

Longitudinal evolution of the tectonic style along the Cyprus Arc



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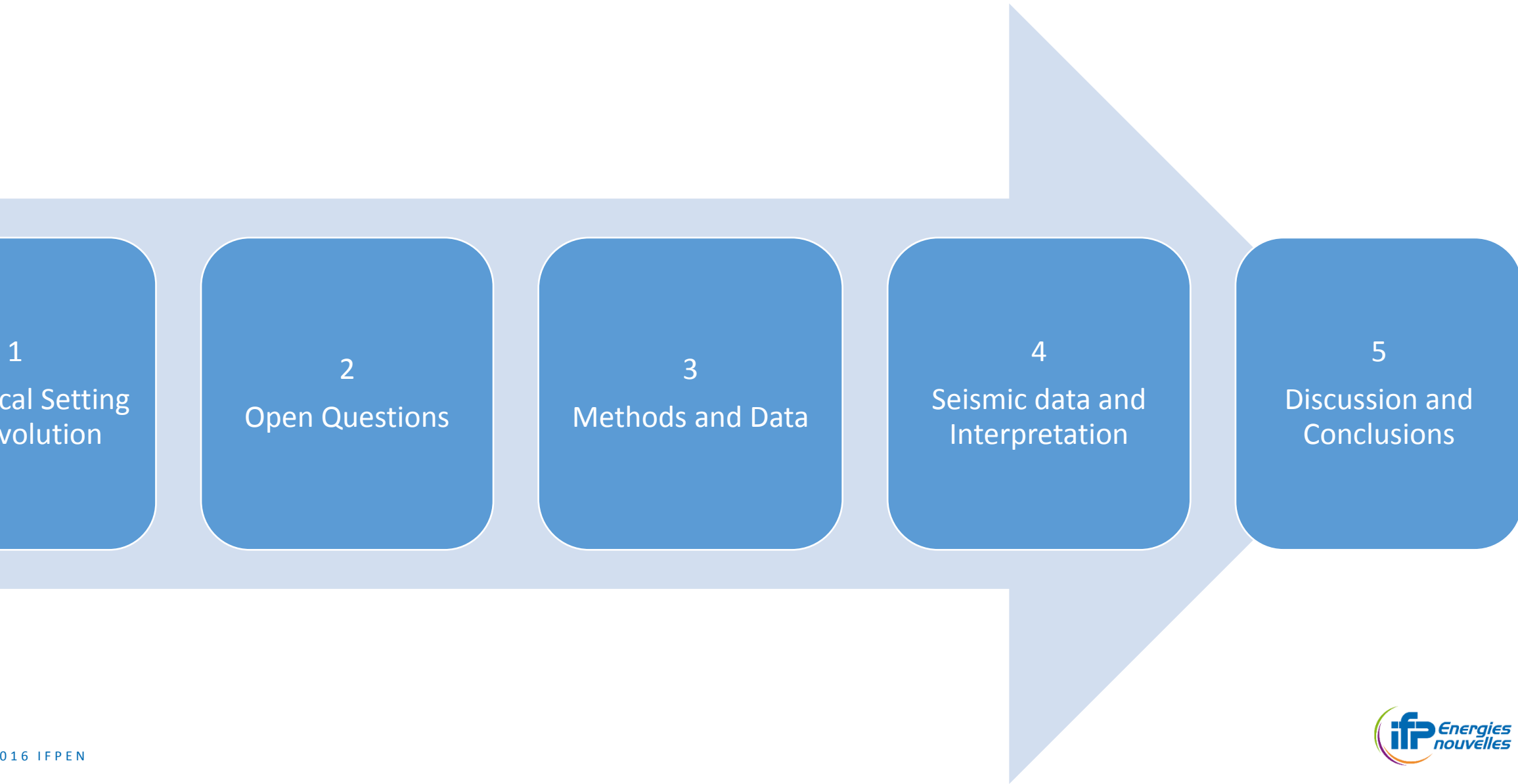
²IFP Energies nouvelles, Geosciences Division, France



