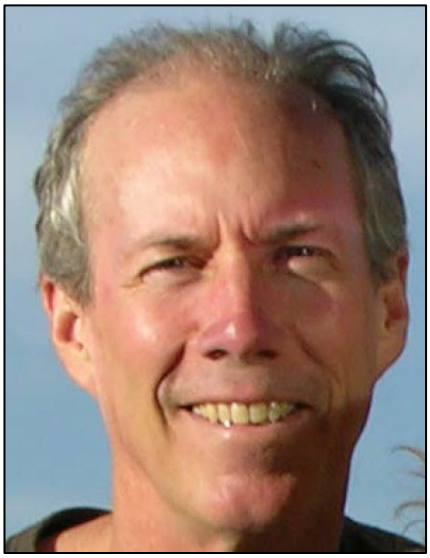

RMS-SEPM Luncheon Talk, Oct 31st, 2017

Fun Things to Do with Digital Logs in Your Spare Time

Steve Cumella, Consulting Geologist to Whiting Petroleum Corporation

ABSTRACT: Robust digital-log datasets allow the subsurface to be creatively imaged using cross sections with single-track color-filled log displays. Furthermore, simple processing of a log can reveal interesting data content not readily visible in normal log displays. For example, the large-scale depositional architecture of sedimentary sequences can be seen in cross sections constructed from gamma-ray logs smoothed over intervals of a hundred feet or so. Another example is using the first derivative of the temperature curve to reveal subtle changes in gradient that result from different thermal conductivities of rocks and the fluid in the rocks. Neutron-log cross sections can indicate gas bearing horizons. Resistivity cross sections can show resistivity reversals that indicate the transition from wet to dry gas. Sonic log cross sections can indicate the presence of overpressured parts of a basin. And the list goes on.

The smoothed gamma-ray cross section of the Mesaverde in the southern Piceance Basin shown below is constructed from hundreds of smoothed gamma-ray logs along four different line-and-corridor segments. Warm colors are low gamma ray. The bright-red marine shorefaces in the lower right prograded during times of low accommodation. These intervals can be traced landward to amalgamated fluvial channel sandstones that are also the result of periods of low accommodation. The low net-to-gross interval in the middle of the cross section acts as a top seal to the Mesaverde gas accumulation in much of the southern Piceance.

Speaker Biography: Steve Cumella is a consulting geologist in Denver, Colorado, working primarily for Whiting since 2014. He received his bachelors and masters in geology at University of Texas at Austin and started his career with Chevron in 1981. Steve worked the Piceance Basin and other Rocky Mountain basins at Barrett Resources, Williams, Bill Barrett Corporation, and Endeavour International. He was awarded Rocky Mountain Association of Geologists' Outstanding Scientist Award in 2005 and AAPG's Robert H. Dott, Sr. Memorial Award for Best Special Publication in 2010. He was an AAPG Distinguished Lecturer in 2011. He is past executive editor of the Mountain Geologist and was president of the Grand Junction Geological Society in 1991. Steve has authored several publications, given numerous presentations, and led several fieldtrips.

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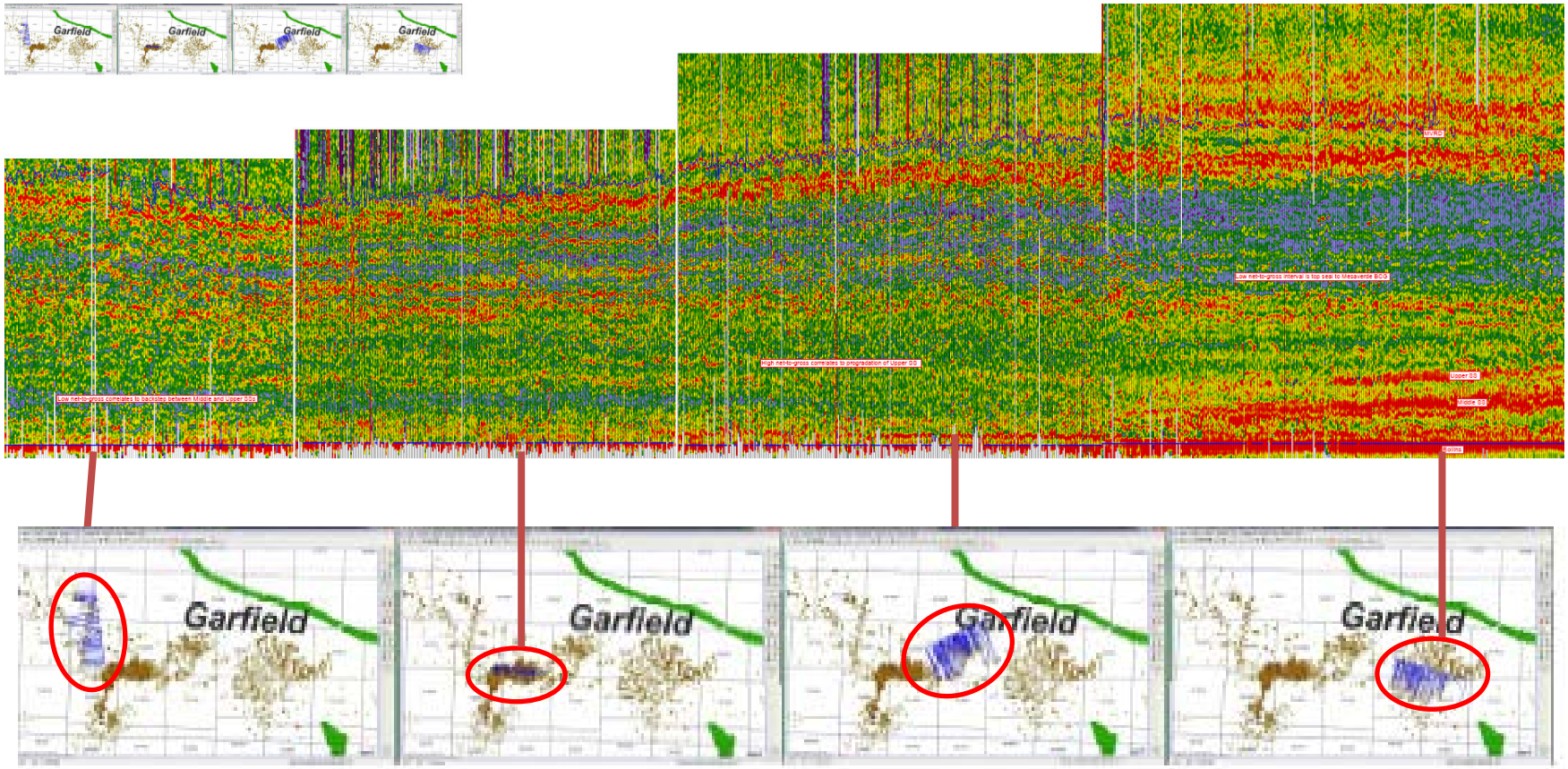

Smoothed gamma ray cross-section, Piceance Basin