



Marine Surveys



Marine Survey involves the study, mapping and analysis of both subsea environmental conditions and ocean territories in order to better inform and help manage human activities within them.

In-depth knowledge

The acquisition, processing and presentation of technical data relating to surface and sub-surface marine environments is critical to several over-water operations, including the planning, installation and maintenance of pipelines and cables, coastal construction projects, infrastructure maintenance, navigation and the sustainment of marine ecologies.



Providing survey solutions for shallow and deep-water operations

Global solutions from Fugro

Fugro's purpose-built survey vessels, technology and experienced personnel provide a broad range of offshore services. These typically include:

- Hydrographic charting surveys
- Exclusive Economic Zone (EEZ) and Law of the Sea (UNCLOS) consultancy and surveys
- Inshore shallow water surveys
- Airborne LIDAR bathymetry
- Submarine cable route surveys
- Seabed sampling and sediment coring
- Habitat mapping services
- Desktop studies, geographic information services (GIS), and marine data management services
- Geochemistry
- UXO / ordnance detection



Offering engineering recommendations using in-house expertise



Using proven Airborne LIDAR Bathymetric technologies

Marine Surveys



**ADVANCED TECHNOLOGY
SUPERIOR QUALITY
UNRIVALLED EXPERIENCE
'FIT FOR PURPOSE' SOLUTIONS**

Cable and Pipeline Studies

Desktop studies include comprehensive background information and engineering recommendations to assist cable and pipeline route planning, future survey operations, installation and maintenance.

Fugro has conducted custom desktop studies throughout the world with landings in over 75 countries for leading submarine cable companies, scientific and governmental institutions. Studies include:

- Route design
- Burial feasibility issues
- Survey and cable installation permit requirements
- Fisheries analysis
- Geology, meteorology and oceanographic conditions
- Engineering recommendations
- Route position lists and straight line diagrams
- Risk assessments for cable and pipeline systems
- Risk assessments for survey and installation operations

Cable and Pipeline Route Inspections

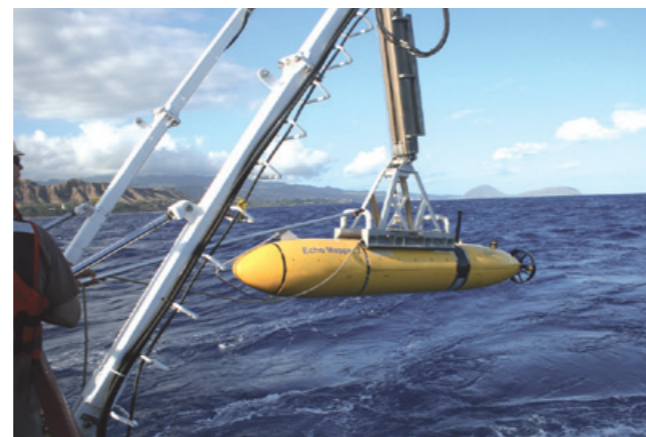
An exposed cable or a free-span pipeline can easily result in a costly breakage, so Fugro provides a range of suitable methods for conducting route inspections.

Combined with time series analysis, we can visually demonstrate protection requirements due to currents, tides, and sediment movements.

We deploy specialised equipment such as ROVs for detecting, tracking, and mapping using multibeam, side scan sonar and underwater video, AUVs for following routes automatically and a Remotely Operated Crawler for shallow water environments.

Cable and Pipeline Route Surveys

From trans-oceanic crossings to inshore surveys, you can be assured of comprehensive support and in-depth experience from Fugro. We have mapped millions of square kilometres of seafloor to full ocean depth, including hundreds of thousands of cable route kilometres.



In critical continental shelf areas, where cable burial is required, we have developed systems that provide continuous detailed information on the depth and thickness of sediment layers and soil characteristics. Our Cone Penetrometer Test (CPT) systems provide in situ measurements of sediment types, stratification, density and soil shear strength in water depths to 2,000 metres.

