

PS Obstacles and Pitfalls of the Everyday Interpreter: The Role of Geophysics in Resource Plays*

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Abstract

With the advent of resource plays dominating current drilling programs, geophysics has gone from the driver of selecting drilling locations into a secondary role as engineers and landman attempt to modify the drilling process into an assembly line structure. While to a certain extent the drilling and completion procedures can be duplicated over numerous wells over a significant area, seismic data helps in differentiating geologic changes across the basin. Staying in zone, drilling the sweet spots first and avoiding geohazards is priceless when comparing the costs for acquisition of a new 3-D survey or reprocessing and inversion of existing 3-D seismic data in comparison to drilling a well that encounters those problems as mentioned above. In order to assist the drilling department in the design of the horizontal well path and to circumvent geohazards, today's geophysicist must not only use traditional data sets but also incorporate techniques like bandwidth extension, inversions both poststack and prestack where several rock property volumes are generated and coherency applied either on a surface or upon a volume. Converting horizon surfaces to depth using multiple techniques that render the same answer is also critical. This poster will demonstrate how an interpreter can utilize these techniques in order to provide benefits in drilling resource plays.

OBSTACLES AND PITFALLS OF THE EVERYDAY INTERPRETER

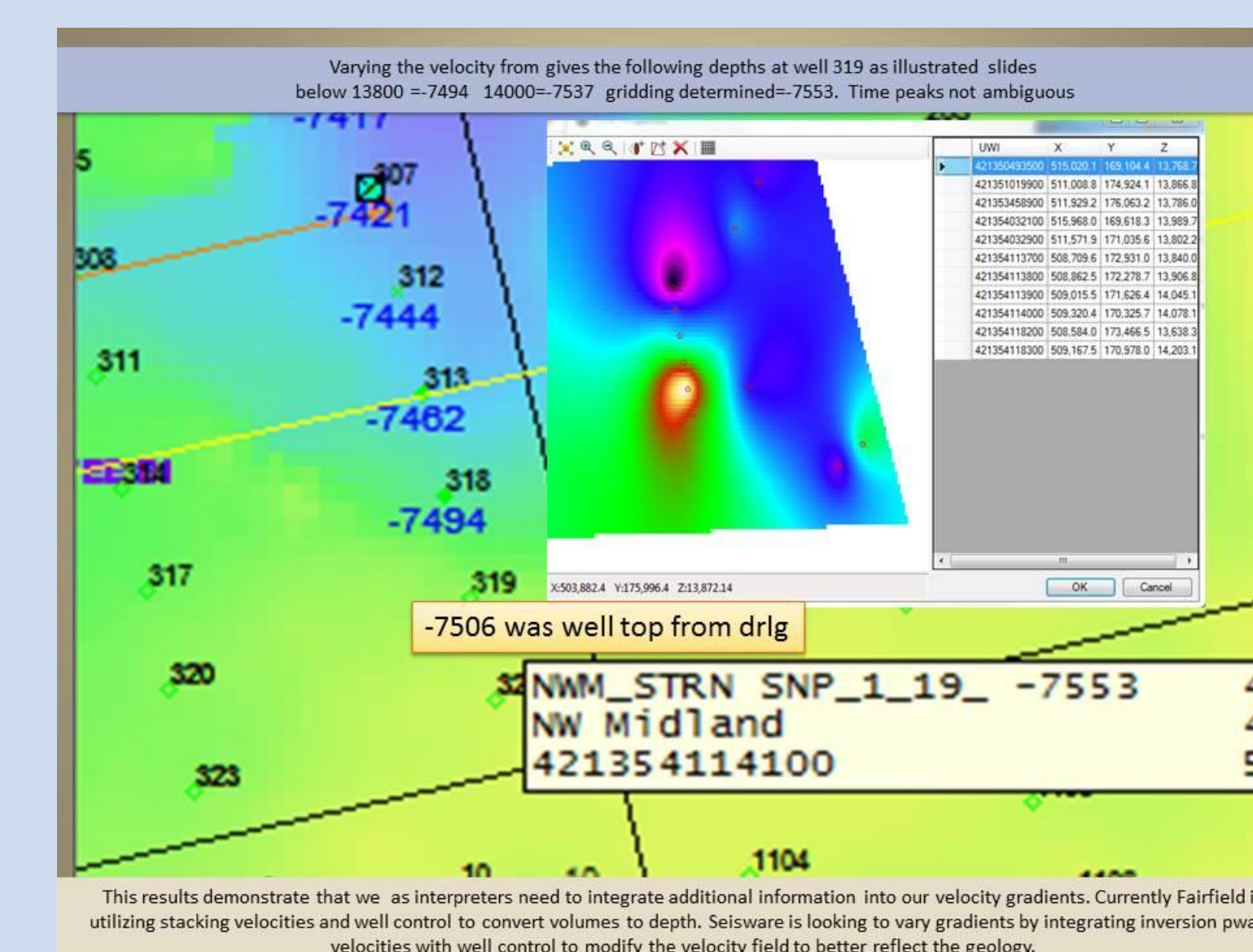
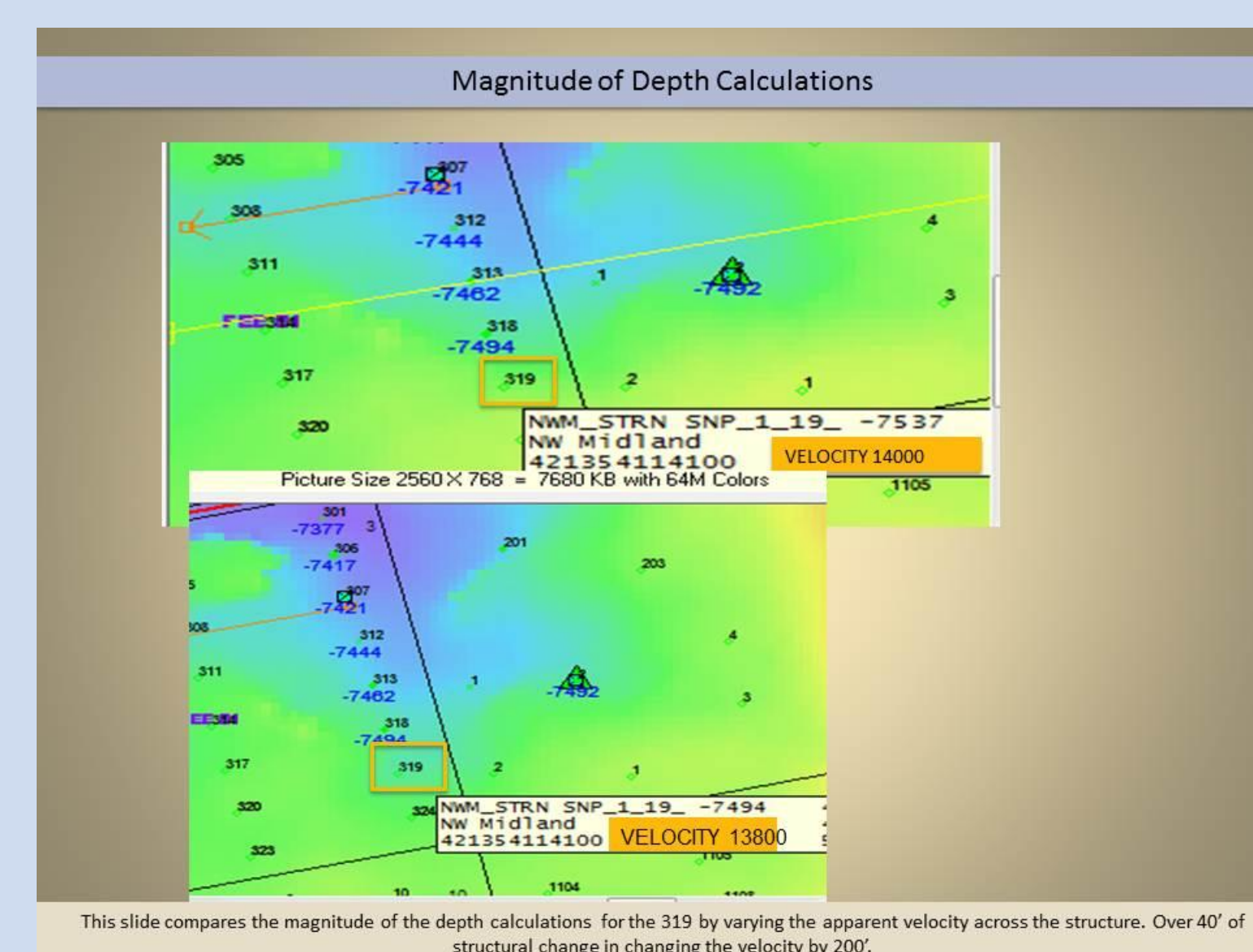
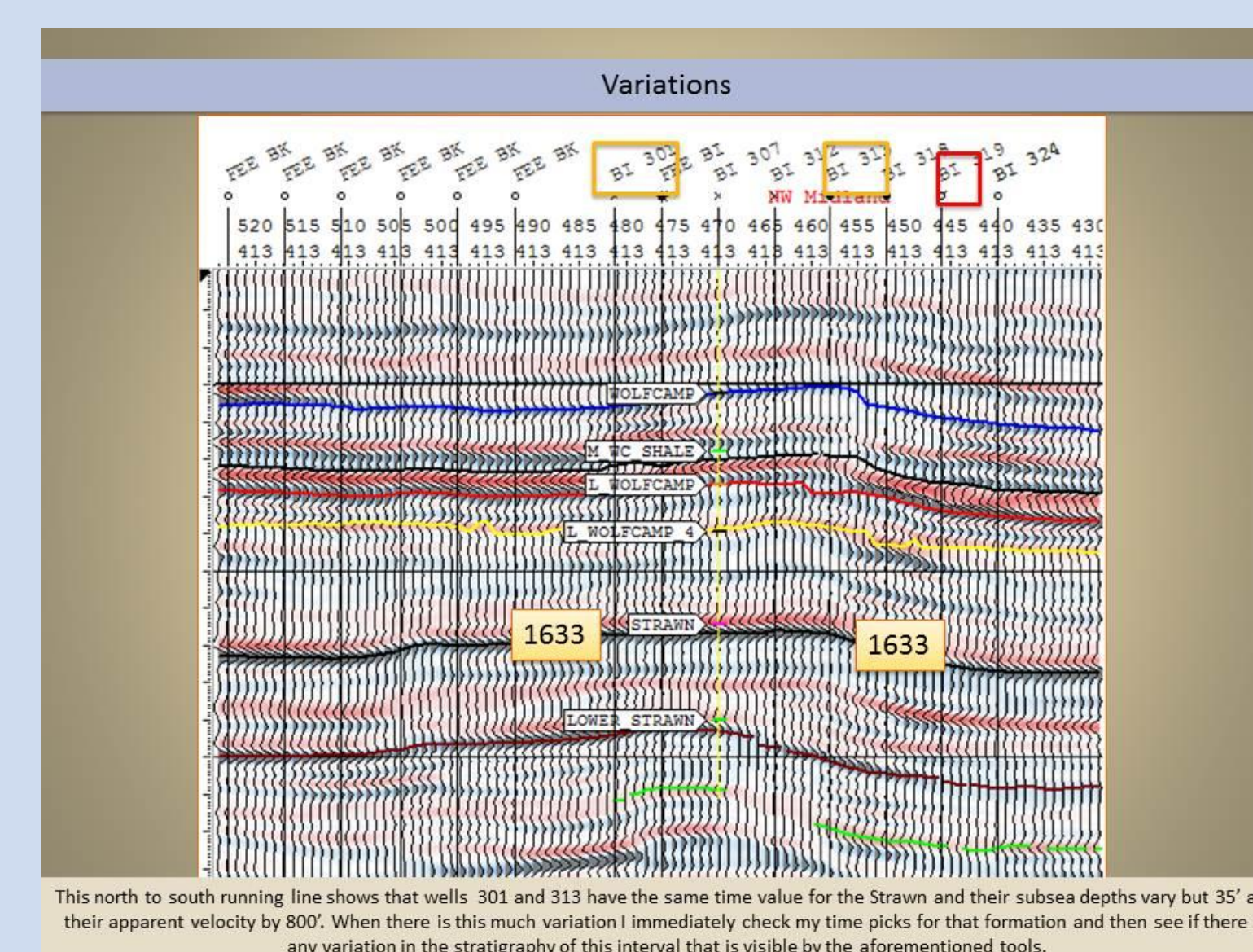
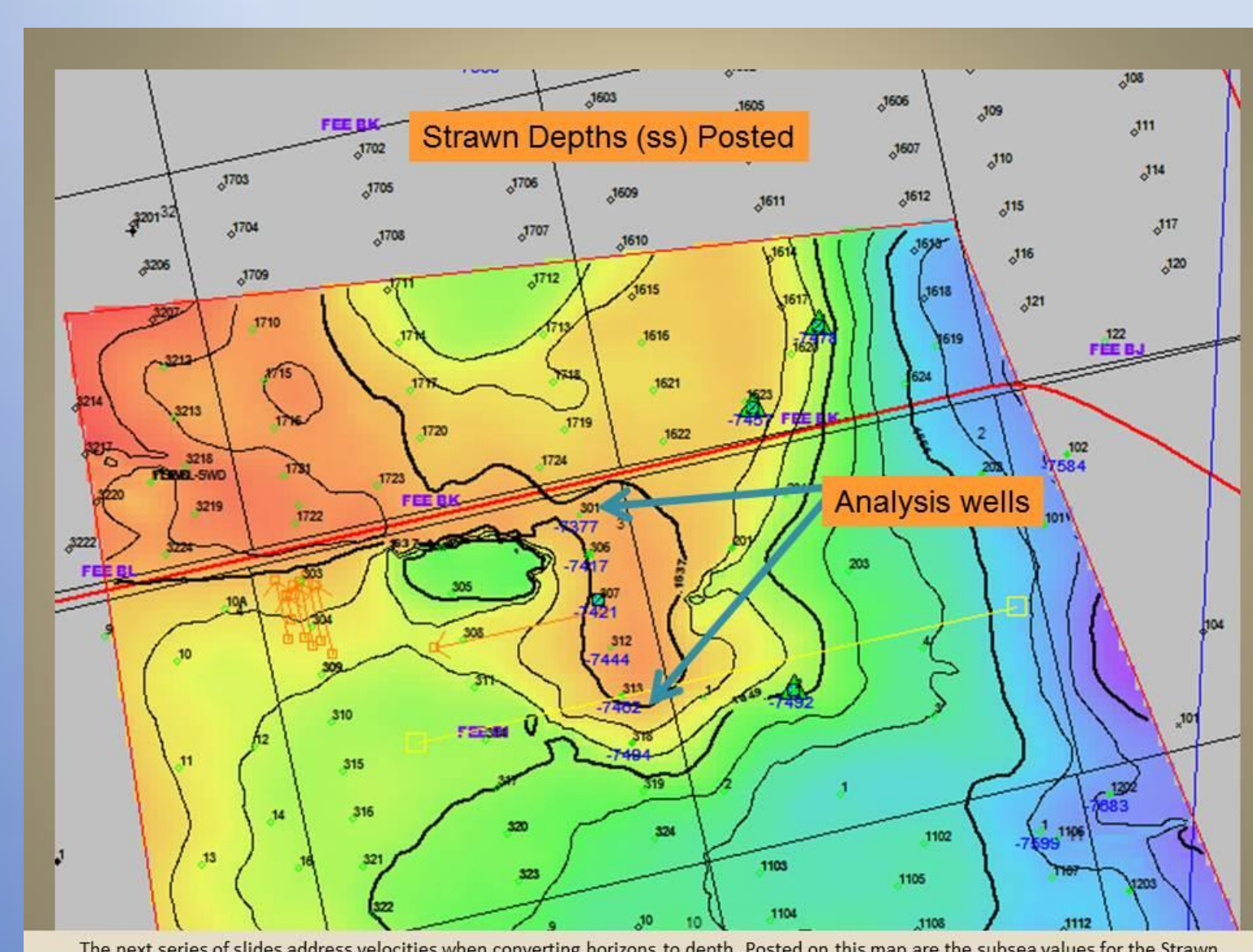
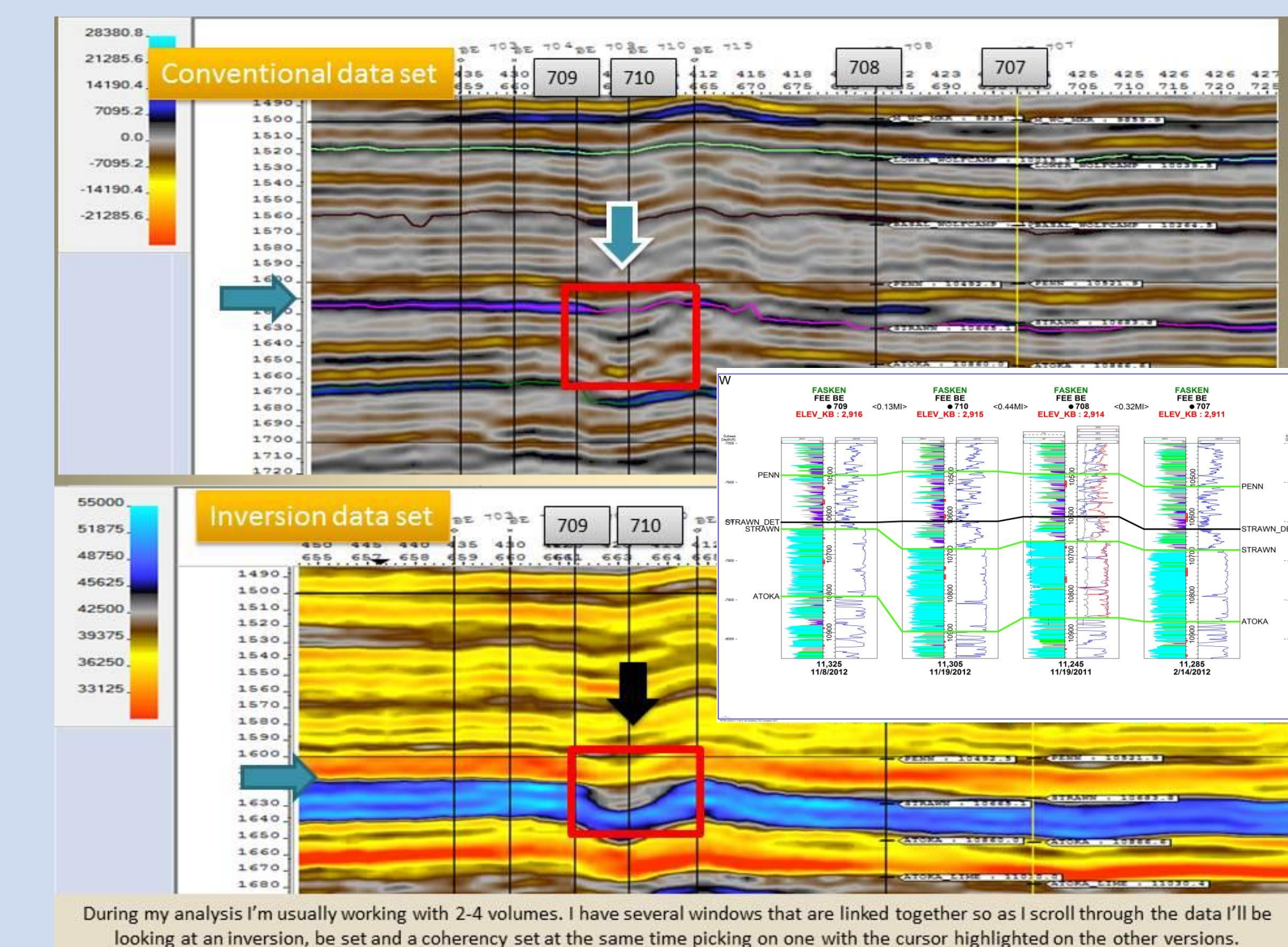
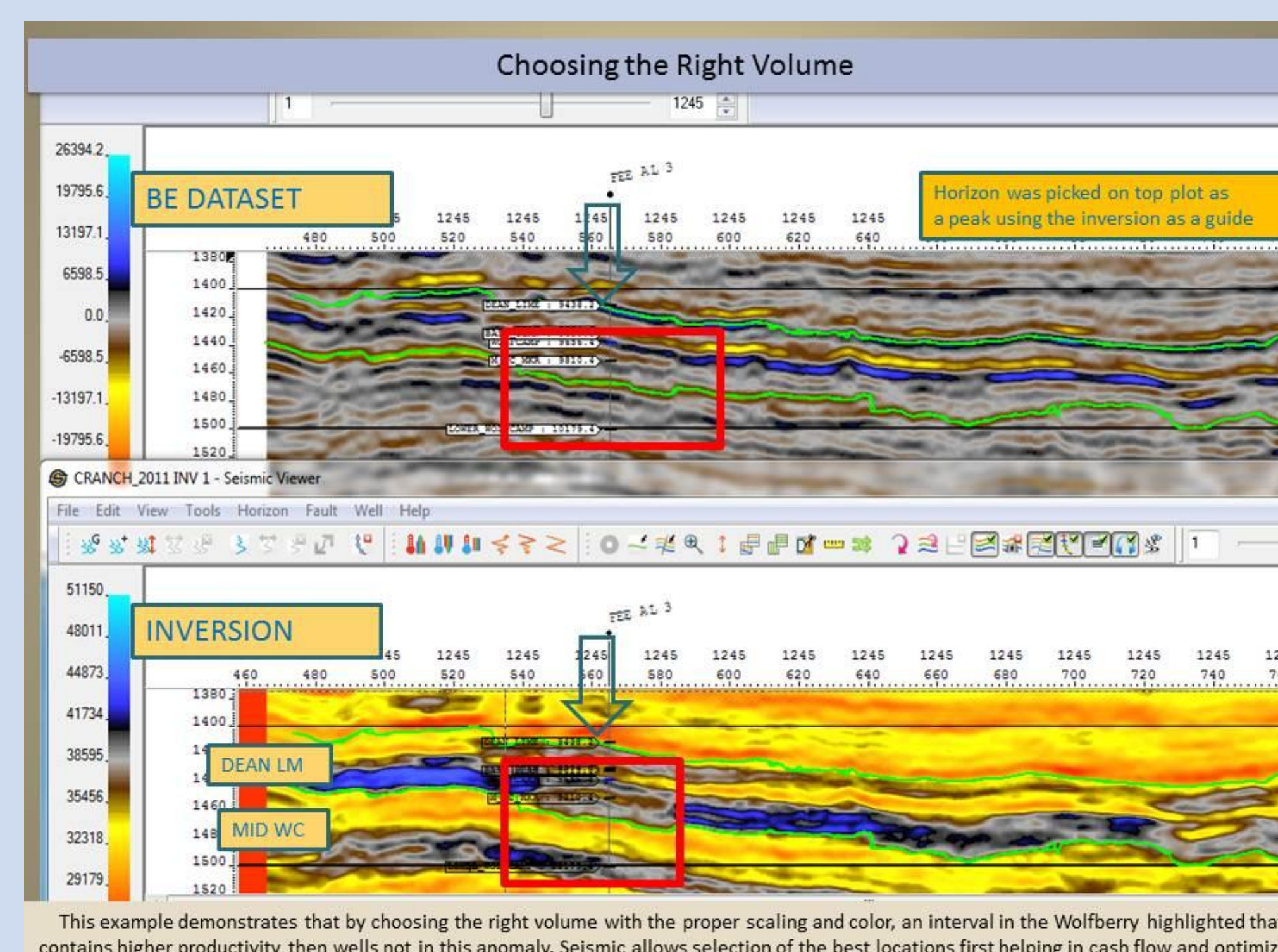
