UgCS
INTEGRATED SYSTEMS

erelis
ADVANCED UAV SOLUTIONS AND SERVICE

Bathymetric surveys with a UAV and an echo sounder conducted in Israel by ERELIS

UgCS Integrated Systems is a product of SPH ENGINEERING
SMART PLANES & HELICOPTERS

integrated.ugcs.com

In April of 2021 drone service provider ERELIS, Israel, conducted a series of bathymetric surveys using a drone equipped with a single-beam echo sounder in the Mediterranean and Dead seas. The data was partly validated by authorized local surveyor Dr.Valeri Gutman from DRAKAR Surveying Ltd. with previous data of the same areas that was measured by Miss Yafit Bitton (M.Sc. Student) under the supervision of Prof. Dov Zviely from the Faculty of Marine Sciences at the Ruppin Academic Center, Israel.
Professor Dov Zvieli: "The bathymetric data collected by the drone demonstrated a good match to the data surveyed by manned boat equipped with multi-beam or single-beam echo sounders".

Used equipment and software:

- UgCS SkyHub onboard computer
- UgCS software option for the echo sounder (onboard software for SkyHub, manages echo sounder and logs the data in CSV, NMEA 0183 and SEG-Y formats)
- UgCS True Terrain Following system with radar altimeter
- UgCS Pro ground control software
- Echologger ECT400 single-beam echo sounder
- Eye4Software Hydromagic software package
- DJI M600 Pro drone
- GeoGenie PPK GNSS receiver, used as a rover on the drone
- NTRIP service provider (ETKES)
- RTKPOST utility for RINEX files post-processing

The drone with echo sounder is ready for take-off

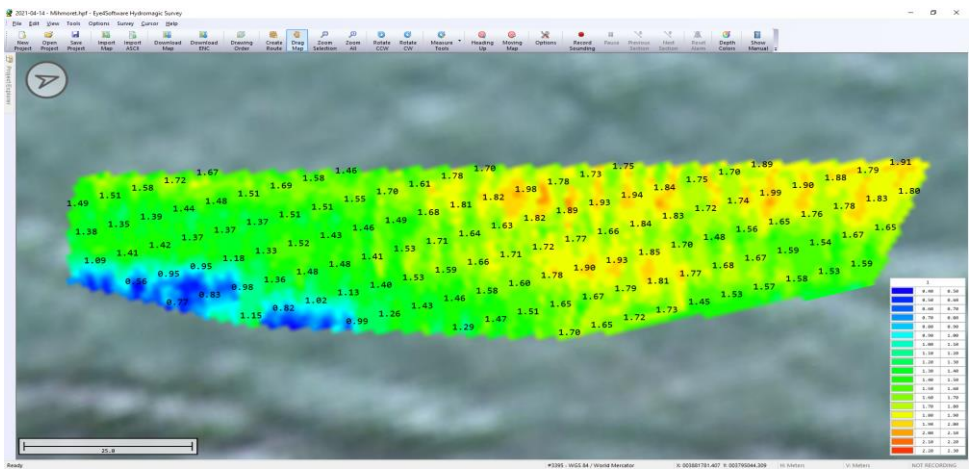
#1 Mikhmoret Area, Mediterranean sea

Purpose of the survey is to check applicability of the aerial system for bathymetric surveys in the surf zone.

Bathymetric survey in surf zone

Data sample: https://files.ugcs.com/s/a3wCcsiK7Kr9QsD

Were conducted 2 surveys using the same route and system demonstrated good repeatability of results, the average difference between 2 data acquisitions in these challenging conditions is below 10cm.

