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Paleogeography and sequence stratigraphy of the Northern Vienna Basin

[1]HLAVATÝ, I., [1]ŠÁLY, B., [2]KOVÁČ, M. and [3]HUDÁČKOVÁ, N.

[1]Slovenský plynárenský priemysel, a. s. odštepný závod Výskum a vyhľadávanie nafty a plynu (OZ VVNP), Votrubova ul. 11/a, 825 05 Bratislava

[2] Comenius University, Faculty of natural Sciences, Depart. of Geol. and Paleontol., Mlynská dolina G, 98 42 15 Bratislava, Slovakia

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Paleogeography and sequence stratigraphy of the Vienna Basin, similarly as other Western Carpathian Neogene basins, was heavily overprinted by tectonics during the Carpathian orogen collision with the European platform and evolution of the Pannonian back arc basin.

Southward migration of the Early Miocene depocenters, followed by deepening in the northern part during the Middle Miocene is a common feature of basin paleogeography. These facts are in good agreement with tectonics controlling basin evolution:

a) the Eggenburgian–Ottnangian transpressional tectonics led to piggy-back basin development on the top of the thrusted nappes of the Flysch zone belonging to the Western Carpathian accretionary wedge, as well as development of the wrench fault furrow type basins in front of the paleoalpine consolidated part of the orogen,

b) during the Karpatian and the Early Badenian transtensional tectonics controlled formation of the pull-apart basin depocenters,

c) whole crustal extension led to graben and horst structue evolution in the Middle – Late Miocene.

Sedimentary gap (hiatus) and erosion at the Early / Middle and Middle / Upper Miocene boundary can be recognized not only on the basin margins but often also in the basin fill. As good correlation levels in the Vienna Basin, similarly as in all Western Carpathian basins can be used:

- Eggenburgian transgression (NN 2) ..... ca 20.5 My
- Karpatian transgression (NN4, *Uvigerina graciliformis*) ..... ca 17.5 My
- Early Badenian transgression (NN5, *Orbilina suturalis*) ..... ca 15.1 My
- Late Badenian transgression (NN6, *Velapertina* sp.) ..... ca 13.8 My
- Early Sarmatian transgression ..... ca 13.0 My
- Early Pannonian transgression ..... ca 11.0 My

The Vienna Basin depositional pattern shows at least ten 3rd order sequence stratigraphy cycles (different in the individual depocenters). The global sea level changes are accelerated or overprinted by regional tectonics and sedi-

