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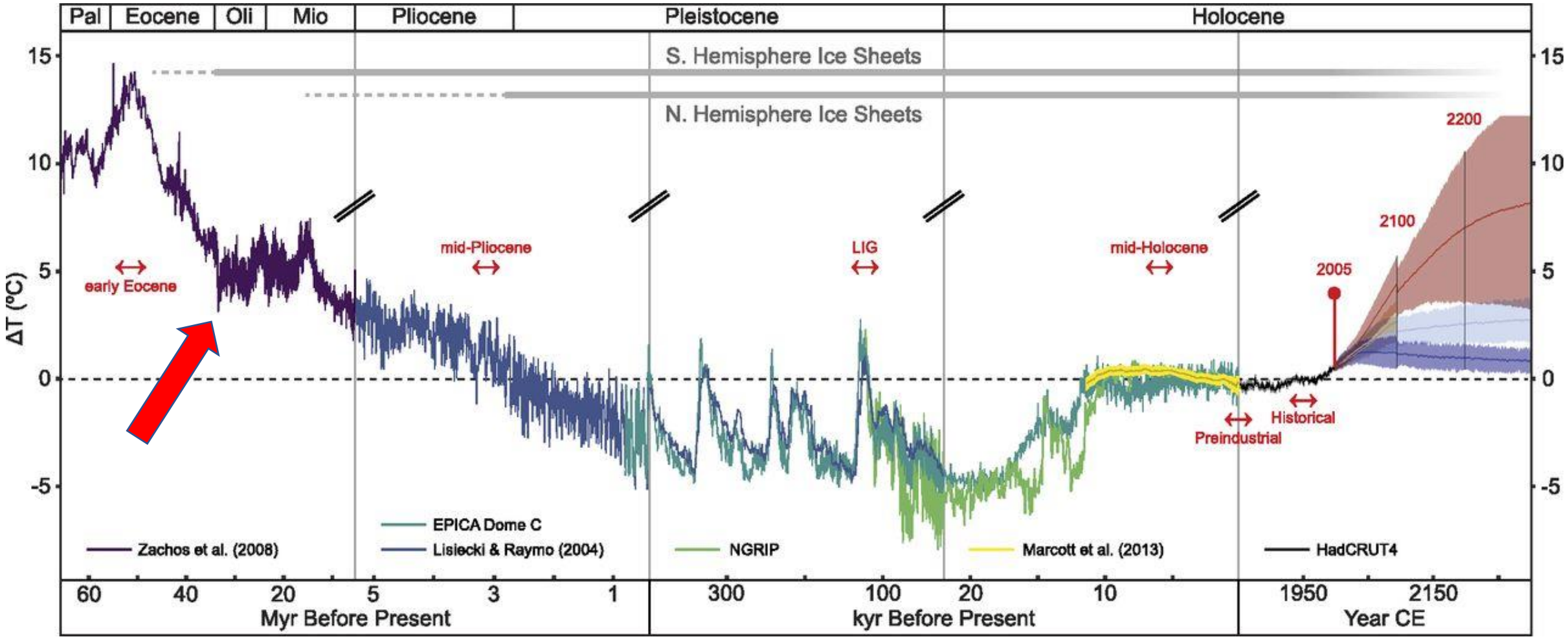
AGH

Interplay of global climatic and regional tectonic controls in marginal basins, with an example of the Cergowa Beds deposition (Outer Carpathians) during the Oligocene icehouse

Terminal Eocene Event (TEE)

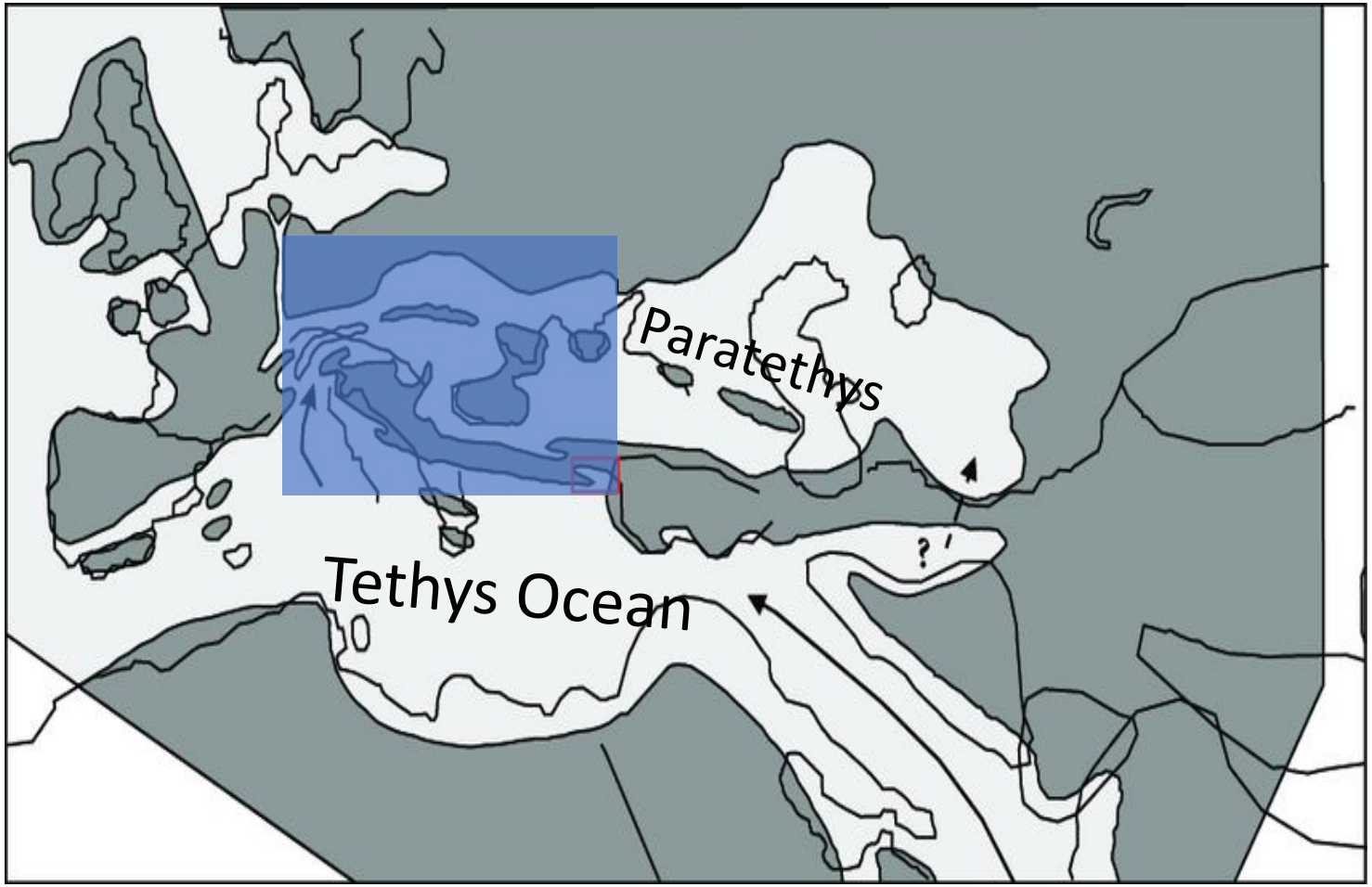
climate cooling at the Eocene-Oligocene boundary



