

Scientific Support Services



Marine Research Vessels and Facilities

Marieke J. Rietveld*

The NIOZ research vessel Pelagia sailed 317 operational days in total for 16 cruises during 2007. The National Programme for Sea Research comprised 8 cruises by Pelagia and another 3 projects by other research vessels. Active participation in the Ocean Facilities Exchange Group (OFEG) continued.

Marine Research Facilities

The Netherlands Marine Research Facilities (MRF) is a national structure integrated within NIOZ. MRF advises the Earth and Life Sciences (ALW) of the Netherlands Organisation for Scientific Research (NWO) on the technical, logistic and financial aspects of the National Programme for sea research. MRF supplies suitable ship capacity, dedicated technicians and sea-going equipment. When sea-going research projects have been approved of and granted by ALW, MRF assists the chief scientists in their planning, preparation and execution of the cruises. MRF also advises ALW on long-term investments, in consultation with the financial department and marine technical services of NIOZ and the advisory committees on CTD systems, auto-analyser systems, moored instrumentation systems, bottom sampling and seismic systems and biological sampling systems. Scientists and technicians from all Dutch groups involved in sea-going research participate in these advisory committees for pooled equipment. The Long Term Planning on MRF investments is updated every year and the update for the years 2007 – 2011 was submitted to NWO/ALW.

NIOZ/MRF is responsible for the maintenance of the national equipment pool and NIOZ runs several marine research vessels and other facilities for accommodating scientific programmes of the oceanographic community in the Netherlands. NIOZ participates with its multipurpose RV Pelagia and its equipment pool in the Ocean Facilities Exchange Group (OFEG), wherein ship-time is exchanged between partners on a bartering basis.

Research vessels

Research vessel Navicula is a 25 m NIOZ research ship specially designed for working in the shallow Wadden Sea. She has been built in 1980, and elongated in 1999, with a major upgrade in 2004. In 2007 an overall fire monitoring and alarm system has been installed. RV Navicula sailed for 187 days and also worked in the German and Danish part of the Wadden Sea.

The largest sea-going facility is RV Pelagia, a 66 m NIOZ research vessel developed for oceanographic research in coastal seas, on continental shelves and in the blue ocean. RV Pelagia was built in 1991 (ISM Certified) and was specially designed as a multipurpose research vessel with most favourable nautical and acoustical properties, with a very low noise level due to diesel-electric drive. Scientific gear used onboard comprises a variety of CTD-systems and water samplers (including the Ultra Clean CTD system TITAN), diverse biological sampling methods, seismic surveys, deep tow sonars, coring activities (box-, multi-, pis-



Testing the MOB boat.

ton, gravity, vibro-, CPT) as well as deployment and recovering of deep-sea moorings and bottom landers, including a deep sea crawler (MOVE!). Since 2006 RV Pelagia is equipped with a KONGSBERG EM 300 1 x 2 degree Swath multi-beam echo sounder for shallow and deep water.

In 2007 the implementation of the recommendations of the Committee Future Pelagia (CFP) resulted in an amended labour agreement for the members of the Pelagia crew.

Since RV Pelagia is now over 15 years of age and has come to the midterm of her operational life time, an expertise survey was held for the development of a long term maintenance plan for the remainder of the ship's operational life, and to decide on the right moment for a mid-life conversion. The expert's report will be presented to the NIOZ board at the beginning of 2008.



Recovery of ALBEX lander after one year of deployment in Witthard Canyon. Photo: Carlo Fiori.

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RV Pelagia cruise programme 2007

After a four week maintenance period, RV PELAGIA sailed for 317 operational days, including a barter cruise of 26 days for a science team of Bremen University. In August a survey was done in the North Sea on a 28 days commercial charter. On 31 August 2007, just before the ship was sailing out for a research cruise in the northern North Atlantic, NIOZ could offer a possibility to the research council NWO to invite the standing Dutch Parliament Committee for Science & Technology, and give a presentation of the NWO science policy on board RV Pelagia in Scheveningen harbour.

