



TPAO
TÜRKİYE PETROLLERİ A.O.

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How Turkey will contribute to the southern discoveries of the Eastern Mediterranean?

• Exploration Perspective •

November 01, 2013

2nd IENE Regional Upstream Workshop, Athens

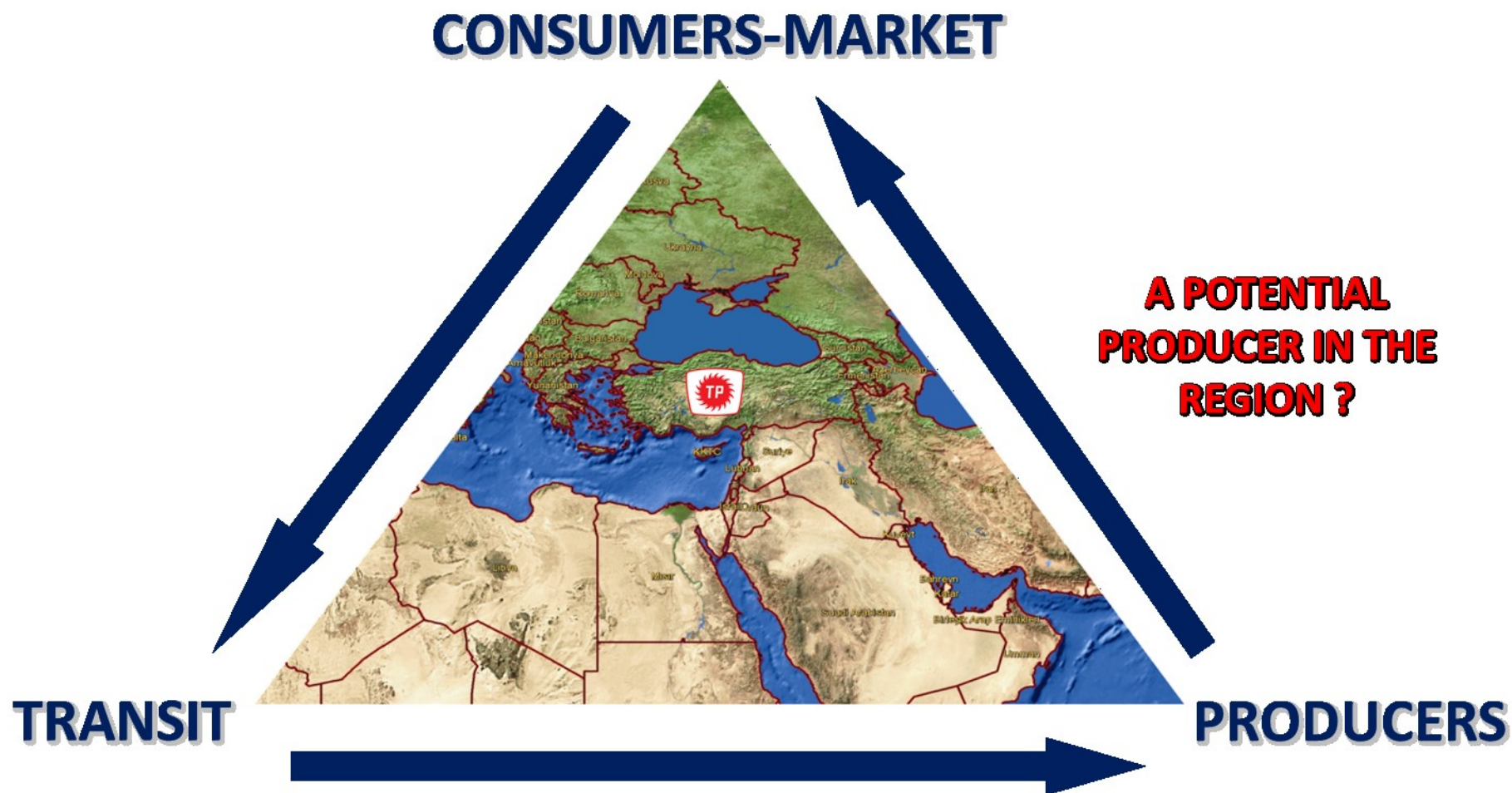


TPAO - NATIONAL OIL COMPANY

- **RESERVE: 1 Bn boe (2P: ~9 Bn boe)**
- **PRODUCTION: ~ 70.000 boe/day**
- **59 years EXPERIENCE IN E&P**
- **DEEP OFFSHORE EXPLORATION**
- **CURRENT CASH FLOW: 2,2 Bn \$**
- **E&P INVESTMENTS (2002-10): \$ 5.5 Bn \$**
- **PLANNING INVESTMENT (2011-14): 3.8 Bn \$**