Temperature trends in the Cenozoic

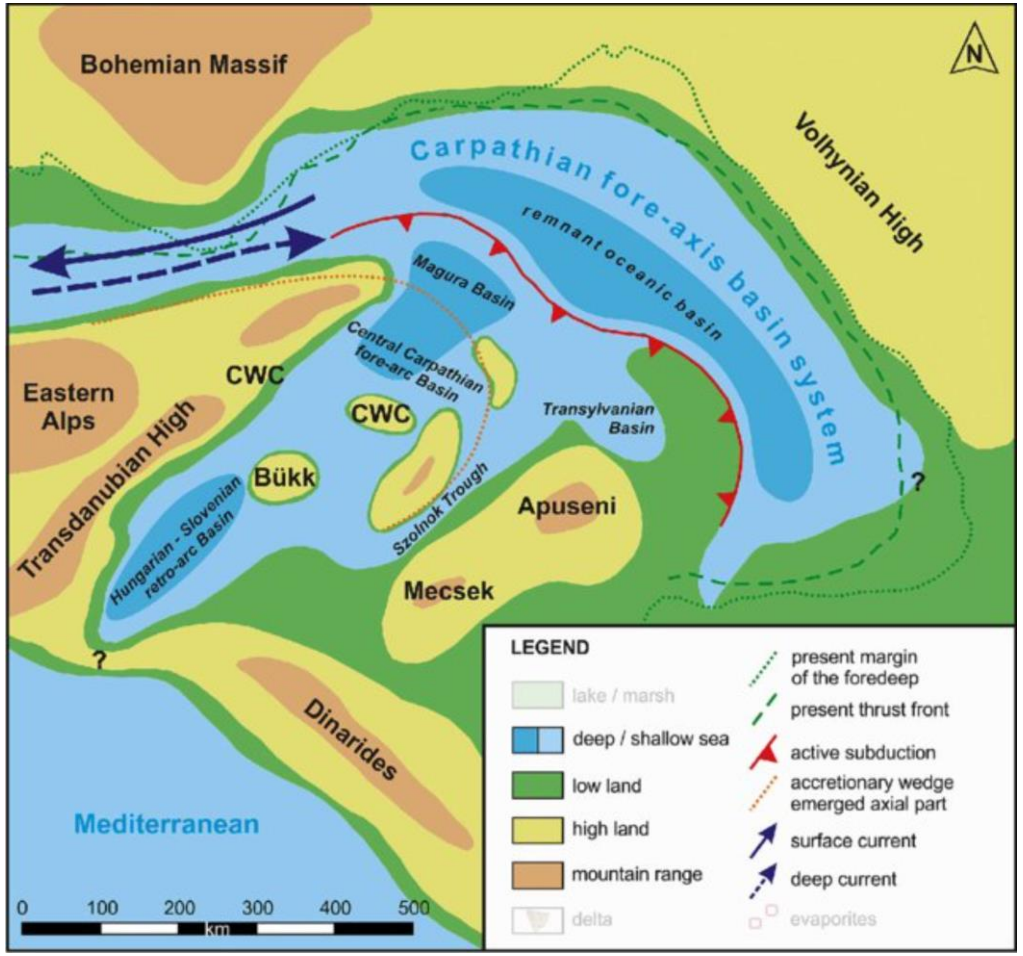
Burke et al., 2018

Palaeogeography of the Tethys and Paratethys area
in the Early Oligocene with ocean and land distribution



