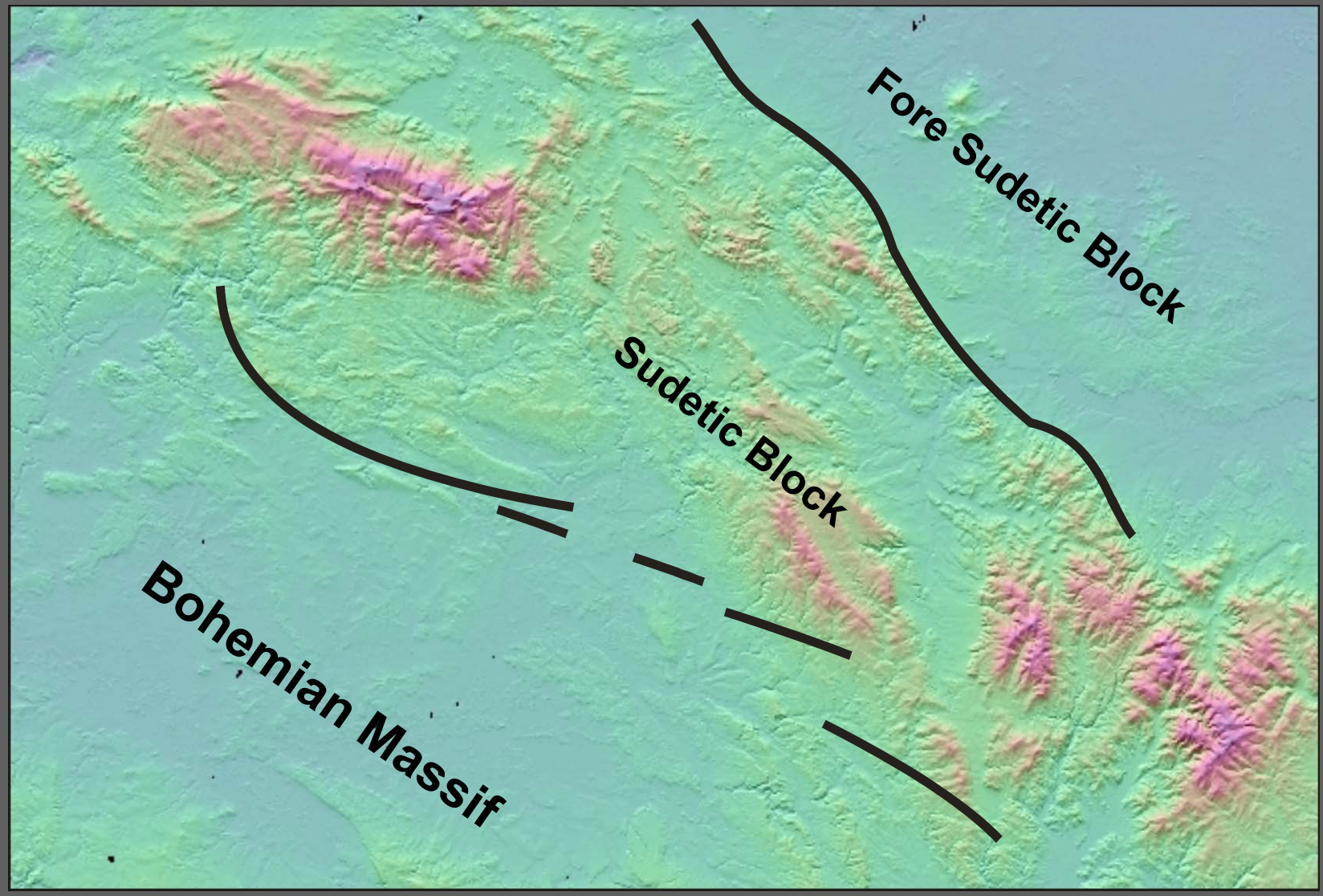
SEEK SIMPLICITY, AND DISTRUST IT…

Alfred North Whitehead
1861-1947

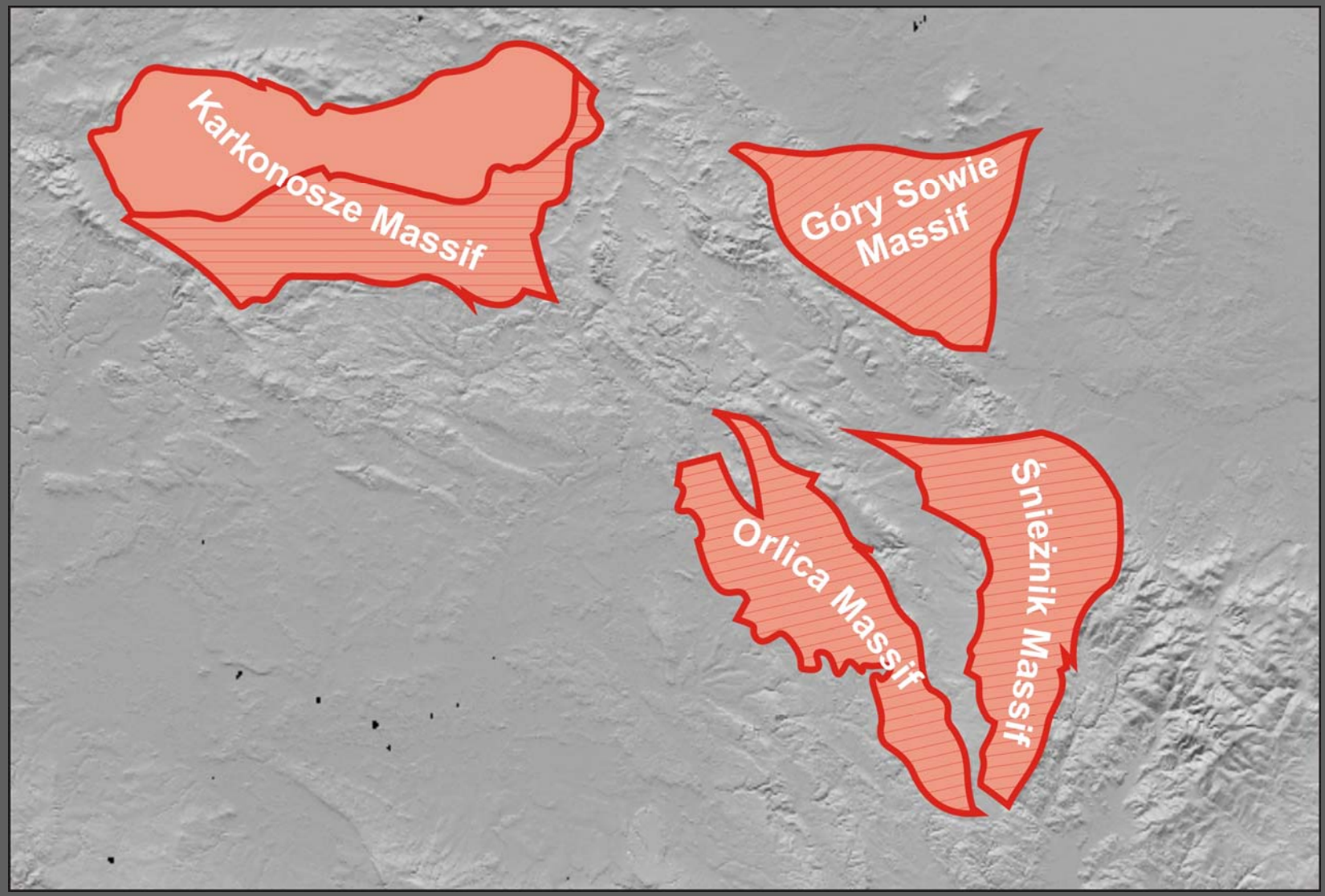
Palaeogeography and tectonic evolution of the Žernov-Nachod-Kudowa sedimentary area

