

An Introduction to the Berea and Rogersville Shales in Kentucky



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Kentucky Geological Survey

Appalachian Chapter NARO, West Liberty, KY 16-May-2015

Kentucky Geological Survey

- Research & Public Service Center
- Established 1838
- Focus areas
 - Research in earth resources & processes
 - Disseminate data, knowledge, & experience
- Stakeholders
 - Public
 - Industry
 - Government
 - Educators



WWW.UKY.EDU/KGS

The screenshot displays the website for the Kentucky Geological Survey (KGS) at www.uky.edu/KGS/. The page features a blue header with the UK logo and the text "Kentucky Geological Survey Earth Resources—Our Common Wealth". A navigation bar includes links for Home, Mobile, Contact, About, Staff, Calendar, and SiteMap, along with a search box. A left sidebar menu lists various categories: General Geology, Online Maps (highlighted), Data, Research/Programs, Publications, Outreach and Education, Laboratory, and Well Sample & Core Library. A dropdown menu under "Online Maps" lists: Online Maps Home, Coal Information, Coal Resource, Core & Sample Holdings, Energy Infrastructure, Geologic Map, Groundwater Quality, Karst Potential, Kentucky Arches, KGS Geoportal, Land Use Planning, Landslide Information, Mineral Resources, Oil and Gas Permits, Petroleum Geology, and Water Wells & Springs. The main content area includes a "Of Interest" section with a "KGS RESEARCH IN THE PUBLIC INTEREST" banner, a map titled "KGS Annual Seminar, May 15", and a news item about "Planned project would create music from KGS groundwater data". At the bottom, there are links for "More News & Announcements", "KGS Newsletter", and "Update your KGS newsletter subscription".

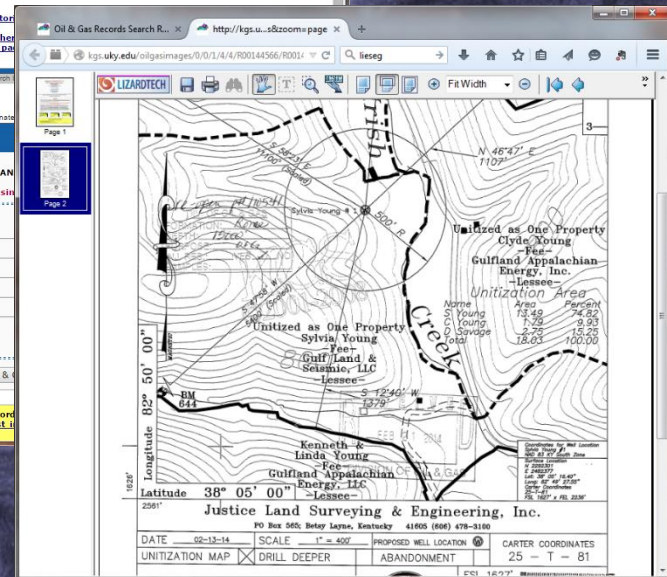
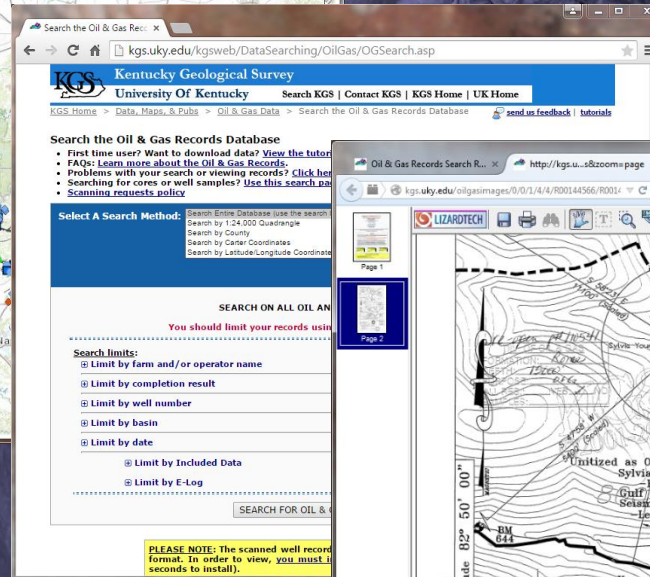
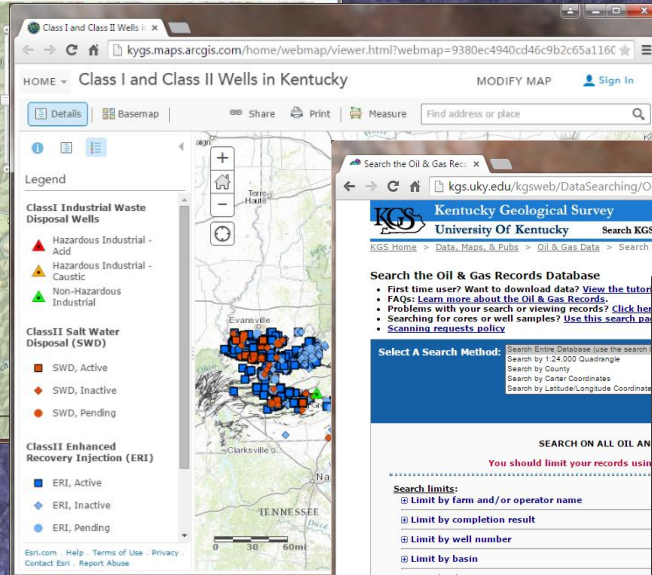
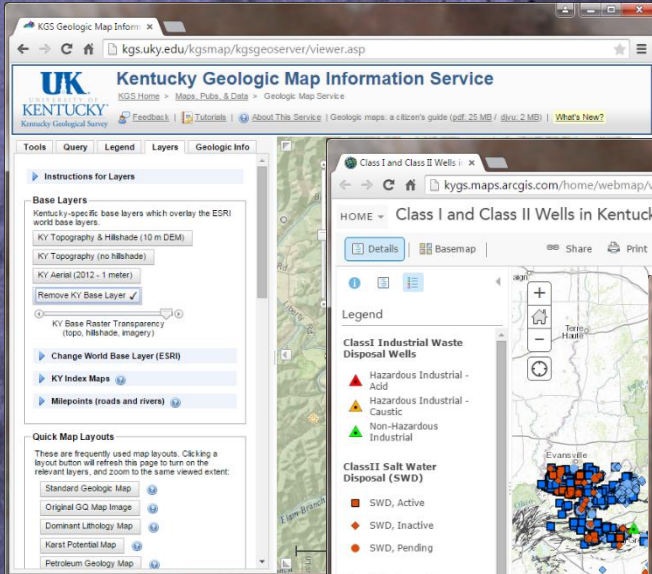
- Water wells & springs
- Earthquakes
- Coal
- Minerals
- Mapping
- Karst

