Environment Canada

State Geologic Survey

Arizona Geological Survey
California Geological Survey
Colorado Geological Survey
Geological Survey of Alabama
Illinois State Geological Survey
Indiana Geological Survey *(2)
Kansas Geological Survey
Kentucky Geological Survey *(2)
Maryland Geological Survey
North Dakota Geological Survey
Ohio Division of Geological Survey
Oklahoma Geological Survey
Pennsylvania Geological Survey
Utah Geological Survey
West Virginia Geological and Economic Survey
Wyoming State Geological Survey

Other State Agency

California Department of Forestry and Fire Protection
California Department of Oil, Gas and Geothermal Resources
California Energy Commission
California Environmental Protection Agency
Georgia Environmental Facilities Authority
Georgia Forestry Commission
Idaho Carbon Sequestration Advisory Committee
Illinois Department of Commerce & Economic Opportunity
Illinois Department of Natural Resources
Louisiana Department of Environmental Quality
Maryland Energy Administration
Minnesota Pollution Control Agency
Montana Bureau of Mines and Technology
Montana Department of Environmental Quality *(2)
Montana GIS Services Bureau Information Technology Services
Montana Governor's Carbon Sequestration Working Group
Montana Natural Resource Information System-Montana State Library
Montana Public Service Commission
Nevada Bureau of Mines and Geology *(2)
New Mexico Bureau of Geology
New Mexico Energy, Minerals, and Natural Resources Department
New Mexico Oil Conservation Division
North Carolina State Energy Officer
North Dakota Department of Health
North Dakota Industrial Commission Oil and Gas Division
North Dakota Petroleum Council
Ohio Coal Development Office
Oregon Department of Forestry
South Carolina Department of Agriculture
Utah Automated Geographic Reference Center (AGRC) *(2)
Utah Division of Air Quality
Utah Energy Office
Washington State Department of Natural Resources
Wyoming Carbon Sequestration Advisory Committee
Wyoming Department of Environmental Quality

Indian nation

Navajo Nation
Nez Perce Tribe
The Confederated Salish and Kootenai Tribes

Environmental NGO

California Climate Action Registry
Ducks Unlimited, Inc.
Jackson Hole Center for Global Affairs
National Carbon Offset Coalition
Natural Resources Trust
Ohio Environmental Council
Ohio Forestry Association
Pacific Forest Trust

Media/Outreach

AJW Group
EnTech Strategies, LLC / New Directions
Prairie Public Television
The Keystone Center
The Phillips Group

University and academic institution

Arizona State University
Boise State University
Brigham Young University
California Institute for Energy and Environment
California Polytechnic Institute
California State University at Bakersfield
Dine College
Energy & Environmental Research Center (University of North Dakota)
Inland Northwest Research Alliance
Massachusetts Institute of Technology *(2)
Michigan State University
Mississippi State University
Montana State University - Bozeman
New Mexico Institute of Mining and Technology
New Mexico State University
North Dakota State University
Ohio State University
Oklahoma State University
Pennsylvania State University
Purdue University
South Dakota School of Mines and Technology
Southern Illinois University
Stanford Global Climate Energy Project
Texas A&M University *(2)
University of Alaska Fairbanks
University of California
University of Idaho
University of Maryland
University of Oklahoma
University of Regina
University of Texas at Austin, Bureau of Economic Geology *(2)
University of Utah
University of Wyoming
Utah State University
Virginia Tech
West Virginia University
Western Michigan University

Local Agency

San Francisco Department of the Environment

Pipeline

KinderMorgan CO₂ Company, L.P. *(2)

*(#) Participate in multiple partnerships (# of partnerships)

