

Discerning the channel pattern and identification of change in depositional features using Principal component analysis: a case study in North Gandhar area of Cambay Basin

Conclusion

Spectral decomposition on seismic data generates different frequency volumes that capture acoustic impedance variations on the media along ray path. Principal component analysis (carried out on the spectral decomposition volumes) has enabled us in reducing the visualisation from ten volumes to effective four volumes, called principal components that corresponds ~93% variance of data. Out of the four PCA components PC1 represents most variance (~47%) in data whereas PC2, PC3 and PC4 represent less variance (~22%, 13%, and 10%) in the data that can also be associated to random noise or bad picks. Therefore, Principal component analysis is an effective visualization tool which can be useful in discerning the channel pattern and thus identifying the change in depositional features. A channel system running from E-SE (landward) towards W-NW (basinward) is clearly seen at 25Hz and PC1 slices. However, appearance of the channel diminishes towards east which could be indicative of tidal influence.

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