Energy & Minerals

Oil and gas well map service

Specialty map services

Data searching



Scanned images

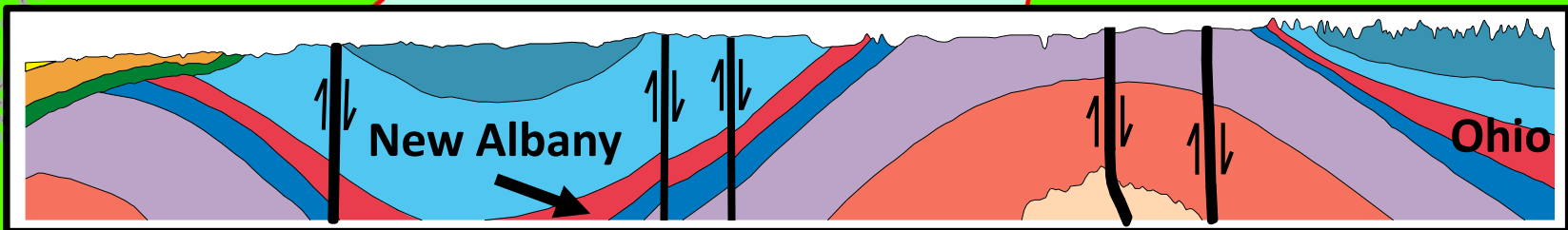
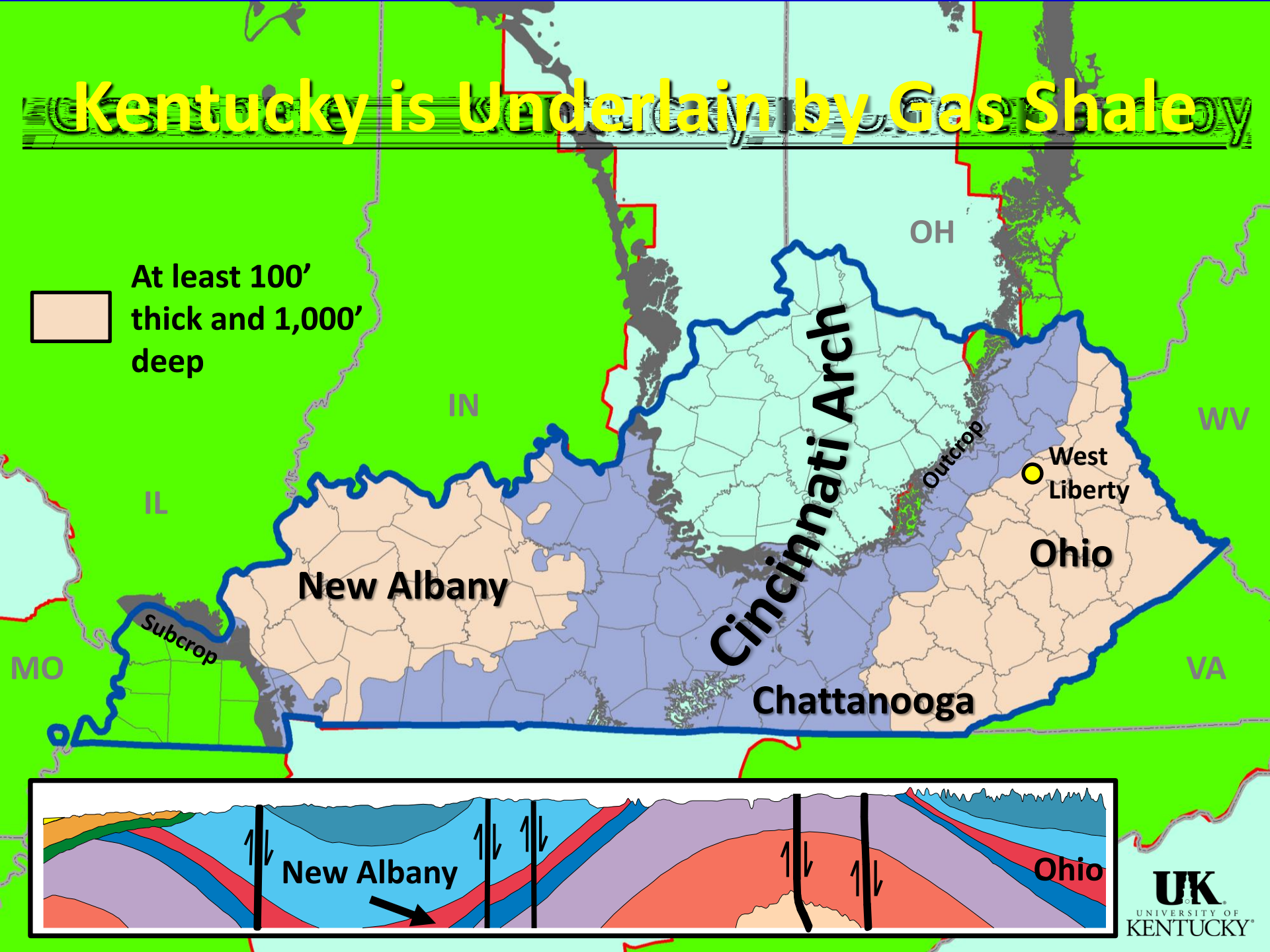
Acknowledgements

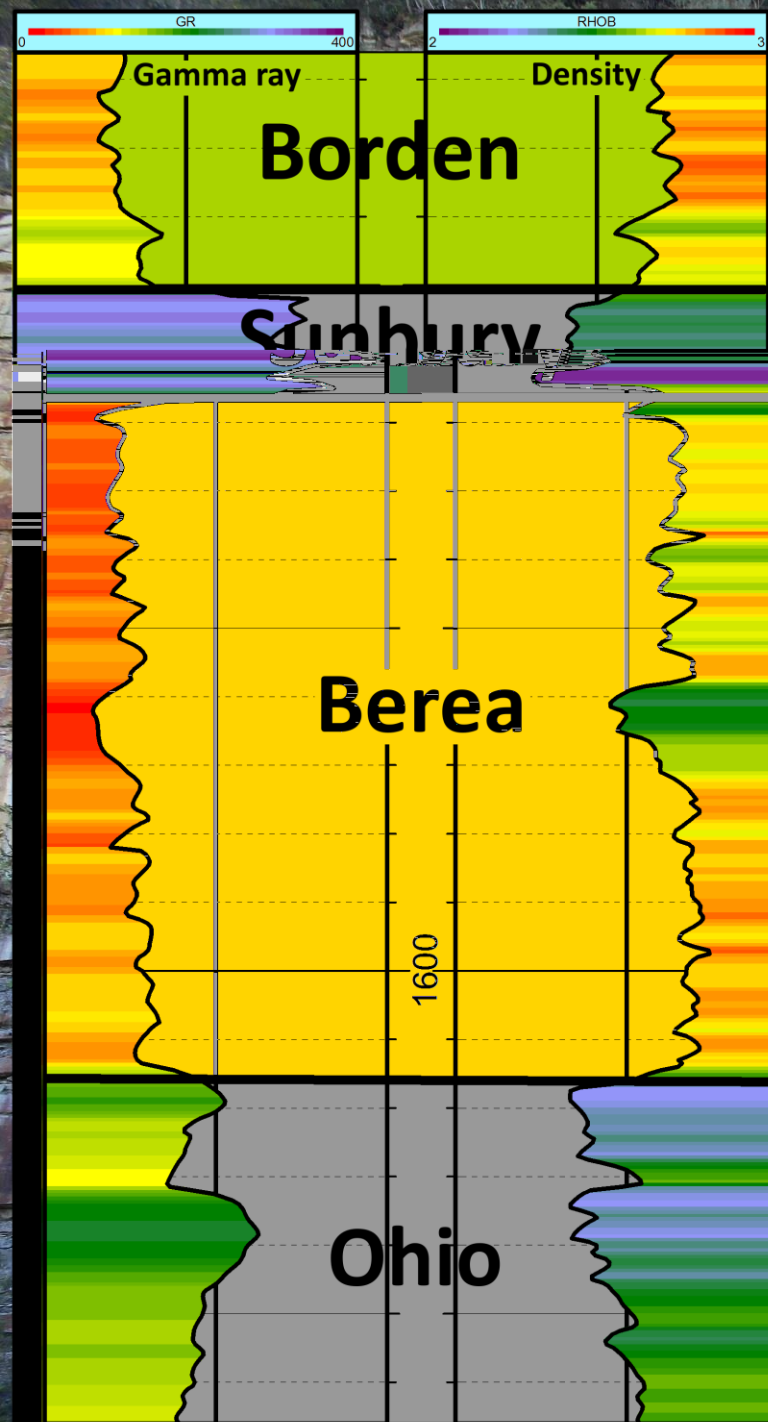
- Dave Harris
- Steve Greb
- John Hickman
- Cortland Eble
- Tom Sparks
- Rick Bowersox
- Warren Anderson
- Marty Parris

