

2017



Integration

A Strategy for the 13th Kentucky Geological Survey

Preamble

Strategic planning is a process of defining an organization's purpose, vision, and mission, and then developing a set of strategic actions to achieve those goals.

- First, what do we want to become as an organization? The vision and mission in this plan articulate the answers to those questions.
- Second, what beliefs intrinsically motivate us and give meaning to our core values describe those beliefs.
- Third, what is our plan to attain our vision, fulfill our mission, and honor our core values? The 16 strategic actions enumerated in this plan offer an ambitious yet achievable plan to move KGS forward on a program of transformative integration over the next decade.

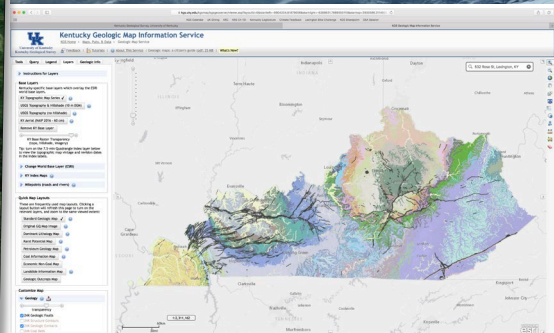
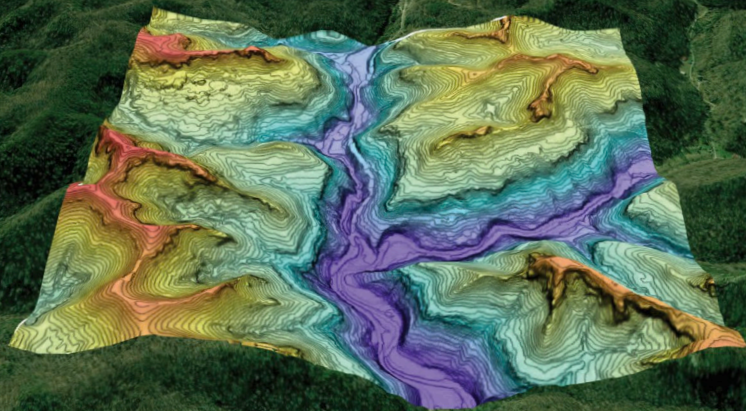
This plan is the product of a process that began in late 2016. The process involved discussions within each KGS section, a strategic planning retreat for the KGS leadership, preparation of a draft plan by the director, review and comment by KGS leadership, an internal presentation and discussion to solicit additional KGS leadership, and finally comments from the UK Vice President for Research and the KGS Advisory Board. A set of discussions led to minor revisions of the plan, ultimately producing this plan as now reading:

Like all good plans, this one acknowledges that the future is unpredictable and therefore a living document to revisit and revise as appropriate.

