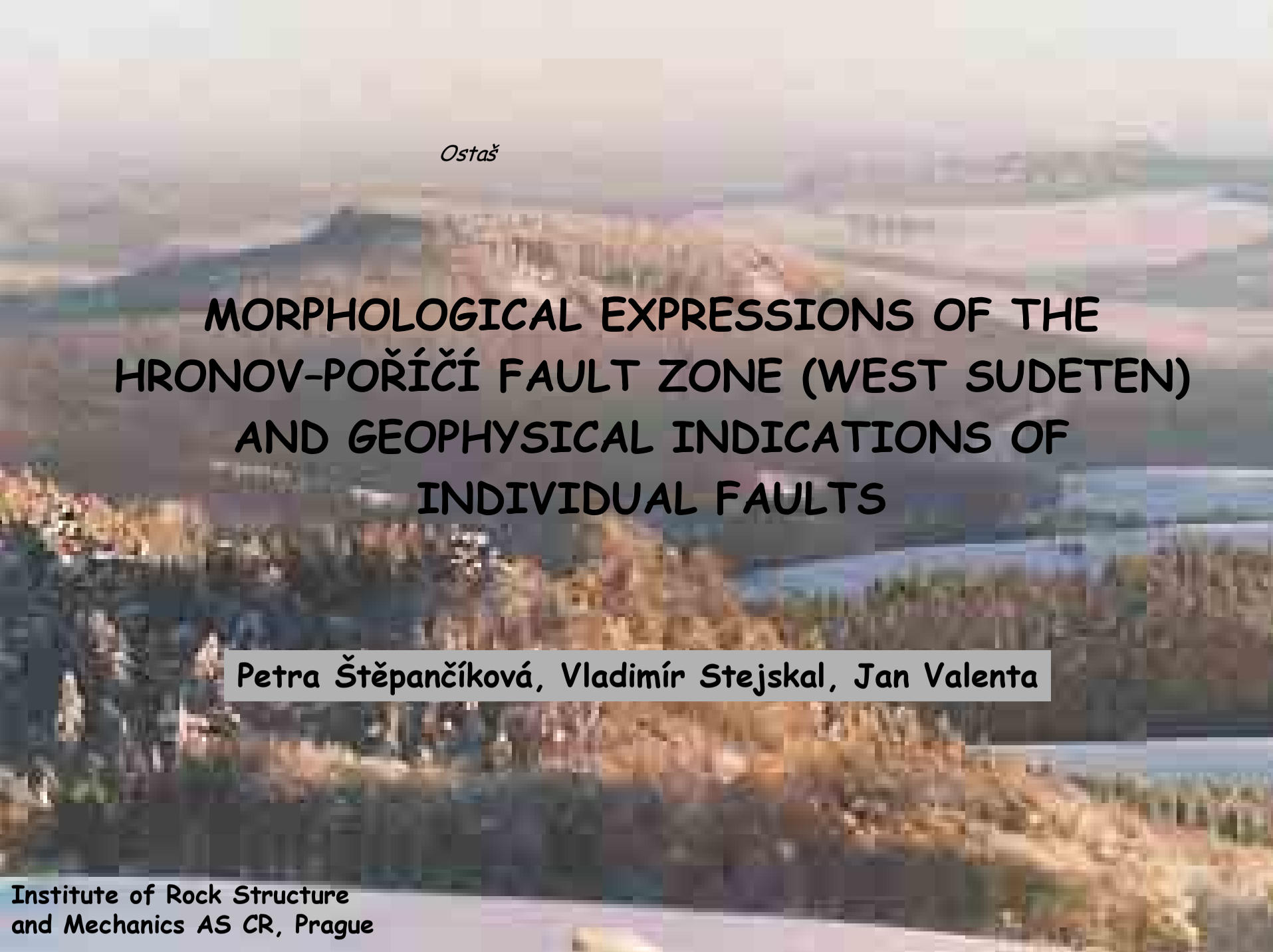

MORPHOLOGICAL EXPRESSIONS OF THE HRONOV–POŘÍČÍ FAULT ZONE (WEST SUDETEN) AND GEOPHYSICAL INDICATIONS OF INDIVIDUAL FAULTS