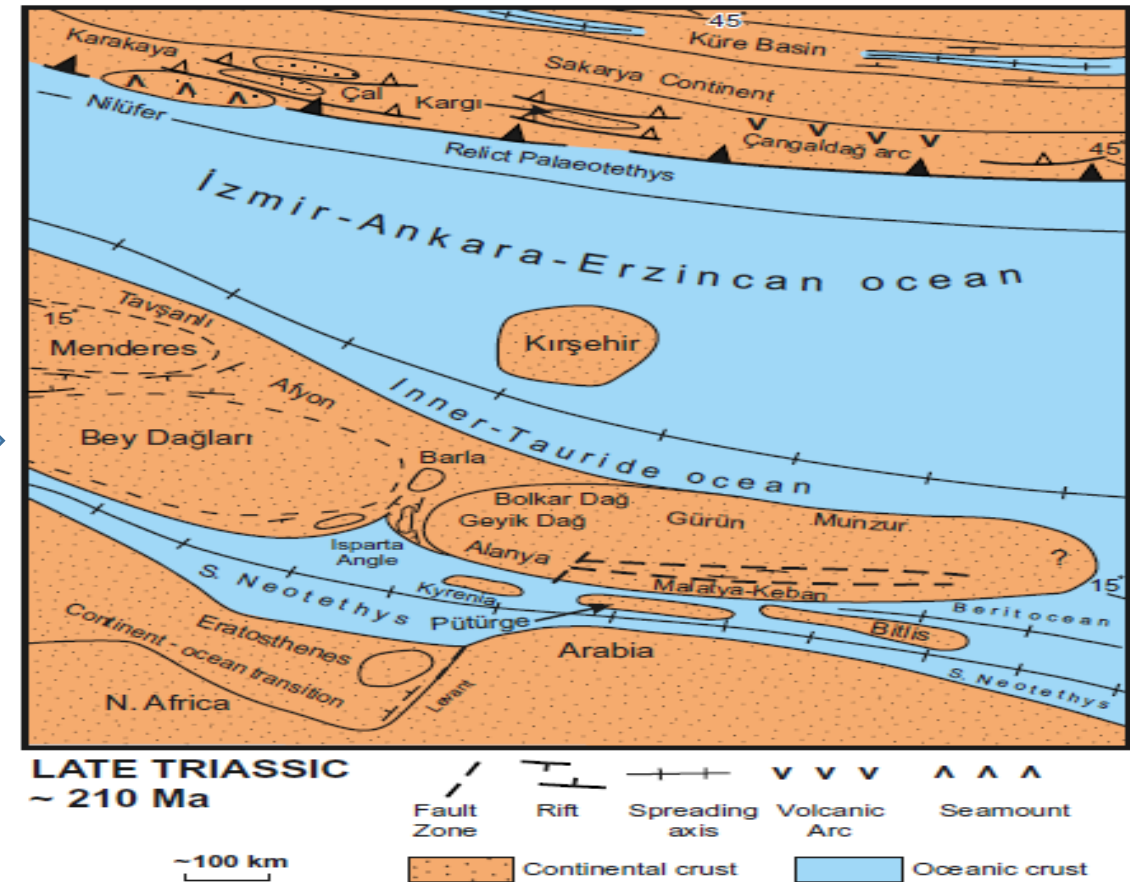
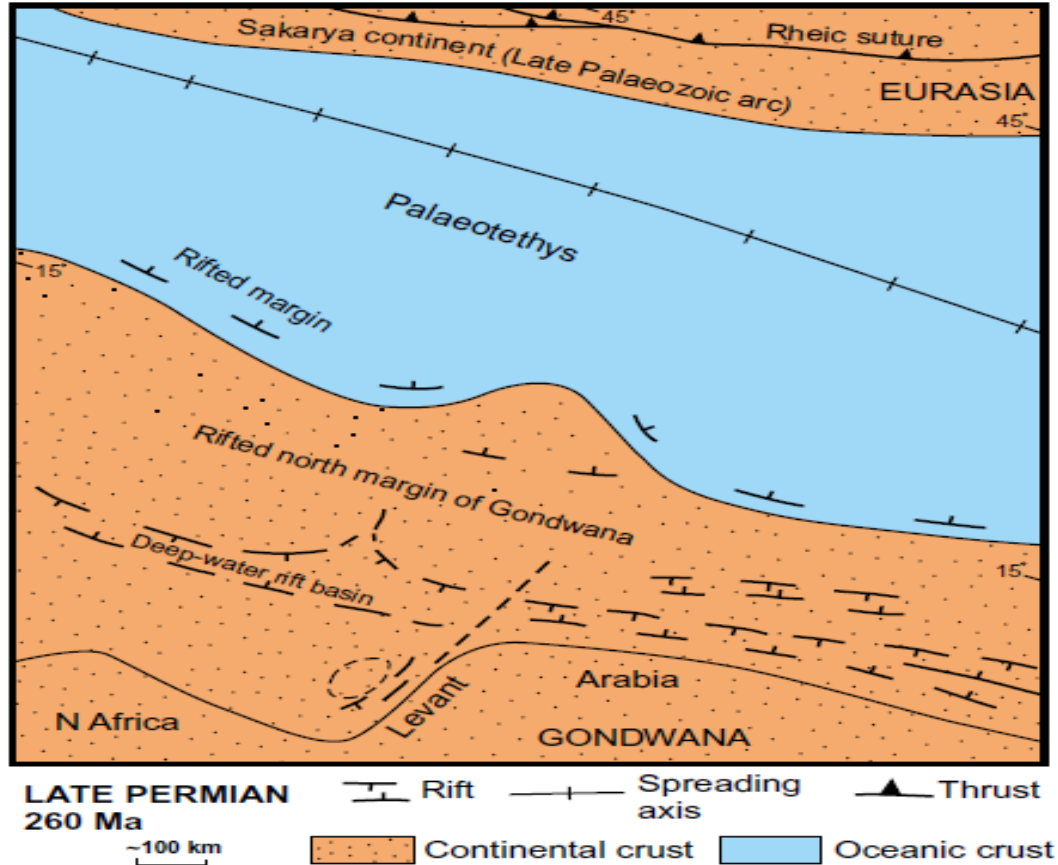
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OUTLINE



1. GEOLOGICAL SETTING AND EVOLUTION



Late Permian-Triassic-Jurassic

- Tethyan rifting
- Opening of Neo-Tethys ocean
- Creation of Levant basin and Herodotus basin
- Eratosthenes Continental Block is detached from Arabian plate

Robertson et al., 2013.

