



WESTCARB Annual Business Meeting

Public Outreach Lessons to Date

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WESTCARB's Public Outreach Committee

Name	Organization	Role
Sally Benson	LBNL	Committee Chair; Spokesperson (shared with WESTCARB Technical Director and others)
Martha Krebs	CA Energy Commission	Executive Guidance/Strategy; Federal Policymaker Contacts
Reid Edwards	LBNL	Strategy/Policy Advisor
Rich Myhre	BK _i	Committee Coordinator; Presentation Materials, Website
Barry Biediger	Utah AGRC	GIS Data Management and Web Tools; NATCARB Liaison
Pilot Host Personnel	Pilot Hosts	Partners in Strategy Development and Implementation

WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP



“Carbon Sequestration” Is a Big Word

- “CO₂ capture and storage” is a bit more descriptive, but “sequestration” is in the established lexicon
- Although everyone has heard of global warming, not everyone understands the role of CO₂ (people sometimes confuse global warming with the ozone hole and think CFCs are the primary culprit)
- Many people recognize fossil fuel use contributes to climate change, but are not generally familiar with the carbon cycle and its timeframes
- Few people (<5%?) are familiar with carbon sequestration—public opinion largely unformed



Background—CO₂ in Our World

- Carbon dioxide (CO₂) is an essential part of nature’s carbon cycle. Plants and plankton take up CO₂ for photosynthesis, and people and other animals exhale CO₂.
- CO₂ is widely used commercially; it puts the fizz in soda pop and the head on a glass of beer, and is also used in fire extinguishers and many industrial applications
- CO₂ is a primary product of combustion; it is released whenever fuel or waste is burned. CO₂ is also produced in manufacturing processes, such as the making of fertilizer or gasoline. We produce far more CO₂ than we need.
- Accordingly, human activities are increasing the amount of CO₂ in the atmosphere



Background—CO₂ and Climate Change

- CO₂ in the atmosphere limits the escape of heat from the Earth's surface to space, keeping the planet hospitable. Without this so-called "greenhouse effect," we would experience daily temperature swings of hundreds of degrees.
- Increased CO₂ concentrations in the atmosphere have been linked to warmer global average temperatures. Scientists call it "climate change" instead of "global warming" because higher CO₂ concentrations can change not only temperature, but also rainfall, storm intensity, and other aspects of climate.
- Scientists predict that climate changes in the Sierra and Cascades will include more winter rain and earlier mountain snowmelt



Background—CO₂ Capture and Storage

- Coal, oil, and natural gas represent CO₂ removed from the atmosphere millions of years ago by plants and plankton. Burning these fuels releases this "stored CO₂." If we could capture and "re-store" the CO₂ produced during combustion, we would curb atmospheric CO₂ buildup and climate change. This concept is called "carbon sequestration."
- With respect to CO₂ capture, techniques to separate CO₂ from other gases are available commercially, but need to be re-engineered to reduce costs before they can practically be applied to large industrial "sources" such as power plants
- For CO₂ storage, many secure geologic formations—such as the types that hold oil and gas—appear suitable for storing CO₂ for millennia. Field tests are needed to determine how to best use such formations for captured CO₂.



Know Your Audience

- Effective outreach is designed around the information needs and perceptions of the recipients, not the proponents
- You must build affinity/trust with your audience
- Many pilots are in rural areas; history with particular industries, regulatory agencies, or natural events may evoke strong opinions
- At a public meeting, your audience may be many audiences



Public Perception Research

- Led by University of California–Berkeley; applies “social science” principles
- Coordinated activity with two other Regional Partnerships
- Will involve pilot community (Thornton, CA) and non-pilot/“control” communities
- Methods may include focus groups and surveys
- Results will guide public outreach strategies/materials



Common Questions—Geologic

- Is it safe?
- Why here?
- Will it work and make a difference?
- What's in it for us?



