

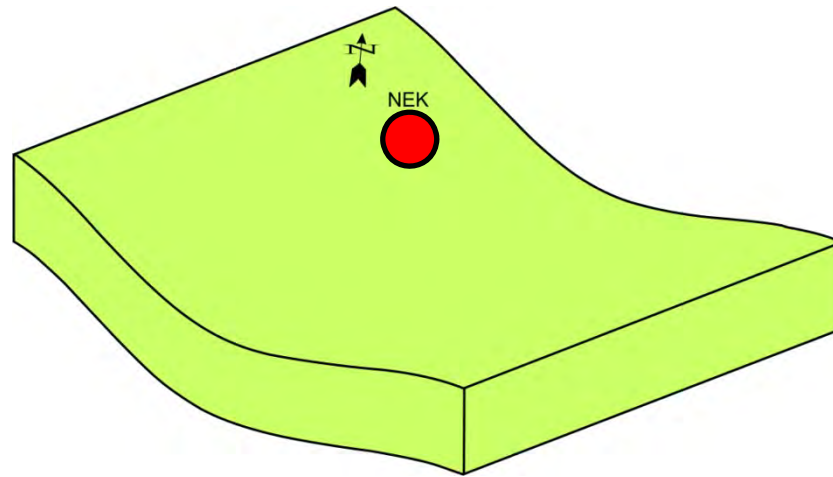
KRŠKO BASIN

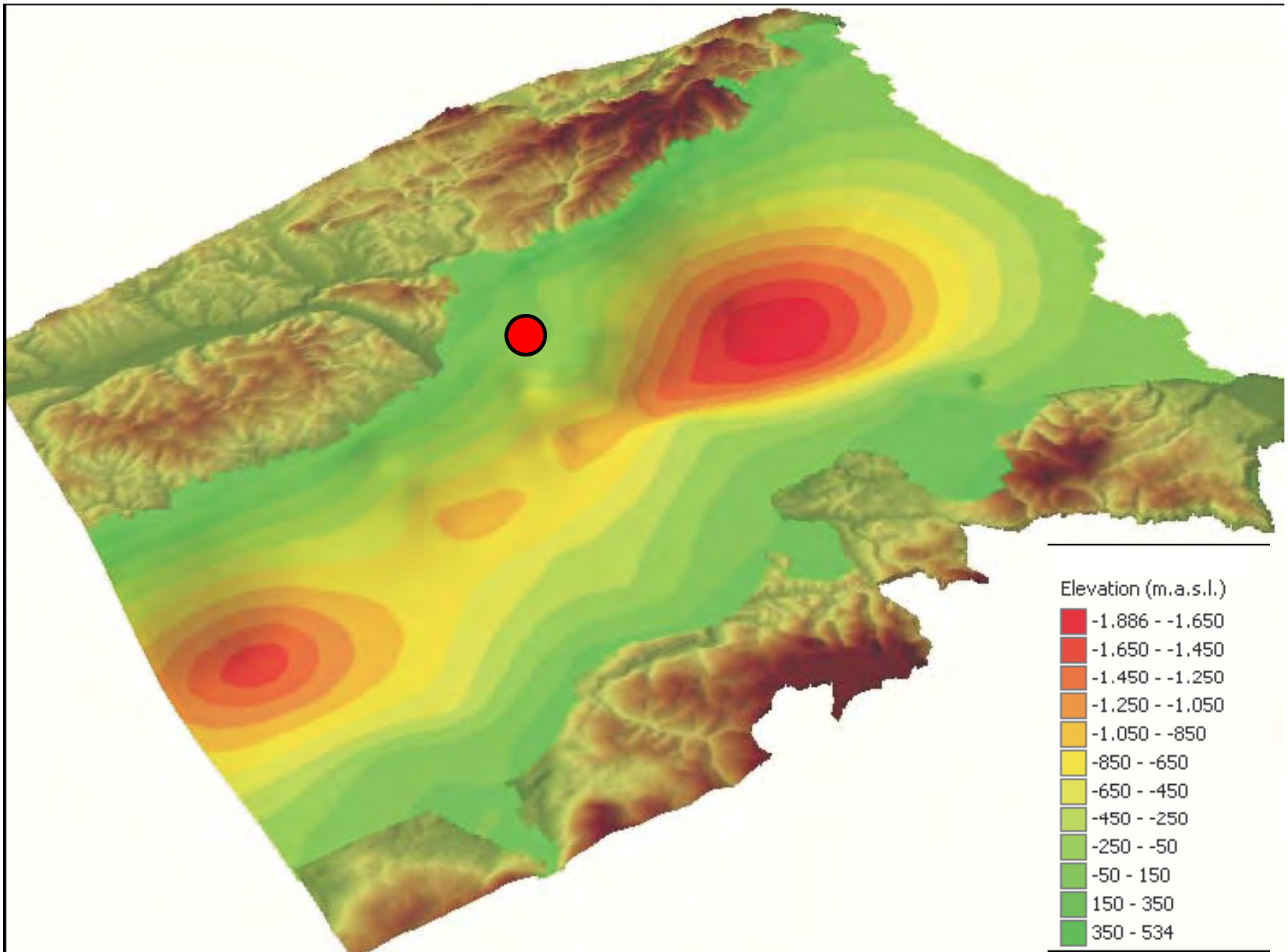
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GEOLOGY, TECTONICS, SEISMOTECTONICS

