

Geologic Structure & Seismic Analysis

Kentucky Geological Survey
Task Leader

Trenton Black-River Research Consortium

June 8, 2004



Industry Partner Support

- All sponsors e-mailed February 26, 2004
- Telephone contact with all with the exception of Compton Petroleum
- Face to face visits in April 2004 with:
 - Seneca (Scott Gorham)
 - Seismic Exchange Inc. or SEI (Jeff Lester)
 - GeoData (Biff Rummerfield)
 - EXXON (Pinar Yilmaz)



Industry Partner Support, cont.

- Data in house from:
 - Seisco: Covers KY, WV and small parts of PA and NY
 - New York State Museum: covers W NY
 - Pennsylvania Survey data: western PA
 - North Coast Energy: covers small parts of WV (Evans and Paragon data). KGS signed an agreement for use of this data
- Pending data:
 - Petro-Evaluation for Muskingum County, OH and possibly some other data
 - EXXON seismic data proposal through GeoData



Industry Partner Support, cont.

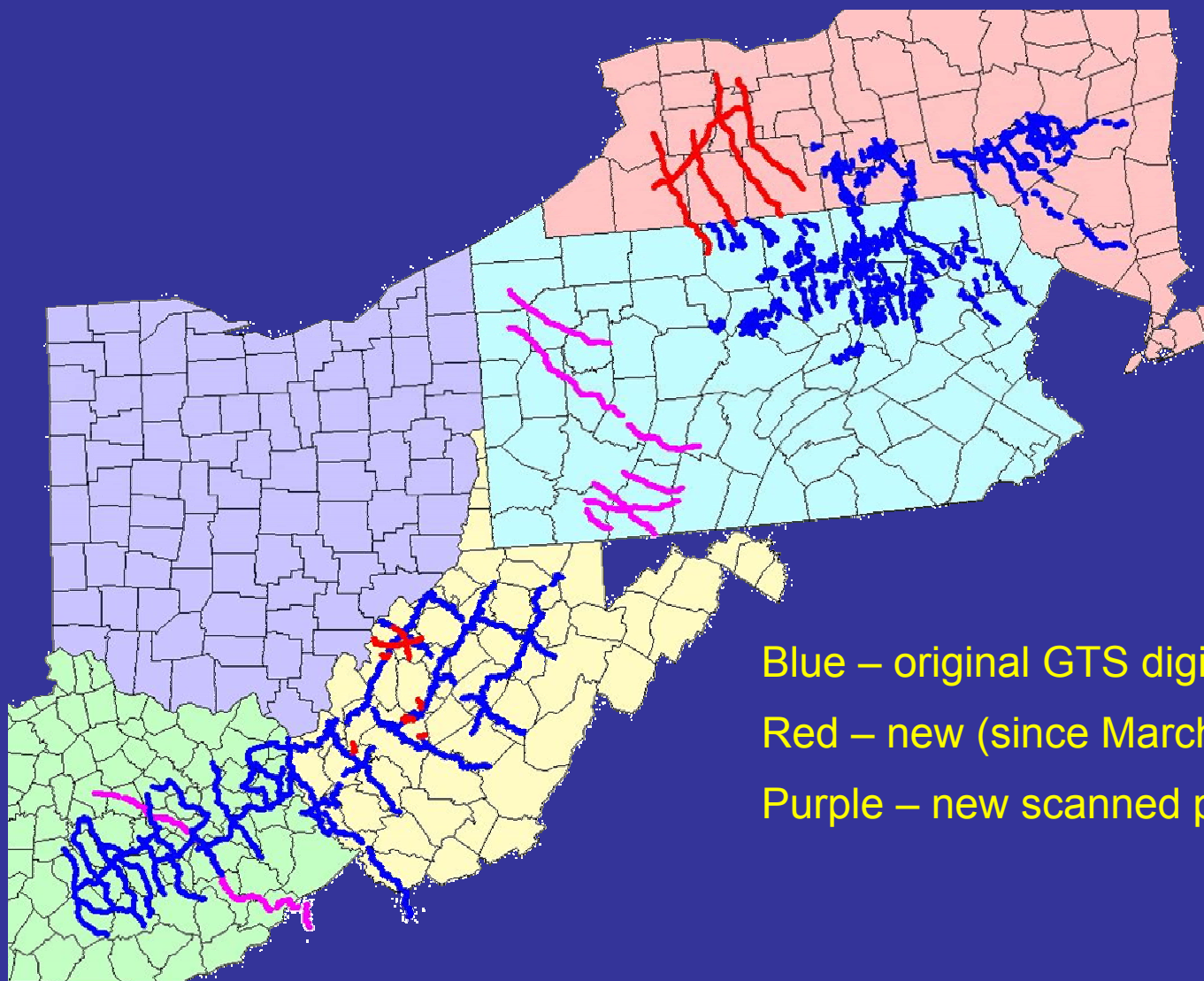
- Problems
 - SEI now is brokering most of the major's seismic data and SEI is hard to deal with
 - The “wait and see” attitude of many of the sponsors
 - Fear of confidentiality violation
 - Fear of sharing even derivative data with other members

