

Seismostartigraphy of the Maykopian clinoforms in the Middle Caspian

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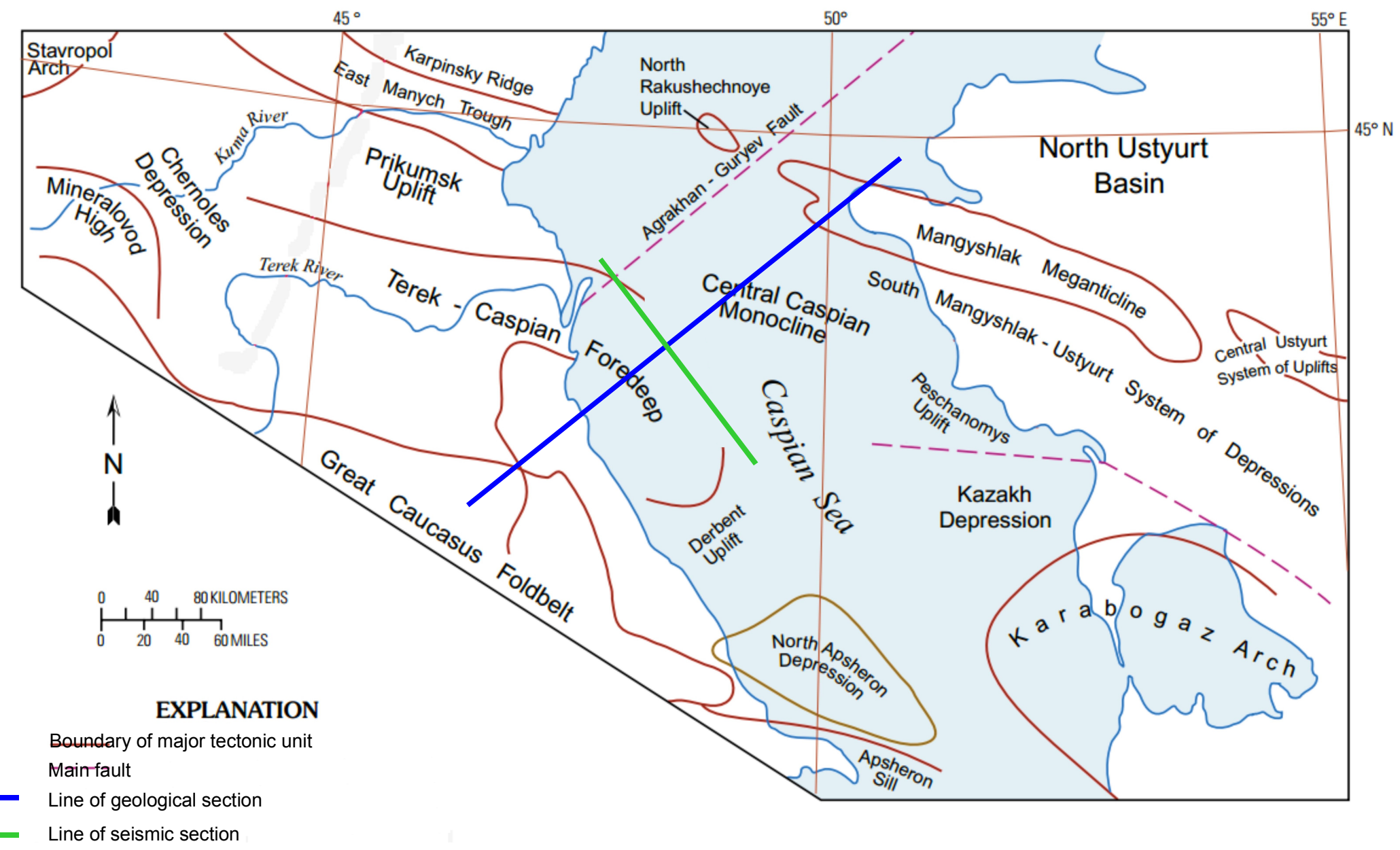


