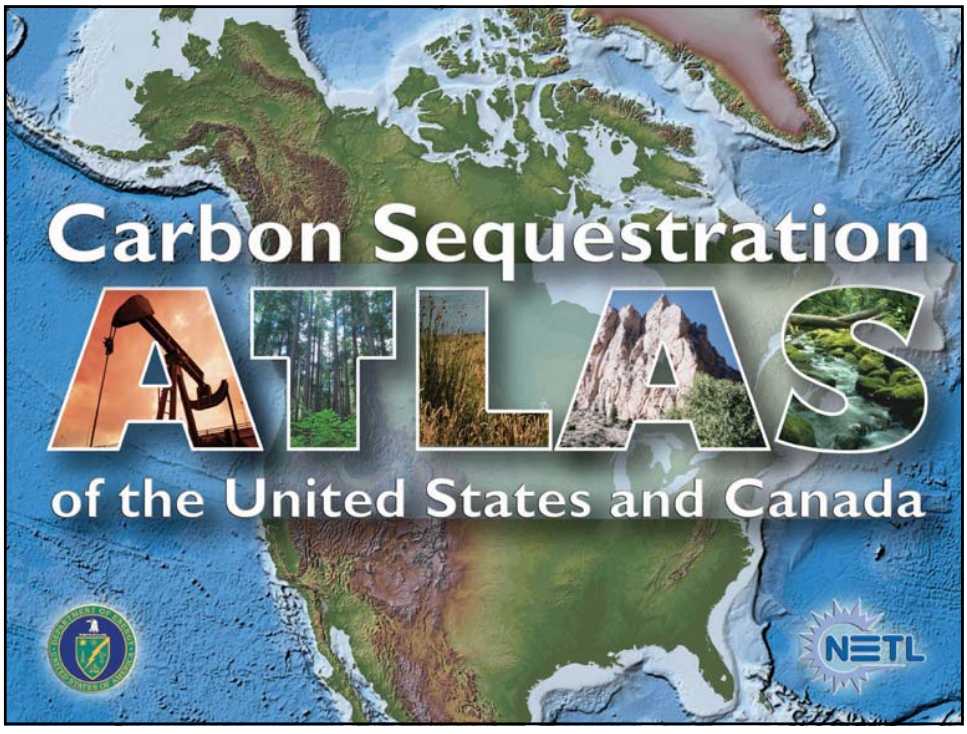
WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP
westcarb.org

WESTCARB Annual Business Meeting

The Carbon Sequestration Atlas of the United States and Canada

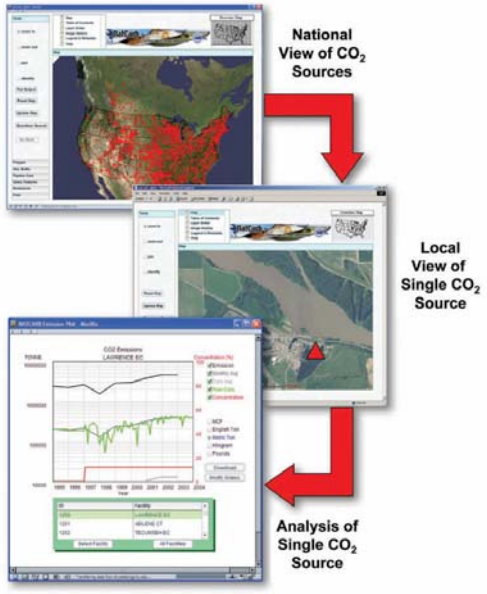
Mary Jane Coombs
Research Coordinator
California Institute for Energy & Environment
maryjane.coombs@ucop.edu

