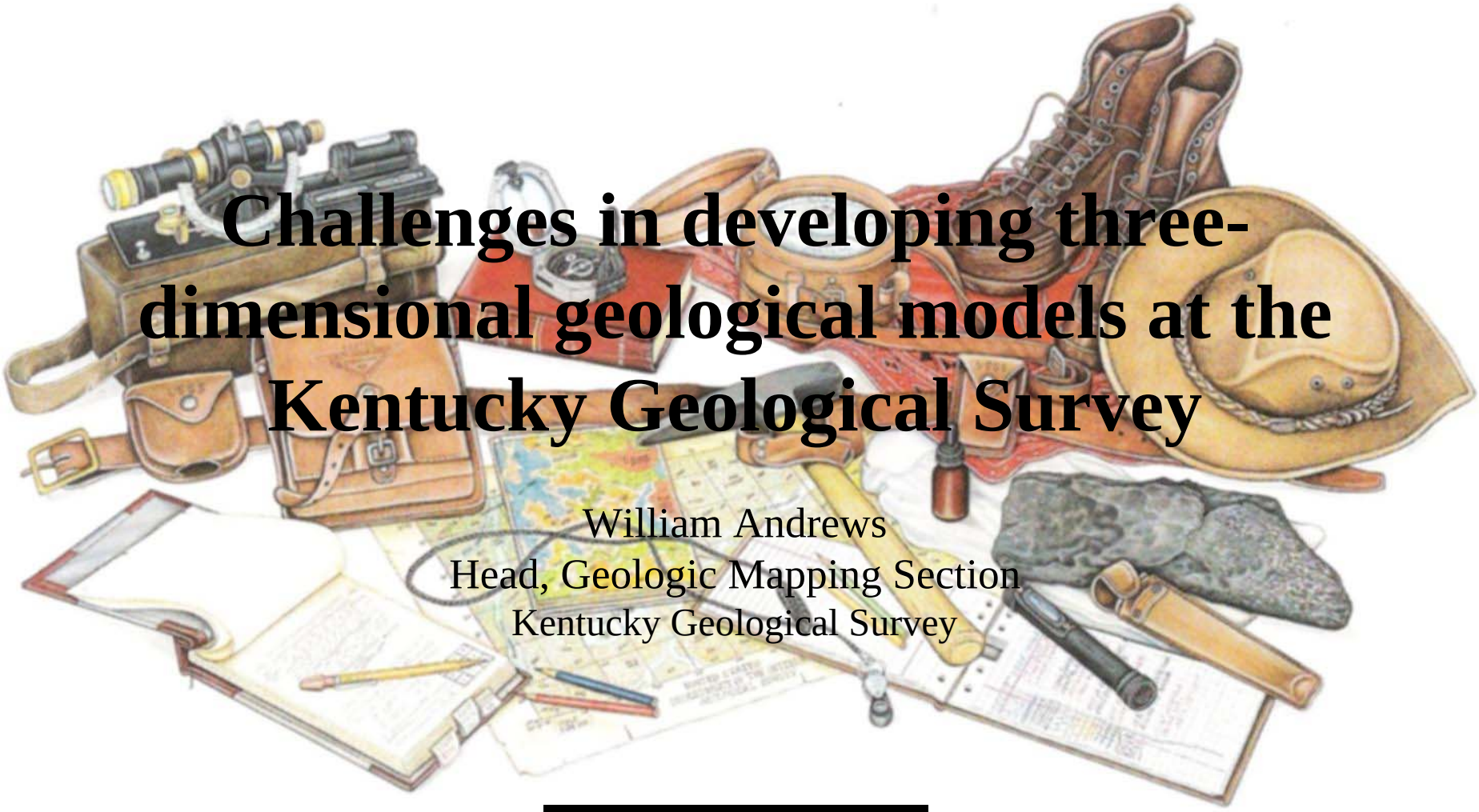
The following was presented at DMT'11
(May 22-25, 2011).

The contents are provisional and will be
superseded by a paper in the
DMT'11 Proceedings.

