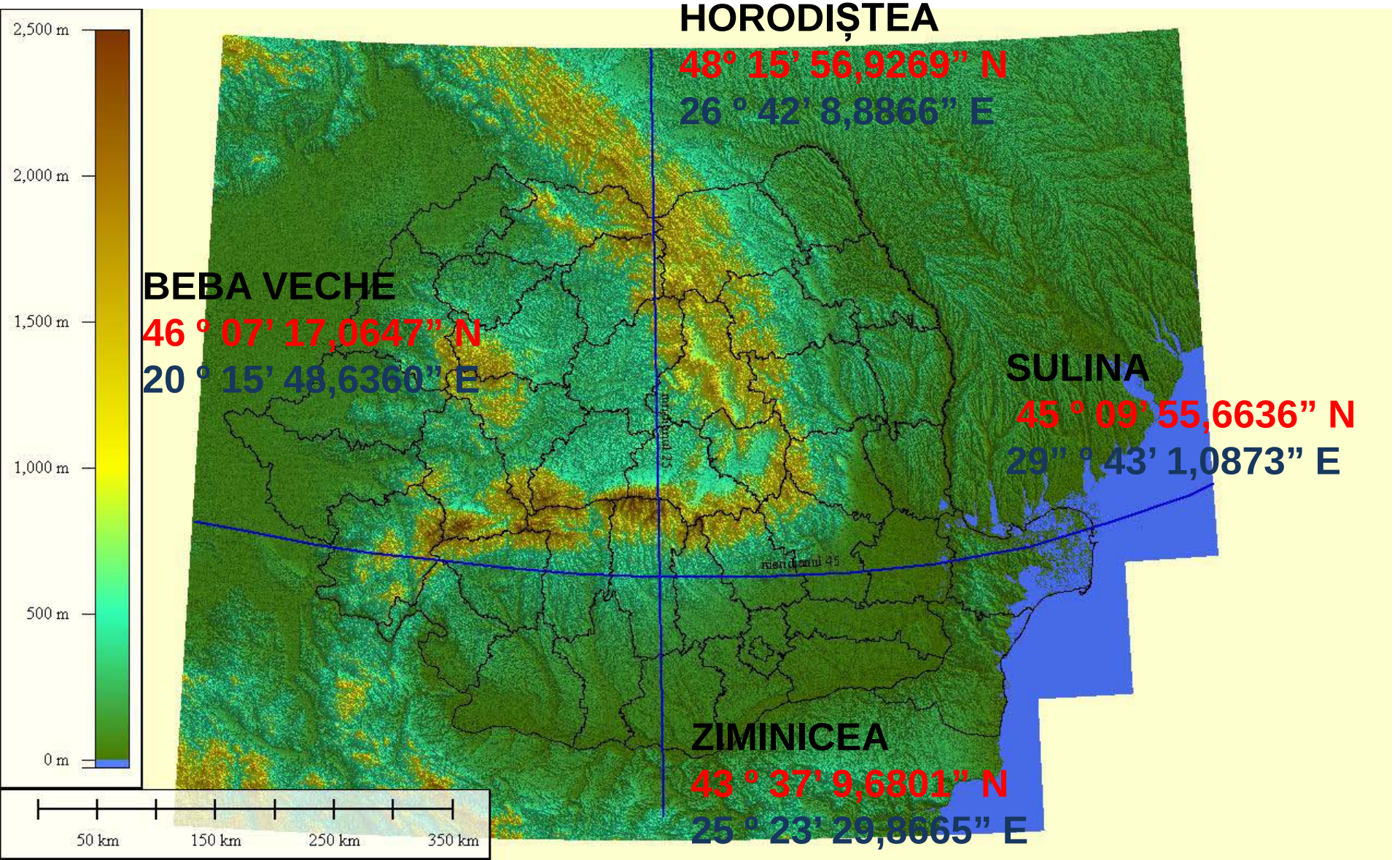
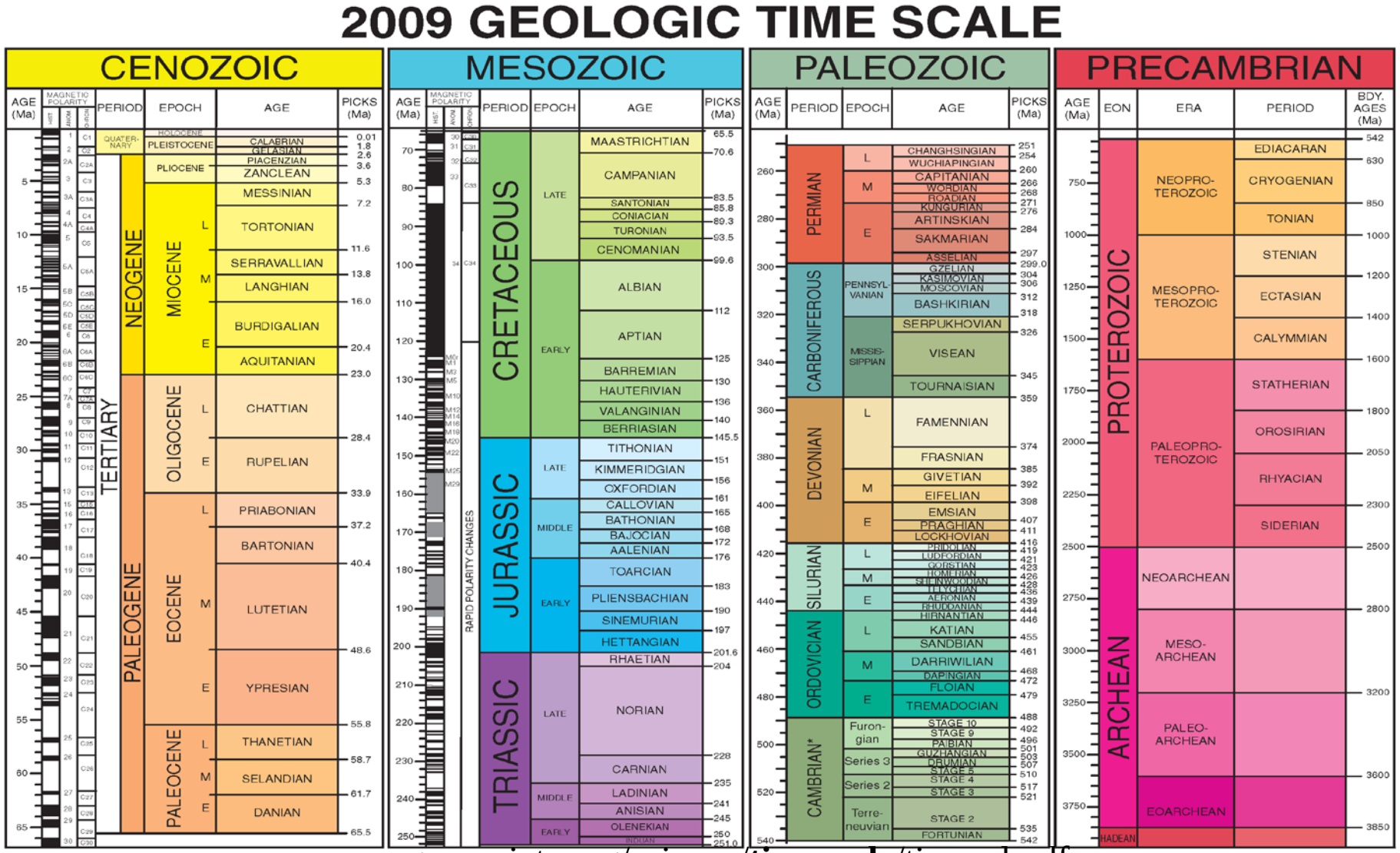
Seminar 1
Aşezarea geografică a României; Schiţe paleogeografice cu evoluţia teritoriului României în etape caracteristice (prepaleozoic-cuaternar) şi caracterizarea principalelor unităţi morfostructurale

Așezarea geografică a României



Vârstele Pământului

Eră – Perioadă – Epocă - Vârstă

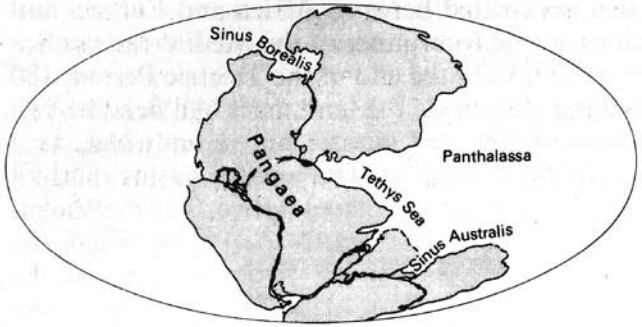


www.geosociety.org/science/**timescale**/timescl.pdf

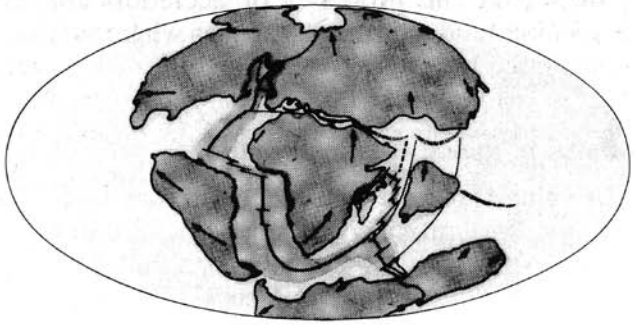
International ages have not been fully established. These are current names as reported by the International Commission on Stratigraphy.

Walker, J.D., and Geissman, J.W., compilers, 2009, Geologic Time Scale: Geological Society of America, doi: 10.1130/2009.CTS004R3C. ©2009 The Geological Society of America.

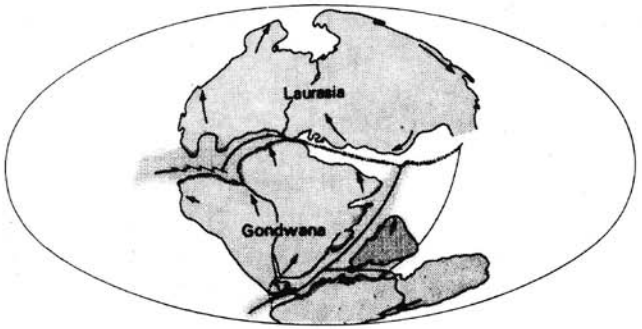
Tectonica globală și evoluția paleogeografică



