The Emerging Deepwater Province of Northwest Egypt*

Peter Krois[1], Katie Hannke[2], Bernhard Novotny[3], Tarek Bayoumi[3], Hussein Hussein[3], and Gabor Tari[1]

Search and Discovery Article #10241 (2010)
Posted June 21, 2010

*Adapted from oral presentation at AAPG International Conference and Exhibition, Rio de Janeiro, Brazil, November 15-18, 2009

[1]OMV Exploration & Production GmbH, Vienna, Austria (peter.krois@omv.com)
[2]OMV (UK) Ltd, London, United Kingdom
[3]OMV (Egypt), Cairo, Egypt

Abstract

The offshore basins of Northwest Egypt represent an underexplored region in the Eastern Mediterranean Basin. The Matruh Trough is located along this segment of the Egyptian offshore and covers an area of about 10,000 km^2. This trough, trending almost perpendicular to the coastline, is located west of the Nile Delta province and north of the Western Desert and its offshore part extends across a relatively narrow shelf into deepwater.

The Obaiyed Offshore block, covering most of the Matruh Trough, is considered a prospective undrilled deepwater block downdip from the numerous gas and oil fields of the Western Desert petroleum province. At least five deepwater play types have been identified in the block. Most of them are related to a large shale detachment system and therefore are considered unique to the Matruh Trough. The numerous listric-fault bounded supra-detachment structures, providing repeatability and consequently low finding costs, are very similar to the classical raft play of the Lower Congo Basin.

Outside the offshore Matruh Trough, another important untested deepwater play type is related to a prominent syn-rift hinge-zone striking obliquely to the coastline. A recently acquired 1,500 km^2 3D seismic survey images this trend very well with prospects appearing analogous to some significant discoveries in equatorial West Africa.

In the ultra-deepwater of Northwest Egypt, the Messinian subsalt play also remains untested. However, its exploration potential is

considered very similar to other deepwater regions of the Eastern Mediterranean, including the area of the recent discoveries of Tamar and Dalit.

References

Dolson, J.C., M.V. Shann, S. Matbouly, C. Harwood, R. Rashed, and H. Hammouda, 2001, Petroleum Potential of Egypt, *in* Petroleum Provinces of the Twenty-first Century, AAPG Memoir 74, p. 453-482.

Chimney, P.J. and C. Kluth, 2002, Evidence for low-angle sub-horizontal "hanging" faults in rotated fault blocks, Cabinda, offshore Angola: AAPG Annual Meeting Expanded Abstracts, p. 30.

Roberts, G. and D. Peace, 2007, Hydrocarbon plays and prospectivity of the Levantine Basin, offshore Lebanon and Syria from seismic data: GeoArabia, v. 12/3, p. 99-124.

The Emerging Deepwater Province of NW Egypt

Peter Krois*, Katie Hannke,
Bernhard Novotny, Tarek Bayoumi,
Hussein Hussein and Gabor Tari

AAPG International Conference
November 15 – 18, 2009

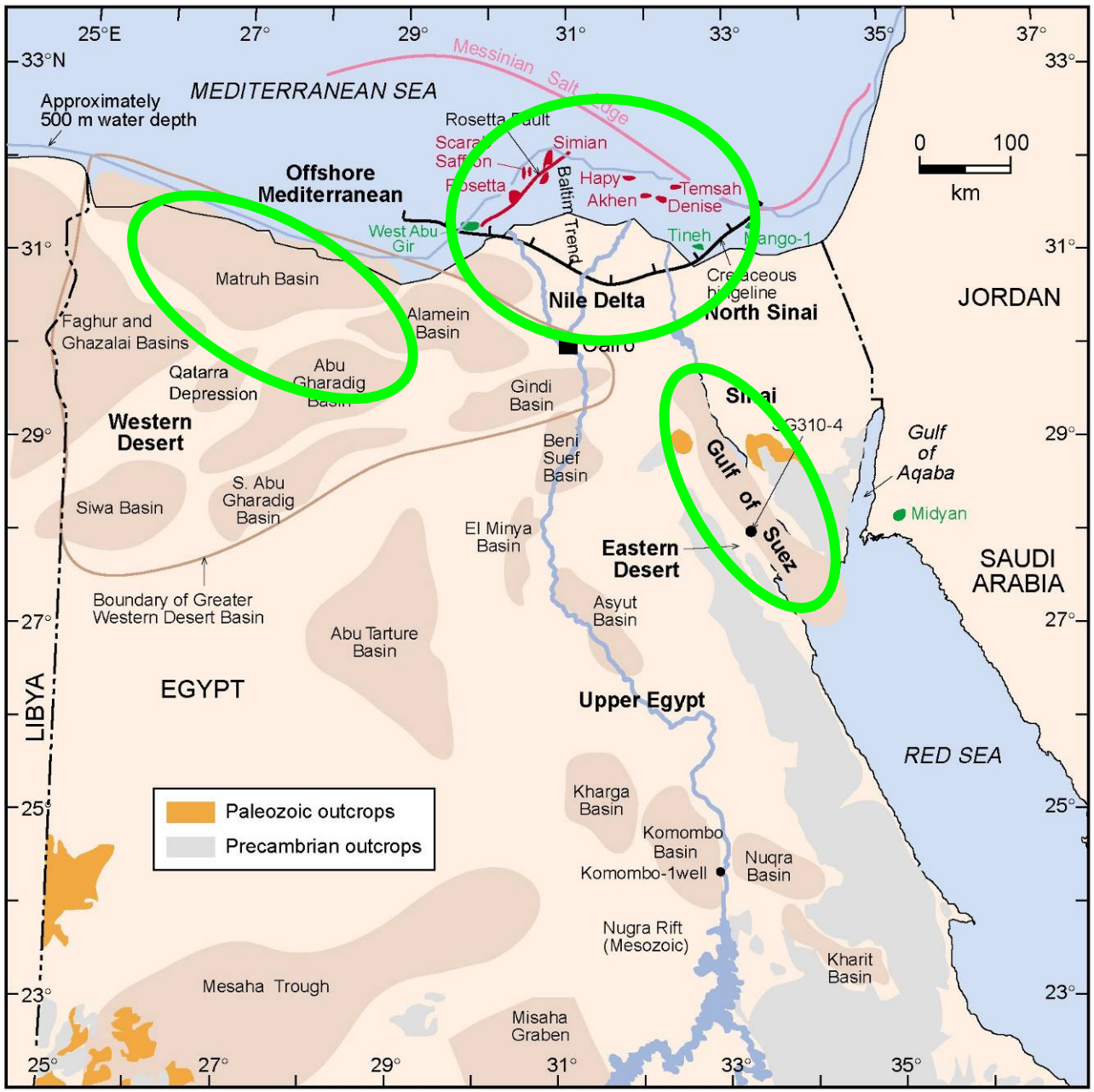
Move & More.

OMV

Presentation Outline

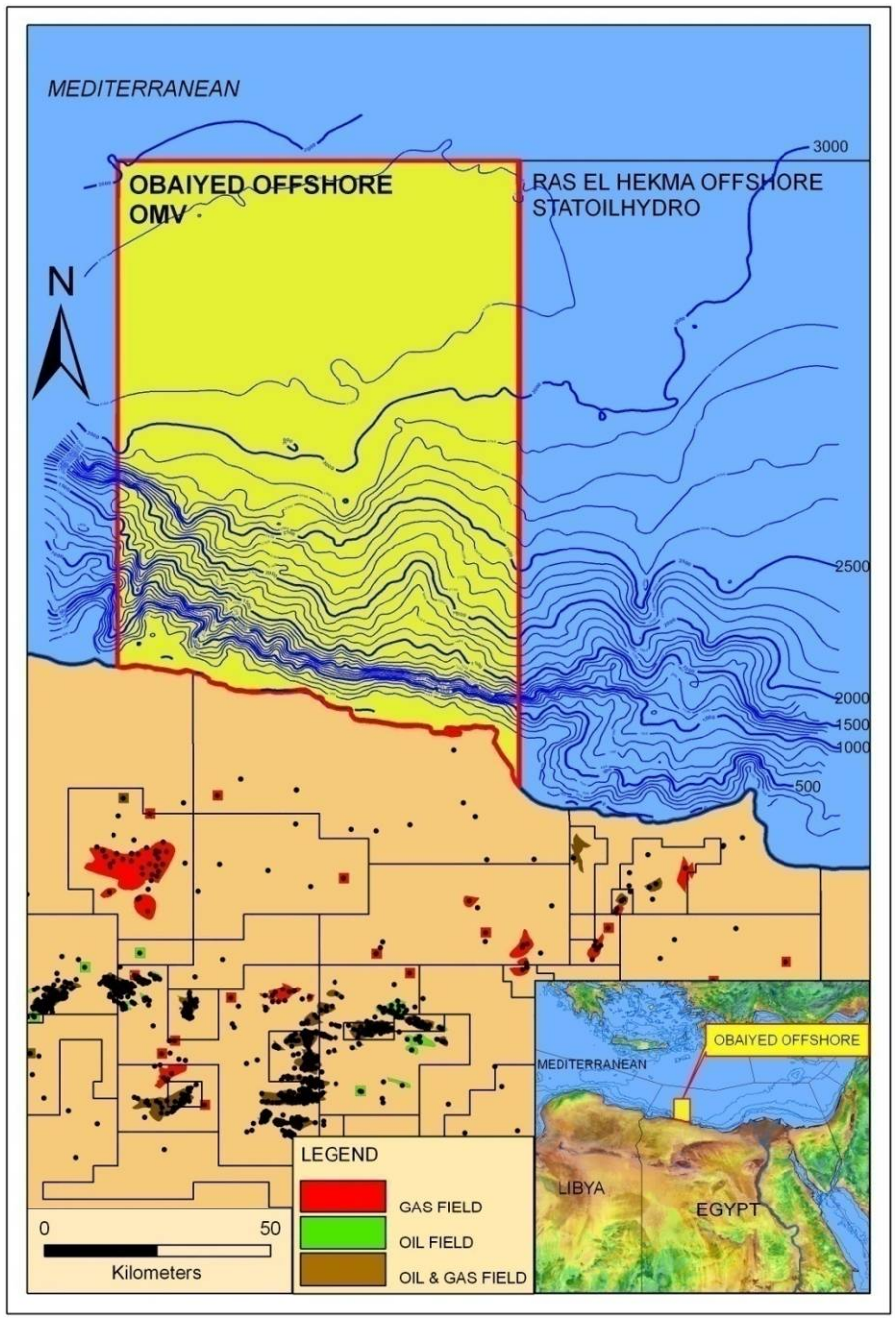
- Regional setting, offshore NW Egypt
- Deepwater play types in NW Egypt
  - Rafts
  - Hinge zone (marginal ridge?)
  - Messinian subsalt
- Seismic examples
- Analogues
- Conclusions