May 15, 2017

Kentucky Geological Survey

2017-2018 Annual Report





Dave Williams

Section Head

October 2018



Brandon Nuttall

Geologist V

June 2019



Mike Lynch

Tech Transfer

June 2019



Warren Anderson

Geologist V

May 2019



Bart Davidson

Geologist IV

January 2019



Dr. Jason Dortch

Geologist IV

Geomorphology and
Quaternary geology



Dr. Amy Wolfe

Geologist IV

Geohealth and
environmental
geochemistry

July 2019



Hudson Koch

Geologist I

Landslide hazards
and risks



Dr. Ben Tobin

Geologist IV

Karst hydrogeology



Sarah Arpin

Geologist II

Groundwater
database manager



Yichuan Zhu

Post-doc

Machine learning
and AI methods

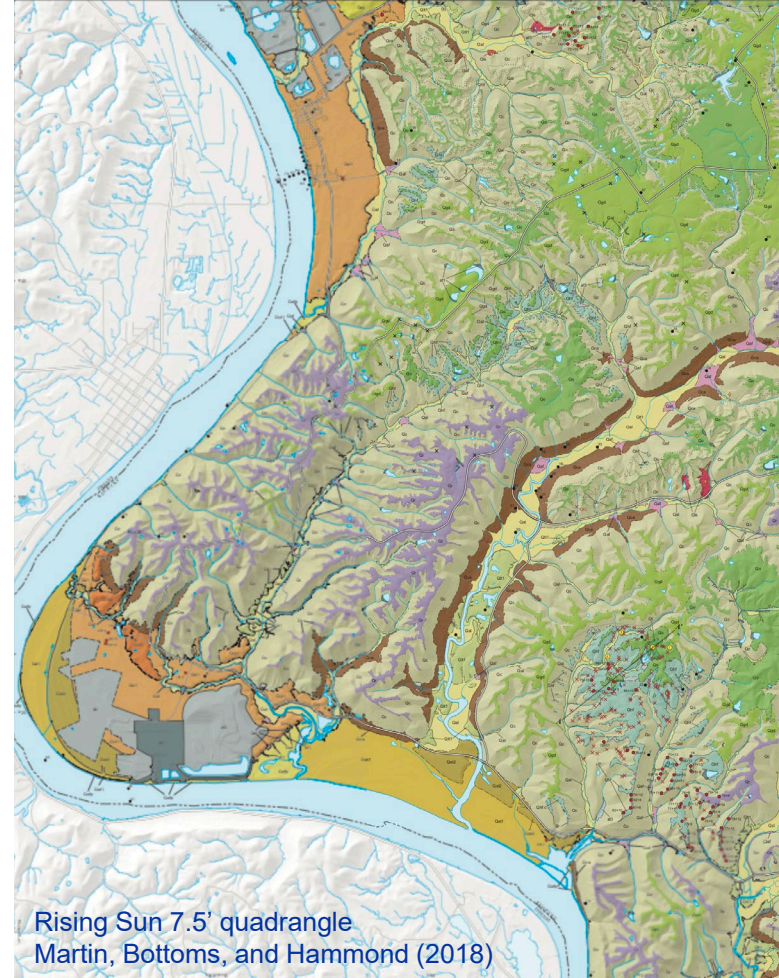
October 2019

Temporary support staff and interns

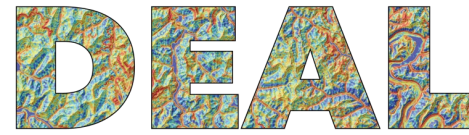
- **Natalie Fields**, Core Photography Technician, EARL (IMLS Grant)
- **Gordon Dowell**, Geologist Technician, EARL (IMLS Grant)
- **Clayton Gullet**, Geologist Technician, EARL
- **Sarah Johnson**, Research Assistant, Landslide remote sensing and UAV apps
- **Faisal Ahmed**, Research Assistant, FEMA Big Sandy ADD Landslide Project
- **Ashton Killen**, Intern, FEMA Big Sandy ADD Landslide Project
- **Russel Rogers**, Intern, KGS seismic network
- **And...soon...the KGS Commonwealth Research Assistantship in Applied Geoscience**