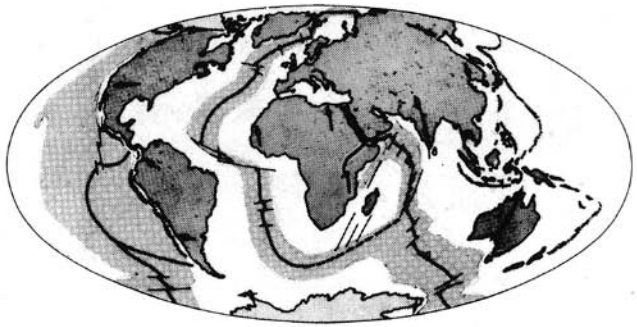
a 200 million years ago



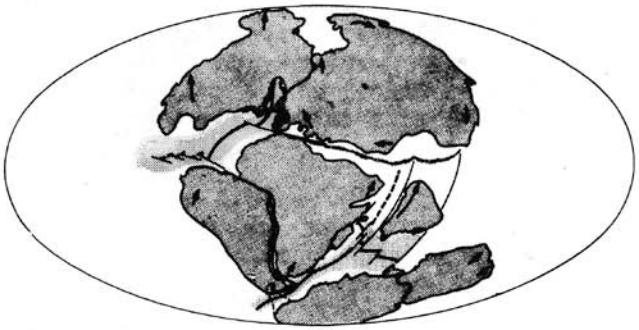
d 65 million years ago



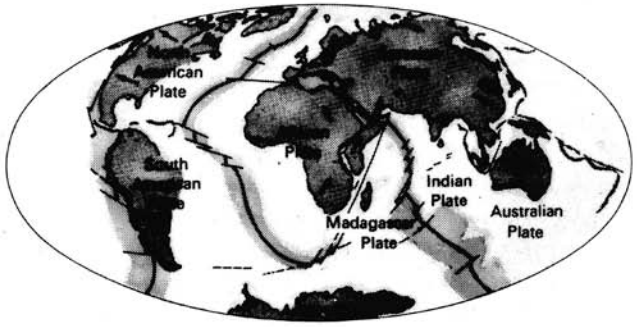
b 180 million years ago



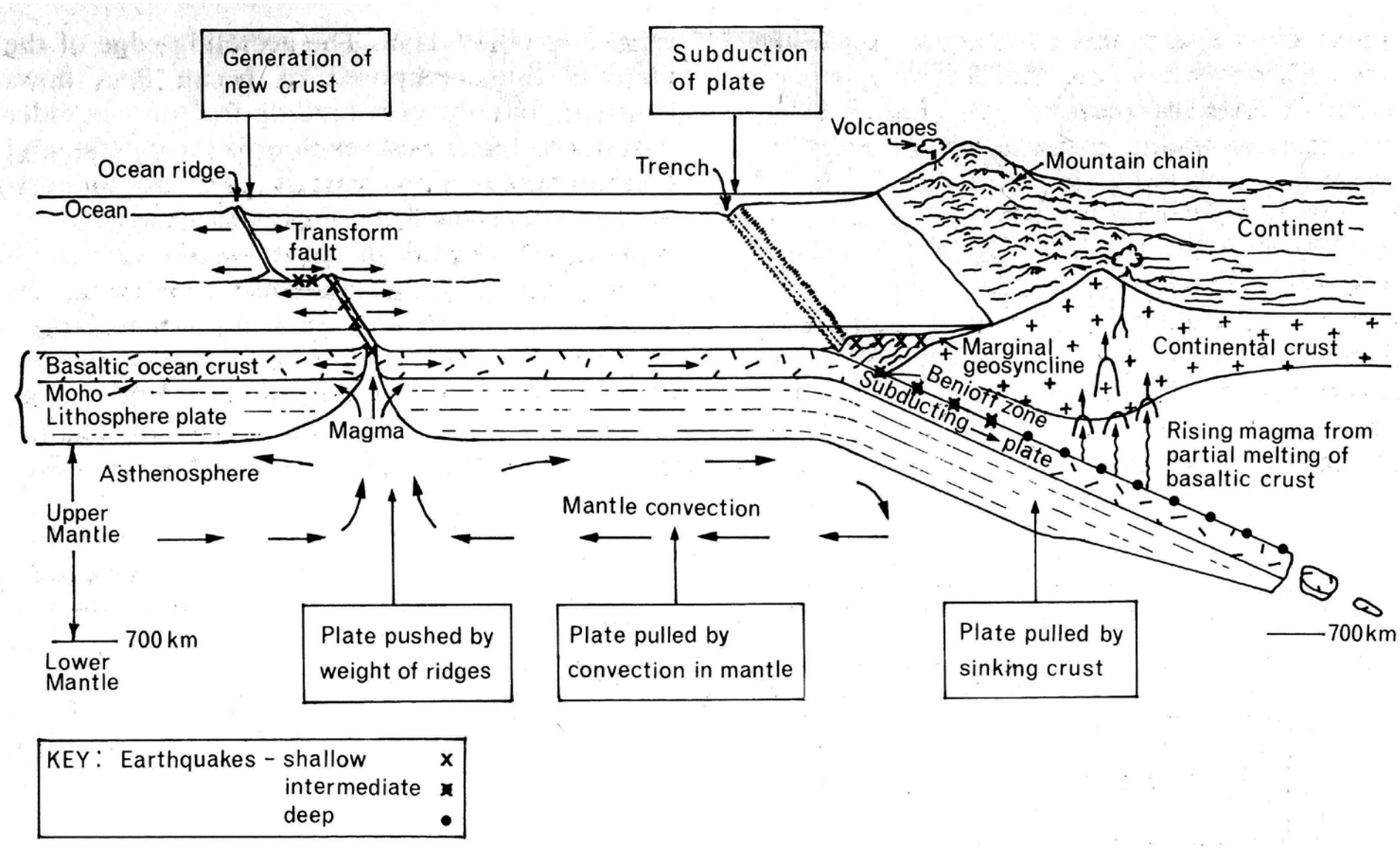
e Today

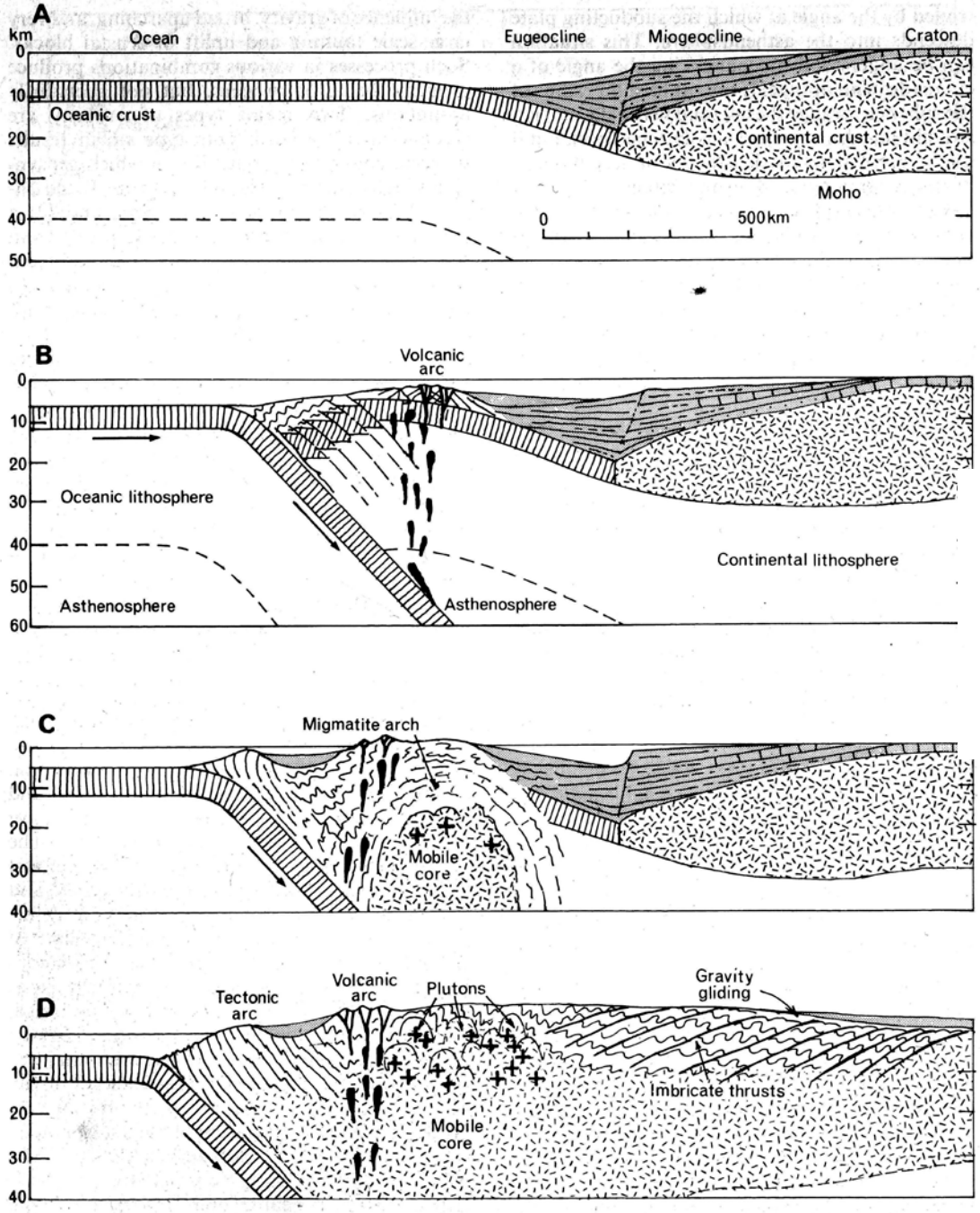


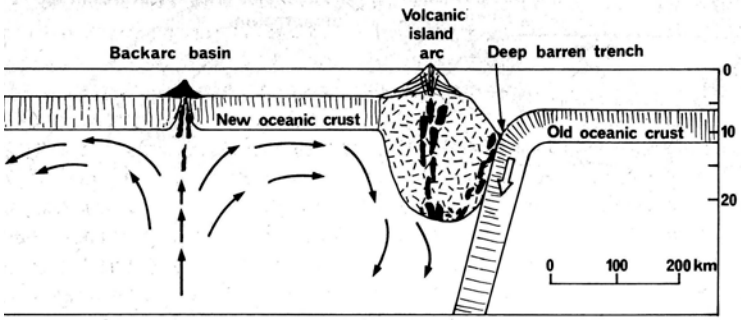
c 135 million years ago

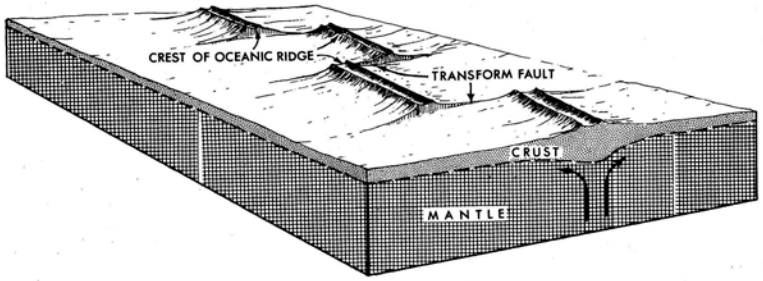


f 50 million years from today


Generation of new crust
Subduction of plate
Volcanoes
Mountain chain
Ocean ridge
Trench
Ocean
Transform fault
Continent
Marginal geosyncline
Continental crust
Basaltic ocean crust
Moho
Lithosphere plate
Magma
Benioff zone
Subducting plate
Rising magma from partial melting of basaltic crust
Asthenosphere
Upper Mantle
Mantle convection
700 km
Lower Mantle
Plate pushed by weight of ridges
Plate pulled by convection in mantle
Plate pulled by sinking crust
700km
KEY: Earthquakes - shallow
intermediate
deep







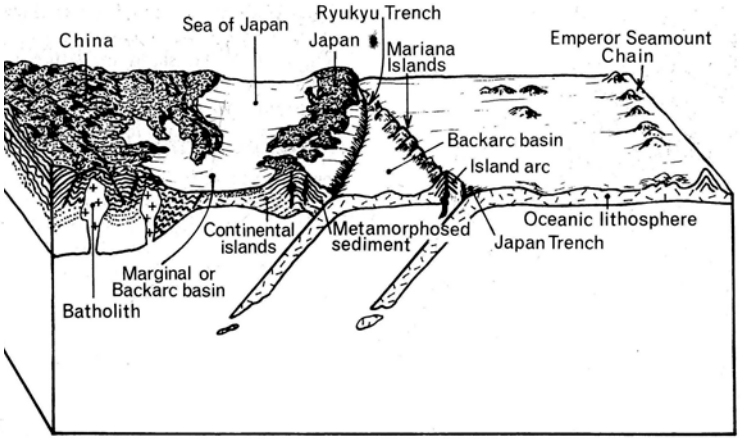
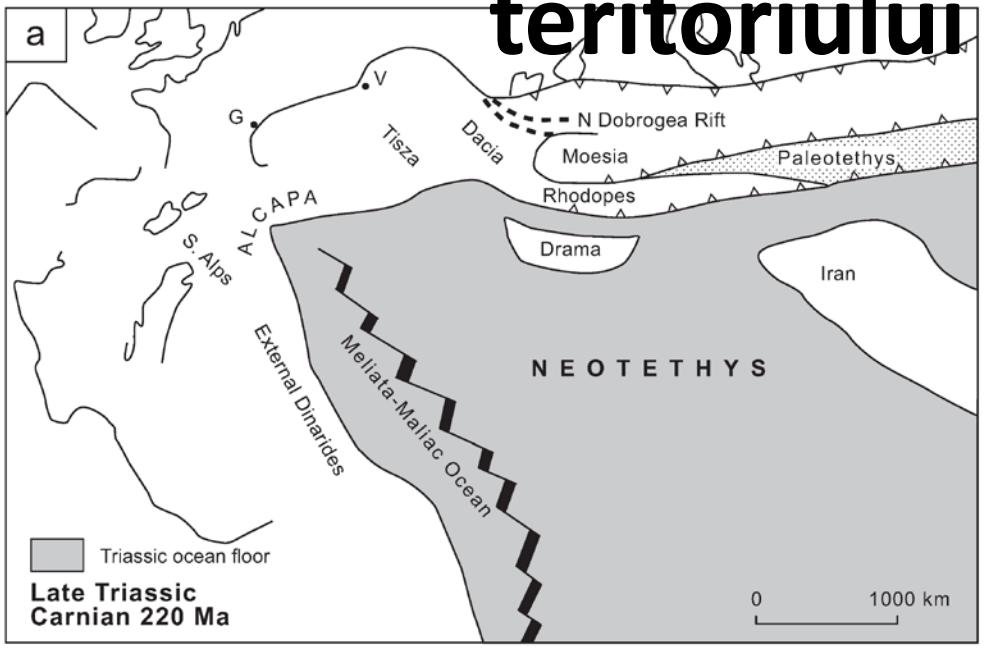
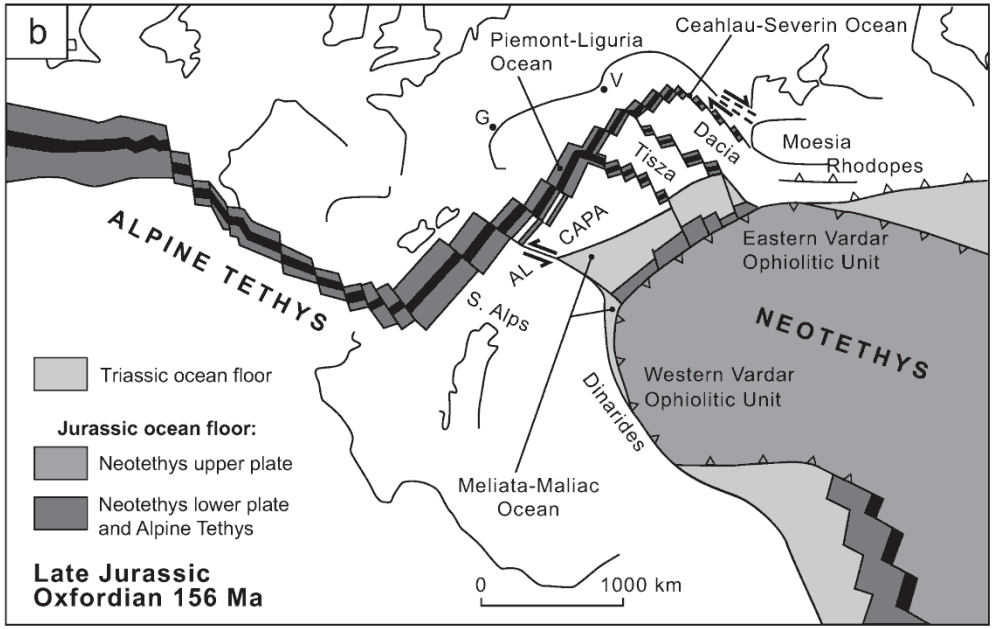
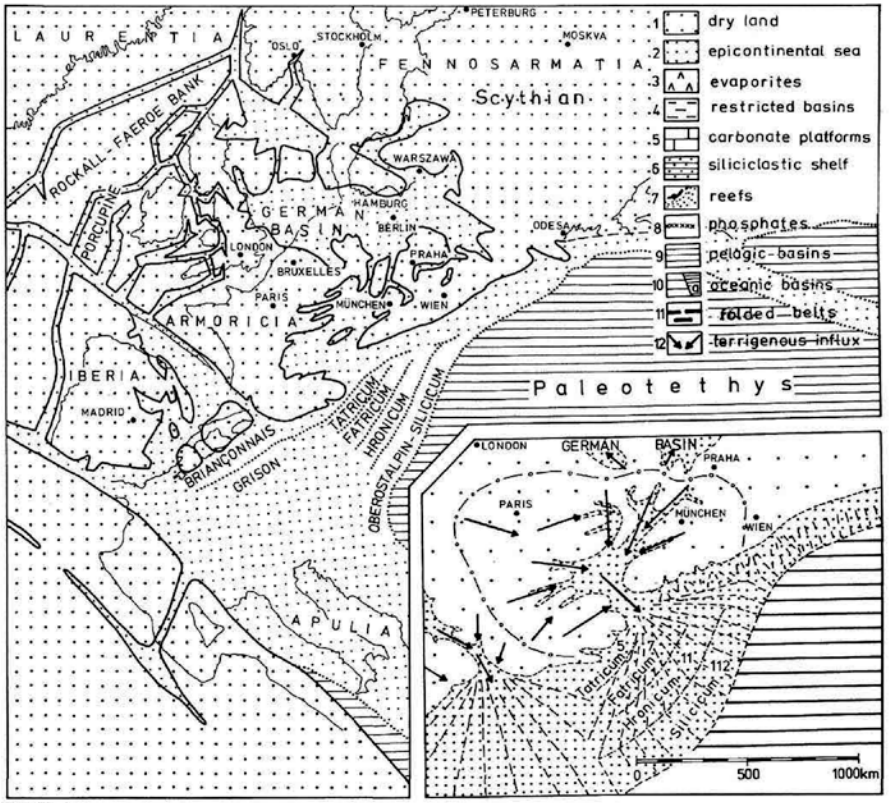


Fig. 4.6 Possible stages of a cordilleran orogeny. A stable passive margin suffers subduction, then arching of a mobile core, and finally emplacement of granite batholiths and large-scale overthrusting and gravity sliding onto the continental foreland (based on Dewey and Bird, 1970).

Schiţe paleogeografice cu evoluţia teritoriului României



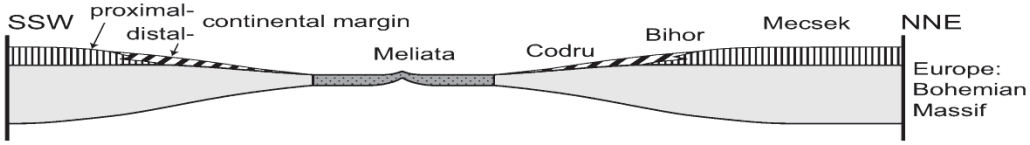


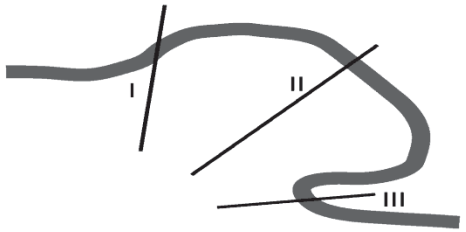


Text-Fig. 1.
Paleogeographic sketch map of Europe (a) and the Western Carpathian area (b) during the Scythian, Lower Triassic.
The numbers in the latter figure denote sedimentary rates in mm/Ka.