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Hronov-Poříčí Fault Zone

Broumovská vrchovina

Broumov

Trutnov

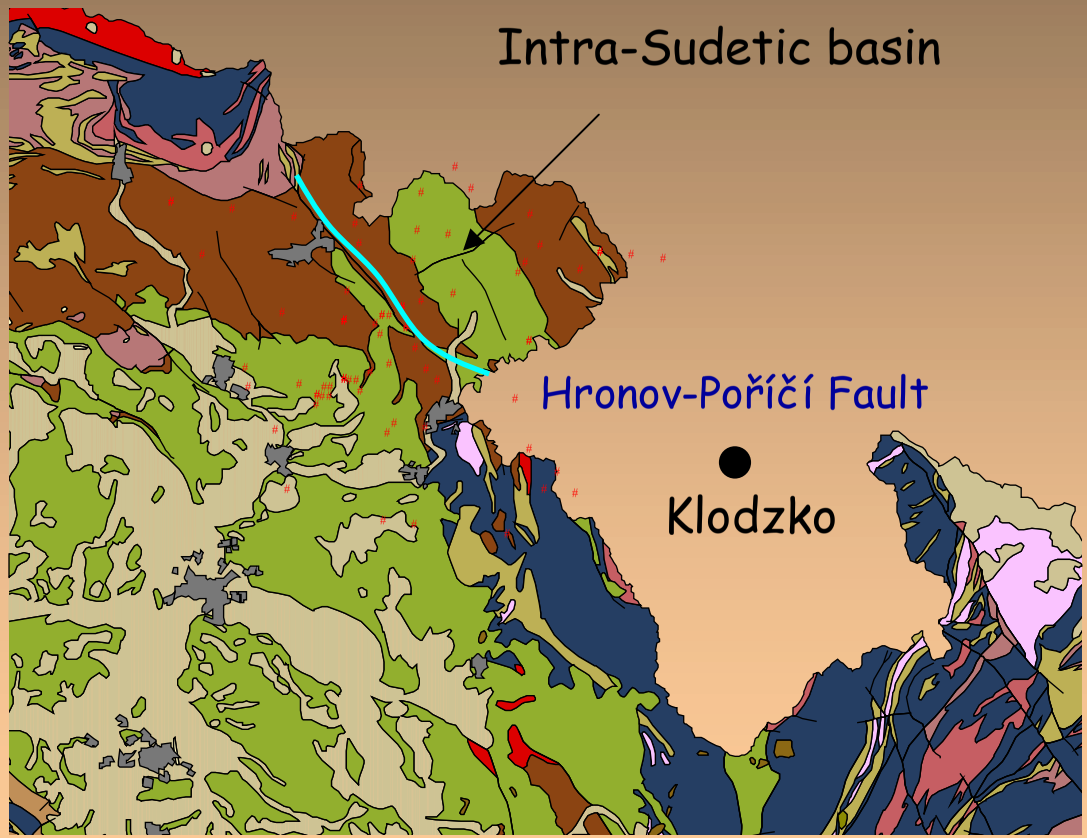
HPZ

Hronov

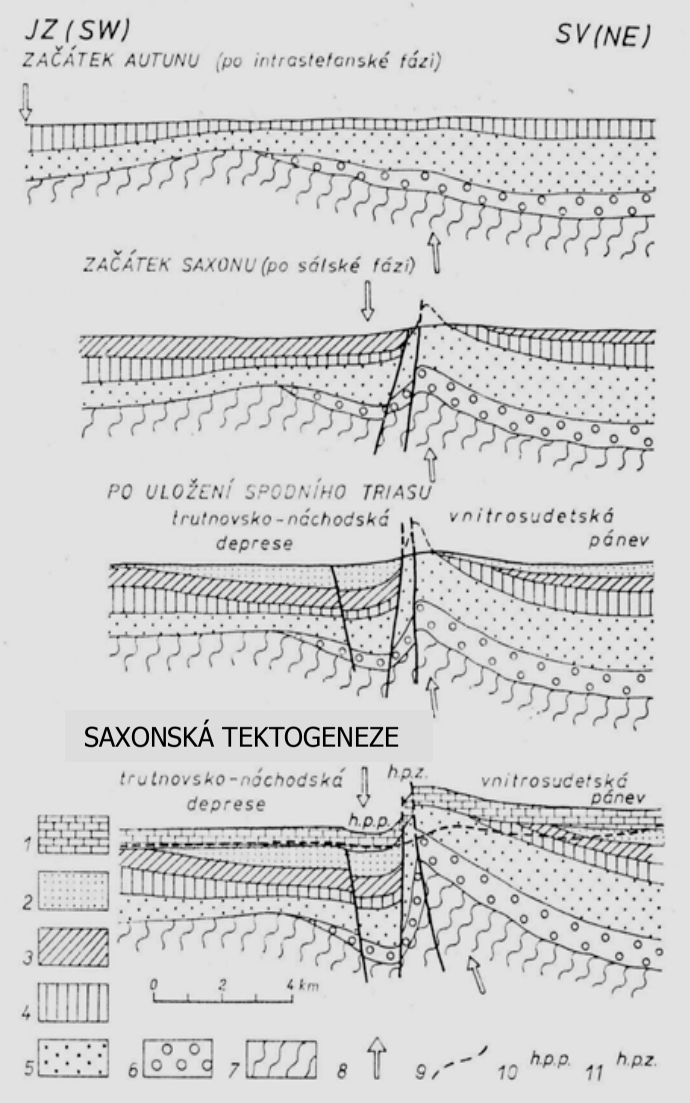
Krkonošské podhůří

Náchod

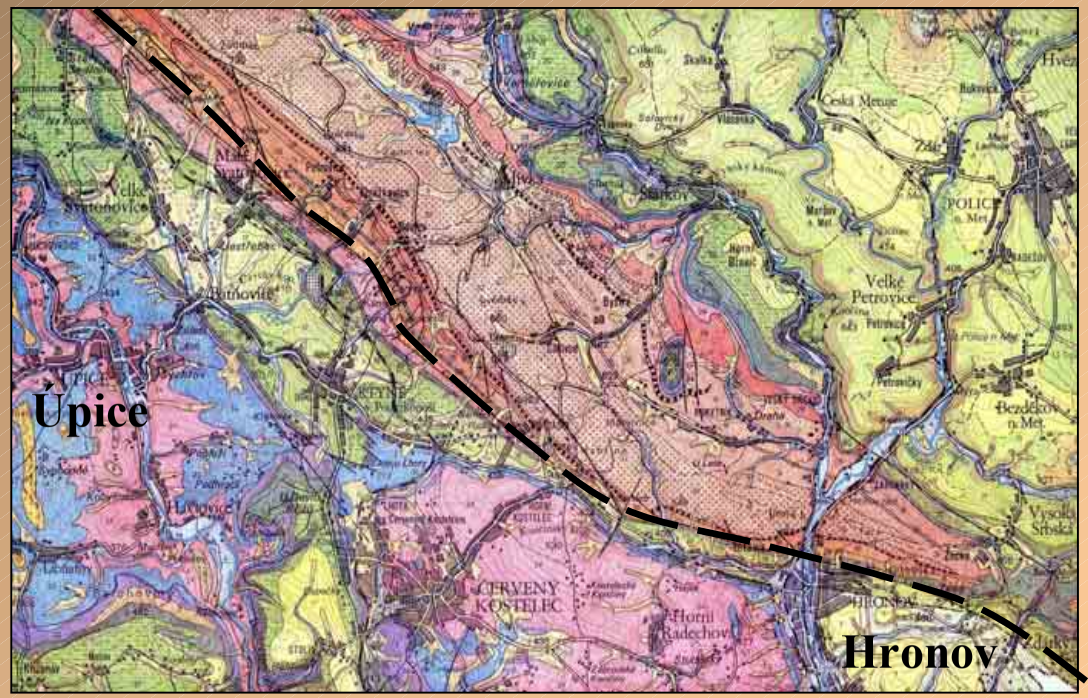
Geology



- Variscan diorites, gabbro
- graitoids
- granodiorites
- Moldanubicum (gneisses)
- Quaternary (loess, sands, gravels)
- Cretaceous (sandstones, claystones)
- Proterozoic orthogneisses, migmatites
- Paleozoic folded and metamorphosed (phyllite)
- Paleozoic folded and unmetamorphosed
- Permo-Carboniferous (sandstones, conglomerates)
- Moldanubicum (paragneisses, migmatites)
- Proterozoic folded rocks (phyllites, micaschist)
- Tertiary (sands, clays)
- Ultrabasic rocks
- Tertiary vulcanites
- Proterozoic and Paleozoic vulcanites
- granites



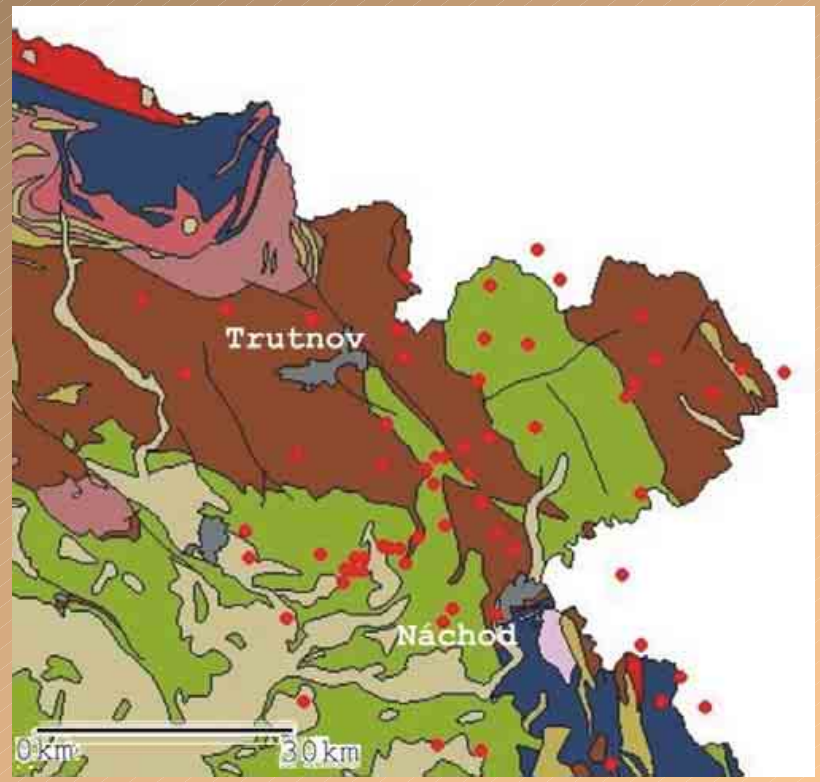
- Hronov-Poříčí Fault -since Upper Palaeozoic
- HPF - thrust
- Jestřebí Mts - uplifted along HPF



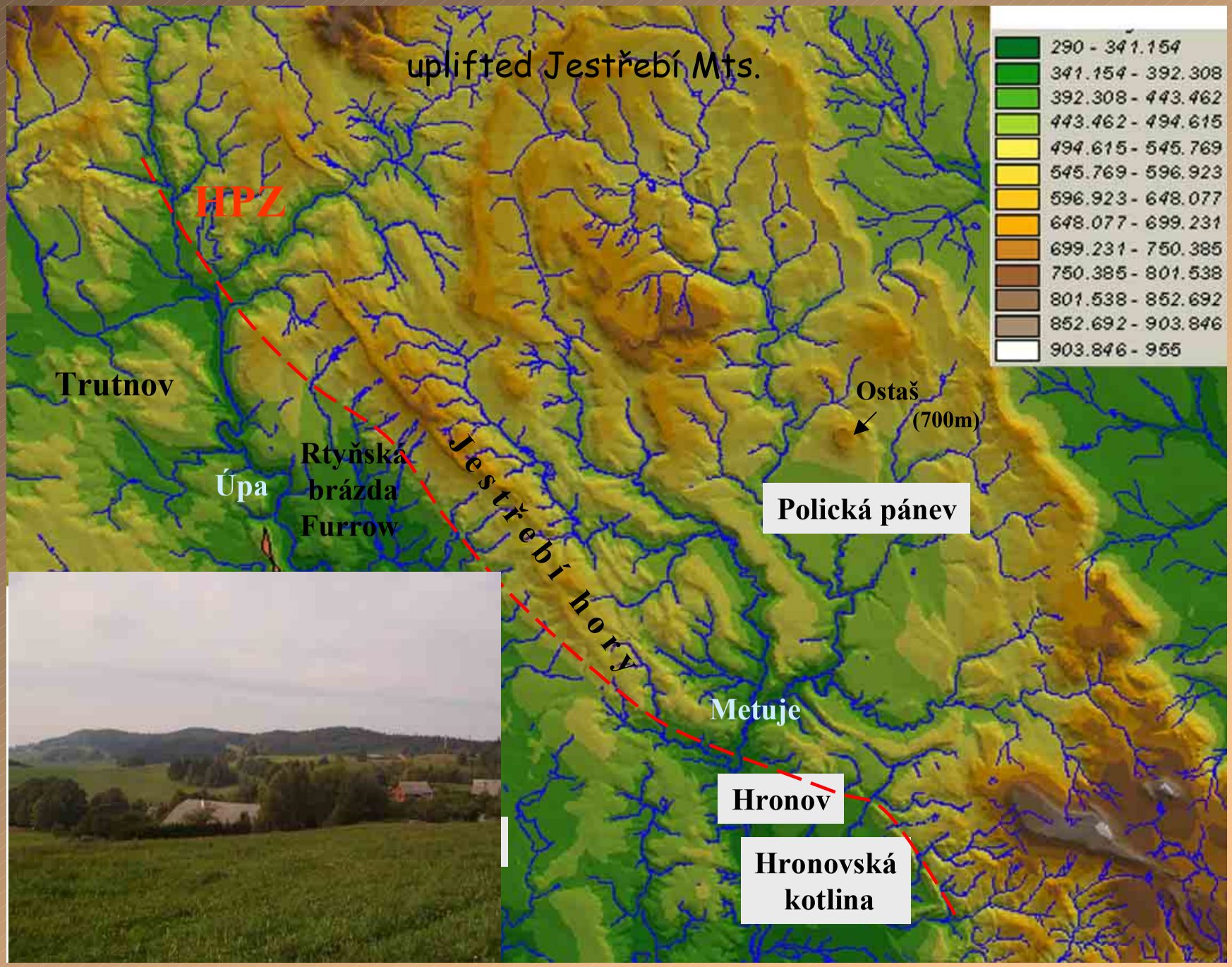
Hronov-Poříčí Fault Zone - 40 km,
Permocarbonian vs. Cretaceous

