

Waterside Mapping Using the Dynamic Laser Scanner ILRIS-3D^{MC} and the Interferometric Bathymetry Sensor SWATHplus-H

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ABSTRACT

Laser scanning and interferometric bathymetry are at the cutting edge of coastal survey technology and can be very beneficial when mapping complex waterside areas. Since 2005 Codevintec Italiana srl, has tested the integration of these two methodologies, carrying out a number of high-resolution surveys and generating complete and accurate digital models of areas both above and below water level, with results that are unachievable by any other topographical survey method.

Our integrated approach uses a boat-mounted Optech ILRIS-3D^{MC} laser scanner to survey areas above water level, while a SEA SWATHplus-H wide-swath sonar system collects underwater topographic data. A combined GPS and inertial platform (Applanix POS/MV 320) measures the position and 3D attitude of the two sensors during the survey. The similarity of the data provided by the two systems (point cloud and intensity value) makes it easy to integrate the two surveys using commercial PolyWorks software. The final product is a single 3D model made up of bathymetric and topographic data.

This paper discusses the trial surveys carried out with the Italian Navy (Istituto Idrografico della Marina Italiana) in Porto Venere, Italy. The survey site was concentrated in particular around the area of the Church of San Pietro. The church was built by the Genoese between 1256 and 1277 on the ruins of a Paleochristian church, which in turn was built over a pagan temple dedicated to the goddess Venere Ericina (Venus Erycina). The Church of San Pietro sits on a rocky promontory and emanates a serenity that it is hard to imagine elsewhere in the world.