Triassic - Jurassic boundary

a) NW Dinarides - Tisza - Bohemian massif (I)

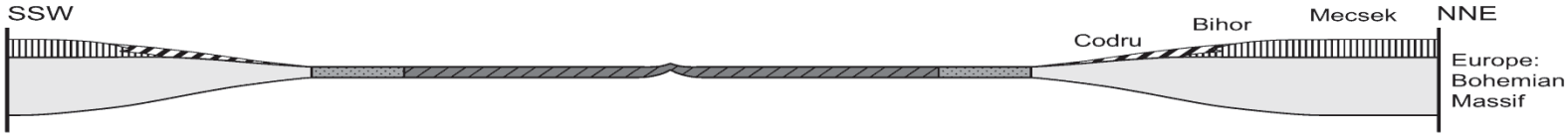




approximate orientations of the schematic section sketches in respect to the present-day Carpathian embayment

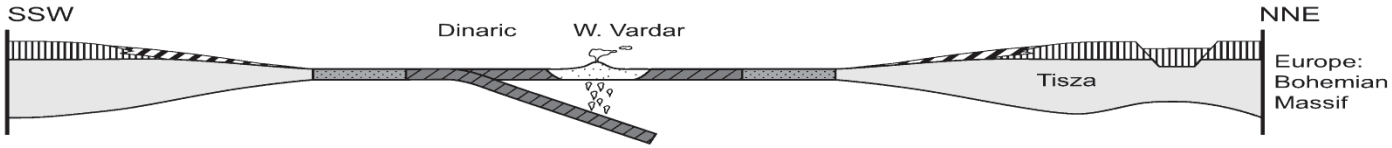
Early Jurassic

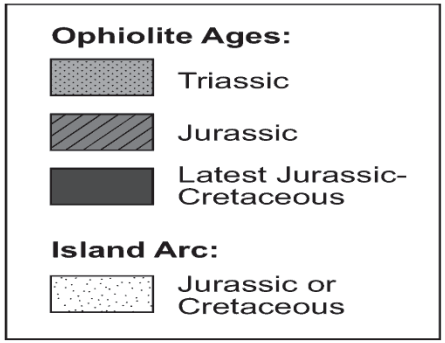
b) NW Dinarides - Tisza - Bohemian massif (I)



early Middle Jurassic

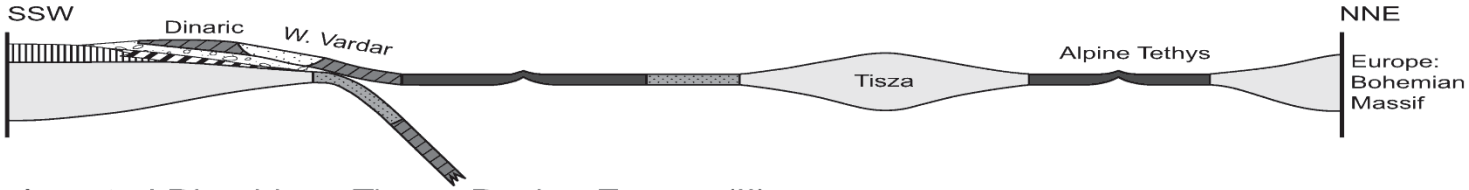
c) NW Dinarides - Tisza - Bohemian massif (I)



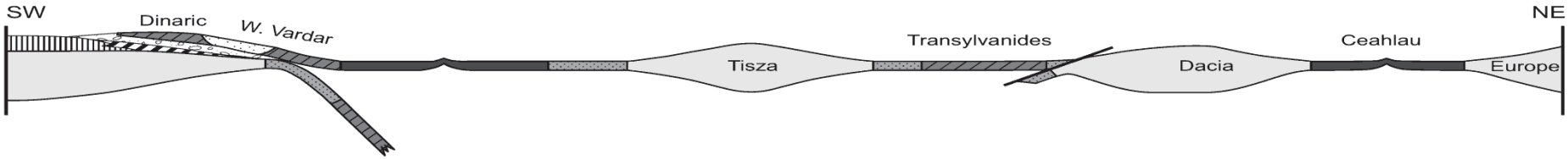


latest Jurassic

d) NW Dinarides - Tisza - Bohemian massif (I)

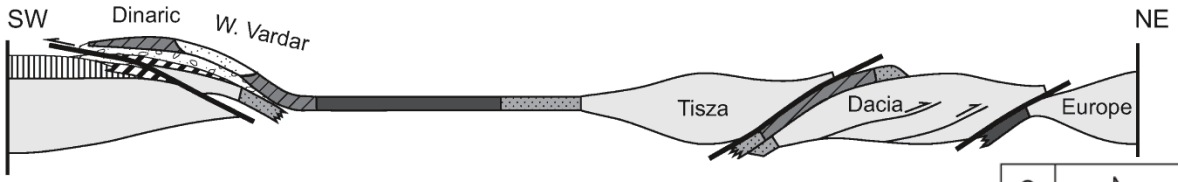


e) central Dinarides - Tisza - Dacia - Europe (II)

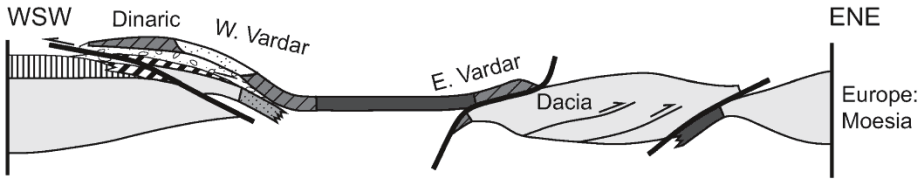


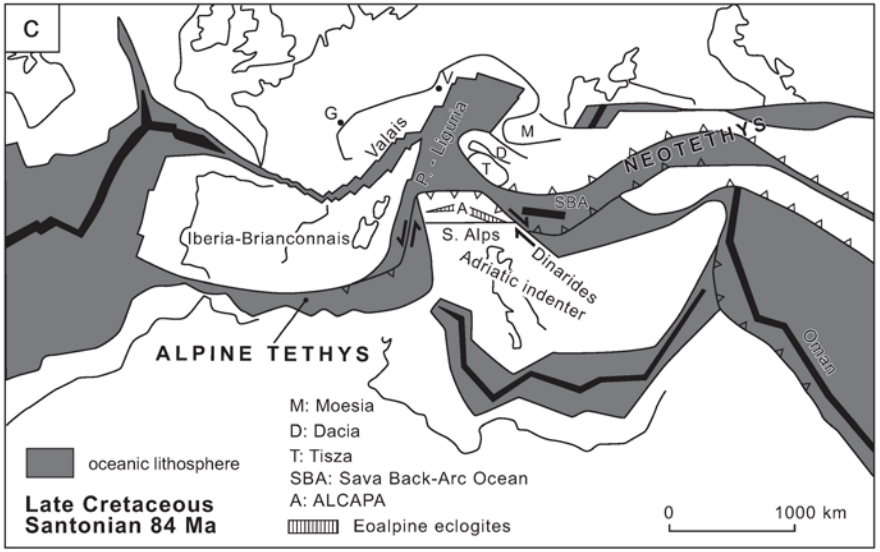
late Early Cretaceous

f) central Dinarides - Tisza - Dacia - Europe (II)



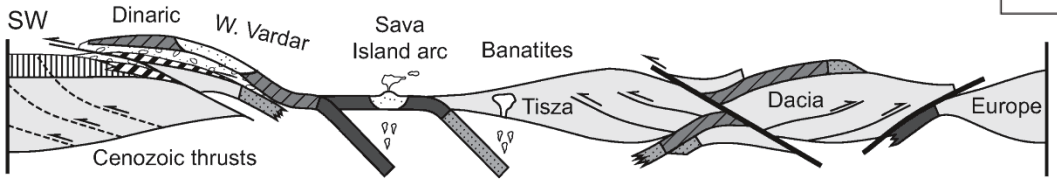
g) SE Dinarides - Dacia - Moesia (III)





Late Cretaceous

h) central Dinarides - Tisza - Dacia - Europe (II)



i) SE Dinarides - Dacia - Moesia (III)

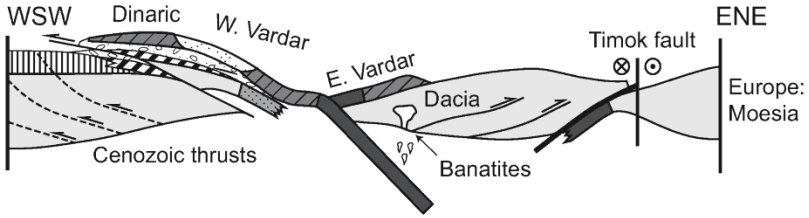
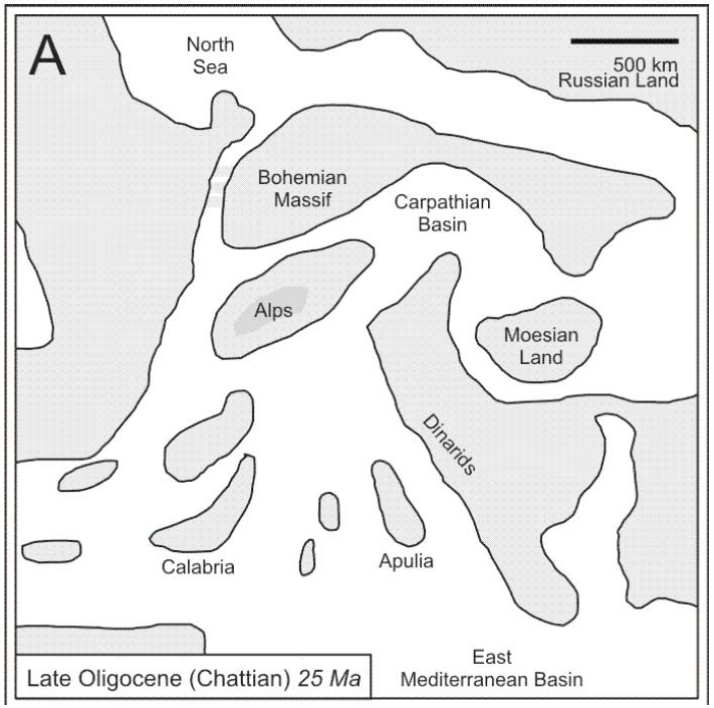
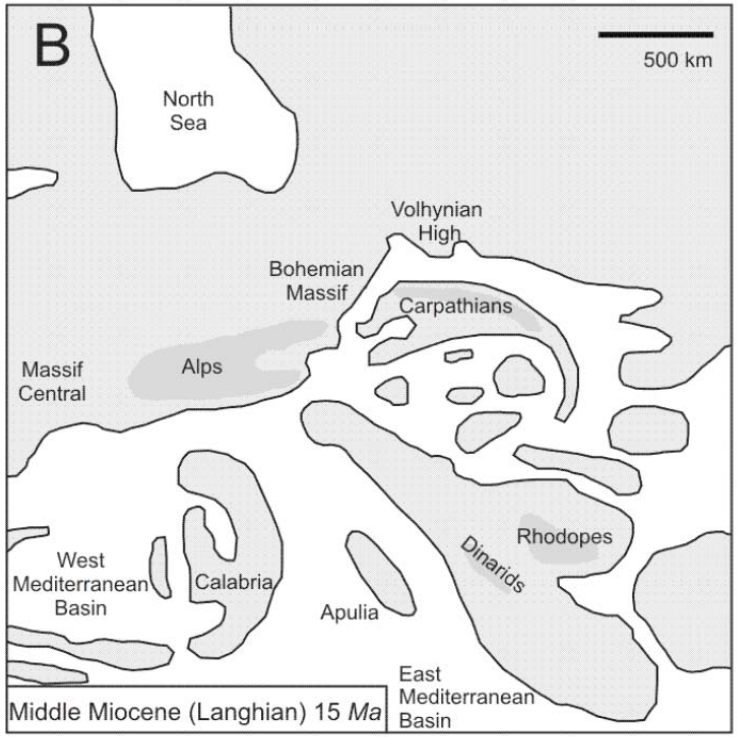
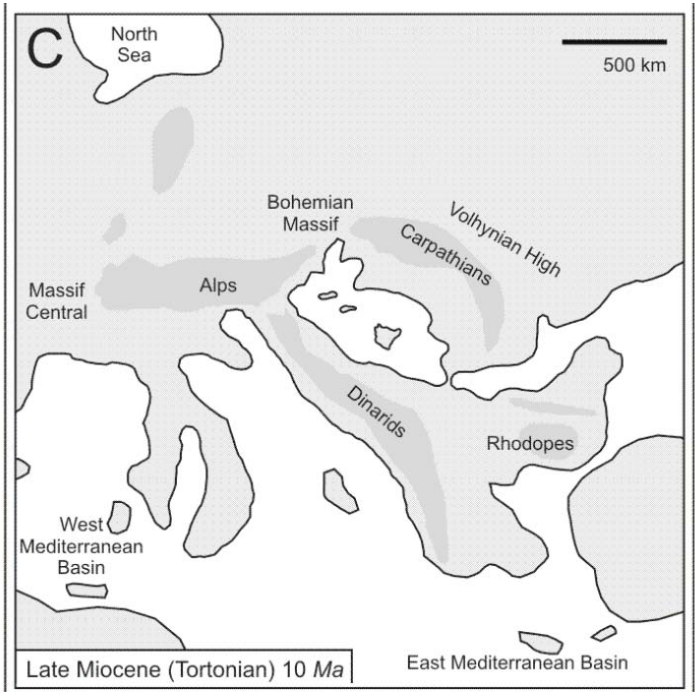


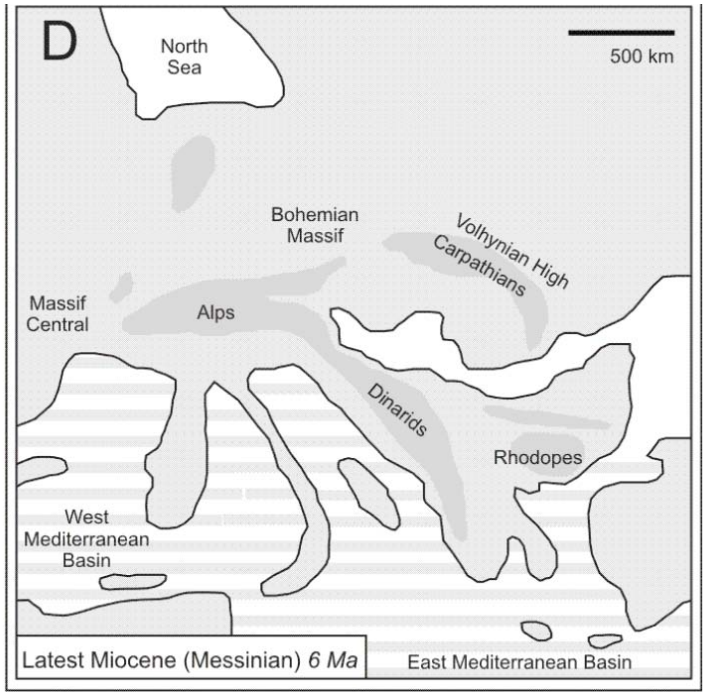
Fig. 5. (Continued).

