

Proven and New Plays in the Levant Basin - The Next Step in Developing Hydrocarbon Resources Offshore Israel

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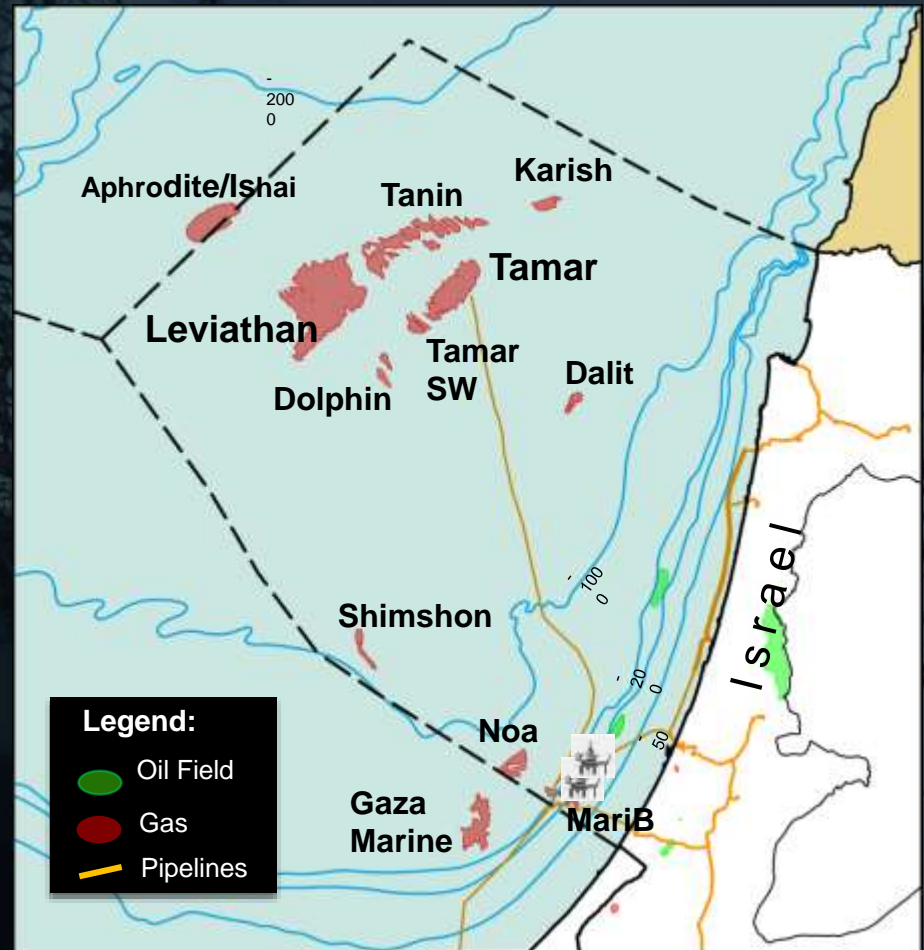
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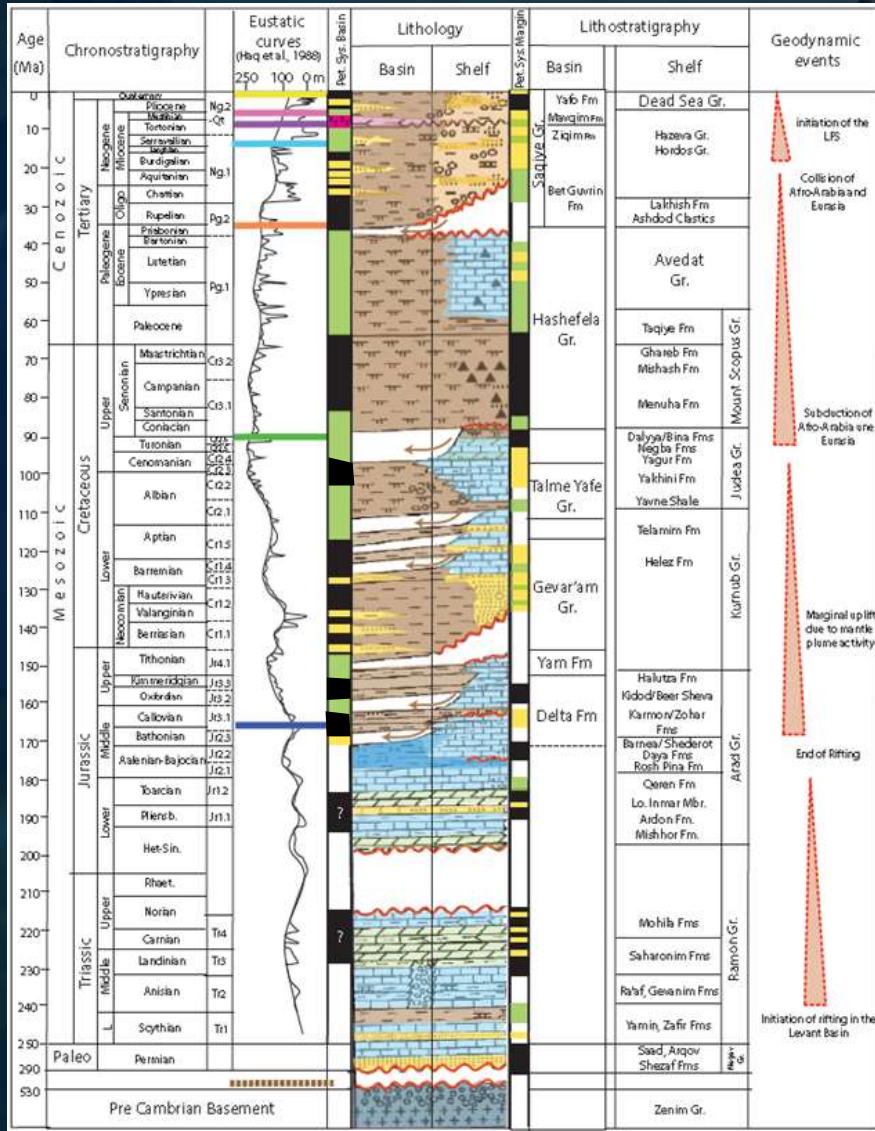
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Status of E&P Offshore Israel

- 10 gas fields were discovered in the past 15 years
- Recoverable gas reserves & resources:
 - > 30 TCF of gas
 - 50 MMBL of condensate
- 3 gas fields were completed and producing
- Leviathan and Karish are being developed with first-gas in 2019-2020
- Gas production has large effect on Israel's economy, export options are opening
- Developing our offshore hydrocarbon resources was set as a primary objective of the Ministry of Energy



