

# PROJECT facts

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



## NATIONAL CARBON SEQUESTRATION DATABASE AND GEOGRAPHICAL INFORMATION SYSTEM (NATCARB)

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### Background

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). The project was later expanded to include the seven Regional Carbon Sequestration Partnerships and a prototype to integrate databases for terrestrial carbon 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 System (GIS) and relational database covering the United States and parts of Canada. This digital spatial database allows users to estimate the amount of carbon dioxide (CO<sub>2</sub>) emitted by sources (such as power plants, refineries and other fossil fuel consuming industries) in relation to geologic formations that can provide safe, secure sequestration sites over long periods.

### Description

Allows users to identify, locate, and characterize large stationary CO<sub>2</sub> sources. It also allows users to determine the quality, size, and geologic integrity of potential CO<sub>2</sub> sequestration sites, including producing and depleted oilfields and gas fields, unconventional oil and gas reservoirs, unmineable coal seams, and saline water formations. All information can be accessed online through a single interface that will access multiple servers in various locations.

### 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 CO<sub>2</sub> sources throughout the United States and parts of Canada.



## **PARTNERS**

University of Kansas

West Virginia University

Kansas State University

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

The DOE Regional CO<sub>2</sub>  
Partnerships

## **COST**

**Total Project Value**  
\$5,934,736

**DOE/Non-DOE Share**  
\$4,548,688 / \$1,386,048

## **Objectives**

The objectives of this project are to:

- Develop a national carbon sequestration geographic information and relational database management system covering the U.S. and operating through a portal maintained by the National Energy Technology Laboratory website.
- Develop online tools to provide real-time display and analysis of CO<sub>2</sub> sequestration data.

## **Benefits**

The NATCARB project will benefit the United States power industry by providing improved online tools for the real-time display and analysis of CO<sub>2</sub> 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 CO<sub>2</sub> is necessary to prevent the buildup of greenhouse gases in the atmosphere.

## **Accomplishments**

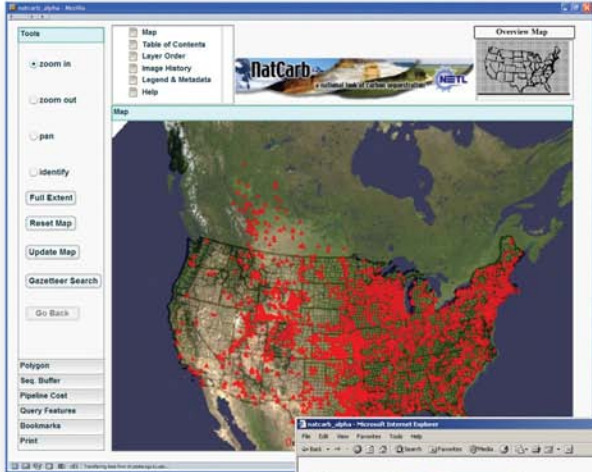
The NATCARB map server is active and currently running on the internet, and can be utilized by accessing the following web address: <http://www.natcarb.org>. Reliable communication among the various servers has been established, and tools have been developed to query, display, and analyze CO<sub>2</sub> 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 CO<sub>2</sub> under various conditions.

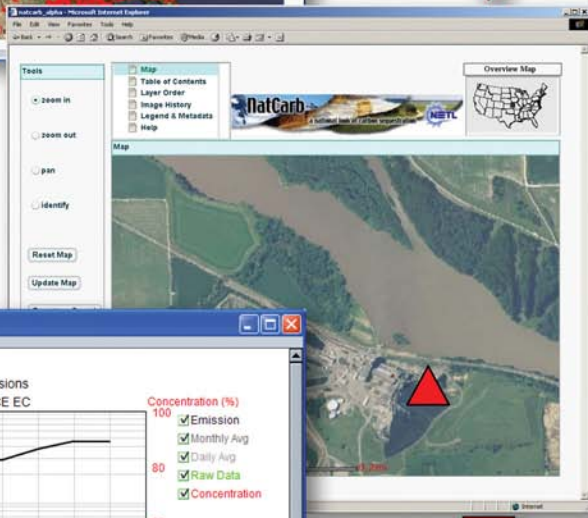
Not only is the NATCARB server connected to all seven Regional Carbon Sequestration Partnerships but data on states not included in any of the Partnerships has been entered into the database. To provide national coverage, data in real-time is being pulled from public servers including the U.S. Geological Survey's Center for Earth Resources Observation & Science (USGS-EROS) and from the Geography Network. Major CO<sub>2</sub> sources have been obtained from U.S. Environmental Protection Agency databases, and data on major coal basins and coalbed methane wells was obtained from the U. S. Department of Energy's Energy Information Agency. Though it is available through the NATCARB site, the databases are stored and managed by the Regional Partnerships.

