Displaying Joint Data via the Kentucky Geological Survey's Online Map Service

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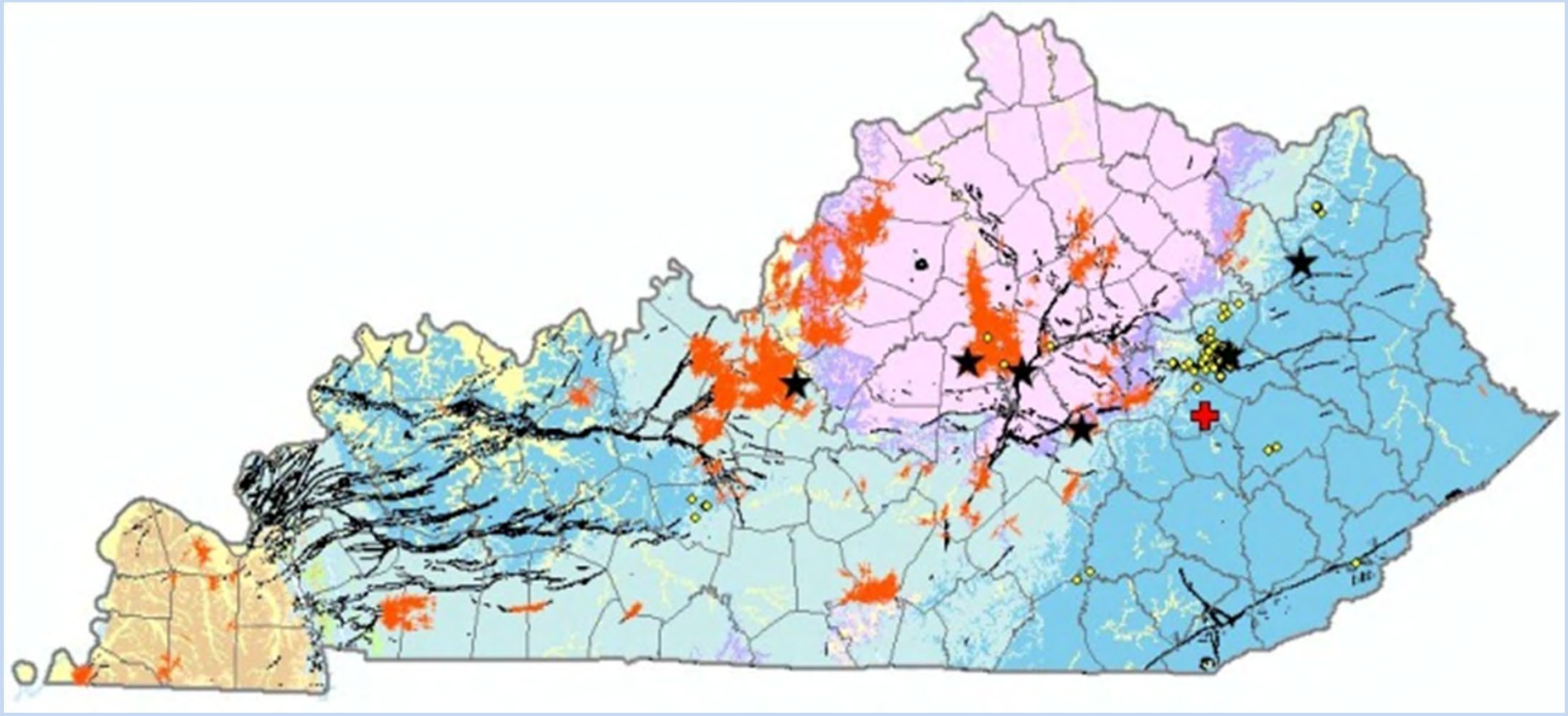
KGS Joint Database

- Joint database created in response to Kentucky Transportation Cabinet requests for geologic information in areas for road improvements.
- Locations of joint data:
  - Roadcuts
  - Areas affected by landslides or rock falls
  - Natural arch locations
- Joint orientations captured during the digitization of geologic quadrangle maps.
- How KGS displays this data is evolving.

