

^{PS}Plays and Prospectivity Offshore Lebanon, Syria and Cyprus: New Insights from Depth-Imaged Seismic Data*

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Abstract

This paper illustrates the nature of the Levantine Basin and adjacent areas based on an analysis of modern seismic data acquired and processed by Spectrum Geo Ltd ([Figure 1](#)). It shows that the Levantine Basin is comprised of a substantial thickness (> 10,000 metres) of Mesozoic to Cenozoic sediments above a rifted terrain of probably Triassic-Lower Jurassic age.

Depth imaged sections are used to show the nature of the Basin, including its relationship to the Eratosthenes Seamount and the Larnaca Thrust Zone. Depth imaged sections with Time Migration comparisons ([Figures 2, 3, 4, 5, 6, and 7](#)) are also used to illustrate some of the numerous plays seen in the area. These consist of:

- Jurassic and older: faulted structures, rollovers and basin margin plays.
- Upper Jurassic to Middle Cretaceous: mounds, reefs, progrades, drape structures, structural/stratigraphic plays and unconformity plays.
- Middle Cretaceous to Paleogene: anticlines, fault blocks, rollovers, mounds, drapes, structural/stratigraphic plays and basin margin pinch-outs.

- Sub-Salt (with salt as the seal) and Intra-Salt (Messinian): pinchouts, bright spots, channels and mounds.
- Post Salt (Pliocene to Recent): channels and mounds.

Depth imaging of the seismic data is shown to aid the evaluation of many of these plays and to highlight the prospectivity of offshore Lebanon, Syria and Cyprus.