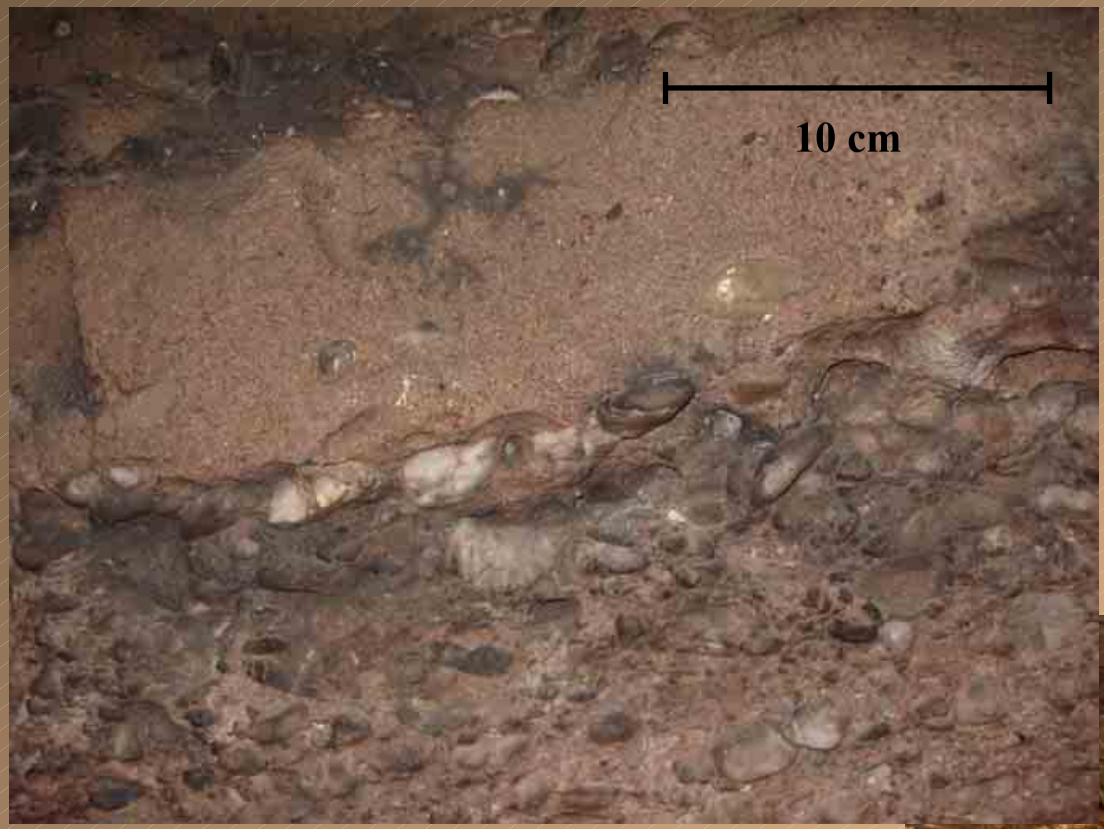
Present-day activity - seismicity

Datum	Maximální intenzita I_o	Magnitudo
10.1. 1901	7°	4,6
28.8. 1903	3°	2,4
21.-22.12. 1905	3-4°	2,7
13.5. 1908	4°	3,0
10.9. 1910	3°	2,4
26.3. 1928	3-4°	2,7
30.1. 1949	4-5°	3,5
24.4. 1957	5°	3.8
2.12. 1961	4-5°	3,5
3.11. 1963	5°	3.8
21.11. 1979	5°	3,7
5.5. 1984	3°	2,4
7.5. 1984	4-5°	3,3
15.5. 1984	3°	2,4
20.3. 1985	4°	3,0
22.4. 1992	4-5°	2,3
24.8. 1992	3°	1,7
24.6. 1999	3°	2,2
25.10.2005	3-4°	3,4



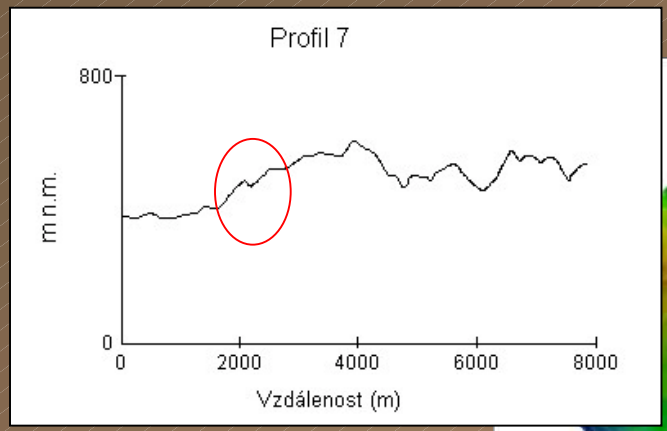
- Last 300 years – 30 earthquakes (macroseismic)
- Strongest earthquakes M = ± 4.6, I = 7° (Kárník a kol. 1984, Procházková 2002).

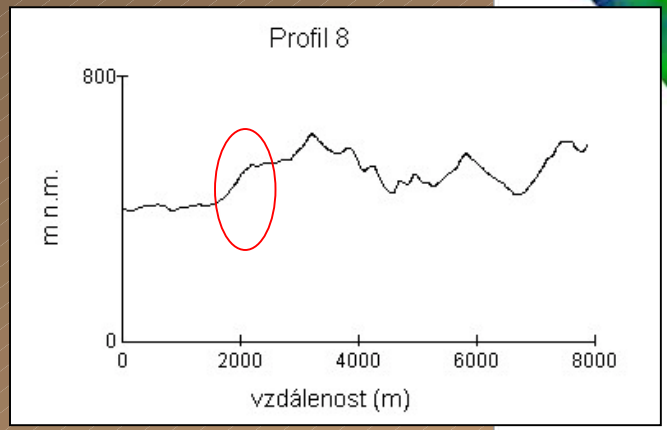

uplifted Jestřebí Mts.
HPZ
Trutnov
Úpa
Rtyňská
brázda
Furrow
Jestřebí hory
Ostaš
(700m)
Polická pánev
Metuje
Hronov
Hronovská
kotlina
290 - 341.154
341.154 - 392.308
392.308 - 443.462
443.462 - 494.615
494.615 - 545.769
545.769 - 596.923
596.923 - 648.077
648.077 - 699.231
699.231 - 750.385
750.385 - 801.538
801.538 - 852.692
852.692 - 903.846
903.846 - 955