Jurand Wojewoda, Institute of Geological Sciences, University of Wrocław, Wrocław, Poland



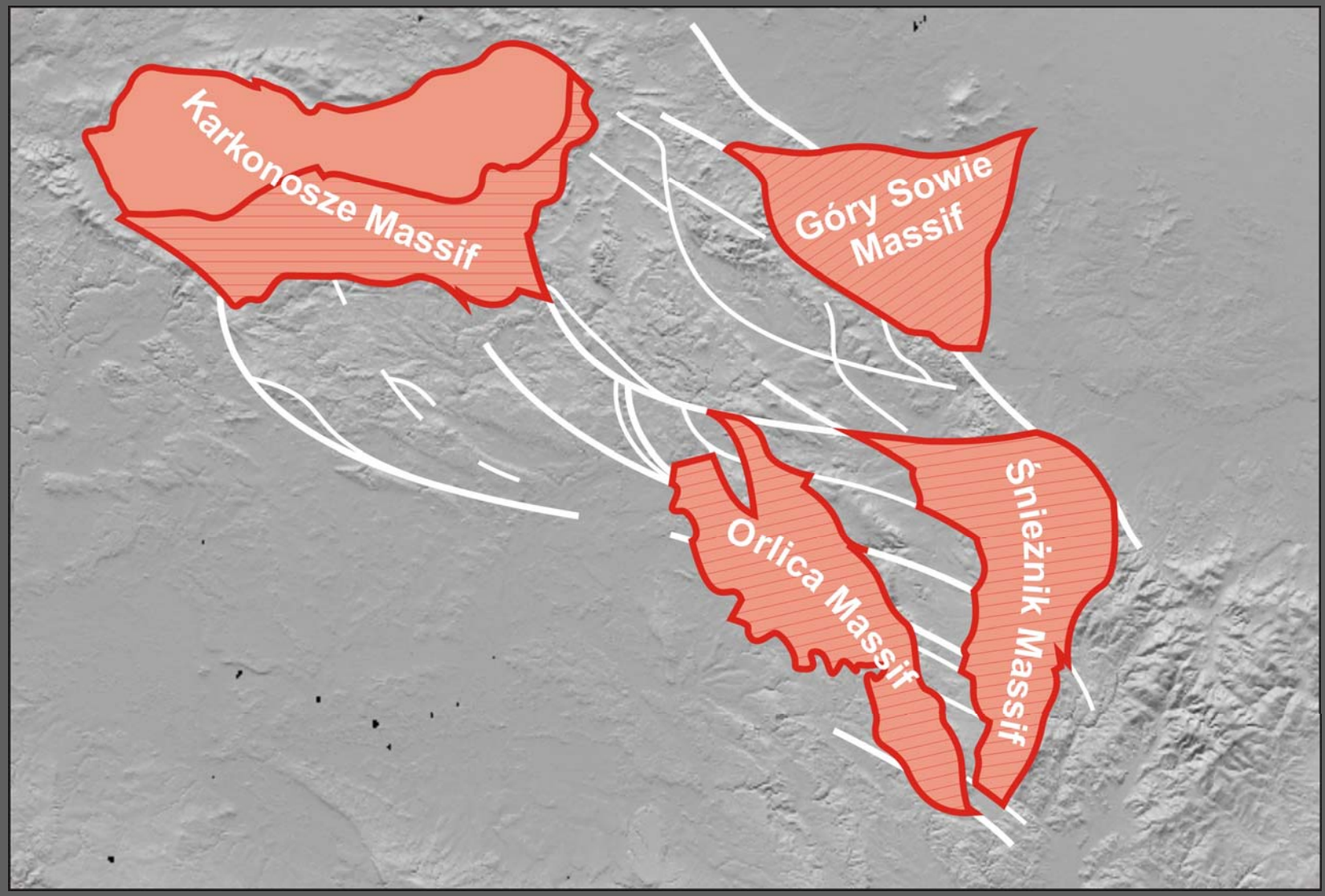
The major crystalline massifs constituted a background for post – Variscan tectono-sedimentary sudetic units - sedimentary basins. Almost the whole time during the basin formation and basin filling they constituted morphological elevations which supplied the basins.

