Bathymetric Survey of Newlyn Harbour

The Unmanned Survey Solutions' (USS) Inception class Unmanned Survey Vessel has been developed to address a gap in the shallow water sector. This hydrographic survey vessel is composed of tough aluminium hulls, weed cutting propellers and provides bathymetric surveys in areas where access for a traditional survey vessel is not possible such as quarry lakes, lagoons, mining ponds and other shallow water zones.

Summary

The harbour master required a bathymetric survey of Newlyn's tidal harbour for a pre-dredge bathymetry assessment. The harbour, a hive of activity and industry, is a vital fishing port, boat yard and leisure craft anchorage. Its tidal range meant that much of the designated survey site was above drying height throughout the tidal cycle. In these Ultra-Shallow regions, the Inception mark II with its combined survey package excels and provides a complete, efficient and cost-effective survey solution.

The Task

The client required a bathymetric survey for a pre-dredge assessment of Newlyn Harbour. Successful completion of the survey hinged on providing a time-efficient and effective survey solution in ultra-shallow zones throughout most of the tidal cycle. The area of the site was approximately 115,000m^2, and required operations to run 6 metre survey line-spacing with additional cross-lines to achieve sufficient coverage. The Inception Mark II's quick deployment, mobility and ultra-shallow zone capability made it an obvious choice for the job.

The Solution

The USS Inception class USV can be easily transported by van and its quick mobilisation and deployment procedure means that online survey activities can commence almost immediately upon arrival at site. Once deployed, it is remotely piloted from shore with the aid of an additional HYPACK navigation display. The solution for this application consisted of a CEE HydroSystems CEESCOPE-USV system, a combined SBES, GNSS, Telemetry system and HYPACK survey software package.

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Method

All operations were carried out with a two-man survey team. Survey operations were adaptive due to tidal restrictions and vessel movements, despite this, the entirety of the survey site was completed within the allotted three day window. The average survey speed of the vessel was approximately 3 knots, both inside & outside the harbour walls. The 4-hour endurance from a full charge enabled the team to complete all daily survey operations with a single battery change-over. Recovery, battery exchange, equipment checks and redeployment were achieved within a 45-minute period. The hydrographic software, HYPACK provided a turnkey solution, and allowed for the project planning, acquisition, real-time QC, post-processing and creation of deliverables.

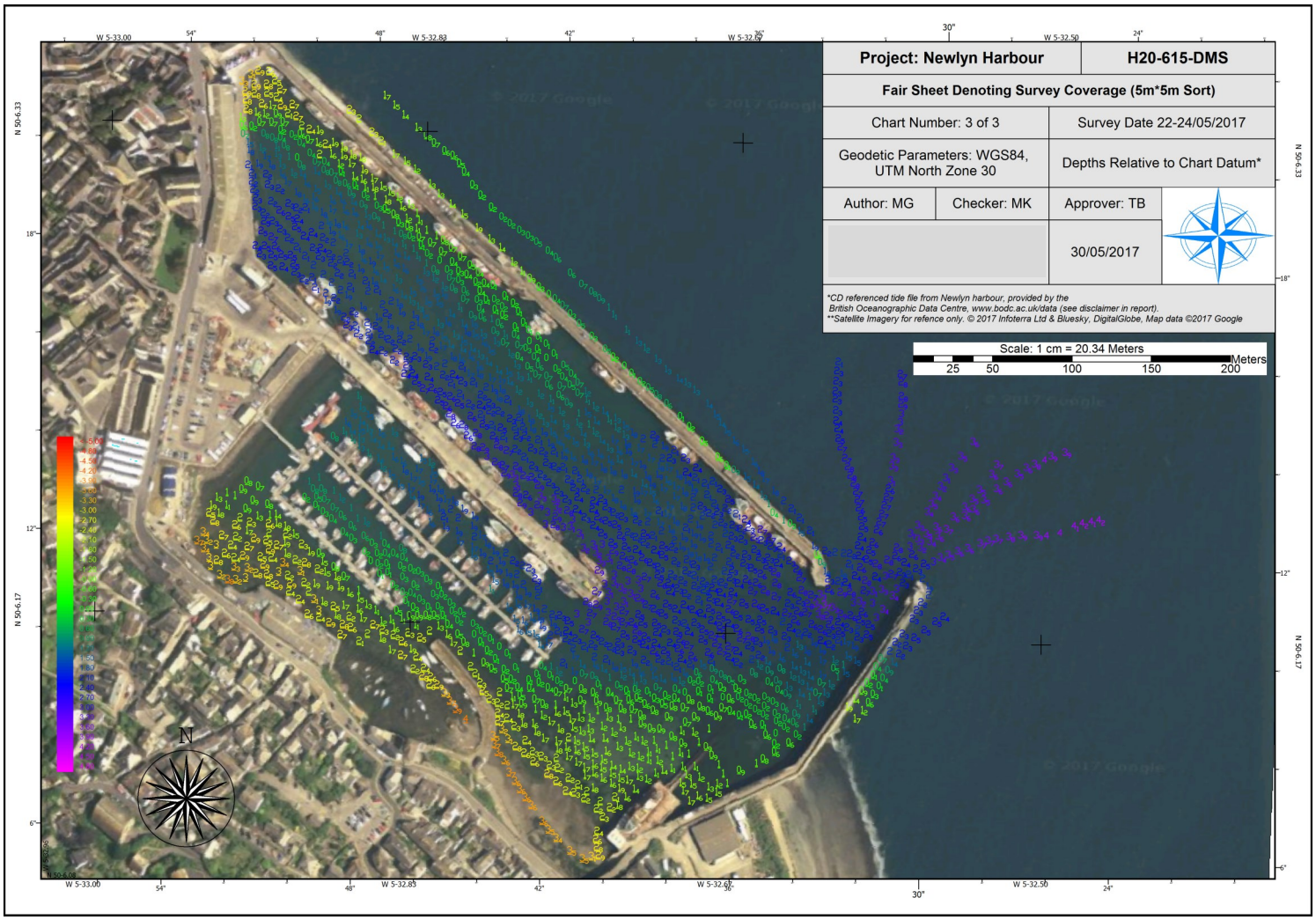

Figure 1. Sample bathymetric chart and overlaid satellite imagery produced from the data collected with the Inception Mark II USV survey solution.

All photos courtesy of Laurence Hartwell (through-the-gaps.co.uk, 2017)