5. Underwater Photogrammetric Acquisition across Different Archaeological Scenarios: Evaluation of a Stereoscopic Workflow for Submerged Cultural Heritage Documentation

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Underwater photogrammetry is widely used for documenting submerged cultural heritage, supporting the generation of high-resolution 2D and 3D products for archaeological interpretation, conservation, and dissemination. Its effectiveness, however, is strongly influenced by acquisition geometry, environmental conditions, metric control, radiometric quality, and site configuration. This paper evaluates the transferability of a controlled stereoscopic underwater photogrammetric workflow across two markedly different archaeological scenarios along the Apulian coast in southern Italy. The Cesine Cannons Shipwreck was documented through separate survey areas at approximately 2.5–3 m depth, whereas the Novaglie Cannons Shipwreck extends across a wider and morphologically complex seabed at depths of approximately 25–30 m. The workflow is based on CRAB (Calibrated Rig for Aquatic photogrammetric Bicamera system), a diver-operated calibrated stereoscopic platform with two synchronised high-resolution cameras and a controlled baseline. The comparison examines how acquisition geometry, metric control and georeferencing, radiometric enhancement, photogrammetric processing, and final products respond to the different spatial and operational requirements of the two surveys. The results show that the same stereoscopic framework can support both localised and site-scale archaeological documentation, provided that its operational components are adapted to the environmental conditions, spatial extent, and documentation objectives of each context.