

# Concept of Autonomous UUV/USV Operations for Harbor Surveys

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## SUMMARY

Harbors and ports are constrained environments especially for harbor and port surveys due to heavy marine traffic, constructions and cargo operations. Survey time is restricted by working hours of the crew, the tide, marine traffic, occupied berths, and dredging operations. All these influencing factors have to be taken into account for the survey planning and execution. To increase the flexibility of hydrographic surveys an autonomous approach seems promising as the application of autonomous survey platforms has strongly progressed in recent years. Their utilization have been extended to various uses like military, oil and gas, scientific research, and offshore renewables but so far they are not deployed for everyday harbor surveys. This article deals with the requirements and demands of hydrographic harbor surveys based on questionnaires completed by port authorities and the challenges of the application of autonomous vehicles in this field, before proposing a concept of a semi-autonomous solution which could be realized in the near future.

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