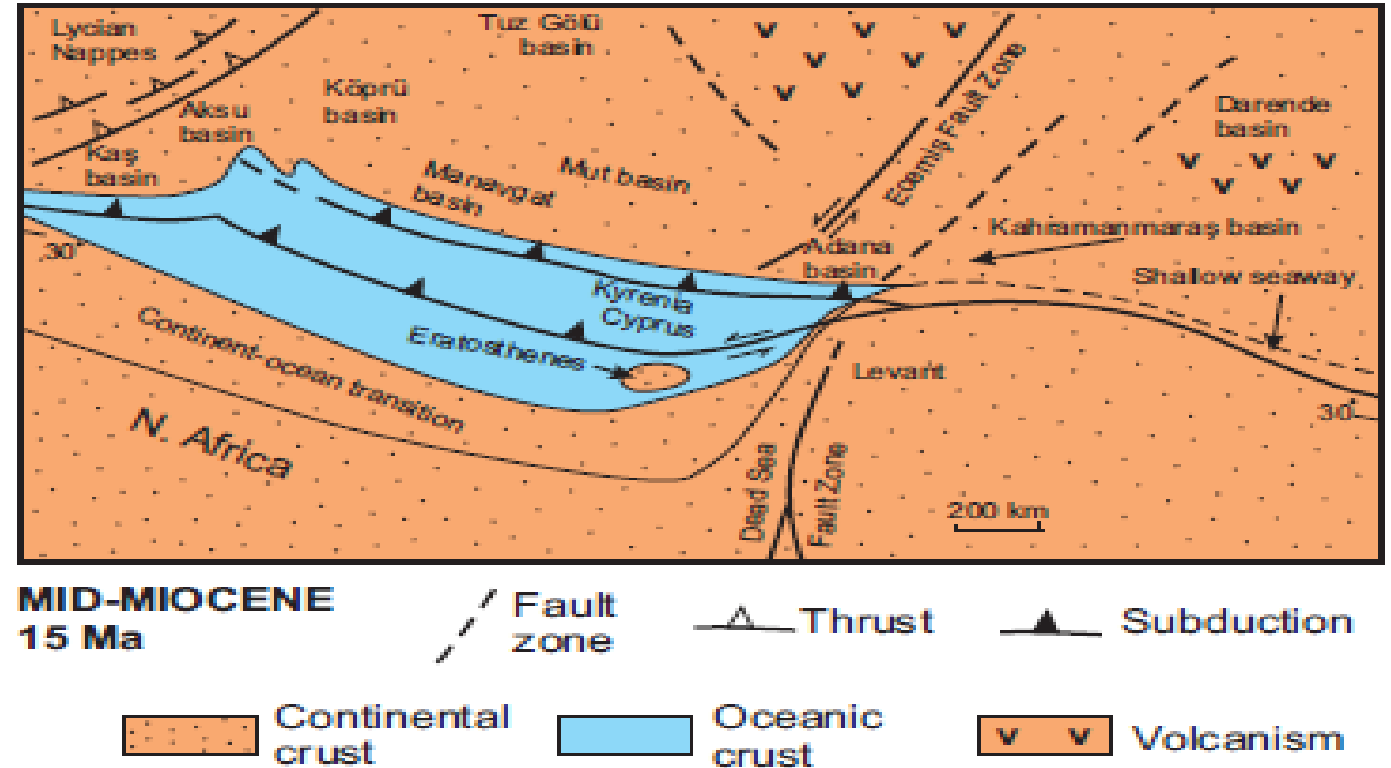
1. GEOLOGICAL SETTING AND EVOLUTION

Upper Cretaceous

- Initial closing of Neo-Tethys
- African plate moves northward with respect to Eurasian plate
- Emplacement of ophiolites in the region

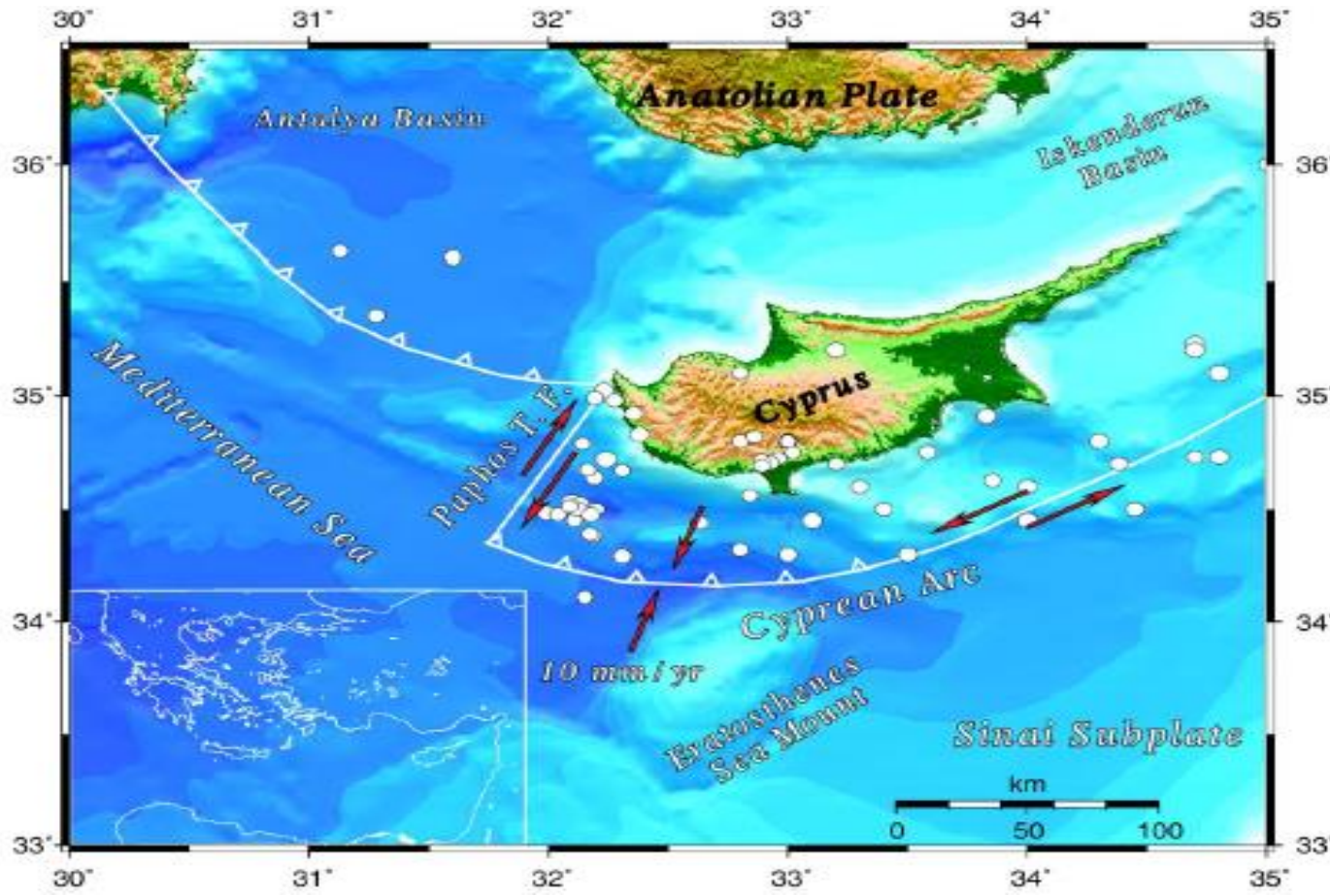
Miocene to Recent

- Collision of African-Eurasian plates
- Expulsion of Anatolia micro-plate towards the southwest
- Compression leads to reverse and strike-slip structures (Cyprus arc-Latakia ridge)



Robertson et al., 2012.