Exploration
Production
Drilling
Gas Storage
Pipeline

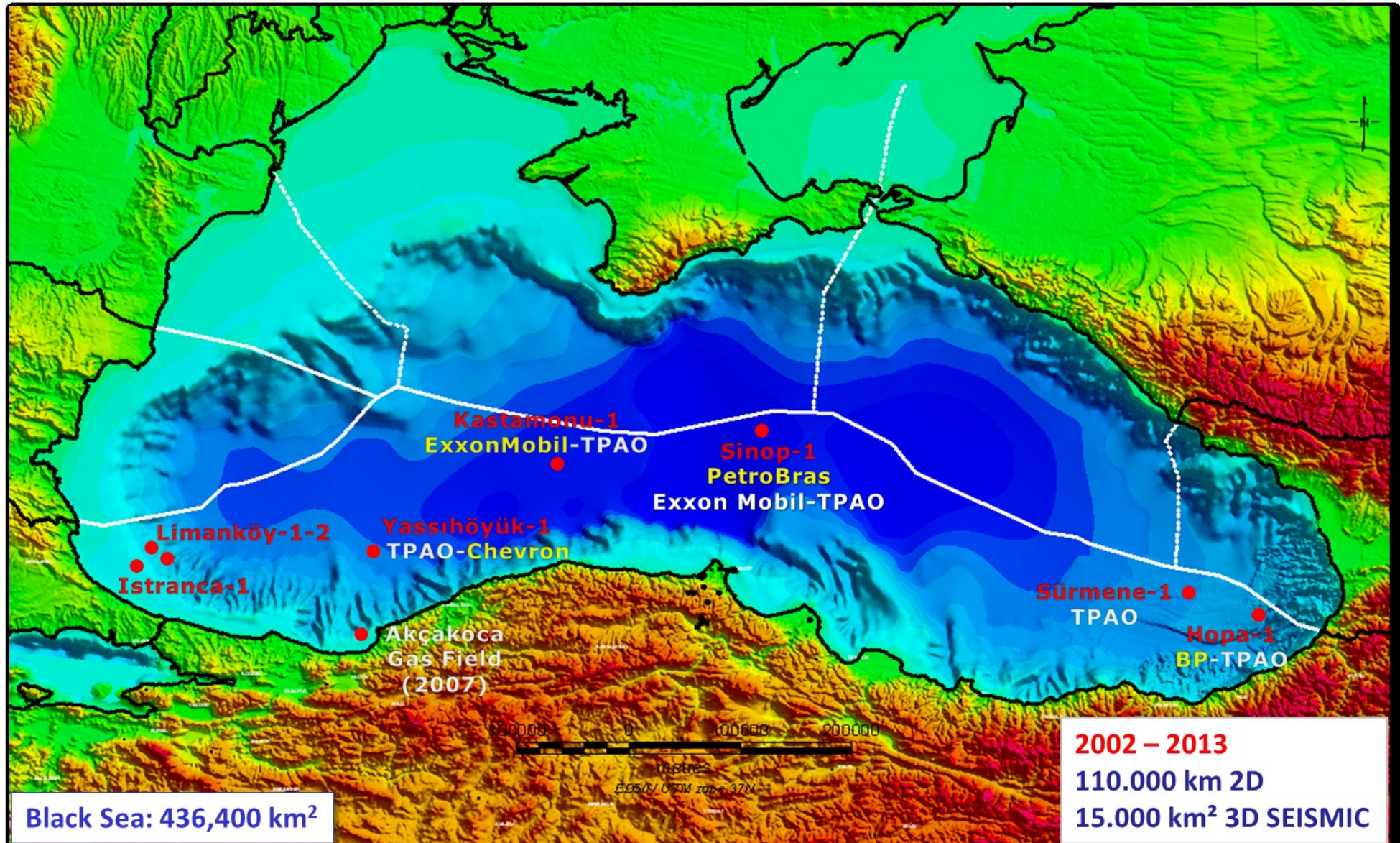


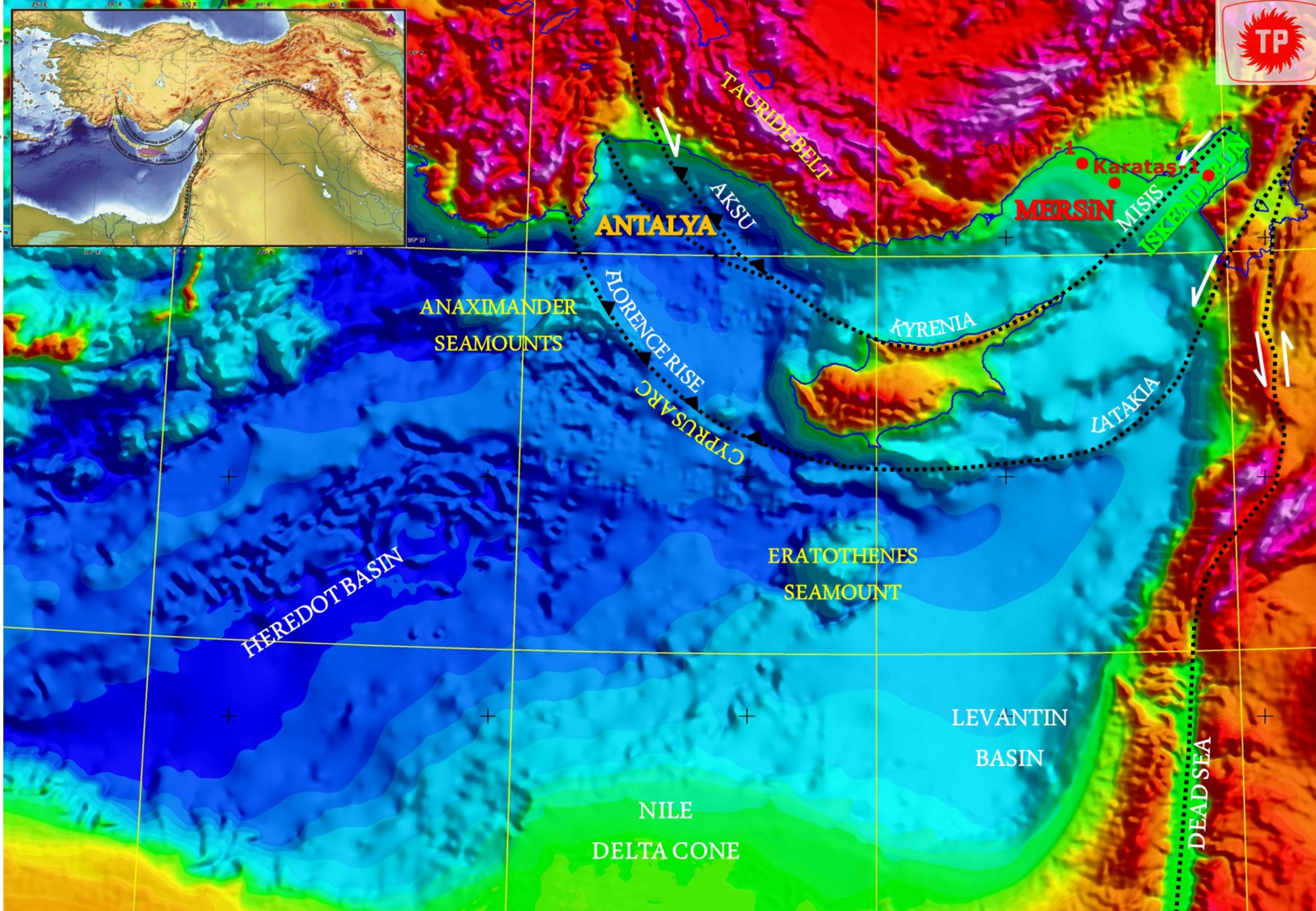




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Exploration