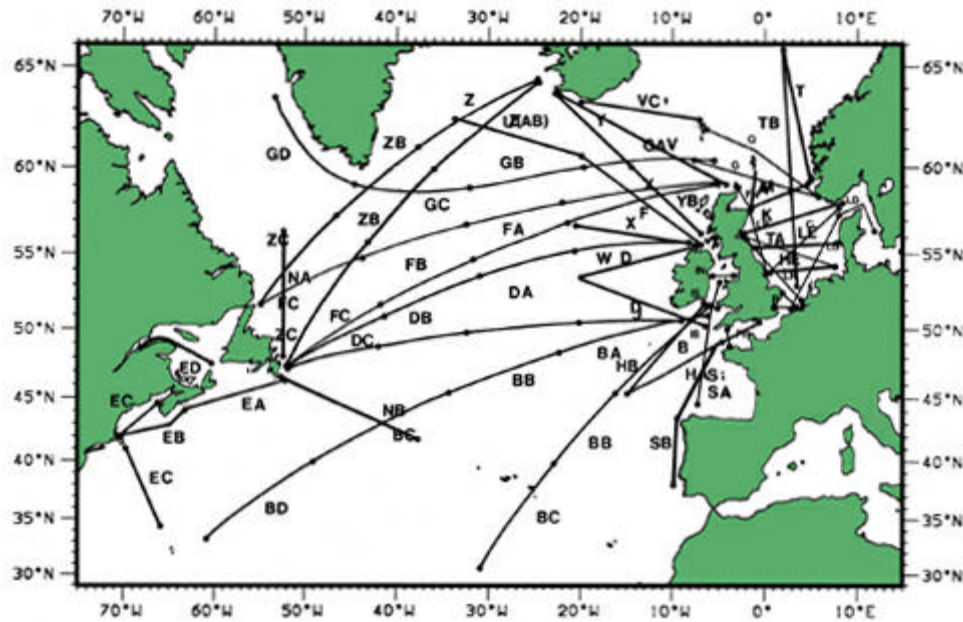


Sir Alister Hardy Foundation for Ocean Science

INTRODUCTION

The aims of the CPR Survey are to monitor the near-surface plankton of the North Atlantic and North Sea on a monthly basis, using Continuous Plankton Recorders on a network of routes to cover the area. The map below shows the full network of routes that have been towed over the last 60 years, each with two letter route ID. These routes were not all used at the same time. For detailed maps of every tow in each year, refer to the following publication:

Warner A.J. and Hays G.C.(1994). Sampling by the Continuous Plankton Recorder Survey. *Prog. Oceanog.*34, 237-256



The CPR is a plankton sampling instrument designed to be towed from merchant ships on their normal sailings. Alister Hardy used the first prototype to sample euphausiids in the Antarctic on the Discovery cruises of 1925-27. He modified the design for use in the North Sea, and started collecting plankton in the 1930s. The CPR was deployed in the North Sea regularly from 1946, on a number of routes. It is about one metre long, made of gunmetal, phosphor-bronze and stainless steel, with a lead nose cone. It is towed on 10mm wire rope at a depth of about 10 metres from towing ships. The wire is connected to the CPR via a shock absorber. The CPR has been operated successfully at speeds of 22 knots, and its robust design allows deployment in rough seas without fear of excessive damage.