Energy &
Minerals
Section

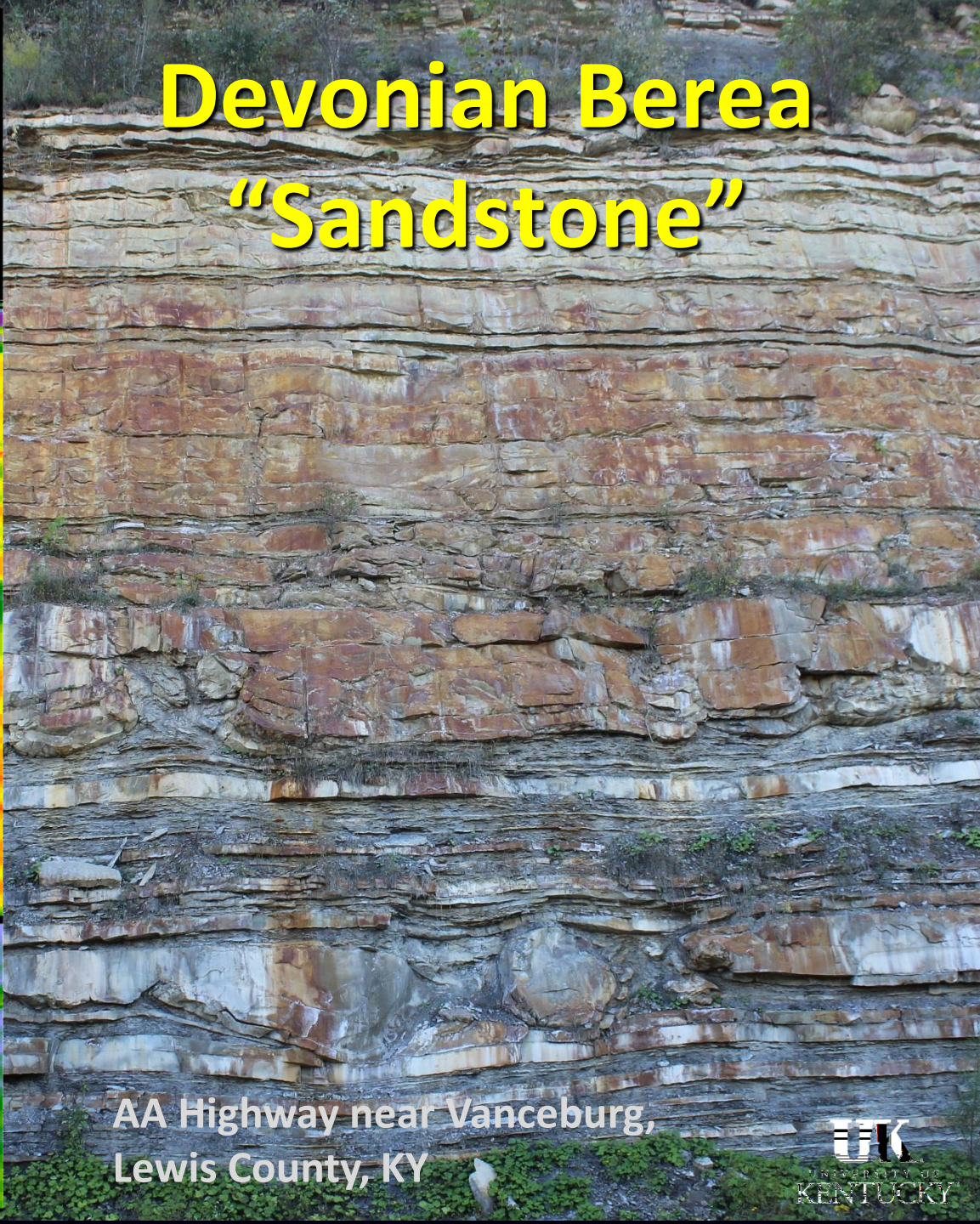
Kentucky is Underlain by Gas Shale

At least 100'
thick and 1,000'
deep