in Black Sea

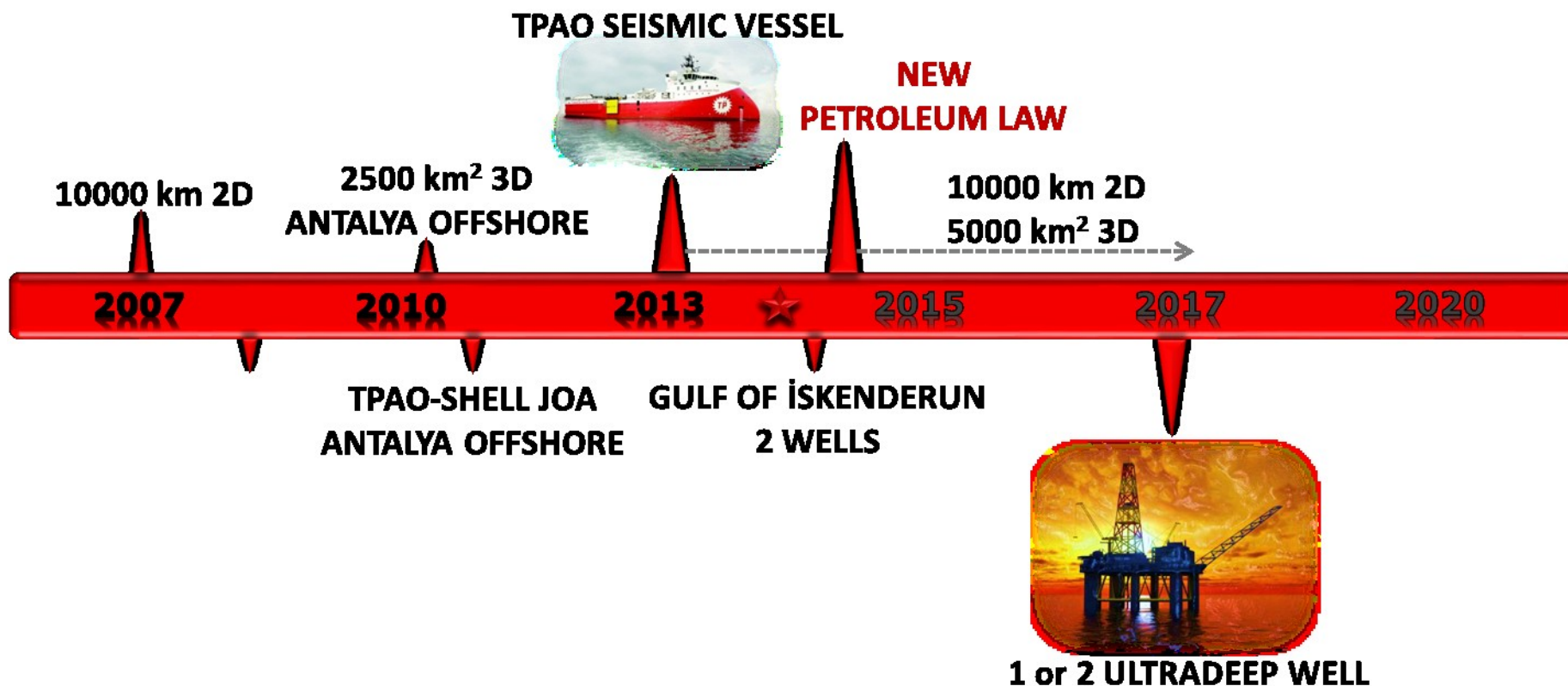






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Timeline for Mediterranean at TPAO (2007-2020)