jívecké souvrství

araukarity





Morphostructure

Jestřebí hory Mts

7

8

Rtyně

Hronov

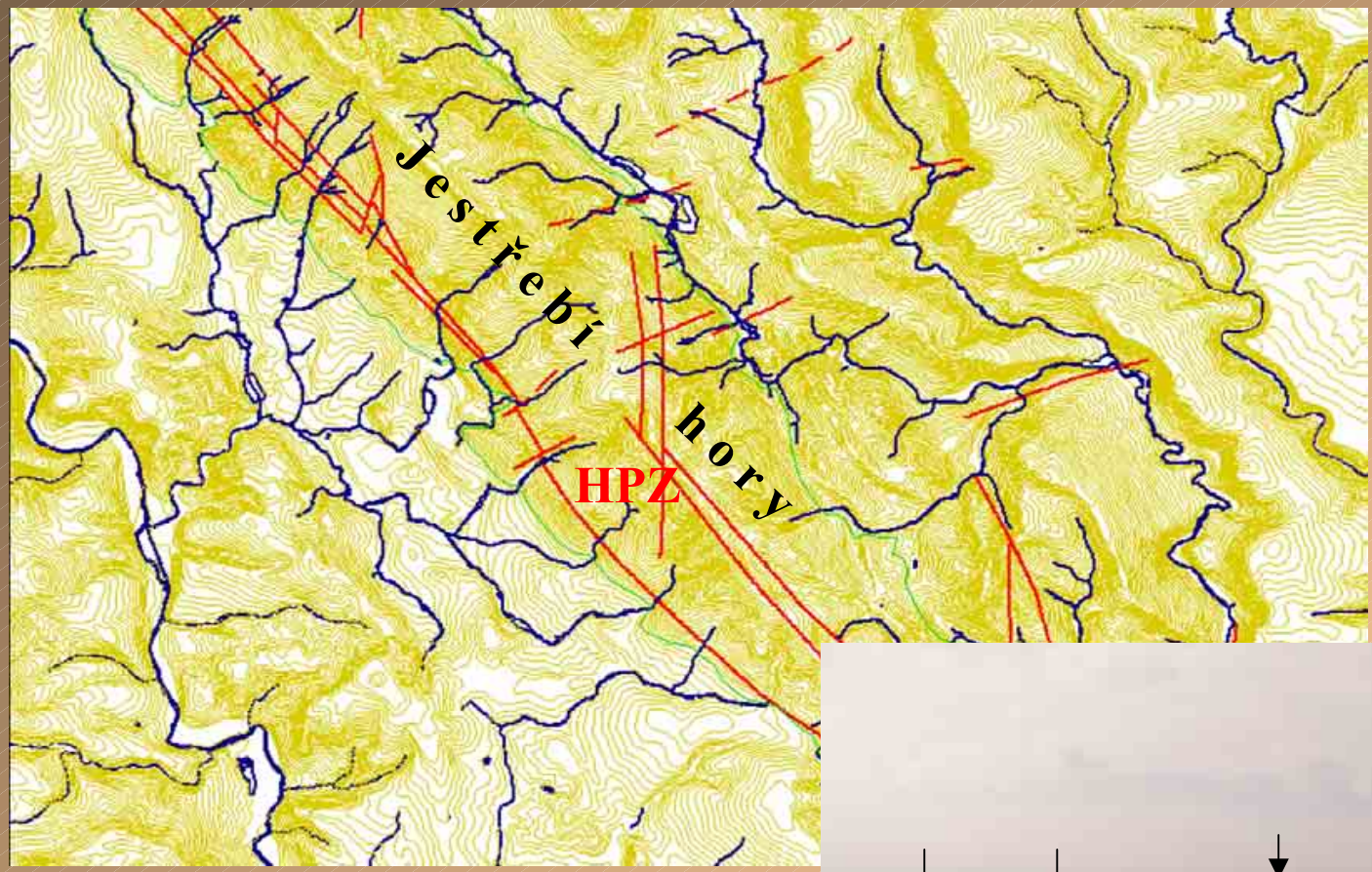
Meters
0 1 125 2 250 4 500

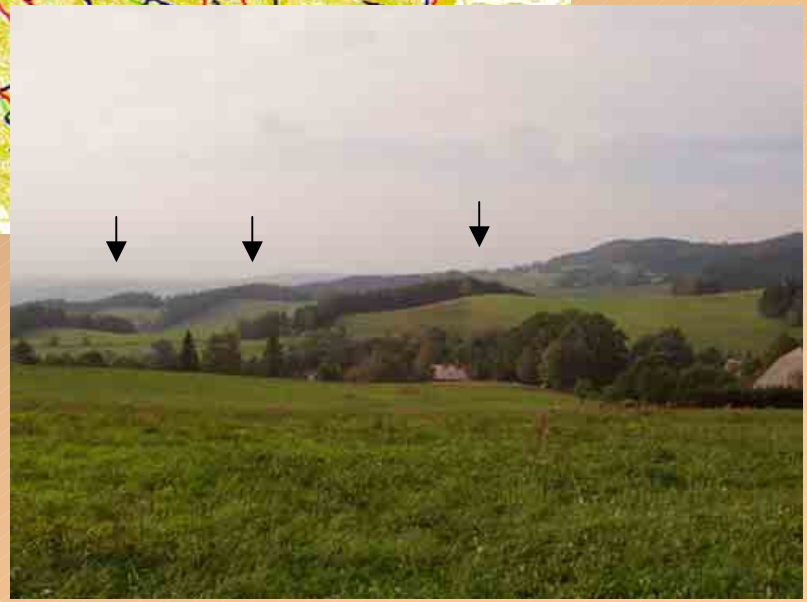
- highest part – related to max. thickness of conglomerates and arcose – cuesta
- SW slope – related to flexure accompanied by normal faults

