A Seismic Geometry Experiment: Testing Orthogonal vs. Megabin vs. Slimbin and 5D Minimum Weighted Norm Interpolation

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Summary

An experimental seismic survey was acquired in Southern Alberta in November, 2011. The purpose of this experiment was to determine the best geometry type (eg. orthogonal, megabin or slimbin) and the best corresponding acquisition parameters to image a reservoir that is discontinuous in both the lateral and vertical domains. In the past, this area's typical seismic survey had a megabin geometry with a 35m by 70m natural bin size and whose target was large Mannville Channels. When the target reservoir changed, the seismic data requirements also changed and therefore the survey geometry and parameter choices needed to be re-evaluated. The experimental survey was designed to enable multiple geometries with various bin sizes to be extracted from it, with the additional ability to interpolate coarser grids down to finer grids in an effort to compare 5D MWNI data to real data of the same grid. The resulting ten surveys were then processed completely separately to enable each survey to solely contribute to its own processing parameters from statics to decon and through to migration. Some universal standards were set in the processing with the goal of ensuring that the sole variables being examined were the acquisition parameters and geometries themselves. Evaluation and comparison of the various data sets was conducted in both the pre-stack gathers and the stacks.

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