KGS Joint Database



Strike and dip data from geologic maps

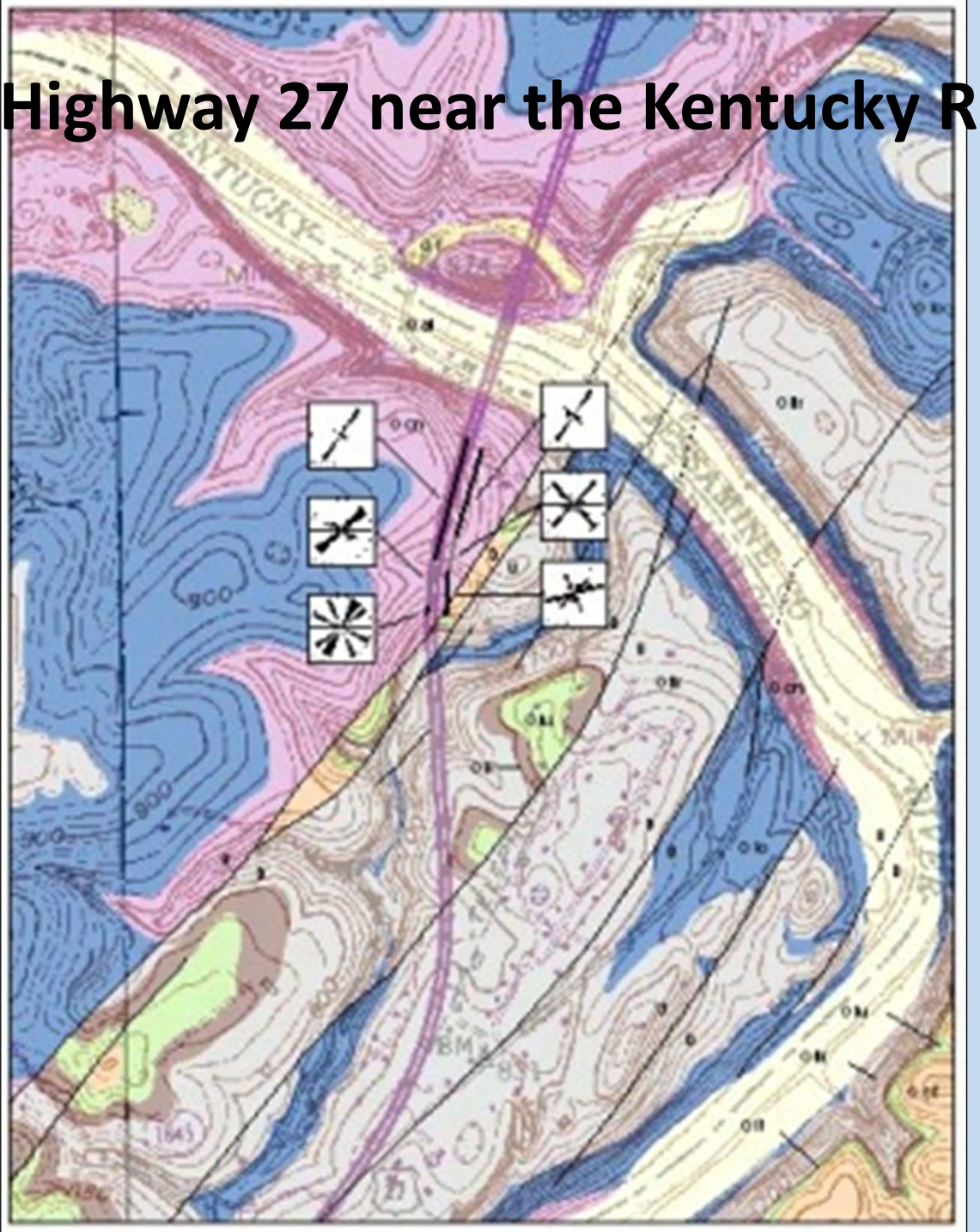
Natural arch locations

Roadcuts

Landslides/rock falls

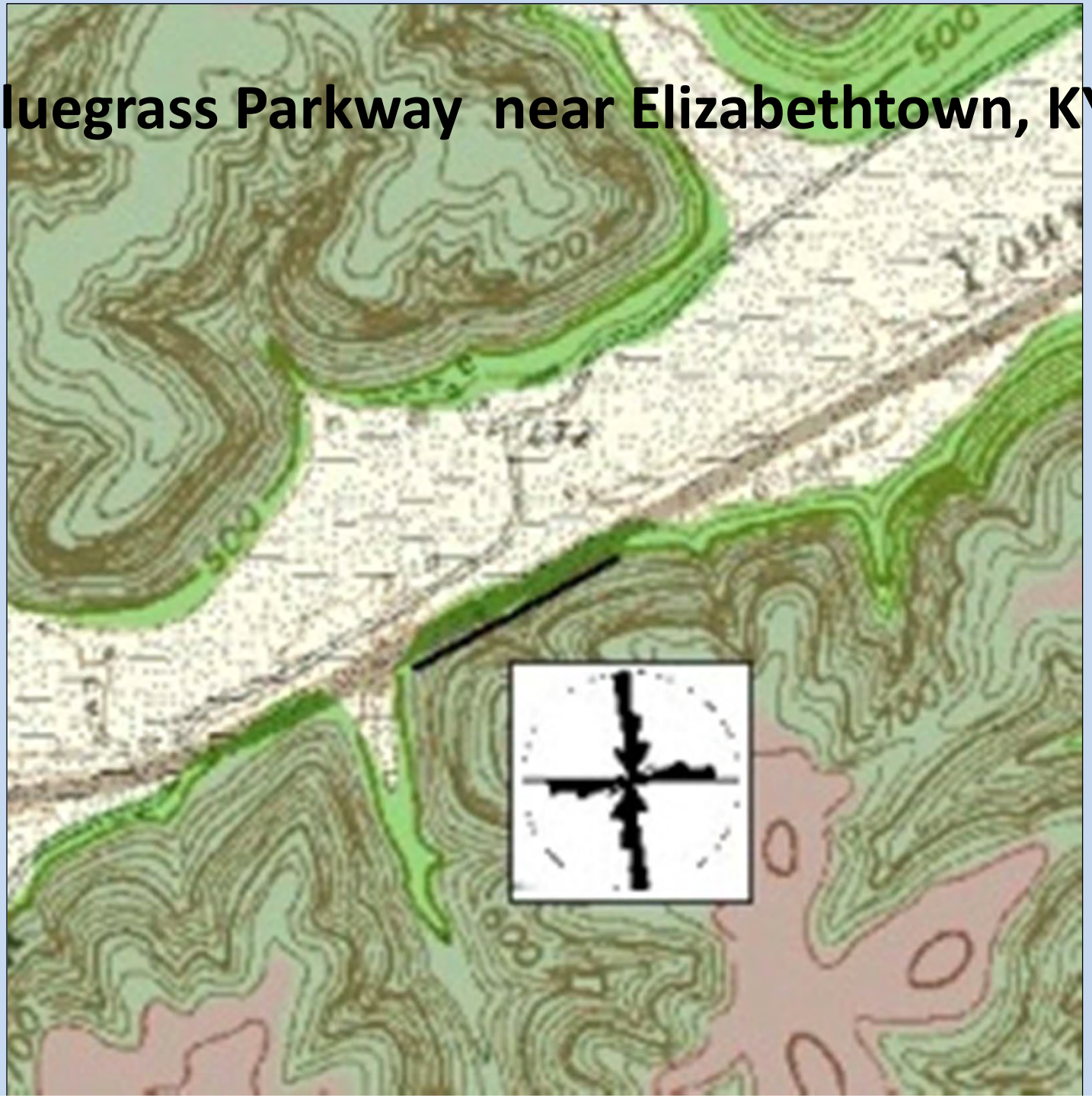
U.S. Highway 27 near the Kentucky River