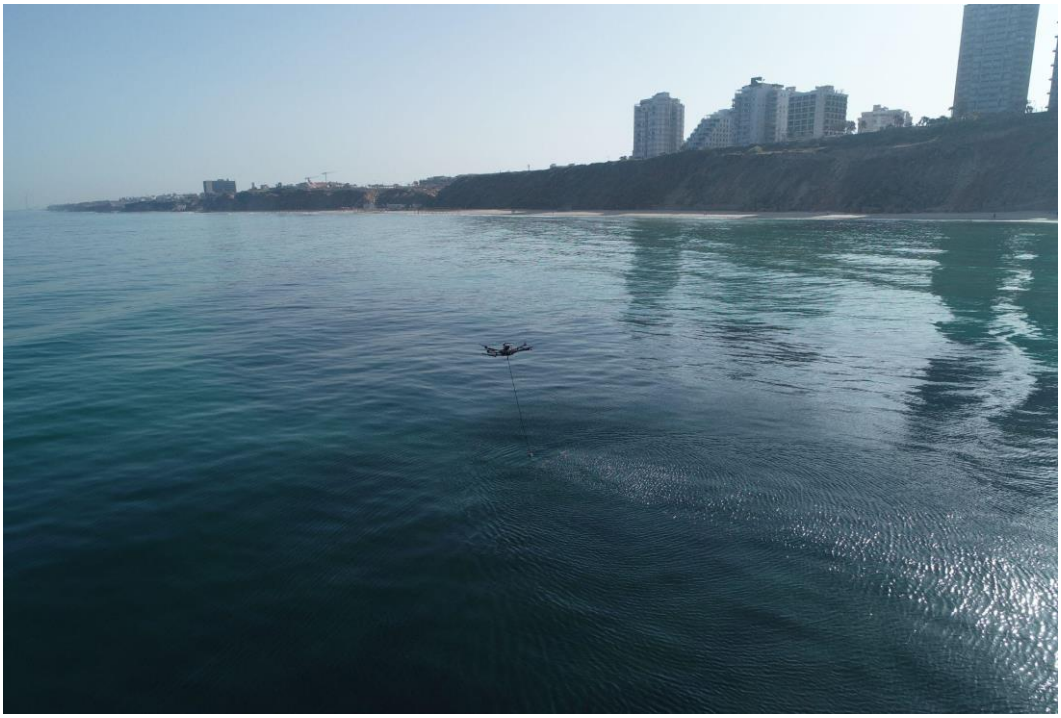


Depth matrix in surf zone

Noted that the average inclination of the sensor during this survey was around 14 degrees. The induced error of a few centimeters for the shallow survey can be ignored, but for better results, more heavy housing can be used to stabilize towed echosounder in waves.

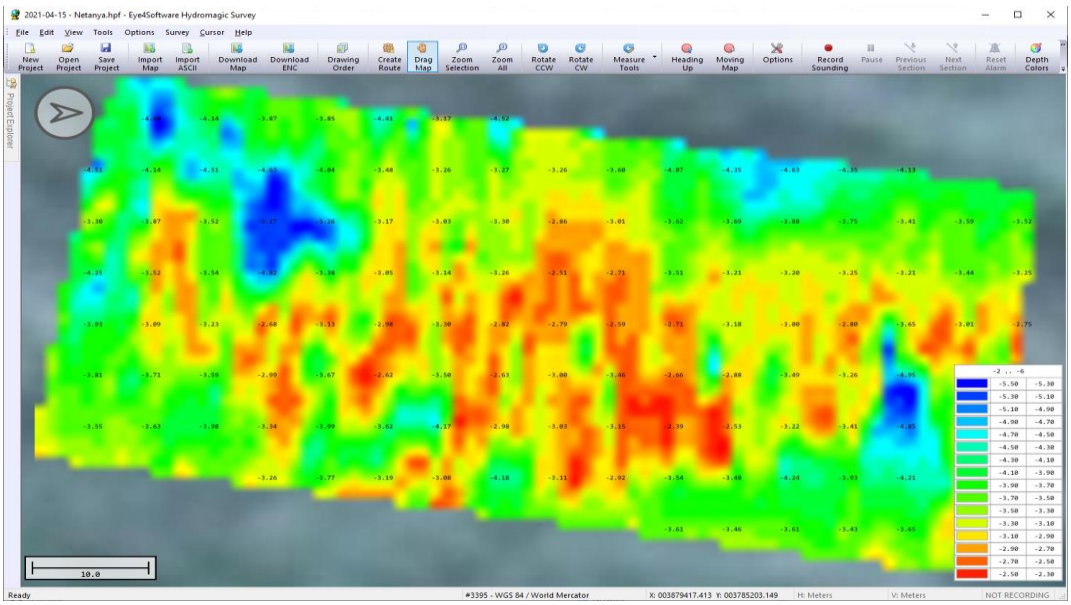
#2 Bathymetric survey near Netanya city in central Israel

Surveyed area with rocky bottom.



Bathymetric survey near Netanya

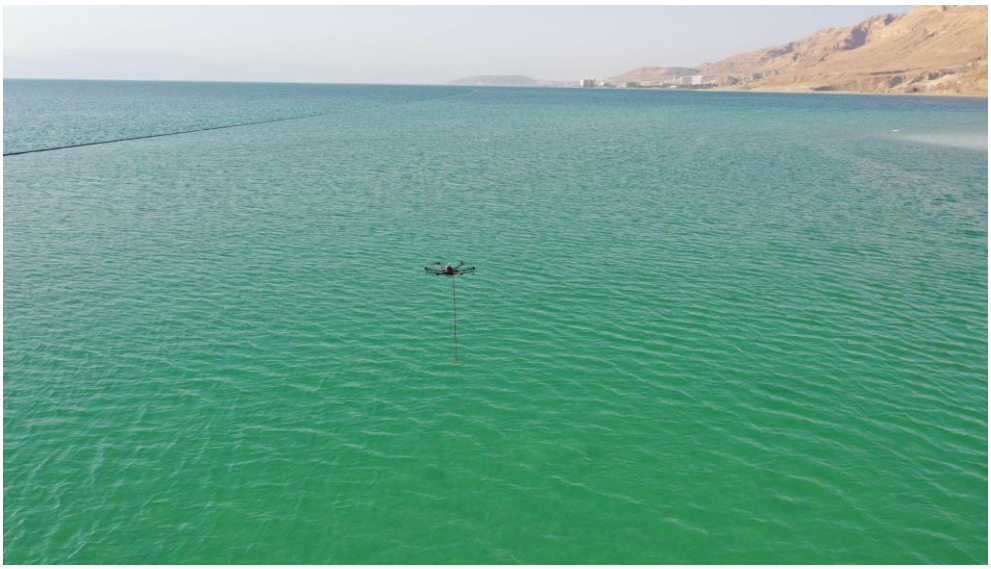
Data sample: https://files.ugcs.com/s/m8ZFnCGEwQS5L4L



