

Dynamic Mapping of Kansas Oil and Gas Data

Jeremy D. Bartley, Kurt Look, & Tim Carr
Kansas Geological Survey
KU Energy Research Center





Kansas Oil & Gas Overview

1860 first oil wells drilled in Kansas along Wea Creek.

1873 first commercial gas well near Iola.

1892 first commercial oil well near Neodeha.

1915 El Dorado Field in Butler County was Discovered.

● **6,289 Oil and Gas Fields**

● **2,228 Oil Operators and 989 Gas Operators**

● **14,804 Active Oil Leases
16,056 Active Gas Leases**

● **41,713 Active Oil Wells
17,647 Active Gas Wells**

● **395,034 Wells**

● **1,741,049 Geologic Tops**

● **Current Production**

★ **35 Million Barrels Oil**

★ **533 Billion Cubic Feet Gas**



Kansas Challenge

Monthly Changes to Well
Database from Kansas
Corporation Commission

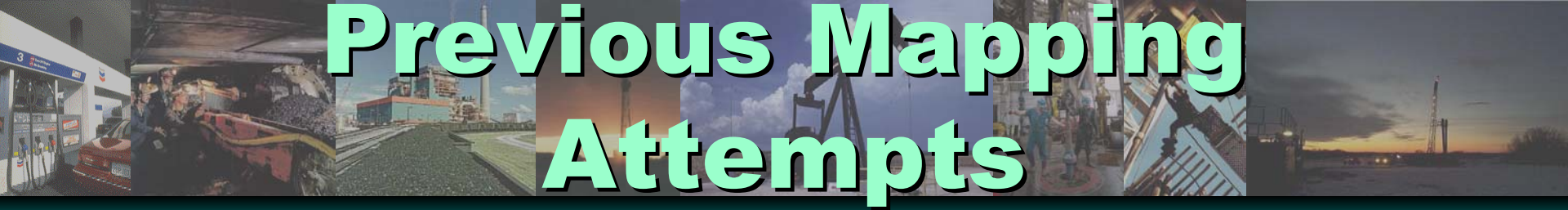
3000 Additions

2500 Changes

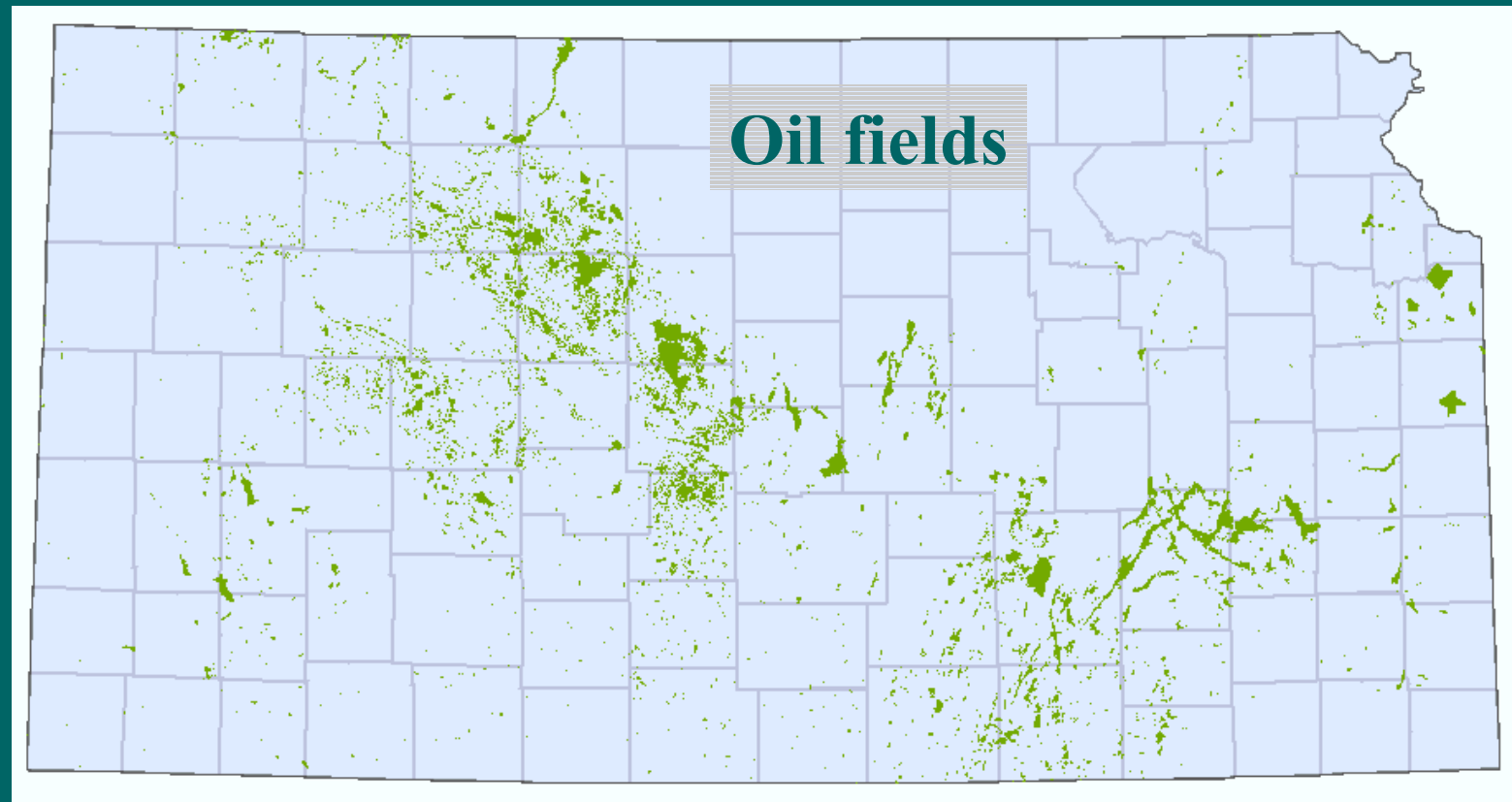
300 Deletes

Monthly Changes to
Lease Database from
Kansas Department of
Revenue

- 🔥 **Multiple Overlapping Scales of Data**
- 🔥 **Incomplete Data**
- 🔥 **Inaccurate Data**
- 🔥 **Constantly Changing Data—DYNAMIC!**
- 🔥 **Multiple Data Sources**



Previous Mapping Attempts



Digitized off of lease production in 1993.
Has not been done since.



Kansas Goals

December 1995, 4,238 individual “hits” recorded to oil and gas data on the Internet.

December 2002, 191,116 individual access sessions recorded to oil and gas data on the Internet.

