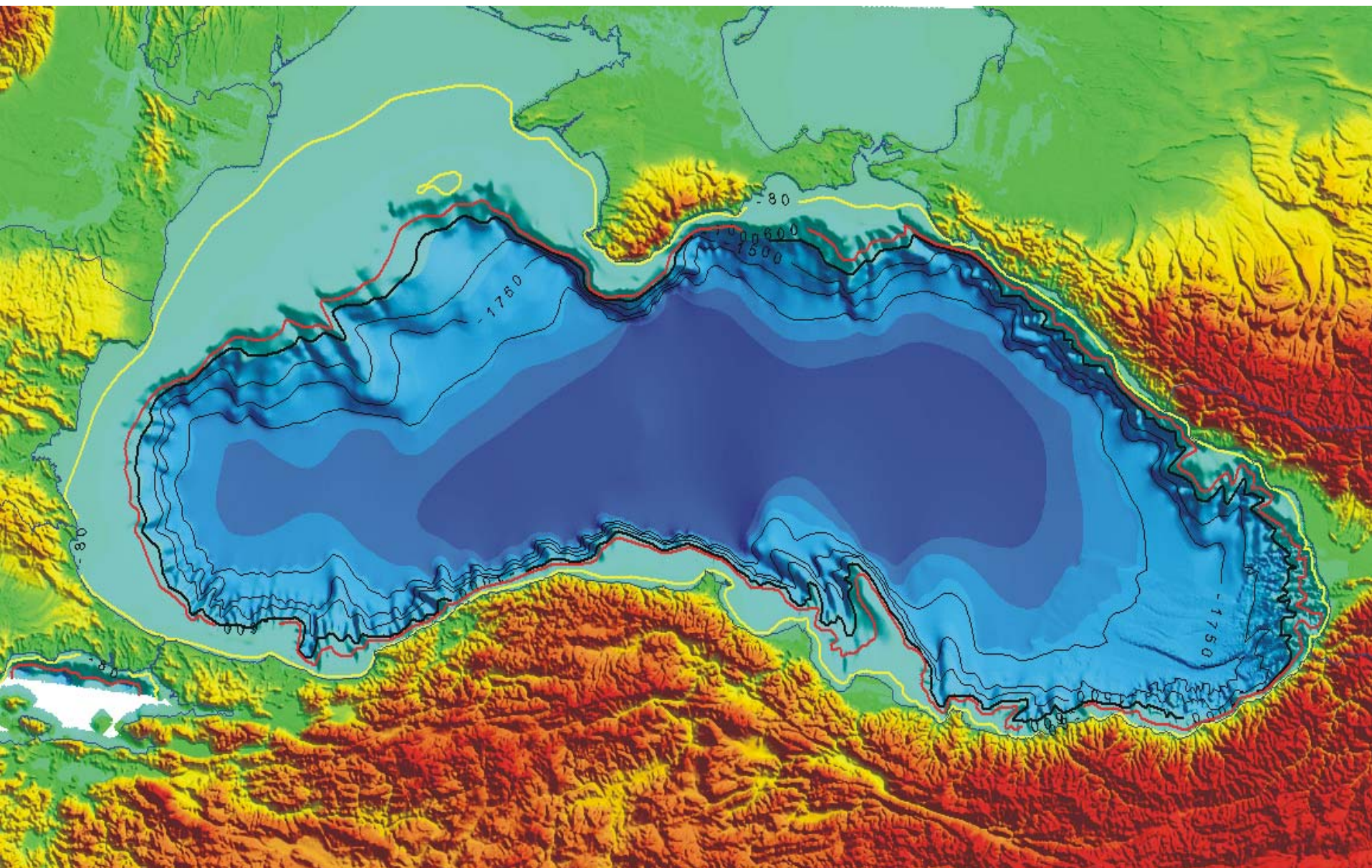
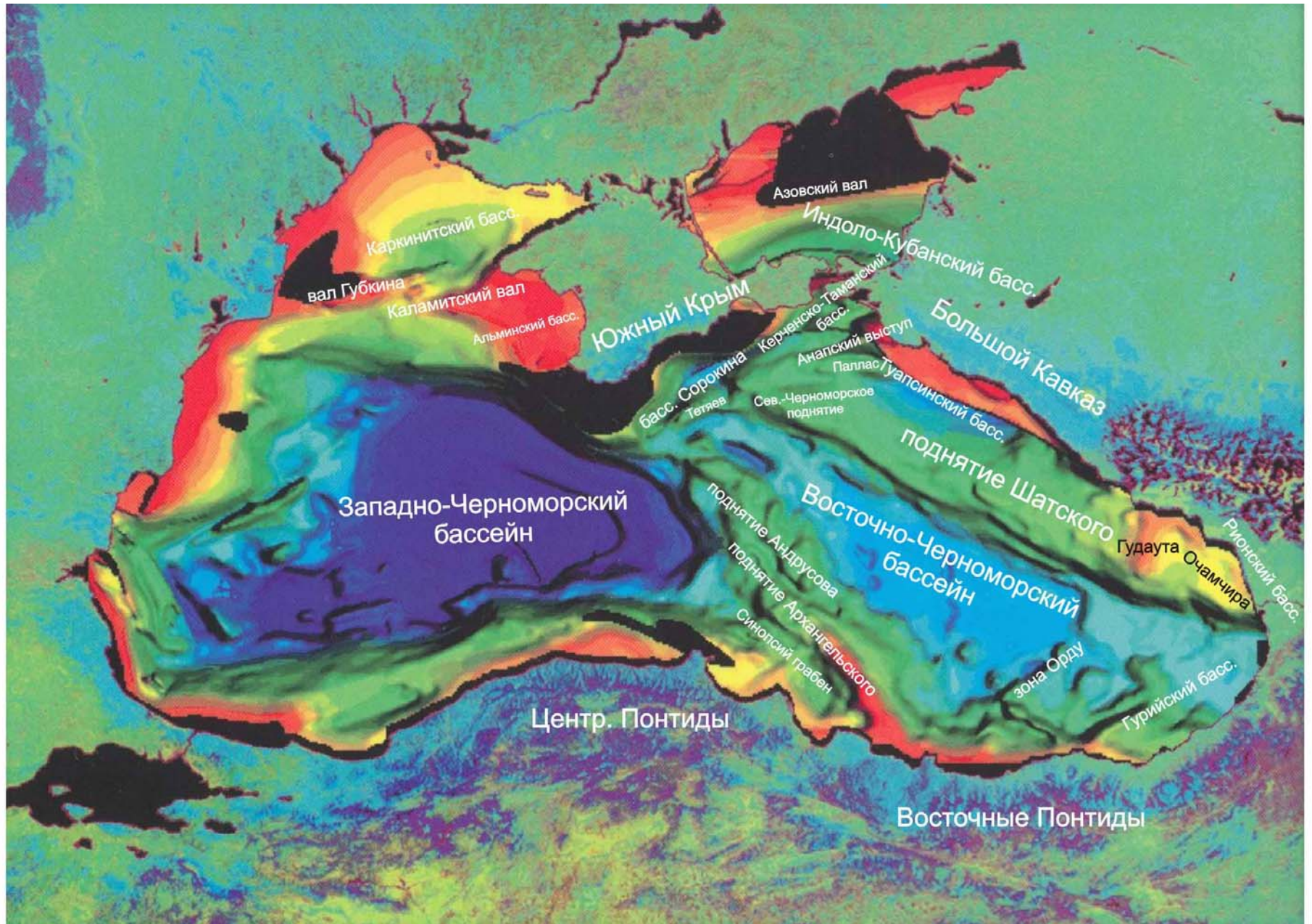


Черное море

Топография дна Черного моря

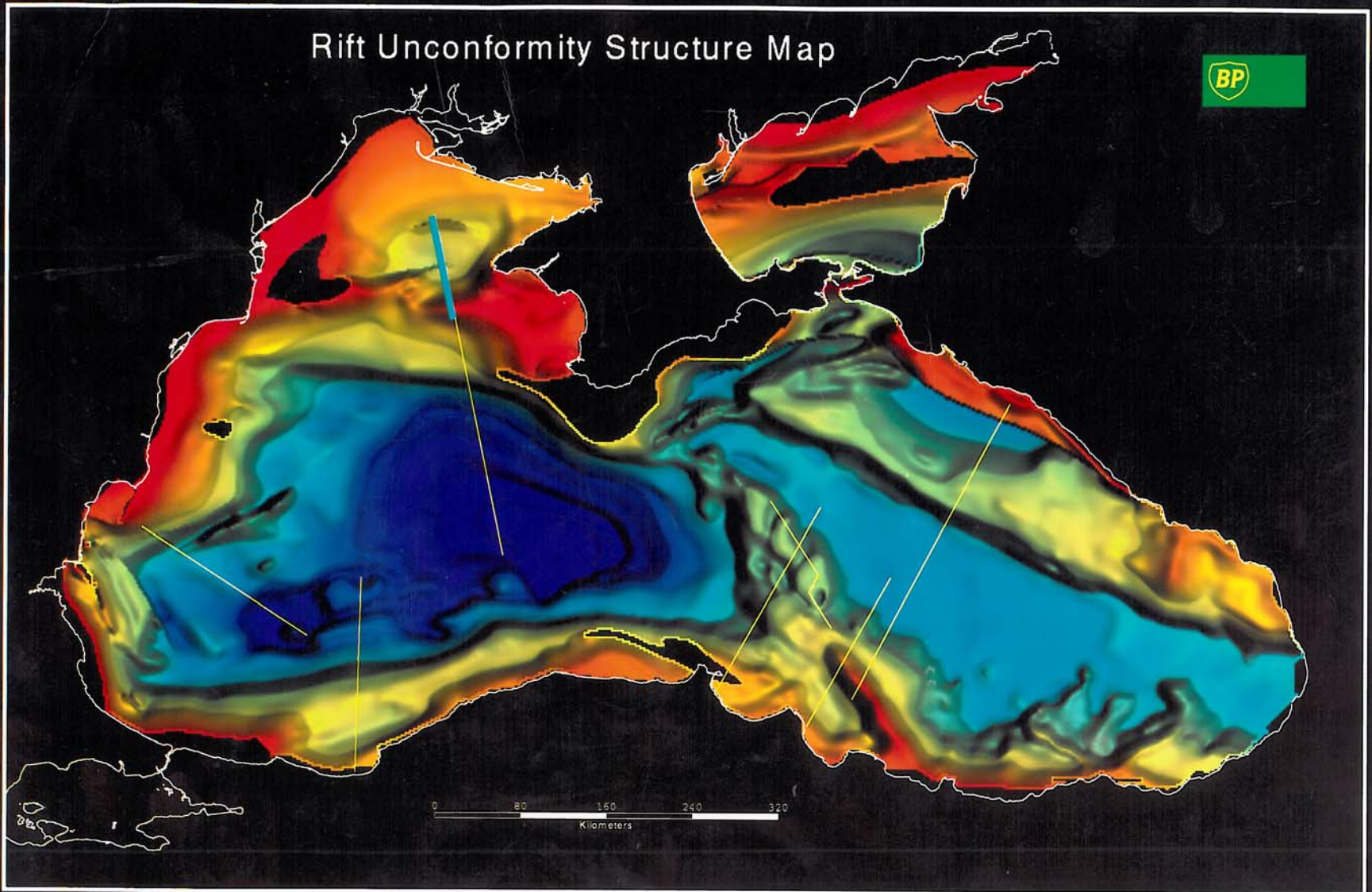


Карта рельефа подошвы осадочного чехла (Robinson)

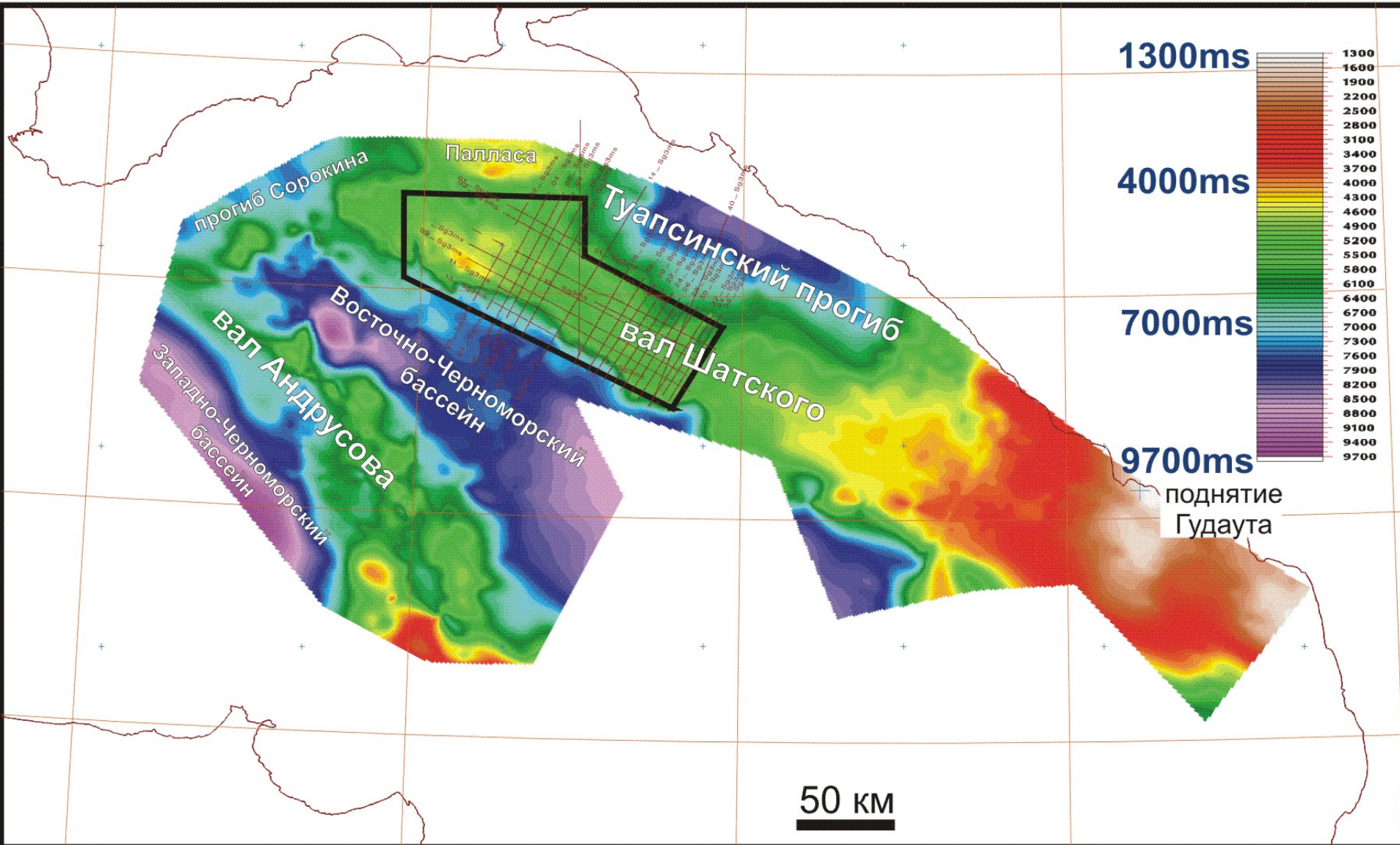


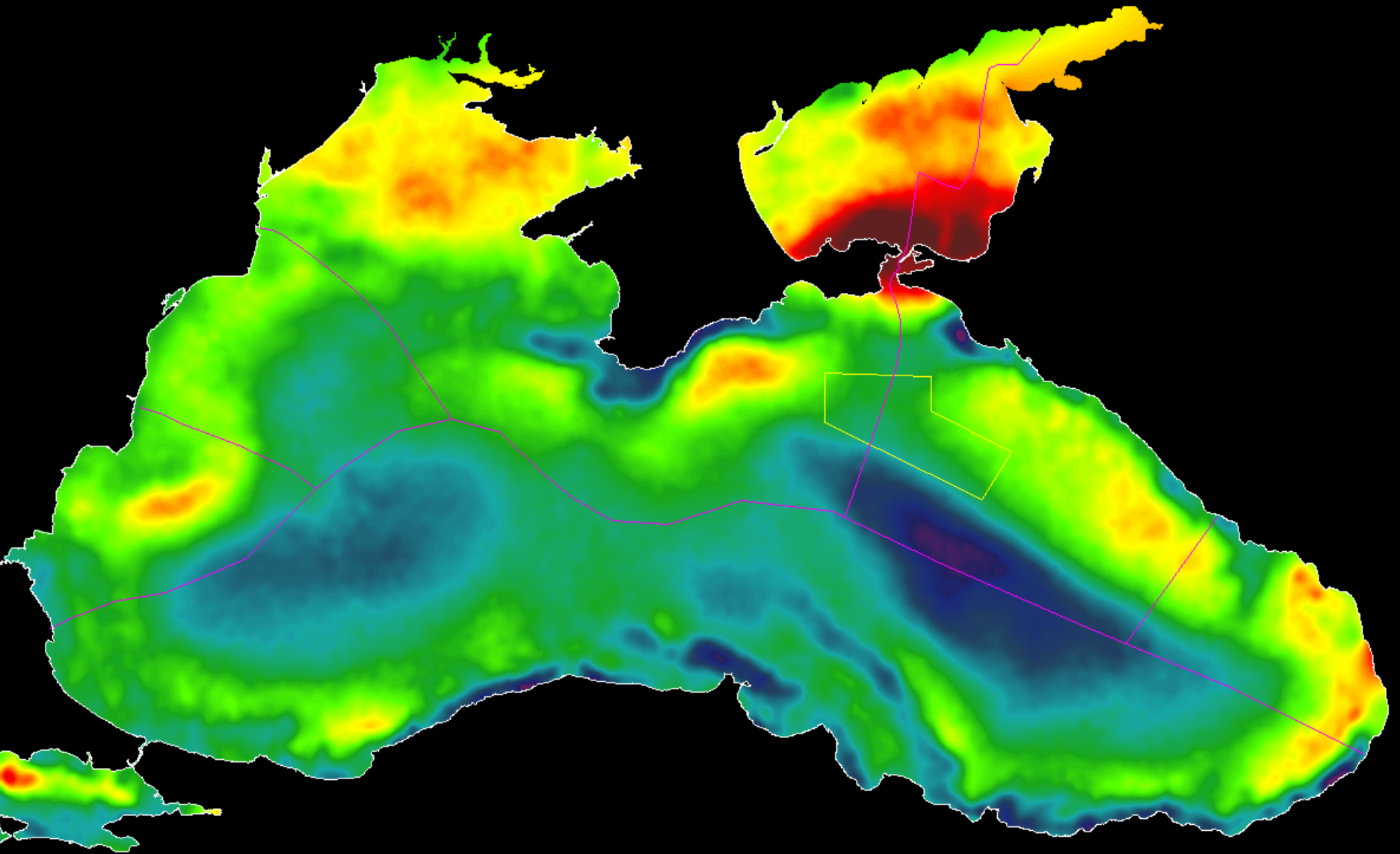
Карта рельефа подошвы осадочного чехла (Robinson)

Rift Unconformity Structure Map

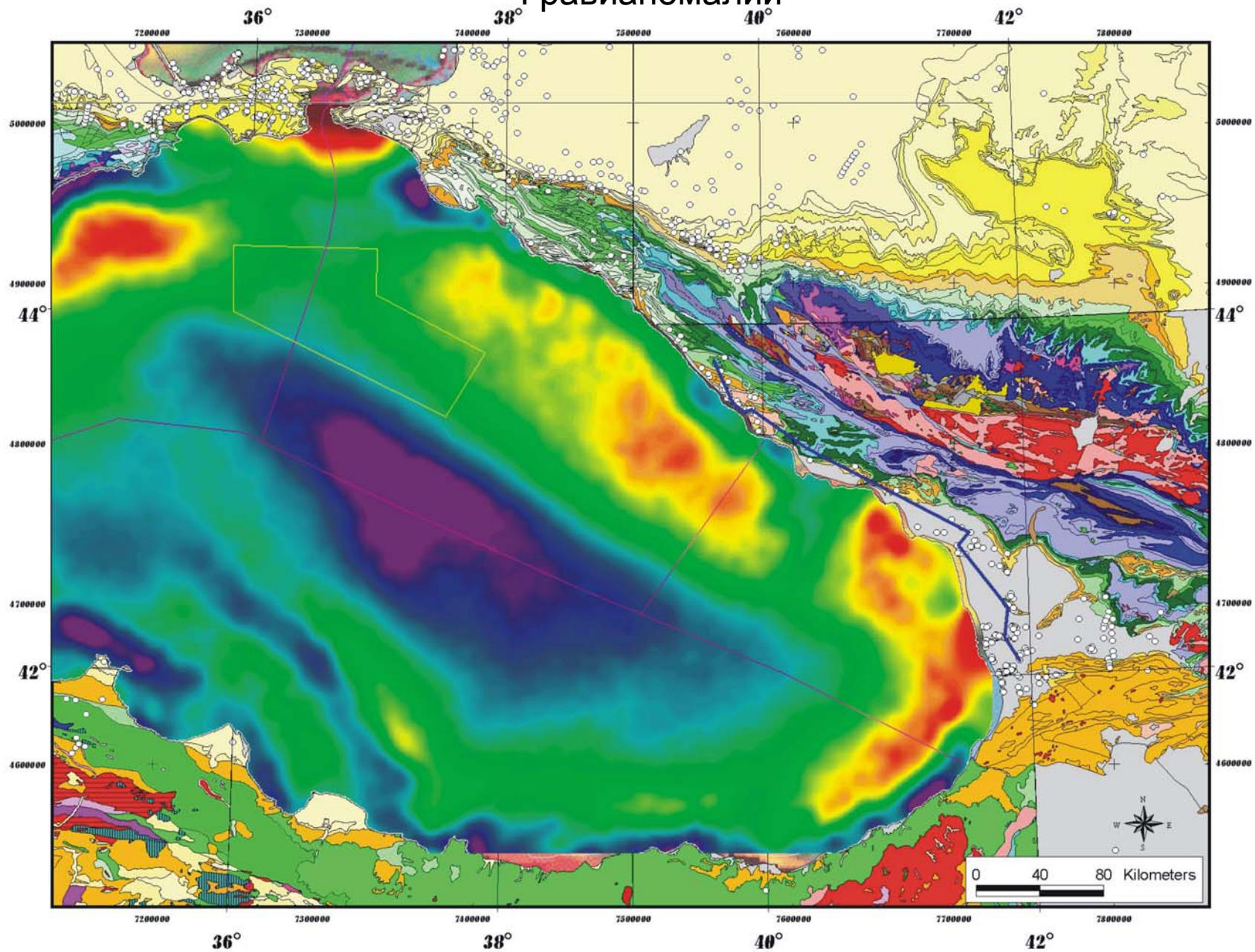


Временная карта поверхности внутриэоценового несогласия (маркера)