Science projects were funded by the Netherlands Research Council NWO (also funding 92 days ship time), the European Union (no ship time funding), and NIOZ (175 days of which 98 days for the NWO National Programme and 19 matching EU/GBP projects); 50 days were funded by charterers and other third parties. An overview of the Pelagia cruise program 2007 is presented below and this over-



RV Pelagia leaving Galway harbour packed with gear end of September 2007. Picture Courtesy GalwayShips.com.

view also comprises the cruises by other research vessels with Dutch participation. Details of the cruises within the National Programme (funded by NWO) are given in the next subchapter.

To accommodate the cruises by RV Pelagia, diplomatic clearance has been granted by Denmark, France, Germany, Iceland, Ireland, Morocco, Norway,

Portugal, Spain, Sweden and UK. Besides calling at homeport Texel, port calls for change of crew and scientific party as well as (un)loading scientific equipment took place in Brest (France), Cuxhaven (Germany), Caniçal and Funchal (Madeira-Portugal), Lisbon and Portimão (Portugal), Cork and Galway (Ireland), Aberdeen (Scotland - UK), Lysekil (Sweden) and Fortaleza (Brazil).

Cruises by RV Pelagia and by NIOZ parties on other ships during 2007

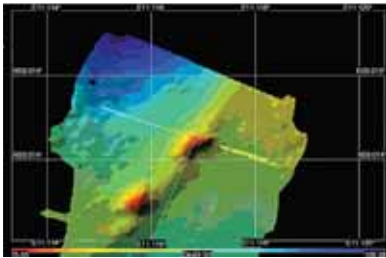
For cruises on foreign research vessels both the chief scientist and the leader of the NIOZ party are indicated.

Res. vessel & cruise	Departure	Arrival	Area	Project	Chief Scientist/NIOZ scientist
Aurora Australis V3	16/01 Hobart (Aus)	15/02 Hobart	Antarctic	SAZ-Sense	B. Griffiths / C.P.D. Brussaard (BIO)
Pelagia 64PE260	05/02 Texel	09/02 Texel	North Sea	COSTRA	M.J.N. Bergman (MEE)
Pelagia 64PE261	19/02 Texel	02/03 Texel	North Sea	COSTRA	M.J.N. Bergman (MEE)
Pelagia 64PE263	07/03 Lysekil (Swe)	15/03 Lysekil	Skagerrak	BIOSYS	C. Maier (BIO)
Pelagia 64PE265	19/03 Texel	26/03 Texel	North Sea	NoordzeeWind	R. Daan (MEE)
Pelagia 64PE266	26/03 Texel	31/03 Texel	North Sea	BSIK	G.C. Duineveld (MEE)
Pelagia 64PE267	11/04 Texel	27/04Lisbon (Por)	North Atlantic	GEOTRACES/HERMES	K.R. Timmermans (BIO)
Pelagia 64PE268	28/04 Lisbon (Por)	17/05 Portimao (Por)	North Atlantic	MICROSYSTEMS	H. de Haas (MCG)
Aegaeo	07/05 Piraeus (Gre)	18/05 Piraeus	Med. Sea	Poseidon II	A. Gogul / T. Yokokawa (BIO)
Cefas Endeavour	15/05 Lowestoft (UK)	22/05 Lowestoft	North Sea	MEC	D. Sivy / S.S. Oosterhuis (BIO)
Pelagia 64PE269	20/05 Portimao (Por)	11/06 Cork (Irl)	North Atlantic	CANYONS	H.C. de Stigter (MCG)
Pelagia 64PE270_a,b,c	13/06 Cork (Irl)	01/7 Brest (Fra)	North Atlantic	HERMES	M.S.S. Lavaley (MEE)
Maria S. Merian 05/3	14/06 Nuuk	04/07 Nuuk	W-Greenland	MSM05	J. Harff / T.O. Richter (MCG)
Discovery 320	15/06 Falmouth (UK)	18/07 Clyde (UK)	North Atlantic	DOGEE II	P. Nightingale / H.J. Zemmeling (BIO)
Pelagia 64PE271	03/07 Brest (Fra)	30/07 Texel	North Sea	MICROVIR	C.P.D. Brussaard (BIO)
Polarstern ARK-XXII/2	28/07 Tromso (Nor)	10/10 Bremerhaven	Arctic Ocean	SPACE/GEOTRACES	U. Schauer / P. Laan (BIO)
Pelagia 64PE273	03/08 Cuxhaven (Ger)	26/08 Cuxhaven	North Sea	Charter BSH	---
Pelagia 64PE275	31/08 Texel	27/09 Galway (Irl)	North Atlantic	CAMP/VAMOC/LOCO	G.-J. A. Brummer (MCG)
Cefas Endeavour	13/09 Lowestoft (UK)	21/09 Lowestoft	North Sea	MEC	D. Sivy / S.S. Oosterhuis (BIO)
James Clark Ross JR209	27/09 Immingham (UK)	08/10 Cape Verde	North Atlantic	Madeira Abyssal Plain	C. Day / M. Baas (MBT)
Pelagia 64PE276	30/09 Galway (Irl)	23/10 Galway	North Atlantic	CARBONATE	H. de Haas (MCG)
Poseidon	15/10 Texel	19/10 Texel	North Sea	NoordzeeWind	M.J.N. Bergman (MEE)
Pelagia 64PE278	26/10 Galway (Irl)	18/11 Caniçal (Por)	North Atlantic	Barter Uni-Bremen	D. Kieke / S. van Heuven (RUG)
Cefas Endeavour	26/10 Lowestoft (UK)	02/11 Lowestoft	North Sea	MEC	L. Fernand / M.A. Baars (BIO)
Pelagia 64PE279	21/11 Funchal (Por)	16/12 Fortaleza (Bra)	N./S. Atlantic	LOCO-IW	J.J.M. van Haren (FYS)
Pelagia 64PE280	19/12 Fortaleza (Bra)	16/01/2008 Las Palmas	N./S. Atlantic	ARCH-OCEAN	G.J. Herndl (BIO)

