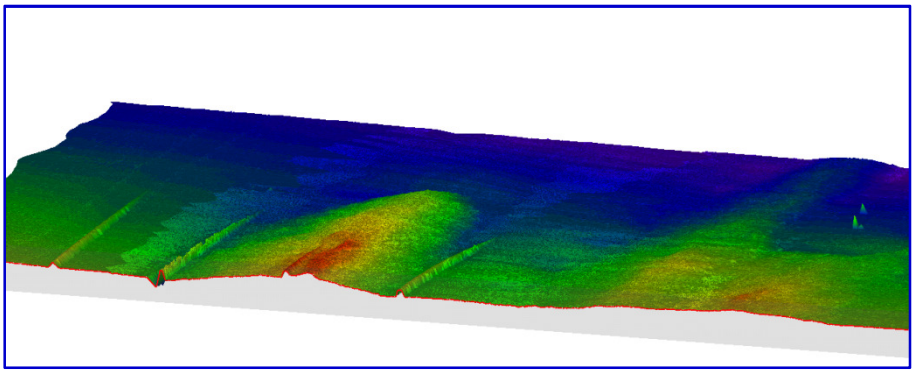
GEOPHYSICAL SURVEYS

bathymetry, sidescan sonar,

shallow seismics and topography

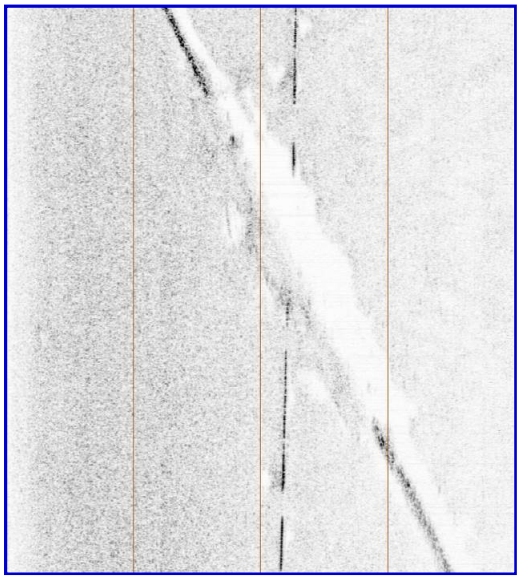
BATHYMETRIC SURVEY



Bathymetric surveys are carried out every time is requested to know in details the seafloor morphological conformation: inside harbors to check minimum draft, for dredging estimation or as preliminary survey; outside the port to monitor erosion phenomena or to observe the effect of a beach nourishment; in open water as preliminary survey for pipes or cables laying.

Bathymetry would be performed by mean of singlebeam or multibeam echosounder. The parameter to evaluate the quality of bathymetric survey is the reliability and accuracy obtained (up to 5x5cm by mean multibeam). On the survey vessel the echo sounder data and the GPS positioning information are recorded and displayed by the navigation system. Afterwards the data are processed with tide level correction and coordinates conversion. Finally, the data can be displayed with different formats: elevation maps, contour lines maps, profiles, 3D images (above 3d sections in a pipelines shore approach) and volumes computation. All the data are acquired and processed following the I.H.O. standard and accordingly to the coordinate system required.

APPLICATIONS: Coastal survey for harbour engineering, bionomic studies, dredging, pipeline and cable shore approaches, erosion monitoring.



SIDE SCAN SONAR SURVEY

A Side Scan Sonar generates an acoustic image of the sea floor which is interpreted according to the shape and the intensity of acoustic echoes and shadows.

Much better of underwater cameras, the Side Scan Sonar can cover larger areas in a shorter time. The positioning and navigation system allows the vessel to follow a pre-established track and to locate the position of targets detected during the survey. The records appear as “stripes”, acoustic images of the portion of sea floor (changeable in width) nearby the course of the vessel. The “stripes” are digitally recorded and printed on thermal paper. In this case, a subsequent elaboration allows the creation of digital maps of the sea bottom by combining several geo-referenced “stripes” (mosaiking). The image above represents mattress pipeline protection at the crossing point.

APPLICATIONS: Enviromental studies, sea grass prairies monitoring, debris and wreck research, archeological surveys, bionomic studies, pipeline survey.