See also earlier Proceedings (1997-2010)
http://ngmdb.usgs.gov/info/dmt/

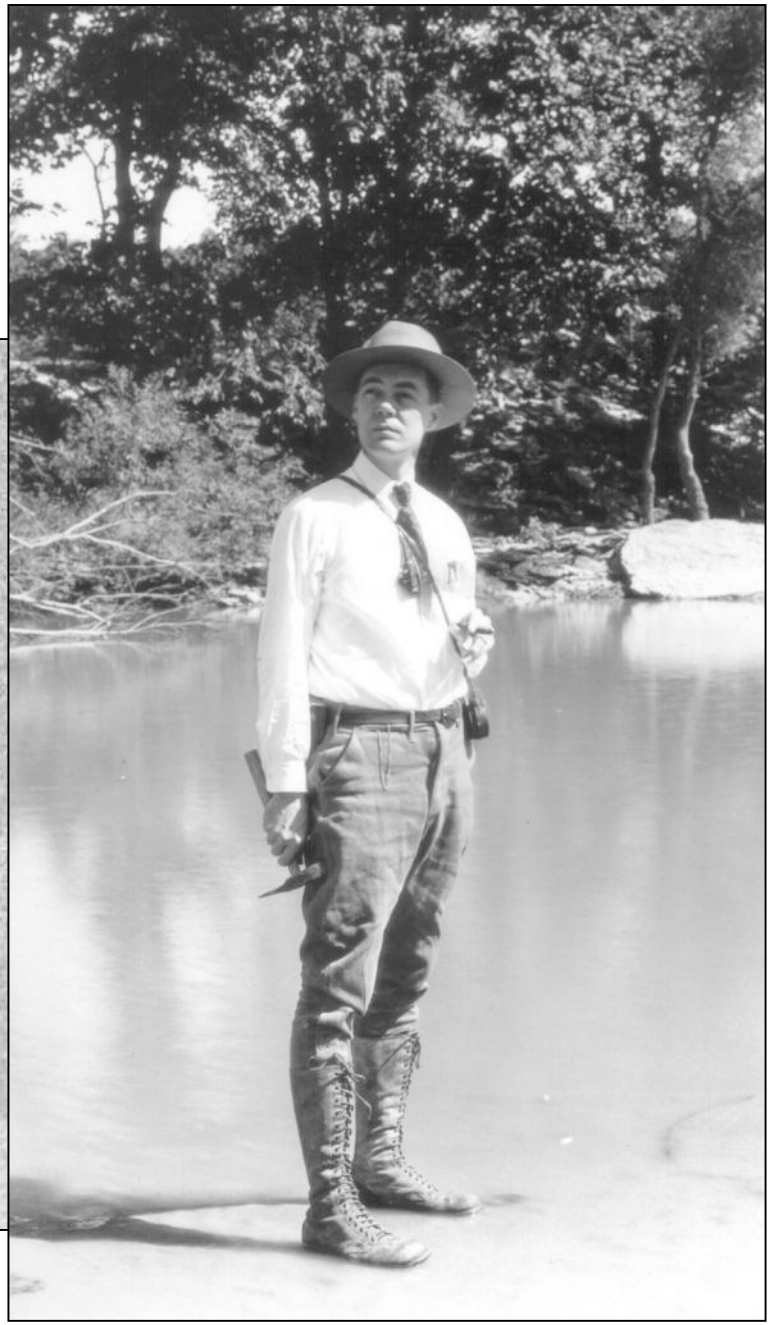


Challenges in developing three-dimensional geological models at the Kentucky Geological Survey

William Andrews
Head, Geologic Mapping Section
Kentucky Geological Survey

Legacy:

KGS has a long history of talented staff

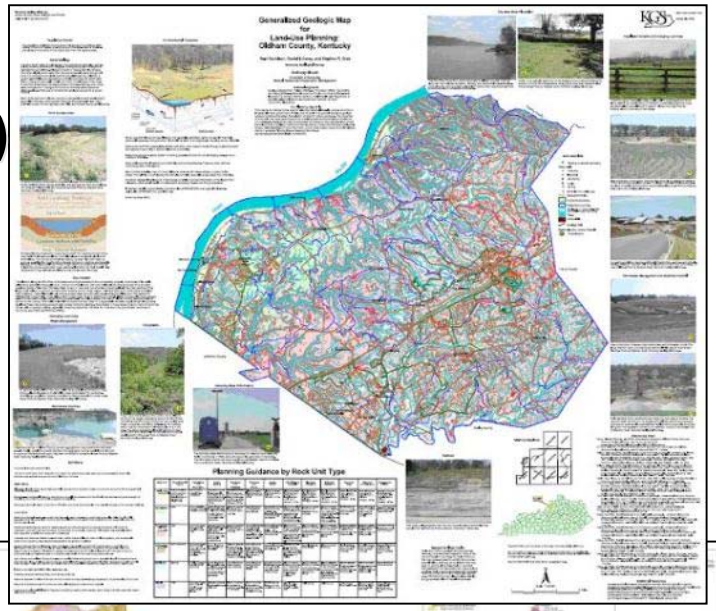


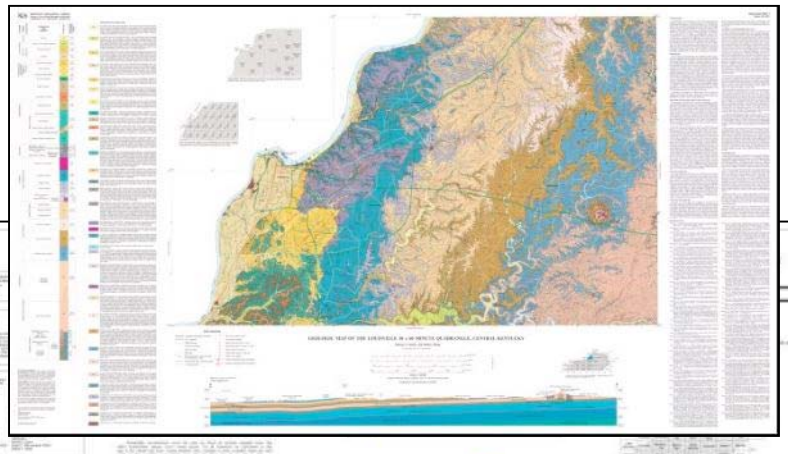
Legacy:

Statewide published 1:24k 2D mapping (1960-78)

All quads digitized (1996-2004)

Multiple statewide derivative products





Legacy:

Geologic map data served free online

Maps, descriptions, columns, strat figures

text search: find highlight text clear highlight

Kentucky Geological Survey
Geologic Map Service

Geologic and feature descriptions for visible themes

- Print This Page
- Hide Clipped Stratigraphic Column Images

Note: Economic descriptions in this report are historic in nature and may not reflect current conditions

Description Source:
Geologic map of the Little Hickman quadrangle, central Kentucky