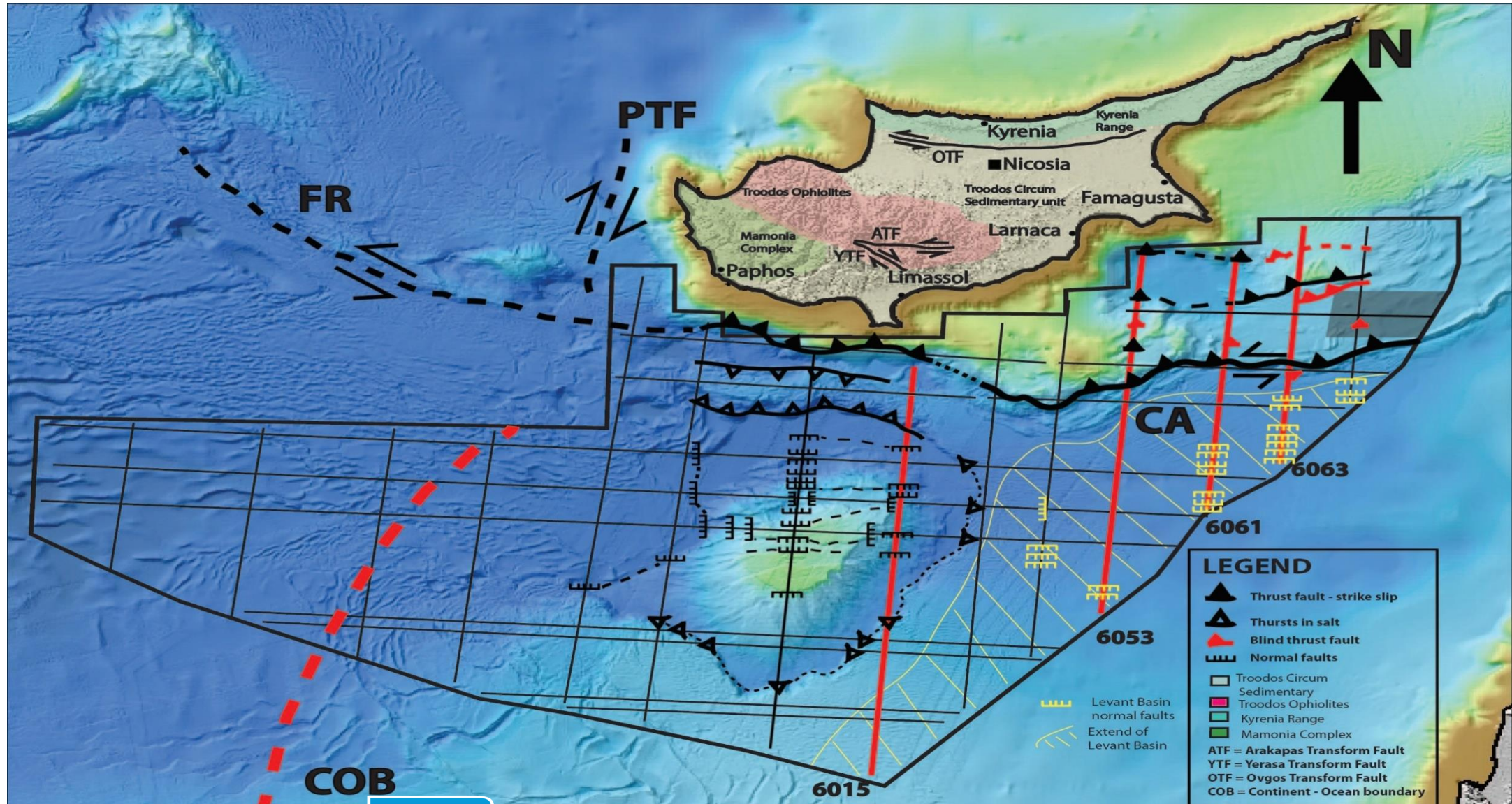
2. OPEN QUESTIONS



- What is the nature of the tectonic structures along the Cyprus arc?
- What is their age?
- What is the mechanism explaining them?

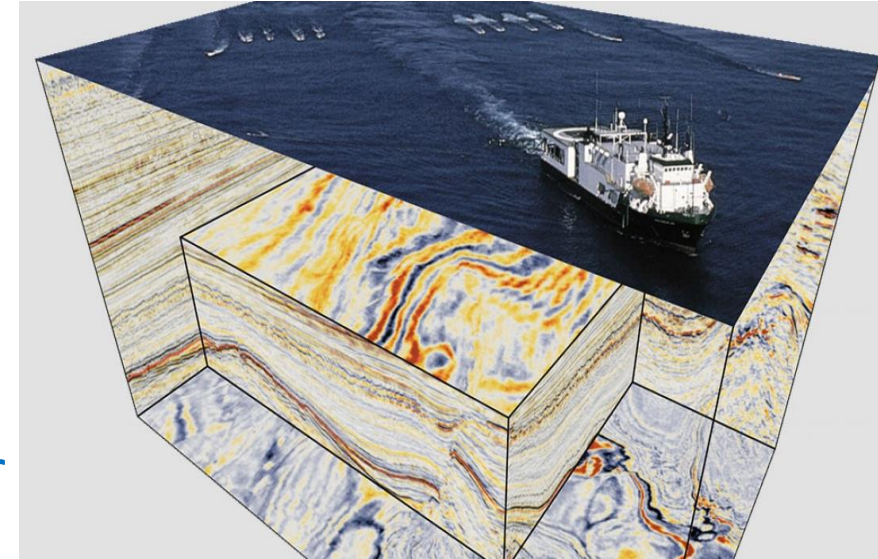
Papadimitriou and Karakostas, 2006.