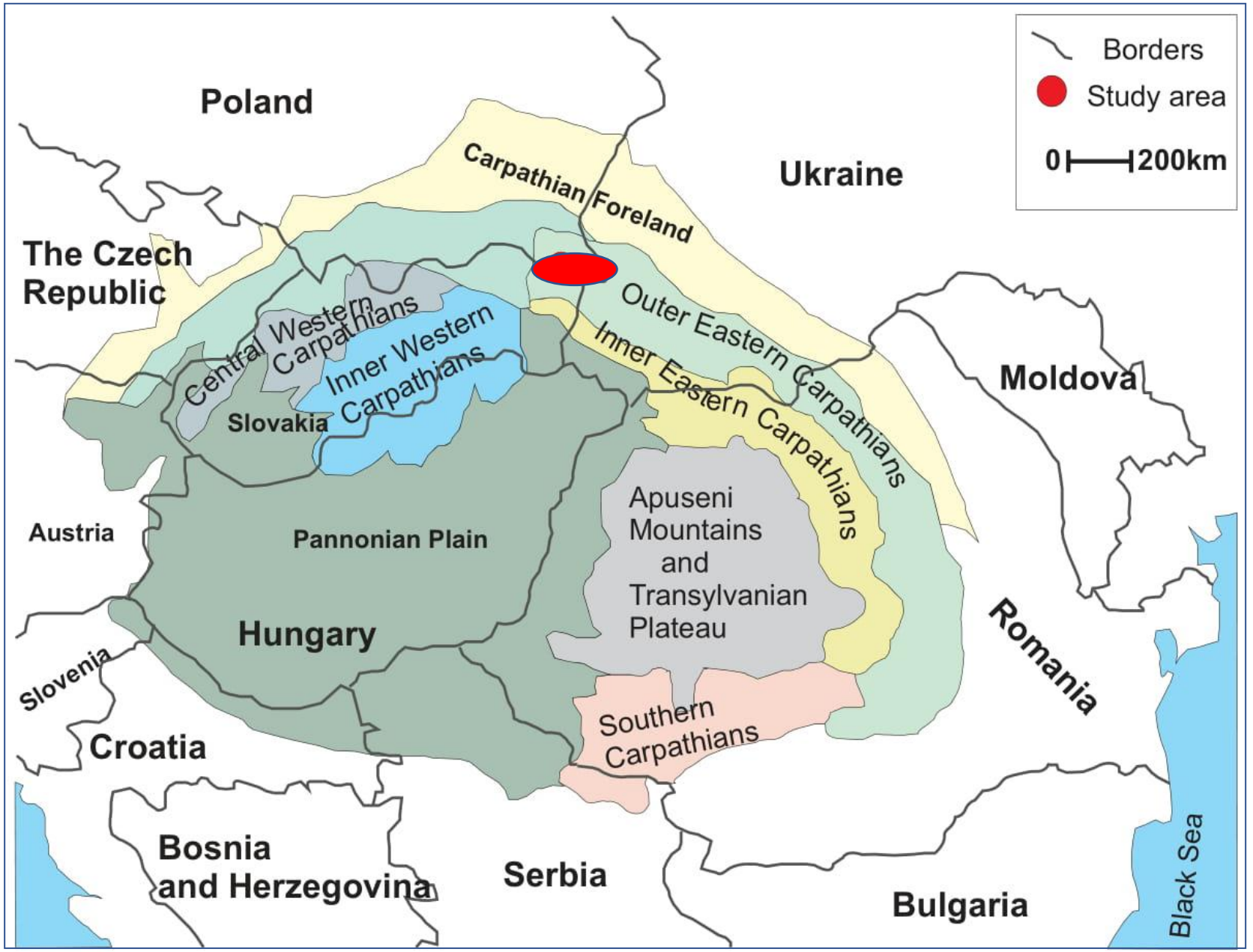
Akgun et al., 2013

Palaeogeography of the Central Paratethys
in the Early Oligocene



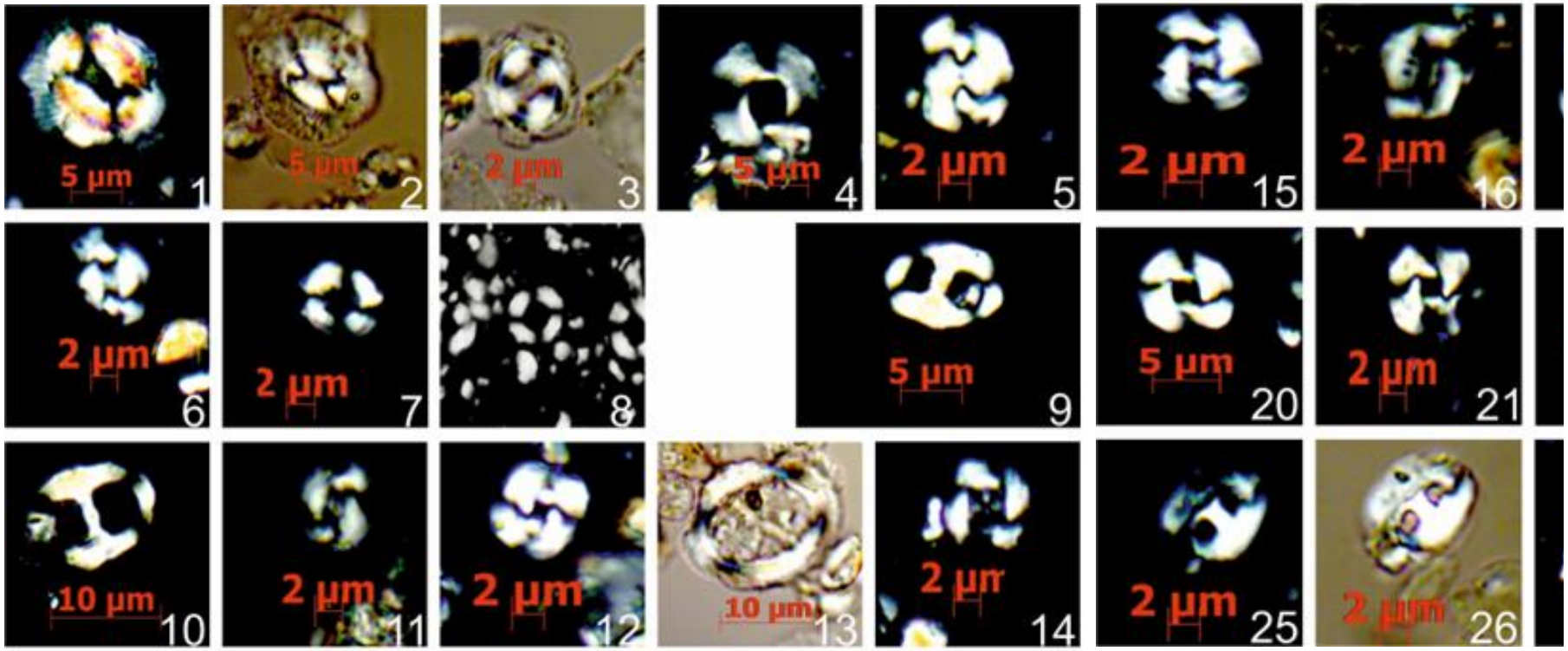
Kovac et al., 2018

Regional subdivisions of the Carpathians



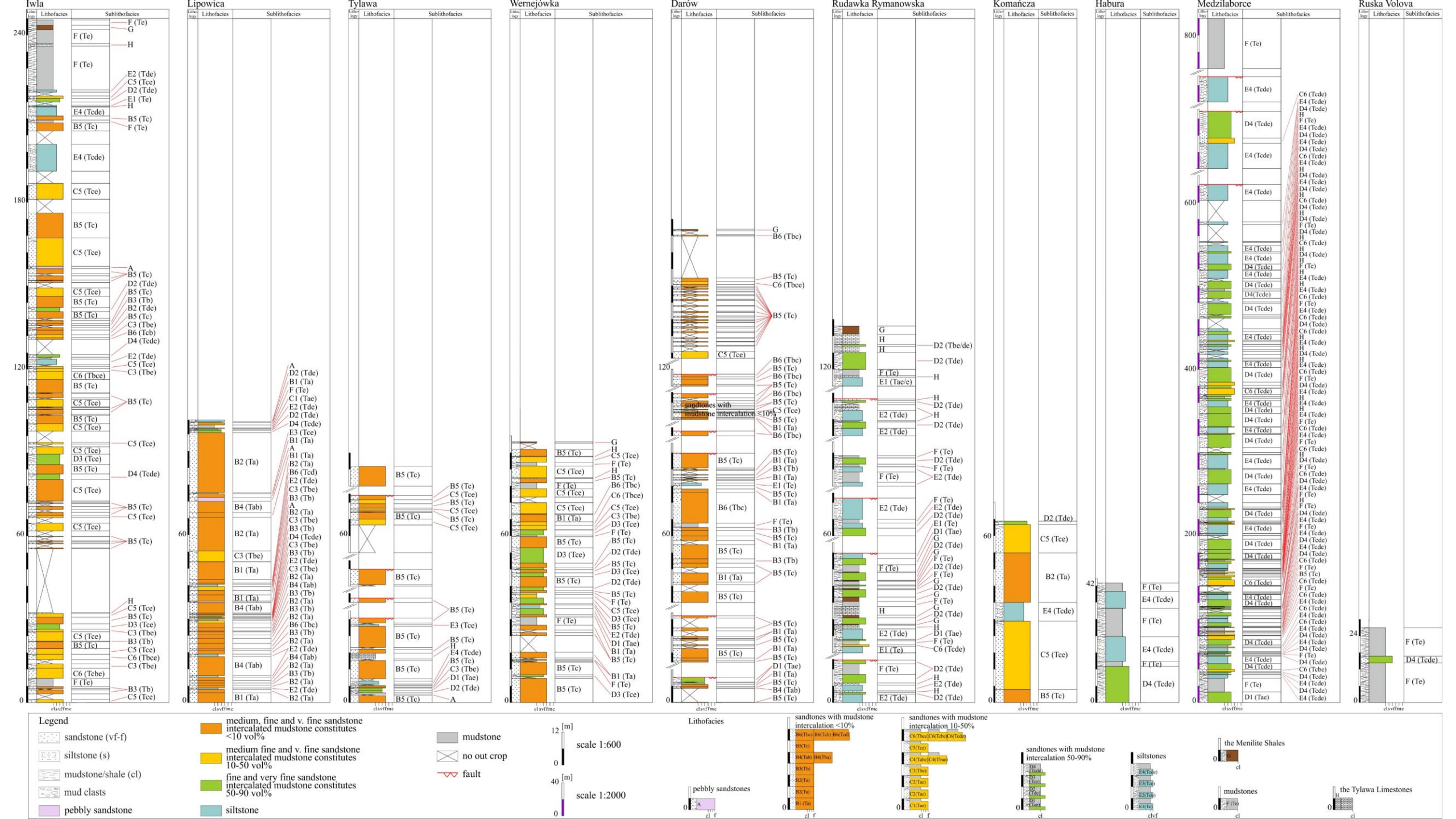
Ciszkowski et al., 2009

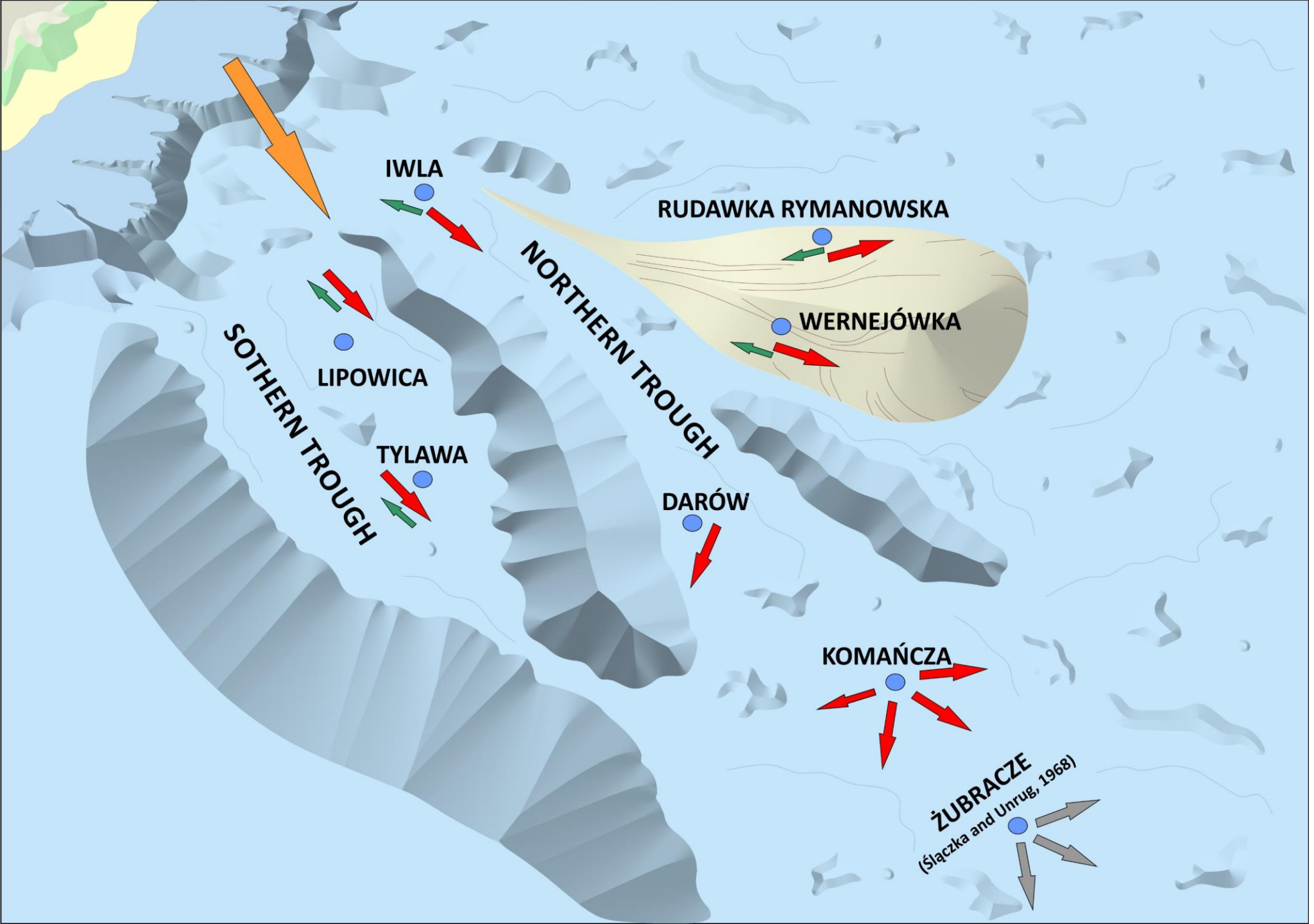
Age of the Cergowa Beds



EPOCH		STANDARD MEDITERRANEAN STAGES	CENTRAL PARATETHYS STAGES	ZONE (Martini 1971)
OLIGOCENE	LATE	CHATTIAN	EGERIAN	NP25
			KISCELLIAN	NP24
	EARLY	RUPELIAN		NP23
				NP22
				NP21
EOCENE	LATE	PRIABONIAN	PRIABONIAN	NP19-20
				NP18
	MIDDLE	BARTONIAN	BARTONIAN	NP17
		LUTETIAN		NP16

