

# Distributed Spatial Databases

## The **MIDCARB** Carbon Sequestration Project: Midcontinent Digital Carbon Atlas and Relational DataBase

Possible Internet Integration Demo for UC03

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<http://www.midcarb.org>

4/14/2003



# Midcarb Overview

- Characterize Major CO<sub>2</sub> Sources
  - Quantity, Quality, Location
- Characterize Potential Sequestration Sites
  - Geology and Reservoir Characteristics
- Supply this data to the public
  - For use as tools in cost/feasibility analyses, etc.
- Publish data in both spatial and tabular formats (syndication)
  - Publish map service through ArcIMS
  - Publish tabular data through ColdFusion



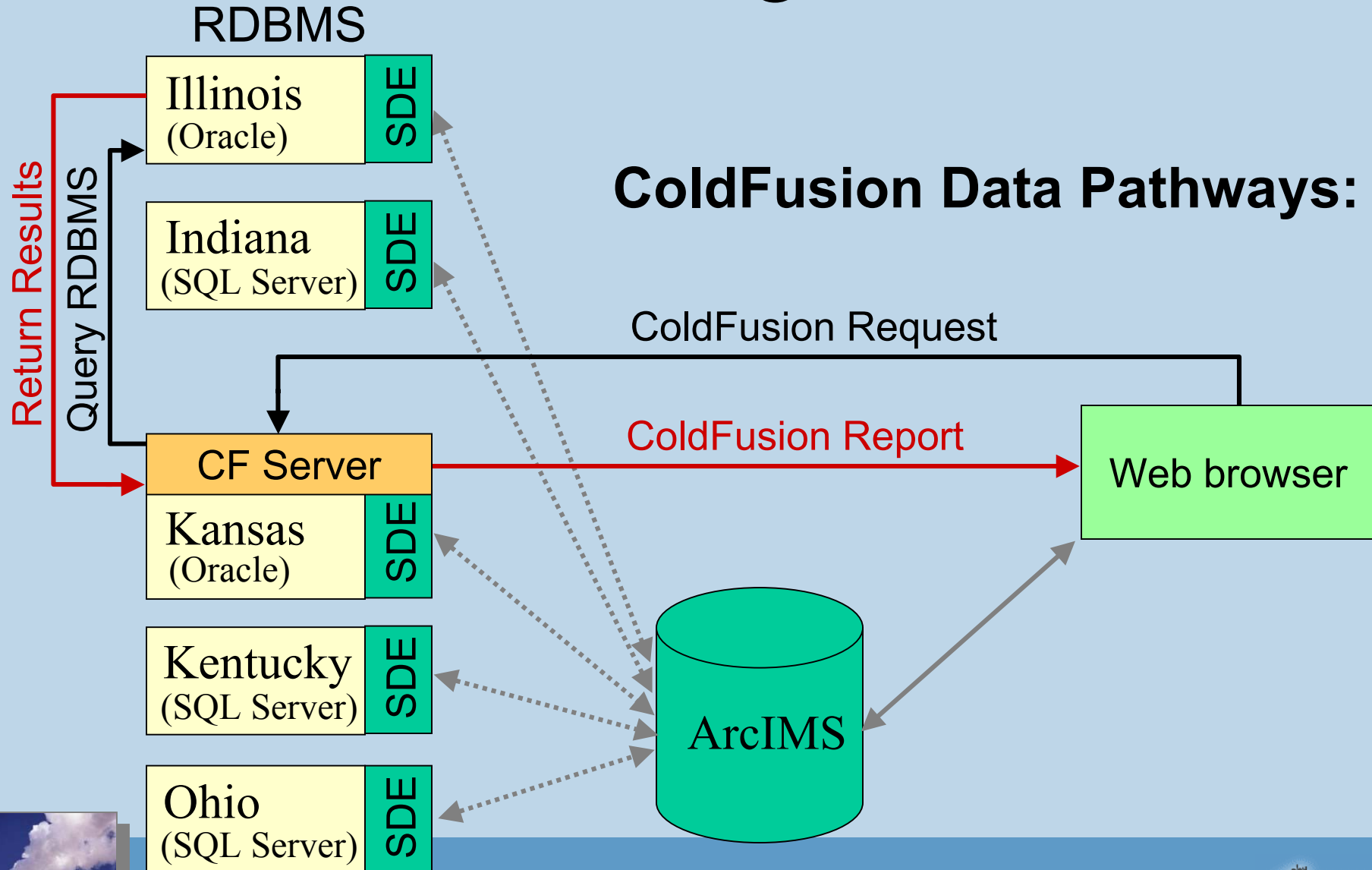
# Overview Continued

## Database Structure:

- Each state will maintain their own data layers according to their own database design in their RDBMS
- A standard structure for MIDCARB database themes is under construction to define what data elements are necessary and how the information will be presented to the user
- Spatial Data will be served with SDE (possibly adding OGC WMS images in the future)



