



3D Marine Seismic Data Acquisition Technologies from Narrow Azimuth Surveys to Wide Azimuth Surveys with Processed Data Examples

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Summary

Land 3D has, over the last 20 to 30 years, benefited from using recording geometries with increasingly wide source-to-receiver azimuths and improved offset distributions. These have been made possible by the availability of recording systems with increased channel capability and improved system reliability and, to a certain extent, by selection of wider azimuth geometries. Marine 3D seismic data acquisition on the other hand has, until recently, been unable to benefit from improved processing techniques and algorithms due to limited crossline offsets and azimuth distributions. Initial narrow azimuth surveys starting with single source dual streamer surveys to multi-streamer multi-azimuth surveys have had one aspect in common: a very narrow azimuth range is covered with each of these technologies for each pass of the vessel. A recent change in marine acquisition geometries has been made with regards to improving the crossline offset and azimuth distributions. The improvements vary from the use of additional source vessels being recorded by one or more streamer/source vessels to coil shooting. Unfortunately, these multi-vessel wide azimuth surveys are not being acquired universally because of operational considerations and/or the considerable increase in the data acquisition cost. Data examples are used to illustrate improvements in sub-salt illumination, multiple attenuation and improvements in signal to noise ratio. Processing successes in turn will greatly enhance drilling successes in offshore prospects.