# Interpretive Velocity Model Building for Seismic Data Acquired Across a Complex Structure in Southern Alberta

J. Helen Isaac and Don C. Lawton
University of Calgary, Calgary, AB, Canada; jisaac@ucalgary.ca

Abstract/Excerpt

We processed in time and depth two seismic lines from an area of extremely complex geology in the Turtle Mountain area of Southern Alberta. The time processing was desinged to attenuate noise and enhance signal in the data. To develop a velocity model for pre-stack depth migration (PSDM) we integrated all available sources of velocity and geological information into the interpretation of preliminary depth migrated seismic data. We used the near-surface velocity models derived from refraction statics analysis together with constant velocity migrations for velocity information in the shallow section. The location of velocity pull-ups on the time migrated sections acted as a guide to the extent of high-velocity carbonates carried in the hangingwall of a major thrust fault. We integrated the mapped surface geology, geological cross-sections, well depths and interval velocities from sonic logs into the velocity model. The depth processed sections show a more realistic geometry than the time sections for the reflectors at depth. The seismic data cannot image the shallow, steeply dipping strata in Turtle Mountain itself. Our interpretation is based upon published geological models, surface geology maps, well data and the seismic character where the reflections are imaged adequately.