

Enhancing SAR Seep Interpretation With Broadband Seismic Data: A Case Study From the Timor Trough

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ABSTRACT

The Timor orogenic wedge represents one of the youngest and most complex geological areas in the world. The oblique subduction and later collision of the Australian Plate gives the Timor Trough a broad range of structural settings in a relatively small area. This study aims to increase the understanding of the petroleum system within the Timor Trough and addresses the growing need to integrate existing datasets to enhance value in the prolonged downturn affecting the oil and gas industry. By combining NPA's sea surface oil slick data derived from SAR imagery and 2D seismic data acquired by CGG's Multi-client New Ventures, an oil slicks to seismic workflow has been developed which allows the linking of sea surface slicks with features on the seabed and within the subsurface which are potentially related to seepage. The project combines these data sources in order to create hotspot maps which describe the quality and frequency of these seepage related features, for example DHI's, possible migration pathways, fluid escape features or seabed features. By combining these maps with the sea-surface slicks, areas of hydrocarbon generation, migration and escape are able to be identified. 3D modelling software is utilised to link these hotspots within the seismic along strike and identify the most important and continuous structures. By identifying and understanding the geology where hydrocarbons are reaching the surface it is possible to identify potential locations where the same hydrocarbons may be trapped. This enhances the efficient identification of prospects within a basin.