Hronovsko-poříčský příkop

Hronovská kotlina
u Hronova


Trutnov Hilly Land
Rtyně Furrow
Jestřebí Mts

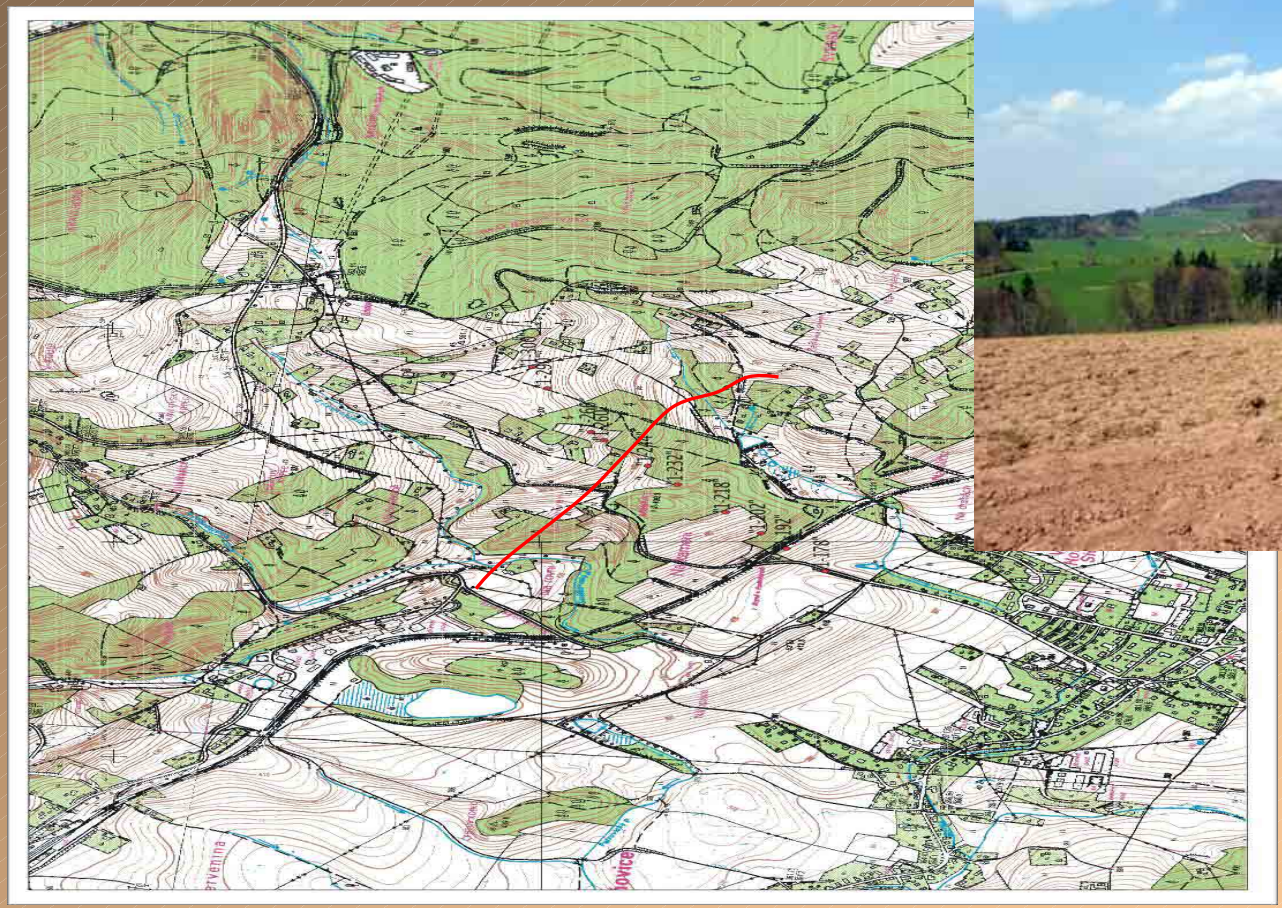




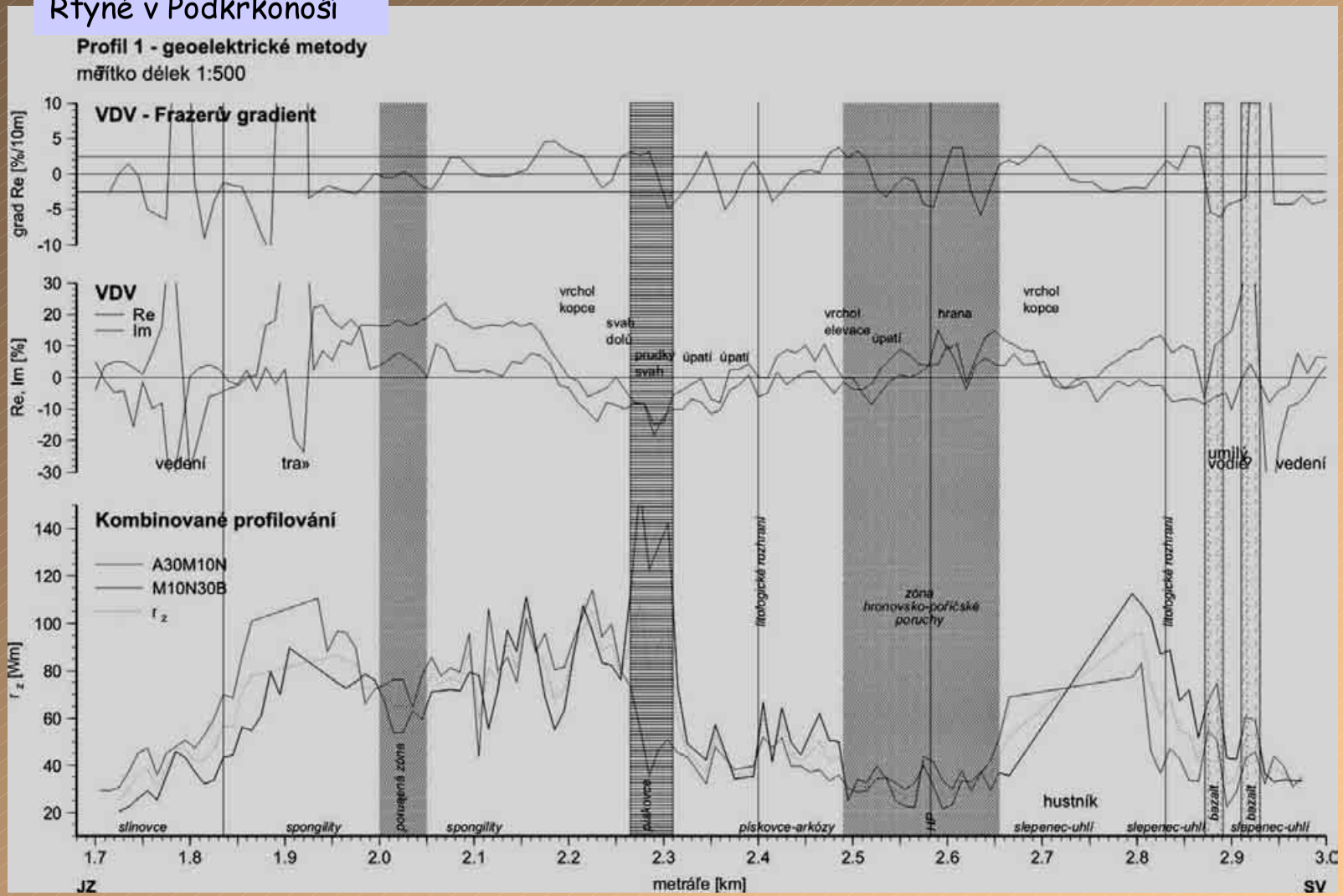
- Morphological expression of the flexure and HP thrust fault
- Normal faults accompanying thrust (Tásler 1979)– younger – not documented yet
- Fault scarp – rectilinear foot, triangular facetes (Demek 1992)

Geophysical measurements

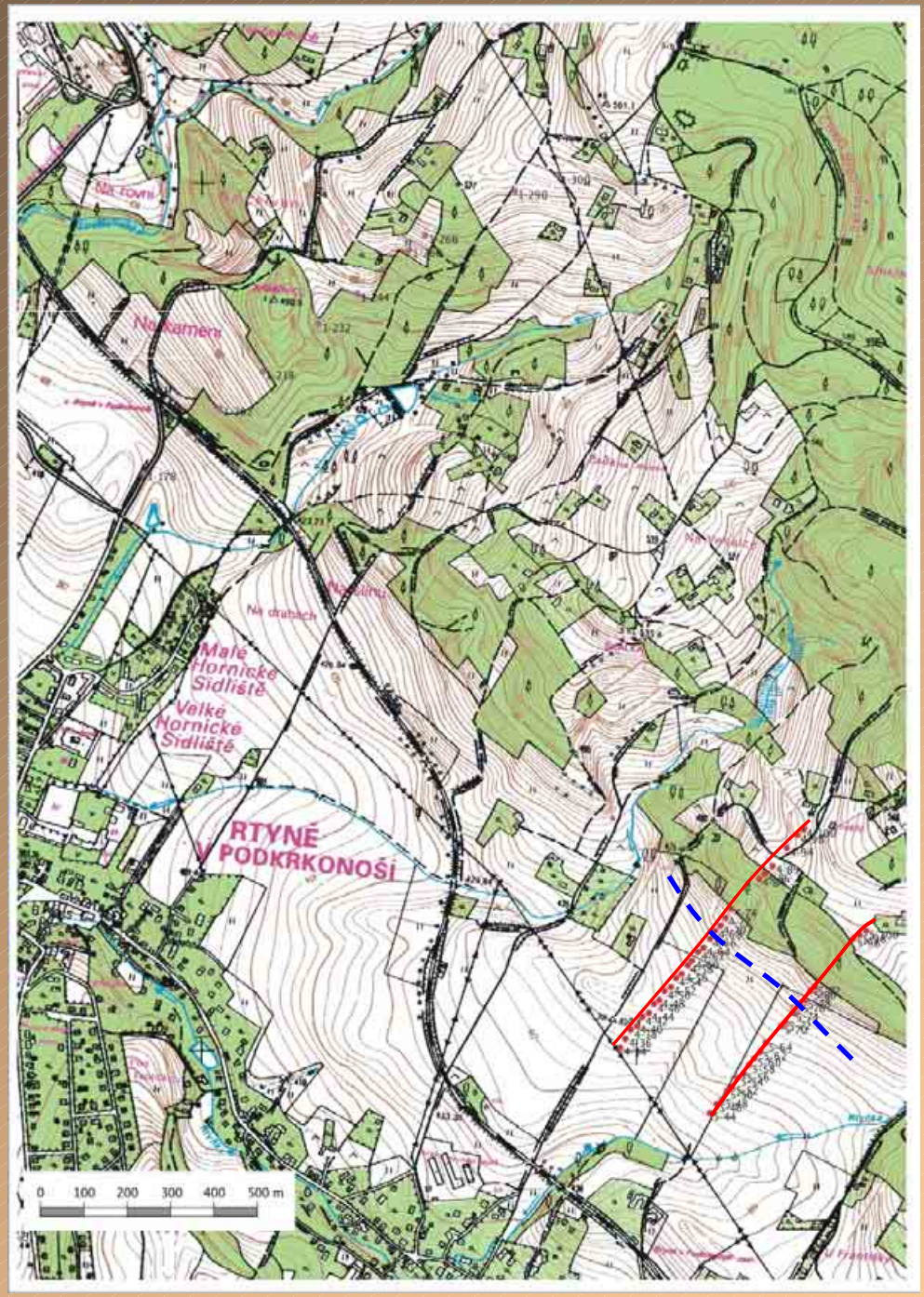
- in order to prove existence of a fault bordering the Jestřebí Mts and controlling its young development
- 3 Geoelectrical profiles (Spring, Autumn 2006)