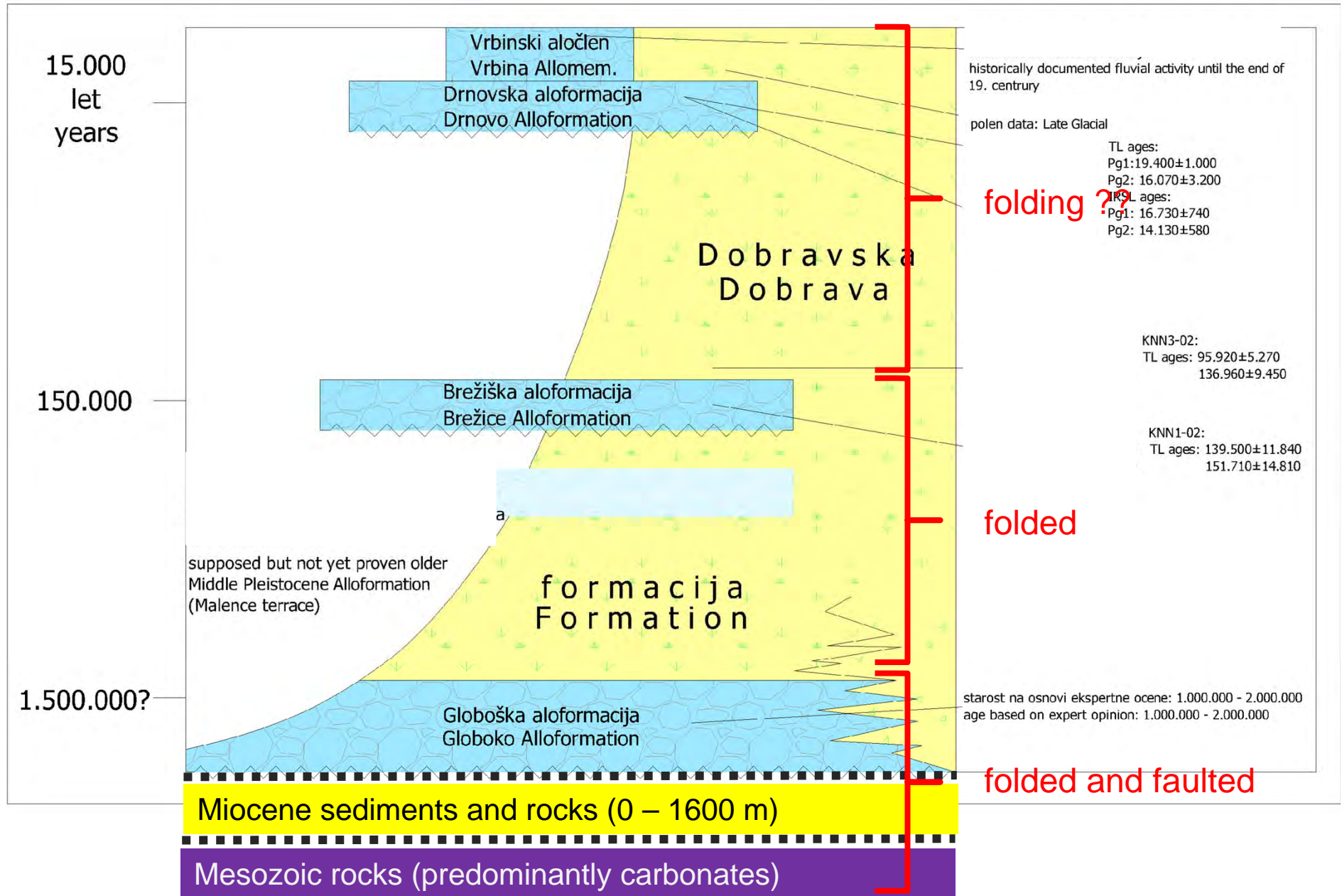
A brief overview

Krško Basin
Krško Syncline

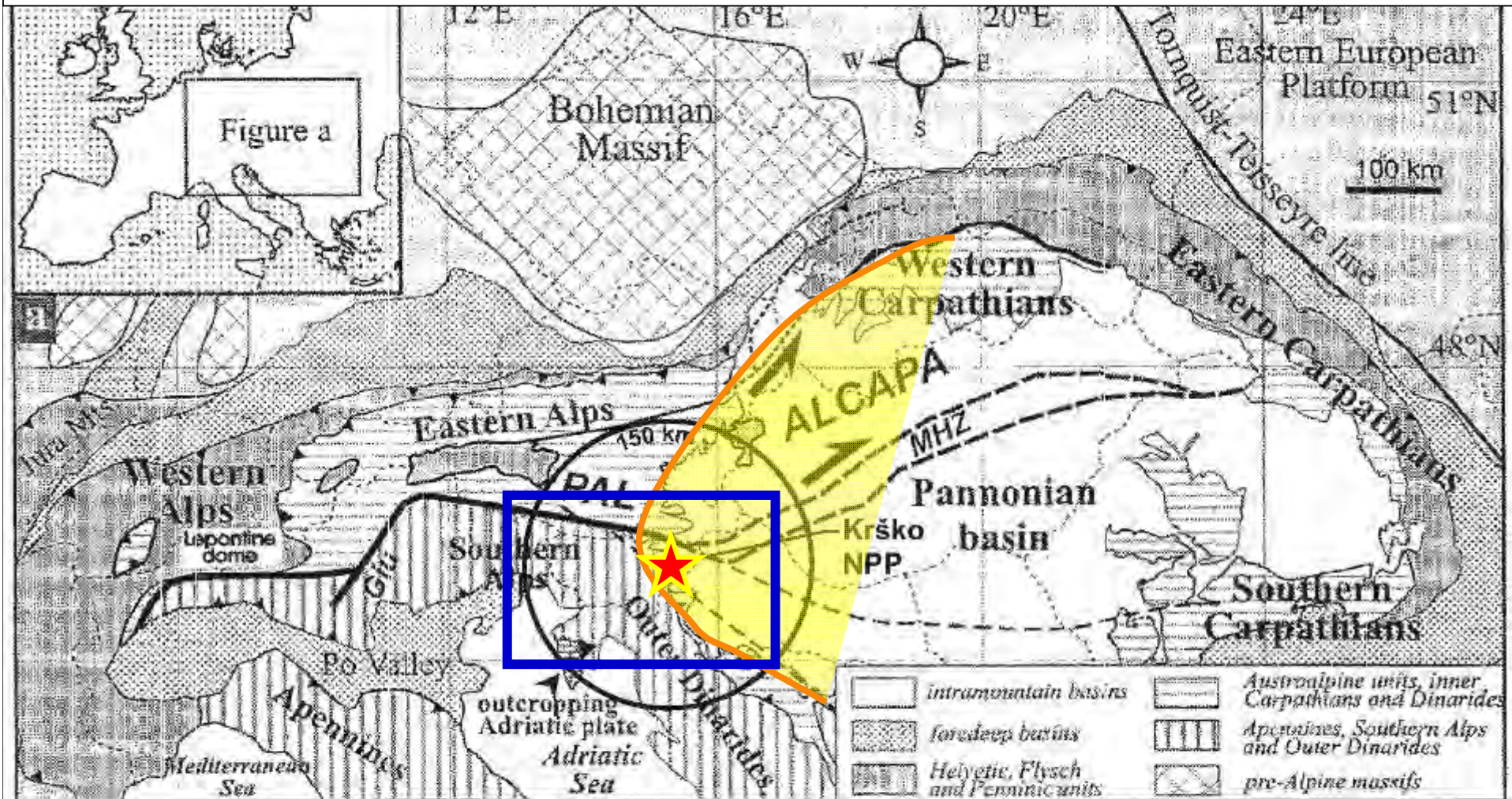




- general stratigraphy (and deformation pattern) -

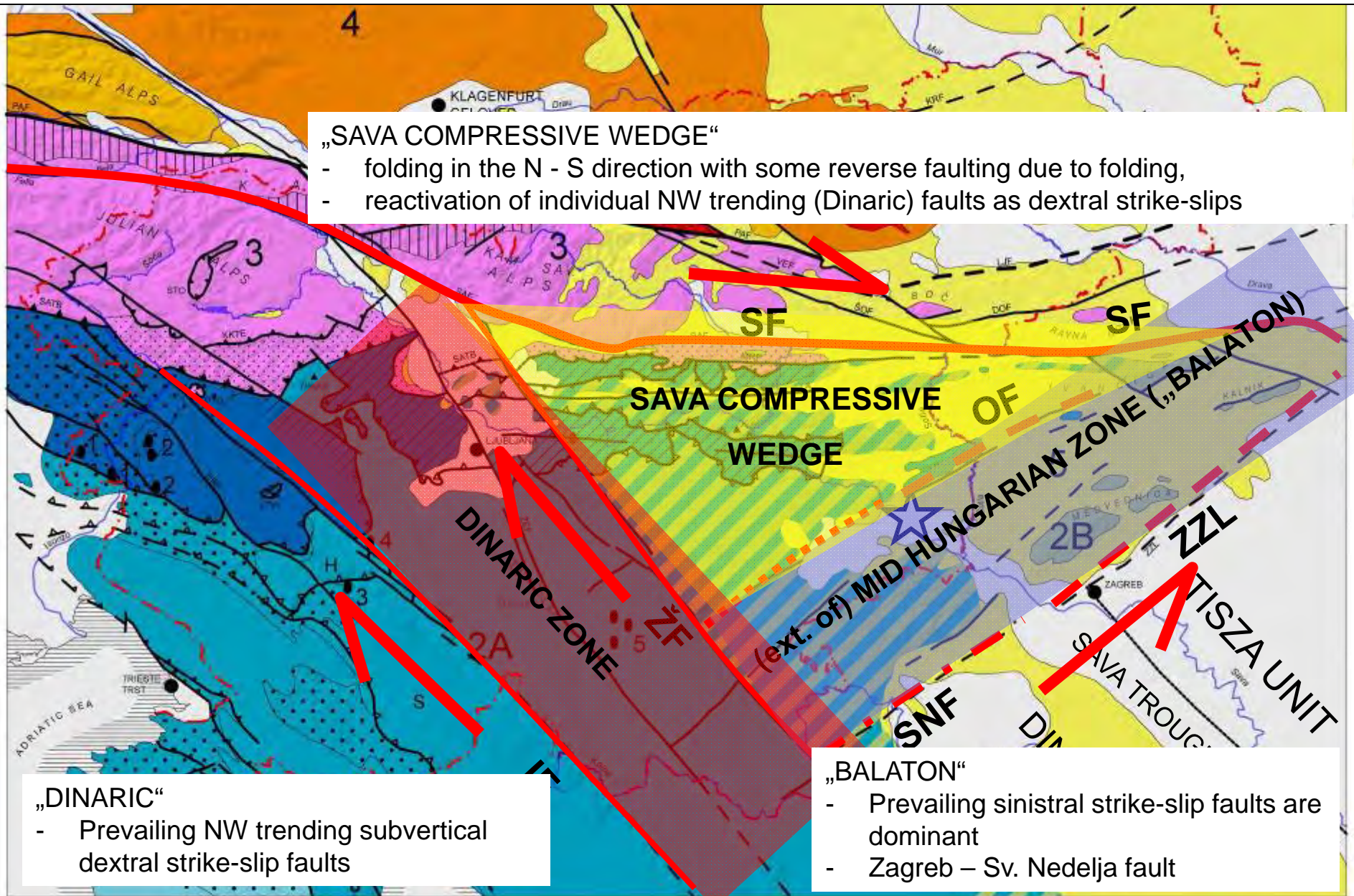


TECTONIC SETTING AT LARGE SCALE

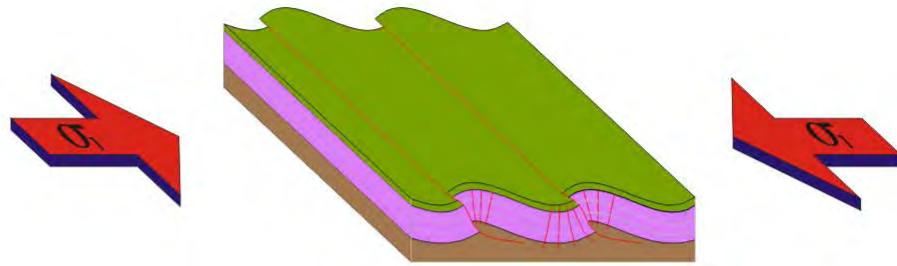


Note:
Position of the Periadriatic Line (PAL) and its continuation along the Middle Hungarian Zone (MHZ) and the extruded ALCAPA wedge within the Alpine-Carpathian Orogen (modified from Fodor, et al., 1998).