Ongoing Data Acquisition

- Eleven new analog (paper copies) of regional seismic lines have been scanned and loaded into PetraSeis™ software
- Five new digital (SEG-Y) regional seismic lines from western New York state have been loaded into Kingdom Suite™ software
- Nine new digital (SEG-Y) regional and field scale seismic lines from central West Virginia have been loaded into Kingdom Suite™ software, including 2-3 processed versions of each (enhanced stack, migrated, etc.)



Current Seismic Data Loaded



Blue – original GTS digital data

Red – new (since March) digital data

Purple – new scanned paper data

Interpretation of Current Data

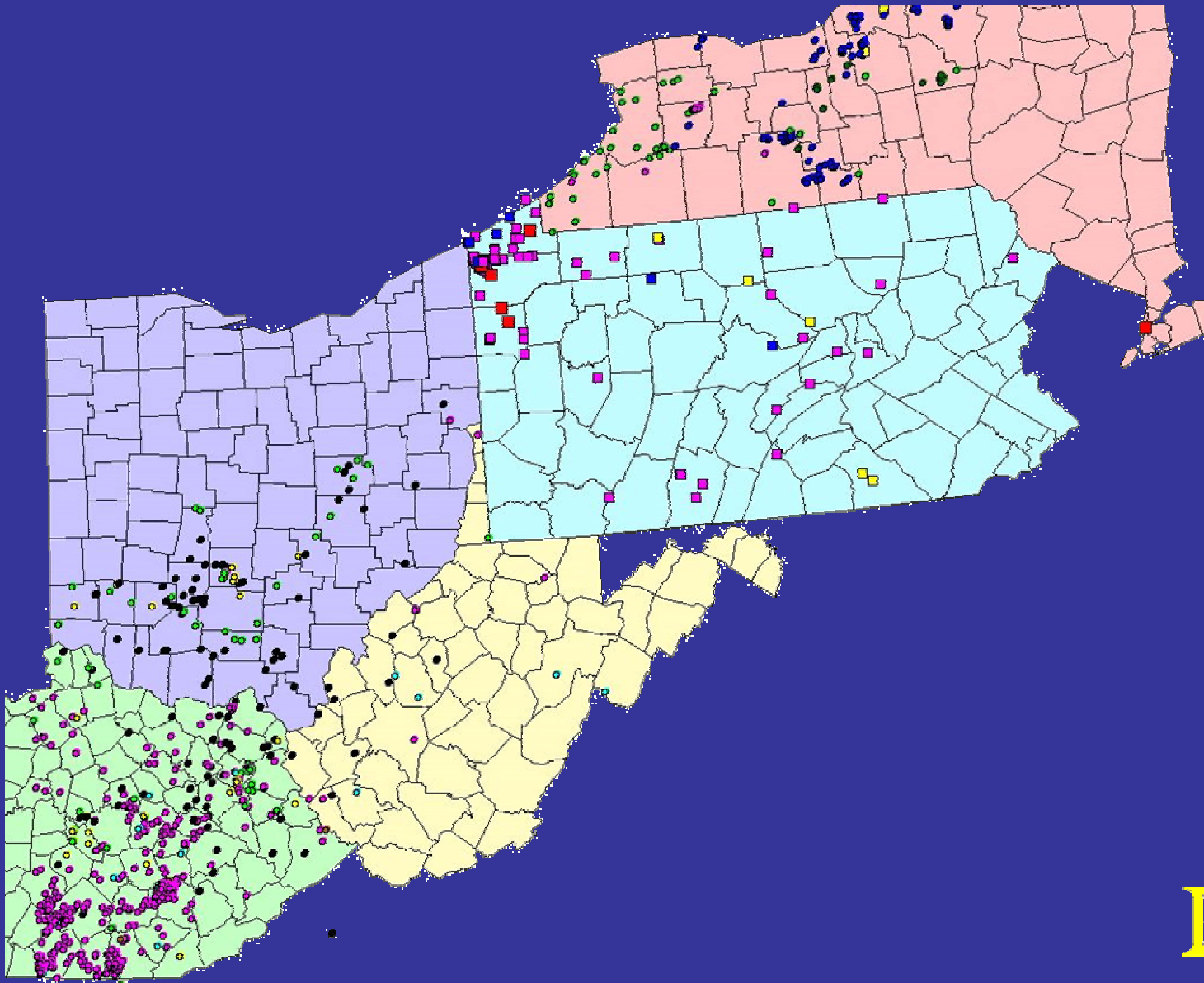
- Six regional seismic horizons interpreted for northeastern PA/southern NY region
- Depth (TWT) horizons gridded over Northern Appalachian project area:
 - Tully Ls (Devonian)
 - Trenton Ls (Ordovician)
 - Precambrian metamorphic basement (partial)