Electric Utility

AES Warrior Run
Ameren
American Electric Power
Baard Energy
Basin Electric Power Cooperative
Cinergy *(2)
Constellation Energy Group
DTE Energy
Duke Power
Excelsior Energy Inc.
First Energy
Georgia Power Company
Great Northern Power Development
Great River Energy
Intermountain Power Agency
Louisville Gas and Electric Energy
Manitoba Hydro
Minnkota Power Cooperative, Inc.
Montana-Dakota Utilities Co.
Oklahoma Gas and Electric
Otter Tail Power Company
PacifiCorp *(2)
PNM, Public Service Co. of New Mexico
Progress Energy
Puget Sound Energy
Salt River Project
Sask Power
SCANA
Sierra Pacific Power
South Carolina Electric & Gas Company
Southern Company
Tampa Electric Company
Tennessee Valley Authority
TransAlta
Tucson Electric Power Company
Xcel Energy

Coal

Alliance Resource Partners (Mettiki Coal)
Arch Coal, Inc.
Burlington Resources
CONSOL Energy Inc.
Kiewit Mining Group
Peabody Energy
The North American Coal Corporation

Oil & Gas

Aera Energy LLC
Amerada Hess Corporation
BP *(2)
ChevronTexaco *(2)
ConocoPhillips *(2)
Eagle Operating, Inc.
Encore Acquisition Company
Fischer Oil & Gas, Inc.
Marathon Oil Company
Occidental Petroleum
Oxy Permian Ltd.
Saskatchewan Industry and Resources
Shell
Tesoro Refinery
Yates Petroleum Corporation

CO₂ Trading

Chicago Climate Exchange
Environmental Financial Products

Chemicals

Air Liquide
Aventine Renewable Energy
Dakota Gasification Company
LincolnLand Agri-Energy
Monsanto
Scotts Company

Engineering and Research

Advanced Resources International *(3)
Applied Geo Technologies
Augusta Systems, Incorporated
Babcock & Wilcox
Battelle Memorial Institute
Bechtel Corporation
Bki
Clean Energy Systems, Inc. *(2)
Consultant, David C. Thomas
D.J. Nyman & Associates
Electric Power Research Institute (EPRI) *(3)
Golder Associates
Greenwood Enterprises
GTI
McNeil Technologies
Merchant Consulting
Nexant, Inc. *(2)
Petroleum Technology Research Centre
RMS Research
Science Strategies
SFA Pacific
Susan Rice and Associates, Incorporated
Terralog Technologies
The Sampson Group
Unifield Engineering, Inc.
Winrock International *(2)

National laboratory

Idaho National Engineering and Environmental Laboratory
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Los Alamos National Laboratory *(2)
Oak Ridge National Laboratory
Pacific Northwest National Laboratory *(2)
Sandia National Laboratories

Industry Trade Group

American Petroleum Institute
Arkansas Oil and Gas Commission
Cement Industry Environmental Consortium
Center for Energy & Economic Development (CEED) *(4)
Illinois Corn Growers Association
Illinois Oil and Gas Association
Indiana Oil & Gas Association
Interstate Oil and Gas Compact Commission (IOGCC) *(4)
Kentucky Oil & Gas Association
Lignite Energy Council
National Council for Air and Stream Improvement
National Regulatory Research Institute
New Mexico Oil and Gas Association (NMOGA)
Ohio Corn Growers Association
Ohio Soybean Council
Ohio Turfgrass Foundation
Petroleum Technology Transfer Council
Southern States Energy Board
Western Governors' Association *(3)
Western Interstate Energy Board
Western States Petroleum Association (WSPA)

*(#) Participate in multiple partnerships (# of partnerships)

