

Co₂ Sequestration Potential in Kentucky Coal Beds

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Enhanced Gas Recovery From Kentucky Coal Beds

Kentucky coal adsorption $\sim 2 \text{ CO}_2 : 1 \text{ CH}_4$

Tasks -

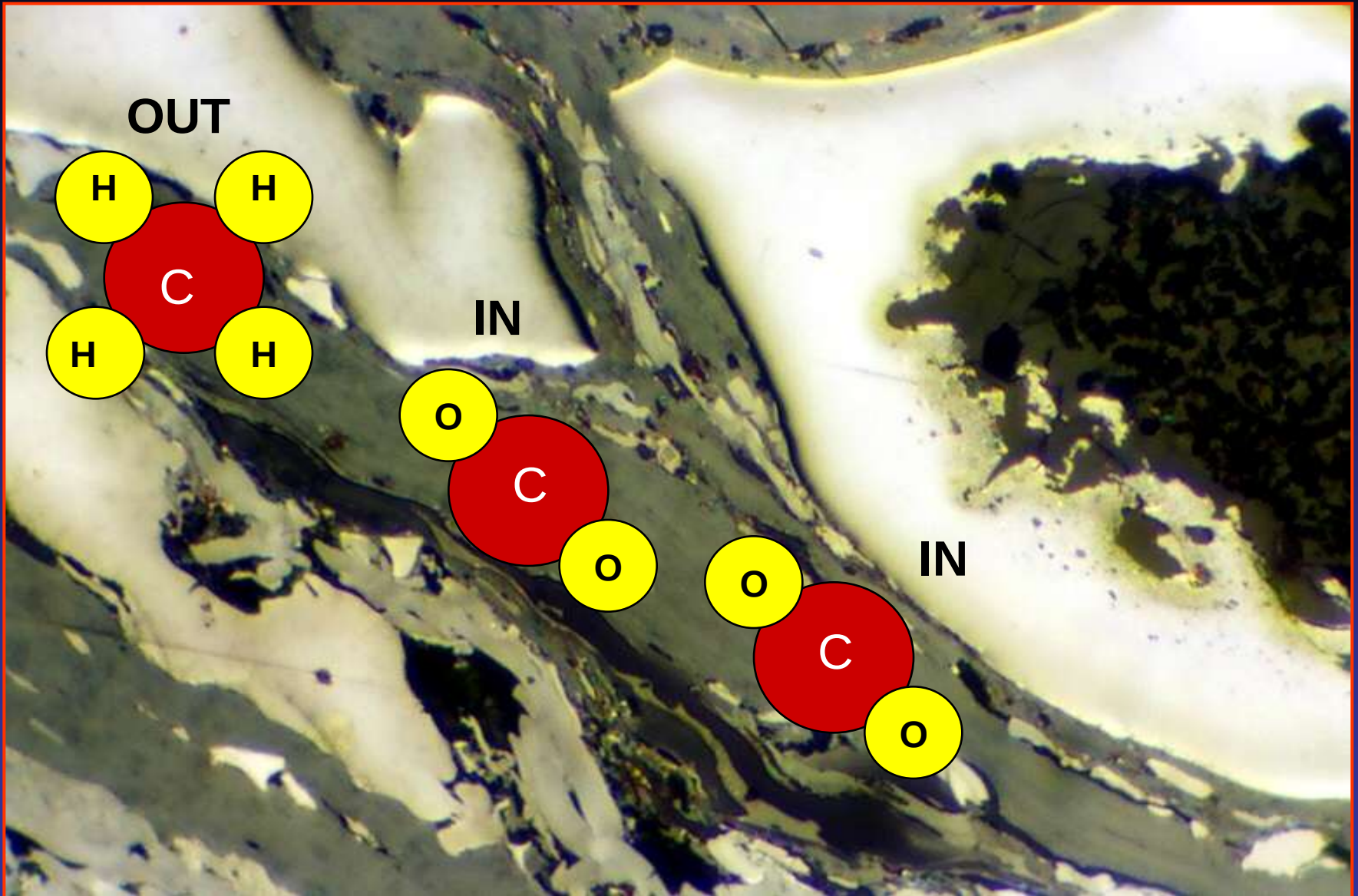
Identification of CBM target beds.

Identification of areas with cumulative coal thickness and lateral extent.

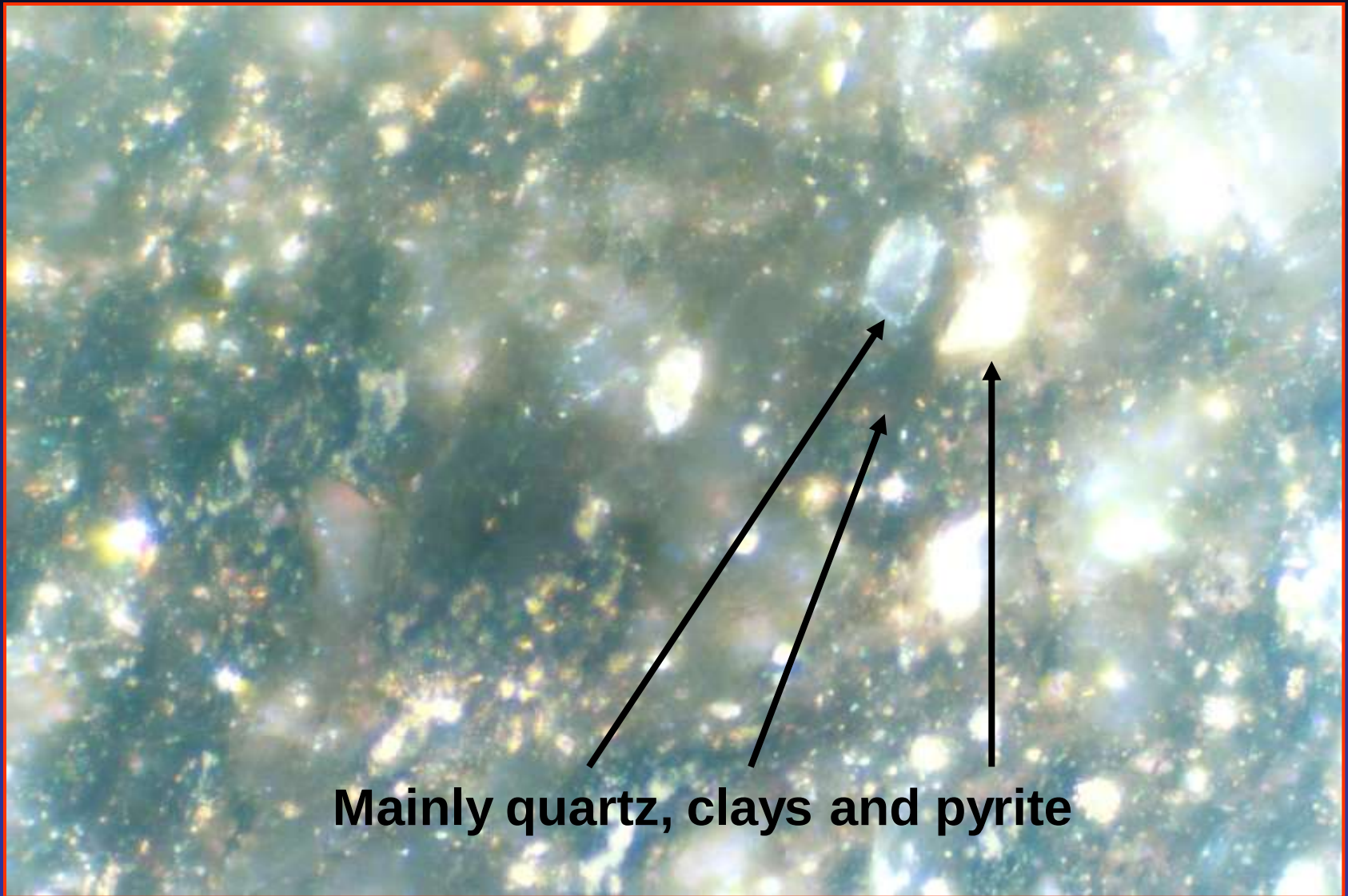
Identification of fault zones and mined out areas.

Paucity of CBM data – no EGR data.

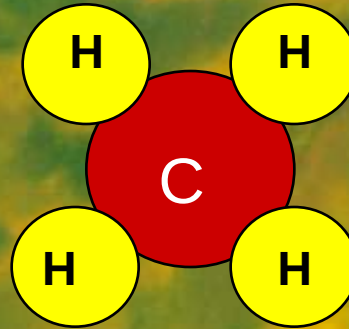
Kentucky bituminous coal



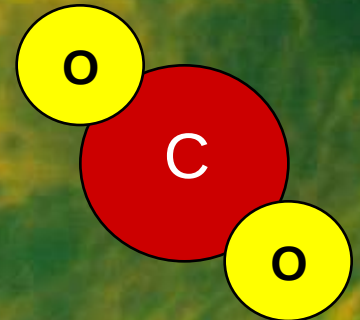
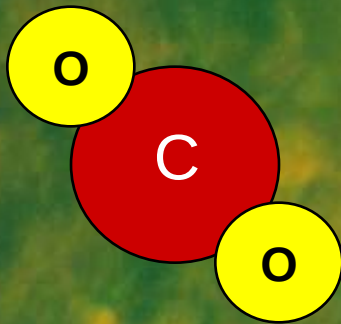
Devonian Shale – White Light



