CRS processing - a key to improved static and dynamic corrections in seismic data from Saudi-Arabian deserts

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Static shifts from near-surface inhomogeneities very often represent the key problem in the processing of seismic data from arid regions. In this case study, the deep bottom fill of a wadi strongly deteriorates the image quality of a 2D seismic dataset. The resulting static and dynamic problems are solved by both conventional and CRS processing. A straight forward approach derives conventional refraction statics from picked first breaks, and further goes through several iterations manual velocity picking and residual statics calculation. The surface-induced static and dynamic inhomogeneities, however, are not completely solved by these conventional methods. In CRS processing, the local adaptation of the CRS stacking parameters results in very detailed dynamic corrections. They resolve the local inhomogeneities that were not detected by manual picking of stacking velocities, and largely compensate for the surface-induced deterioration in the stack. The subsequent CRS residual statics calculations strongly benefit from large CRS stacking fold which increases the numbers of estimates for single static shifts. This improves the surface consistent averaging of static shifts, and the convergence of the static solution which removes the remaining static shifts in the 2D seismic data. The large CRS stacking fold also increases the signal-to-noise ratio in the final CRS stack. An almost identical resolution is obtained by an alternative CRS stack based on every second shot only. This indicates that the aquisition fold could be halved without deteriorating CRS image quality.