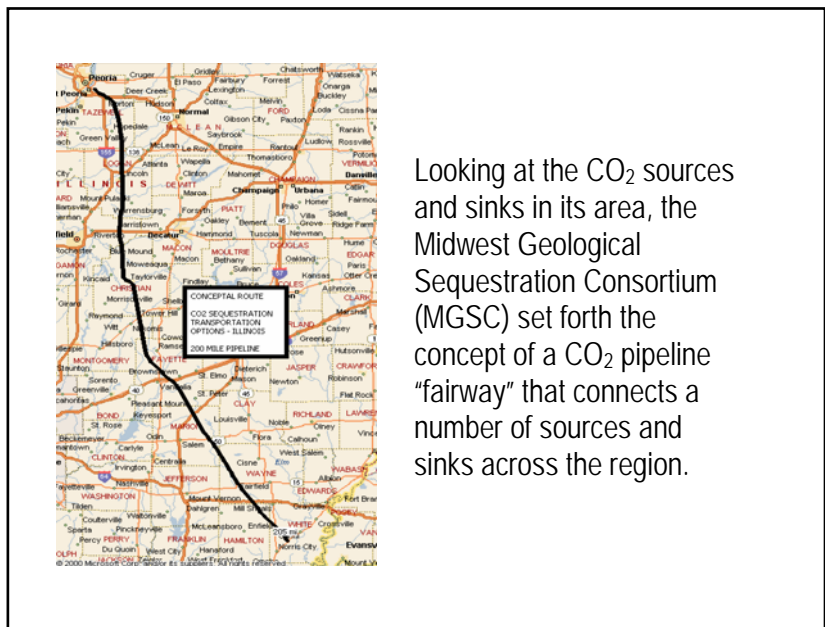
Accomplishment 2. Created a Carbon sequestration atlas for the United States

A carbon sequestration atlas is defined as an index of CO₂ emissions point sources of significant size, geologic formations with the potential to store carbon dioxide, and terrestrial ecosystems with potential for enhanced carbon uptake – all referenced to their geographic location for the purposes of matching sources and sinks.

This atlas will serve two inter-related purposes. At the implementation level, it will increase access to source/sink information and enhance the ability of interested persons to identify viable projects. At the policy level it will provide a robust picture of the sequestration opportunities throughout the United States.

For point sources of CO₂ emissions, the atlas contains the location (longitude and latitude), the total amount of CO₂ emitted per year, the concentration of CO₂ in the exhaust gas, the exhaust gas pressure, and other useful metrics. The atlas contains information on over 5,500 emissions sources representing roughly 45% of total U.S. CO₂ emissions. The atlas also contains information on geologic and terrestrial sinks. For geologic reservoirs, the location, depth, temperature, porosity, and other factors needed to assess the amenability for CO₂ injection and storage capacity are available. Terrestrial ecosystems contain location, average annual rainfall, soil quality, and other parameters needed to estimate potential annual carbon uptake. Each region maintains a regional atlas which contains information on features specific to their area.

An important part of the Carbon Sequestration Atlas is an information system that makes the data accessible to persons who want to use it. Each of the partnerships developed a spreadsheet or database to manage the information they gathered, and they performed the hard work of standardizing units and assumptions. The University of Kansas has developed an Internet-based portal, NatCarb, that brings the data from all the partnerships together at one site. Among other features, NatCarb offers mapping software that enables a user to select a source and investigate sink or pipeline opportunities in the vicinity. The four figures on the following page provide a walk-through of the NatCarb information system. It is just one example, and if you are interested we encourage you to try NatCarb out for yourself at <http://www.natcarb.org>.



