



# Geophysical Surveys



Geophysical data provides vital information on the geology of the sub-bottom strata, required for any engineering, construction, drilling, production or mining activity.

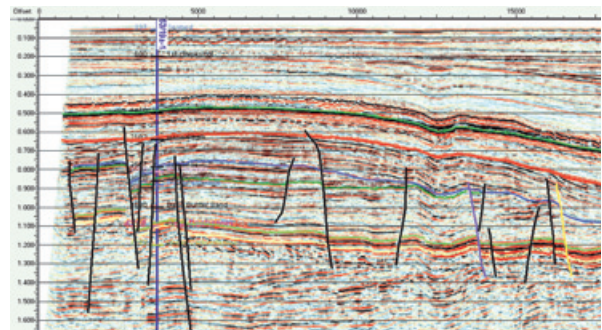
## Getting to the bottom of risk

Detailed geophysical surveys and assessments of the seabed and sub-seabed are critical to de-risking the cost-effective design of marine structures and subsea installations.

## Global solutions from Fugro

Fugro's strategically-located geophysicists, marine biologists, environmental scientists, engineers and specialists deploy an international fleet of geophysical survey vessels, AUVs, seabed sampling and testing tools and LIDAR equipment to provide our customers with high quality data acquisition, interpretation and presentation. This service includes:

- Bathymetric charting
- Shallow geologic feature profiling
- Geotechnical assessments
- Geohazard surveys and identification
- Pre-installation surveys
- Deep-water field development surveys
- Exploration seismic data acquisition
- Pipeline route surveys
- Environmental surveys
- Mineral surveys
- Hydrographic surveys
- Navigation and conservancy surveys
- Monitoring services
- Charting and UNCLOS surveys



Acquiring the highest quality data to provide exceptional interpretation



Deploying an international fleet of dedicated survey vessels



Using highly skilled teams for all surveys

# Geophysical Surveys



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

## Geophysical Surveys

Fugro's international fleet of strategically located geophysical survey vessels and geohazard specialists provide high quality geophysical data acquisition and interpretation services.

These include:

- Bathymetric charting of the sea floor for safety-critical and engineering applications
- Locating and identifying man-made artifacts such as debris, shipwrecks and sub-sea structures
- Profiling shallow geological features and structures to assist with engineering studies and facilities design
- Seabed and sub-surface geotechnical assessments
- Locating and identifying geohazards to ensure safe and efficient exploration drilling, facilities installation and production operations

Our comprehensive desktop study and geoconsulting services integrate all available data. Included are 3D exploration seismic data, legacy geophysical data, geotechnical data and project specific acquired data. These are used for detailed engineering design and environmental risk analysis of the project. Data processing, interpretation and presentation services then provide our clients with results in quality-assured formats, including concise reports and traditional paper charts which are also available in digital formats.

## Inspection Surveys

**Pipeline inspection surveys to detect free-spans, damage, defects, leaks, erosion or pipeline movement, require innovative technology and experience.**

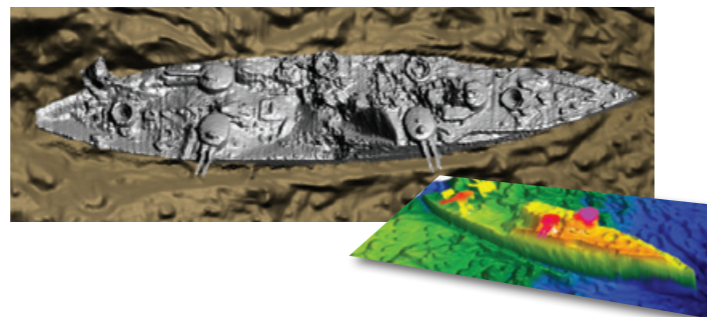
Fugro's highly skilled team is supported by a fleet of dedicated geophysical, acoustic survey and ROV/ROTV inspection vessels offering clients the most comprehensive range of solutions.



## Pre-installation Surveys

**A survey and seabed inspection, performed shortly before the start of engineering work, can help to ensure that the work area is properly prepared.**

This means not only clearing away obstructions, but correctly locating and identifying potential operational hazards.