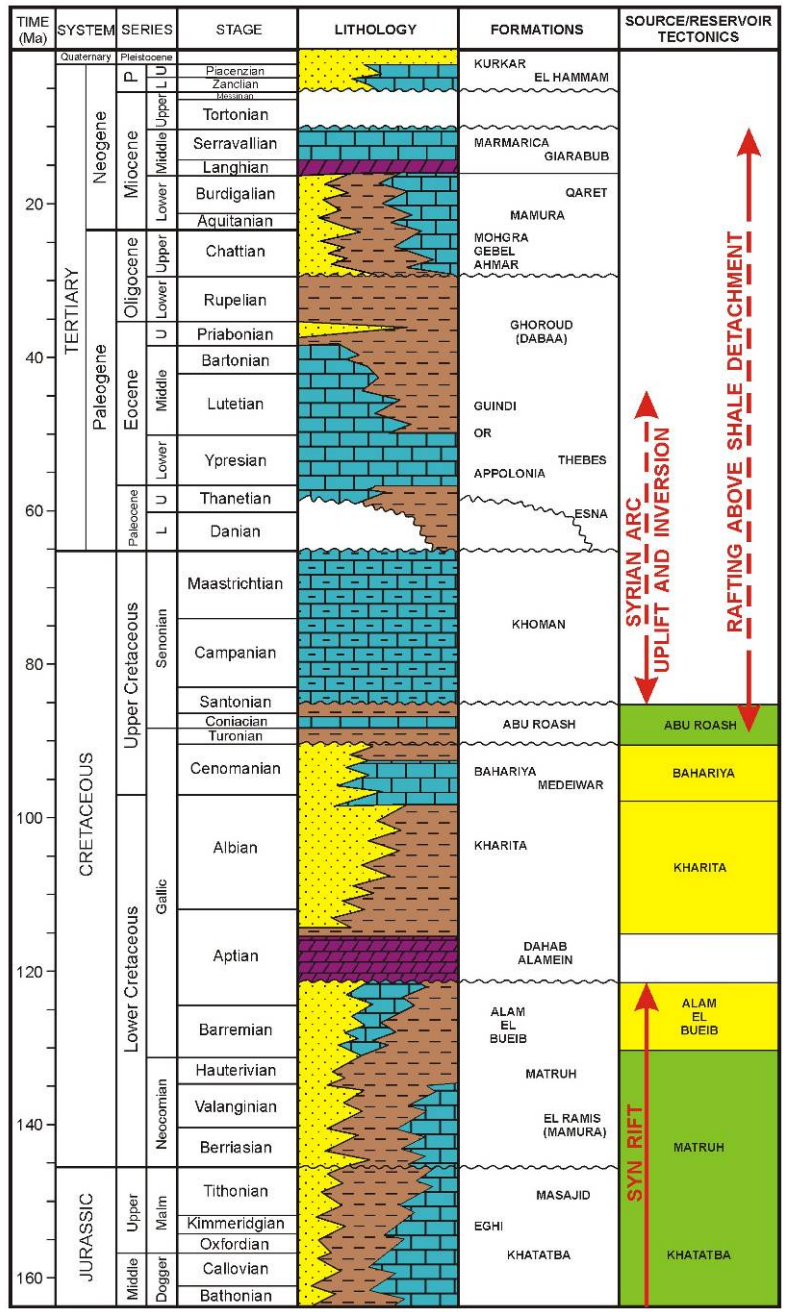
Sedimentary basins and petroleum provinces of Egypt



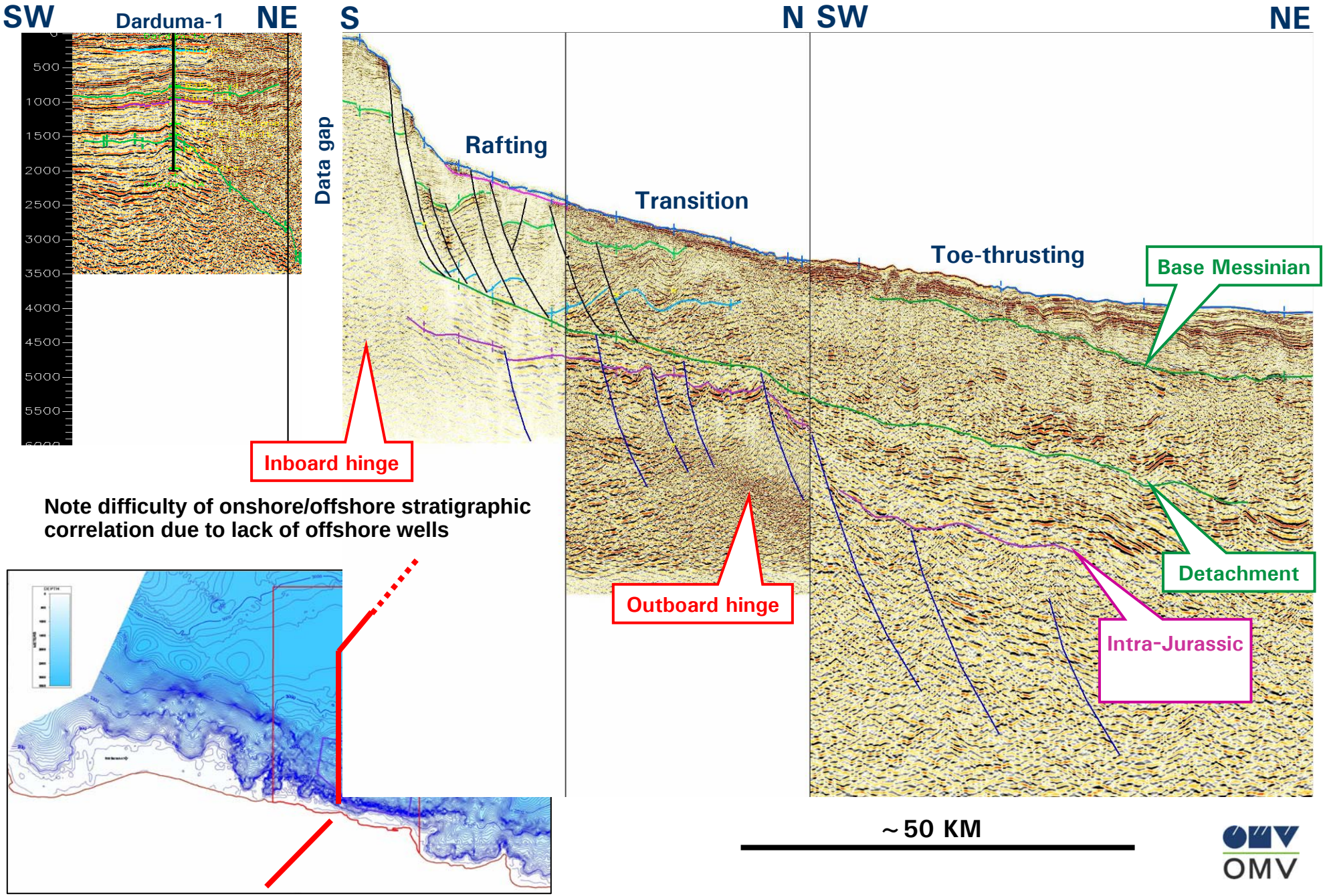
After Dolson et al.(2001)