Data Interpretation, cont.

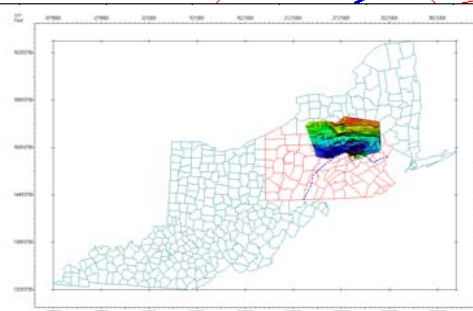
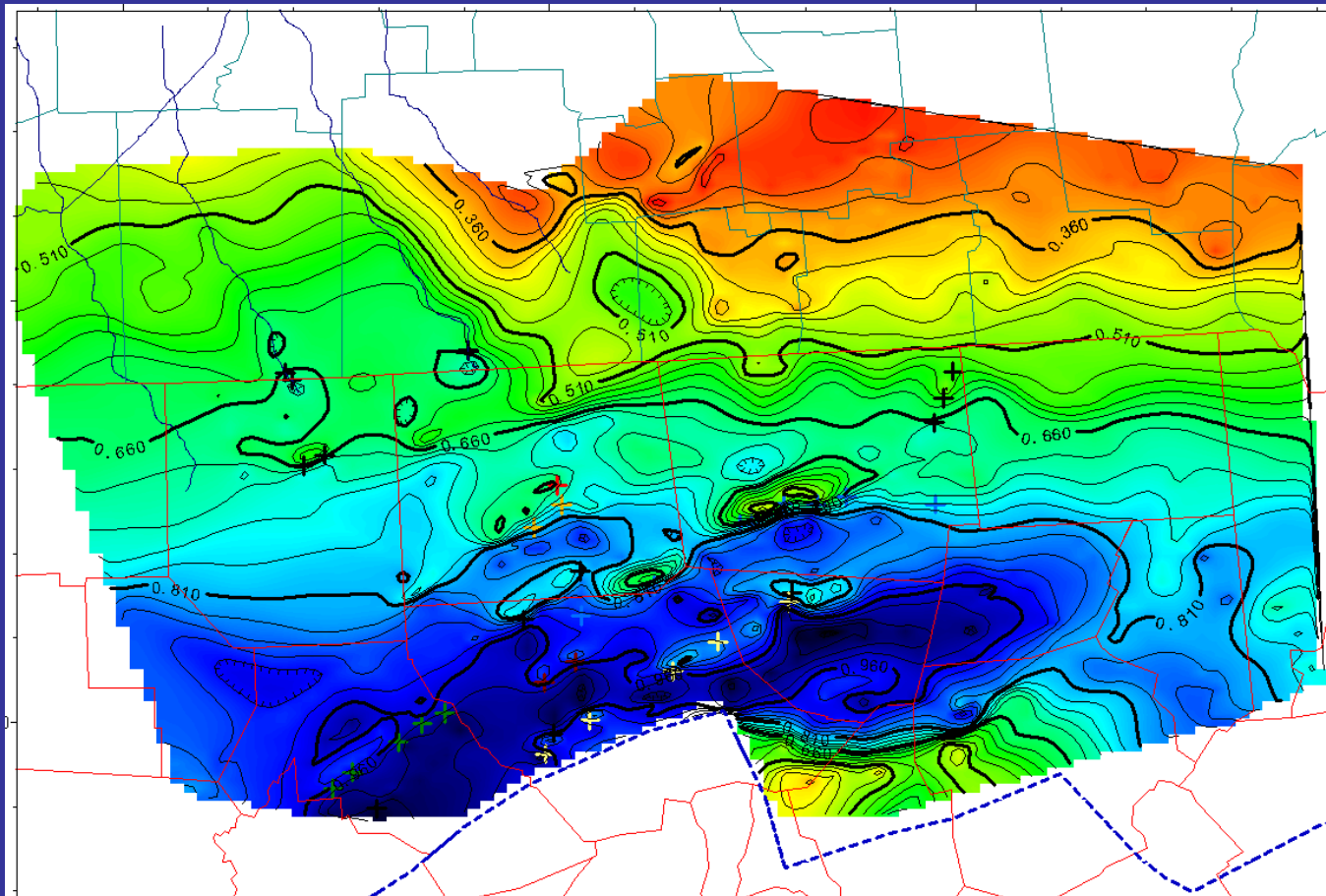
- Preliminary depth (feet) to Trenton Ls map for northeastern PA/southern NY
- Up to 16 stratigraphic horizons interpreted along southern Appalachian seismic lines
- The interpretation of apparent basement offsets, along with other major faults is nearing completion (for the data presently collected by consortium).



