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Not All Seismic Anomalies Are Seeps

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Summary

Kenya's Shell-BG operated L10 A & B blocks contain the only offshore oil discovery on the East African margin. This discovery is encouraging for oil exploration in the region; however, uncertainty remains over the source of the oil and the extent of the source across the basin. To address this major uncertainty for the region, Shell-BG Kenya and Fugro have undertaken a geochemical survey with 5000 km2 of multibeam echosounder bathymetry and backscatter datasets, and piston cores to identify and sample macro and micro hydrocarbon seepage in the area.

Shell-BG Kenya and Fugro present here our targeted approach to Seephunting in offshore Kenya. We include the initial results from the operational phase and the lessons learned from the characterisation of a seafloor with strong bottom water currents, major fault escarpments, a volcano and deep-water sediment waves. We demonstrate the value of high-resolution multibeam in sea floor characterisation together with full integration of the available 3D seismic data. This fully integrated approach allowed for 1) efficient reduction of the number of targeted sample sites, 2) increasing the concentration of drop cores per identified seep feature and 3) increasing the chance of sampling macro or micro seepage at the site. Geochemical analysis of the piston core samples is in progress.

The survey revealed challenging seafloor conditions for Seephunting. Detailed work characterising the area and its uncertainties prior to the survey and the systematic use of exploratory piston cores to address those uncertainties during operations gave the survey the greatest chance of sampling seepage present. Shell-BG Kenya and Fugro therefore have confidence that the results will be representative of seep activity in the area and will influence the prospectivity of the region. The technical and operational learnings from Seephunting in Blocks L10A & B from the seafloor, water column and subsurface will also aid in other Seephunting endeavours in the region and elsewhere.

Abstract

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