

MARINE TECHNOLOGY

The new organization of the Marine Technology department that was implemented in 2004 was able to settle down in 2005. In the beginning of the year Bob Koster became the new head of the Electronics department, a position he swapped with Ruud Groenewegen. Being part of the national Marine Research Facilities (MRF) of NIOZ, we were very glad to be evaluated for the first time by the International Peer Review Committee. The contribution of the MRF-facilities to the mission of NIOZ was seen as “absolutely essential” and the overall assessment was rated “very good to excellent”. This view strengthens our vision that we are developing in the adequate direction - being expressed in our motto: “Effective Technology for Excellent Science”

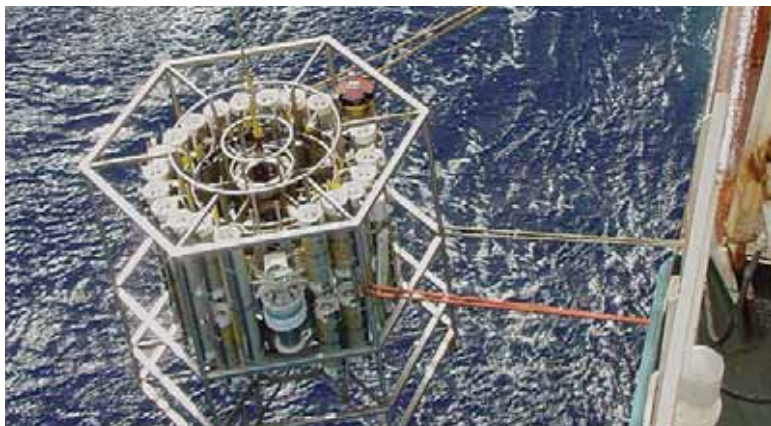
In 2005 we worked on 280 projects, of which a few are highlighted in this paragraph.

Improved flushing of CTD water sampling system

The CTD water sampling system is an important basic tool in the great majority of our research cruises. When small differences in water quality should be detected, the system was restricted by insufficient refreshment of the sampled water. The flushing capability of the entry- and exit valves could be

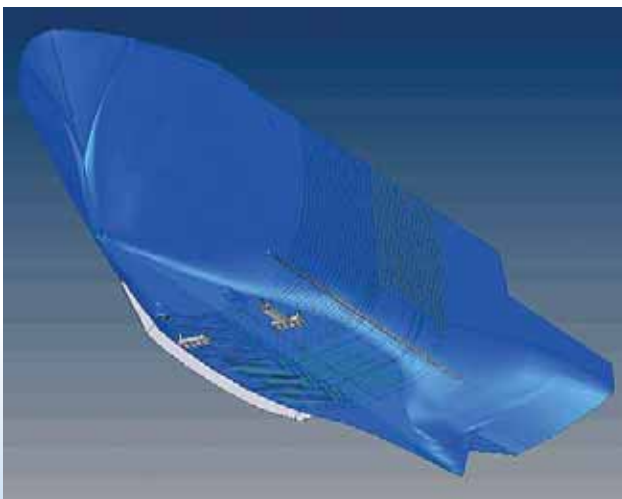
increased by changing the triggering system from a vacuum system to a pressure system. Tests of the

innovated system showed a significantly improved flushing rate of the sample bottles.



CTD water sampling system

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“Looking up” view of the RV Pelagia’s hull showing the mounting of the multibeam

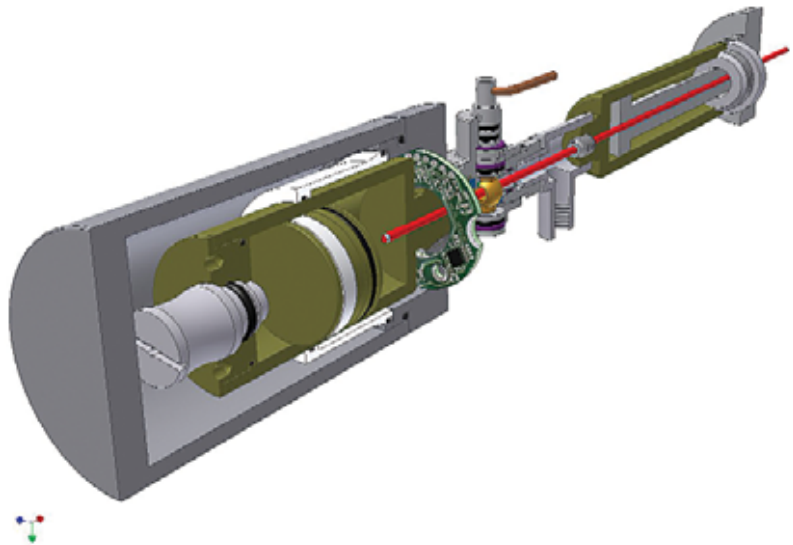
Multibeam Echosounder study

For a seagoing research vessel a Multibeam Echosounder is often a standard part of the ship-board equipment. Therefore NIOZ was very happy that an application to the NWO-middelgroot programme was granted to purchase such a system. One of the first questions to be answered was which of the several options should be chosen to mount the system to the RV Pelagia. An extensive study resulted in an Add-On solution, because in this way optimal data quality could be combined with a limited effect on the ship’s resistance.