Wells used for preliminary correlations



Preliminary Tully Two Way Time Structure



2971000



Kentucky Geological Survey

Trenton Black River

Location: NY/PA

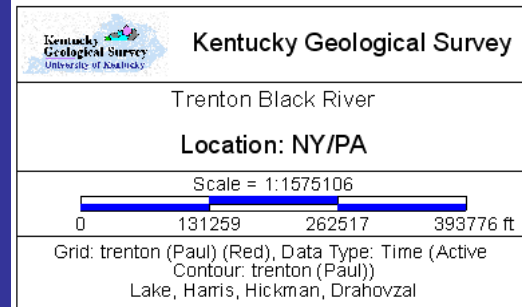
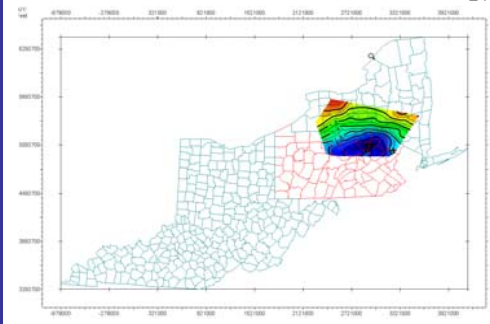
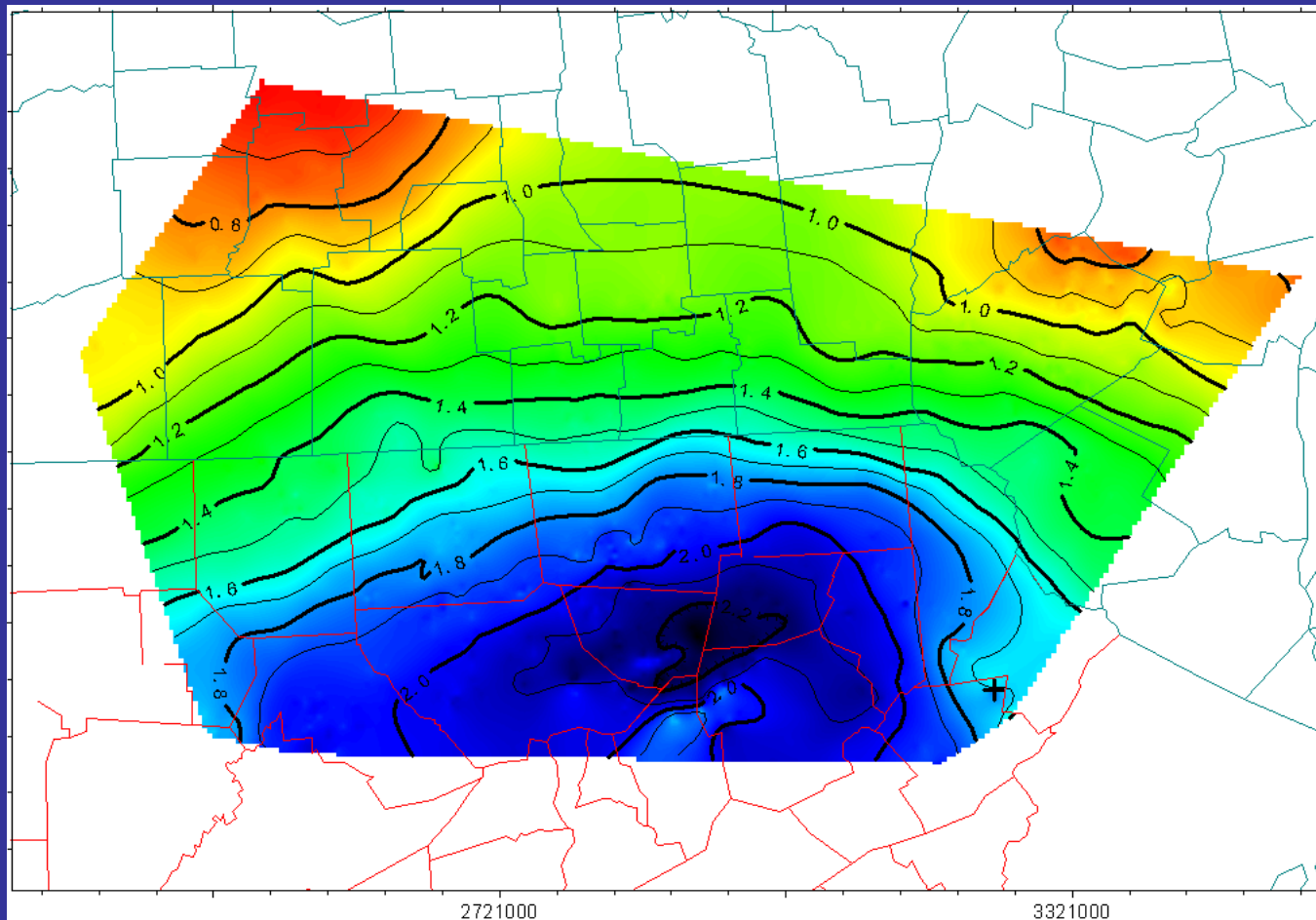
Scale = 1:937516

