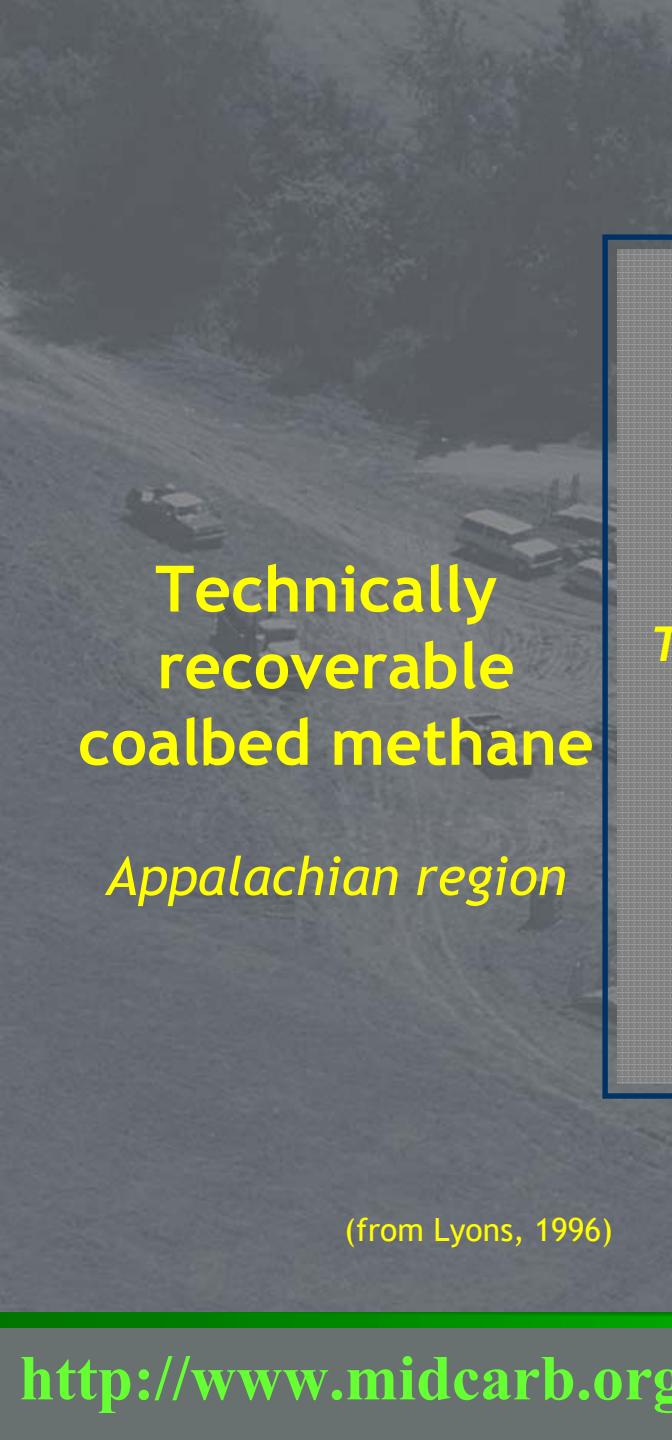




# GIS Technology: A Pathway for Regional Geospatial Analysis of Coalbed Methane Assessment and Future Resource Development

Ernie R. Slucher and Mark Vinciguerra  
*Ohio Geological Survey*

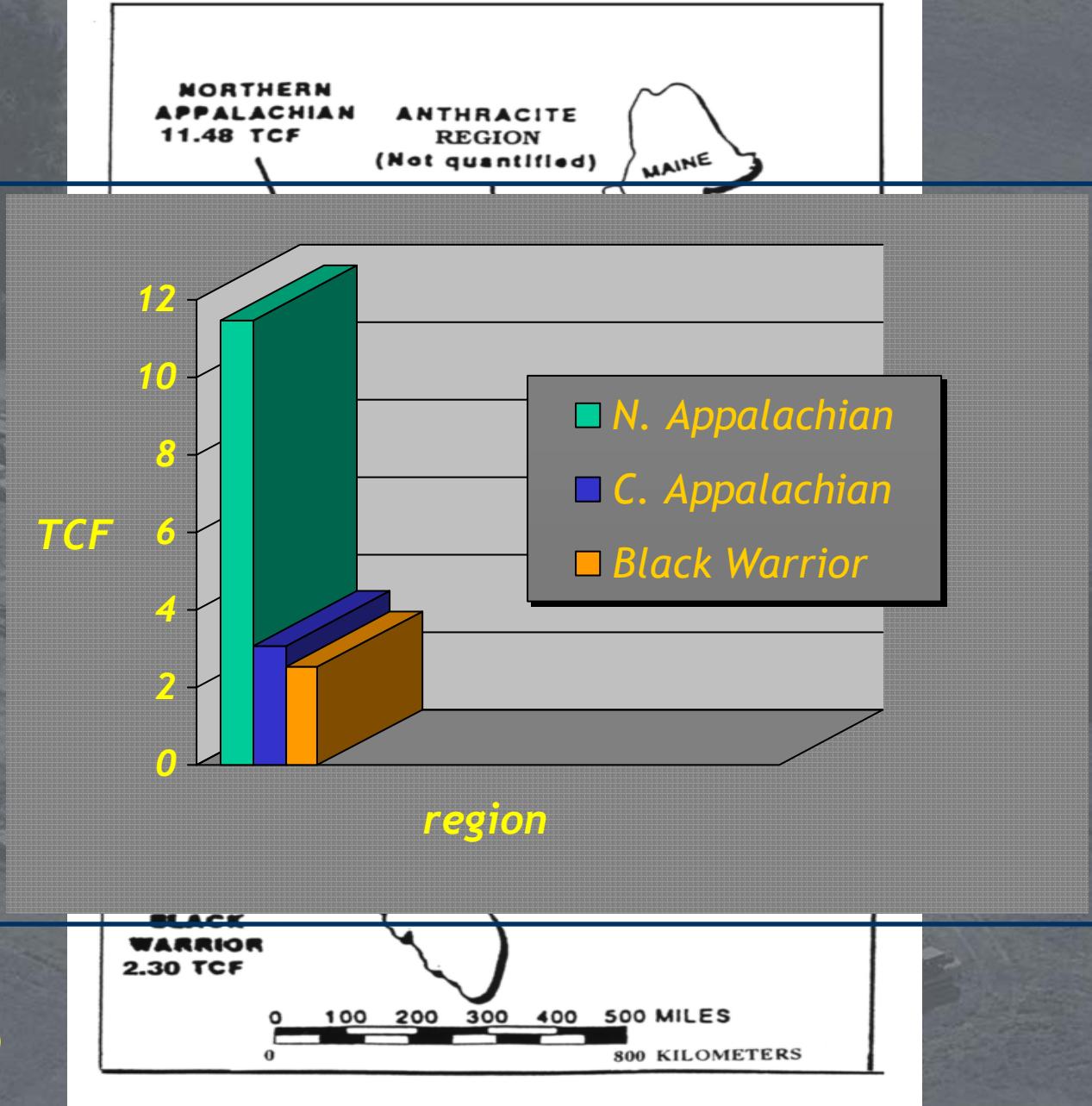


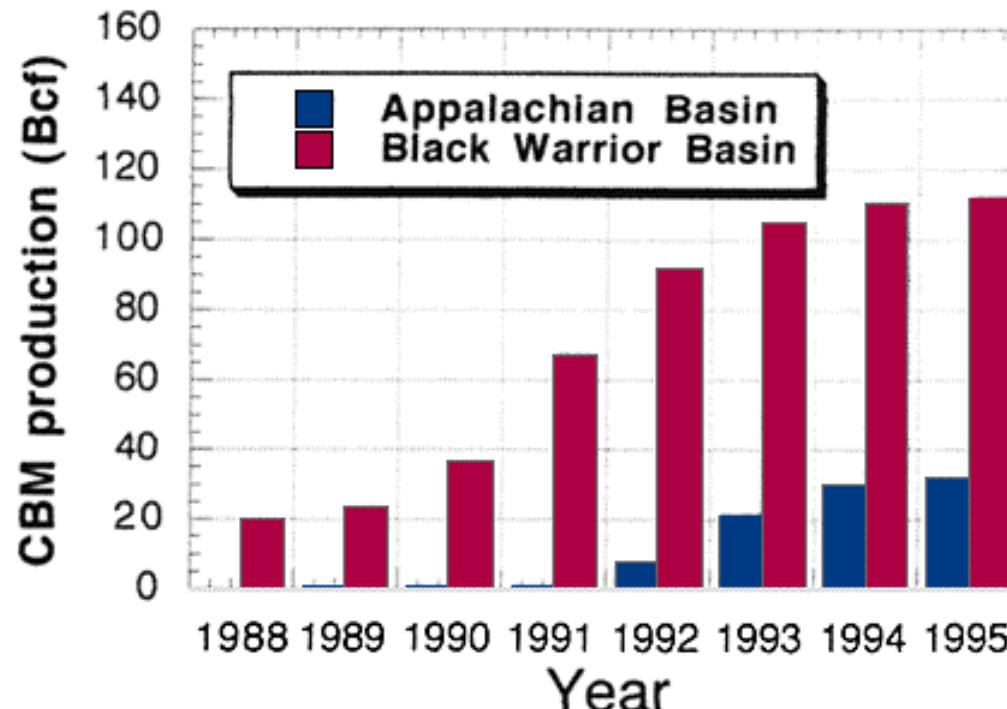


Technically  
recoverable  
coalbed methane

*Appalachian region*

(from Lyons, 1996)

