

NATIONAL ENERGY TECHNOLOGY LABORATORY



SECARB Annual Stakeholders' Briefing

Update on Sequestration Program and RCSP Initiative

March 9, 2011

Traci D. Rodosta, RCSP Coordinator

March 2011



Carbon Storage Program Goals

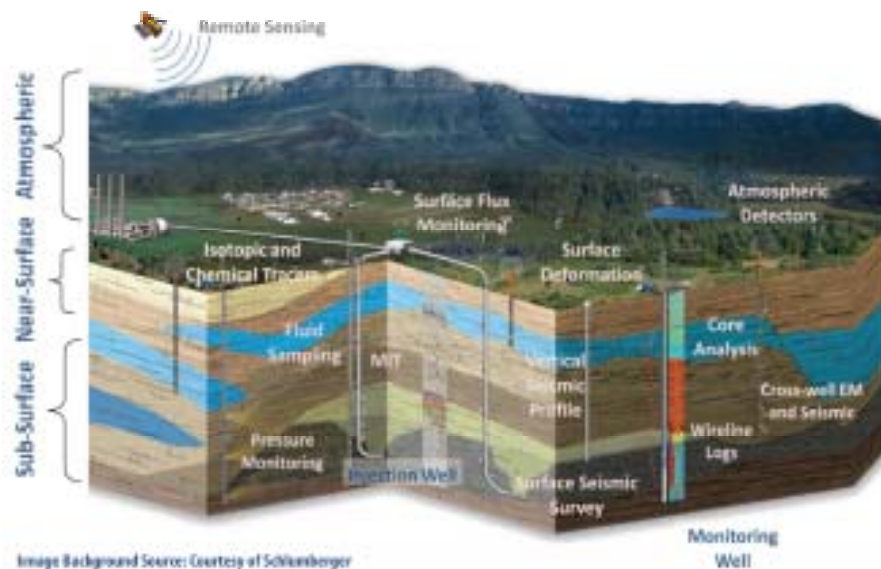
Develop Technology Options That...

- **Deliver technologies & best practices that provide Geologic Carbon Storage (GCS) and CO₂ Utilization with:**