Reference

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

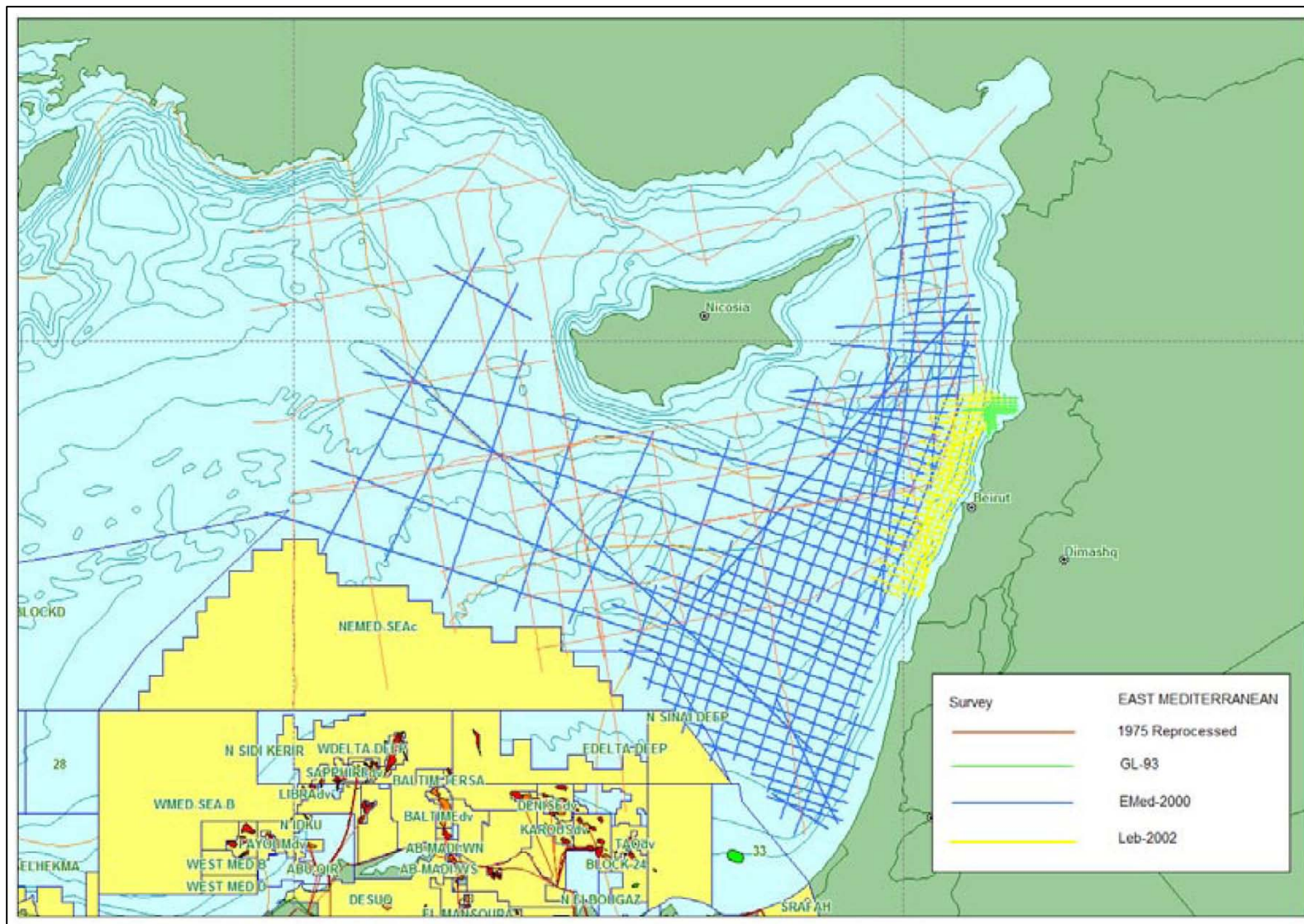


Figure 1. Spectrum's East Mediterranean MC2D seismic database.