U.S. Highway 27 near the Kentucky River



Bluegrass Parkway near Elizabethtown, KY
KGS

Bluegrass Parkway near Elizabethtown, KY



Rock fall near Beattyville, KY

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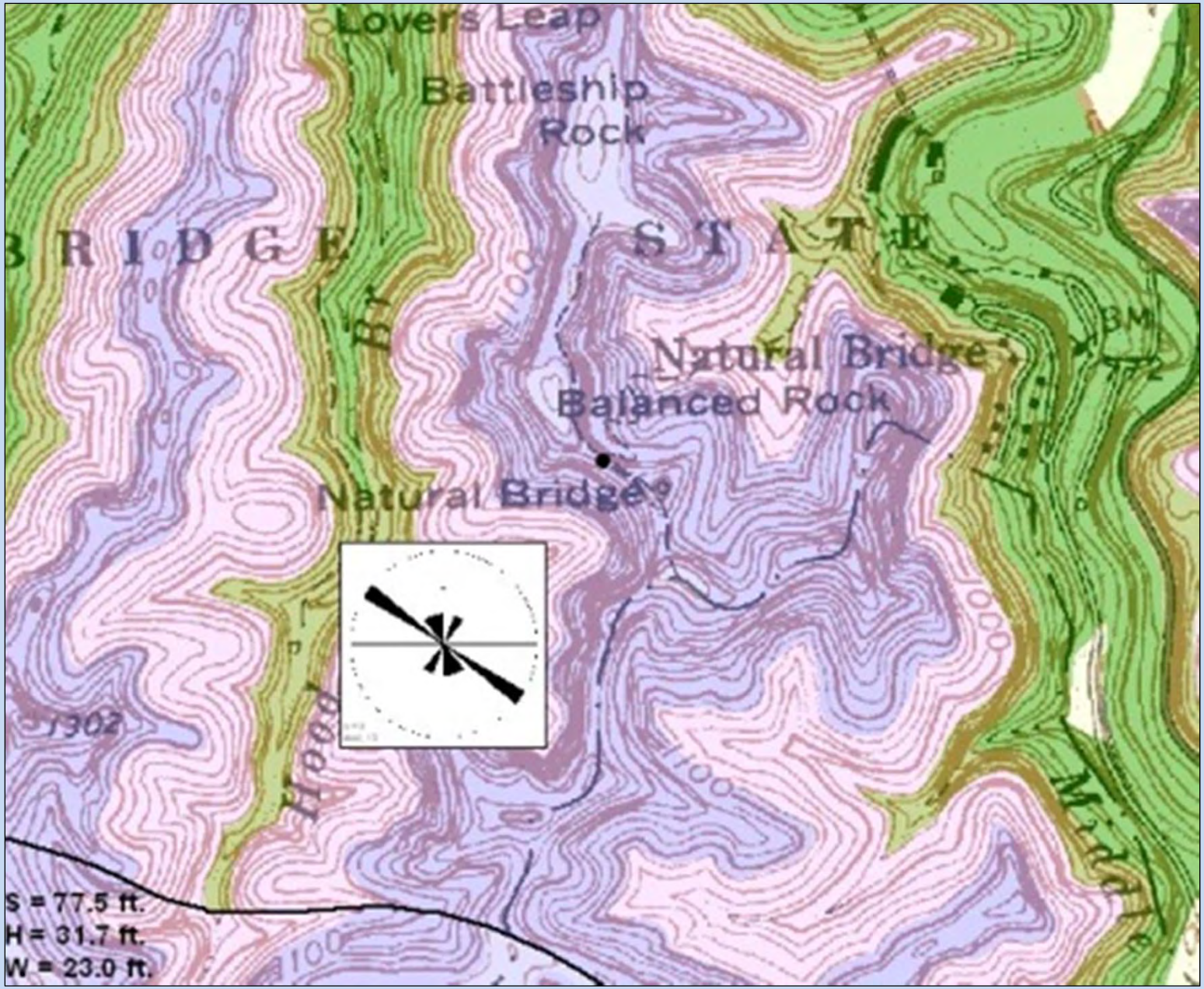
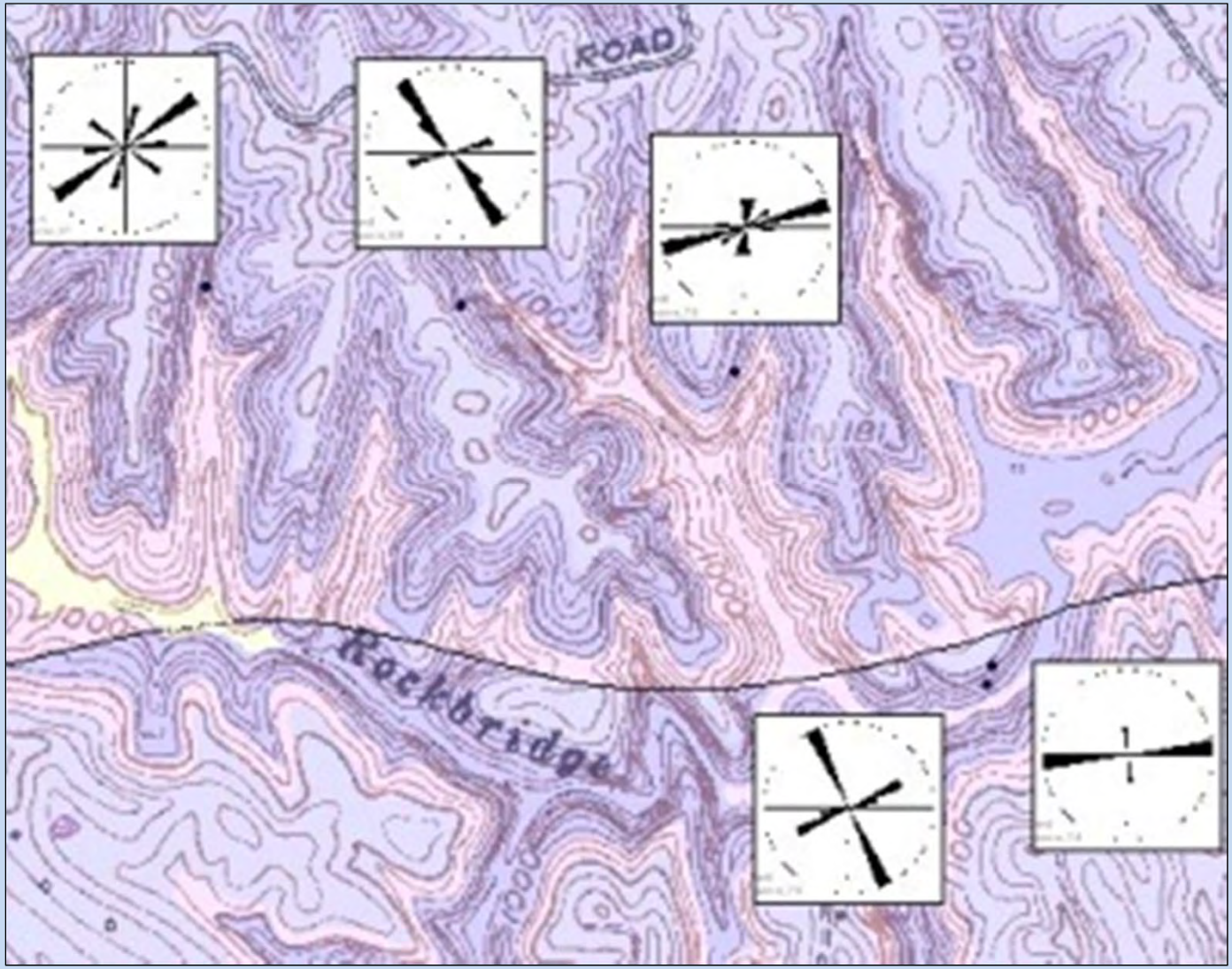
Natural Bridge State Park

Natural Bridge State Park



Log Arch

Relationship between joint orientations, faults, and topography in eastern Kentucky