Introduction

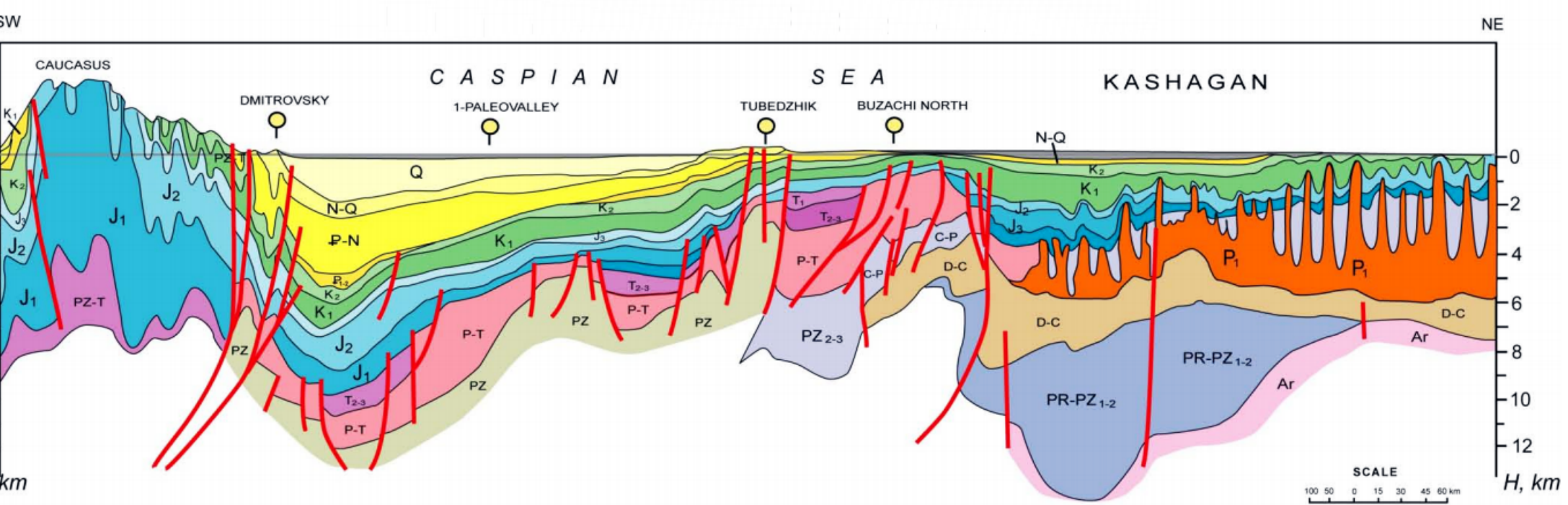
Maikop series (P_3-N_1) is a unique stratum, distributed over a vast territory from Romania to Kazakhstan. It also has great oil and gas potential. The first tributaries of oil were in the early 20th century in Baku (Azerbaijan). However, these deposits have not yet spent its oil and gas potential.

The point of our work is to reveal features of local structure and sedimentogenesis of clinoform deposits of Oligocene-Miocen complex of the North Caspian by seismostratigraphy analysis.

Generalized map, showing main structural units of Middle Caspian [3]



Geological section across the Caspian sea [3]