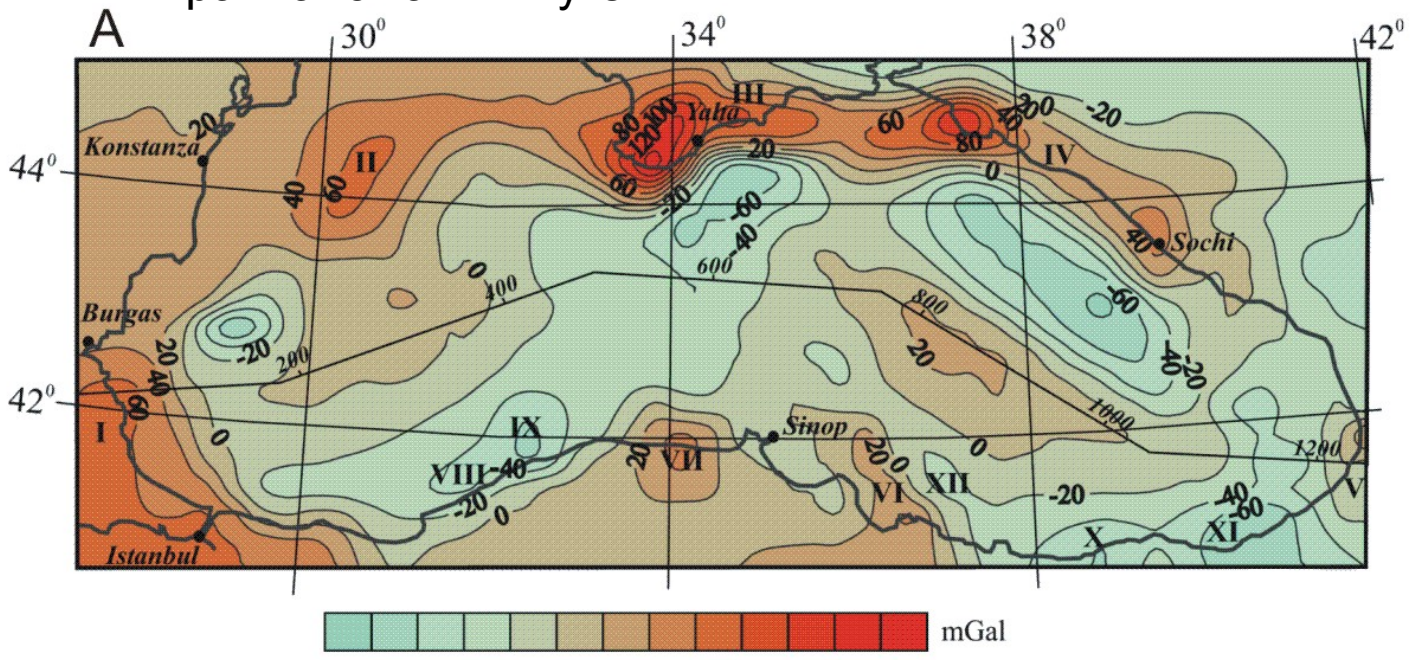




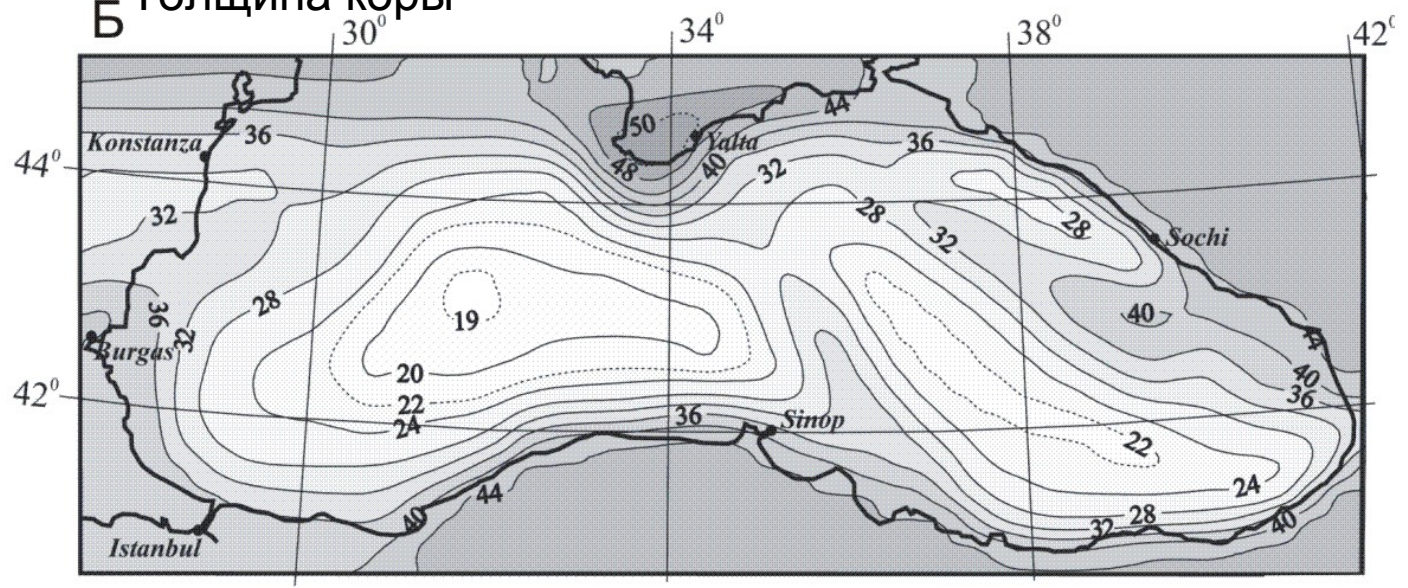
Гравіаномаліи



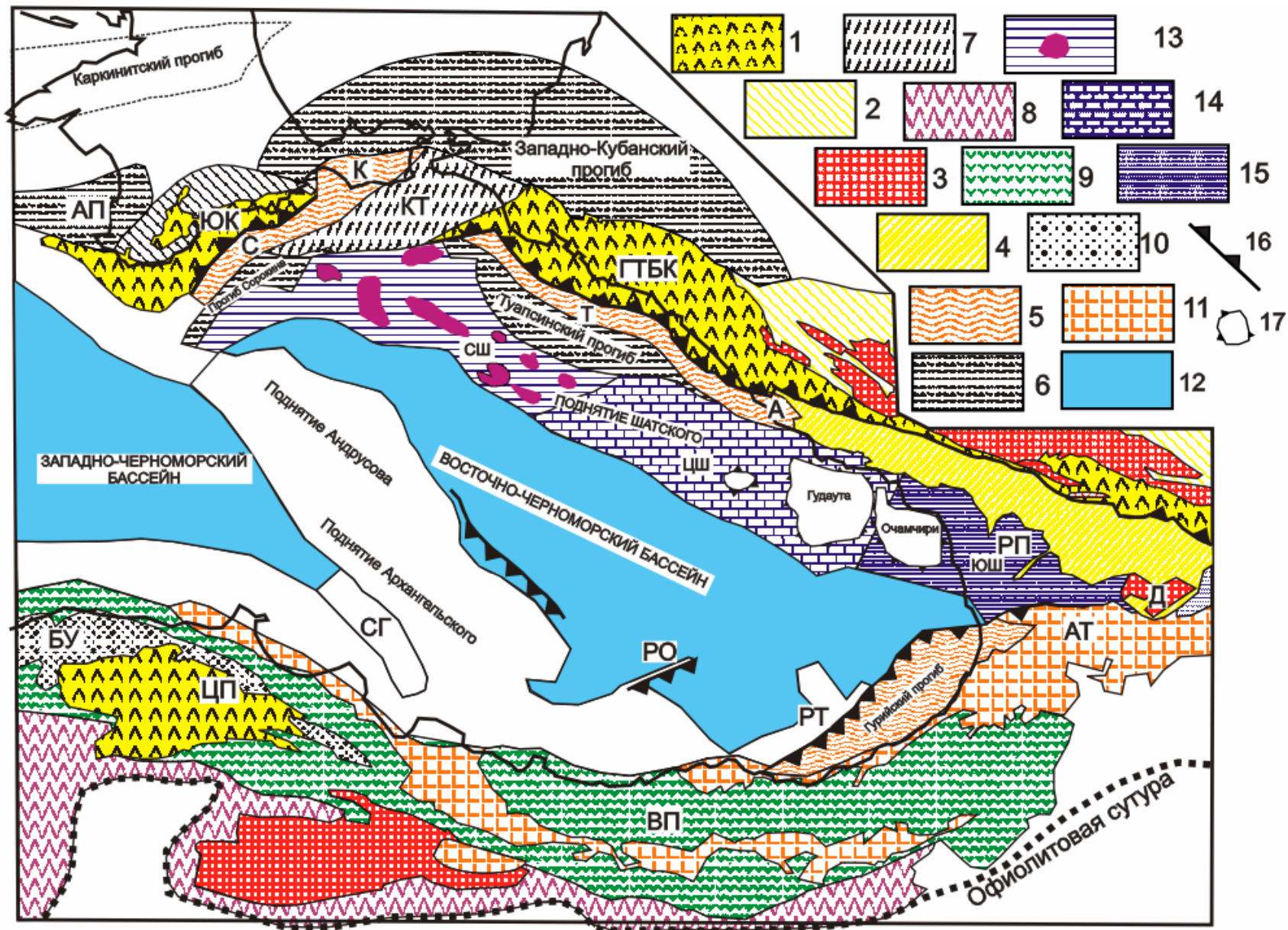
Гравианомалии Буге

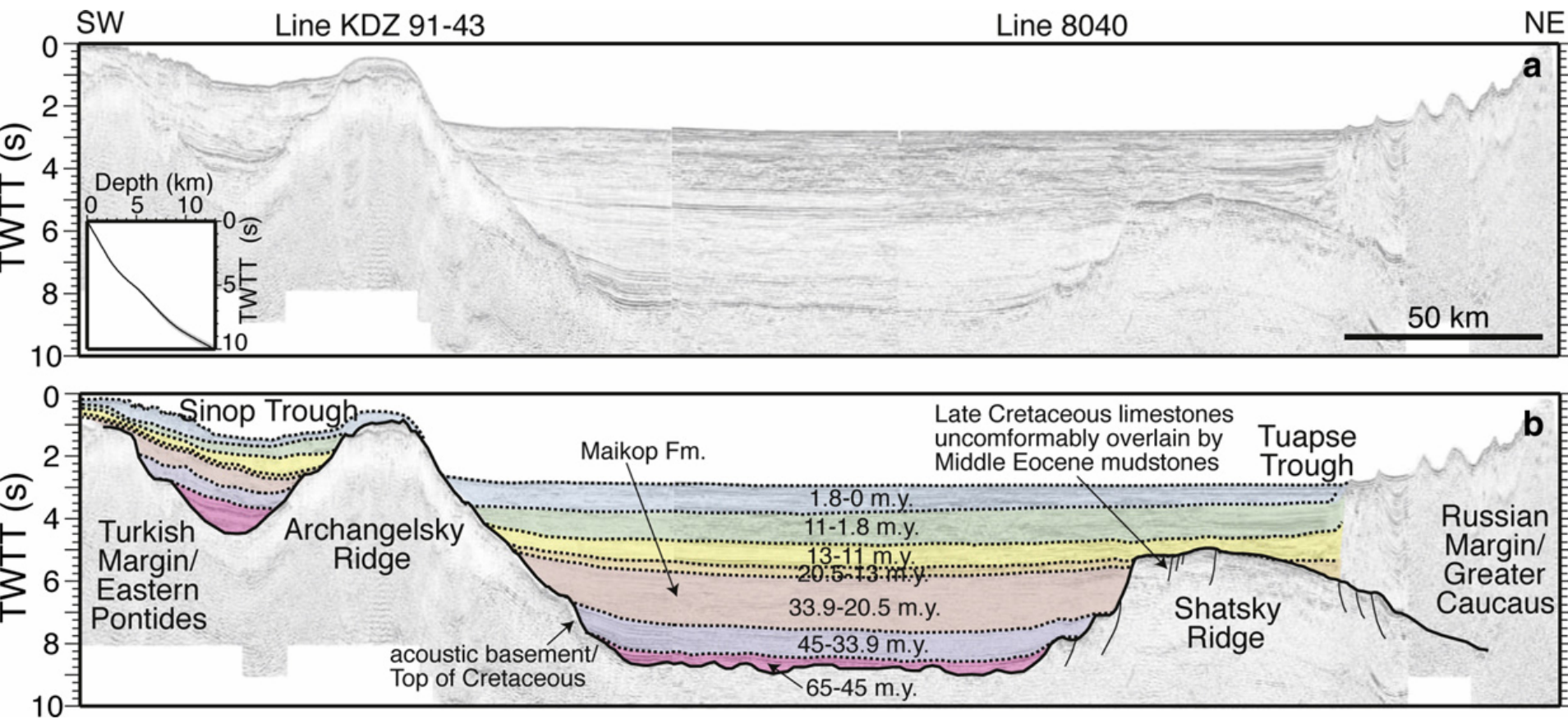


Б Толщина коры



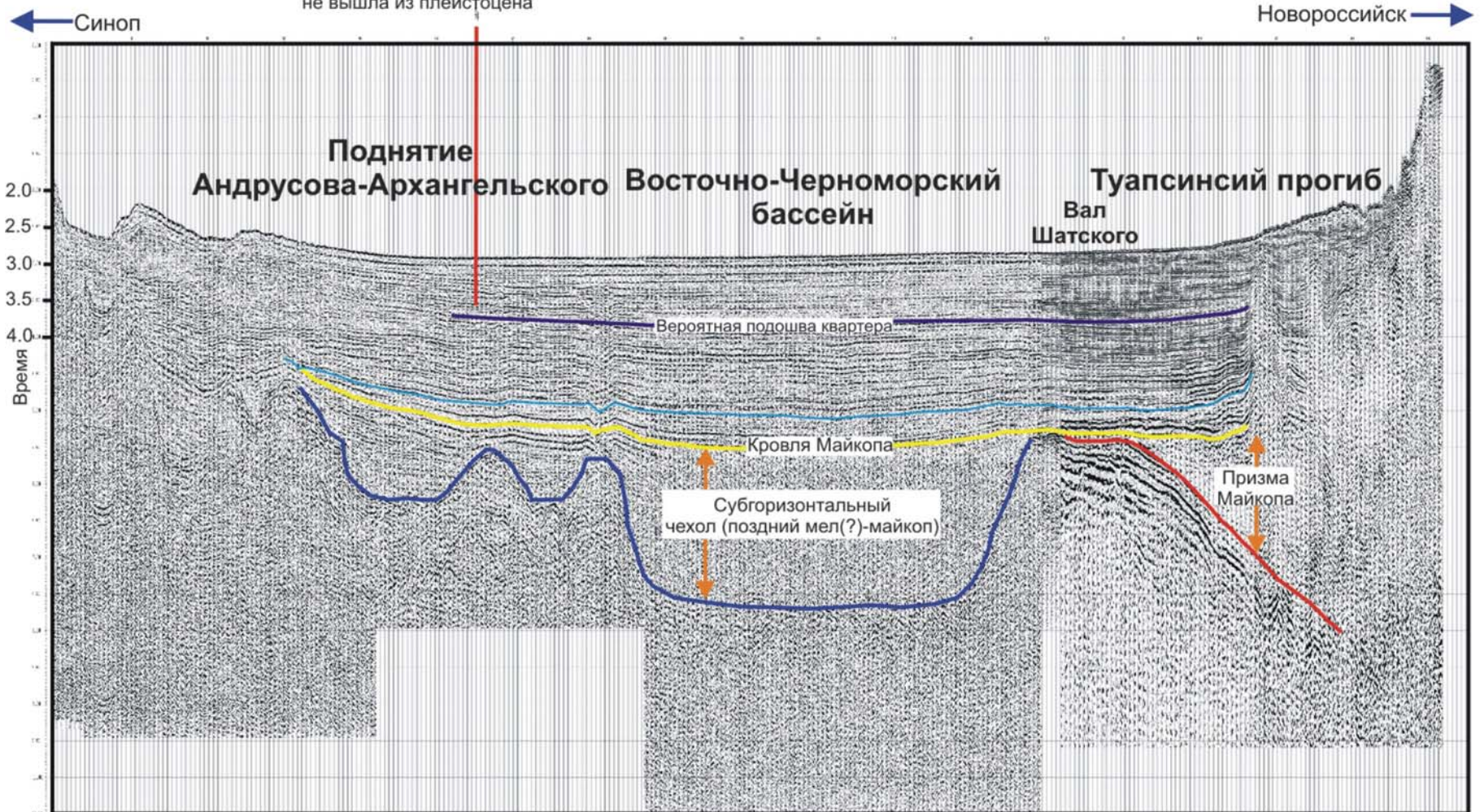
Тектоническая схема Восточно-Черноморского региона

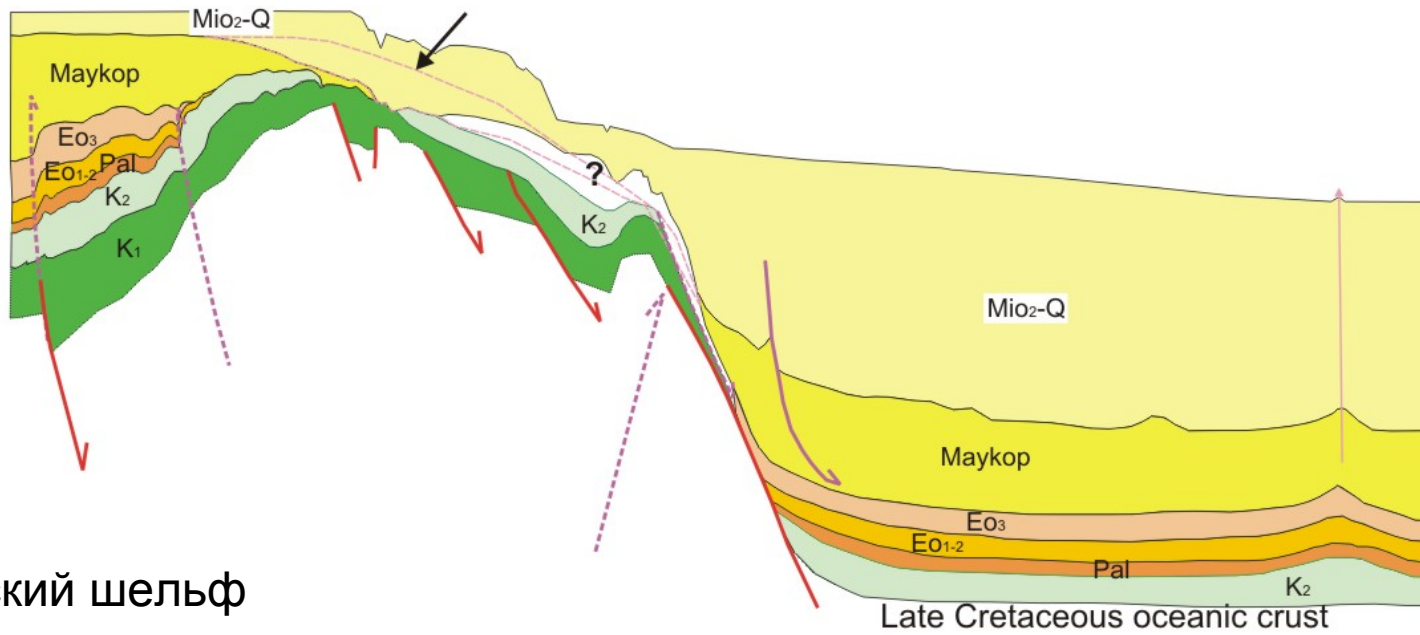




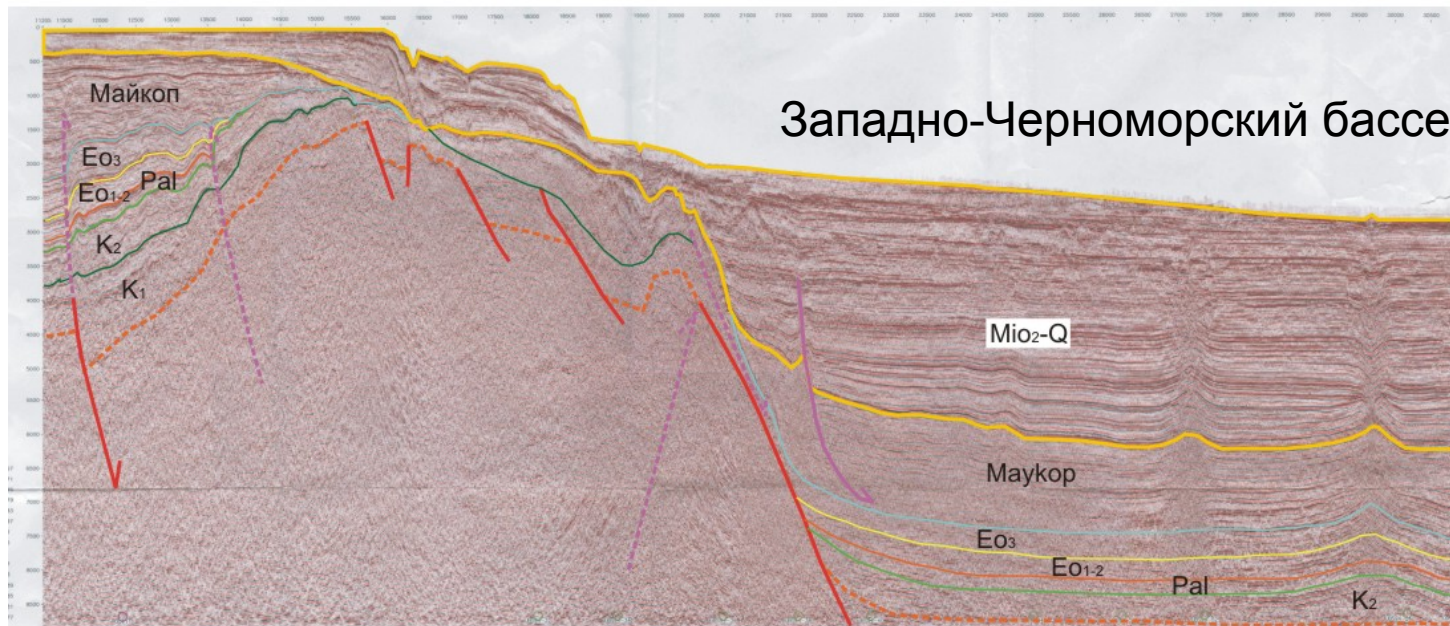
ПОЛОЖЕНИЕ СКВАЖИНЫ DSDP-379 НА РЕГИОНАЛЬНОМ СЕЙСМИЧЕСКОМ ПРОФИЛЕ

Скважина DSDP-379A
Прошла 624.5 метра,
не вышла из плейстоцена

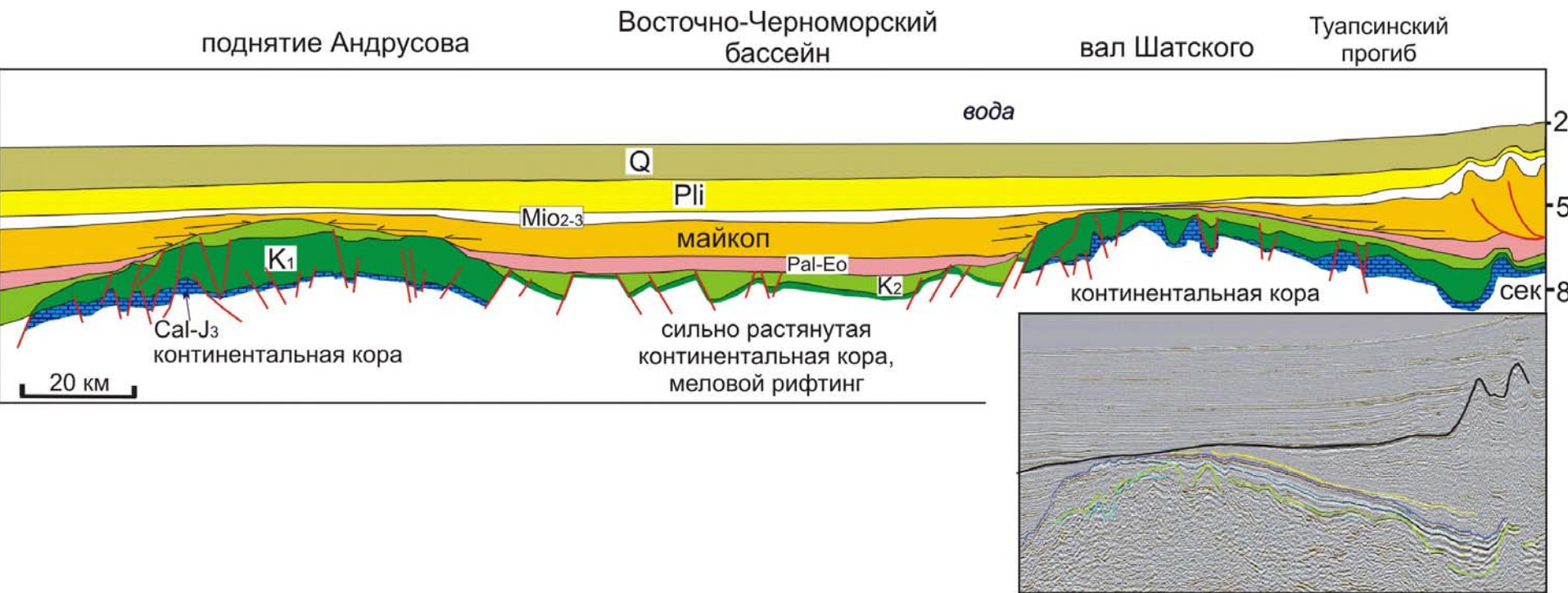




Одесский шельф



Западно-Черноморский бассейн



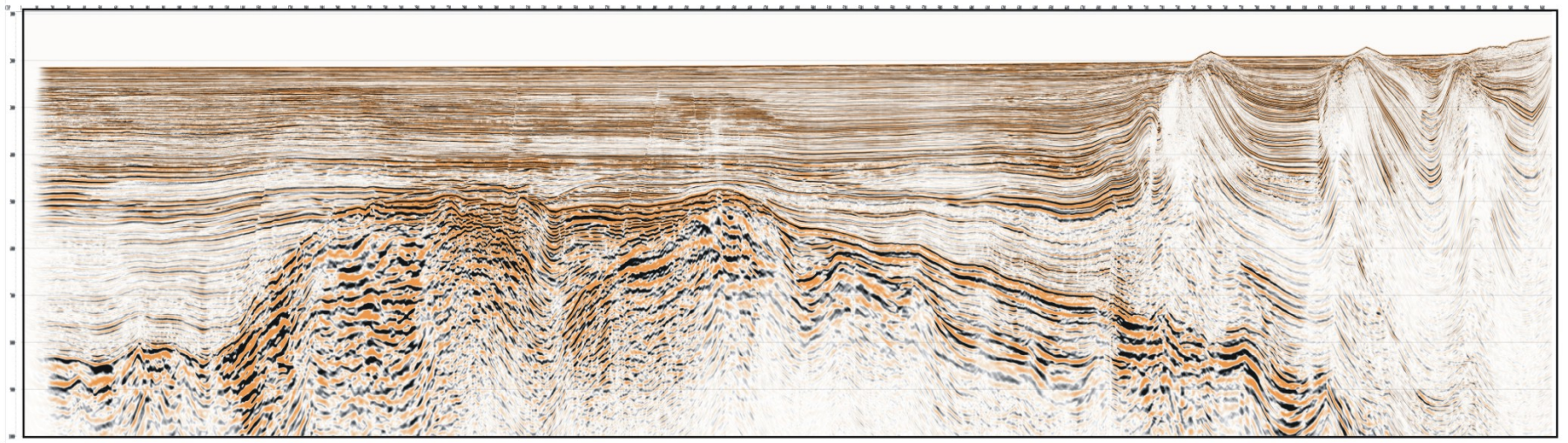
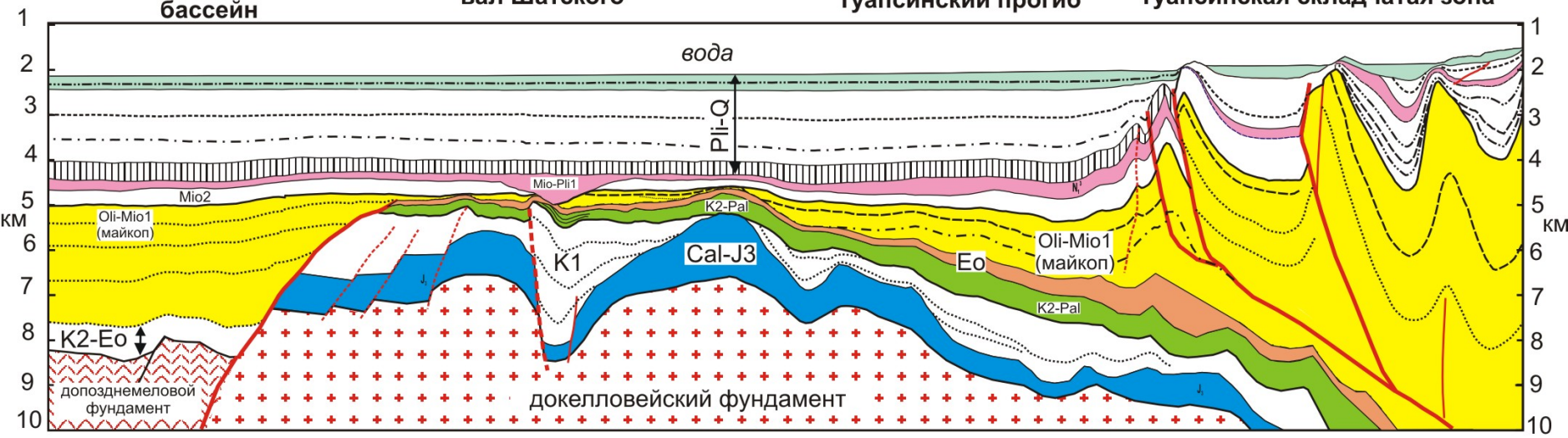
Геленджик →

Восточно-Черноморский бассейн

вал Шатского

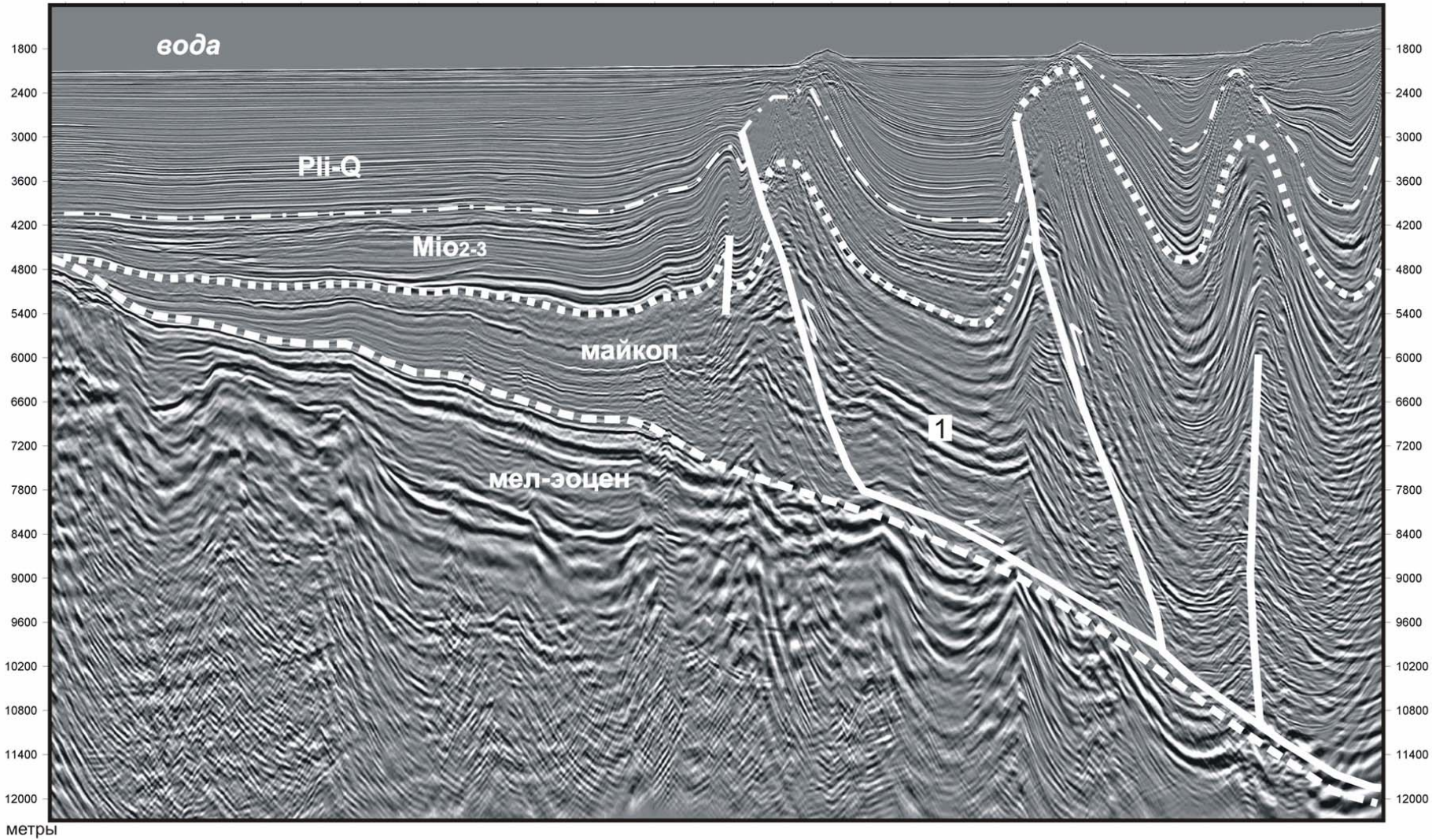
Туапсинский прогиб

Туапсинская складчатая зона



Туапсинский прогиб

Туапсинская складчатая зона



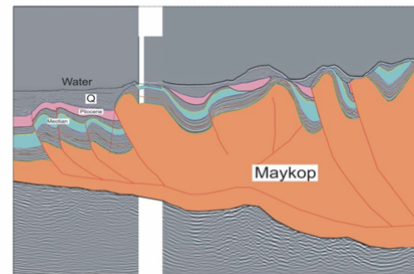
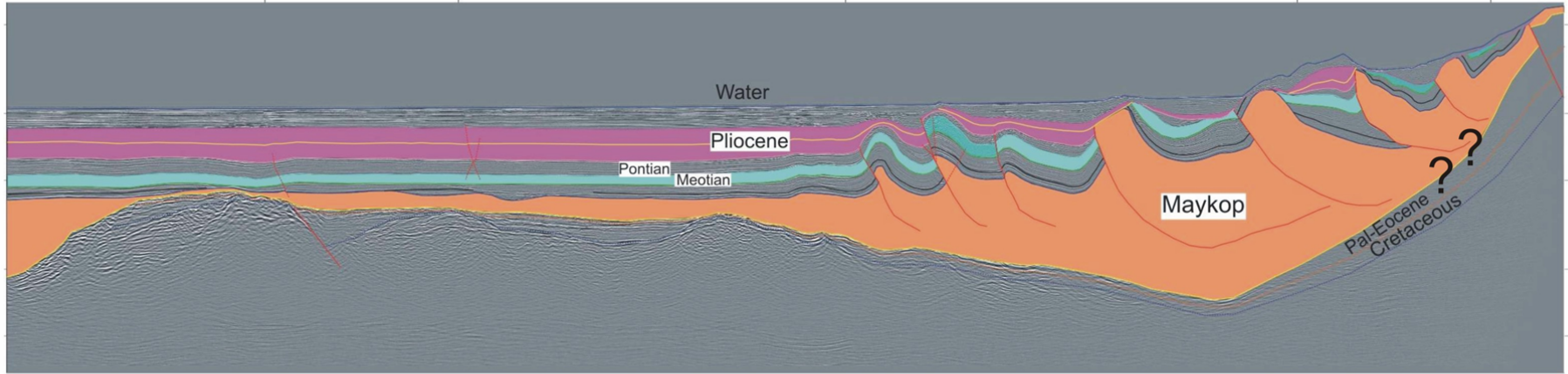
Tuapse Foldbelt and Shatsky Ridge