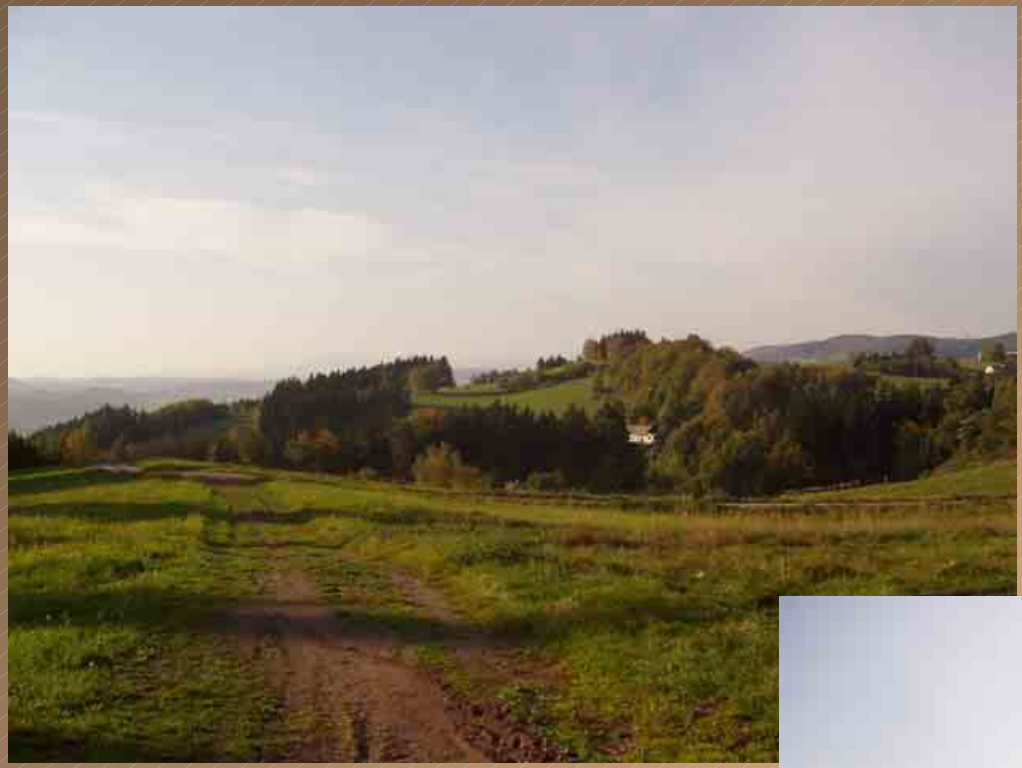


Rtyně v Podkrkonoší



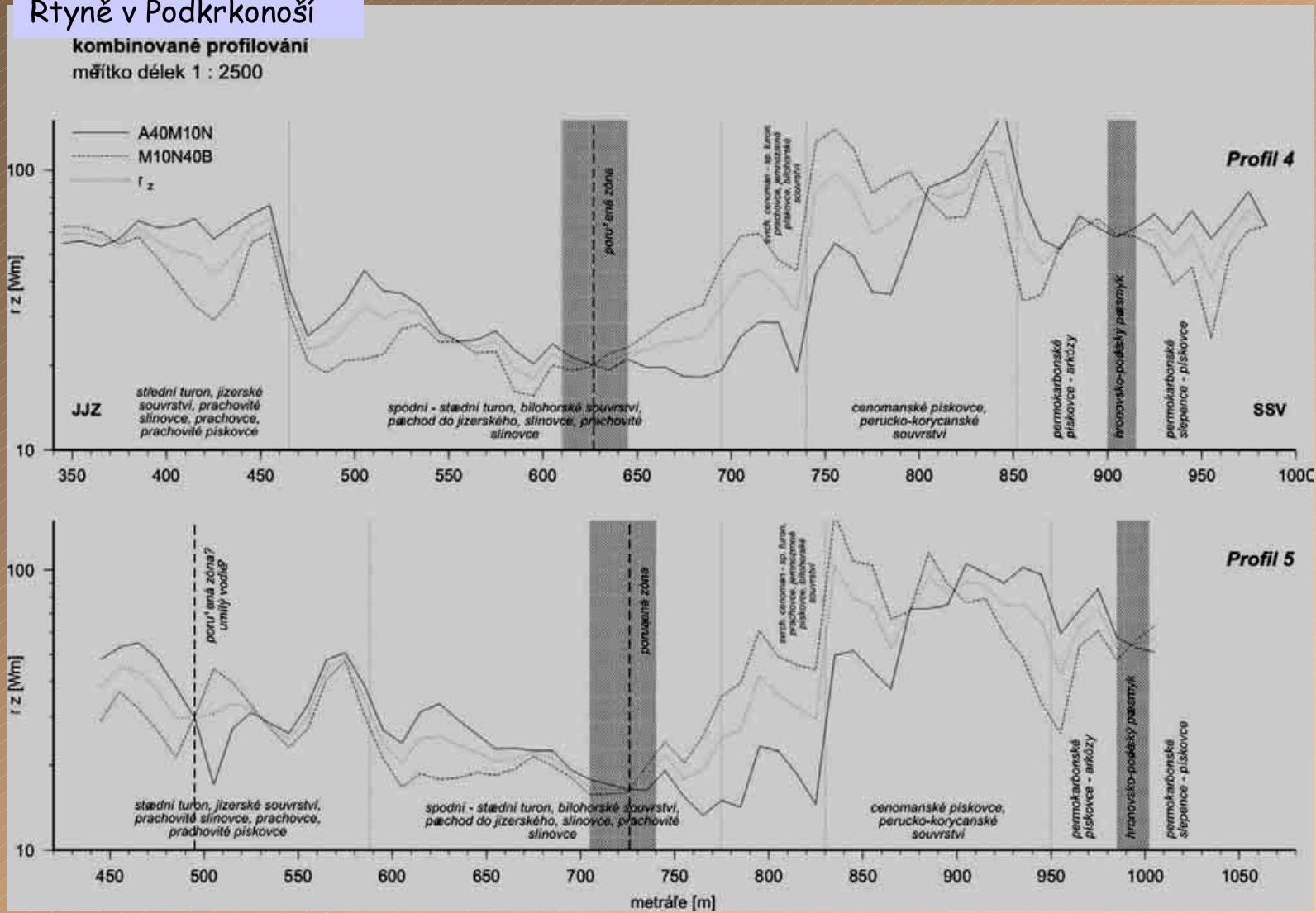
Mountain front of Jestřebí Mts


Na Kamenci
Na drahách
Malé Hornické Sidliště
Velké Hornické Sidliště
RTYNĚ V PODKRKONOŠÍ
0 100 200 300 400 500 m



Beginning and end of profiles

Rtyně v Podkrkonoší



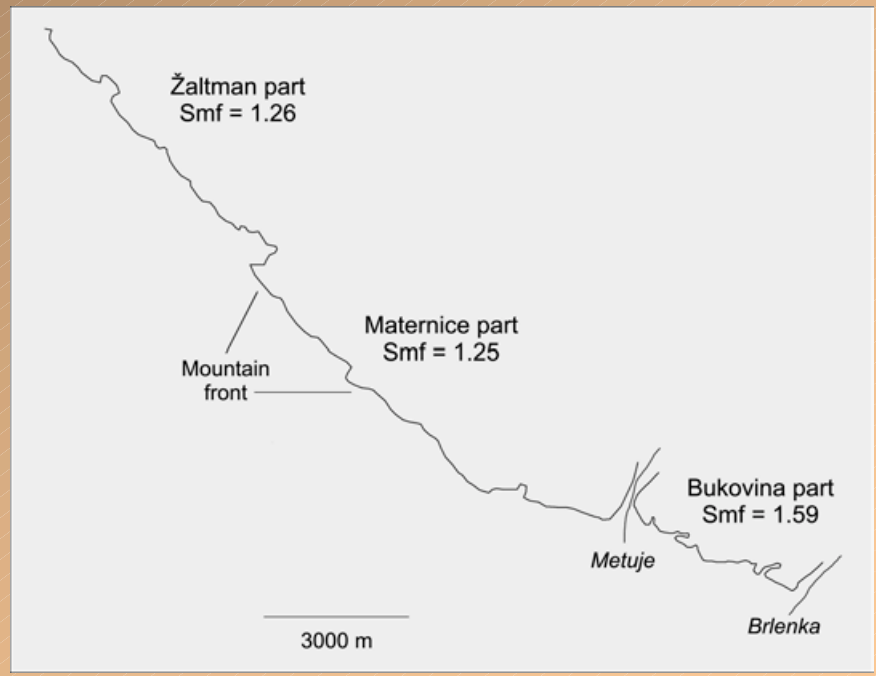
Mountain Front Sinuosity

$S = (L_{mf})/(L_s)$

(Bull, McFadden 1977)