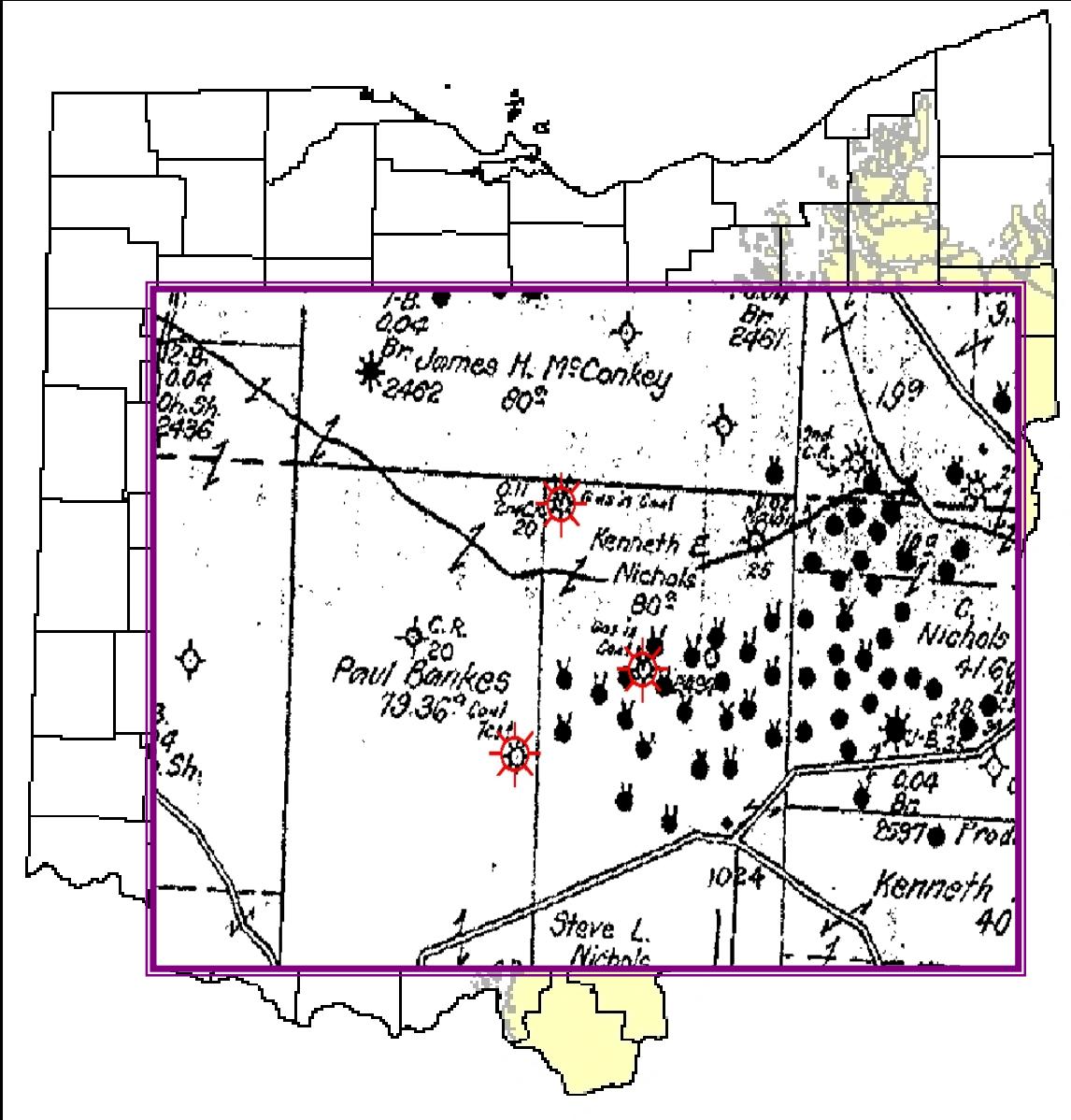


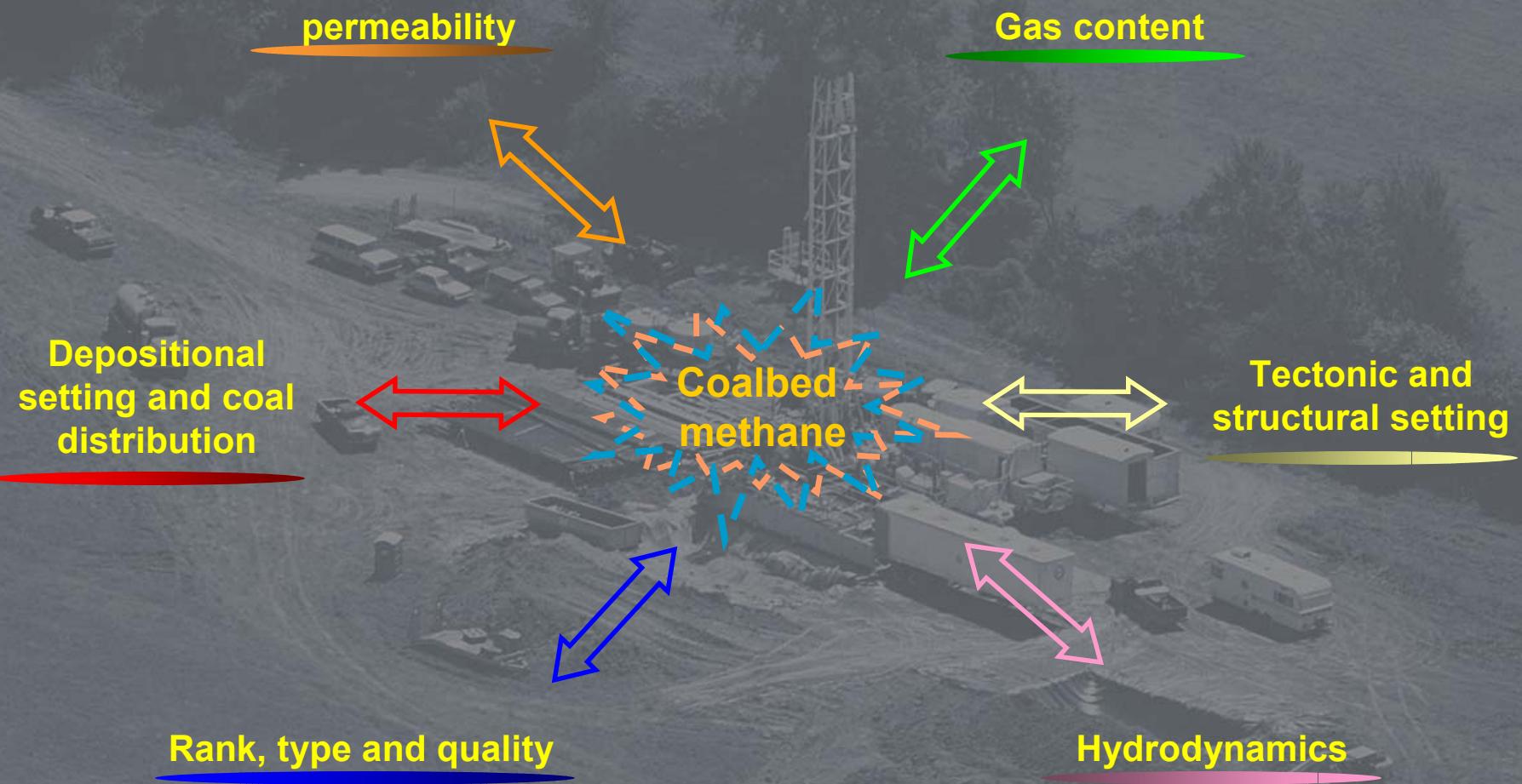


(Lyons, 1996)



# Historic coalbed methane fields in Ohio





# *Geospatial databases:*

- ↗ National Coal Resource Data System (NCRDS)
  - »*Stratigraphic sections*
  - »*Core data*



