

Efficient and On-demand Unmanned System for hydrography and Risk Management

Jerry Bao, Yading Lee and Ewan Zhang (China, PR)

Key words: Bridge surveying; Hydrography; Risk management; Spatial planning; General mapping; reconnaissance; USV; multibeam; bathymetry; point clouds

SUMMARY

Effective coastal and inland waterway management—spanning spatial planning, infrastructure maintenance like bridge surveying, and immediate risk management—depends on timely and accurate hydrographic data. Traditional survey methods are often costly, logistically complex, and slow to mobilize. This paper presents the application of the HydroBoat 1200MB, a turnkey USV multibeam solution, designed to address these challenges.

The system provides significant operational advantages, including a "7.5x Efficiency Boost" over single-beam methods and "Up to 50% Cost Savings" by eliminating the need for separate SVP devices, boat rentals, or large field teams. Its "5min Quick Start" capability makes it an ideal "on-demand" tool for rapid reconnaissance and post-disaster bathymetry surveys, which are critical for risk management.

This paper explores case studies in complex environments, such as "shallow, cluttered waters". The system's 512 beams and wide swath generate high-density 3D point clouds, enabling detailed mapping of features like "Vertical Walls" and bridge scour. Its automated features, including auto obstacle avoidance, ensure reliable data collection in challenging conditions.

By combining high-resolution multibeam data with a cost-effective, rapidly deployable platform, the HydroBoat 1200MB streamlines the entire hydrography workflow. This paper demonstrates its practical value in providing actionable data for general mapping, engineering, and risk mitigation.