- view stratigraphic column (.pdf) for this quadrangle: GQ-792

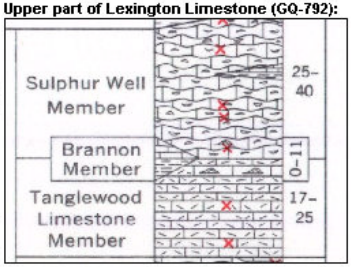
Olu **Upper part of Lexington Limestone**
(Lower Ordovician - Middle Ordovician)

Mapped or described as these unit(s) on the original GQ:

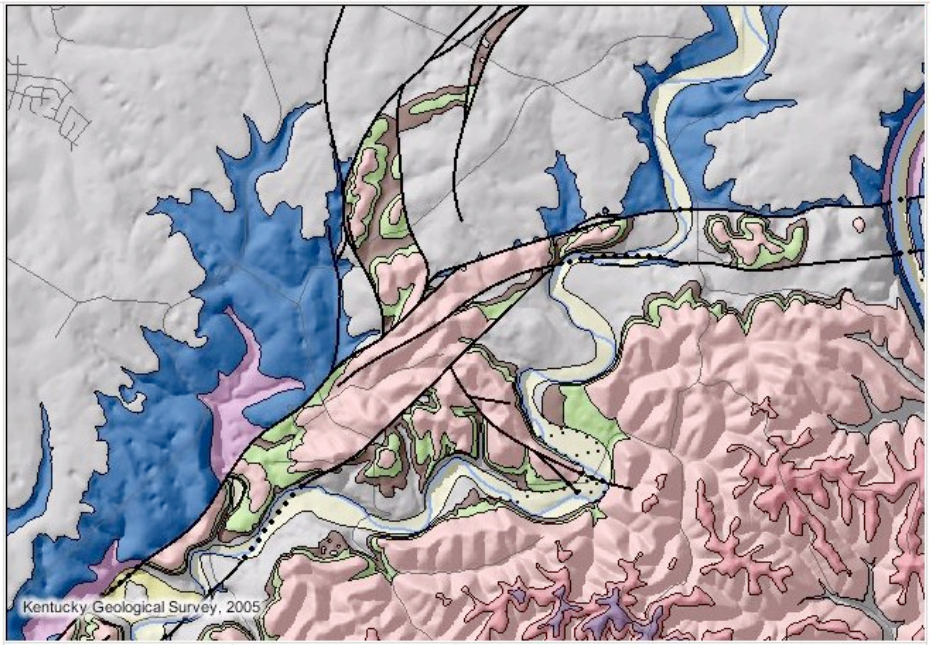
BRANNON MEMBER
Primary Lithology: Limestone and shale
Limestone and shale: Limestone, greenish-gray to medium-bluish-gray, weathers grayish orange; micrograined, in even beds a few inches thick, interbedded with gray shale; some limestone beds contorted; sparse fossils. Present only in southwestern part of quadrangle.

SULPHUR WELL MEMBER
Primary Lithology: Limestone
Limestone, light-olive- to medium-gray, weathers light to light brownish gray; fossiliferous, partly dolomitic, in lenticular beds a few inches thick; characterized by abundant bryozoans, with few brachiopods and

Upper part of Lexington Limestone (GQ-792):



Kentucky Geological Survey
Geologic Information Service (beta)
Note: please disable popup blocking software for full functionality.



Current Scale = 1:48,000

Map Scale: choose a map scale

Map Size: half page (650 x 450)

KY MAPS

Map Legend Map Layers Geologic Information

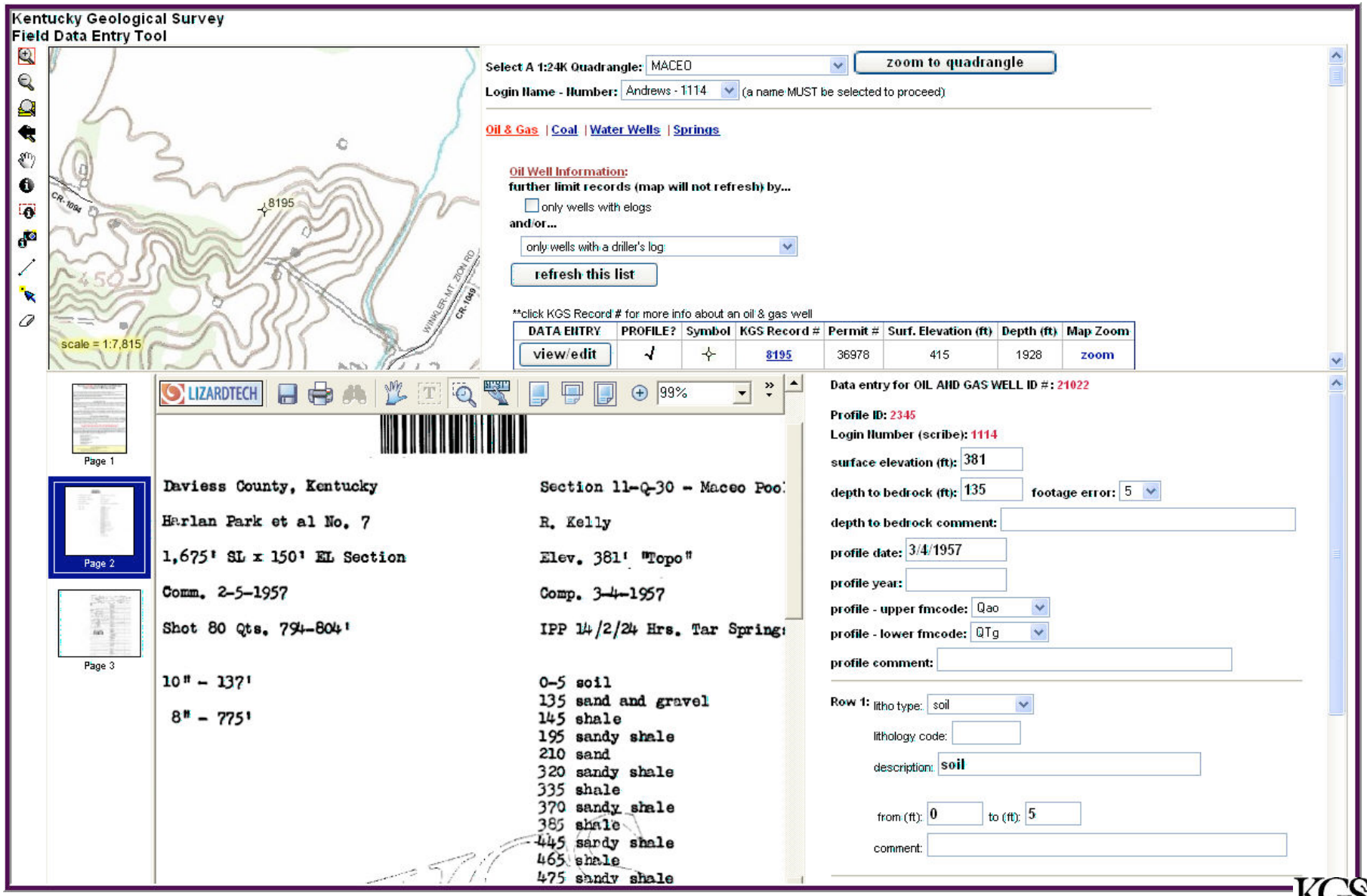
Geologic Units In Current View:
- hide geologic units
1:24,000 scale data (detailed geology)