Common Questions—Terrestrial

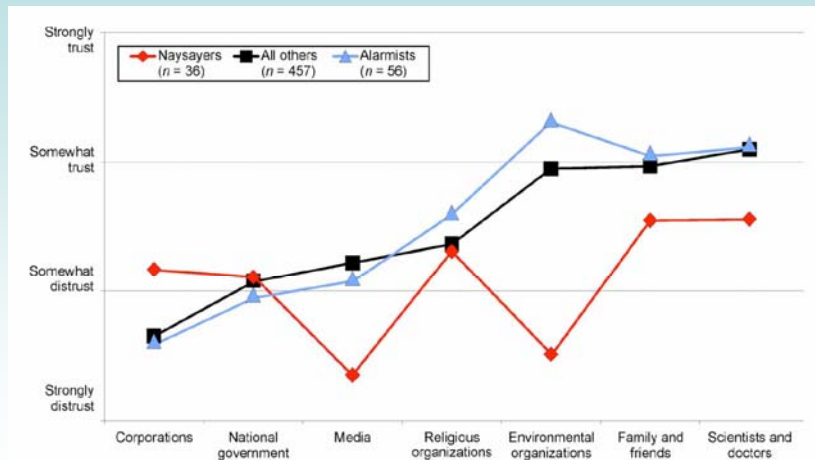
- Will this add regulatory burden and/or restrict my land management options?
- What will it cost?
- What will I have to do to qualify for marketable carbon credits?
- Parallel set of questions for public land managers



Watch Your Analogies

- Injection wells will fall under USEPA/state UIC programs, and Class I (hazardous waste) wells may offer liability/insurance precedents, but avoid creating perception that CO₂ is a “waste” we’re “dumping”
- CO₂ needs to be stored safely for a long time, and could in theory be extracted at some future time for re-use—like spent fuel rods—but any nuclear analogy is fraught with public perception risk
- We’re recycling the fossil fuel after energy extraction

Who Does the Public Trust?



Source: Dr. Anthony Leiserowitz, Decision Research, ecotone@uoregon.edu

Third-Party Endorsements

- Especially valuable for non-technical audiences and those unfamiliar with carbon sequestration
- Assure third party is locally perceived as trustworthy
- Need them to speak on your behalf—you give up some control of the message
- Need to find mutual interests to generate enthusiasm

Public Meeting Experiences

- Rosetta geologic pilots (Thornton, CA)
- Shasta County terrestrial pilot (Anderson, CA)

Media Experiences

- Media inquiries can disrupt public outreach strategies; you don't always get attention when you want it
- The story will never be error-free; be satisfied if main messages come through accurately
- Your quotes will be balanced by someone who opposes or is skeptical about your project
- Headlines aren't written by reporters; they may end up more or less favorable than the story
- Broadcast media lives for sound bites
- Although you give up control, it is cost-effective and provides an element of third-party objectivity

WESTCARB Website Overview

- www.westcarb.org; mirror site maintained at www.bki.com/westcarb
- Project explanation in plain language; primer on carbon sequestration
- List of partners
- Information on Phase I results and Phase II activities
- Links to news stories on WESTCARB and carbon sequestration
- Library of WESTCARB papers and presentations

Website Overview (cont'd)

- Access to WESTCARB GIS “carbon atlas”
- Password-protected area for partners
 - Contact lists
 - Project documents, such as Phase I reports
 - Calendar of WESTCARB conference calls and meetings
 - Templates for PowerPoint presentations
 - Links to DOE resources and other Regional Partnerships

westcarb.org Home Page



WEST COAST REGIONAL CARBON SEQUESTRATION PARTNERSHIP
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CO₂ SEQUESTRATION
geologic transport
terrestrial capture

WESTCARB is a collaborative research project bringing together dedicated scientists and engineers at 70 public agencies, private companies, and nonprofits to identify and validate the best regional opportunities for keeping CO₂ out of the atmosphere and thereby reducing mankind's impact on the climate.

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WESTCARB Overview

The West Coast Regional Carbon Sequestration Partnership (known as WESTCARB) is exploring opportunities in six Western states and one province for removing CO₂ from the atmosphere by enhancing natural processes and by capturing it at industrial facilities before it is emitted, both of which will help slow the atmospheric buildup of this greenhouse gas and its associated climatic effects.

WESTCARB will identify the major sources of man-made CO₂ in its territory; assess the status and cost of technologies for separating CO₂ from process and exhaust gases at large industrial plants; determine the potential for storing captured CO₂ in leak-proof geologic formations; establish the extent to which changes in the management of forests, rangelands, and agricultural lands could increase carbon storage by plants and soil; and assess the logistics of building pipelines to move CO₂ from the points of capture to the points of storage. Economic co-benefits will be estimated as well, such as improved cropland and timber resource values and increased oil and gas production through CO₂-enhanced recovery.