Oligocen - Miocen









Miocen

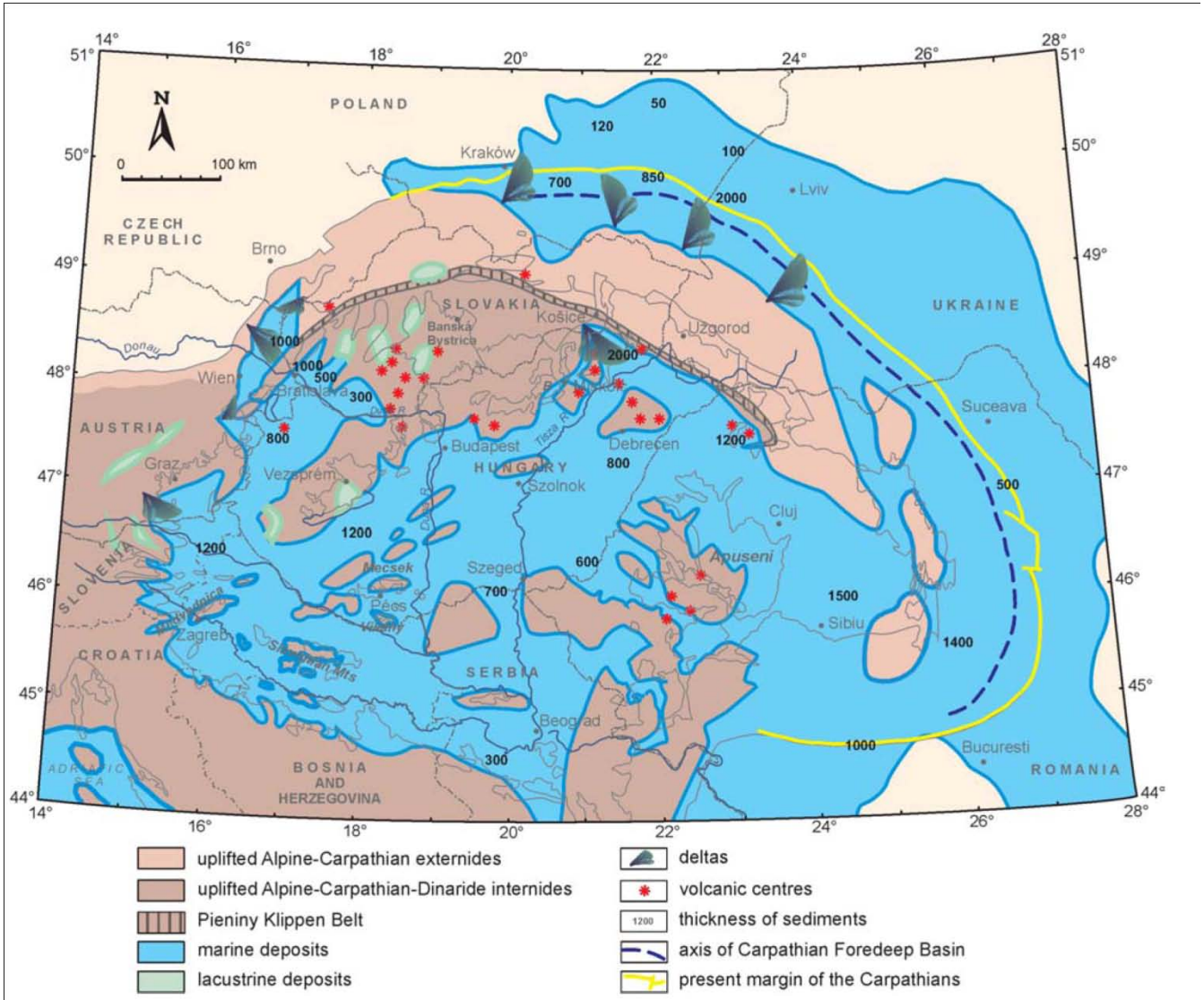
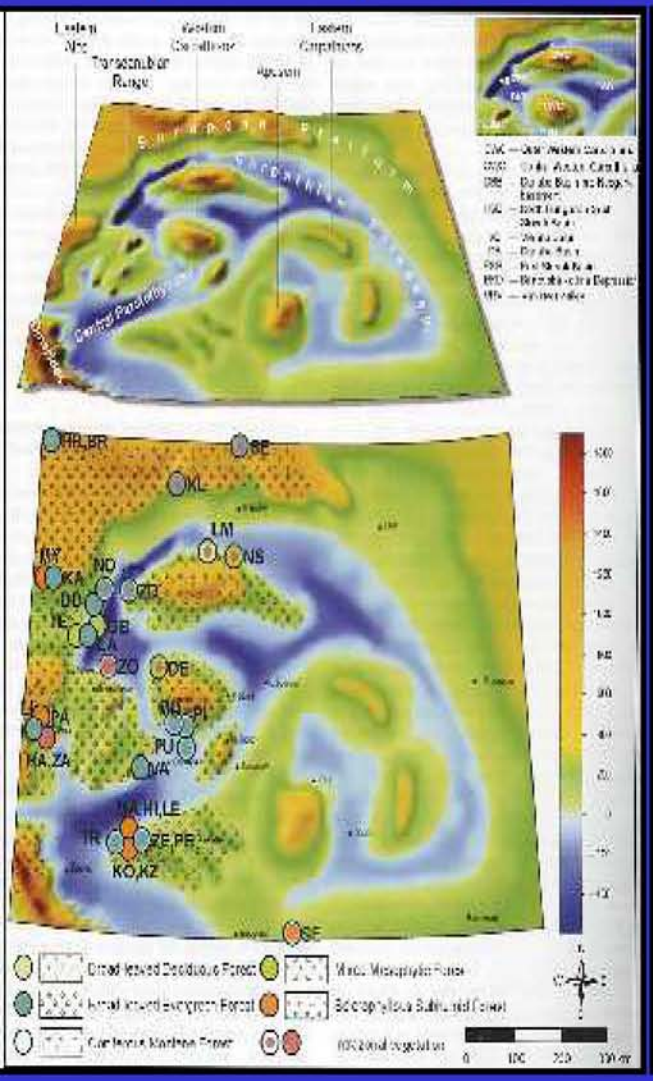


Fig. 4. Paleogeographical-palinspastic map of the Central Paratethys during the Late Badenian (early Serravallian–Late Badenian–Konkian (13.6–12.7 Ma)).

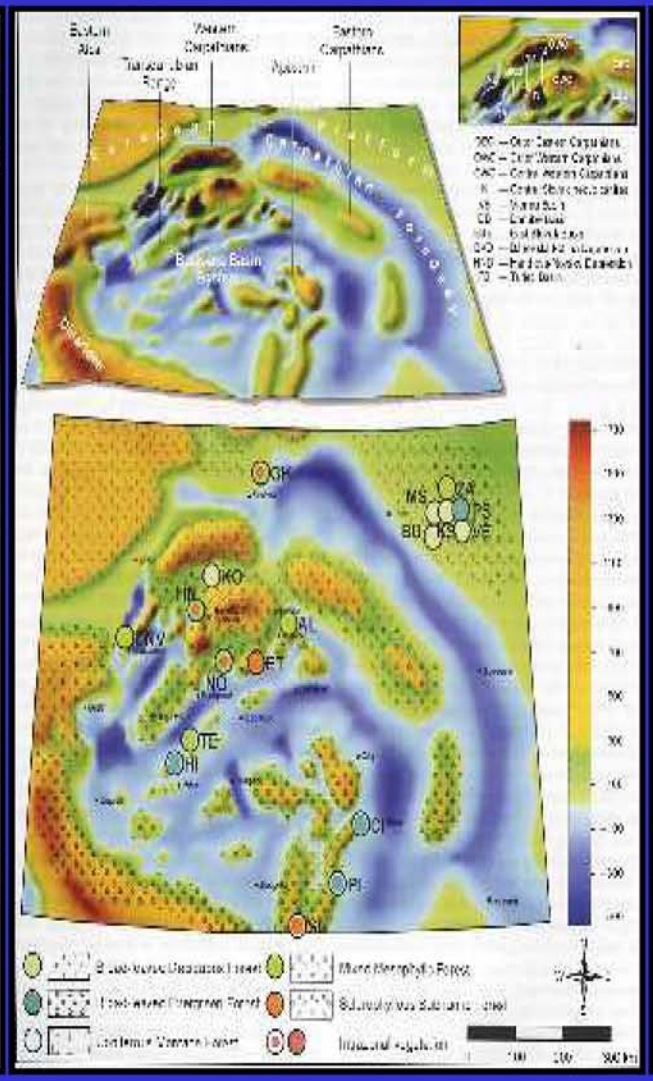
MICHAL KOVÁČ et. Al., - Badenian evolution of the Central Paratethys Sea: paleogeography, climate and eustatic sea-level changes, GEOLOGICA CARPATHICA, DECEMBER 2007, 58, 6, 579—606

Central Paratethys climatic parameters
(Kovac et al, 2002 & Kovar et al. 2003)

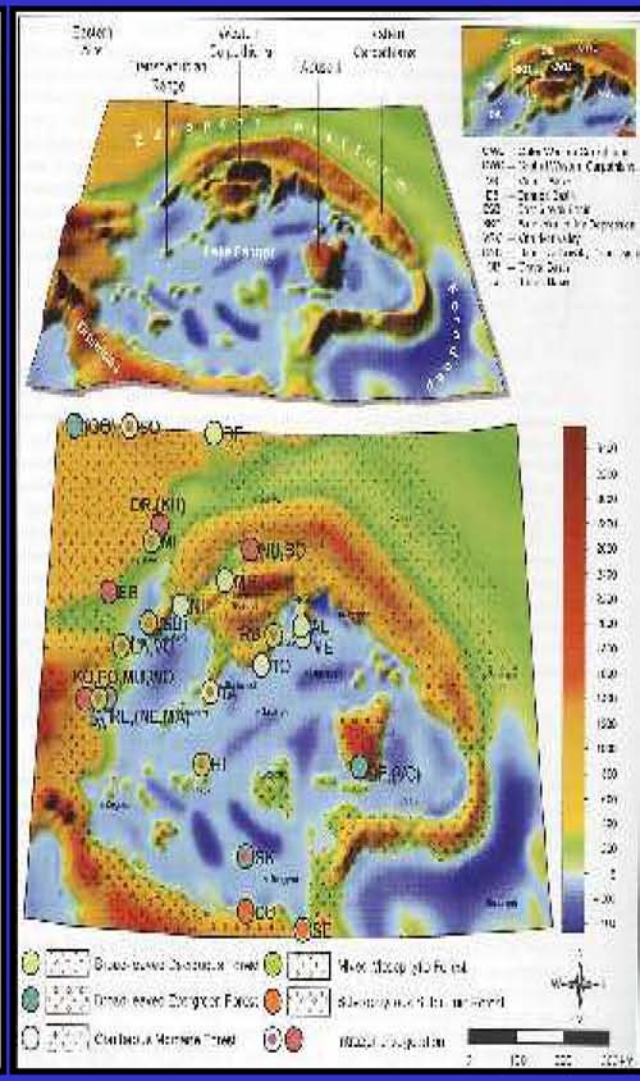
Karpatian – Early Badenian



Late Badenian – Early Sarmatian



Early to Middle Pannonian



Successivly drier conditions

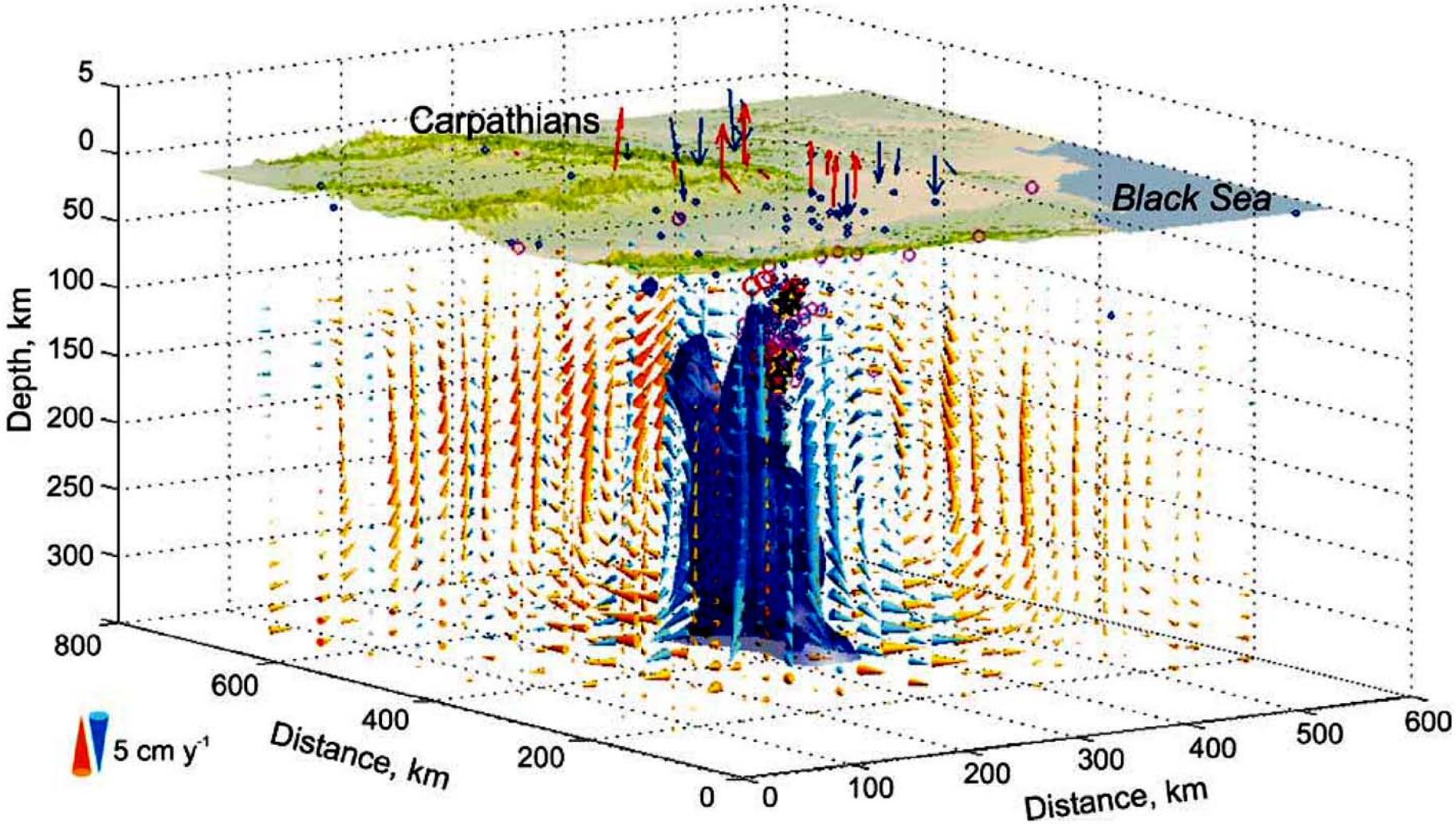
Lacurile Miocen-Pliocene

1: Rzehakia Lake System (RLS ~ 17.5–17.2 Ma),
2: Dinarid Lake System (DLS, ~ 17–15 Ma),
3: Lake Skopje (LSK, ~ 15 Ma)
4: Paratethyan Sarmatian Lakes (PSL, 12.4–11.8 Ma),
5: South German lakes (incl. Lake Steinheim) (SGL, 14.3–~ 12 Ma),
6: Lake Pannon (LP, 11.6–5.8 Ma)
7: Lake Slavonia (LS, ~ 4–3 Ma),
8: Lake Transylvania (LT, ~ 4.5–3 Ma),
9: Lake Dacia (LD, ~ 5–3 Ma),

10: Lake Kosovo (LK, ~ 3–2 Ma),
11: Lake Šoštanj (LSO, 2.5 Ma),
12: Lake Petea (P, 0.1–0 Ma).