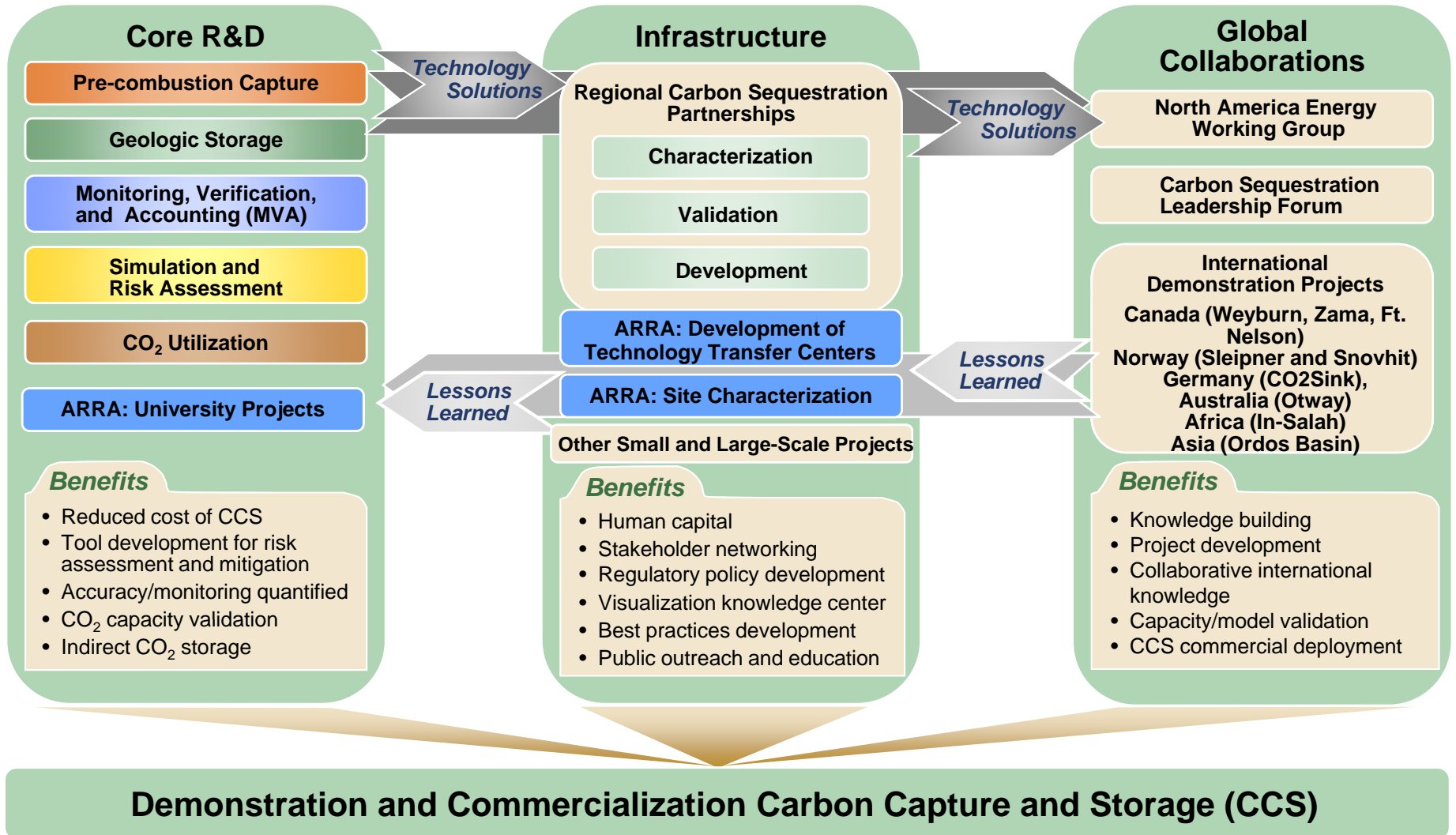
- 99% storage permanence
- +/- 30% capacity in reservoirs
- \$10/ ton CO₂ Utilization
- Validation of Formation Classes

- **Supporting Activities**

- Core R&D Projects
- Infrastructure Development
- International R&D Collaboration at Field Projects