East-Black
Sea Basin

Shatsky Ridge

Tuapse Basin

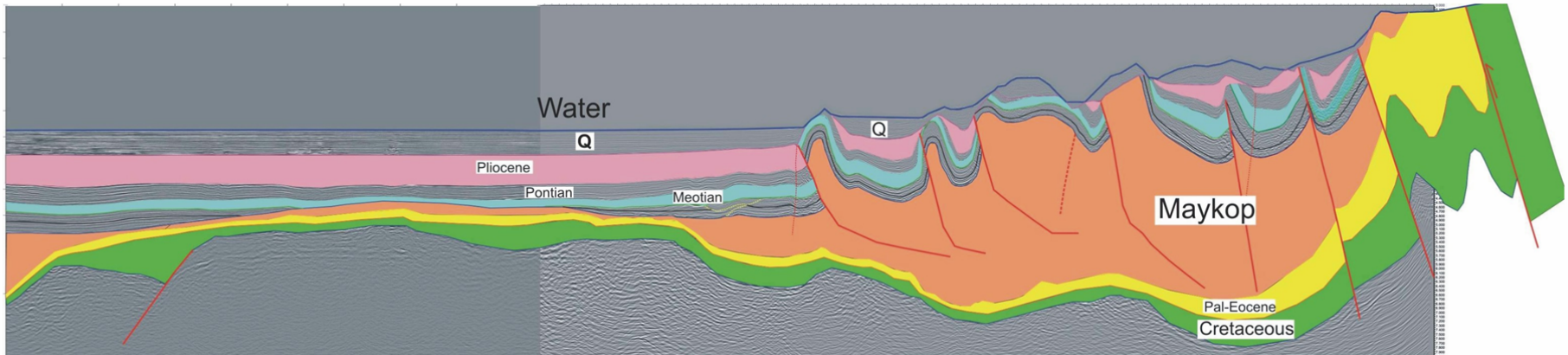
Great
Caucasus



East-Black
Sea Basin

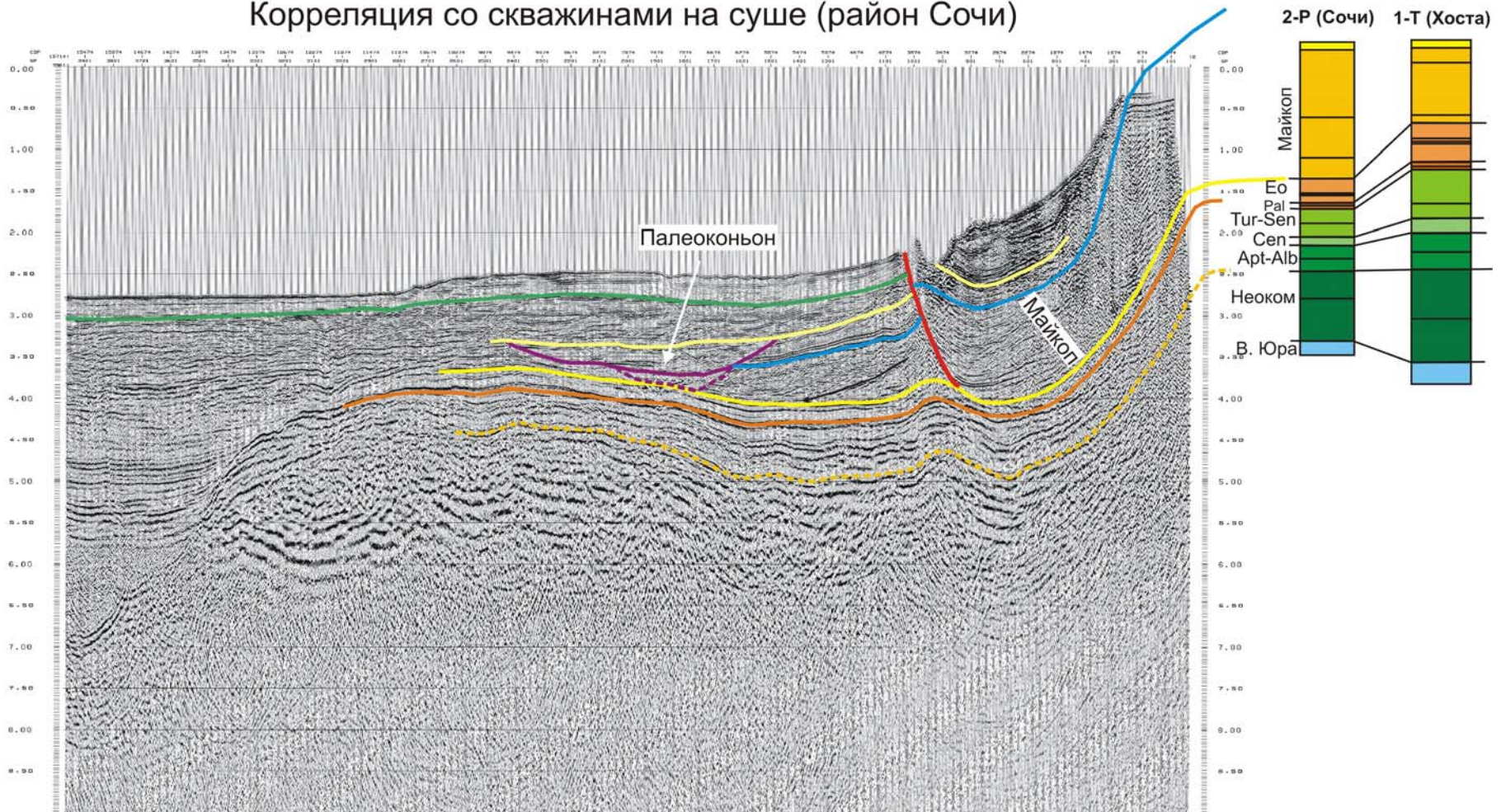
Shatsky Ridge

Great
Caucasus

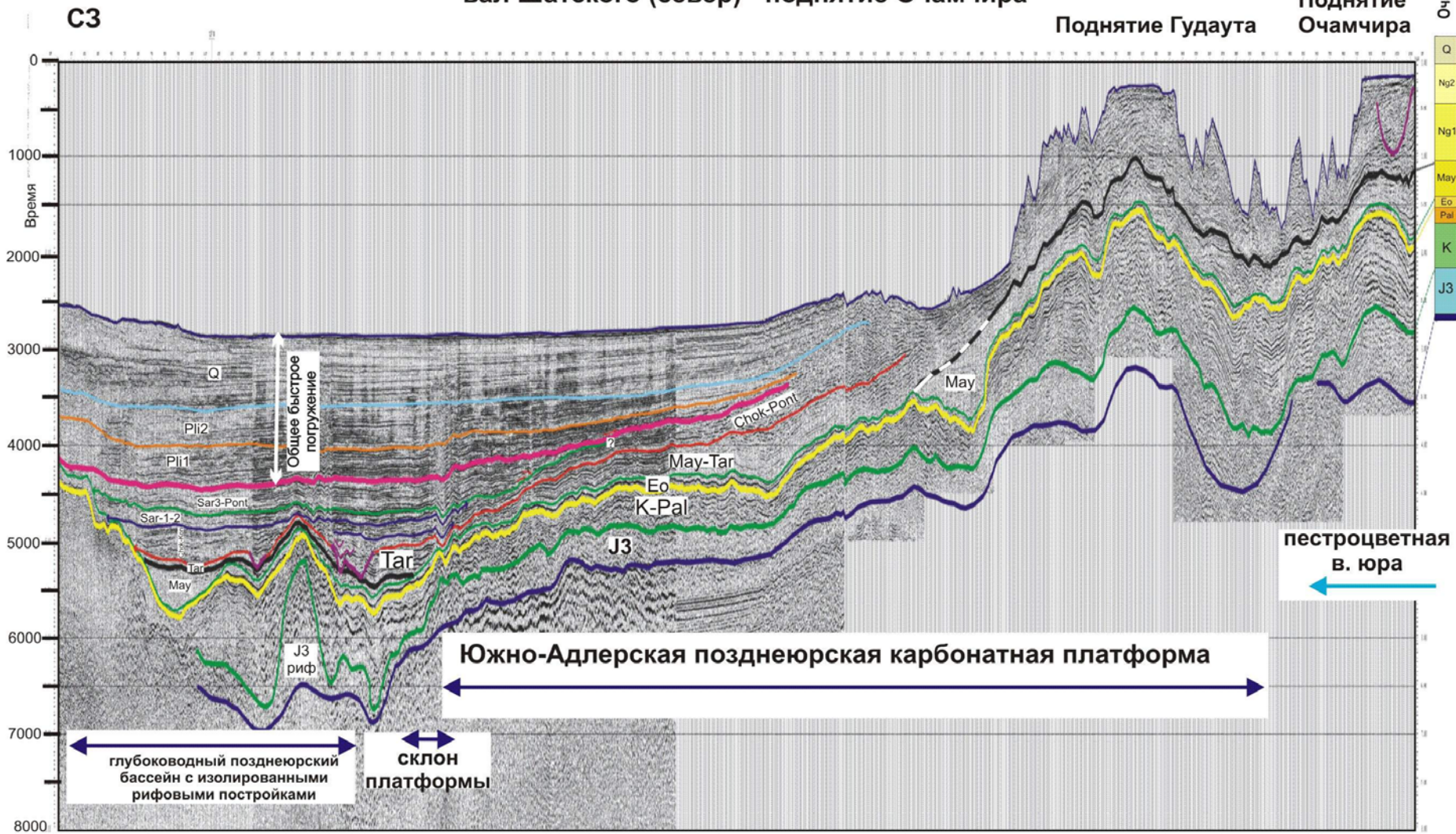


Роснефть

Корреляция со скважинами на суше (район Сочи)



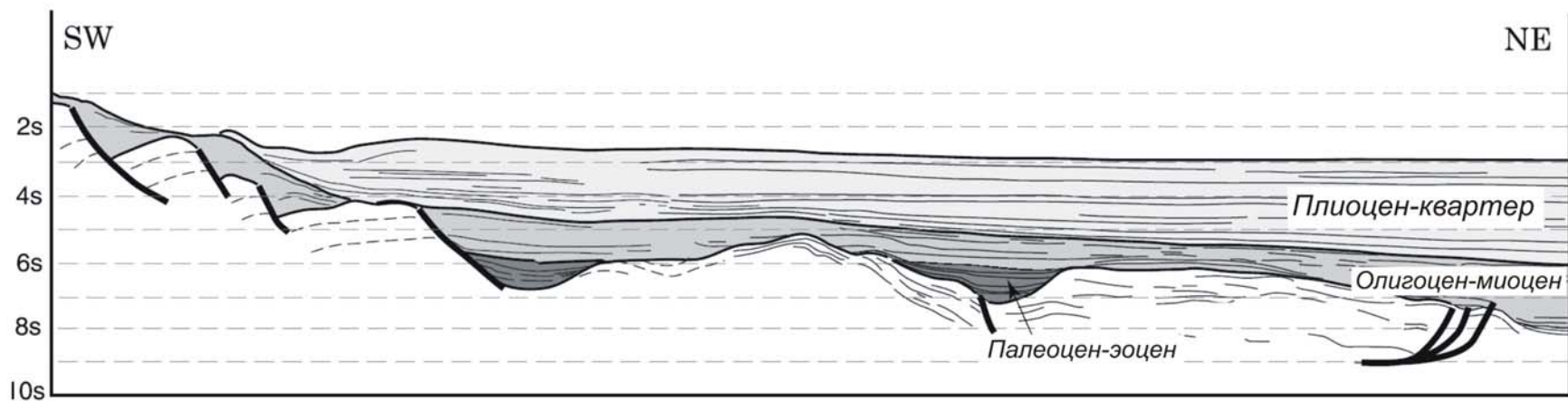
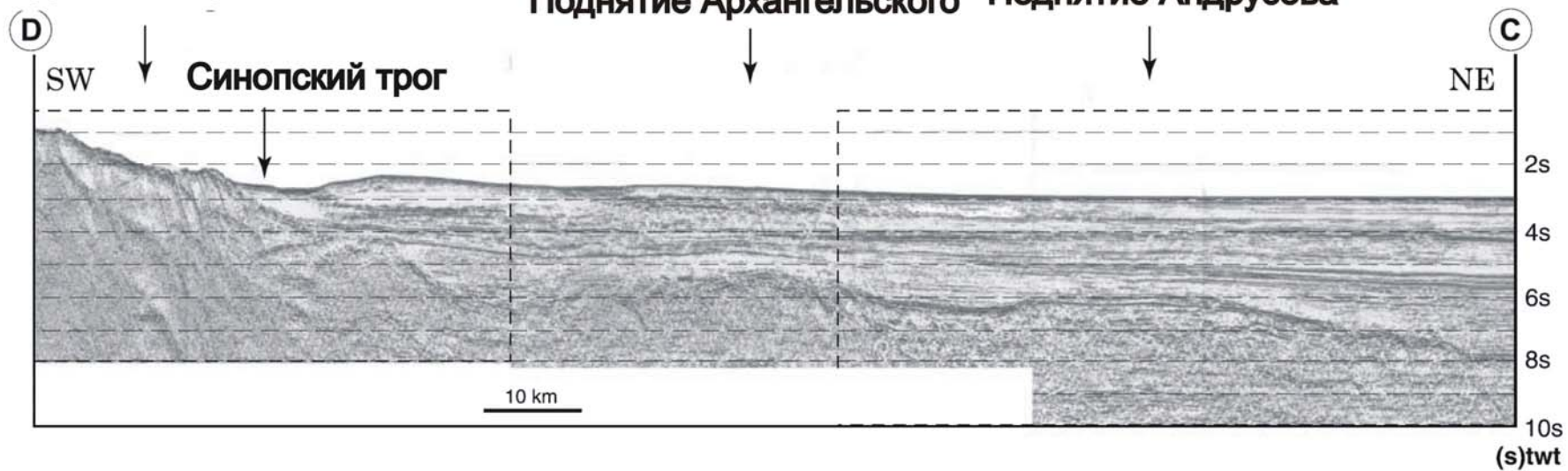
Временной разрез вдоль синтетического сейсмического профиля вал Шатского (север) - поднятие Очамчира

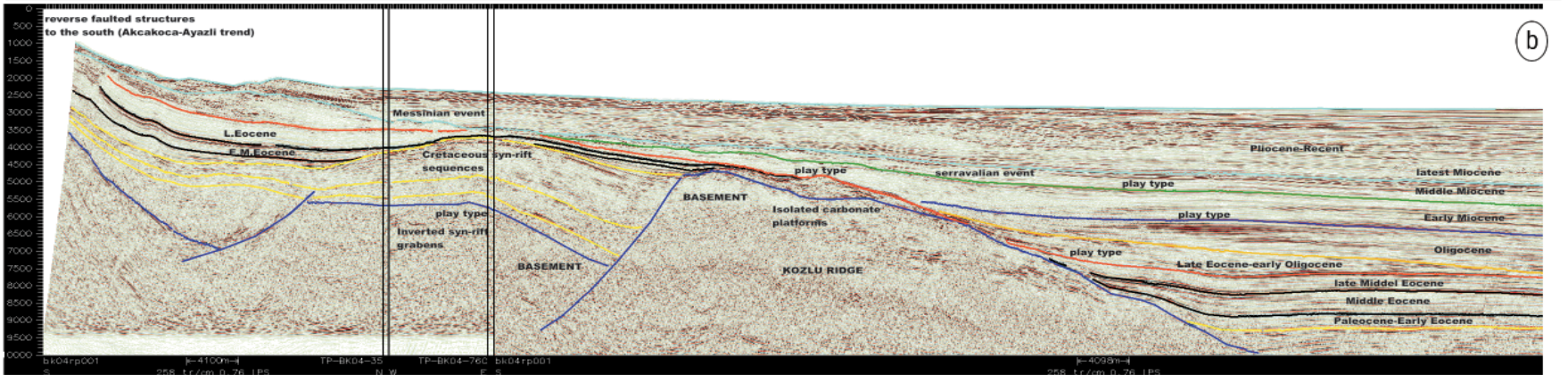
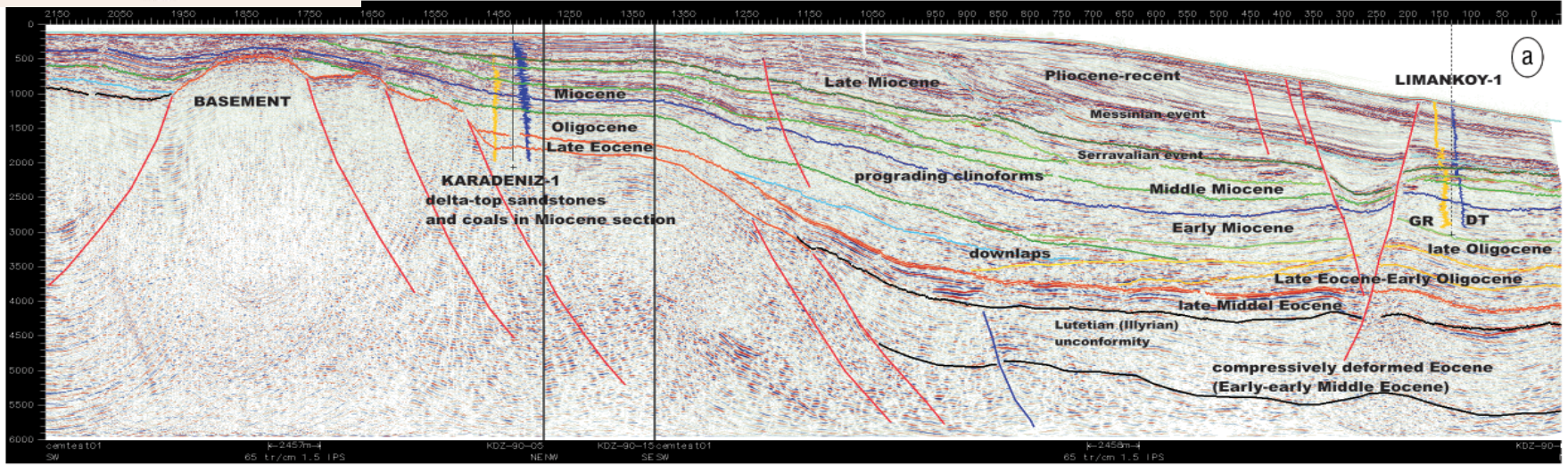
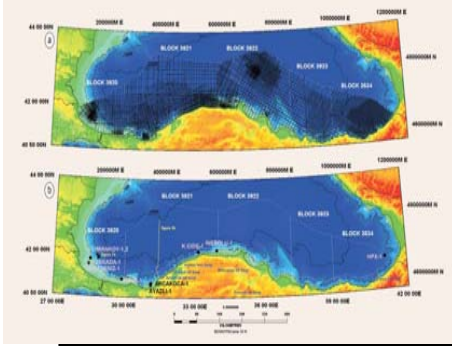


Турецкая окраина

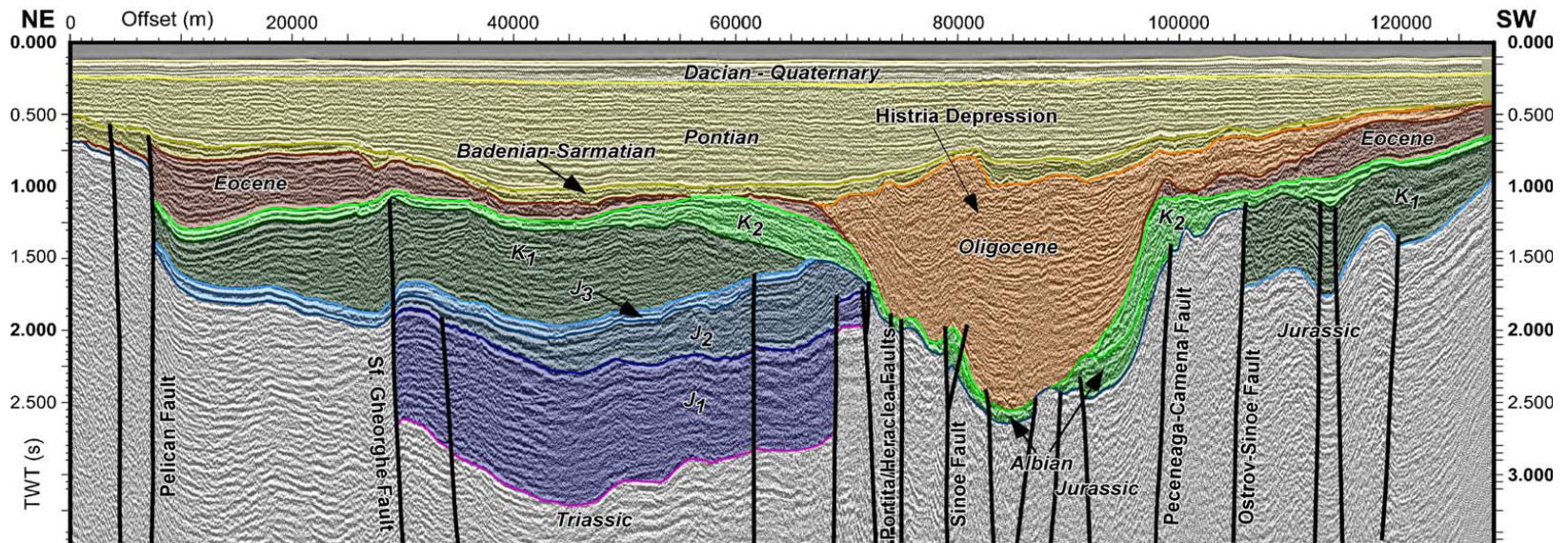
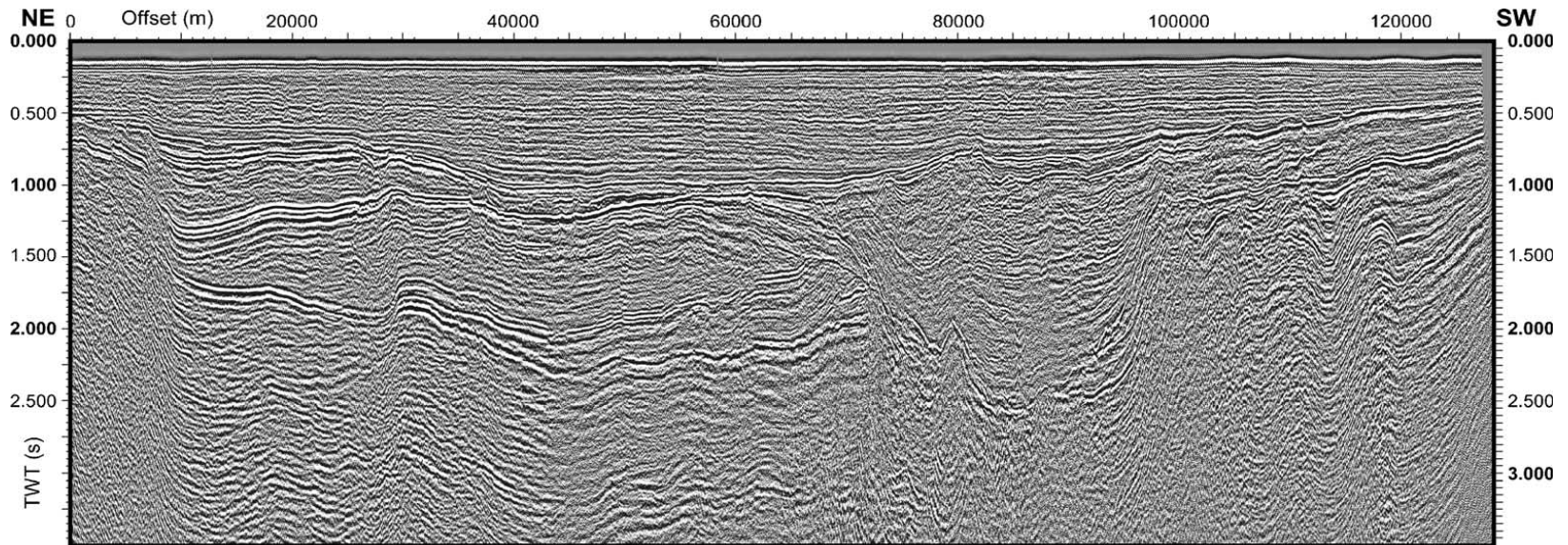
Поднятие Архангельского

Поднятие Андрусова

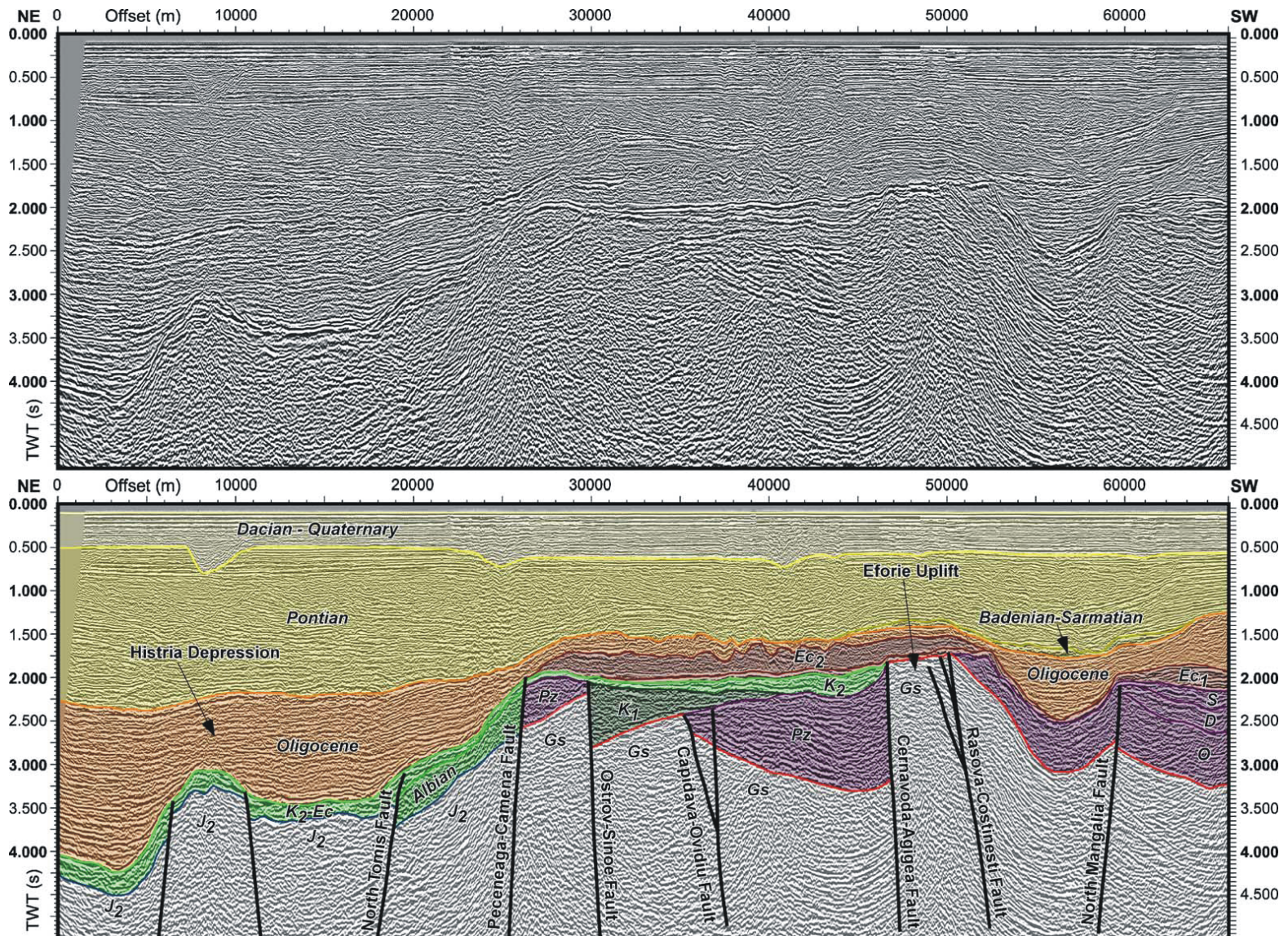




Seismic illustrations of the basin-scale structure and stratigraphy of the southwestern Black Sea margin. (a) Karadeniz-Limankuy line and (b) Akcakoca line. (Location on Figure 1b).

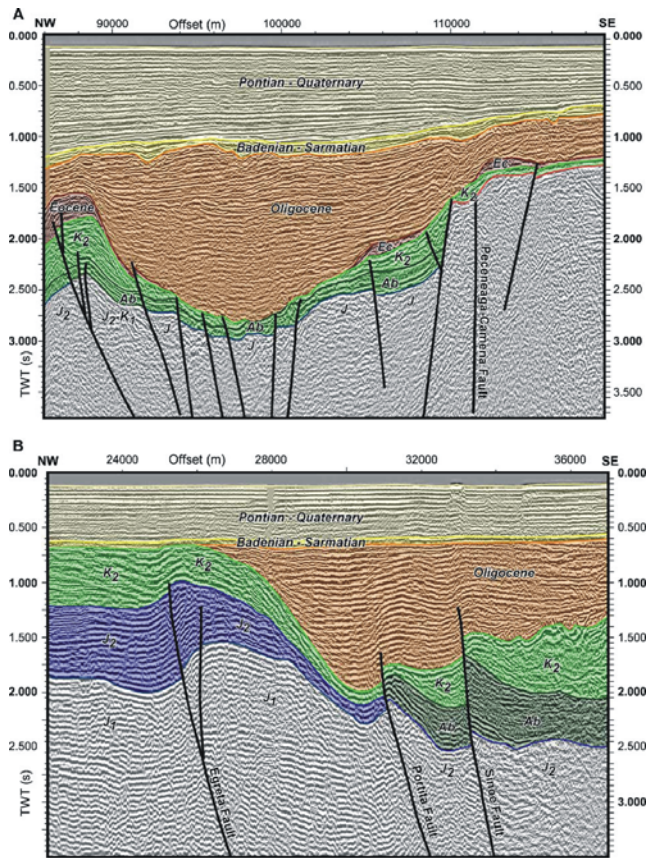


NE–SW seismic line 1 and interpretation. Note the high exaggeration of the vertical scale leading to an apparent subvertical position of faults in the profile. See Fig. 2 for profile location. Gs: greenschist, Tr: Triassic, Jr: Jurassic, Jr1: Lower Jurassic, Jr2: Middle Jurassic, K1: Lower Cretaceous, Ab: Albian, K2: Upper Cretaceous, Eo: Eocene.



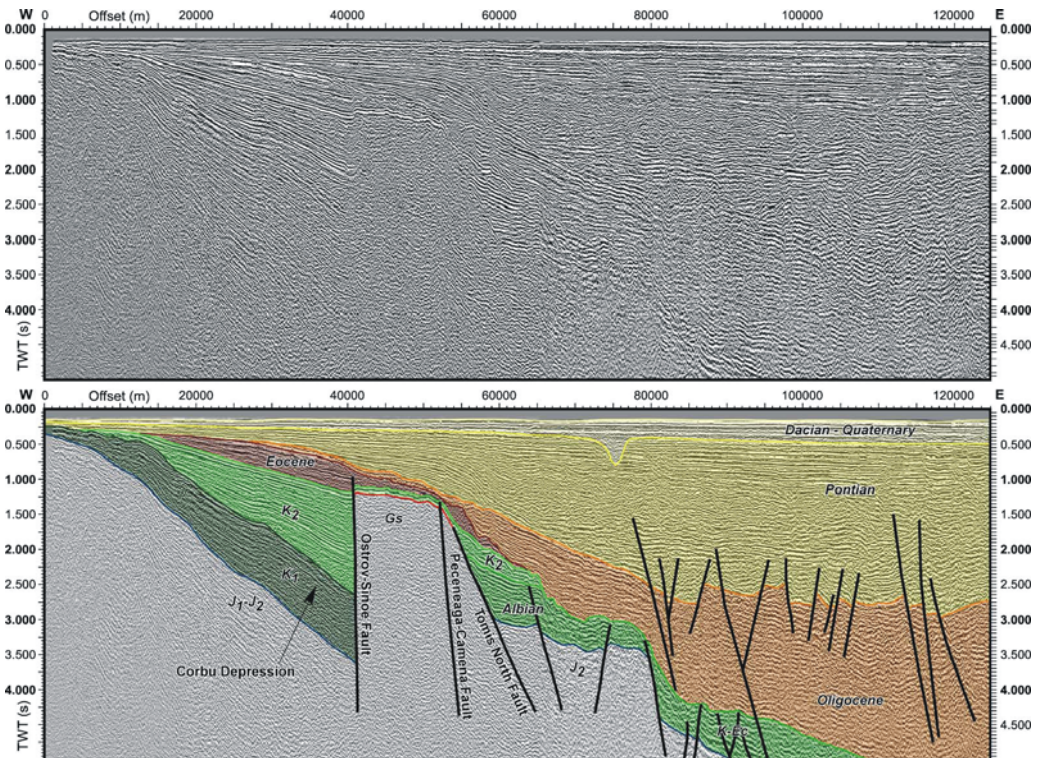
NE–SW seismic line 2 and interpretation. Note the high exaggeration of the vertical scale leading to an apparent subvertical position of faults in the profile. See Fig. 2 for profile location. Pz:

Paleozoic, D: Devonian, O: Ordovician, S: Silurian, Ab: Albian, K–Eo: Cretaceous–Eocene, Eo1: Lower Eocene, Eo2: Upper Eocene.