Seattle, WA
November 27, 2007

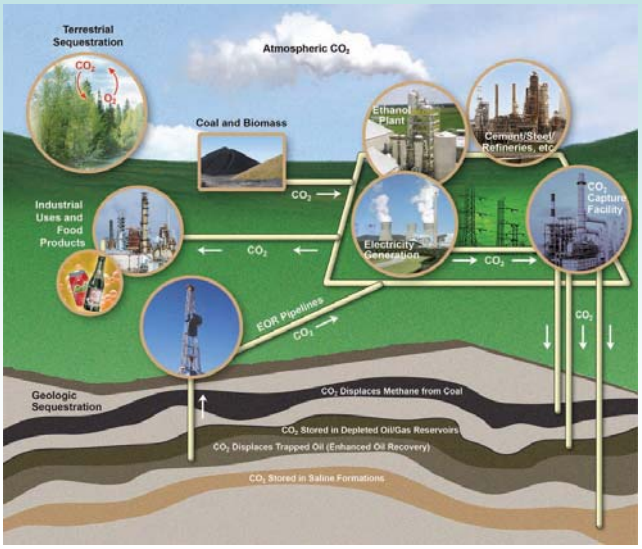


National Carbon Sequestration Atlas

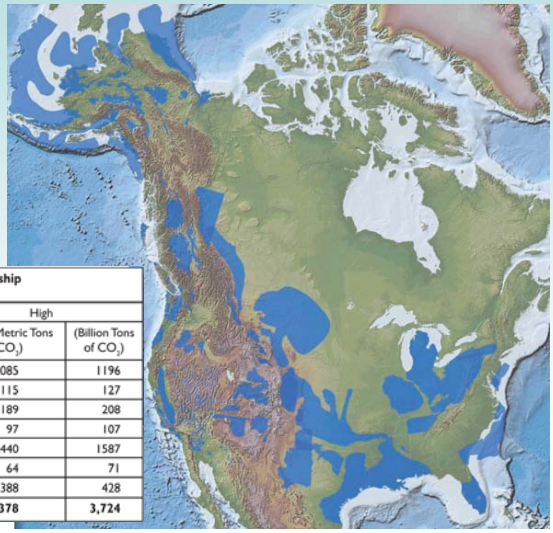
- Display and analyze CO_2 sources and potential sequestration sites
- "Lite" version of data: www.natcarb.org
- Downloadable data: http://clone.kgs.ku.edu/requests/provines/



Introduction (e.g., "What is Carbon Sequestration?")



National Perspectives (e.g., saline formations)



CO_2 Capacity Estimates by Partnership
Saline Formations

	Low		High	
	(Billion Metric Tons of CO_2)	(Billion Tons of CO_2)	(Billion Metric Tons of CO_2)	(Billion Tons of CO_2)
BIG SKY	271	299	1,085	1196
MGSC	29	32	115	127
MRCSP	47	52	189	208
PCOR	97	107	97	107
SECARB	360	397	1,440	1587
SOUTHWEST	18	20	64	71
WESTCARB	97	107	388	428
Total	**919**	**1,014**	**3,378**	**3,724**

WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP

5

West Coast Regional Carbon Sequestration Partnership (WESTCARB)

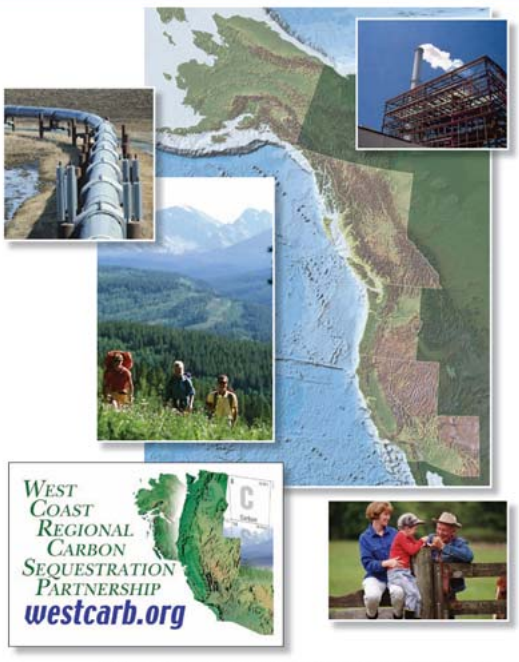
West Coast Regional Carbon Sequestration Partnership

Western North America is characterized by picturesque natural beauty, an entrepreneurial spirit, and a large and growing population. Featuring cultural and economic diversity to match its geographic superlatives, the West Coast Region has one of North America's broadest mixes of CO_2 sources and an equally broad array of opportunities to curb atmospheric CO_2 buildup through carbon sequestration.

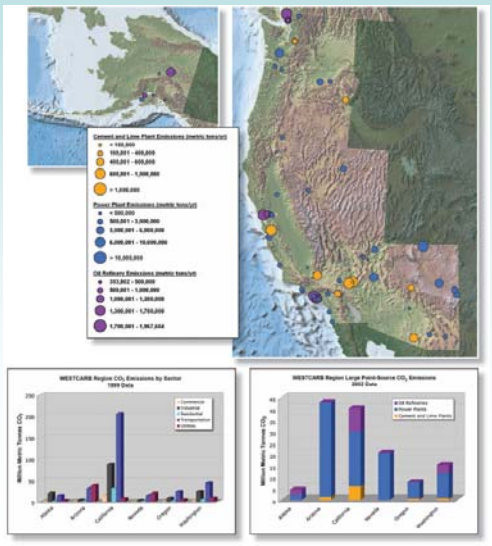
The West Coast Regional Carbon Sequestration Partnership (WESTCARB), led by the California Energy Commission, comprises researchers from more than 70 public agencies, private companies, and nonprofits in the U.S. and Canada. WESTCARB's goal is to identify and map the regional opportunities for geologic and terrestrial carbon sequestration. WESTCARB also seeks to validate the feasibility, safety, and efficacy of some of the best regional opportunities through pilot-scale field tests.

Results of WESTCARB characterization studies to date show excellent carbon sequestration potential throughout the Region. Numerous EOR and enhanced gas recovery opportunities, as well as ECBM, offer the potential for geologic sequestration to get an economic foothold. In addition, large, broadly distributed saline formations have the capacity to store hundreds of years of the Region's industrial emissions, if needed. Terrestrial sequestration opportunities are among the best in North America and provide a viable approach to offsetting the Region's relatively large transportation-related CO_2 emissions.