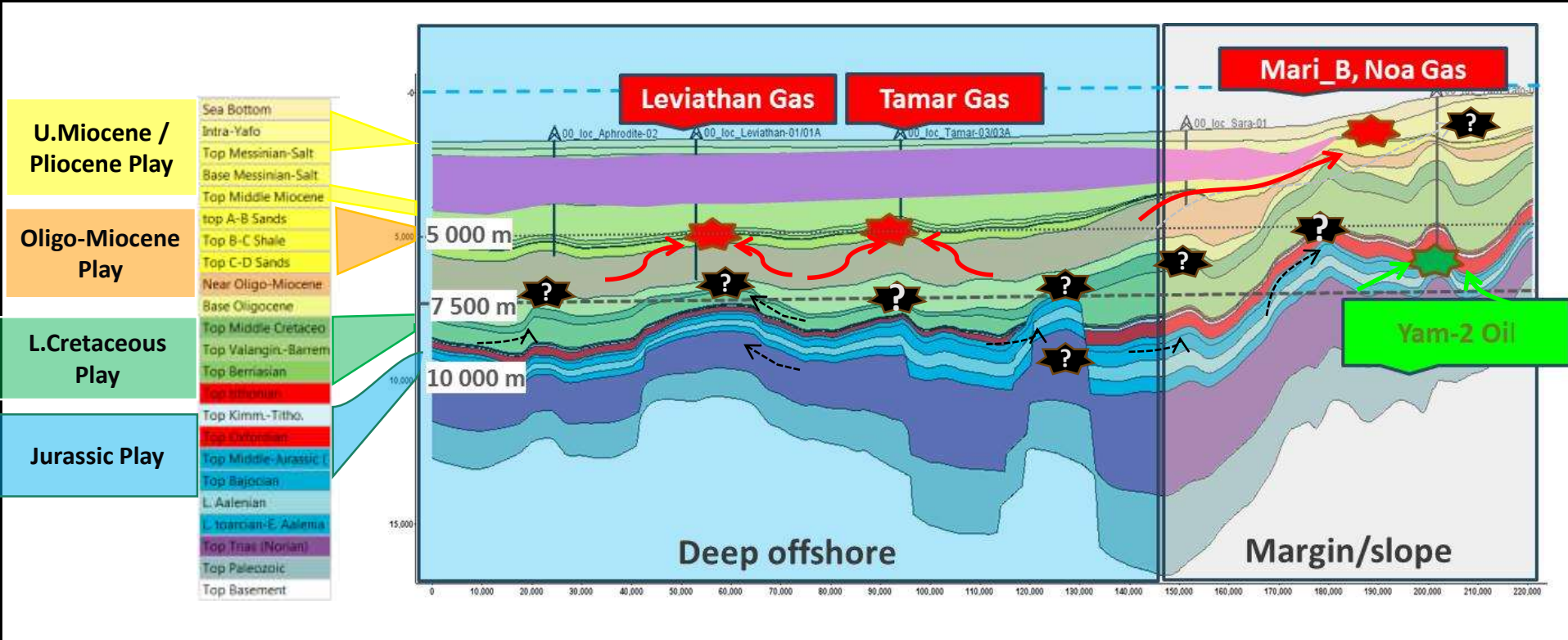
Levant Basin Characteristics



- Multi-phase tectonic evolution
- Potential source rocks in Mesozoic and Cenozoic successions
- Evidence for extensive coarse-grained siliciclastic transport into the basin throughout its history
- Favorable condition for deep thermogenic systems and shallow biogenic systems
- Basin analysis study estimates unrisked resources in the range of 7000 BCM of gas and 26 BBL of oil



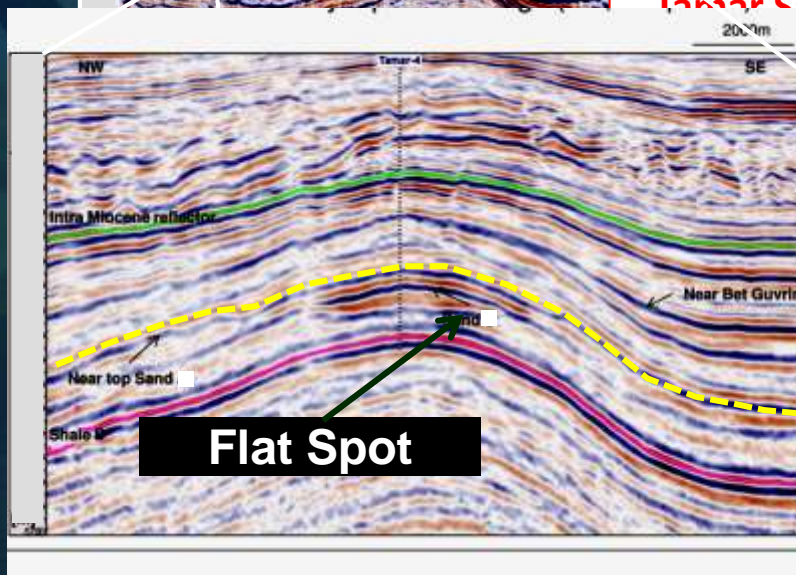
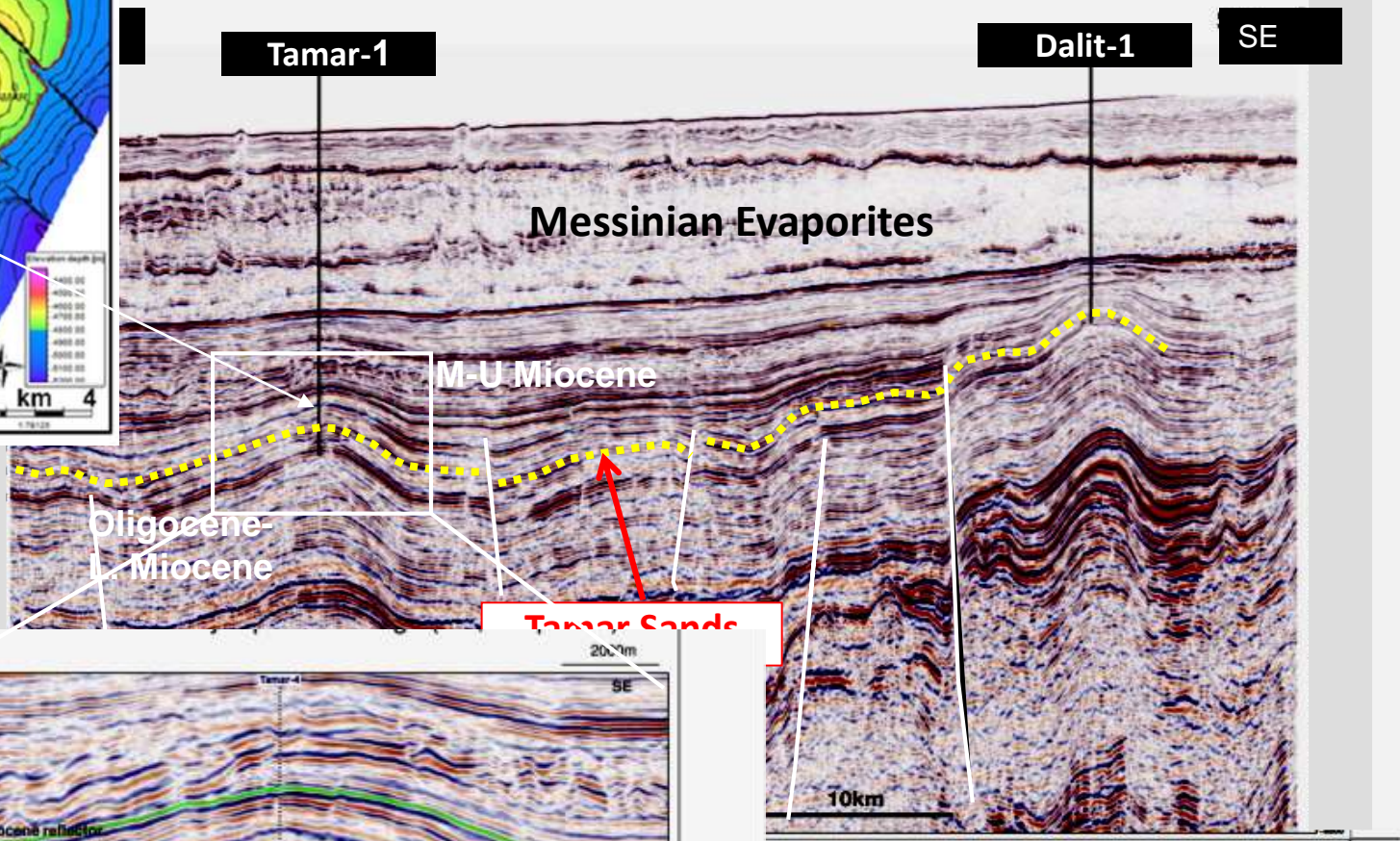
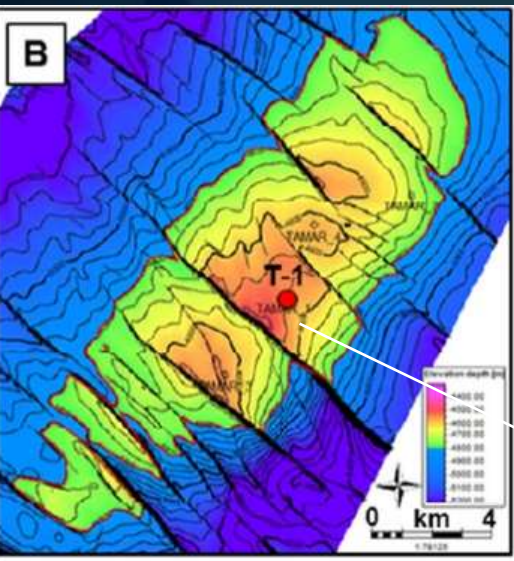
Proven and Potential Hydrocarbon Plays