TPAO | Joint operation with Shell

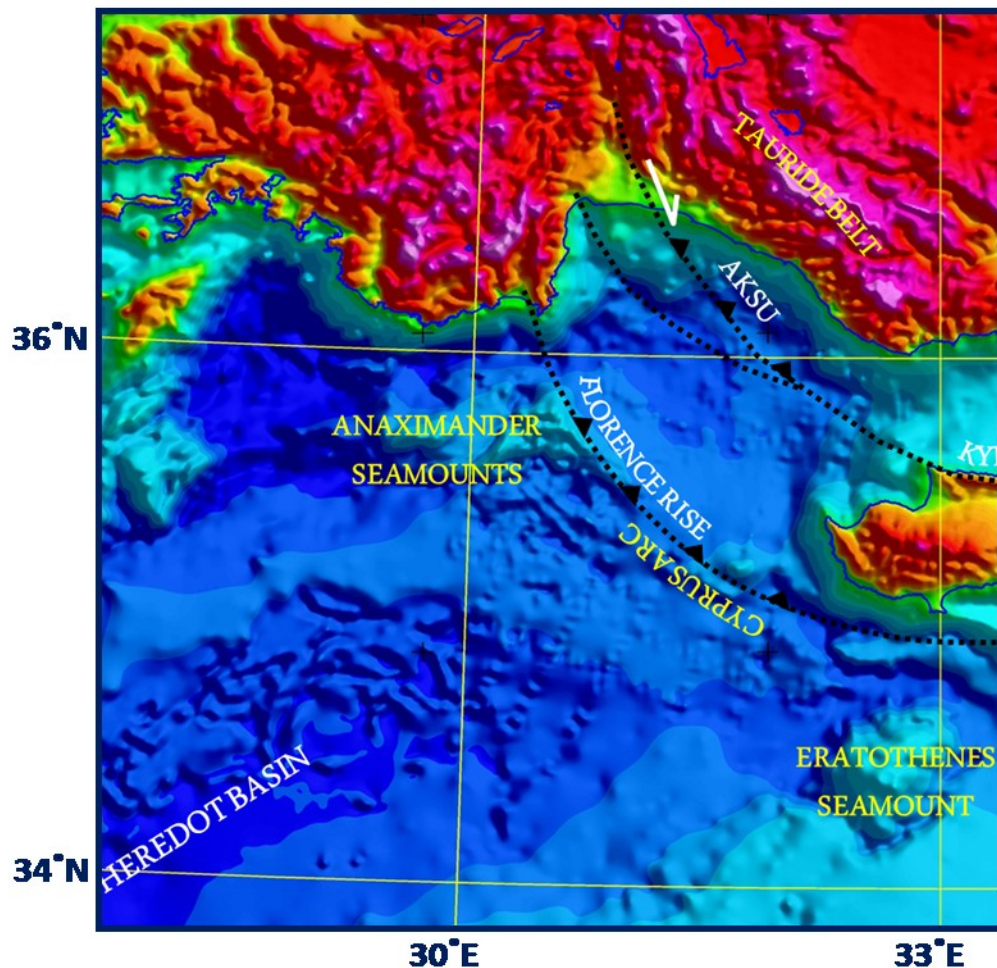


**JOINT OPERATION AGREEMENTS SIGNED
WITH SHELL !! 23 NOV 2011**





TPAO | Antalya Basin

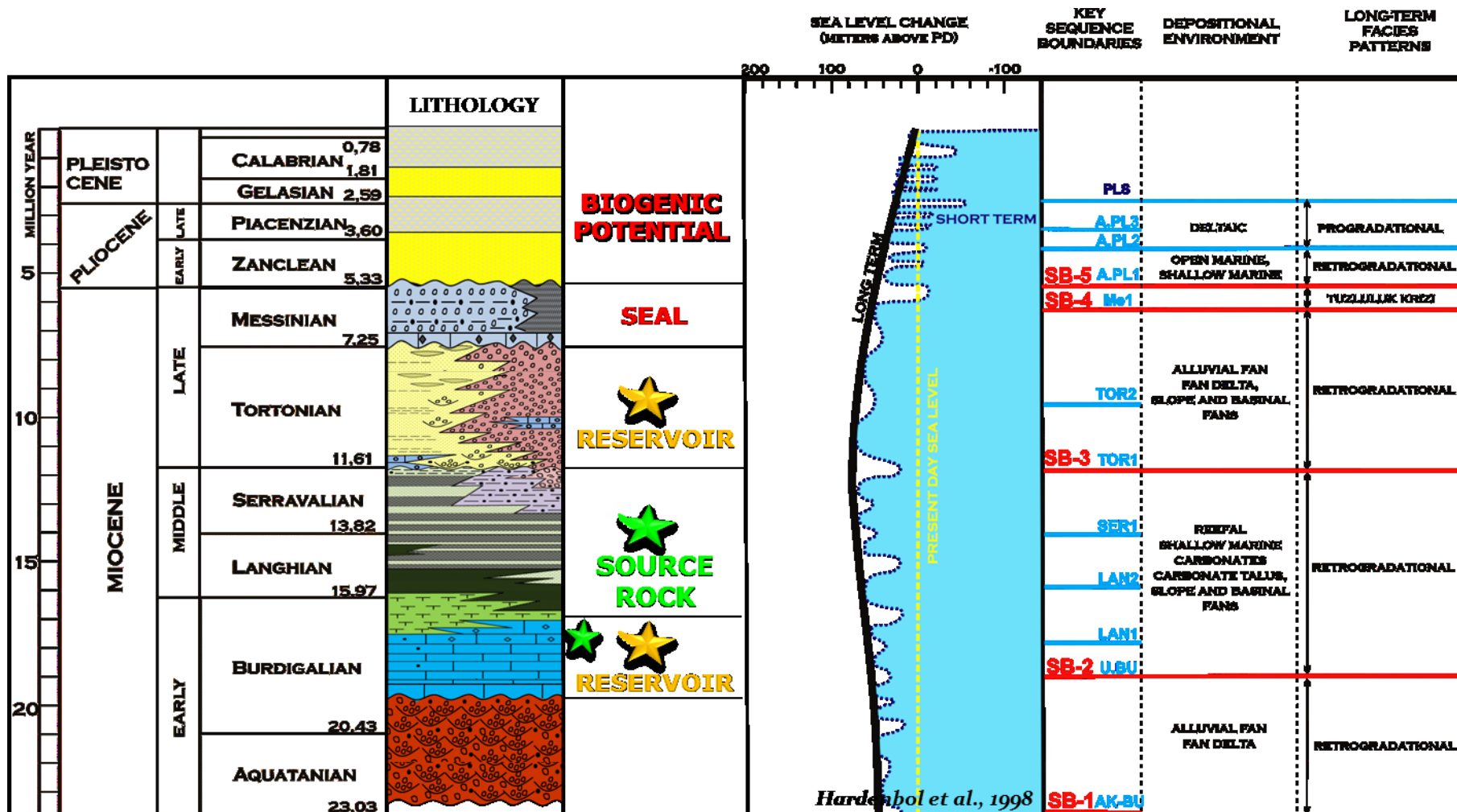


- **Untested large structures with potential reserves more than 10 tcf gas.**
- **The hydrocarbon potential is predominantly for gas from Miocene source rock. However, oil generation from Cretaceous black shales is also in the range of possibilities.**
- **Miocene turbiditic and deltaic sandstones are primary targets. Miocene reefs are secondary targets.**
- **No seal problem! Miocene targets are overlain by thick Messinian evaporites.**