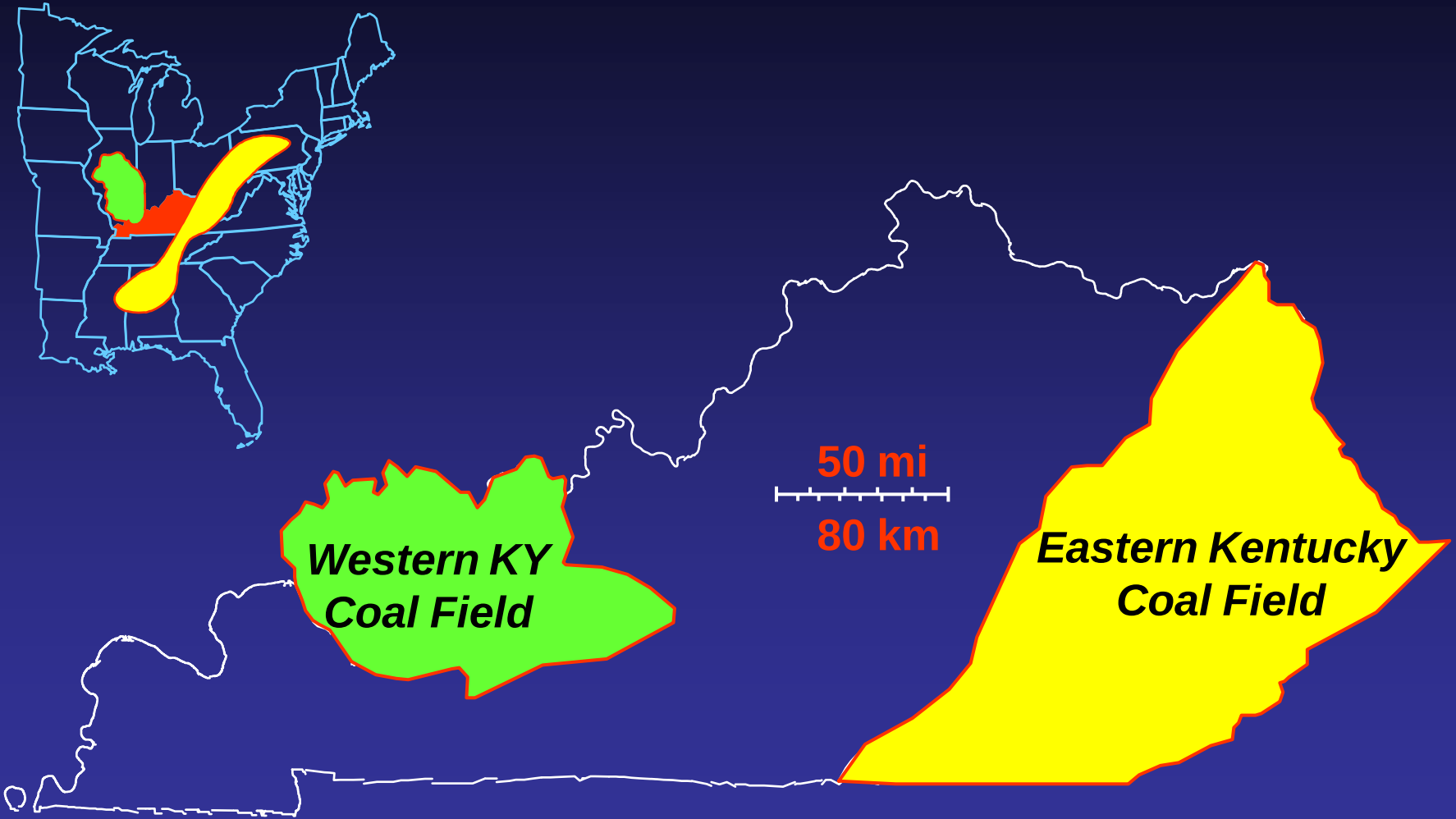
Devonian Shale – Fluorescent Light



Abundant organic matter of (mainly) algal origin

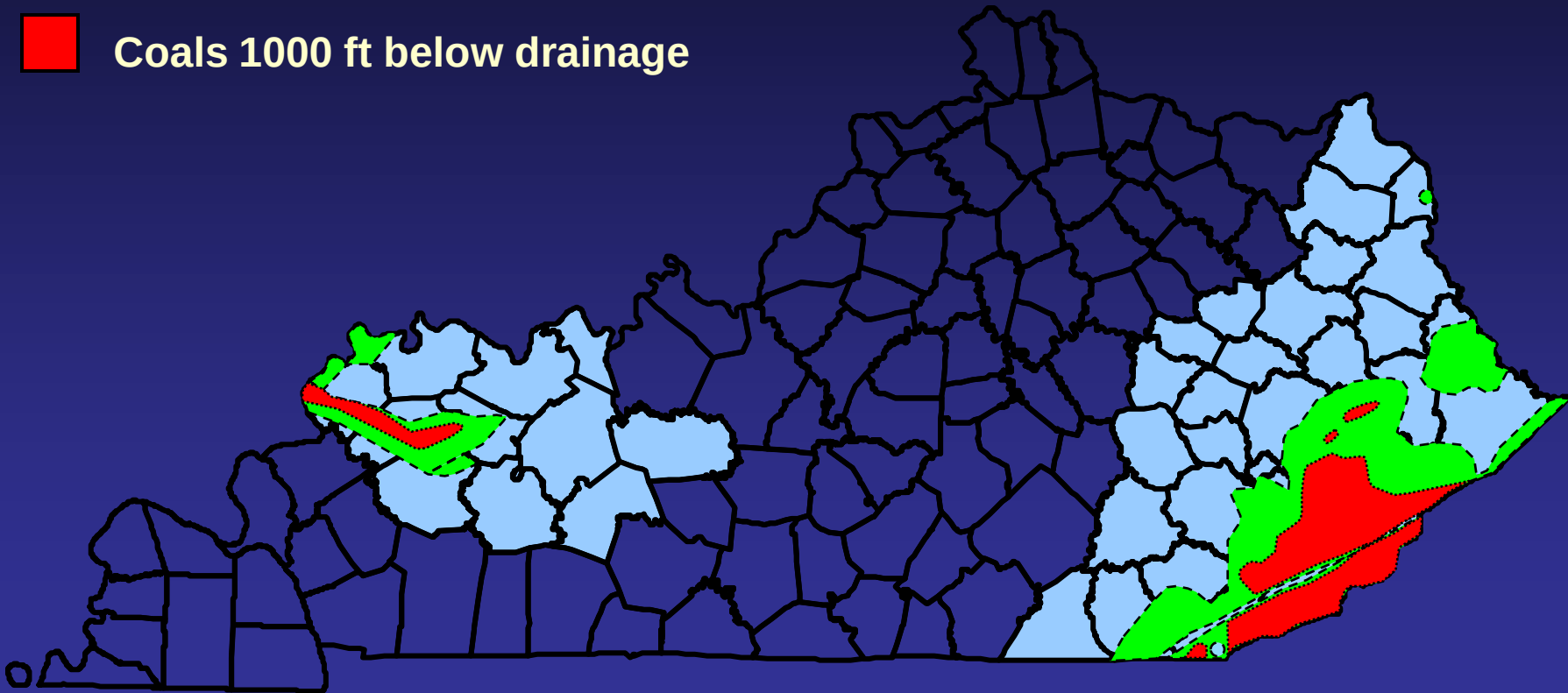


Coal Fields in Kentucky



Deep coals in Kentucky

- Coal fields
- Coals 500 ft below drainage
- Coals 1000 ft below drainage



WKY CBM Potential - Stratigraphic Summary

Period / System	Euro- pean Stage	US Mid- Continent	Group	Formation	Lithology	
Pennsylvanian	Upper	Vir- gilian	McLeansboro	Mattoon Bond Patoka		
		Missourian				
	Middle	Desmoinesian	Raccoon Creek	Shelburn Carbondale		
		Bolsovian		Tradewater		
		Duck-mantian				
Low.	Lang-settian	Morrowan	Caseyville			

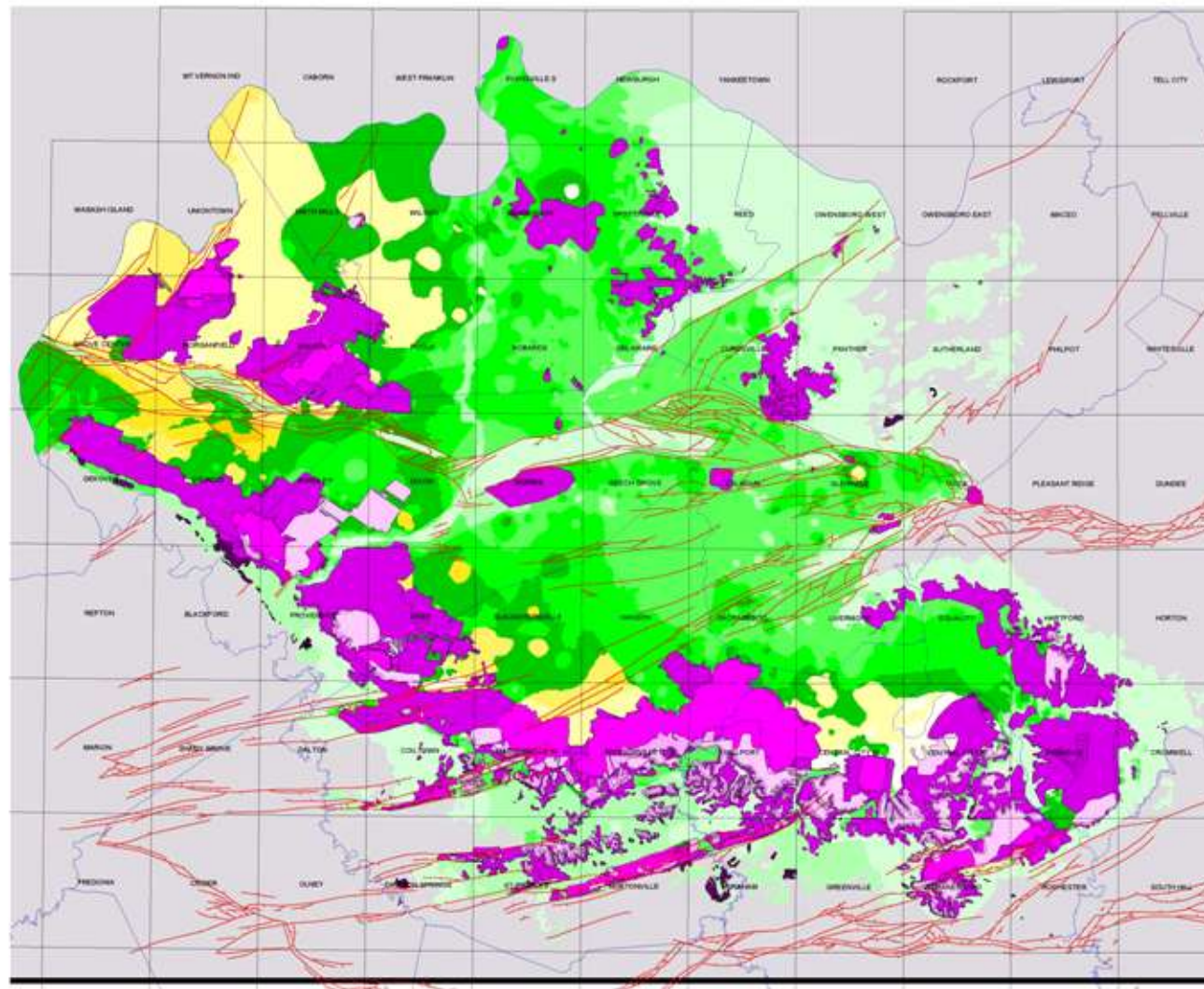
Poor - thin, discontinuous coals. Limited Fm distribution.