Regional tectonic model (e.g. Placer,2008) places the Krško basin into the SW extension of the Mid-Hungarian Zone



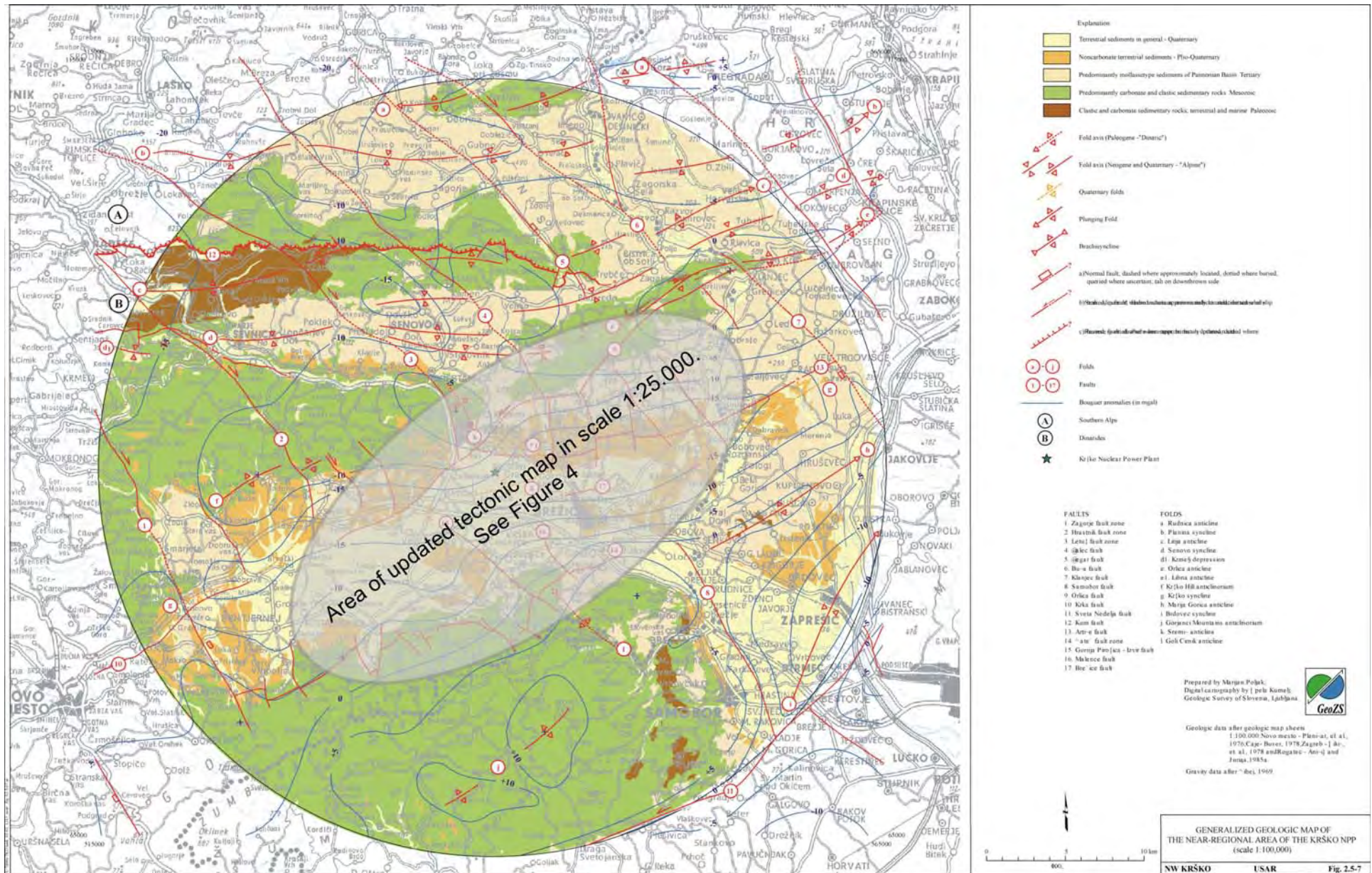
Genesis of the Sava folds (Krško syncline being one of them)



