Archaeological methodology and deep water archaeological surveys: challenges and perspectives

Dellaporta K.P.[1] and Sakellariou D.[2]

[1]*Ministry for Culture, Klepsydras 2, Athens 105 55, katerinadellaporta@yahoo.com.*
[2] *Hellenic Centre for Marine Research, 19013 Anavyssos, Greece, sakell@ath.hcmr.gr*

We present an overview of the well developed and commonly followed standard methodologies in underwater archaeological research along with recent technological progress in deep water surveys. Our aim is to identify challenges posed by the state of the art marine engineering achievements and to explore perspectives towards an interdisciplinary methodology and concept for the benefit of underwater archaeological research and in the frame of the archaeological deontology.

Remote sensing marine geological-geophysical techniques enable quite high resolution mapping of the seafloor at almost any depth. Underwater vehicles, manned or unmanned, autonomous or remotely operated, equipped with highly sophisticated scientific devices extend the limits of underwater archaeology to include almost full ocean depths.

Mutual understanding and close collaboration between archaeologists, marine scientists and engineers is a prerequisite for the best use of technology and experiences for the benefit of deep water archaeology.

Morphotectonic analysis along the neotectonic faults of Geras Gulf of Lesvos Island (NE Aegean, Greece)

Delogkos E.[1], Valkaniotis S.[1], Zouros N.[2] and Pavlides S.[1]

[1]*Department of Geology, Aristotle University of Thessaloniki, 54124, Thessaloniki, Greece, edelogko@geo.auth.gr, svalkan@geo.auth.gr, pavlides@geo.auth.gr*
[2]*Department of Geography, Aegean University, 81100, Mytilene, Lesvos, Greece, nzour@aegean.gr*

The tectonic structure of Lesvos is characterized mainly by an extensional regime acting from Neogene to recent while it is also under the influence of the westward migration of the southern branches of the North Anatolian Fault and the North Aegean Trench (NAT). Some of the main active faults of Lesvos Island are extended along the Geras gulf, which form an area of particular importance due to its proximity to the town of Mytilene. At a primal study of faults, a rift zone was found by neotectonic mapping, with deep-slip to oblique-slip normal faults of general direction NW - SE and W – E, respectively. Afterwards, based on rural measurements, the stress pattern of the area was studied as the main directions of the strain-stress field trends (σ_1, σ_2, σ_3) were calculated. In some specific sites of fault surfaces overlapping generations of slickenside striae were observed, meaning that more than one field tectonic trends acted in the same position in different time periods. The results include two main distinct tectonic phases; the oldest one with extensional axis directed NE-SW and the newest trending NNW - SSE. The tectonic analysis and the interpretation of digital relief model (DEM), as well as the use of satellite imagery of the study area, have contributed significantly to the quantitative and qualitative analysis of morphotectonic characteristics of the faults. On the basis of the digital relief model, morphological sections were constructed perpendicular to the faults in order to extract information on the morphology of the slope. Moreover, profiles of morphological slope gradients were constructed along faults, based on the slip map of the digital relief model, with mean gradient ranging from 14° to 16° for most of the faults. These values seem to be related to the lithology of the rising block and the uplift rate. Shaded relief maps and three-dimensional imaging helped identifying faults. The determination of the effect of the tectonic geomorphological phenomena can be defined and quantified with morphotectonics indicators. In the present study five (5) morphotectonics indicators were applied: Stream Length – Gradient Index (SL), Drainage Basin Asymmetry Factor (AF), Hypsometric Integral (HI), Ratio of Valley – Floor Width to Valley Height (Vf), Mountain – front Sinuosity (S). The calculation of morphotectonic indicators in the regional faults confirmed the activity, and the recent action,