1



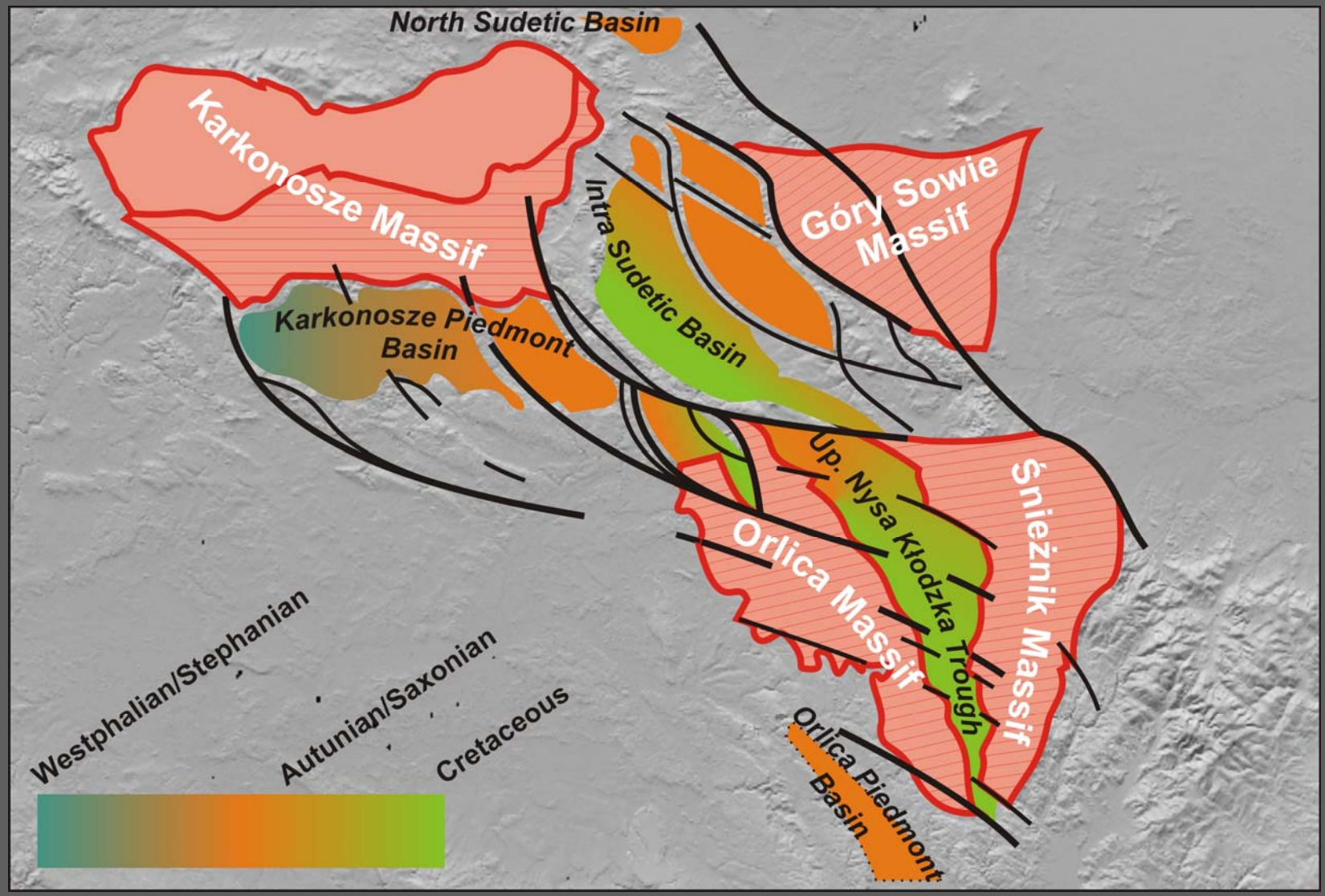
The crystalline massifs borders are defined by stepply inclined fault planes, both normal and reverse. The areas located between the massifs are densely cut by dominantly WNW-ESE trending faults of the so called „sudetic strike“ – i.e. 105^{o} . The most distinct are horizontal displacements both left- and right latteral.

2



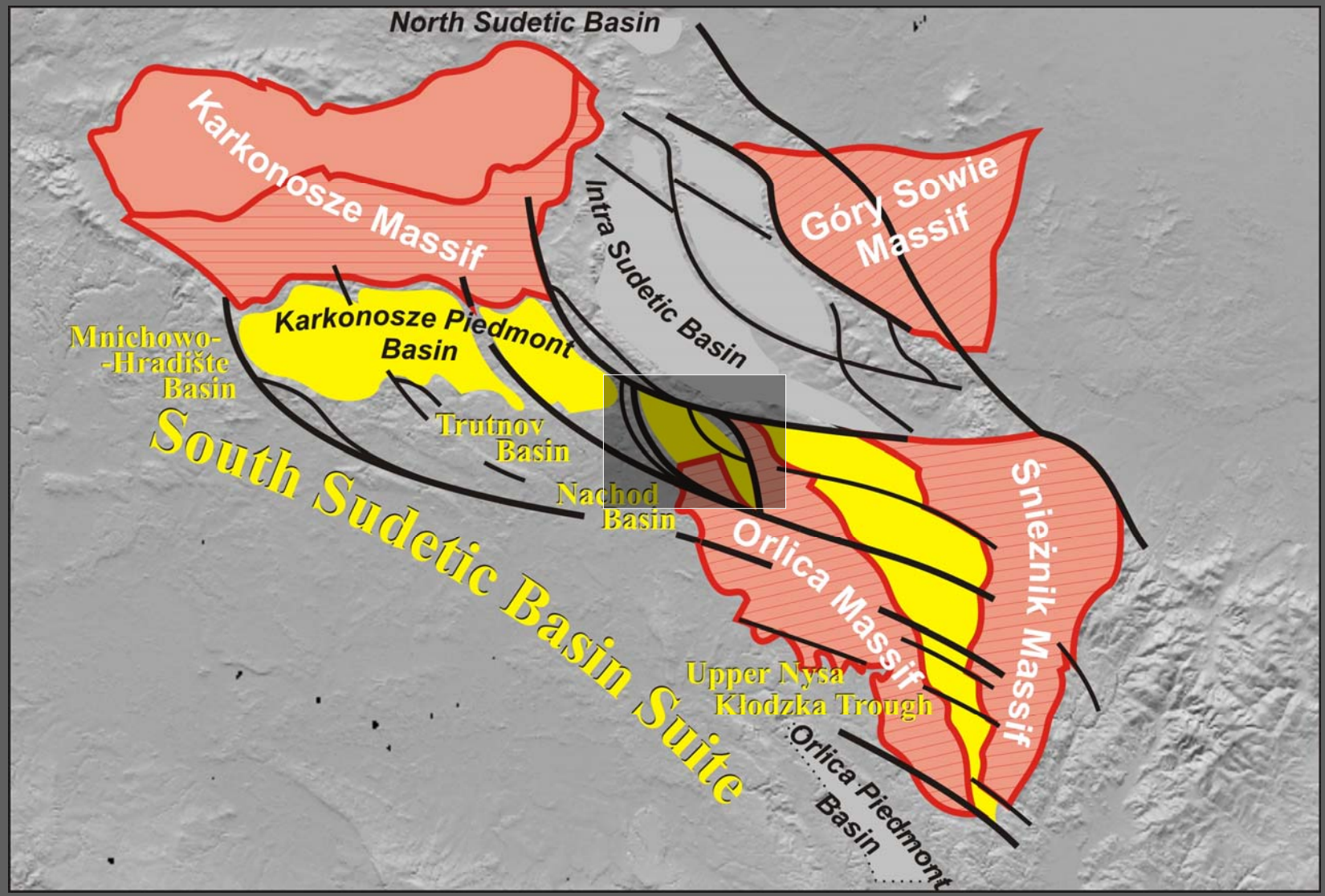
Post-orogenic basins in Sudetes develop since late Carboniferous troughout late Cretaceous up to the Recent. They started into existance earliest on the west and succesively later to the east of the region. The oldest one is the The Karkonosze Piedmont Basin, whereas the youngest one is the Upper Nysa Kłodzka Trough.

