The "GIS of Underwater Baiae" with 3D documentation: a useful tool to record the state of conservation of a Roman submerged town

Barbara Davidde (ISCR), Roberto Petriaggi (ISCR), Gabriele Gomez de Ayala (Naumacos)

In 2001 the Superior Institute for Conservation and Restoration (ISCR) launched the project Restoring Underwater to study and test the most appropriate methods and instruments for the conservation of ancient underwater structures, focusing particular attention on control of biological infestation, cleaning surfaces and recovery archaeological architecture. Since 2003 the experimentations were carried out in the Underwater Park of Baiae. This submerged area of about 176.6 hectares safeguards the archaeological remains of the Roman town of Baiae and the infrastructures of Portus Iulius and represents an underwater area of great environmental value. In order to provide a cognitive picture of the general state of conservation of the underwater archaeological structures and of the seriousness of the deterioration in progress, a data recording system, called SAMAS (Scheda Analitica Manufatti Archeologici Sommersi), was devised. It was composed by the Analytical Data Card of underwater archaeological finds (SAMAS Data Card) which is linked to the SAMAS Bio Data Card, and the SAMAS Second Level Bio Data Card, where phenomena of chemical and physical decay caused by the growth of benthonic organisms are recorded. These data records are now insert in the ISCRs GIS di Baia Sommersa (ISCRs GIS of Underwater Baiae).

The adoption of such a data recording system during the phases, prior and after restoration, in our opinion, proves useful for determining the conservation treatments as well as any structural restoration operations. The documentation gathered can furthermore provide valuable indications for the organization appointed to protect and manage the underwater site.

Recently a new type of relief was carried out to document a room paved with opus sectile situated in the Underwater Park of Baiae, not far from the Nymphaeum of Punta Epitaffio (-5 m), using Naumacos L1 scanner laser. Naumacos L1 system has been created specifically for the archeological research and for the stratigraphic survey during the underwater excavation. The L1 system generates a cloud of dots to create a photographic textured model, that is accurate within a millimeter. L1 system can scan big areas and automatically merge them into a mosaic, getting to an improved submillimetric level of precision, which means that it’s possible to obtain an archeological survey of smaller details.

This method of 3D documentation shows better the state of conservation of the monuments, and increase the value of scientific dissemination.

barbara.davidde@beniculturali.it; r.petriaggi@tiscali.it; info@naumacos.com