Qal	**Alluvium** (Quaternary - Quaternary)
Qt	**Terrace deposits** (Quaternary - Tertiary)
QTf	**High-level fluvial deposits** (Quaternary - Tertiary)
Oa	**Ashlock Formation** (Upper Ordovician - Upper Ordovician)
Occ	**Calloway Creek Limestone** (Upper Ordovician - Upper Ordovician)
Og	**Garrard Siltstone** (Middle Ordovician - Upper Ordovician)
Ocf	**Clays Ferry Formation** (Middle Ordovician - Upper Ordovician)
Olu	**Upper part of Lexington Limestone** (Lower Ordovician - Middle Ordovician)
Olt2	**Tanglewood Limestone Member (2)** (Lower Ordovician - Middle Ordovician)
Olb	**Brannon Member** (Lower Ordovician - Middle Ordovician)
Olt1	**Tanglewood Limestone Member (1)** (Lower Ordovician - Middle Ordovician)
Ollr	**Lower part of Lexington Limestone** (Lower Ordovician - Middle Ordovician)
Oto	**Tyrone Limestone and Oregon Formation** (Lower Ordovician - Middle Ordovician)
Ocn	**Camp Nelson Limestone** (Lower Ordovician - Middle Ordovician)

Geologic Symbols:

Legacy:

Online skills have generated online data entry tools



Today:

Continuing to produce 2D mapping

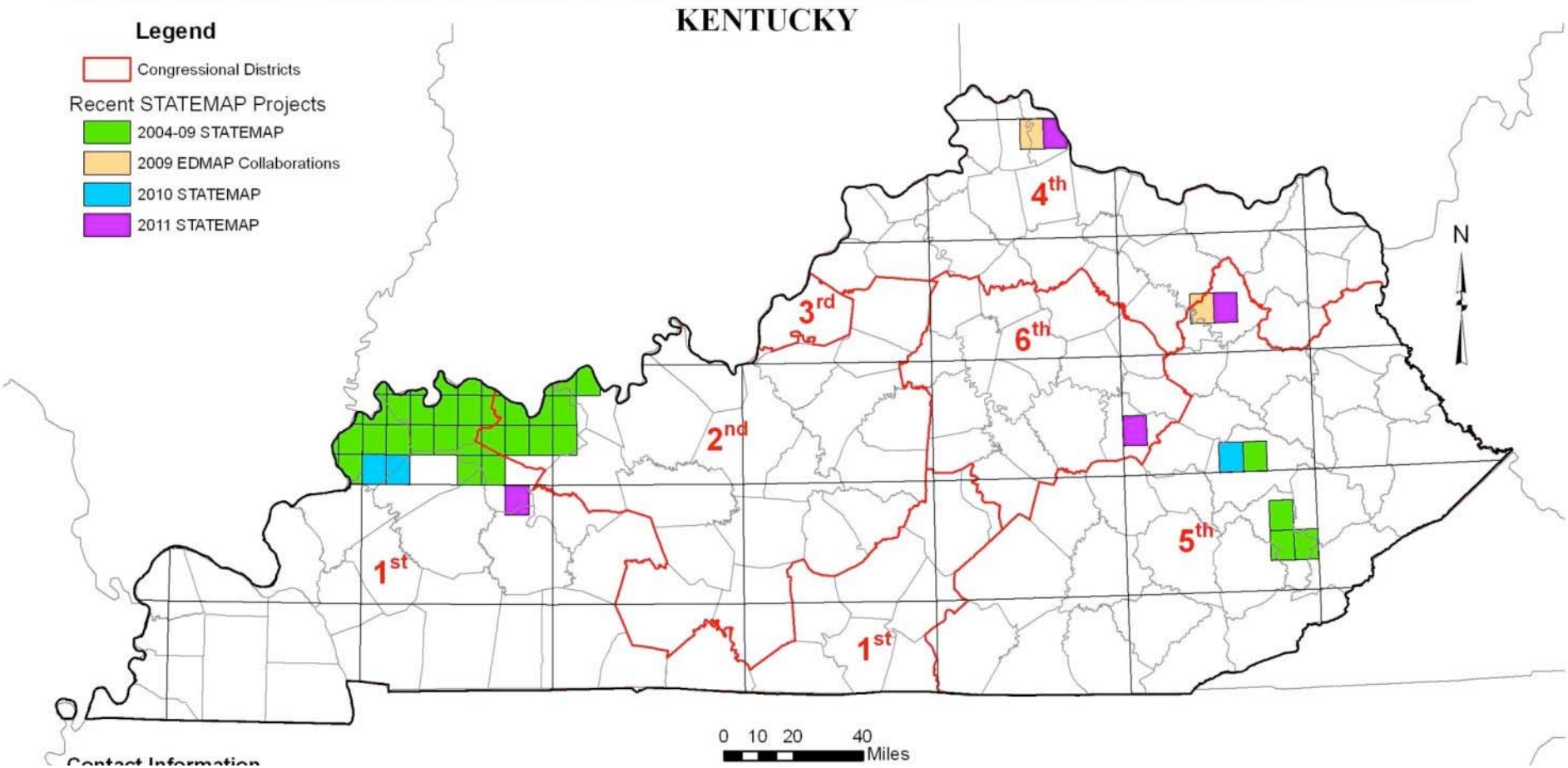
AASG Association of American State Geologists