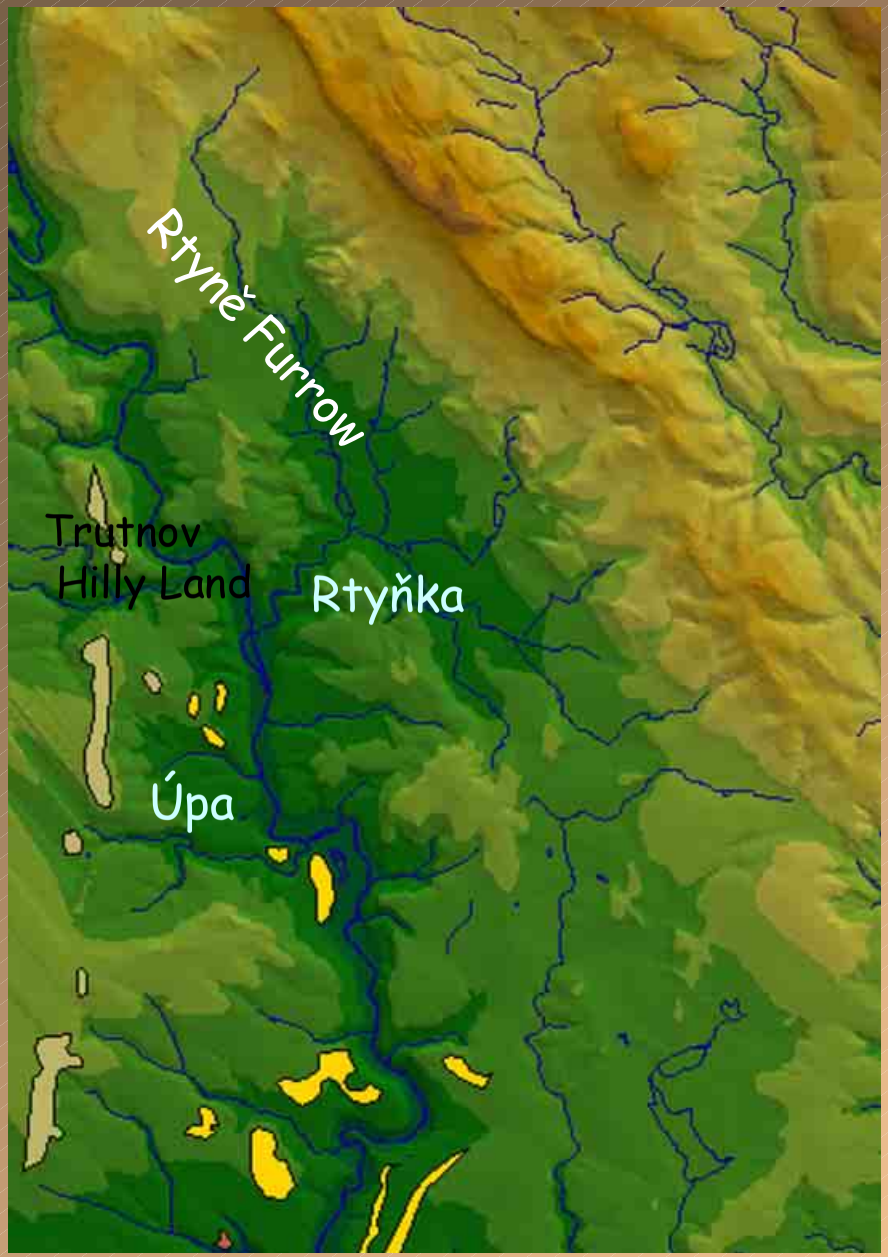
Lmf – length of mountain front

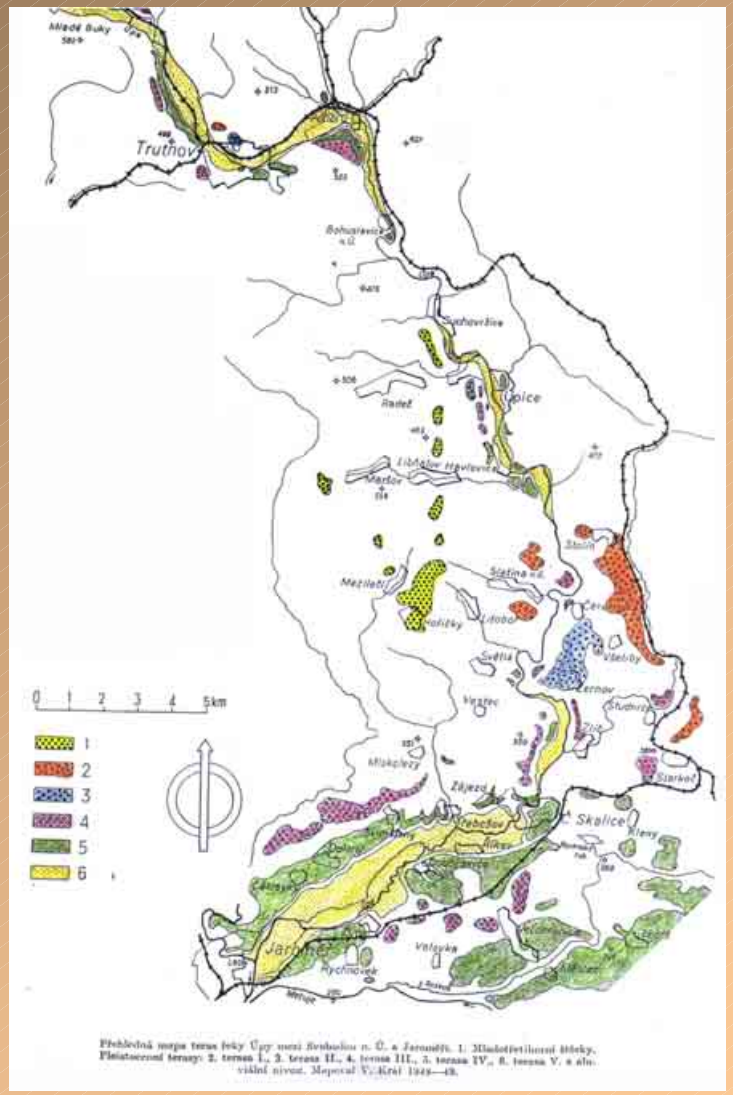
Ls – straight-line length of mf



- active uplift/young fault scarp – straight mountain front
- $S \sim 1 \rightarrow$ active fault controlling the slope foot
- $S \geq 2 \rightarrow$ low tectonic activity
- Foot of the Jestřebí Mts: S = 1.26

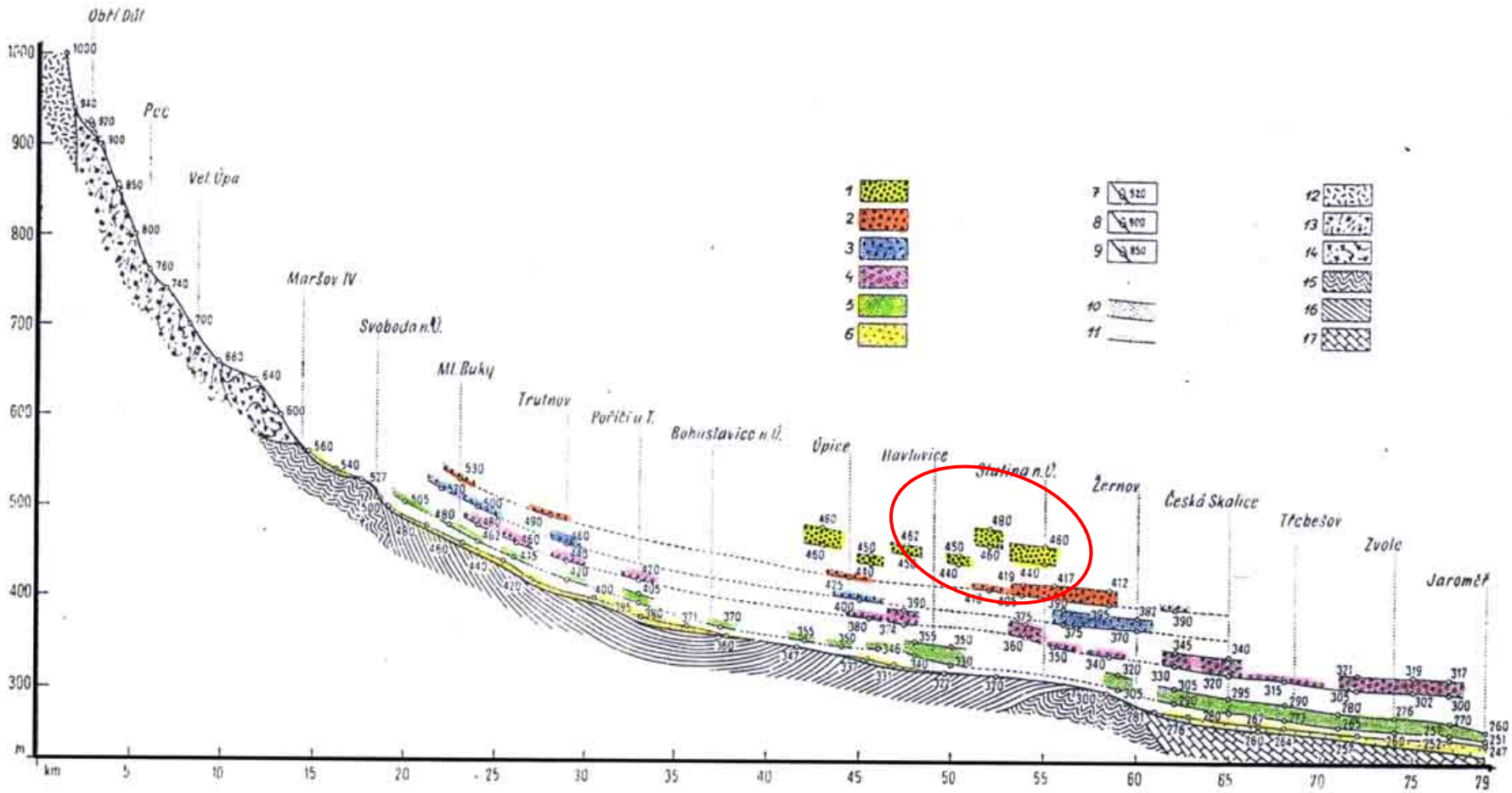
Differential tectonic movements during Neogene/Quaternary (morphology)





