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Revealing Intricate Subsurface Geology Faster

Solutions for different acquisition environments, geologic settings and E&P objectives can be released in a rapid time frame.

CONTRIBUTED BY WESTERNGECO

Current market conditions have pressured the oil and gas industry to develop increasingly efficient and reliable solutions that are delivered in an accelerated timeframe. Additionally, the need to accurately map the subsurface, leading to more informed and correct drilling and field development decisions, has become more critical than ever.

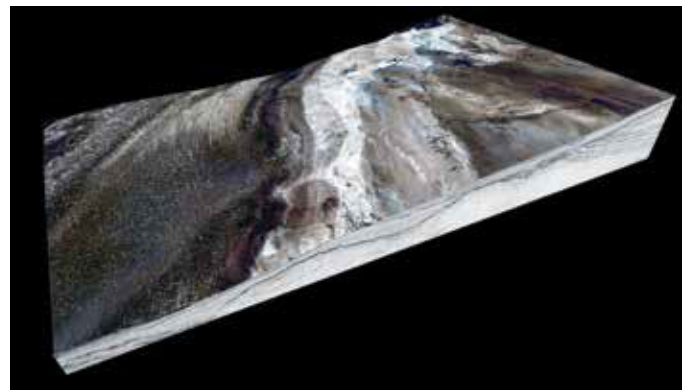
The IsoMetrix marine isometric seismic technology from WesternGeco meets these rigorous requirements by providing reliable high-quality solutions to complex client challenges while maintaining a short turnaround time. A growing track record of successful seismic acquisition projects from around the world using this technology proves that the necessary solutions for different acquisition environments, geologic settings and E&P objectives can be released in a rapid time frame.

The IsoMetrix unique multimeasurement acquisition and single-sensor measurements enable a wide range of acquisition geometries that contribute to cost-effective and efficient exploration. Furthermore, the technology produces accurate imaging not only of target formations but also of the overburden, potential shallow drilling hazards and even seabed morphology—all from one acquisition dataset.

Sensors in the IsoMetrix towed-streamer acquisition system generate independent acoustic pressure and acceleration measurements in the vertical and crossline horizontal directions. While pressure and vertical pressure gradient measurements alone might be combined to offer high-quality broadband data in the time domain, the extra crossline measurements enable spatial wavefield reconstruction and full 3-D deghosting.

Multimeasurement technology provides the ability to tow streamers deeper along their full length, expanding the operational weather window. Deep tows boost low-frequency content, which improves the stability of prestack amplitude inversion, particularly in the absence of extensive well control.

In the last year large exploration-style datasets have been acquired in a variety of settings including offshore Africa, offshore Australia, offshore Canada and the West of Shetlands area as well as commercial 4-D projects in the North Sea. This has presented the opportunity for the IsoMetrix technology to yield new insights across a variety of geological and geophysical settings and in the presence of the challenges those settings present.



The IsoMetrix data in conjunction with eXchroma software provides a satellite-style image of the subsurface in the Flemish Pass. (Image courtesy of Schlumberger)

Additionally, on these recent surveys, efficient acquisition techniques such as fan shooting and continuous line acquisition method have been implemented on a large scale, demonstrating that these techniques' full compatibility with the multimeasurement streamer technology and wavefield reconstruction. Also, the technology has proven to be compatible with wide-azimuth acquisition and has shown the benefits that this combination of technologies brings.

By leveraging the significant onboard compute capacity of the IsoMetrix vessels and the data processing expertise of personnel both onshore and offshore, the sophisticated processing flows are executed in the field, including source and receiver side deghosting, full 3-D surface related multiple elimination, multiple attenuation and prestack time migration. This allows for delivery of an accelerated product from the vessel shortly after acquisition is completed.

On larger surveys these workflows were executed on a section-by-section basis, thus releasing partial volumes while still in the acquisition phase. By extracting attributes from the data, operators now have new insights into the geology of the subsurface in a shorter period of time, allowing for earlier exploration and development decisions.

To learn more about these and other ongoing IsoMetrix technology projects, please visit the Schlumberger booth 903. A special lunch presentation, "Revealing New Insight and Impacting Key Decisions: IsoMetrix Technology across the Globe," will take place Wednesday, June 14, at 12:15. ■