



ORAL PRESENTATION

Frontier Sabah Malaysia – New Exploration Opportunities Unveiled by Latest Regional 3D Seismic

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INTRODUCTION

The NW Sabah Basin also referred to as the Baram-Balabac basin, Sabah, or NW Borneo Basin, covers an area of approximately 43,000 km² with marine Tertiary beds typically more than 8 km thick. It receives its major sediment input from the Baram Delta, which is a prolific hydrocarbon province extending from Brunei to NW Sabah, as well as from the Champion and Meligan deltas. Gravity loading and thin-skinned deformation has resulted in a fold and thrust belt in the inboard area. This initiated near the shelf in the Mid Miocene, which then propagated north-westward in the Pleistocene. This fold and thrust belt, which hosts turbidite reservoirs within anticlinal structures, has been the major focus and most successful play area in the basin to date.

Further outboard of the fold and thrust belt, beyond the Sabah Trough, lies the NW Sabah Platform, also known as the Dangerous Grounds. It consists of rifted continental fault blocks that split during the opening of South China Sea. Eocene-Oligocene syn-rift packages that were deposited during this extensional phase potentially host source rocks that could be mature at present-day to charge the overlying mid-Miocene carbonates. This is a play type that is typically targeted and successful in SE Asia. Due to the lack of any seismic data in the Dangerous Grounds, it remains as a frontier area which has had limited exploration activities, that is until now.

EXPLORATION OPPORTUNITIES UNVEILED

18,000 km² of regional multiclient 3D data acquired between 2014 and 2017 show incredible high-quality images of the fascinating and complex geological frontier province of the Sabah Basin. This is the first ever regional scale seismic dataset that provides the explorationist with the ultimate tool to better understand the sub-surface geology and fairway systems of offshore Sabah. The measured broadband seismic data's high-fidelity imaging was enabled through advanced acquisition technology solutions, coupled with high end processing techniques, to provide the imaging solution that was necessary to better illuminate and image the complex structural geometries of the fold and thrust belt of the Sabah Province.

This paper will showcase contiguous regional geological correlations from the petroleum play types of the inboard fold and thrust belt of Sabah, out past the Sabah Trough and outboard to the older rift systems of the Dangerous Grounds. Regional key horizons such as MMU (Mid-Miocene Unconformity), which has historically been difficult to track below the fold and thrust belt, can now be confidently interpreted across the entire basin.

New geological understanding and exploration opportunities will also be presented based on the interpretation of the latest regional 3D data. It is evident that a series of sub-basins exist in the outboard Dangerous Grounds. These sub-basins may host potential source rocks that are buried deep enough to be present-day mature. Pre-rift and syn-rift packages can be observed within these sub-basins, which would have been deposited during the extensional phase of the opening of the South China Sea. Several direct hydrocarbon indicators (DHI's) provide strong evidence of a working petroleum system in the Dangerous Grounds.

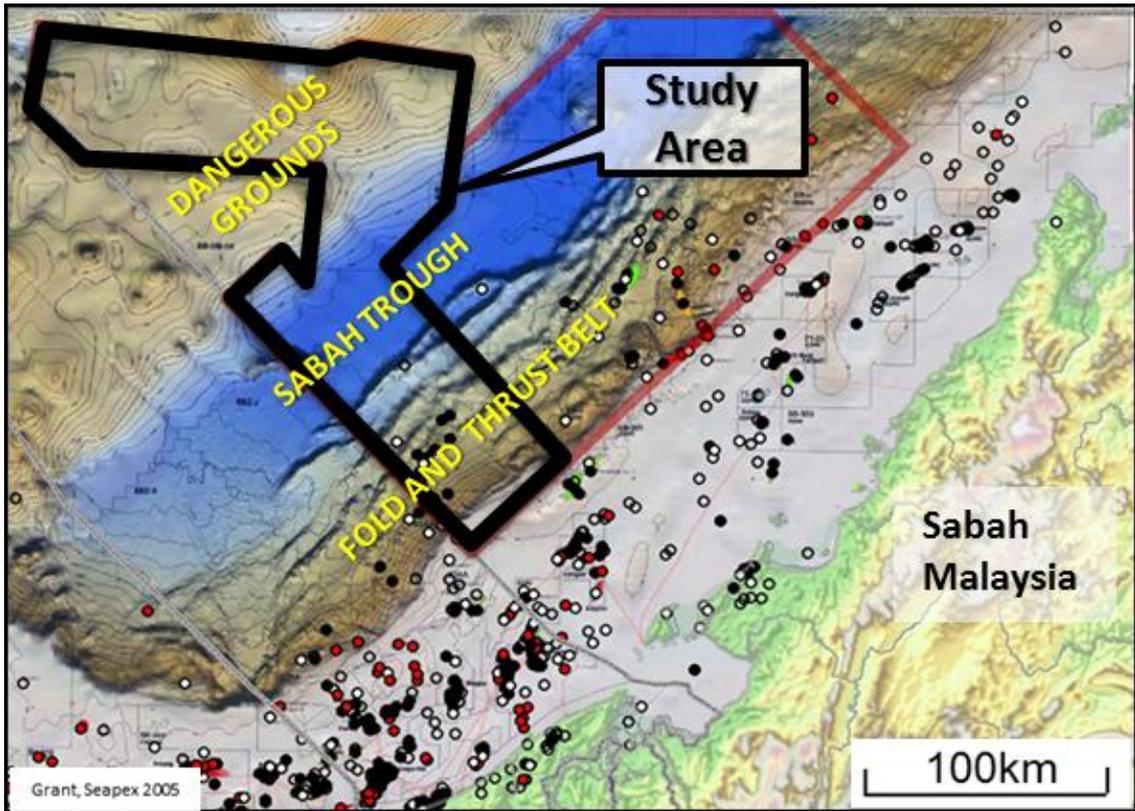


Figure 1. Location map of NW Sabah highlighting the study area. The map also illustrates the various geological terranes.