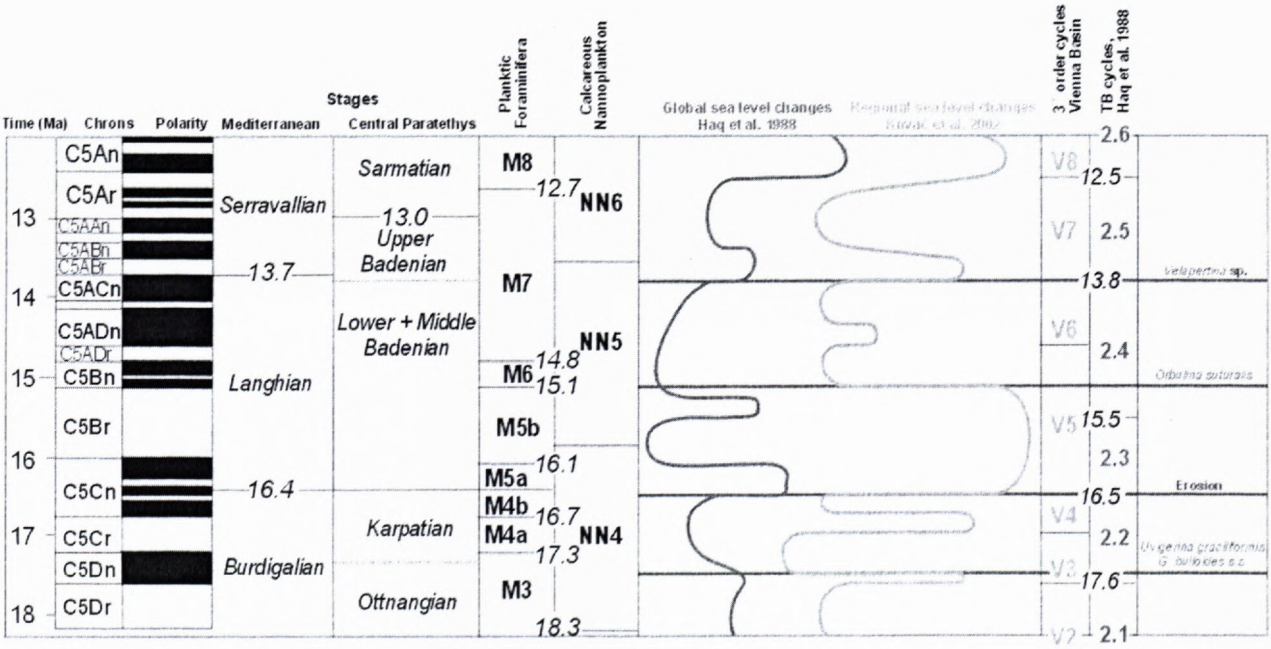

Fig.1. Sea level changes and correlation levels in the Northern Vienna Basin

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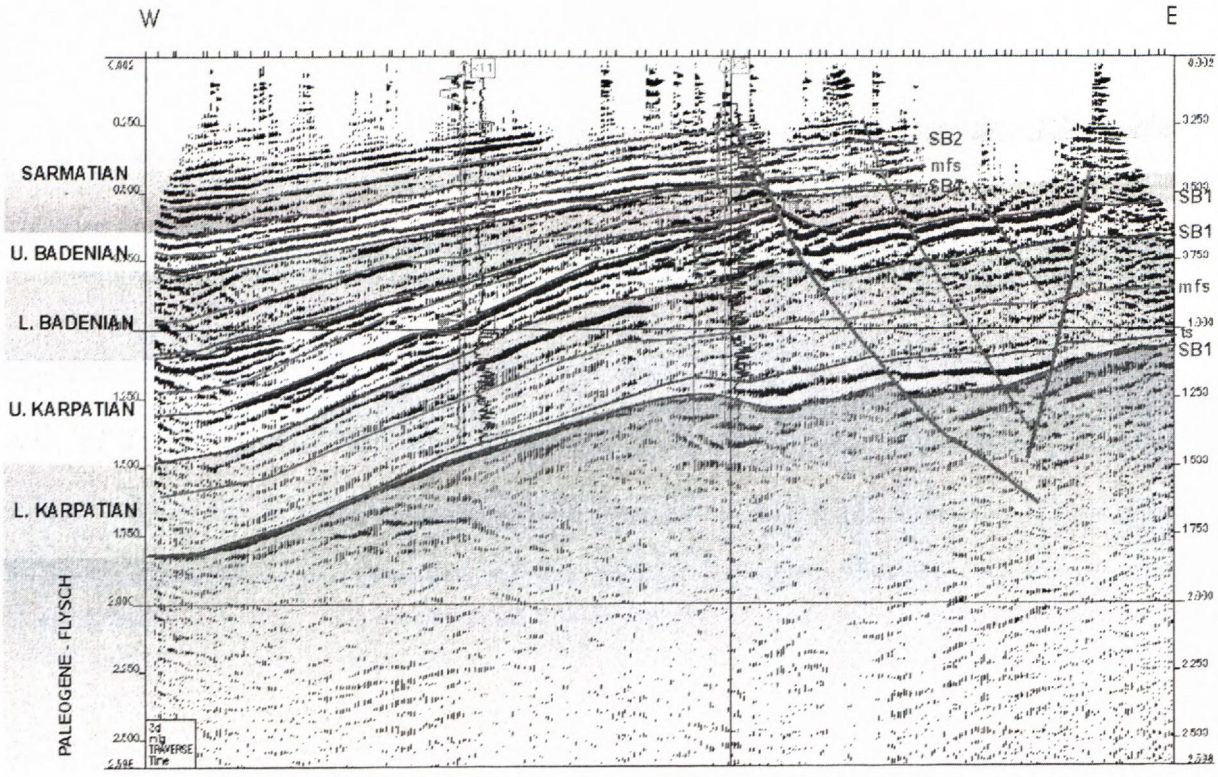

Fig.2 Seismic section from the northeastern part of the Vienna Basin with sequence stratigraphic interpretation