National Carbon Sequestration Database Walk Through

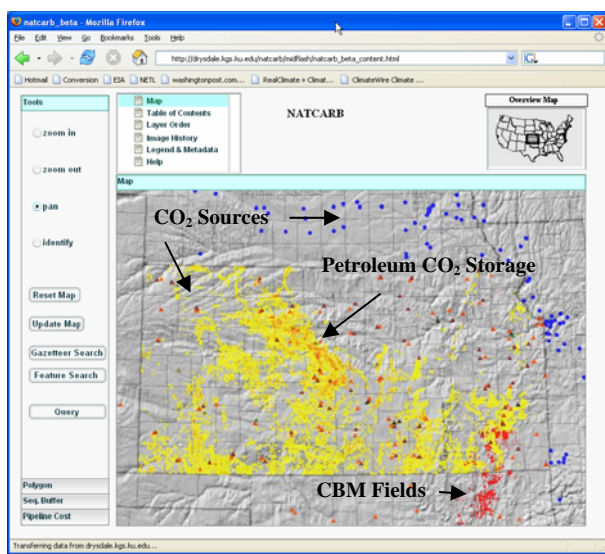


Figure 1. A view of the state of Kansas showing CO₂ sources (dot icons), areas with petroleum CO₂ storage potential (yellow), and CBM fields (red). Additional data can be layered to show the location of coal fields; oil and gas fields, wells, and production; agricultural sequestration values; brine sample locations; and more.

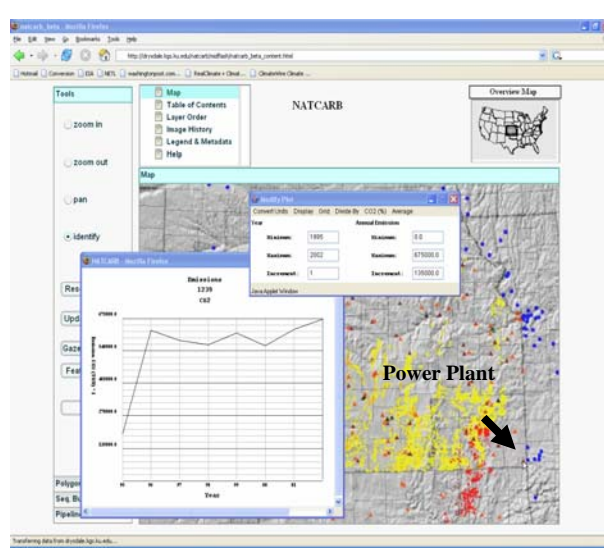


Figure 2. NatCarb allows a user to access more detailed information on sources of interest by simply clicking on the source icon. Above is shown CO₂ emissions from a coal-fired power plant in southeastern Kansas for the years 1995 to 2002 (675,000 tons CO₂ in 2002).

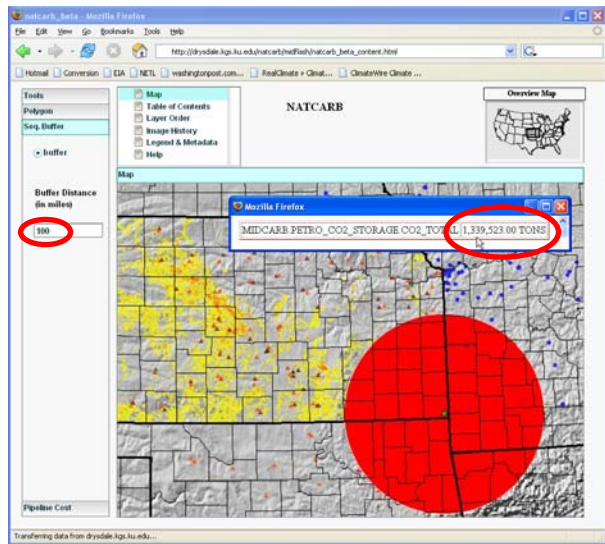


Figure 3. NatCarb's buffer feature allows a user to calculate the CO₂ storage capacity within a given distance of a single CO₂ source or group of sources. NatCarb calculates a CO₂ storage potential of 1.3 million tons CO₂ within a 100 miles of the power plant shown in Figure 2.