National Programme for Sea Research

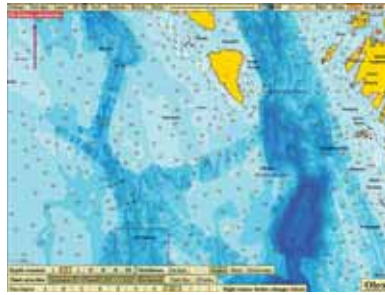
In 2007 the National Programme consisted of eight Pelagia cruises and three programs were done by NIOZ parties on other research vessels, all facilitated by grants of NWO/ALW.

1. BIOSYS (BIODiversity and EcoSYstem Functioning of Deep Water Coral Reefs in the Mediterranean and N.E. Atlantic; chief scientist Dr. C. Maier, NIOZ). A 14 days cruise was performed in the Skagerrak off the Swedish coast on board RV Pelagia. During the cruise aspects of the ecology and biology of cold water corals on Tisler Reef were studied.



Multibeam map of sampling site

2. MiCROSYSTEMS (Seismic, sedimentological, geochemical and biological studies of carbonate mounds, mud volcanoes and mud diapirs in the SE Gulf of Cadiz, part of the ESF EuroDIVERSITY programme; chief scientist Dr. H. de Haas, NIOZ). A 24 days cruise on board RV Pelagia was performed with the aim to resolve the morphology and the internal structure of the carbonate mounds at the Pen Duick Escarpment and one or more mud volcanoes in the Gulf of Cádiz.



Map of research area

3. HERMES-CANYONS (Hotspot Ecosystem Research on the Margins of European Seas – Canyons; project manager Prof.dr. T.C.E. van Weering, chief scientist Dr. H. de Stigter, NIOZ), a 21 days cruise was performed in the Atlantic Ocean in the Lisbon-Setúbal and Nazaré Canyons offshore the Portuguese coast, and the Whittard Canyon in the northern Bay of Biscay South West of Ireland, on board RV Pelagia. The aim of the cruise was to determine by which processes exactly the canyons are incising themselves in the seafloor, and under what conditions these processes are active.

4. MiCROVIR (Virus control of the picophytoplankter *Micromonas pusilla* population dynamics in European waters, chief scientist Dr. Corina Brussaard, NIOZ). A 30 days cruise was performed studying the greater North Sea and Channel area to clarify the ecological importance of virus infection for the widely distributed picoplankter *M. pusilla*.

5. CARBONATE (Carbonate mound studies, an ESF EuroMARC project, programme manager Prof.dr. T.C.E. van

Weering, chief scientist Dr. H. de Haas, NIOZ). A 24 days cruise on board RV Pelagia was performed West of Ireland to study the carbonate mounds and the role of these systems in the global carbon cycle. The cruise was specifically aimed at determining the most suitable sites by means of seismics, multibeam, coring, video and lander deployment, for drilling with the German MEBO drilling system on a subsequent cruise with the Irish RV Celtic Explorer.

