# Seismic Inversion – A Work Flow For Model-Based Inversion

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## Summary

The main objective of seismic inversion is to extract the subsurface geology in terms of lithology and possibly infer the presence of pore fluids using surface seismic data and well log data. The output of the seismic inversion process is an acoustic and/or shear impedance volume(s). The results of the seismic inversion process can be extended to calculate pore fluids and predict lithologic parameters such as porosity and water saturation.

The inversion process can be applied to post-stack or pre-stack data. The work flow illustrated in this poster will be for post-stack data seismic inversion.

A possible workflow for performing a Model-based Seismic Inversion consists of loading three types of data: well logs (sonic and density logs), seismic data and horizon data. After the initial qc of the input data, the well data is correlated with the seismic data and a zero phase wavelet is extracted. An initial model is built from the low frequency component of the well log. The inversion process is applied at each well location and the inversion parameters are evaluated. The inversion process is then applied to the entire data set. The inversion result is qc'd using time slices of a window centered about the target horizon.

In addition to the work flow of a model based inversion, a brief illustration of other inversion methods such as Sparse Spike, Colored, Recursive and Neutral network will be included.

Furthermore, a brief discussion and illustration of pre-stack inversion and extension of results from the inversion process to other applications such as AVO will be included.