

Towed Streamer EM Surveys

OIL AND GAS APPLICATIONS

Electromagnetic (EM) methods, which measure the electrical resistivity of the sub-surface, are used to complement other geophysical approaches across the hydrocarbon exploration and exploitation life cycle. Multiphysics workflows incorporating both EM and seismic data can lead to improved seismic imaging and more robust determination of rock and fluid properties.



Improved seismic imaging in areas of complex geology such as around basalt or salt



Prospect ranking and improved probability of success



Prospect evaluation and quantitative determination of rock and fluid properties

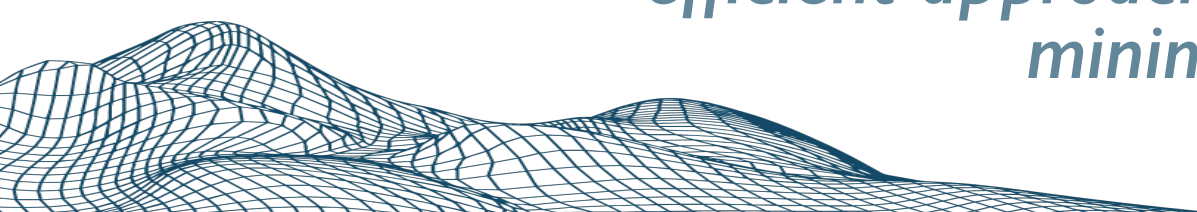


Step-out or near field exploration close to existing fields

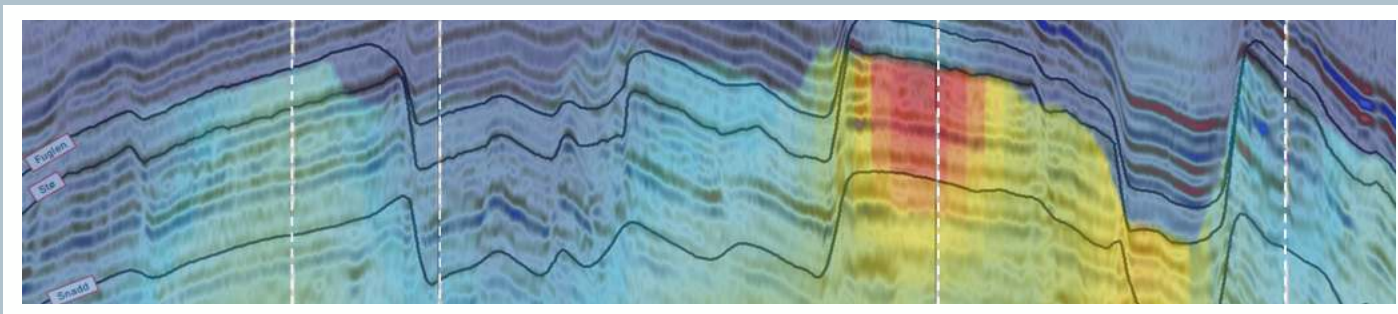


Carbon capture and storage during and after injection

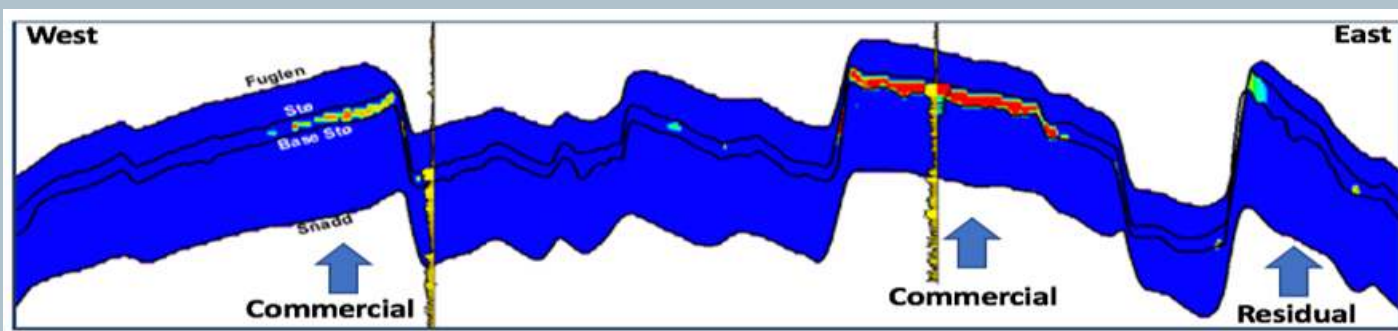
The towed streamer EM system provides an efficient approach to acquire EM data with minimal environmental impact.



Applications in Exploration and Appraisal



BARENTS SEA, NORWAY



RESISTIVITY DATA

The hydrocarbon accumulations are clearly mapped as areas of elevated resistivity (red) in this seismically guided inversion of towed streamer EM data



MULTIPHYSICS ANALYSIS

RESISTIVITY, SEISMIC AND TOWED STREAMER EM DATA

Hydrocarbon saturation derived from petrophysical joint inversion of electric and elastic attributes

Alvarez, P., Alvarez, A., MacGregor, L., Bolivar, F., Keirstead, R. & Martin, R., 2017. Reservoir properties prediction integrating controlled source electromagnetic, pre-stack seismic and well log data using a rock physics framework: Case study in the Hoop Area, Barents Sea, Norway, Interpretation, 5 (2), SE43-SE60.