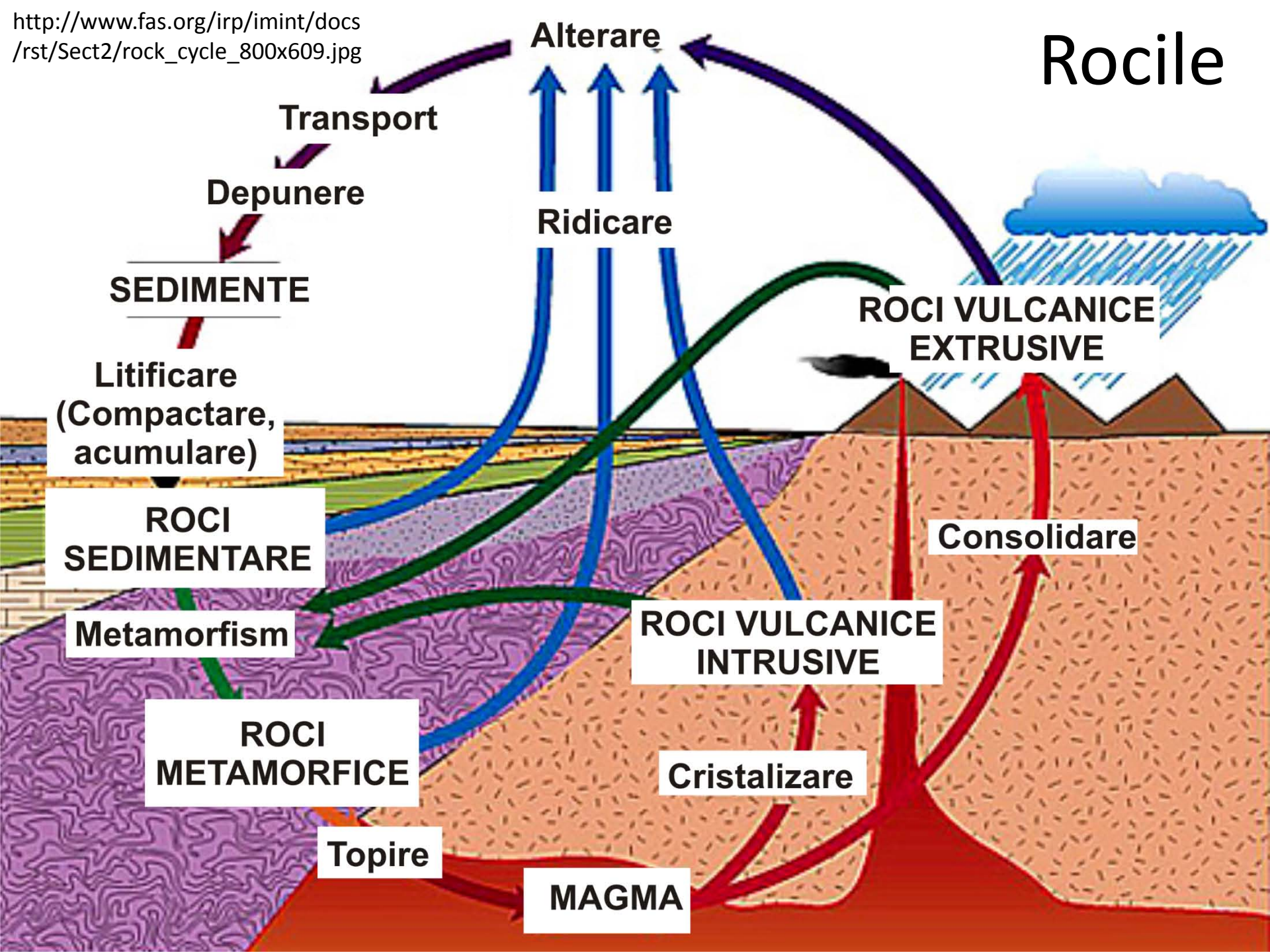
Mathias Harzhauser, Oleg Mandic, Neogene lake systems of Central and South-Eastern Europe:
Faunal diversity, gradients and interrelations, Palaeogeography, Palaeoclimatology, Palaeoecology,
Volume 260, Issues 3-4, 14 April 2008, Pages 417-434, ISSN 0031-0182, DOI: 10.1016/j.palaeo.2007.12.013.

Astăzi

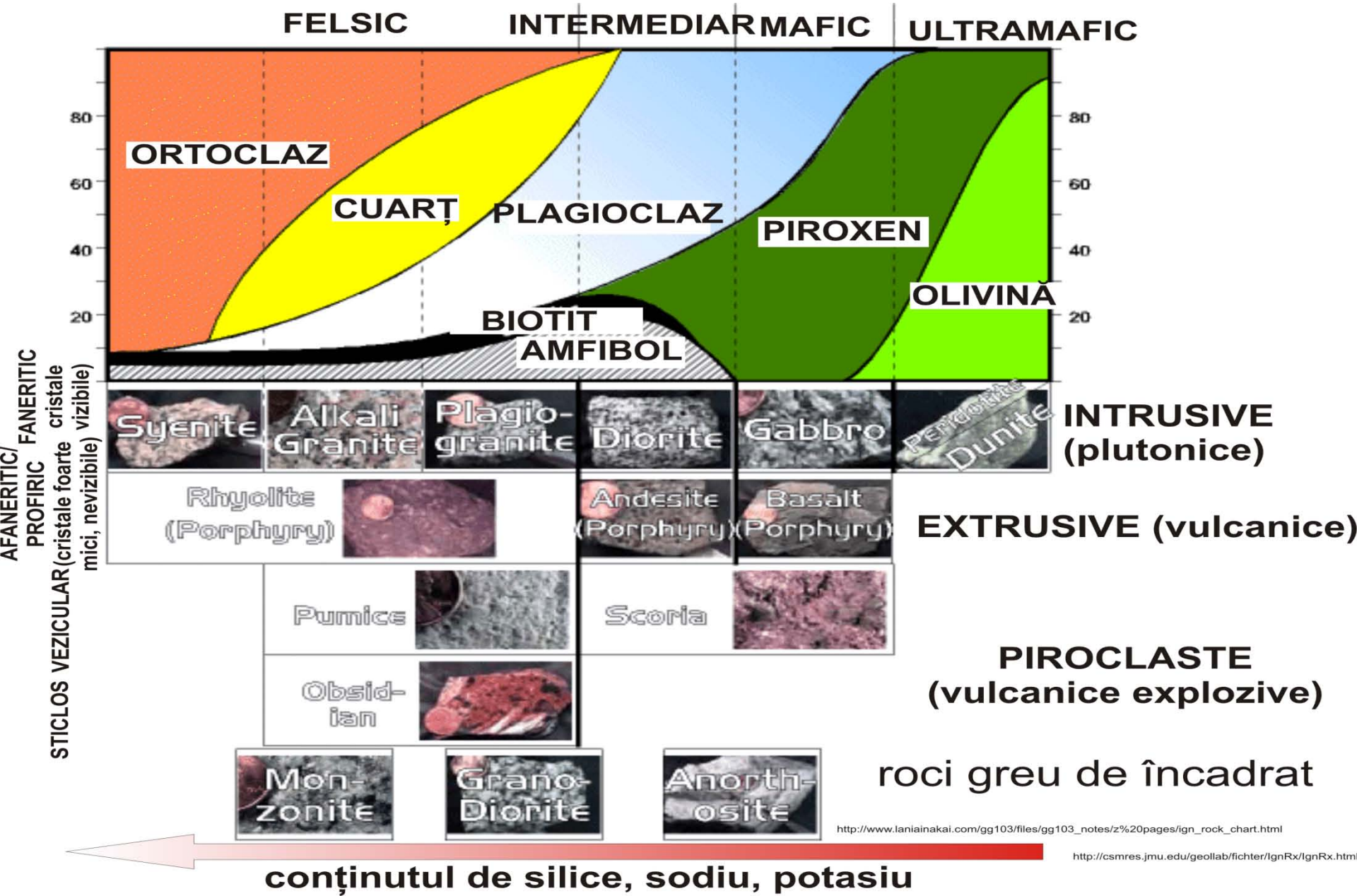

Carpathians
Black Sea
Depth, km
5
0
50
100
150
200
250
300
800
600
400
200
0
Distance, km
0
100
200
300
400
500
600
Distance, km
5 cm y-1

http://www.fas.org/irp/imint/docs/rst/Sect2/rock_cycle_800x609.jpg

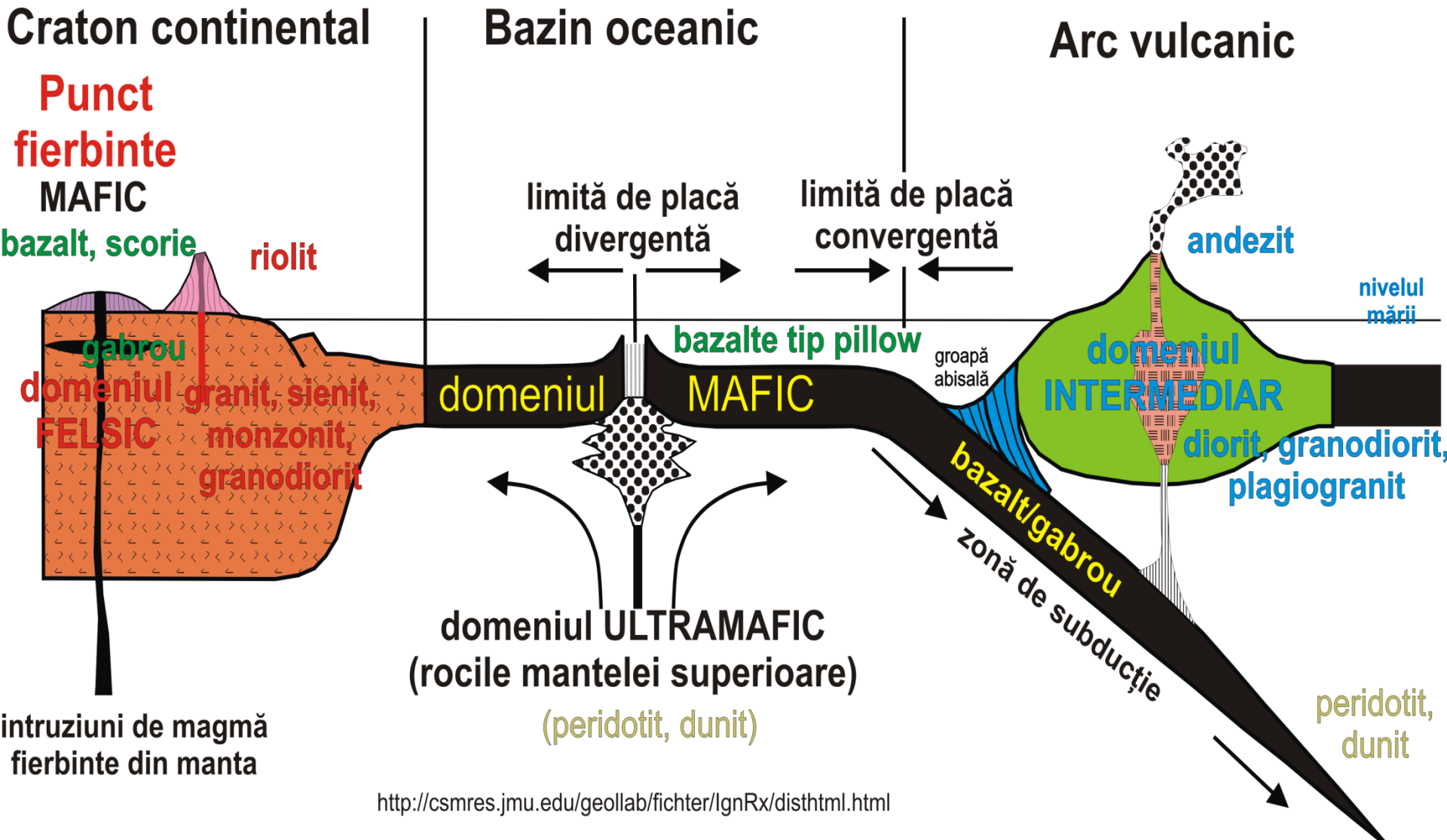
Rocile



Rocile vulcanice

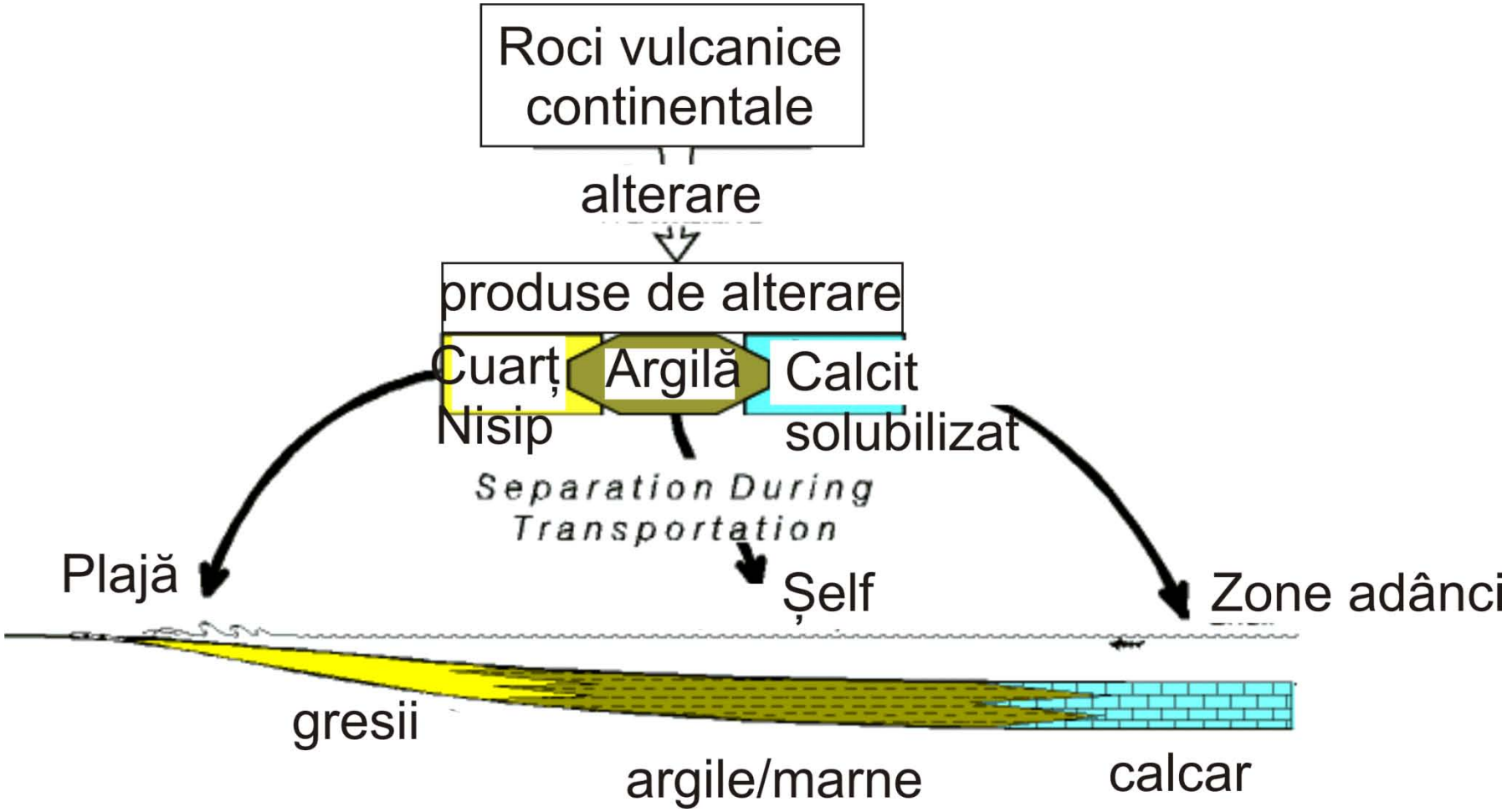


Domeniile de proveninețe a rocilor vulcanice



http://csmres.jmu.edu/geollab/fichter/IgnRx/disthtml.html

Rocile sedimentare



	neconsolidate		consolidate
Clastice	grohotiș	→	brecie
	bolovăniș	→	conglomerat
	pietriș	→	microconglomerat
	nisip	→	gresie
	praf	→	loess
	mâl	→	argilă/marnă
Bioclastice	calcare biogene		