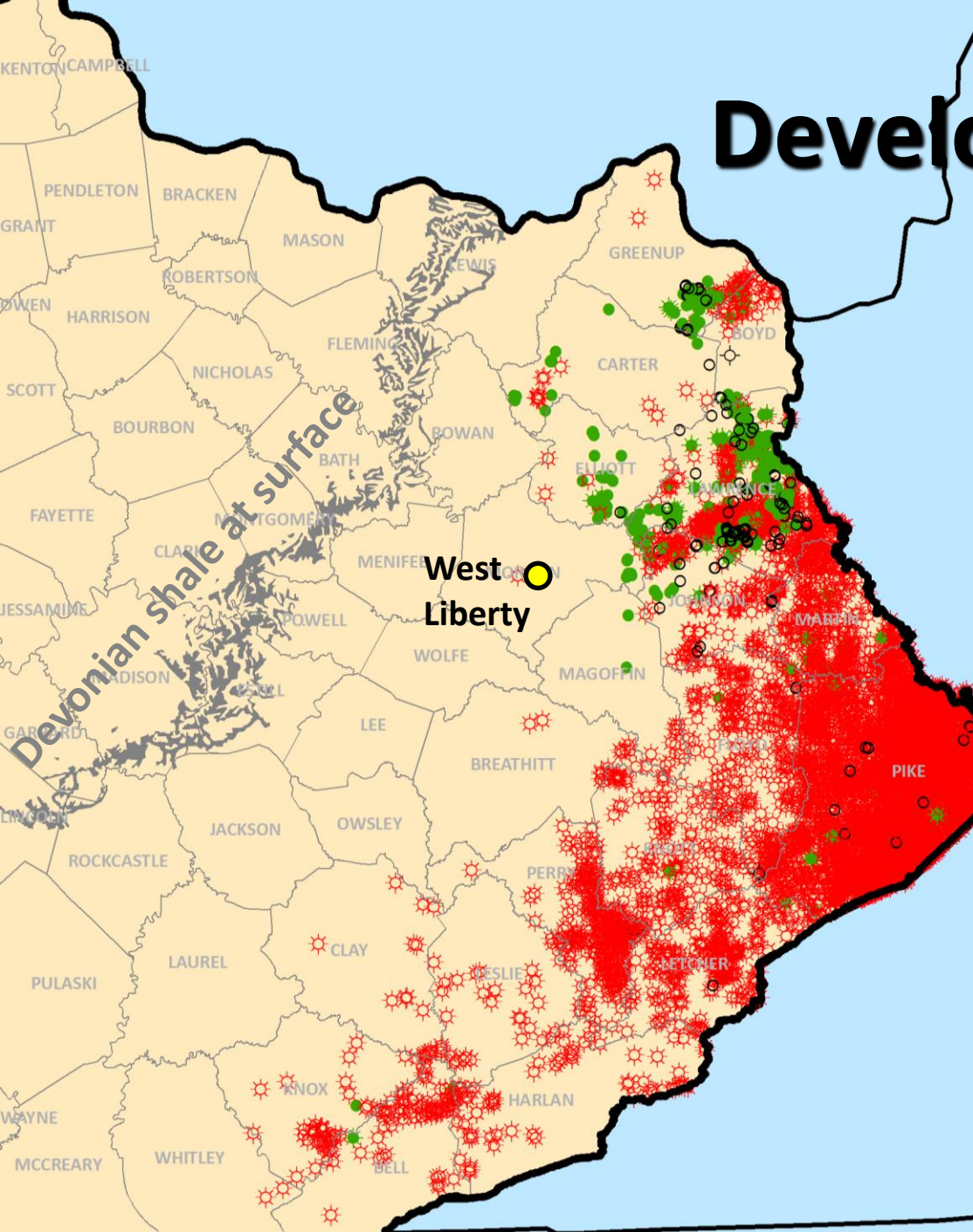


Devonian Berea "Sandstone"



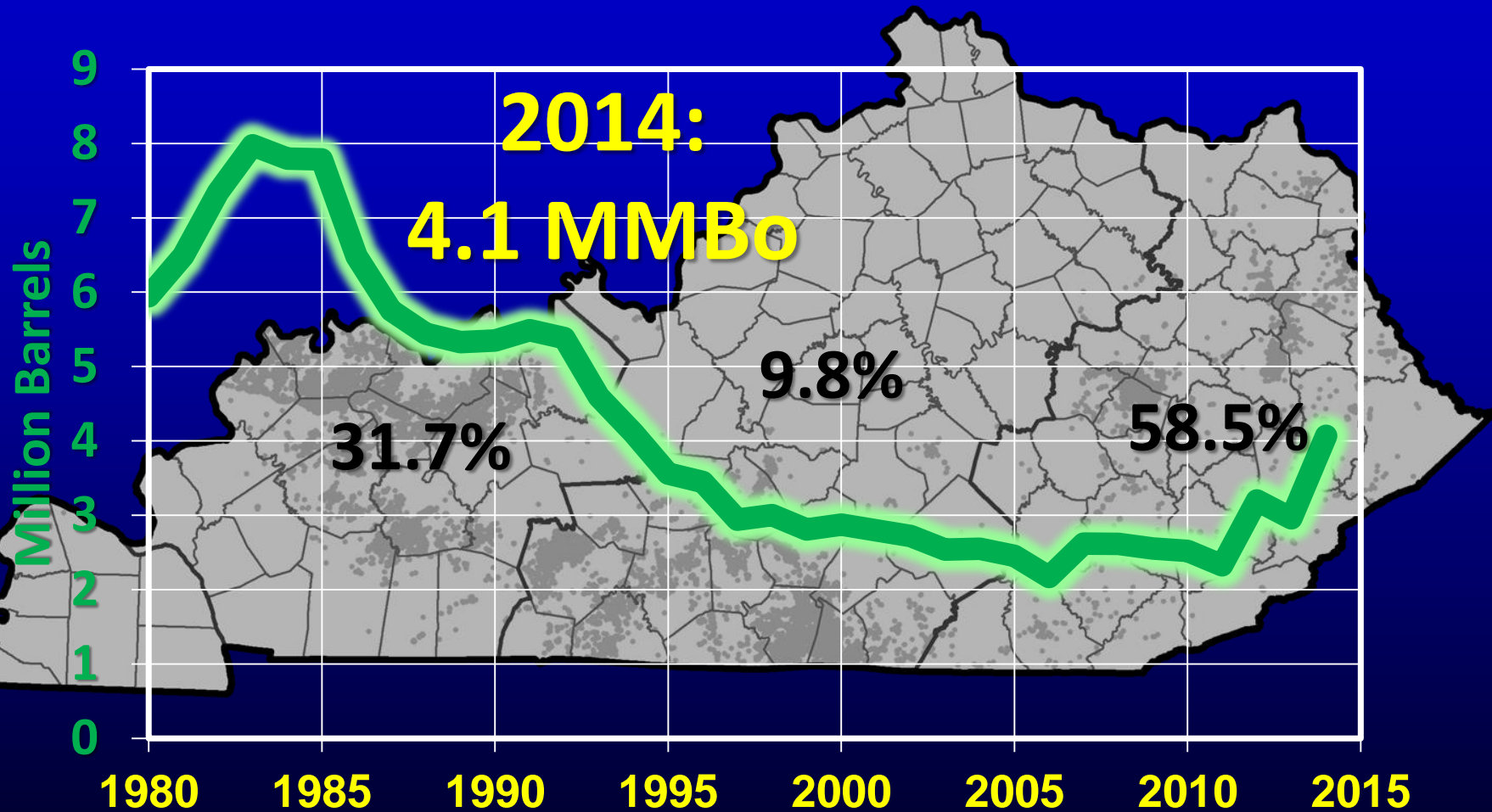
AA Highway near Vanceburg,
Lewis County, KY