Good - thick, extensive coals. Widespread Fm distribution.

Maybe - coals near the top may have some potential.

Poor - thin, discontinuous coals. Limited Fm distribution.

Cumulative coal thickness for the western Kentucky No. 6, No. 7, No. 9, No. 11, No. 12, and No. 13 coals



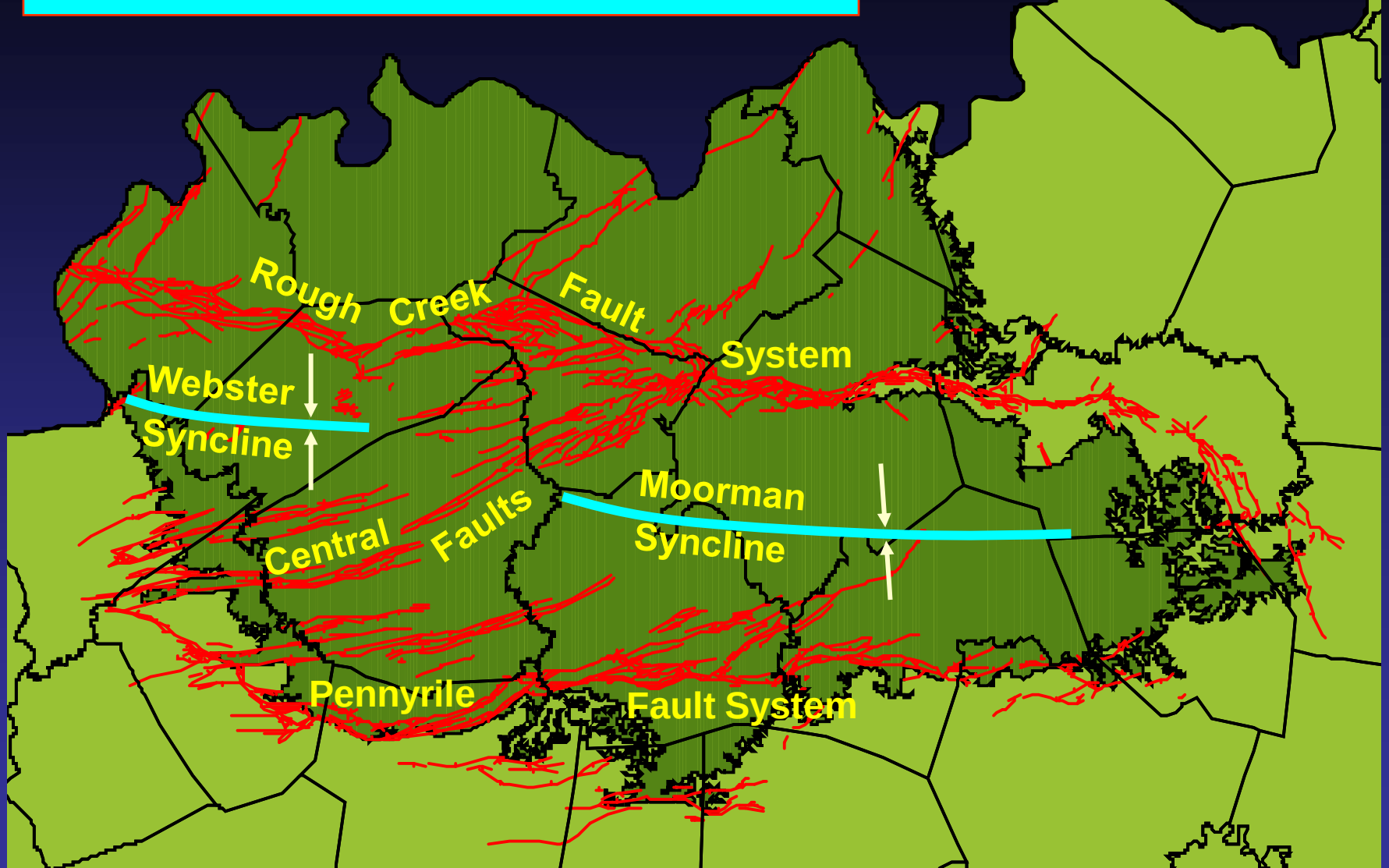
- >15 cum. ft.
- <15 cum. ft.
- Mined out
- Faults

Thickness by Springfield coal
where cumulative coal greater
than 15 ft.

Cumulative coal thickness in feet
for coal area that is less than
15 ft.