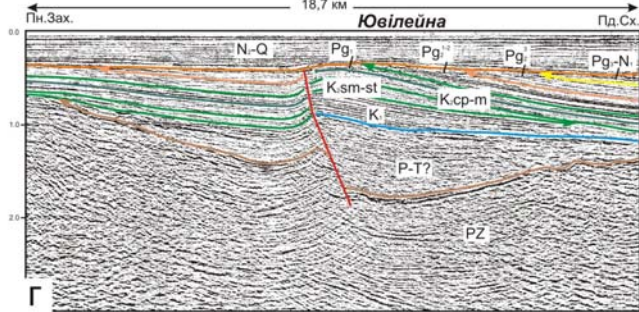
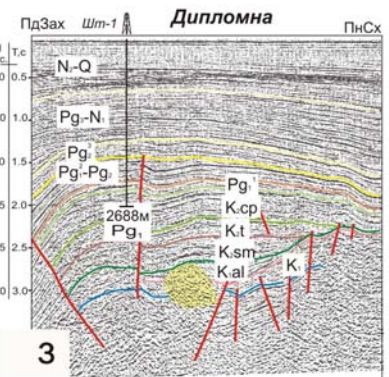
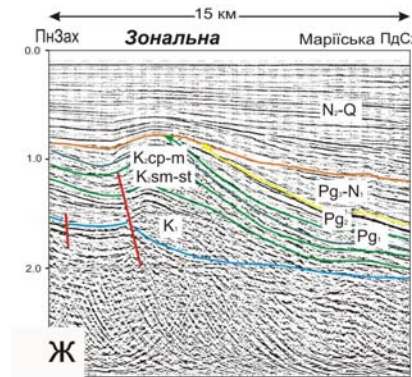
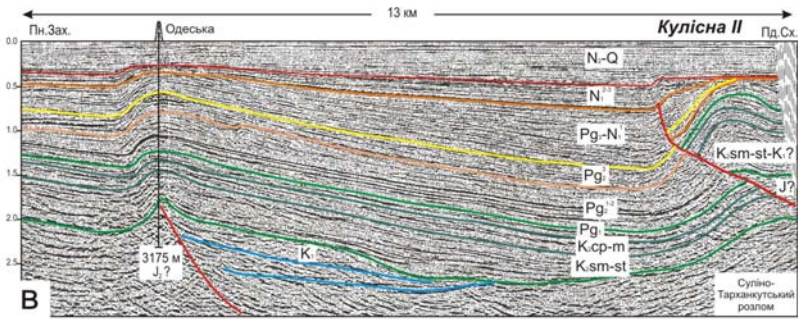
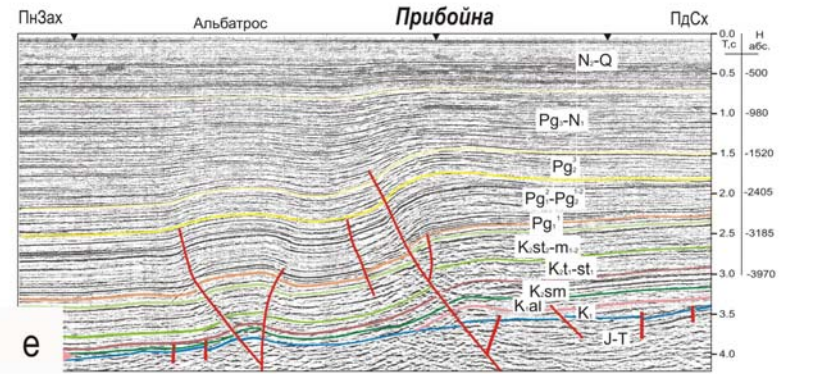
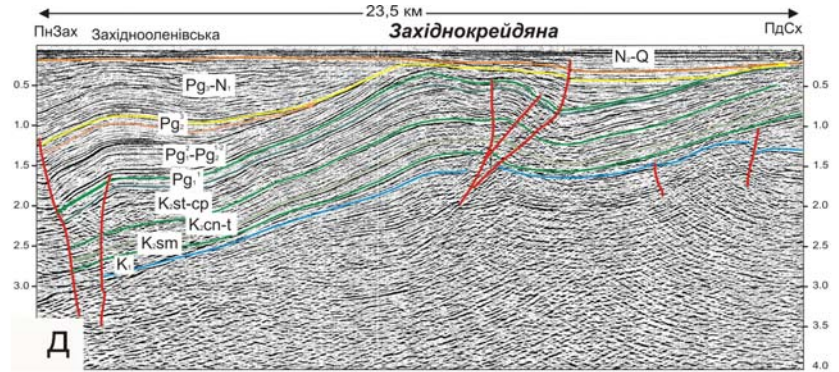
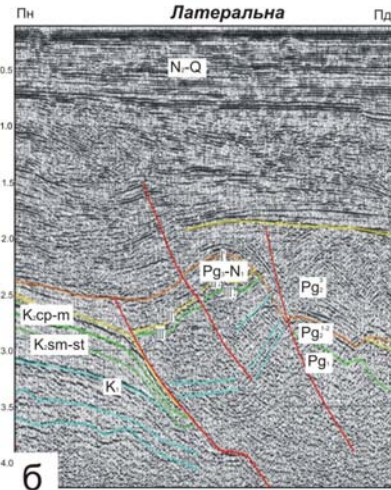
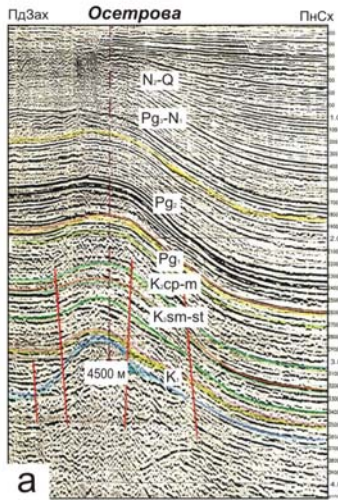
A. NW–SE seismic line 3 and interpretation. See Fig. 2 for profile location. Jr: Jurassic, Jr2–K1: Middle Jurassic–Lower Cretaceous, Ab: Albian, K2: Upper Cretaceous, Eo: Eocene; B. NW–SE seismic line 4 and interpretation. See Fig. 2 for profile location. Jr1: Lower Jurassic, Jr2: Middle Jurassic, Ab: Albian, K2: Upper Cretaceous.

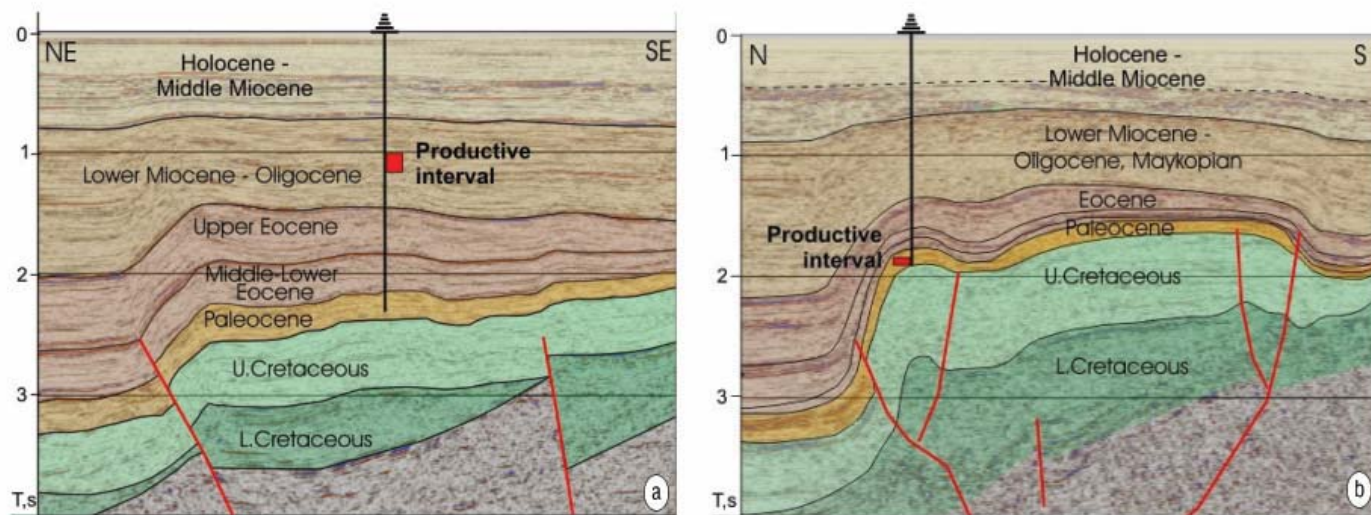
C



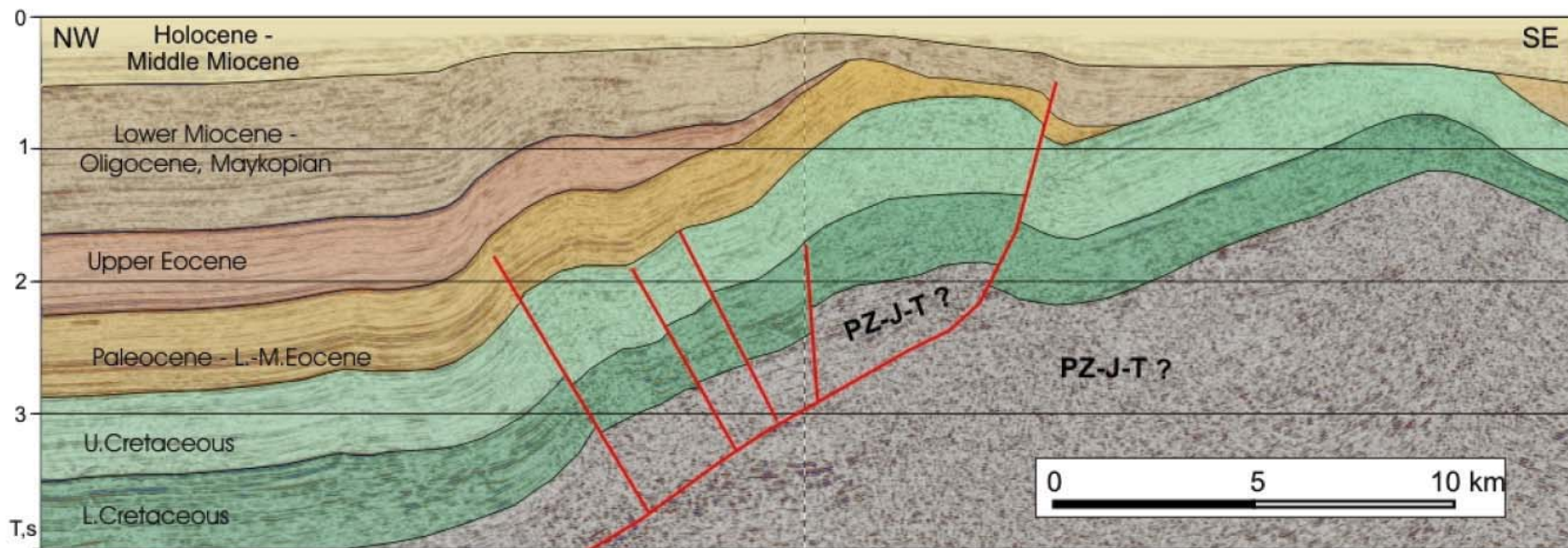
W–E seismic line 6 and interpretation. Note the high exaggeration of the vertical scale leading to an apparent subvertical position of faults in the profile. See Fig. 2 for profile location. Jr: Jurassic, K: Cretaceous, Eo: Eocene.

Одесский шельф (Стовба, Хрящевская и др.)



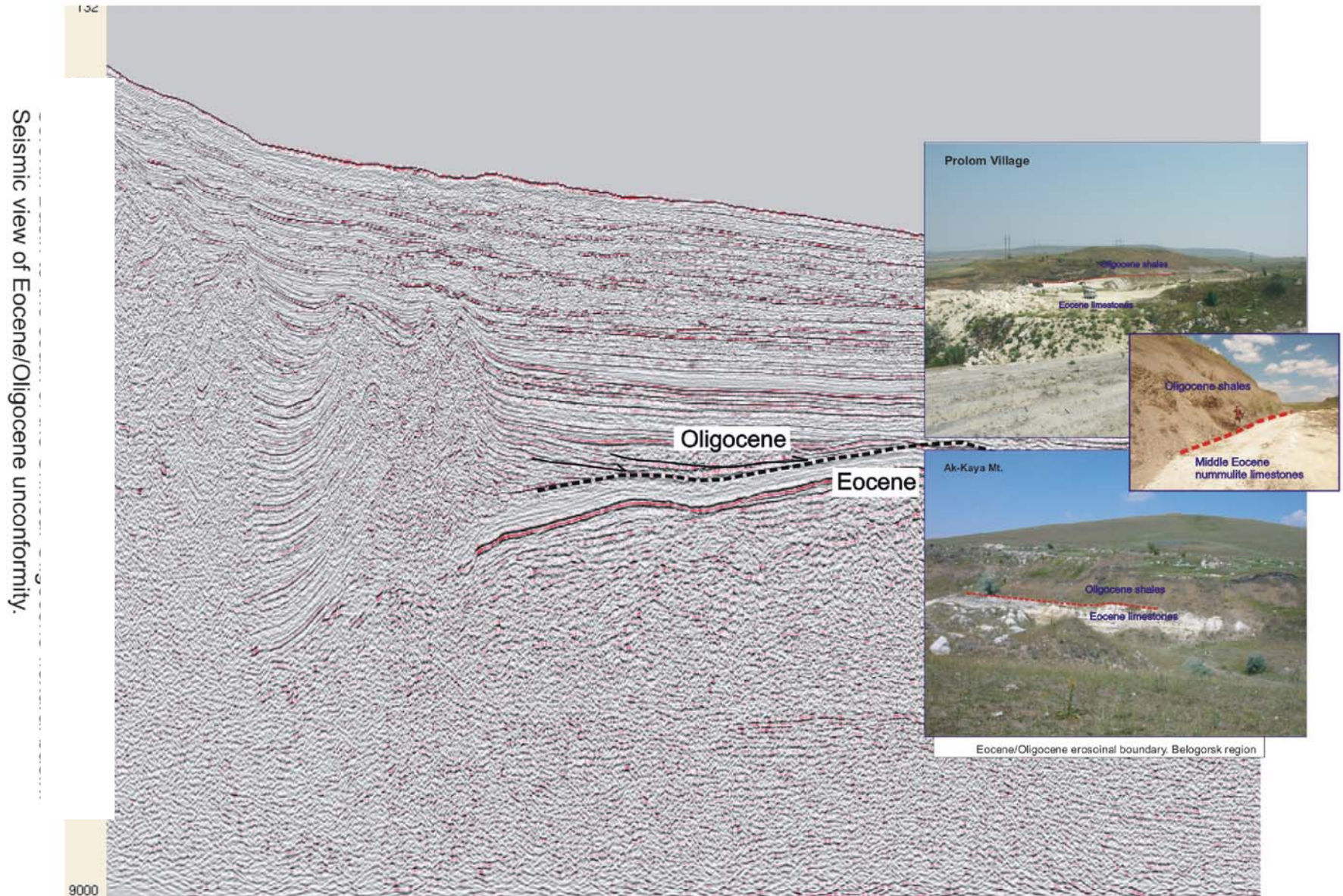


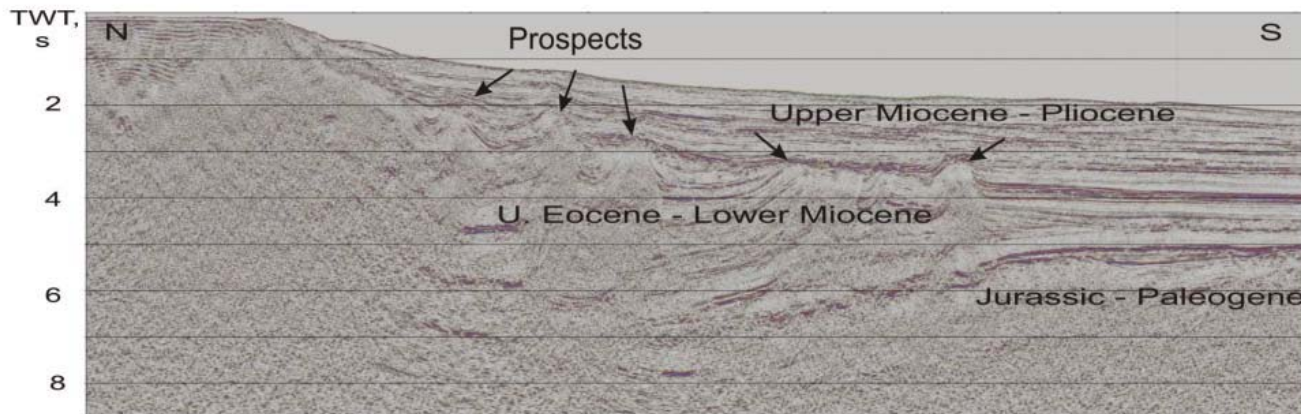
Typical inverted structures of the Odessa Shelf: (a) Krymskaya; (b) Shtormovaya.



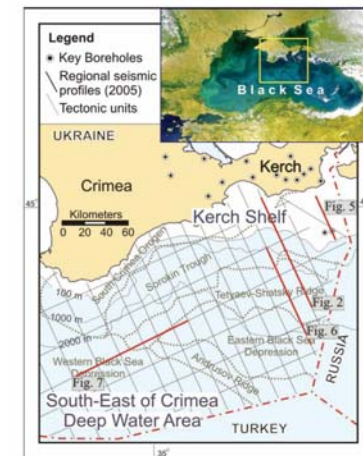
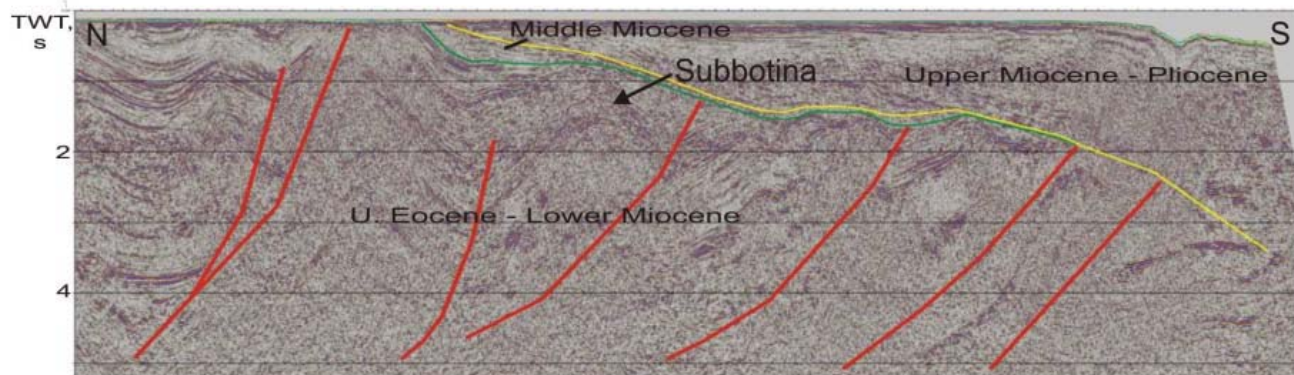
Structure of Zahidno-Kreydyana prospect (location on Figure 1).

Прогиб Сорокина, майкоп образует краевой прогиб

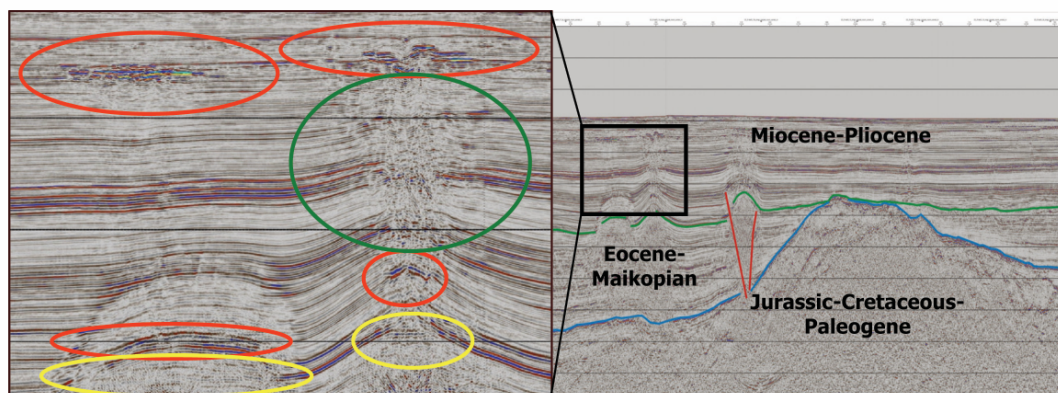




Regional seismic section. For location, see Figure 1.



Typical seismic expression of prospects and leads in the Kerch Shelf area. For location see Figure 1.

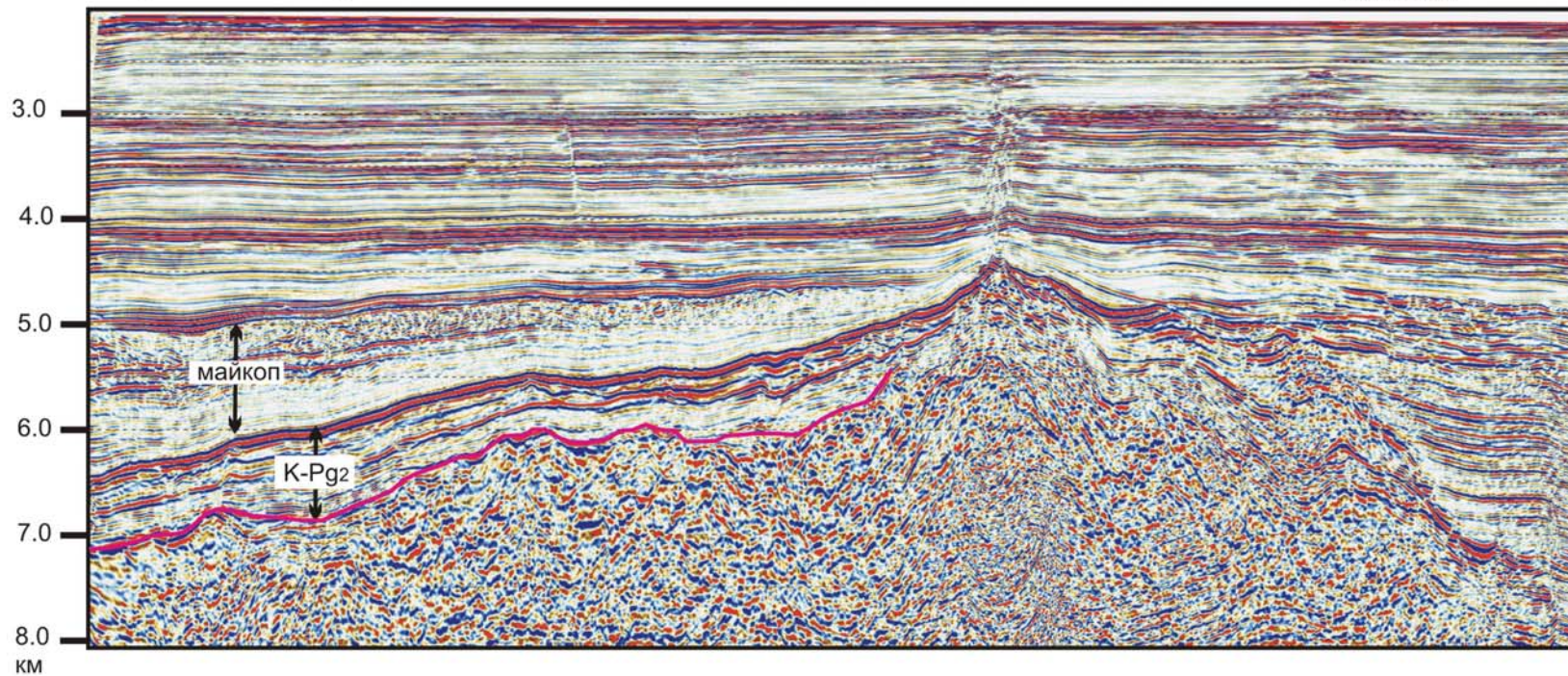


The Andrusov Ridge (right) and typical DHIs (direct hydrocarbon indicators), such as gas chimneys, shallow-gas accumulations, and fl at spots, seen on the 2005 seismic reflection data (left). For location see Figure 1.

Туапсинский прогиб

WBS-02-24

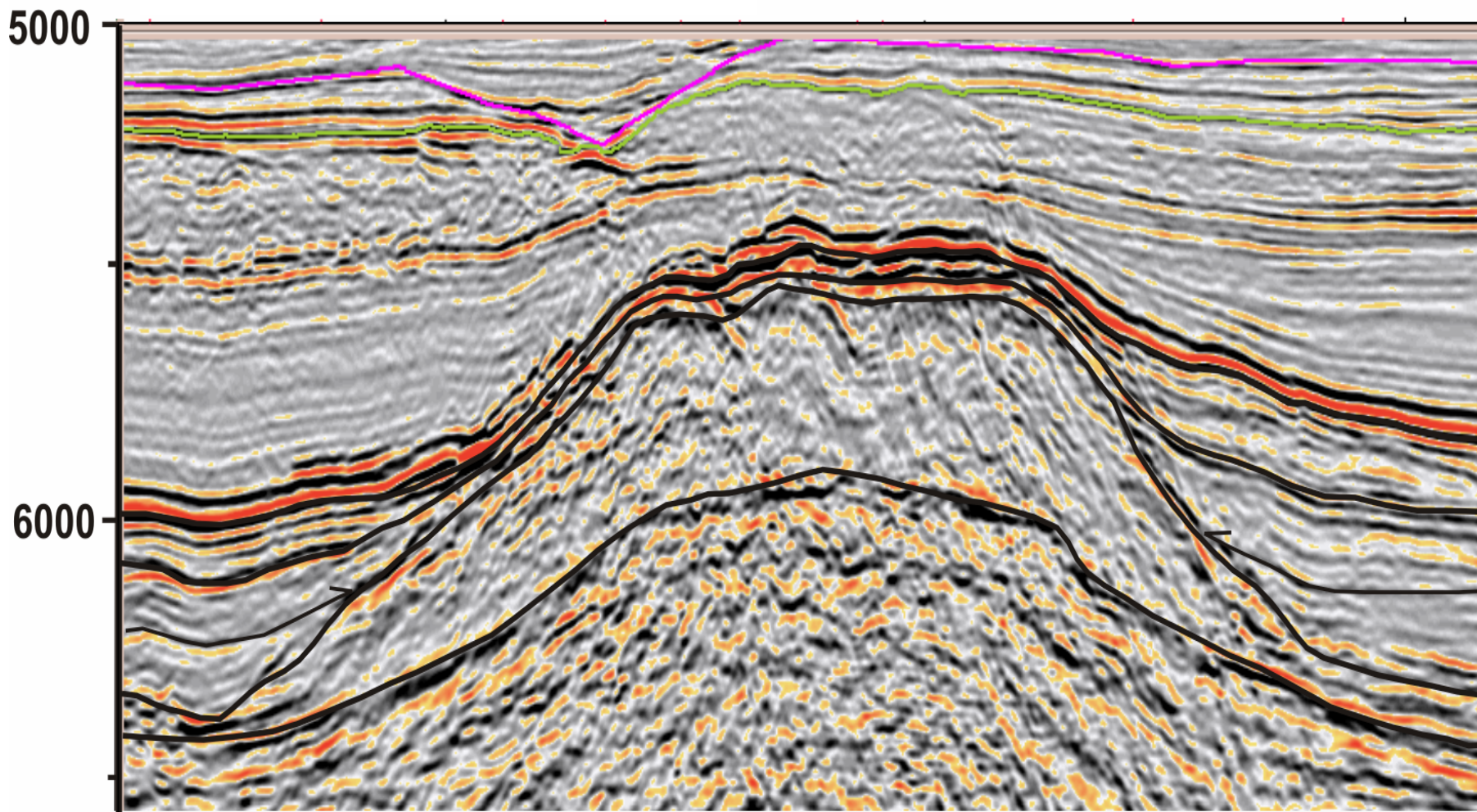
Южно-Дообская структура
Восточно-Черноморский бассейн