● **Data Enhancement**

● **Data Access**

● **Data Analysis**

● **Data Display**

● **Data Maintenance**

● **Data Integration**

KEYS

- GIS Software ArcIMS & ArcSDE
- Enterprise Database (Oracle)
- Web Development software (ColdFusion)

Data Enhancement

Kansas Image Viewer - Netscape

File Edit View Go Bookmarks Tools Window Help

http://mapster.kgs.ukans.edu/kgs/oilgas/imageviewer/imageviewer_d1.cfm

Mail Shop Bookmarks KGS Server Cont... KGS ArcIMS 3.1 ... KGS ArcIMS 4 C... MAPSTER IMS WEBMAPS IMS DEUTERON IMS

Kansas Image Viewer

Oil and Gas State of Kansas Geographic Information Systems Policy Board, Data Access and Support Center, and the Kansas Geological Survey.
Please email questions and comments on the field viewer to [Jeremy Bartley](mailto:Jeremy.Bartley@kgs.ukans.edu)

Kansas Oil and Gas Field Viewer [help](#)

Overview Map

Zoom Level: 1.5 Zoom In Zoom Out Pan
Identify Field Identify Well Full Field Extent

ARROYO
MISSISSIPPIAN & MORROWAN
Produces Oil
Produces Gas
Active
Legal Field Definition

Legend
PLSS
County Boundary

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☐ All Wells in Area
☐ Highways
☐ Roads
☐ Rivers and Streams
☐ Major Streams
☐ Water Bodies
☐ City Boundary
☒ County Boundary
☐ View Aerials
☐ View Topo

update map

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Netscape

http://mapster.kgs.ukans.edu/kgs/oil

http://mapster.k...d_kid=1000152060

Legal Field Definition for ARROYO

Section-Township-Range	Quarter Calls
08-29S-41W	SE
09-29S-41W	ALL
10-29S-41W	S2
11-29S-41W	SW
14-29S-41W	ALL
15-29S-41W	ALL
16-29S-41W	ALL
21-29S-41W	ALL
22-29S-41W	ALL
23-29S-41W	ALL
24-29S-41W	NW
26-29S-41W	NW
27-29S-41W	N2 & SW
28-29S-41W	NW & S2
34-29S-41W	NW

Data Enhancement

http://hercules.kgs.ku.edu/website/sdmanager/more_info.cfm?object_n...

Table Comments:
Main table for field nomenclature. Do not use Discovery info from this table
Definition information for FIELDS

Column Name	Null?	Column Type	Column Comments
ACRES		NUMBER(7)	
CUM THRU 1965		NUMBER(12)	
DATA_SOURCE		VARCHAR2(40)	
FIELD CODE BEENE		NUMBER(4)	
FIELD CODE DOR		NUMBER(5)	
FIELD_NAME		VARCHAR2(40)	
KID	Not Null	NUMBER(10)	
PRODUCES_GAS		VARCHAR2(3)	
PRODUCES_OIL		VARCHAR2(3)	
STATUS		VARCHAR2(20)	
UPDATE_DATE		DATE	
UPDATE_INITIALS		VARCHAR2(7)	

http://hercules.kgs.ku.edu/website/sdmanager/more_info.cfm?object_name=...

Table Comments:
Describes T-R-S locations of field. Can be ALL of a section or just parts.
Definition information for FIELDS_SECTIONS

Column Name	Null?	Column Type	Column Comments
FIELD_KID		NUMBER(10)	
KID	Not Null	NUMBER(10)	
LOTS_LEO		VARCHAR2(40)	
MAPPING_COMPLETED		VARCHAR2(1)	
QUARTER_CALLS		VARCHAR2(80)	
QUARTER_CALLS_LEO		VARCHAR2(40)	
RANGE		NUMBER(2)	
RANGE_DIRECTION		VARCHAR2(1)	
SECTION		NUMBER(2)	
TOWNSHIP		NUMBER(2)	
TOWNSHIP_DIRECTION		VARCHAR2(1)	
UPDATE_DATE		DATE	
UPDATE_INITIALS		VARCHAR2(7)	

Data Enhancement

http://hercules.kgs.ku.edu/website/sdmanager/more_info.cfm?object_name=...

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QUARTER_CALLS_LEO		VARCHAR2(40)	
RANGE		NUMBER(2)	
RANGE_DIRECTION		VARCHAR2(1)	
SECTION		NUMBER(2)	
TOWNSHIP		NUMBER(2)	
TOWNSHIP_DIRECTION		VARCHAR2(1)	
UPDATE_DATE		DATE	
UPDATE_INITIALS		VARCHAR2(7)	

SDE LAYER

Definition information for ACRES_640_GEOGRAPHIC
SIZE (in bytes) = 2,703,360
Number of Rows = 81803

Column Name	Null?	Column Type	Column Comments
OBJECTID * C	Not Null	NUMBER	Add Comments
RECNMBR * P	Not Null	NUMBER(11)	Add Comments
SHAPE * R		NUMBER	Add Comments
TRS *		VARCHAR2(10)	Add Comments

Table Comments:
Mapping of SEC-TWP-RAN to SDE layer OBJECTID.
Coordinates are unprojected. Latitude-
Longitude.

Add/Alter Comment

Data Enhancement

Kansas Image Viewer - Netscape

File Edit View Go Bookmarks Tools Window Help

http://mapster.kgs.ukans.edu/kgs/oilgas/imageviewer/imageviewer_d1.cfm

Mail Shop Bookmarks KGS Server Cont... KGS ArcIMS 3.1 ... KGS ArcIMS 4 C... MAPSTER IMS WEBMAPS IMS DEUTERON IMS

Kansas Image Viewer

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Kansas Oil and Gas Field Viewer help

Overview Map

Zoom Level: 1.5 Zoom In Zoom Out Pan
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ARROYO
MISSISSIPPIAN & MORROWAN
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Produces Gas
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County Boundary

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☒ County Boundary
☐ View Aerials
☐ View Topo

update map

Copyright (c) 2003 KGS

Document Done (2.329 secs)

Netscape

http://mapster.kgs.ku.edu/kgs/oil

http://mapster.k...d_kid=1000152060

Legal Field Definition for ARROYO

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15-29S-41W	ALL
16-29S-41W	ALL
21-29S-41W	ALL
22-29S-41W	ALL
23-29S-41W	ALL
24-29S-41W	NW
26-29S-41W	NW
27-29S-41W	N2 & SW
28-29S-41W	NW & S2
34-29S-41W	NW

Data Access

Kansas Image Viewer - Netscape
File Edit View Go Communicator Help

Oil and Gas
State of Kansas Geographic Information Systems Policy Board, Data Access and Support Center, and the Kansas Geological Survey.
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Kansas Oil and Gas Field Viewer [help](#)

Overview Map

Zoom Level: ☐ Zoom In ☐ Zoom Out ☐ Pan
☐ Identify Field ☒ Identify Well ☐ Full Field Extent

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☒ County Boundary
☒ View Aerials
☐ View Topo