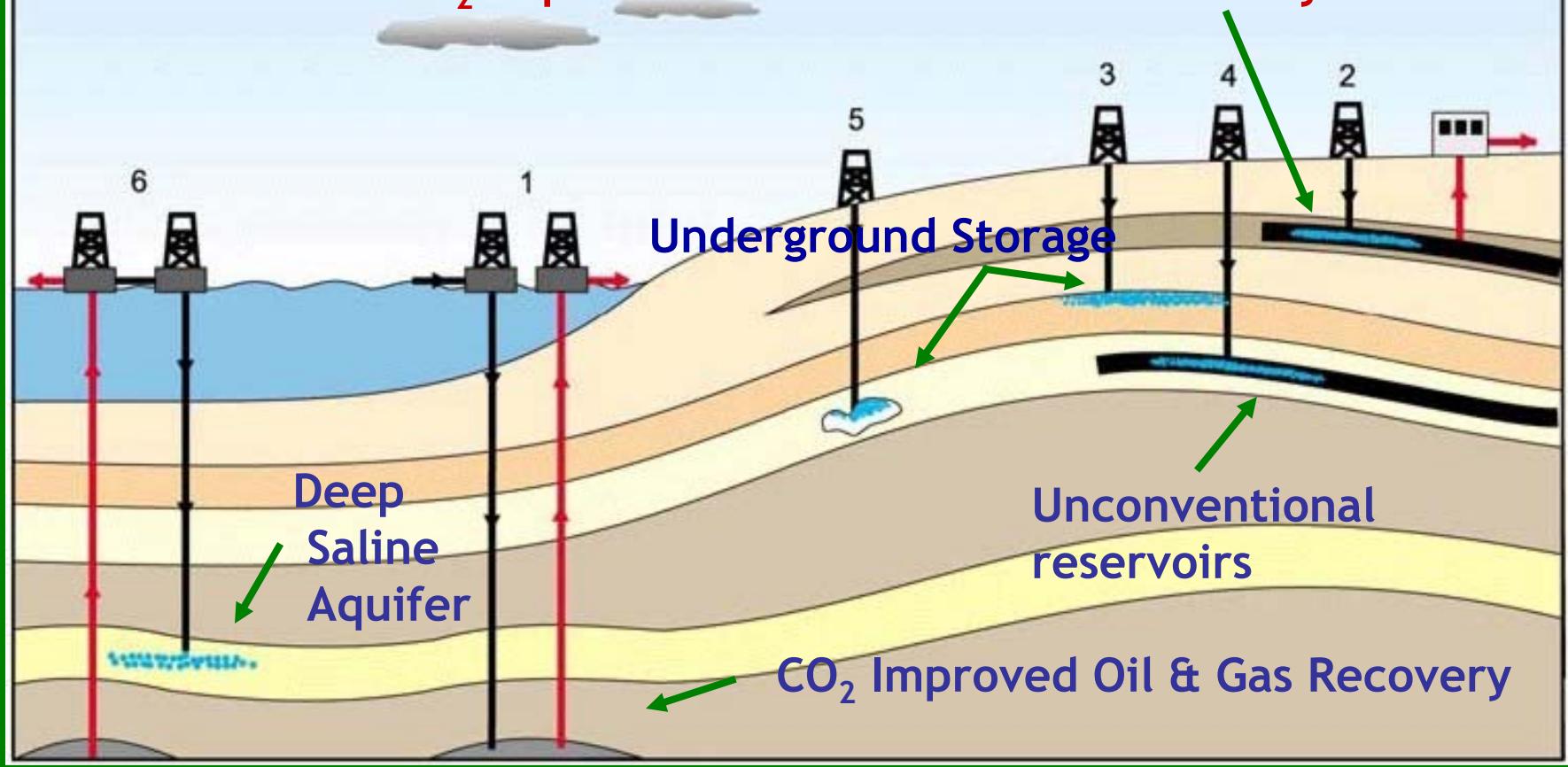
# MIDCARB Consortium



<http://www.midcarb.org>



## CO<sub>2</sub> Improved Coal Bed Methane Recovery



Modified from: <http://www.spacedaily.com/news/greenhouse-00j.html>



*For more information on MIDCARB.....*

Theme 3

EMD/DEG Geological Sequestration of CO<sub>2</sub>

Wednesday May 14

Kansas Geological Survey  
Exhibitor Booth 2200

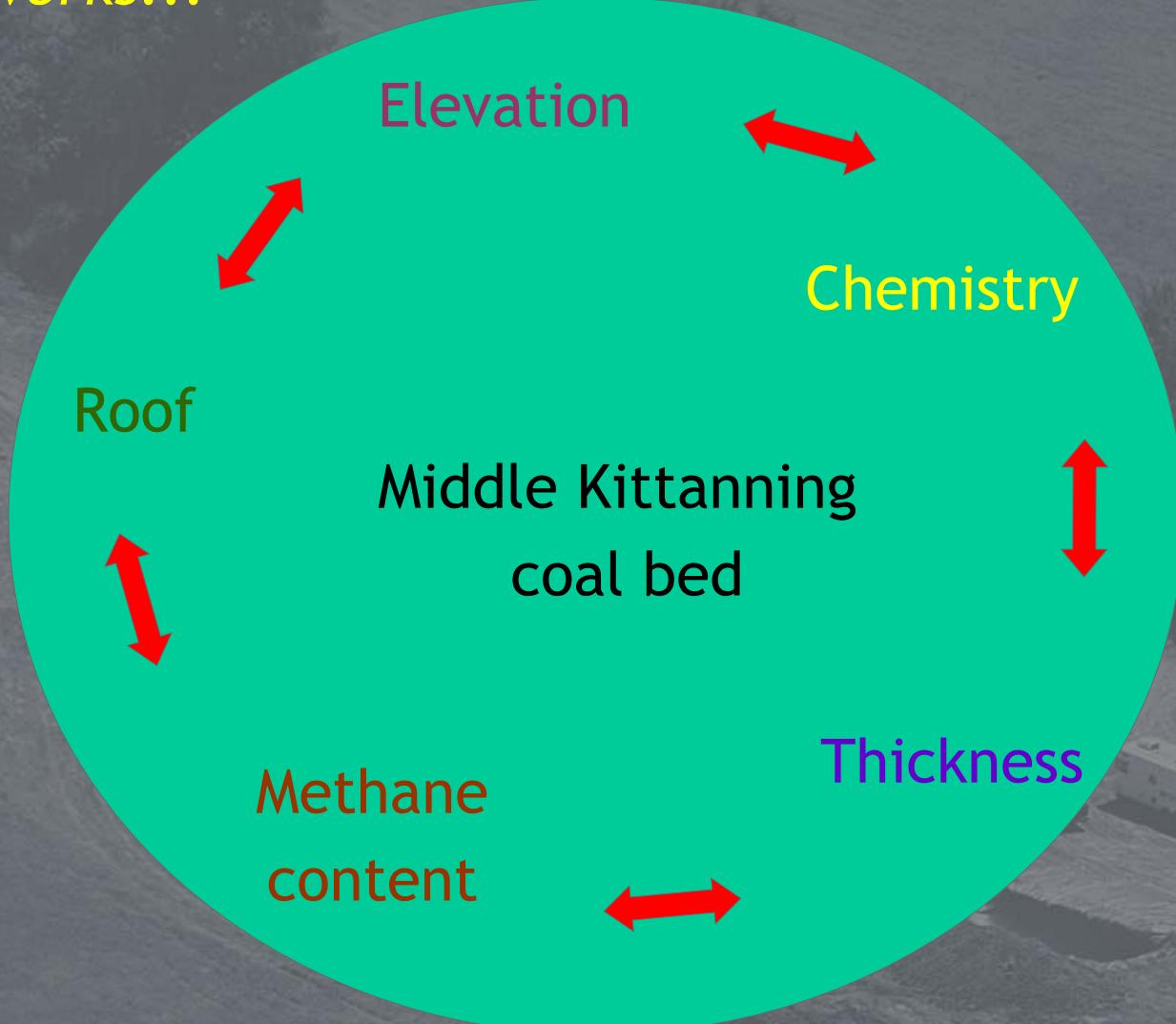


# *Goals*

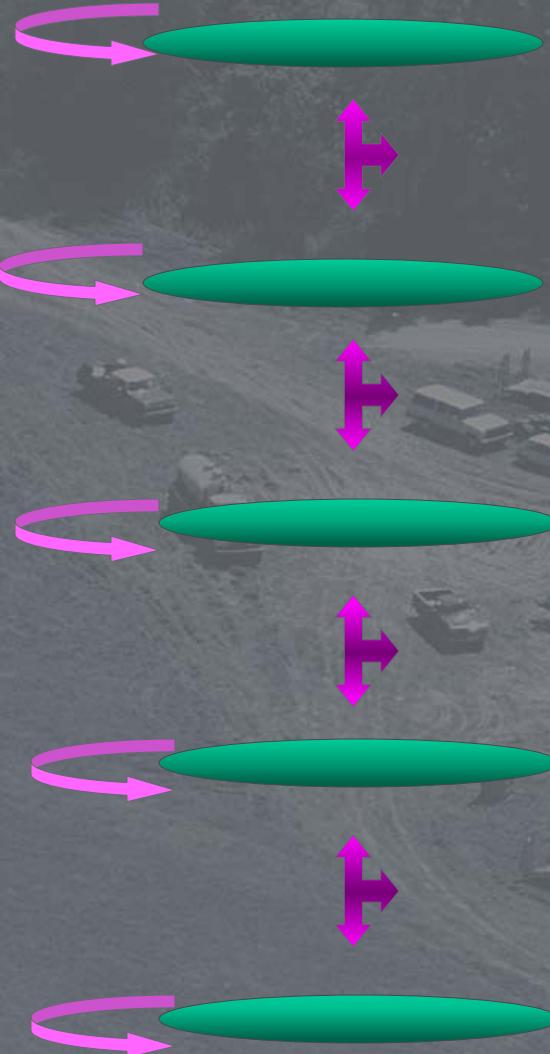
- Convert basic coal quantitative and qualitative data into digital form
