



WESTCARB Regional Partnership

Phase II: Providing Underpinnings for Deployment

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Who Is WESTCARB?

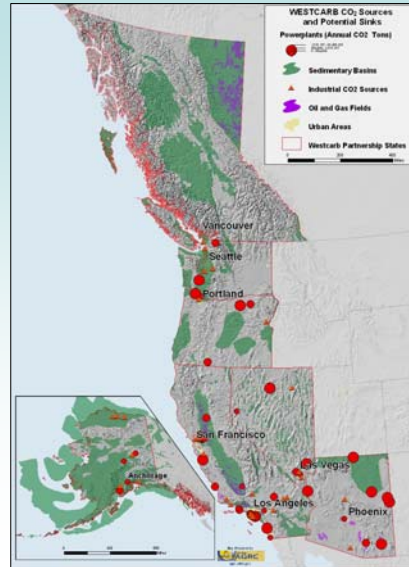
- Researchers from more than 70 organizations comprising:
 - Resource management and environmental protection agencies
 - National laboratories and research institutions
 - Conservation nonprofits and climate registries
 - Oil and gas companies
 - Power companies
 - Pipeline companies
 - Colleges and universities
 - Trade associations and policy coordinating bodies
 - Vendors and service firms
 - Consultants
- Led by California Energy Commission

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Sedimentary Basins Broadly Distributed

- Storage potential is large – in California, 100 to 500 Gt in saline formations, 3.4 Gt in oil reservoirs, 1.8 Gt in gas reservoirs
- Data reside at Utah AGRC, publicly accessible, part of NATCARB database
- Regional data being used as starting point for commercial project development



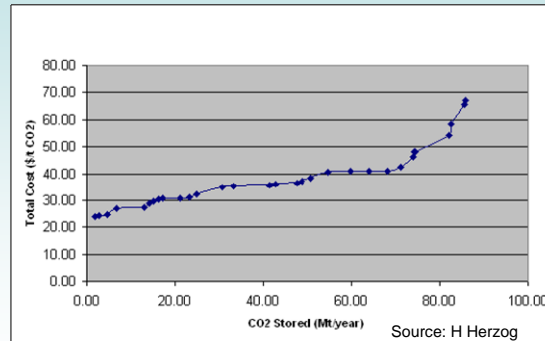
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Work Continues on Capture Technology and Costs

- Complete source-sink matching and capacity-cost analyses; perform plant siting study
- Updated review of capture options, integration with power plants
- Site-specific studies of capture options

Marginal Cost Curve for California, Current Conditions



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West Coast Terrestrial Opportunities Are Large: 40-Year Analysis Shows Much Capacity <\$10/ton

	California		Oregon		Washington	
	Area million acres	Quantity MMT CO ₂	Area million acres	Quantity MMT CO ₂	Area million acres	Quantity MMT CO ₂
Grazing Lands—Afforestation						
< \$2.40/metric ton CO ₂	3.61	1138	0.16	37.5	0.06	14.8
< \$10/metric ton CO ₂	17.1	3228	10.5	1007	6.17	1031
< \$20/metric ton CO ₂	20.1	3347	17.4	1420	9.07	1219
Crop Lands—Afforestation						
< \$2.40/metric ton CO ₂			0	0	0	0
< \$10/metric ton CO ₂			1.91	458	0.26	57.2
< \$20/metric ton CO ₂			3.33	560	3.32	271
Forests—Rotation Extension 5 yr extension, 20 yr contract						
< \$2.40/metric ton CO ₂		0		0		6.08
< \$10/metric ton CO ₂		0		0.37		7.17
< \$20/metric ton CO ₂		7.25		1.80		13.55

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Pilots Planned in Arizona, California, Oregon, and Washington

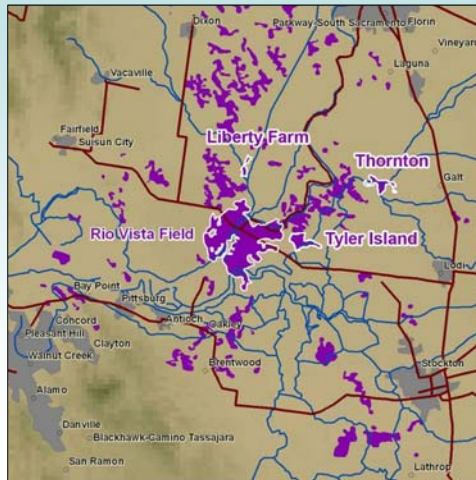
- Pilots are representative of best sequestration options, unique technologies and approaches, in region
- Pilots involve site-specific focus for
 - Testing technologies
 - Assessing capacity
 - Defining costs
 - Assessing leakage risks
 - Gauging public acceptance
 - Testing regulatory requirements
 - Validating monitoring methods