## Deep-water Field Developments

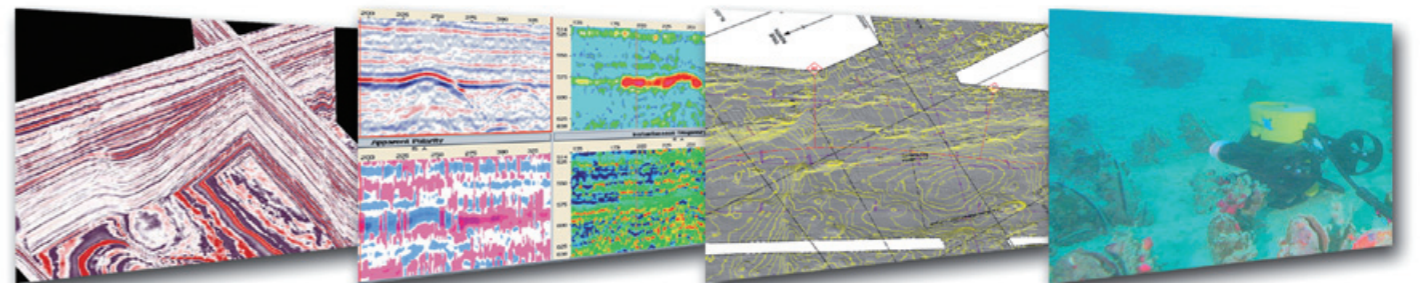
**A strategically deployed fleet of Echo Class autonomous underwater vehicles (AUVs) provides engineering-grade precision survey data for the development of deep-water oilfields and the installation of transmission pipeline systems in water depths down to 3,000 metres.**

The high resolution of such data and the precision with which it is coupled with the seabed, enables confident geohazard risk assessments of a deep-water development and its geological setting.

## Geohazard Surveys

Fugro supports safe exploration and production activities by providing high resolution geophysical surveys using HR2D and Short Offset HR3D techniques. These identify and map geohazards that could impact on the safety of drilling or installation operations.

These include shallow gas, active faulting zones and areas of potential hydrates. A combination of high resolution geophysical surveying and geotechnical investigation provides further information on seabed conditions to aid in predicting jack-up leg penetration and anchor holding capacity for foundation engineering studies.



## Shallow Target Exploration Seismic Surveys

**Fugro's expertise in the acquisition of high resolution seismic data is ideally suited to seismic exploration surveys where the depth to the zone of interest is less than 3 kilometres.**

These surveys can be undertaken using dedicated Fugro survey vessels or vessels of opportunity, each equipped with field proven and reliable mobile acquisition systems. High resolution seismic sources and processing systems provide data of the highest quality which, after processing, can deliver 3D volumes for standard work station interpretation.

## Pipeline Surveys

**Detailed corridor mapping provides the essential raw data for the design and installation of sub-sea linear structures, such as oil and gas pipelines, flow lines and umbilicals.**

Seabed sampling and testing tools - such as grab samplers, vibrocorers and Cone Penetrometer Testing (CPT) units - can be combined with high resolution seismic and geophysical data to provide accurate information on the structure of the seabed. This data is essential for providing a correctly engineered design that avoids the often considerable costs associated with over-engineering for uncertainties.

## Environmental Surveys

**Offshore oilfield and civil engineering activities around the world require stringent pre- and post-activity baseline assessments to confirm that developments will not adversely impact the environment.**

Fugro's team of highly skilled marine biologists and environmental scientists acquire high resolution images of the seafloor and associated benthic communities, and conduct systematic sampling programmes using a variety of devices. Data is then analysed at our NMBAQC-approved laboratory and comprehensive reports are prepared.

# Geophysical Surveys

## Renewables, Port and Coastal Surveys

**We provide a range of specialist survey vessels, bathymetric LIDAR aircraft, compact AUV systems and expert teams to meet the requirements of the renewable energy industry and the port and coastal engineering community.**

These are used to deliver services such as:

- Hydrographic surveys
- Navigation and conservancy surveys
- Surveys and support services for dredging works
- Monitoring services for beach and foreshores, sediment movement and material recycling
- Coastal Zone Management surveys, including climate change adaptation and tsunami modelling programs



## Mineral Surveys

**The exploration for valuable seafloor minerals demands leading-edge technology.**

Fugro's high-resolution AUVs and other geophysical systems, combined with geotechnical sampling programmes, provide the deep-sea mining industry with detailed and comprehensive views of ocean floor structures and surface texture in order to assist with the identification of mineral deposits and the design of optimal recovery solutions.

## Charting and UNCLOS Surveys

**Detailed charts of the seabed and sub-seabed geophysical information aid the evaluation of precious national assets and the definition of international maritime boundaries.**

Fugro's fleet of survey vessels, autonomous underwater vehicles and bathymetric LIDAR aircraft are equipped with the latest technology to provide a comprehensive seabed charting service at scales suitable for all applications.



### Fugro NV

Veurse Achterweg 10  
2264 SG, Leidschendam  
The Netherlands  
Telephone : +31 (0) 70 311 1422  
Email : [offshoresurvey@fugro.com](mailto:offshoresurvey@fugro.com)