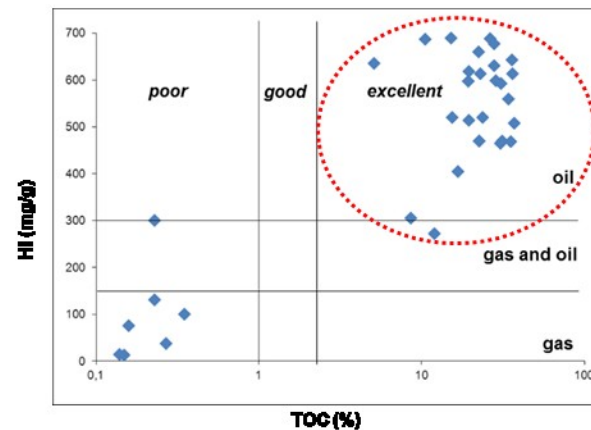
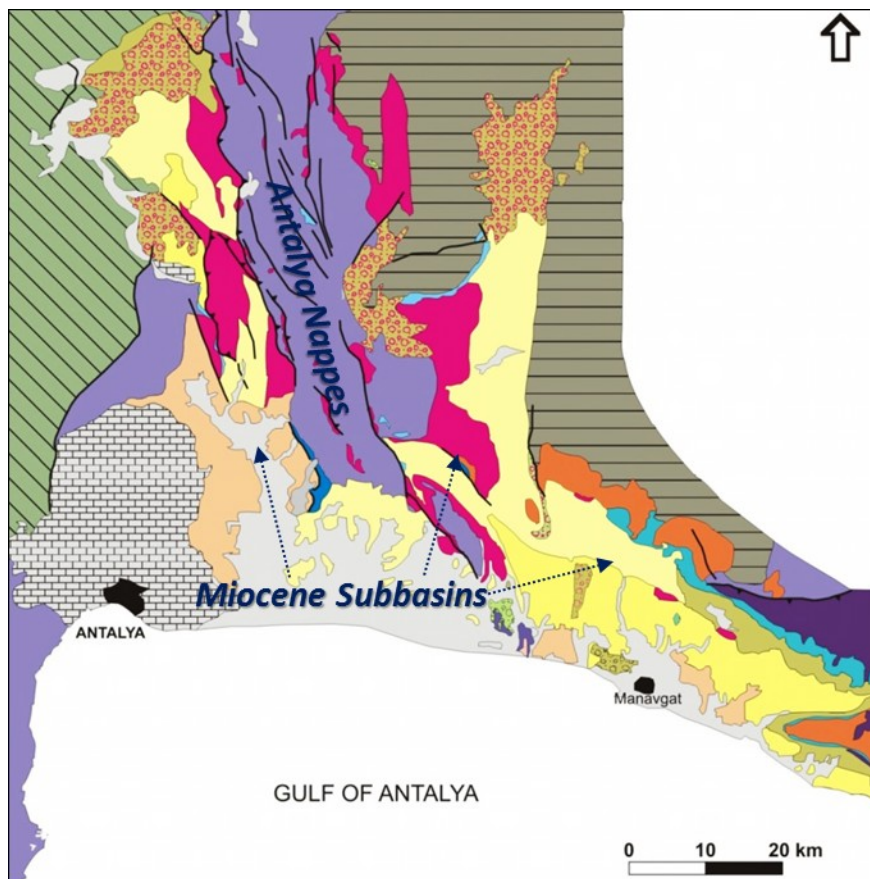
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Miocene Petroleum System



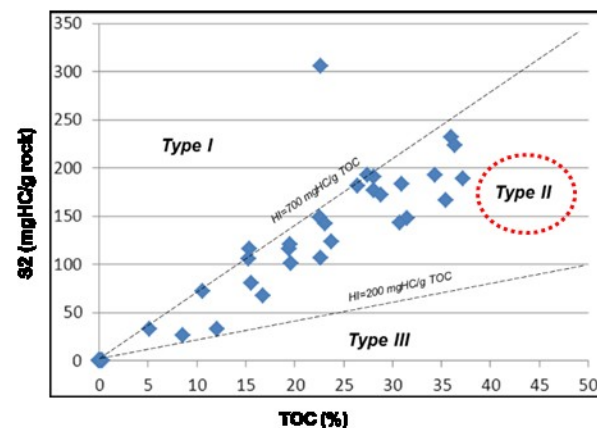


TPAO | Rock-eval prolysis results for Cretaceous



Hydrogen richness of source rock or Hydrogen Index (HI) versus total organic carbon (TOC) graph.