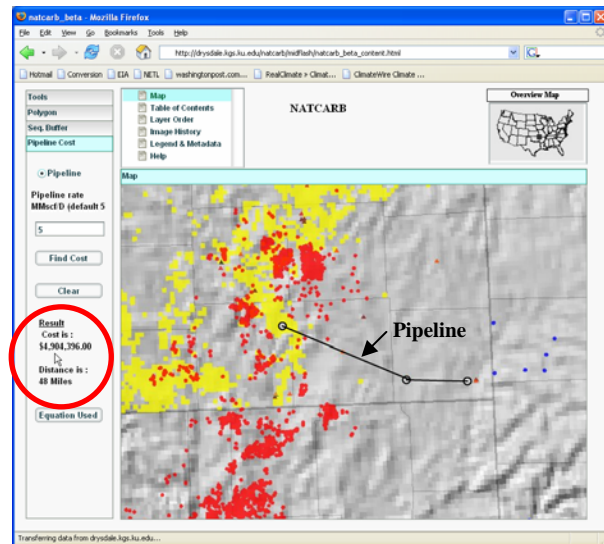


Figure 4. NatCarb can calculate the cost of building a pipeline from a CO₂ source to a nearby sequestration site. In this case, NatCarb estimates a 50 mile pipeline with a flow rate of 5 MMscf/d would cost \$5 million to build.

Accomplishment 3. Obtained an improved understanding of the permitting requirements that future sequestration deployments will need to meet

The risks of carbon sequestration are small, both in absolute terms and in comparison to risks associated with other economic activities, and they can be managed and minimized. But they are not zero, and before a sequestration project can be undertaken, it must be approved or permitted under one or several safety and environmental regulations.

Researchers in the core program are studying the mechanisms that drive the safety and environmental risks associated with carbon sequestration and are developing technologies and techniques to minimize or eliminate them. The Phase I partnerships have complemented this effort by grounding the program's ideas about the levels of acceptable risk with the reality of opinions and standards of state and local regulators and other local constituencies. The partnerships have brought forth the fact that different geographies and geologies pose different kinds and levels of risk, and also, the public in different regions have different attitudes toward risk and the balance between environmental protection and economic development.

The near-term challenge for the Sequestration Program is to obtain permits for field tests and other large experiments that it seeks to conduct, notably the field tests being considered for Phase II of the regional partnerships. Project-level Environmental Assessments (EAs) have been prepared for the CO₂ geosequestration projects near Houston, Texas and Southeast Virginia. Also, a programmatic Environmental Impact Statement is being developed that will address societal issues related to the program success or failure. It builds upon the first two EAs and will provide a framework for all subsequent project-level EAs so that those efforts can be focused on project and location-specific environmental impacts.

Working in collaboration with the Interstate Oil and Gas Compact Commission (IOGCC), the partnerships began to address a larger question of how future commercial sequestration deployments could and ought to be permitted. The IOGCC is well-suited to study this issue. It represents the governors of oil and gas producing states, and thus brings to bear a wealth of experience in the development and implementation of environmental regulations for activities related to energy production, transport, and use. The IOGCC has had success in nurturing state-level competency for the management and implementation of air and water regulations.

The IOGCC report, "A Regulatory Framework for Carbon Capture and Storage" states that the injection of CO₂ into underground formations for the purpose of GHG control is a new and unique undertaking from a regulatory perspective. The IOGCC tenders that regulation of CO₂ injection can be accommodated by altering existing regulations for either natural gas storage or underground injection of hazardous waste. More research and experience will be needed in the area, but the IOGCC document is an excellent resource.

Interstate Oil and Gas Compact Commission



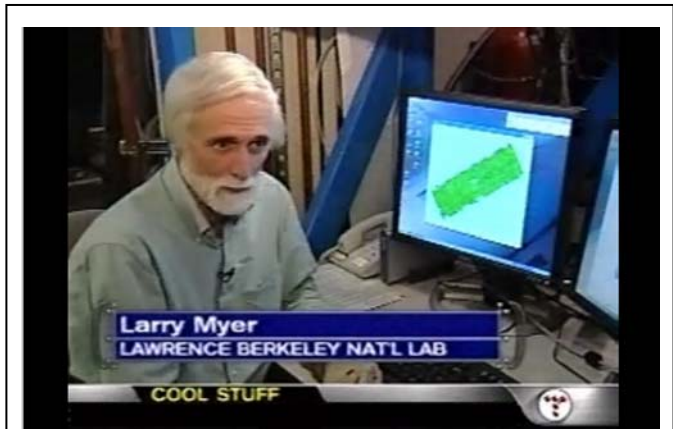
Representing the Governors of Oil and Natural Gas Producing States

"The Task Force strongly believes that inclusion of non-EOR CCGS (Carbon Capture and Geologic Storage) wells under Class I or Class V of the UIC program would not be appropriate or conducive to the growth of CCGS as a viable option in mitigating the potential impact of CO₂ emissions on the global climate."

