

Elastic iNversion for Advanced ground modelling in offshore wind

Publieke samenvatting / Public summary

Aanleiding

Offshore wind is scaling fast, but site investigations remain costly and slow because they rely on many Cone Penetration Tests (CPTs) with limited spatial coverage. Ultra-high-resolution seismic (UHRs) surveys already map whole sites, yet their potential to deliver engineering parameters is underused. By combining full-physics WEB-AVO inversion with machine learning, seismic data can be translated into design-relevant properties (ρ , M , G_{max}) and CPT-equivalent predictions (QT, RF). This enables fewer intrusive tests, shorter vessel time, lower emissions and faster, better-informed decisions for wind farm development.

Doelstelling

The project will operationally validate the WEB-AVO workflow for offshore wind seabed characterization. We will recover ρ and M from UHRs, derive G_{max} , and—via calibration at co-located CPTs—predict QT and RF across the full survey area. We will quantify accuracy at blind CPT sites, assess uncertainty and spatial resolution, and define data-quality thresholds and QC protocols for repeatable use. The outcome supports DEI+ objectives by enabling faster, more cost- and resource-efficient site investigations with a reduced offshore footprint.

Korte omschrijving

Six work packages: (1) identify and secure two UHRs+CPT datasets and one public legacy dataset; (2) adapt and configure the WEB-AVO workflow and QC; (3) process and validate Dataset 1 with blind-

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat
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site testing; (4) apply and optimize on Dataset 2 and compare robustness/repeatability; (5) exploratory application to public legacy seismic data for early-stage screening; (6) consolidate results into a pilot-ready release, technical manual and scale-up plan. DiReC leads technology, processing and validation; Fugro supplies datasets and scientific/operational guidance.

Resultaat

A pilot-ready, documented WEB-AVO workflow validated on two offshore UHRS+CPT datasets; velocity cubes, resolution and uncertainty maps; quantified accuracy at blind CPT locations; and a comparative assessment of an exploratory case for screening use. The project delivers evidence for CPT/time/cost reduction while maintaining design-grade confidence, plus recommendations to enable Fugro to scale the method into routine site investigations.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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