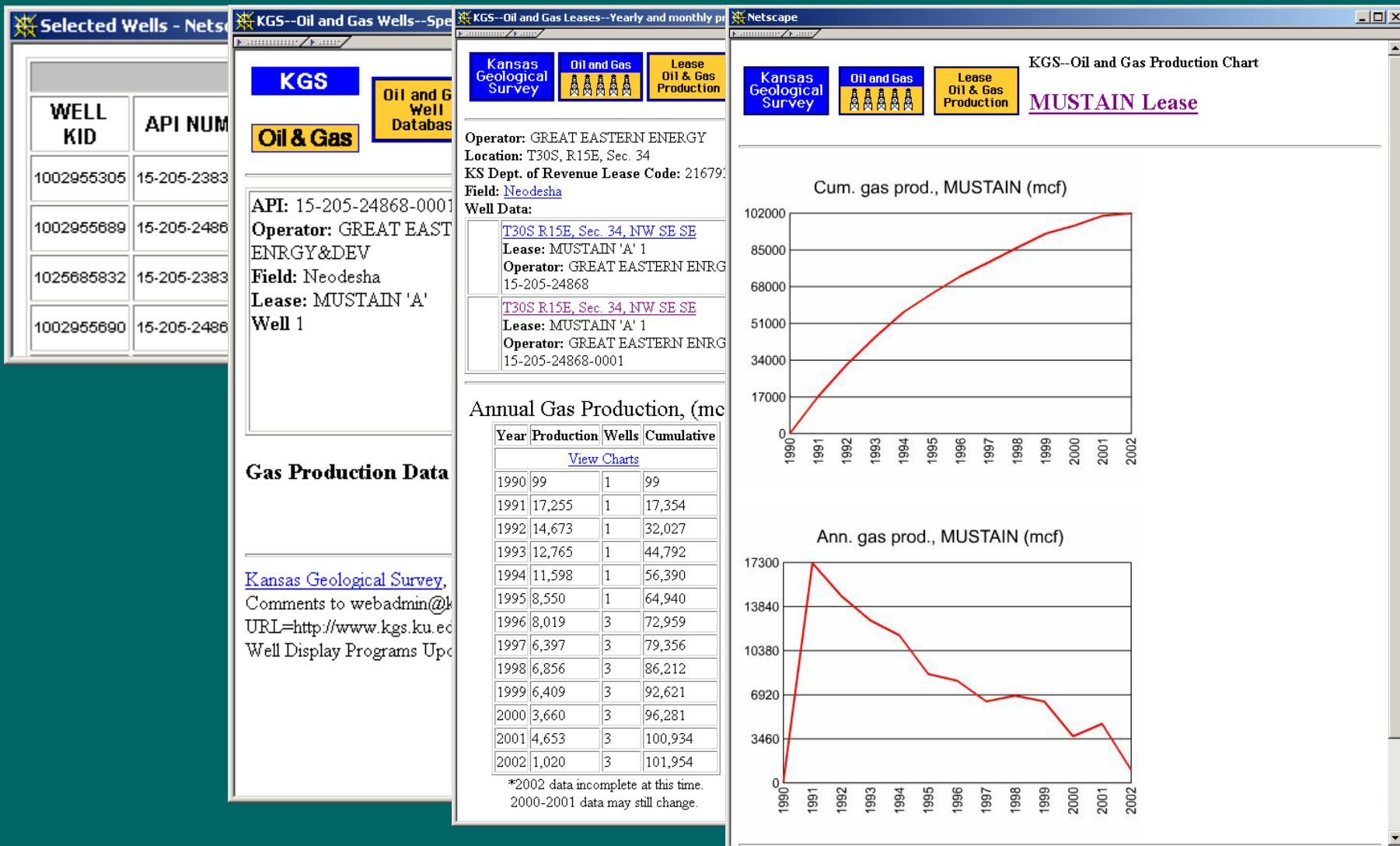
JEFFERSON-SYCAMORE
ARBUCKLE & BARTLESVILLE
SANDSTONE & BEVIER &
MARMATON GROUP &
RIVERTON COAL & WEIR-PITT
COAL
Produces Oil
Produces Gas
Active
[Legal Field Definition](#)

Legend ?
☒ PLSS
☒ Highways
☒ Interstate
☒ US Highway
☒ KS Highway
☒ Roads
☒ County Boundary

Map
Wilson
Montgomery
Copyright (c) 2002 KGS
0 0.1 mi

update map

Data Access



Data Access

```
SELECT a.recnmbr as RECNUMBR,  
       decode(sign(avg(b.x1)-avg(c.x2)),
```

```
)/avg(b.x1)),0),  
)/avg(b.x1)),0),
```

<http://hercules.kgs.ku.edu/KGS/oilgas/production/imageviewertest.cfm>

Table Comments:
Monthly/yearly oil
Updated monthly.

<http://hercules.kgs.ku.edu/KGS/oilgas/production/imageviewertest.cfm>

Definition info

Column Name

[PERCENTCHANGE](#)

[RECNUMBR](#)

Table Comments

This is an Overview
of gas from 1970 to
take this view
section feature

Add/Alter Columns

[YEAR](#)

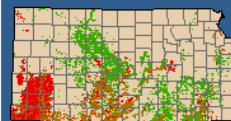
Kansas Oil & Gas Production Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail Print Preview

Address <http://hercules.kgs.ku.edu/KGS/oilgas/production/imageviewertest.cfm>

Links [KDWP](#) [KARS Green Report](#) [KSHS Archeology](#) [KSHS Historical Property Inventory](#) [KDEM](#) [MAPPED](#) [MIDCARB](#)



State of Kansas Geographic Information Systems Policy Board, Data Access and Support Center, and the Kansas Geological Survey

Please email questions and comments to [Jeremy Bartley](#)



Kansas Oil & Gas Production Viewer Yearly Production Data from 1970 to Present

help

reset

Oil-Gas Production:

Product: **Gas**

Function: **Percent Change**

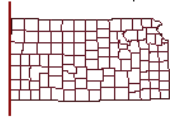
Year Begin: **1970**

Year End: **1980**

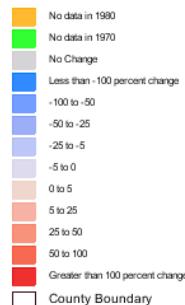
Go

[View State Wide Stats](#)

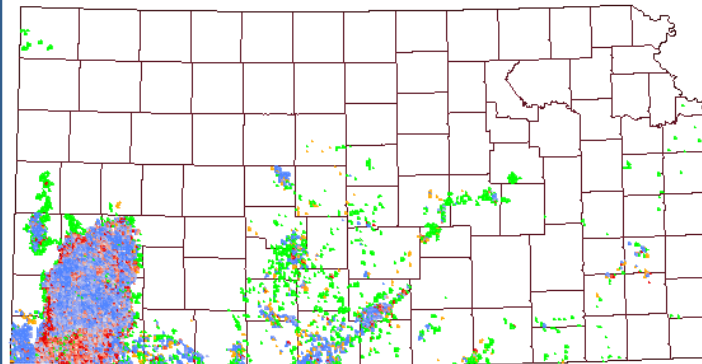
Overview Map



Legend
Percent_change



Zoom Level: **1.5** ☒ Zoom In ☐ Zoom Out ☐ Pan ☐ Identify
[Full Extent](#)



