KEY FACTS

The West Coast Regional Carbon Sequestration Partnership (WESTCARB) is a collaborative research project bringing together more than ninety public agencies, private companies, and nonprofits to identify and test the best regional opportunities for keeping CO_2 out of the atmosphere, thereby reducing humankind's impact on the climate.

Covering Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington—and the Canadian province of British Columbia—WESTCARB is one of seven U.S. Department of Energy funded partnerships dedicated to characterizing regional carbon storage opportunities and conducting technology validation and CO_2 storage assessment projects. The California Energy Commission manages the WESTCARB team and is a major co-funder.

Carbon Storage—A Vital Option for Reducing CO_2 Emissions

Slowing the buildup of CO_2 in the atmosphere, and ultimately lowering its concentration to mitigate global climate change, will require widespread reductions in CO_2 emissions. More efficient energy use, alternative fuels, electric-drive transportation, electricity from non-CO_2-emitting sources, and carbon storage are among the multiple solutions needed to effect this transformation.

Carbon storage refers to "capturing" CO_2 and storing it away from the atmosphere for centuries. This allows society to reduce CO_2 emissions from fossil fuel use, while affordable non-CO_2-emitting energy and transportation systems are developed.

Major Approaches to Carbon Storage

WESTCARB is examining regional opportunities for several types of carbon storage. Geologic storage involves collecting CO_2 at industrial sources such as power plants, oil refineries, gas processing facilities, cement kilns, and ethanol plants, and transporting it via pipelines to sites where it can be securely stored in deep geologic formations.

Terrestrial carbon storage involves changing the management of forests, rangelands, agricultural lands, and wetlands to remove more CO_2 from the air via photosynthesis and/or to reduce CO_2 emissions from these ecosystems.

Carbon storage often provides economic and environmental co-benefits. Terrestrial storage, for example, can improve the health of forests and streams. CO_2 injected into older oilfields is used to boost oil recovery. Similar benefits may be achieved from CO_2 injection into gas fields and natural gas storage reservoirs. Other revenue-generating uses for CO_2 are under development, ranging from cement and plastics manufacturing to growing algae for conversion to biofuels. Collectively, such greenhouse gas reducing applications are referred to as carbon utilization.

Proving the Best Regional Storage Options

To determine which geologic storage approaches are best suited to WESTCARB's territory, researchers reviewed geologic maps and data from public agencies and private companies. The geologic formations identified for storage were deep saline formations (underground strata of porous rocks filled with saltwater), deep unmineable coal seams, and depleting oil and natural gas fields. Currently, WESTCARB is focused on developing more detailed subsurface information through characterization wells and seismic surveys in areas with high potential for geologic CO_2 storage. This field work helps validate the feasibility, safety, and efficacy of carbon storage techniques.

Additionally, WESTCARB addresses issues such as regulatory and permitting requirements for CO_2 storage, CO_2 monitoring and verification protocols, and protection of public health and the environment.

For terrestrial carbon storage, researchers worked with forest products companies, ranchers, conservation groups, and public lands foresters. Together, they characterized terrestrial storage options by cost, storage capacity, and co-benefit potential to create state-by-state analyses of carbon storage opportunities.

WESTCARB's small-scale terrestrial storage projects (now concluded) involved reforestation of marginal lands, extended timber harvest cycles, and removal of forest brush that could stoke wildfires. At some locations, cleared brush was taken to a biomass power plant, helping displace fossil fuel use.

Community Involvement

To increase public awareness of carbon storage opportunities, WESTCARB engages stakeholders through public meetings, a website, presentations and technical papers at conferences, and research on community concerns and decision making. Combined with its field project results, these WESTCARB efforts support a more thorough understanding of the role that carbon storage can play in mitigating adverse climate change.

WESTCARB reports are publicly available. Supporting geographic information system data can be accessed at: www.westcarb.org/carbonatlas.htm and www.netl.doe.gov/technologies/carbon_seq/natcarb/index.html.

For More Information

Please visit our website at www.westcarb.org.

You may also e-mail WESTCARB's technical advisor, Elizabeth Burton (eburton@lbl.gov).

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U.S. Environmental Protection Agency, Regions 9 and 10
U.S. National Park Service
Utah Automated Geographic Reference Center
Washington State Department of Natural Resources
Western Governors' Association/ Western Interstate Energy Board
Western Shasta Resource Conservation District
Western States Petroleum Association
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