Development History



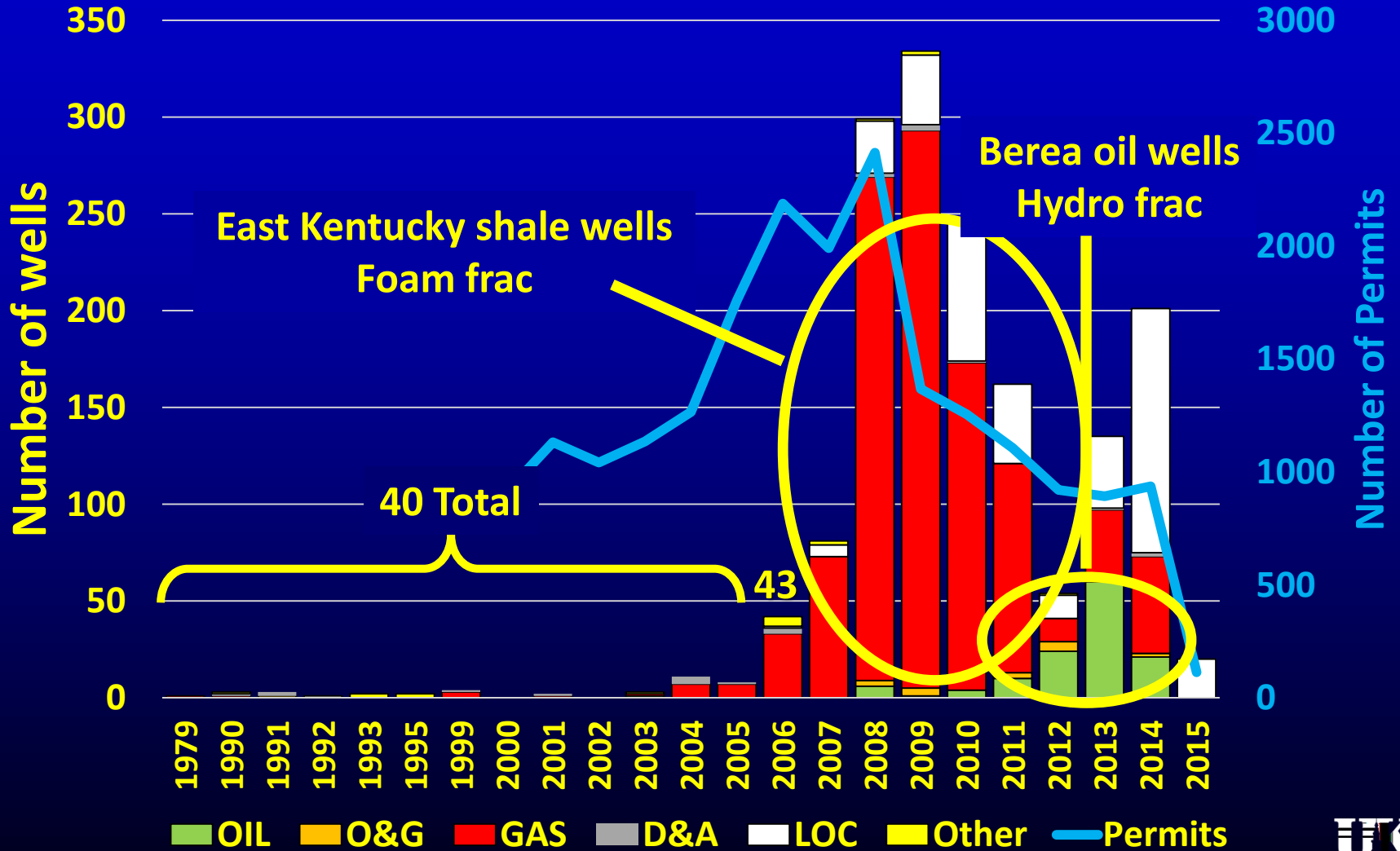
- **1879 – 1st producer near Paintsville, Johnson Co.**
- **1890s – Blaine Creek, Lawrence Co.**
- **1905 – Minor producer with shows of oil & gas**
- **1920s – Drilling boom**
- **1980s – Section 29 tax credit**
- **2011 – Horizontal wells, slickwater fracks**