3. METHODS AND DATA



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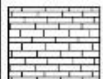
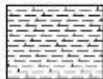
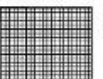
- 24 profiles of 2D seismic data available for this project.
- 10 lines of conventional 2D data recorded in 2006-2008 and reprocessed in 2011. Seismic grid 10 x 20 km.
- 14 lines of 2D data shot with the dual sensor GeoStreamer technology recorded in 2008 and processed in 2009. Seismic grid 20 x 20 km western domain and 5 x 5 km eastern domain.



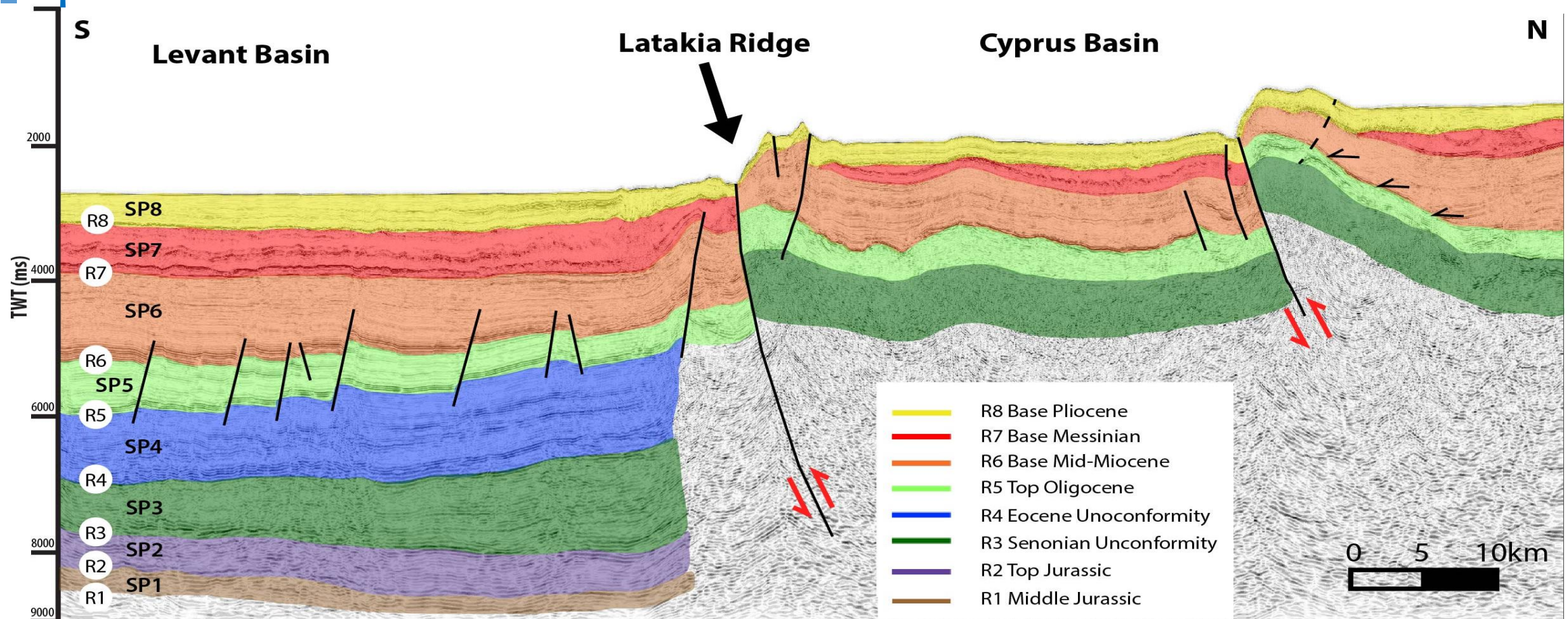
3. METHODS AND DATA

- R1 = marks the beginning of post rift phase
- R2 = separates Up. Jurassic – E. Cretaceous
- R3 = major unconformity, subsidence of Levant Basin
- R4 = siliciclastics overlain by deep marine sediments, subsidence of Levant Basin
- R5 = deep water clastics
- R6 = deep water mixed system
- R7 = Messinian salt
- R8 = hemi-pelagic sediments due to inundation of Mediterranean Sea

Depth (m)	Seismic Characterization	Proposed Age	Lithology	Seismic Units Horizons
1000	Water Column	—	—	
2000	Medium to high amplitude parallel reflectors	Pliocene Pleistocene		R9 SP8 R8
3000	Low acoustic impedance, transparent sequence	Messinian		SP7 R7
4000	Low to medium amplitude semi continuous reflectors / interbedded with hummocky reflectors	Middle - Upper Miocene		SP6 R6
5000	High acoustic impedance contrast, medium to high amplitude reflectors	Lower Miocene		SP5 R5
6000	Upper unit medium amplitude parallel reflectors Base unit low amplitude semi continuous reflectors	Oligocene / Eocene		SP4 R4
7000	Low amplitude non continuous reflectors, with some chaotic features	Eocene / Senonian		SP3 R3
8000	Medium amplitude non continuous reflectors	Early Cretaceous		SP2 R2
9000	High amplitude semi continuous reflectors	Late Jurassic		SP1 R1
10000				