- Oligo-Miocene, Tamar Sand Play (Proven)
- Pliocene, Yafo Sand Play (Proven)
- Middle Jurassic, Fractured Carbonate Play (Proven)
- Lower Cretaceous Sand Play (Potential)
- Jonah High Multiple Plays (Potential)

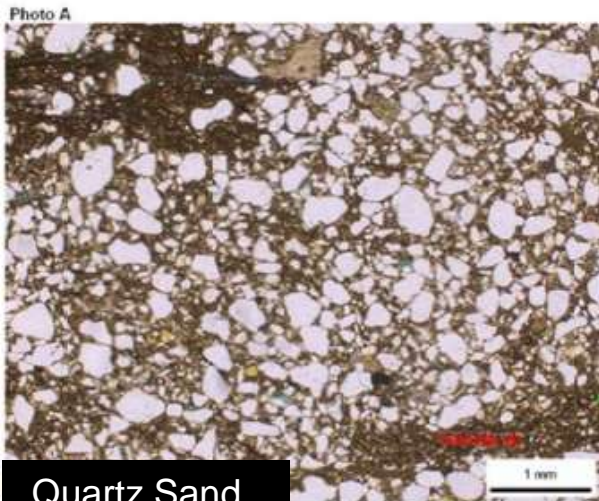
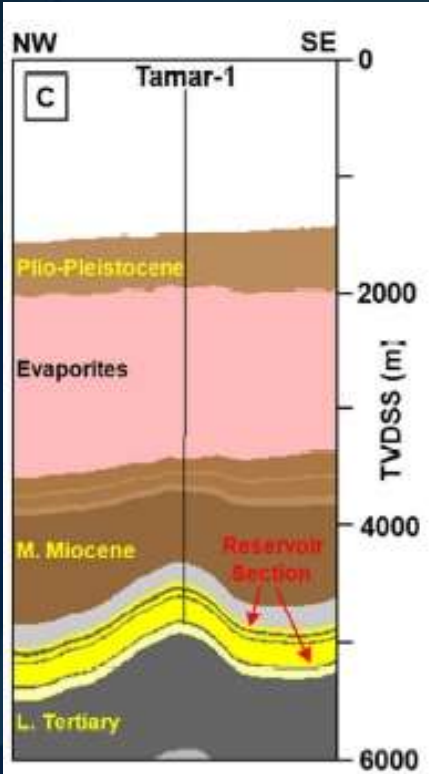


Oligo-Miocene Tamar Sand Play

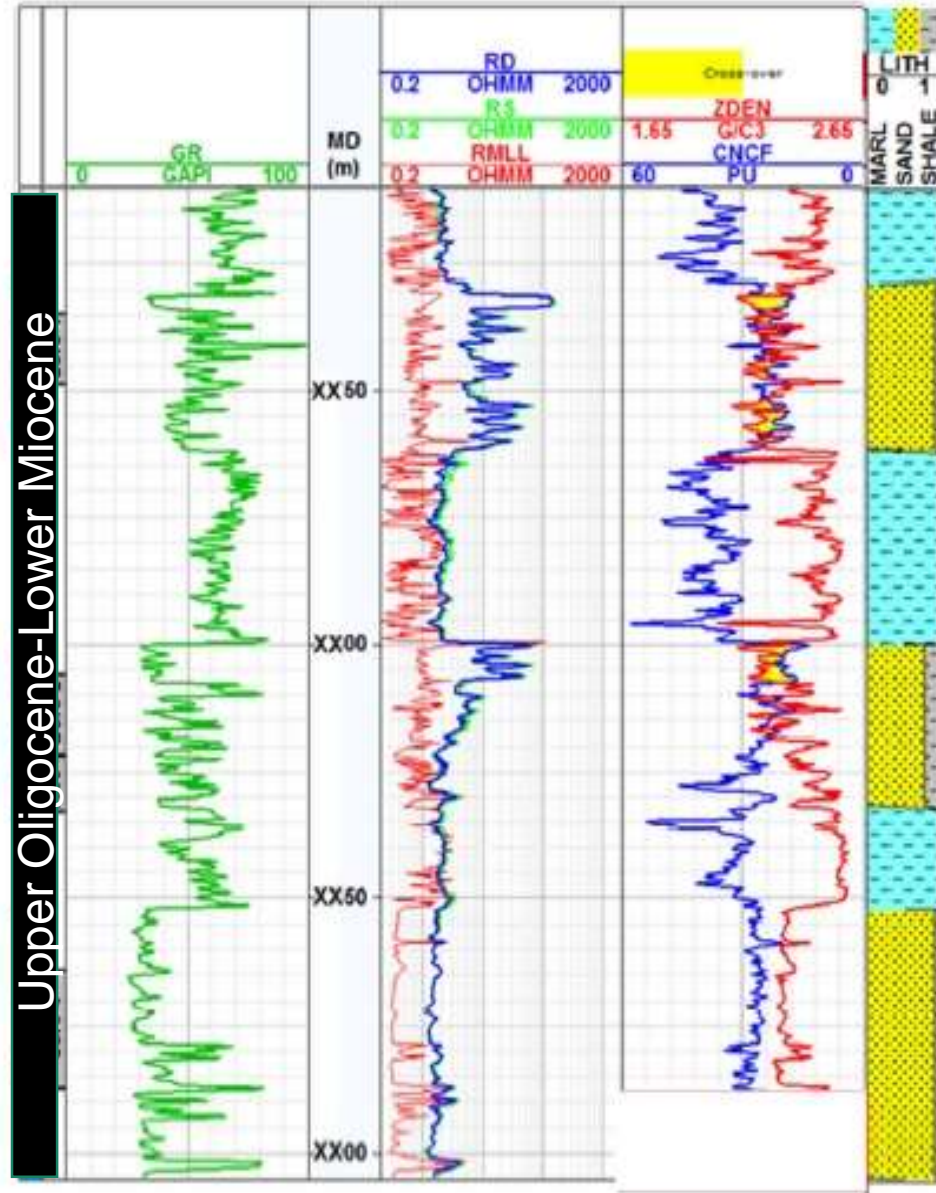


Turbidite sands of Chatian to Aquitanian age, charged with dry, biogenic gas and trapped within Syrian-Arc type structures in the deep basin; source is Oligo-Miocene shale