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0 74.2mi

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Visible

- ☒ Dynamic Production Map
- ☒ County Boundary
- ☐ LEGAL FIELD BOUNDARIES

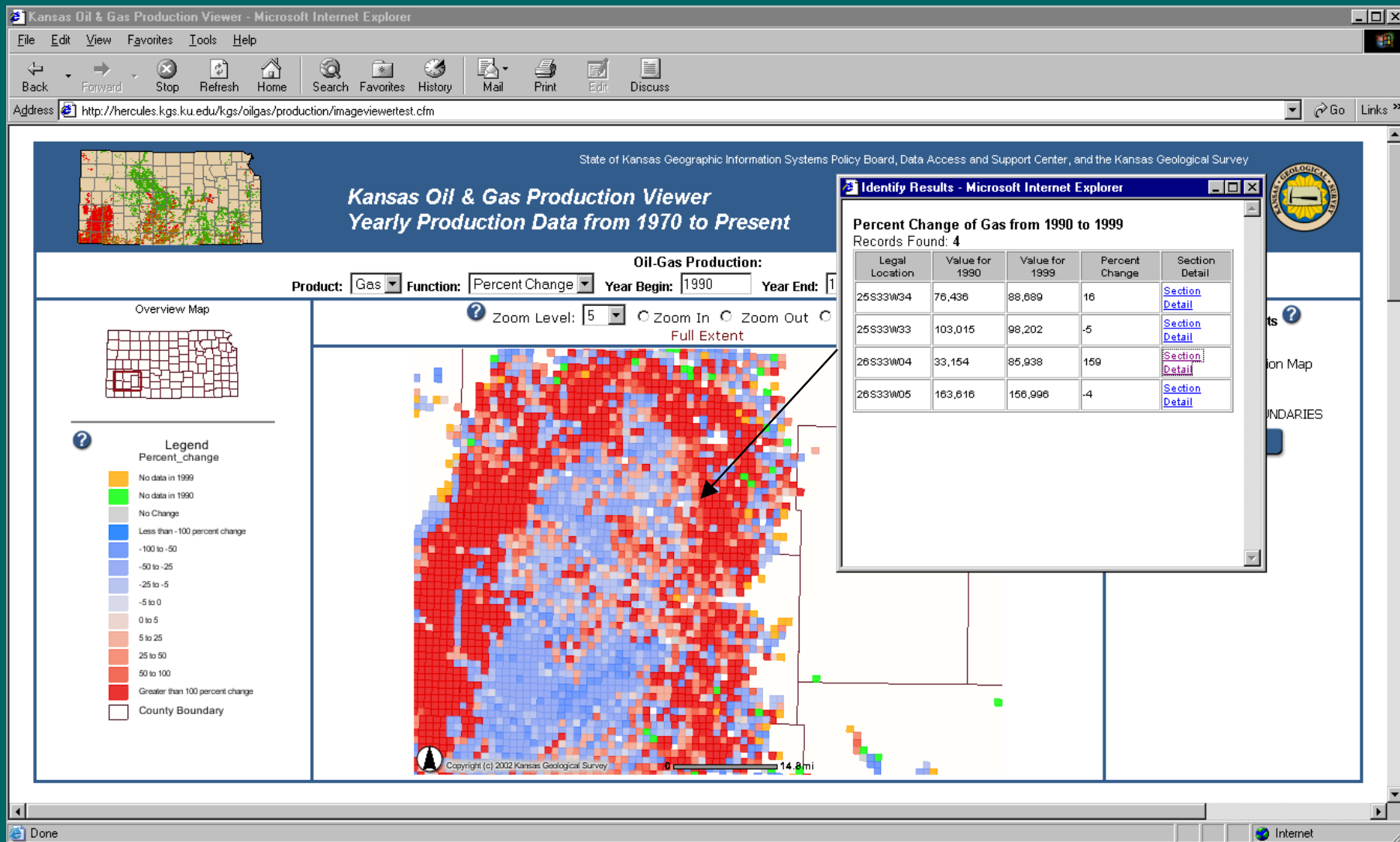
update
map

ENTCHANGE

ENTCHANGE

Internet

Data Access



Data Access

Kansas Image Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss


Address http://mapster.kgs.ukans.edu/kgs/oilgas/imageviewer/imageviewer_d1.cfm?field_kid=1000148164&fieldmap=yes&wells=no&otherformations=no&allfields=yes Go Links »

Oil and Gas

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Kansas Oil and Gas Field Viewer [help](#)

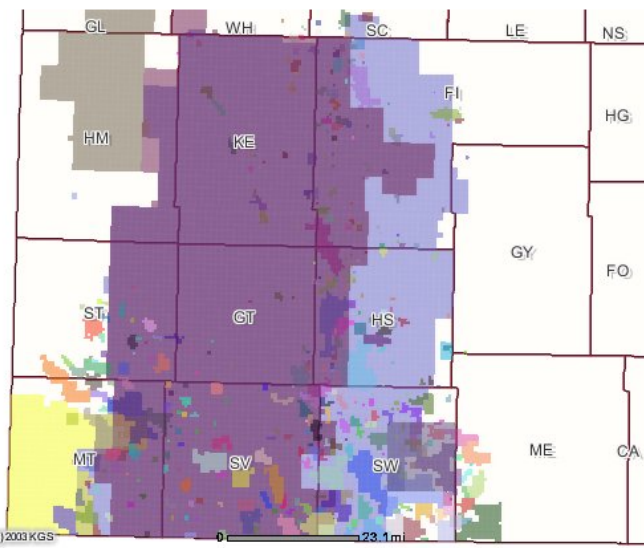
Overview Map



HUGOTON GAS AREA
CHASE GROUP
Produces Oil
Produces Gas
Active
[Legal Field Definition](#)

Legend
County Boundary

Zoom Level: 1.5 [Zoom In](#) [Zoom Out](#) [Pan](#)
[Identify Field](#) [Identify Well](#) [Full Field Extent](#)