IOGCC CO₂ Geological Sequestration
Task Force
Final Report
January 24, 2005

Accomplishment 4. Raised awareness and support for sequestration as a greenhouse gas mitigation option, both within industry and the general public

Once the partnerships were initiated, persons all around the United States who were involved in them naturally began talking with friends and acquaintances about the topic of carbon sequestration. What they found was consistent with a formal survey recently conducted by the Massachusetts Institute of Technology – awareness of carbon sequestration, and geologic sequestration in particular, is near zero within the general public. And so emerged a two-fold challenge for the partnership outreach efforts. First, was to raise awareness of carbon sequestration, and second was to build on that awareness an understanding that carbon sequestration technologies can play a significant and safe role in mitigating greenhouse gas emissions.



Larry Myer of the West Coast Regional Partnership participates in a Tech TV Interview on the topic of carbon sequestration and greenhouse gas emissions mitigation

Sequestration outreach and education is not an easy undertaking as the concepts of injecting compressed CO₂ underground or managing forests or rangelands for increased carbon uptake are highly technical. Furthermore, because outreach and education was one of several goals for the partnerships, there were limitations on expenditures. The partnerships exhibited creative and innovative approaches. Articles about sequestration were placed in local newspapers, and several persons involved in the partnerships made appearances on local television programs. The PCOR partnership developed a half hour documentary shown on Prairie Public Television. All seven partnerships developed websites that describe their activities and provide links to other sites of interest (see partnerships at-a-glance). Several partnerships experimented with innovative, internet-based outreach efforts including a modified chat room for fielding questions about sequestration and web-based town meetings.