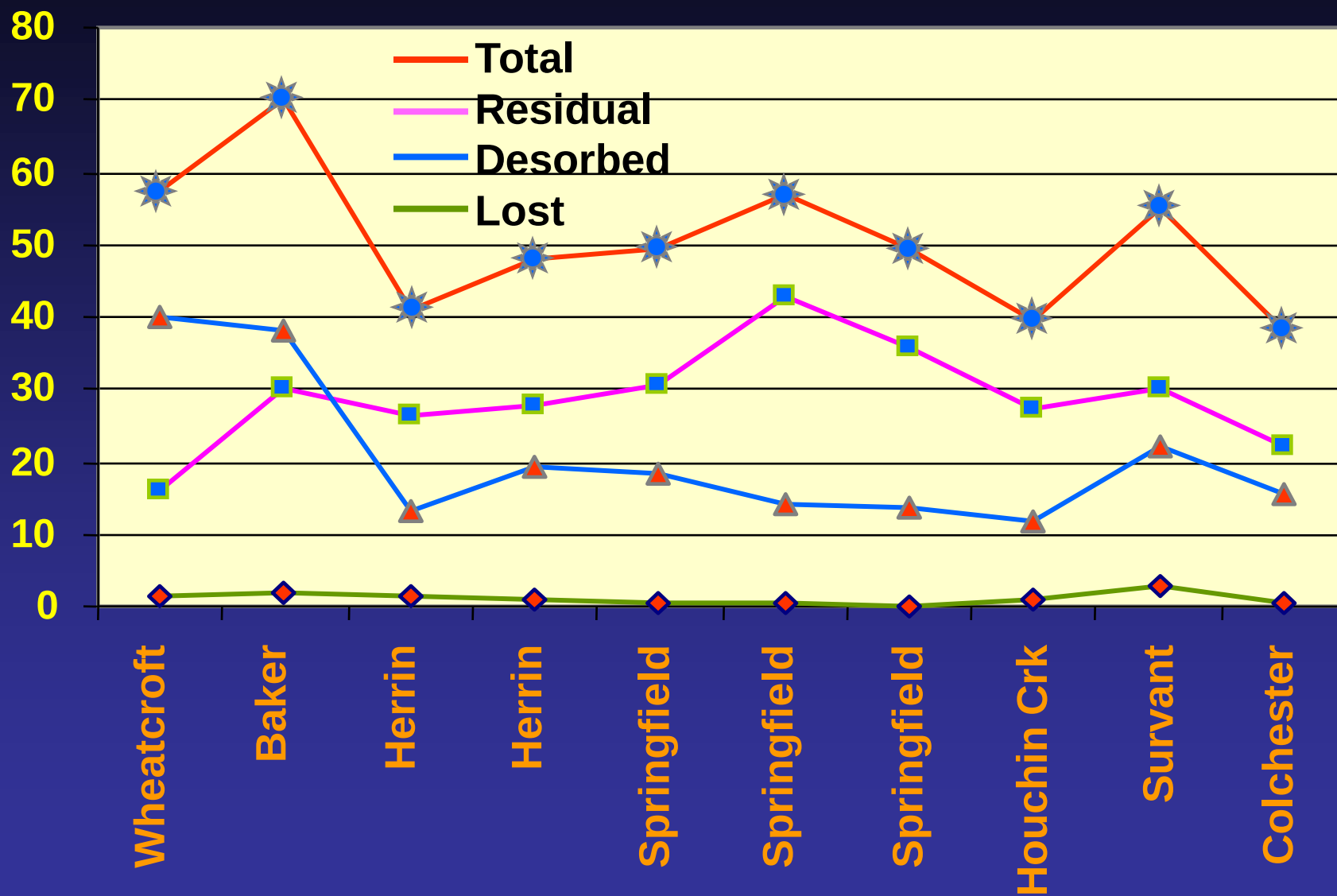
7 0 7 14 Miles

Western Kentucky Coal Field Structural Features



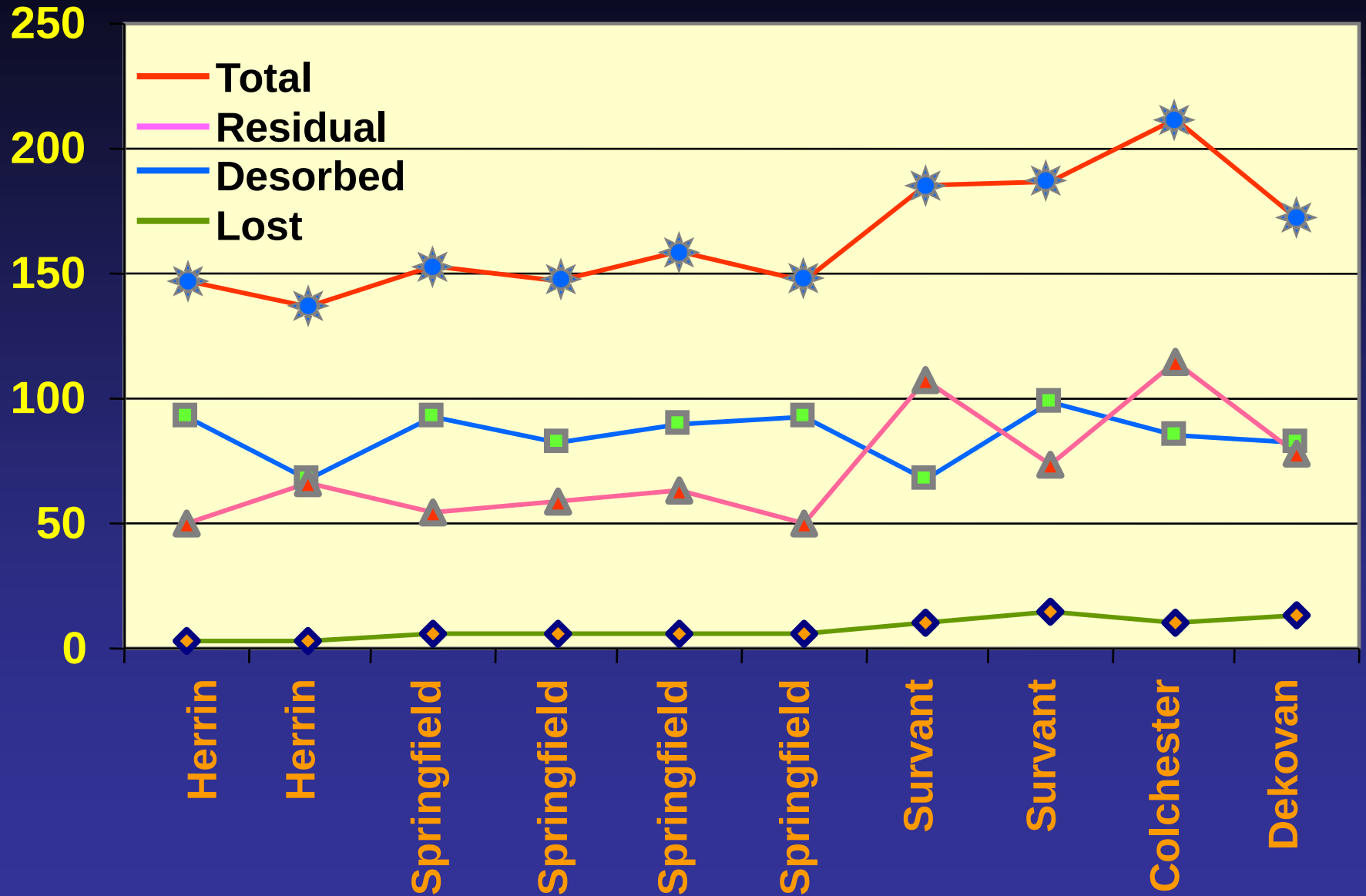
Scf/
ton

CBM From Western Kentucky Coals



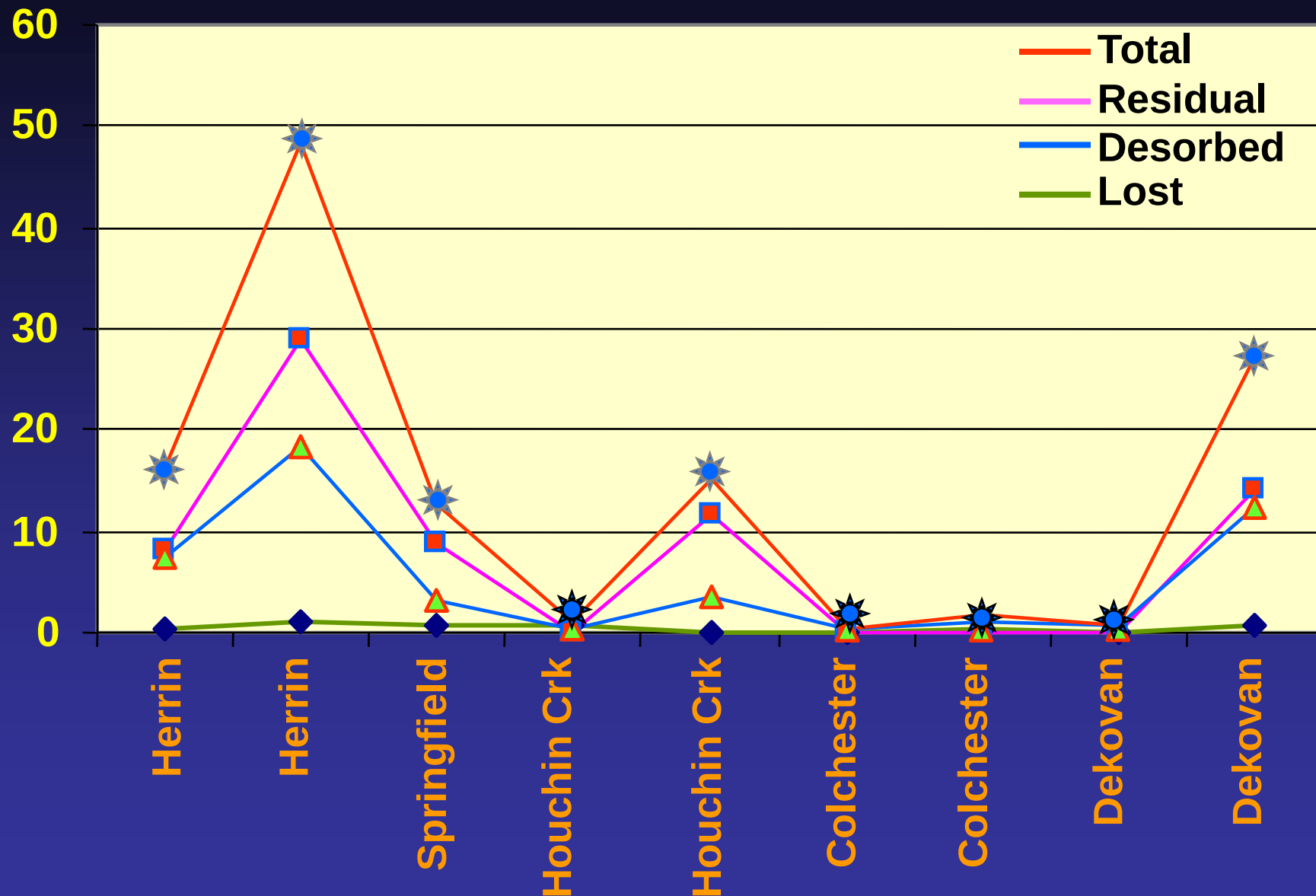
CBM From Western Kentucky Coals

Scf/
ton



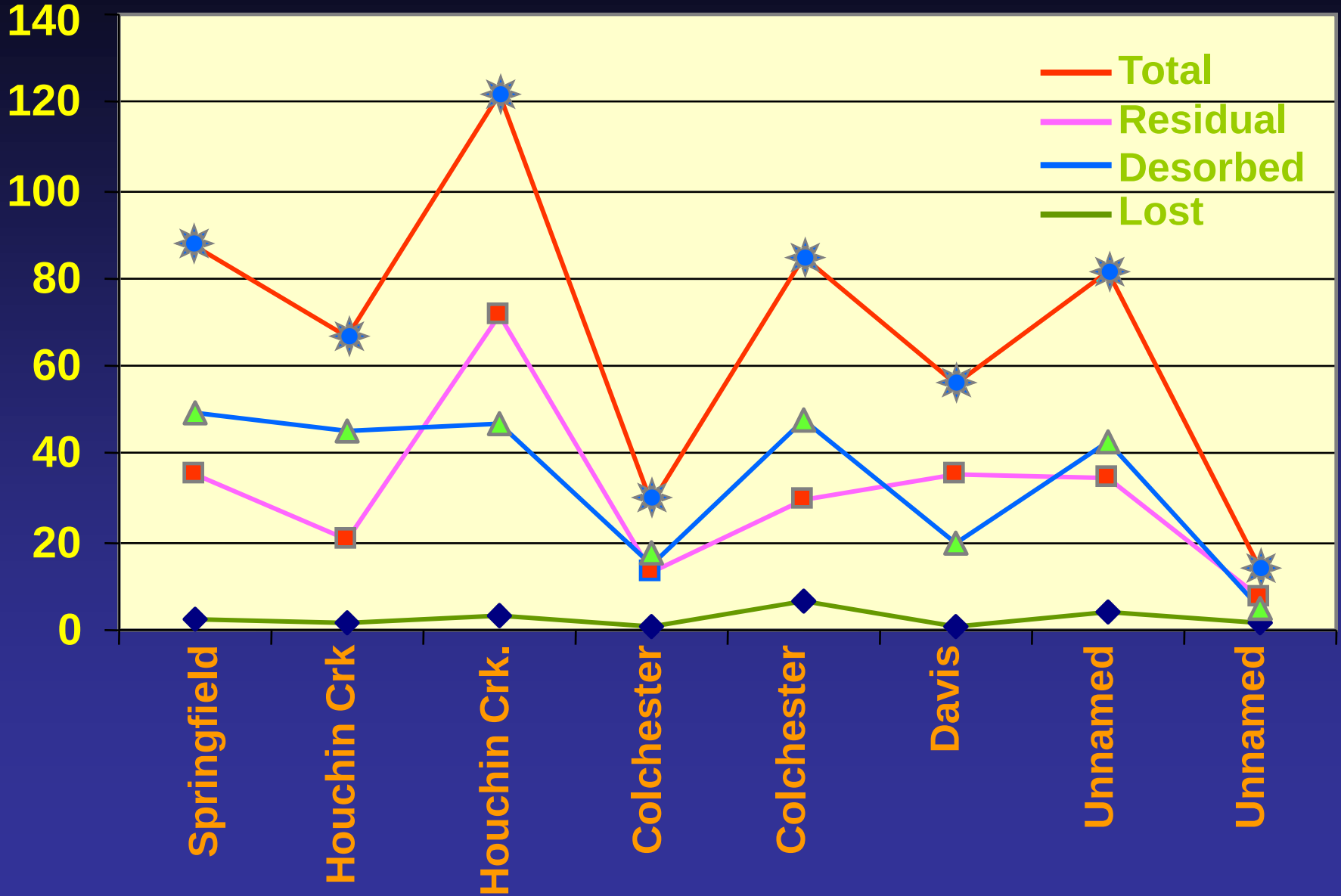
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CBM From Western Kentucky Shales



