



# Seabed Survey and Mapping

Phoenix's survey and positioning services provide effective and efficient geophysical, geotechnical, and environmental survey support to worldwide marine and renewables construction projects, and offshore oil and gas operations. Utilizing Remotely Operated Vehicles (ROVs), an Autonomous Underwater Vehicle (AUV), and side scan sonar technology and equipment, Phoenix technicians routinely provide quality survey data to assist our clients with important project decisions.

## Geophysical/Site Surveys

Phoenix's geophysical and site survey services can be utilized for offshore drill rig moves, drilling geohazard investigations, or wind farm developments. By employing magnetometers, multi-beam echosounders (MBEs), and side scan sonar (SSS), existing subsurface structural features, geological layers, and/or buried debris, infrastructure, and utilities can be identified. In municipal waterfronts, debris from years of infrastructure construction, demolition, and abandonment can be detected in areas that require upgrades or rehabilitation.

## Habitat and Benthic Surveys

Our highly experienced teams deliver efficient and scientifically robust marine ecological survey and assessment services to evaluate the impact of proposed marine activities on biological and physical resources and seafloor conditions. The Bureau of Ocean Energy Management (BOEM) requires these types of surveys in areas affected by the construction, installation, and operation of buoys, cables, meteorological towers, wind turbines, and supporting structures.

## Contact us to learn more

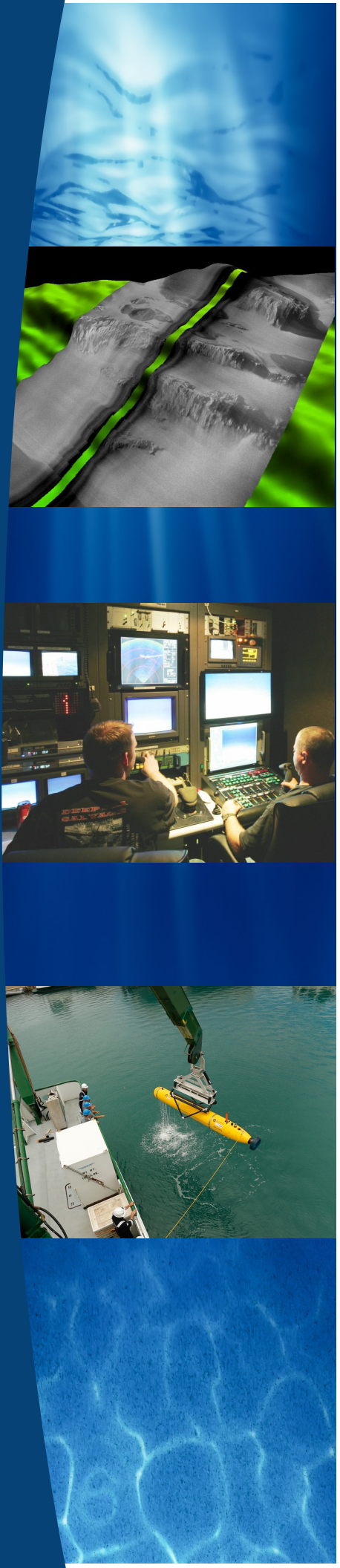
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## Inspections (Pipeline/Umbilical/Cable)

Offshore pipeline/umbilical/cable inspections represent a unique challenge in that they occur in some of the harshest environments on the planet. Phoenix performs quality pipeline/umbilical/cable inspections with ROV video and acoustics, and multibeam or side scan sonar to accurately monitor and evaluate for leaks or provide regular visual inspections.

## Route Surveys (Cable and Pipeline)

Route surveys are used to confirm that the client's chosen route is suitable for cable or pipelay by gathering detailed information using MBEs, SSS, sub bottom profiler (SBP) systems, and magnetometers. Phoenix technicians carry out route surveys prior to cable and pipe laying operations or subsea construction.

## Seabed Mapping

The ocean's floor is as complex as it is deep. Through bathymetric data gathered utilizing MBEs—either ROV-based or over-the-side pole-based—flatlands, walls, seamounts, and vast trenches can be readily identified. This information can be invaluable in offshore applications involving dredging, trenching, sonar/acoustic pipeline inspections, or site surveys.

## Unexploded Ordnance (UXO) Surveys

Phoenix offers surveying services to locate and identify UXO that may be in the vicinity of proposed renewables developments. We conduct magnetometer and gradiometry surveys using towed arrays that can operate from very shallow to deep water conditions.

## Supporting Services

In addition to the above, Phoenix also offers the following accompanying survey related services:

- Computer Aided Design (CAD) and Geographical Information Systems (GIS) support
- Data processing and reporting
- Dimension control surveys (including offset measurements)
- Differential Global Positioning System (DGPS) verifications
- Quayside vessel gyro and motion sensor calibrations
- Ultra-short Baseline (USBL) calibrations
- Video recording for documentation

**Phoenix International Holdings, Inc.**

**An employee owned company**