Survey results, numbers are elevation in ELUM 2.0

#3 Bathymetric survey in Dead Sea

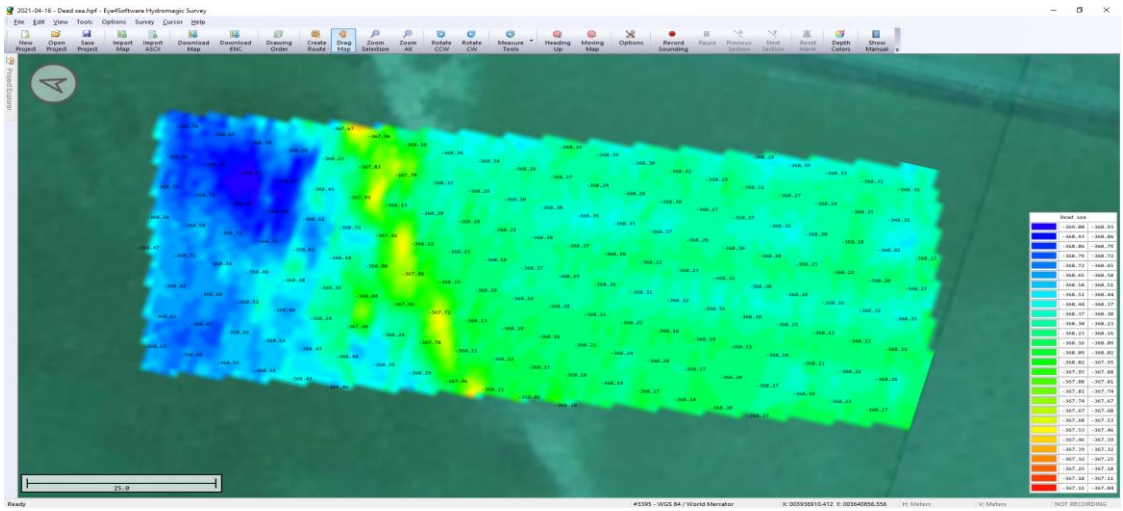
Purpose of the survey is to check applicability of the aerial system for bathymetric surveys in Dead Sea (with extremely salt water).



Bathymetric survey in Dead Sea

Data sample: https://files.ugcs.com/s/S8xkW5b2emNNbqS

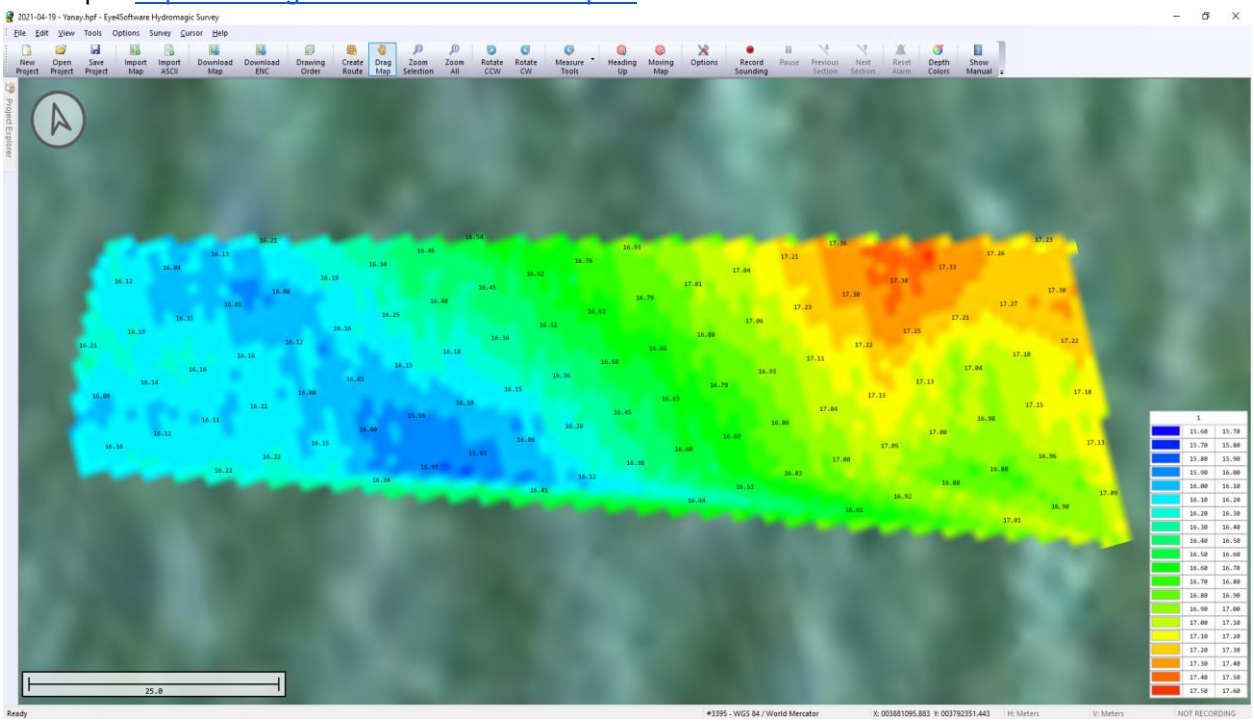
The system demonstrated good repeatability of measurements, but for better results, more heavy housing can be used to keep towed echo sounder in extremely dense water.