Light microscope images of calcareous nannofossils from the Cergowa beds in the Dukla and Fore-Dukla tectonic units (CN — crossed nicols, NL — normal light): **1.** *Coccolithus eopelagicus,* CN, sample 2I; **2.** *Coccolithus eopelagicus,* NL, sample 2I; **3.** *Coccolithus pelagicus*, NL, sample 3I; **4.** *Cyclicargolithus floridanus,* CN, sample 1L; **5.** *Reticulofenestra bisecta,* CN, sample 1L; **6.** *Reticulofenestra lockeri*, CN, sample 1R; **7.** *Reticulofenestra ornata,* CN, sample 2R; **8.** *Reticulofenestra ornata,* CN, sample 2R; **9.** *Pontosphaera fibula,* CN, sample 2R; **10.** *Pontosphaera fibula*, CN, sample 2R.; **11.** *Reticulofenestra lockeri,* CN, sample 3R; **12.** *Cyclicargolithus abisectus,* CN, sample 1H; **13.** *Chiasmolithus oamaruensis,* NL, sample 1M; **14.** *Reticulofenestra reticulata,* CN, sample 1M; **15.** *Reticulofenestra lockeri,* CN, sample 4M; **16.** *Reticulofenestra lockeri,* CN, sample 1M; **17.** *Reticulofenestra umbilica,* CN, sample 4M; **18.** *Reticulofenestra umbilica,* CN, sample 1M; **19.** *Cyclicargolithus abisectus,* CN, sample 1M; **20.** *Cyclicargolithus floridanus*, CN, sample 4M; **21.** *Cyclicargolithus floridanus,* CN, sample 1M; **22.** *Cyclicargolithus floridanus,* CN, sample 1M; **23.** *Pontosphaera fibula,* CN, sample 1M; **24.** *Zygrhablithus bijugatus,* CN, sample 4M; **25.** *Helicosphaera recta,* CN, sample 4M; **26.** *Helicosphaera recta,* NL, sample 4M; **27.** *Helicosphaera recta,* CN, sample 4M; **28.** *Isthmolithus recurvus*, CN, sample 1M; **29.** *Reticulofenestra ornata,* CN, sample 1M.