Sponsored research examples

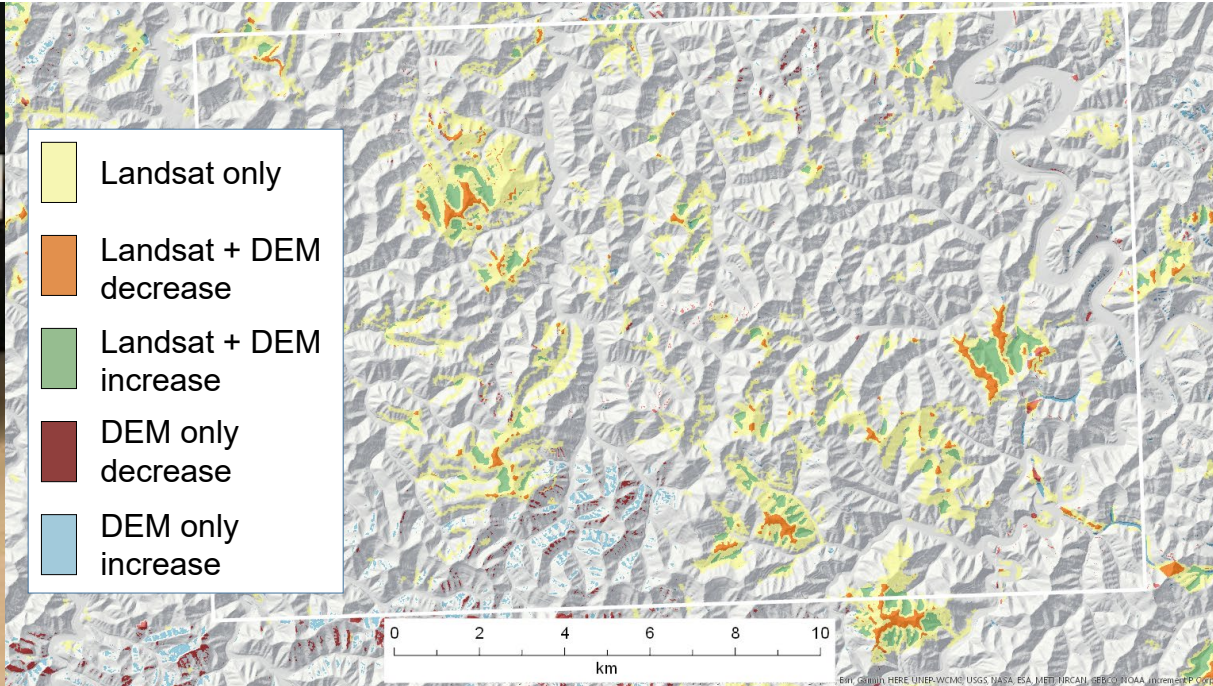
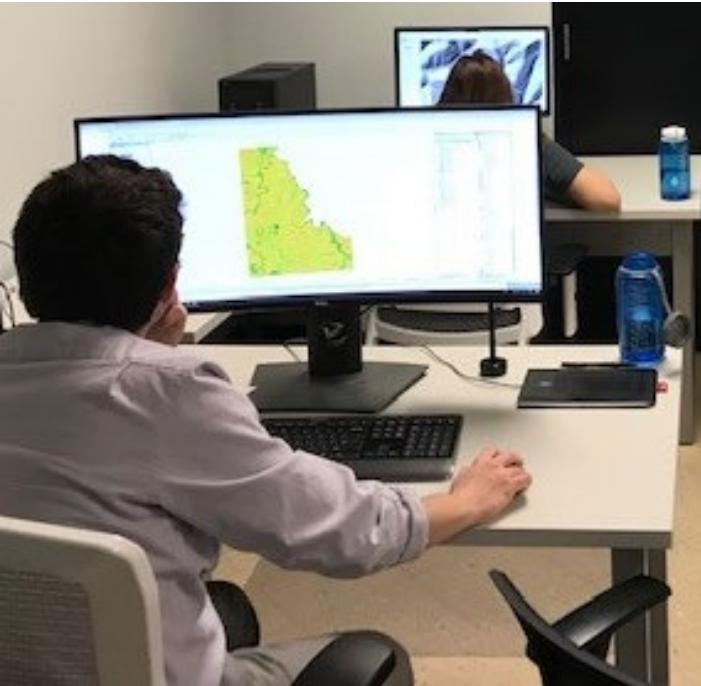
- Surficial geologic mapping (USGS NCGMP)
- Geologic data preservation (USGS NGGDPP)
- Hicks Dome critical minerals (USGS Earth MRI)
- Geologic core digital image archive (IMLS)
- Big Sandy landslide hazards (FEMA, KY DMA)
- Paducah GDP seismic monitoring and groundwater modeling (DoE, CAER)
- KY aquifer designation (USGS)
- Nutrient and sediment runoff (USDA NRCS)
- Carbon sequestration partnership (DoE, Battelle)