3



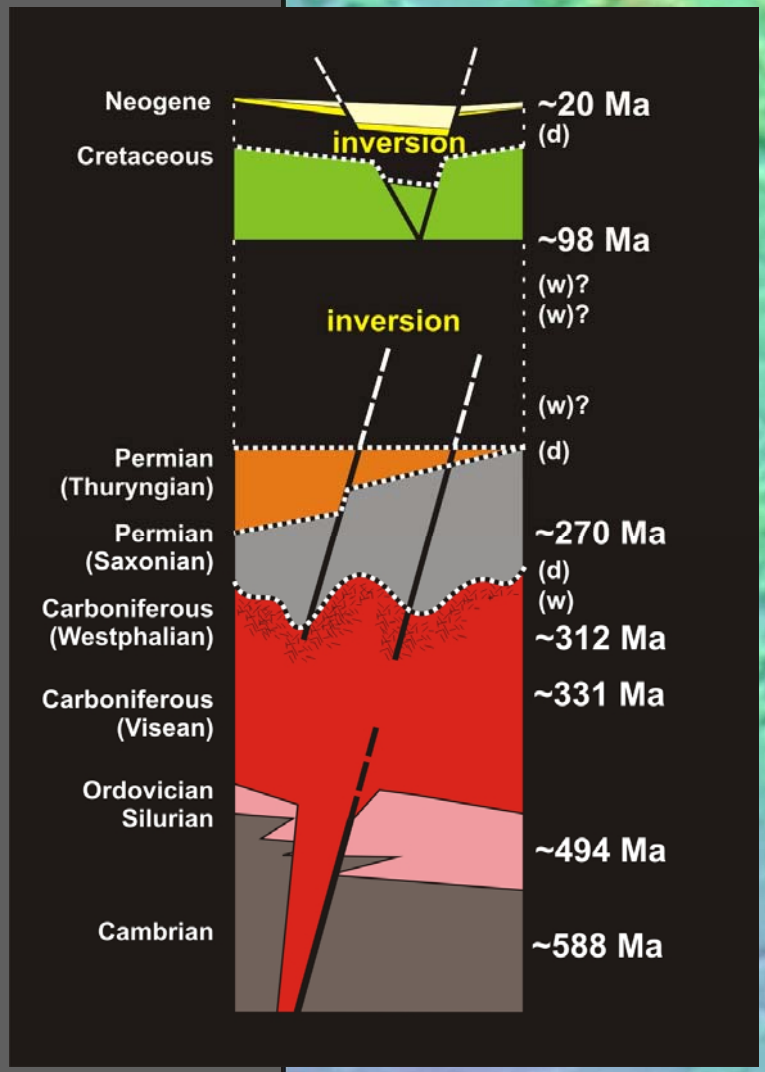
The Mnichowo-Hradište (sub)Basin, the Trutnov (sub)Basin, the Nachod (sub)Basin and the Upper Nysa Kłodzka Trough (sub) Basin, which are filled with Permian, Triassic and Neogene sediments constitute the **South Sudetic Basins Suite**. All these basins originated or developed on the same fault system network.

4



The Nachod Basin basement comprises crystalline rock assamblage of Cambrian to Ordovician age of the protolithe (the Orlica-Nove Mesto unit) and Carboniferous granitoids (the Čerma & Kudowa Granites). Permian to Neogene sediments succession underlie sprolites of different age – late Westphalian, Jurassic and early Cretaceous.

