



Balancing cross-sections combining field work and remote sensing data using LithoTect software in the Zagros fold-and-thrust belt, N Iraq.

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The Zagros fold-and-thrust belt has formed in detached Phanerozoic sedimentary cover rocks above a shortened crystalline Precambrian basement and evolved through the Late Cretaceous to Miocene collision between the Arabian and Eurasian plate, during which the Neotethys oceanic basin was closed. Deformation is partitioned in SW directed folding and thrusting of the sediments and NW-SE to N-S trending dextral strike slip faults. The sub-cylindrical doubly-plunging fold trains with wavelengths of 5 – 10 km host more than half of the world's hydrocarbon reserves in mostly anticlinal traps. Generally the Zagros is divided into three NW-SE striking tectonic units: the Zagros Imbricate Zone, the Zagros Simply Folded Belt and the Zagros Foredeep.

This work presents a balanced cross-section through the Simply Folded Belt, NE of the city of Erbil (Kurdistan, Iraq). The regional stratigraphy comprises mainly Cretaceous to Cenozoic folded sediments consisting of massive, carbonate rocks (limestones, dolomites), reacting as competent layers during folding compared to the incompetent behavior of interlayered siltstones, claystones and marls. Although the overall security situation in Kurdistan is much better than in the rest of Iraq, structural field mapping was restricted to asphalt streets, mainly because of the contamination of the area with landmines and unexploded ordnance. In order to extend the structural measurements statistically over the investigated area, we used a newly developed software tool (www.terramath.com) for interactive structural mapping of spatial orientations (i.e. dip direction and dip angles) of the sedimentary beddings from digital elevation models. Structural field data and computed measurements were integrated and projected in NE-SW striking balanced cross-sections perpendicular to the regional trend of the fold axes. We used the software LithoTect (www.geologicssystem.com) for the restoration of the cross-sections. Depending on the interpretation of the shape of the synclines, which are not exposed and covered by Neogene sediments, the shortening is in the order of 10-20%. The restoration confirms that large scale faulting is only of minor importance in the Simply Folded Belt.