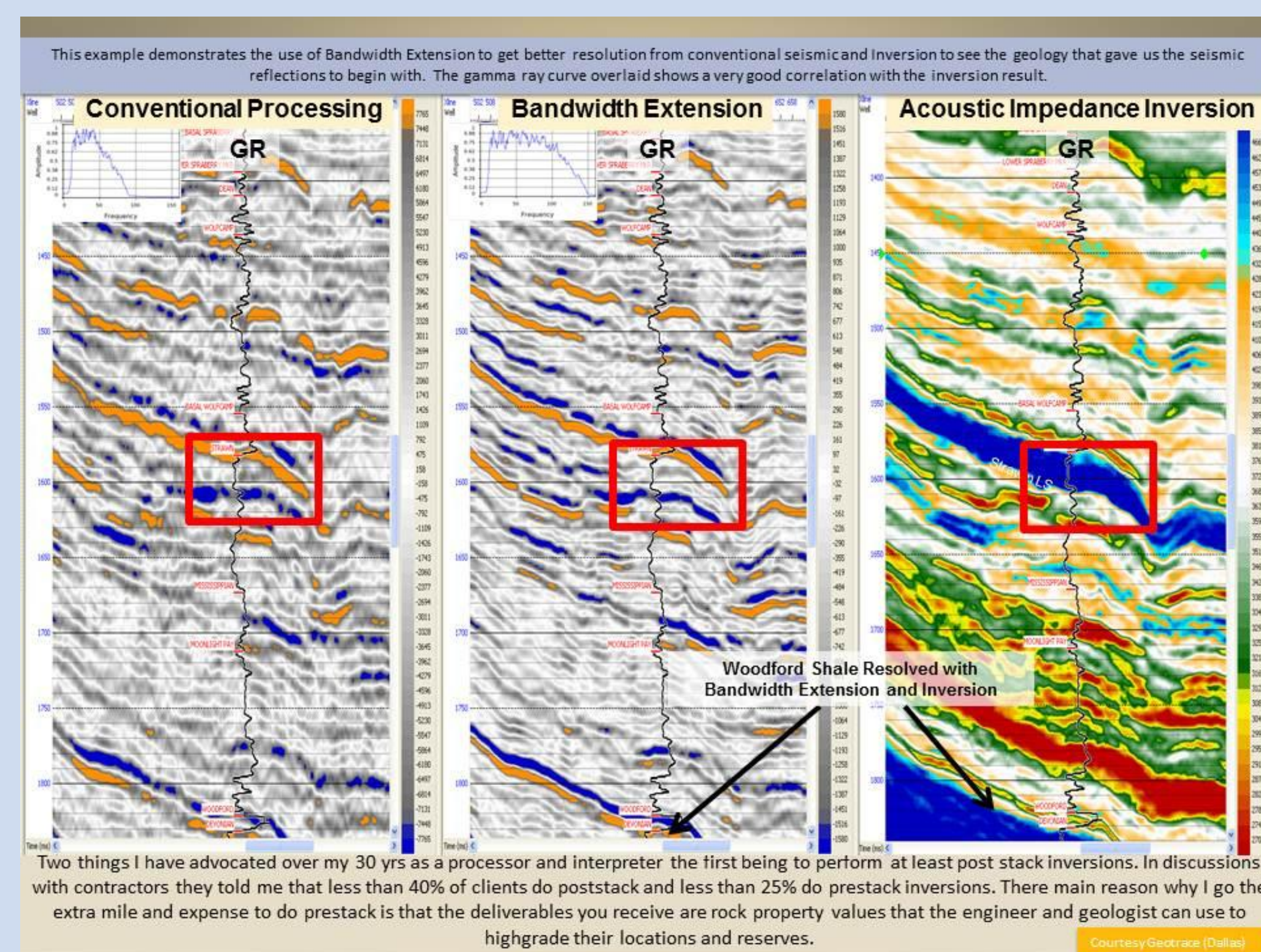
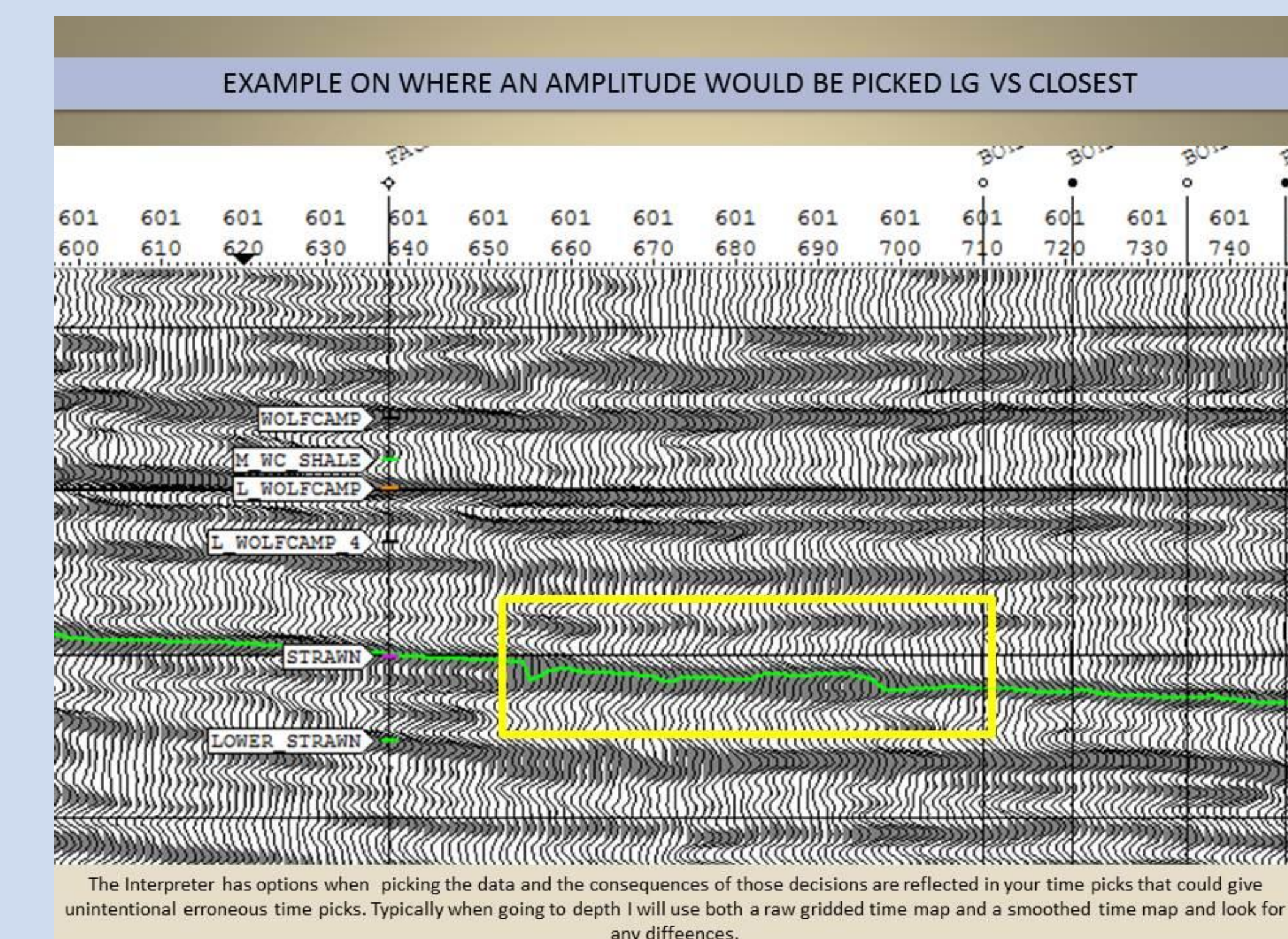
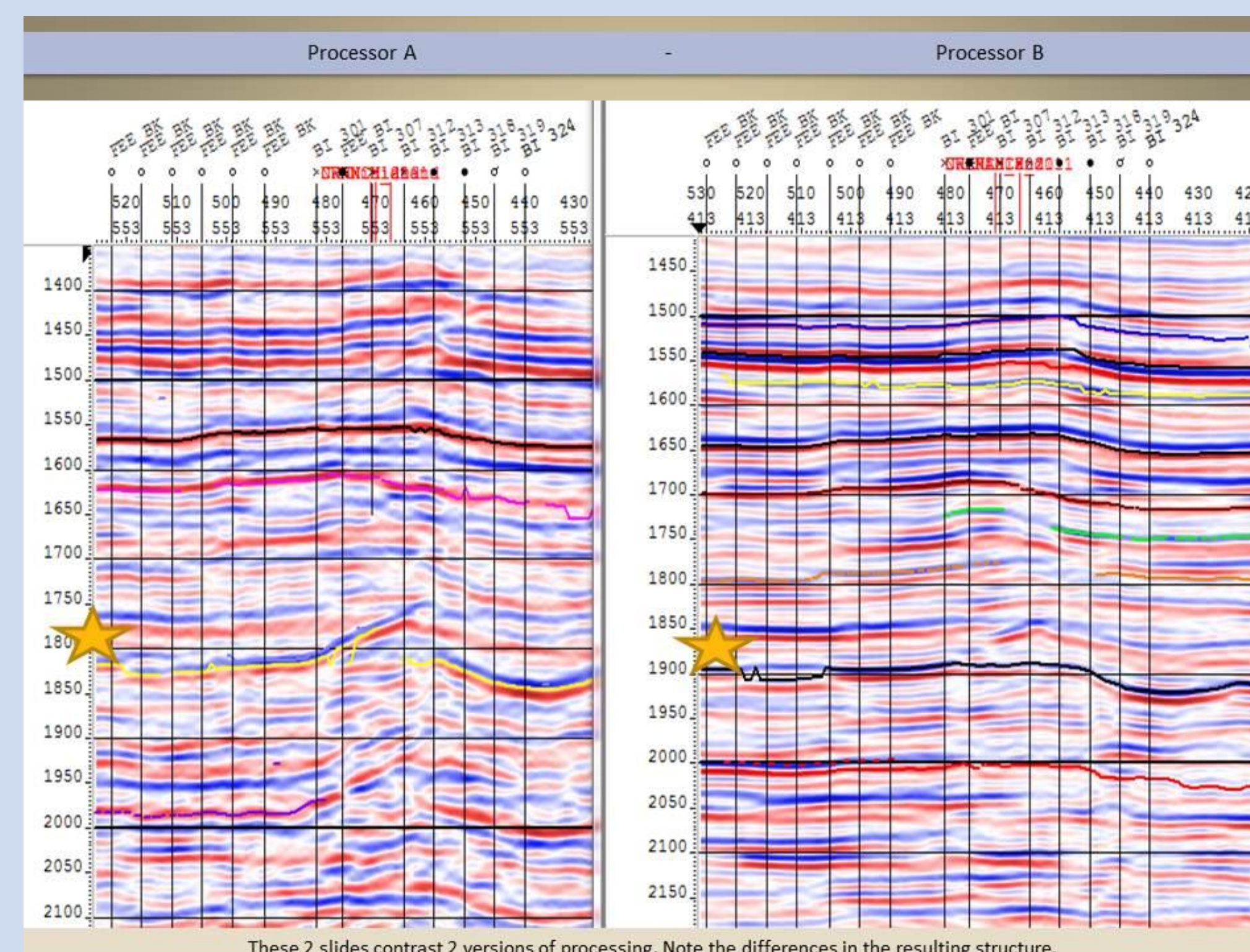
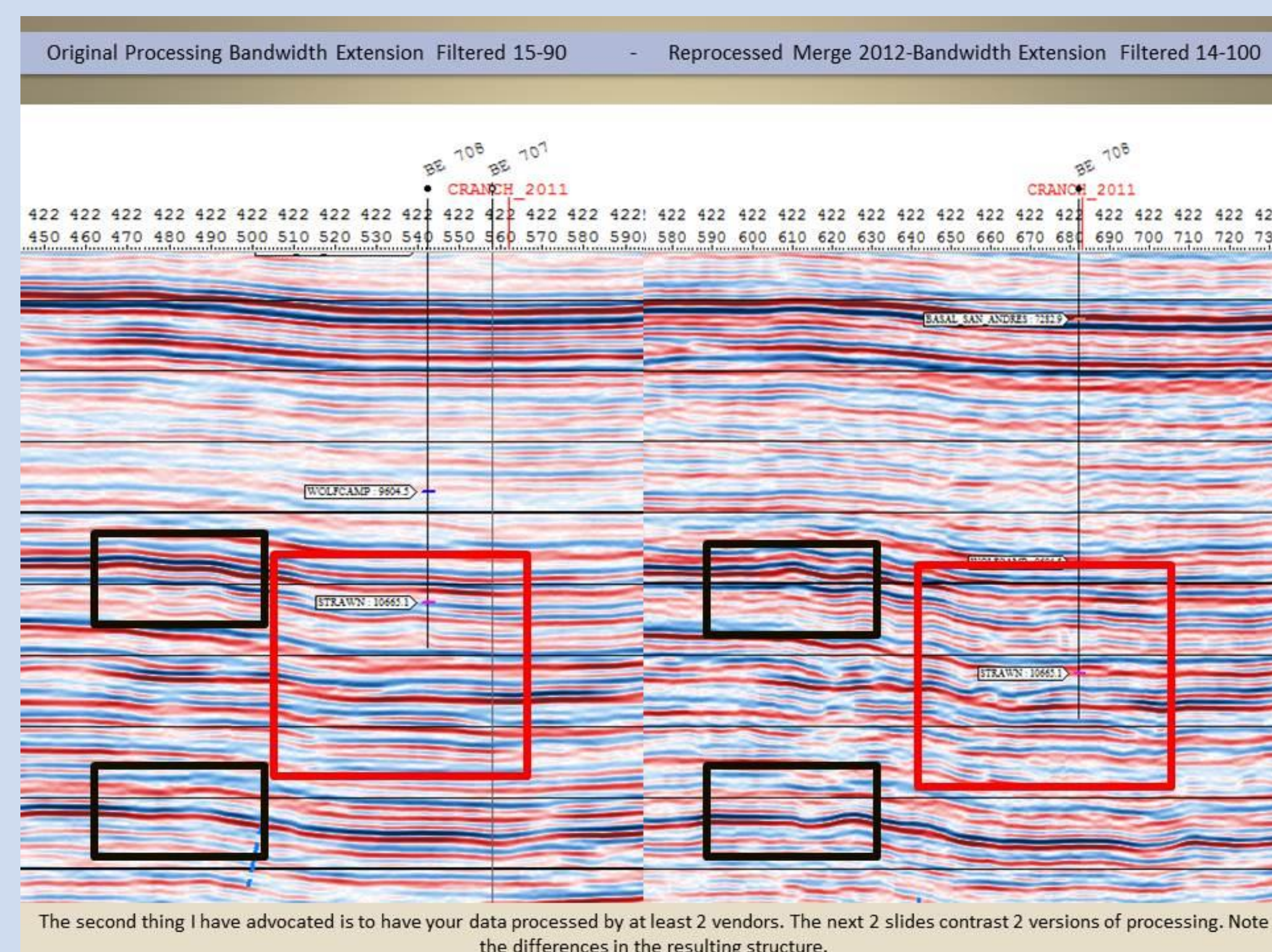
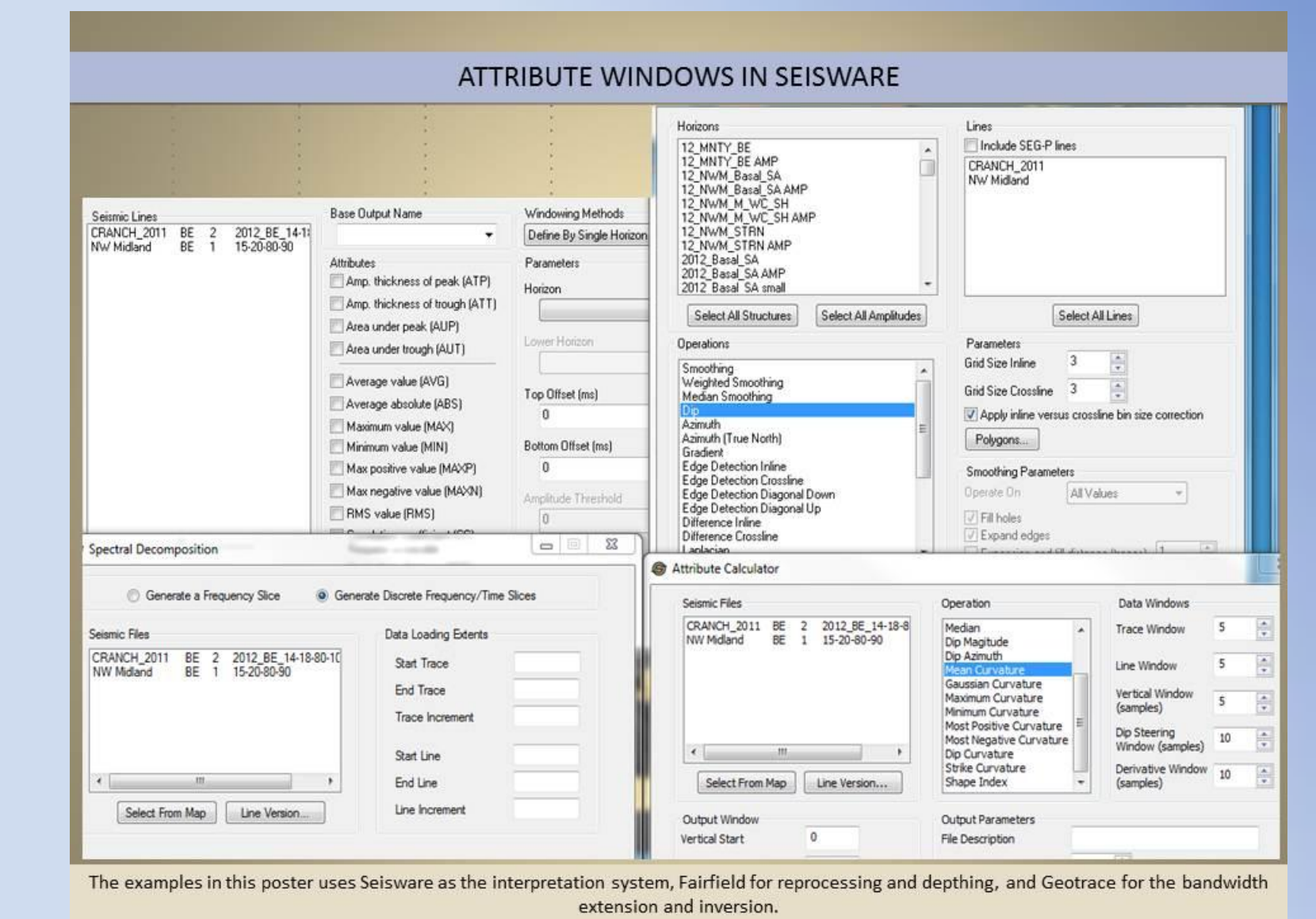
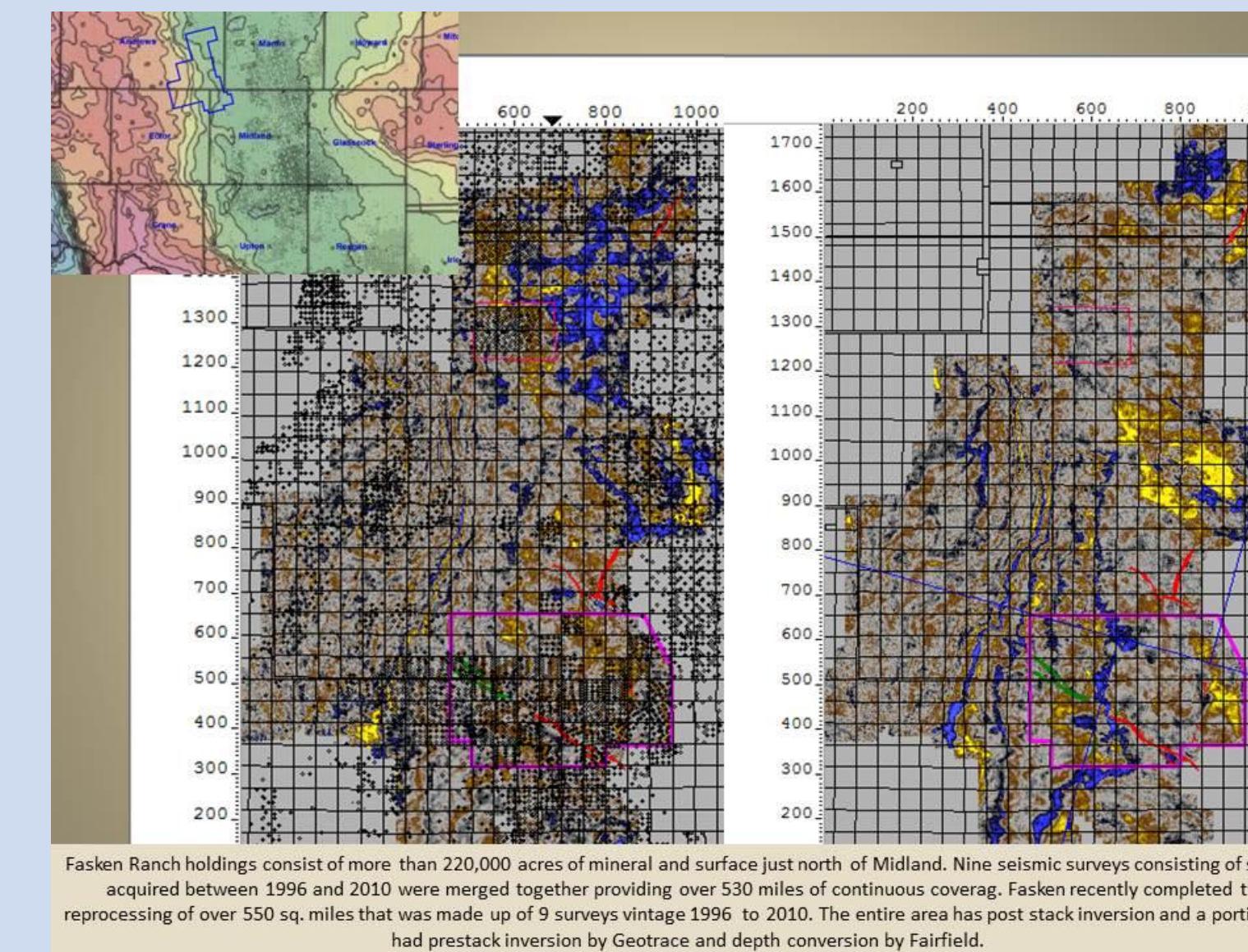
The Role of Geophysics in Resource Plays