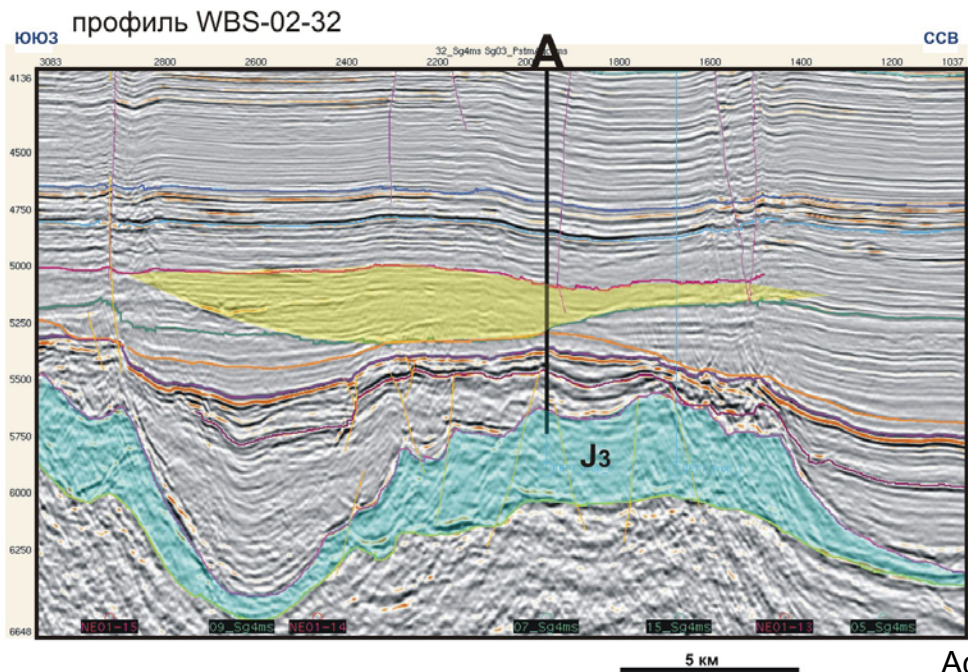
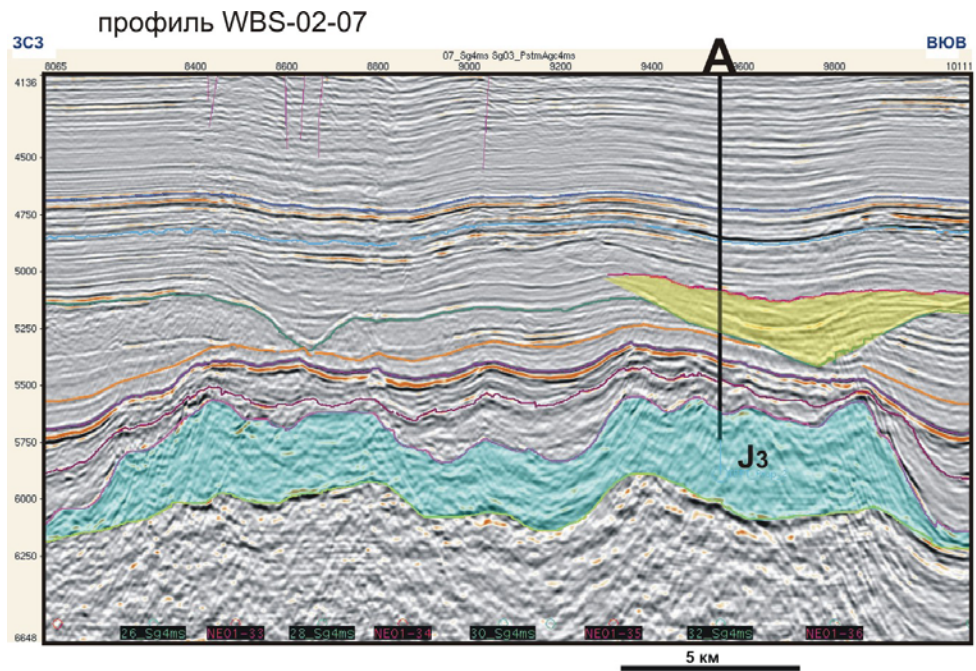
Вероятный рифовый массив, вал Шатского

(Афанасенков, Никишин, Обухов, 2005)

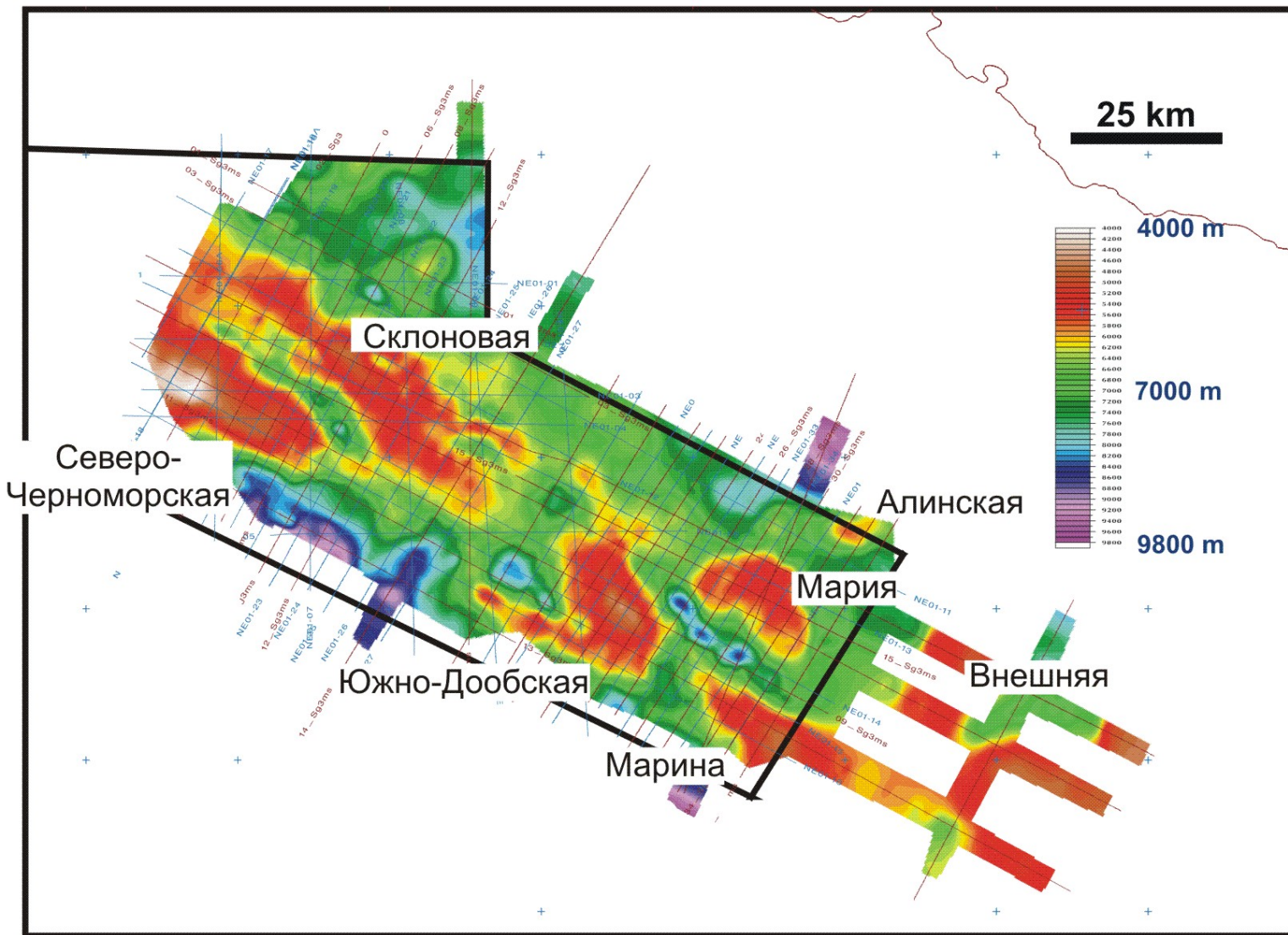
Структура Мария



5 km



Глубина до кровли позднеюрской платформы



Схематический разрез через Многориффовый бассейн

СЗ

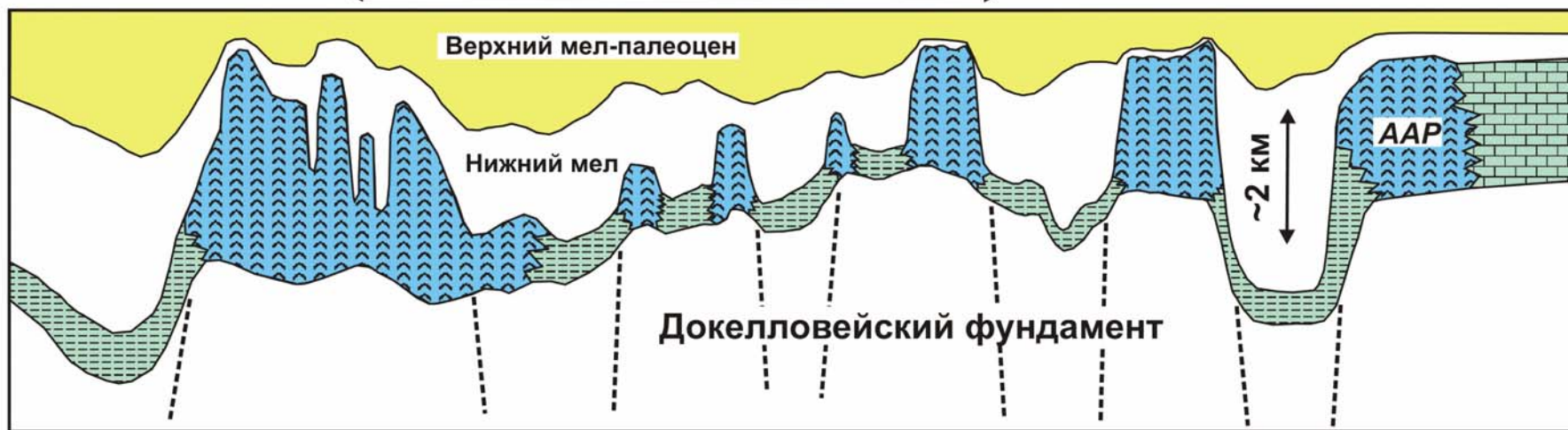
Структура
Склоновая

~100 км

Структура
Мария

Структура
Внешняя

ЮВ
Южно-Адлерская
карбонатная платформа



1



2

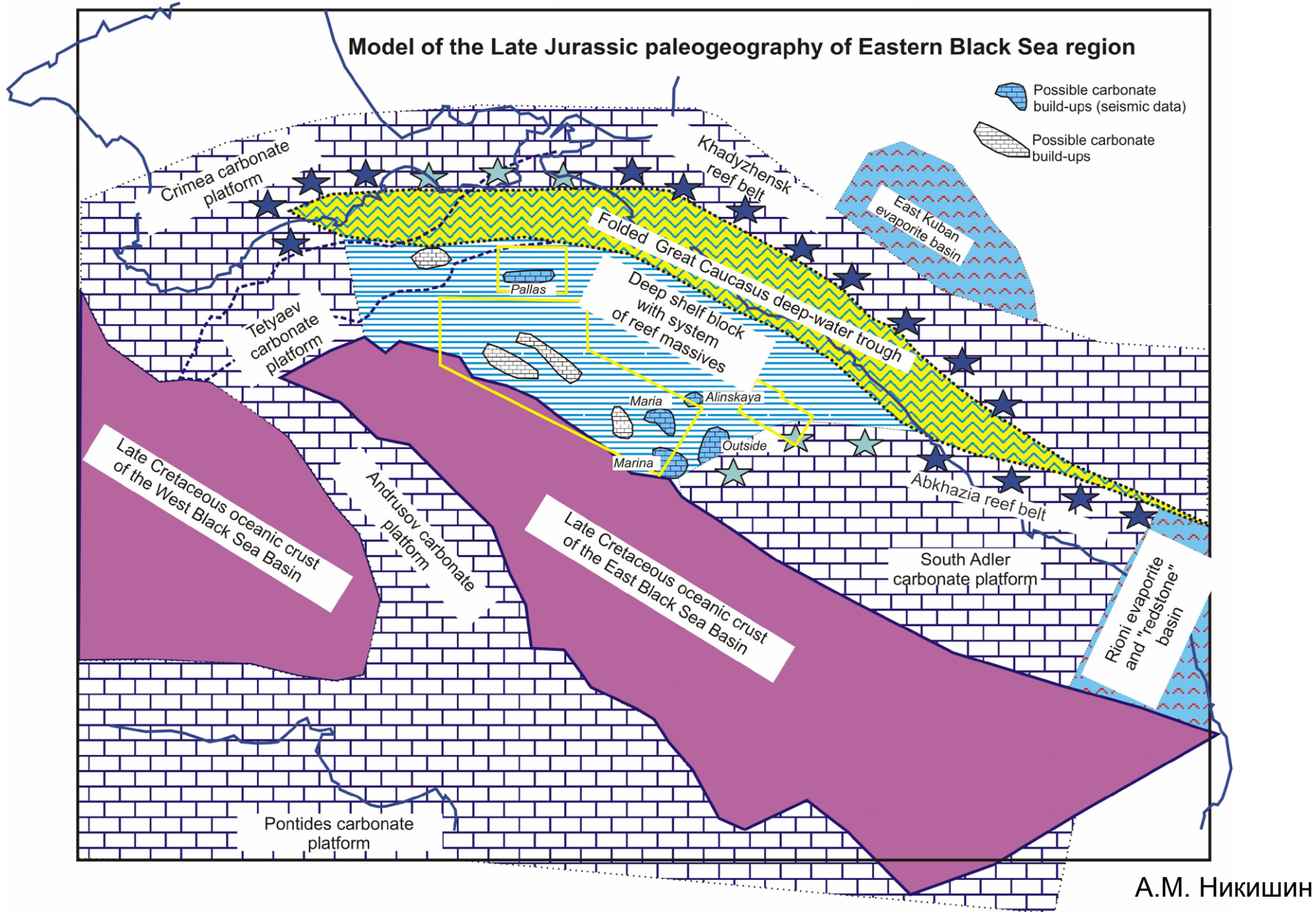


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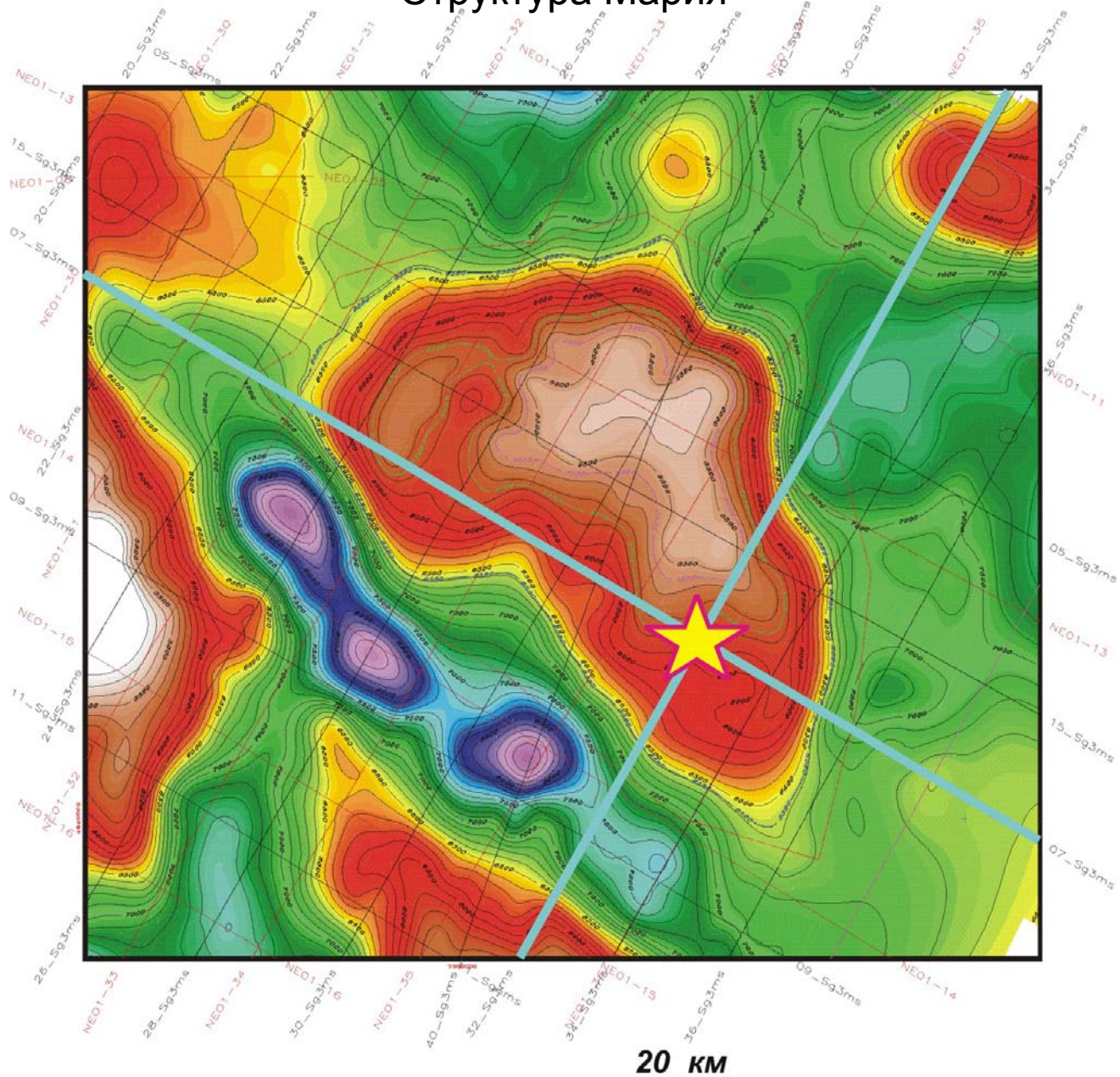