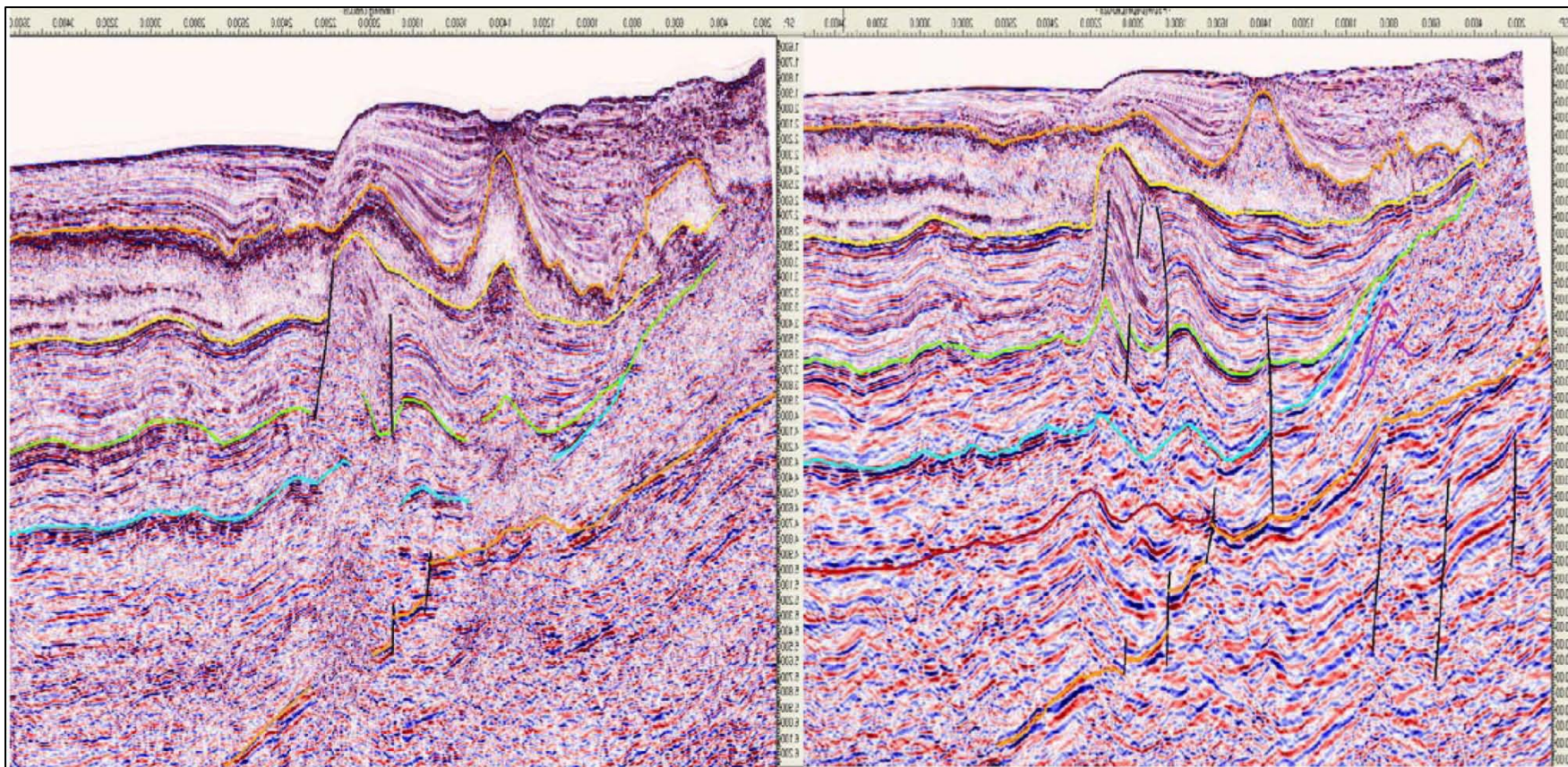


Figure 2. Comparison of Time Migration (on left) with PSDM (on right). The PSDM section shows: Less distortion below the base salt (yellow horizon); more and more easily mapable events in the Tertiary and Cretaceous; better imaging of the Cretaceous Reef and Jurassic fault blocks. Easier identification of plays on the PSDM section. A larger version of the PSDM section (with identified horizons) is shown in Figure 3. Section width is approximately 40 km. Location is offshore Lebanon. Note: PSDM = Pre Stack Depth Migration. All PSDM examples displayed in depth.