UK University of Kentucky Kentucky Geological Survey

USGS science for a changing world

National Cooperative Geologic Mapping Program

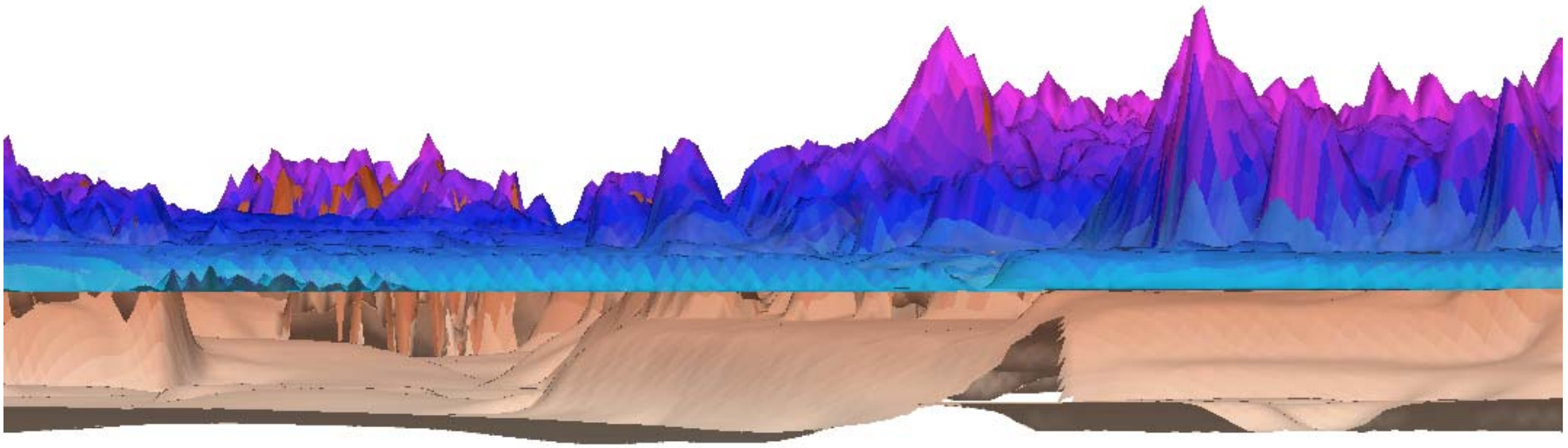
STATEMAP Component: States compete for Federal matching funds for geologic mapping



Toward 3D:

