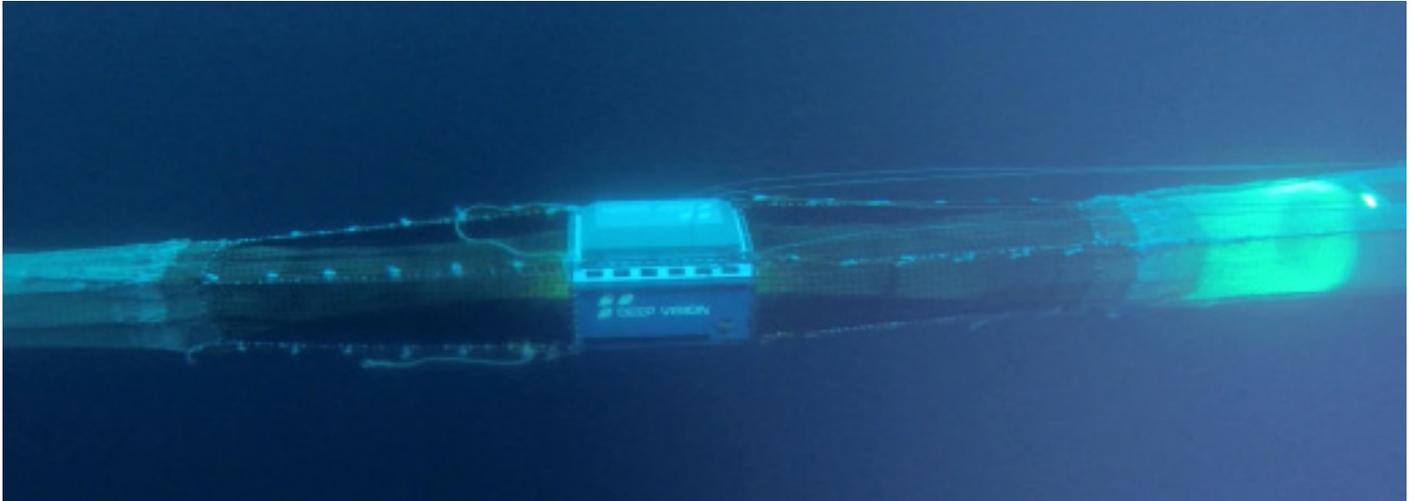


# DEEP VISION - a revolution in fish sampling

Deep Vision is a subsea vision system for identifying and measuring fish under water. A subsea camera unit attached to the trawl makes it possible to identify and measure fish without bringing the catch aboard the vessel. Deep Vision is an invaluable tool for marine researchers and a great technological leap towards more sustainable fisheries.



**DEEP VISION FRAME UNDER WATER:** The Deep Vision frame is attached to the trawl and records images of all organisms passing through. This unique approach to fish sampling enables research to be done without bringing the fish onboard the vessel. PHOTO: Jan Tore Øvredal/CRISP

Deep Vision is the result of cutting edge computer vision technology and advanced image analysis techniques incorporated into robust and innovative subsea enclosures.

The system is currently used for research purposes with the great advantage of research being conducted without bringing the fish onboard.

## Time, depth, length and species

The Deep Vision system consists of a frame and camera unit attached to the cod end of the trawl, the end being open or closed. During a haul all organisms

passing through the trawl are lit up by LED lights and photographed by a stereo camera.

The high definition images are analyzed in the Deep Vision software for registration of species and semiautomatic length measurement. All images are logged with time and depth information which, correlated with GPS data, will show the exact position of the fish in the water column along the haul (see figure next page).

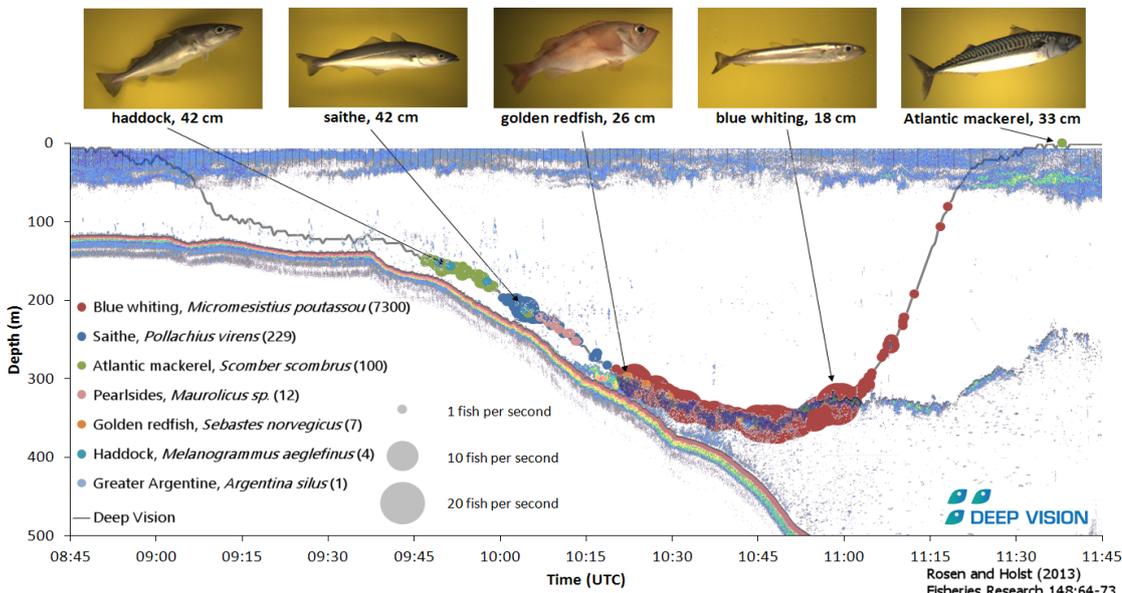
The unique images and information collected from the sea can be used to great benefit for a range of research purposes, such as using the images to confirm acoustic data in resource mapping.