Established in Fall 2003, WESTCARB is one of seven research partnerships co-funded by the U.S. Department of Energy (DOE) to characterize regional carbon sequestration opportunities and conduct pilot-scale validation tests.



westcarb.org Sequestration Primer

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Carbon Sequestration Introduction

CO₂ Is a Greenhouse Gas

Carbon dioxide, or CO₂, in the atmosphere reflects the Earth's infrared radiation back to the surface, causing heat to be trapped as in a greenhouse. The amount of CO₂ in the air had been relatively constant for ten thousand years until the Industrial Revolution in the 1800s. Since then, the world's population has grown tremendously, as has the combustion of fossil fuels, especially coal, oil, and natural gas. Because CO₂ is a primary product of combustion, the atmospheric concentration of CO₂ has been on the rise. At the same time, average temperatures throughout much of the world have inched up and other climatic changes have been documented, indicating the connection between our use of fossil fuels and climatic effects.

There's No "Silver Bullet" for Curbing Global CO₂ Emissions

Slowing and ultimately reducing man-made CO₂ emissions is a complex challenge that will require multiple solutions, including more efficient energy use, alternative fuels, electric-drive transportation, electricity from non-CO₂-emitting energy sources, and carbon sequestration.

Carbon sequestration refers to the "capture" of CO₂ and long-term storage away from the atmosphere. CO₂ can be captured in two basic ways—by enhancing natural processes that remove it from the air and by applying industrial processes that remove it from fuel gas or exhaust gas at major "point sources," such as refineries, power plants, or cement plants. No practical means are known for capturing CO₂ from the exhaust of "mobile sources," such as automobiles.



westcarb.org Sequestration News

Sequestration News

This webpage provides links to announcements, newsletters, project abstracts, and other general news about carbon sequestration. For WESTCARB-specific news links, see [WESTCARB News](#).

Select a link of interest from the list below to view the associated news or informational item.

[The Carbon Sequestration Newsletter](#), a monthly U.S. Department of Energy e-periodical summarizing recent news in the field of carbon sequestration, as well as the latest publications, events and announcements, and legislative activity. Select the "Get the News" link from the Latest News text box on the DOE National Energy Technology Laboratory's Carbon Sequestration Website home page.

[Saline Aquifer CO₂ Storage \(SACS\)](#), a large-scale demonstration of CO₂ injection into an underground saline formation from an offshore natural gas-producing platform in the Sleipner Field between Norway and Scotland.

[CO₂ Capture Project](#), also known as the Carbon Capture Project, a research consortium comprising the U.S. Department of Energy, European Union, Norway Klimatek, and international energy companies, which is developing and demonstrating advanced technologies that can markedly reduce the cost of separating CO₂ from fossil power plant fuel or exhaust gases, processing it for shipping to storage sites, and injecting it into suitable geologic formations.

[The Weyburn CO₂ Monitoring Project](#), an effort by Canadian oil producers

westcarb.org Carbon Atlas Home Page

WESTCARB Carbon Atlas

The [WESTCARB Carbon Atlas](#) is an interactive geographical information system (GIS) showing the location of major "point sources" of CO₂ emissions; geologic formations capable of storing CO₂; rights-of-way for potential CO₂ pipelines; boundaries of publicly owned lands relevant to geologic and terrestrial sequestration opportunity characterization (e.g., national forests); and vital existing features, such as transportation arteries (e.g., interstate highways and railroads), rivers and streams, and jurisdictional boundaries (e.g., state, county, and municipal limits).

Organizing various pieces of data by location—the premise of GIS knowledge bases—is an effective means of combining data from numerous existing public domain sources with new information being developed by WESTCARB. GIS databases are widely used throughout the public and private sectors, and the GIS-based WESTCARB Carbon Atlas will facilitate communication and application of WESTCARB results.

The WESTCARB Carbon Atlas is hosted by the Utah Automated Geographic Reference Center, which is hosting analogous databases for each of the four regional carbon sequestration partnerships in the territory covered by the Western Governors' Association. By working closely with

Location X

- Wetlands
- Highways and Railroads
- Easements
- Property Boundaries
- Utilities
- Streams
- City Boundaries
- Slope or Aspect
- Aerial Imagery