Obaiyed Block and Western Desert petroleum province





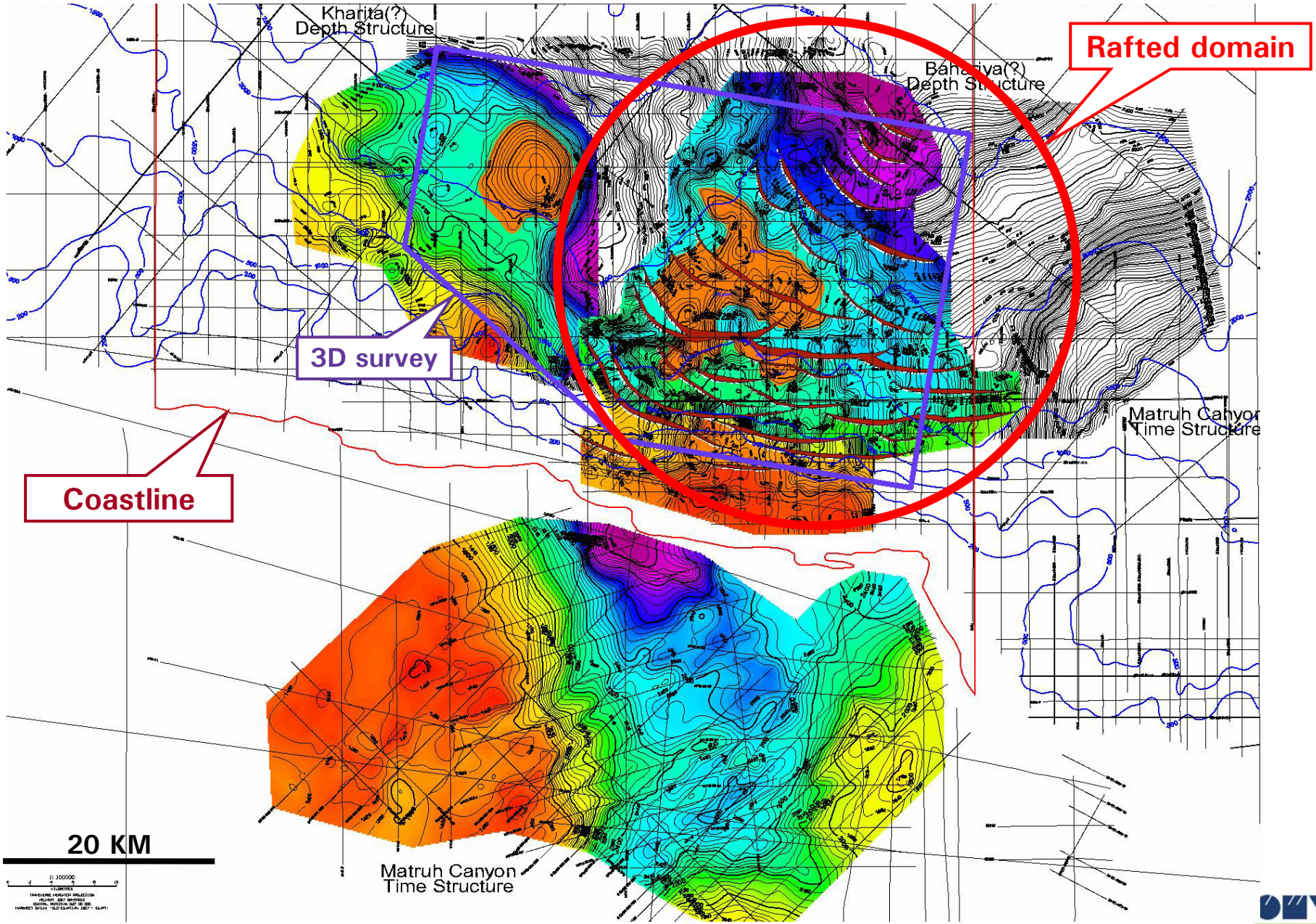
Regional onshore/offshore 2D seismic transect



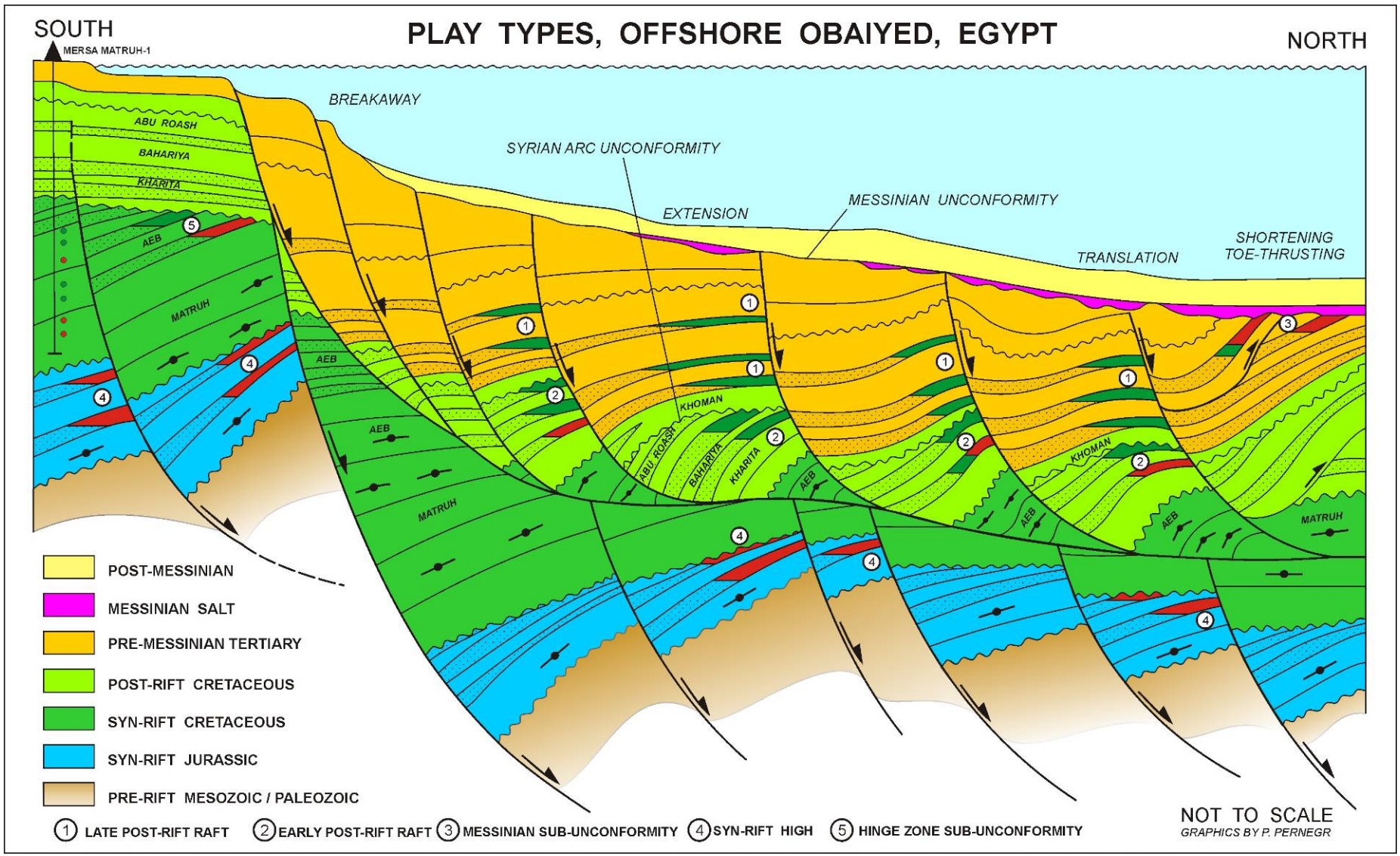
Note difficulty of onshore/offshore stratigraphic correlation due to lack of offshore wells