Chimice	calcar	
	chert	
	cretă	
	gips →	evaporite
	sare →	evaporite
Biologene	turbă	
	cărbune	

Rocile metamorfice

Roci silicioase Gresii	→	Cuarțit Gneis
Argile/marne	→	Șisturi Filite
Calcare	→	Calcare cristaline Marmure

Caracterizarea principalelor unităţi morfostructurale

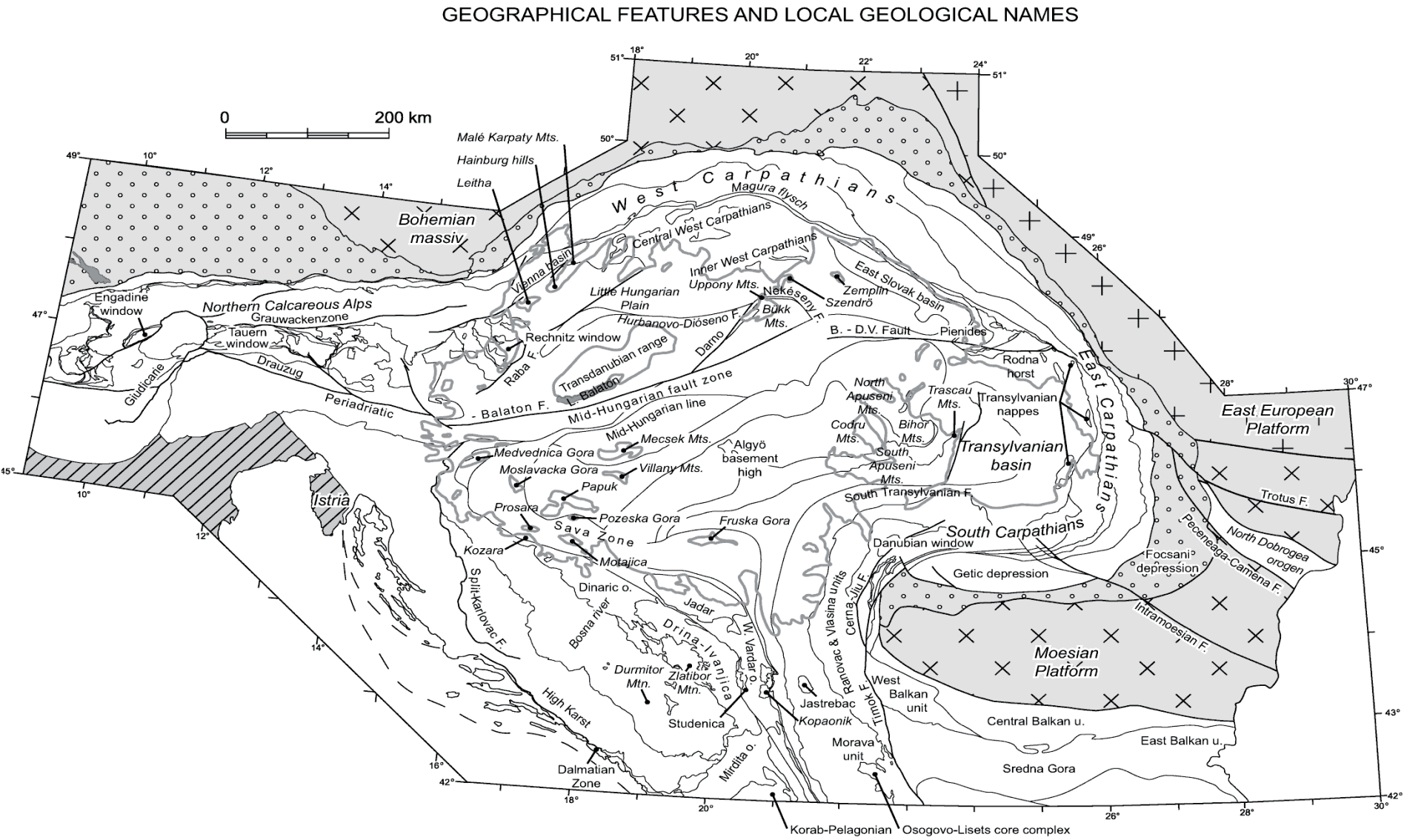


Fig. 1. Index map of geographic and geological names used in the text (see also Plate 1).

Unitatea de orogen

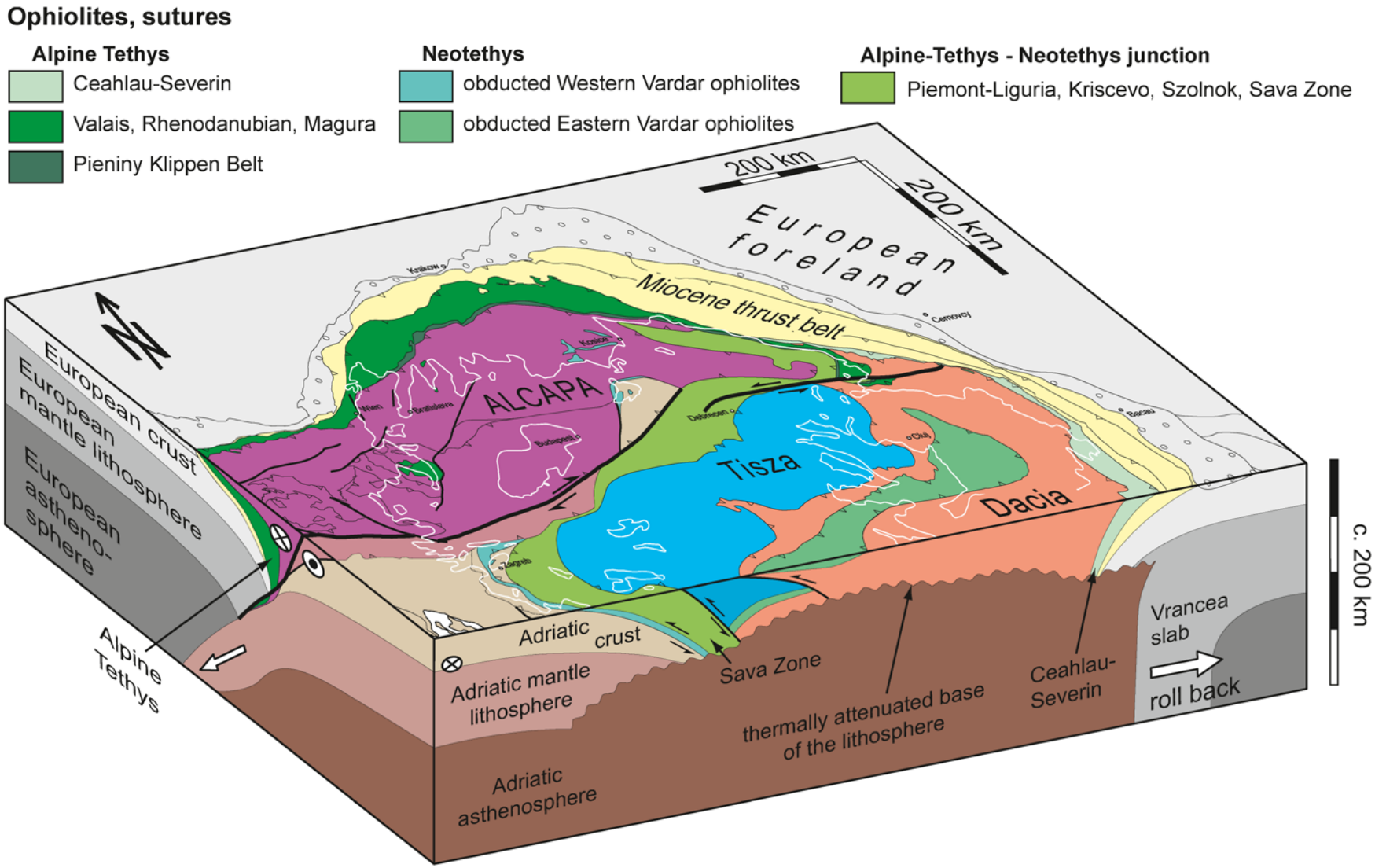
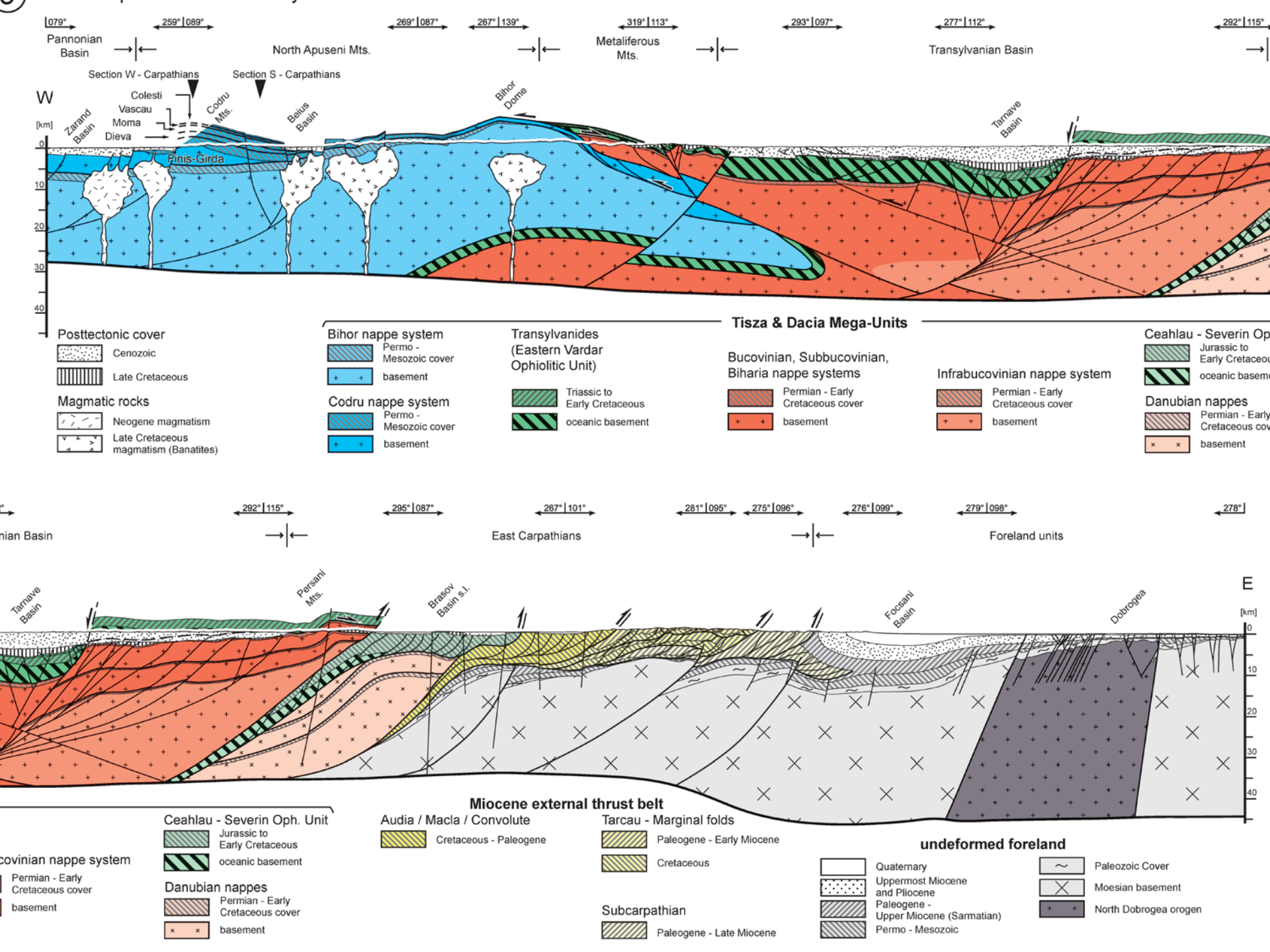
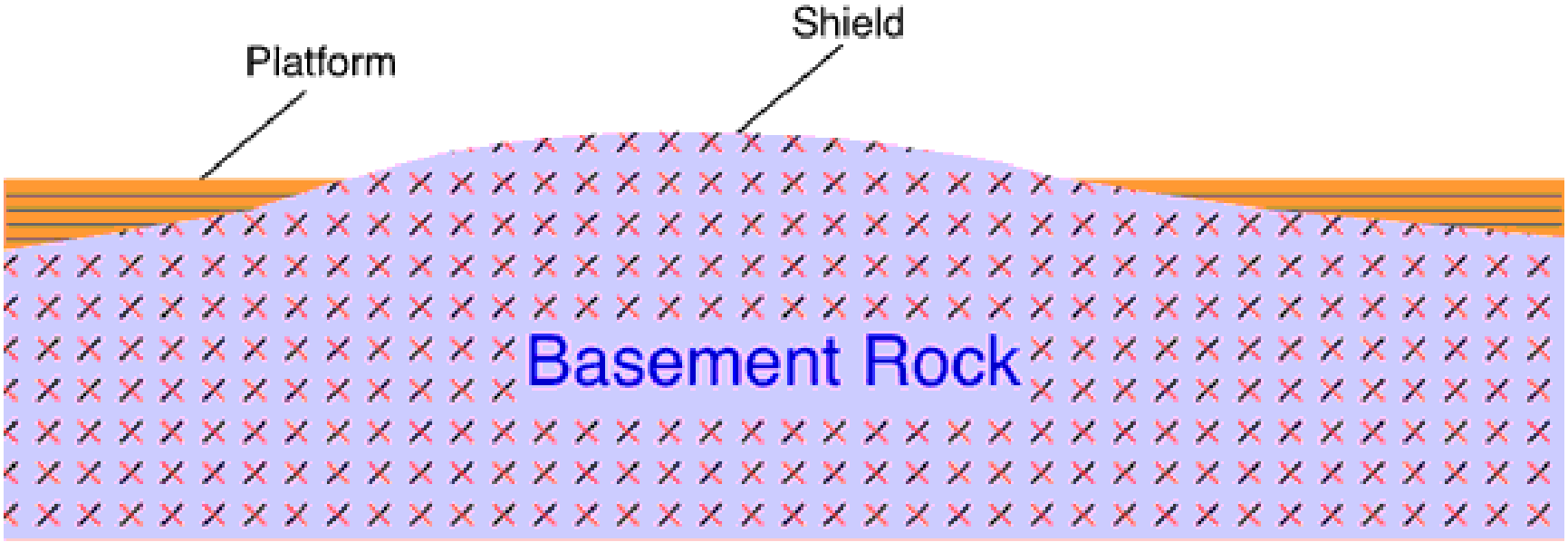