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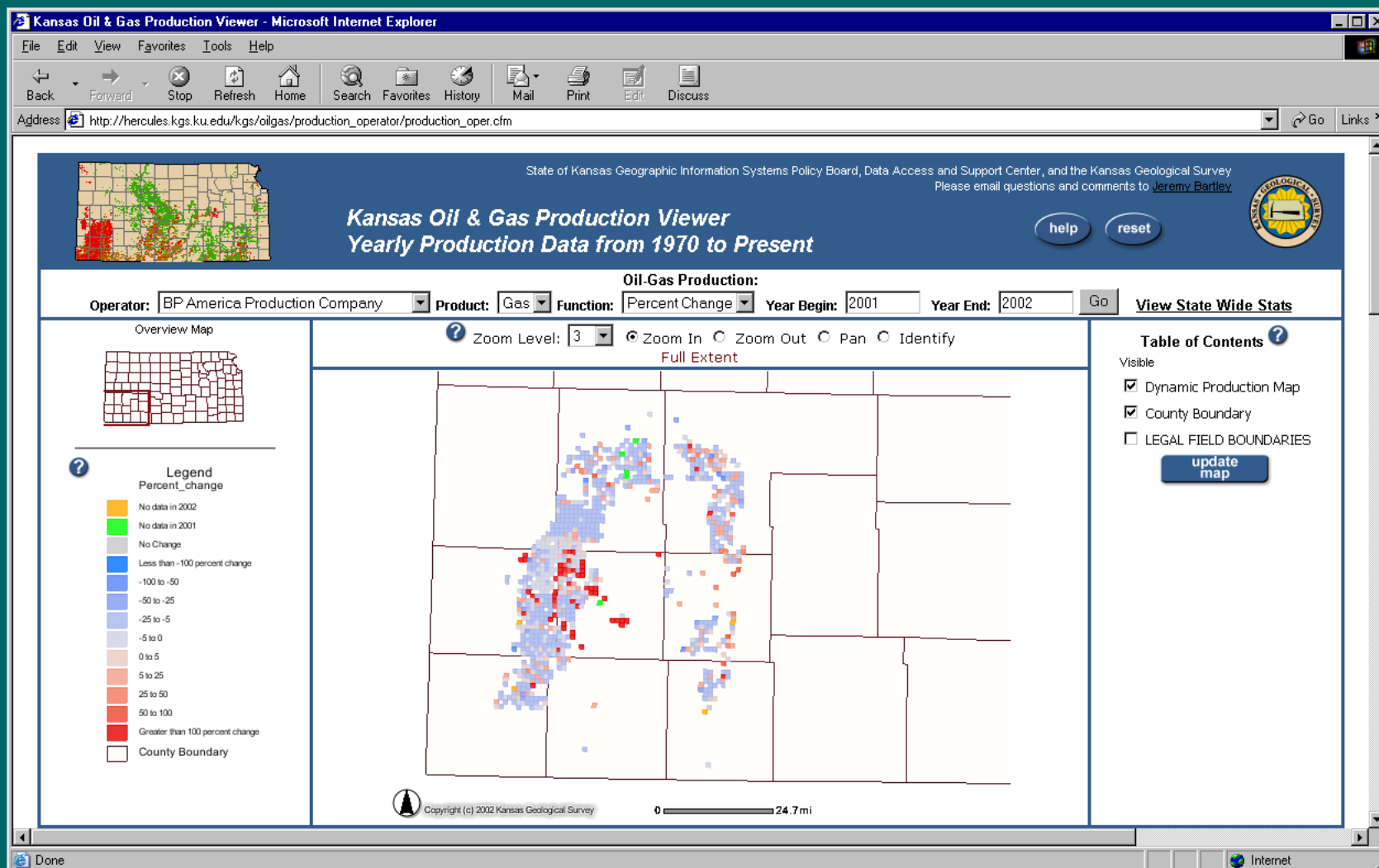
- ☐ Current Oil & Gas Wells (HUGOTON GAS AREA)
[Download Wells](#)
- ☒ Current Field (HUGOTON GAS AREA)
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- ☐ All Wells in Area

Zoom In [PLSS]
☐ Highways
Zoom In [Roads]
Zoom In [Rivers and Streams]
☐ Major Streams
Zoom In [Water Bodies]
☐ City Boundary
☒ County Boundary
Zoom In [View Aerials]
Zoom In [View Topo]

[update map](#)

Done Internet

Data Access



Data Access

Oil Producers, Inc. of Kansas

File Edit View Favorites Tools

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address <http://abyss.kgs.ku.edu/p>

KGS **Operator Oil & Gas Production**

Oil & Gas

Oil Producers, Inc. of Kansas
PO Box 8647
Wichita, KS 67208-0647
Status: Active

Year	Oil		
	Production (bbls)	Wells	Ch
	View Oil Chart		
1996	-	128	17
1997	185,685	129	35
1998	173,280	129	53
1999	186,997	151	71
2000	175,493	157	89
2001	299,346	167	1,
2002	612,029	173	1,
2003*	77,416	147	1,

*2003 data incomplete at this time

Kansas Geological Survey
Comments to webadmin@kgs.ku.edu
URL=<http://www.kgs.ku.edu/>
Programs Updated June 6, 2003
Production data from Kansas I

Oil and Gas Production--Oil Producers, Inc. of Kansas - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://abyss.kgs.ku.edu/pls/abyss/oil.ogop4.MapPg?f_id=1028000163

