NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A: GENERAL

1. NAME OF RESEARCH SHIP HMDS VÆDDEREN CRUISE NO. 15-16-17

2. DATES OF CRUISE From 11 August 06 To 25 April 07

3. OPERATING AUTHORITY: ROYAL DANISH NAVY
ADMIRAL DANISH FLEET

TELEPHONE: ADF HQ +45 8943 3099/ SHIPS GSM +45 2527 5944/ SHIPS SAT 008 70 76 3747 448

TELEFAX: ADF HQ +45 8943 3171/ SHIP +45 2521 1045

TELEX:

4. OWNER (if different from no. 3)

5. PARTICULARS OF SHIP:

Name:	HDMS VÆDDEREN Naval vessel
Nationality:	DANISH
Overall length: (in metres)	112,3
Maximum draught: (in metres)	6,0
Net tonnage:	3500 t
Propulsion e.g. diesel/steam:	diesel
Call sign:	OUEW
Registration port and number (if registered fishing vessel)	

6. CREW

Name of master:
Captain Lars Henrik Hansen

Number of crew: 99

7. SCIENTIFIC PERSONNEL

Name and address of scientist in charge:

15A: Prof. Katherine Richardson
Biological Institute, University of Aarhus, Finlandsgade 14
8200 Aarhus N, Denmark
15B: Stiig Markager, seniorscientist, adjuct professor.
National Environmental Research Institute, Denmark
15C: Lone Gram, Danish Institute for Fisheries Research
Department of Seafood Research
Søltofts Plads, DTU bldg 221
DK-2800 Kgs Lyngby, Denmark
15D: Henrik Skov, DMU, Frederiksborgvej 39, 4000 Roskilde, Denmark
15E: Jakob Strand, Ph.D.,
National Environmental Research Institute,
Department of Marine Ecology,
Frederiksborgvej 399,
4000 Roskilde, Denmark
15F: Jakob Tougaard, National Environmental Research Institute, Box 358, Frederiksborgvej 399, 6000 Roskilde Denmark
15G: Niels Larsen, Danish Meteorological Institute
Lyngbyvej 100, DK-2100 Copenhagen, Denmark
15H: Rune Dietz
(DMU(AM)):Frederiksborgvej 399, 4000 Roskilde
15I: Rene Forsberg, Danish National Space Center

	(Danmarks Rumcenter), Juliane Maries Vej 30, DK-2100 Copenhagen Ø, Denmark **15J**: Niels Lorenzen, Danish Institute for Food and Veterinary Research Hangoevej 2, DK-8200 Århus N, Denmark **16K**: Marianne Holmer**,** Institute of Biology, University of Southern Denmark, Campusvej 55, DK5230 Odense M **16L**: Dr. Antoon Kuijpers**,** Geological Survey of Denmark and Greenland (GEUS), Øster Voldgade 10, DK 1350 Copenhagen K, Denmark **16M**: Peter Roepstorff, Dept. Biochemistry and Molecular Biology, University of Southern Denmark, DK 5230 Odense M, Denmark **17H**: Prof. Michael M. Hansen , Danish Institute for Fisheries Research, Vejlsøvej 39, DK-8600 Silkeborg
Tel/telex/fax no.:	**15B**: +45 4630 1305 **15C**: +45 4525 2586/+45 4588 4774 **15D**: +45 4630 1162 **15E**: +45 4630 1865 ; Fax: +45 4630 1114 **15F**: +45 46301956 / +45 46301114 **15G**: +45 3915 7414/+45 3915 7460 **15H**: +45 4630 1938; +45 2125 4035 **15I**: +45-3532-5719, fax +45-3536-2475 **15J**: +45 7234 6901 **16K**: +4565502605/+4565930457 **16L**: +45-38142367 / +45-38142050 **16M**: Phone: +45 65502404, Fax: +45 65932661 **17H**: tel. +45 8921 3100 fax: +45 8921 3150
No. of scientists:	**15A:** 6 **15B**: 2 **15C**: 6-8 **15D**: 4 **15E**: 1-2 **15F**: 2-3 at a time, Max 10 in total **15G**: 4 (1 on-board part of cruise) **15H**: 3 + an unknown number of international scientists (2 at this moment) **15I**: 5 (on different legs of the expedition) **15J**: 4-6 **15K**: 8 **16L**: 18 (incl. engineers) **16M**: 3 **17H**: 12

8. GEOGRAPHICAL AREA IN WHICH SHIP WILL OPERATE (with reference to latitude and longitude)

Within UKVI EEZ, Anegada Jungfern Passage

9. BRIEF DESCRIPTION OF PURPOSE OF CRUISE

15A: To collect a multidisciplinary dataset describing the upper ocean processes controlling ocean-atmosphere carbon exchange on a global scale.