K-Pg folding and faulting

NEAR REGIONAL ASPECT

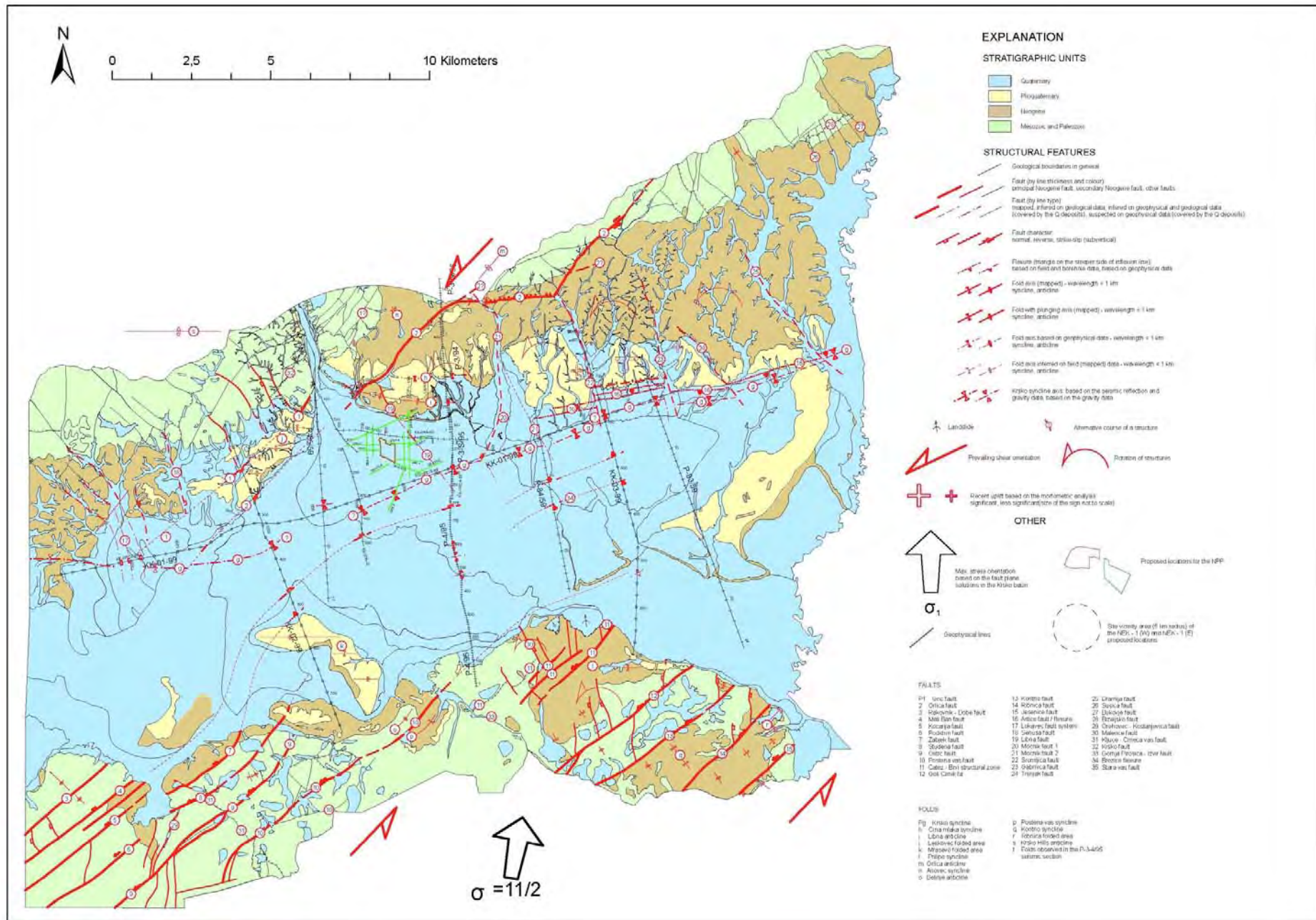
NEAR REGIONAL (r=25 km) GEOLOGY



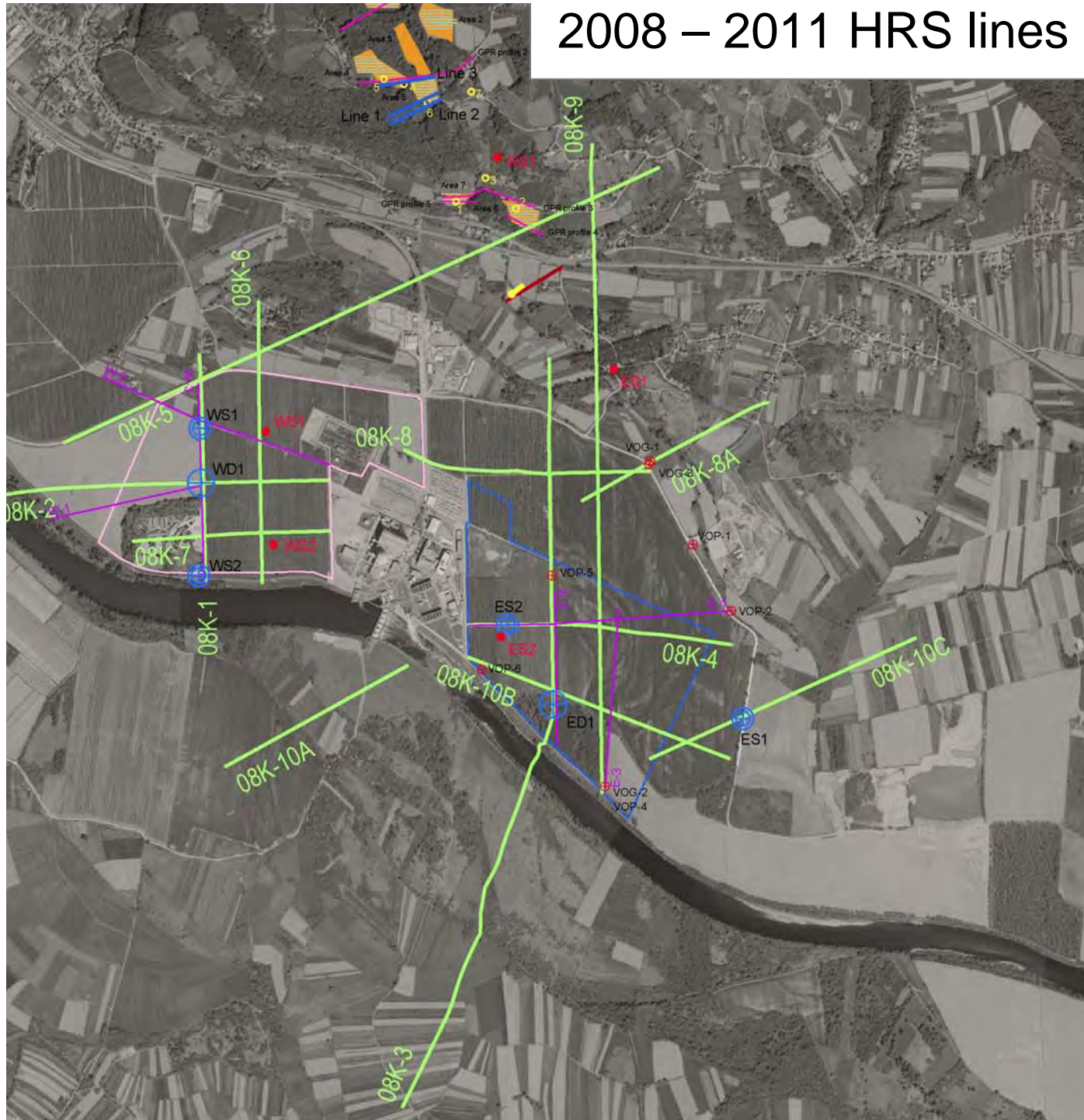
The updated 1 : 25.000 scale geologic map and the new tectonic model are a result of:

- Previous investigations (summarized in the 2003 PSHA study)
- Additionally mapped and remapped areas in the S and SE part of the Krško Basin
- Revised geophysical data (seismic sections)
- Morphometric study
- New HR seismic reflection lines (and other geophysics)