OMV

Composite map of 2D leads, Obaiyed Offshore



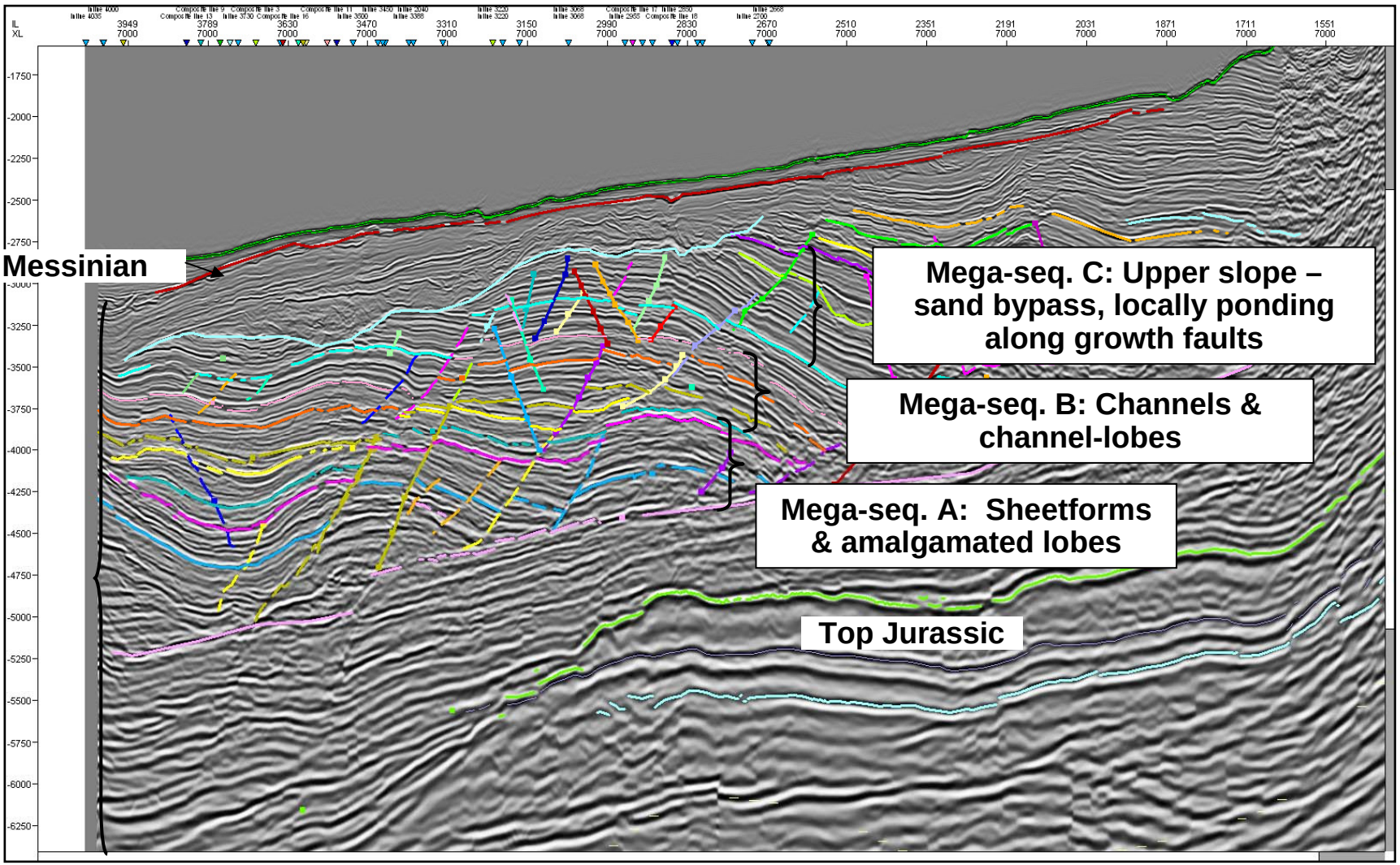
Play types, shelf and upper slope



3D Seismic character of rafts

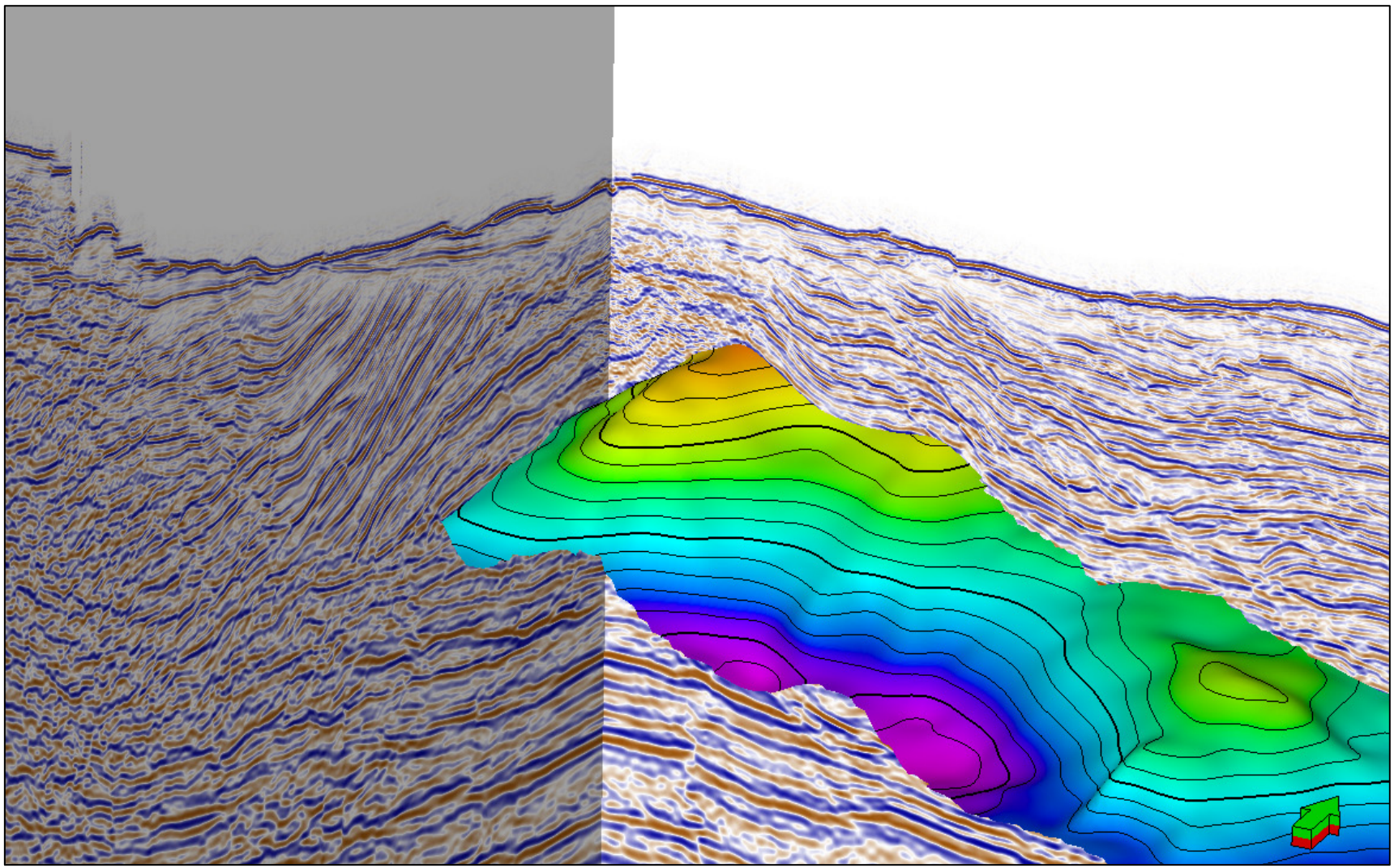
North

South



15km

3D seismic example of a typical raft target



Multiple low-angle normal faults, Block 0, Cabinda, Angola

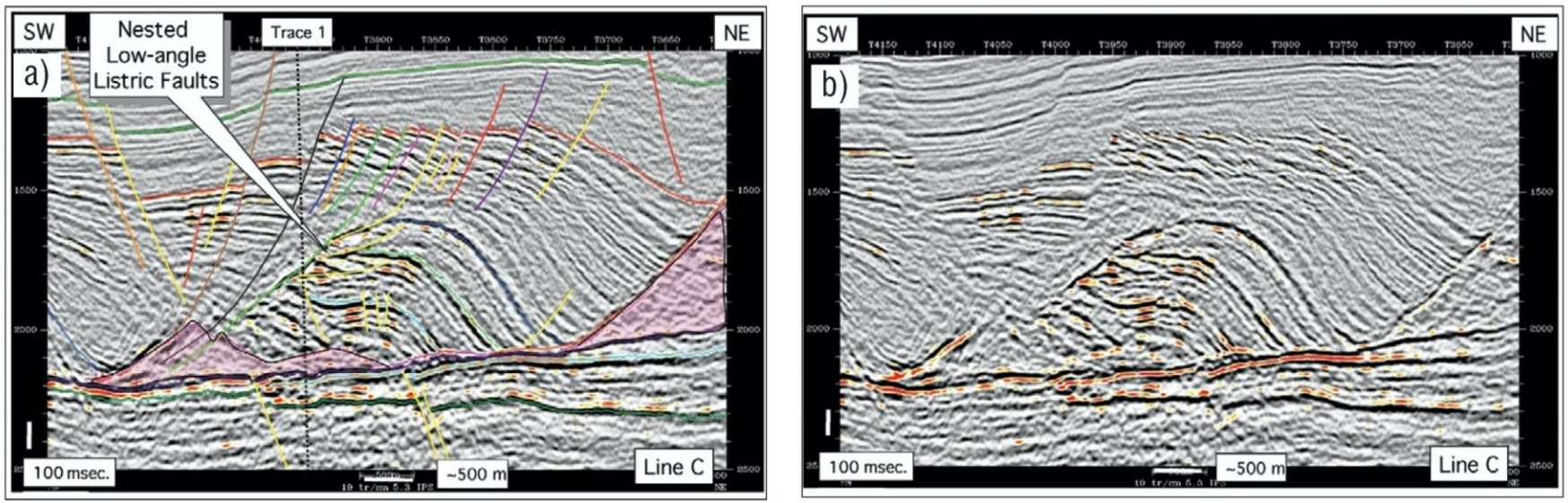


Figure 7. (a) Dip-oriented line C from Kali 3D survey, with horizon and fault interpretation. Line shows several stacked low-angle listric faults. (b) Same line as (a) without interpretation.