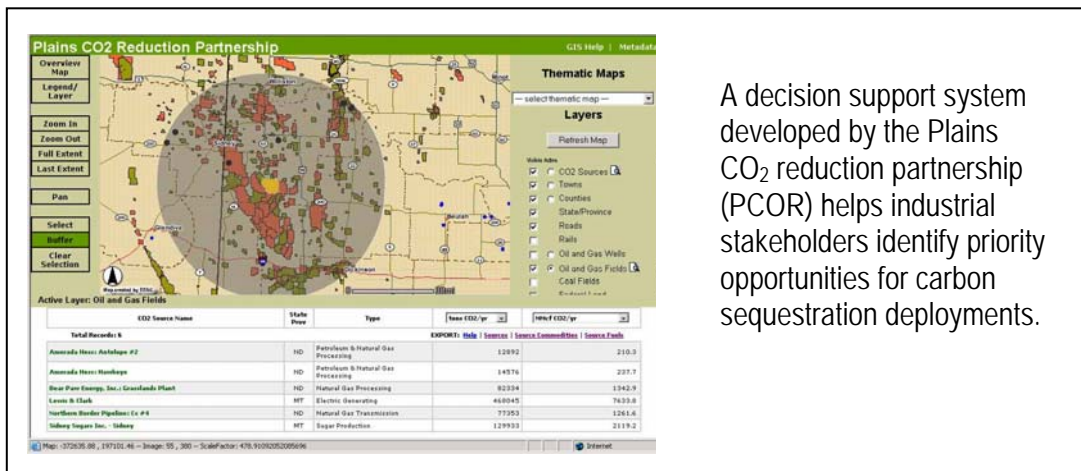
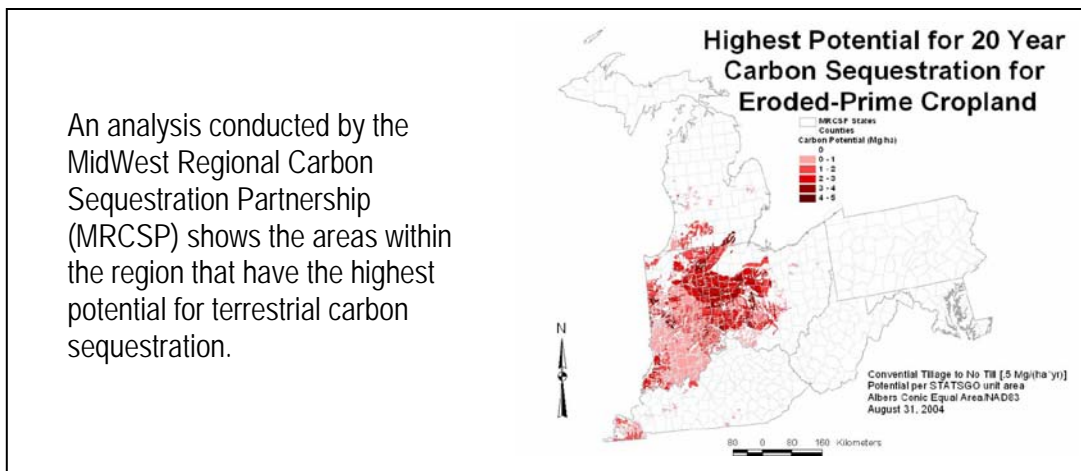
Efforts to raise awareness were complemented with efforts to achieve support and participation. Many partnerships proactively identified key groups of stakeholders, including prominent local industries, Indian tribes, government officials and civic organizations. They conducted briefings, dialogues, and meetings for the purpose of building relationships with them. For example, members of the Southwest Regional Partnership engaged in a process called “mediated modeling,” in which they held a series of three meetings with a group of stakeholders and allowed the stakeholders to provide input and shape the modeling of sources and sinks within the region. This process improved the sources and sink model, and also gave their stakeholders a sense of ownership of the partnership and its results. Partnerships also used focus groups to gauge people’s understanding and opinions on climate changes and sequestration. Findings from these groups will help the partnerships as they develop outreach tools and strategies for communicating the benefits of carbon sequestration throughout their regions.

Accomplishment 5. Identified and vetted priority opportunities for sequestration field tests

A key and overarching goal of the Phase I partnerships was to identify opportunities throughout the United States where technologies developed within the core R&D program could be received and demonstrated. There are an enormous number of possibilities, and a large part of the task involved screening out lower-priority possibilities and then prioritizing among candidate projects with different bundles of pros and cons. Once a candidate was identified the partnerships would often look for interested industry partners willing to play a lead role in it. If interest was found, the project was studied more closely in an iterative process.

The exact identity of the projects that were identified as priorities are proprietary and will be revealed with the announcement of Phase II awards in the fall of 2005. Projects that provide ancillary benefits (e.g., enhanced oil recovery, enhanced coalbed methane recovery, repair of degraded lands) are obviously more attractive to industry partners. Preliminary results indicate that geologic storage deployments will center on the availability of pipelines.

Examples of Analysis in Support of the Future Carbon Sequestration Deployments



Accomplishment 6. Established a series of protocols for project implementation, accounting, and contracts

Carbon sequestration will have little market penetration, according to the groups involved in the regional partnerships, unless a monetary value is assigned to the CO₂ that is stored in either terrestrial or geologic formations. Credits will only be as valuable as the methods and data which demonstrate that the permanence of the stored CO₂ can be verified to a certain level of confidence. Documentable credits could then be recorded in voluntary state and federal registries, such as the DOE Energy Information Agency's 1605(b) GHG reporting guidelines and/or accepted as tradable credits through institutions such as the Chicago Climate Exchange or foreign exchanges. The Partnerships are truly international with the formal addition of 4 Canadian Provinces to the Westcarb and PCOR Partnerships, and increasing collaboration with organizations from Australia, China, and Japan.