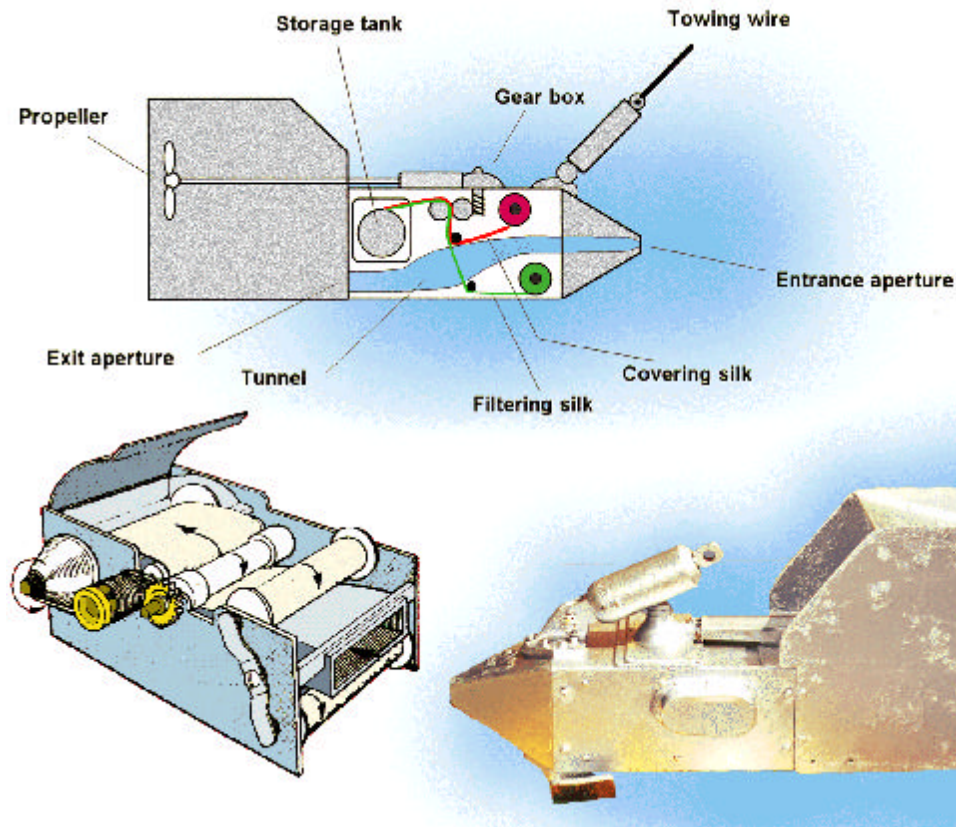


Diagram showing a cutaway view of the CPR the plankton filtering mechanism and a photograph of the instrument

The CPR works by filtering plankton from the water over long distances (upto 450 miles) on a constantly moving filter made of silk. The filter silk is wound through the CPR by a propeller. The cut away diagram shows the layout of the plankton filtering mechanism (sometimes described as the 'internal mechanism' or 'cassette') and the propeller.

The internal mechanism (also shown) is a self contained cartridge that is loaded with the filtering silk at the laboratory and placed inside the CPR prior to deployment. On some tows, the ships are supplied with several internal mechanisms which they load into the CPR to increase the sampling range. On return to the laboratory, the silk is removed from the mechanism and divided into samples (known as blocks) representing 10 nautical miles of towing. The plankton on these samples are then analysed according to standard procedures.

Before cutting, the colour of the silk is simply compared to a colour chart and given a 'green-ness' value of 0 (no greenness), 1 (very pale green), 2 (pale green) or 6.5 (green). Other colours are not recorded. This is a subjective analysis, with arbitrary values returned, but it can be the first indication of phytoplankton blooms on our samples.

After cutting into blocks, microscopic analysis of the plankton contained on the sample is undertaken. A subsample of the block is examined under high power magnification to identify and count phytoplankton species present. (the sub-sample is about 0.001 of the whole sample). This analysis is known as 'Phytoplankton field analysis'.

Another sub-sample analysis for small zooplankton is then carried out under a lower magnification, where all individuals seen in a traverse of the silk are identified and counted. (This sub sample is about 0.02 of the whole sample). This analysis is known as 'zooplankton traverse analysis'.

Finally, all zooplankton larger than about 2mm are identified and counted from the whole sample. They are spotted by eye, but identified under the microscope. This is known as 'zooplankton eyecount analysis'.

After analysis, the counts are checked and added to the CPR database, which contains details of the plankton found on over 170000 samples taken since 1946 in the North Sea and North Atlantic Ocean.