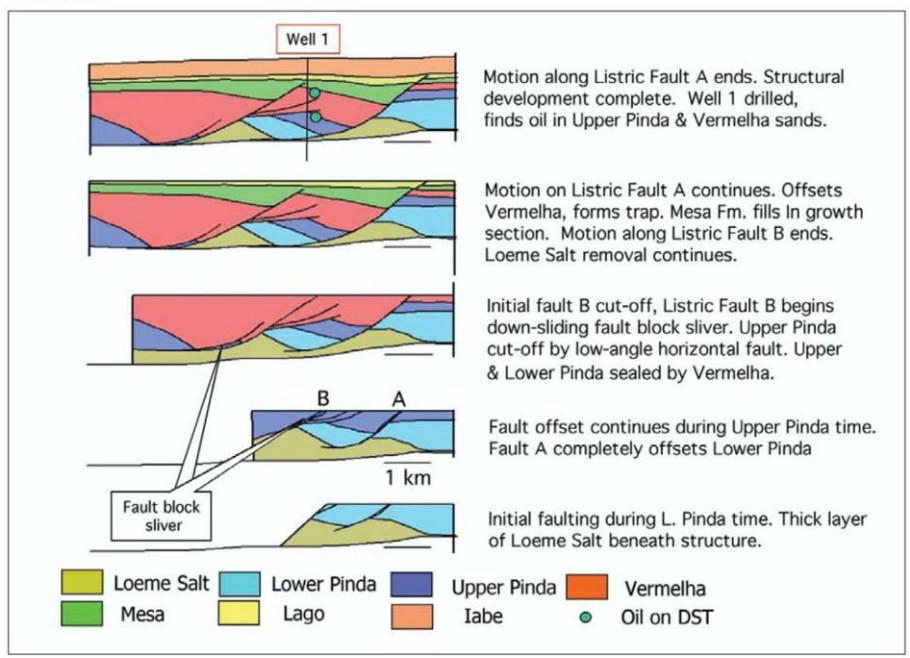
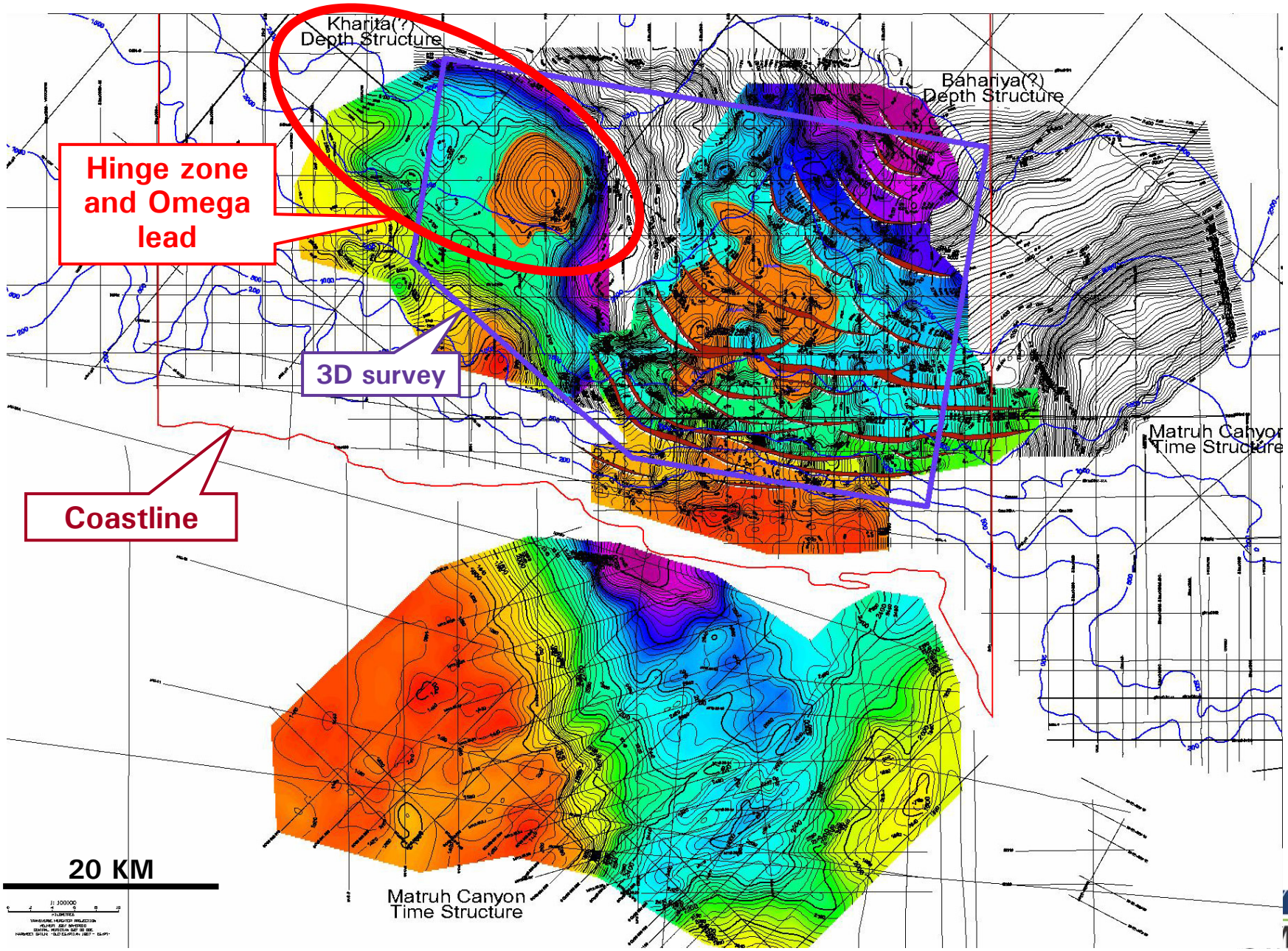


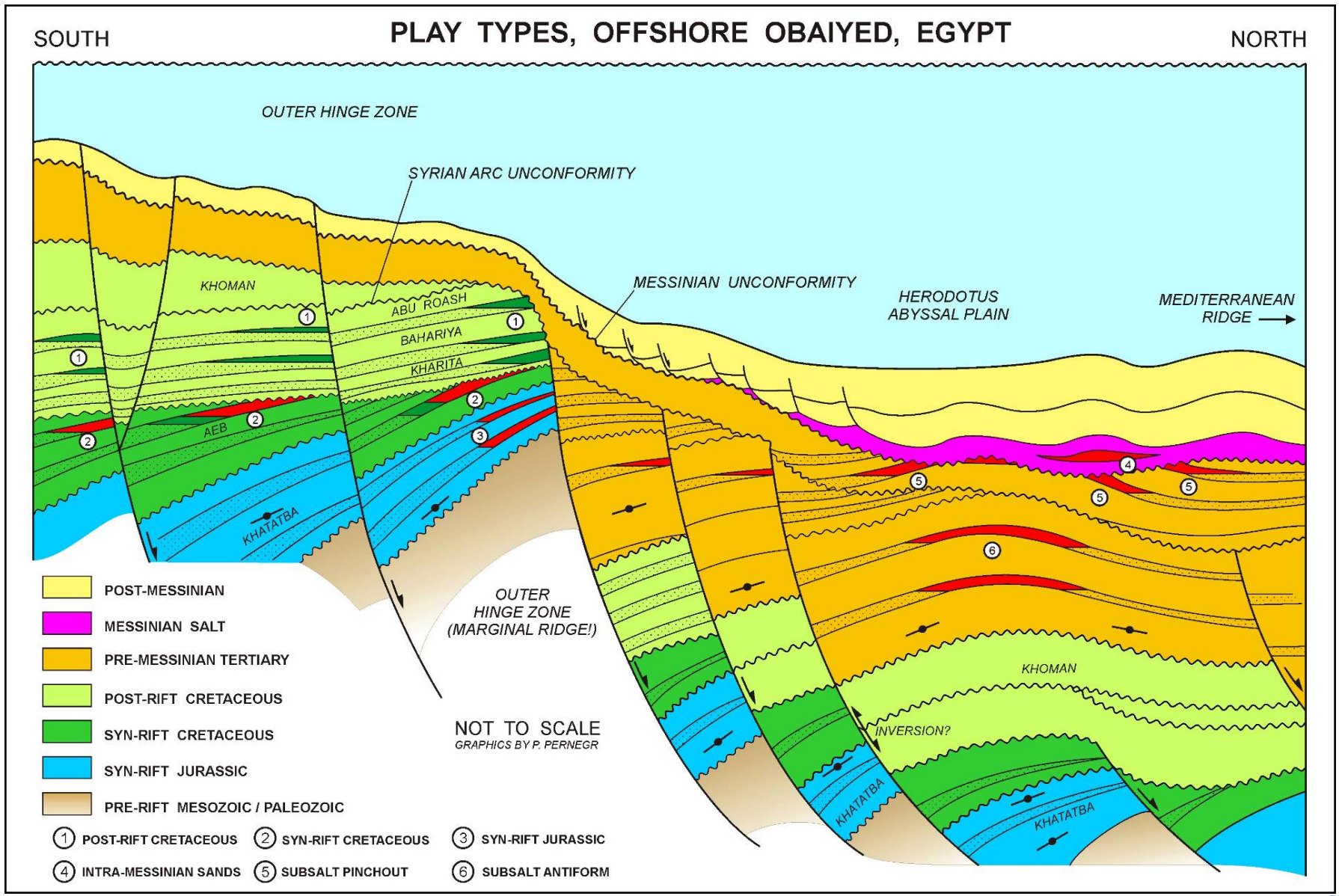
Figure 15. Lithotect depth reconstruction of line A from Kali 3D survey.