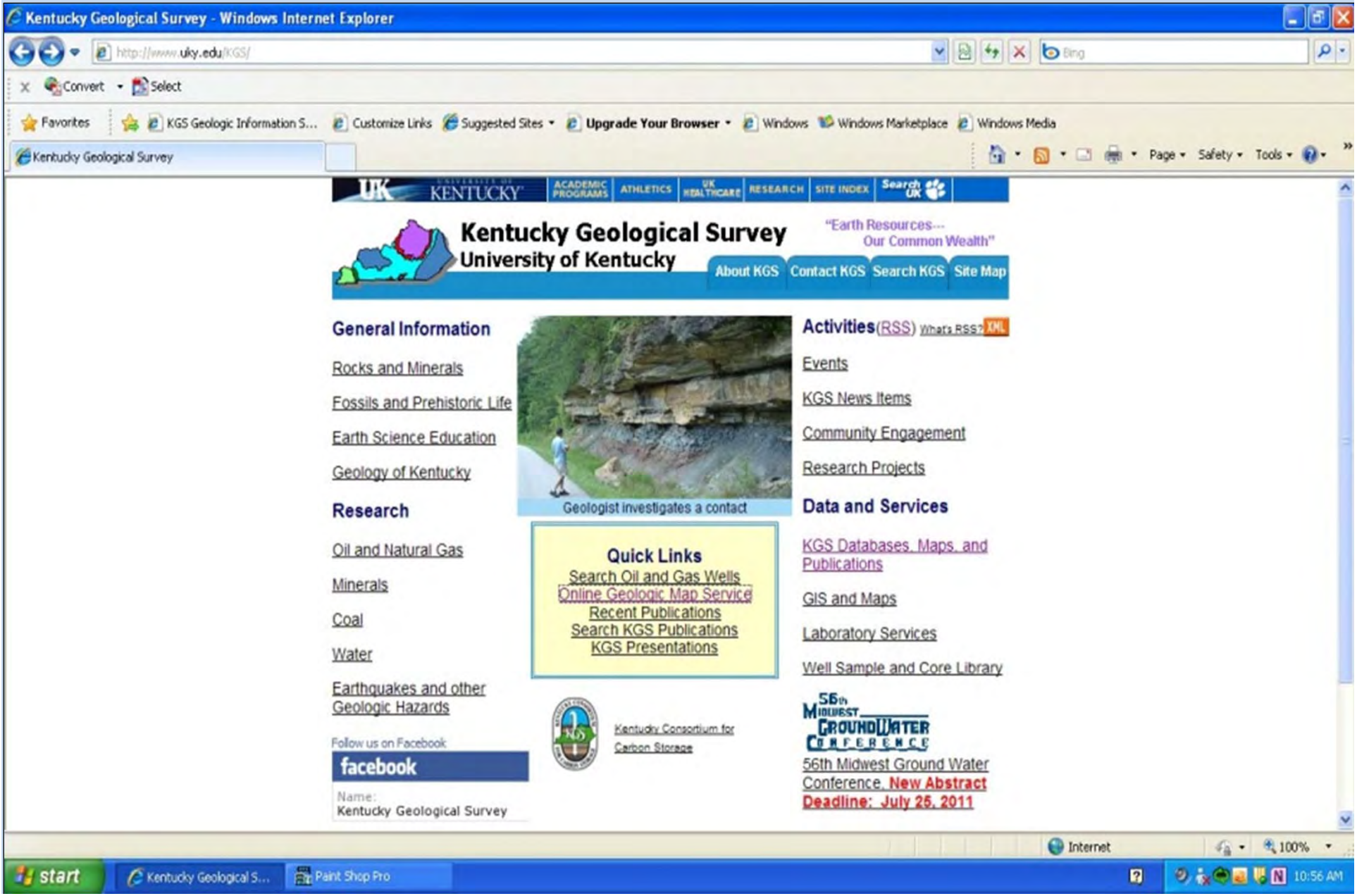


Data collection and procedures

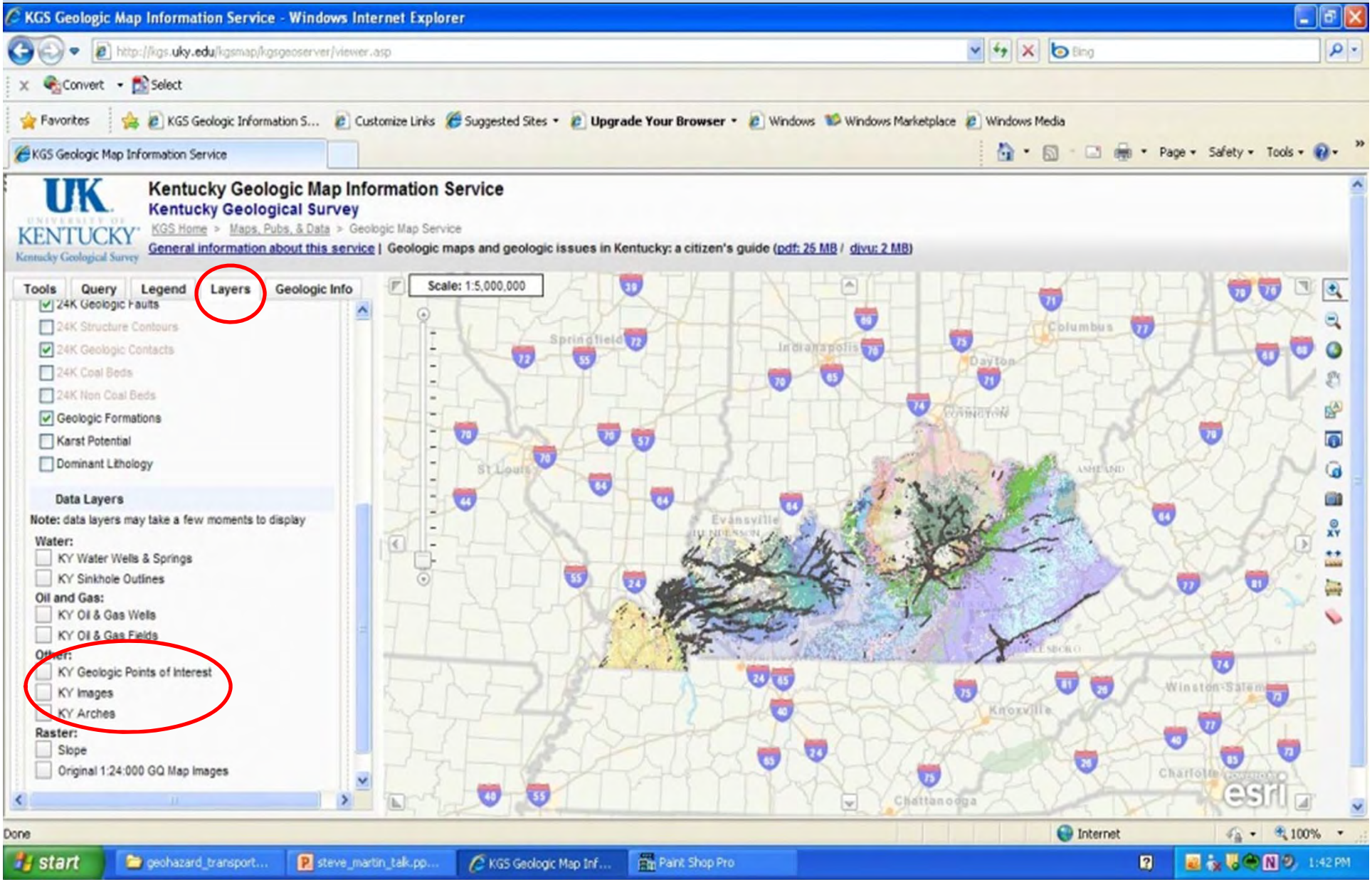
- Identify jointed roadcut (exposure) and take pictures.
- Print pictures and mark the location of joints measured on photo.
- Transfer joint information to spreadsheet and create Rose diagram.
- Create “profile” on KGS online map service
  - includes photographs and rose diagrams
  - will include raw joint data (future)