Objectives of the project:

- To quantify the marine carbon cycle in the upper ocean together with the air-sea exchange of CO2, trace gasses and particle deposition from Greenland to Antarctica.
- To compare the roles and contributions of different ocean regions in/to physical, chemical and biological processes in the global carbon and nutrient cycles.
- To take advantage of new technology and remote sensing to quantify the role of ocean mesoscale activity – "ocean weather" - on the spatial variability of air-sea gas exchange of CO2 on the global scale.

15B: Analysis of dissolved organic matter in seawater, including bacterial degradation and effects of virusis

15C: The purpose of this particular project (as part of the Galathea3 cruise) is to isolate antagonistic microorganisms from water and algal samples. We will focus on isolation of bacteria from the Roseobacter clade but will also at selected locations isolate filamentous fungi. These micro organisms will be further characterized after the cruise and we will study their physiology and elucidate their role

in oceanographic environments as well as their biomedical potential
15D: Measurements of the global distribution of mercury in the atmosphere
15E: 1. To study the distribution and levels of organic and inorganic pollutants in the marine environment in various parts of the Earth with special focus on near-coastal areas along international ship lanes and pristine areas by collecting and analyzing a large number of environmental samples (sediment, epifaunal invertebrates, fish), to estimate the contribution of the international ship traffic to pollution of the marine environment
2. To collect representative invertebrates from the selected study areas and store them to allow molecular genetic characterization of their capacity for metabolizing xenobiotics. This part of the research program is a continuation of an ongoing characterization of cytochrome P450 genes and enzymes in mainly polychaetes and crustaceans.
15F: Recording of underwater sounds from marine animals. Recording of undisturbed natural background noise.
15G: Global atmospheric measurements and investigations of cirrus clouds, stratospheric ozone, water vapor and ultraviolet (UV) radiation by installment of a micro-lidar, a SAOZ-spectrometer, an optical depth sensor, and a UV radiometer. During the passage through the inter-tropical convergence zone observations by lidar measurements and launches of balloon-borne ozone-, temperature-, and humidity sensors. The objective of the measurements will be investigations of the formation of high altitude decks of cirrus clouds in the tropics. The measurements will take place in connection with the formation of strong tropical convective systems (tropical thunderstorms) which at high altitudes generate outflows of thin layers of cirrus particles, made up of ice particles. In addition measurements of surface UV radiation for atmospheric chemistry investigations, biological process studies, and validation of satellite based measurements to derive UV radiation.
15H: Catching sea turtles with a dip net from rubber boats. The sea turtles will be equipped with satellite transmitters and Pit Tags and a small tissue sample for DNA identification will be taken. The sea turtles will be release about an hour after being catched.
Some sea turtles will be caught in international waters. Others will be caught in local waters (fx. Solomon Islands, Australia, Peru, Ecuador, Azores, Venezuela etc.)
Sea turtle species:
Caretta caretta,Lepidochelys kempii, Lepidochelys olivacea, Chelonia mydas, Natator depressus, Eretmochelys imbricata, Dermochelys coriacea
15I: Measurements of sea level heights and waves with GPS and shipborne laser; gravity measurements
15J: Catching of fish of various species for:

- sampling of tissues and sequencing of genes related to the immune system.
- isolation of fish viruses and fish parasites for genetic and morphological characterization.

Emphasis will be made to catch/sample a limited number of individuals (e.g. 10-200, depending on prevalence) for each species.
16K: Collection of seagrasses and sediments from 0-15 m´s water depth in the coastal zone by scuba divers. Deployment of incubation chambers for 1-2 days a different stations, which will be sampled 2-4 times pr. day by scuba divers.
16L: Marine geological investigations using multi-channel seismics, subbottom profiler, and sediment coring with focus on the study of 1) plate tectonics and sediment instability, and 2) paleoceanographic and climate change. In addition, hydrographic studies using CTD with water sampling will be carried out by the University of the Virgin Islands (UVI) at St. Thomas, while plankton tows will also be part of the work programme.
16M: Identify and isolate novel fluorescent protein in marine organisms.
17H: We intend to sample newly hatched larvae of European (*Anguilla anguilla*) and American eel (*A. rostrata*) along with other plankton in order to describe their distribution in relation to hydrographical parameters. Moreover, we will sample eel larvae for subsequent population genetic analyses in order to determine if eels are subdivided into genetically different populations. Moreover, we will attempt to sample eel eggs, verify the species of origin of eggs and determine their distribution in the water column. Finally, we will attempt to catch adult spawning eels using a trawl operated by a commercial trawler.