KGS **Operator Oil & Gas Production**

Oil & Gas

Oil Producers, Inc. of Kansas

[Summary Page](#)
[List of Leases](#)
Map Showing Leases

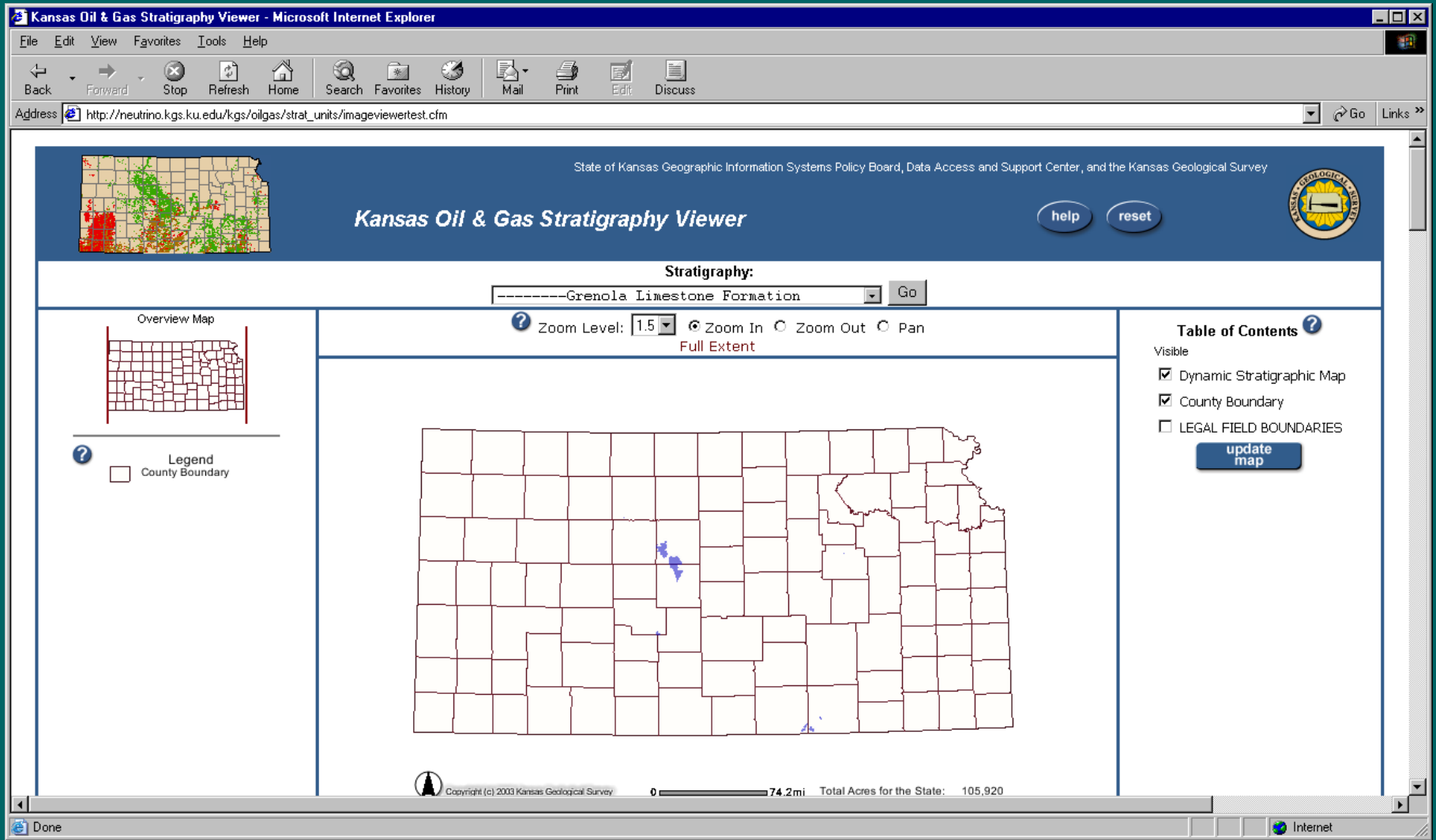
Oil Producers, Inc. of Kansas

■ GAS (89 sec.) ■ OIL (91 sec.) ■ BOTH (46 sec.) Operating from 1996 to Present

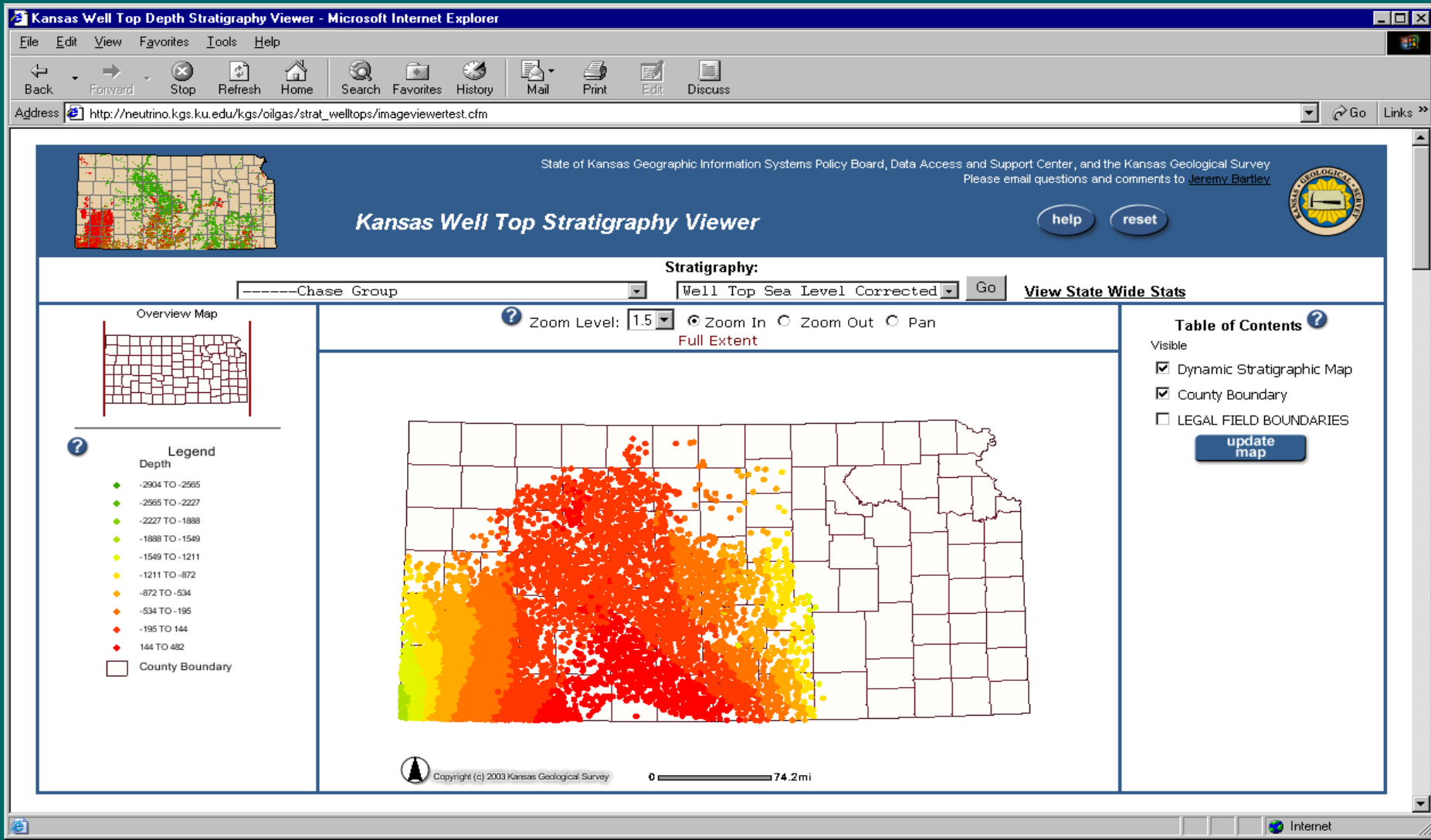
Copyright (c) 2003 Kansas Geological Survey Total Sections = 226

Done Internet

Data Display



Data Display



Data Maintenance

Kansas Image Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://mapster.kgs.ukans.edu/kgs/oilgas/imageviewer/imageviewer_d1.cfm Go Links

Oil and Gas

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Kansas Oil and Gas Field Viewer help

Overview Map

ARROYO SOUTHEAST
MORROWAN
Produces Oil
Produces Gas
Active
Legal Field Definition