Oligo-Miocene Tamar Sand Play



Quartz Sand

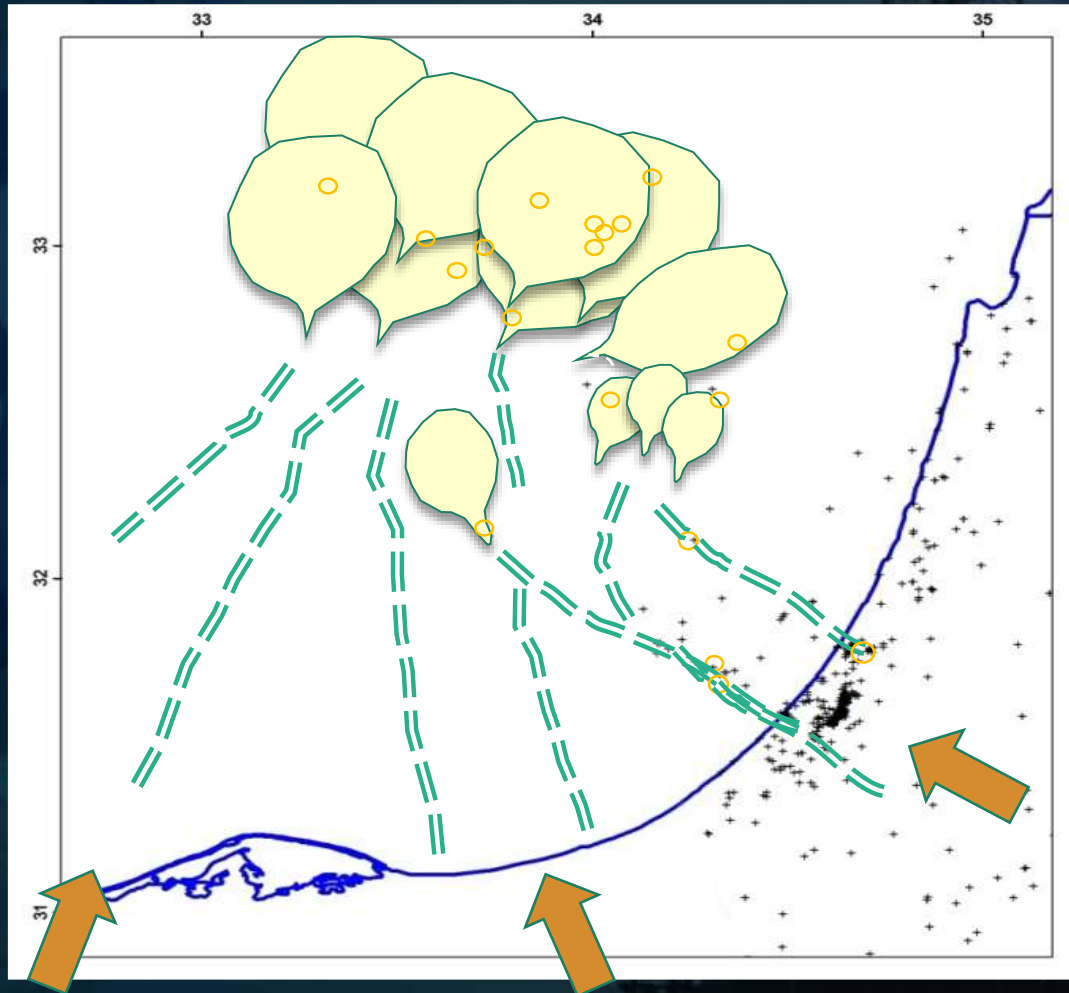


A Sand

B Sand

C Sand

Oligo-Miocene Depositional System

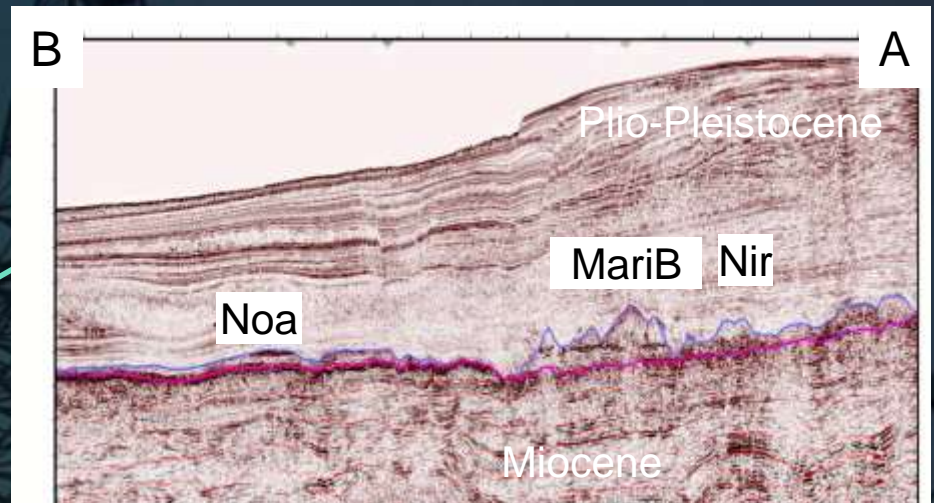
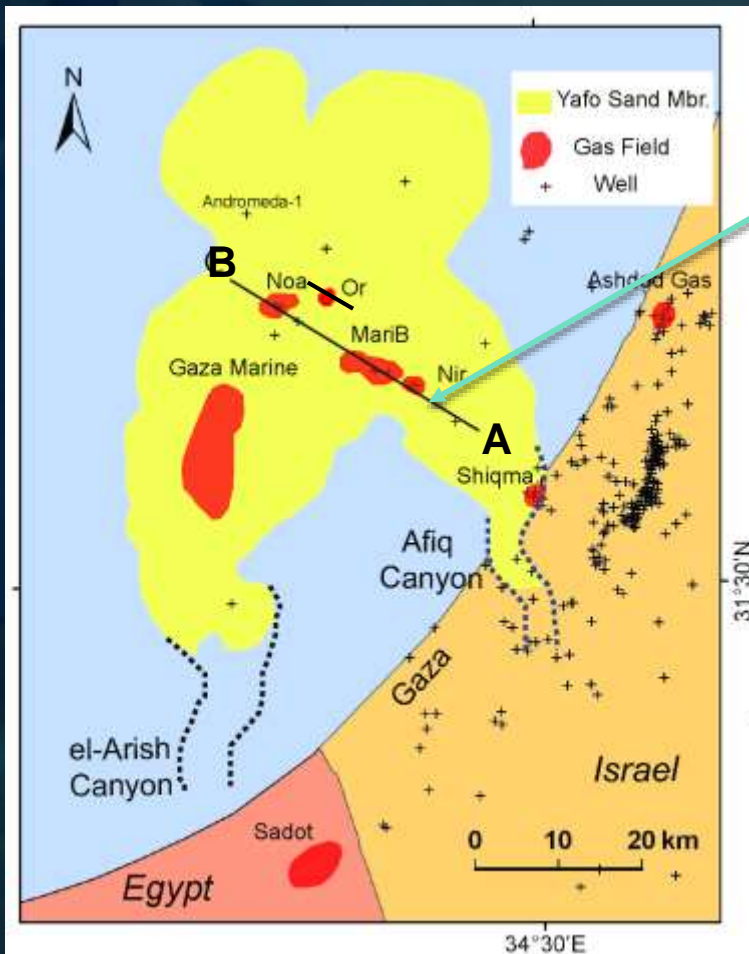


- Vast sandy, submarine channel-fan systems were deposited during Oligo-Miocene times in the Levant Basin
- The origin of sands is not well constrained, however, sand transport is associated with the uplifting and erosion of the Arabian-Nubian Shield prior to the break-up of the Suez-Dead Sea Rift system

Arabian-Nubian Shield



Pliocene Yafo Sand Play

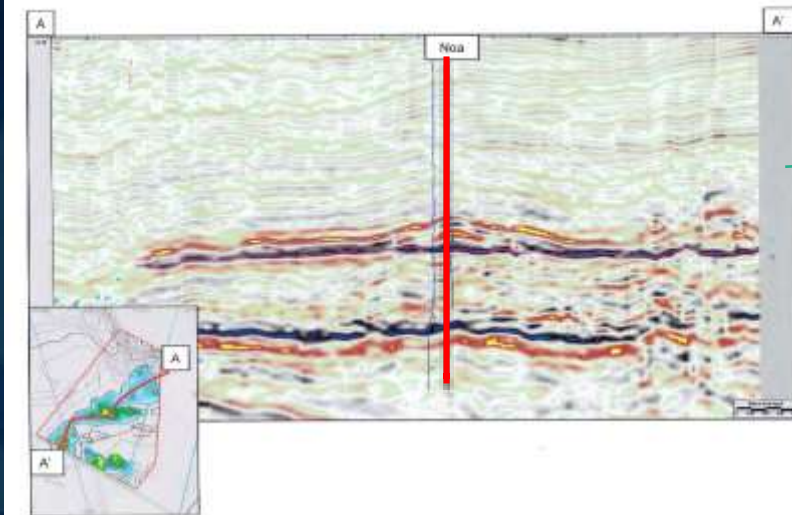


Turbidite Sands of Lower Pliocene age, charged with dry, biogenic gas and trapped within lobes and domes above Messinian Evaporites; source is Miocene shale