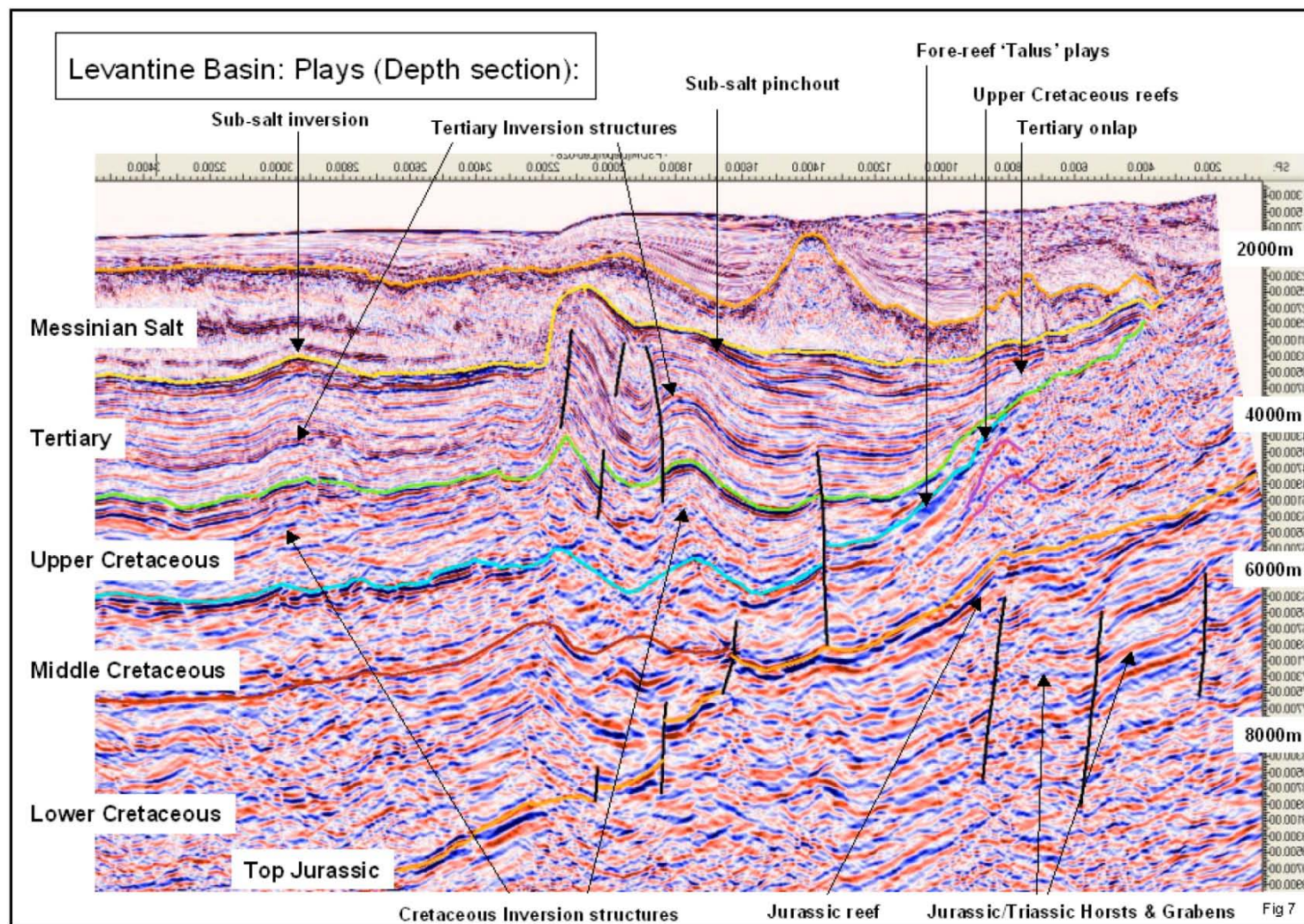


Figure 3. PSDM section offshore Lebanon showing numerous plays. Section width: 40 km.