	Deep water (carbonate dominated)		Deep water (mixed system)		Deep water (siliciclastic dominated)		Salt
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4. SEISMIC DATA AND INTERPRETATION



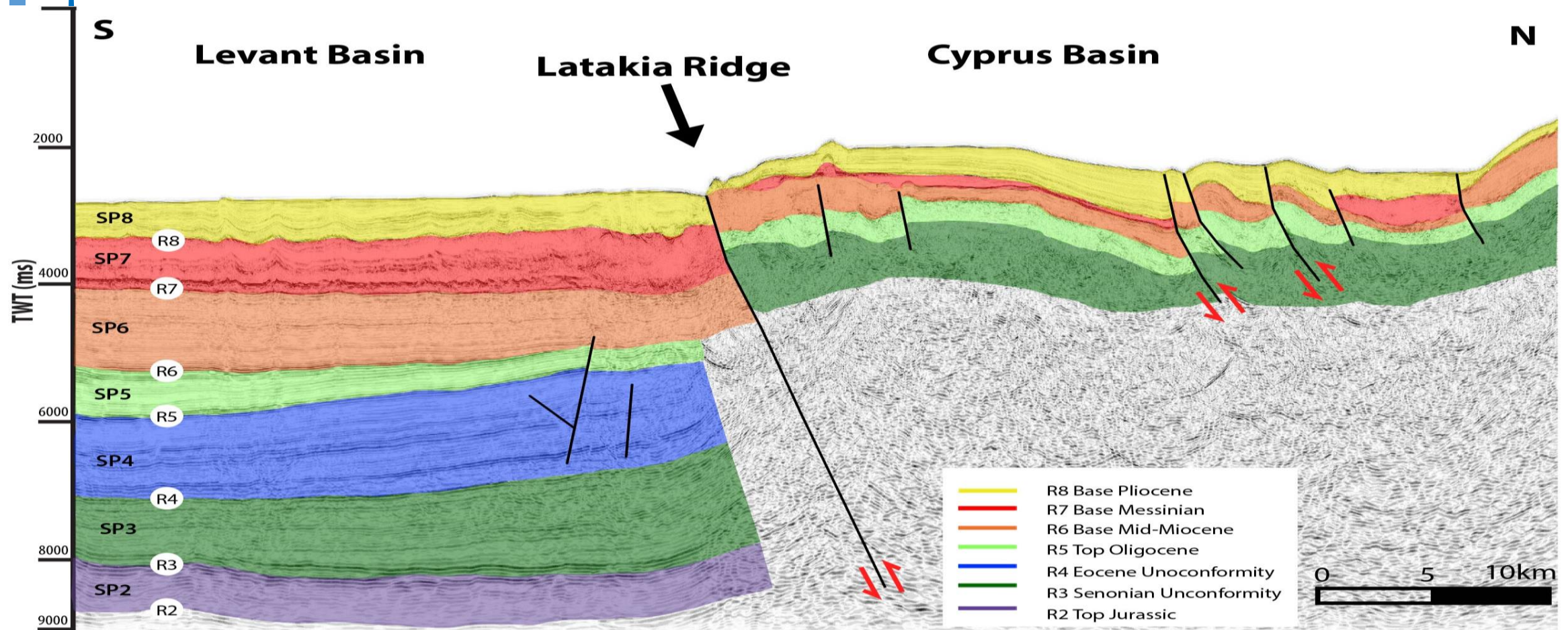
Seismic line 6063



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4. SEISMIC DATA AND INTERPRETATION