Digital Earth Analysis Lab

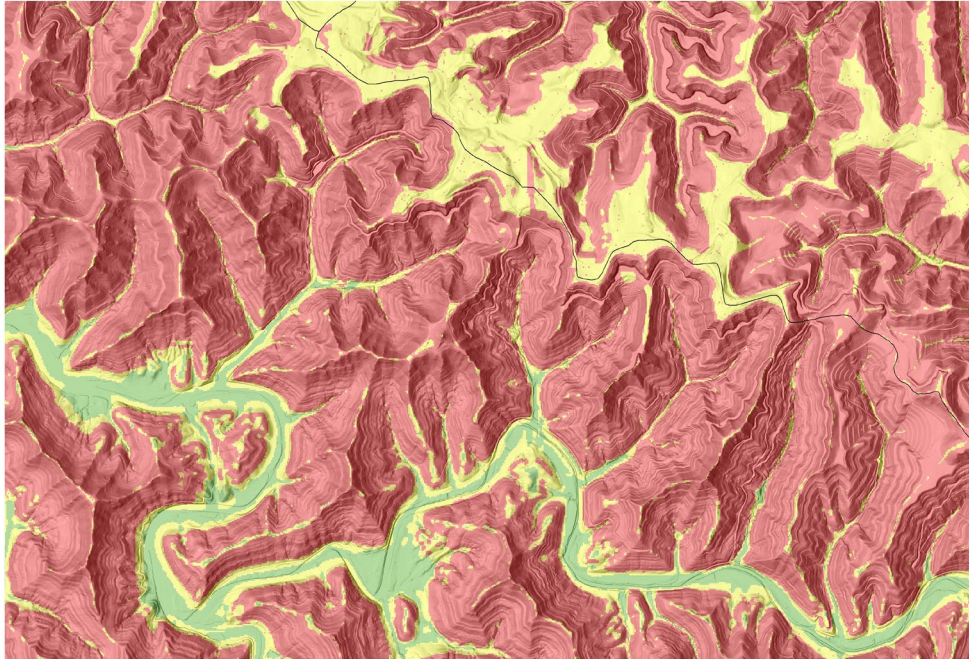


Digital Earth Analysis Lab  Kentucky Geological Survey



Haneberg (2018, GSA)

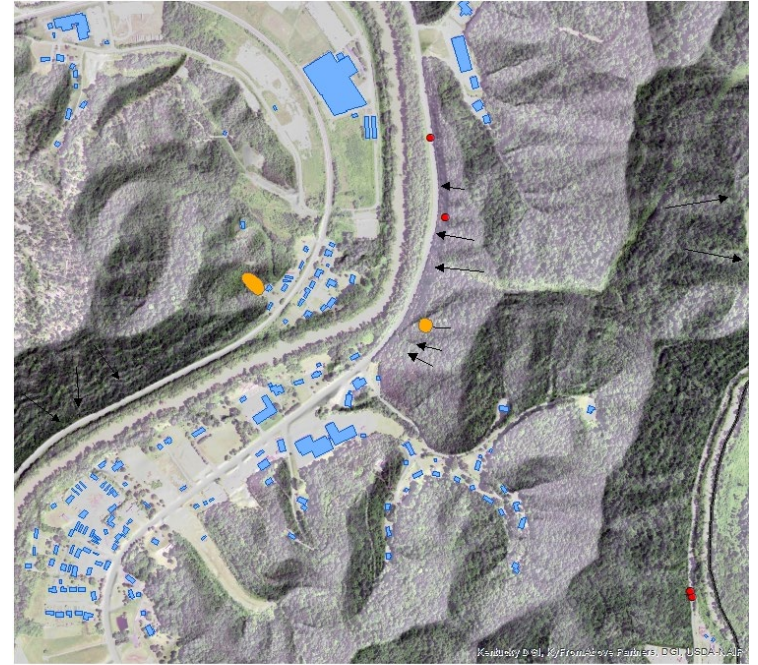
Big Sandy ADD LiDAR based landslide hazard and risk



