# The Underwater Cultural Heritage of Puglia, Italy: a geodatabase for tourism and research

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**Abstract.** Underwater Cultural Heritage (UCH) presents relevant challenges for documentation, monitoring, access and preservation, but the topic has gained more recognition in recent years, mainly thanks to digital technology applications [1]. However, managing the digital data documenting UCH is still tricky [2]. International documents like the 1996 ICOMOS Charter and the 2001 UNESCO Convention emphasize UCH in-situ preservation, also encouraging sharing and public access [3]. Despite various national and international initiatives, UCH documentation remains fragmented without databases that promote and share interoperable data built upon decades of studies and excavations and foster collaborative research. Examples of existing databases include Australia's National Shipwrecks Database and the Bermuda 100 Challenge, which highlight the potential for enhancing protection and tourism through systematic documentation. GIS, webGIS, and geodatabases are critical for managing CH data and enabling spatial representation and analysis, but very few projects have applied GIS and webGIS to UCH [4]. Notable international initiatives like the Wreck Site and MACHU GIS demonstrate the potential of GIS technologies, though access is often restricted due to sensitive data. In Italy, the national cataloguing systems collect data related to CH in general, and UCH must fit into cataloguing sheets conceived not specifically for UCH. Discrepancies and criticalities among the national and regional databases emerge. The SITI platform for Friuli Venezia Giulia's archaeological chart is an exception, but a unified UCH database using common standards is still absent in Italy. In this paper, we present the first results of the ongoing research related to "Andar per Mare" and "Archim3des", two projects aim to promote UCH of Puglia region in Italy. Both projects will be based on a single geodatabase derived from the Underwater Archaeological Map of Southern Puglia, i.e. the 'Matrix' webGIS implemented by University of Salento, which will be completely revised, and several webGIS applications will draw data from the geodatabase. The geodatabase will be the core of a unified system that allows data publishing in webGISs and on a website. This work illustrates the creation of geodatabases, the retrieval of data from existing sources, and the development of webGIS applications. Creating a comprehensive UCH database faces challenges considered in the paper, in detail: data model creation (Fig.1 left), data interoperability, international standard adherence, storing bilingual data content, and data exchange between the website, webGIS, and the geodatabase. The

proposed research describes creating a single geodatabase for two different stakeholders, the public and scholars. The "Andar per Mare" website - integrating several webGIS applications (Fig.1 right) - will promote UCH tourism, while the "Archim3des" project will assist scholars in storing and studying UCH through webGIS applications. The UCH Puglia system - composed of a geodatabase, webGIS applications and website – will be replicable, aiming to be adopted by other institutions.

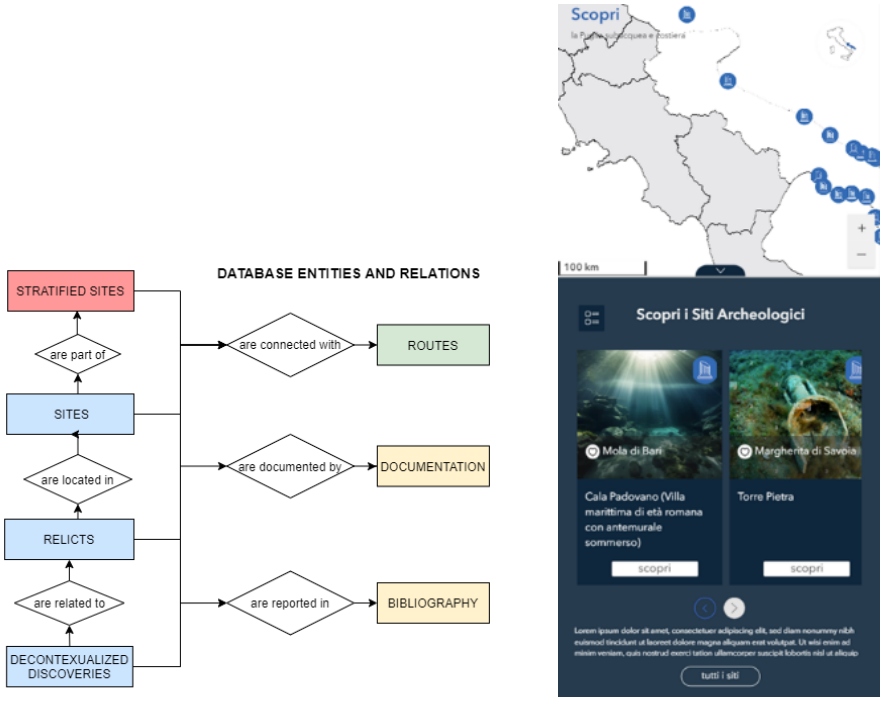


Figure 1. Data model of the UCH geodatabase (left) and example of a webGIS application (right).

## References


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