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Rosetta Resources CO₂ Storage Pilot



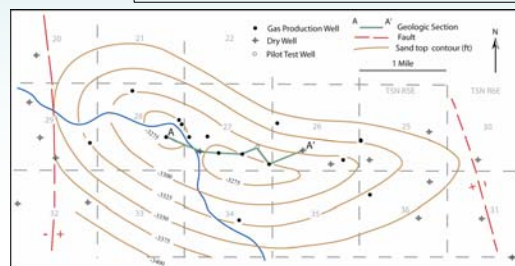
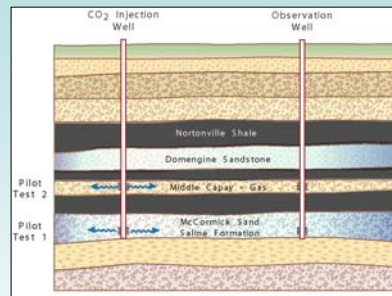
- Lead industrial partner: Rosetta Resources
- Validate sequestration potential of California Central Valley sediments
- Test CO₂ Storage Enhanced Gas Recovery
- Focus on monitoring

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Pilot Test Design

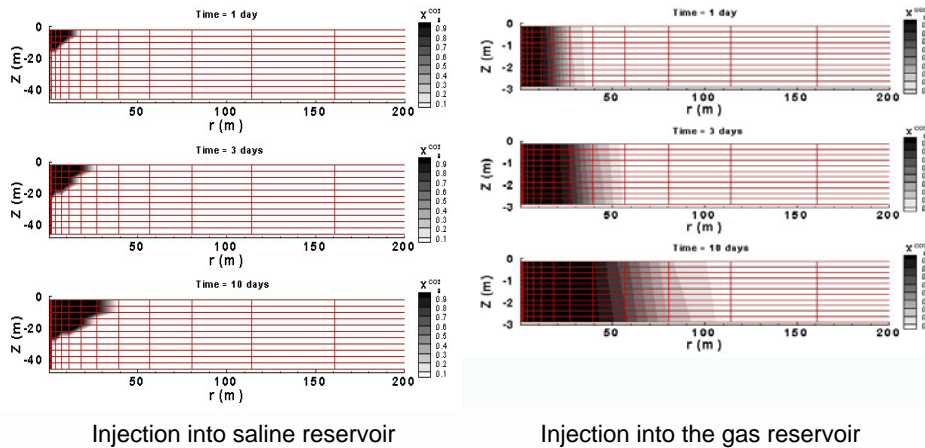
Two separate CO₂ injections of about 2000 tons each



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Simulations Provide Basis for Test Design



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Northern Arizona Saline Formation Pilot

- Lead industrial partner: Salt River Project, through EPRI Tailored Collaboration program
- Coal resources are 54% of annual generation
- Gas/oil resources are 26%



SRP's generating assets

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Lake County (Oregon) Terrestrial Pilot

- Research fire models
- Carry out fuel treatment, measurement and monitoring activities
- Assess potential of hybrid poplar “plantations”



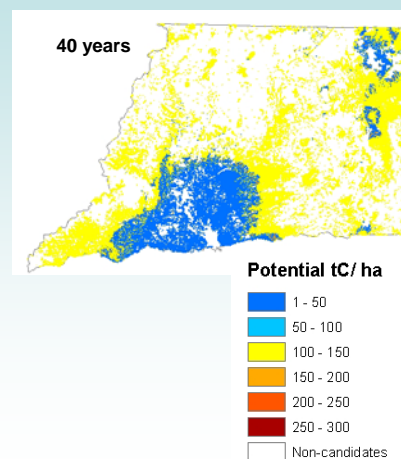
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Shasta County (California) Terrestrial Pilot

- Validation of forest growth type for rangelands
- Develop and test fuel management activities; baselines and measurement and monitoring
- Validate emissions reductions from conservation and sustainable forest management practices



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