seabots
A Company of GPAINNOVA

CASE STUDY

SB 100 PRO USV in PORT OF BARCELONA

for Water Analysis and Multibeam bathymetry

Unmanned Surface Vehicle

Multibeam Echosounder,
Multiparametrical probe & Water sampler

The Company

Founded in May 2019 in Barcelona as a spin-off of the GPAINNOVA Group, SEABOTS' activity revolves around the development of technologies for exploring and preserving the marine environment, such as USVs (Unmanned Surface Vehicles) and smart buoys.

Just a few months after its creation, the company was granted the Fuera de Serie ("state-of-the-art") Design & Innovation Award, promoted by one of the most important publishing groups in Spain, in the category of Sustainability.

In 2020, SEABOTS deployed more than 100 buoys to study the coastal waters on beaches in Eastern Spain and launched the SB 100 PRO model, a multipurpose marine drone for all kinds of tasks in sheltered waters. Depending on the payloads, this USV can be used in the fields of hydrology, water analysis, research, Search & Rescue (SAR), mooring inspection and other tasks. Likewise, its use allows access to restricted areas, in which navigation may be restricted, difficult or dangerous.

Another product developed by SEABOTS is SB 100 Cleaner, specially designed for sea water surface cleaning in ports and marinas.

The Opportunity

Naval robotics can replace tasks that have always been carried out by traditional methods, which have a high ecological impact and expensive operating costs.

USVs are becoming widespread in several areas in the naval sector. In this real case study, we present a need that is shared by many ports: Mooring inspection in harbors and marinas.

CASE STUDY Using SEABOTS' SB 100 PRO USV

Payloads

SEABOTS' SB 100 PRO USV is the most versatile USV platform on the market for sheltered waters activities. It is an indispensable tool for a fast, efficient and precise work. Both the operating costs and its environmental footprint are extremely low, and it allows to expand the range of possibilities in the field of data acquisition.

MBES

Wassp S3 is one of the world's most cost-effective, professional survey and mapping multibeam sonar solutions. Designed as a mid-level sounder, the S3 will meet your budget, operational needs and future technology roll-out. And it lets you cover your survey area up to 10 times faster than a single-beam sounder. It can be integrated in SEABOTS's SB 100 PRO USV and it's compatible with HYPACK, BeamworX, EIVA and QINSy and others with a range of export options.

Water Analysis & Water Sampler

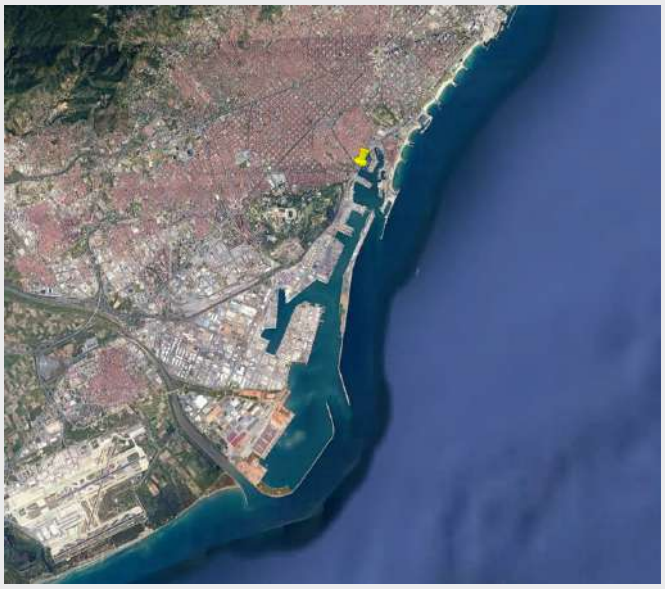
Multiparametrical probe WIMO from NKE Instrumentation was integrated in the bow of the USV SB 100 PRO. Water parameters were analysed with sensors of conductivity and salinity, temperature, oxygen concentration and turbidity.

At the same time a water sampler was integrated in the stern. This mechanism allows four surface-water samples (15cm) of 150ml each, to be taken at the desired locations, using the controller as an actuator and these samples being geo-referenced. The samples can be used for further analysis in a specialised laboratory.