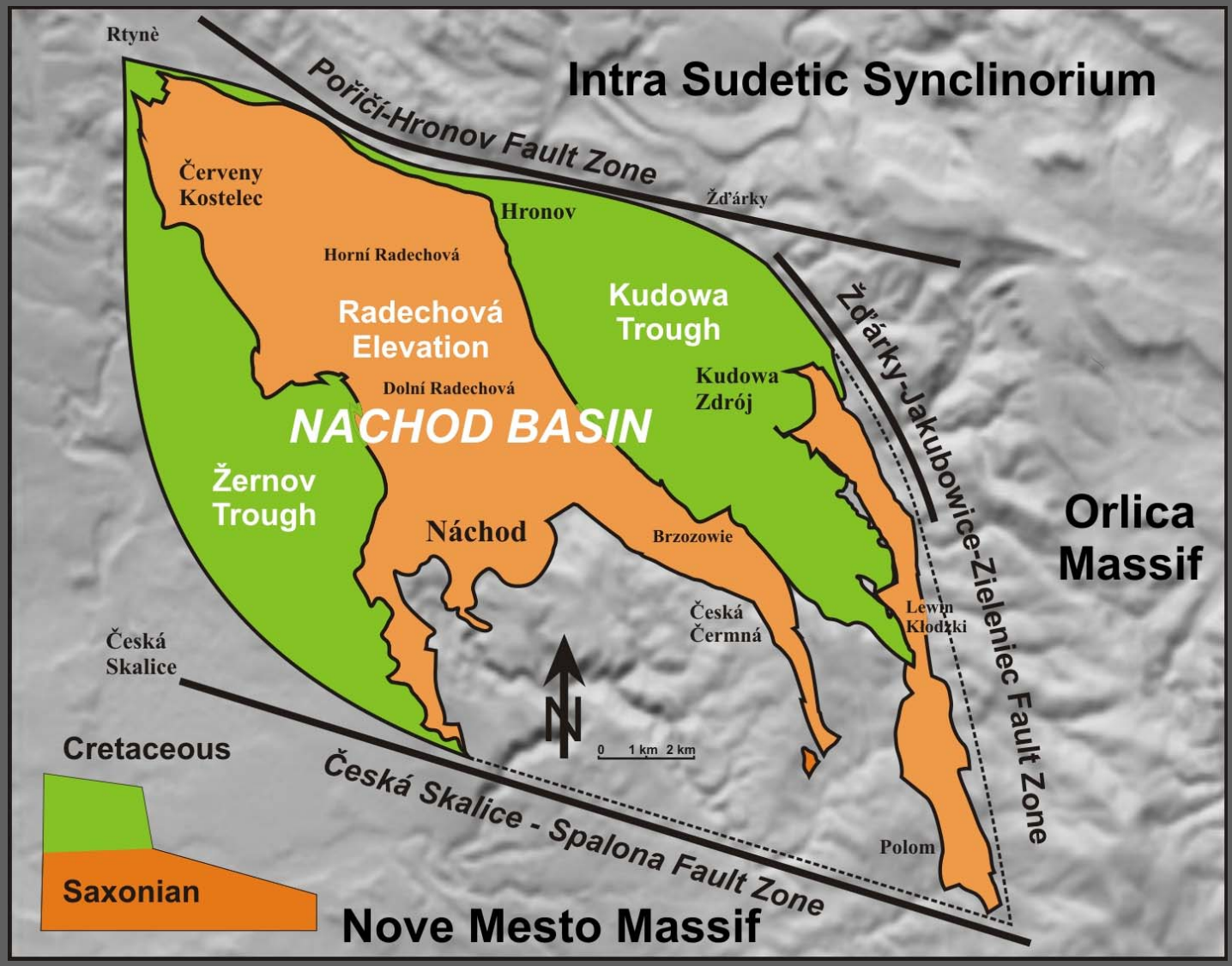
6



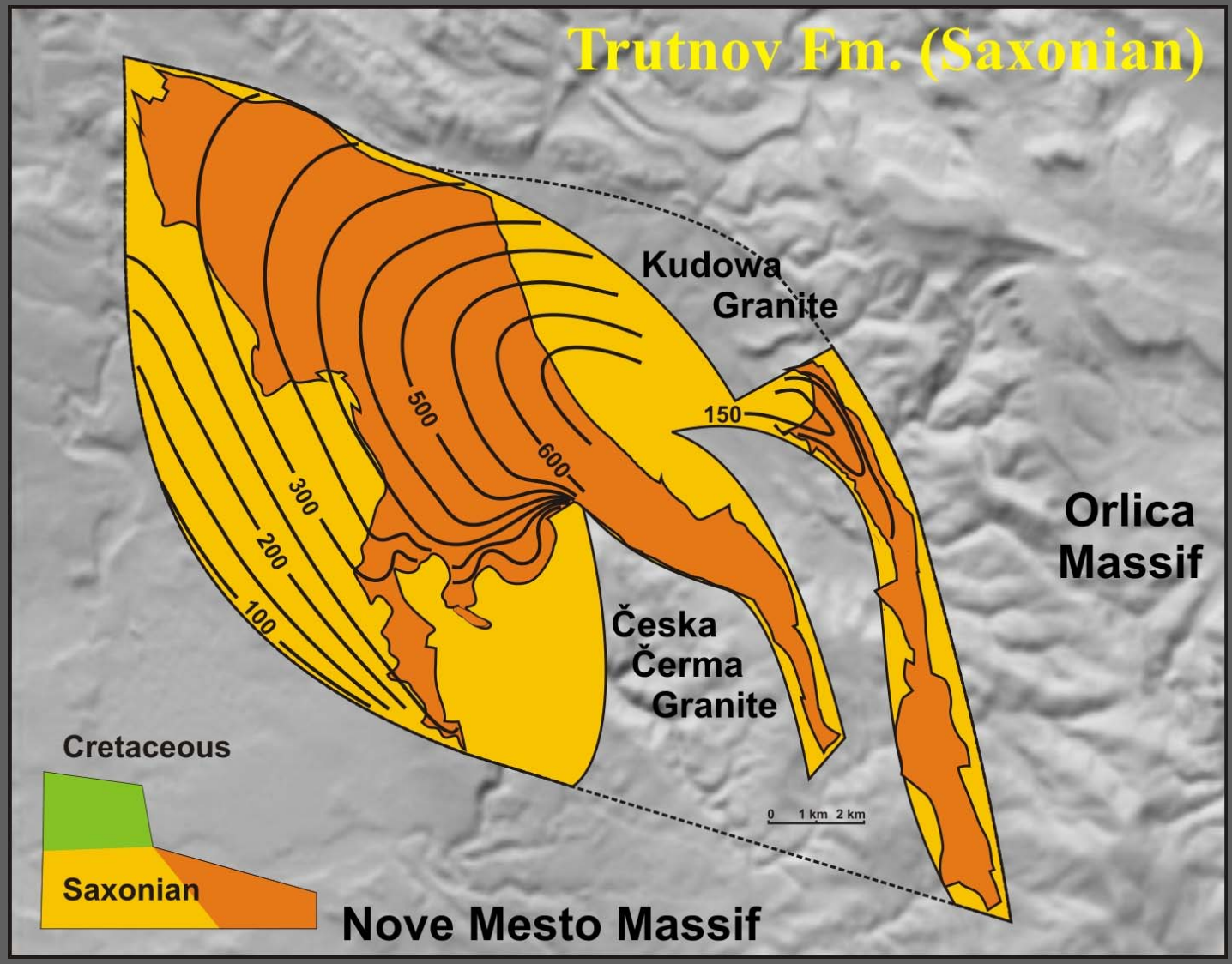
At least two geomorphic and tectonic **inversions** can be documented – first, during the Jurassic – early Cretaceous and second during the Paleogene

In the Nachod Basin area outcrop the Permian sediments (Saxonian, Thuringian), the Triassic sediments (Bundsandstein), upper Creatceous sediments (Cenomanian, Coniacian) and the Neogene sediments (Miocene, Plio-Pleistocene and Recent). The Nachod Basin constitutes a rhombhoidal fault bounded area.