The updated 1 : 25.000 scale geologic map



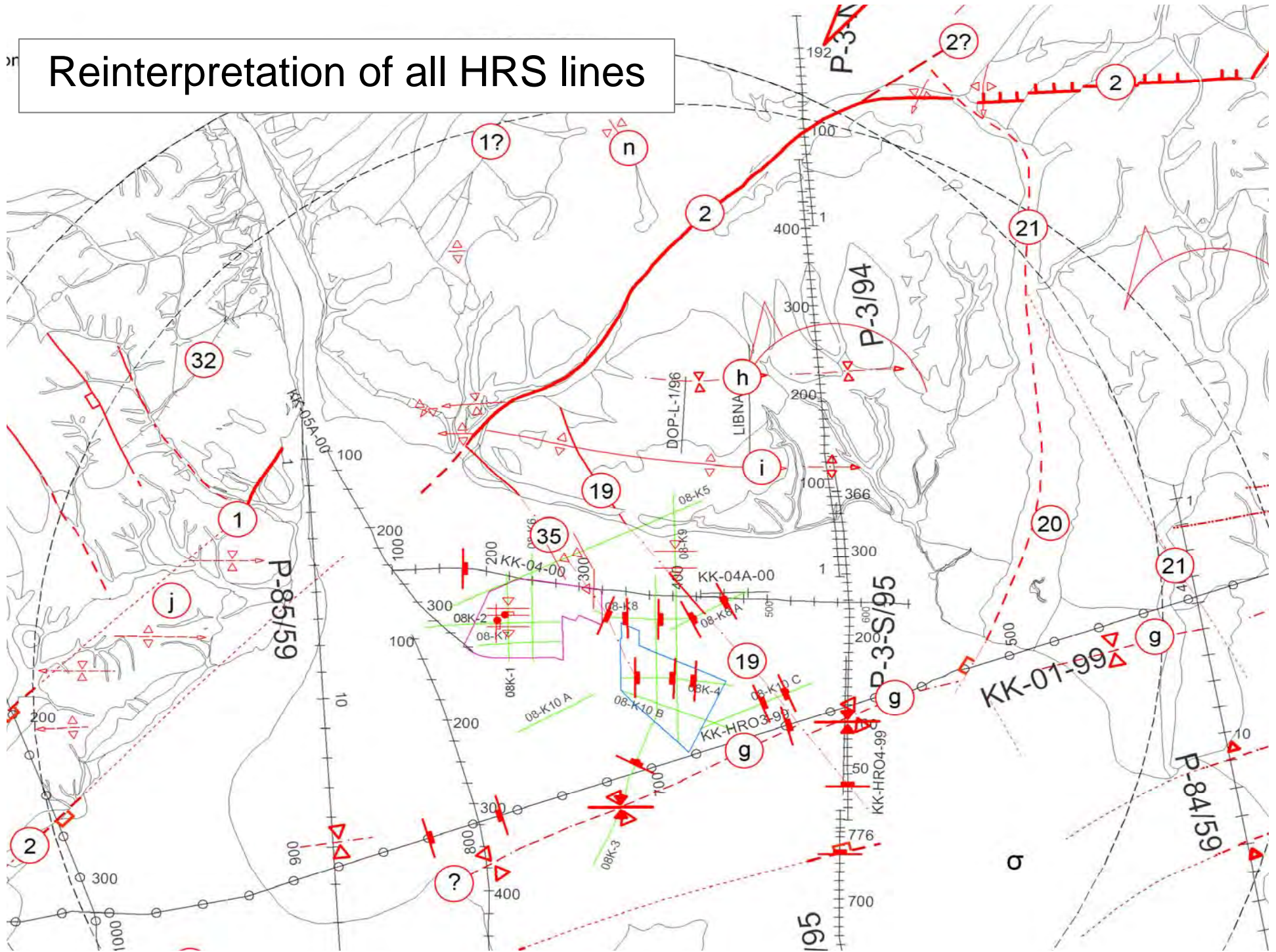
2008 – 2011 HRS lines



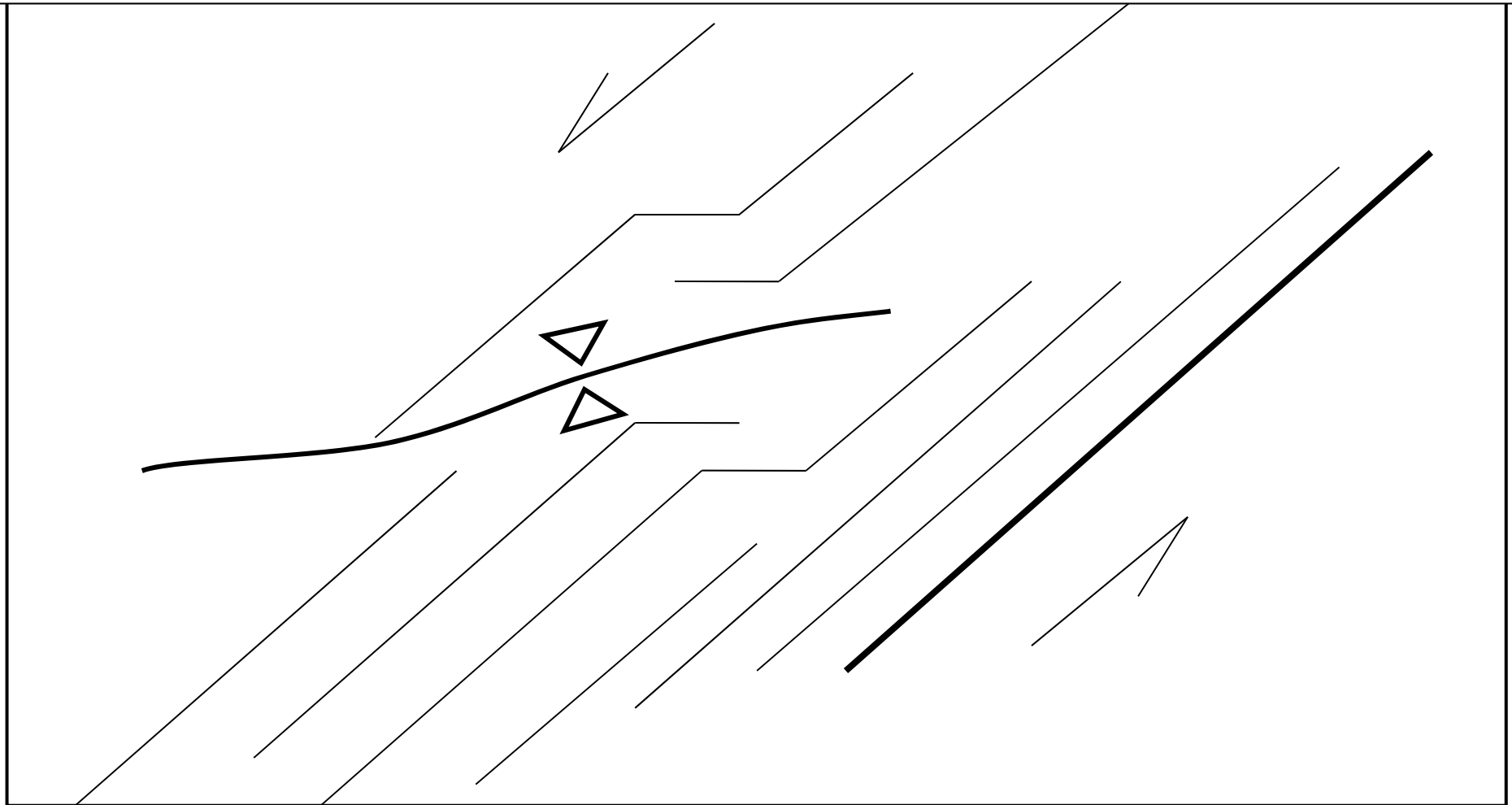
Key

- Temporary accelerographs
- ES2
- ⊙ Boreholes 2009
- Stari grad trench geophysical
- HRS sections
- 2D ERT sections
- GPR profiles
- GPR profiles
- ⊥ Trench at Stari grad
- ⊕ Test pits on Libna
- E site
- W site
- MASW profile
- Resistivity mapping
- ⊕ ARAO Boreholes
- VOG-2

Reinterpretation of all HRS lines

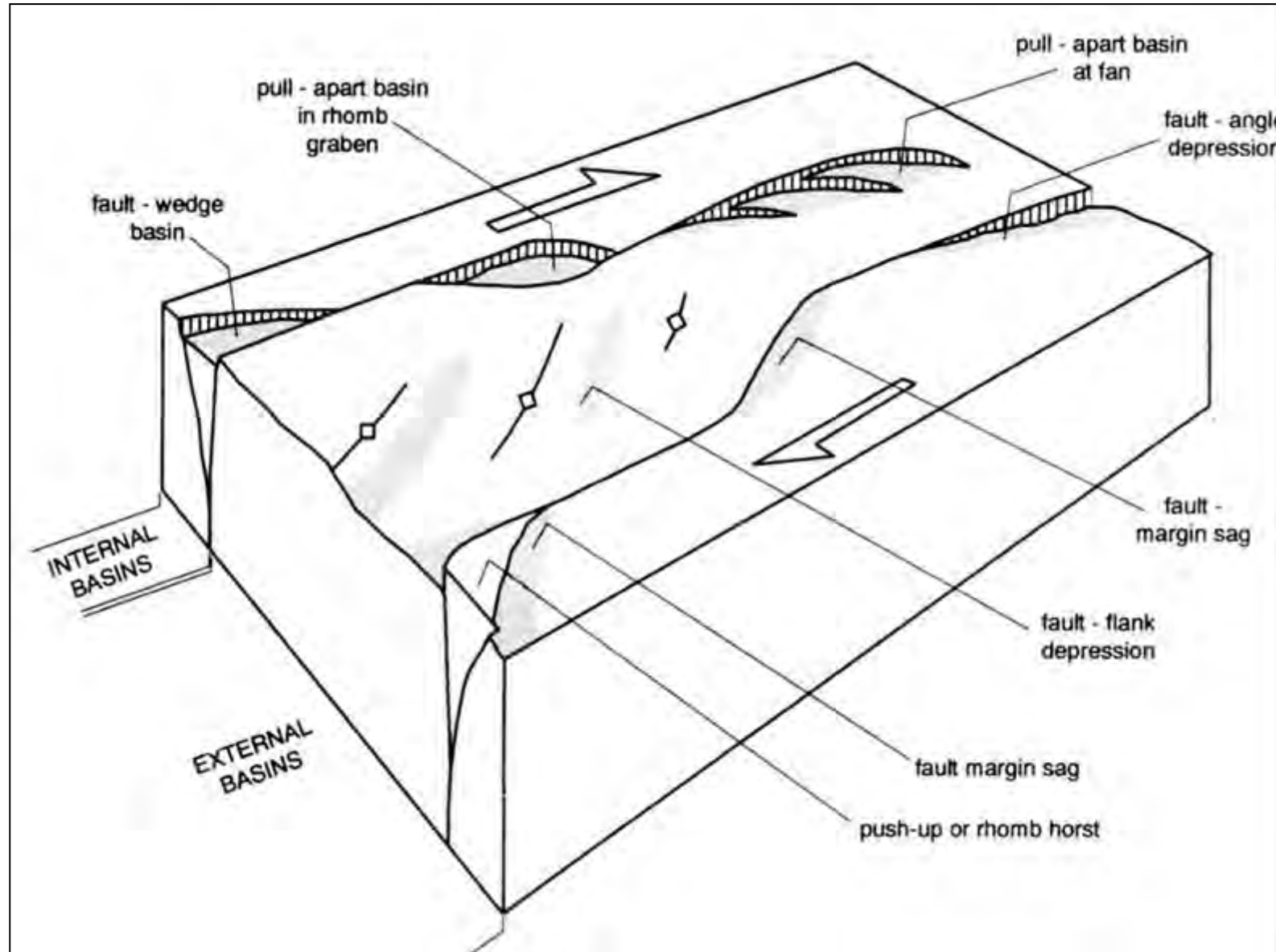


The principal element of the updated tectonic model is a system of the parallel NE trending sinistral strike-slip Balaton faults with occasional stepovers and the Krško syncline oblique to the main faults trend.