$$(HI = (S_2/TOC) \times 100).$$

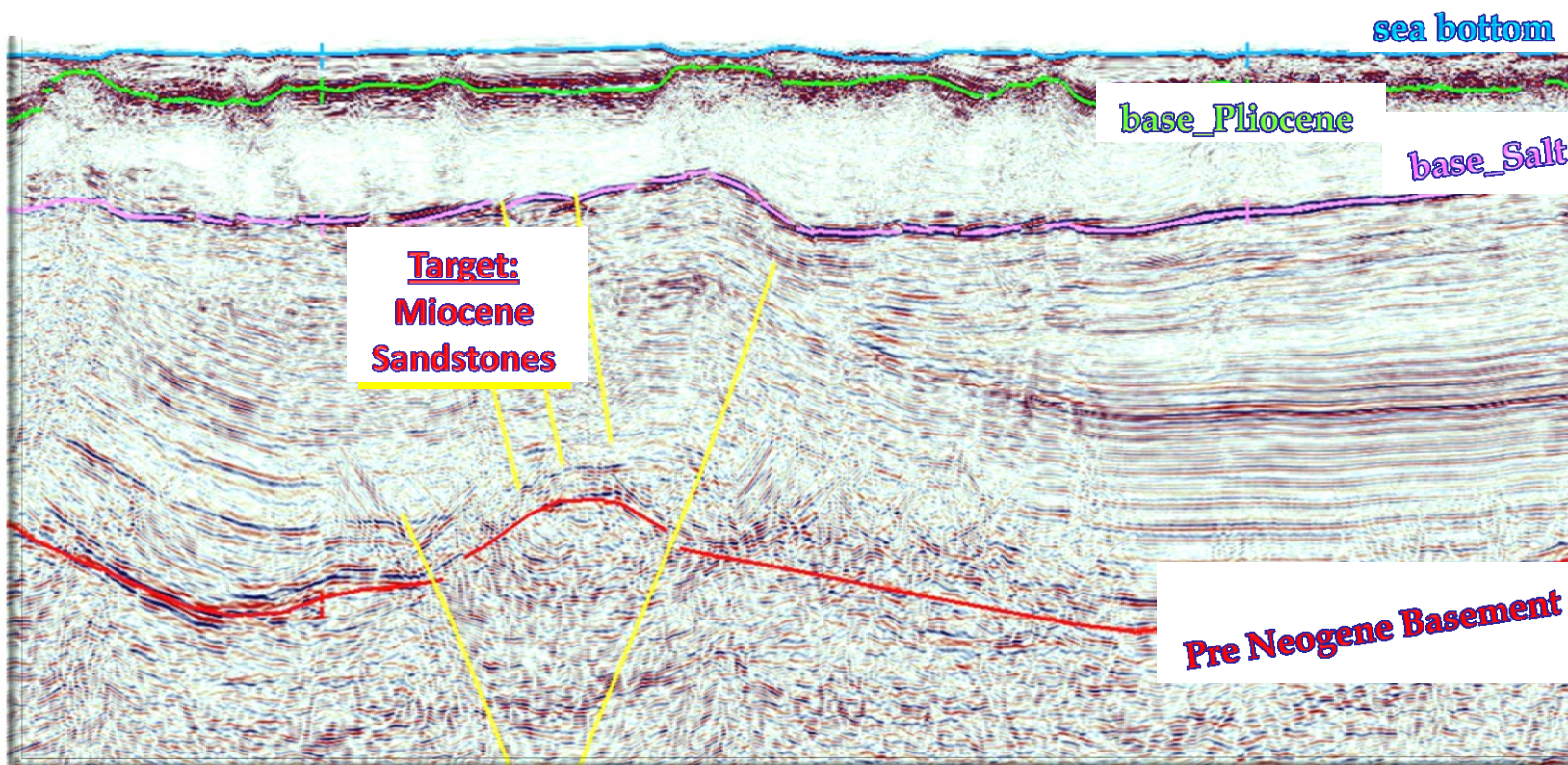


S2 versus TOC distributions for Cretaceous shale samples from Antallia nappes, SW Turkey



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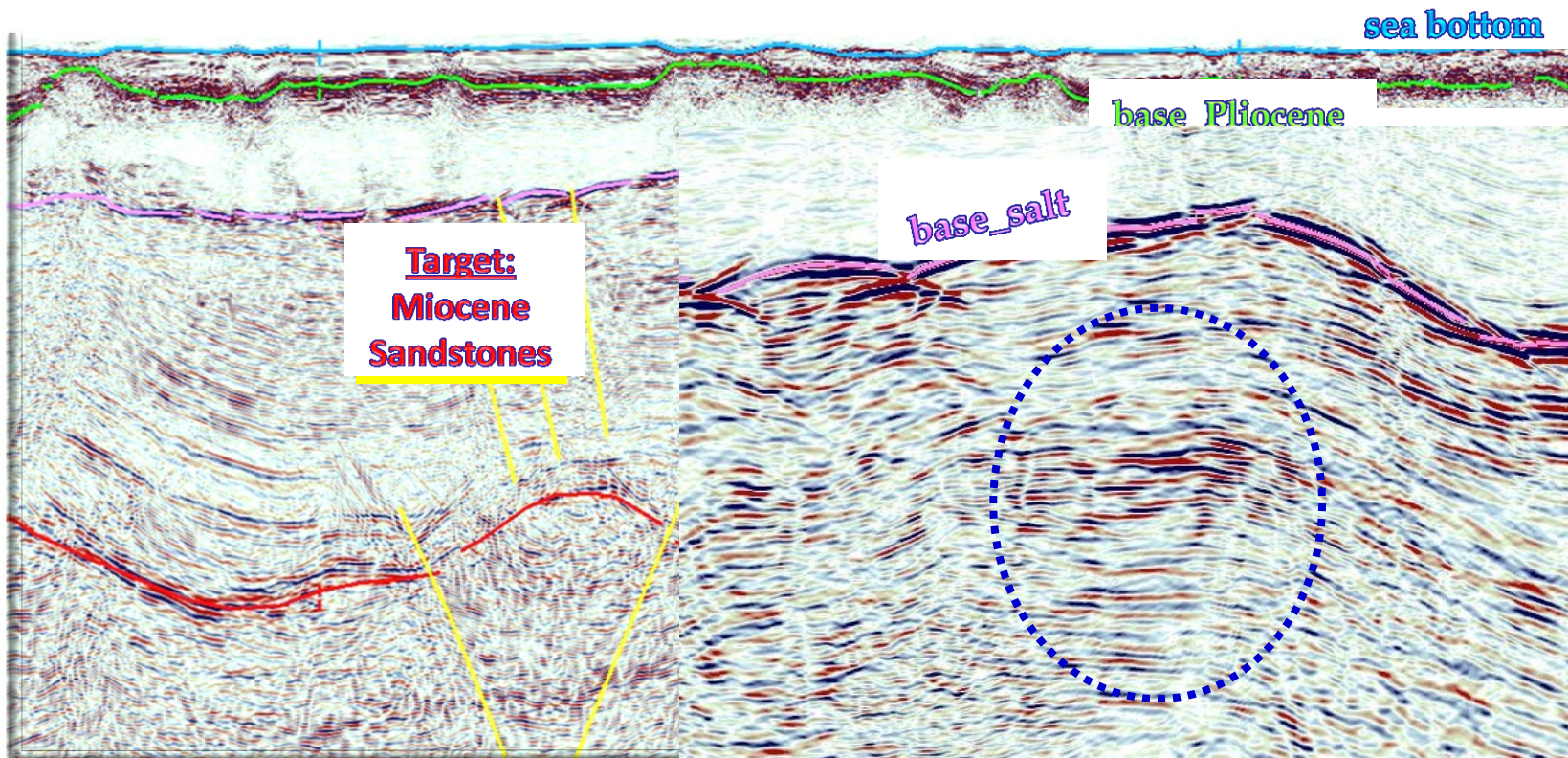
Antalya Subsalt Leads