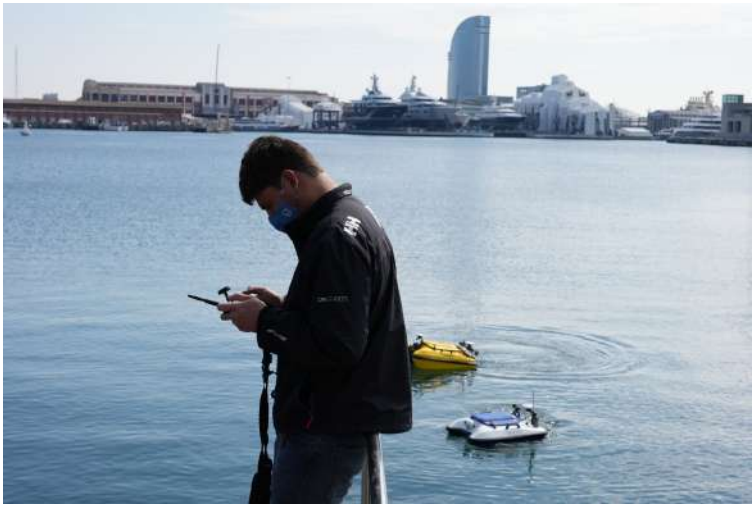
CASE STUDY: Using SEABOTS' SB 100 PRO USV

Location

The mission took place in Port of Barcelona (Spain), the largest port in the Mediterranean in terms of cruise traffic and the fourth largest in the world behind only the Caribbean ports.



Data Acquisition

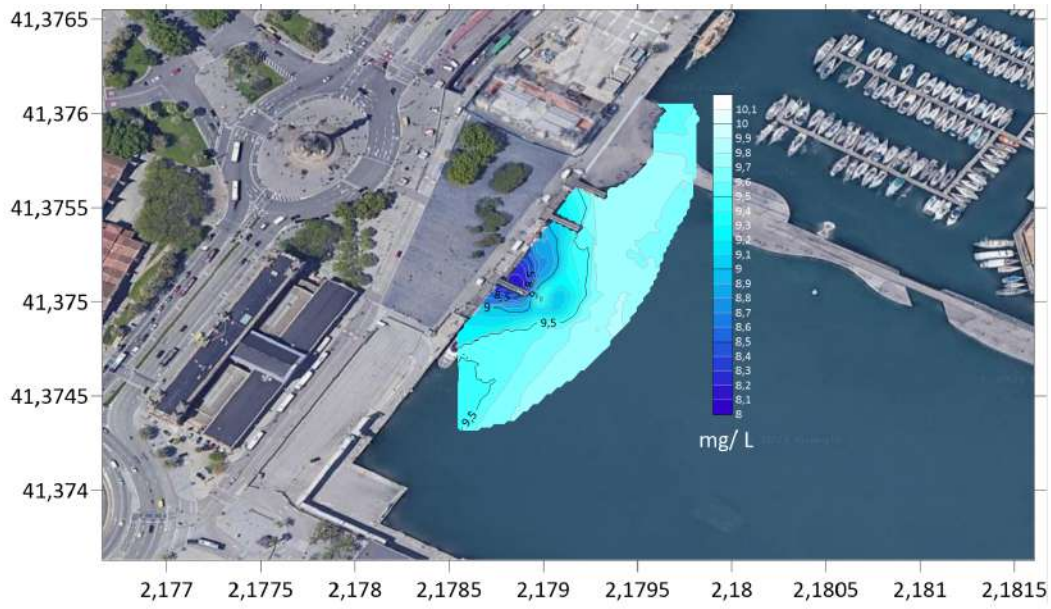


During the operation, GPASEABOTS deploy 2 USV equipped with different instrumentation each with the objective of providing a complete service for the needs of a port as large and important as the Port of Barcelona.