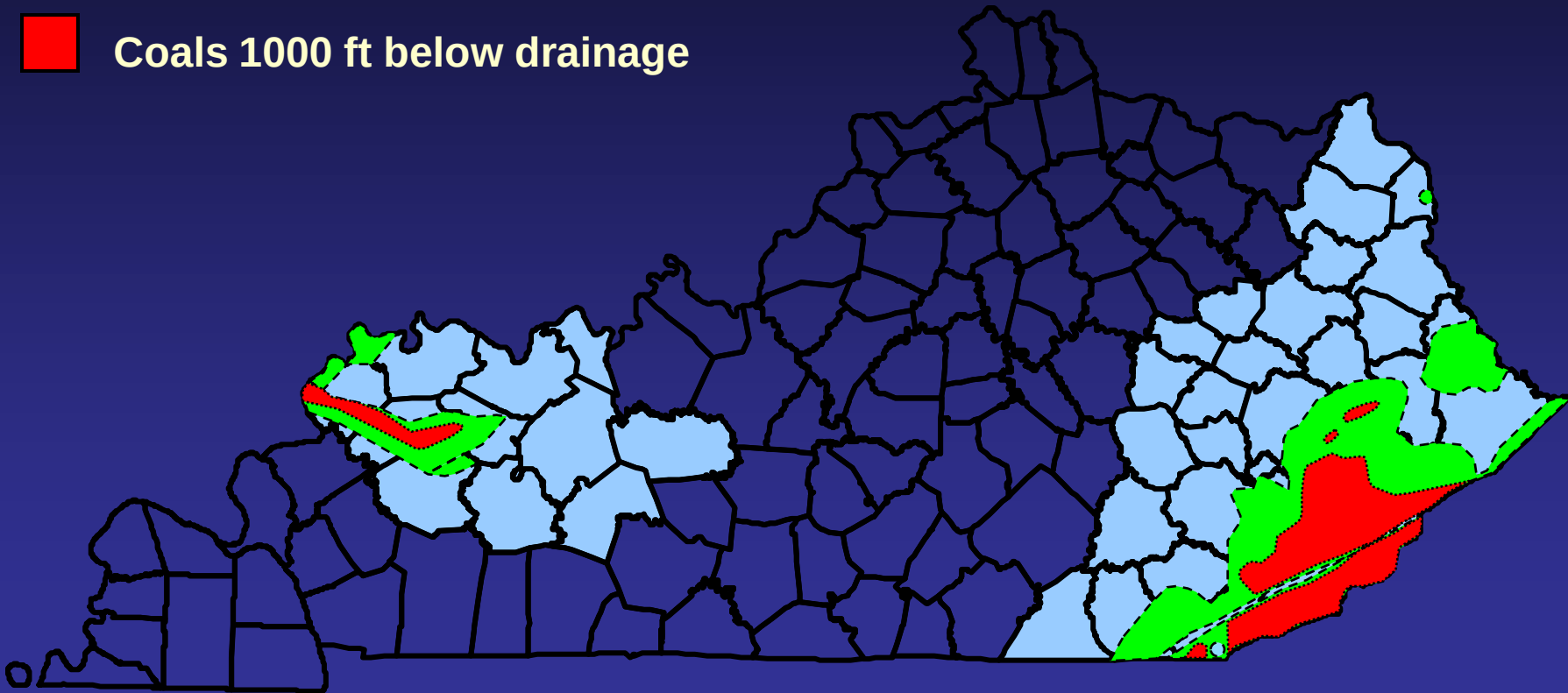
CBM From Western Kentucky Shales

Scf/
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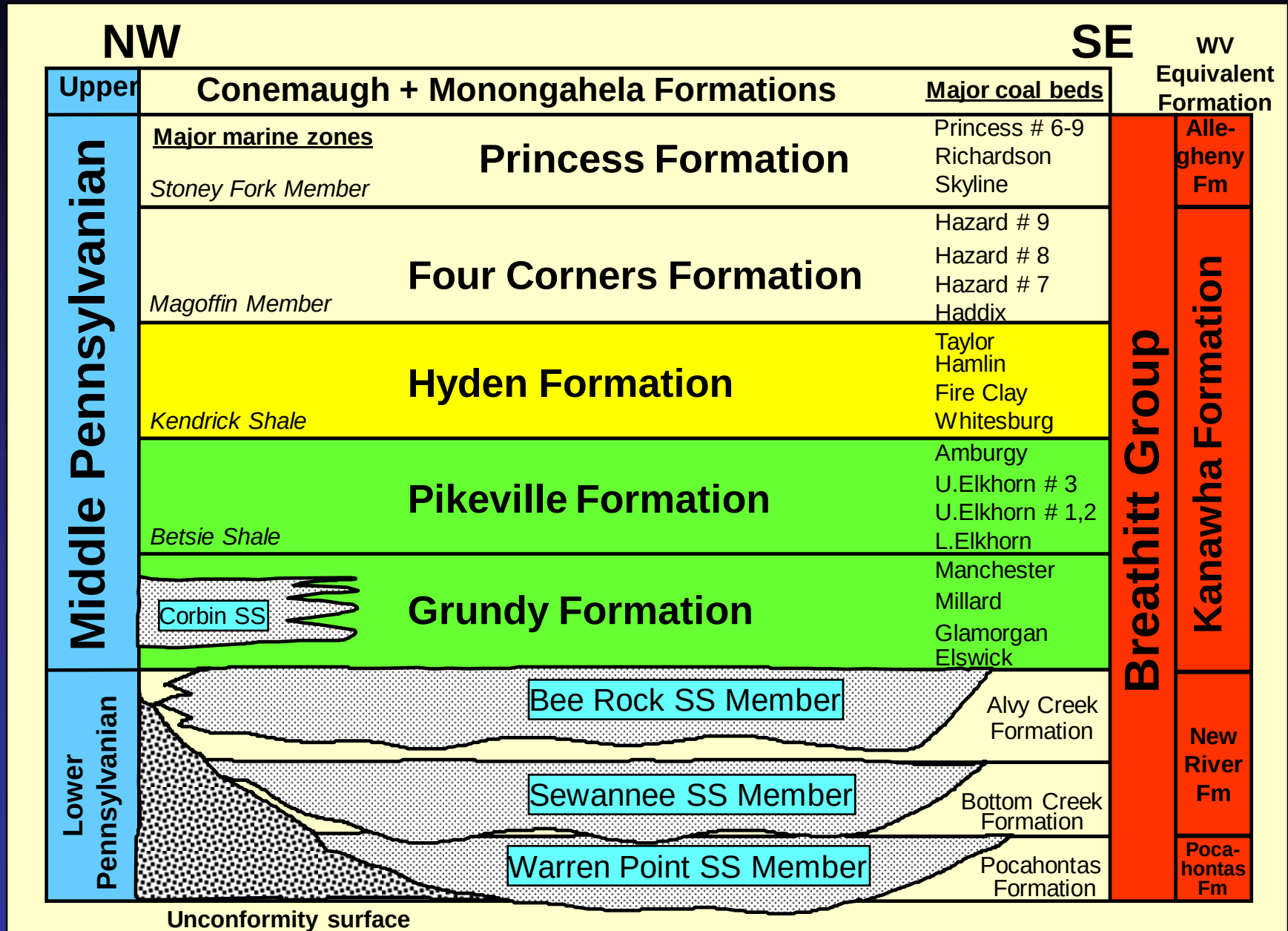