Chimney and Kluth (2002)

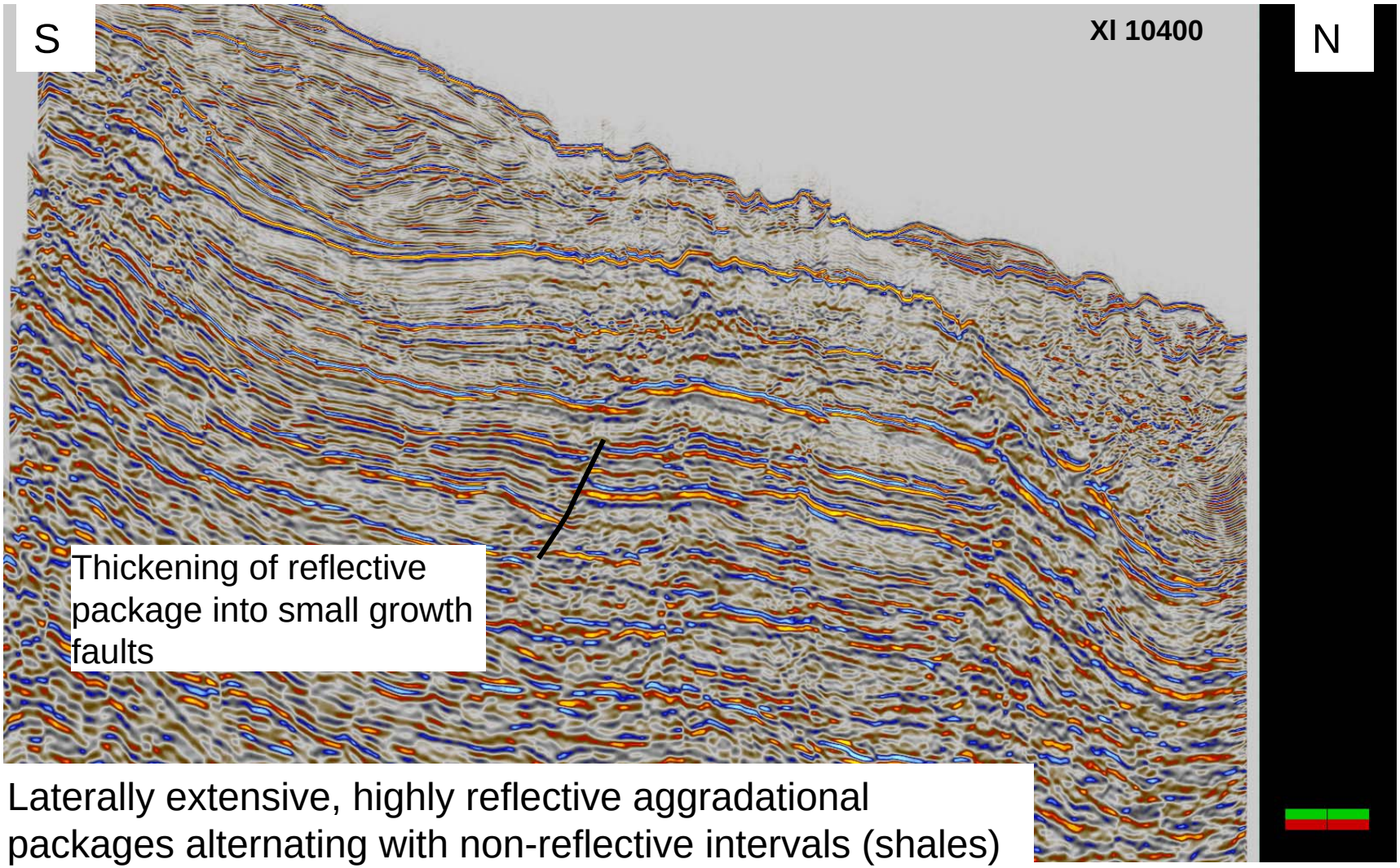
Composite map of 2D leads, Obaiyed Offshore