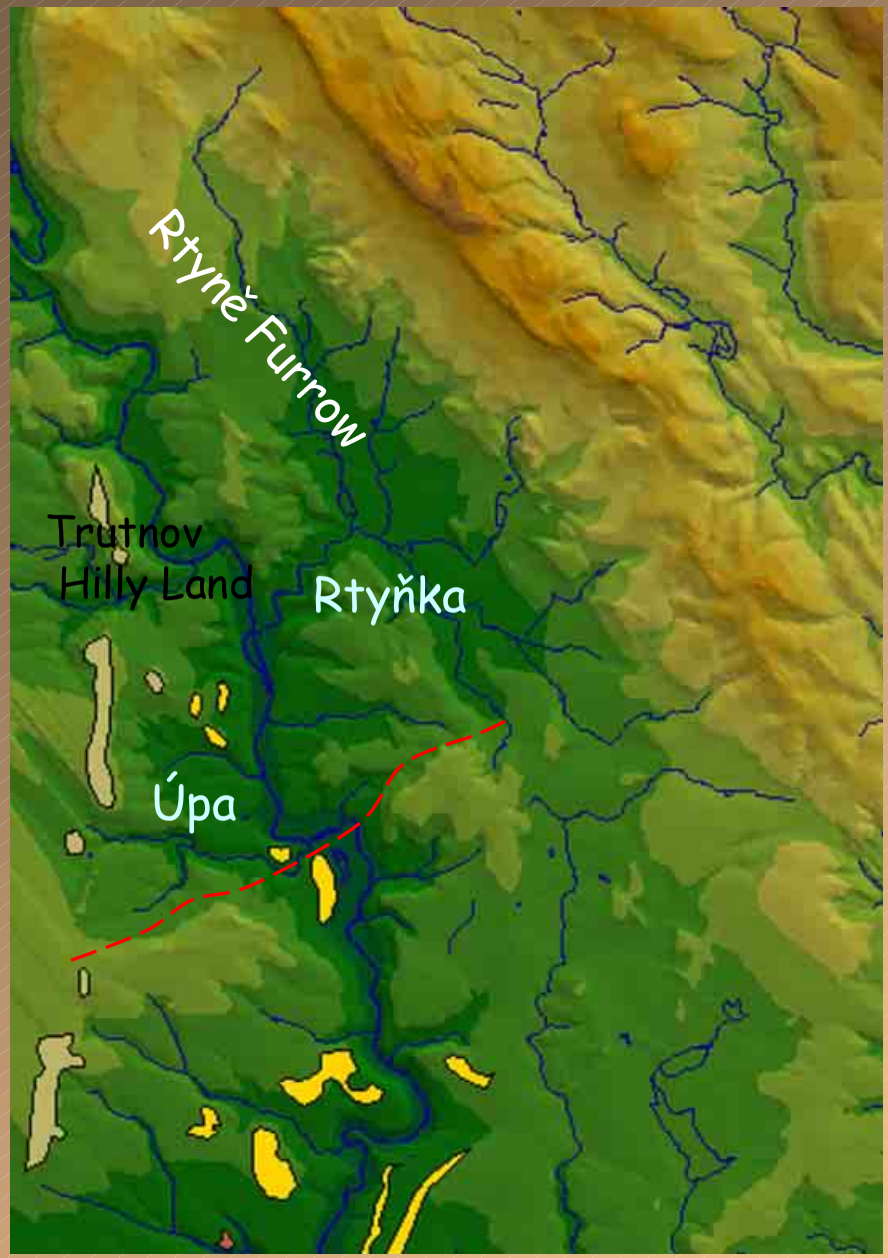
1 Neogene level
5 Pleistocene levels

Longitudinal profiles of the Úpa River terraces (Král 1949)



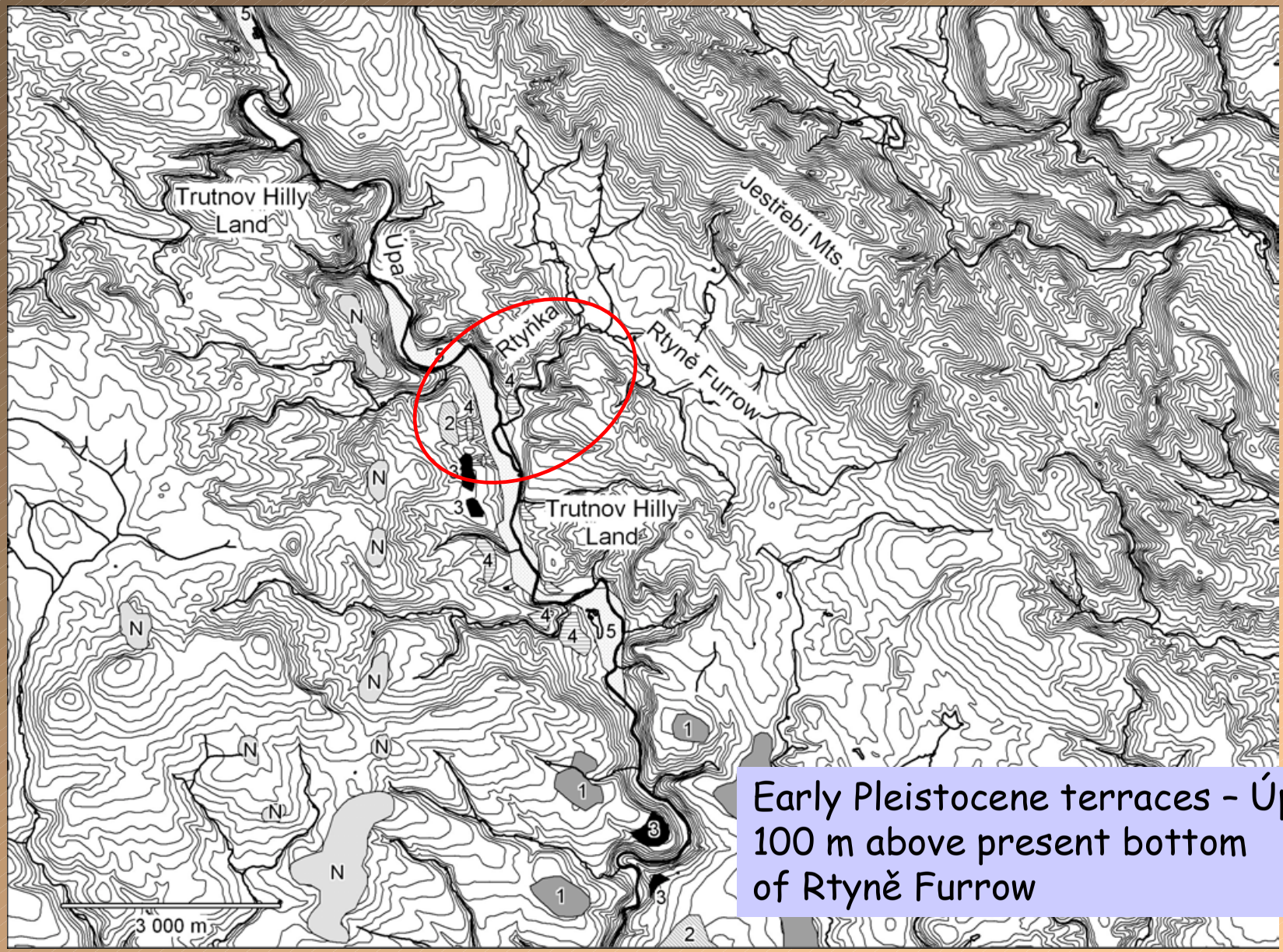
Podélný profil terasami Úpy podle V. Krále

1 — mladotřetihorní štěrky, *2* — I. terasa (pleistocenní), *3* — II. terasa, *4* — III. terasa, *5* — IV. terasa, *6* — V. terasa, *7* — nejstarší morény, *8* — mladší morény, *9* — nejmladší morény; *10* — akumulační terasa, *11* — erozní terasa, *12* — žula, *13* — série svorových rul, *14* — ortoruly, *15* — fylitová série, *16* — permokarbon, *17* — křída



Neogene/Pleistocene movements

Pleistocene – udisturbed terrace levels



Early Pleistocene terraces – Úpa 100 m above present bottom of Rtyně Furrow

antecedent valley
of Rtyňka River

Conclusions

- The study of drainage network evolution and perturbations in fluvial terrace levels revealed the evidence of tectonic movements dating back to Pliocene/Pleistocene to Early Pleistocene.

- Seismic activity as evidence of present-day tectonic activity.

- The results of geophysical work confirmed the trace of the HPT as well as a fault running along the foot of the Jestřebí Mts along which the Mts were probably uplifted during its youngest development.


Thank you for your attention....