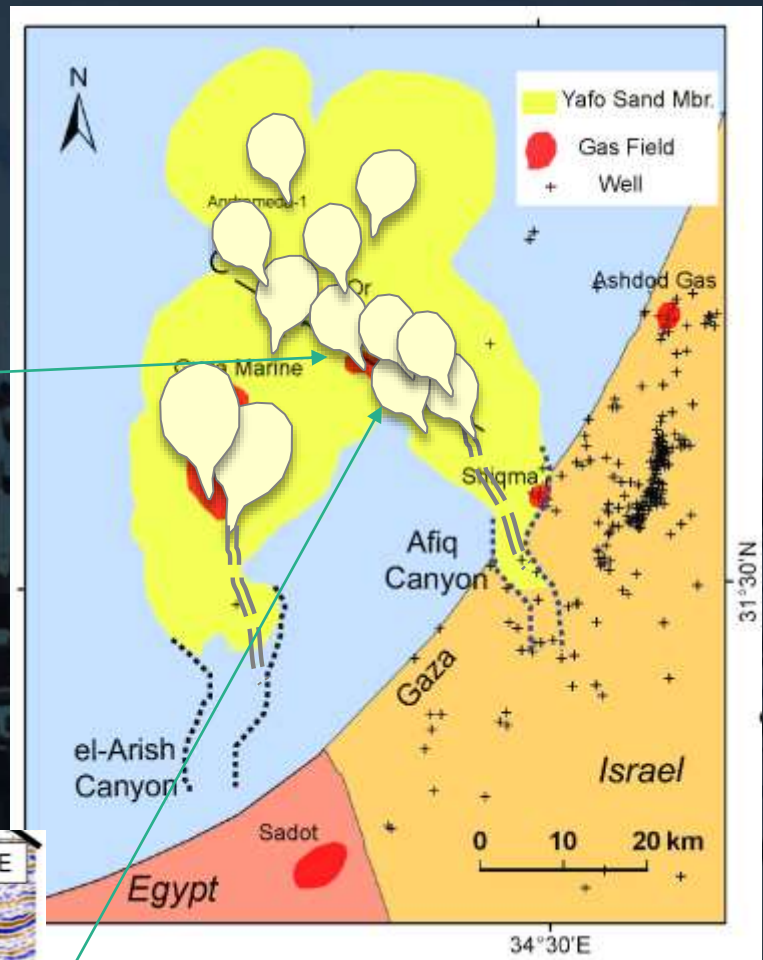
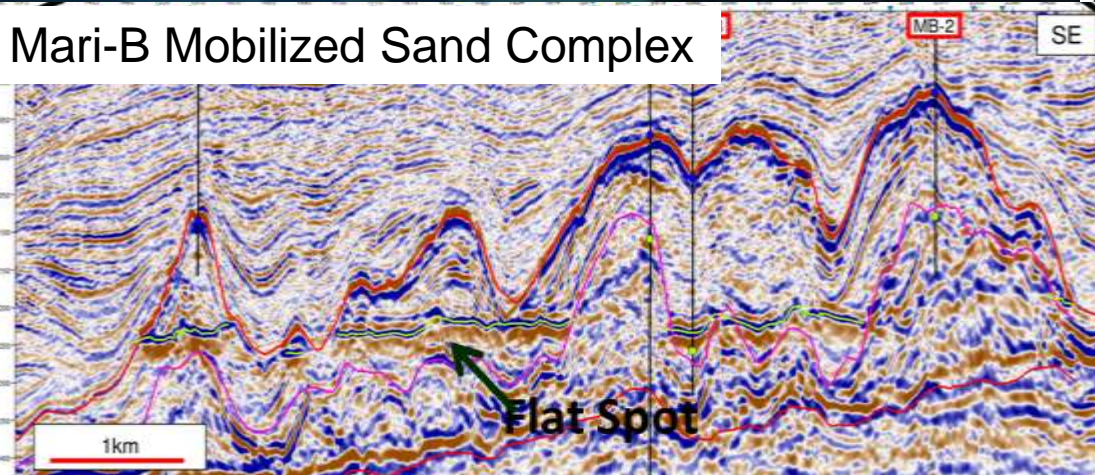


Pliocene Depositional System

Noa Turbidite Lobe



Mari-B Mobilized Sand Complex



Potential for other gas-bearing turbidite lobes further north, pending on existence of a transport system

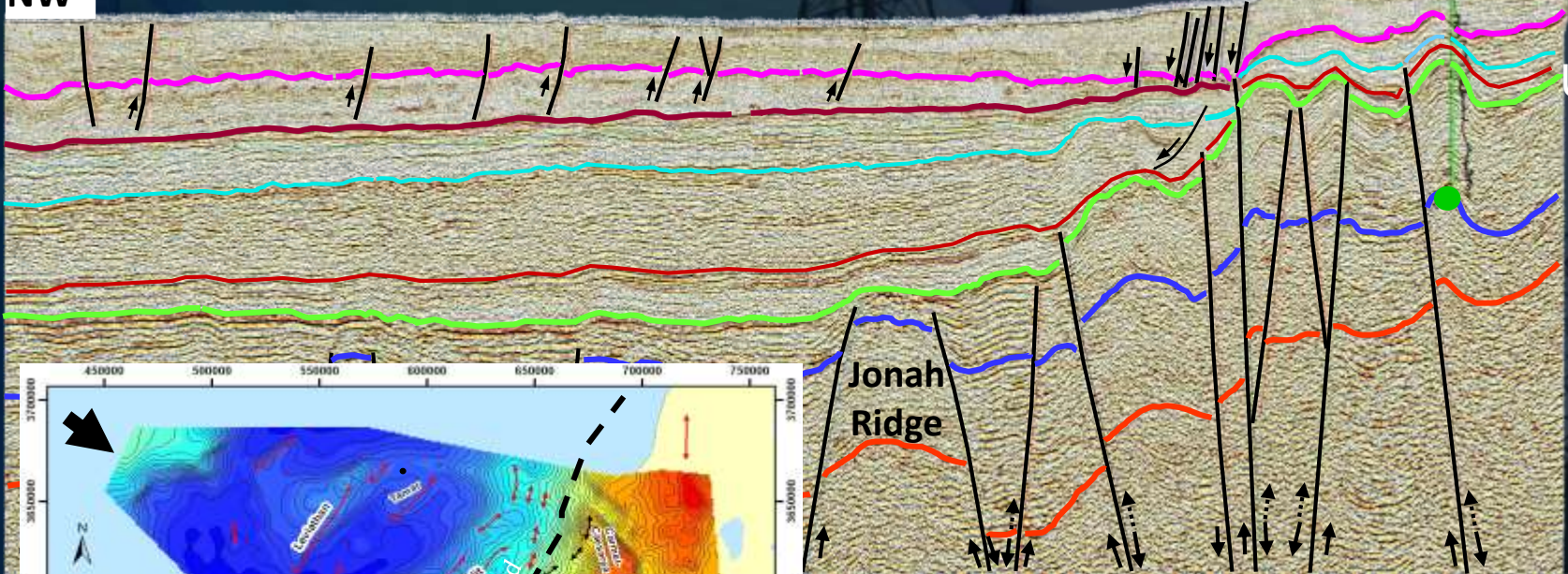


Middle Jurassic Fractured Carbonate Play

Yam Yafo-1

SE

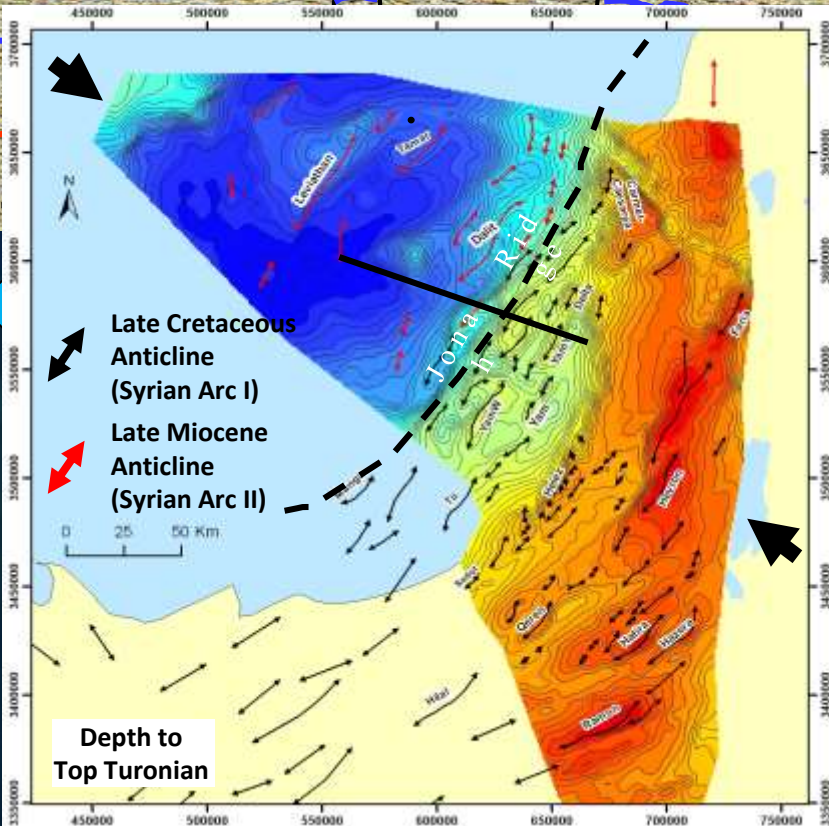
NW



Up. Cret.