Legend
PLSS
County Boundary

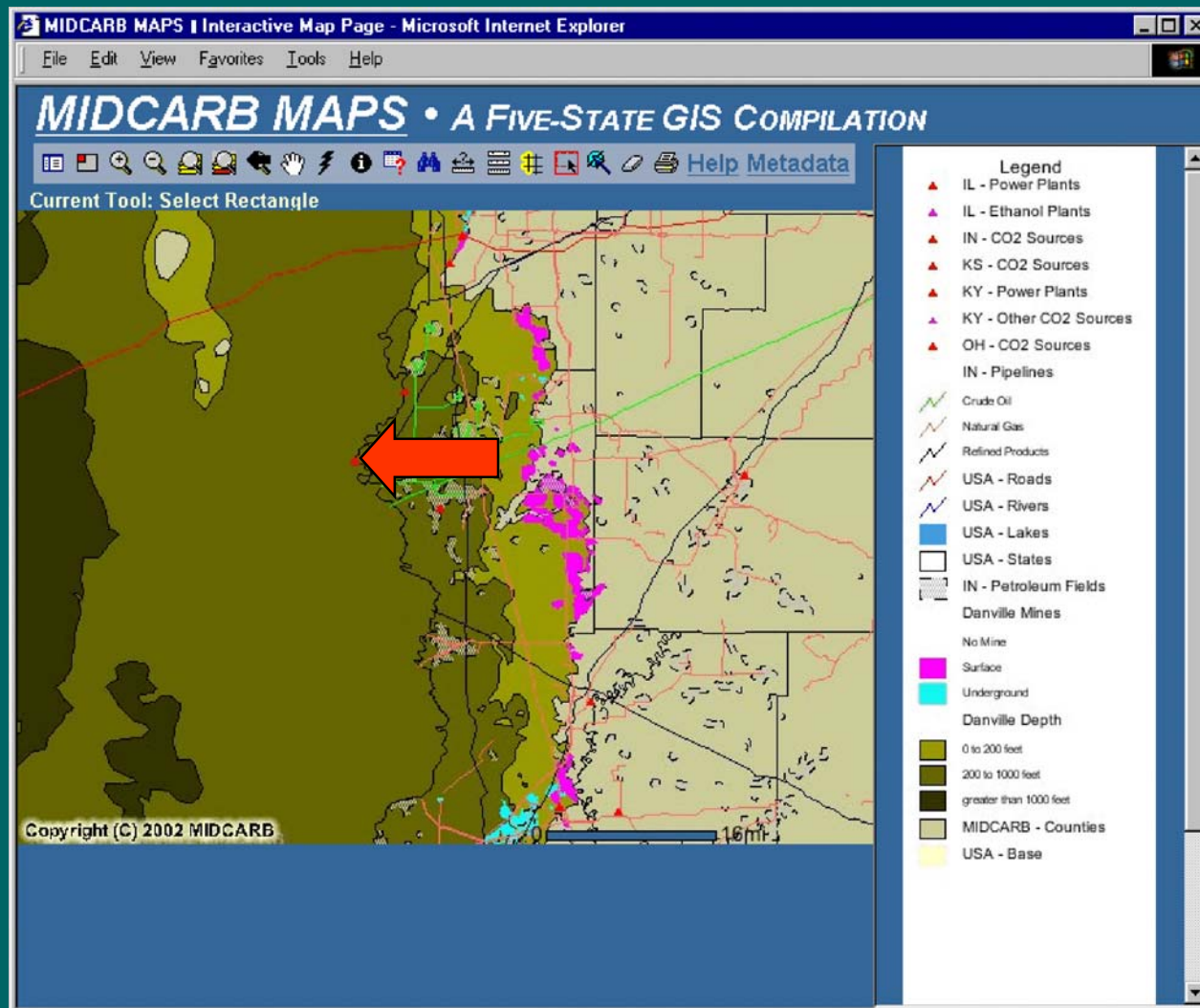
Zoom Level: 1.5 Zoom In Zoom Out Pan
Identify Field Identify Well Full Field Extent