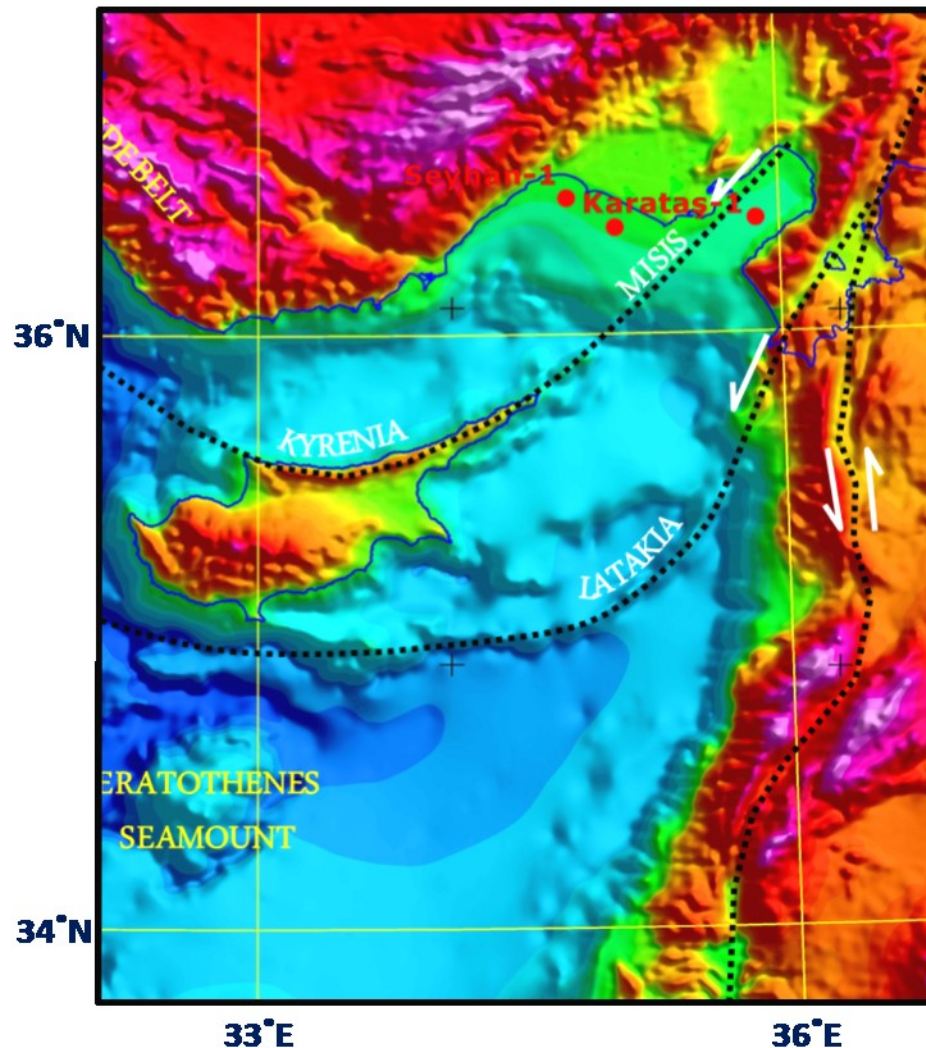
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Antalya Subsalt Leads





TPAO | Mersin-İskenderun Basins

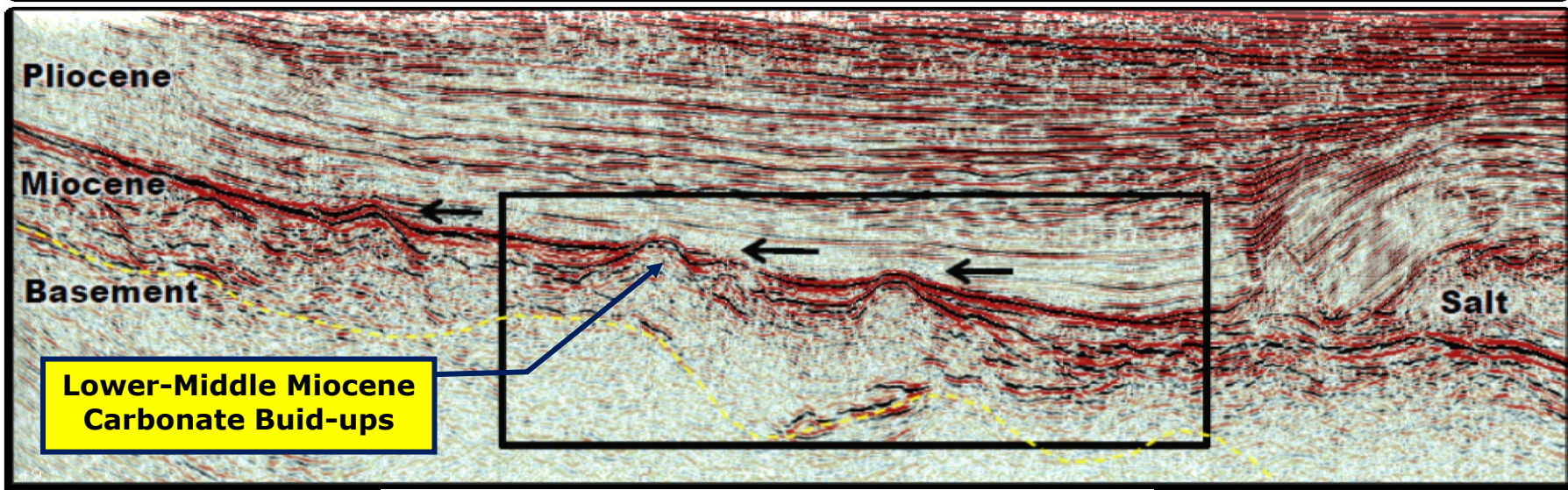
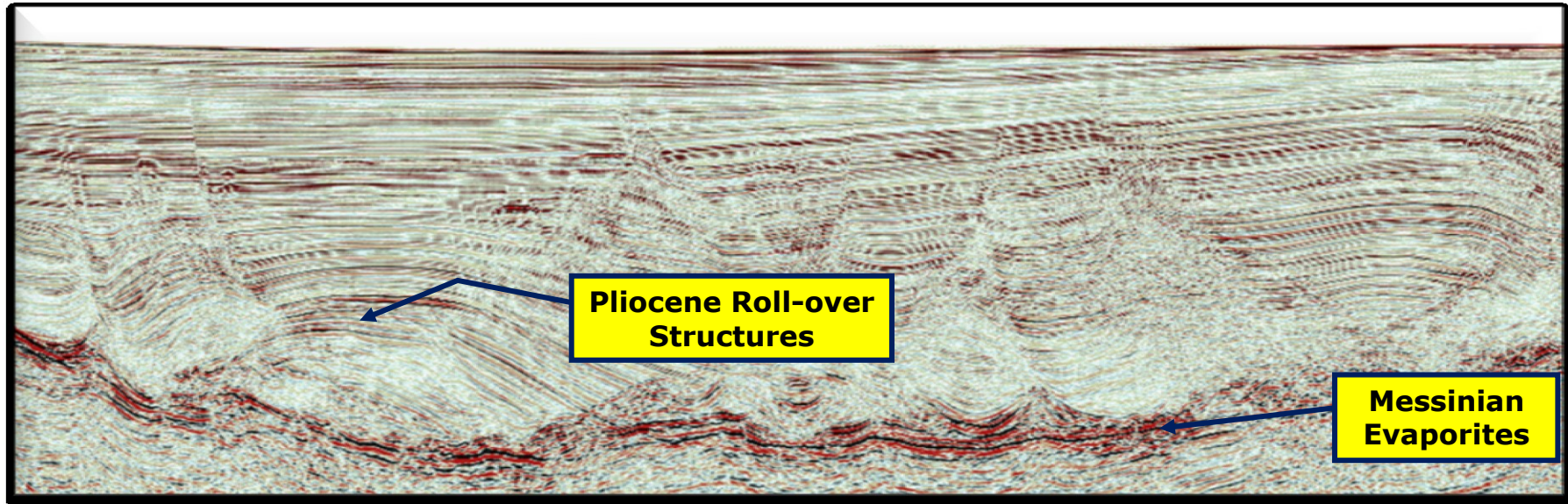