Kentucky Oil Production

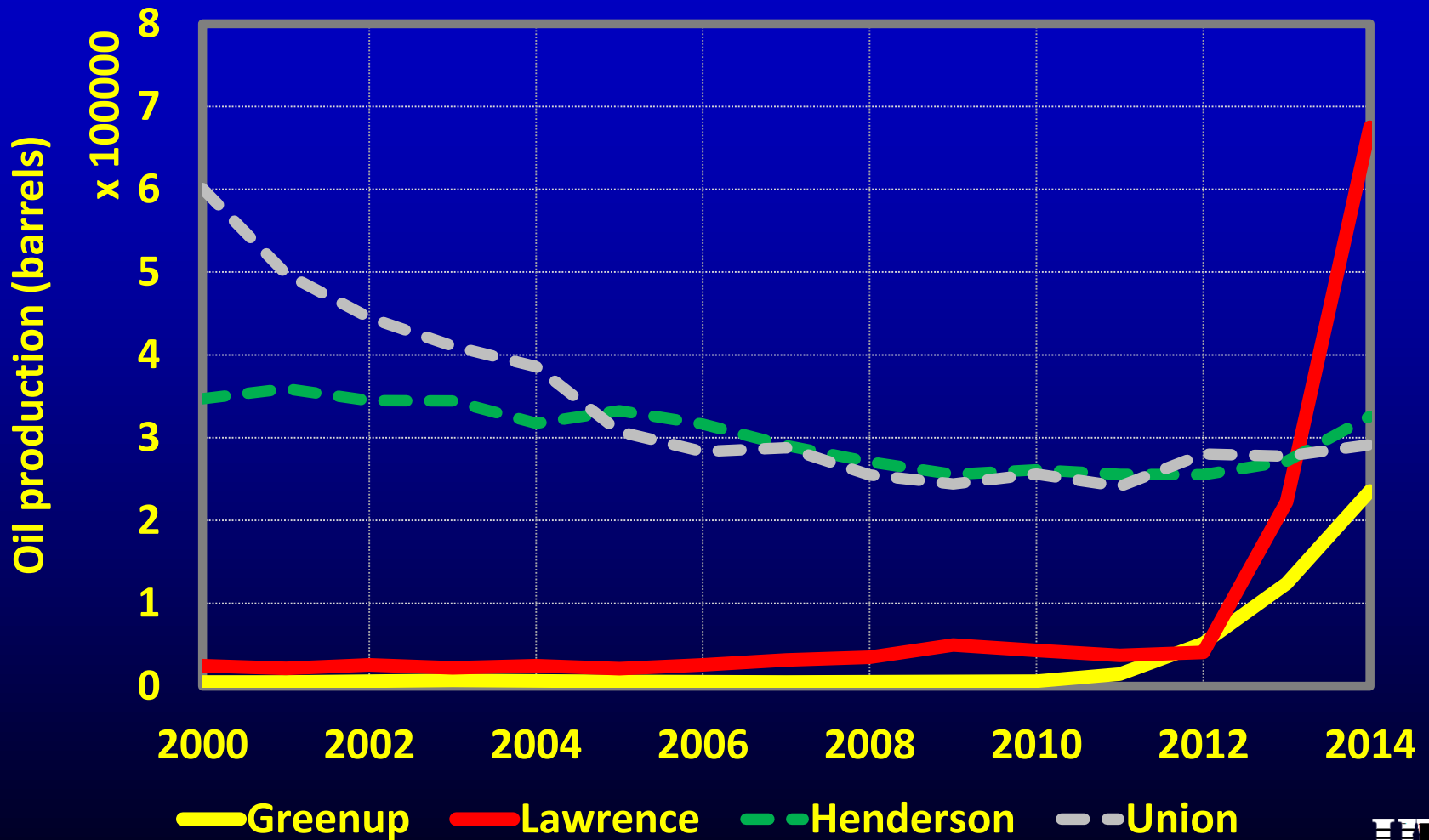


63 Kentucky counties

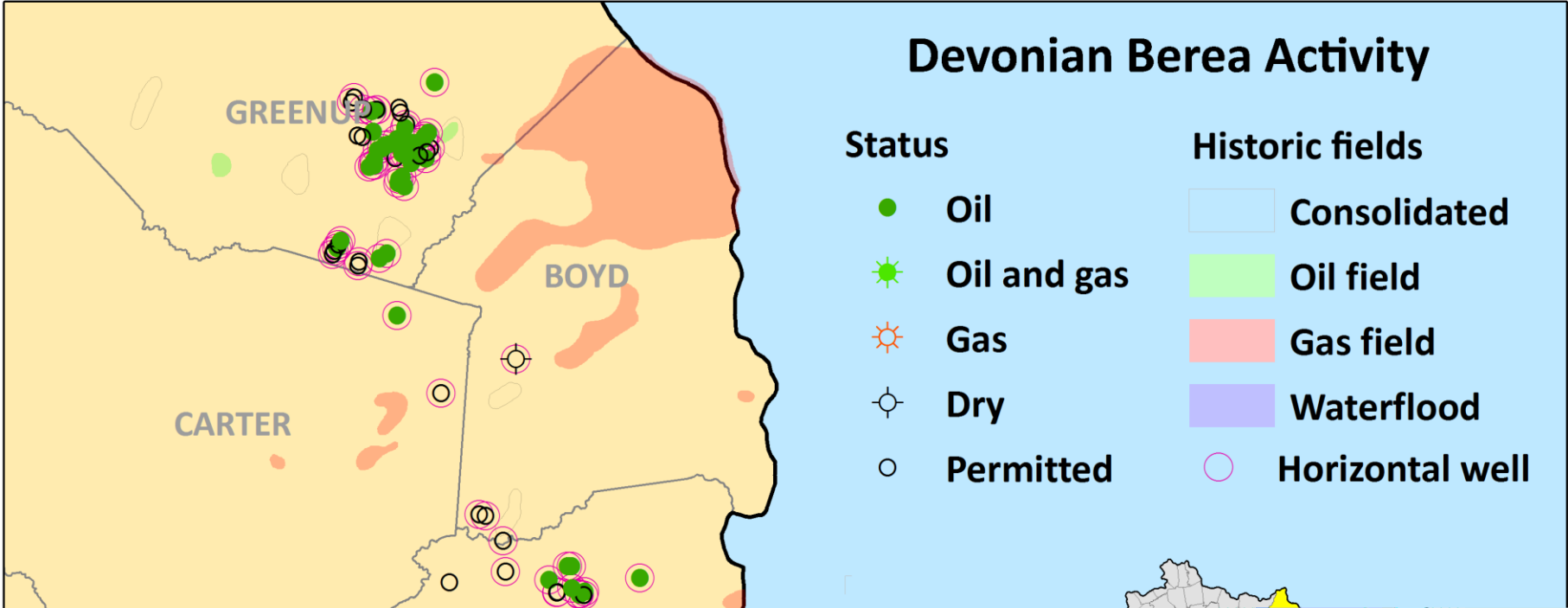
Horizontal Wells By Year



Berea Renaissance



Devonian Berea Activity

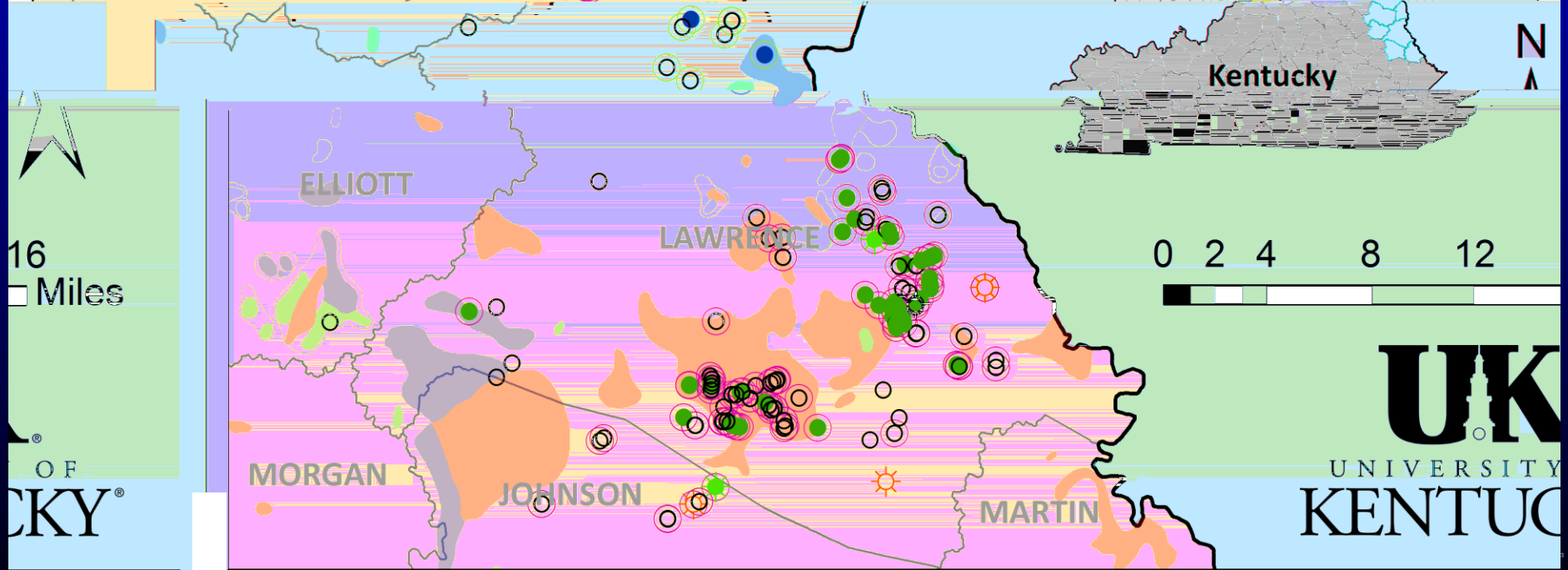


Status

- Oil
- ★ Oil and gas
- ★ Gas
- + Dry
- Permitted

Historic fields

- Consolidated
- Oil field
- Gas field
- Waterflood
- Horizontal well



16 Miles

0 2 4 8 12

UK
UNIVERSITY
KENTUCKY

Berea Sandstone Consortium

Sunbury

Berea

**Marty Parris, Stephen Greb, Cortland Eble,
Brandon Nuttall, Dave Harris**

**Develop a better understanding of the
distribution and preservation of organic
matter and maturity with respect to
occurrence of production.**

Berea &
Bedford

Berea



AA Highway, photo courtesy S. Greb



Consortium Partners

Funding Partners

- Nytis Exploration
- Cimarex Energy
- Abarta Oil & Gas
- Hay Exploration
- EQT Production
- Vinland Energy
- Fireborn
- CountryMark