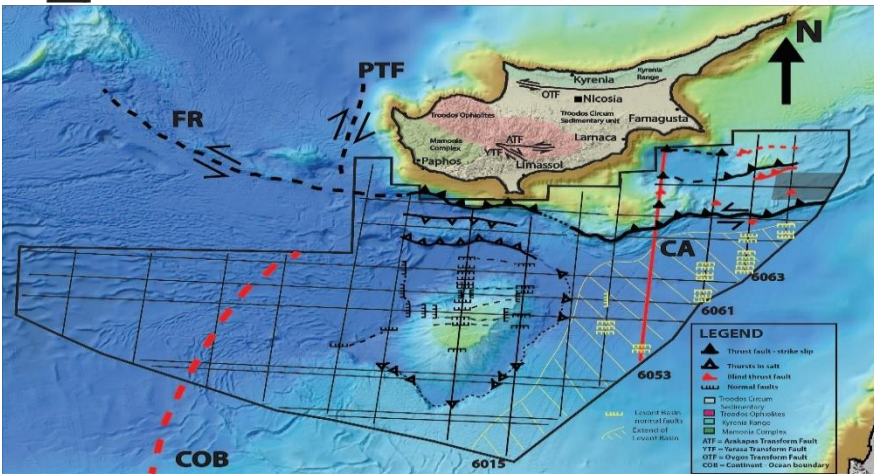
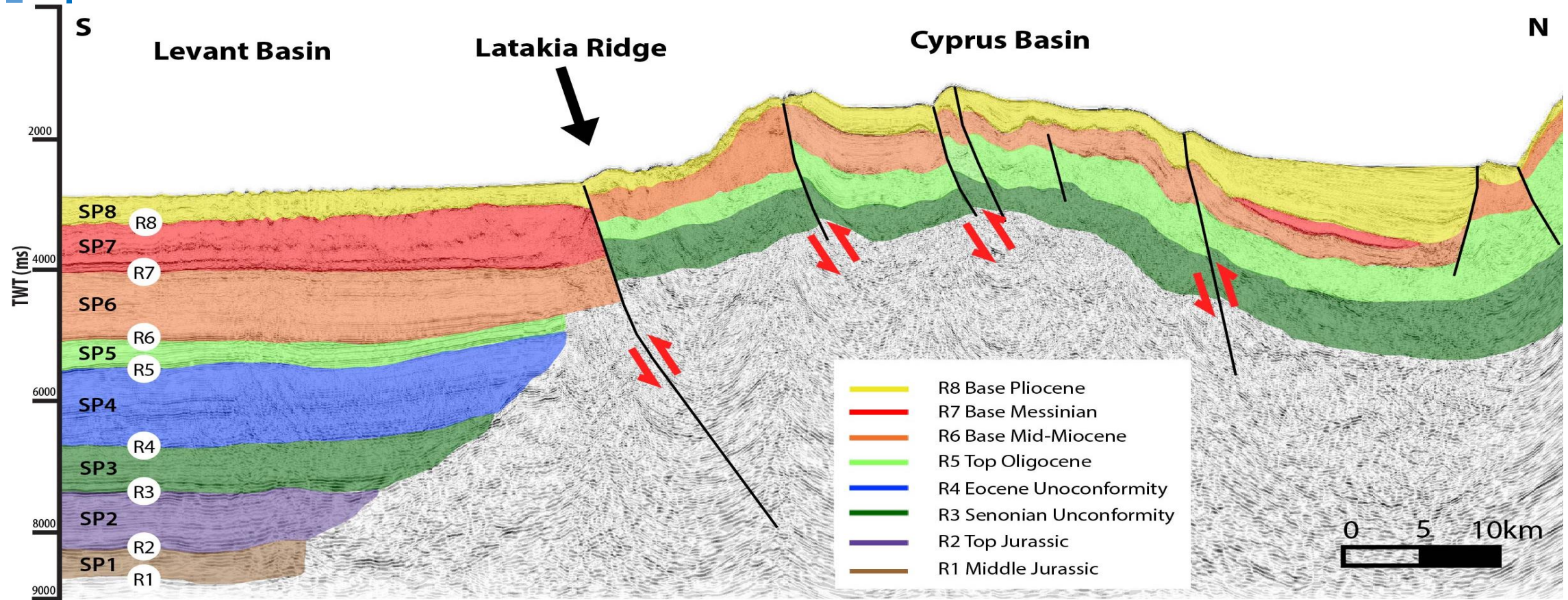
Seismic line 6061



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4. SEISMIC DATA AND INTERPRETATION