0 78126 156253 234379 ft

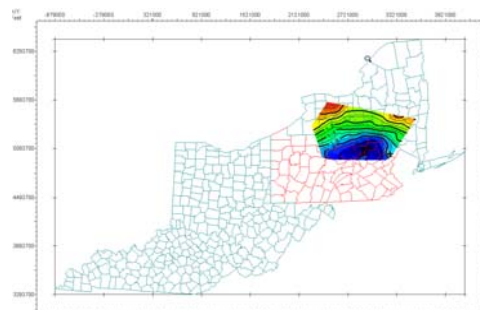
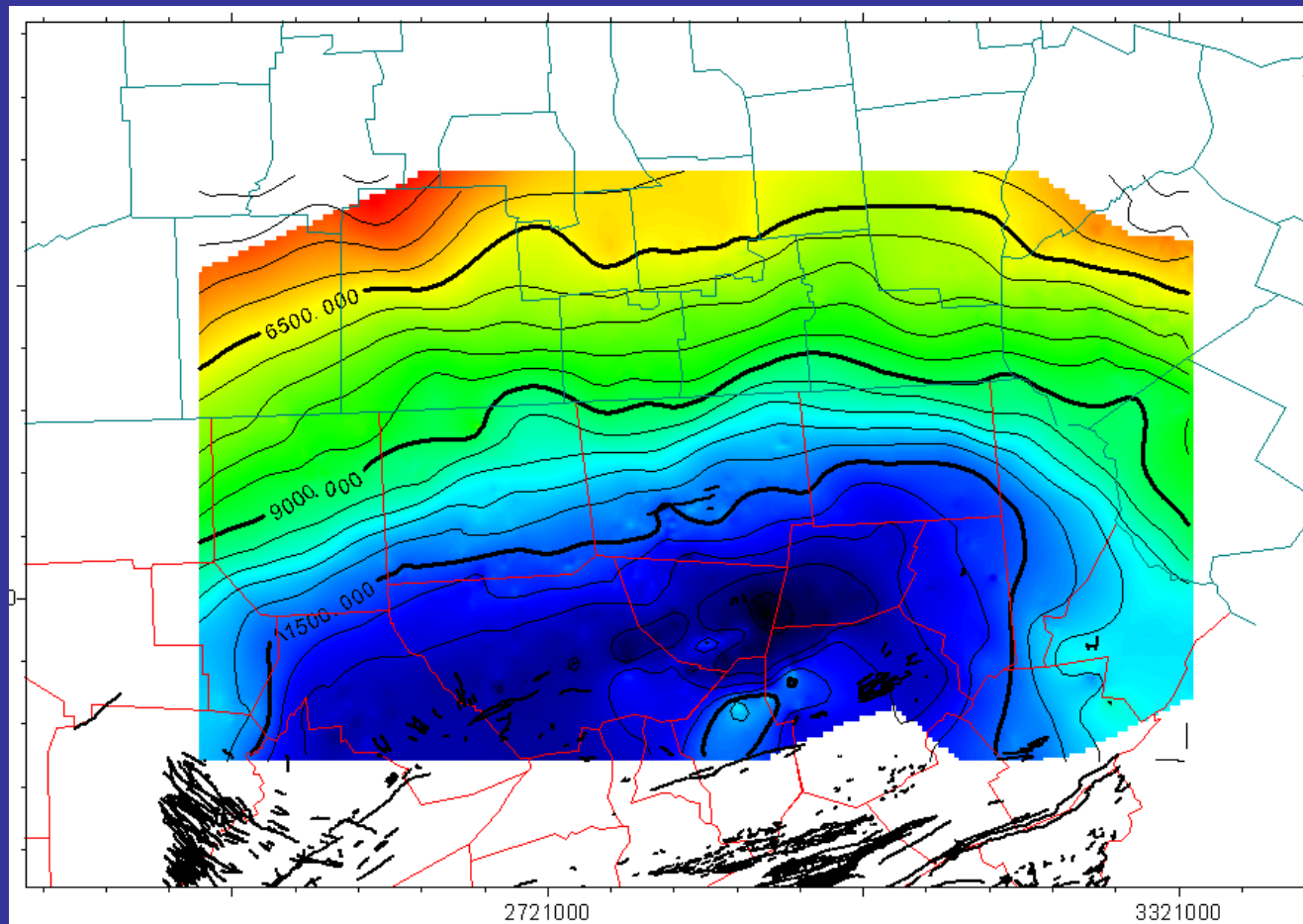
Grid: tully (Paul) (Red), Data Type: Time (Active Contour:
tully (Paul))
Lake, Drahovzal, Hickman, Harris



Preliminary Trenton Two Way Time Structure



Preliminary Trenton Structure Subsea



Kentucky Geological Survey

Trenton Black River

Location: NY/PA

Scale = 1:1597374

0 133114 266229 399343 ft

Grid: trenton subsea (Paul) (Red), Data Type: Depth
(Active Contour: trenton subsea (Paul))
Lake, Hickman, Harris, Drahovzal