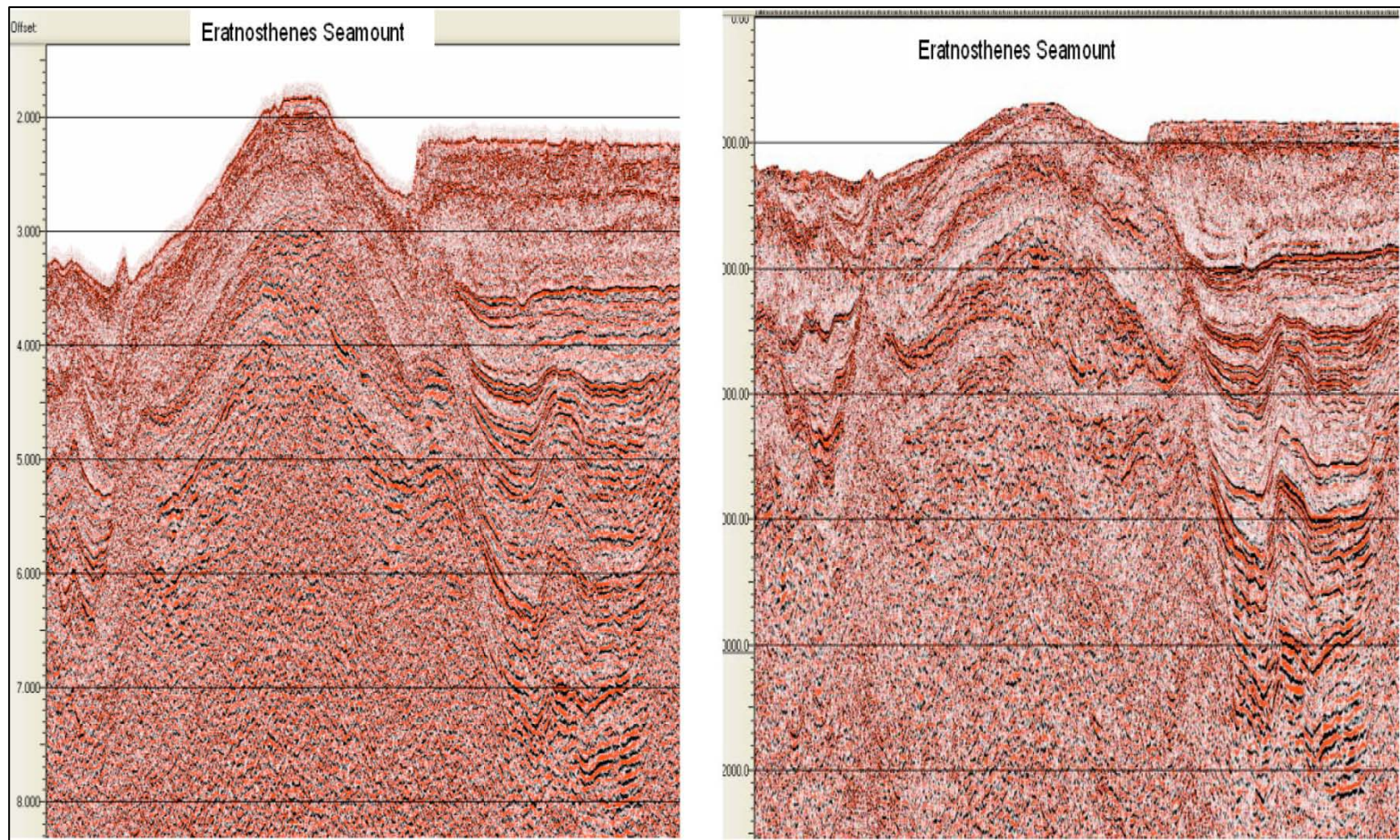


Figure 4. Time Migration (2000 processing) vs. PSDM (2009 processing) over the Eratnosthenes seamount (Cyprus waters). Timing lines every 1 second on the time display and every 2000 m on the depth display. Section width: approx 190 km.