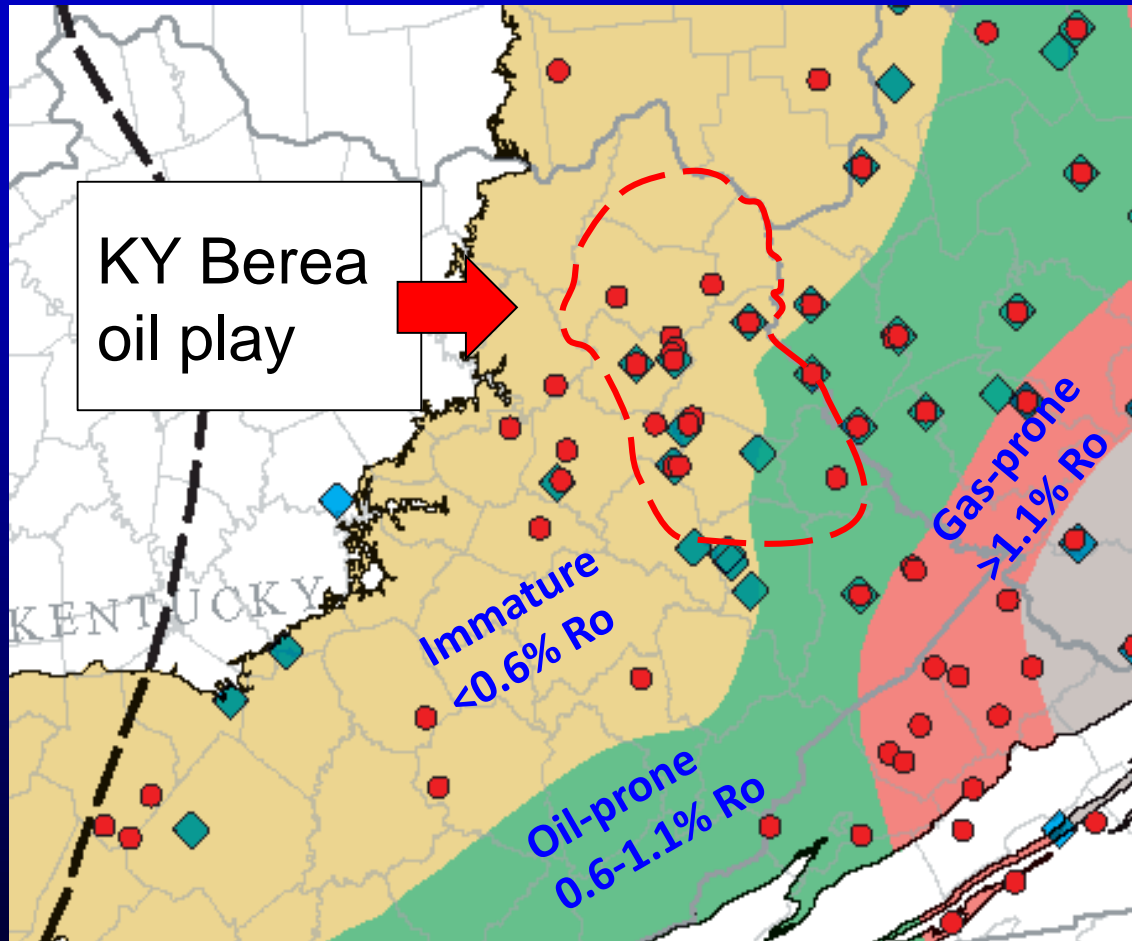
In-Kind Research Partners

- U.S. Geological Survey
- Ohio Division of Geological Survey
- R.J. Lee Group, Inc.
- Universal Well Services

KGS Principal Investigators

- Marty Parris
- Steve Greb
- Cortland Eble

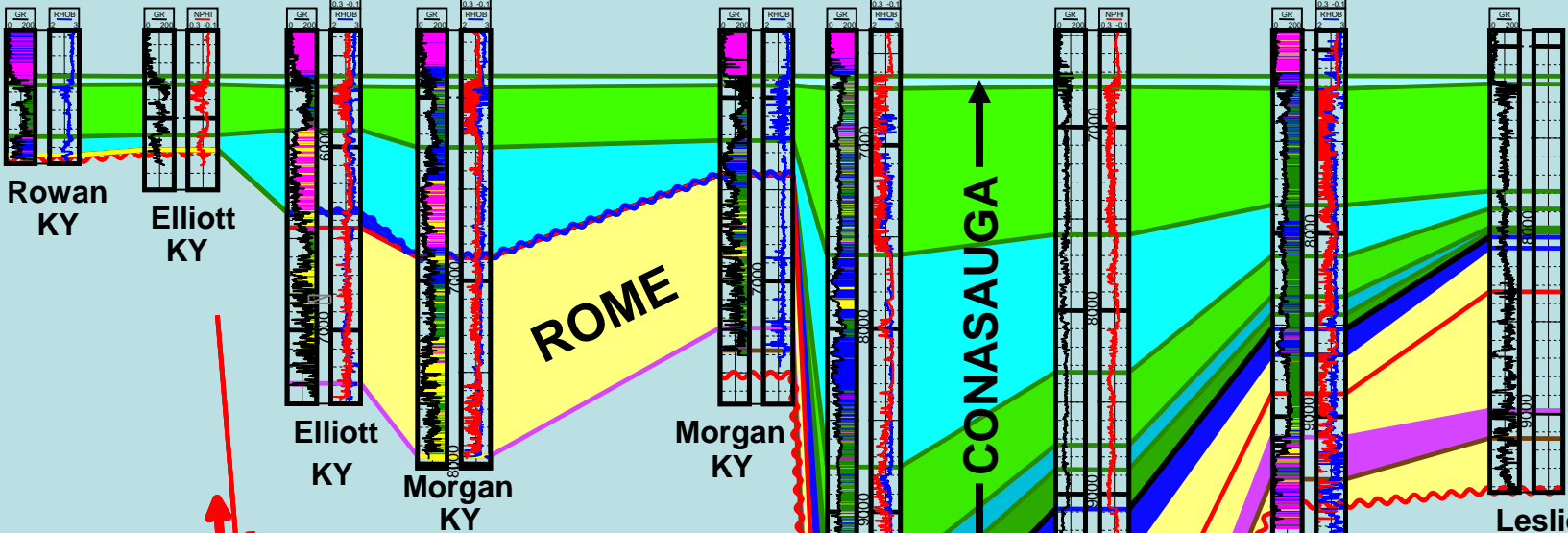
Key Research Question



What are the controls on Berea production where it is thermally immature?

USGS Thermal Maturity Map
(East and others, SIM 3214, 2012)

North <7.63MI> <7.86MI> <7.17MI> <16.66MI> <5.91MI> <12.60MI> <11.93MI> <11.95MI> South