  - Utilize a GIS to analyze data
- Identifying favorable locations for coalbed methane and CO<sub>2</sub> sequestration



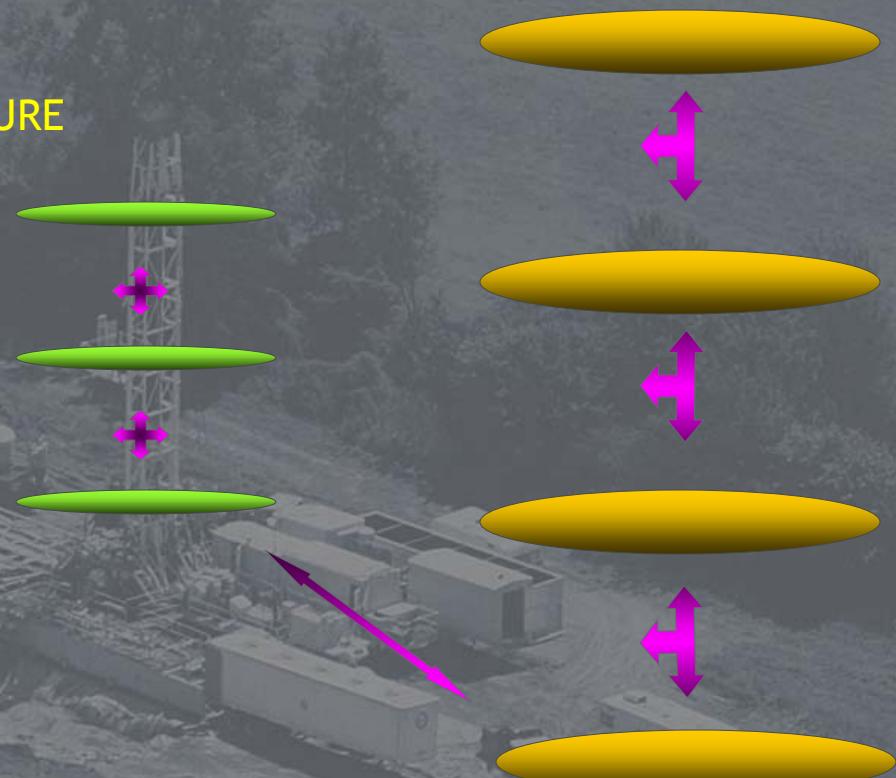
# How GIS works...



COAL



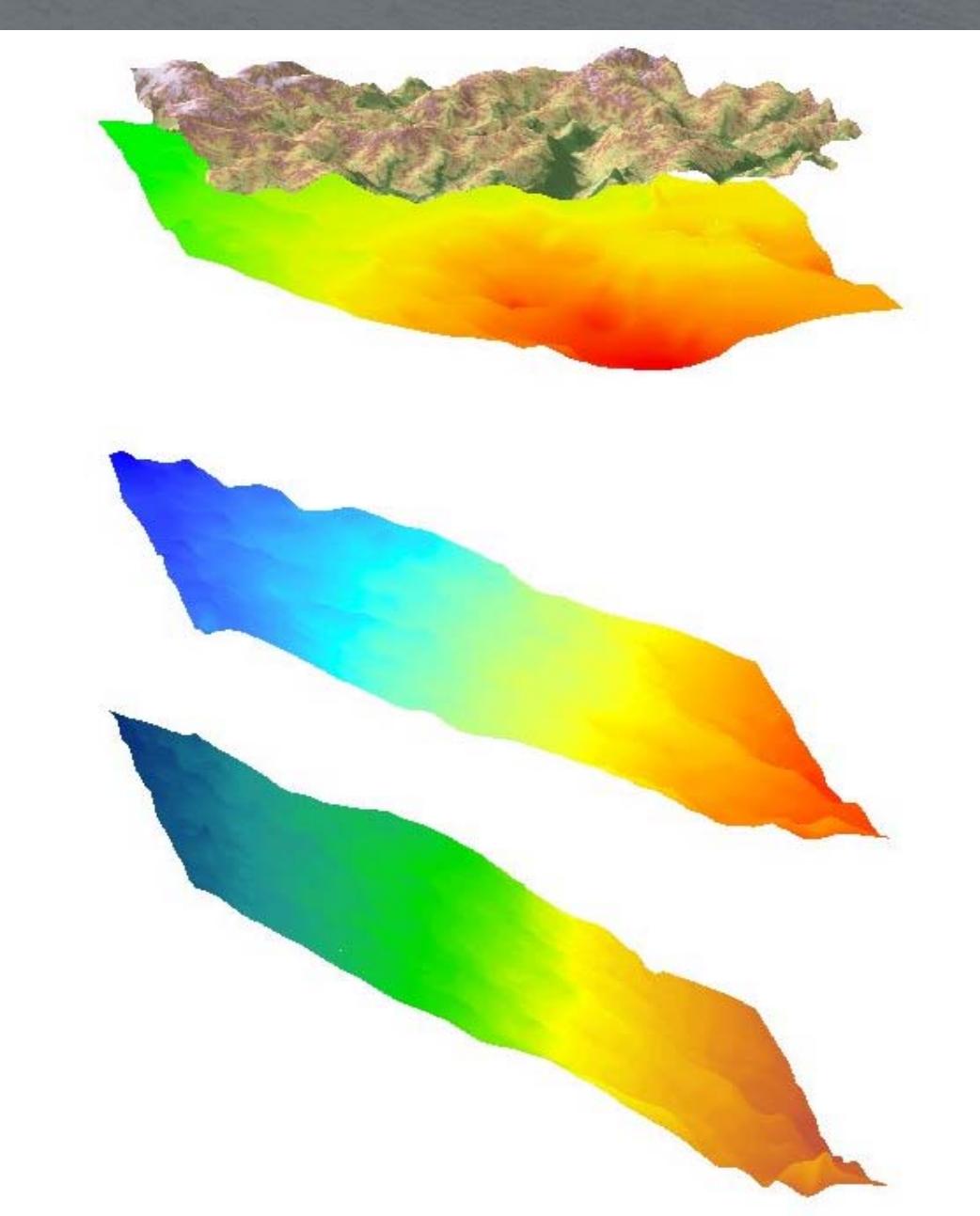
OIL/GAS



STRUCTURE



# Spatial Relationships



# *The GIS Advantage!*

- Ability to use multiple data/map types in spatial analysis, queries, and plots
- Readily updateable
- Creation of derivative products that may be cost prohibited by other methods
- Plot-on-demand products results in lower publication/production cost