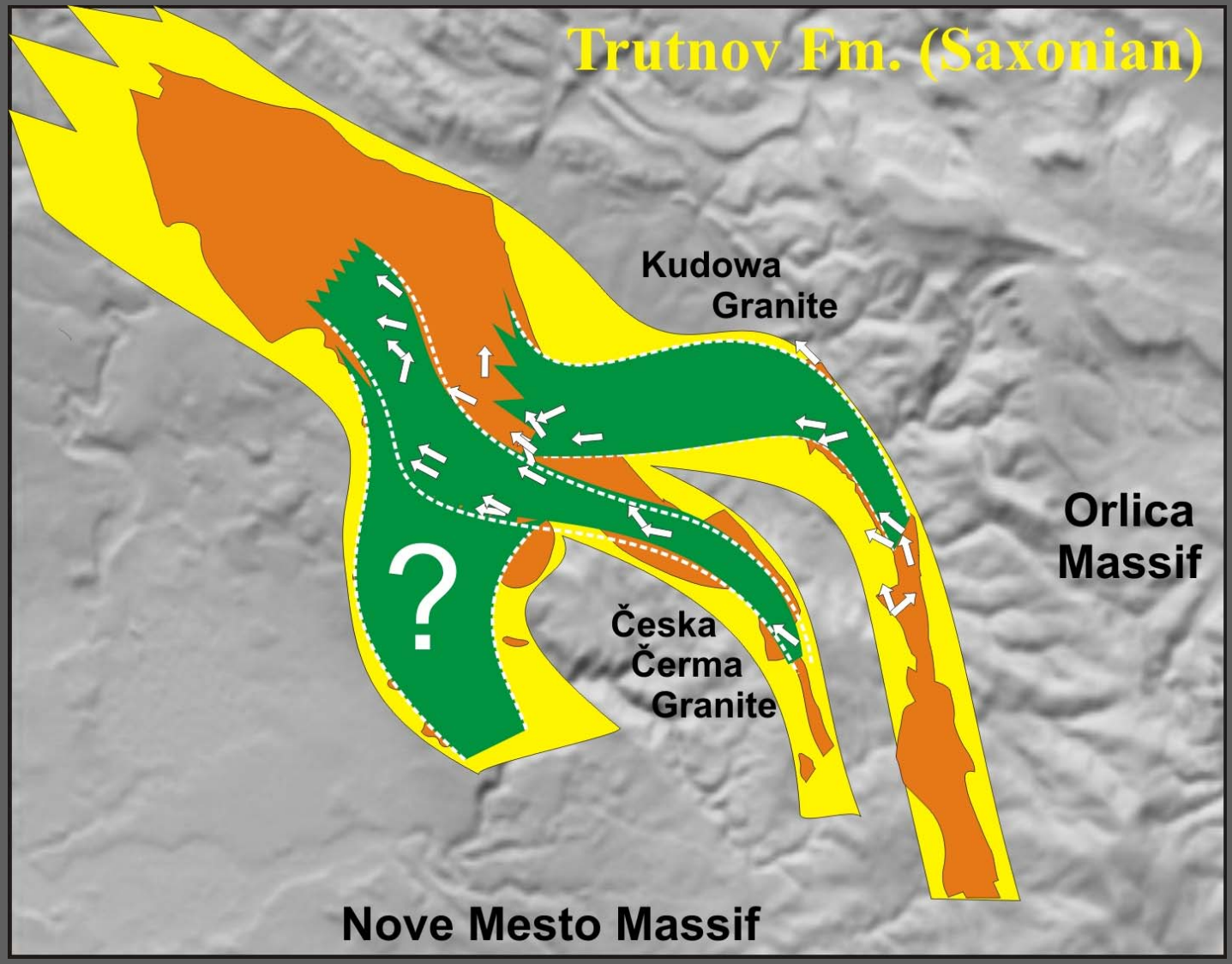
8



Lower Permian (Saxonian) sediments of the Trutnov Formation outcrop over nearly whole area of the basin. They fill local tectonic grabens which take now elevated position just due to post-Triassic inversions. The depocentre of the Trutnov Fm. is located nearby the Nachod. Sediment thickness is corresponds to the basin shape.



Sedmimentary features of the Trutnov Fm. evidence its fluvial origin. Paleocurrent indicators prooves general paleotransport towards the west. Both textural and structural features led to reconstruction of fluvial palaeotracts which evidently correspond to local tectonic features – grabens and half-grabens.



The sedimentary features that evidence palaeoflow and are indicative for palaeo-transport reconstruction are fluvial channels. Very well outcroped sediments of the Trutnov Fm. make it possible to reconstruct particular fluvial tracts over the long distances, often more than 2 km.

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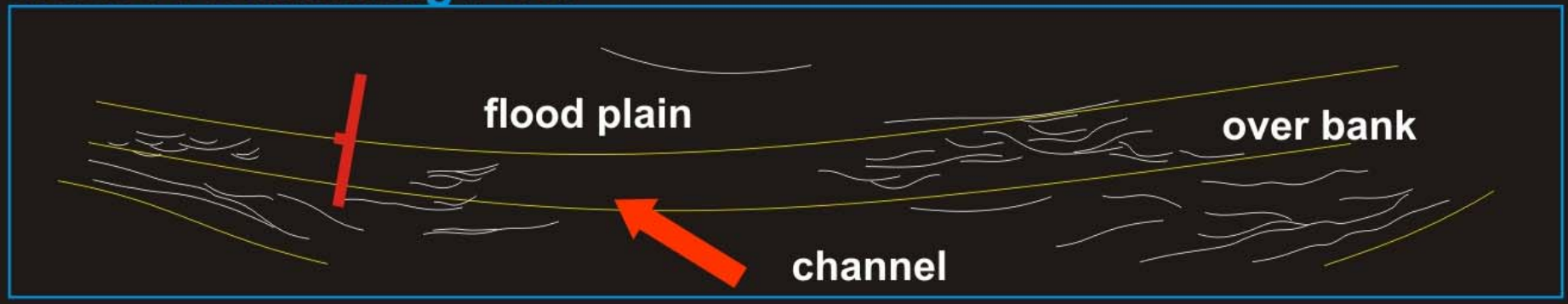
Nachod Swimming Pool



The textural features – clast imbrication and lineation of the longest axes, when are measured in the channel lag deposits (traction material), also evidence westerly directed palaeoflows. In the same places the low angle cross bedding is obliquely inclined what mostly reflects the slopes accretion of the latteral bars.

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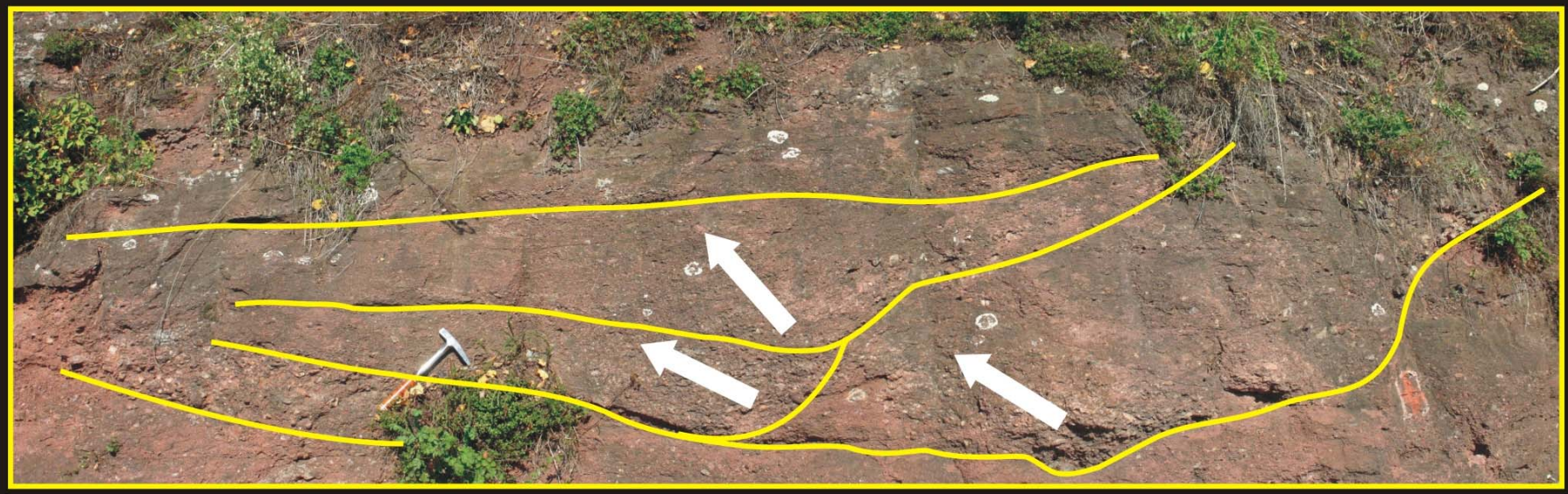
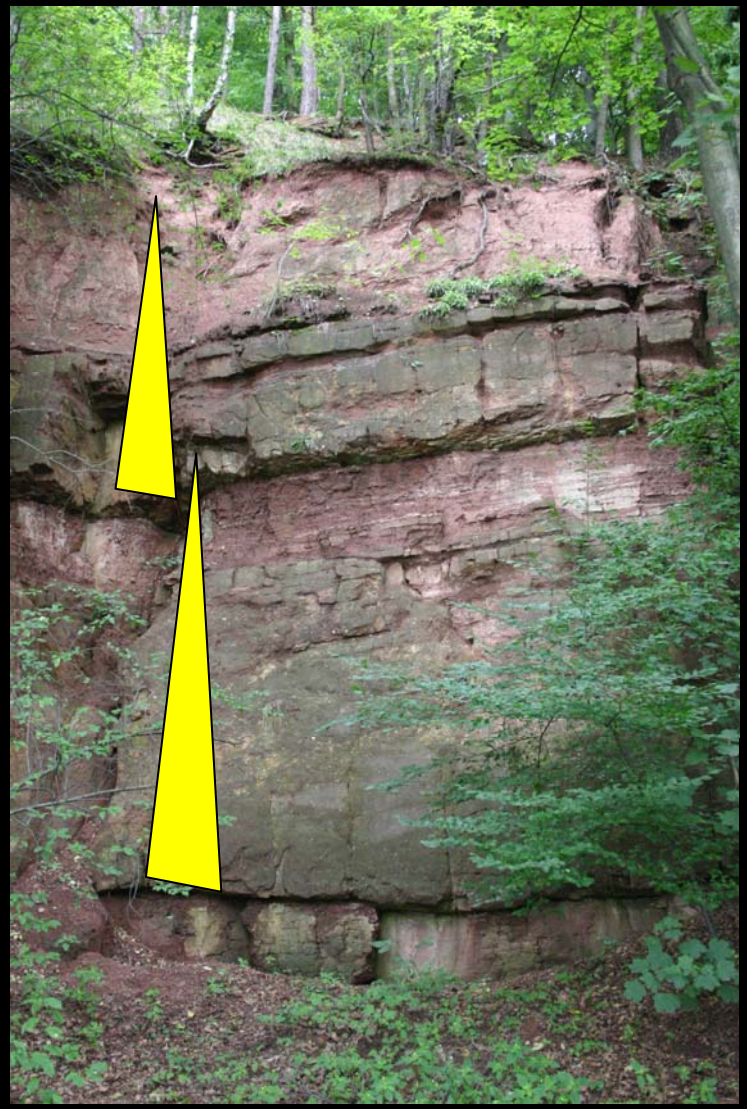
Nachod Centre