# Tabular Integration



# Tablular Integration—Data View

**Midcarb Facility Browser - Netscape**

File Edit View Go Bookmarks Tools Window Help

http://hercules.kgs.ku.edu/midcarb/tab/index.html

**MIDCARB - Kansas - Utility Facilities - Netscape**

File Edit View Go Bookmarks Tools Window Help

http://hercules.kgs.ku.edu/midcarb/tab/all\_tab.cfm

**MIDCARB Facility Browser**

Select a State and a Facility

**Midcarb Facility Browser - ArcIMS Viewer - Netscape**

File Edit View Go Bookmarks Tools Window Help

http://hercules.kgs.ku.edu/website/midcarb/MIDCARB\_NEW/viewer.htm?ACTIVE\_LAYER=2&Query=FACILITY\_ID=1275&QueryZoom=Yes

**MIDCARB MAPS**  
A Five State GIS Compilation

Latest News:  
NEWLY ADDED LAYERS:  
IL Petroleum Fields

**Map Layers**

Select Active Layer:  
KS - CO2 Sources

- CO2 Sources
- Infrastructure
- Base
- Petroleum
- Coal
- Geology
- Aquifer

AutoRefresh Map

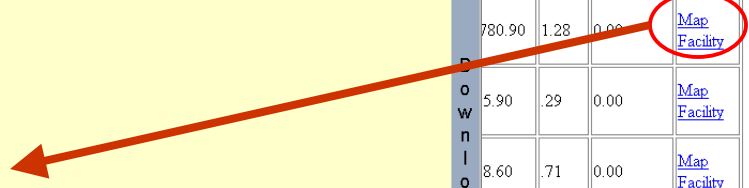
© MIDCARB 2002

**MIDCARB Facility Inventory**

Utility (2001 emissions details)

national emission details.  
area containing these facilities.

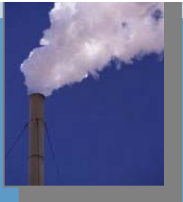
Home	SO2 (Tons)	NOX (Tons)	Mercury (lbs)	Map
3,393.50	1.12	0.00		<a href="#">Map Facility</a>
780.90	1.28	0.00		<a href="#">Map Facility</a>
5.90	29	0.00		<a href="#">Map Facility</a>
8.60	71	0.00		<a href="#">Map Facility</a>
441.50	41	0.00		<a href="#">Map Facility</a>
427.30	88	0.00		<a href="#">Map Facility</a>
5.20	25	0.00		<a href="#">Map Facility</a>
4.50	1.02	0.00		<a href="#">Map Facility</a>
1.30	87	0.00		<a href="#">Map Facility</a>



Total facilities found: 82; number passing filter: 9.

[Create Map](#)

Part of the [MIDCARB](#) programs Updated April 1, 2003  
 Technical comments or questions  
 Web comments to [webadmin](#)

