Mapping Submerged Features at Ada Estuary Using Side Scan Sonar: A Multi-Instrumental Approach to Riverbed Characterization

Sebastian Senyo Botsyo (United Kingdom), Isaac Bleboo, Tengan Yvonne Enyelko-Anu, Jafar Ali Abdul and Yahaya Hafiz Nubanie (Ghana)

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SUMMARY

Side scan sonar (SSS) technology provides critical capabilities for detecting and mapping submerged features in shallow-water environments, supporting both navigation safety and environmental monitoring objectives. This study employed an integrated survey approach combining side scan sonar, echo sounder, and Global Positioning System (GPS) technology to investigate the riverbed morphology and identify submerged objects at Ada Estuary, Ghana. The research methodology incorporated systematic transect lines spaced at 20-meter intervals to ensure comprehensive coverage of the survey area. Data processing was conducted using specialised hydrographic software, including HYPACK, Quizzy, and Surfer, for visualisation and analysis. Results revealed a relatively flat riverbed topography with minimal submerged contacts, primarily consisting of tree stumps, pipes, and scattered debris. The findings demonstrate the effectiveness of recreational-grade side scan sonar systems for small-scale hydrographic surveys, with applications extending to navigation safety, environmental assessment, and coastal zone management.