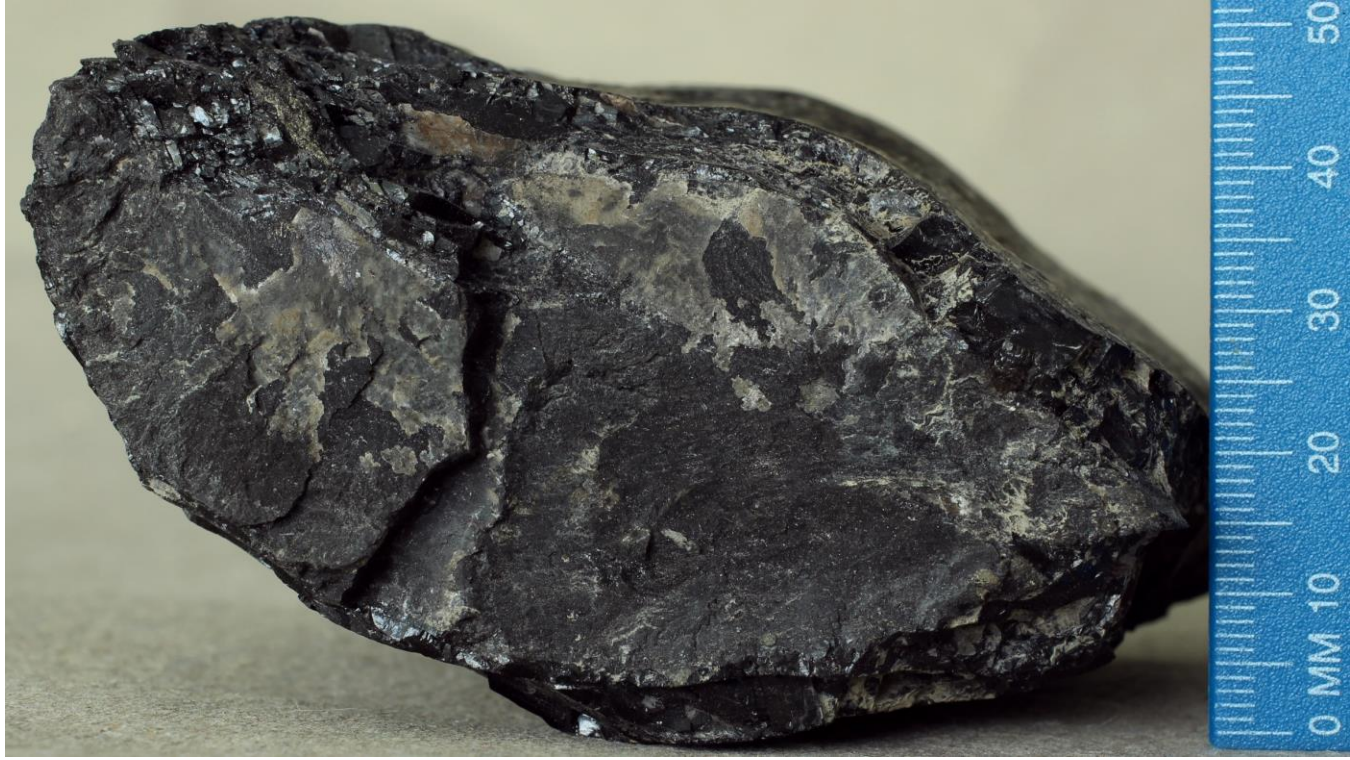

Iwla
Lipowica
Tylawa
Wernejówka
Darów
Rudawka Rymanowska
Komańcza
Habura
Medzilaborce
Ruska Volova
Lithofacies
Sublithofacies
clsvffmc
sandtones with mudstone intercalation <10%
Legend
sandstone (vf-f)
siltstone (s)
mudstone/shale (cl)
mud clasts
pebbly sandstone
medium, fine and v. fine sandstone intercalated mudstone constitutes <10 vol%
medium fine and v. fine sandstone intercalated mudstone constitutes 10-50 vol%
fine and very fine sandstone intercalated mudstone constitutes 50-90 vol%
siltstone
mudstone
no out crop
fault
scale 1:600
scale 1:2000
pebbly sandstones
sandtones with mudstone intercalation <10%
sandtones with mudstone intercalation 10-50%
sandtones with mudstone intercalation 50-90%
siltstones
the Menilite Shales
mudstones
the Tylawa Limestones

