

3D VISUALIZATION OF THE SEDIMENTARY INFILL AND POLYPHASE SUBSIDENCE EVOLUTION IN THE NORTHERN AND CENTRAL PARTS OF THE VIENNA BASIN (MIOCENE)

LEE, Eun Young*; WAGREICH, Michael

Department of Geodynamics and Sedimentology, University of Vienna, Austria

eun.lee@univie.ac.at

Vienna Basin, sedimentary infill, subsidence, visualization, Miocene

This study calculates and visualizes well data acquired from the northern and central Vienna Basin for the sedimentary infill and subsidence evolution, using BasinVis 1.0. The thickness evolution of seven selected horizons are visualized using sediment distribution maps, isopach maps, and cross-sections. The subsidence analysis from wells reaching the pre-Neogene basement results in subsidence depth and rate maps of basement and tectonic subsidence of the study area. Due to the position, the Vienna Basin has a complex and polyphase evolution history from the piggy-back basin phase (Early Miocene) to the pull-apart basin phase (Middle – Late Miocene). The models visualized in this study provide detailed insights into the evolution of the Vienna Basin, which is closely related to changes in the regional stress regime and the paleoenvironmental setting. In the piggy-back basin phase, sedimentation and subsidence are minor, E-W to NE-SW trending parallel to the strike of the orogen, and restricted to small depressions in front of the Alpine thrust. In the late Early Miocene, the Vienna Basin changes to a pull-apart basin system characterized by wider sedimentation areas and fast subsidence along sinistral strike-slip faults and related listric normal faults. The depressions of the Early Miocene are filled mainly with sediments supplied through small deltaic systems entering from the Alps area. After minor sedimentation and slow subsidence during the early Middle Miocene, the development of the Vienna Basin is controlled and accelerated by NE-SW trending synsedimentary normal faults, especially the Steinberg fault, until the Late Miocene. The Vienna Basin from the late Middle to Late Miocene is characterized by E-W extensional rift-type and slowing down subsidence, which corresponds to the E-W trending extension of adjacent basins and the western parts of the Pannonian Basin system. During this time, enormous amount of sediments are supplied from the Alpine Molasse Basin area by a broad paleo-Danube delta complex.