4

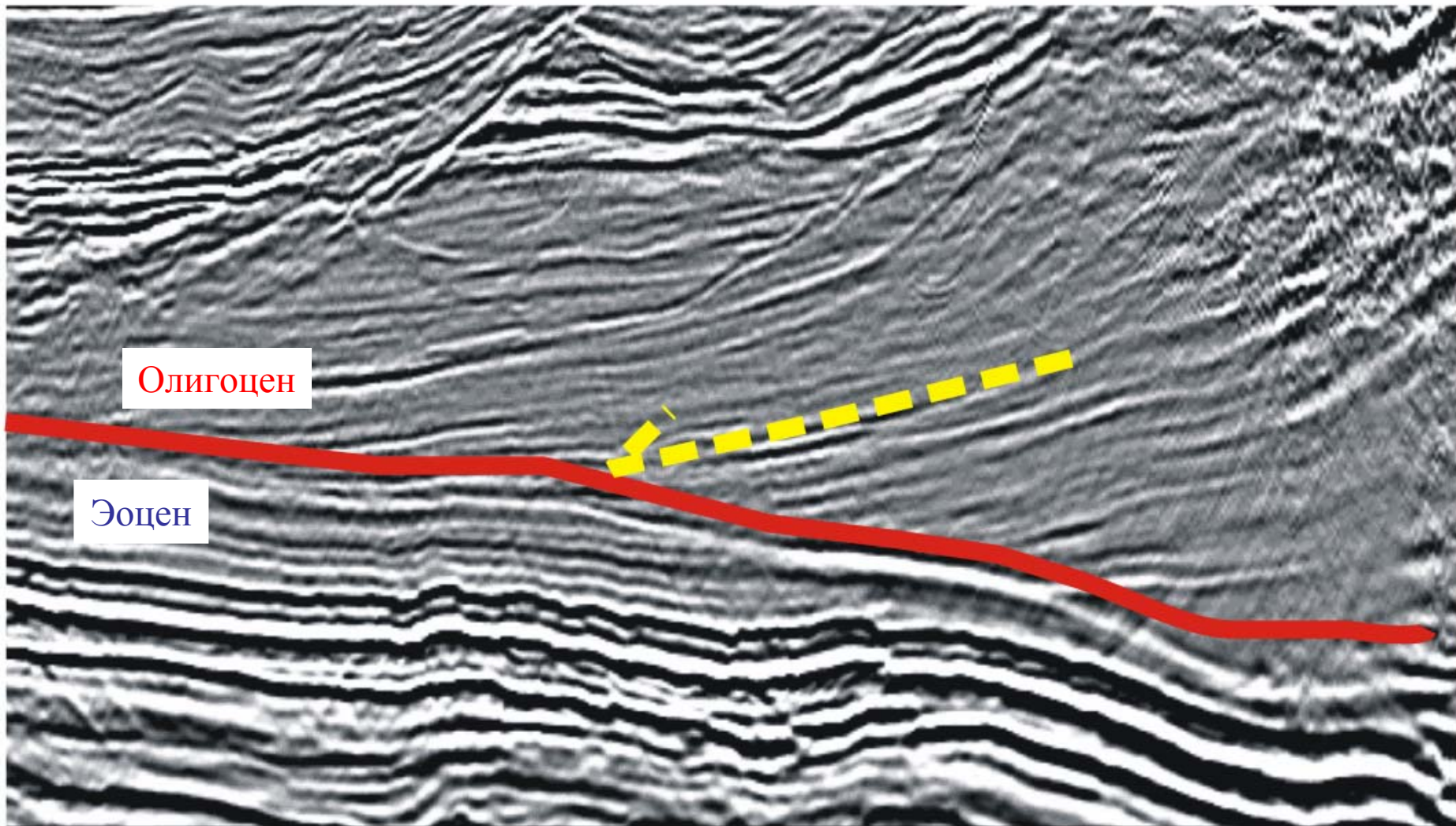
Late Jurassic paleogeography

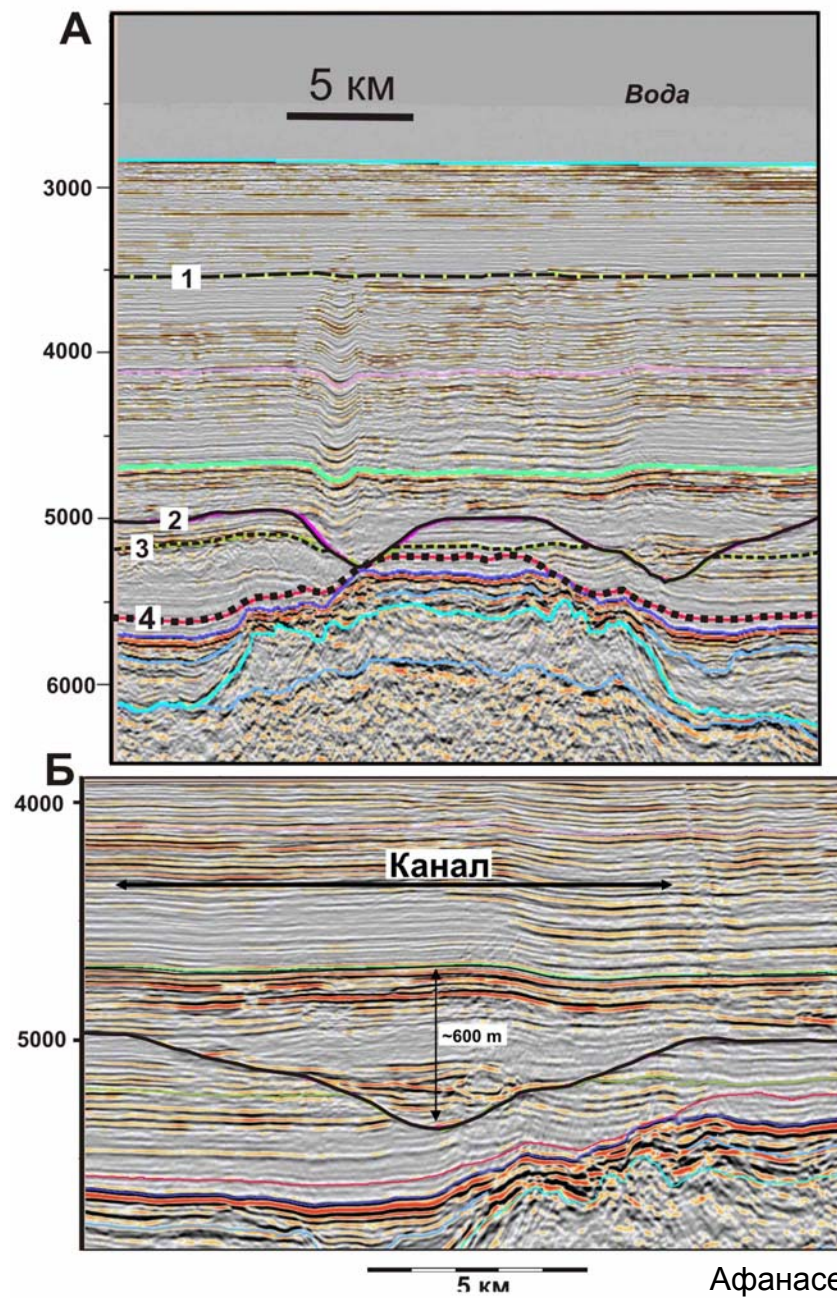


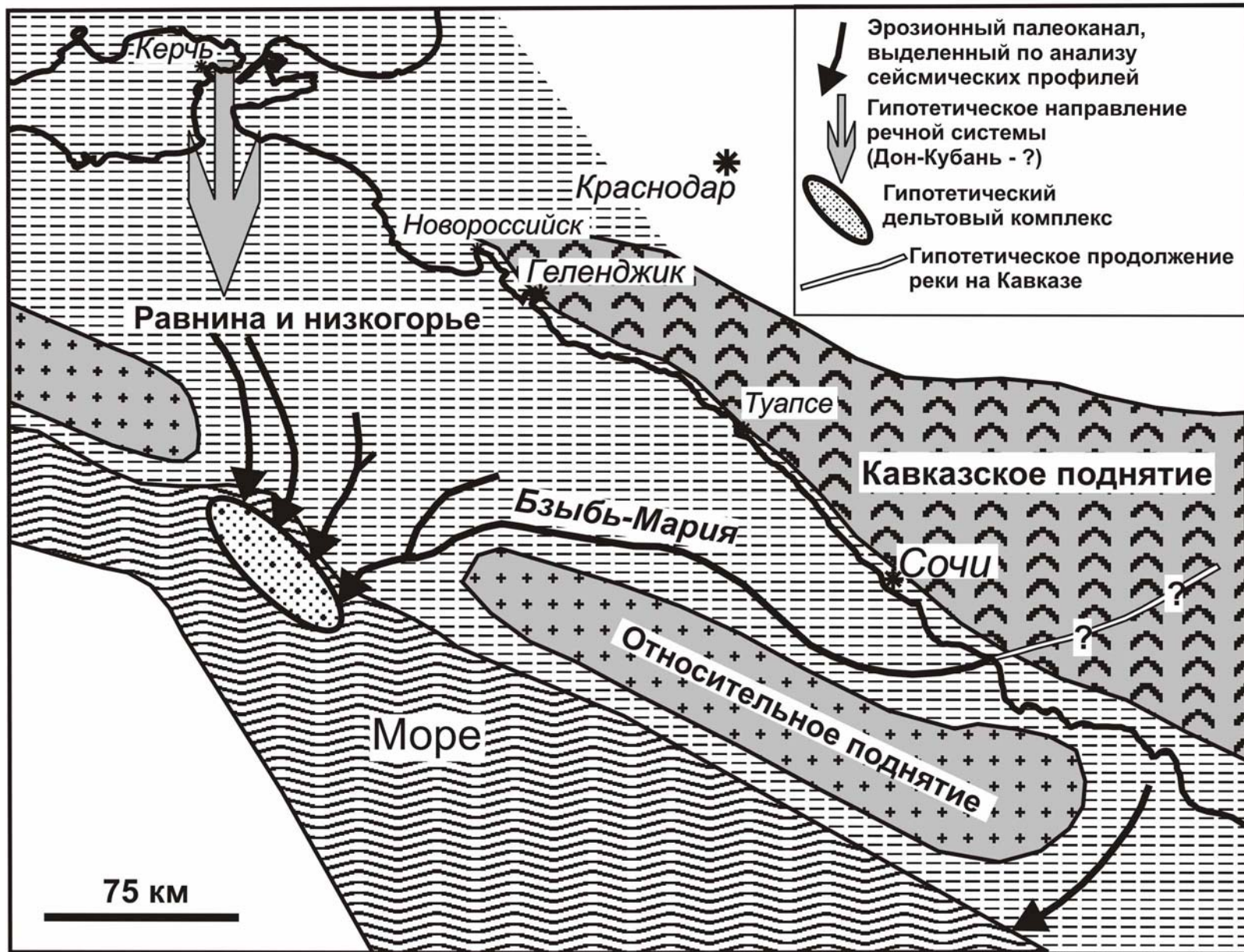
Структура Мария



Туапсинский прогиб, вероятная подошва майкопа



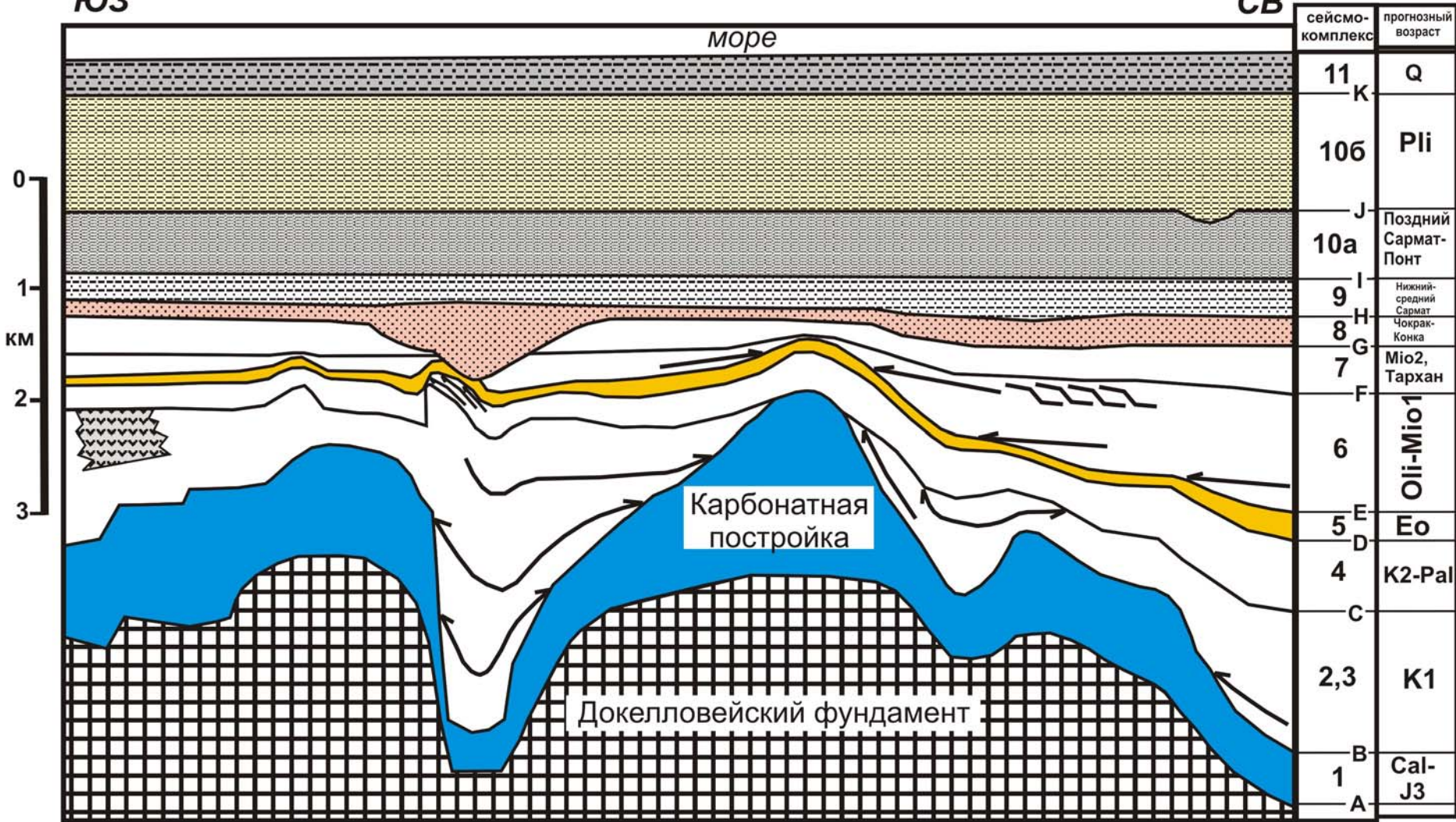




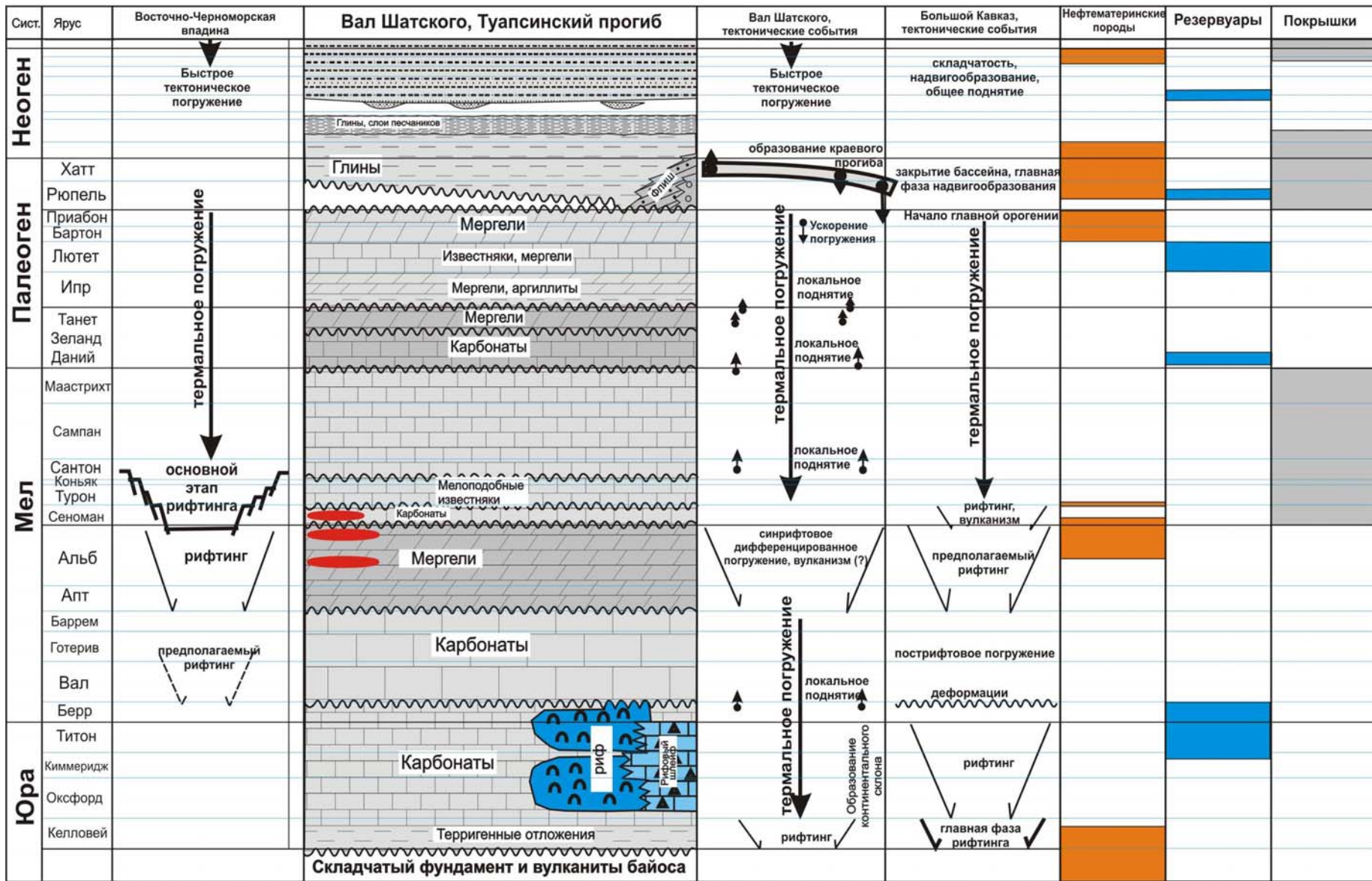
СЕЙСМОКОМПЛЕКСЫ СЕВЕРНОЙ ЧАСТИ ПОДНЯТИЯ ШАТСКОГО-ТУАПСИНСКОГО ПРОГИБА

ЮЗ

СВ

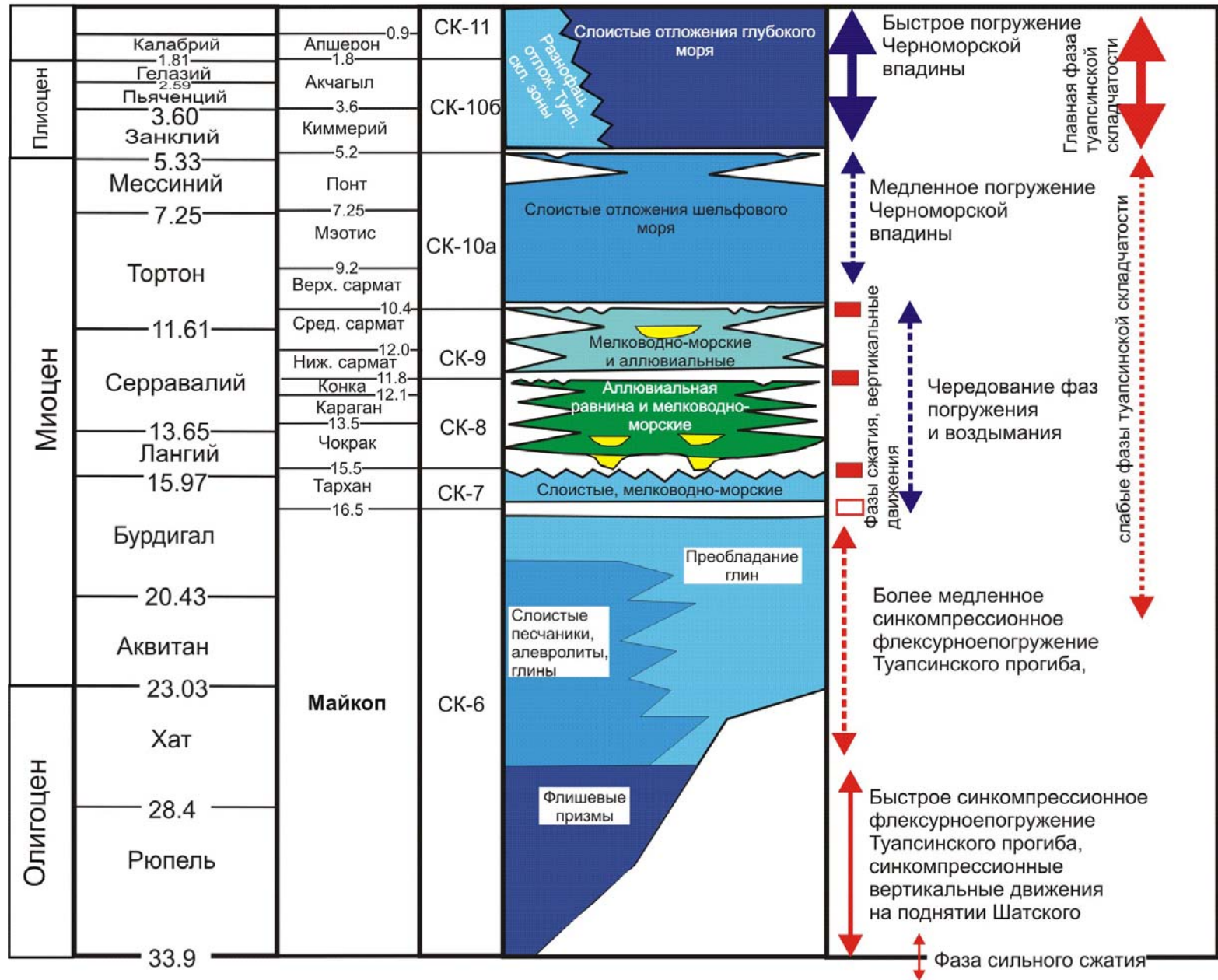


возможные вулканиты

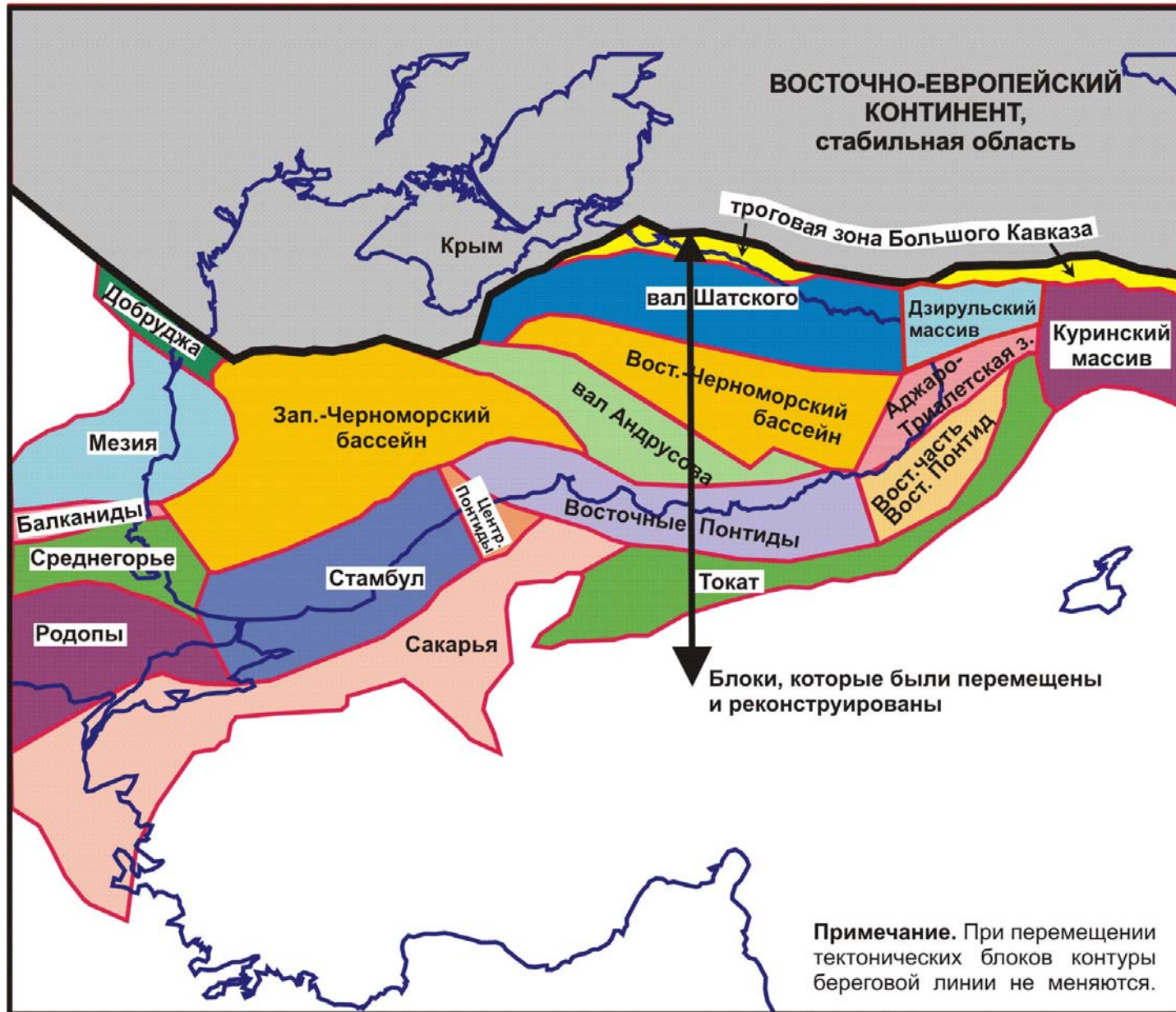


 Возможные вулканы

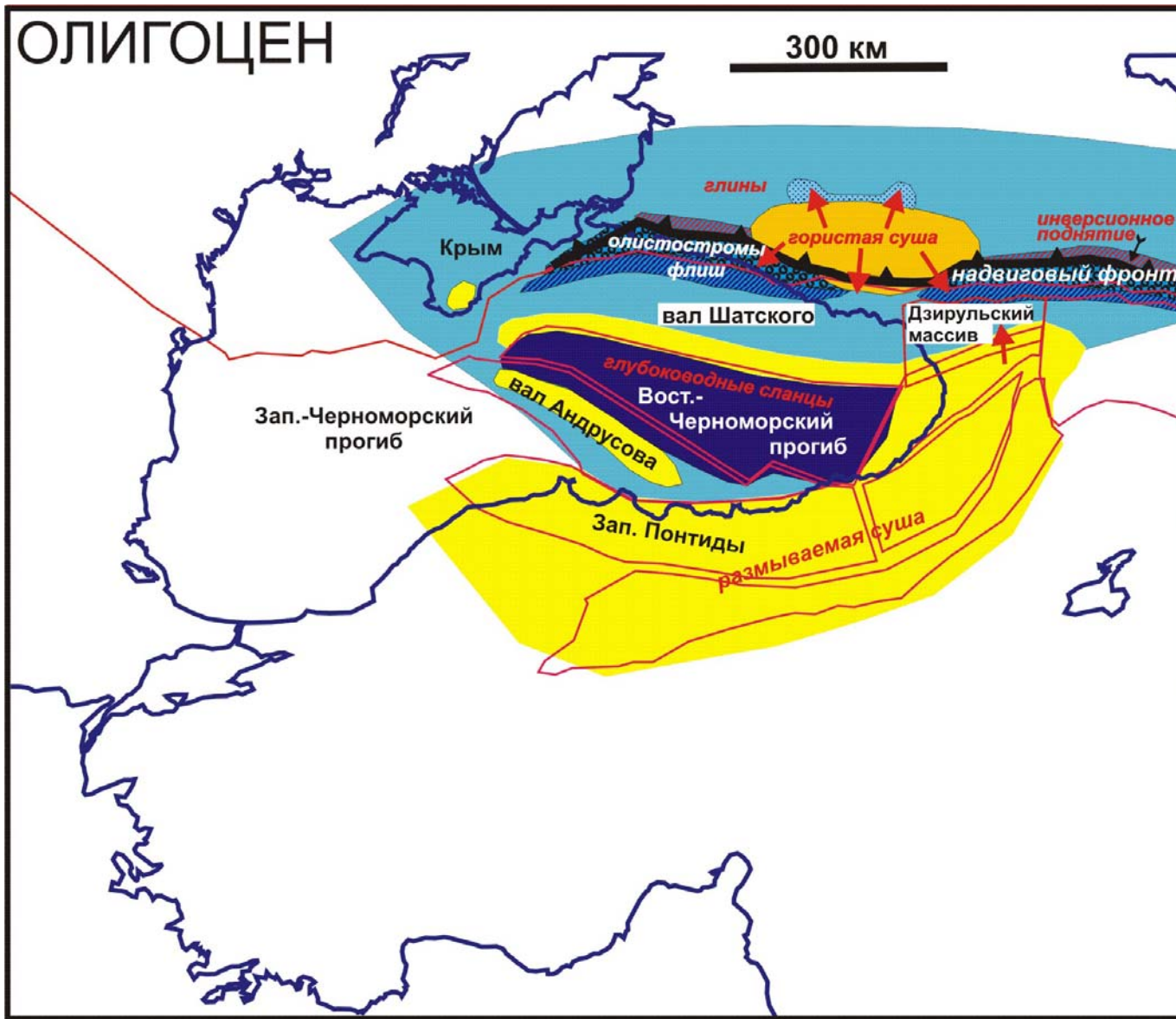
Схема хронostrатиграфии олигоцена, неогена и квартера вала Шатского и Туапсинского прогиба



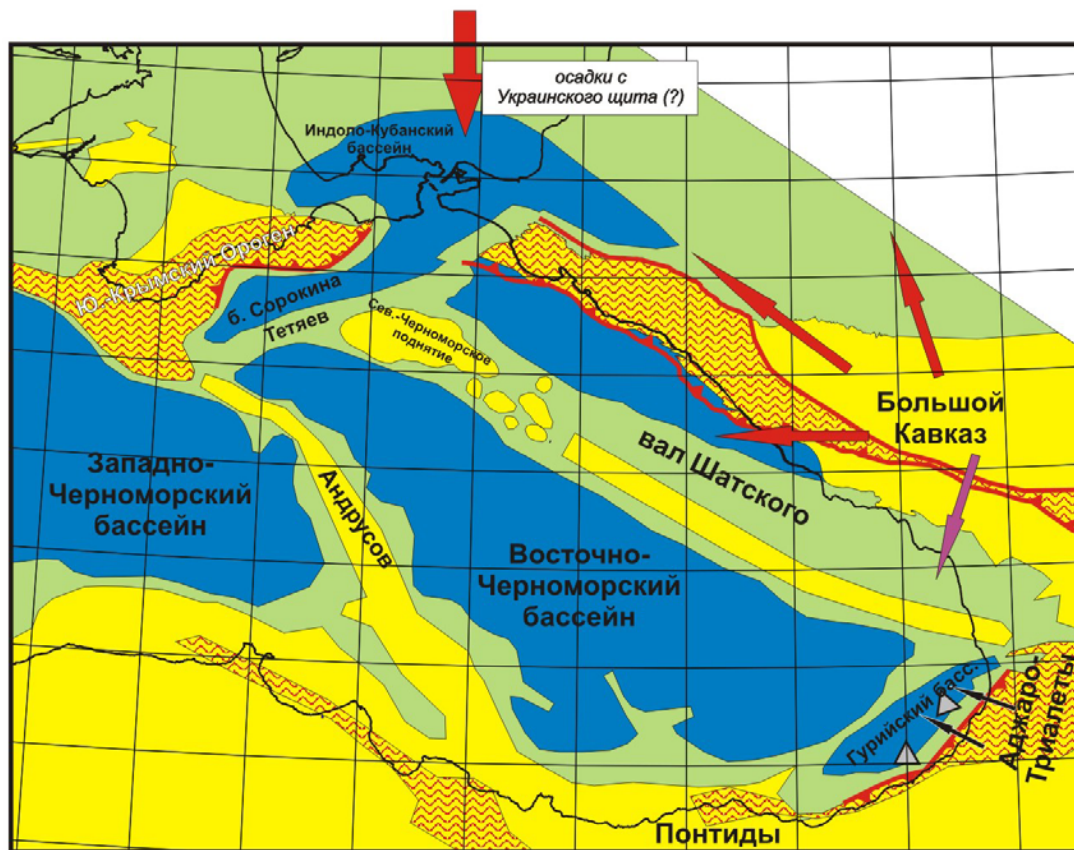
ОСНОВНЫЕ ЛИТОСФЕРНЫЕ БЛОКИ ЧЕРНОМОРСКОГО РЕГИОНА



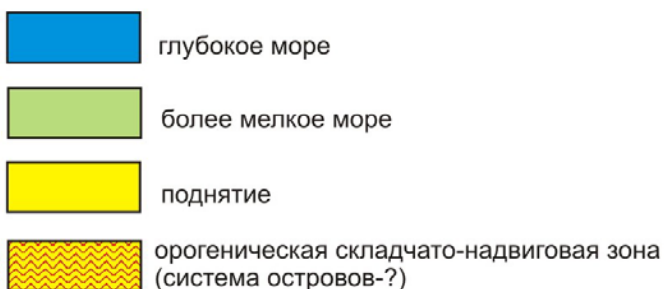
ОЛИГОЦЕН



Модель тектоники и палеогеографии Восточно-Черноморского региона для ранне-среднемайкопского времени (без палеотектонических реконструкций)