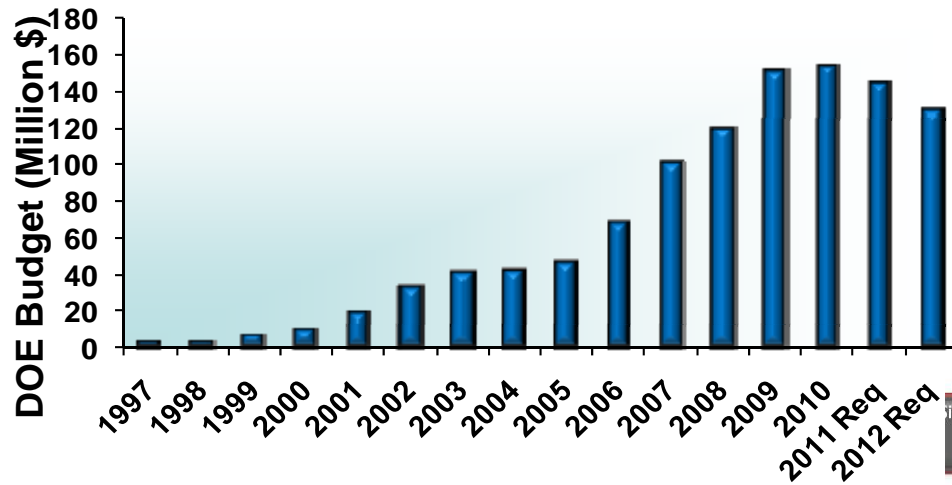


CARBON SEQUESTRATION PROGRAM with ARRA Projects



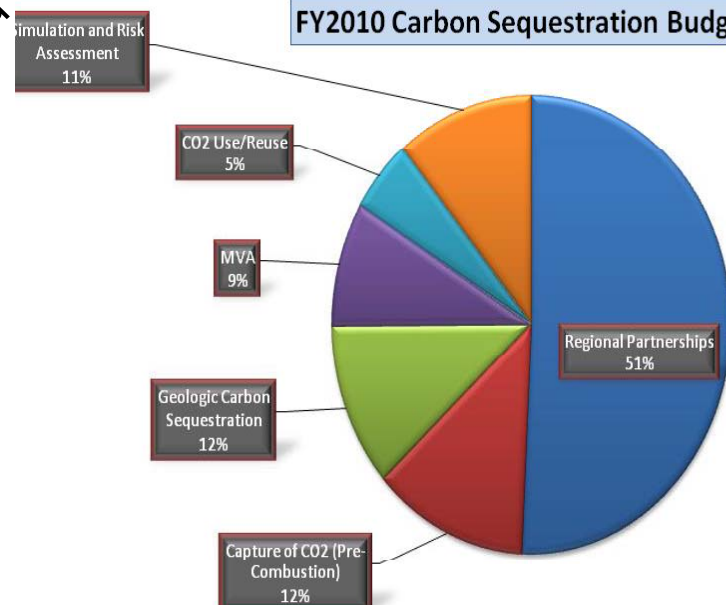
Sequestration Program Total Funding

2010 Program Statistics



Strong industry support
~ 39% cost share on projects

FY2010 Carbon Sequestration Budget Breakdown



Diverse research portfolio

105 Active R&D Projects

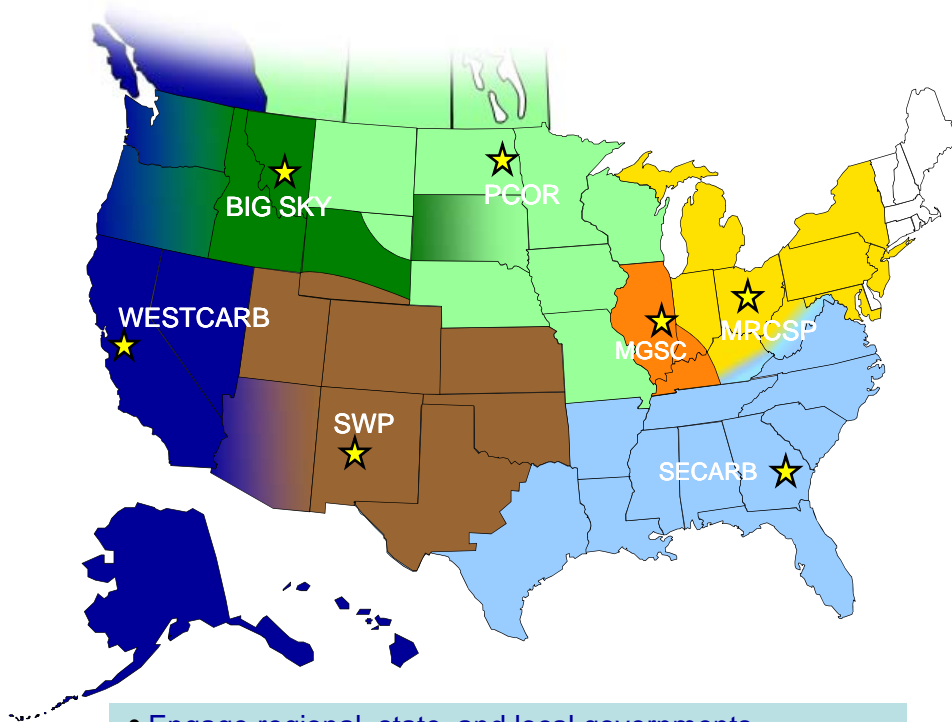
60 ARRA Projects (FY10 - \$120M)

Regional Carbon Sequestration Partnerships

Developing the Infrastructure for Wide Scale Deployment

Seven Regional Partnerships

400+ distinct organizations, 43 states, 4 Canadian Provinces



- Engage regional, state, and local governments
- Determine regional sequestration benefits
- Baseline region for sources and sinks
- Establish monitoring and verification protocols
- Address regulatory, environmental, and outreach issues
- Validate sequestration technology and infrastructure

