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ABSTRACT

DEMULTIPLE TECHNIQUES USED IN THE COLUMBUS BASIN FOR THE REMOVAL OF SHALLOW GAS RELATED REVERBERATIONS.

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In the Colombus Basin, off the east coast of Trinidad and Tobago, the presence of multiples and their attenuation has long been a known issue. The Multiple problem in this area can be separated into two main components.

Firstly, due to the shallow water bottom, there are many short period multiples, which are difficult to separate from primary energy in terms of moveout. However, additionally and more specifically to this area, there are isolated pockets of very strong reverberation trends that are known to be associated with the presence of shallow gas pockets. These strong reverberation trends not only obscure the primary reflections in these areas, but the rapid transition in and out of the problem areas signifies that the reverberations are truncated laterally. Inevitably, this can generate strong migration artifacts in a modern amplitude friendly Kirchhoff Pre Stack migration sequence, further obscuring the image of the primary reflections.

This combination of problems presents not only a challenge for the processing Geophysicist but also for the interpreter who struggles to separate multiple energy from genuine primary reflections on the final migrated volume, if these multiple problems have not been addressed.

The conventional demultiple workflow in shallow water is to use Tau-p deconvolution to attack short period multiple events, by exploiting the periodicity of the multiple energy in the Tau-P domain. However, during various processing and re-processing projects conducted in the area, it was noted that after the application of Tau-P deconvolution, the strong reverberations were still present in isolated areas associated with the shallow gas pockets. Hence,in 2006, WesternGeco in collaboration with BP, designed and tested a new multiple attenuation suite in order to optimize multiple removal. The suite of tests consisted of Selective T-X Deconvolution, Cascaded Tau-P Deconvolution, BP Targeted Deconvolution, Surface Multiple Attenuation and Deterministic Water Layer Demultiple

Results

After testing the different combination of techniques the best results were obtained by the cascaded application of 2D SRME and BPTT Targeted Deconvolution in the Tau-P domain.

Conclusion

WesternGeco in collaboration with BPTT were able to successfully attenuate strong reverberations by utilizing innovative combinations of existing and proprietary demultiple techniques.

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