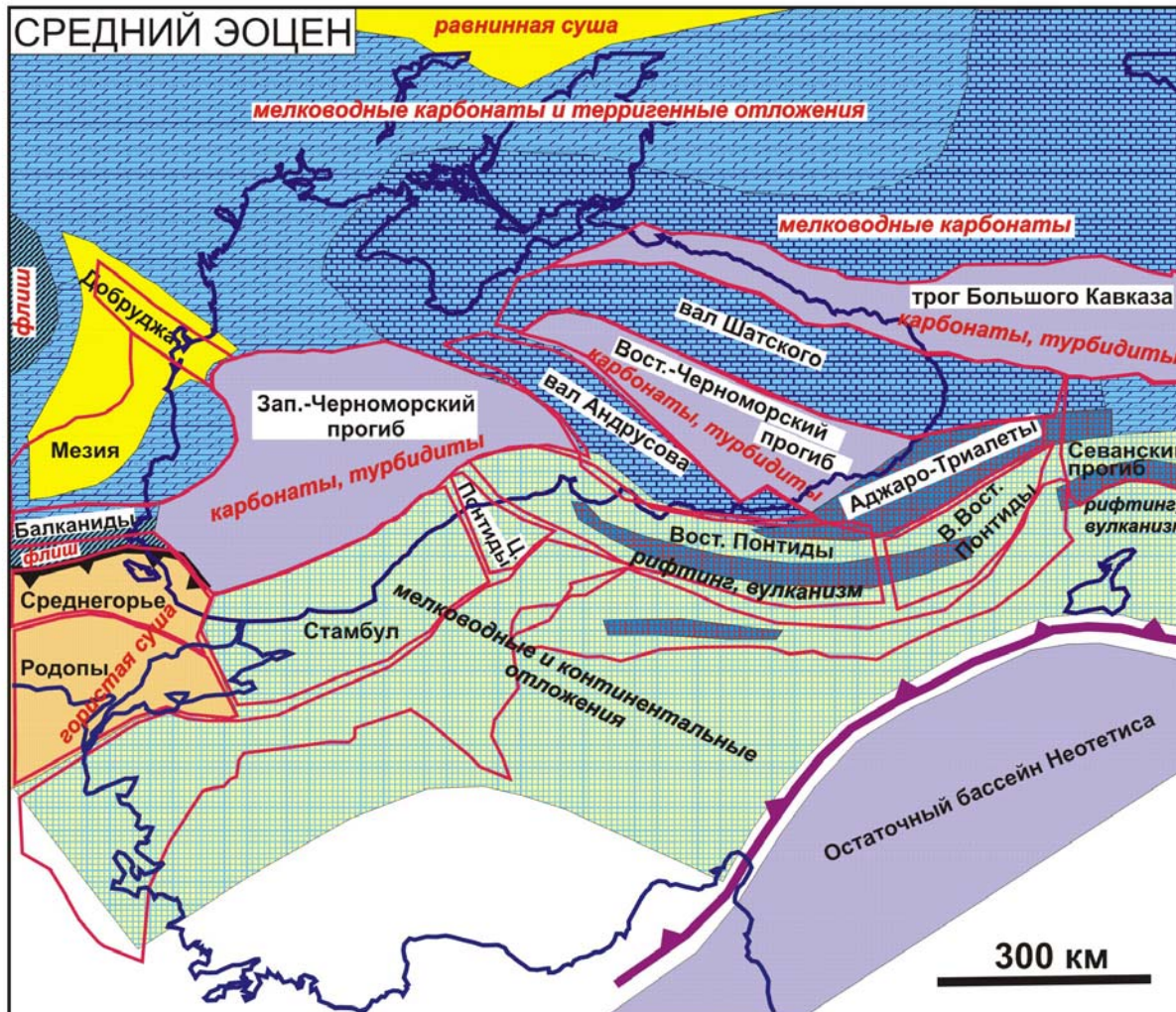


палеогеография

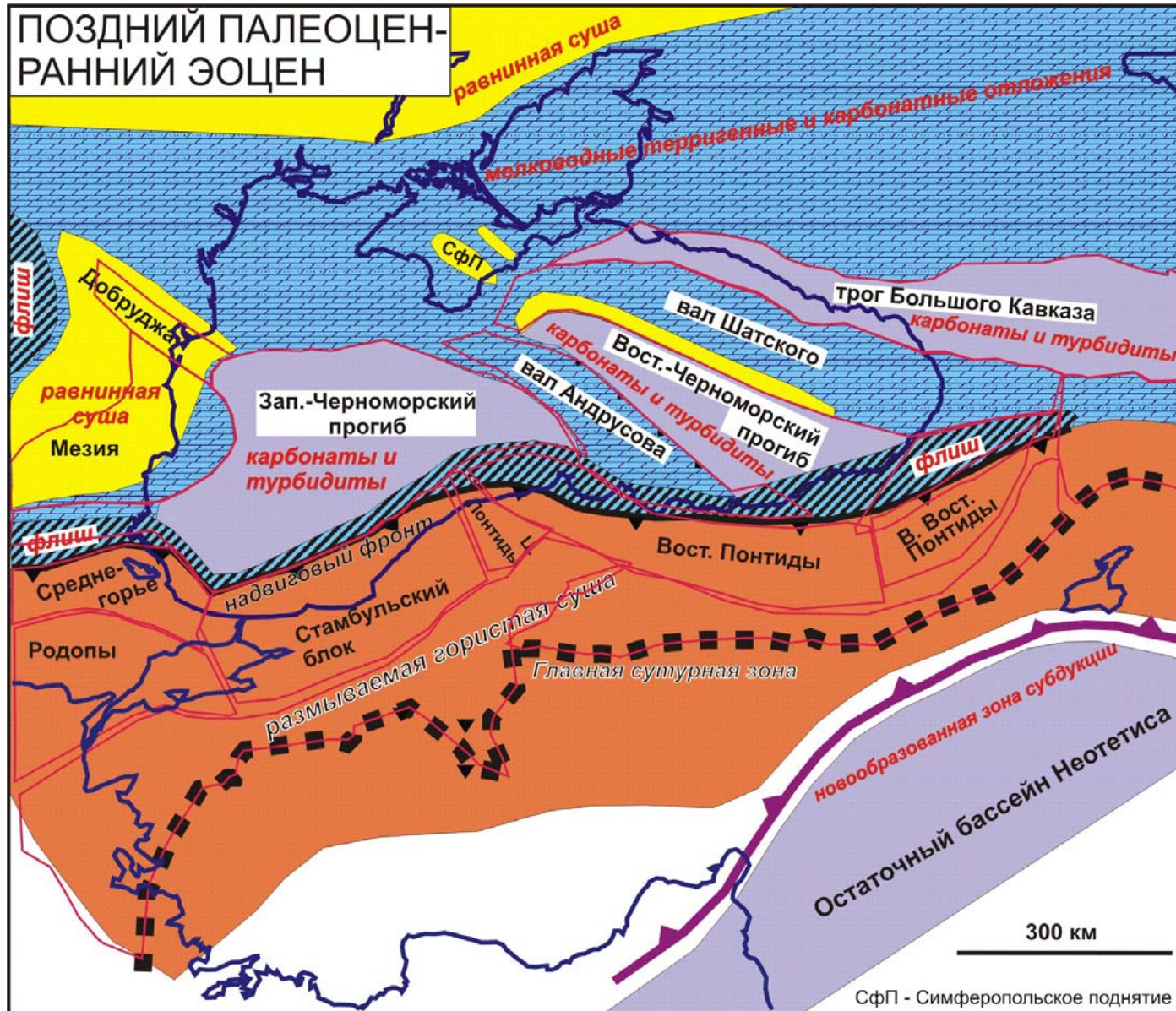


направления транспорта осадка и типы песка по составу кварцевый

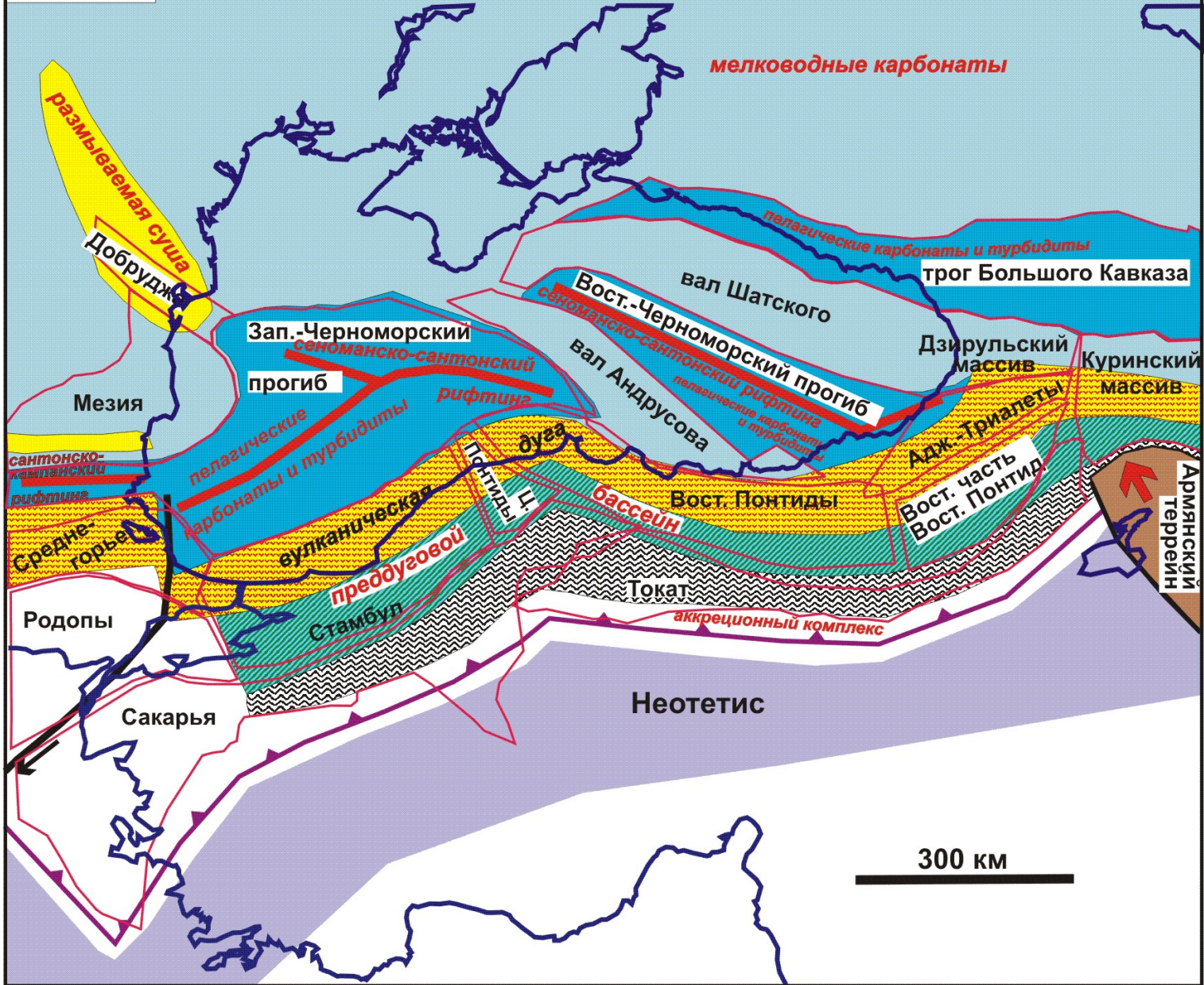


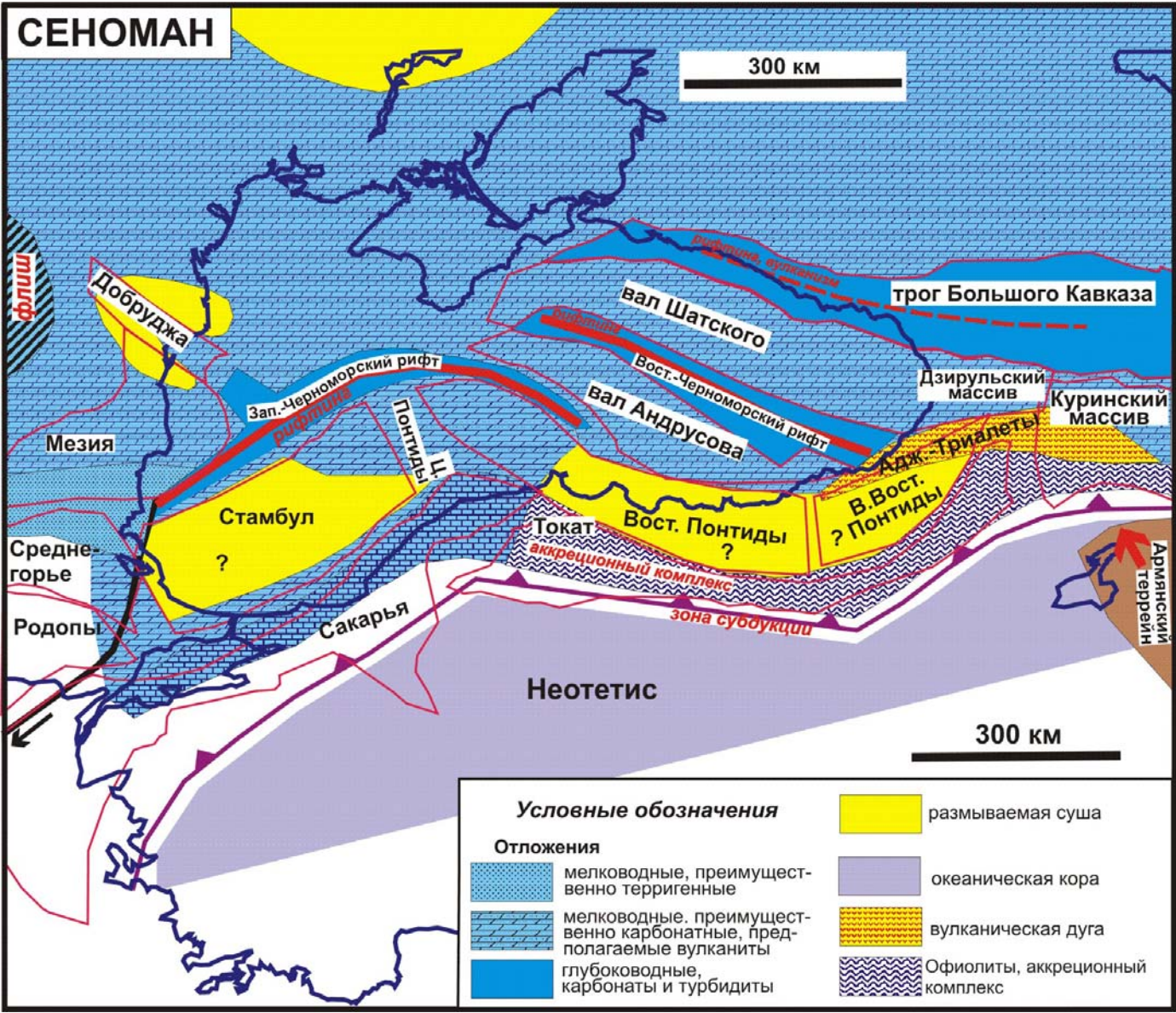


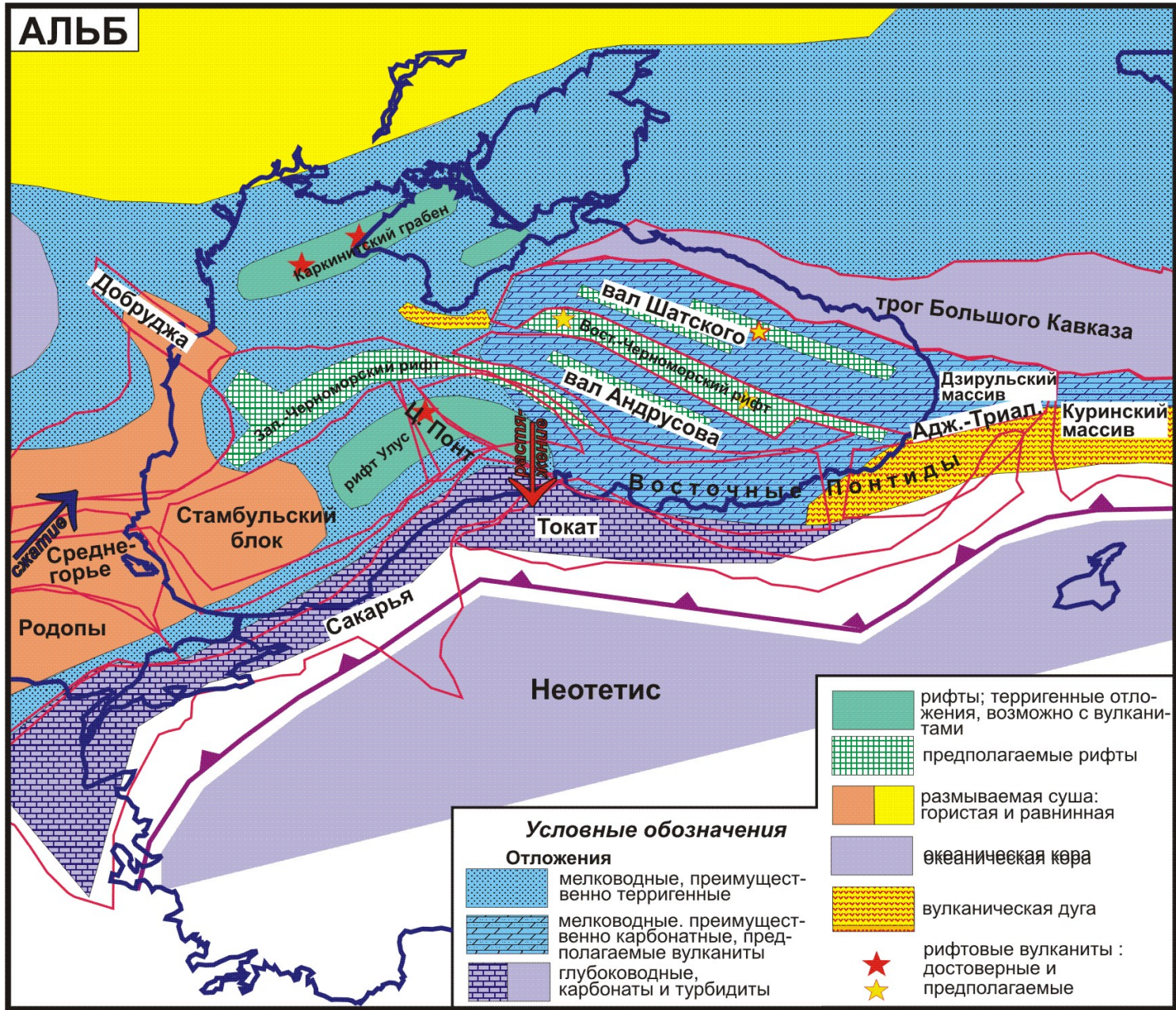
ПОЗДНИЙ ПАЛЕОЦЕН- РАННИЙ ЭОЦЕН

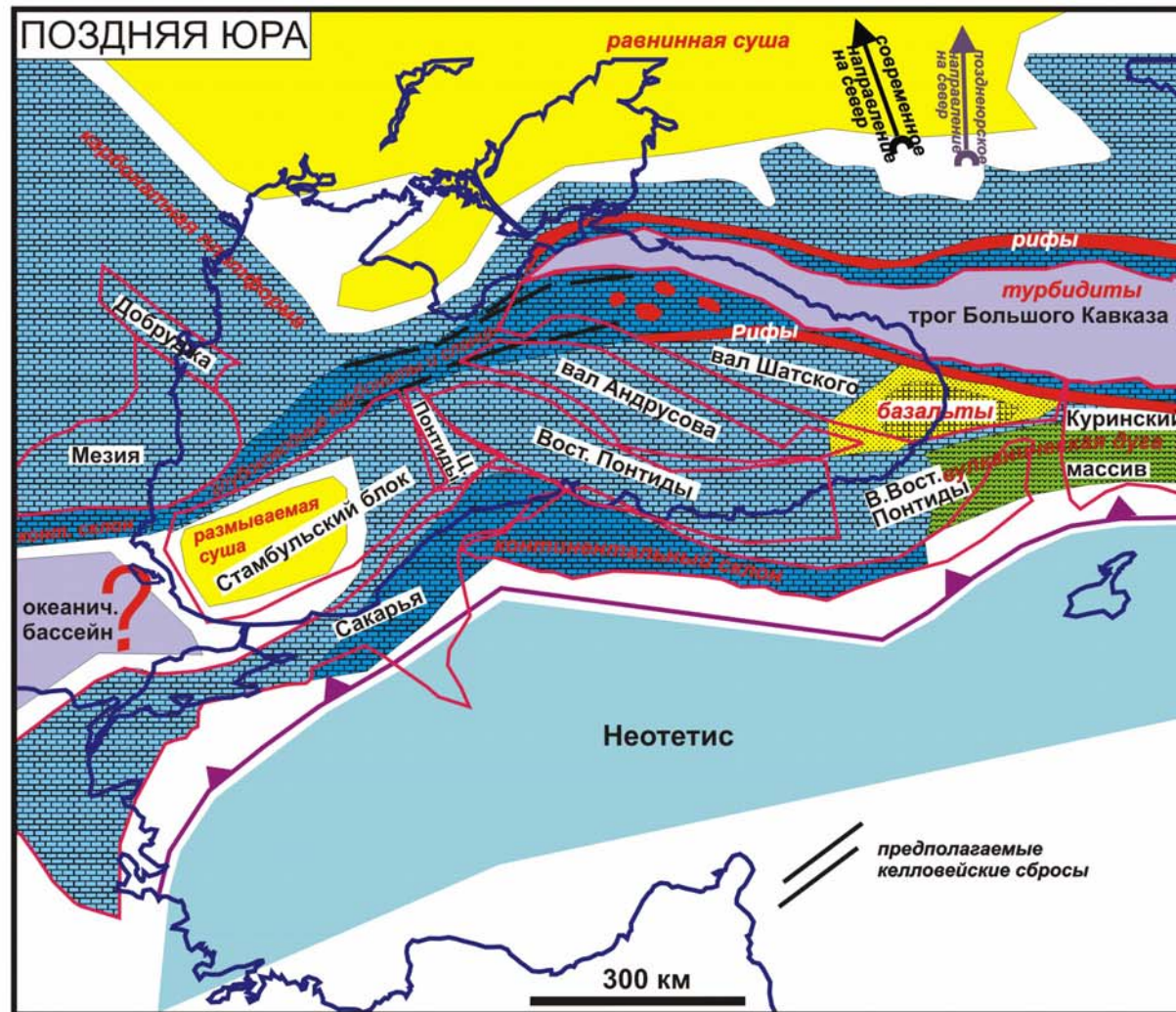


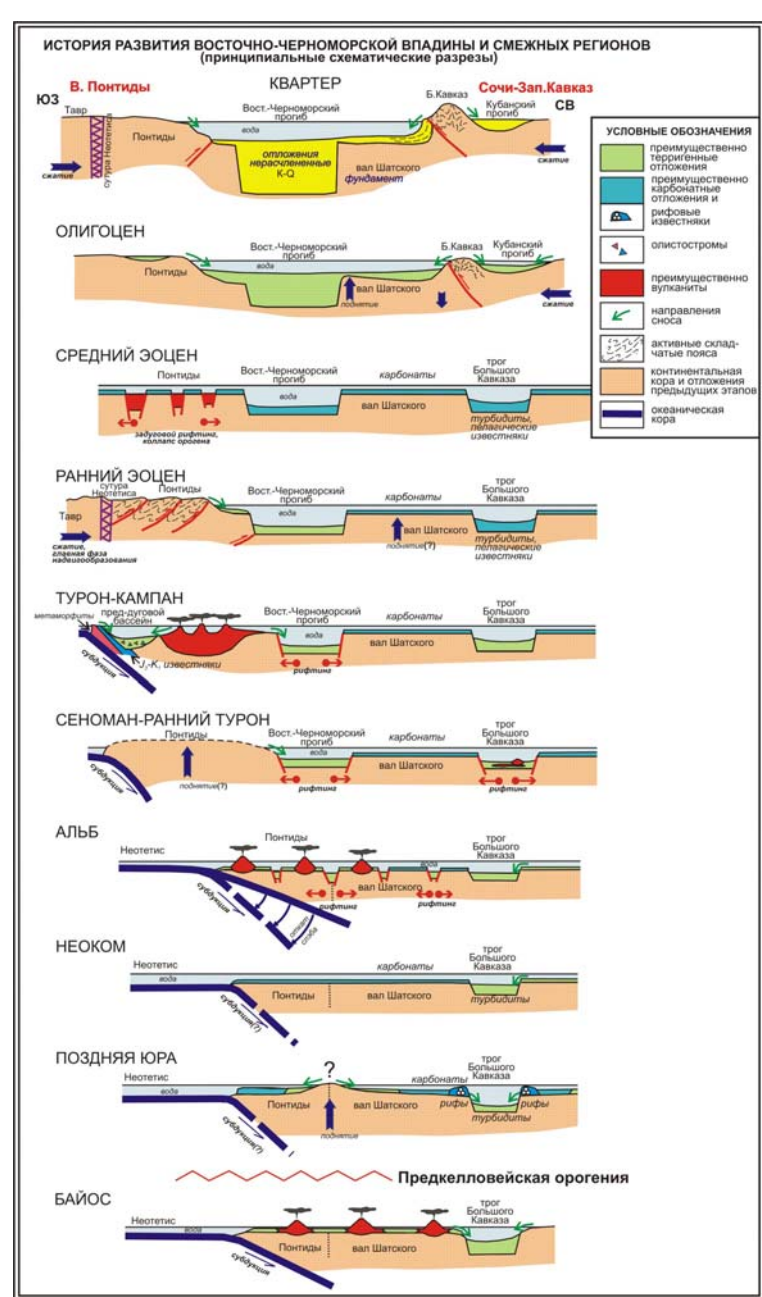
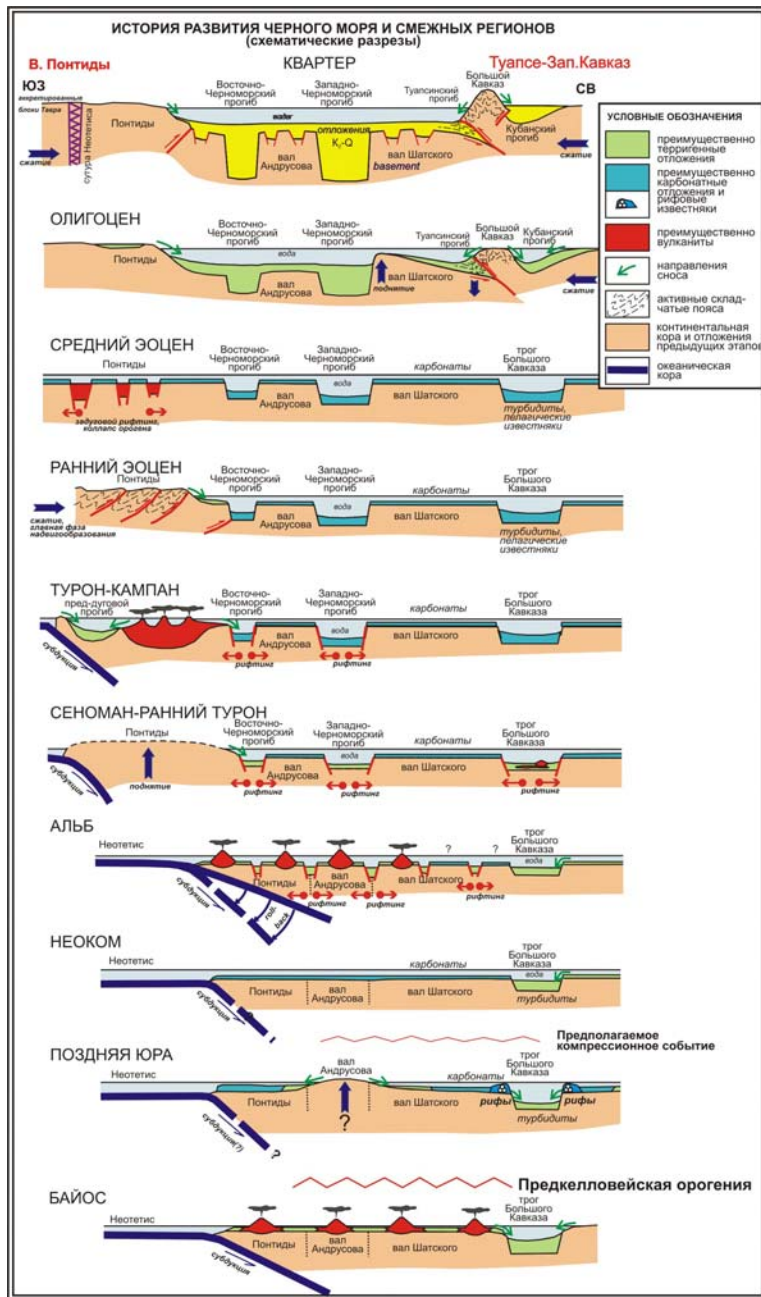
СЕНОН

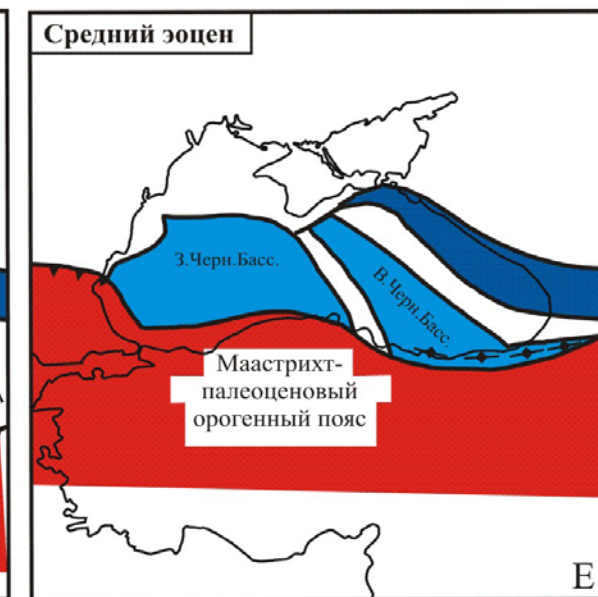
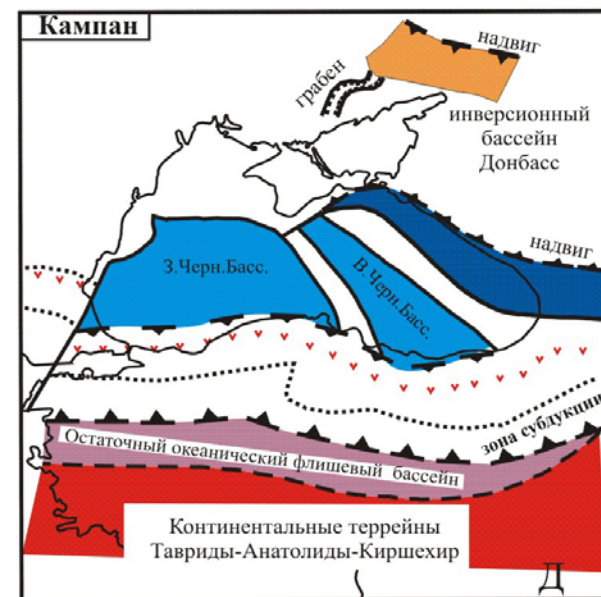
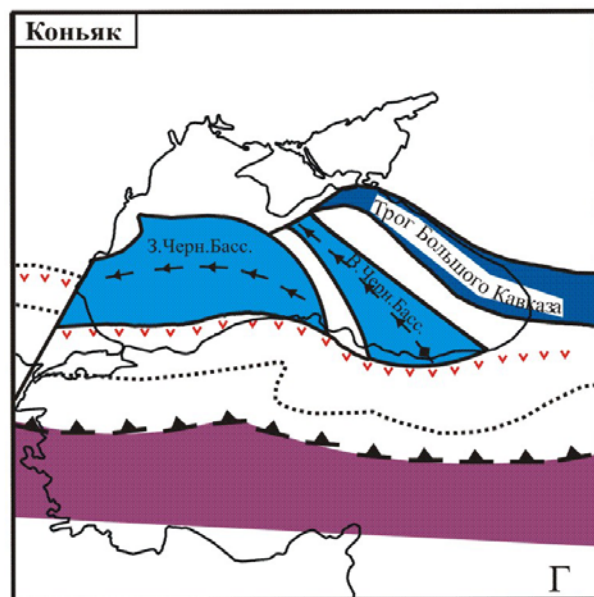
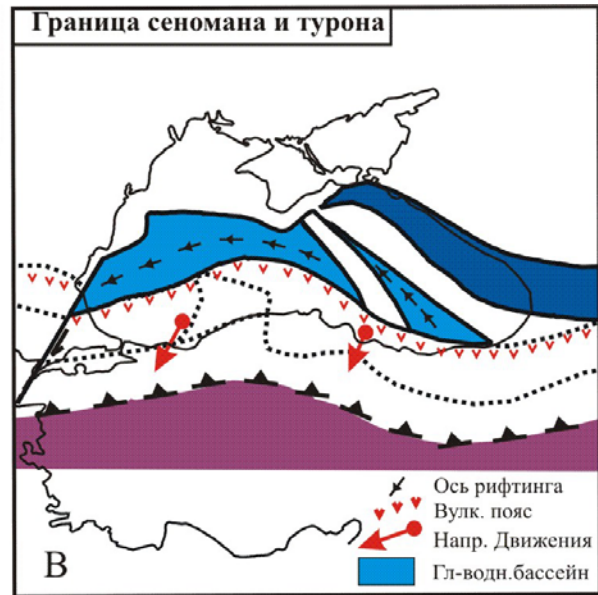
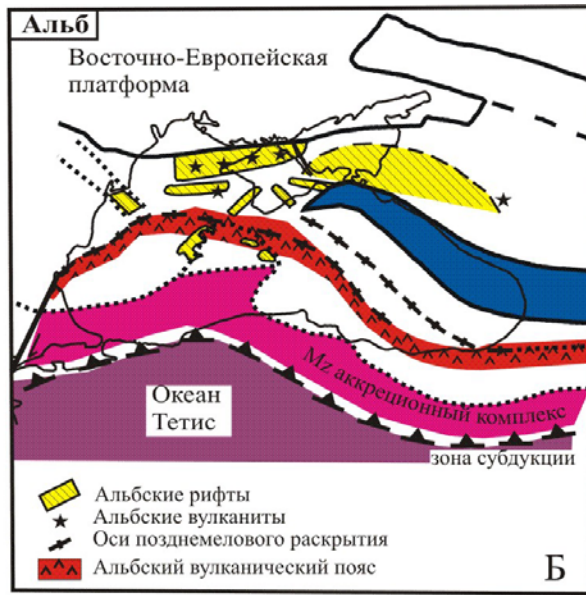




