

Reconstructing Submerged and Buried Cultural Heritage from Shallow Water to Digital Environment with Geoinformatics

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Abstract. Time, space and human intervention, are responsible for the conservation of archaeological remains and cultural heritage (CH) in general. The present and future survival of cultural remains is often compromised/threatened, particularly when the “space” in which these artifacts are today is hostile, rendering the documentation process a complex and expensive task.

The accessibility to information regarding the current-state of now-submerged sites by minimizing the gap of available protocols and procedures for shallow-water CH investigations is nowadays quite important, considering the projected sea level rise due to climatic and geological factors. Thus it is very important to develop ways to explore and promote these under-studied submerged contexts improving at the same time the community awareness and involvement in protection practices.

Under this framework the project “Clepsydra: Translating Submerged and Buried Cultural Heritage from Shallow Water to Digital environment with Geoinformatics” funded by the Hellenic Foundation for Research and Innovation will integrate the archaeological research with state-of-the-art methodologies and innovative technological aspects for the documentation and promotion of CH adapting equipment and practices to the shallow underwater context.

The contribution to the documentation of current state of CH in different sites in eastern Mediterranean focusing mainly in Greece will pass through: a) aerial/satellite remote sensing –specifically targeted to historical reconstruction of coastal zone and seabed–, b) digital photogrammetry –with customization of remotely controlled floating device and specific protocols to account for the camera/lens distortion in water medium–, c) geophysical mapping (electrical resistivity tomography and multisensor magnetic gradiometry) –with adaptation of sensors and protocols for the wet environment, d) risk assessment –integration of collected spatial information for the estimation of risks for cultural sites–, e) Virtual/Augmented Reality platform –fed with the above for the promotion of submerged cultural material in unprecedented ways.

Ultimately, the results of this work can be integrated in the strategic framework of developing an effective interdisciplinary research model that could be applied to similar archaeological surveys in coastal or shallow-water environments thus contributing substantially towards the management and promotion of the concealed cultural resources.

Keywords: coastal archaeological sites, photogrammetry, satellite remote sensing, geophysics, virtual reality