Progress in Pressure Retaining Deep Sea Sampler

The activity of bacterial life recovered from the deep sea proved to be heavily affected by the drastic changes in pressure when samples were raised to the sea surface. The bacteria “did not like” the strong decompression they experienced when taken from 5km depth at 500 bar to 1 bar at the sea surface. To cope with this, we started to develop a High Pressure Sampler in 2004. Although the progress of the project was severely restricted by funding drawbacks, a small scale start-up could yet be realized and several titanium samplers - complex but effective - were produced.

In cooperation with the Old Dominion University in Norfolk, USA, equipment was constructed which allowed for the addition of



3 D model of the Pressure Retaining Deep Sea Sampler in combination with the nutrient injector-unit

nutrients to the samples while maintaining their original high pressure environment in the sampler. In this way, the bacteria could be fed at 600 bar. The samplers were

used during the Archimedes cruise 2005 and proved to be technically and scientifically successful.

Sensors in MOONPOOL on new Texel ferry

The on-line monitoring of the tidal inlet Marsdiep using the TESO ferry sailing between Texel and Den Helder entered a new era by the introduction of a new ferry. The christening of the new ferry “Dr Wagemaker” in July allowed us to start using a flexible and retrievable monitoring platform, in a moon-pool set-up which makes servicing and replacement of equipment much easier. As on the old ferry Schulpengat, the passengers can see several on-line data on two big plasma screens in the passengers saloons.



Current sensors at Texel ferry monitoring platform



Bottom lander before deployment



Bottom lander after recovery

Improvements in Recruitment bottom landers

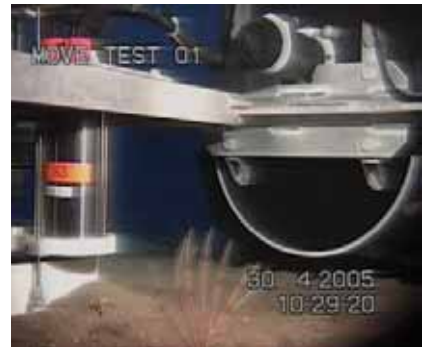
For the study of settling of bivalve larvae in the North Sea, autonomous bottom landers are used. These landers have a deployment period of approximately six weeks. Especially in the spring heavy bio-fouling can easily endanger reliable data sampling and lander recovery. Improvements were implemented on the larval collector, the recruitment trays and the pop-up recovery system to tackle this severe problem.

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Progress MOVE (MOBILE VEhicle for benthic research)

The MOVE is a deep sea crawler designed to perform bottom research at several stations. Successful trials were performed on the continental slope west of Portugal at a depth of 1300 m.

Video snapshot of the MOVE in action showing bottom measurements and bottom water sampling



Sediment Trap Sample Splitter

A sediment trap collects the slowly falling particles (marine snow) that will form the future seafloor sediment layers. Splitting one valuable recovered sample into several exactly the same subsamples requires special equipment. An improved version of the existing Tennant and Baker high precision splitter (NOAA) was developed.

The sediment trap sample splitter, filter bottle and control unit.

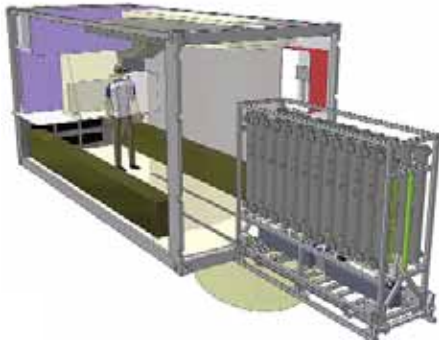


Ultra Clean water sampling

For measuring very low concentrations of trace metals (mainly iron) the standard CTD-water sampling systems are inadequate because the background levels of metals

are far too high. In order to allow for contamination free sampling, an entirely new system was developed. The main issues in the new solution are: the use of a Titanium CTD-frame, the use of a container-

ized clean room (class 10.000) and clean, effective shipboard handling. The system will participate in 2 cruises in the International Polar year 2007 – 2008.



Clean container for sub-sampling



The rectangular Titanium frame can be driven into the Clean Container



Trials onboard of the RV Pelagia

Operational assistance for Utrecht University on the Italian RV Universitatis

Besides the common technical assistance during sea-going cruises on the RV Pelagia, cruises on other research vessels such as the British RSS Discovery (NOC) and the Italian RV Universitatis were supported by NIOZ technicians.

Utrecht University cruise: deployment of sediment traps on board of the RV Universitatis