2,000 1,000 0 2,000 Feet



Landslide Susceptibility

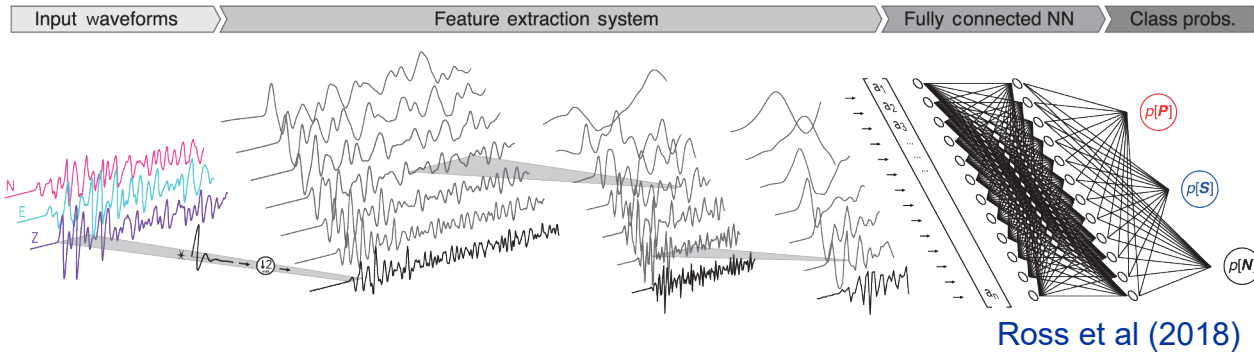


0 125 250 500 Meters

Kentucky 9th, K/From 2010's, Farmers, DGI, USDA, NAD83

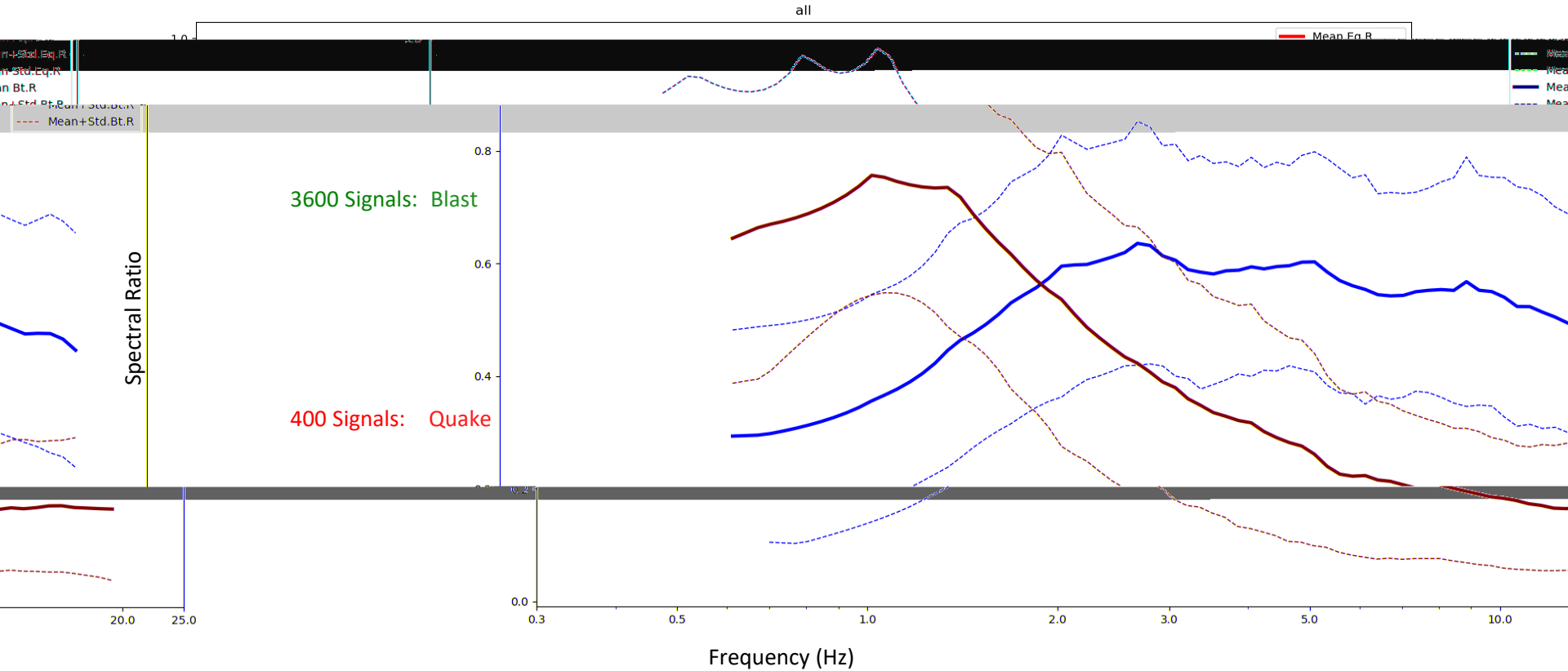
Background seismicity in eastern Kentucky