In the area of Radechova Elevation the fluvial sediments are arranged in the fining upwards cycles that evidence relatively gently inclined palaeoslope and episodic subsidence. Numerous vertical slickensides with dominantly horizonatal striation evidence important role of the strike slip motion during the basin invertions.

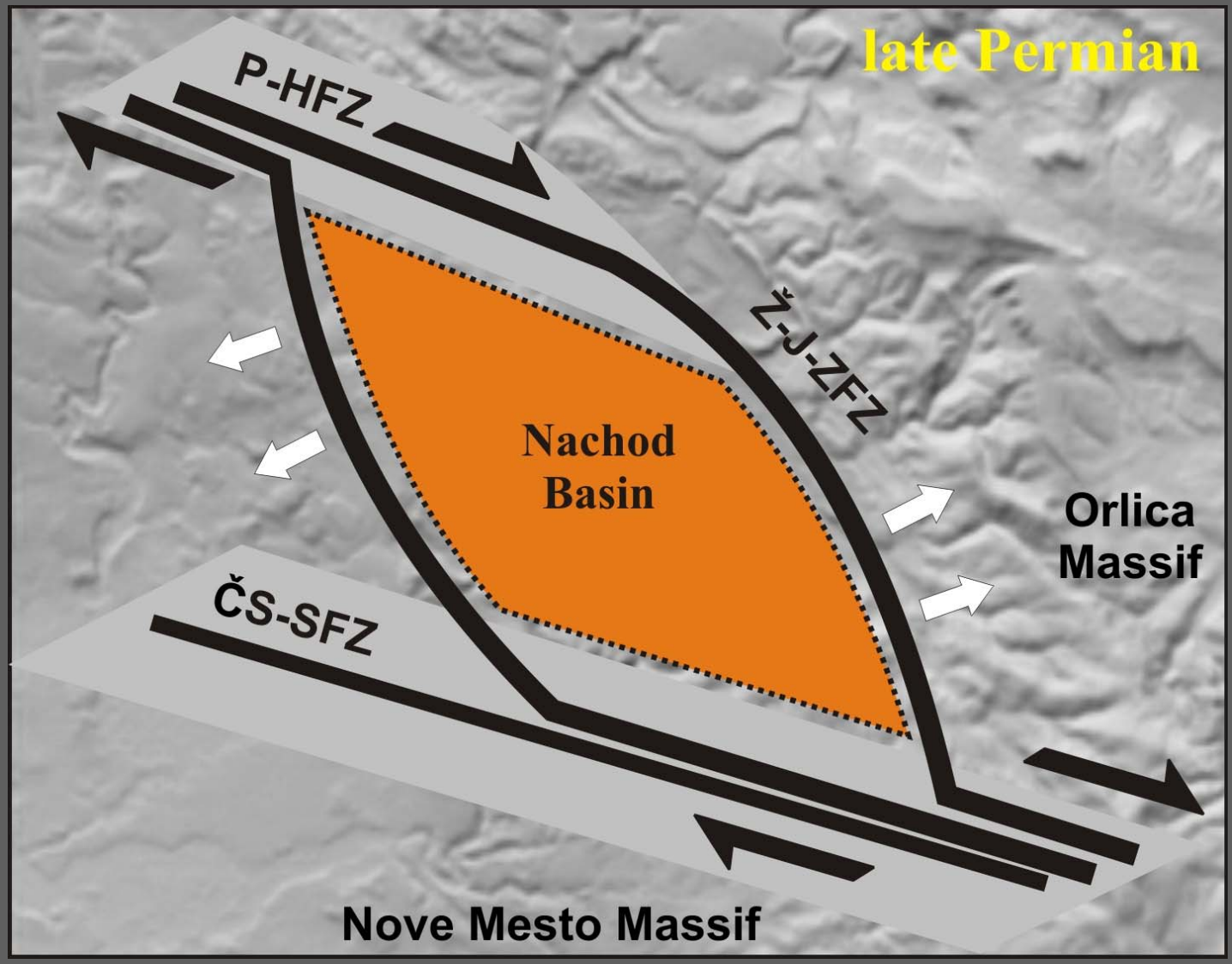
13

fining upwards fluvial channel to overbank cycles (Dolni Radehova)