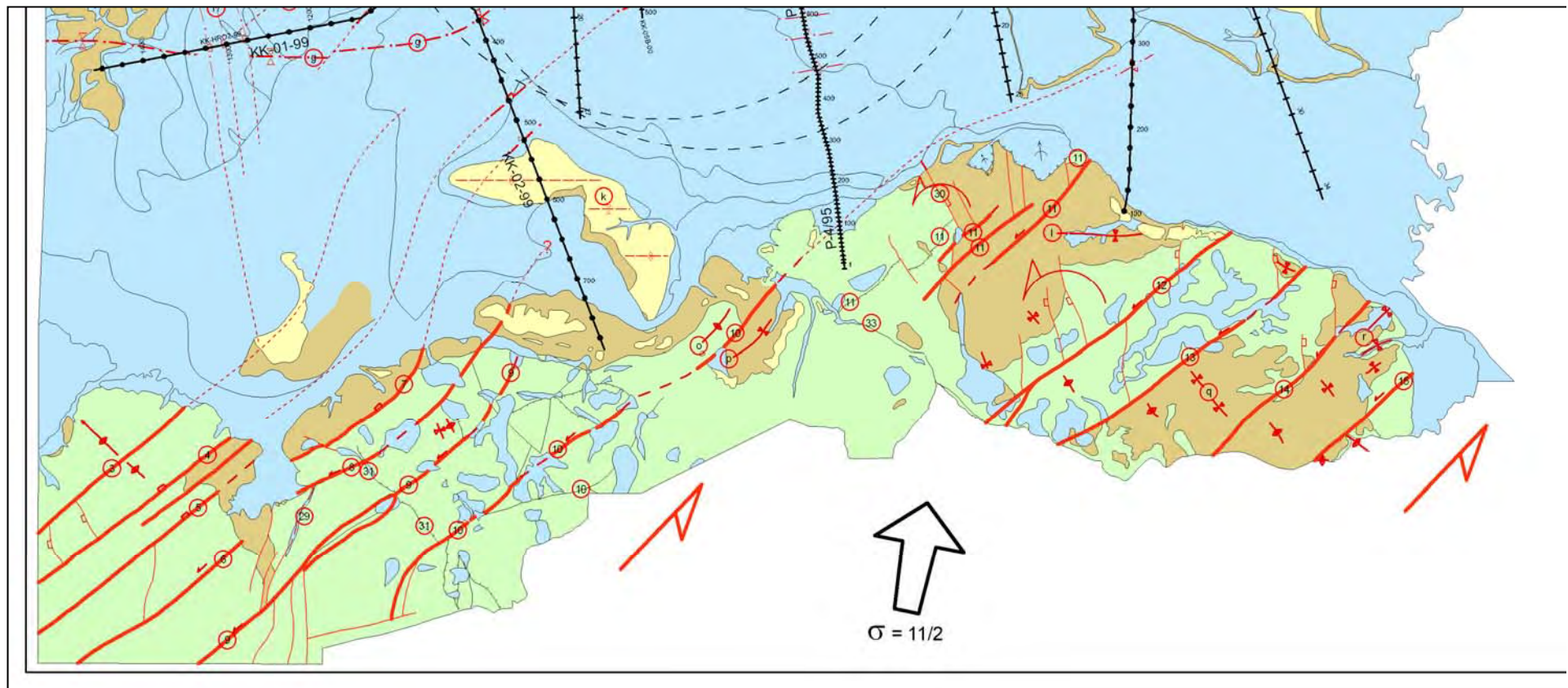


This kind of a synform is addressed as a **FAULT FLANK DEPRESSION** in Woodcock & Schubert (1994).

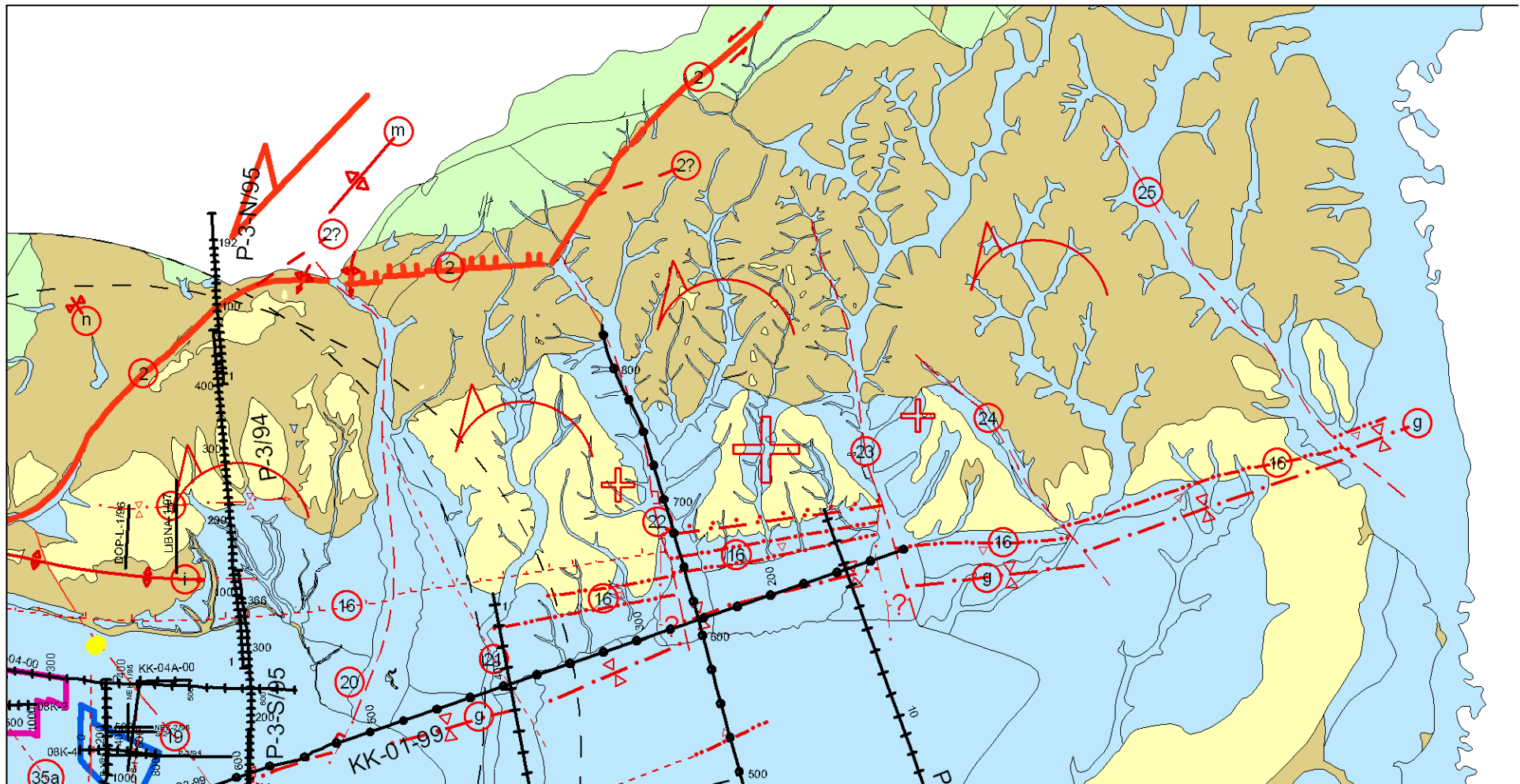
(The model is drawn for the dextral strike slip.)