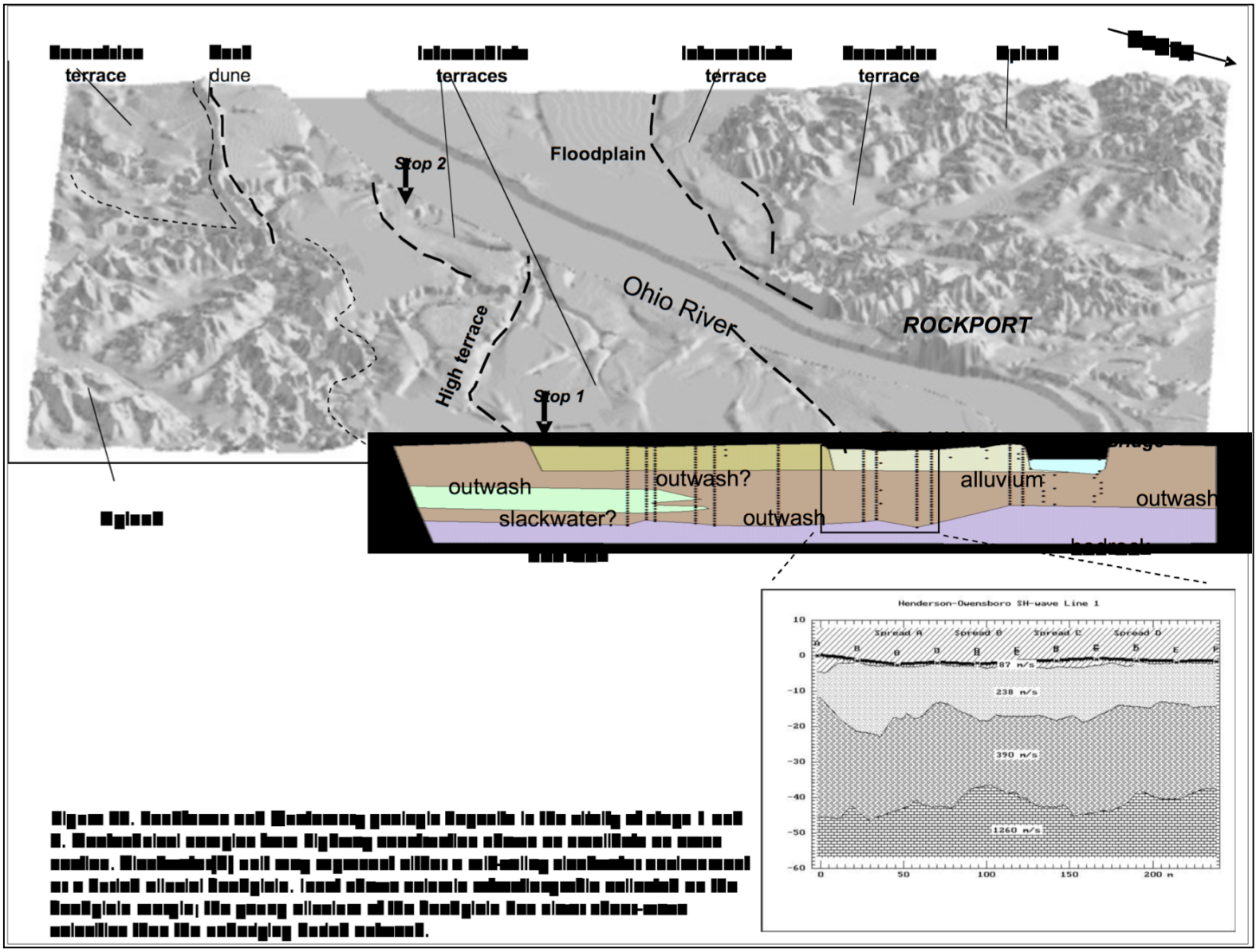
Sharp distinct surfaces, instead of sharp distinct polygons

But the world doesn't always work that way…



Toward 3D:

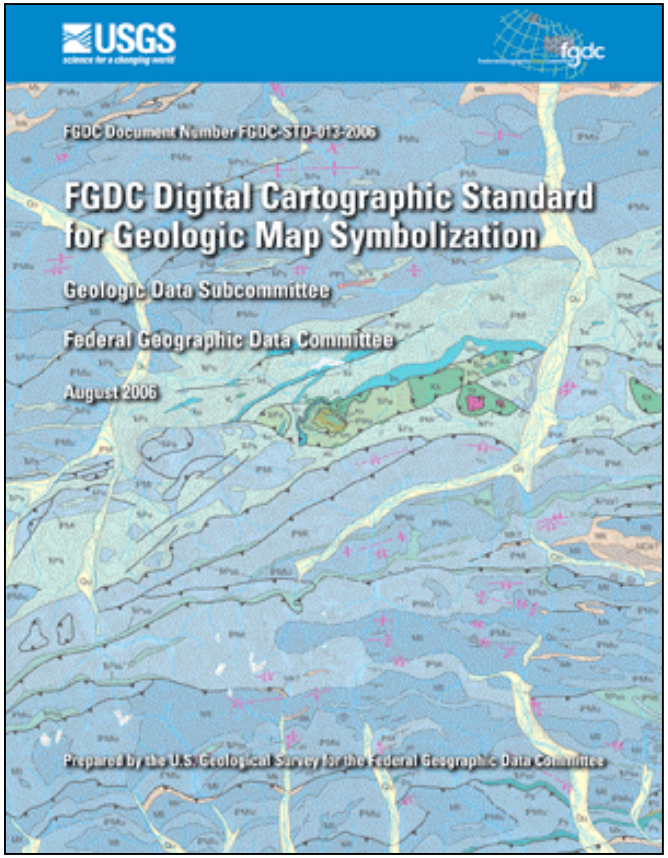
Dilemma of integrating large and complex databases