# Depth of coal bearing rocks



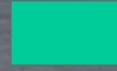
0 - 200



200 - 500



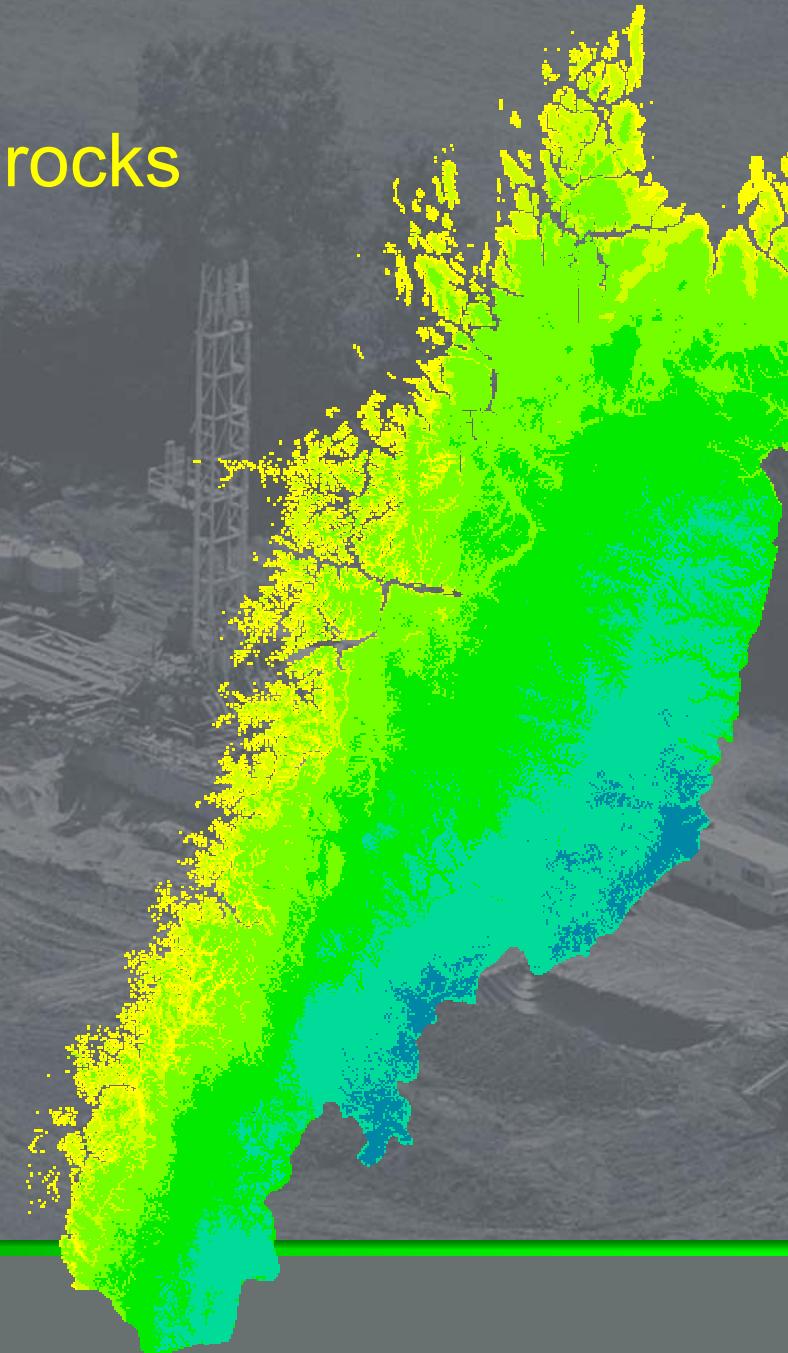
500 - 1000

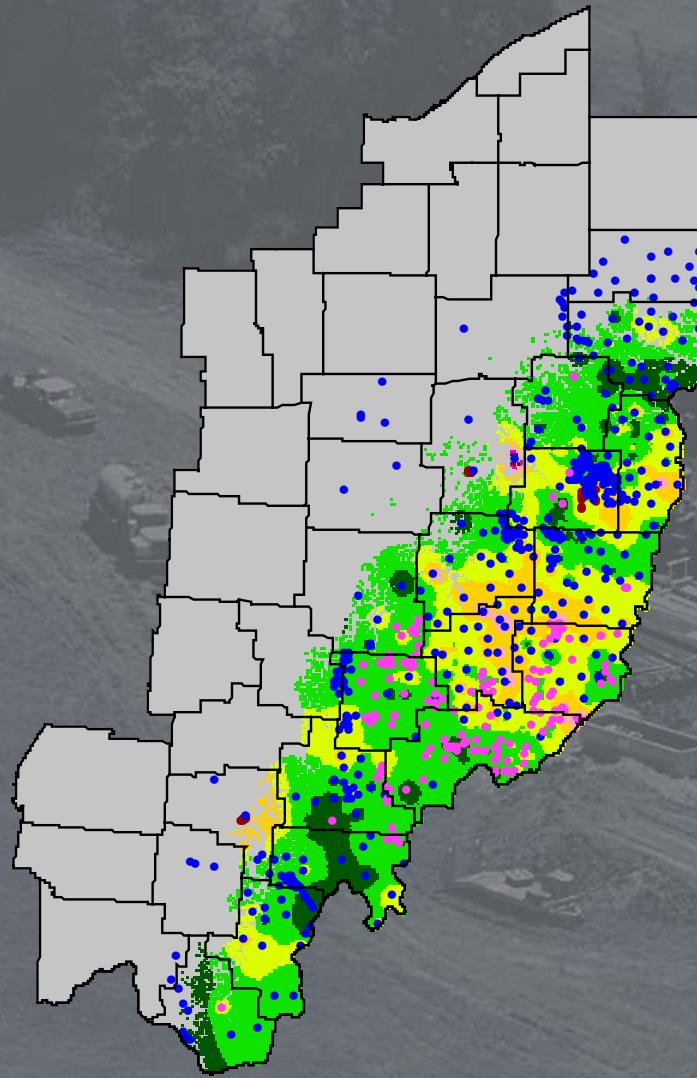


1000 - 1500



2000+

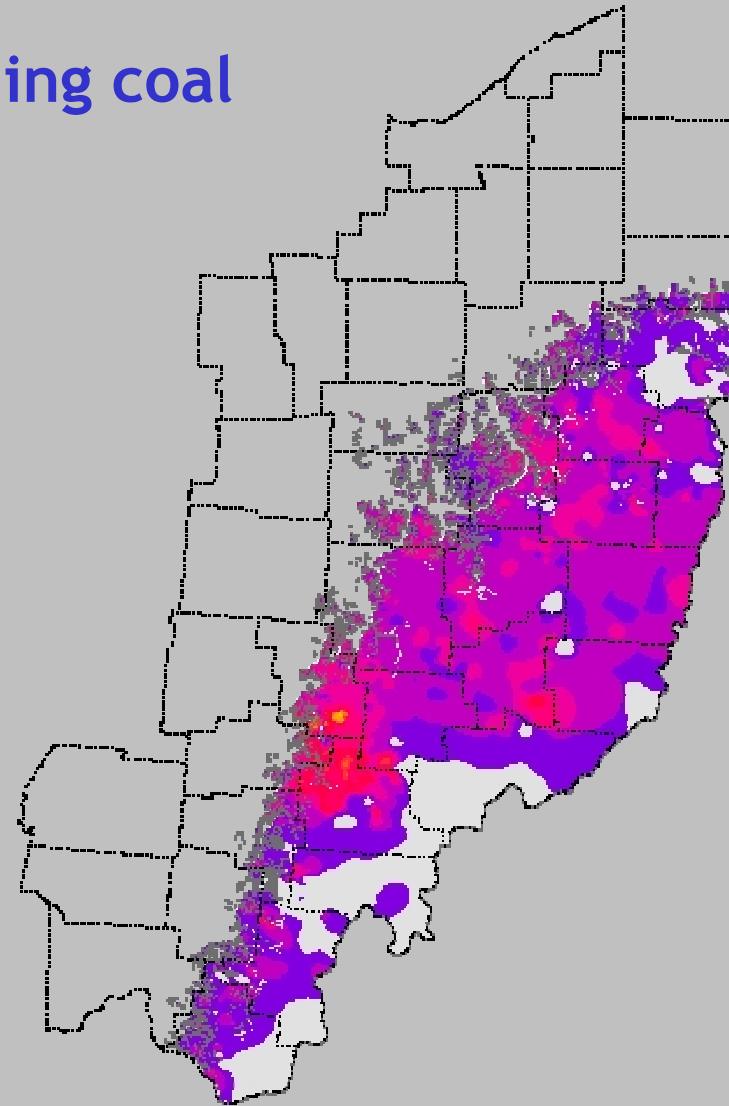




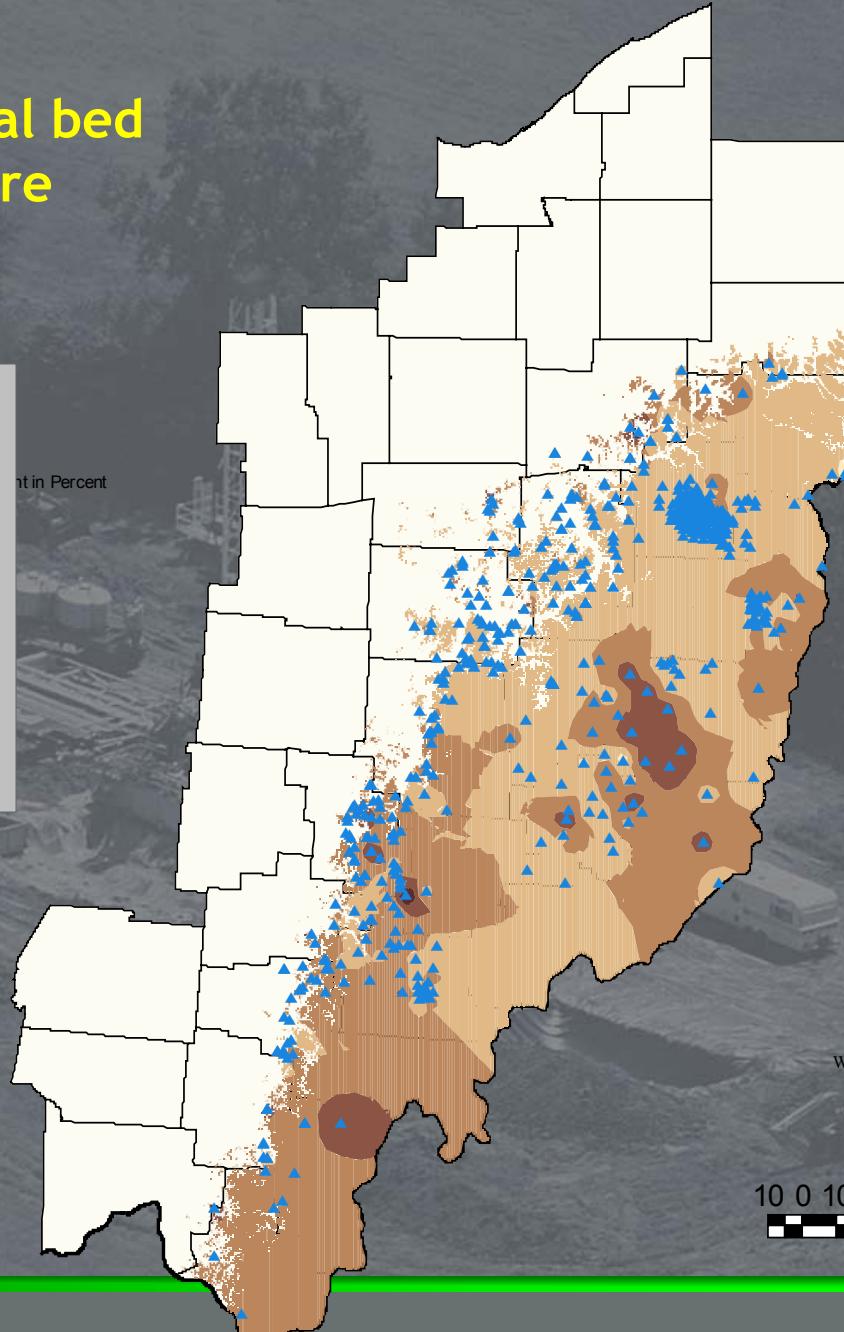
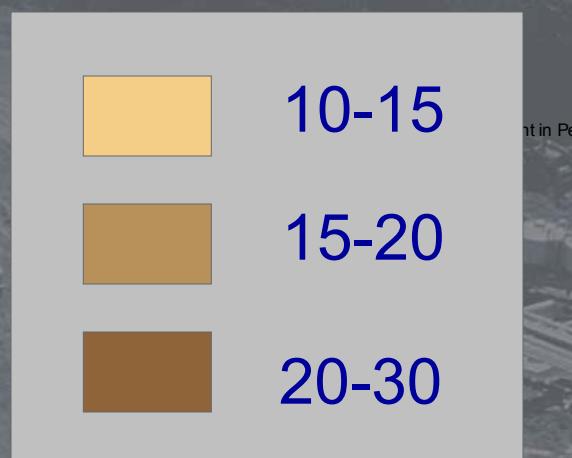
Net coal  
*Allegheny and Pottsville Groups*