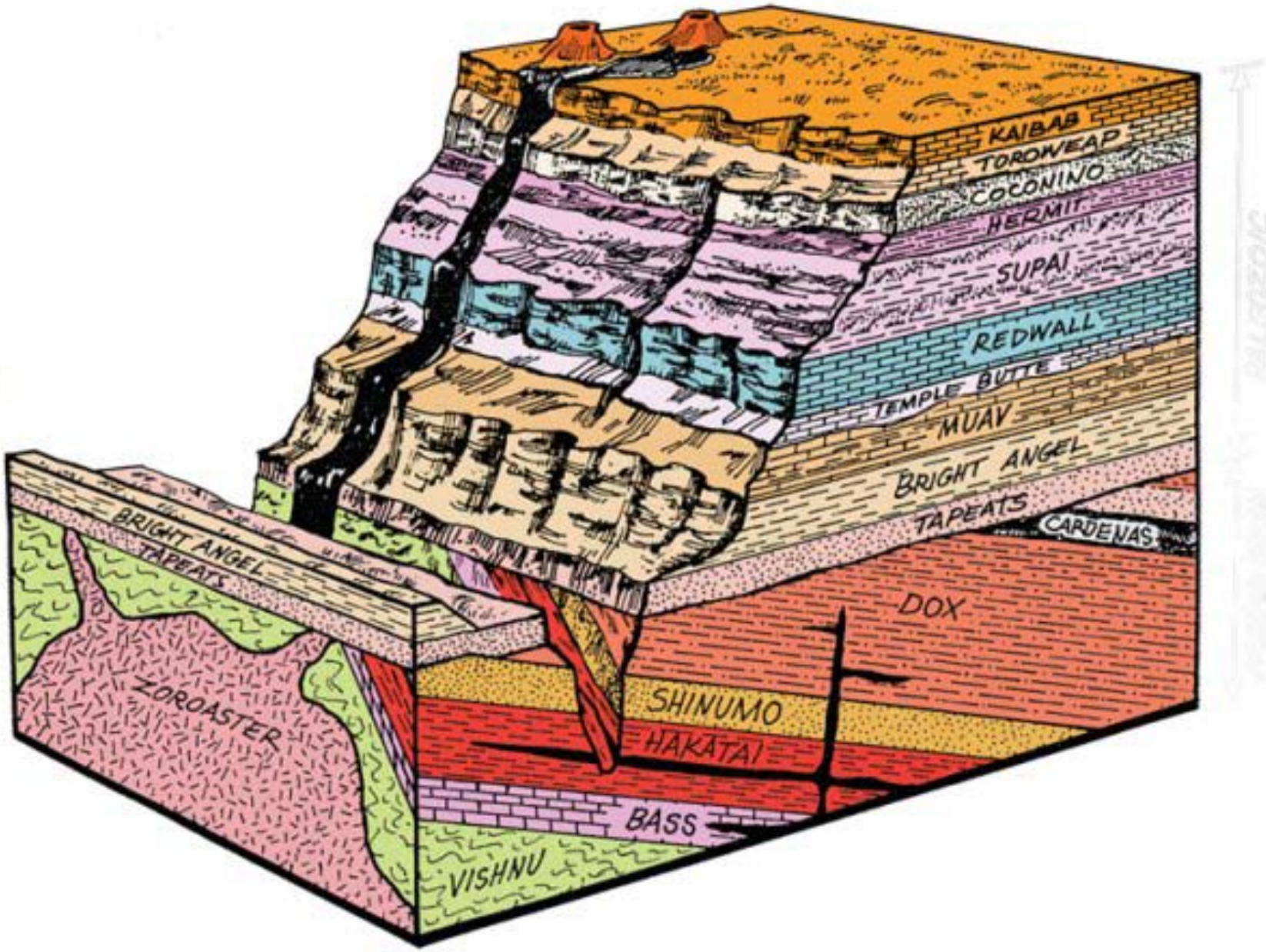
Fig. 11. Interpretative block diagram showing present-day lithospheric structures in the Eastern Alps, Carpathians and northern Dinarides. The horizontal lid of the block represents a simplified version of the tectonic map presented in Fig. 2; the vertical block walls are interpretative representations of the vertical tomographic sections (Fig. 9a and c). The MOHO depth in the N–S-trending, western edge of the block is roughly after Brückl et al. (2007). In the E–W-trending edge of the block, no seismic MOHO is shown, but the fossil crust-mantle boundary in order to better document the lithosphere tectonics. In addition to tectonic stretching, the lithosphere underneath the Pannonian Basin is also strongly thermally attenuated, giving a possible explanation for the absence of the Adriatic lithospheric slab underneath the Dinarides.


079°
259° | 089°
269° | 087°
267° | 139°
319° | 113°
293° | 097°
277° | 112°
292° | 115°
Pannonian Basin
North Apuseni Mts.
Metaliferous Mts.
Transylvanian Basin
Section W - Carpathians
Section S - Carpathians
W
[km]
Colesti
Vascau
Moma
Dieva
Zarand Basin
Codru Mts.
Beius Basin
Bihor Dome
Tarnave Basin
Finis-Girda
0
10
20
30
40
Posttectonic cover
Cenozoic
Late Cretaceous
Magmatic rocks
Neogene magmatism
Late Cretaceous magmatism (Banatites)
Tisza & Dacia Mega-Units
Bihor nappe system
Permo - Mesozoic cover
basement
Codru nappe system
Permo - Mesozoic cover
basement
Transylvanides (Eastern Vardar Ophiolitic Unit)
Triassic to Early Cretaceous
oceanic basement
Bucovinian, Subbucovinian, Biharia nappe systems
Permian - Early Cretaceous cover
basement
Infrabucovinian nappe system
Permian - Early Cretaceous cover
basement
Ceahlau - Severin Op
Jurassic to Early Cretaceou
oceanic basem
Danubian nappes
Permian - Early Cretaceous cov
basement
292° | 115°
295° | 087°
267° | 101°
281° | 095°
275° | 096°
276° | 099°
279° | 098°
278°
East Carpathians
Foreland units
Tarnave Basin
Persani Mts.
Brasov Basin s.l.
Focsani Basin
Dobrogea
E
[km]
0
10
20
30
40
Miocene external thrust belt
Ceahlau - Severin Oph. Unit
Jurassic to Early Cretaceous
oceanic basement
Danubian nappes
Permian - Early Cretaceous cover
basement
Audia / Macla / Convolute
Cretaceous - Paleogene
Tarcau - Marginal folds
Paleogene - Early Miocene
Cretaceous
Subcarpathian
Paleogene - Late Miocene
undeformed foreland
Quaternary
Uppermost Miocene and Pliocene
Paleogene - Upper Miocene (Sarmatian)
Permo - Mesozoic
Paleozoic Cover
Moesian basement
North Dobrogea orogen