Deep coals in Kentucky

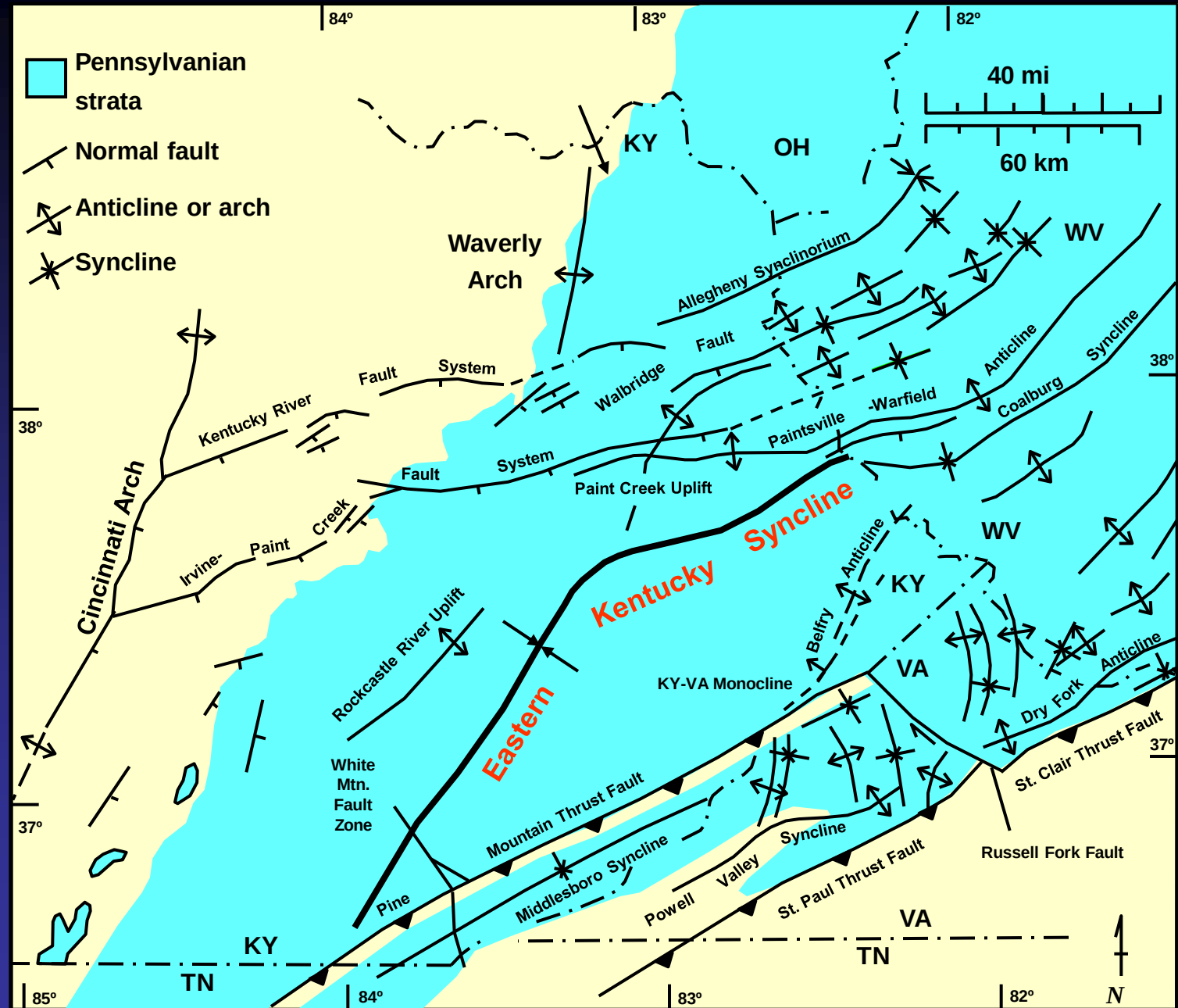
- Coal fields
- Coals 500 ft below drainage
- Coals 1000 ft below drainage



EKY CBM Potential - Stratigraphic Summary



Structural Features in the Eastern Kentucky Coal Field



Structure on the Lower Elkhorn coal bed

Sea level - 500 ft

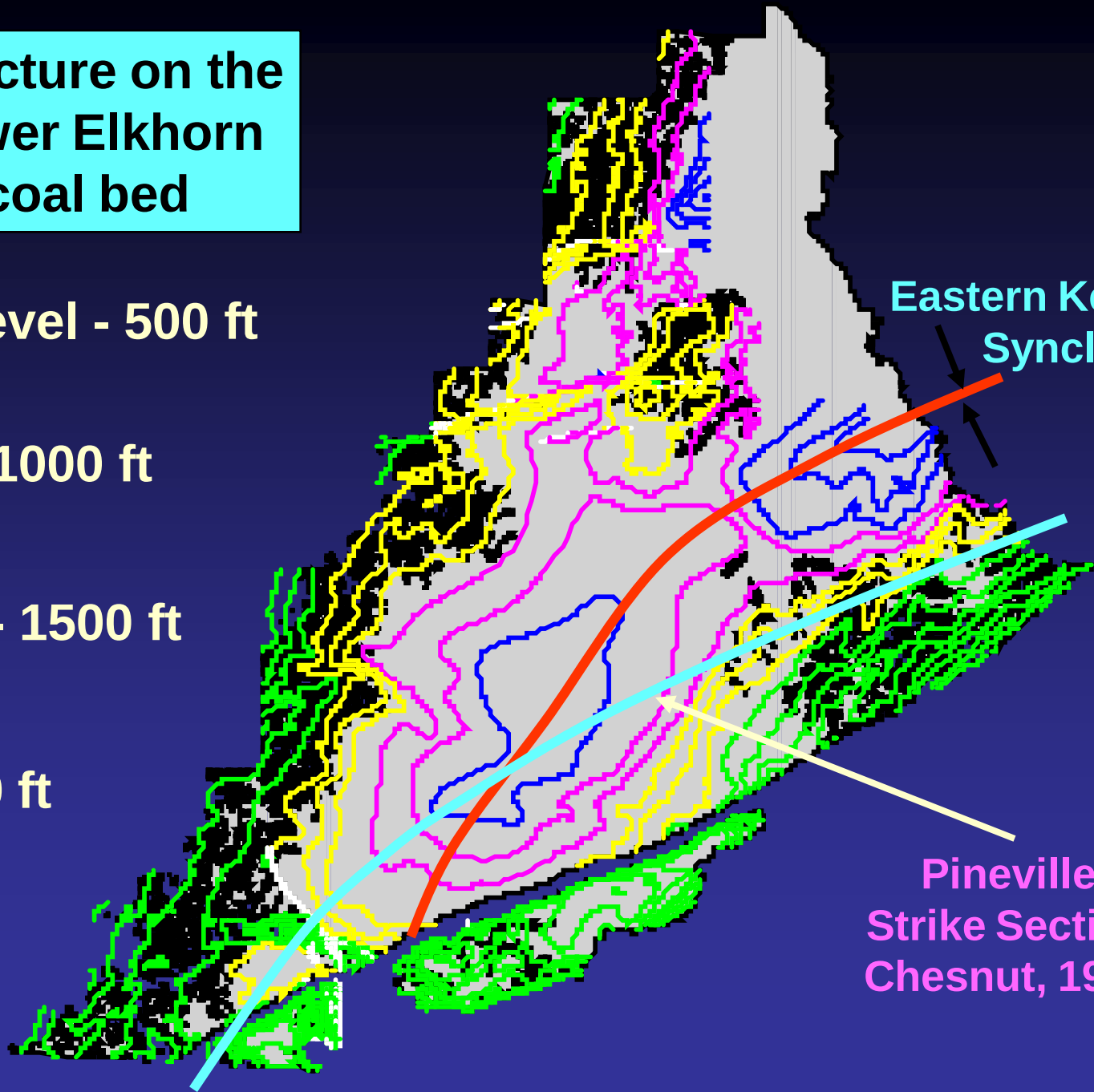
501 - 1000 ft

1001 - 1500 ft

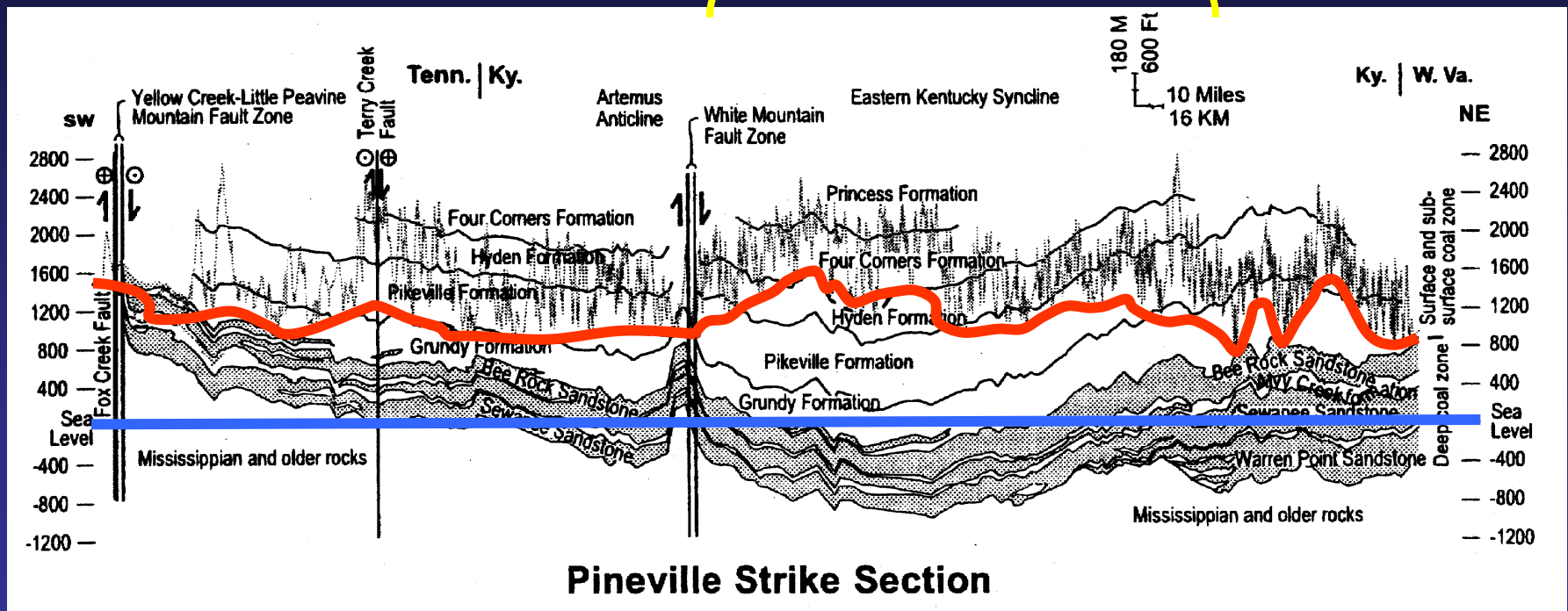
>1500 ft

Eastern Kentucky
Syncline

Pineville
Strike Section
Chesnut, 1992



Area of the EKCF with significant below drainage coal resources in the Hyden, Pikeville and Grundy Formations