Tectonic and Geological structure

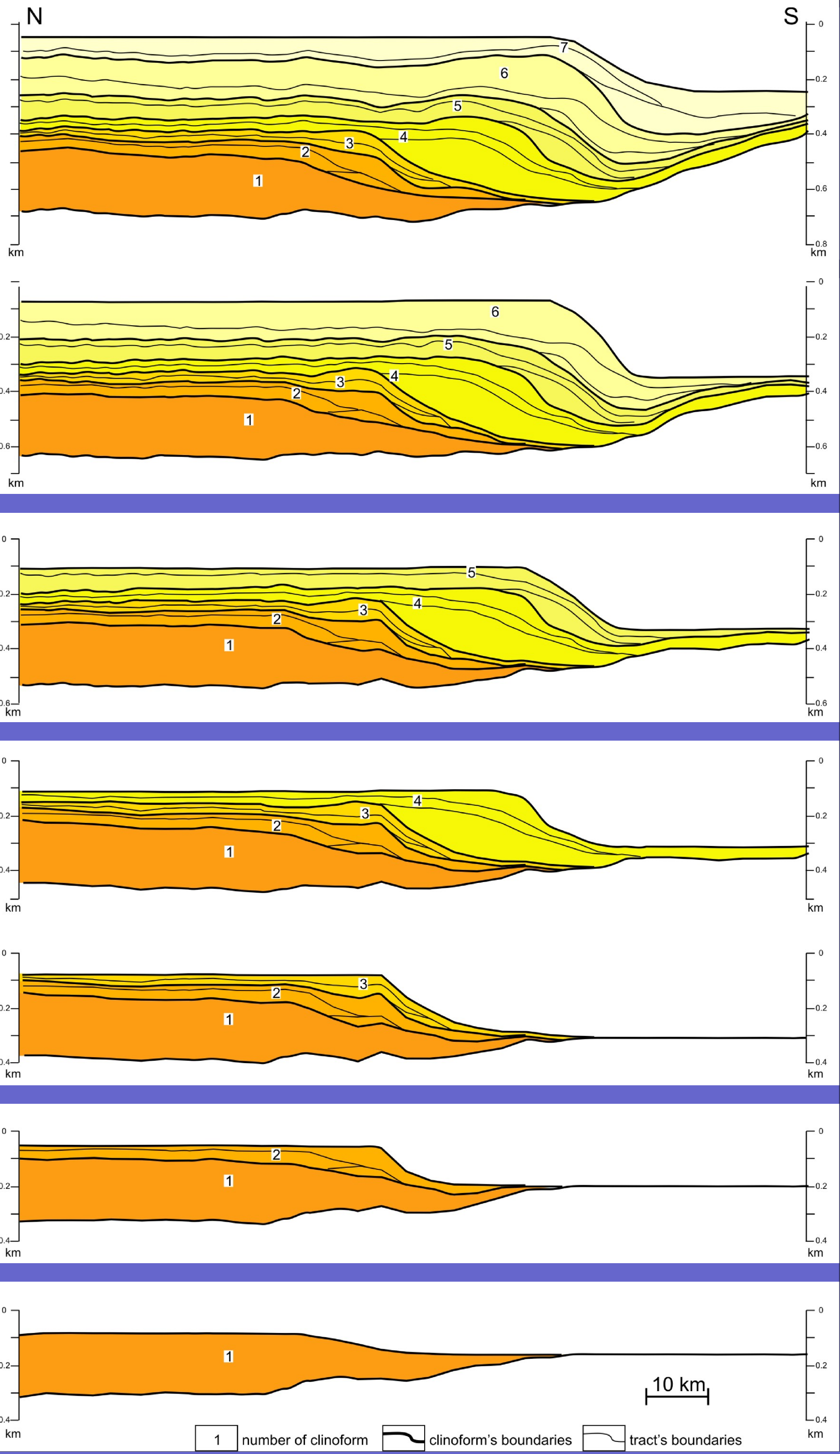
The region of study is situated in the area of contact of platform structures, foredeep and orogenic areas.

The sedimentary cover is represented by Devonian-Cenozoic terrigenous and carbonate sediments.

Studied Maykopian complex in Middle Caspian is represented predominantly by clay and carbonate-clayey coastal-marine sediments. Complex's thickness reaches its maximum (2-2.5 km) in the Terek-Caspian trough.

Complex lays with unconformity on the Eocene deposits and forms system of clinoforms. On the seismic sections it reveals 7 progradational clinoforms, which relay each other from north to south.