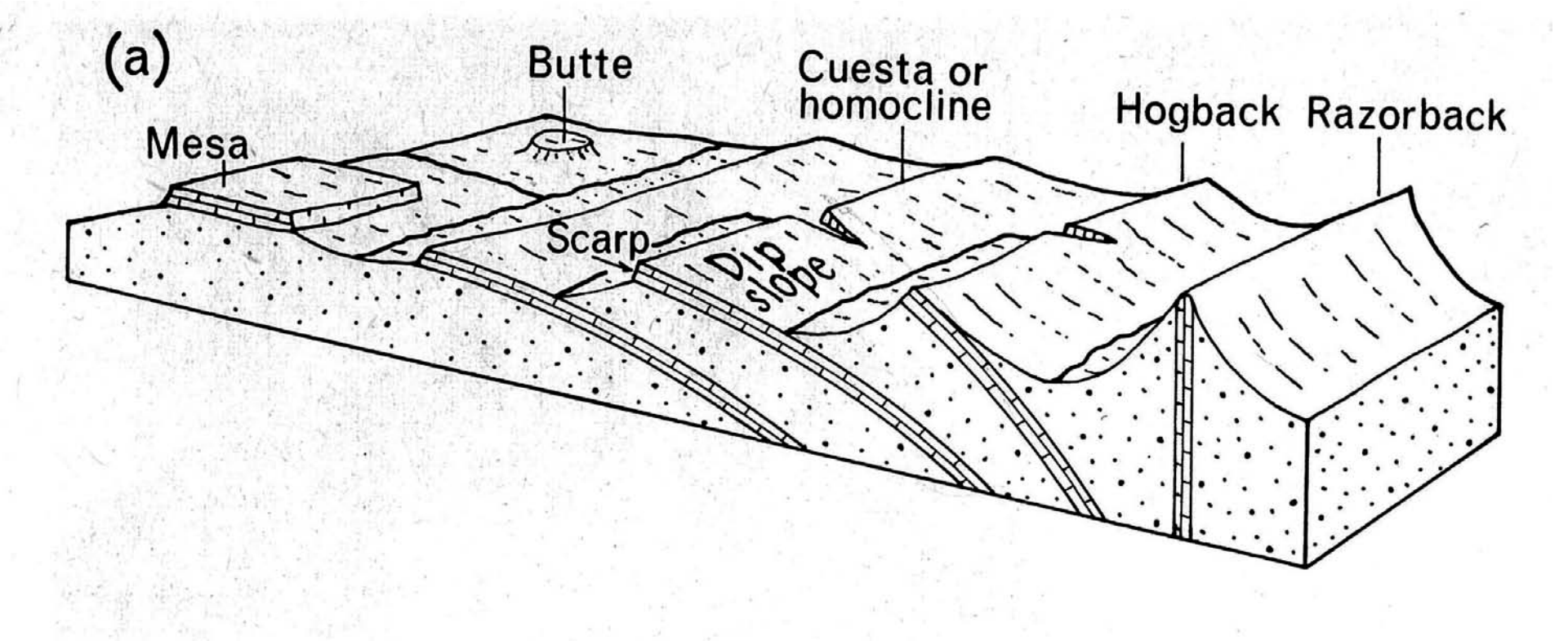
Unitatea de platformă



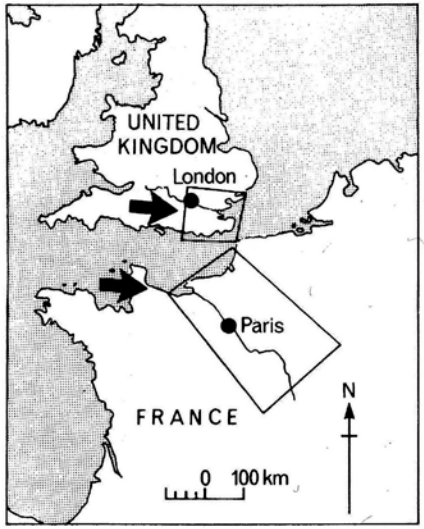
Structura tabulară

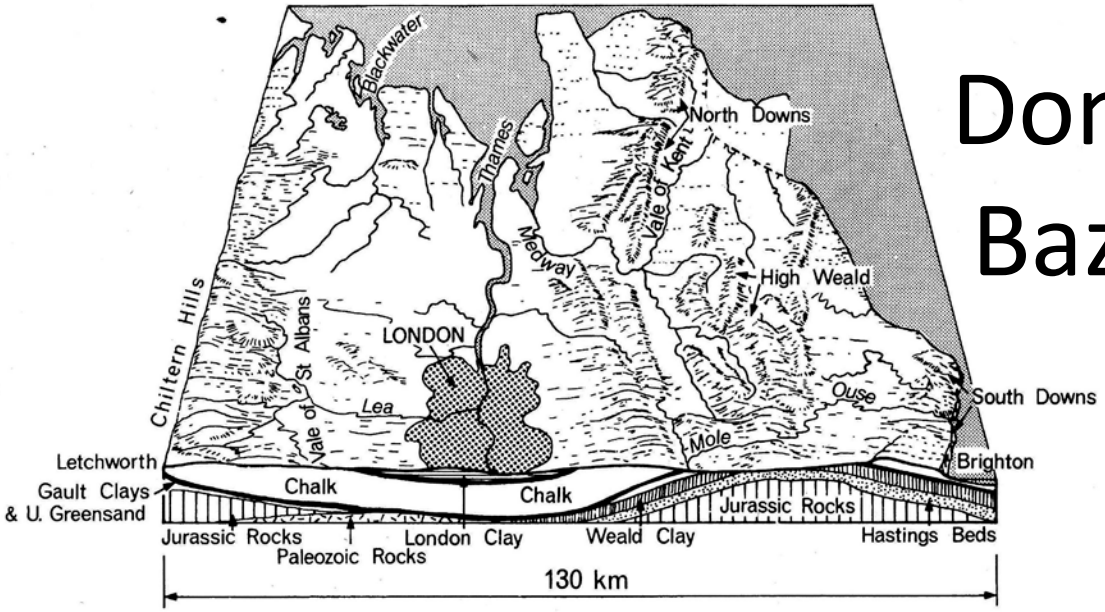


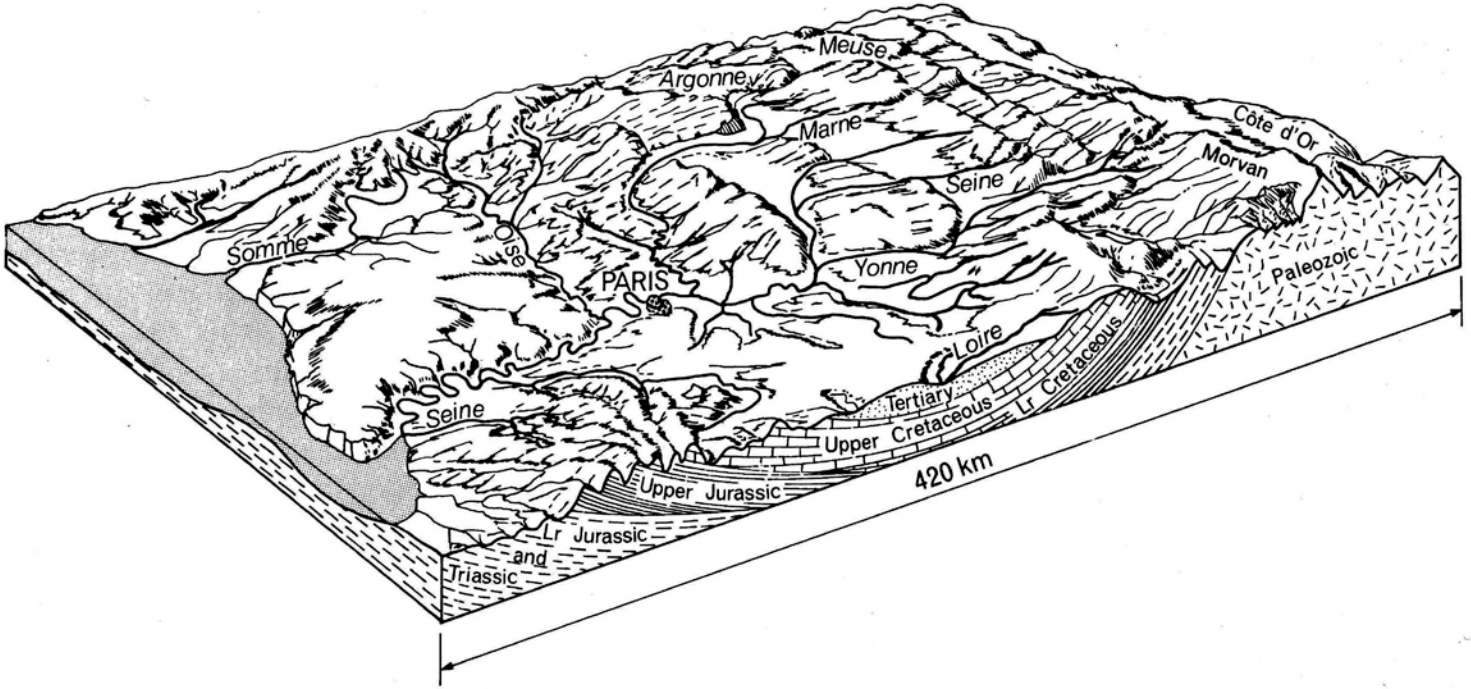
Structura monoclinală



Domurile Bazinele







Structura cutată

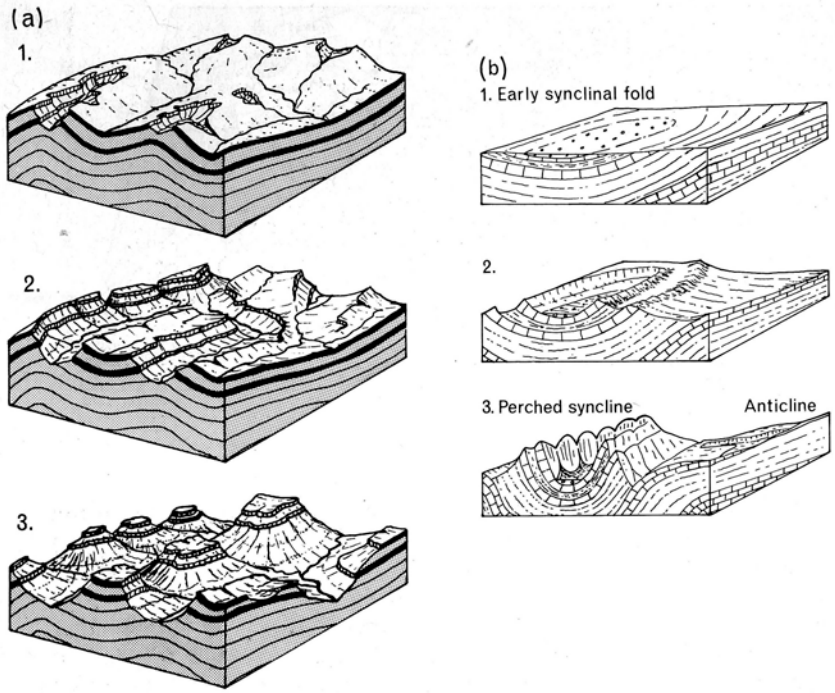


Fig. 4.41 (a) Formation of synclinal mountains from erosion of anticlines with resistant beds. (b) A planated fold has no relief initially, but continued compression and differential erosion cause the development of outward-facing scarps of a perched syncline and unroofing of a growing anticline (b, after Tricart, 1968).

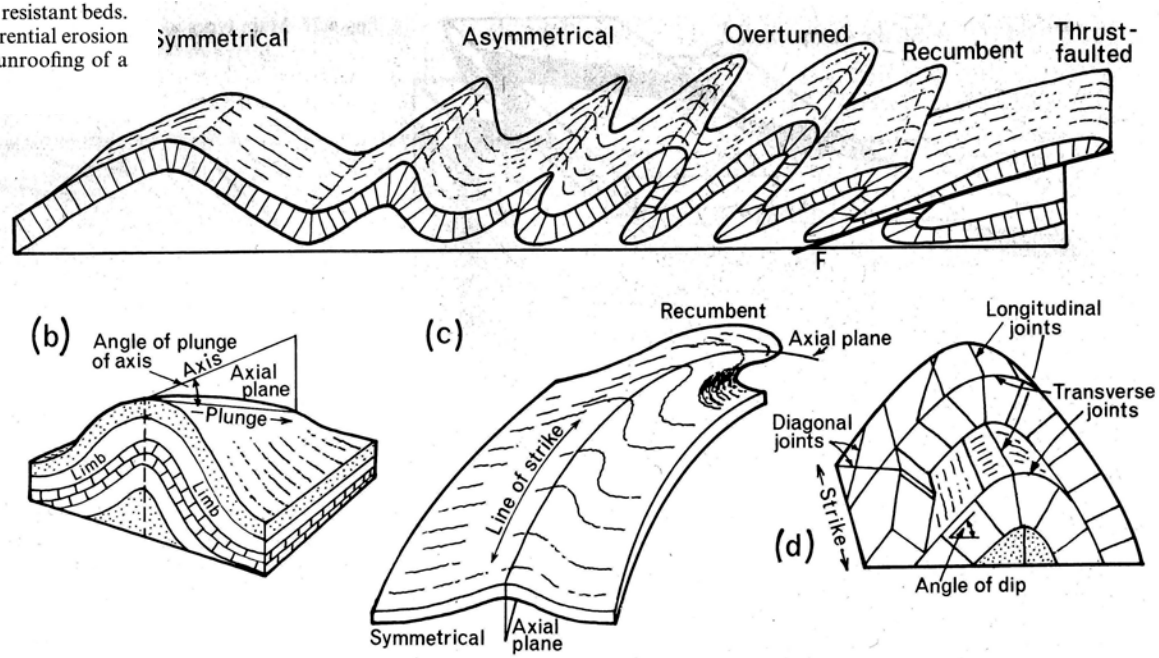
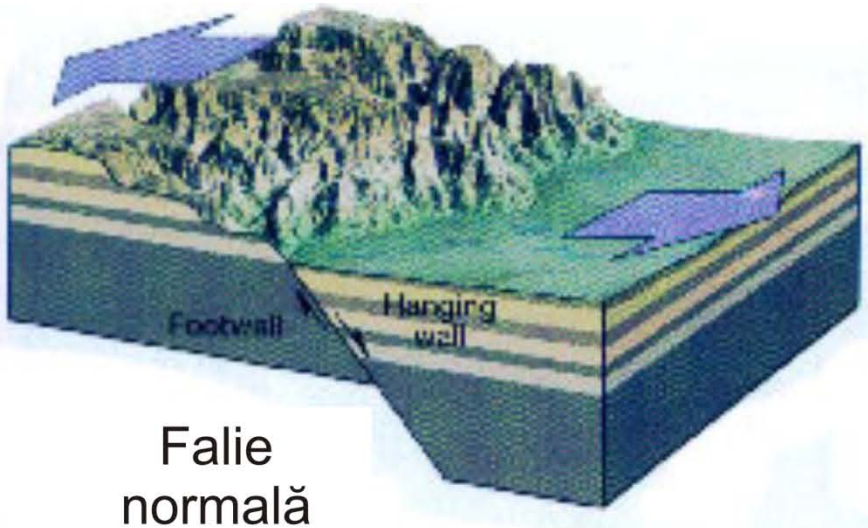
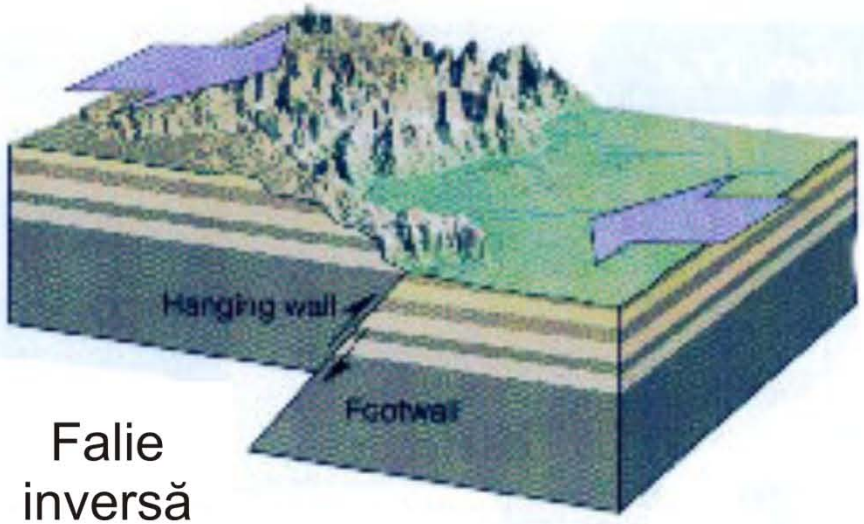


Fig. 4.27 (a) Types of fold. (b, c, d) The axis, plunge, dip, strike, and axial plane of folds, and their joints.

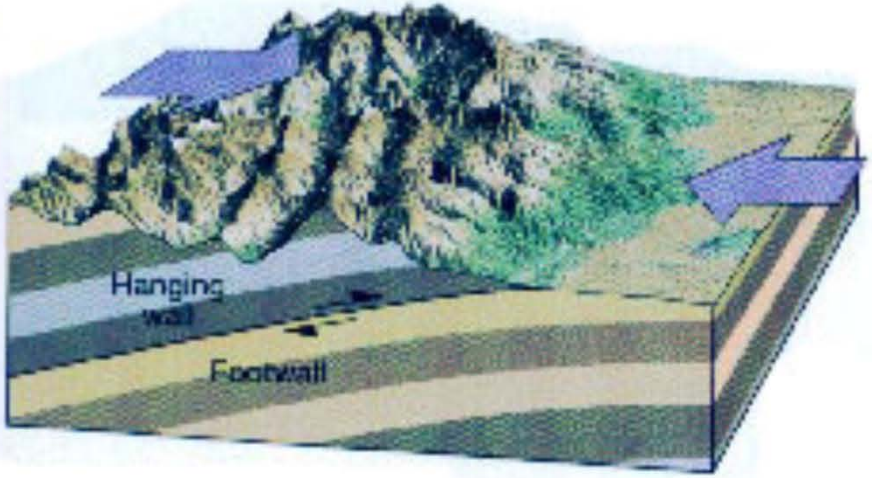
Structura faliată



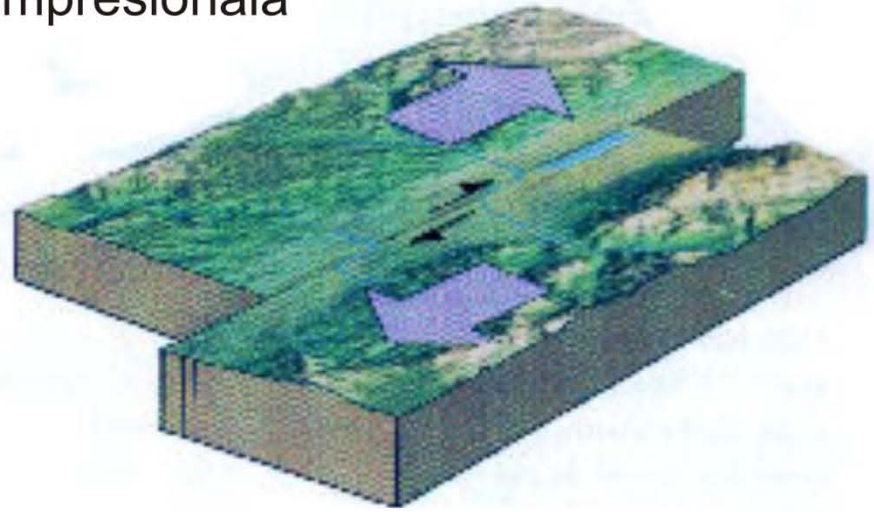
Falie normală extensională

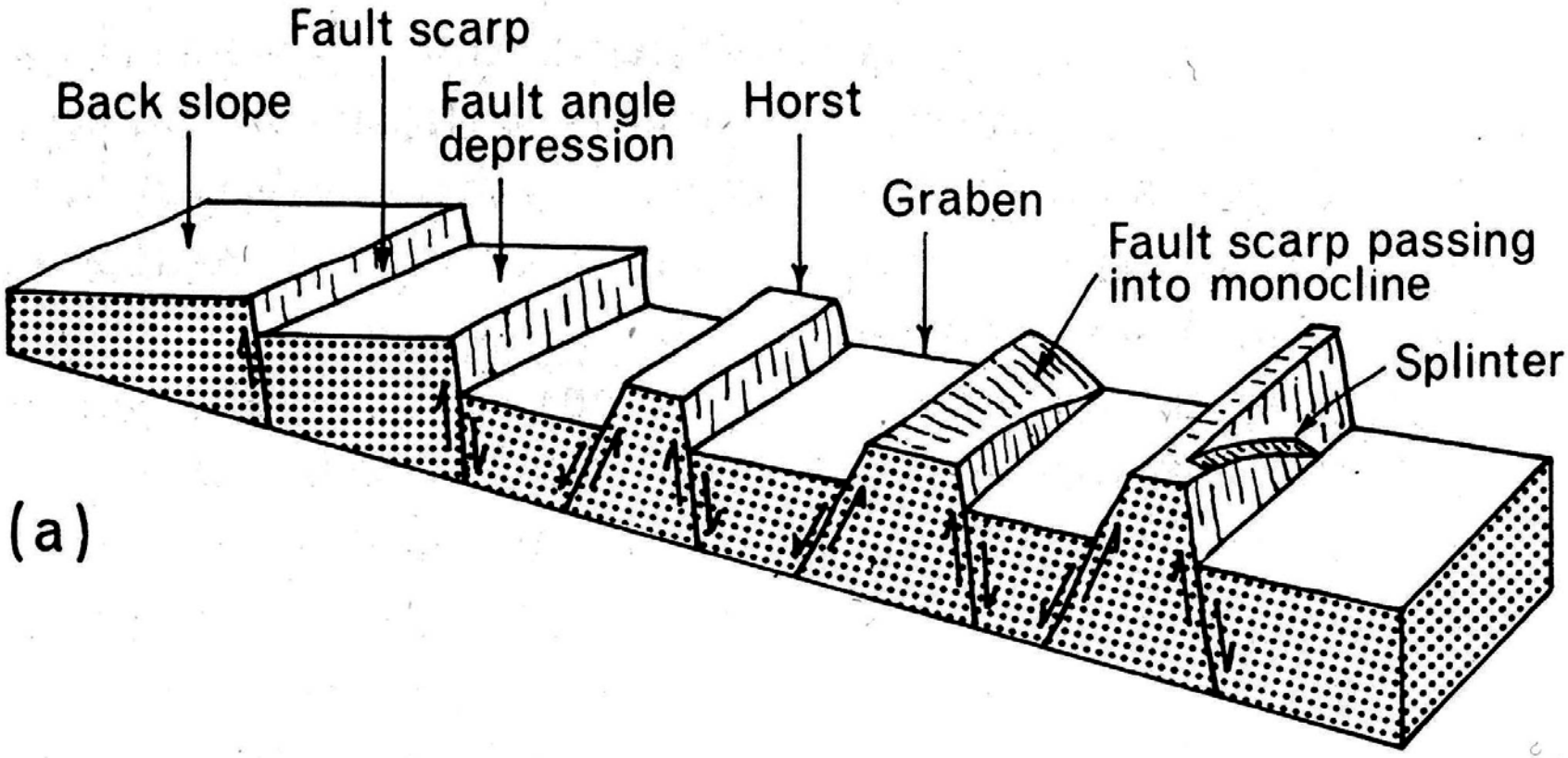


Falie inversă compresională



Falie de încălecare



Falie de decroșare

Horsturile și grabenele