Characterization Phase (2003-2005)

Search of potential storage locations and CO₂ sources

Found potential for 100's of years of storage

Validation Phase (2005-2011)

20 injection tests in saline formations, depleted oil, unmineable coal seams, and basalt

Development Phase (2008-2018+)

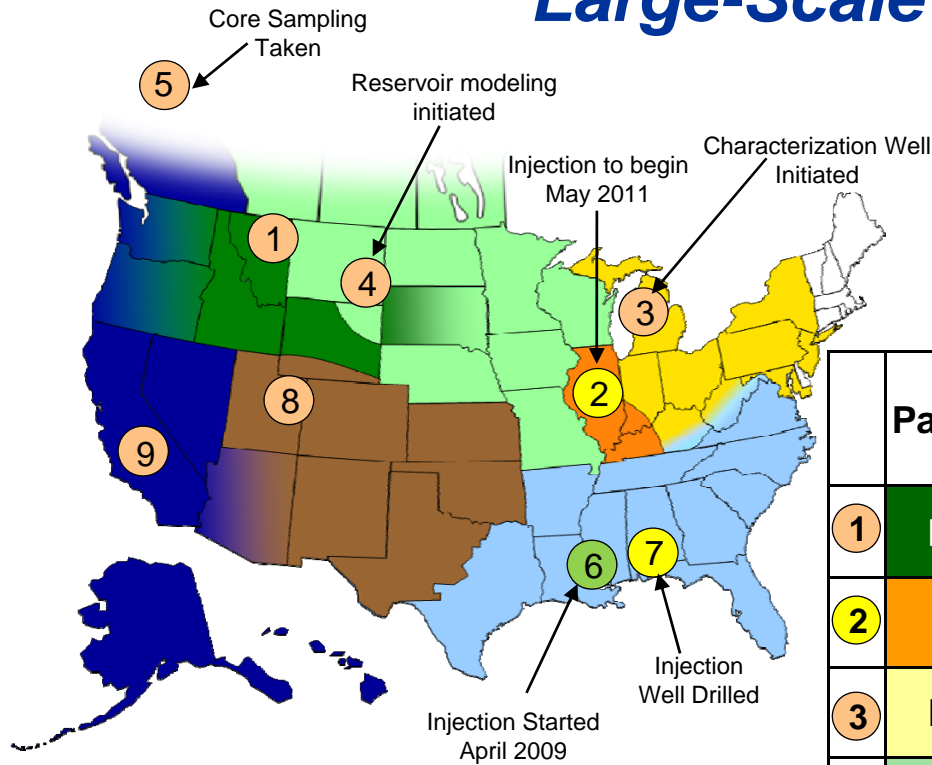
9 large scale injections (over 1 million tons each)

Commercial scale understanding

Regulatory, liability, ownership issues

RCSP Phase III: Development Phase

Large-Scale Geologic Tests



- ✓ Large-volume tests
- ✓ One injection commenced April 2009
- ✓ Remaining injections scheduled 2011-2015