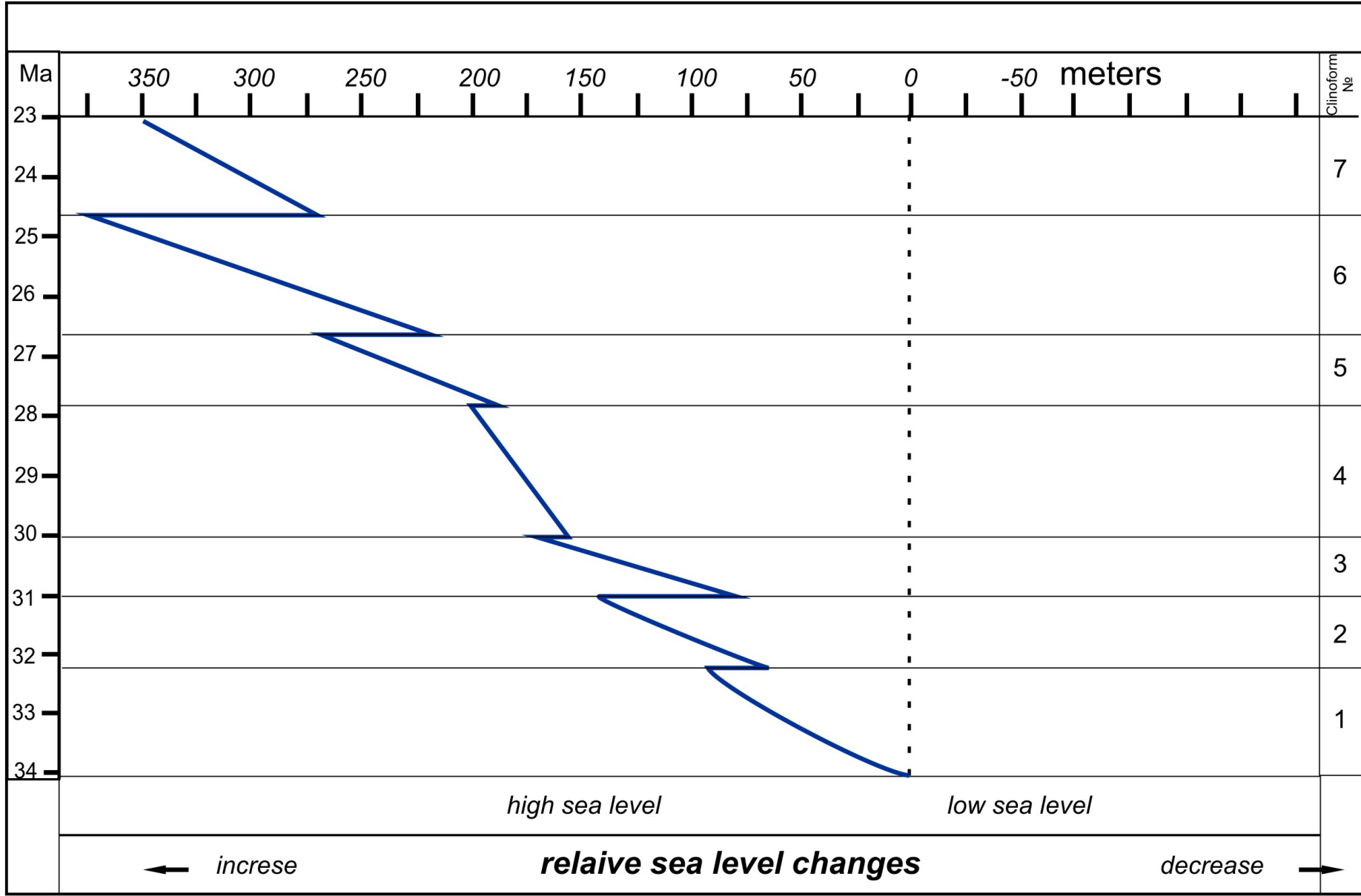
Paleoreconstructions of sedimentary complexes



Paleoreconstructions (i.e. consistent horizons alignment) makes possible to remove the influence of post sedimentation tectonic movements and represent section of sedimentary bodies for the time of their accumulation. Also, it allows to judge more accurately about the circumstances of their formation.

The present structural plan of the territory is due to subsidence of the Terek-Sulakskoy depression (which was started in Oligocene) and differs from the structural plan during Maykopian time.

