

A data portal: Blue Insight



A remote operation centre



Contracted by ConocoPhillips Scandinavia AS

Autonomous vehicles

Advanced sensors

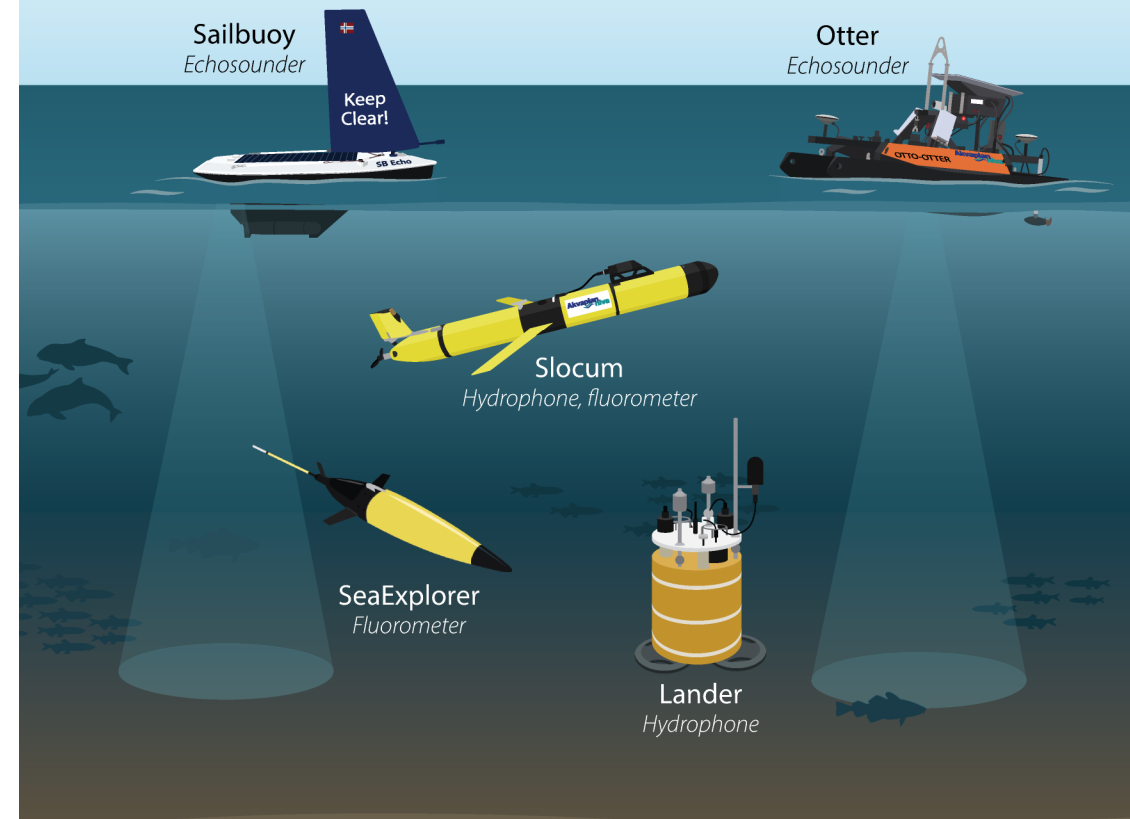
Digital models

Real time observations

Low CO₂ emissions

GLIDER

Environmental impact study of seismic activities and produced water by using autonomous systems



A fleet of autonomous vehicles

Akvaplan
niva

Produced water

Produced water is a regulatory discharge generated during offshore oil extraction. To understand the fate of the discharge into the sea across multiple spatiotemporal scales, we developed a high-resolution hydro-dynamic model.

We performed an in-situ mapping of the discharge using three under water autonomous vehicles rigged with sensors to detect a fluorescent dye injected in the produced water. In situ data allowed to verify, recalibrate and validate the model.

To monitor possible effects of the discharge on zooplankton and fish, high resolution echosounders were deployed from uncrewed surface vehicles for months around Ekofisk. No impact was measured in the distribution, nor biomass of zooplankton and fish.

Seismic impact

Seismic sound propagation was modelled to assess the exposure of fish at known spawning areas north of the Ekofisk field. Model predictions were consistent with in-situ measurements of sound intensity from a hydrophone mounted on an underwater Slocum glider at different distances from the seismic vessel operating at Ekofisk.

A hydrophone was deployed on the seafloor in the vicinity of Ekofisk to monitor baseline sound level from the installations, other maritime activities, and environmental sound for a whole year. Seismic operations increase the underwater sound levels during the survey period.

To measure possible effects of seismic activity on plankton and fish, several echosounders were deployed from uncrewed surface vehicles and seafloor fixed platforms. Measurements carried out before, during and after the seismic survey, showed no significant impact of seismic activity in the large-scale distribution and biomass of zooplankton or fish. We observed a temporary aggregative response in fish in the vicinity of the seismic vessel (~1km) corresponding to a behavioural avoidance reaction which ended after the vessel had passed.