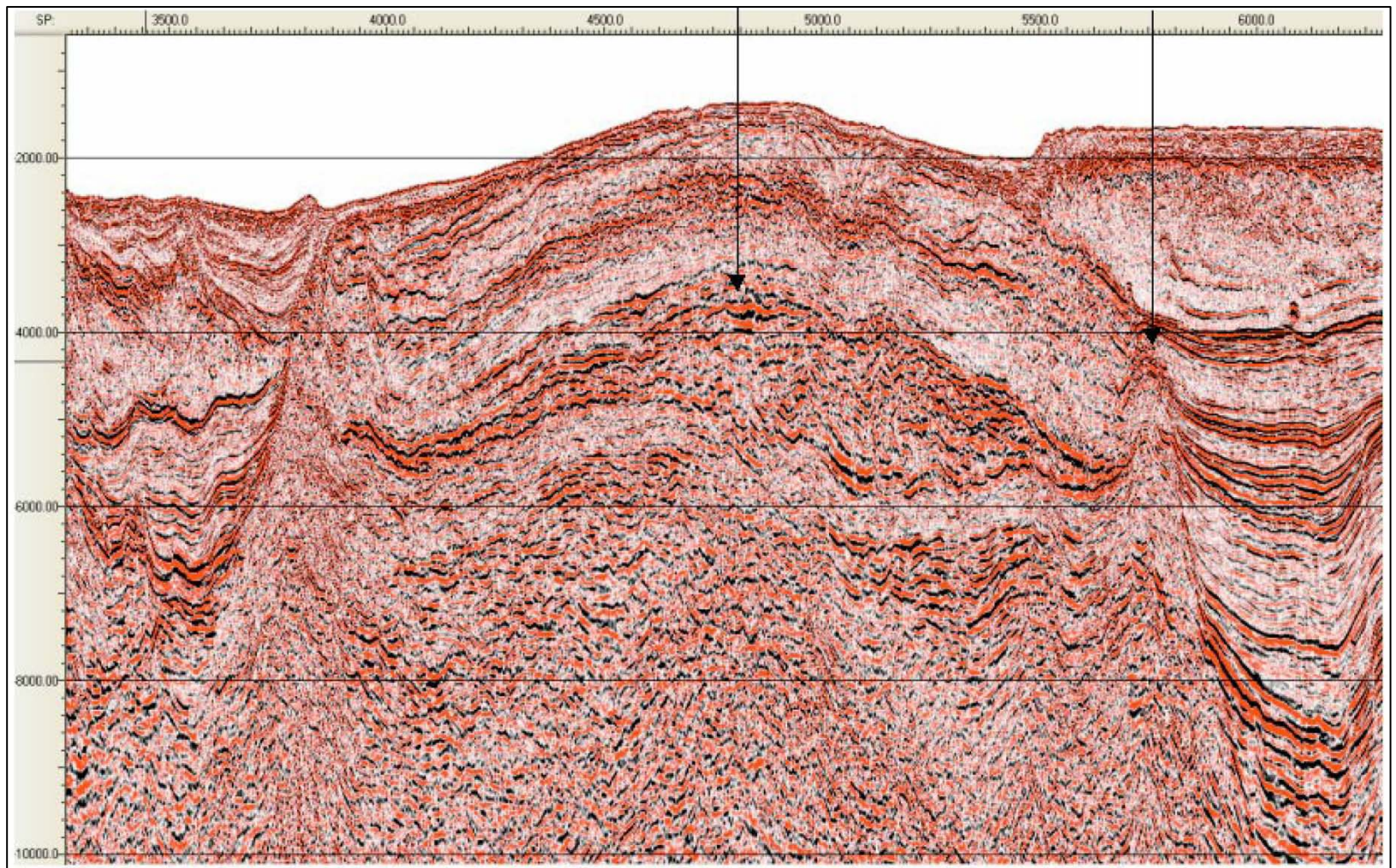


Figure 5. Plays on and around the Eratnosthenes Seamount on PSDM section (a larger version of the RHS of Figure 4). Section width approximately 150 km.