Relative sea level changes curve

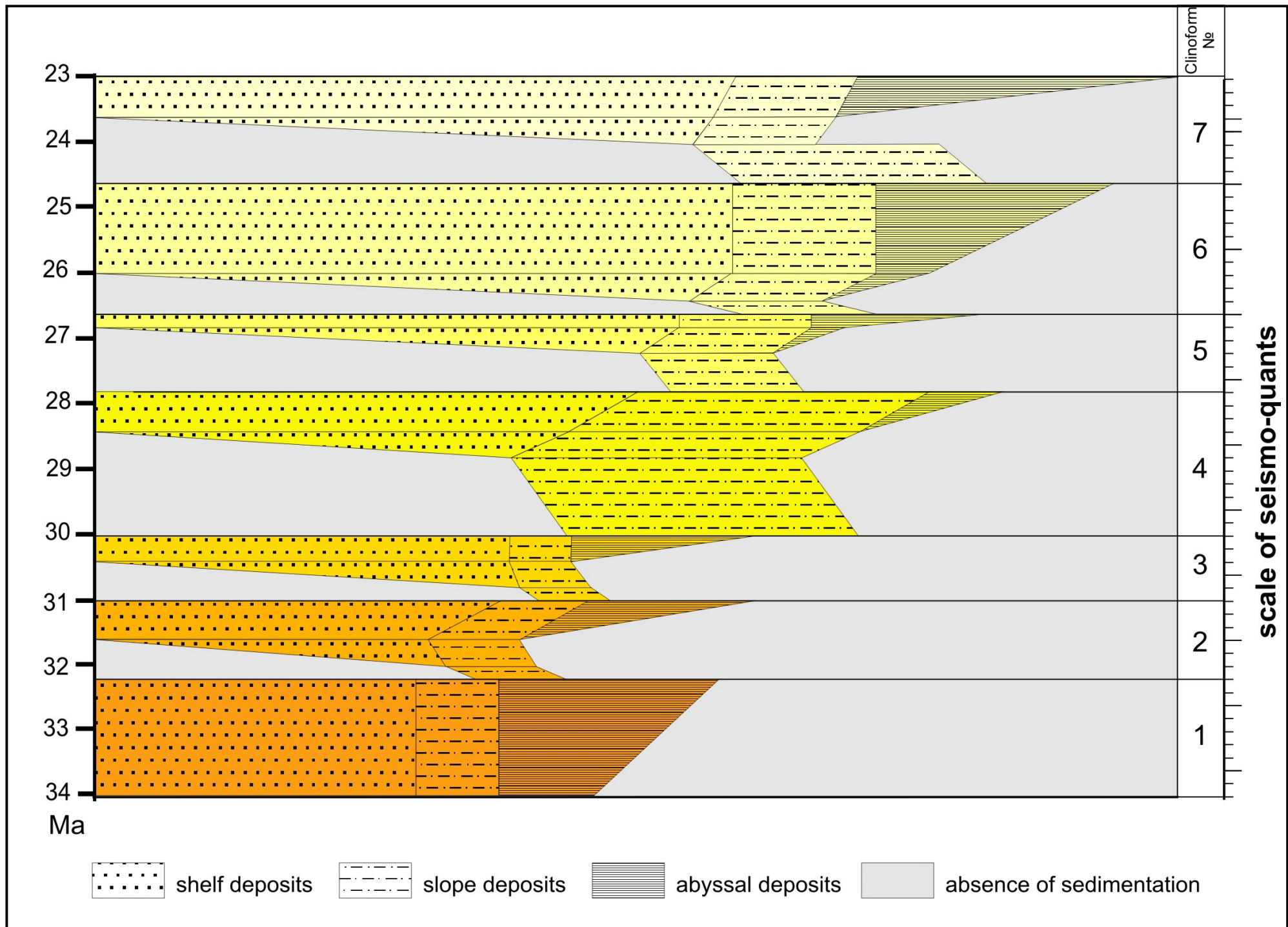


The curve is constructed by the way of measuring height increment (distance) between two adjacent inflection points of accumulative shelf.

The process of shelf's progradation was controlled by gradual rising of the relative sea level.

