

Mike Perz | TGS

Shallow PSDM velocity-building in the Delaware Basin: a synthetic study



Biography:

Mike Perz holds a BSc in Physics (University of Toronto) and an MSc in Geophysics (University of British Columbia). Upon graduating in 1993, he joined Pulsonic Geophysical as a seismic processing applications programmer, and four years later moved to Geo-X Systems Ltd. (later Divestco Inc.), first writing code then managing the processing R and D group. In 2010, Mike joined Arcis Corporation where he was employed as Vice President of Technology and Integration at the time that organization was purchased by TGS in 2012. He remains at TGS to this day, and his current title is Director, Technology and Innovation, a role whose primary mandate is to demonstrate the value of seismic in

unconventional resource development. Mike's research interests have historically spanned all elements of land processing, including deconvolution, interpolation, azimuthal imaging, and, most recently, pre-stack depth migration.

Abstract:

It is well-known that near-surface heterogeneity in the Delaware Basin poses a major challenge in seismic imaging. While the processing industry continues to struggle to address the challenge, some notable advances have been made in recent years, all of which are leading to imaging improvements. Such advances include the use of novel refraction statics techniques, incorporation of potential field information, as well as the application of full-waveform inversion to better elucidate complexity in near-surface velocities. At the same time as these near-surface velocity-estimation pursuits are unfolding, pre-stack depth migration (PSDM) in the Delaware is gaining immense popularity, to the point of becoming commonplace. Despite this routine use of PSDM, confusion abounds on the topic of how to best incorporate our near-surface velocity estimates into the PSDM shallow-model-building process. This talk will attempt to eradicate the confusion through use of a carefully-controlled synthetic experiment in which the (known) near-surface velocity distribution is inspired by actual Delaware shallow geology. The talk will address common comments/questions/misconceptions such as:

- "Inserting my refraction-based velocity estimate into the shallow PSDM model doesn't work well in practice even though it's a theoretically pleasing process."
- "What part of my shallow velocity estimate should go into my PSDM model versus what part should be applied to my data in the form of a static correction?"
- "The thing that matters the most in Permian PSDM is to migrate from topography instead of from flat datum"

Although the talk focuses on synthetic data, it will be punctuated by real data examples.