## **Plans**

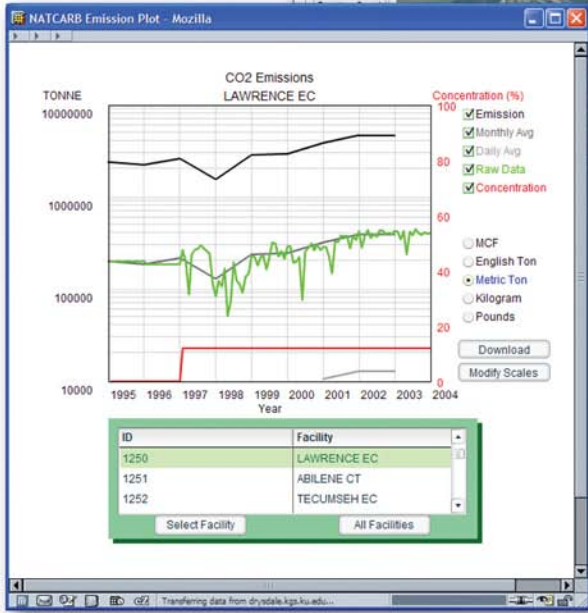
NATCARB intends to generate high quality national scale maps and begin development of a new version of the Carbon Sequestration Atlas of the United States and Canada.



**National  
View of CO<sub>2</sub>  
Sources**



**Local  
View of  
Single CO<sub>2</sub>  
Source**



**Analysis of  
Single CO<sub>2</sub>  
Source**

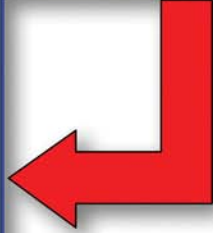


Figure 1. CO<sub>2</sub> Sources

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## WEBSITE

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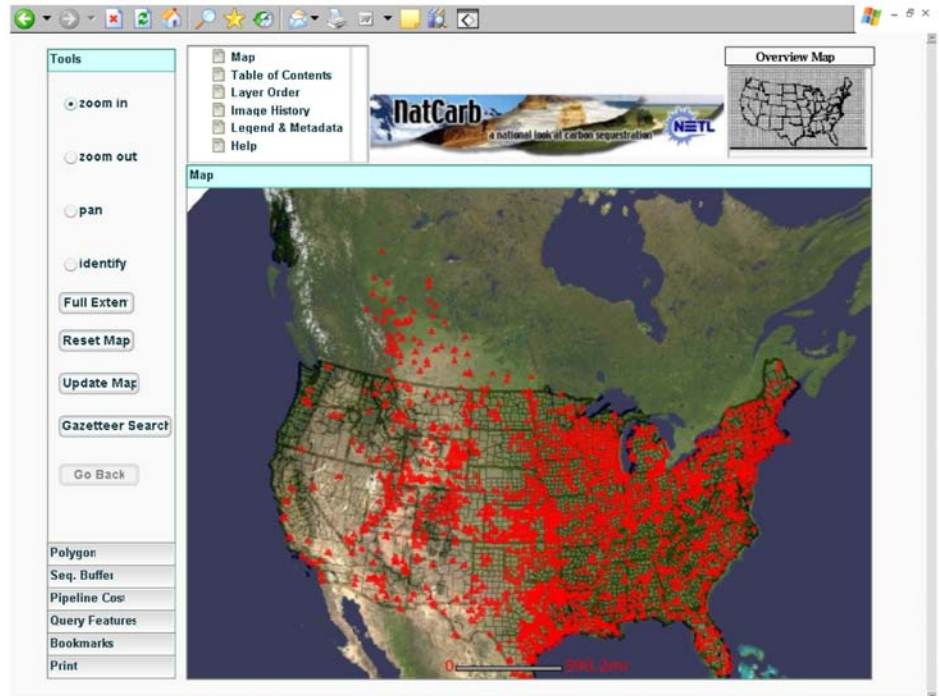


Figure 2. CO<sub>2</sub> Sequestration Sites