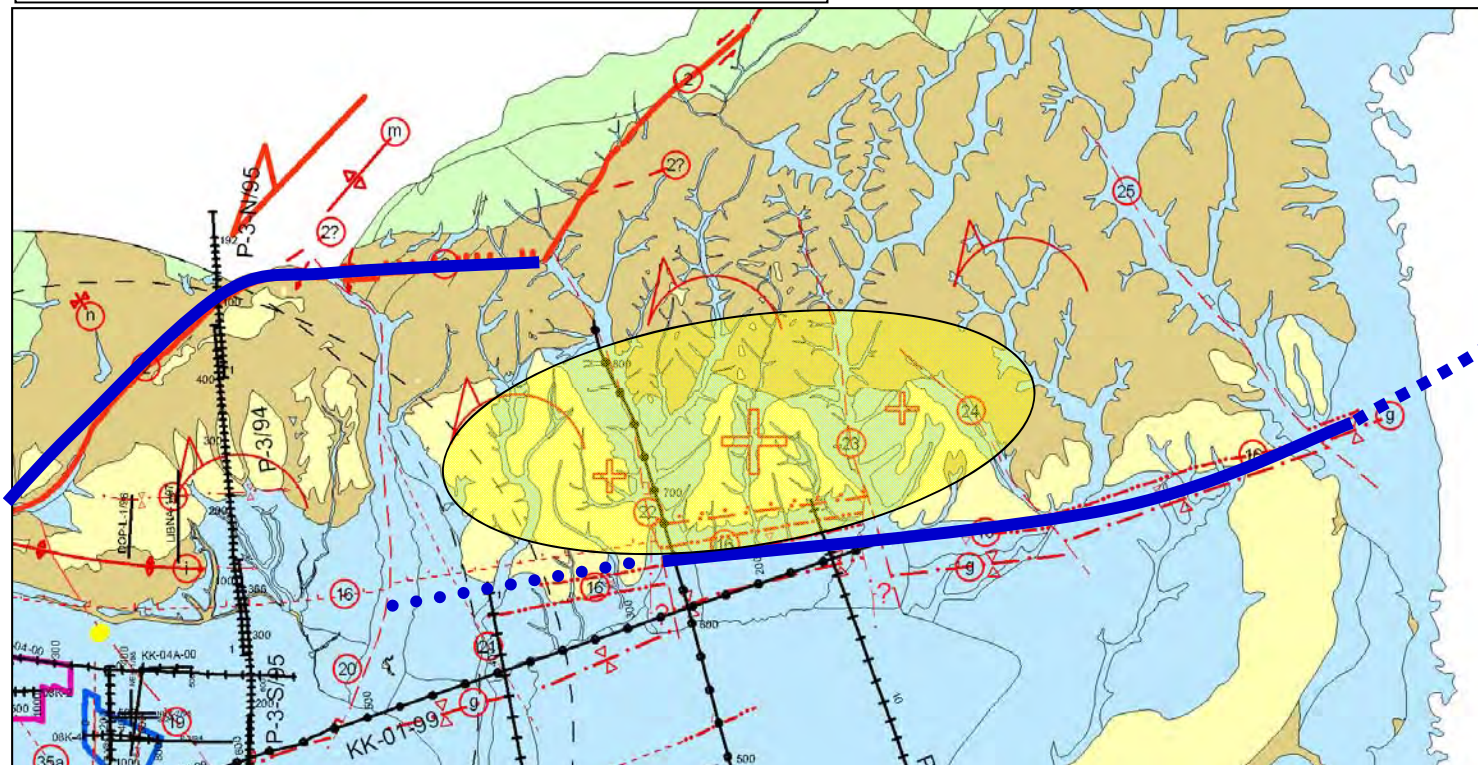
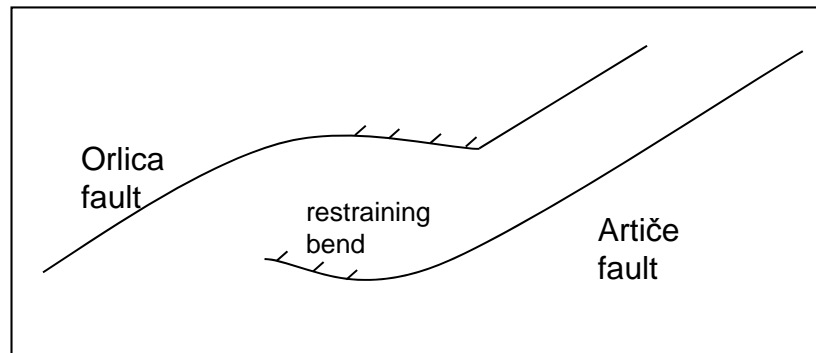
„Riedel type“ faults between the principal Balaton faults are frequent and their sigmoidal forms suggest sinistral strike slip character of the Balaton system (Mid-Hungarian Zone). CCW rotation of the structures between the Balaton faults is interpreted.



The same is interpreted for the faults S of the Orlica fault as well.
(including the Libna Fault)

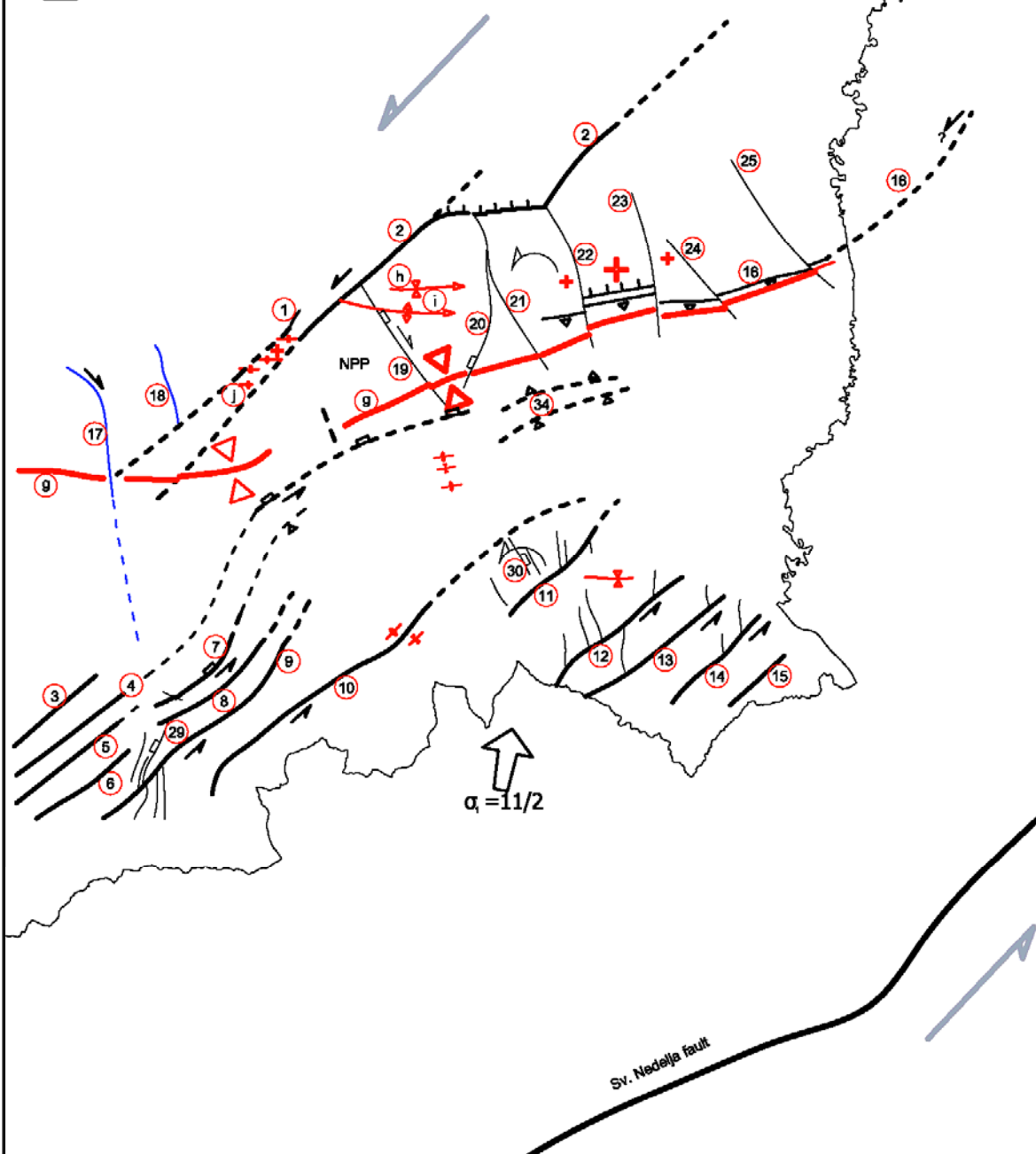


An ongoing (restricted though) uplift of the Globoko subbasin area (yellow ellipse) is explained by a restraining bend in the stepover area between the Artiče and the Orlica faults. Artiče structure is considered as a Balaton structure stepping over to the Orlica fault.