Detection using CalTech deep-learning algorithm with home-grown detectors

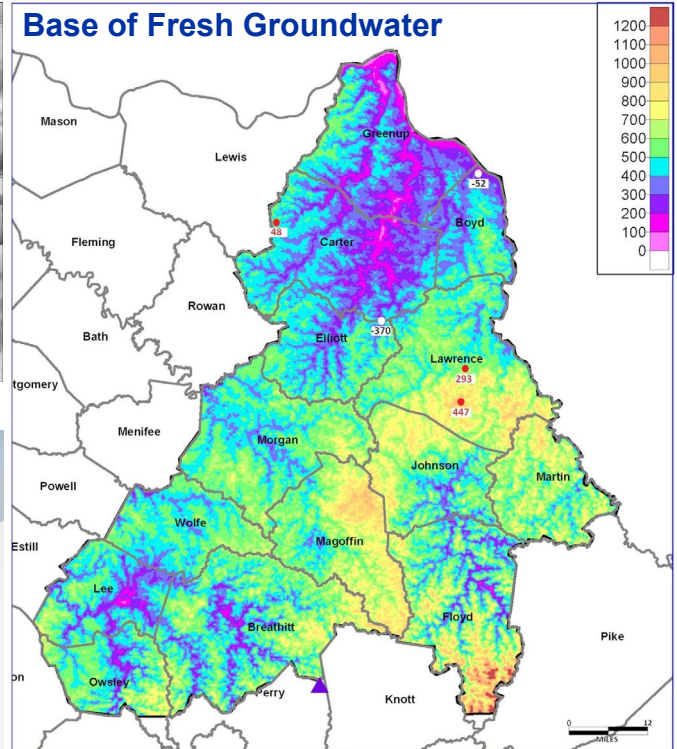
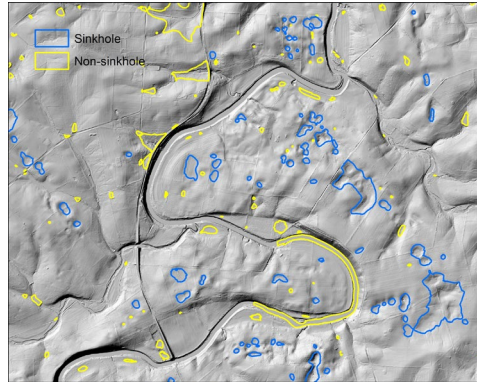


Discrimination using differences in spectral content trained by 3 years of manually classified eastern Kentucky earthquake and blast seismograms

