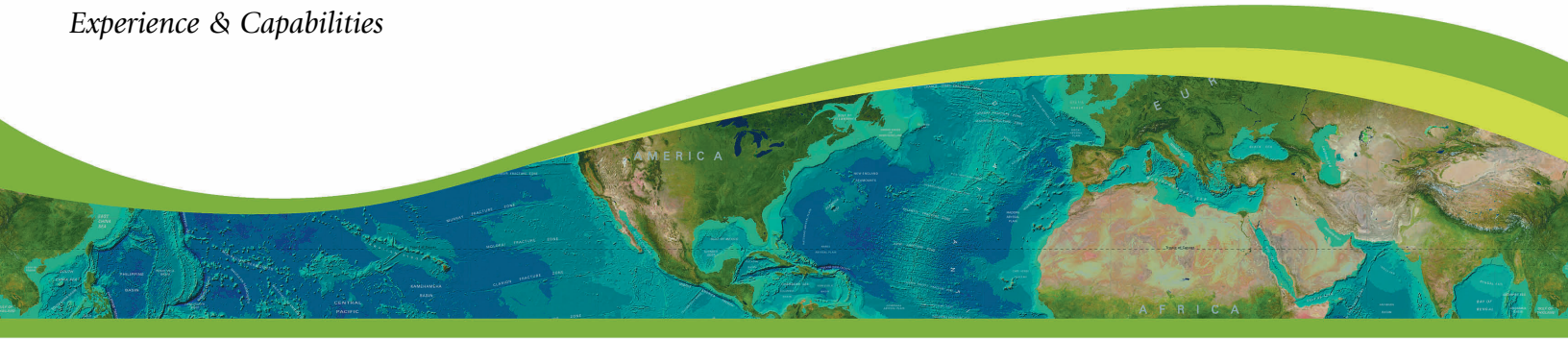


# Arctic Engineering

## Experience & Capabilities



### Experience

GEMS joined with Gregg Drilling and TDI Brooks International to form an arctic team that provides key arctic geoscience services. Our team's arctic experience includes:

- Site investigations
- Geophysical surveys
- Foundation analyses and design for offshore oil and gas exploration and production facilities

Offshore projects for the team include Alaska, Canada, and Russia. And, a number of team members having over 30 years' experience working on projects in the Arctic.

GEMS' core group consists of geologists, geotechnical engineers, geophysicists, and technicians that have a wide range of experience in the Arctic. Our professional staff has worked on arctic projects worldwide involving a variety of soils, including permafrost. GEMS has provided our clients with geoscience services in the following Arctic regions.

- Beaufort Sea (U.S. and Canada)
- Chukchi Sea
- Bering Sea
- Labrador Sea (Newfoundland)
- Barents Sea (Russia)
- Kara Sea (Russia)
- Sakhalin Island (Russia)

Our team of professionals has extensive experience in all aspects of arctic geology and geotechnics. We conduct geophysical surveys and geotechnical investigations using a methodology that results in high-quality data for the Arctic and all regions of the world. This experience means that our professionals can effectively respond to our clients'

needs. We are sensitive to the diverse cultures present and are still effective with local, national, and international regulatory processes important to expediting projects. The GEMS team has worked on projects for Shell, BP, ExxonMobil, ConocoPhillips, Marathon, Chevron, Dome Petroleum, TransCanada Pipeline, and Esso Canada.



### Capabilities

Our experience specifically includes expertise in the following areas:

- Cold region foundation design
- Permafrost engineering
- In situ testing and sampling
- Specialized cold region laboratory testing
- Production well thermal analyses and thaw settlement
- Gravity base foundation analysis
- Thermal properties of soil and frozen soil
- Ice foundation interaction analyses
- Geophysical and ice gouge surveys
- Pipeline route selection and burial studies