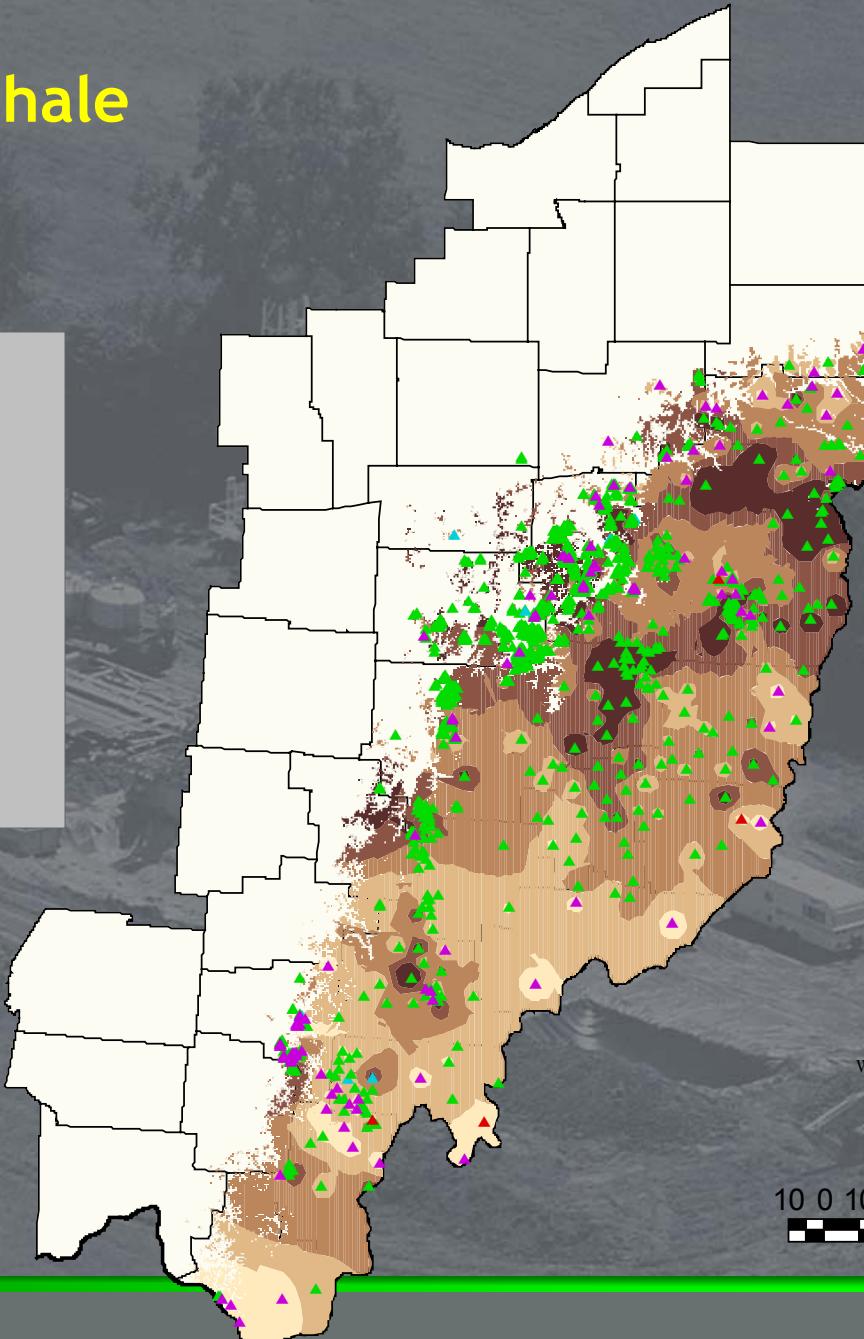
# Middle Kittanning coal *Isopach*



## Middle Kittanning coal bed % ash and moisture



# Middle Kittanning roof shale *isopach (feet)*



# Preliminary Methane Potential

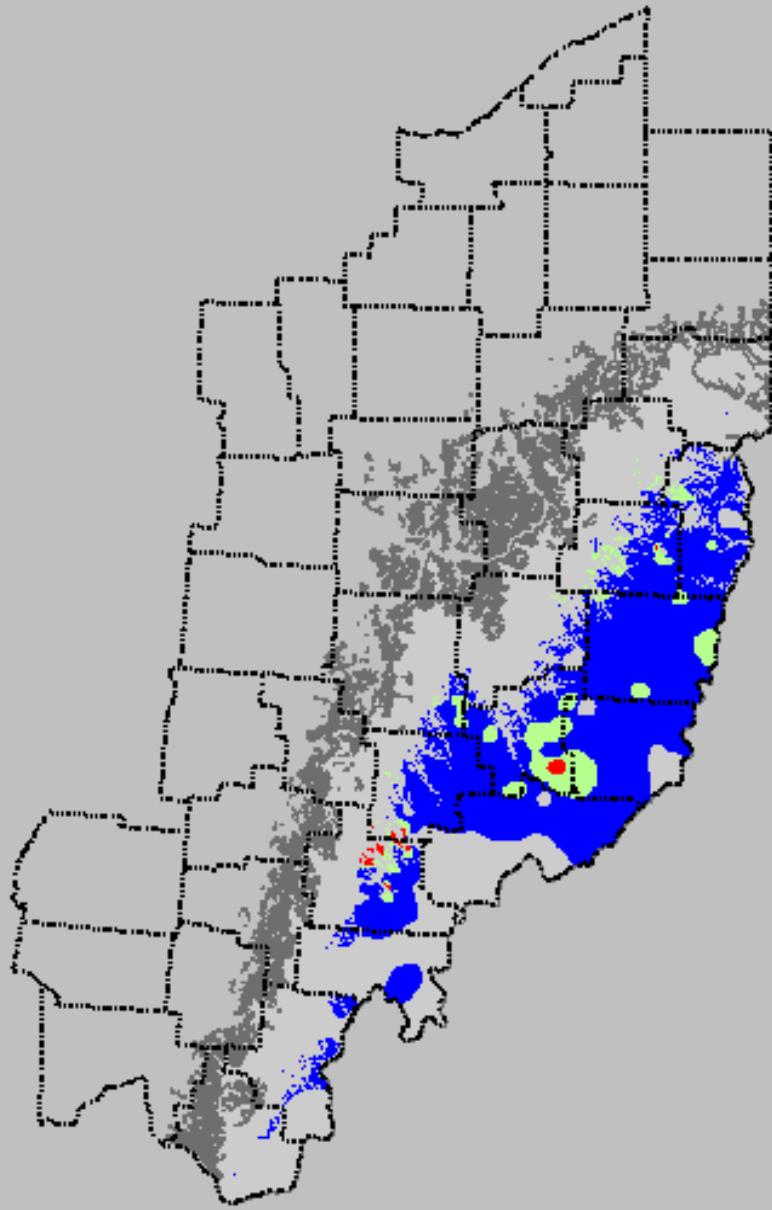
## *Middle Kittanning Coal*

Middle Kittanning resource  
~ 470 BCF

Total state CBM resource  
~ 4.8 TCF

MCF/acre

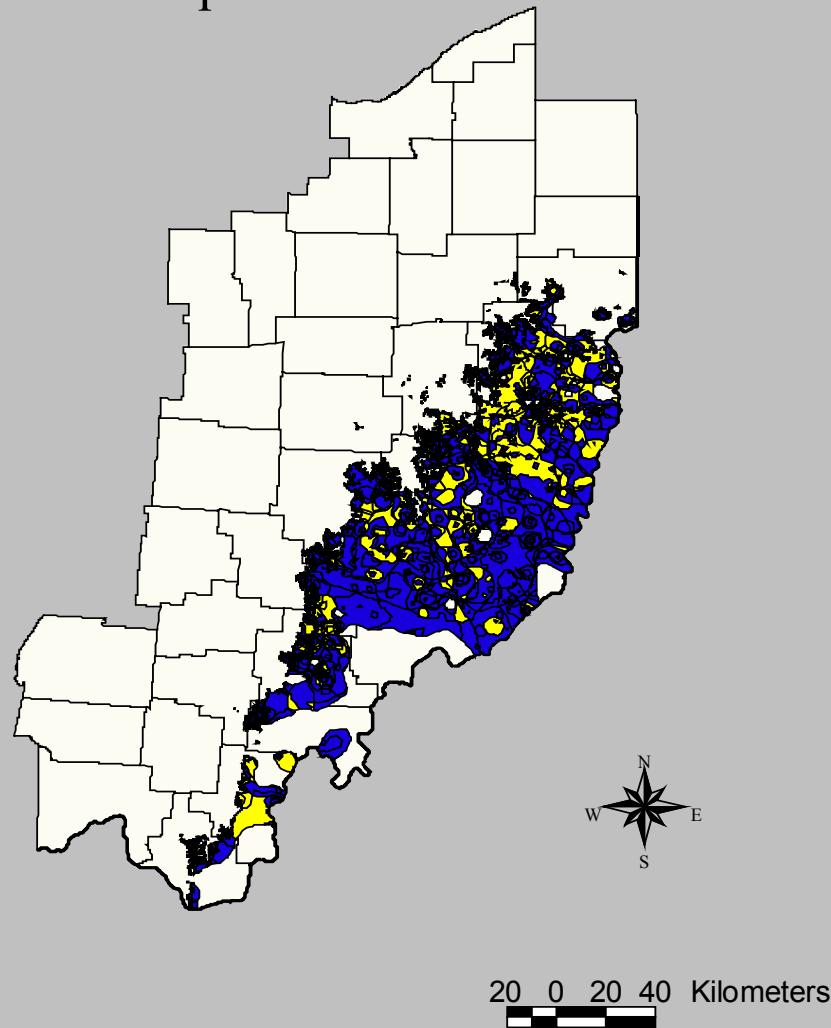
- 657-901
- 412-656
- 166-411



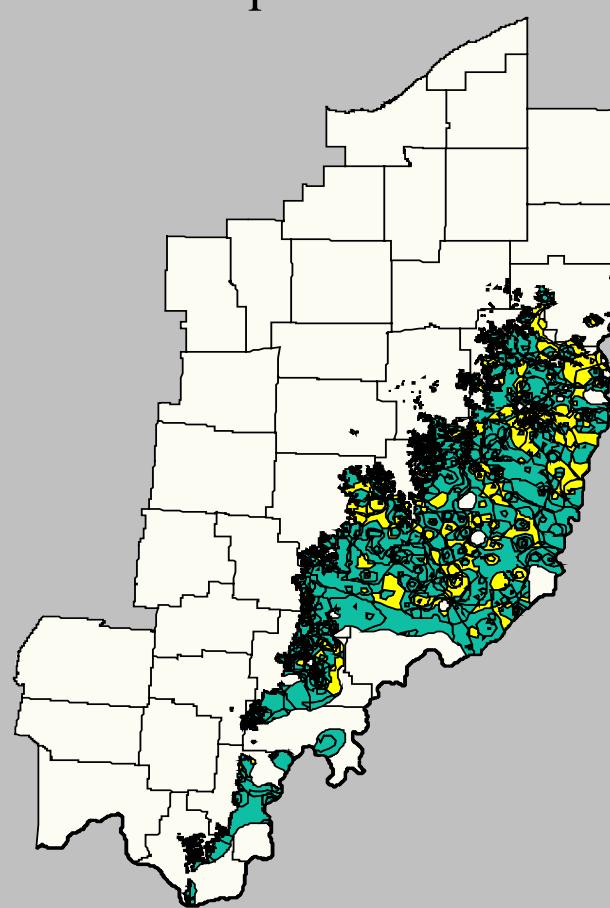
# What relationship exist between internal and external data layers?



Middle Kittanning Coal bed  
Query: Coal Thickness Greater  
than or equal to 42 inches.



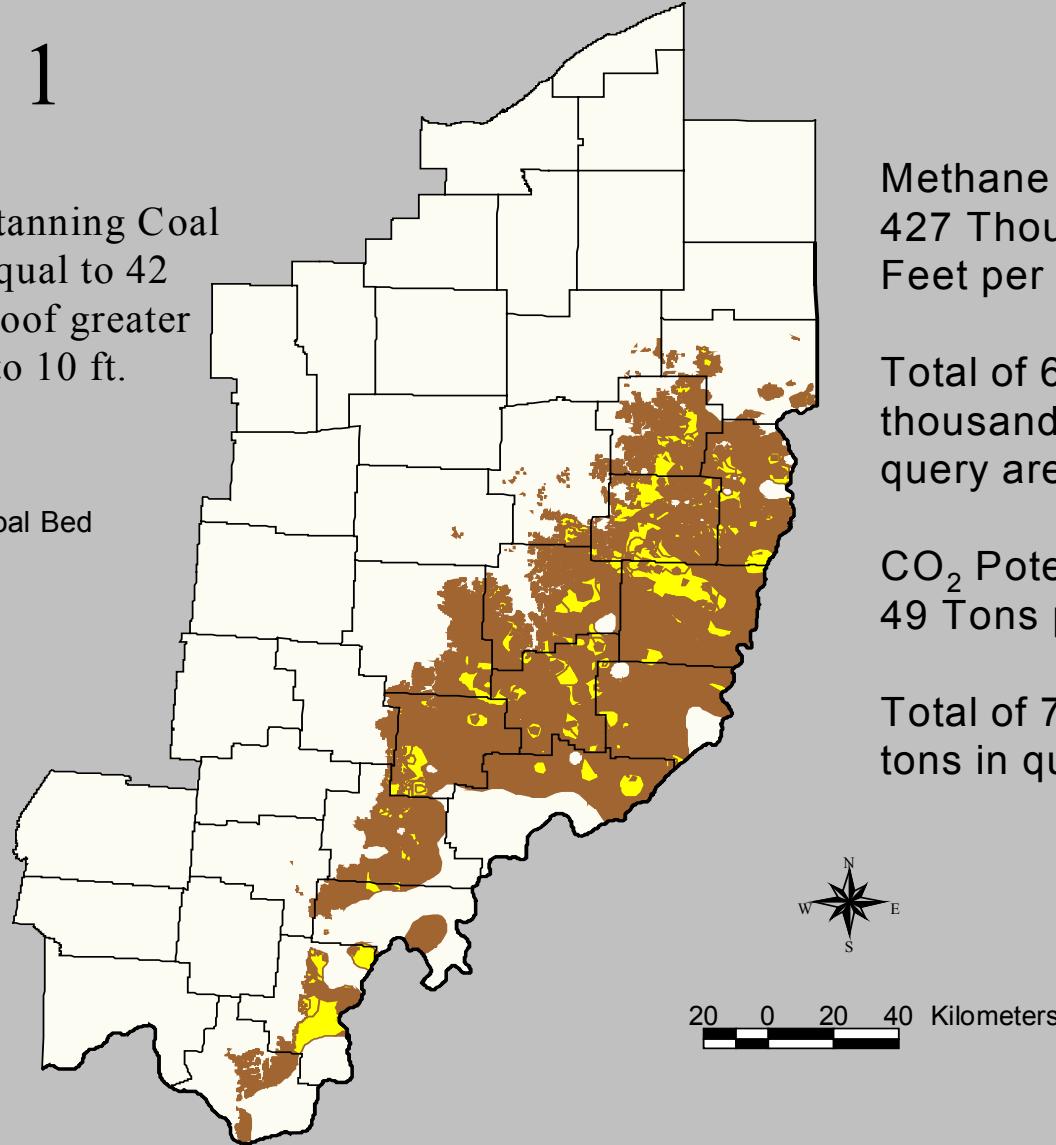
Middle Kittanning Coal bed  
Query: Shale Roof less than or  
equal to 10 ft.



# Query 1

Query: Middle Kittanning Coal  
greater than or equal to 42  
inches and shale roof greater  
than or equal to 10 ft.

-  Ohio Boundary
-  County Boundary
-  Middle Kittanning Coal Bed
-  County



Methane Potential =  
427 Thousand Cubic  
Feet per Acre

Total of 675 million  
thousand cubic feet in  
query area.