Irvine-Paint Creek shelf

Kentucky River Fault Zone

1,000 feet

Grenville Basement

Irvine-Paint Creek Fault Zone

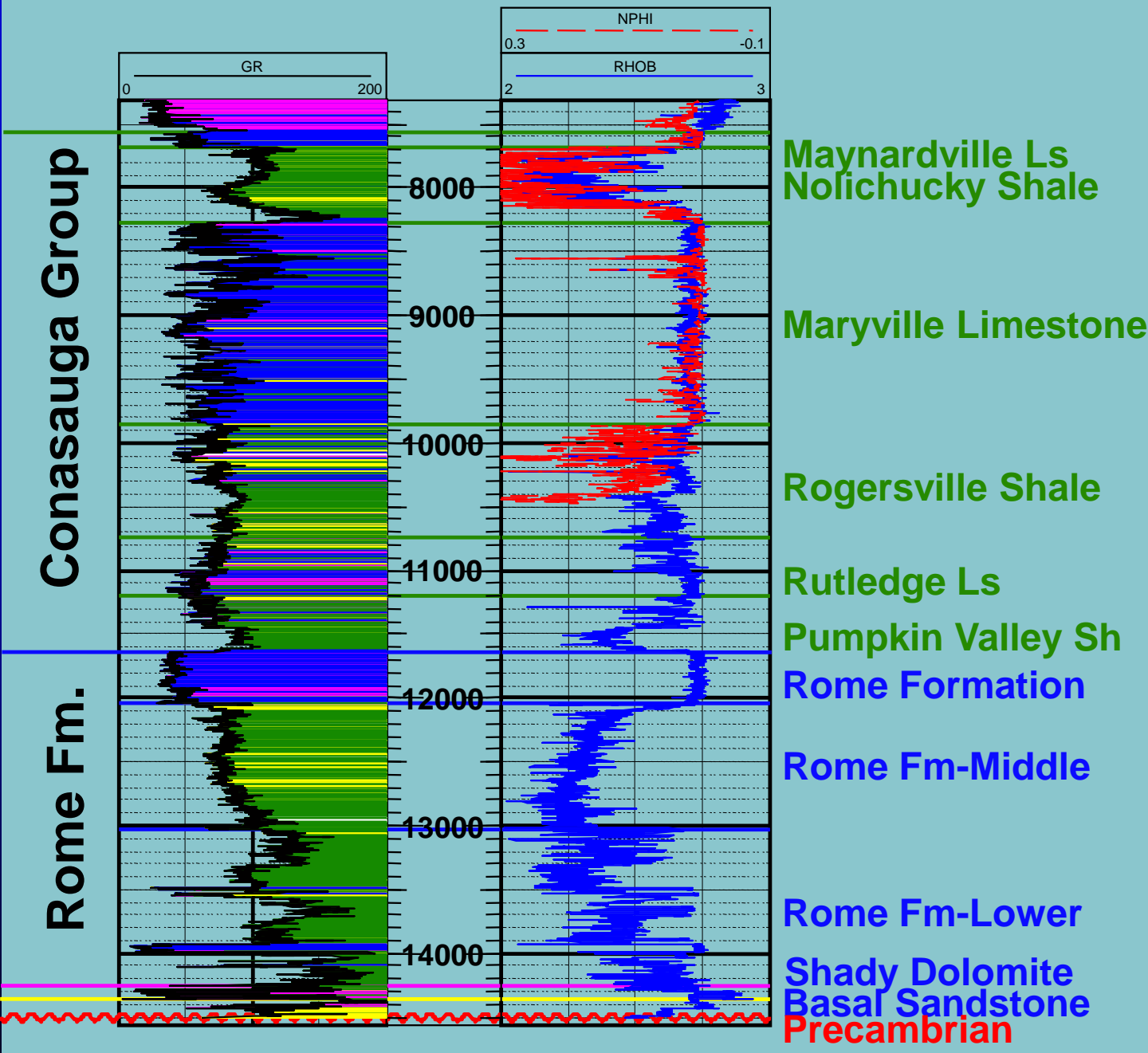
Dave Harris, KGS



Rome Trough Study, 2004

Identified
Rogersville
as a source
rock.

*Gamma ray shaded
by log-calculated
lithologies*





Rogersville

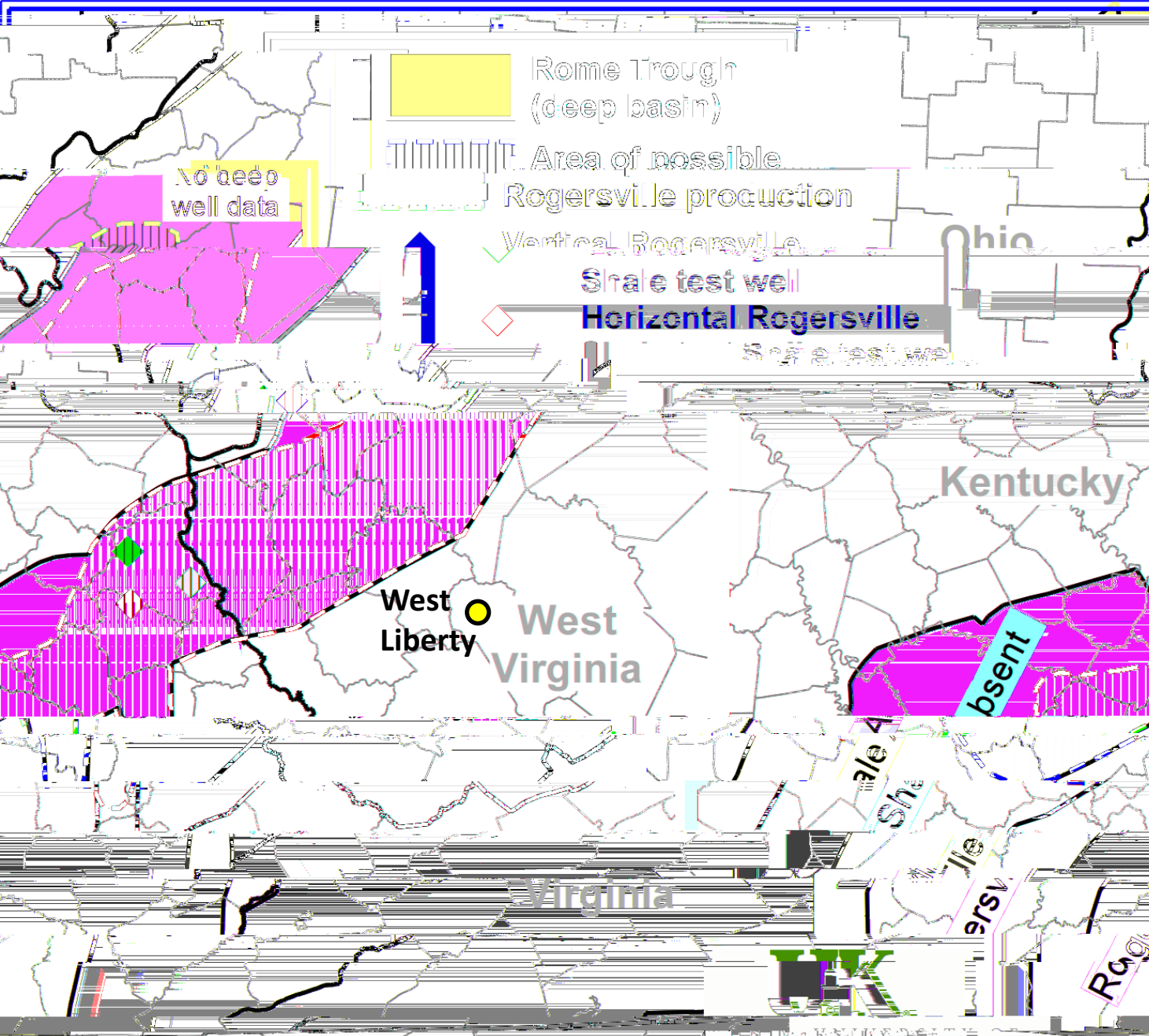
- Dark, organic-rich shale
- Fine-grained white silt
- 5,000 to 10,000 feet deep in eastern Kentucky

*Exxon #1 Smith, WV (core)
Photo courtesy Dave Harris, KGS*

Rogersville Activity

COUNTY	WELL	TYPE	STATUS
Lawrence (KY)	Bruin #1 Young	V	Tested
Lawrence (KY)	Bruin #1 Walbridge	V	Permitted
Putnam (WV)	Cabot #50 Amherst	V	Drilled (Gas)
Johnson (KY)	Horizontal Tech #572360 EQT	H	Permitted
Lawrence (KY)	Strat test permit 111649	?	?
Lawrence (KY)	Strat test permit 111720	?	?
Lawrence (KY)	Strat test permit 111721	?	?
Lawrence (KY)	Strat test permit 111757	?	?

Rogersville Play Area



(Based on data available in 2004)

Courtesy Dave Harris, KGS

Note: Parts of

In Conclusion

- **Devonian Berea**
 - A demonstrated oil producer
 - Additional potential across much of eastern Kentucky
- **Cambrian Rogersville**
 - Speculative
 - Limited data suggests potential
- **It all depends on the price of oil and gas**

Thanks!

- **Kentucky Geological Survey**
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