## Prosjektoppgave / Diplomoppgave at Statoil's research center

## QC of CSEM sensitivity tool by inversion

Marine Controlled Source Electro Magnetic (CSEM) inversion is a relatively new method for detecting and imaging hydrocarbon reservoirs located in the subsurface below the seabed. 3D imaging is done in practice by iterative inversion of the CSEM data.

Statoil has developed a tool to study the uncertainty of reservoir parameter estimates obtained by inversion. These uncertainties depend on the geological setting, on the data acquisition parameters, on the quality of the source and receivers and on certain properties of the inversion algorithm used. This tool is much faster than inversion tests.

Statoil wants to use this tool:

- for CSEM feasibility studies
- for designing optimal survey parameters when planning new CSEM surveys
- for predicting the benefits of improvements in the technology

One of the challenges of CSEM is to manage to image deeper reservoirs. Using our tool, we have for example been able to make interesting predictions about the possibilities of deeper imaging and about the types of improvements in data acquisition that are necessary for that.

However, our predictions have not been confirmed by inversion tests yet. Before this new tool can routinely be used in Statoil we must compare its predictions with inversion results for a series of tests representing typical CSEM current situations and future challenges (e.g. imaging at larger depths).

The work will therefore consist of making new predictions with our sensitivity tool and to compare them with, and hopefully validate them by, inversion results, first in 1D and then in 2D or 3D.

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