Several partnerships are working to create new project accounting protocols or leverage work that has been done by State Agencies, such as those in California. Most of the protocols have focused on the terrestrial sequestration projects. This is appropriate since that technology is readily deployable. The Big Sky Partnership's Project Workbook for Reforestation has developed a series of guidelines for project implementation, MM&V standards, third party verification requirements, and contracts between producers and aggregators of credits that would be salable on the Chicago Climate Exchange. The Big Sky is also enhancing and expanding the C-Lock system developed by North Dakota. This system registers farmers who are modifying land management practices and assigns carbon credits based on default carbon accumulation rates. The WestCarb is working with Winrock International to set up MMV protocols to satisfy the California GHG Registry.



Technologies may be very different, but the procedures developed for these terrestrial accounting protocols will serve as examples of how to design project accounting protocols for geologic sequestration.

Memorable Quote from a Participant

“We'll never know if carbon sequestration can be an effective solution unless we move forward with these research and development efforts. But these efforts can't occur in a vacuum. We're working with energy companies and with the general public to make sure this is an acceptable and lasting solution.”

Ken Nemeth
Southern States Energy Board, 2004

Regional Sequestration Partnerships - Planning for Success

Three planning and management decisions led, in part, to the success of the Phase I Partnerships.

1. The Partnerships were awarded through an open competitive solicitation process with 20% cost-share required. Interest in the Regional Partnerships was high; seven awards were made from a pool of twenty-two proposals and an average of 40% cost share was offered. Competition motivated the proposers to think of creative and efficient approaches to the tasks and also to assemble teams of capable persons with relevant capabilities. The cost-share requirement forced the proposers to engage industry stakeholders and to find areas of mutual self-interest.

2. The tasks set before the Partnerships complement the ongoing core R&D program and provide a progression toward technology field tests and the FutureGen demonstration project. The task of defining and categorizing CO₂ sources and sinks is not research, but it requires an understanding of the underlying science and the results can provide direction for technology development efforts. Similarly, the identification and prioritization of near term sequestration field tests, pulsing of public opinion regarding the projects, and assessment of regulatory requirements, are not a demonstration project but they give insight into what will be needed for a demonstration project. The activities of the partnerships fall between research and demonstration and they aide both.

3. The Office of Fossil Energy and NETL have encouraged a healthy competition among the partnerships and also facilitated information sharing. One of the valuable outcomes from the structure of the Regional Sequestration Partnerships effort and the competitive solicitation process is that the seven winning partnerships offered markedly different approaches to the scope of work. For example, some offerers proposed relatively large organizations covering a wide geographical area. Others proposed a smaller, more focused group. Some partnerships chose a relatively large academic presence on the team. Others offered more industry participants. Several of the partnerships strengthened their team with unique partners. For example, the PCOR partnership includes two agencies of the Canadian government, and the Southwest and Big Sky partnerships both include Indian nations. These differences provided the DOE with a robust initiative. DOE sponsored both general workshops and more focused technology area working group meetings to facilitate information exchange among the partnerships. During information exchanges, more effective approaches showed themselves and were quickly adopted. Thus the Phase I partnerships' effort was efficient as well as robust.



The U.S. Department of Energy's carbon sequestration team is an important part of the Regional Sequestration Partnerships. Each of the persons listed below is available to assist you and to answer any questions about this document. John Litynski is the primary point of contact at NETL for the Regional Sequestration Partnerships.

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SARAH FORBES (304) 285-4670 Sarah.Forbes@netl.doe.gov	BOB KANE (202) 586-4753 Robert.Kane@hq.doe.gov
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You can also find information about carbon sequestration and the regional sequestration partnerships at our web sites:

<http://www.netl.doe.gov/sequestration>
http://www.fe.doe.gov/coal_power/sequestration/



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