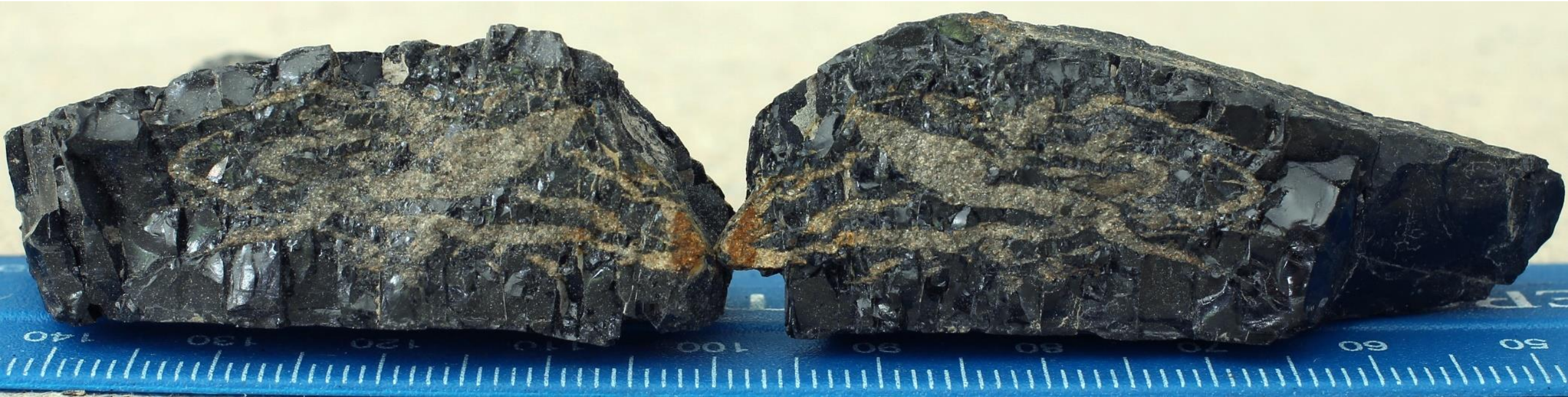


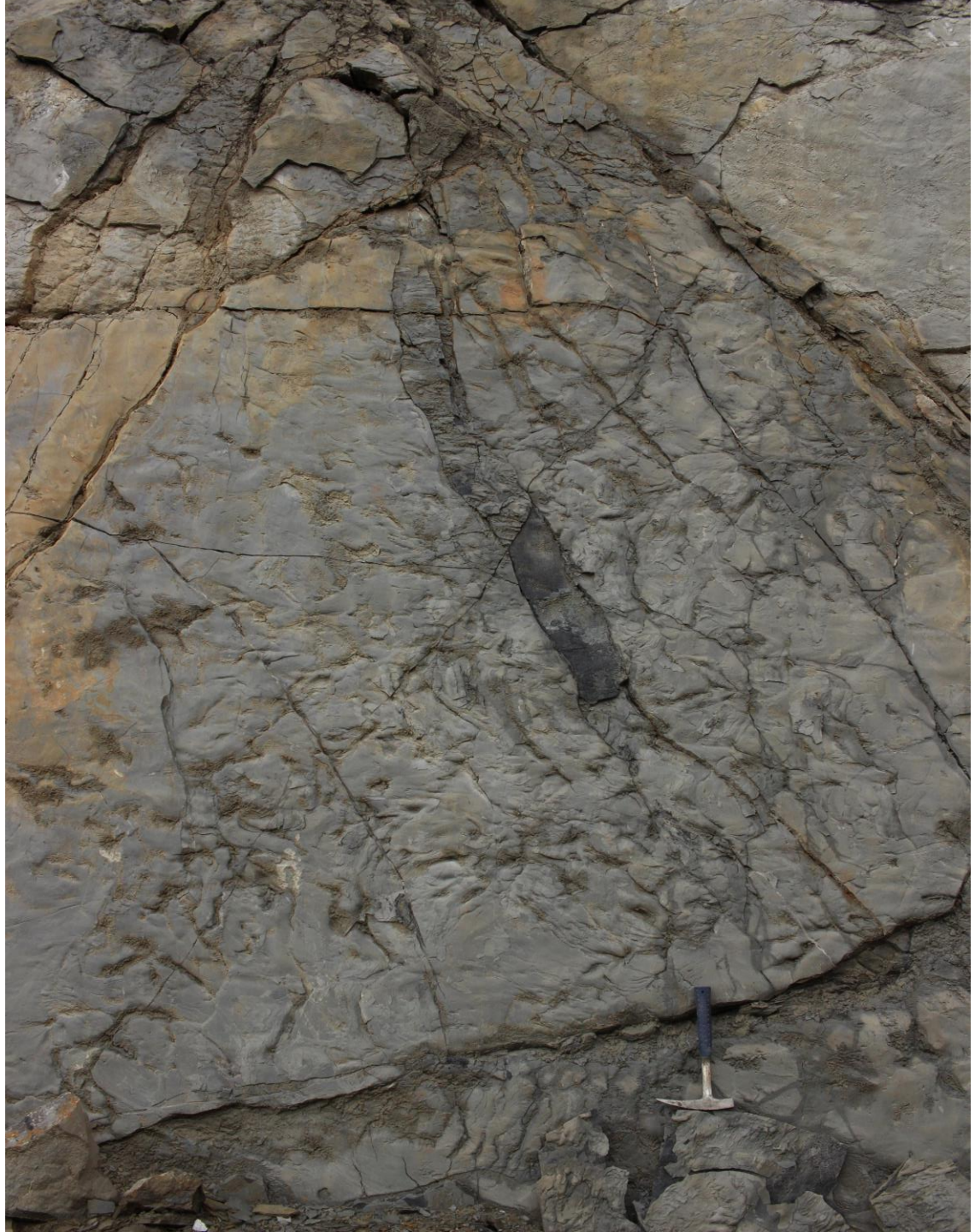
Development of the Cergowa basin during the NP23

