KY3D

New dimensions for KGS databases

William “Drew” Andrews
John Hickman, Doug Curl, Carrie Pulliam
Kentucky Geological Survey
University of Kentucky

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Why pursue 3D?

KGS and national strategic plans focus on 3D

Other states/entities have experience with county-scale 3D; drive toward data exchange/compilation.

Kentucky's geological audience is not currently requesting 3D products, but we know 3D can help answer numerous issues for the Commonwealth.

A 3D data system provides a framework for holistic spatial integration of KGS data, and will facilitate numerous analytical capabilities.

KGS has a wealth of 3D-ready data.

KGS is building an integrated 3D database

Updateable/expandable (always add new data, never finished)

Accessible (open source outputs, web tools)

Honest (clearly express uncertainty, feature level metadata)

Data driven, adaptive resolution

Client-focused, multi-application

Foundational (driver of inquiry and exploration)

Flexible (inquiry resource, not a single product)

Available 3D-ready data!

Original GQ program:

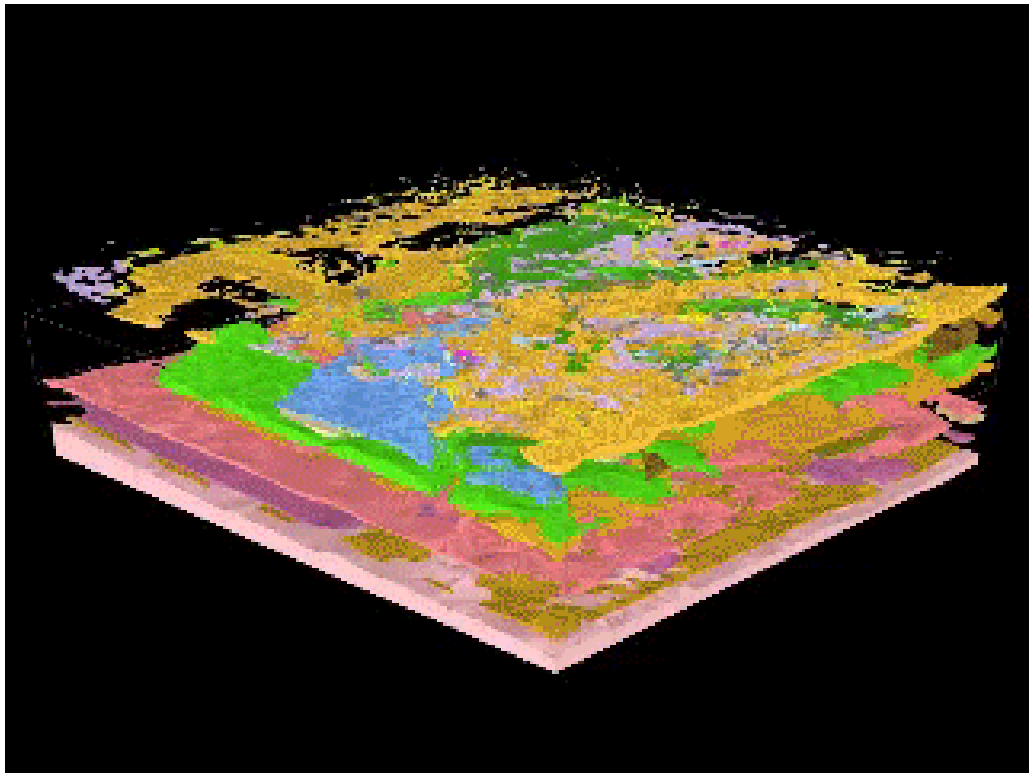
- Elevation based!! ~*One horizon already digitized per quad*
- All data collected in elevations
- Structure contours created for every horizon
- Interpolated onto topographic base by cartographers
- (*DEM extraction from contacts should produce "good" elevations)*

Similar interval+anchor horizon method will be used for 3D interpolations

Numerous basin studies, play assessments, regional subsurface projects

Strat tops database: data source and learning tool

Not ready to spin blocks yet:



Visualization will be inevitable, but is NOT the priority.