CO<sub>2</sub> Potential =  
49 Tons per Acre

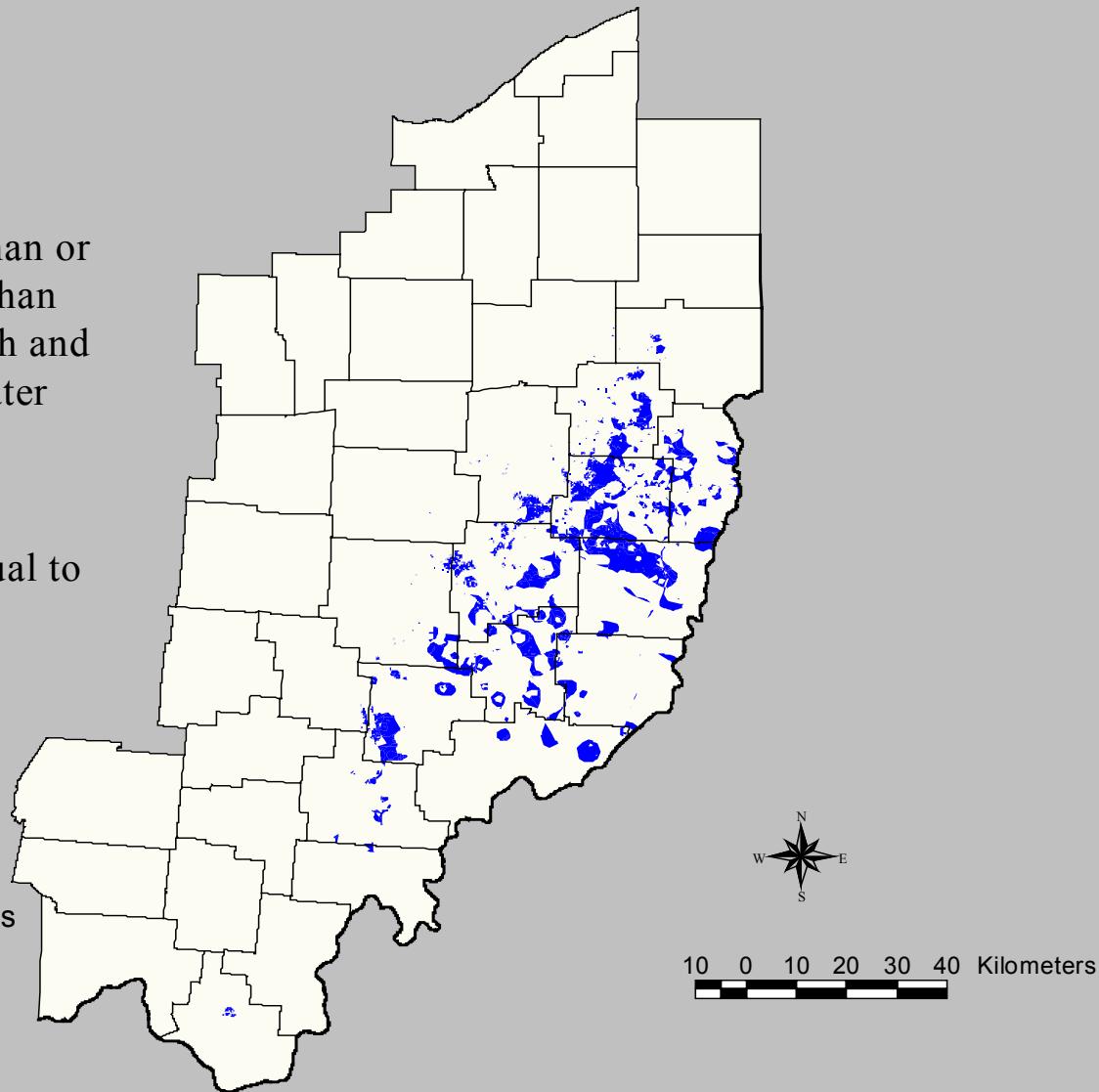
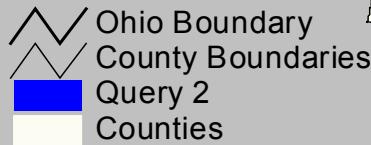
Total of 78 million  
tons in query area.

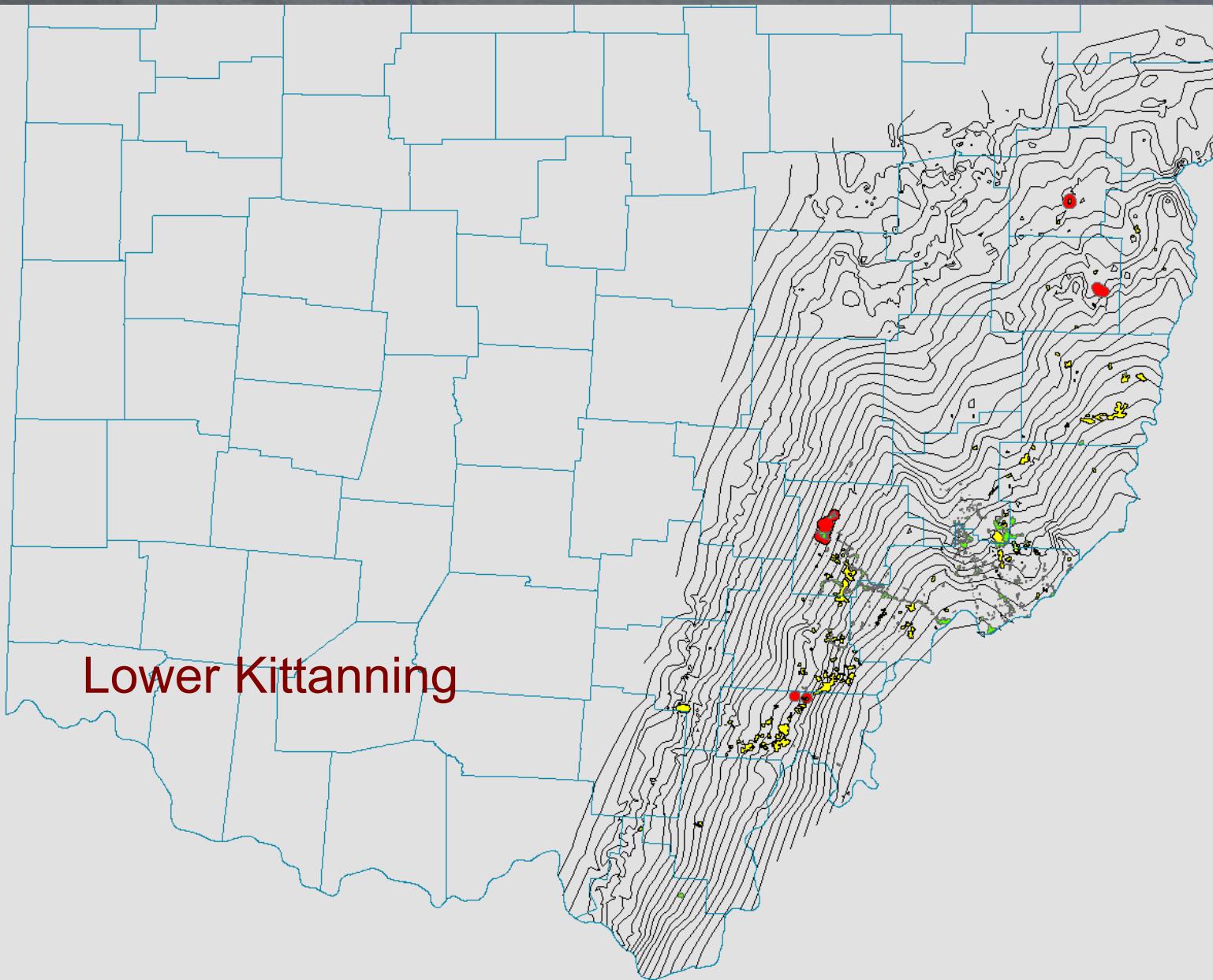


# Query 2

Query 2: Coal greater than or equal to 42 inches, less than or equal to 20 percent ash and moisture, shale roof greater than or equal to 10 ft.

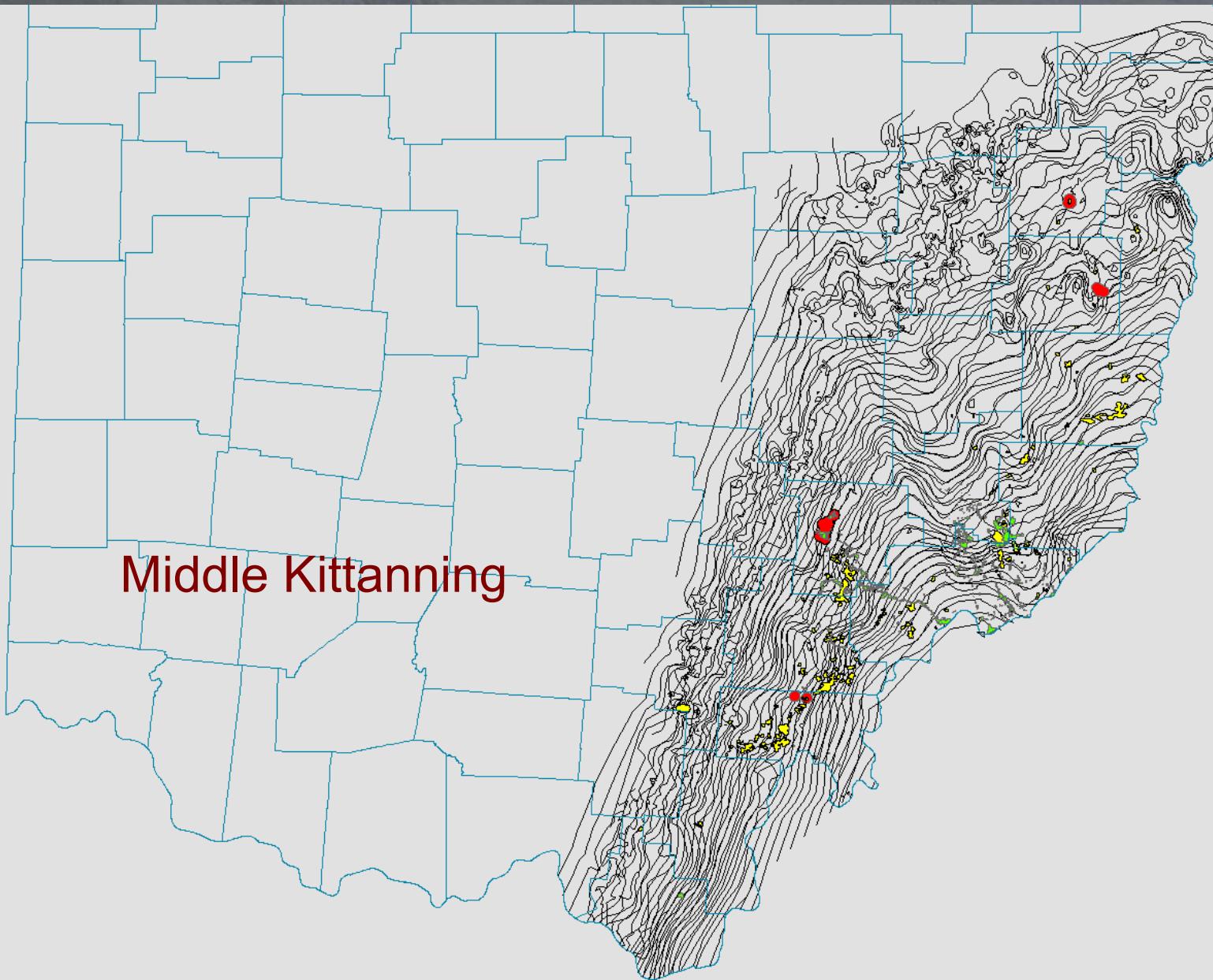
Results intersected with sulfur greater than or equal to 3 percent.