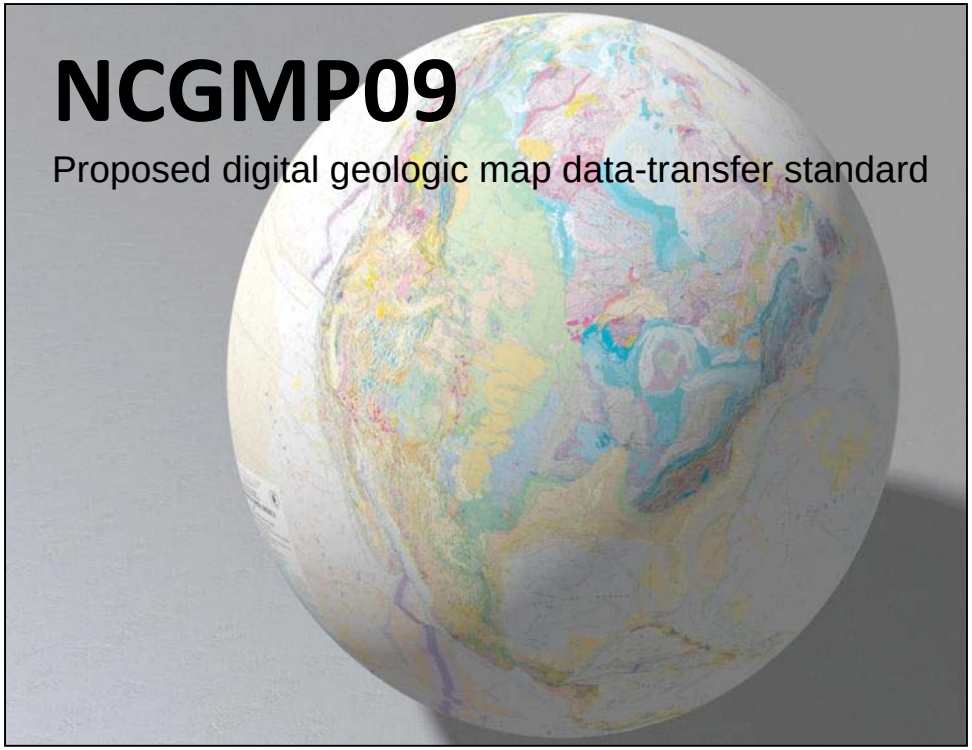


[illegible]

Toward 3D:

How to integrate concepts of feature-level confidence and variability into 3D/rater database?





Toward 3D:

Sharp contacts… ok, this one's easy…

Toward 3D:

Gradational contacts… how do you attribute/display this in 3D…

Toward 3D:

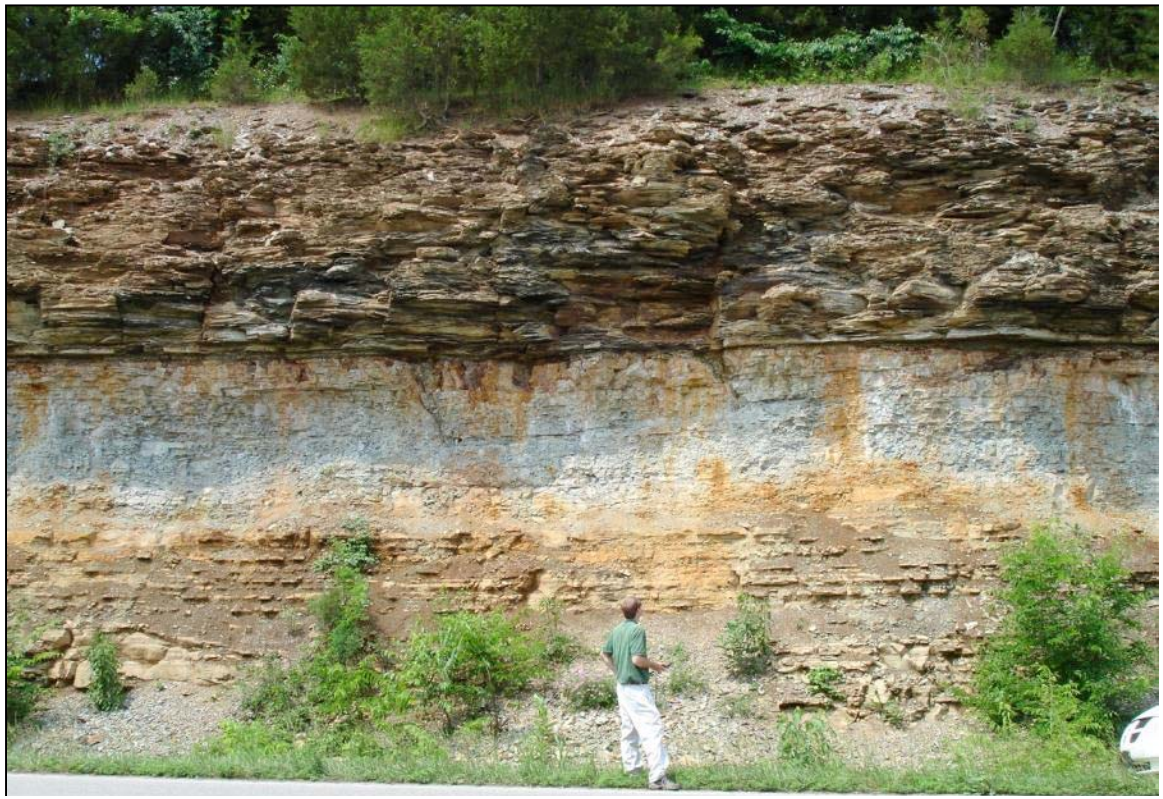
Faults… ~ tilted sharp contacts… ok… manageable…