- Injection Ongoing
- 2011 Injection Scheduled
- Injection Scheduled 2012-2015

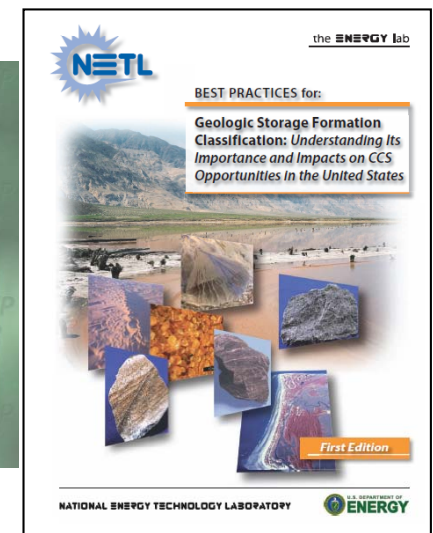
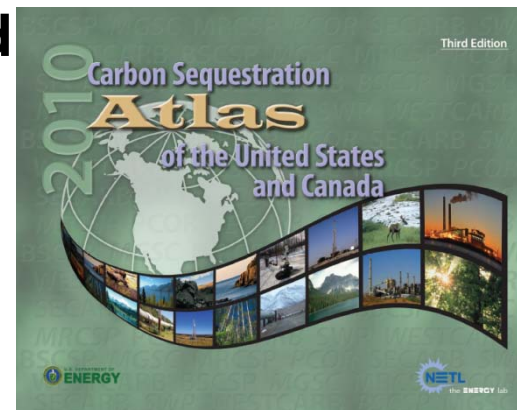
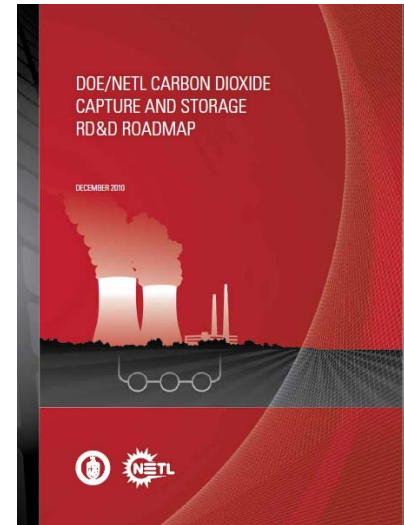
Note: Some locations presented on map may differ from final injection location

	Partnership	Geologic Province	Target Injection (metric tons)
1	Big Sky	Nugget Sandstone	>1,000,000
2	MGSC	Illinois Basin-Mt. Simon Sandstone	1,000,000
3	MRCSP	Michigan Basin-St. Peter Sandstone	1,000,000
4	PCOR	Powder River Basin-Bell Creek Field	>1,000,000
5		Horn River Basin- Carbonates	>1,000,000
6	SECARB	Gulf Coast – Cranfield Field-Tuscaloosa Formation	2,400,000
7		Gulf Coast – Paluxy Formation	300,000
8	SWP	Regional Jurassic & Older Formations	1,000,000
9	WESTCARB	Central Valley	TBD

Carbon Storage

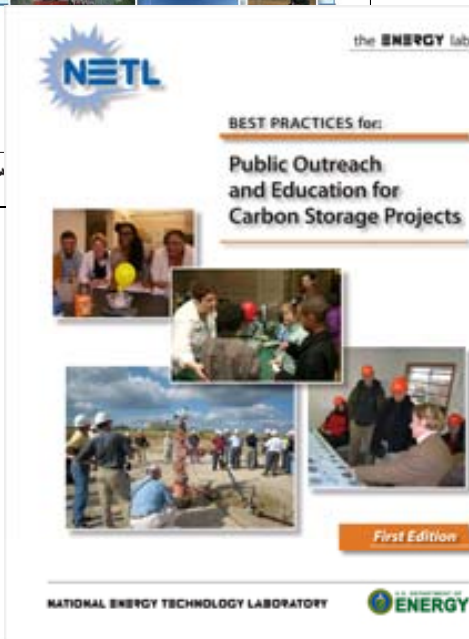
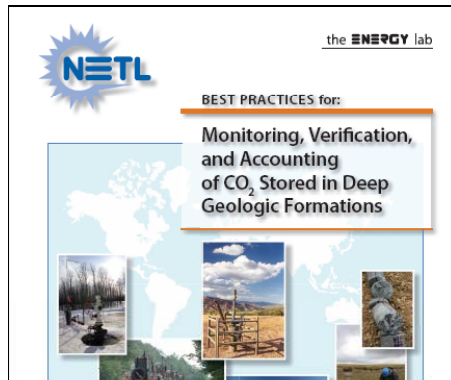
Key FY2011 Program Documents

- DOE CCS Roadmap – Dec 2010
- Carbon Sequestration (Storage) Technology Program Plan – Feb 2011
- 2010 Carbon Sequestration Atlas of the United States and Canada – 3rd Edition
- Best Practice Manuals
 - Storage classes
 - Technical manuals