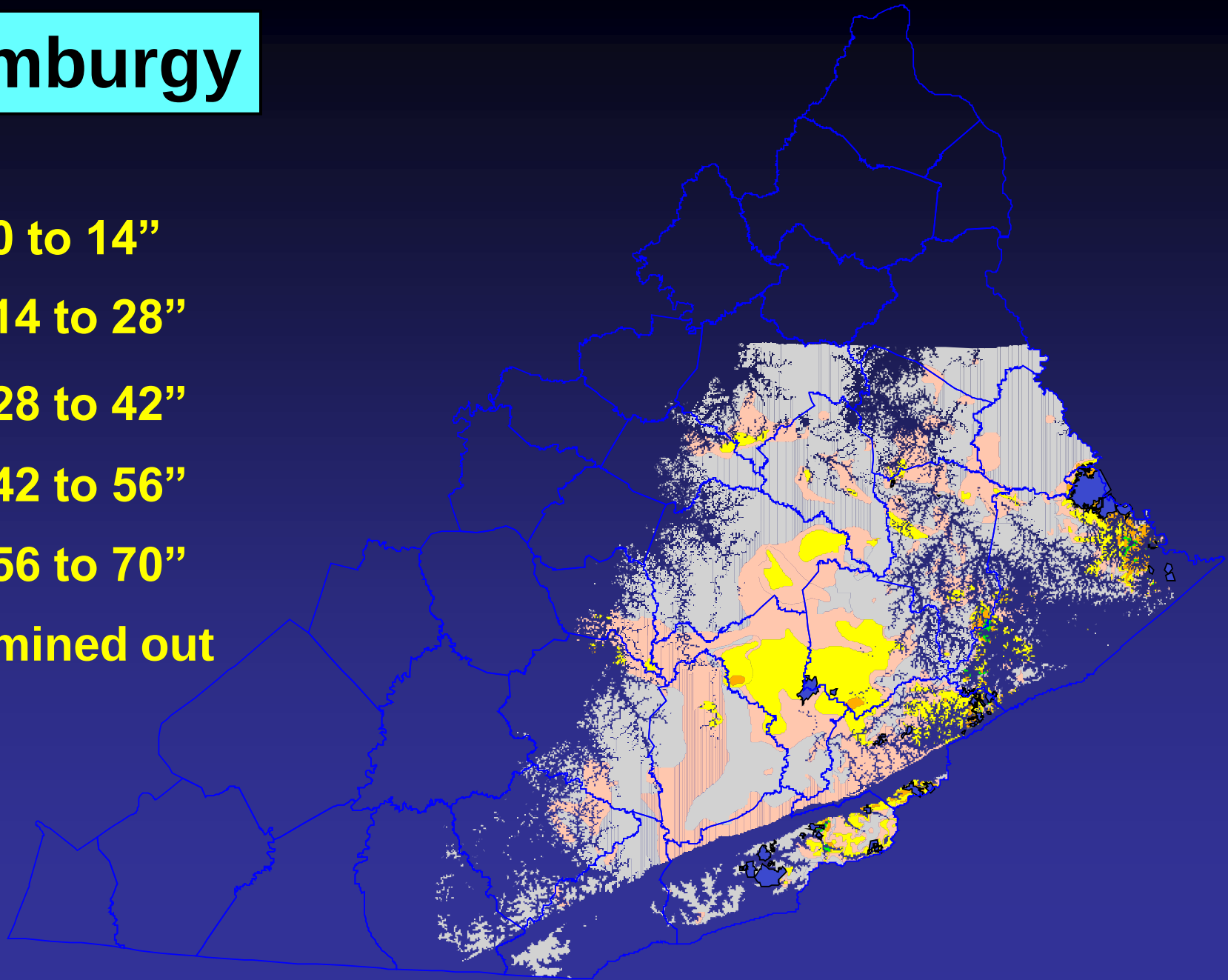


Regional Drainage level

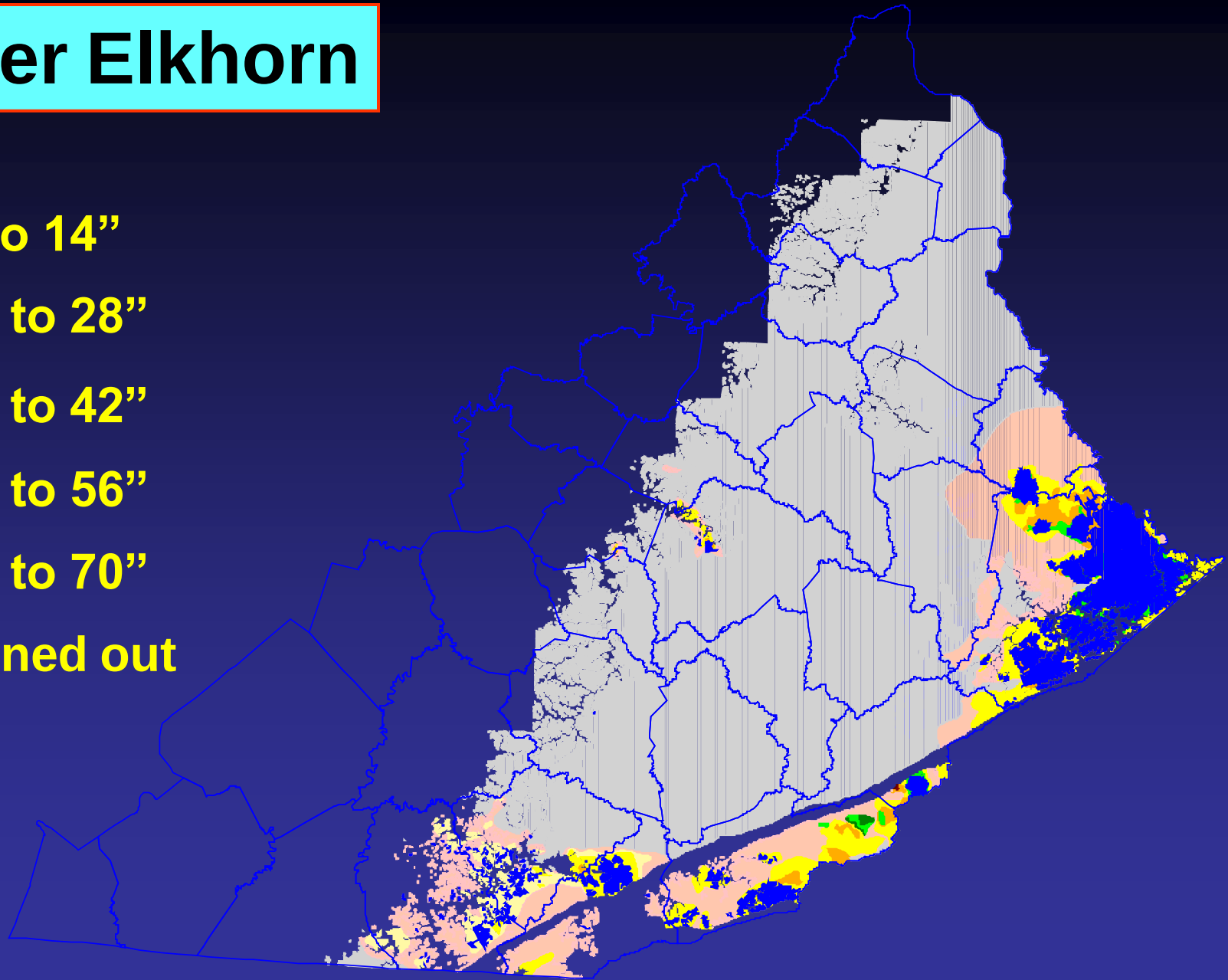
Sea Level

Cross section from Chesnut, 1992

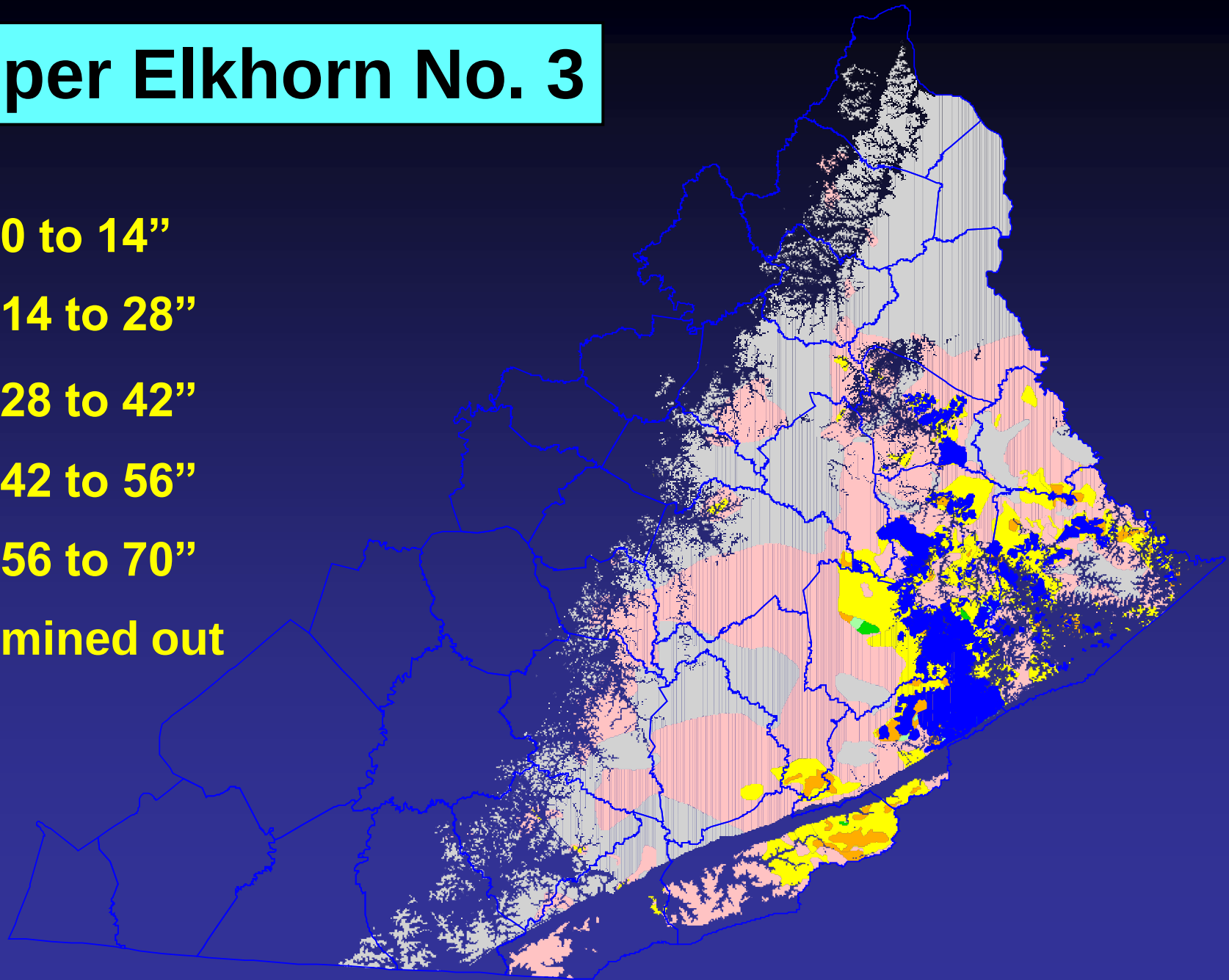
Amburgy



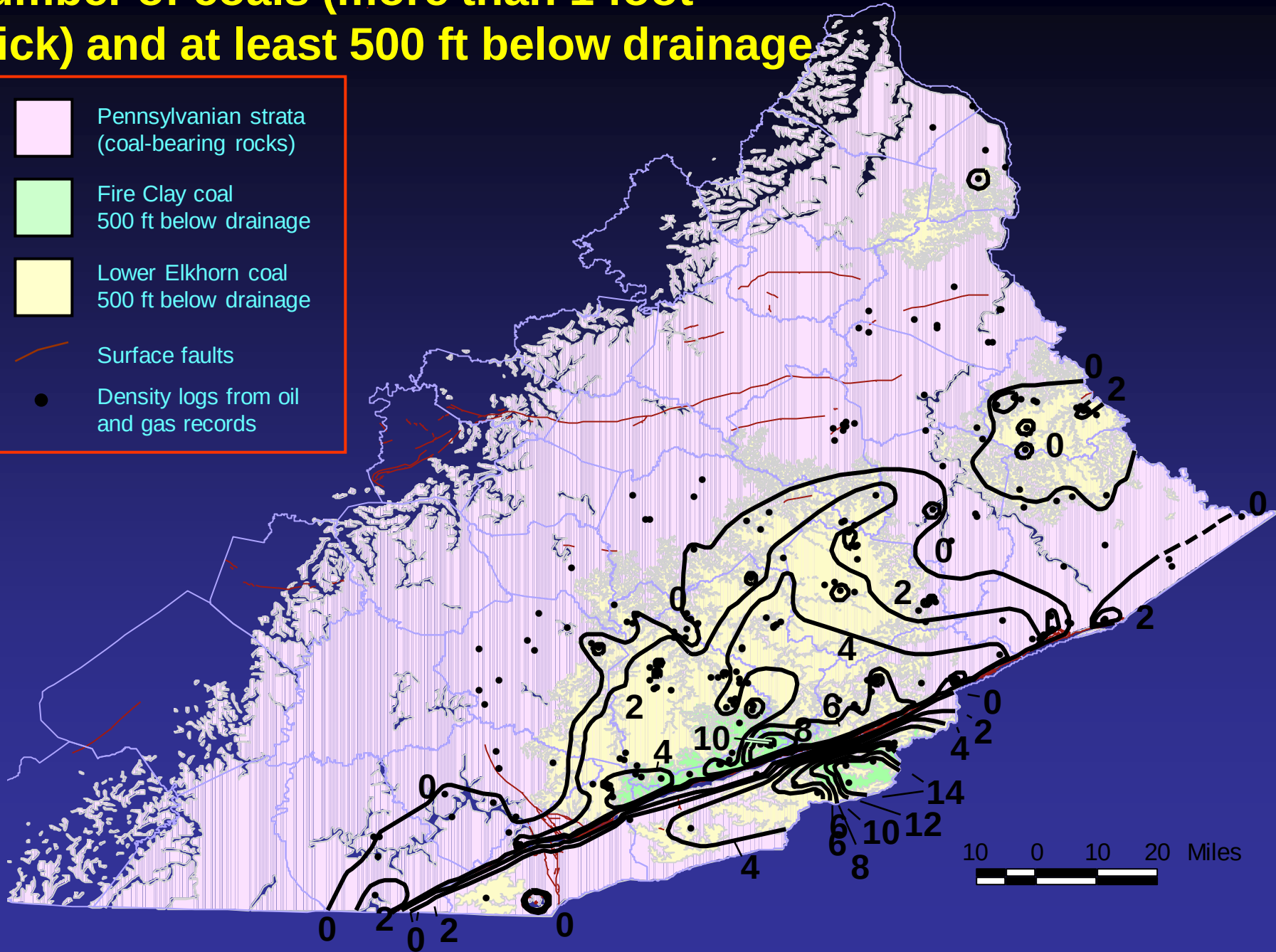
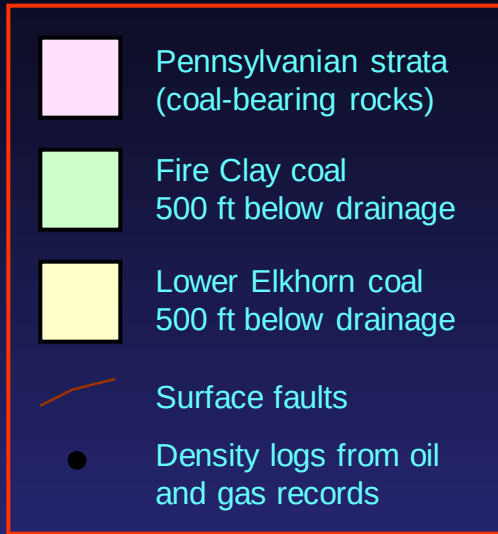
Lower Elkhorn



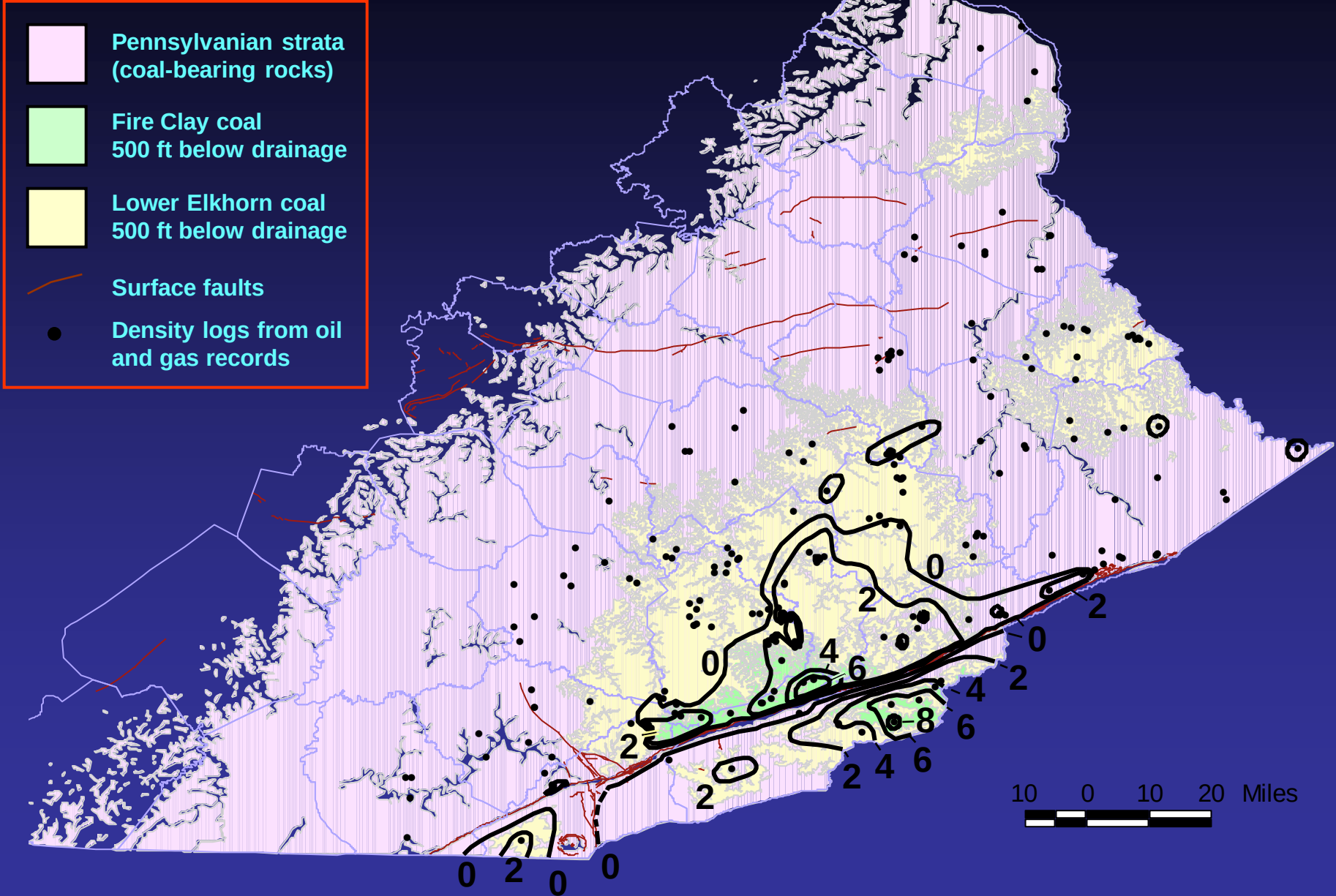
Upper Elkhorn No. 3



Number of coals (more than 1 foot thick) and at least 500 ft below drainage



Number of coals (more than 1 foot thick) and at least 1000 ft below drainage



Project Goals for Coal EGR

Industry Partner

Provide core samples for analysis in an area that might be suitable for EGR.

KGS

Provide analytical data

- Canister desorption

- Gas composition

- Gas origin

- CH₄ and CO₂ adsorption isotherm data

- Permeability testing

Thank You! – Questions?