I-75 near Berea, KY
19
10
9
12
11
8
7
6
5
KGS

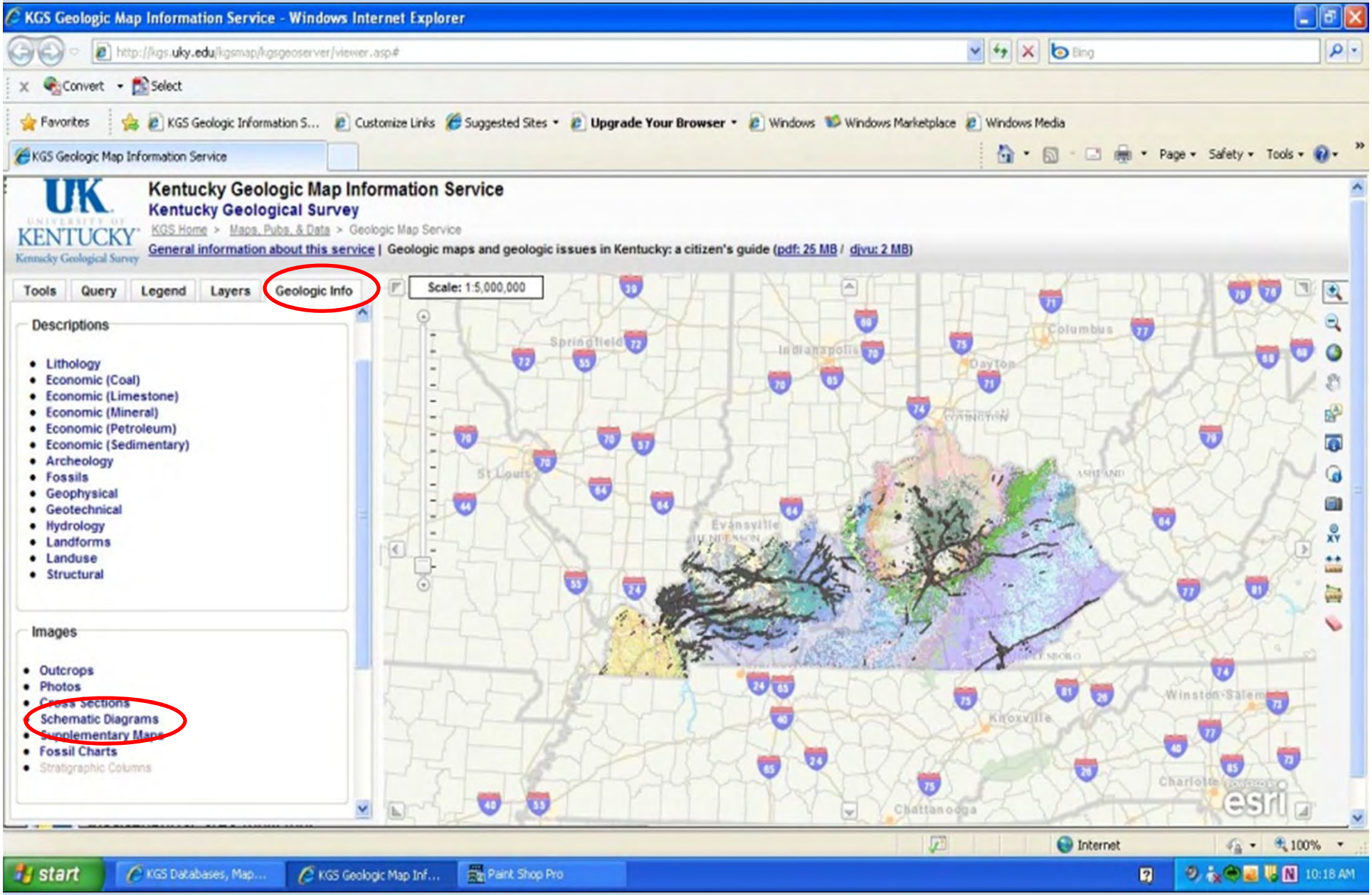
Navigate to http://www.uky.edu/kgs/ then click on “Online Geologic Map Service”