Earthquakes and blasts have distinct frequency spectra



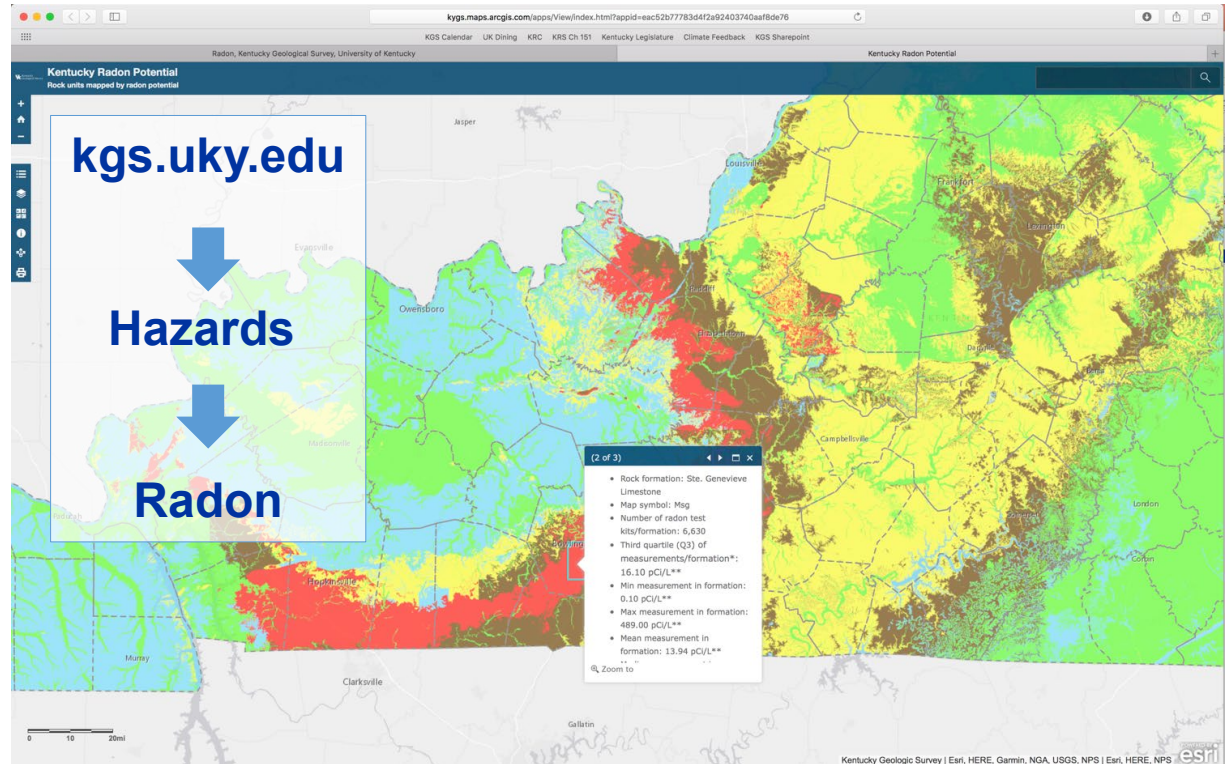
Water resources research



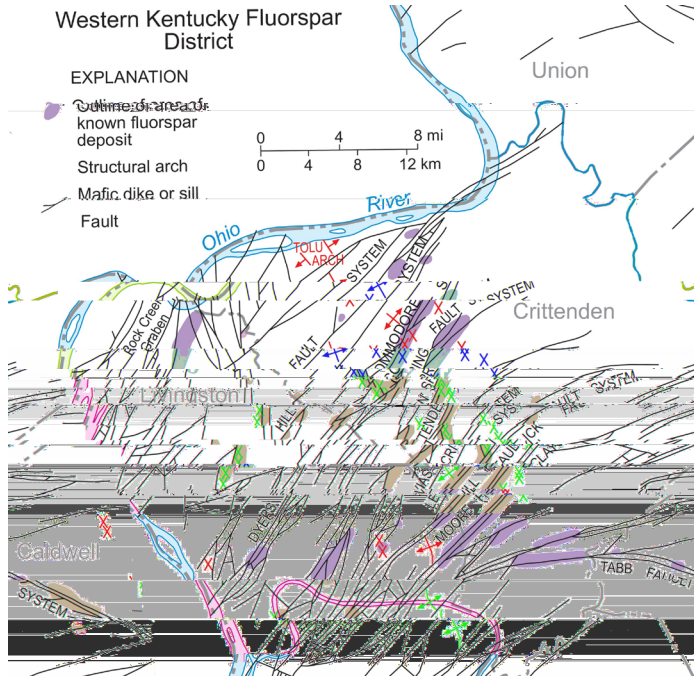
Davis, Parris, and Grider (2019)

Geohealth and radon potential mapping benefits

- Intersection of 71,000 home test kit results and statewide 1:24,000 geologic maps
- Interactive online version in 2018
- Continuing collaboration with UK College of Nursing BREATHE and KY Department of Public Health
- UK-USGS economic analysis: **\$2.3 to \$3.8 million healthcare cost savings per year in Kentucky** (2018 Intl Radon Symposium)