## Deep Vision sorting system

The Deep Vision software is under continuous development, the long term goal being a system that can automatically measure and classify different species so that digital information about the mix of species can be sent

**SCREEN SHOT:** The stereo camera system takes five images per second, which are further processed in the Deep Vision software for information about length and species. All images are provided with time and depth information that correlated with GPS data give invaluable information about the position of the fish.





**DEEP VISION OVERLAYED WITH SONAR DATA:** Deep Vision is an invaluable tool in acoustic mapping of resources. All images are logged with information about time and depth. Combined with sonar data the system shows the density of different species along the haul.

in real-time to the vessel. Combined with a sorting mechanism this will benefit the commercial fisheries enabling them to map and sort the catch before bringing it onboard.

The use of Deep Vision in commercial fisheries will be a great technological leap towards reduced bycatch and more sustainable fisheries.

### Cutting edge monitoring technology

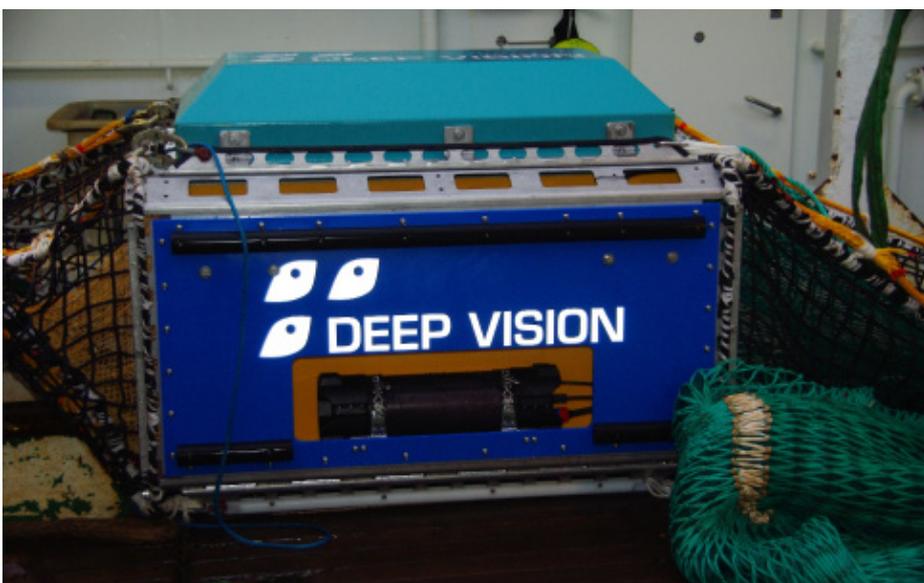
A sister company of Scantrol AS, Scantrol Deep Vision AS is dedicated exclusively to the development of cutting edge technological solutions for fish sampling and monitoring.

The Deep Vision system is developed with close access to Scantrol's extensive experience and know-how in monitoring and control systems for the marine industry, and in close cooperation with Institute for Marine Research (IMR) in Bergen.

The system has been tested on several of the research institute's vessels and is featured as part of IMR's Centre for Research-based Innovation in Sustainable fish capture and Pre-processing technology (CRISP). The aim of CRISP is to bring together world-leading Norwegian companies that supply fishery technology and marine products with scientific research institutions in order to develop innovative technology and solutions for sustainable harvesting of marine resources.

The latest version of the Deep Vision system was during the first half of 2015 trialed on three cruises, two of them with "G.O. Sars", for a total of 30 hauls.

The commercial prototype of Deep Vision is available for rental. Please see contact information below for availability and quotation for your project.



### Deep Vision features:

- 2000m depth rating
- 40.000 Lumens of light
- Dual high-speed, high sensitivity colour cameras
- High quality optics
- Stereo camera for accurate length measurement
- Depth sensor
- 8 hours battery power
- WiFi and Ethernet connection