Detailed surveys of corridors for telecommunication and power cables allow engineers to design cost-efficient, practical and safe installation routes. Fugro's purpose-built survey vessels – equipped with hull-mounted high resolution multibeam echo sounders, sub-bottom profilers, towed sidescan sonar and magnetometer systems, with round-the-clock data processing and charting – are permanently mobilised to serve the submarine cable and pipeline industry.

UNCLOS / EEZ Surveys

Fugro has more than 50 years experience in hydrography, geophysics, seafloor geology and geodesy.

We are ideally placed to support UNCLOS and Article 76 with EEZ mapping, environmental and metocean surveys, worldwide positioning services and Vessel Tracking Systems (VTS).

Airborne Hydrographic LIDAR

Fugro provides highly efficient, cost-effective solutions to coastal zone and riverine mapping projects, utilising the most thoroughly proven Airborne LIDAR Bathymetry (ALB) technologies.

Our Fugro LADS Mk 3 and SHOALS-1000T systems collect data quickly and safely over coastal zones, across land and sea interfaces, and rivers and lakes.

Hydrographic Surveys

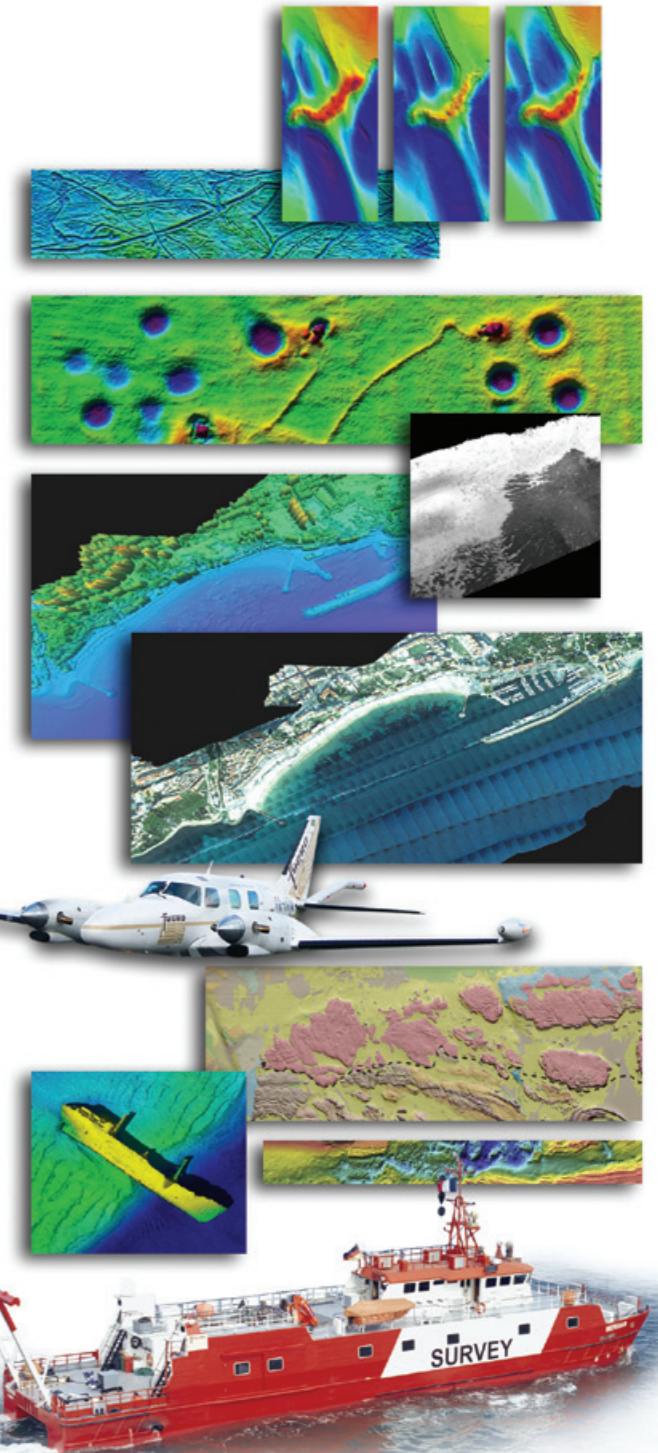
With a variety of survey vessels to choose from, Fugro can conduct hydrographic surveys in shallow, inshore, deep or EEZ waters.