- Various structural and stratigraphic traps; rollover anticlines and positive flower structures.
- Both suprasalt and subsalt plays with biogenic and thermogenic potential.
- Miocene carbonate build-ups are major targets. Lower Pliocene turbiditic sandstones are secondary targets, with biogenic potential.
- No seal problem! Miocene targets are overlain by thick Messinian evaporites.



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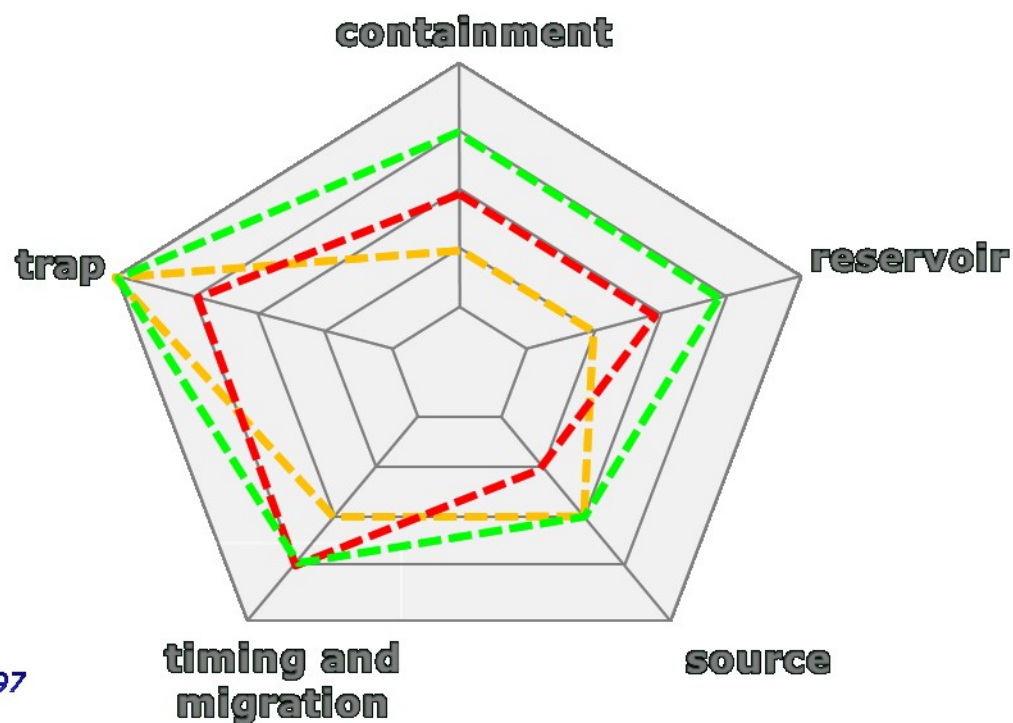
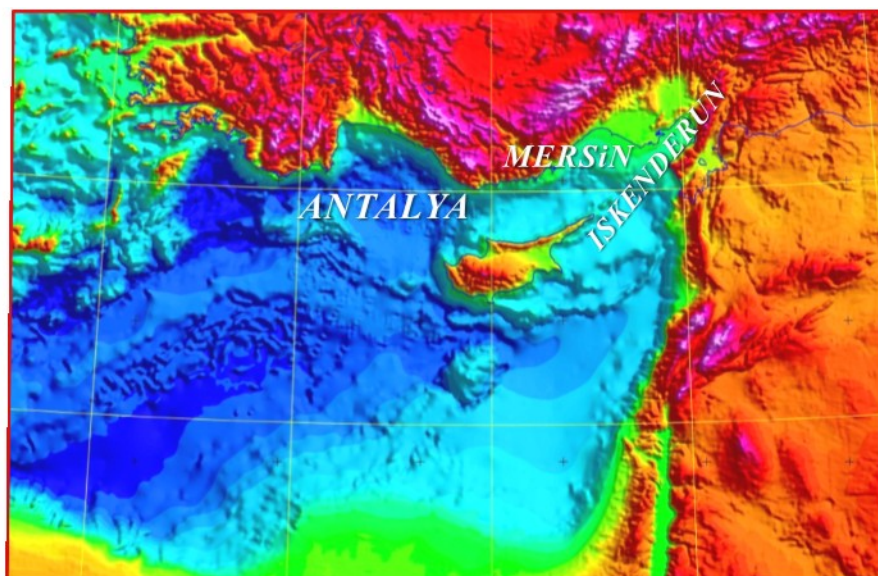
Mersin Subsalt and Suprasalt Leads





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Geological chance factors of subsalt plays



BASINS	UNRISKED REZERV ESTIMATION (P50)	GEOLOGICAL RISK <i>Otis and Schneiderman, 1997 classification</i>
ANTALYA	10 tcf gas	High Risk: $0,06 < POS < 0,12$
MERSIN	2+3 tcf gas	Medlum Risk: $0,12 < POS < 0,25$
ISKENDERUN	200 mbbls oil	Medlum Risk: $0,12 < POS < 0,25$

Thank you !!!



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