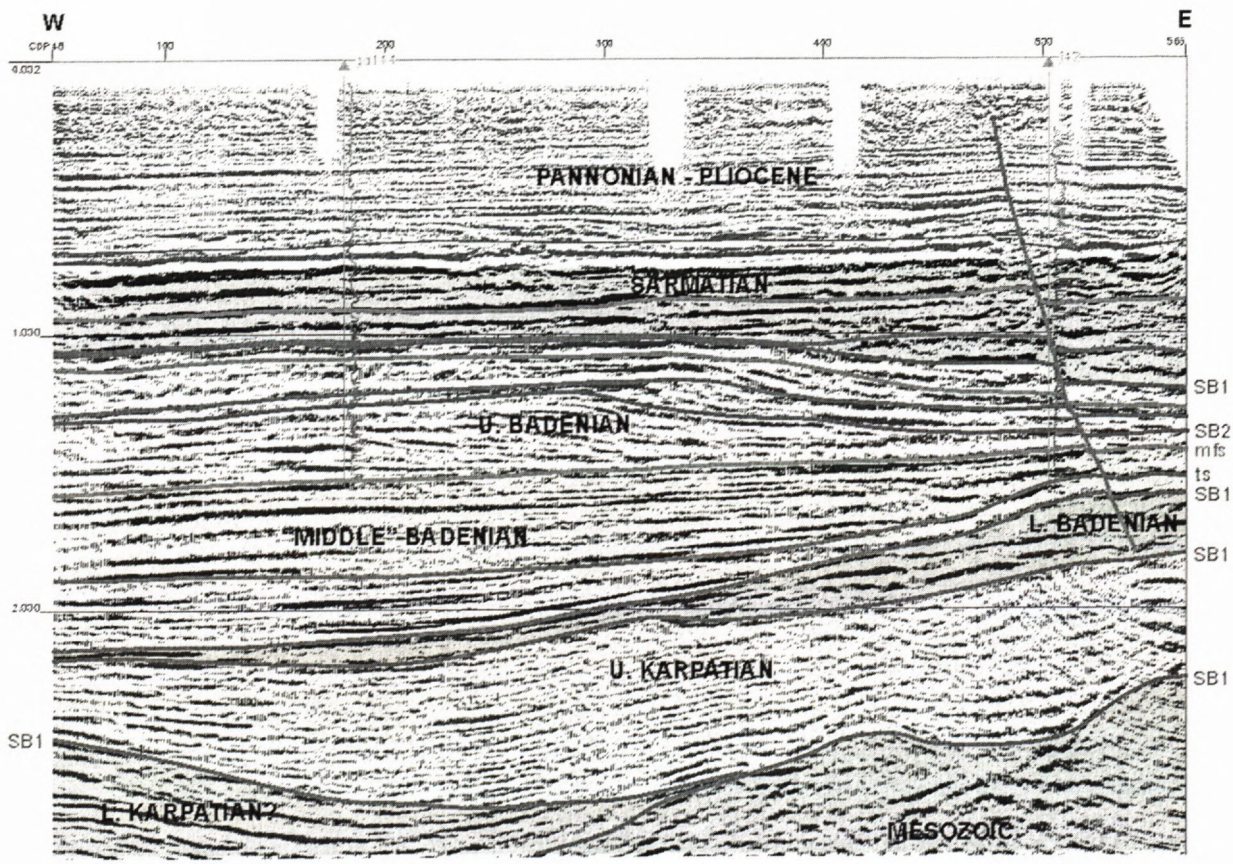

Fig. 3 Seismic section from the central part of the Vienna Basin with sequence stratigraphic interpretation

ment input (Fig. 1). The Miocene basin fill sequence stratigraphy 3rd order cycles were observed by geophysical and geological methods (seismic lines, logs, borehole cores, micropaleontology – paleoecology) in stratigraphical position: the Eggenburgian, Ottnangian, Early Karpatian, Late Karpatian, Early Badenian, „Middle Badenian", Late Badenian – Sarmatian, Sarmatian and in the Pannonian.

Many seismic sections and borehole data (logs & cores) were analyzed to create sequence stratigraphic model of the Neogene sedimentary fill of the Vienna Basin. The erosional boundaries, truncations on seismic profiles, and also angular unconformities documenting depocenters movement can be observed as a result of tectonic activity (Fig. 2). There are good examples of prograding clinoform bodies in the upper Badenian highstand systems tract (HST) sediments, parallel reflections of transgressive systems tract (TST) sediments with onlaps as well as downlap surface marking the maximum flooding surface (mfs) shown on Fig. 3.

Borehole data (logs & cores) were used for detailed analysis of lithology, sedimentology and paleoecology. There were identified general fining upward transgressive trends on log curves with mfs on the top, coarsening upward trends in prograding HST and LST sedimentary bodies and isolated blocky patterns documenting erosive channel fill.