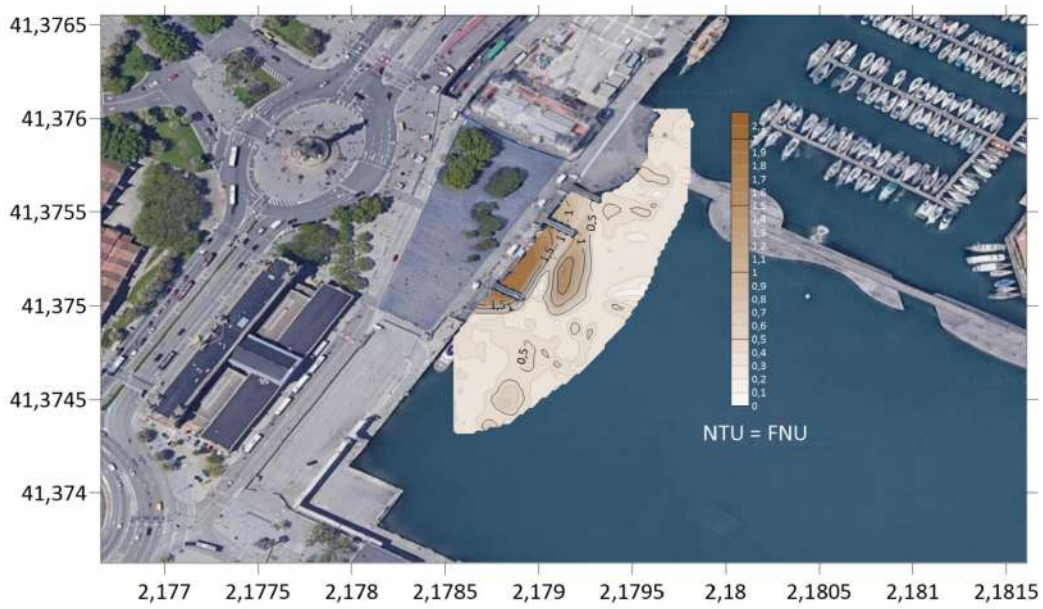
One of the USVs has been equipped with Wassp S3 MBES, to make multibeam bathymetry of the harbour bottom and identify lost anchorages on the seafloor.

The other USV has been equipped with WIMO Multiparametrical probe and water sampler. We deployed the drone and collected water samples at points that we considered important because of the data we were seeing live from the ground station.

Results



Oxygen concentration measurated by a WIMO Multiparametrical probe integrated on the SB 100 PRO.



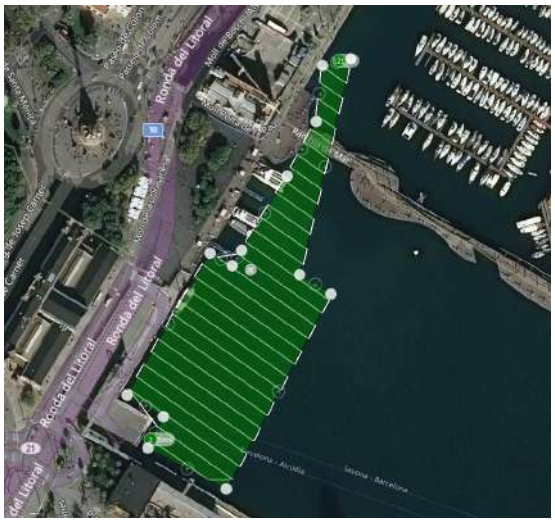
Turbidity measurated by WIMO Multiparametrical probe integrated on the SB 100 PRO.

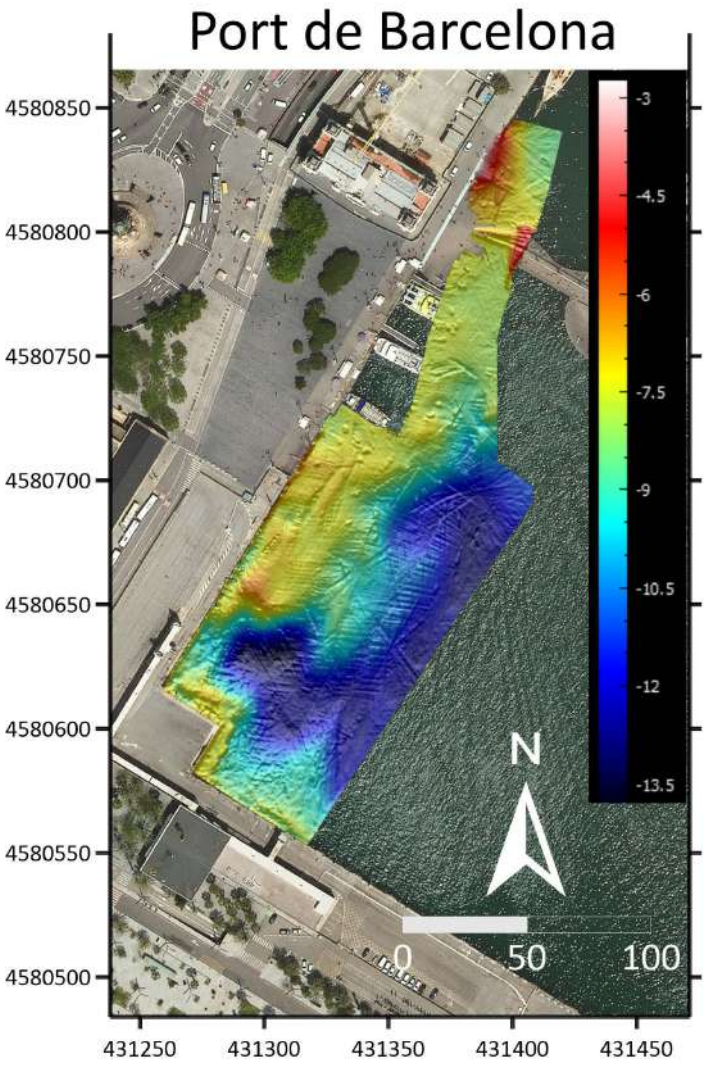
On this occasion we detected the outflow of water of residual origin at the edge of the dock, where the turbidity and oxygen values were affected. Using the SB 100 PRO USV, a solution was found to this filtration of waste water problem in the port, maintaining the water quality required for the administration.