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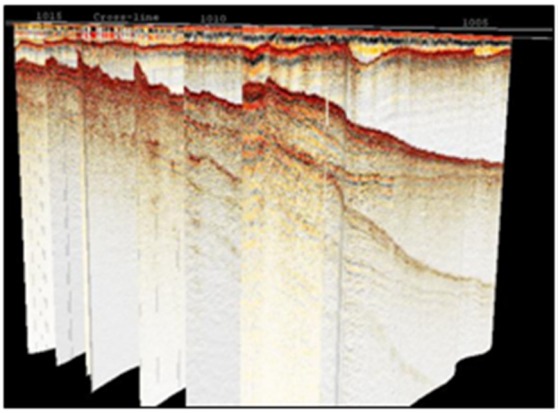
SHALLOW SEISMIC SURVEY

The seismic surveys realized using a Sub Bottom Profiler providing information about the sea floor layering, the nature and thickness of sediments and the existence of buried structures. The Sub Bottom Profiler data are digitally recorded and printed on thermal paper like an acoustic image of the sea floor section along the vessel track.



The signal penetrates in up to 40 m below the sea bottom with a 30 cm resolution while the vessel track is controlled by a positioning and navigation system. The data are then geo-referenced in order to locate the depth and position of a possible buried target, to create a sediments map, to estimate the quantity and quality of material to be removed during an excavation or to define the morphology of a rocky layer. Better than corer, which provides a punctual information, the seismic survey provides a continuous measurement along the track of the vessel supplying information about the seafloor stratification on wide areas. (In the picture seismic data 3D presentation)

APPLICATIONS: Detection of rocky layer, evaluating volumes and type of material to be dredged, research of relict sands, buried target detection, very shallow hazard.

TOPOGRAPHICAL COASTAL SURVEYS

Thanks to the high precision of the GNSS Positioning System and the specific software for data elaboration (CAD and GIS), the coast can be surveyed and mapped in 3D cartographic or digital format with very high accuracy. This kind of survey along with bathymetric studies are the means to observe the beach evolution. The analysis of the coast modification is the basis for researches about erosion phenomena and beaches nourishing.

APPLICATIONS: Coastal monitoring, beach nourishment, cables and pipelines on shore surveys

OTHER ACTIVITIES

In addiction our activities include:

- Sediment sampling with vibrocorer and grab
- Underwater videocamera
- Underwater acoustic measurements

The relationship with trusted companies allow us to offer the followings services:

- Grain size analysis
- UXO (UneXploded Ordnance)
- Chemical, physical and microbiological analysis
- Benthic studies
- Hydrodinamic studies and modelling
- ROV surveys

MAIN EQUIPMENT

- ✓ COLMAR III coastal survey boat
- ✓ Multibeam echosounder Reson 8125, titanium houses
- ✓ Sound Velocity profiler Valeport Mini-SVP
- ✓ SideScanSonar (100-500kHz) Geoacoustics, digital acquisition.
- ✓ Sub Bottom Profiler Uniboom EG&G Mod. 230
- ✓ Sub Bottom Profiler Edgetech SB-424
- ✓ Vibrocorer Rossfelder with buoyancy frame
- ✓ Singlebeam echosounder Odom Hydrotac 200 kHz ,9°.
- ✓ Thermal printer Dowty 3710
- ✓ Towed underwater camera with GPS video overlay
- ✓ USBL Sonardyne Scout and n.2 beacons
- ✓ Gravity corer
- ✓ Van Venn grab
- ✓ Digital tide gauge STS
- ✓ GNSS II freq. Hemisphere R320 RTK base station
- ✓ Topographic GNSS II freq. Hemisphere S320 RTK rover
- ✓ Plotter A0 HP 450C. Theodolite Geodimeter 400 made by Geotronix
- ✓ Multibeam software: Hysweep,Hypack (Hypack inc).
- ✓ n°2 navigation software Navpro (Com-Technology)
- ✓ Seismic acquisition software: Swanpro (Com-Technology)
- ✓ GPS post processing software: Soft-Surv (Novatel)
- ✓ Processing and mapping software: SURFER (Golden Software) , Autocad (Autodesk) and Hypack.