Mid Jur.

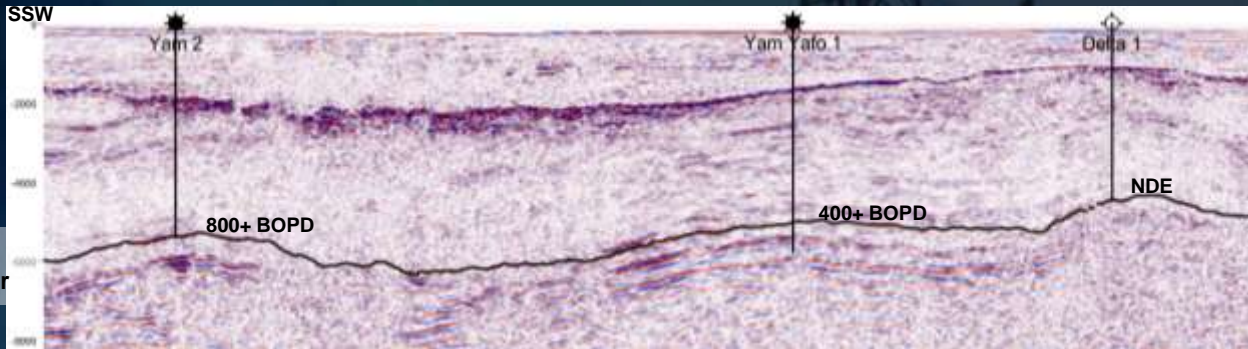
Prec.



Late Cretaceous Inversion

Middle Jurassic carbonate beds charged with light oil, in Syrian-Arc structures on the eastern margin of the basin; source is Middle-Upper Jurassic or older; Not commercially developed although 400-800 BPD were extracted in production tests

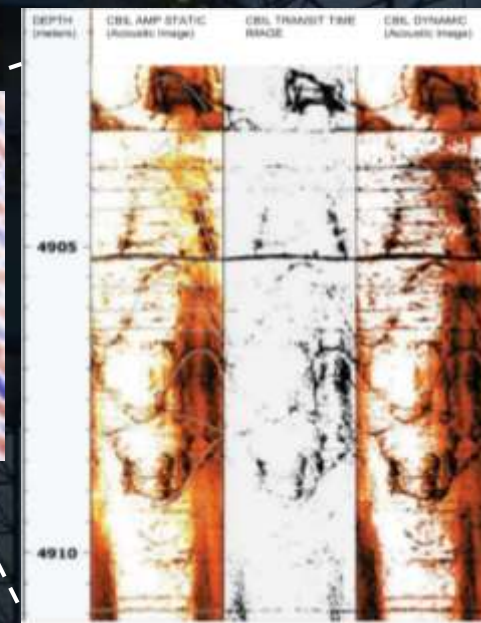
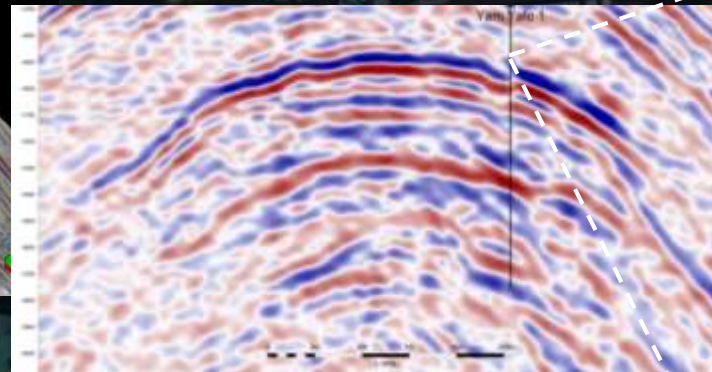
Middle Jurassic Fractured Carbonate Play



Evidence for extensive fracture systems in seismic and well data

THE HIGHEST DENSITY HIGH ANGLE FEATURE INTERVAL 4902-4910 M KB FROM YAM YAFO-I

Ant-Tracking: Depth Slice 4920 m



If properly developed, Jurassic carbonate beds may produce large quantities of light oil

CBIL Log.



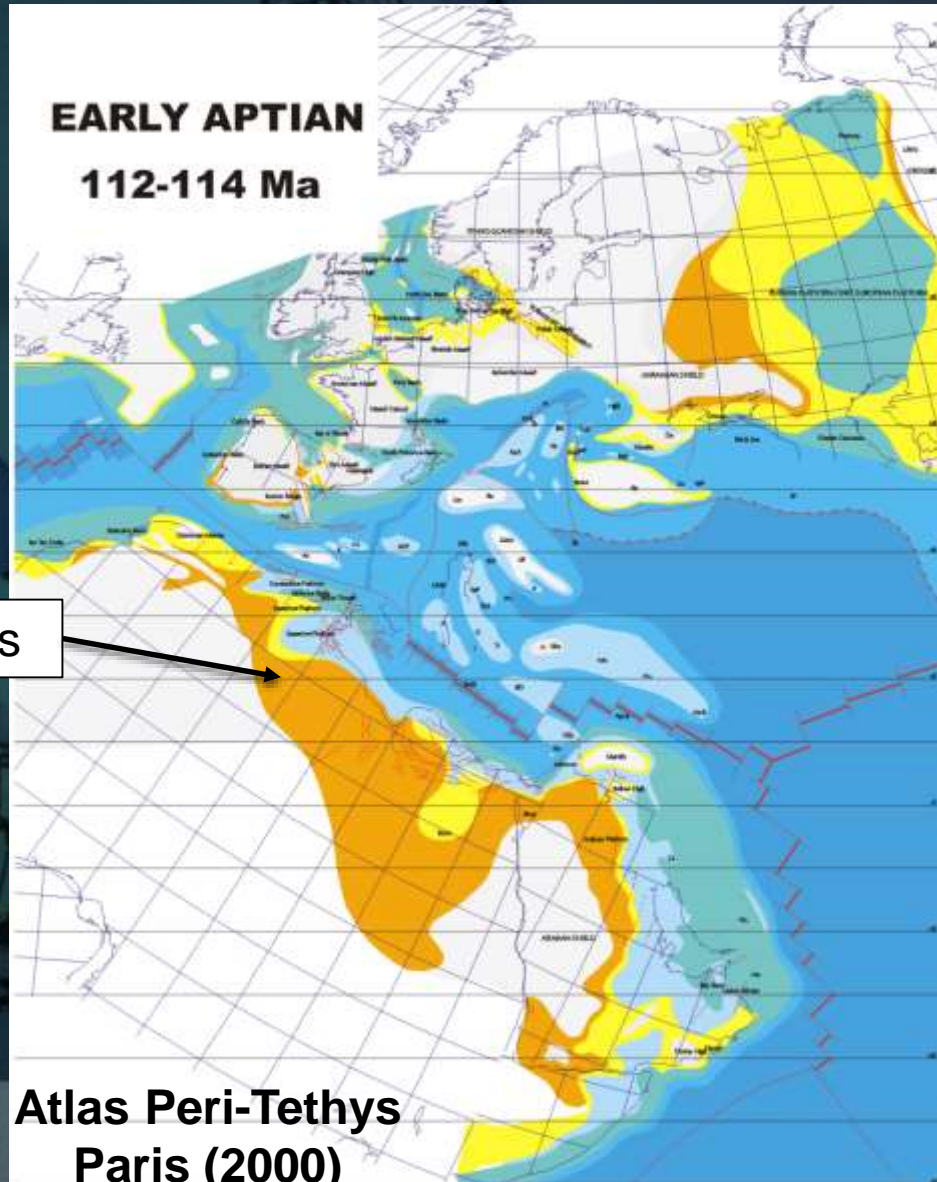
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Lower Cretaceous Sand Play

