



# THE EASTERN MEDITERRANEAN MEGA-BASIN: NEW DATA, NEW IDEAS AND NEW OPPORTUNITIES

6-7 September 2019  
Alexandria, Egypt

AFRICA REGION

## Exploration and Development of Siliciclastic and Carbonate Reservoirs in the Eastern Mediterranean

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### ABSTRACT

Keywords: Carbonates, Siliciclastic, Eastern Mediterranean, Energy hub, Gas fields.

Recent large gas discoveries off-shore Israel, Cyprus and Egypt highlight the Eastern Mediterranean area as a hot spot for global exploration. Zohr is not the only gas field in Egypt, but West Nile Delta (WND), Nooros and Atoll are all important gas fields that add to the national gas production. The source of this poster is a graduation project aims at developing the student's ability to search for the required data through published researches, websites and companies to get the answers for the following questions:

1- Can Egypt become main energy hub in Middle East?

2- Can Israel compete in natural gas race?

Published data covering the complex geology and hydrocarbon potential of the main gas fields in study area have been collected and analyzed. Global LNG prices have risen to a level that makes exports via the Egyptian LNG facilities economic once more. Egyptian companies have already stuck \$15 billion deal for the import of Israel natural gas. Egypt intends to attract additional resources such as Cypriot gas to become the energy and LNG hub of the region.

Egypt is qualified to be a regional hub for energy and LNG hub due to its liquefying plants, pipeline grids, Warehousing, transportation, trading of petroleum and gas products and ports overlooking the Mediterranean and the Red Sea and refineries.



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## Application of Structural Seismic Attributes for “Polygonal Faults” Interpretation in Unconventional Carbonate Reservoir

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### ABSTRACT

Seismic attributes are specific functions derived from seismic data, to enhance the appearance of different geologic features along the main seismic reflectors in both cross-section and map views. In this work we applied volume seismic attributes in order to enhance the appearance of the polygonal faults located at the Abu El-Gharadig basin, North of Western Desert, Egypt. The main objective is to illuminate the small or sub-seismic faults to determine its implication on the unconventional carbonate reservoir, of the Middle Eocene Apollonia Formation. The workflow started by the application of the structural smoothing attribute on a 3D post-stack, depth migrated seismic volume, in order to highlight the discontinuities of the seismic reflectors along the seismic sections. This is followed by the calculation of two main attributes, seismic coherence and curvature attributes. The most positive and most negative curvature attributes allowed us to identify small faults that are below seismic resolution. We found that the curvature attributes delineate faults distribution in our area of study better than other attributes. The presence of these faults had been verified by the geosteering technique applied during the drilling of one of the horizontal wells in the field. As a result, this study can potentially enhance the quality interpretation of seismic data and better identification of the major and minor faults that have an important implication on the fluid flow characterization of the reservoir.



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## Enhancing the Understanding of the Eastern Mediterranean Hydrocarbon Prospectivity Through a Modern Seismic Data Library

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### ABSTRACT

The eastern Mediterranean is a geologically complex region, with multiple plate boundaries, subduction zones, major suture zones, accretionary wedges and fault systems. Over more than a decade PGS has acquired and reprocessed high quality 2D and 3D multichannel seismic data in the region, including in Sicily, Greece, Egypt, Cyprus and Lebanon. Recent discoveries coupled with licensing round activity has drawn significant interest from E&P companies.

There are a number of proven hydrocarbon provinces/basins both onshore and offshore, however the exploration maturity of the basins in this region do vary from mature (e.g. Plio-Pleistocene gas play in the Nile Delta) right through to extremely frontier (e.g. offshore south and west of Greece). The broad coverage and high quality of the seismic datasets available provide an unparalleled opportunity to gain an insight into the region and compare and contrast the different areas to assess what opportunities might exist, both in terms of near-field as well as frontier exploration. Using a combination of seismic interpretation with other geological/geophysical studies, the 3D datasets enable more detailed understanding, which can then be extrapolated using the 2D data that cover a broader area.

The Zohr discovery targeted a Miocene-Cretaceous carbonate reservoir in deep water rather than a clastic reservoir. Can further analogues to Zohr be found elsewhere? What is the extent of the high quality early Miocene deep marine Tamar sands, or are there other similar clastic systems that can be mapped? Is it possible to identify deeper targets with modern imaging and what hydrocarbon trapping mechanisms are available in the region? These are some of the play element questions and insights we will attempt to address and continually seek to uncover using this vast seismic data coverage.

There remains justifiable excitement in this region for E&P companies, and high levels of exploration are expected to continue in the coming years.