Dead Sea survey result, numbers are elevation in ELUM 2.0

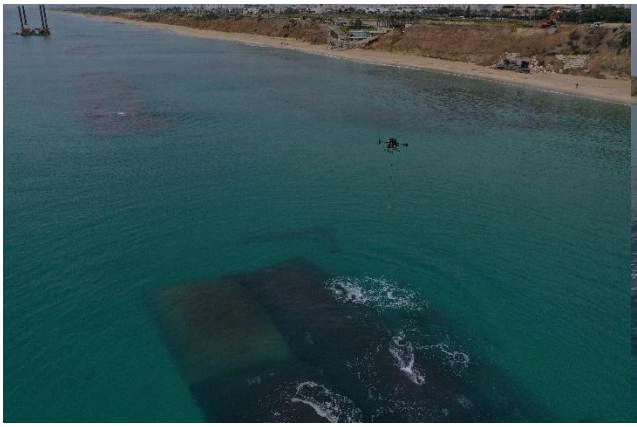
#4 Bathymetric survey near Beit Yanai moshav in central Israel

Data sample: https://files.ugcs.com/s/5KcHrnSZMDqTifZ

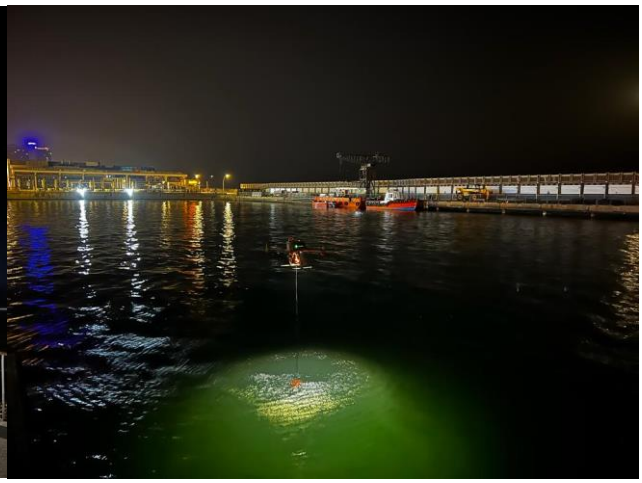


Survey result, numbers are orthometric height

Bathymetric projects gallery:





About ERELIS

ERELIS is a certified CAA/EASA aerial operator company specializing in autonomous data acquisition, real-time data feeds, remote sensing NIR & IR and photogrammetric accurate survey mapping information services. ERELIS is permanently assessing and adding new technologies to its capabilities to determine and maintain high standards of service to our customers with emphasis on client need-based products and services.

About SPH Engineering

SPH Engineering is a multiproduct drone software company and UAV integration services provider. Founded in 2013 in Latvia (EU) as a UAV mission planning and flight control start-up, the company has evolved from a developer of a single flagship product (UgCS) to a market leader of multiple drone solutions. Today, the company boasts a rich global customer, reseller and educational partner network in 150+ countries, while over 45% of partners are located in North America. To provide high-quality solutions for UAV professionals, SPH Engineering's team advances four key product lines: UgCS (mission planning and flight control software), UgCS Integrated Systems (airborne integrated systems with sensors from diverse manufacturers), Drone Show Software (only commercially available software to manage drone swarm flights) and ATLAS (AI platform to process and analyze geospatial data).