**EARLY APTIAN
112-114 Ma**

Continental Clastics

**Atlas Peri-Tethys
Paris (2000)**

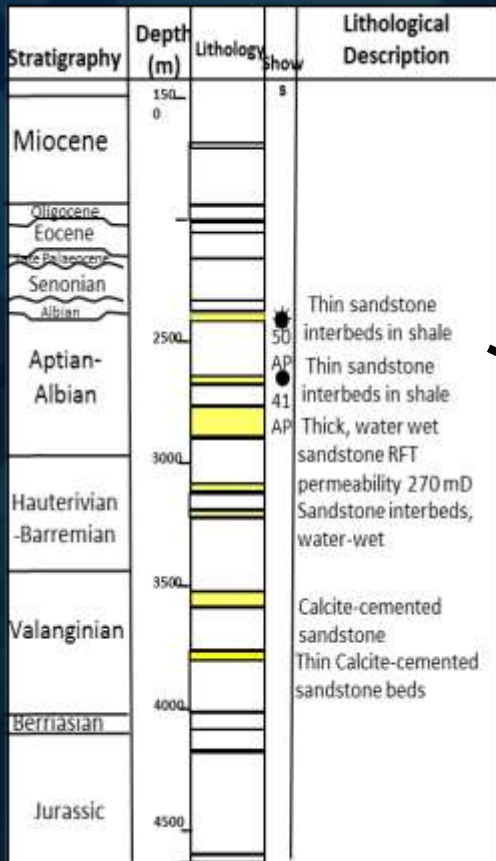


Oil Infrastructure,
Energy Resources

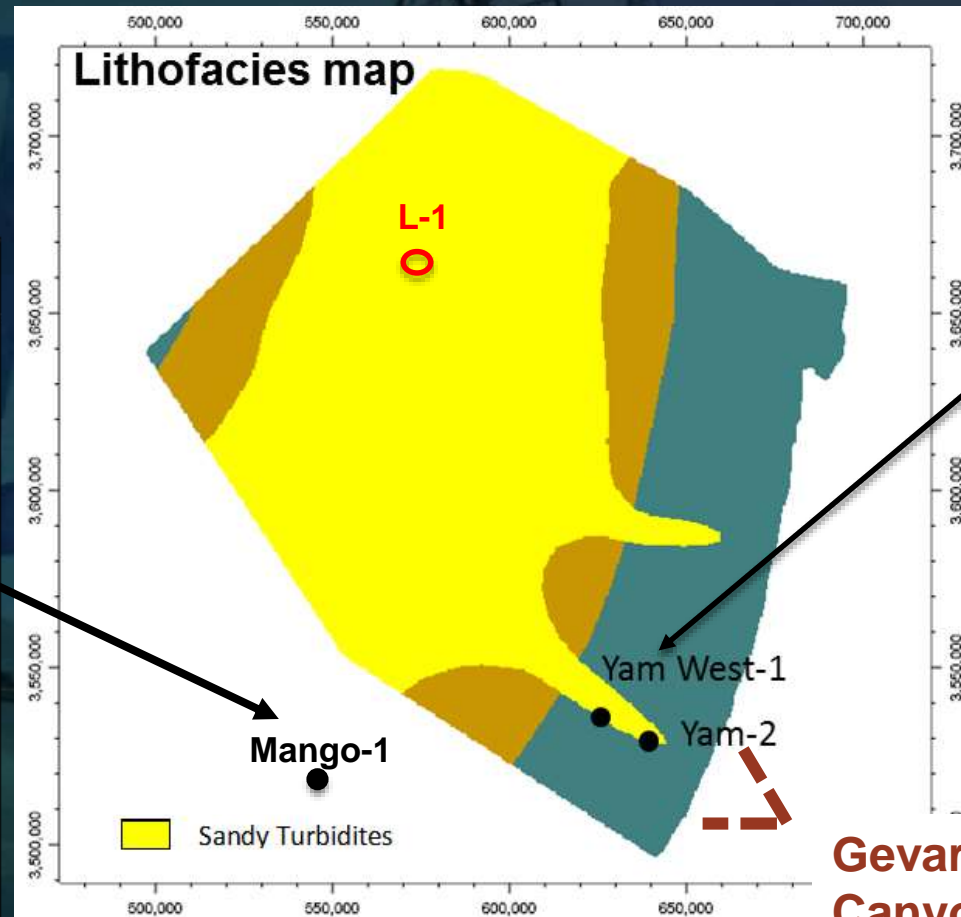
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Oil and Gas Shows in Lower Cretaceous Sands