CCS Best Practice Manuals

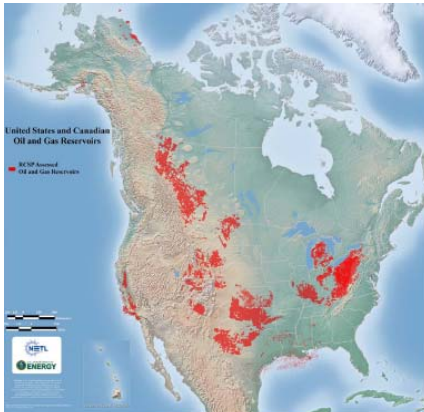
Critical Requirement For Significant Wide Scale Deployment -Capturing Lessons Learned



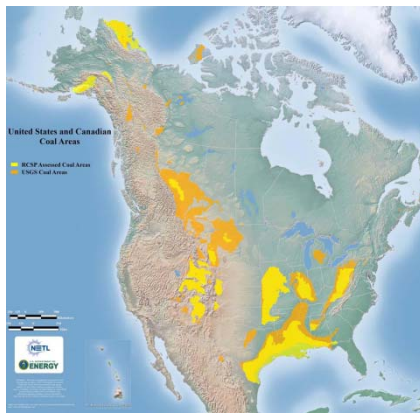
Best Practices Manual	Version 1 (Phase II)	Version 2 (Phase III)	Final Guidelines (Post Injection)
Monitoring, Verification and Accounting	2009	2017	2020
Public Outreach and Education	2009	2016	2020
Site Characterization	2010	2016	2020
Geologic Storage Formation Classification	2010	2016	2020
**Simulation and Risk Assessment	2010	2017	2020
**Well Construction, Operations and Completion	2011	2017	2020
Terrestrial	2010	2016 – Post MVA Phase III	

****Regulatory Issues will be addressed within various Manuals**

National Carbon Sequestration Atlas Highlights Hundreds of Years of Storage Potential

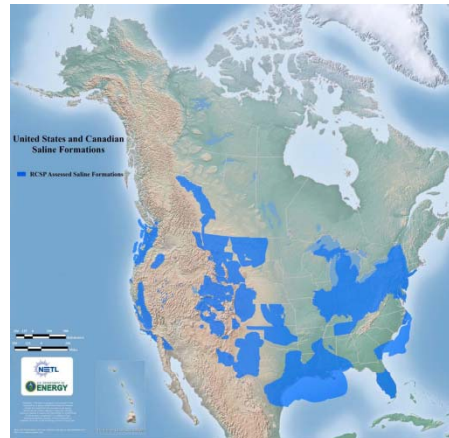


Oil and Gas Fields
143 GT CO₂ Storage Resource*

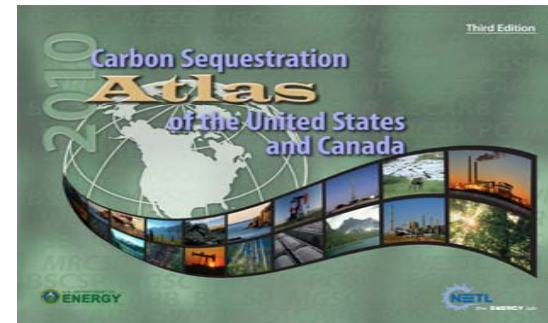


Unmineable Coal Seams
60-117 GT CO₂ Storage Resource*

U.S. Emissions
~ 6 GT CO₂/yr
all sources



Saline Formations
1,653 - 20,213 GT CO₂ Storage Resource*



- DOE's Carbon Sequestration Program
- DOE's International Collaborations
- DOE's National Risk Assessment Partnership (NRAP)
- Regional Carbon Sequestration Partnership (RCSP) Activities
- Refined CO₂ source estimates and CO₂ storage potential across the RCSP regions
- Worldwide CCS projects, CCS regulatory issues
- NATCARB's improved databases and GIS system

*2010 Carbon Sequestration Atlas of the United States and Canada.

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Download: http://www.netl.doe.gov/technologies/carbon_seq/refshelf/atlasIII/atlasIII.pdf

Leveraging International Geologic Storage R&D Projects