Geologic Map Schema (GeMS): digital geologic map data standard

Grass-roots national 2D data standard for map-data exchange

Fields and attributes for GIS point, line, and polygon files

Feature level metadata

Data source attribution (different databases, collaborators)

Base maps used, resolution/scale

Acknowledgement of uncertainty

(identity, location, value, etc)

Hierarchy key (stratigraphic position code)

First Steps:

✓ Data Inventory:
Multiple datasets already exist; 50 years of KGS projects
Some ready to enter, some will need modification

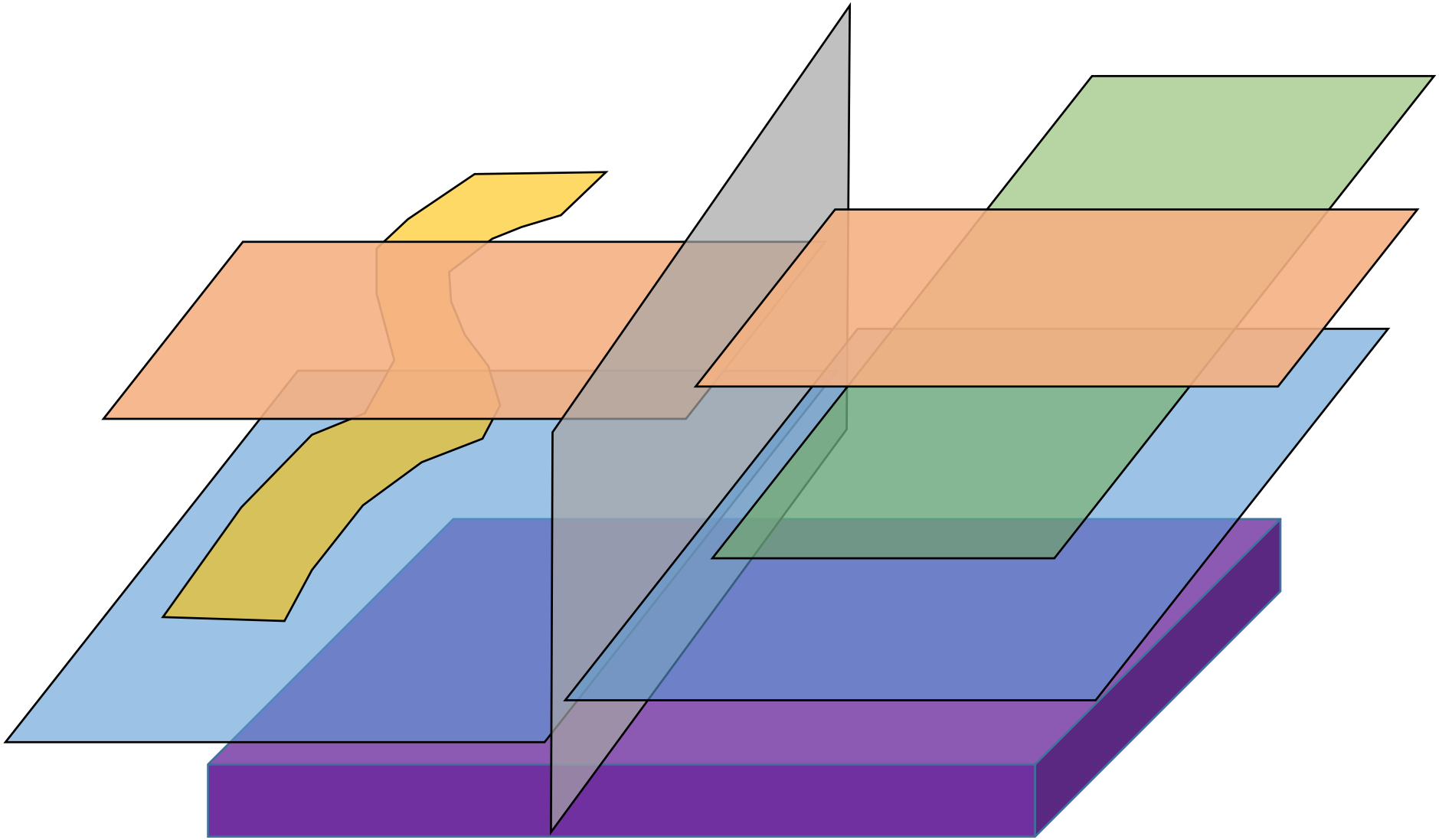
❑ Stratigraphic Framework (Andrews):
Exists (or can be modified) from KGS DMP and Energy Section

❑ 3D Fault Model (Hickman):
In progress, based on 24k digital geology and geophysics

❑ Data Structure (Andrews):
In progress, based on GeMS, ArcHydro and other states' 3D work

Next Steps:

- ❑ Populate data system with available horizons and databases
- ❑ Develop preliminary web tools
- ❑ Begin ~~seeking~~ derivative/associated projects
  - ❑ EarthMRI Hicks Dome
  - ❑ Lexington neighborhood water budget
  - ❑ USGS Appalachian basin model
- ❑ Continue integrating additional KGS data



Questions?

Contact information:

William Andrews
Head, Geologic Mapping Section
Kentucky Geological Survey
228 MMRB, UK
Lexington, KY 40506-0107

Phone: 859-323-0506
Email: wandrews@uky.edu

Web: http://www.uky.edu/KGS