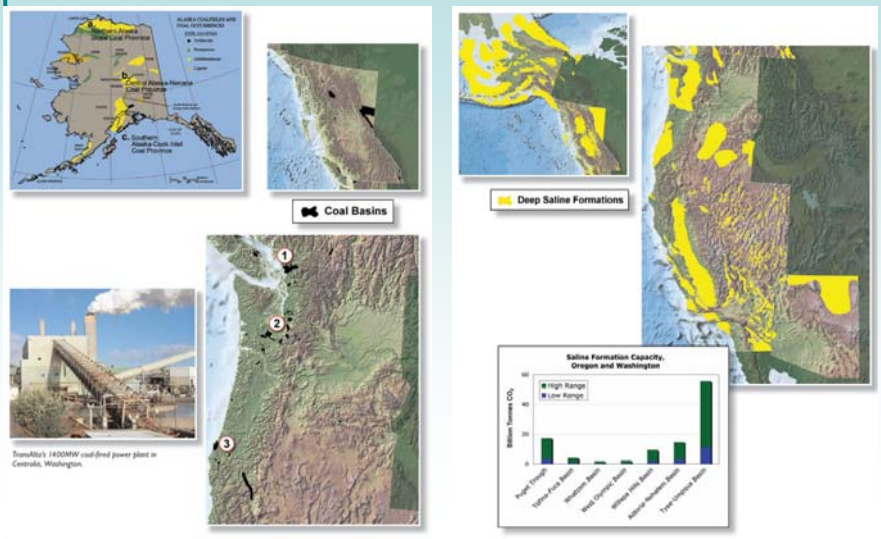
With policymakers seeking to both preserve cherished vestiges of the Old West and to lead the innovation-based 21st century economy, WESTCARB researchers feel carbon sequestration can play an important role in state and provincial efforts to address climate change issues.



Regional Carbon Sequestration Partnership Perspectives: WESTCARB sources



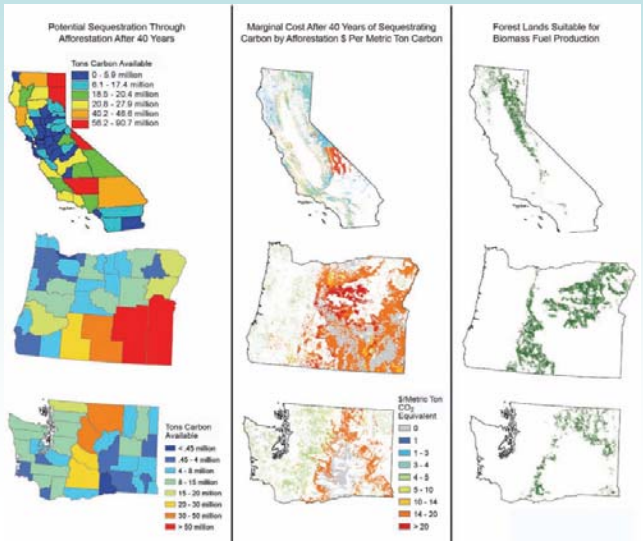
Regional Carbon Sequestration Partnership Perspectives: WESTCARB geologic sinks



Regional Carbon Sequestration Partnership Perspectives: WESTCARB geologic sinks

This historical photograph of Signal Hill in Long Beach, California, dates from 1923, when wells were drilled on townlots. At that time, approximately 41,000 m³ (240,000 barrels) of crude oil was produced daily from about 300 wells, making Signal Hill the most productive field per acre worldwide, and making California the nation's top oil-producing state. Signal Hill may take on new historical significance in the 21st century as a site for geologic CO_2 storage.

Regional Carbon Sequestration Partnership Perspectives: WESTCARB terrestrial sinks



Methodology for Development of Carbon Sequestration Capacity Estimates

APPENDIX A

The volumetric equation for capacity calculation in saline formations with consistent units assumed is as follows:

$$G_{CO2} = A\ h_g\ \phi_{tot}\ \rho\ E$$

Parameter	Units*	Description
G_{CO2}	M	Mass estimate of saline-formation CO_2 storage capacity
A	L^2	Geographical area that defines the basin or region being assessed for CO_2 storage-capacity calculation
h_g	L	Gross thickness of saline formations for which CO_2 storage is assessed within the basin or region defined by A
ϕ_{tot}	L^3/L^3	Average porosity of entire saline formation over thickness hg. Total porosity of saline formations within each geologic unit's gross thickness divided by hg
ρ	M/L^3	Density of CO_2 evaluated at pressure and temperature that represents storage conditions anticipated for a specific geologic unit averaged over hg
E	L^3/L^3	CO_2 Storage Efficiency Factor that reflects a fraction of the total pore volume that is filled by CO_2

* L is length; M is mass

Monte Carlo simulations estimated a range of E between 1 and 4 percent of the bulk volume of saline formations for a 15 to 85% confidence range (Appendix 1).

Download the Carbon Atlas as a PDF at

http://www.netl.doe.gov/technologies/carbon_seq/refshelf/atlas/

Version II of the Carbon Atlas is scheduled for release in November 2008