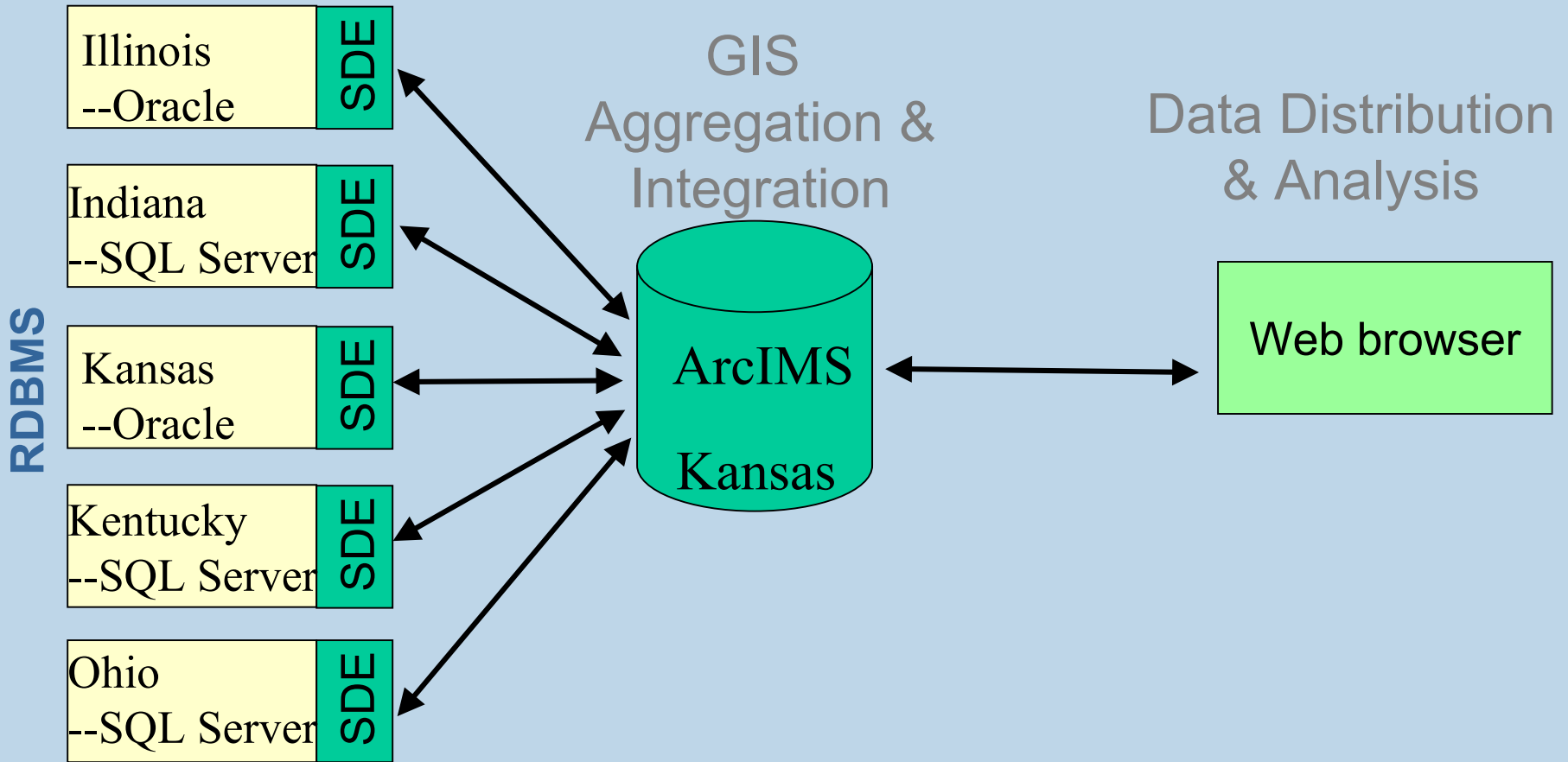


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# Spatial Database Connections



# Midcarb Website—Map Service

Tool mode: Zoom In  
Active layer: IL - CO2 Sources

MIDCARB MAPS  
A Five State GIS Compilation

Latest News :  
last updated: June 28, 2002  
NEWLY ADDED LAYERS :  
IL Petroleum Fields

Map Layers  
Select Active Layer  
IL - CO2 Sources

- CO2 Sources
- Infrastructure
- Base
- Petroleum
- Coal
- Geology
- Aquifer

AutoRefresh Map

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0 200 400 mi

Transferring data from neutrino.kgs.ku.edu...

Home  
Downloads

<http://www.midcarb.org>

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# Application Management Tools

- ColdFusion based application that stores the ArcXML (AXL) file in Oracle. We also use the ArcIMS command line tools to administer our map services remotely through ColdFusion.
- Password protected (Entitlement) site that allows each state to add, remove, or modify layers contained on their SDE server.
- Automated procedure that pings each States SDE servers to see if they are alive and accepting connections, alerts system administrators if there is problem, and dynamically removes bad SDE connections from the main map service.





# Possible Demo

Give each state the ability to manage their SDE layers being served from the MIDCARB site

Data being served from Kentucky's SDE server

Midcarb ARCIMS Layer Manager  
MIDCARB\_DYNAMIC MapService on neutrino

Legend

- KY - CO2 Sources
- Other CO2 Sources
- Power Plants
- USA - States
- MIDCARB - Counties
- USA - Base

Zoom Level: 1.5

Table of Contents

Visible

- USA\_ESRIDASH\_States
- MIDCARB\_ESRIDASH\_Counties
- USA\_ESRIDASH\_Base

Active Layer

USA\_ESRIDASH\_States

This Map Contains Data that is Scale Dependent.  
Some data will not appear on the map until the User is zoomed in.

featureclass	KY - Petroleum Fields	false	2	Petroleum	Kentucky	<a href="#">View Layer Details</a>
featureclass	KY - Petroleum Wells	false	4	Petroleum	Kentucky	<a href="#">View Layer Details</a>
featureclass	KY - CO2 Sources	true	3	CO2 Sources	Kentucky	<a href="#">View Layer Details</a>

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# Possible Demo

Give each state the ability to remotely ADD SDE layers to the MIDCARB site

ADD MIDCARB MAPLAYER	
<b>Layer Name</b>	<input type="text"/>
<b>Layer Type</b> Image not supported	<input type="text" value="featureclass"/>
<b>Layer Visible</b>	<input type="text" value="true"/>
<b>Layer Max Scale</b> <small>(Leave blank if none, otherwise like "1:1000000" )</small>	<input type="text"/>
<b>Layer Min Scale</b> <small>(Leave blank if none, otherwise like "1:1000000" )</small>	<input type="text"/>
<b>Layer Group</b>	<input type="text" value="CO2 Sources"/>
<b>Dataset Name</b>	<input type="text"/>
<b>Dataset Workspace</b>	<input type="text" value="Indiana"/>
<b>Dataset Type</b>	<input type="text" value="point"/>
<input type="button" value="Add New Layer"/>	



# Future Directions

ArcMap Server—Pass mxd file to/from each state.

Incorporate Metadata Server with Midcarb data.

Incorporate OGC Web Mapping Services into Midcarb Site.

Add the ability to add WMS map services for states and organizations that are not running ESRI products

Thanks for your consideration.