Outline

- WHERE ARE WE-Permian Basin Wolfberry Play
- Going about CHOOSING THE "RIGHT" INTERPRETATION VOLUME and ATTRIBUTES
- INTERPRETING FAULTS AND HORIZONS
- CONVERTING TO DEPTH AND WELL PATHS
- INTERGRATION OF MICROSEISMIC AND 3-D DATA

Economics

- 25-50 K / Sq Mile 3-D Acquisition
500 barrels of addl oil @\$80-\$40,000 (cost of 1 sq/mi)
- 1-3 K / Sq Mile Inversion, Pstk Inversion, Reprocessing 20-40 barrels of addl oil (cost of 1 sq/mi reprocessing)
- Depth Mig \$400-3000 Sq Mile
- DRILL COSTS
– 24 wells/ Sq Mile at 1.8 Million (43.2 M vertical)
– Muddlogging 24*10 K/well (240 K)
- Staying in zone, Drlg best locations, NOT drlg into a geohazard-PRICELESS



Critical for Volume and Horizon Time to Depth Conversion

Determine the right volume to pick on, (sometimes 2 data sets) and look at smoothing time before converting to depth

Determine your depth conversions by various methods (1 layer, several layers) and compare them to one another to see if they are reasonable

Incorporate additional data in order to intelligently vary your extrapolated data

SeisWare is looking to pick values on Inversion data and to bring inversion data into the depthing process as soft data

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