6. GEOTRACES (Global marine biogeochemistry of trace elements and isotopes) – test cruise UCC system. The newly developed NIOZ Ultra Clean CTD system (UCC - TITAN) was successfully tested and approved for the upcoming Polarstern cruise (see under 10), during a 12 days test cruise by RV Pelagia in the deep waters of the North Atlantic Ocean between Texel and Lisbon.

For the investment subsidy NWO-Large two cruises were performed for the LOCO project (Long-Term Ocean Climate Observations).

7. CAMP/LOCO/VAMOC North Atlantic (Long-Term Ocean Climate Observations – North Atlantic; project manager Dr. H. van Aken, Chief Scientist Dr. G.J. Brummer, NIOZ); a 28 days cruise was performed by RV Pelagia in the North Atlantic for the CLIVAR work on the transect Malin Shelf – Greenland (CAMP) and for the deployment of the VAMOC lander and the recovery & redeployment of the 4 LOCO moorings in the Irminger Sea.



Science team and crew before a breathtaking background during a cruise on RV Pelagia in the Irminger Sea, East of Greenland, in September 2007.

8. LOCO/IW (Long-Term Ocean Climate Observations – Internal Waves; project managers Dr. H. van Haren and Dr. L. Maas, NIOZ): a 26 days cruise was performed in the North Atlantic, south of the Canary Islands and east of Brazil by RV Pelagia.

For the Netherlands contribution to the International Polar Year (IPY) 2007/2008, cruise participation was granted by NWO/ALW for a programme in antarctic waters and for the GEOTRACES programme in arctic waters.

9. Work on viruses by the IPY-project VIRPOL was done during a 4 week cruise onboard the Australian RV Aurora Australis in antarctic waters in the beginning of 2007 (project manager Dr. C.P.D. Brussaard).

10. Netherlands participation in the Arctic cruise (ARK-XXII/2) with RV Polarstern, project manager Prof.dr. H. de Baar, NIOZ and Groningen University). The 75 days ARK-XXII/2 expedition was a central contribution to the International Polar Year 2007/2008. The Netherlands contribution was concentrated on the work with the NIOZ Ultra Clean CTD system TiTAN and subsequent analyses of iron and other trace metals to determine the physical and chemical speciation of dissolved trace metals in the Polar Oceans.



Dutch science team posing in front of RV Polarstern on the ice edge of the North Pole August 31 2007.

11. Netherlands participation in the British program Marine Ecosystem Connections (Cefas, Lowestoft) in the southern North Sea comprised measurements of the secondary production during 8d-cruises by RV Cefas Endeavour in May, September and October/November.

The OFEG was established to use research vessels from different European institutes more efficiently by exchanging ship time and large equipment. Participants of OFEG are NERC and NOCS (UK), IFREMER (France), BMBF (Germany), NIOZ (NL), UTM-CMIMA of the Spanish research council CSIC, and IMR-UoB of

Norway. In 2007 the OFEG fleet consisted of 21 research ships. The OFEG's primary objective is bartering ship time and exchange of major marine equipment without the need to exchange money. This arrangement has significant advantages. It allows scientists access to a wider range of facilities and equipment than would otherwise be possible, and also it reduces wasted time, and therefore wasted costs on long transit passages.

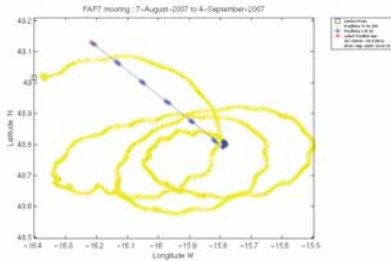
In 2007 a number of Dutch barter exchange cruises were performed in the OFEG framework. A 27 days cruise for a science team of the University of Bremen (Chief Scientist Dr. M. Rhein/Dr. D. Kieke) was done by RV Pelagia in the northern North Atlantic. The UK RRS James Clark Ross did piston core sampling for 2 days in the Madeira Abyssal Plain for a NIOZ science group during the outward voyage from Immingham to the Antarctic. The German RV Poseidon did a 5 days cruise in the Offshore Windpark Egmond aan Zee off the Dutch coast for the NIOZ NoordzeeWind project.