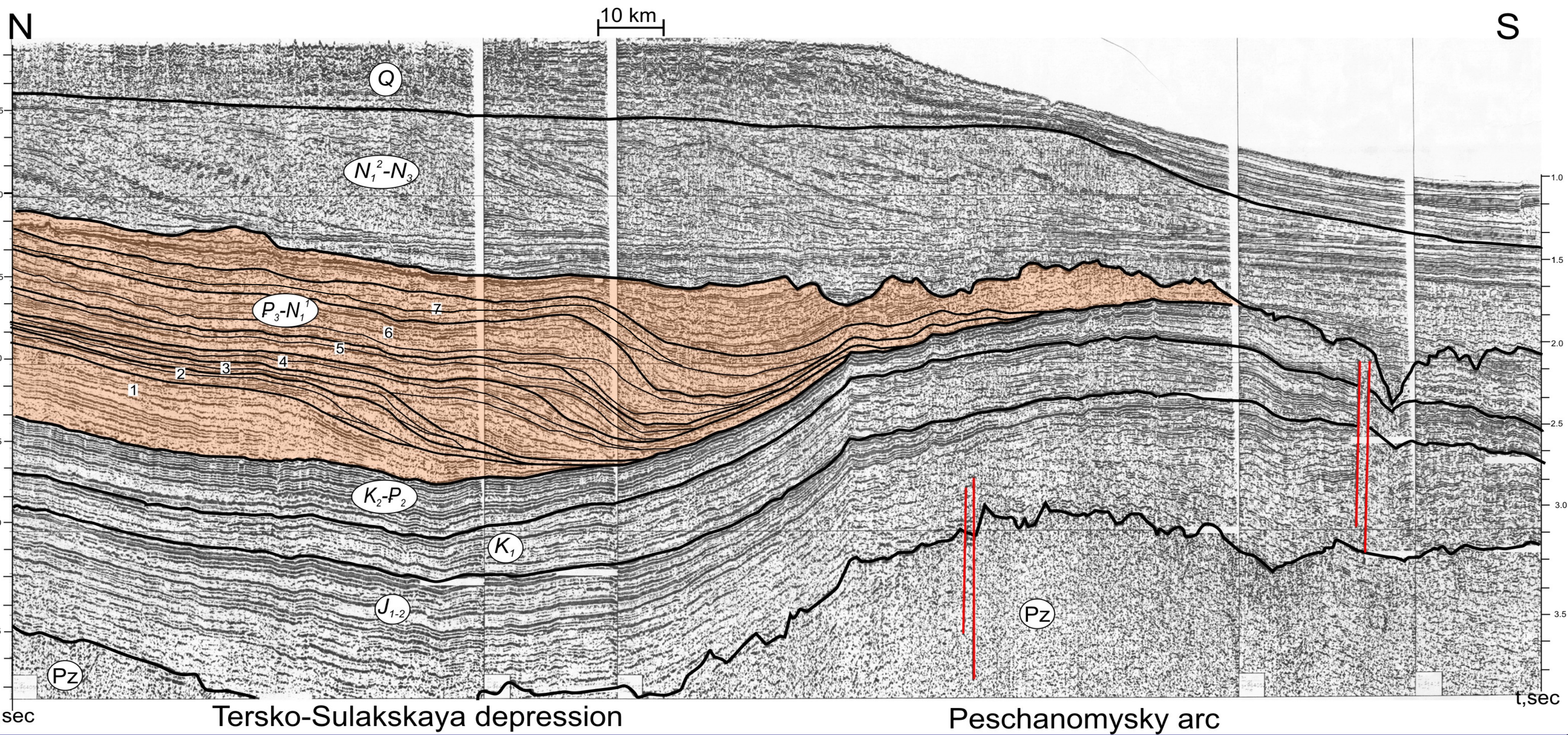
Against the general sea level rise, it observed short-term periods of level decrease for each clinoform. This is due to cyclical fluctuations of relative sea-level.

Chronostratigraphic scheme



Since the beginning of the Oligocene till Lower Miocene time there was a gradual extension of the accommodation area and shelf's edge progradation. It corresponds to the general trend of sea-level rise on the curve of relative sea level changes.

Seismostratigraphy section through the Middle Caspian



Conclusion

Reconstruction revealed that accumulation of Maykopian strata was occurred in offshore conditions and compensated by tectonic subsidence of the bottom.

Based on the interpretation of clinoform position within seismic sections Scythian plate and Volga paleoriver would be consider as the main material sources.

Subsidence of the Terek-Sulakskaya depression was caused by shelf's accrual and gradual relative sea level rise in Oligocene. Due to tectonic stabilization and basin shallowing, upper Maykopian reveals normal layered structure. The geological history of Maykopian basin ends by regional sea regression and fixation of long-term continental conditions. As a result, it led to a deeperosion of Maykopian series in large areas of the studied region.

References

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2. G.F. Ulmshiek.: Petroleum Geology and Resources of the North Caspian Basin, Kazakhstan and Russia.// U.S. Geological Survey Bulletin. 2001.