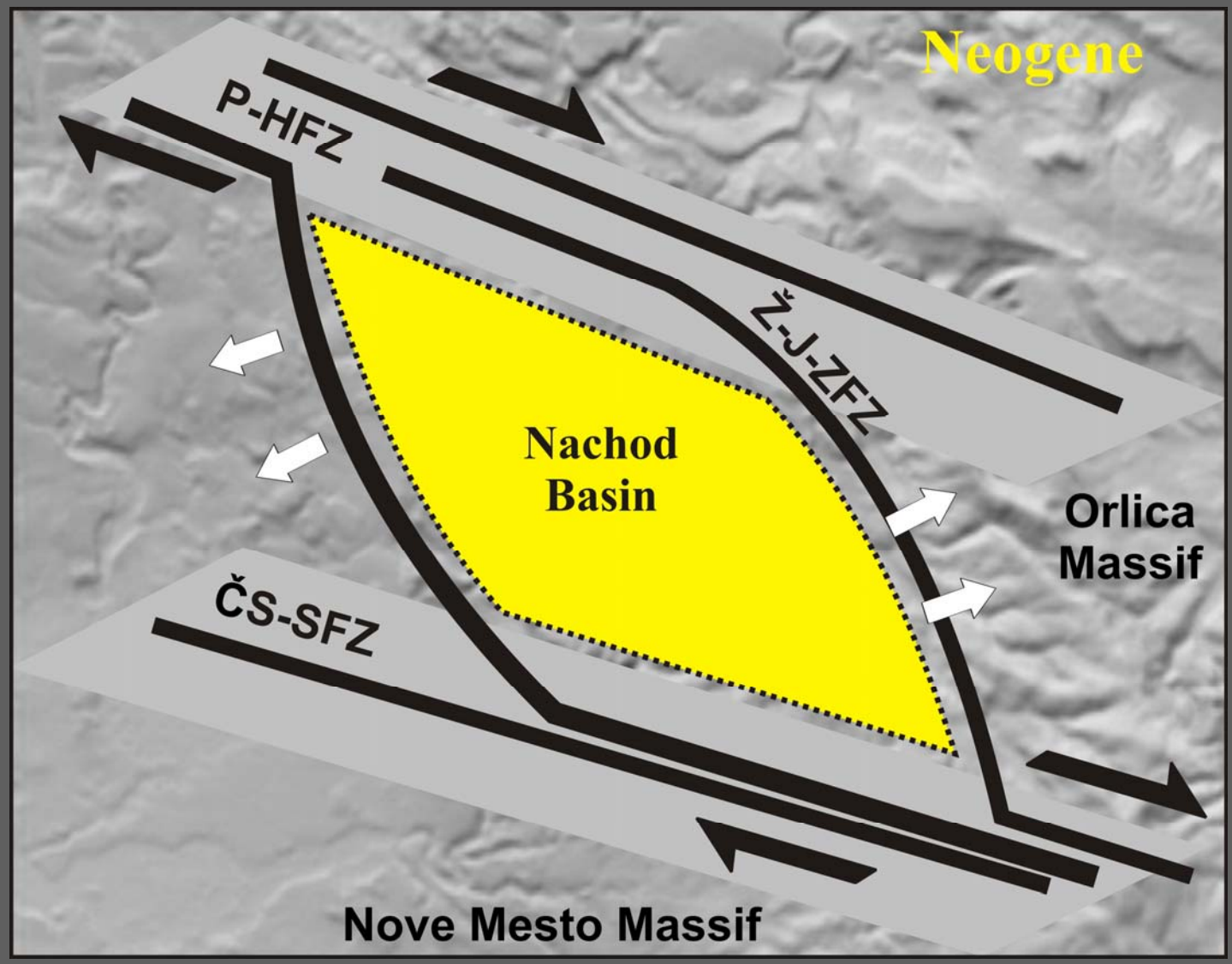


slickenside & horizontal ridge-in-groove-type striation (Lewin Kłodzki)

For the Permian time of the Nachod Basin formation and evolution a model of **rhombhoidal branching fault basin** can by applied.



For the Neogene time of the Nachod area evolution a model of **rhombhoidal pull-apart basin** can by applied.



The Nachod Basin started into existance during the early Permian due to post-variscan inversion. Since the beginning it keeps still a rhomboidal shape what evidence a strike-slip regime of its formation and evolution. The major basin controlling faults were/are **Poříči-Hronov Fault Zone** and by **Česká Skalice-Spalona fault system**.

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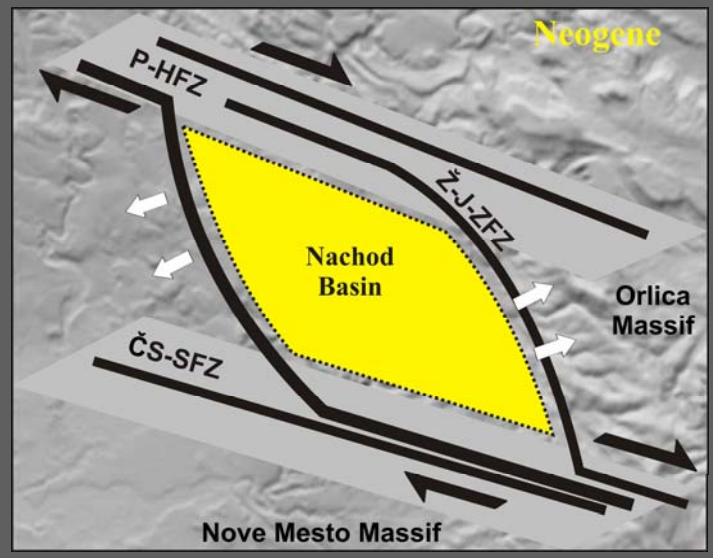
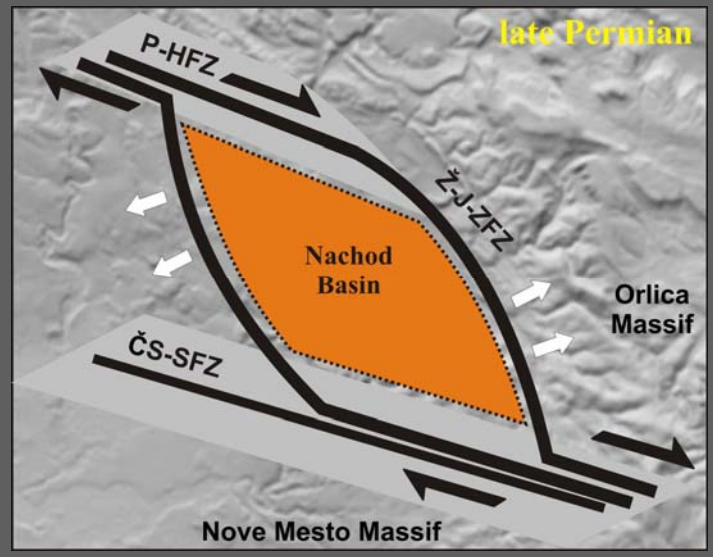
rhomboidal
pull-apart basin



rhomboidal
branching fault basin



Thank you for attantion…

INVITATION

INTRAMOUNTAIN BASINS
REGIONAL CONTEXT OF SEDIMENTARY ENVIRONMENTS AND PROCESSES

POKOS 3 III Polish Sedimentological Conference
formerly: 10th National Meeting of Sedimentologists
Kudowa Zdrój, 2008 September

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