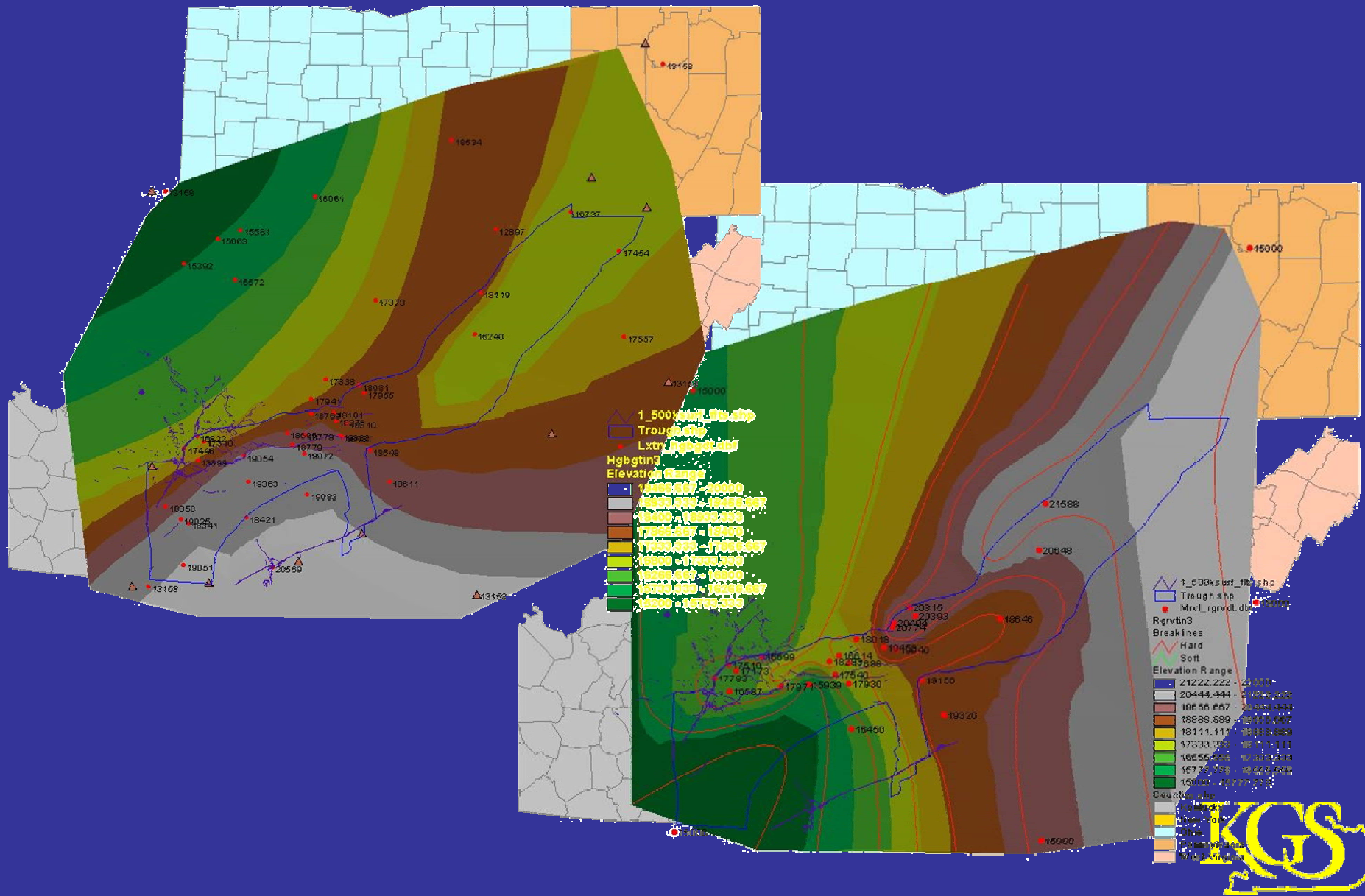


New Regional Velocity Model

- Used for time-to-depth calculations to aid in stratigraphic correlation in areas of poor (or ambiguous) data
- Used tops from 763 wells, and sonic logs from 54 LAS files from deep wells in OH, WV, and KY
- Averaged sonic log data with petrophysical software (TerraStation™) within groups of strata
- Results used in 16 layer regional velocity model
- Average error < 6%, based on well data



Southern App. Velocity Model



For Discussion

- Able to provide a good structural framework with data available (although more data would be better)
- Need to coordinate with the stratigraphy and isopach mapping being led by Ohio Survey
- Ideas of other seismic data that could be available to the consortium?
- Need “concrete” stratigraphic correlation for seismic horizon analysis