Since 1998 NIOZ participated in OFEG with 27 exchanges. Total number of exchanged ship days for the Netherlands numbered 325 by the end of 2007.

Another OFEG advantage is offered by opportunistic interventions by recovering, when within reach, lost equipment



The Ultra Clean CTD alongside RV Polarstern during the ARK-XXII/2 cruise in the Polar Sea



A drifting UK PAP mooring circling in the North Atlantic from 7 August – 4 September 2007, when picked up and recovered by RV Pelagia, then setting course straight to 57°N 28°W where RV Pelagia will deploy the BOBO lander. Picture courtesy NOC.

or drifting moorings, as well as by en-route servicing and turn-around of partners' moorings. In September 2007 RV Pelagia could successfully recover a drifting Porcupine Abyssal Plain (PAP) mooring with 1000 m steel wiring and equipment for a science team of NOC Southampton, during passage from Texel to the Irminger Sea with only a few days' deviation from the original passage track.

OFEG meetings and other international activities

This year the OFEG met twice for its regular meetings, in May in Bergen, Norway, and in November in Paris, France. On 7 February the OFEG members attended the naming ceremony of the UK RRS James Cook, performed by her Royal Highness, Princess Ann, at the quay of the National Oceanography Centre in Southampton. After the ceremony an extra OFEG meeting convened to discuss issues of interoperability and transnational operational teams in relation to possibilities of financial support by the European Commission. Responding to the recommendations of the ESF Marine Board Ocean Research Fleets Working Group (OFWG), OFEG accepted its role within the European research fleet for academic research to act as a forum for the Global and Ocean Class fleet, including heavy equipment. Also OFEG will investigate ways of investment co-ordination and cost sharing. Another favourable development evolving from the partnership is the impulse to international co-operation and

exchange of marine technicians for training and support on board. In October the first OFEG-TECH workshop was organised by the Norwegian OFEG partner IMR in Bergen.

M.J. Rietveld was invited guest at a number of international meetings. At a seminar regarding the French research fleet, organised by the French Ministry of Higher Education & Science and held in Paris on 26 March, she was an invited speaker and testified on Ifremer's high seas research vessel fleet from an international viewpoint. The UNOLS/RVOC meeting at the Florida Institute of Oceanography in St. Petersburg, Florida, USA, was attended in April. In June the European Research Vessel Operators (ERVO) convened at the Flemish Institute of Marine Science (VLIZ) in Ostende, Belgium. Rietveld participated also in the 21st meeting of the International research Ship Operators Meeting (ISOM), hosted by the Institute of Oceanography of the Chinese Academy of Science (IOCAS), in Qindao, China, in October.

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The 2007 OFEG fleet

*) only joint cruises

Vessels shown: L'Atalante, James Cook, Discovery, M.S. Merian, Pelagia, Pourquoi Pas?, Sionne, Thalassa, Alkor, G.O.Sars, Heincke, Meteor, Poseidon, Sarmiento de Gamboa, James Clark Ross, Le Suroit, Jan Mayen, Johan Hjort, Hesperides, Polarstern*, Garcia del Cid.

Marine Technology

Marck Smit*, Patrick Laan, Henk Zemmeling, Geert-Jan Brummer, Aad Vaars, Gerard Duineveld

After a few turbulent years - characterized by several scans and reviews - in 2007 we were very happy to have a strong focus again on our core business: executing "effective technology for excellent science". About 22% of the department's capacity was used to support scientific research cruises at sea, a slight increase of 2% compared to 2006. The workload in modifications and corrective maintenance was considerably higher compared to 2006. In 2007 we worked on 355 projects, of which a few are highlighted below. To improve the Science-Technology interaction we organized a workshop for scientists on "how to run a technical project effectively" in February.

Measuring ultra low iron concentrations in the Arctic

Honoring the international Polar Year 2007 – 2008, 2 major cruises had to be carried out on the German Icebreaker RV Polarstern using the new NIOZ developed TITAN Ultra Clean Water Sampling system. The main objective of these cruises was to measure very low concentrations of trace metals, mainly iron, manganese and aluminum.

The challenge was to adapt the newly developed Ultra Clean system to the RV Polarstern and the harsh operating environment.