Highly detailed images are derived from multibeam data, yielding both accurate information on water depths and clear and crisp images of the surveyed area. Such information is crucial for the safe navigation both within and outside of shipping lanes.

Environmental Benthic Habitat Surveys

Fugro offers a full range of expert services in support of environmental benthic habitat surveys.

These include high resolution seafloor mapping, hyperspectral mapping, project management and consultation, data analysis and interpretation, and sediment classification.



Marine Surveys

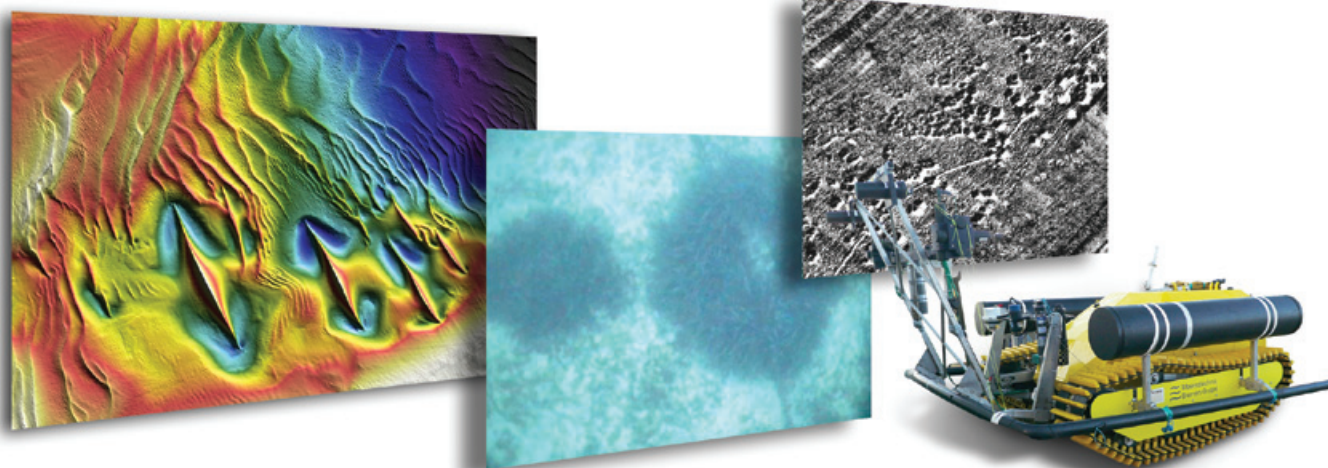
Site Surveys

Site surveys are typically detailed and comprehensive studies of well-defined areas, often carried out in ports, in shipping channels, in areas subject to sediment movement and at sea for offshore construction, explosive ordnance detection, and environmental studies.

Site surveys are also ideal for maintenance inspections of offshore structures, which are often subject to scouring, or sediment erosion at the base of the legs. Fugro operates a wide range of hydrographic equipment suited for the purpose and requirements of these surveys.

We have developed and operate air-transportable AUVs rated to 3,000 metres water depth, equipped with bathymetry, sidescan and sub-bottom sonars matched with a precise surface-referenced inertial navigation system. These systems are easily mobilised onto vessels of opportunity and are suitable for site investigations surveys worldwide.

Whether your site is 1000m² or 1000km², whether it's in Alaska or Zanzibar, Fugro can provide you with the service that best suits your particular requirements.



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