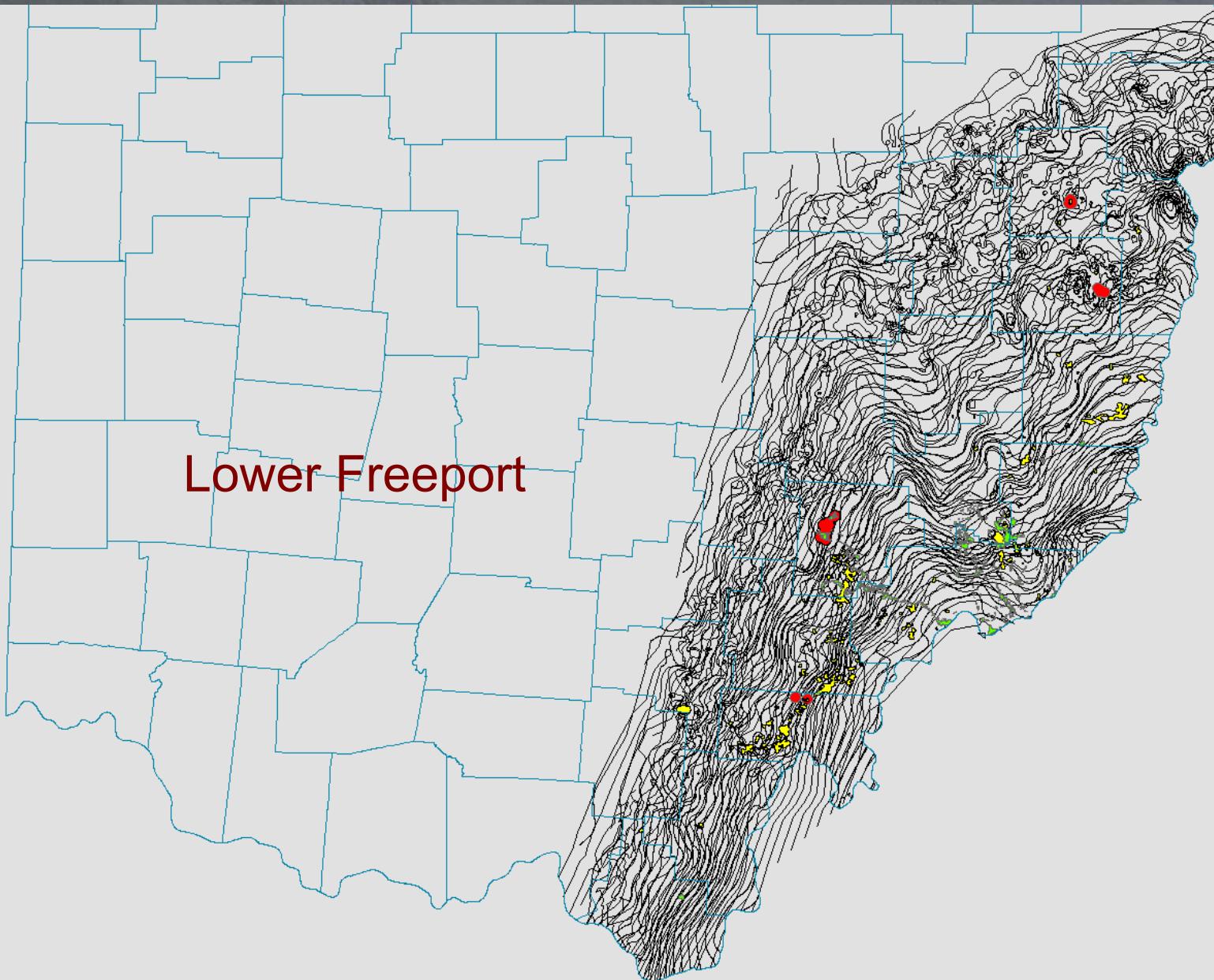


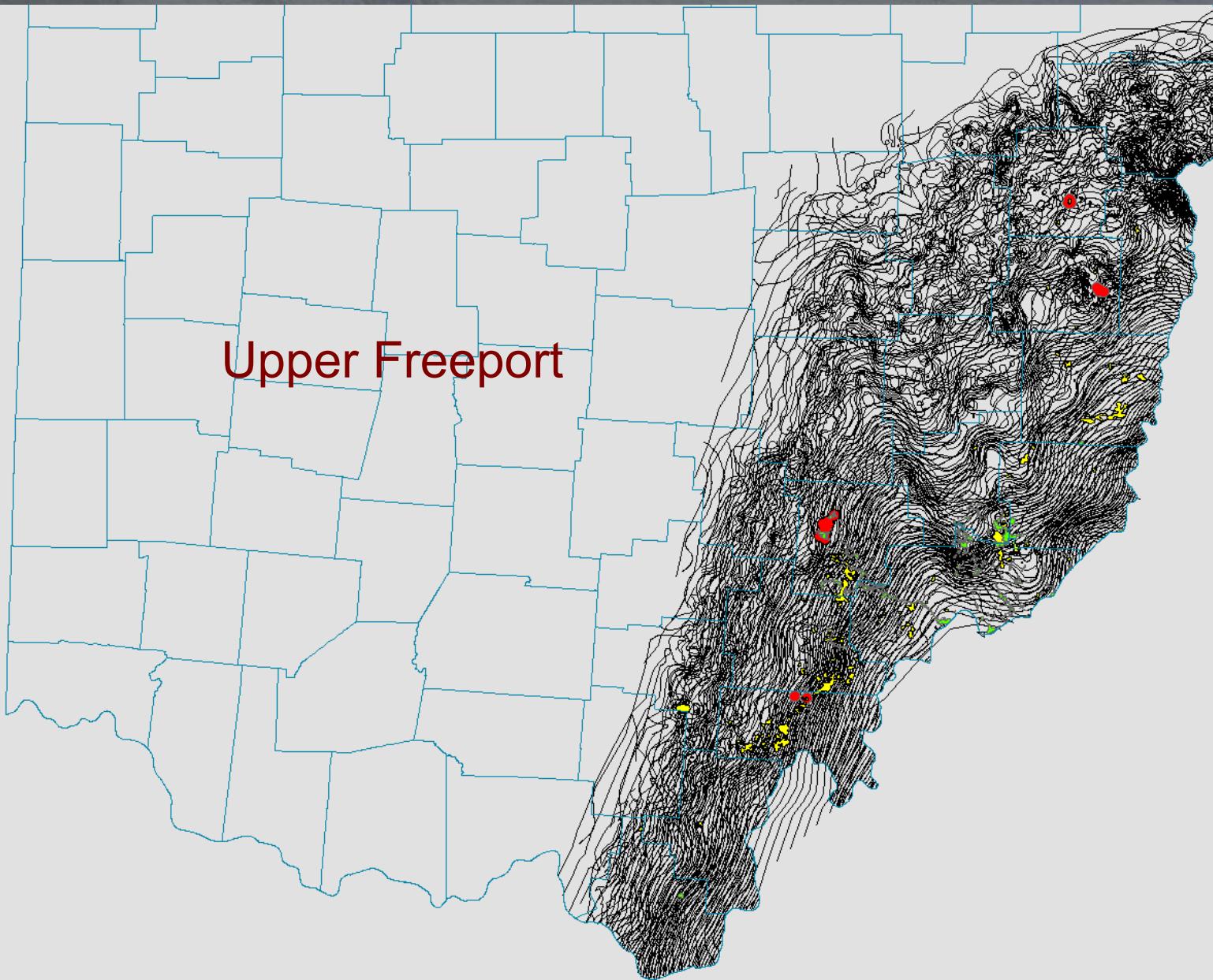


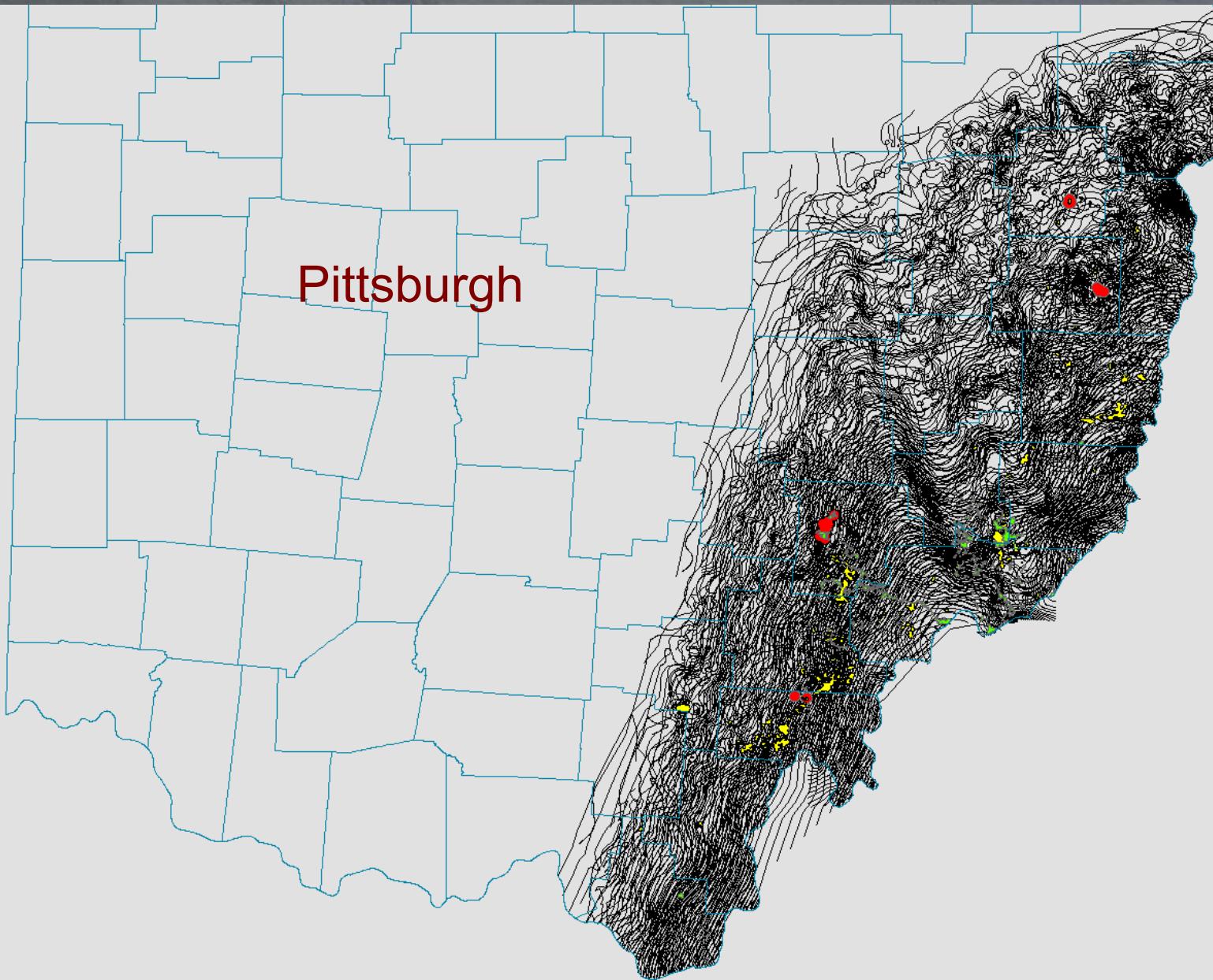
Lower Kittanning











## Acknowledgements

*A special thanks is given to L. Van Dorn, J. McDonald, and J. Wells who contributed to the completion of this presentation*