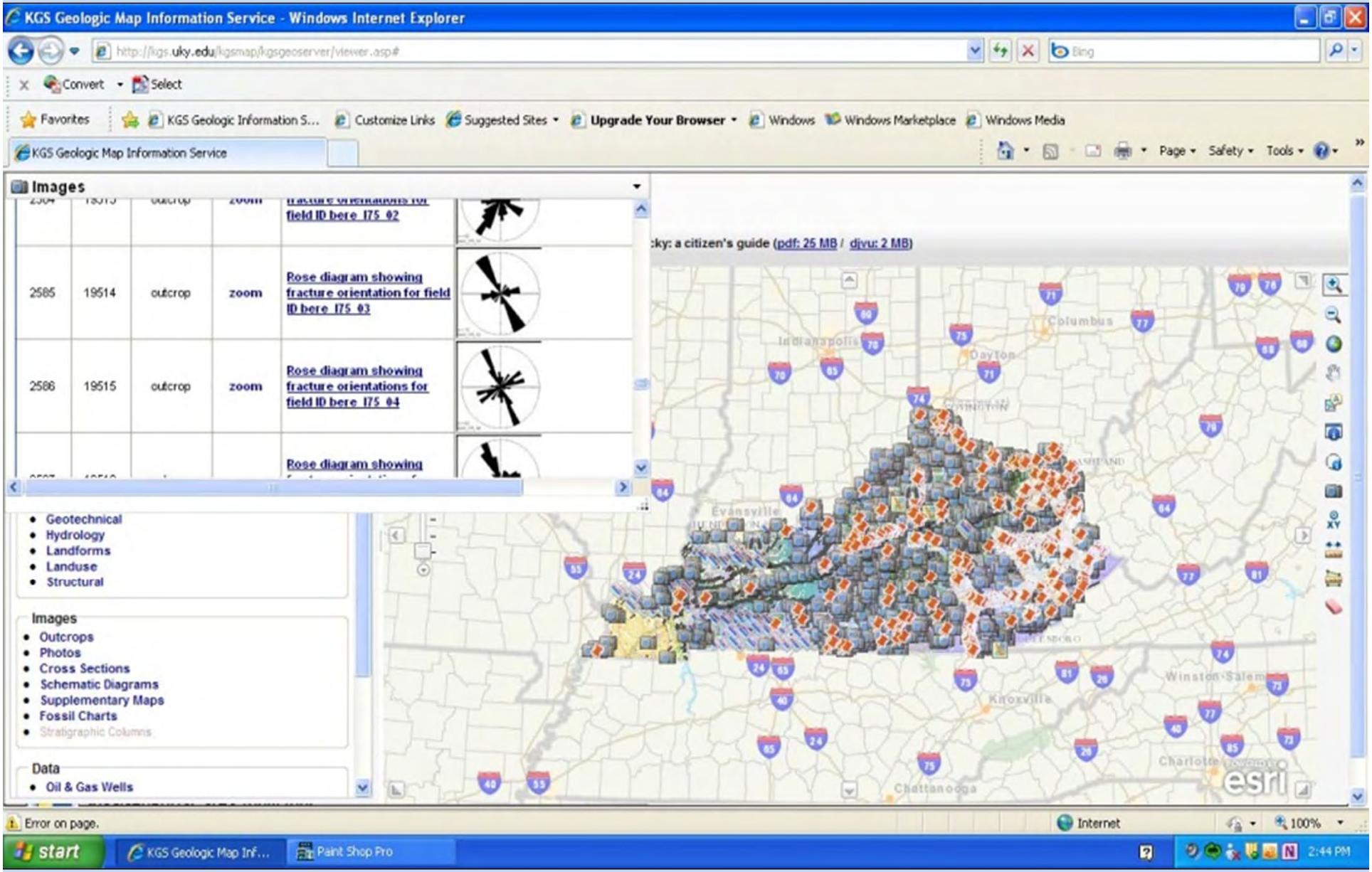
Under the “Layers” tab, select “KY Geologic Points of Interest” and “KY Images”



