The northernmost area of the Earth presents great opportunities, but also great challenges for developers. The Arctic’s extreme climate, remote locations, and changing terrain demand technically adept solutions, uncompromising vigilance, and respect for the environment and ecosystems that exist there. With over four decades of experience, Fugro has become a preferred provider of survey, geotechnical, and subsea services in this vast and often unpredictable region.

**Introduction**

Fugro first started working in the Alaska Arctic in the early 1970s, providing exploration geophysics and geohazard analyses for oil and gas pioneers in the Bering, Beaufort, and Chukchi Seas. As technology and innovation improved over the 1980s and 90s, so too did our range of capabilities, extending to detailed soil and foundation modelling and high resolution engineering studies in areas of permafrost.

Today, our detailed site investigations, geophysical and hydrographic surveys, data interpretation and integration, consultancy support, mapping, and positioning services provide vital insight on the geography, terrain, weather and habitats that exist across the Arctic. From our offices in northern Canada, Alaska, Norway and Russia, we deliver the high quality data and supporting activities that enable safe, responsible, and efficient Arctic exploration and development.
Survey Services
Fugro provides an extensive range of measurement and mapping services for onshore, nearshore, and offshore locations around the world.

Employing state-of-the-art data acquisition technologies on land, from the air, and at sea, we collect, process, analyse, and integrate knowledge to help improve the way the Earth’s resources are used and the way large structures, buildings and infrastructure are designed, constructed, and maintained.

- Meteorology and oceanography
- Weather forecasting
- Offshore structural monitoring
- Marine environmental services
- Airborne lidar bathymetry
- Seep hunting surveys
- Geophysical surveys (onshore/offshore)
- Hydrographic mapping
- Cable route surveys
- Construction survey support
- Satellite monitoring and mapping
- Orthoimagery
- Lidar mapping
- GIS services
- Dimensional control surveys

Geotechnical Services
Fugro’s field data collection, laboratory testing, and geoconsultancy services focus on ground site investigations in onshore, nearshore, and offshore environments.

Identifying geological conditions and foundation zone soils and rocks allows us to create a representative ground model and assess potential geohazards, providing designers and engineers with vital insight to ensure the long-term integrity and safety of buildings, constructions, infrastructure and environmental resources.

- Offshore, nearshore, and onshore geotechnical investigations
- Instrumentation and monitoring
- Geotechnical engineering analysis and foundation design
- Laboratory testing of soils and rocks
- Construction materials engineering and testing
- Nondestructive and deep foundation testing
- Geological and geophysical surveys
- Marine installation services
- Pavement management services
- Gas hydrate investigations
- Geoconsulting services

Subsea Services
Fugro provides subsea support to the global oil and gas, marine civils, and renewable energy sectors during the development, operation and decommissioning of oil and gas fields and the facilities and infrastructure required for offshore windfarms.

We conduct a wide range of subsea construction and installation support services as well as engineering design and tooling, hyperbaric welding, and corrosion protection services using specialist equipment, divers, dedicated vessels and skilled technicians.

- Inspection, repair, and maintenance
- Installation and construction support services
- Drill support and ROV services
- Subsea engineering and tooling
- Trenching services
- Diving services
- Live operations monitoring and visualisation
ARCTIC SPECIALTY SERVICES
In addition to our standard suite of services, we offer a number of capabilities specific to Arctic exploration and development projects.

Permafrost Studies
Measuring, characterising, and monitoring sub-surface conditions in permafrost regions for improved foundation design and long-term structural integrity:
- Utilises geophysical, load testing, CPT, geothermal, and geomonitoring expertise
- Results in accurate, reliable insight on ground temperatures and mechanical properties and conditions
- Enables informed decision-making, engineering, and risk management in highly sensitive areas

3D Iceberg Profiling
Defining complex iceberg properties above and below the waterline for ice engineering, ice management, and risk mitigation:
- Utilises multibeam sonar, digital photogrammetry, and motion compensation technologies
- Results in high density 3D iceberg models
- Enables multiple applications including impact analysis, drift prediction, and in-field ice management, among others

Ice Gouge Investigations
Providing you with critical information about the depth, frequency, and relative age of ice gouges to inform Arctic infrastructure design and installation:
- Requires multibeam (including backscatter), sub-bottom profiler, and sidescan sonar technologies
- Provides a high resolution digital elevation model of the seabed
- Offers information about contemporary and historical ice gouging

Design and Modelling
Modelling and analysing conditions unique to Arctic environments to assist with wellbore and foundation design and engineering:
- Numerical modelling of stability of Arctic offshore mudline cellars to protect wellheads against potential ice gouging hazards
- Evaluation of the impact of thaw-induced ground subsidence on the integrity of Arctic wells due to heat transfer from the wellbore into surrounding permafrost and/or gas hydrates
- Evaluation of the impact of gas hydrate dissociation effects on wellbore integrity
BENEFITS OF FUGRO IN THE ARCTIC

No matter how remote the location, how extreme the conditions, or how complex the undertaking, our Arctic team is prepared to advance your project.

With 45+ years of experience in the region, Fugro is a preferred provider of survey, geotechnical, and subsea services, offering clients:

- Local presence. Our offices in Alaska, Canada, Norway, and Russia are staffed by professionals committed to advancing Arctic programs in their respective regions.
- Arctic HSE. We have developed and implemented certified HSE management systems specific to the Arctic environment.
- Dedicated resources. Our assets include multiple ice-class vessels, as well as Arctic-ready jack-up platforms, land-based rigs, trenching capabilities, survey, and geophysical equipment.
- Proven experience. Our decades-long Arctic experience includes projects in Alaska, Norway, the Canadian Arctic, Greenland, and Russia.
- Multiple expertise. Fugro’s abilities extend into oil and gas, mining, infrastructure, and the public sector markets.