

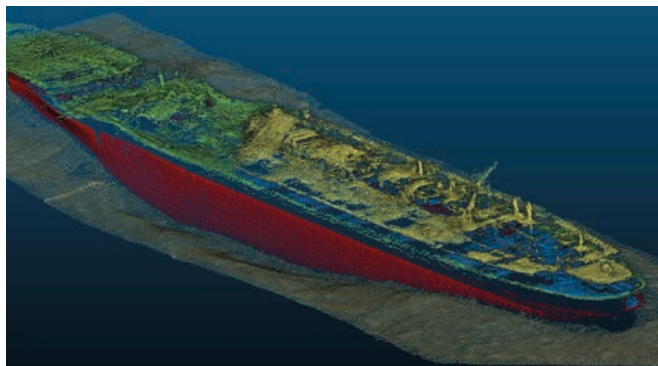
Professional Geoscience Services



Oceaneering geoscientists, geophysicists, geologists, archaeologists, and marine scientists specialize in the processing, interpretation, and reporting of high-resolution geophysical data while following government regulations and client needs to provide valuable deepwater geohazard assessments for all lease development activities.

Desktop Studies

We deliver preliminary studies to aid in the design of the most feasible routing options prior to a field survey. Studies contain bathymetric information as well as general seafloor and soil conditions, utilizing Oceaneering's proprietary databases as well as public domain databases including hydrographic charts, published papers, and publicly available government resources such as the United States Geological Survey (USGS), Bureau of Ocean Energy Management (BOEM), and the Bureau of Safety and Environmental Enforcement (BSEE).



Assessments

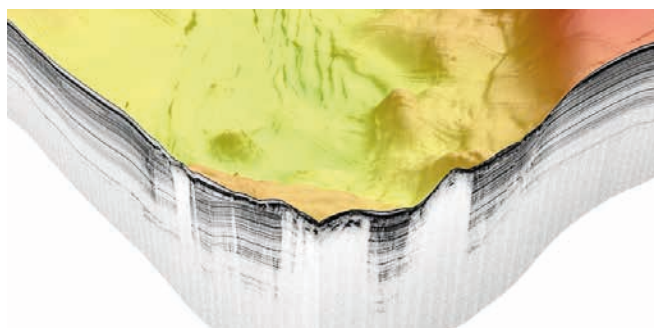
- » **Pipeline Engineering and Block Geohazard**
Using geophysical data from deepwater autonomous underwater vehicle (AUV) or conventional shelf surveys, we provide geohazard assessments over entire lease blocks, as well as engineering and geohazard assessments over proposed flowline routing options. Installation contractors and project engineers use the assessments to identify design criteria for future installations based on the bathymetric, environmental, and surface and subsurface geological hazards identified.
- » **Deepwater Geohazard Block Survey**
Deepwater prospects are usually assessed for geohazards using the operator's exploration-quality 3D seismic data. Our assessments address the seafloor and subsurface drilling hazards, buried shallow gas, and shallow water flow potential.
- » **Wellsite Clearance**
Proposed wellsite clearance assessments accompany deepwater geohazard block survey assessments. Proposed wellsite locations focus on geohazards within a set radius centered on the well, and the 3D seismic data is utilized to create a top-hole drilling prognosis addressing geohazards along the planned wellbore.

» Benthic Community

Deepwater AUV data is utilized to outline potential deepwater benthic communities or other biologically sensitive features. Ground truthing these biologic communities is accomplished using a high-resolution camera mounted on the AUV that creates a seamlessly mosaic image of the seafloor.

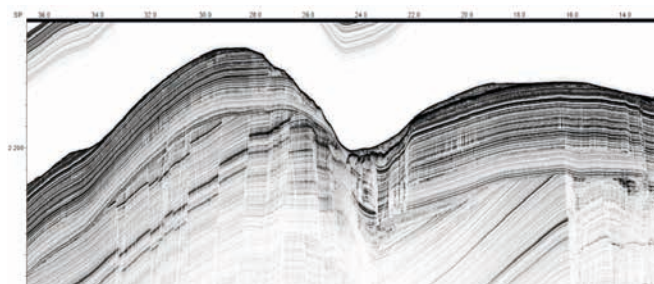
» Archaeological

Marine archaeologists interpret geophysical data of shipwrecks and potential prehistoric habitation sites. Recommendations for avoidance or further investigation of archaeologically significant targets are provided in compliance with BOEM/BSEE guidelines, or other government regulations.



Pipeline Inspection Reports

Our AUVs are outfitted with a Voyis laser bathymetry system and high-resolution camera. Utilizing the ultra-high resolution laser bathymetry data along with proprietary pipeline inspection software, our geoscientists can provide pipeline inspection reports which previously was only possible using a Remotely Operated Vehicle (ROV). Identifiable features included in the report are engineering assets such as anodes, field joints, or support structures, as well as pipeline conditions including spanning, depth of burial, or lateral buckling. The results are provided in a comprehensive pipeline inspection stationing report with alignment sheets providing a visual display of the results, including the geodetically and feature-tagged laser and camera data.



■ For more information: oceaneering.com/survey

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