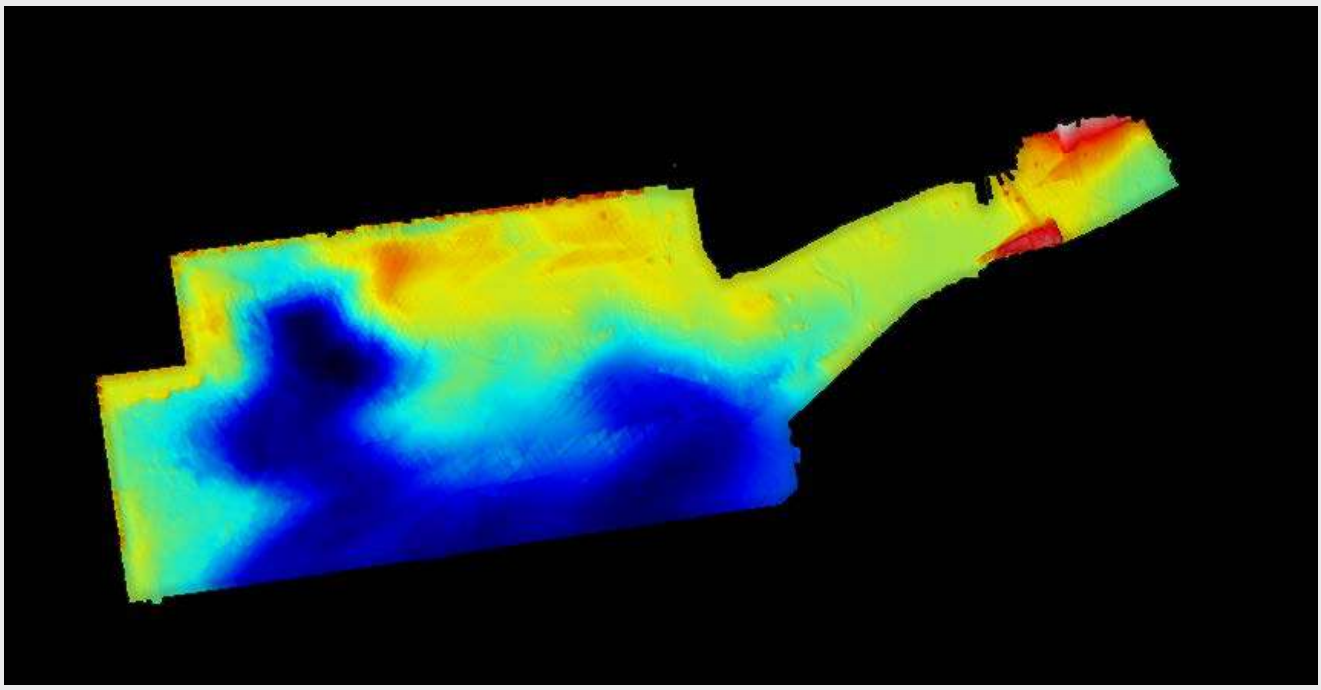
Preliminary results of multibeam bathymetry in Port of Barcelona.

Depth data were acquired using the specializated sofware BeamworX.

The planning of the mission was carried out on the control unit, with its touch screen, the paths followed by the USV were plotted for a 100% overlap on each pass, ensuring the quality of the data.







C/ Maracaibo, 1, naus 2-6, 08030 Barcelona (Spain)
Tel +34 931 256 536 · Fax +34 934 318 271