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☐ View Topo

update map

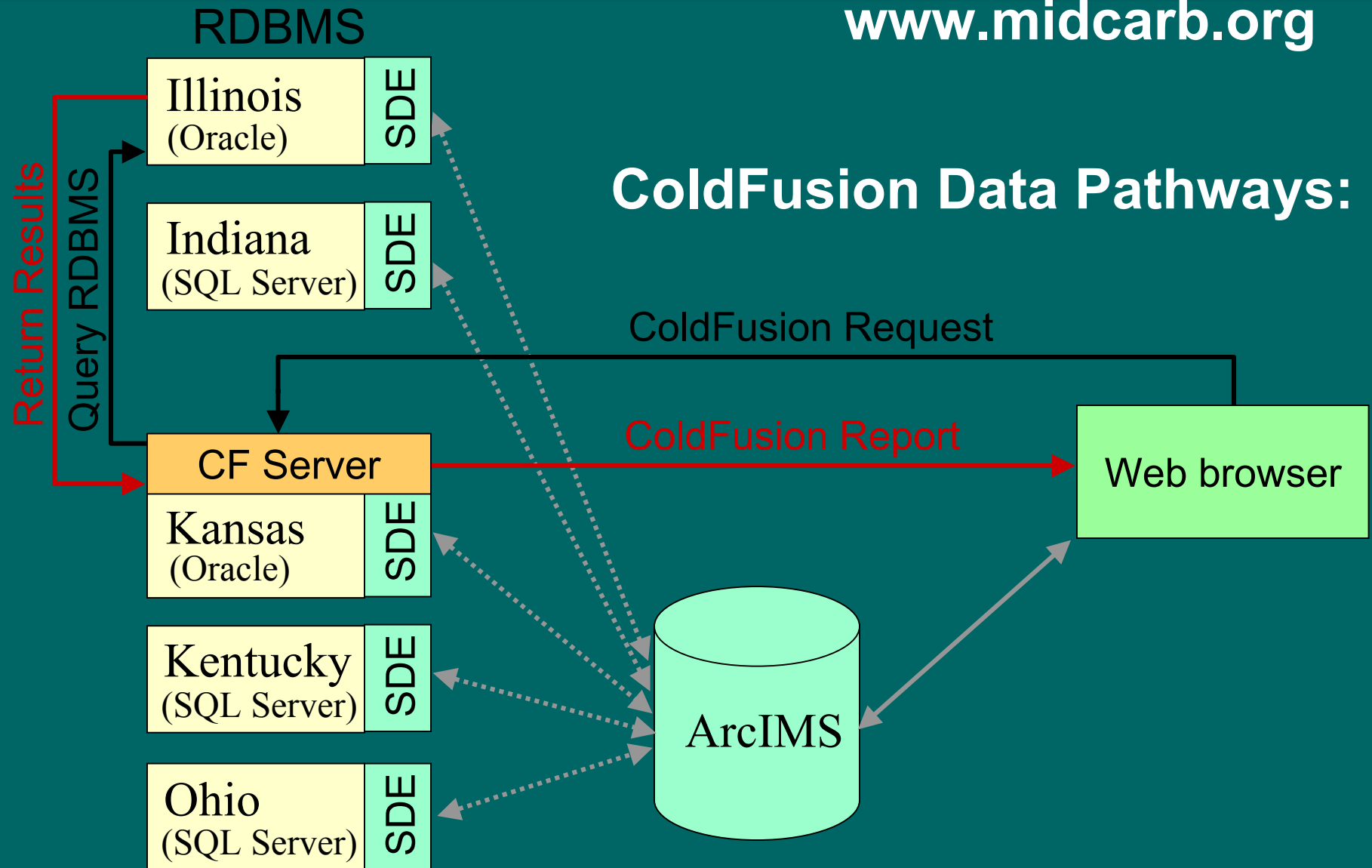
Copyright (c) 2003 KGS

Data Integration

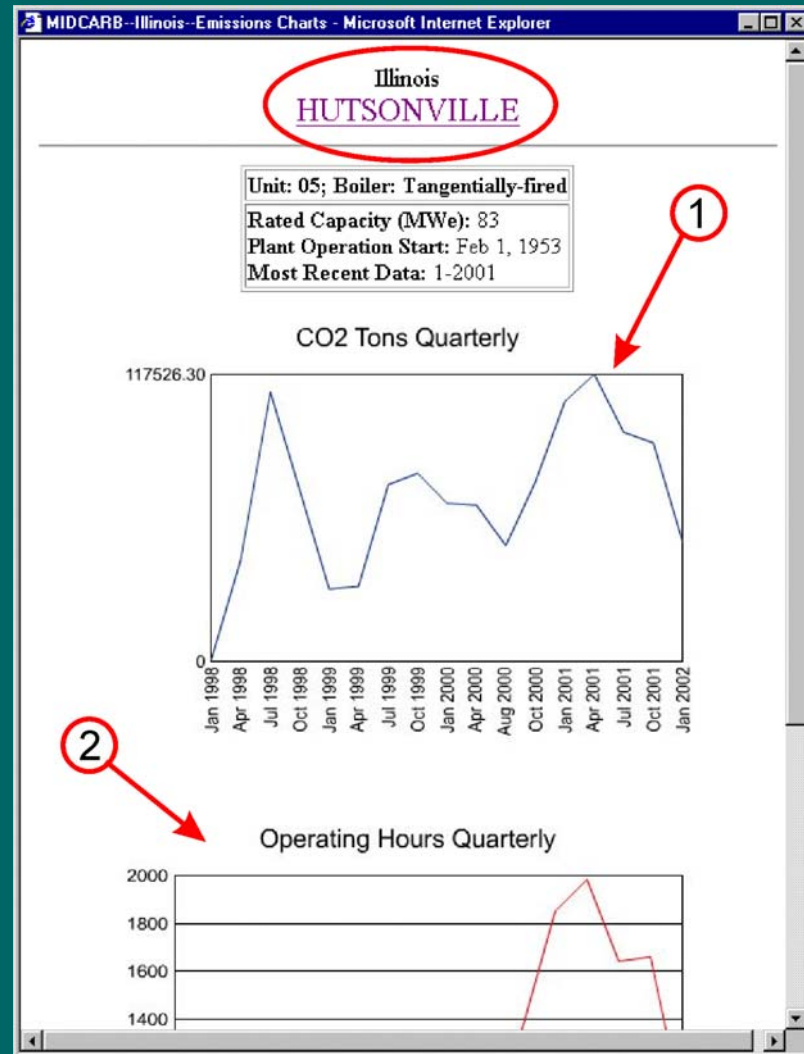
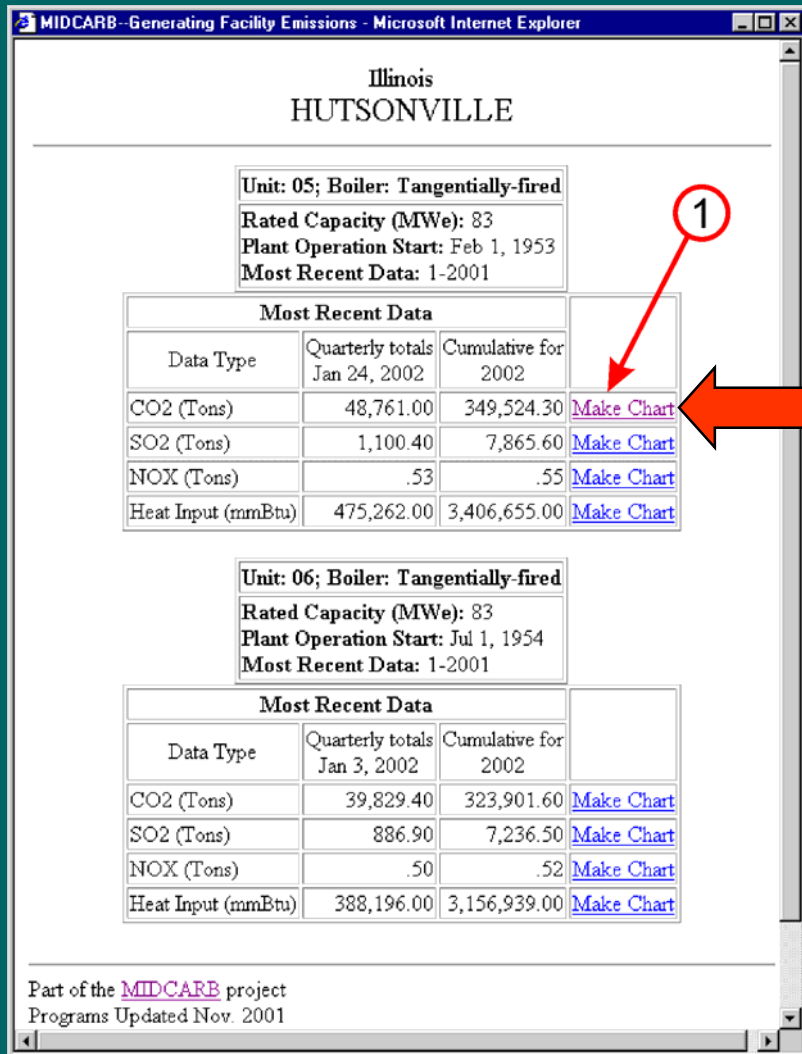


Data Integration

www.midcarb.org



Data Integration





Kansas Goals

🔹 **Data Enhancement**

🔹 **Data Access**

🔹 **Data Analysis**

🔹 **Data Display**

🔹 **Data Maintenance**



Dynamic Mapping of Kansas Oil and Gas Data

**Jeremy D. Bartley, Kurt Look, & Tim
Carr**

**Kansas Geological Survey
KU Energy Research Center**

www.kgs.ku.edu

**Thanks to: Kurt Look, Dana Adkins-Heljeson,
Ken Nelson, Marty Dubois, Lynn Watney, Nathan
Eaton, Amber Shultz, and the Midcarb States
(Indiana, Illinois, Ohio, Kentucky, & Kansas)**





http://hercules.kgs.ku.edu/website/sdmanager/more_info.cf...

Definition information for
ACRES_640_PRODUCTION_OPERATORS
SIZE (in bytes) = 6,103,040
Number of Rows = 173156

Column Name	Null?	Column Type	Column Comments
OPERATOR_KID * R	Not Null	NUMBER(10)	Add Comments
PRODUCT * P	Not Null	VARCHAR2 (1)	Add Comments
PRODUCTION		NUMBER (12,2)	Add Comments
RECNUMBR * P	Not Null	NUMBER(11)	Add Comments
YEAR * P	Not Null	NUMBER(4)	Add Comments

Table Comments:
PRODUCTION or OPERATORS by section. See
\$PACKAGES/plss/acres_640_production_operators
for details.

Add/Alter Comment