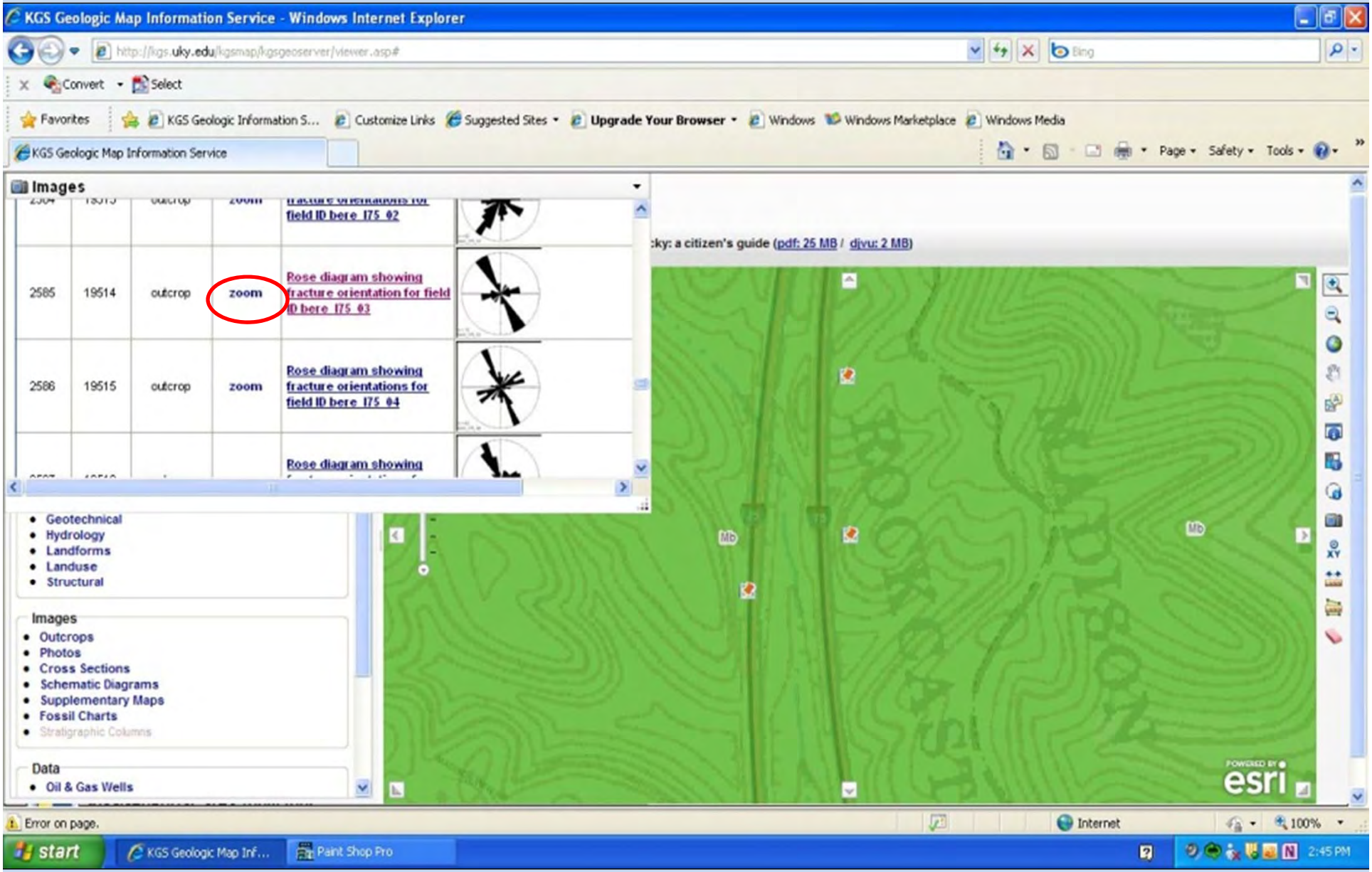
Under the “Geologic Info” tab, select “Schematic Diagrams”.



Scroll down the window to view appropriate Rose diagram

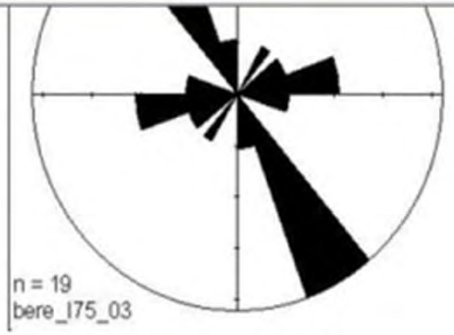


Click on zoom to view the location the joint data



Click on figure caption for information about Rose diagram

Image / Photo Database, Geology Description, Kentucky Geologic Survey - Windows Internet Explorer



Click on the image to see its original size
To Save the picture to your computer, Right click, then Save Picture As

Rose diagram showing fracture orientation for field ID bere_I75_03

View Geologic Map
Link to Full Description

Category:	diagram_struc	**Northing:**	37.534446
Spectra:	black/white	**Easting:**	-84.319856
Resolution:		**Location Method:**	GPS
Source:	Martin, Steve	**Location Precision:**	GPS or survey grade
Format:	JPG	**Looking:**	E
Size:	1.73 MB	**Date:**	4/15/2009
Pixel Dimensions:	340 * 340 (0.12MP)	**Quadrangle:**	Berea
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		Quarry Name:	0
		Image Parent:	0
		Profile ID:	19514
		Field Stop:	No
		WRS_Site ID:	0
		Media Worthy:	No
		Route:	I-75

Keywords

Standard:
Knobs
fracturing
Non_standard:
Rose diagram

Fossil Keywords

Stratigraphic Units:
Cowbell Member

Conclusions

- Joints forming near fault zones are parallel to subparallel in orientation and form due to tectonic stresses.
- Joints forming away from fault zones have varying orientations and often form due to exfoliation.
- In eastern Kentucky, many stream valleys and ridges are joint controlled.
- How we display joint data at KGS is evolving.
- A “layer” of joint data will be displayed on KGS map service in future.
- Digital geologic map data will be combined with new joint data (consistent attributing of data).
- Suggestions?