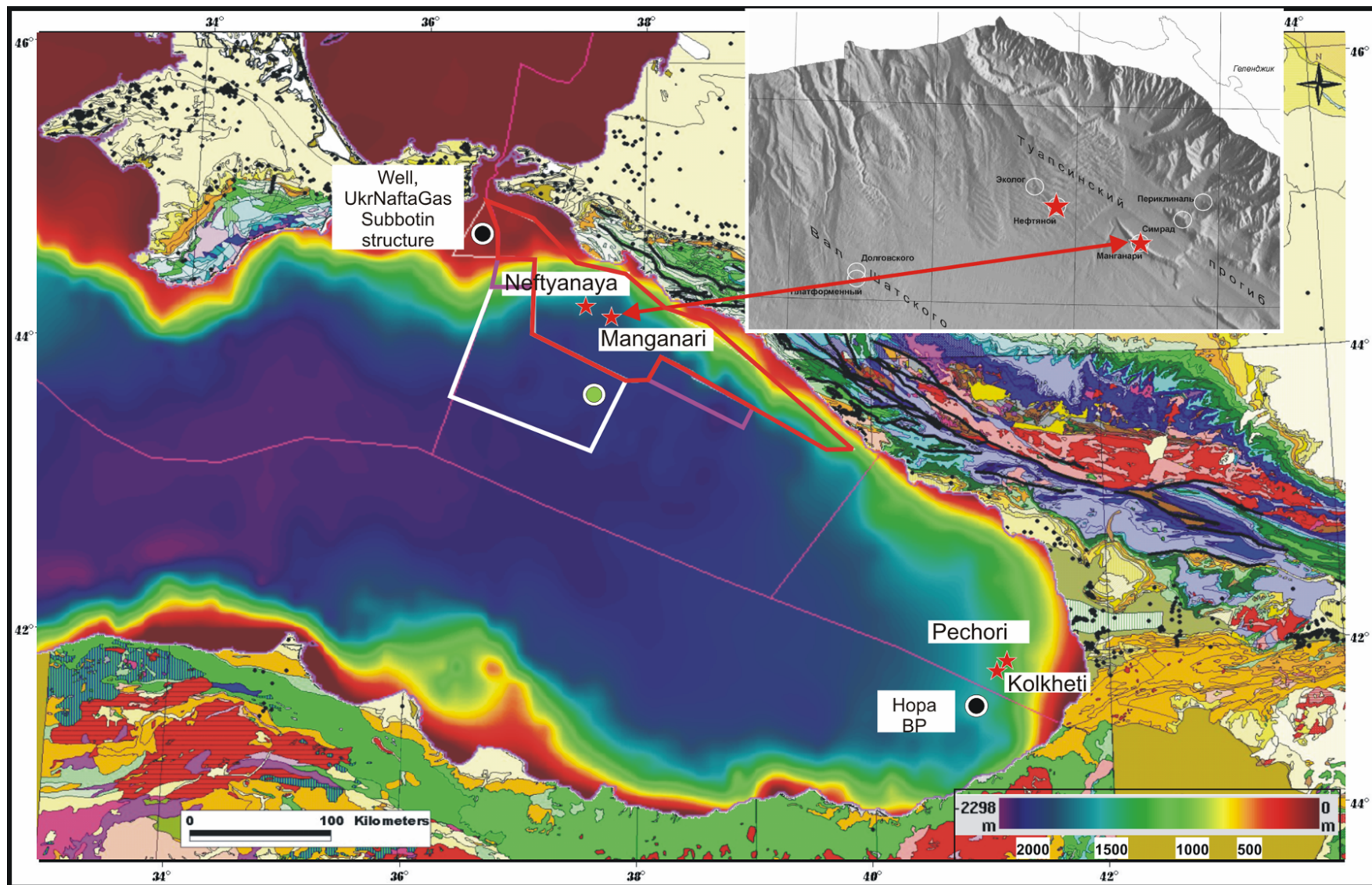




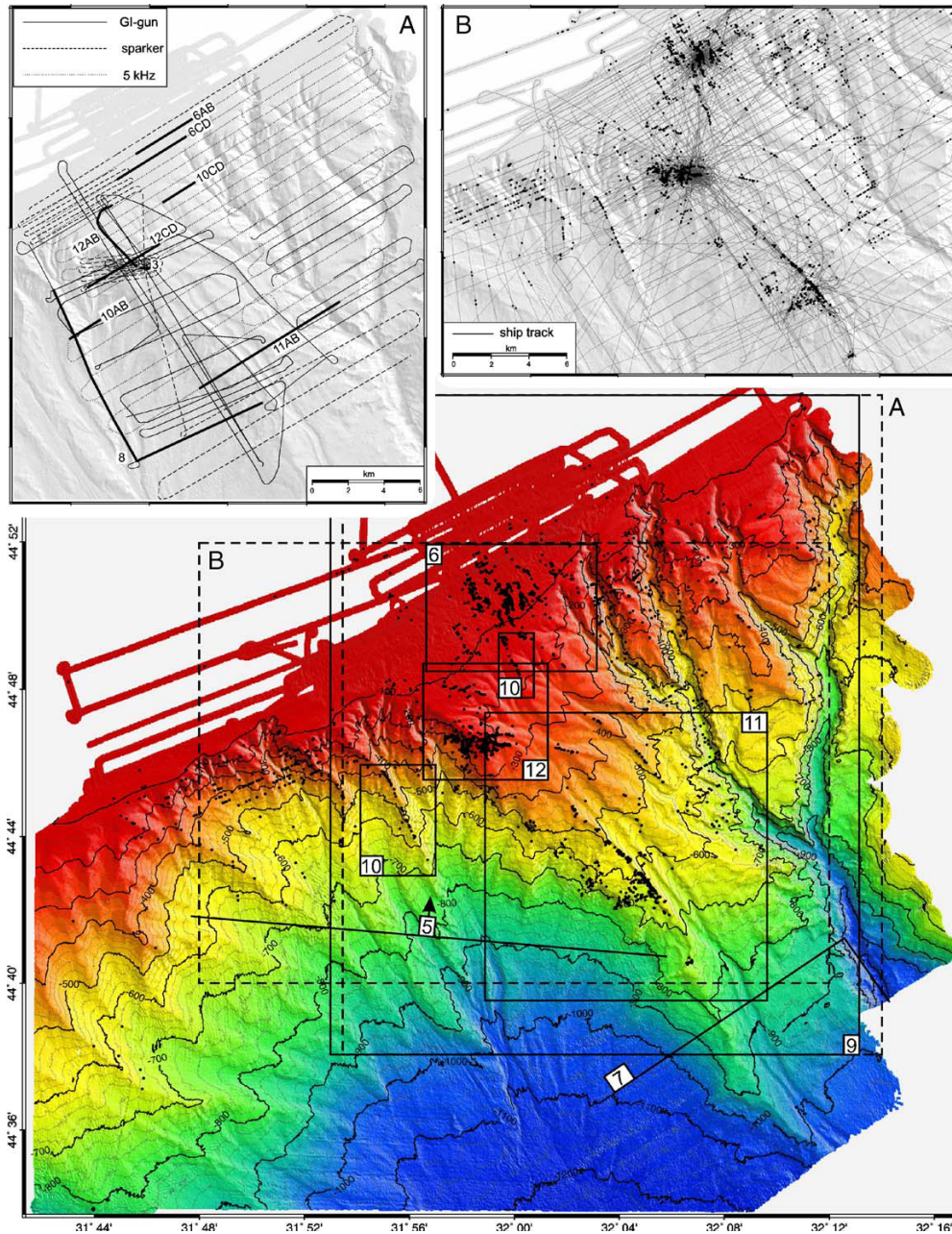


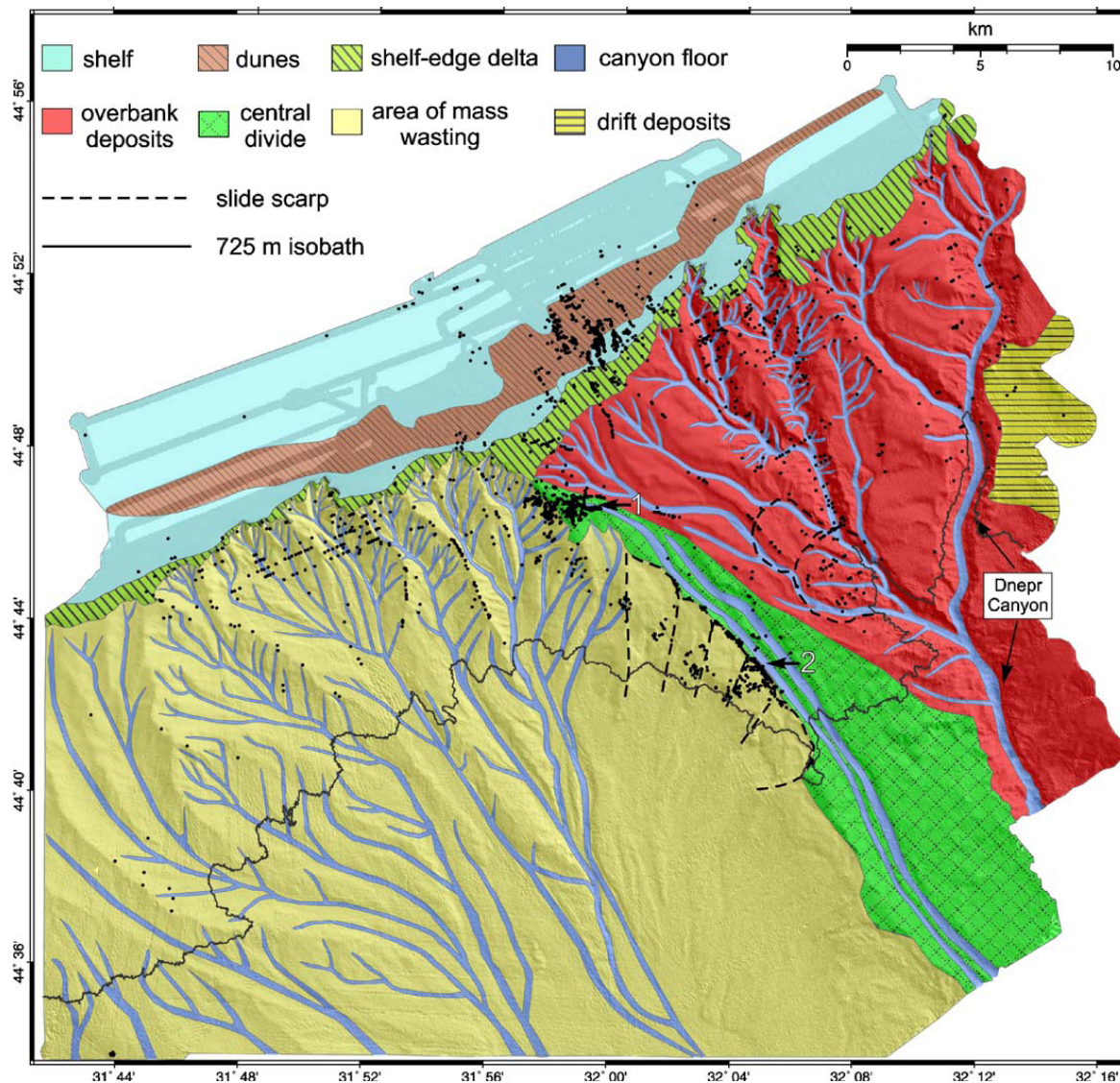


LOCATION OF RECENT DEEP WELLS AND OIL SOURCES ON A SEA FLOOR

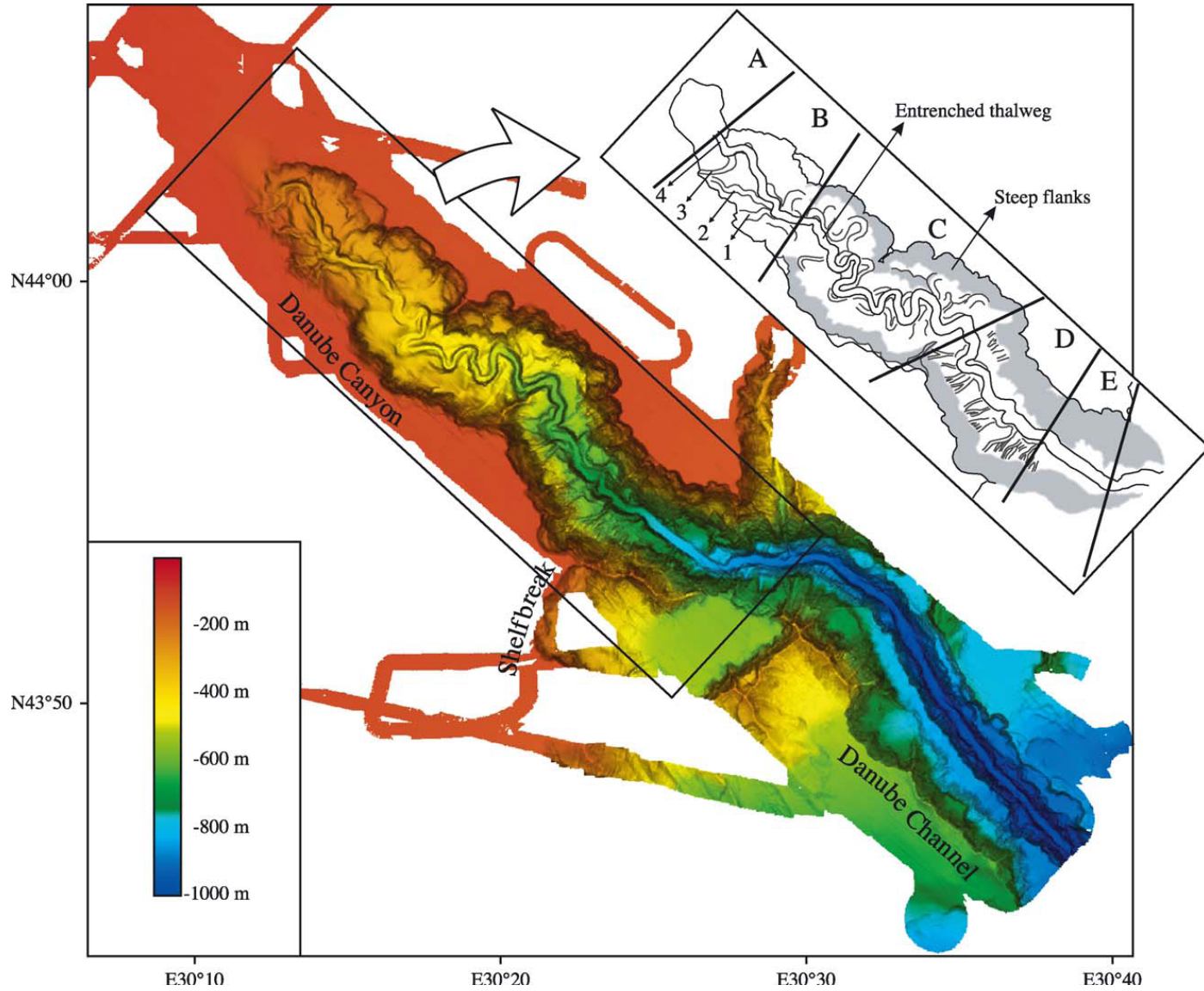


Oil on a sea bottom. Mud volcano (★)
New oil wells (●).
Proposed deep-water well (Yukos) (○).

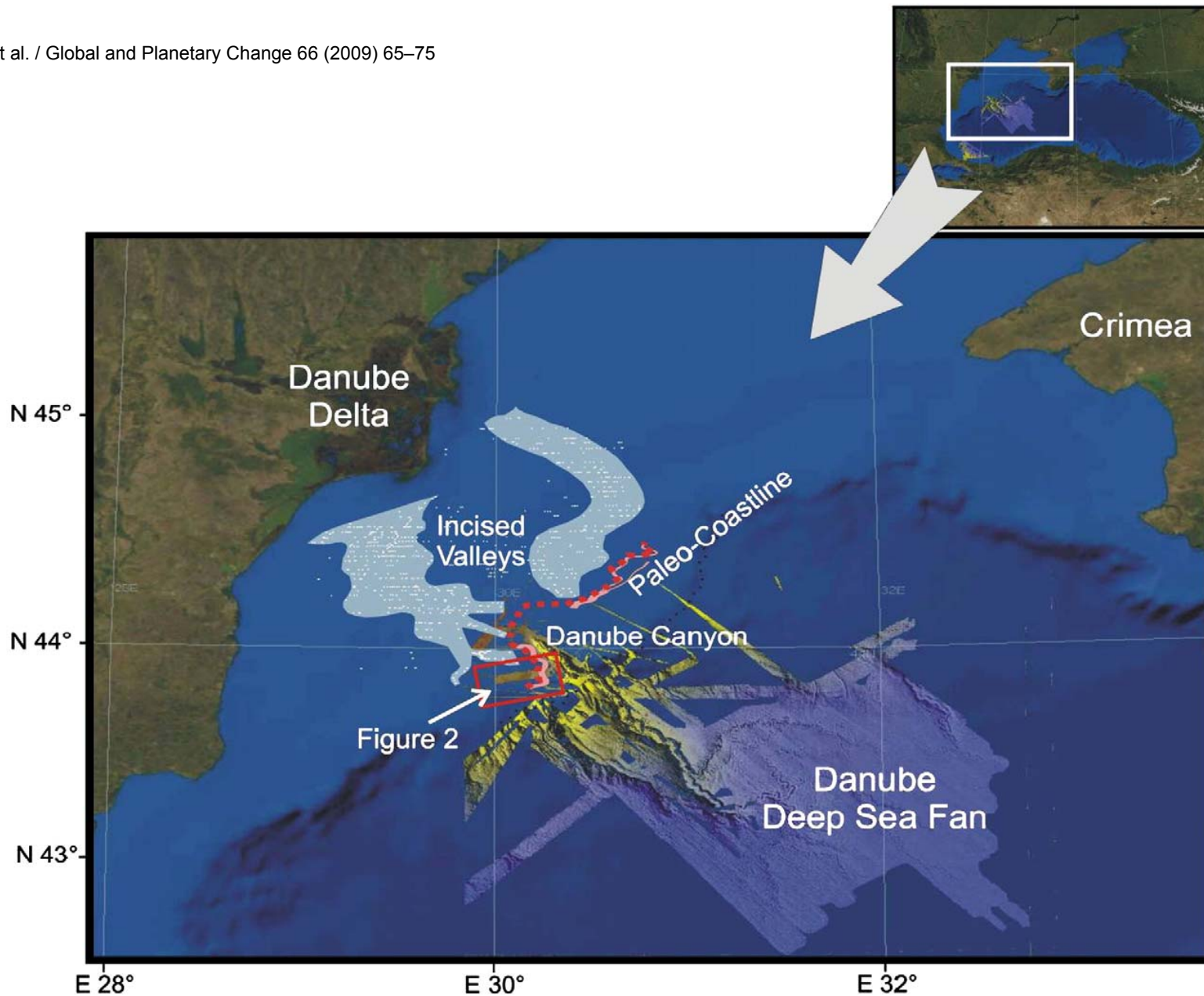




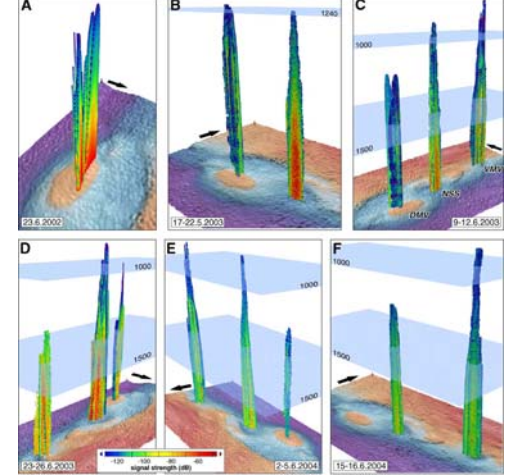
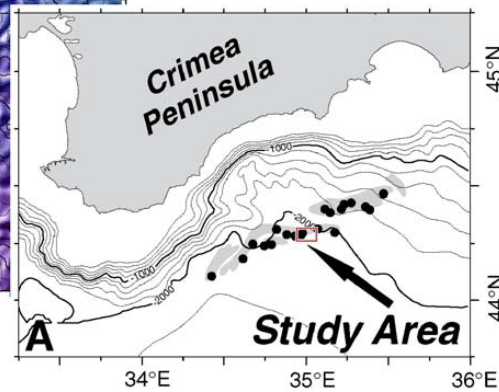
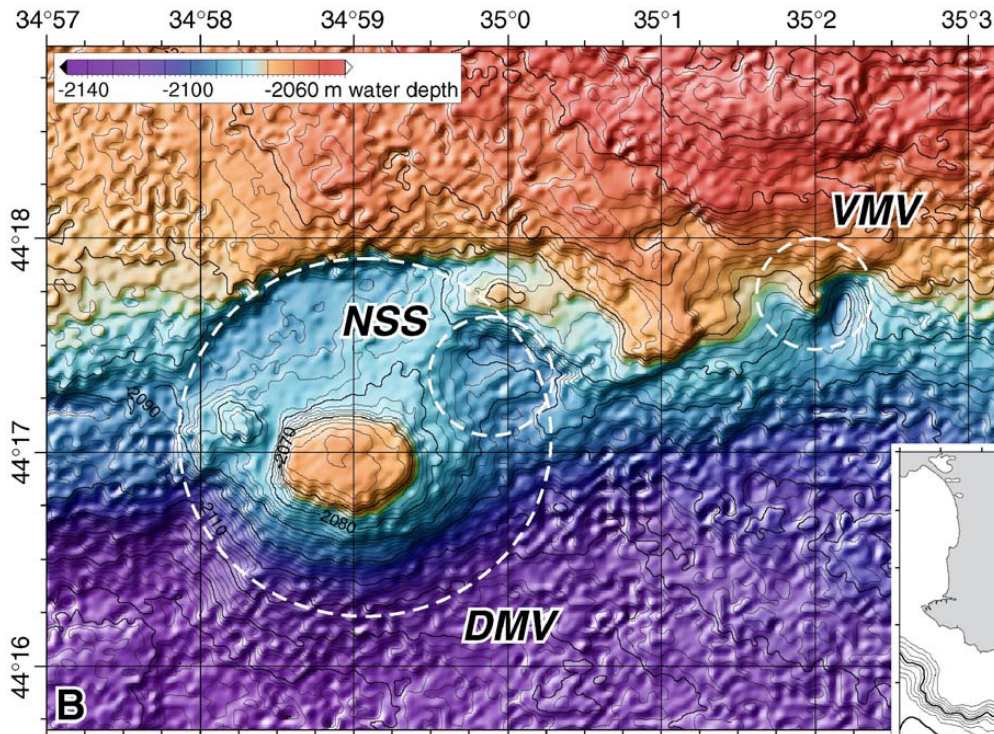
Map of the study area with indication of the major geomorphological regions and canyons. Seep locations are plotted as black dots. The scarps of the submarine landslides are emphasized by dashed lines and the position of two chimney fields is indicated by 2 horizontal arrows (1: Michaelis et al., 2002; 2: CRIMEA cruise 2004).



Bathymetric 3D map of the Danube Canyon, obtained from EM1000 data. The inset box shows a schematic representation of the canyon morphology, and the segments A to E separated along the canyon. Distinct paths of the thalweg in segment B are numbered 1 to 4. Shaded areas mark the steep canyon flanks.

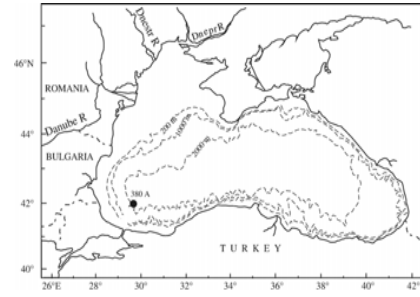
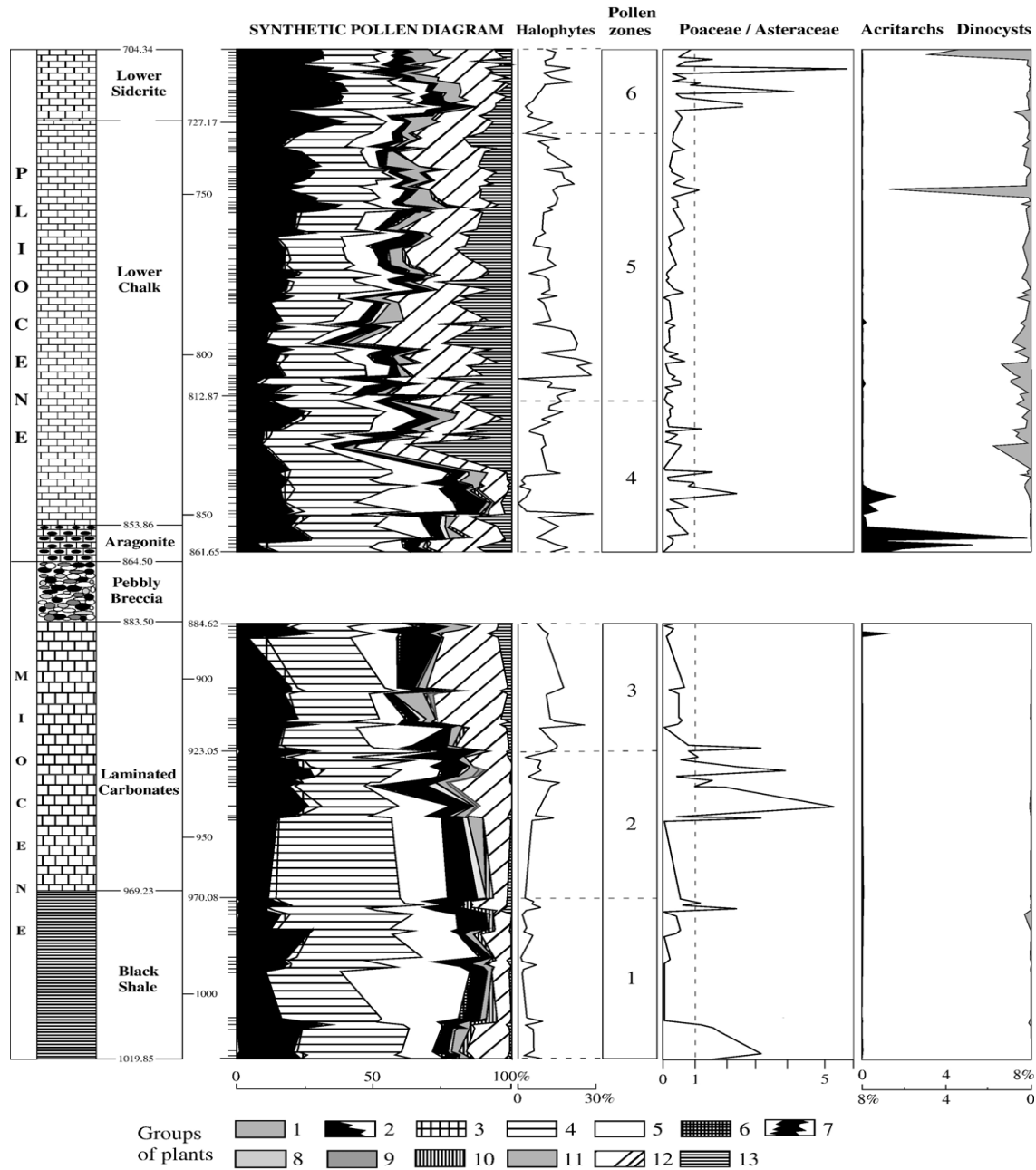


Paleogeographic map of the north-western Black Sea margin. Individual incised paleo channels identified on shallow seismic profiles were shot by the GeoEcoMar Institute and interpreted by Popescu et al. (2004). Areas characterised by dense occurrence of buried channels cluster in two main paleo-drainage systems.



(A) Position of the study area in the Black Sea, SE of the Crimea Peninsula (Ukraine). Little black dots indicate mud volcanoes, gray patches show the distribution of diapiric zones/faults (after Krastel et al. [34]). The sediments extruded from the mud volcanoes are clay-rich deposits from the Maikopian Formation that forms an Oligocene–Lower Miocene sequence of 4–5km thickness [33]. (B) Bathymetric map of the study area with the locations of the investigated mud volcanoes Dvurechenskiy and Vodianitskiy (DMV, VMV) and the Nameless Seep Site (NSS). The overall depth range is from 2040 to 2140m; the contour lines are in 2-m intervals with every 10-m annotate.

(A) 3D view from 54° showing the registered flares on the 23 June 2002. Well visible are the different heights of the western flare (background) which becomes higher from south to north. Less obvious from this direction is that the N–S trending line of the eastern flare (foreground) shows the same height as the NE–SW trending lines. (B) View from 123° showing the much stronger backscatter signals at NSS and an 837-m-high flare at DMV. The blue plain is at 1240m water depth. (C) View from 223° showing the flares above all three bubble locations. DMV shows only very weak backscatter values and a low spatial distribution. NSS and VMV have similar backscattering strength but the rising height at VMV is 150m higher. Blue plains are in 1500 and 1000m water depth. (D) View from 52° showing a strong but less high flare above VMV at the left and a very strong and high flare above NSS. The flare at DMV extends its height with respect to the previous observations, but becomes very thin above 1410m water depth. (E) View from 329° showing the very high flare above NSS and VMVs as well as the almost vanished flare above DMV with a rather thin



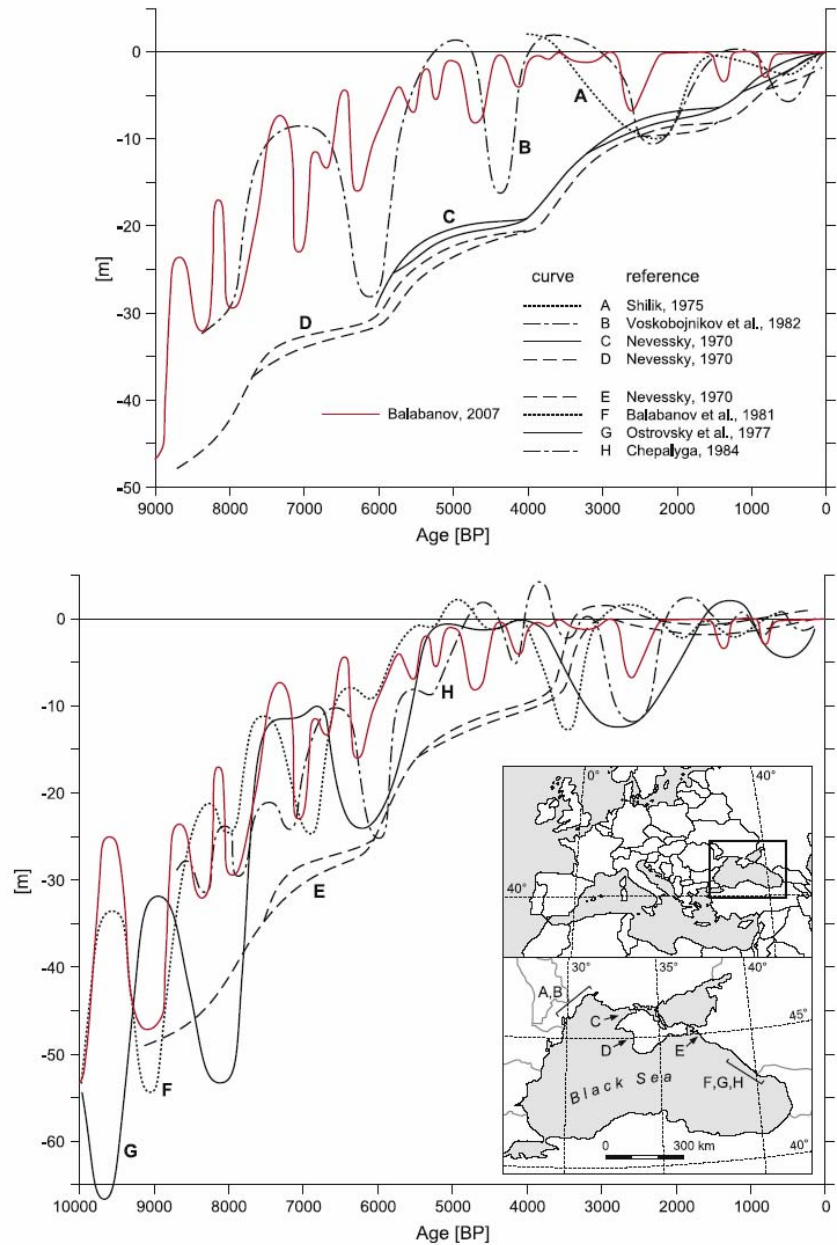
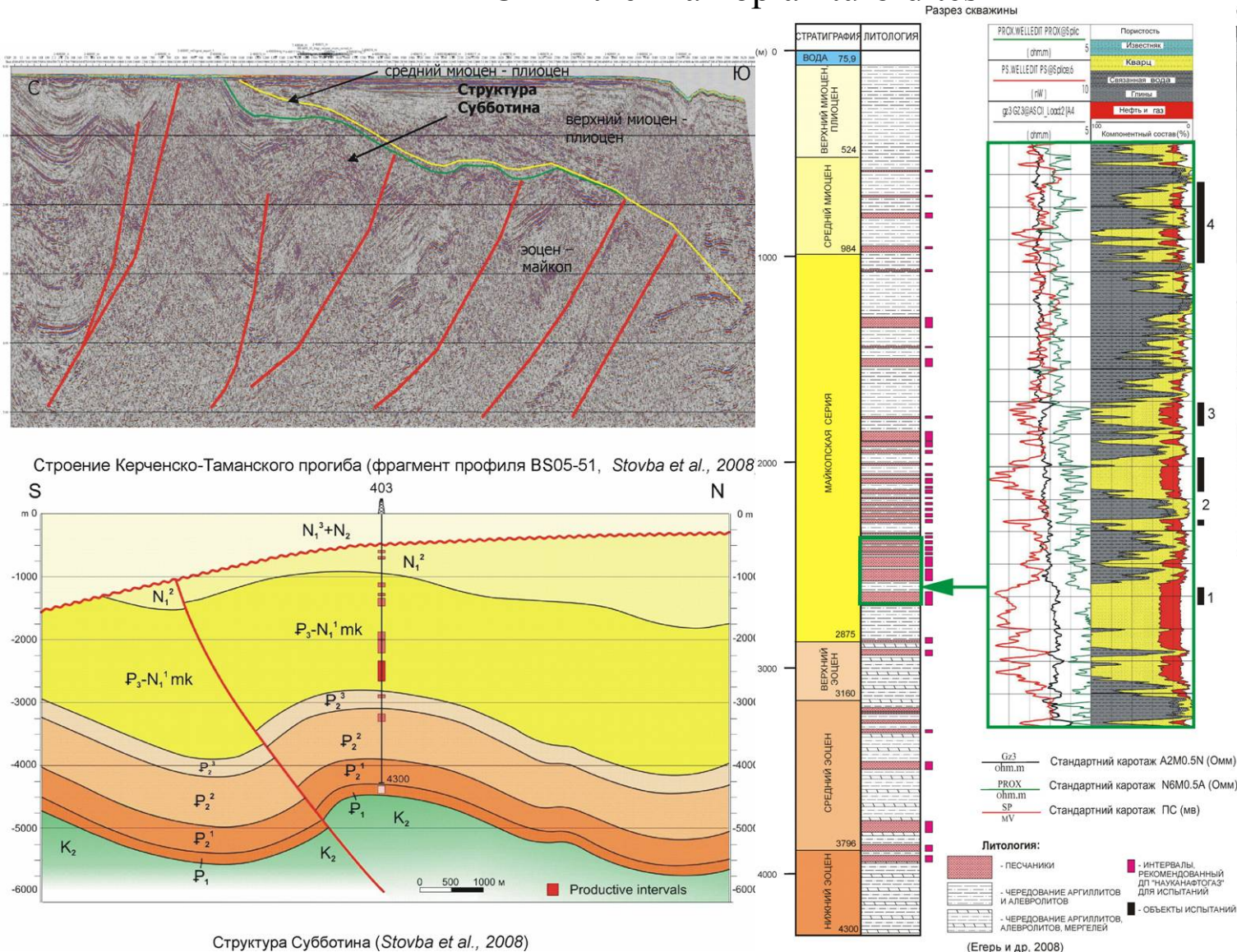


Fig. 6. Sea level curves for the Black Sea. Source: Pirazzoli (1991), Fig. 27, slightly modified.

Subbotin structure and well, Oil in the Maikopian turbidites



Стратиграфическое расчленение скважины

Fig. 1. Subbotin-403 well stratigraphic section (Gozhik et al., 2008)