



## **Oblique opening of Skyros Basin in the North Aegean Sea, based on Morphotectonic Analysis**

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Oblique opening of Skyros Basin in the North Aegean Sea, based on Morphotectonic Analysis Papanikolaou D.1, Nomikou P.1, Livanos I.1, Papantoniou G.1, Rousakis G.2, Lampridou D.1 1University of Athens, Department of Geology and Geoenvironment, Panepistimioupoli Zografou, 15784 Athens, Greece. dpapan@geol.uoa.gr 2 Inst. of Oceanography, Hellenic Centre for Marine Research, Anavyssos, Greece. Detailed analysis of swath bathymetry and seismic reflection profiling has revealed the morphotectonic structure of the Skyros Basin in North Aegean Sea (Greece). The overall geometry of the basin is shaped by a major slope discontinuity, separating the continental platform from the continental slope at depths between 200-400m. The basin forms an equilateral triangle. Its base is 50km long NW-SE trending at the southwest, parallel to the Skyros Island, whereas its pic is located at the northeast, north of Lesvos Island. The basin comprises 9 sub-basins at depths varying from 1200m at the southwest to 600m to the northeast and is structurally divided into three parts: i) the eastern part forms a longitudinal semi-graben with one sub-basin trending ENE-WSW of 45km length, but only 5-8 Km width at depths varying between 600-700m. This sub-basin is bounded to the south by a marginal fault of >1.5km throw but with unknown horizontal displacement. ii) the central part that forms the predominant part of the triangle with 45 Km long NW-SE trending base and 70km long axis at the NE-SW direction. The central part corresponds to an asymmetric graben with a 70km long major marginal fault with >1500m throw along its southern slopes and a 70 km long antithetic fault with >400m throw along its northern slopes. It comprises 5 sub-basins with depths ranging between 950-700m, bounded by important E-W trending strike slip fault zones, characterized by flower structures, with minor vertical components ranging from a few meters up to 200m. iii) the western part of the basin trends NW-SE, is 55 Km long and 25 Km wide, revealing a NW-SE tectonic graben. It comprises two sub-basins, oriented NW-SE separated by an intermediate transverse fault zone. The throw of the western marginal faults offshore Skyros Island exceeds 1200m, whereas the throw of the parallel faults creating the NW-SE tectonic graben is limited to a few hundreds meters. It should be emphasized that the Alpine basement was not detected in the lithoseismic profiles of the western and central parts of the basin, where the postAlpine sedimentary sequences exceed 700m of thickness, contrary to the eastern part, where the maximum thickness was determined at 600m. Seismotectonic and GPS data can be correlated to the morphotectonic analysis of the basin indicating an overall oblique extension towards the SW at a rate of 10-15mm/yr.