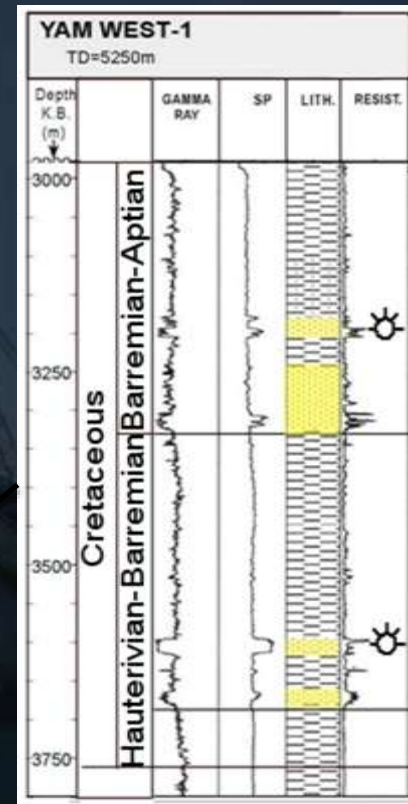
Mango-1



10,000 BPD in production tests

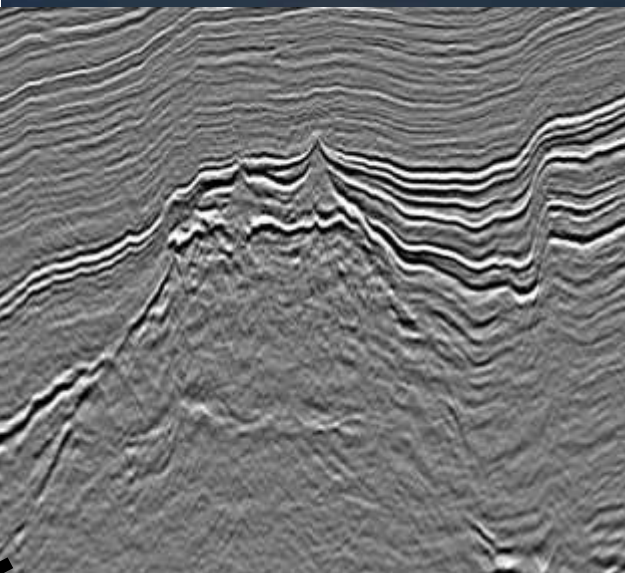
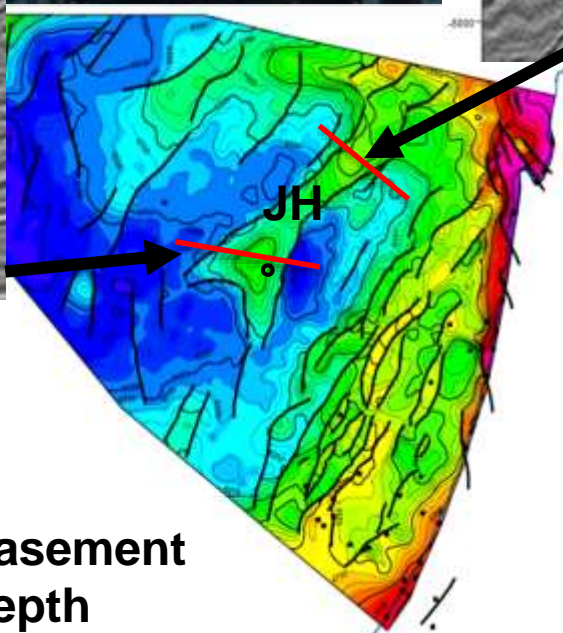
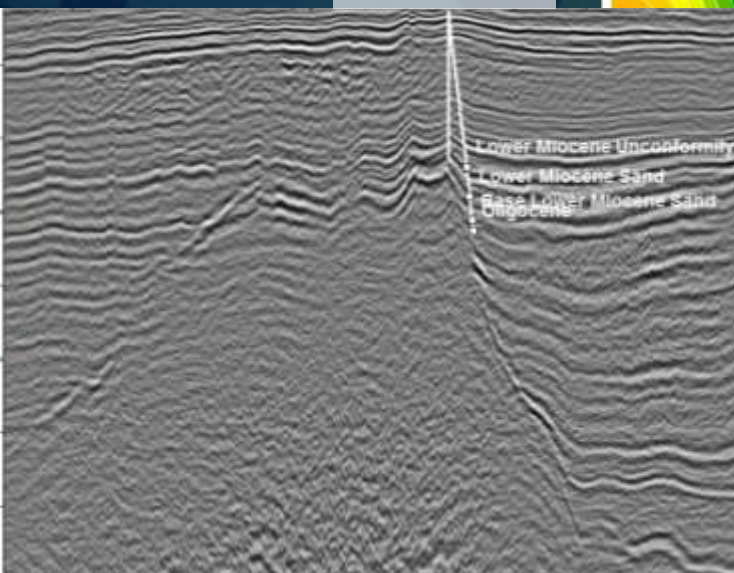
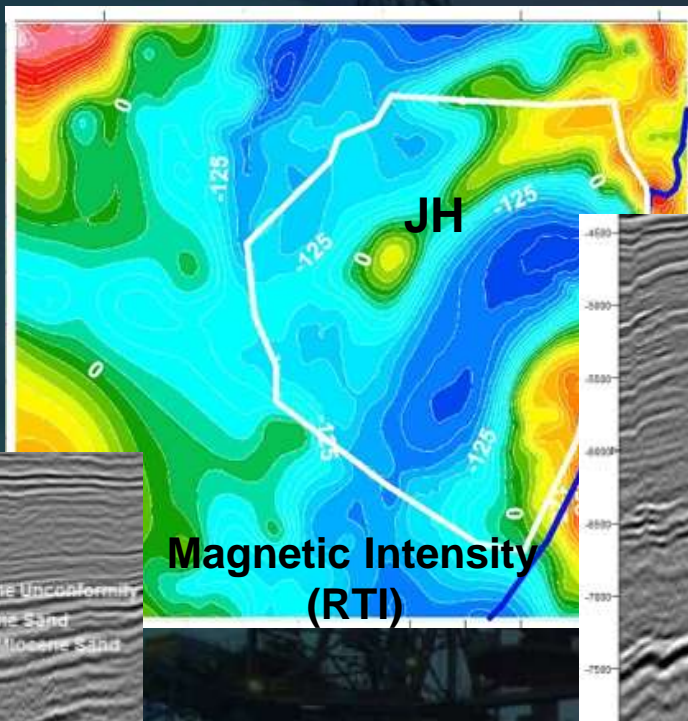


High probability for Lower Cretaceous turbidite sands charged with light oil from Middle-Upper Jurassic source in the basin and its margin



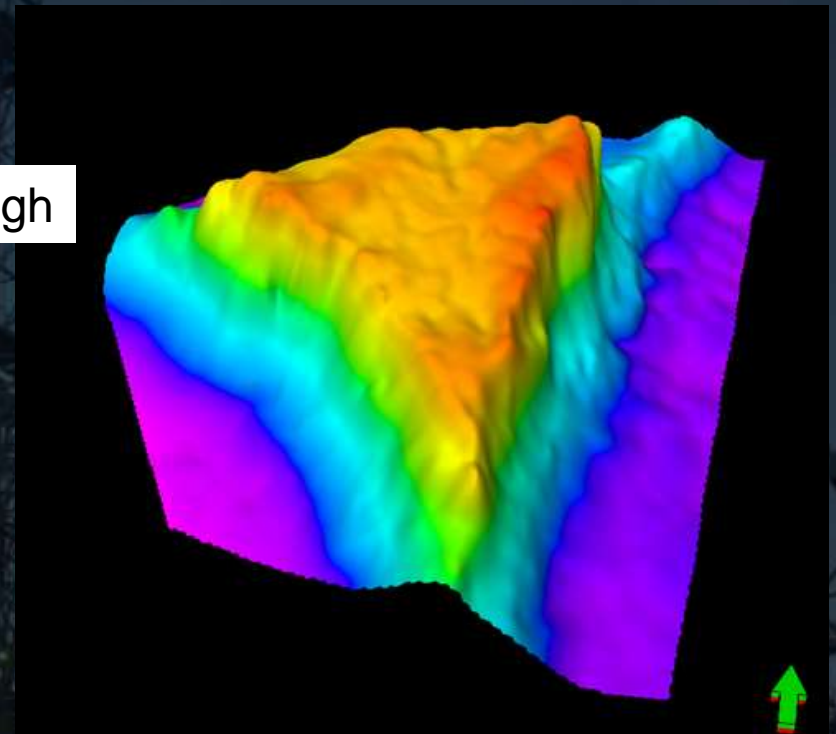
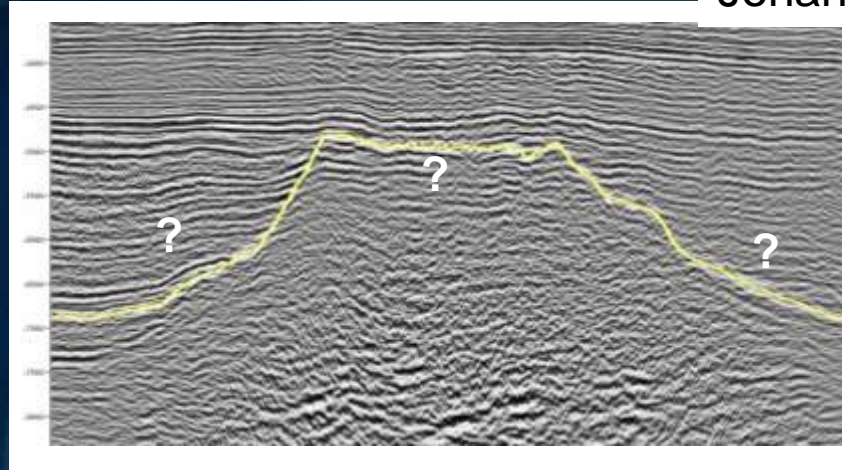
Jonah High Play

Myra-1

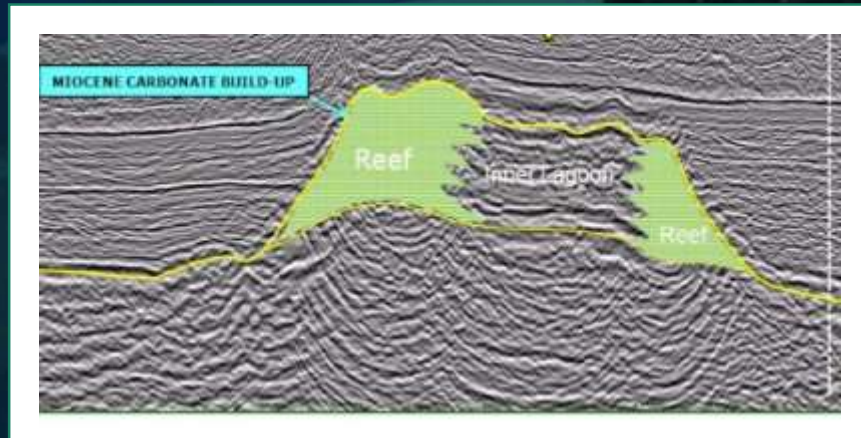


Jonah High Play

Jonah High



Potential reservoirs at the top of the Jonah High and on its flanks can be charged with oil and gas from surrounding Mesozoic and Cenozoic source rocks



Zohr (ENI, 2014)



Mediterranean Sea

Israel

- Lease
- License
- Blocks offered in 1st bid round
- Open Blocks



All five plays shown here
may be found in
exploration blocks that
are open for bidding
offshore Israel

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Conclusions:

- Five hydrocarbon plays had been identified and described offshore Israel
- Three proven plays: Pliocene, Oligo-Miocene and Jurassic can be further developed
- Two new plays need to be proved by drilling, but if exist may hold significant additional potential
- The Ministry of Energy invites companies to explore these and other plays in open blocks offshore Israel



Thank You



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