

Vertical Seismic Profile (VSP): Beyond Time-to-Depth

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The talk will focus on Borehole Geophysics and primarily on VSP (Vertical Seismic Profile, or Borehole Seismic). Our prime attention is on applications beyond the standard time-to-depth application and focuses on 3-D imaging and inversion using geophones temporarily deployed in newly drilled wells. We discuss the state of the art of the technology, what technologies are appropriate for different settings, and what the future may bring. Results will be shown from deepwater Gulf of Mexico prospects and we will discuss how these results have impacted our understanding of the reservoir and reduced risk on development well placement. On imaging algorithms we will examine some exciting new developments, imaging using multiples and “single well” salt flank imaging using interferometry. Imaging with free-surface multiples has the potential to greatly increase the fold and coverage of the VSP image, with additional benefit of being able to image above the receiver array up to the surface.