Play types, hinge zone, lower slope and abyssal plain

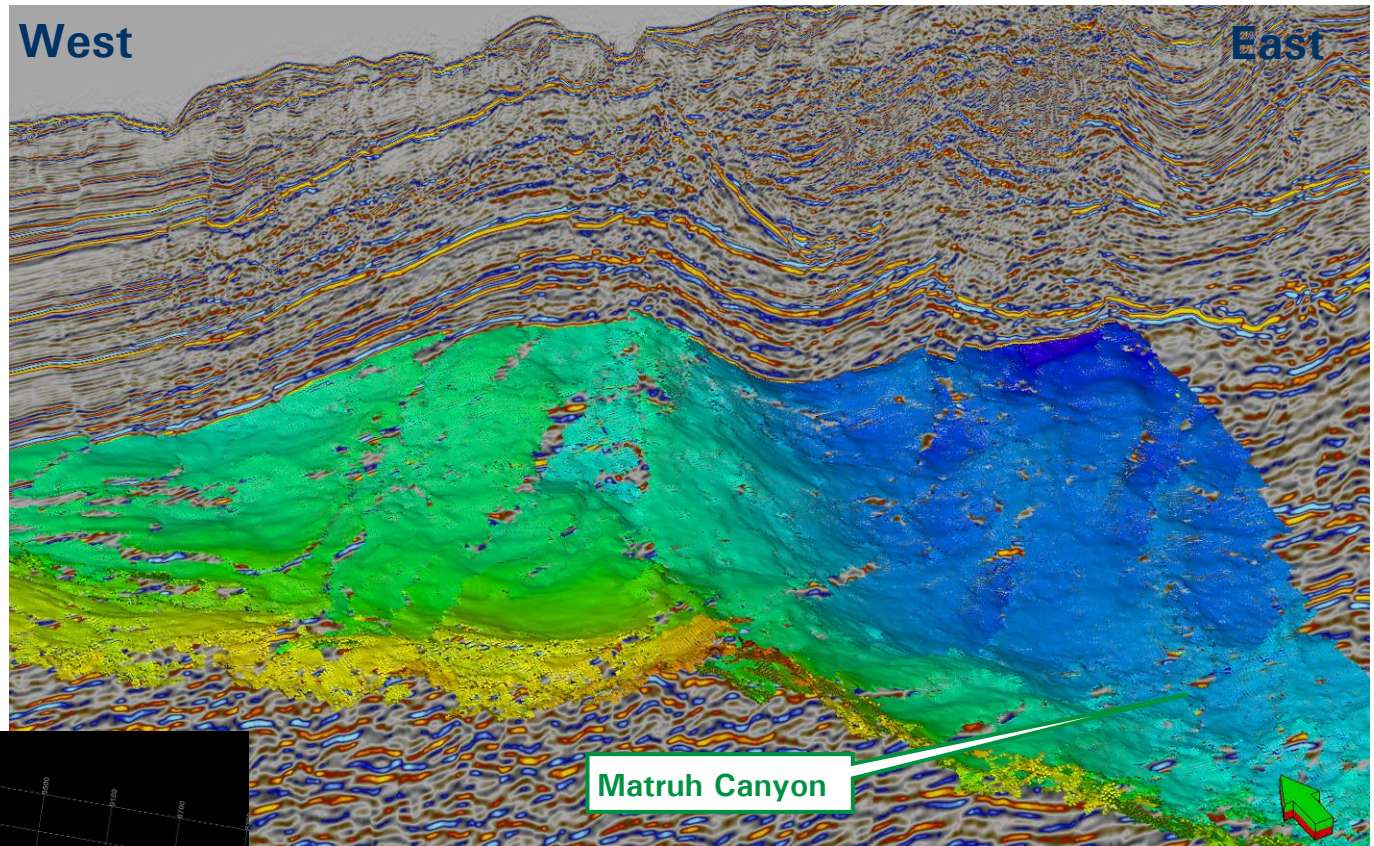


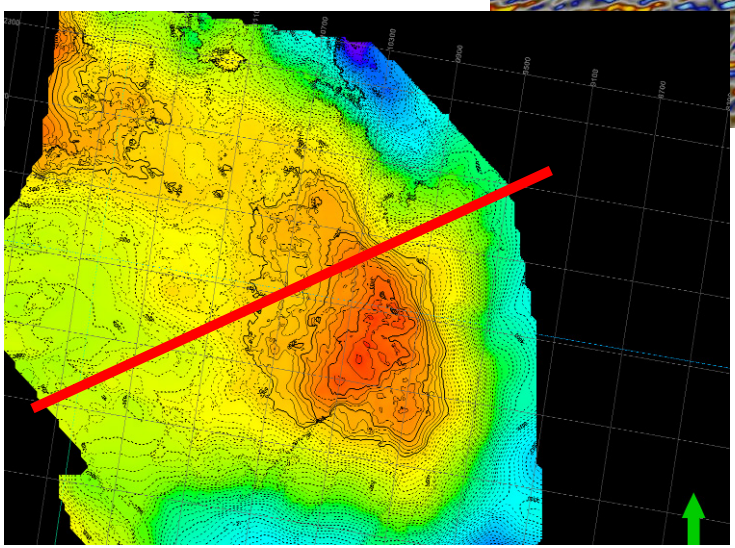
Typical seismic character through Omega



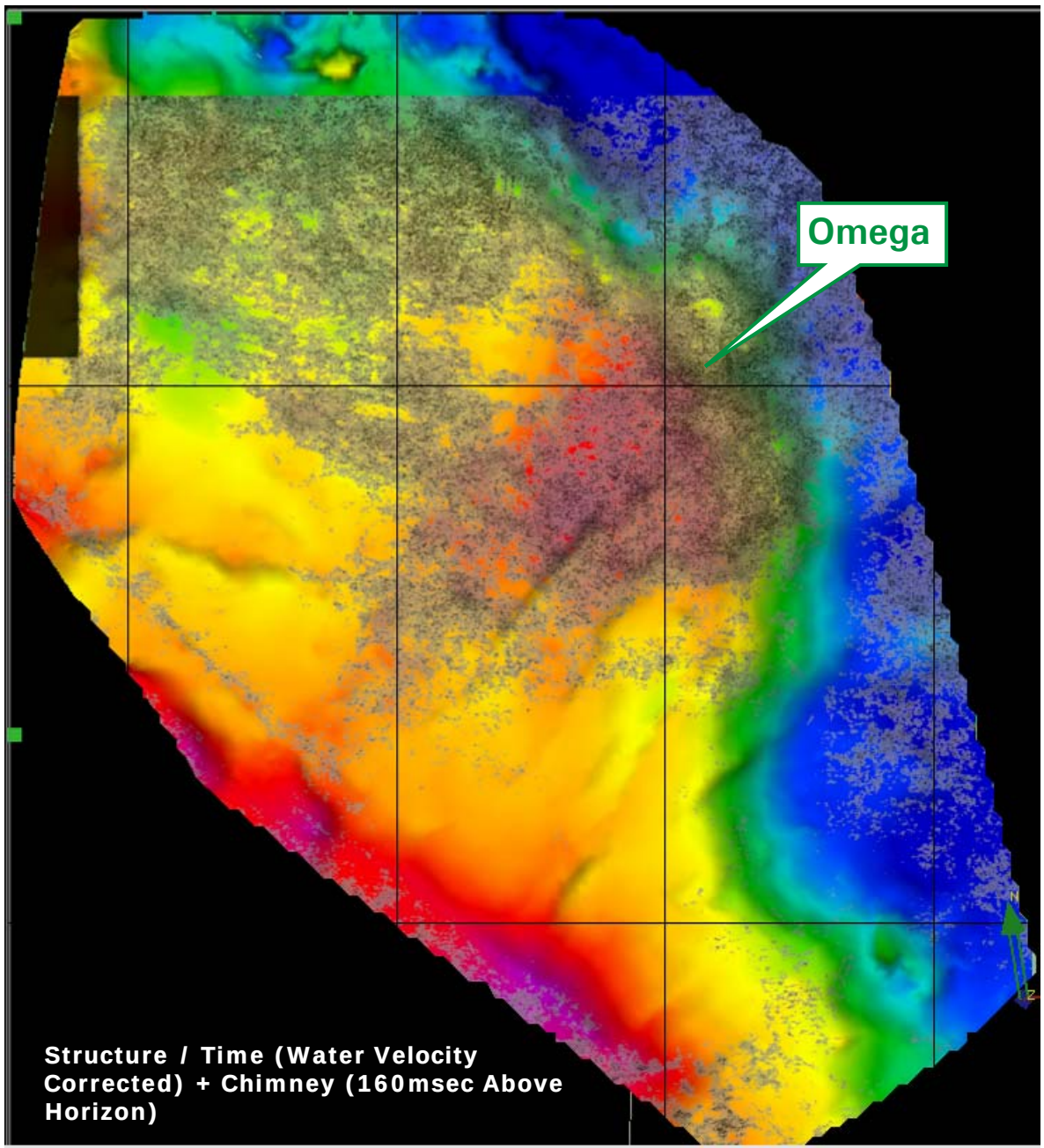
Laterally extensive, highly reflective aggradational packages alternating with non-reflective intervals (shales)