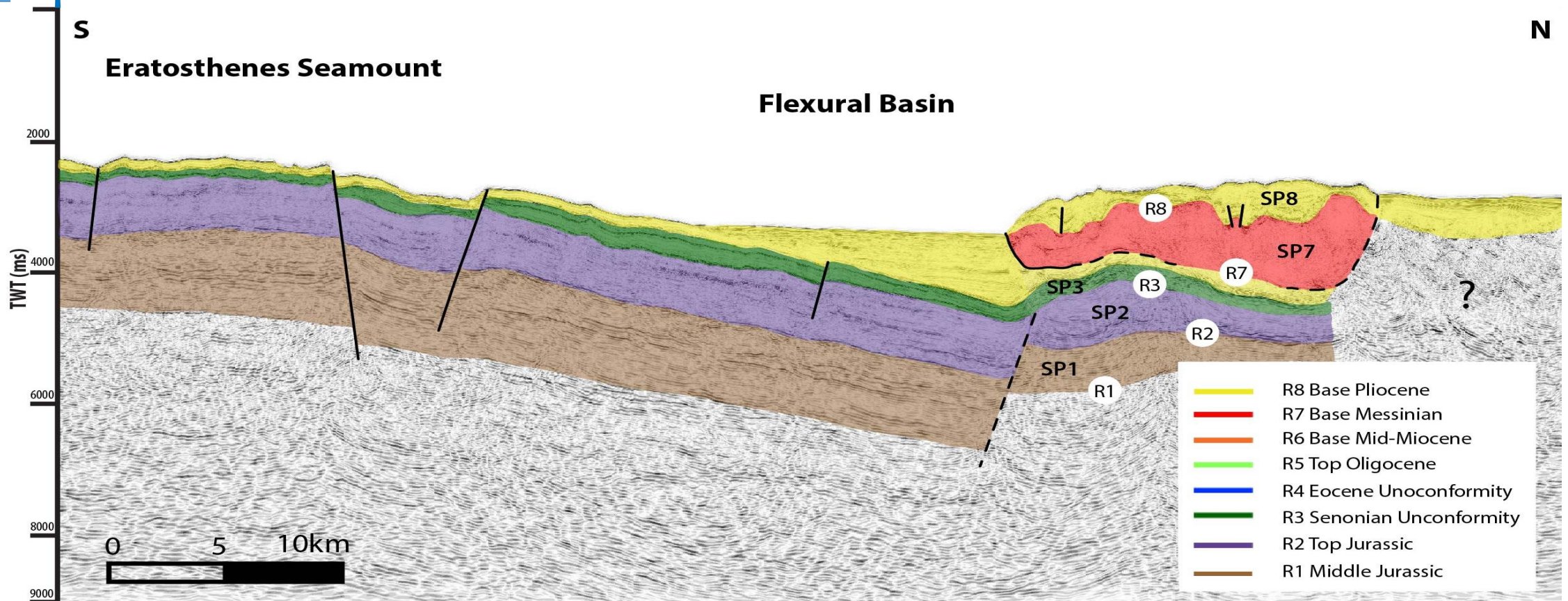
Seismic line 6053



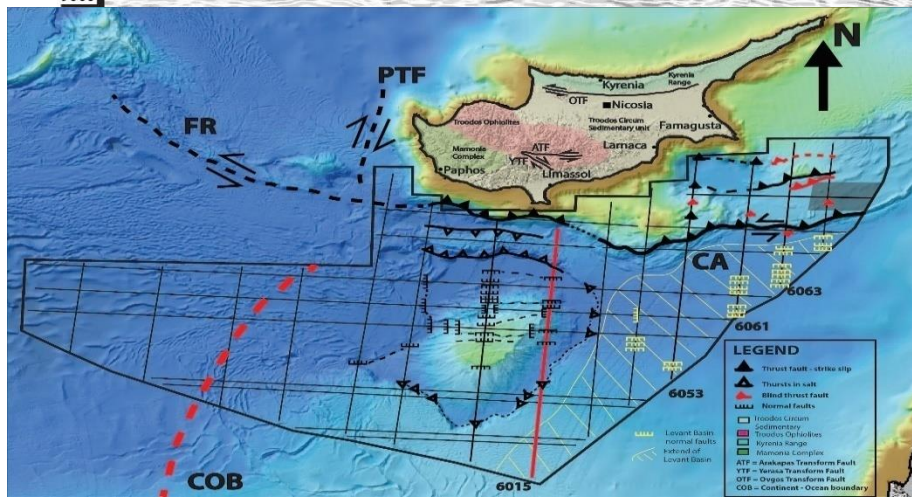
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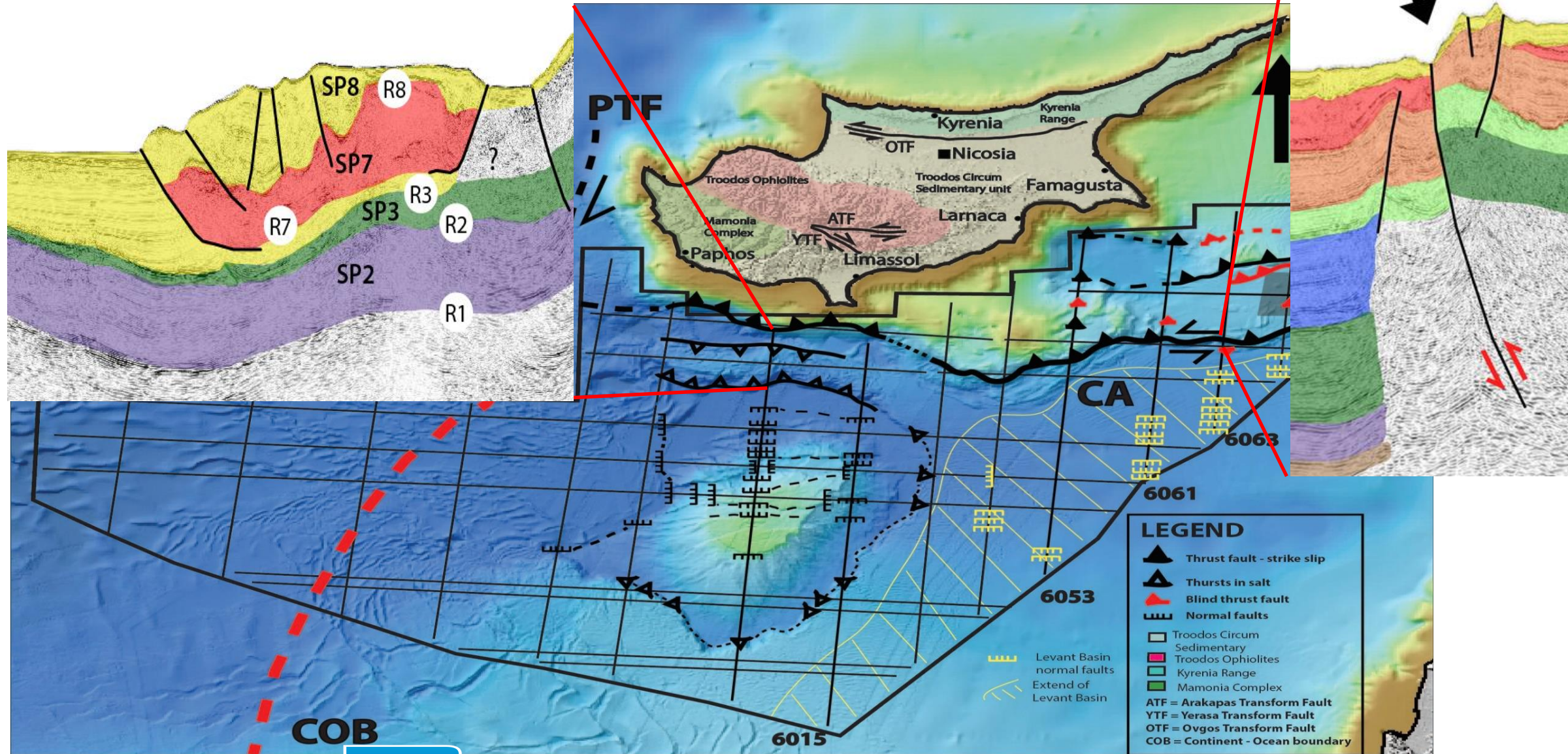
Seismic line 6015



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5. DISCUSSION



5. CONCLUSIONS

- Miocene to Pliocene basins: Cyprus Basin is of Miocene age. Creation of piggy back basins.
- Latakia Ridge sub-vertical apparent thrust fault since Miocene age.
- Eratosthenes Seamount in collision with Cyprus.
- Tectonic style changes from compression (south of Cyprus) to strike slip (south-east of Cyprus).

ACKNOWLEDGEMENT

● UPMC



● IFPEN



● PGS



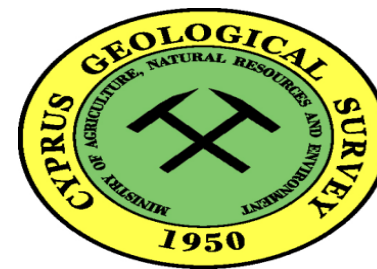
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● CYPRUS GEOLOGICAL SURVEY DEPARTMENT





Thank you for your attention!!

Questions?

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