Towed Streamer Electromagnetic Surveying

The Towed streamer EM method was developed by PGS Geophysical AS and first deployed commercially in 2009 for hydrocarbon exploration. Since then over 20,000 line km of EM data have been collected using this approach. OFG acquired the exclusive rights to this system in August 2020.

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Benefits of Towed Streamer EM



Dense Source and Receiver Coverage

- Both source and receiver coverage are continuous along survey lines
- High resolution of sub-surface resistivity structure within the system's depth of investigation



Efficient Data for a Fixed Budget

- Data acquired three times or more faster than possible using other offshore EM methods, allowing more data to be acquired within a fixed budget



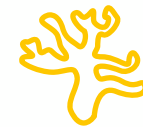
Flexible Operations

- Can be operated from a vessel of opportunity, in combination with other survey technologies



Real-time Data Monitoring

- Data recorded in real time on the survey vessel to give an early indication of data & data quality
- Allows problems to be rapidly resolved



Low Environmental Impact

- No contact with the seafloor
- Transmitted fields have little to no effect on marine wildlife in the survey area

Let's start talking

For further information on resource mapping using OFG's towed streamer EM system and multiphysics interpretation workflows, please contact:



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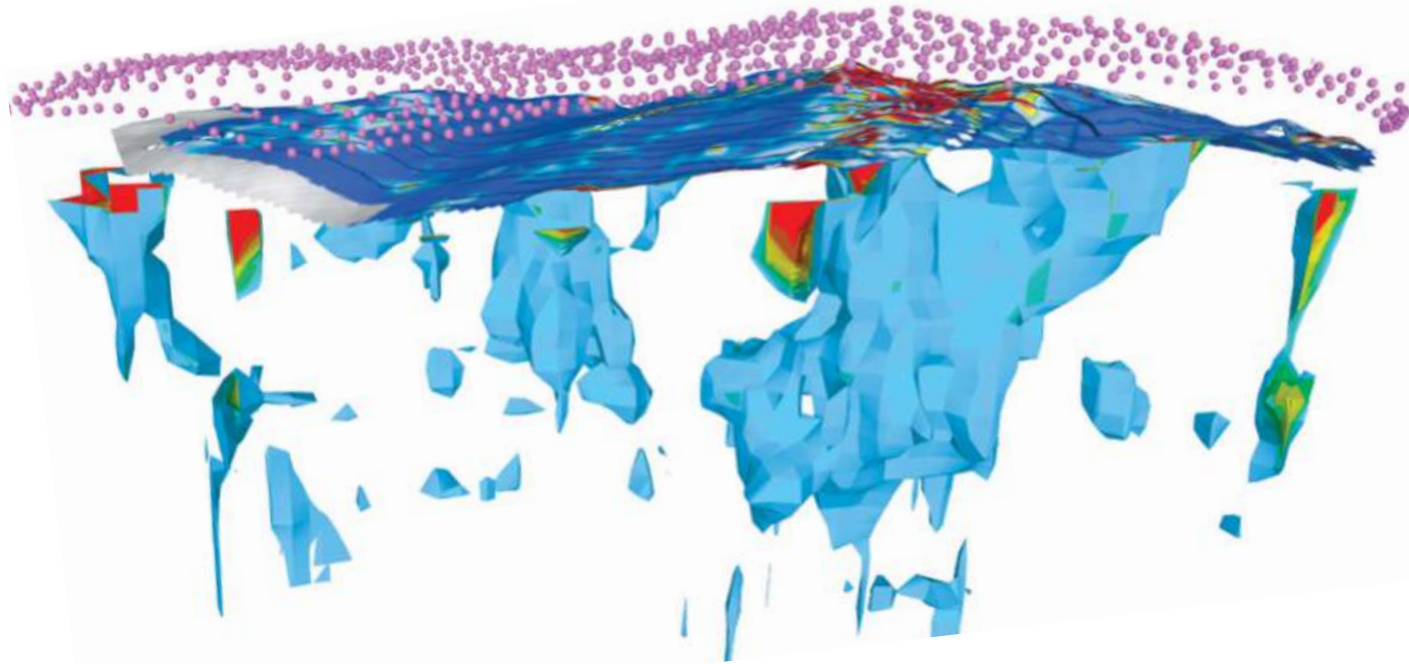
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OFG



OFG formed in 2007 to provide services & expertise for the sea floor minerals industry. Since then, we have expanded our offerings to solve subsea surveying challenges across a range of markets including the renewables, oil and gas, defence and minerals sectors. We bring together expert teams of engineers and geoscientists to design, integrate and operationalize complex sensor systems deployed from AUV, ROV, USV and surface vessels. We collect rich multiphysics datasets, and interpret these to meet and exceed survey objectives in an efficient and safe manner, with minimal environmental impact.

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Wide horizons, *tight* focus.