

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY



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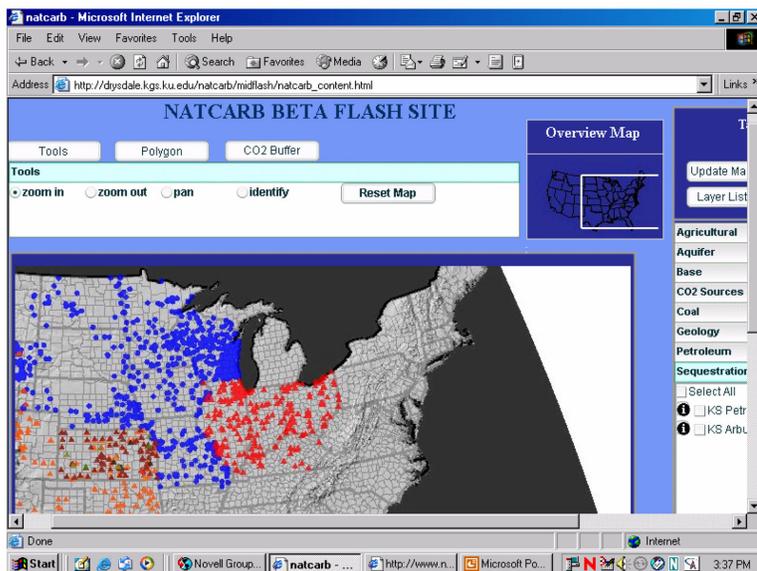
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NATIONAL CARBON SEQUESTRATION DATABASE AND GEOGRAPHICAL INFORMATION SYSTEM (NATCARB)

Current federal energy policy assumes that fossil fuels will continue to be the primary source of energy for the United States and the world well into the 21st century. However, there is growing concern about the possible effect that the increasing atmospheric concentration of carbon dioxide (CO₂) is having on climate change. For this reason, it may become necessary to manage anthropogenic CO₂ emissions. Sequestering CO₂ in geological reservoirs may be one way to safely store carbon over long periods of time, provided the necessary data and tools to analyze the geological feasibility and costs can be developed. A similar possibility exists for terrestrial sequestration where carbon is stored in soils and vegetation.

The National Carbon Sequestration Database and Geographical Information System (NATCARB) started as a joint project among the State Geological Surveys of five Midwestern states (Illinois, Indiana, Kansas, Kentucky, and Ohio), with funding from the Department of Energy's National Energy Technology Laboratory. Later the project was expanded to include the seven regional partnerships established by the Department of Energy and a prototype to integrate databases for terrestrial sequestration with databases on geologic sequestration. The purpose of NATCARB is to assess the carbon sequestration potential in the United States and to develop a national Carbon Sequestration Geographic Information and Relational Database Management System covering the entire U.S. When completed, the digital spatial database will allow users to estimate the amount of CO₂ emitted by sources (such as power plants, refineries and other fossil fuel consuming industries) in relation to geologic reservoirs that can provide safe, secure sequestration sites over long periods.



Source: <http://drysdale.kgs.ku.edu/natcarb/midflash/natcarb.html>

Screen shot of the NATCARB interactive site

CUSTOMER SERVICE

1-800-553-7681

WEBSITE

www.netl.doe.gov

PARTNERS

University of Kansas
Center for Research

The US Geological Survey

The geological surveys in
Illinois, Indiana, Kansas,
Kentucky, and Ohio

The CO2 Regional
Partnerships

COST

Total Project Value
\$4,376,789

DOE/Non-DOE Share
\$3,285,933/\$1,090,856

Benefits

The NATCARB project will benefit the power industry by providing improved online tools for the real-time display and analysis of CO₂ sequestration data. The system links data on sources, sinks, and transportation facilities within a spatial database that can be queried online. NATCARB can assist decision makers by providing access to common sets of high quality data in a consistent manner. This database will prove invaluable should the nation reach the point where sequestration of CO₂ is necessary to prevent the buildup of greenhouse gases in the atmosphere.

NATCARB is organizing and enhancing the critical information about CO₂ sources and developing the technology needed to access, query, model, analyze, display, and distribute natural resource data related to carbon management.

Large stationary CO₂ emission sources are identified, located, and characterized. Potential CO₂ sequestration sites, including producing and depleted oil and gas fields, unconventional oil and gas reservoirs, uneconomic coal seams, abandoned subsurface mines, and saline aquifers, will be characterized to determine quality, size, and geologic integrity. All information will be available online through user query and will be provided through a single interface that will access multiple servers in various locations. This is one of the first demonstrations of a large-scale distributed database of natural resources and geological information. Access to the up-to-date technical information can be used at a regional or national level as a tool to minimize negative economic impacts and maximize the value of CO₂ sequestration for hydrocarbon recovery from oil and gas fields, coal beds, and organic-rich shales.

Primary Project Goal

The primary goal of this project is to construct a relational database management system with spatial query capabilities to evaluate the geographic distribution, physical characteristics, economic parameters, and potential geologic sequestration sites of CO₂ sources throughout the United States. A demonstration to link terrestrial/agricultural and geologic sequestration databases through Kansas State University is also planned.

Objectives

The objectives of this project are to:

- Expand the database originally designed to assess the geological CO₂ storage potential of five Midwestern states (Indiana, Illinois, Kansas, Kentucky, and Ohio) to include the entire U.S.
- Link terrestrial/agricultural and geologic sequestration databases through Kansas State University.
- Develop a national Carbon Sequestration Geographic Information and Relational Database Management System covering the U.S. and operating through a portal under the aegis of the National Energy Technology Laboratory website.
- Develop improved online tools to provide real-time display and analysis of CO₂ sequestration data.
- Enhance the current webpage by making it more user friendly with more advanced query capabilities and more options

Accomplishments

The NATCARB map server is active and currently running on the internet. The NATCARB interactive site can be utilized by accessing the following web address: <http://drysdale.kgs.ku.edu/natcarb/midflash/natcarb.html>. Reliable communication among the various servers has been established, and tools have been developed to query, display, and analyze CO₂ source, sink, and transportation data. Tools allow clients to query and plot emissions or production through time for a single source or a combination of sources across a region. Tools are also available to determine the solubility or physical properties of CO₂ under various conditions.

Not only is the NATCARB server connected to all the regional partnerships, but data on states not included in any of the partnerships has been entered into the database. To provide national coverage, data in real time is being pulled from the USGS-EROS center and from the Geography Network. Major CO₂ sources have been obtained from EPA databases, and data on major coal basins and coalbed methane wells was obtained from the EIA. Although this data is available through the NATCARB site, the databases are stored and managed by the partnerships.