Ultra Clean sampling in the Arctic.



Carbon dioxide fluxes at the sea surface

For studying the biochemistry at the air-sea interface samples have to be taken from the top micro-layers of the sea surface. A rotating glass drum was used for skimming this top-layer. Water samples were taken, simultaneously, at 10, 100 and 200 cm depth to study depth profiles. All the samples were stored in gas-tight bottles.

A very light micro-catamaran supported the glass drum, thus allowing the sampling of small waves. A bigger catamaran was used to follow the bigger waves and to create some payload capacity. The complete system was operated via radio control.

A. Deployment of the Surface Skimmer from the RV Discovery (UK-SOLAS DOGEE II – cruise). B. The mini catamaran carrying the rotating glass drum. C. Drama on day one: the skimmer was hit, partly sunk and capsized!. D. But ..., after a few days of hard work by Electronics Engineer John Cluderay the Surface Skimmer was fully operational again

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Water and bottom sampling combined in one cast

During the LOCO-cruise a vast track of water column measurements was planned at the North Atlantic between Ireland and Greenland. Lowering a rosette water sampler to 5.000 m and bringing it back takes quite some time: approximately four hours. When a bottom sample is needed afterwards the same time interval is required again. In close cooperation with the scientist a system was developed to combine the CTD water sampling with a small bottom sampler, in a way that both could be used within the same cast. The new "mono-corer" that was developed experienced a successful maiden trip.



Recovery of the mono-corer during the LOCO-IS cruise. Inset: 3D CAD design drawing of the mono-corer



Very high resolution for XRF sediment analyzer

One of the ways of looking back into the climate history is by analyzing ocean sediment cores. For the NIOZ X-Ray Fluorescence (XRF)-core scanner a so called Super Slit was developed enabling a very narrow X-ray beam adjustable from 10 mm to 0.1 mm to enter the sediment. Through the resolution of core analyses this innovation could be improved to only a few decades. This development was performed for techno startup company Avaatech BV.

European cooperation in Marine Technology

The European cooperation within OFEG (Ocean Facilities Exchange Group) in the field of RV ship time-exchange has now been working very effectively for several years. In order to improve the exchange

of major – expensive - marine research equipment the OFEG-TECH network was established in October 2007. Furthermore this network aims to improve the exchange of experience and knowledge in the field of Marine Technology. An overview of the available OFEG major equipment is temporarily hosted on: <http://www.nioz.nl/OFEG>

Shipboard technical support

A busy schedule of Scientific Research Cruises was supported. Apart from the cruises on the RV Pelagia we supported cruises on the RV Discovery (UK), RV Polarstern (Germany), RV Poseidon (Germany) and the RV Navicula.



On board of NIOZ regional vessel RV Navicula NIOZ Instrument Technician Johan van Heerwaarden is adapting a video system on deep-sea crawler MOVE.

North Sea Wind Park monitoring program

For the North Sea Wind Park – de facto Netherlands first protected area for marine life - an extensive monitoring program was executed. A wide range of measurements and analyses were carried out using bottom landers, larvae traps, an underwater acoustic to cell phone link, and a suite of other instruments.



Data Management Group

Taco F. de Bruin*, Ronald X. de Koster, Margriet A. Hiehle and Jan Nieuwenhuis

In 2007 the Data Management Group (DMG) participated actively in a series of national and international oceanographic data management projects, while continuing to work on the day-to-day activities for the National Cruise Programme and for the institute.

The DMG is a separate group within the department of Physical Oceanography, funded by NWO-ALW and NIOZ. The DMG represents NIOZ and the Dutch academic oceanographic community within the National Oceanographic Data Committee (NODC). It also serves as the National Antarctic Data Centre (NADC). The main tasks of the DMG are to assist scientists during all phases of a project with data management and, secondly, to archive and keep available and accessible all relevant data of NWO-ALW and NIOZ cruises.

The work for the national (Bsik-funded) NODC-*i* project and the EU-funded SeaDataNet project was continued and extended during 2007. These are two multi-year data management projects, both aiming at a fully distributed and transparent data access architecture. The NODC-*i* project is a national project to enable access to the data holdings of the partners within the NODC. A unique aspect of this project is the inclusion of spatial infrastructural information on top of the environmental information. The EU-funded SeaDataNet project (www.seadatanet.org), with 49 partners from 35 countries bordering the seas around Europe, aims to build a pan-European data access infrastructure. The NODC-*i* project will become the Dutch node in the European SeaDataNet data access network thus it is made sure that both projects will be compliant.