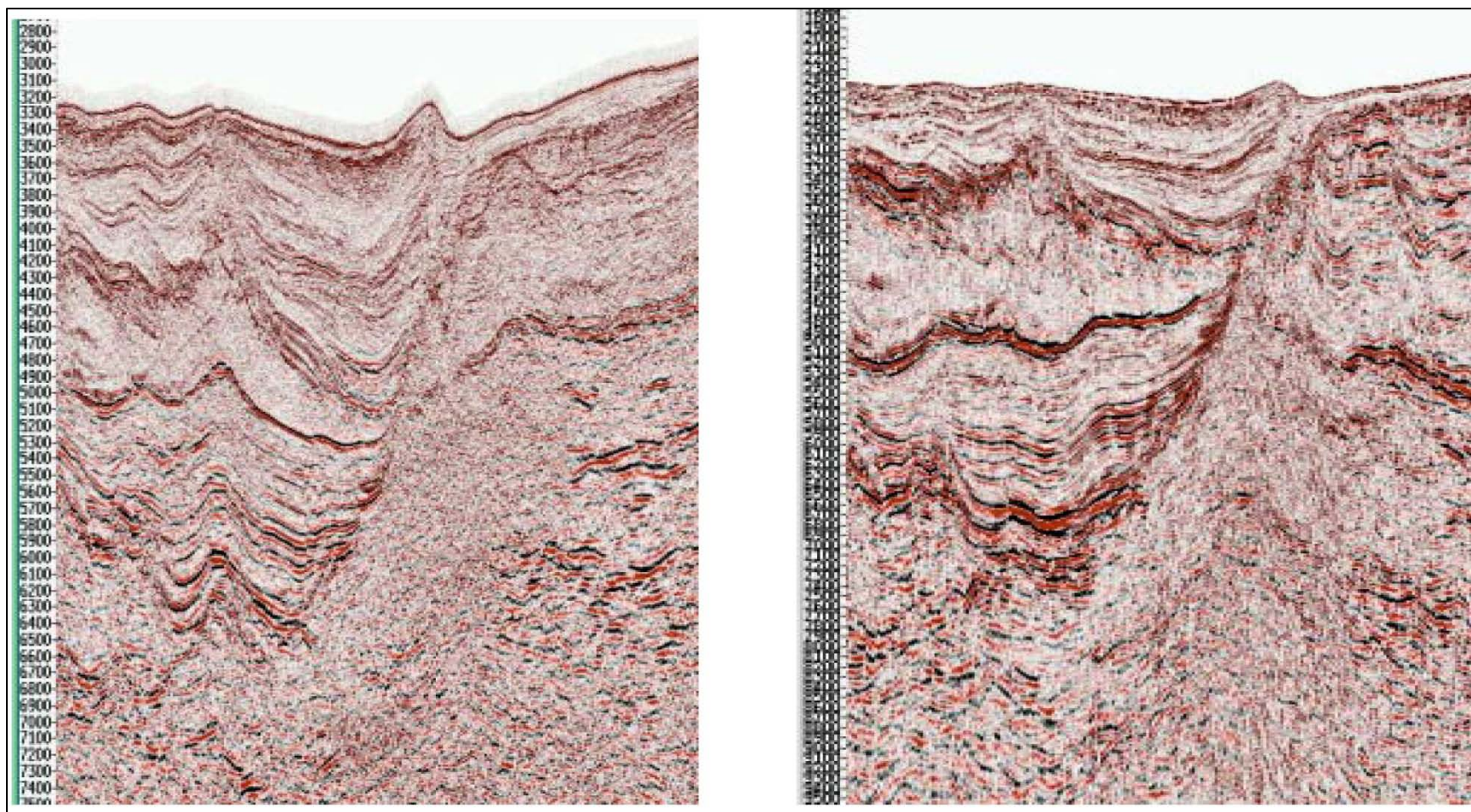


Figure 6. Time Migration (Left) vs. PSDM (Right) showing how nature of the minibasin west of Eratnosthenes apparently changes when viewed in depth.

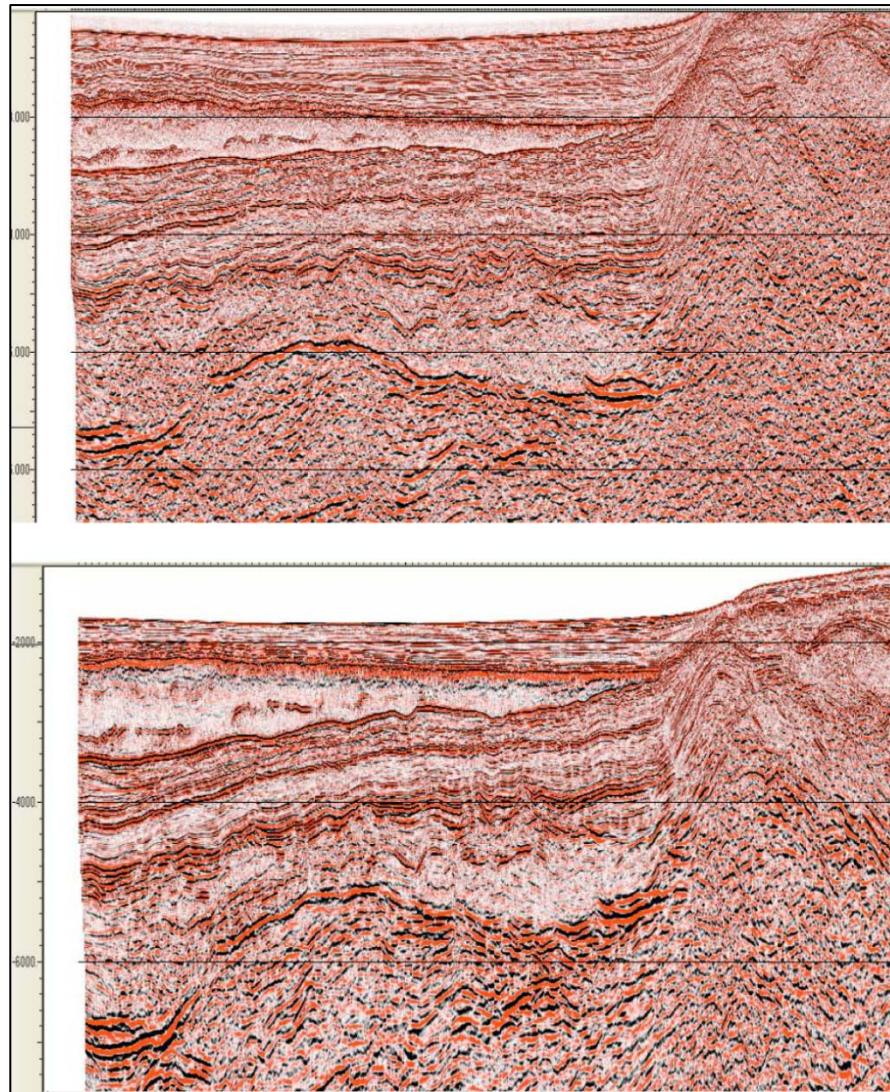


Figure 7. Time migration (upper display) vs. PSDM (lower display) of a S-N line in the Levantine Basin (off Lebanon). North is on the right. Larnaca-Latakia Ridge is on the right. Section width: approx 80 km. Note differences in closure on major events when comparing depth with time, e.g. in the Tertiary between 3000 and 4000 m.