TECTONIC MODEL OF THE KRŠKO BASIN

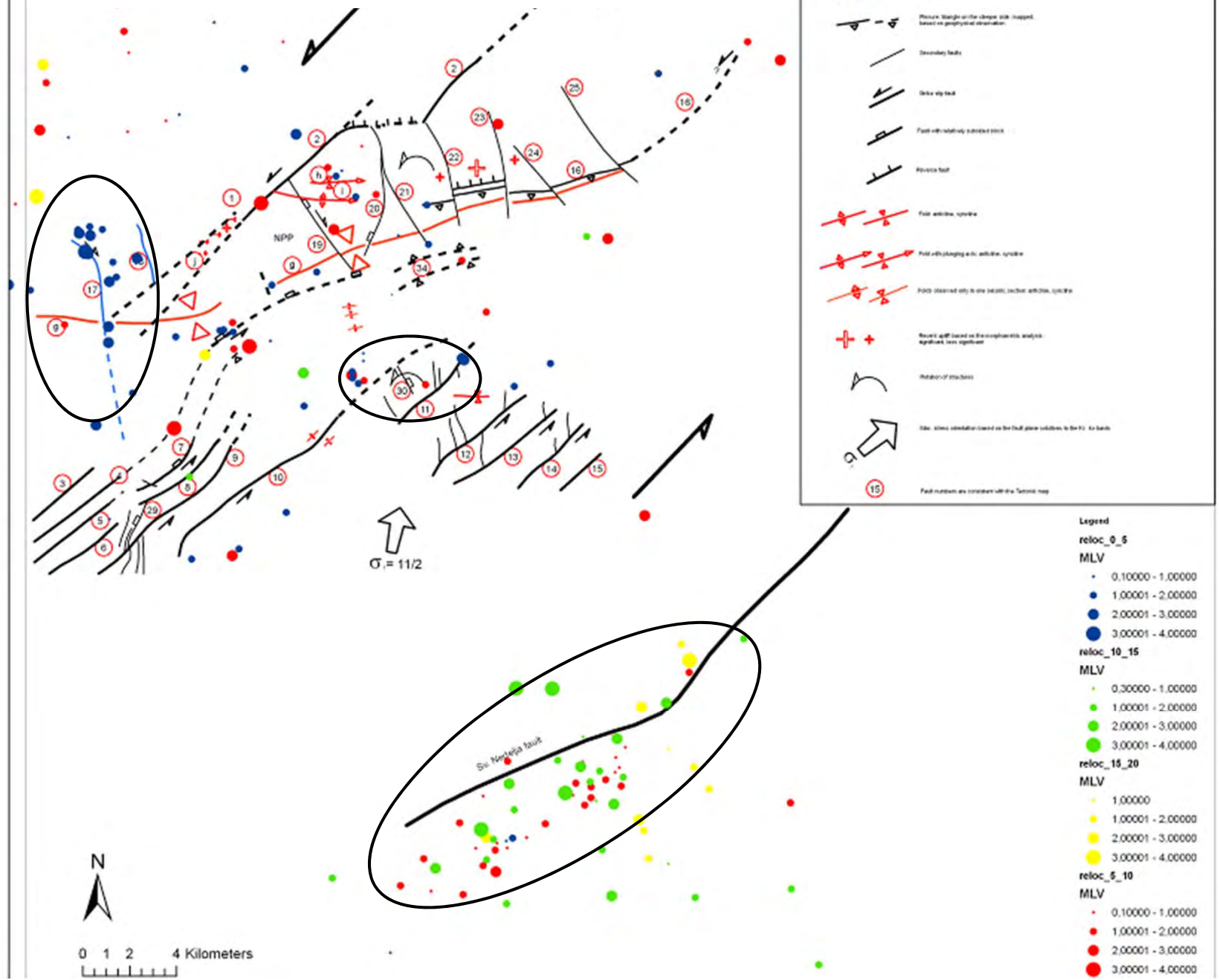
1 km



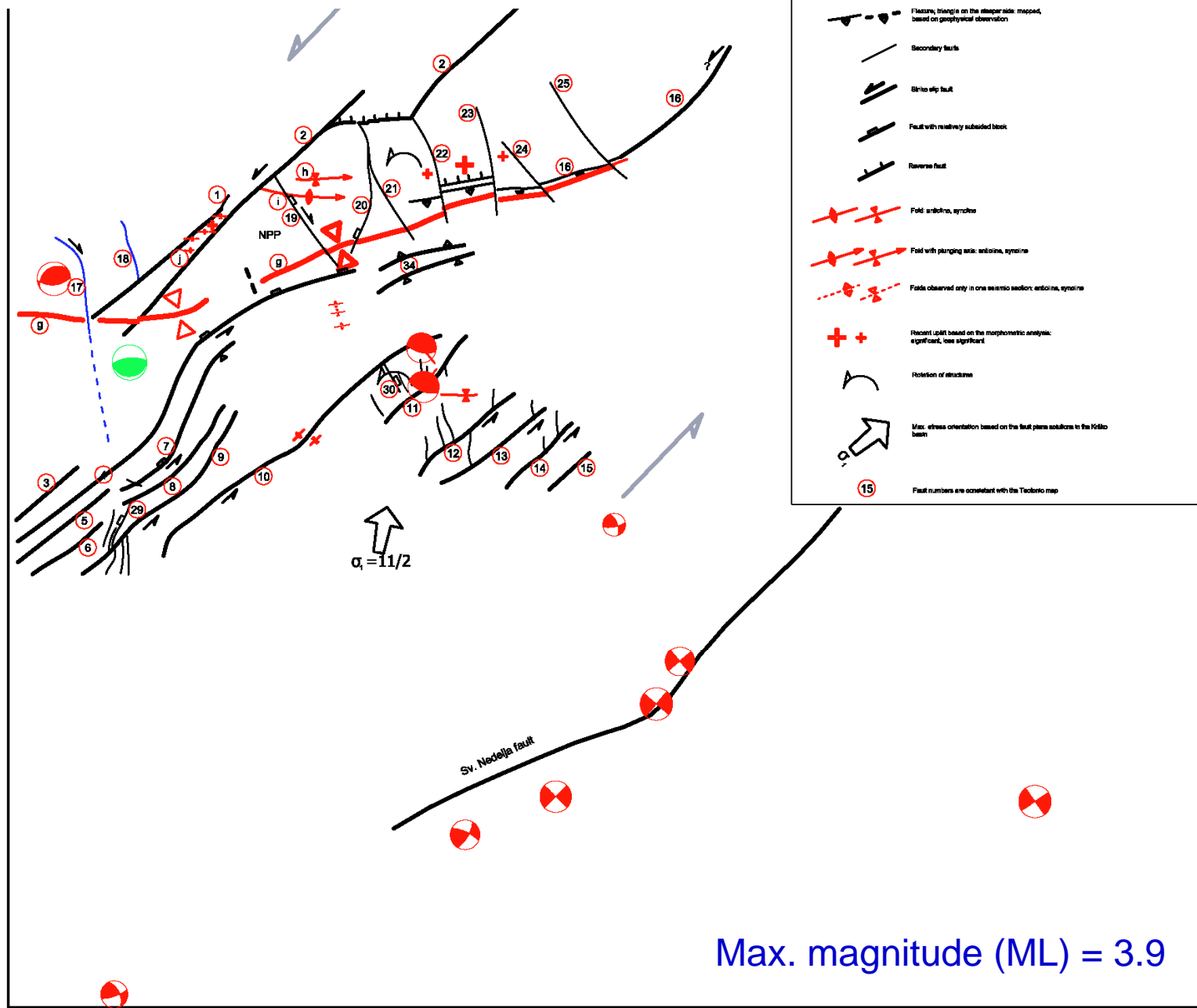
EXPLANATION

- Mapped Eilatov faults, Eilatov faults based on geophysical data and morphology, Dinaric faults, Dinaric faults based on geophysical observation
- Features, triangle on the steeper side: mapped, based on geophysical observation
- Secondary faults
- Strike slip fault
- Fault with relatively subducted block
- Reverse fault
- Fold: anticline, syncline
- Fold with plunging axis: anticline, syncline
- Folds observed only in one seismic section: anticline, syncline
- Recent uplift based on the morphometric analysis: significant, less significant
- Rotation of structures
- Max. stress orientation based on the fault plane solutions in the Krško basin
- Fault numbers are consistent with the Tectonic map

Overlay of the tectonic model and relocated EQ epicenters for 1977 - 2008



Overlay of the tectonic model and fault plane solutions



Outline of the seismotectonic model

- Krško Basin lies at the junction of tectonic zones
 - ⇒ Intersection of faults
 - ⇒ Segmentation of faults
- Balaton (SW-NE) trending right-lateral Zagreb – Sv. Nedelja are the principal faults
 - Deformation diminishes from Zg. – Sv. Nedelja F. toward Orlica
 - Right lateral with step-overs (i.e. Orlica and Artiče F.)

Outline of the seismotectonic model

- Second order faults to the principal faults (i.e. Libna fault)
 - Sinistral with normal component
 - Rotation
 - Are not treated as seismic sources because of geometry and for secondary character
- Focus to Libna because of its vicinity

Conclusion

- Key elements of the 2004 seismotectonic model (PSHA study) are better constrained
- Consequently, key elements of seismic sources are better constrained