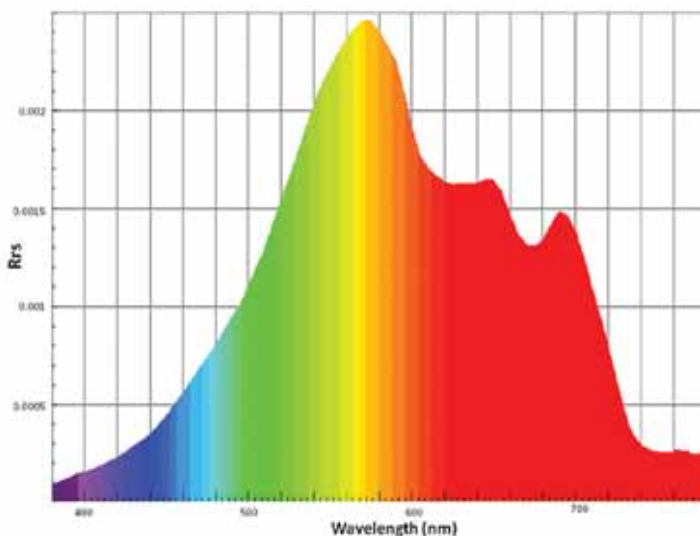
The DMG maintains a series of databases and project websites and pages. A part of these are dynamically linked. This activity includes the daily update of the cruise diary pages on the NIOZ website www.nioz.nl/cruises. The actual positions of RV Pelagia and other research vessels hosting NIOZ scientists, is dynamically

obtained from data supplied by the Climate Research Division of the Scripps Institution of Oceanography and shown on an online map.

The work of populating the NIOZ-CODIS hydrographic database continued. By the end of the year, the CODIS hydrological database contained data from 148 cruises, comprising 5949 CTD profiles and 1809 sample bottle casts. All NIOZ databases were consulted frequently. On average, there were 2290 logins per day. A login is defined as 'a retrieval of data and/or metadata in tabular or graphical form from a database'. One login can consist of multiple queries on the database. Many requests for data and (graphical) data products, both from within the institute as from outside, were answered. These requests are very diverse and range from questions on rescuing data from old and rather obscure cruises to

assisting with the interpretation and processing of XBT data. As participant in the NODC, NIOZ actively participates in international organizations as the IOC Committee on International Oceanographic Data and Information Exchange (IODE) and the ICES-Working Group on Data and Information Management.

Staff of the DMG participated in the CAMP/VAMOC/LOCO/ASOF-2007 (64PE275) and the BSIK/LOCO-IW07 (64PE279) cruises onboard RV Pelagia. Shore-based staff also assisted scientists and crew onboard during these cruises with the delivery and interpretation of weather information. Staff was also involved in several 13-hours cruises onboard RV Navicula for the Marsdiep-project. DMG processed the standard CTD data for all research cruises.



Real-time display of Rrs, remote sensing reflectance, from the colours database. <http://www.nioz.nl/colours>

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The COLOURS database was developed by DMG to provide online access to the data from the COLOURS project by M. Wernand. This is a long-term Remote Sensing monitoring project at the NIOZ Jetty for automated determination of suspended matter (TSM) and chlorophyll (Chl-a) in the Marsdiep.



Work has started to set up and populate a database on Wadden Sea data. Furthermore, web sites for the NODC and the International Research Ship Operators' Meeting (ISOM) were maintained by the DMG. An additional task of the DMG is the development and maintenance of the Netherlands Antarctic Data Inventory (NADI, <http://www.nadi.nl>) for

the Antarctic research projects in the Netherlands. A DMG staff member is the Chief Officer of the Joint Committee on Antarctic Data Management (JCADM), which currently has representation from 31 countries, and co-chairs the International Polar Year Subcommittee on Data Policy and Management. DMG staff participated in a series of national

and international meetings related to oceanographic and polar data management. At these meetings, DMG staff members gave 10 oral presentations on various aspects of scientific data management.