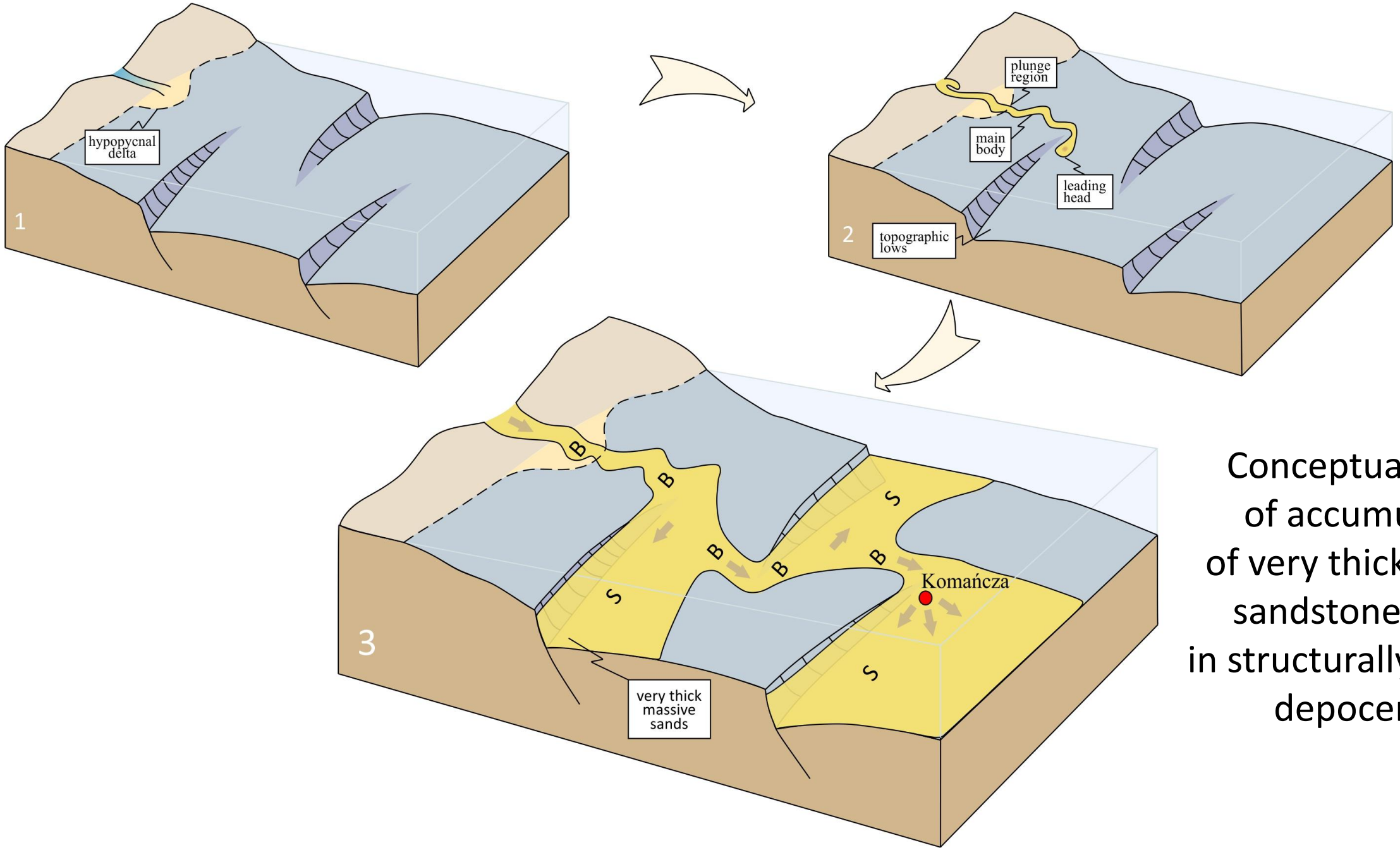
Pszonka et al., in review


metso



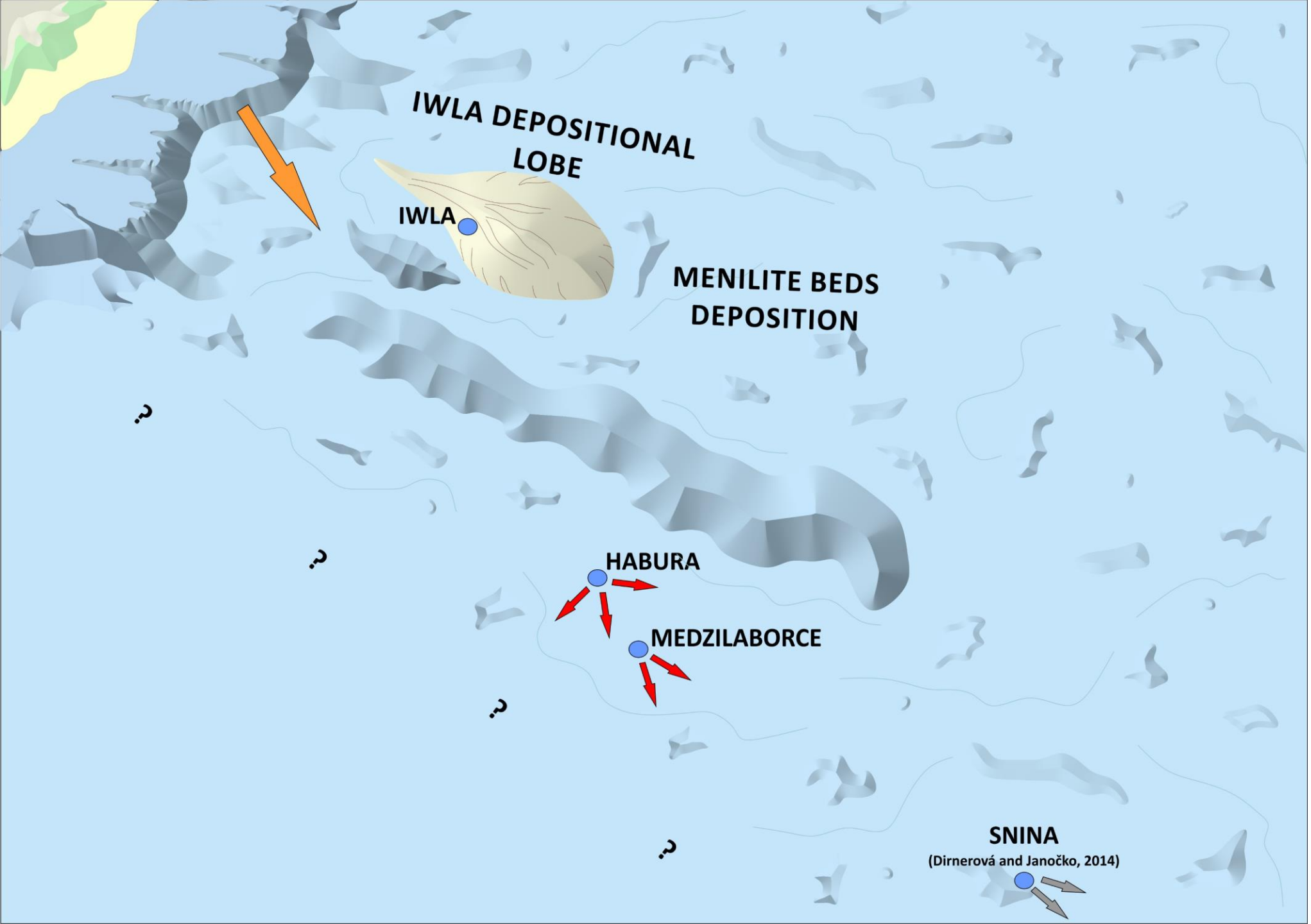






Conceptual model
of accumulation
of very thick massive
sandstone bodies
in structurally confined
depocenters

Zavala et al., 2011



Development of the Cergowa basin during the NP24

Pszonka et al., in review

Conclusions

Regional orogenic movements had affected the basin topography and depositional processes by either intensifying or suppressing the influences of global conditions, as follows:

- marine basin shallowing, isolation from the Tethys Ocean, conversion to brackish depository, uplift of the Silesian Ridge source area, and onset of the sand-rich turbidite supply system during NP23 resulted from simultaneous activity of eustatic sea-level fall and regional compressional deformations,

- reconnection of the Cergowa Basin with the Tethys Ocean and return to the normal salinity levels during NP24 resulted from increase of local subsidence, the rate of which must have been higher than the combined effect of the continuing global sea-level fall and accumulation of the Cergowa Beds.

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