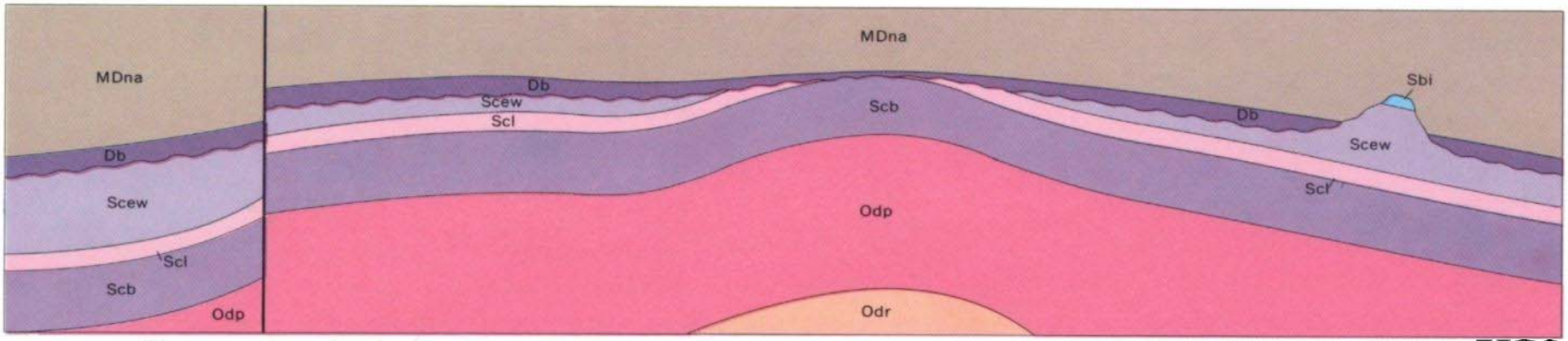
Toward 3D:

Gradational, lateral facies variation… ummm… how?

Toward 3D:

Regional variation in surface characteristics… how do you attribute/symbolize this?



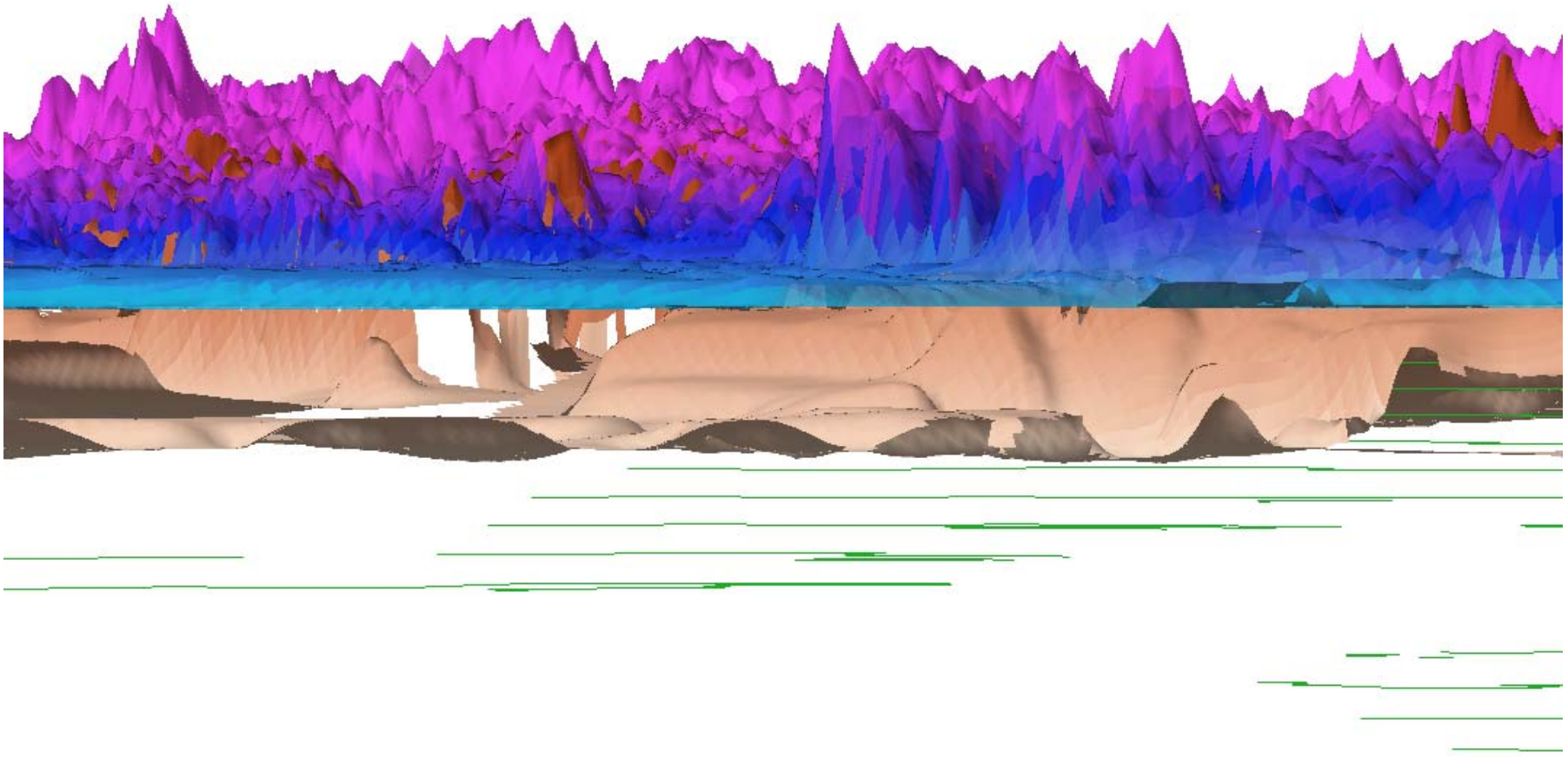


Toward 3D:

Statewide topography (10-m DEM); LiDAR in progress

Localized projects with bedrock topography

Contacts and structure contours from DVGQs, tops from petroleum database



I want YOU…

…to provide feedback.

William "Drew" Andrews
Kentucky Geological Survey
wandrews@uky.edu