Seismic expression of the Omega Lead on 3D seismic



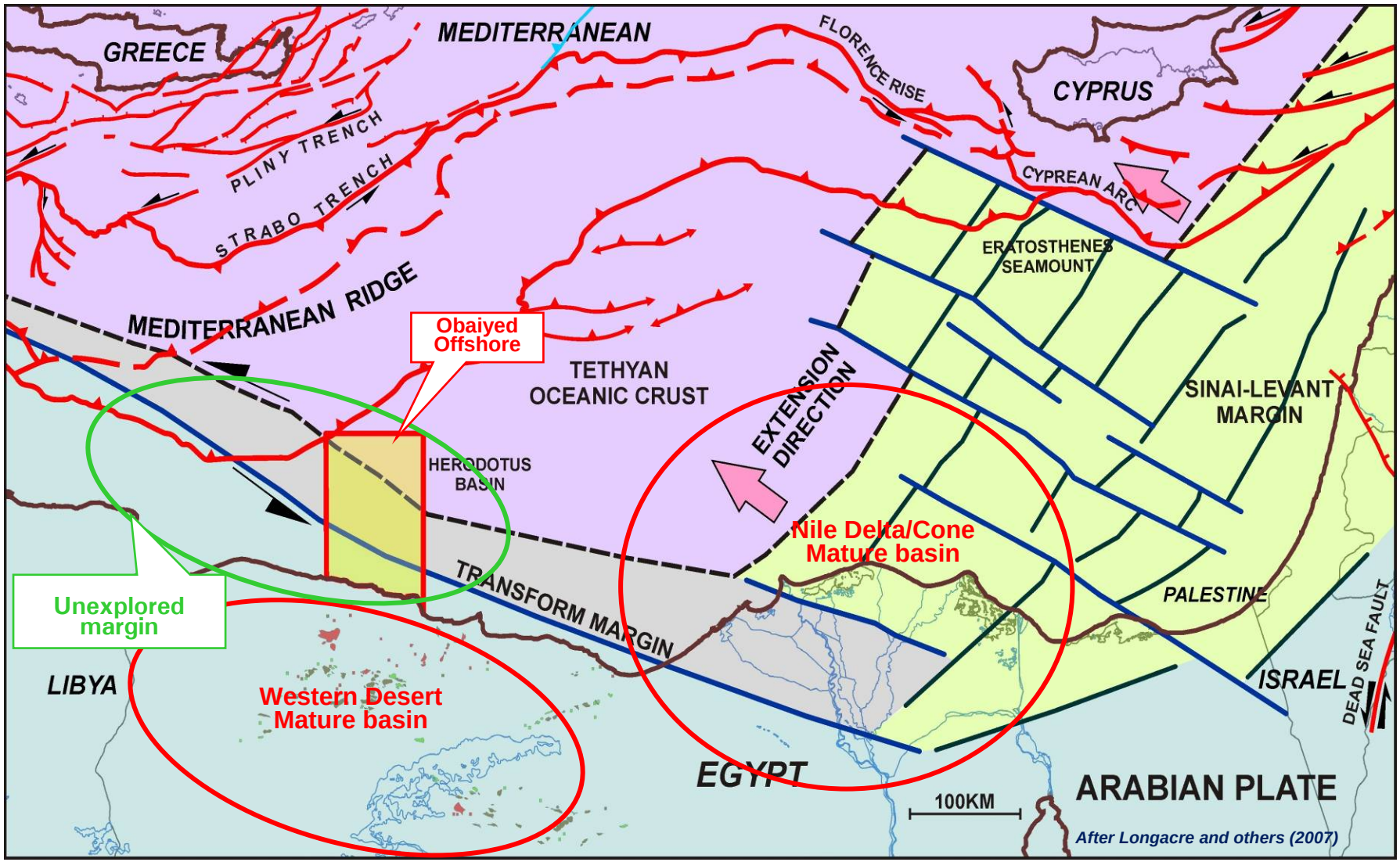


Evidence for gas charge based on a chimney cube

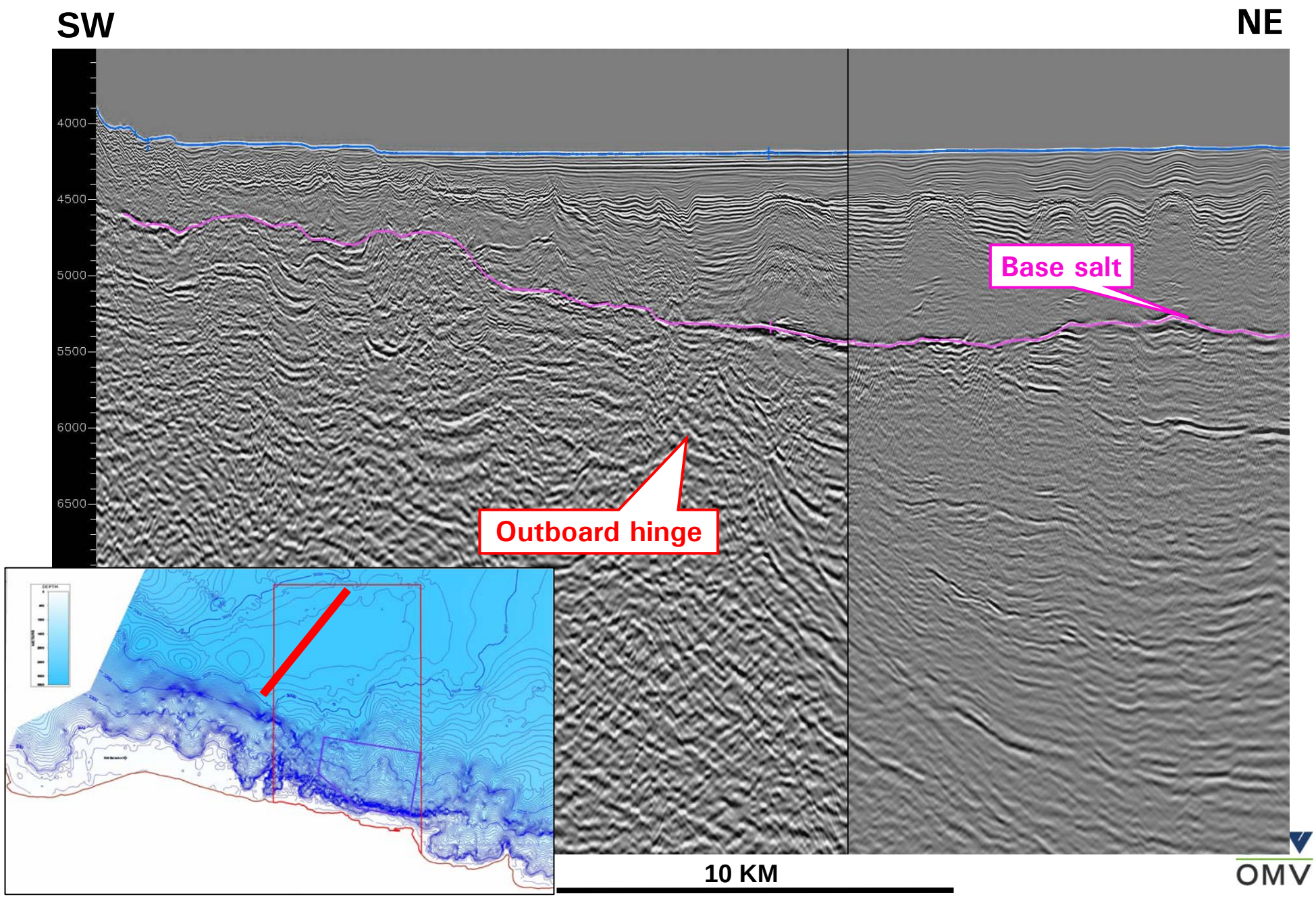


A large gas cloud can be seen over the crest of Omega and along the hinge zone trend to the NW

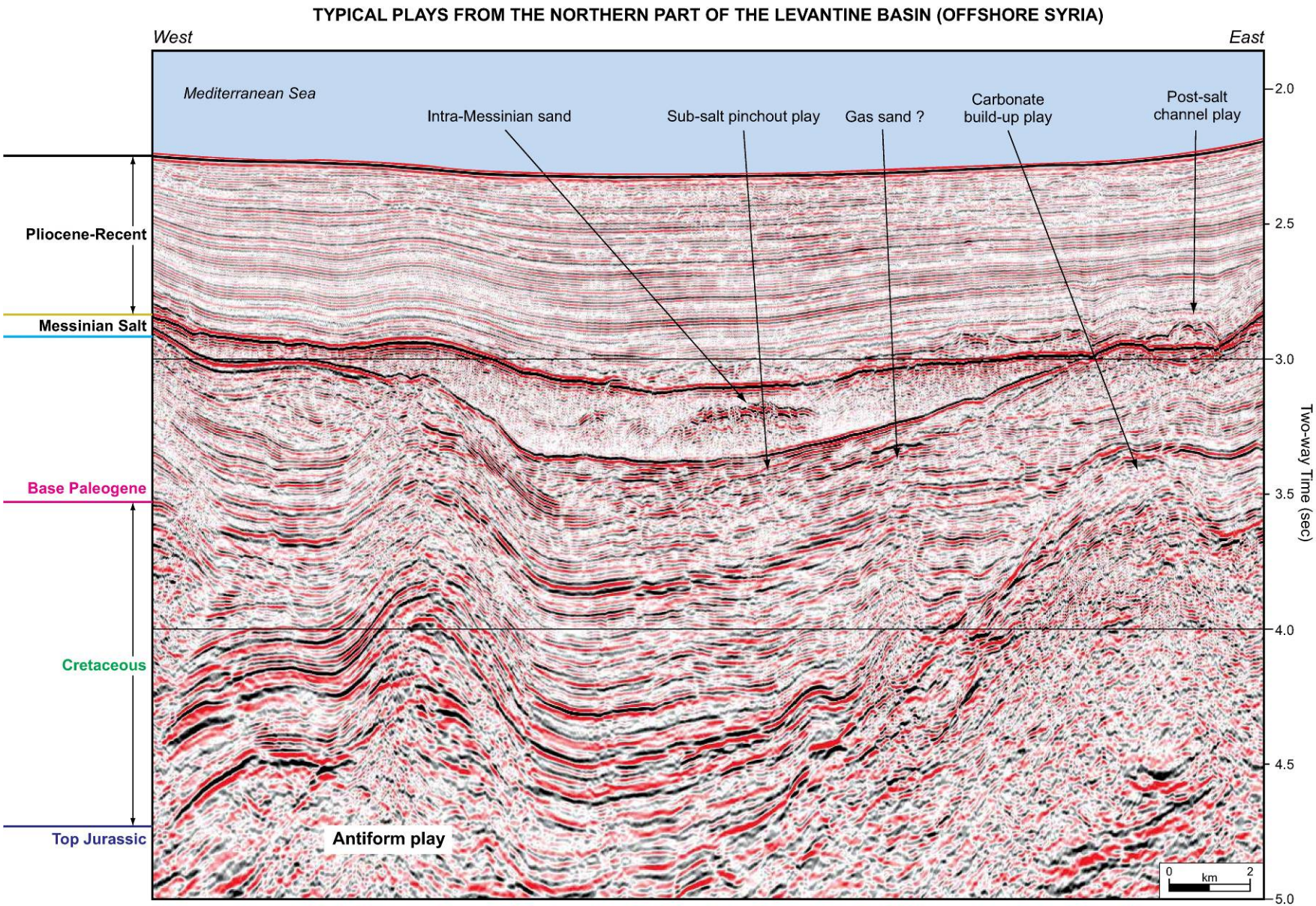
Hinge zone or marginal ridge in the deepwater?



Sub-Messinian potential, offshore Obaiyed



Analogue plays from offshore Syria



Roberts and Peace (2007)

Conclusions

- Offshore NW Egypt is a practically unexplored part of the Mediterranean

- A variety of untested deepwater play types exist which are proven and "traditional" in the wider region
  - rafts in Angola
  - hinge zone(s) in equatorial West Africa
  - Messinian subsalt in the East Mediterranean (Levant)

- Numerous large leads and play types can be defined and offer repeatability in case of success

Thank You!

Beach at Mersa Matruh, NW Egypt

Move & More.

OMV