Energy and minerals research



KGS Well Sample and Core Library

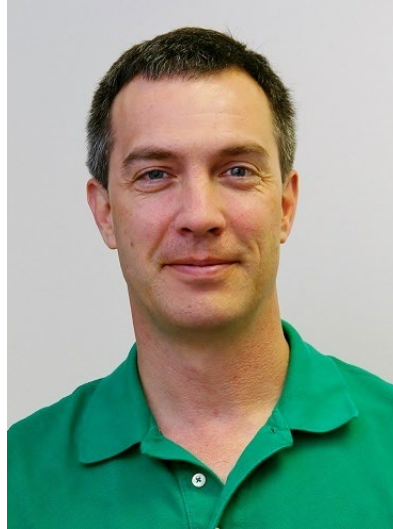


Earth Analysis Research Library staff



Liz Adams

Archives Manager
IMLS Project Leader



Drew Andrews

Geologic and
Facility Manager



Ray Daniel

Principal
Research Analyst



Ryan Pinkston

Research Analyst

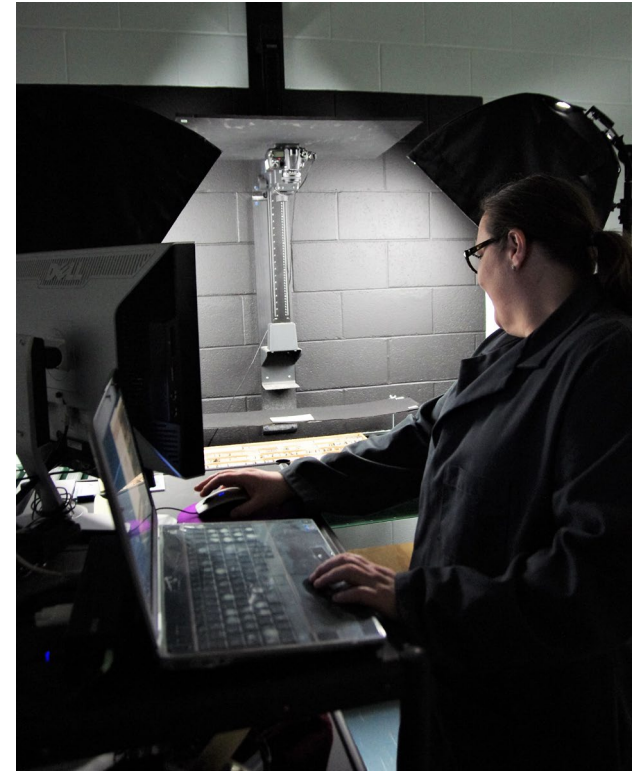
EARL...organized, safe, and professional



EARL sample examination area



Working on the IMLS funded digital core archive at EARL





Core Report (C-474)

University of Kentucky
Kentucky Geological Survey

Oil and Gas Exploration Core Information:

Call Number: C-474
 IGSN Number: [IEKGS0056](#)
 Hole Number: 17
 Purpose: Oil and Gas Exploration
 Quadrangle: Creekville
 County: Leslie
 Operator: PATRICK PETROLEUM
 Farm Name: FORDSON COAL
 Map View: [KGS Geologic Map Service](#)



This core derived from this well:

Oil and Gas Well Information:

Record Number: 52956
 PDF Link (if available): [PDF Document](#)
 Elog Link (if available): [Display E-Log](#)
 Permit Number: 30394
 Well Number: 17
 Quadrangle: Creekville
 County: Leslie
 Carter Coordinates: 10-G-72 2700N, 650W
 Surface Elevation: 1215 ft
 Vertical Depth: 3066 ft



Measured (horizontal) Depth:

Original Operator: PATRICK PETROLEUM, INC
 Most Recent Operator: VINLAND ENERGY OPERATIONS, LLC
 Farm Name: FORDSON COAL CO
 Completion Date: 9/16/1976
 Total Depth Formation: Silurian-Clinton Sh

Associated data and reports (if available):

Horizontal Survey: n/a
 Core Report: [Core Report](#)
 Sample Report: [Sample Report](#)
 Oil Production Data: [Oil Production Report](#)
 Gas Production Data: n/a
 Pay Report: [Pay Report](#)
 Formation Tops Data: [Tops Report](#)



Box Number	From (ft)	To (ft)	Lithology/Stratigraphy
1	2948	2954.1	Box Lithology: 2948 ft - 2954 ft: GRY SS W/F STKS 2954 ft - 2959 ft: GRY SS Box Interval(s): 2948 ft - 2993 ft: Lockport D (355LCKP)



Call No: 474
 Permit No: 30394
 IGSN: IEKGS0056
 Core Purpose: Oil and Gas Exploration
 Operator: Patrick Petroleum

Record No: 52956
 Borehole ID: N/A
 Well/Hole No: 17
 County: Leslie
 Farm: Fordson Coal

Top Dry



Bottom Dry

Box: 1 of 8 Depth: 2948.00-2954.10

Top Wet



Bottom Wet