10. DATES AND NAMES OF INTENDED PORTS OF CALL
St. Thomas: 15-18 March 07 & St. Croix 26-28 March 07 (USVI)

11. ANY SPECIAL REQUIREMENTS AT PORTS OF CALL

NOTIFICATION OF PROPOSED RESEARCH CRUISE

1. PART B: DETAILS

1. NAME OF RESEARCH SHIP HDMS VÆDDEREN CRUISE NO. 16

2. DATES OF CRUISE From 11 August 06 To 25 April 07
Specific for UK VI From 16 March 07 To 28 March 07

3. a) PURPOSE OF RESEARCH

15A: The oceanic carbon reservoir is about 50 times greater than the amount of carbon stored in the atmosphere as carbon dioxide (CO_2). Due to the intense gas-exchange through the air-sea interface, oceanic carbon storage will ultimately determine the future atmospheric CO_2-concentration. Today, oceanic carbon uptake amounts to about one fourth of the anthropogenic carbon emissions and, therefore, the ocean helps reduce the rate of atmospheric CO_2 increase. As CO_2 is a strong greenhouse gas, this oceanic carbon uptake counteracts the climatic influence from anthropogenic carbon emissions. Predicting future rates of oceanic CO_2 uptake requires knowledge relating to the magnitude of oceanic carbon uptake today and processes regulating this uptake. The project proposed will provide important information on these processes.
The marine carbon cycle is regulated through interplay between physical, chemical and biological processes. The fate of the biological fixed carbon depends on the complexity of the succeeding food web. Large phytoplankton cells are normally efficiently transferred up a short classical food chain, while small phytoplankton cells on the other hand fuel a much more complex microbial food web. However, few studies combine measurements of all three types of processes in order to describe atmospheric-ocean carbon exchange and no such studies have been carried out on a global scale. Thus, carrying out the study proposed here over the entire route of the Galathea route will provide a unique contribution to our understanding of the role of the ocean in climate change.
The project integrates a number of activities which involve the expertise from different research teams and the results from each of the activities are expected to provide new and important information related to processes influencing the cycling of carbon and the climate on Earth. However, the ambition of this project is to combine and coordinate all these activities from different scientific disciplines to develop a comprehensive understanding of the interaction between the processes involved in the carbon cycle.
15B: Basic science about concentrations, composition and dynamics of dissolved organic matter in marine systems.
15C: The purpose of this particular project (as part of the Galathea3 cruise) is to isolate antagonistic micro organisms from water and algal samples. We will focus on isolation of bacteria from the Roseobacter clade but will also at selected locations isolate filamentous fungi. These micro organisms will be further characterized after the cruise and we will study their physiology and elucidate their role in oceanographic environments as well as their biomedical potential
15D: To measure the global distribution of mercury in the atmosphere.
15E: 1. To study the distribution and levels of organic and inorganic pollutants in the marine environment in various parts of the Earth with special focus on near-coastal areas along international ship lanes and pristine areas by collecting and analyzing a large number of environmental samples (sediment, epifaunal invertebrates, fish), to estimate the contribution of the international ship traffic to pollution of the marine environment
2. To collect representative invertebrates from the selected study areas and store them to allow molecular genetic characterization of their capacity for metabolizing xenobiotics. This part of the research program is a continuation of an ongoing characterization of cytochrome P450 genes and enzymes in mainly polychaetes and crustaceans.
15H: Equipping sea turtles with satellite transmitters. Collecting DNA tissue samples from the animals.
15I: Measurements of gravity, ocean sea heights and mean dynamic topography, to calibrate and validate global measurements with satellite altimetry.
15J: Project identification: jnr. 2005.09.02.49.
Project title: Search for the origin of the vertebrate immune system.
Purpose: This project aim at chasing and characterising the evolutionary origin of the immune defence mechanisms against infectious diseases in higher vertebrates. We hereby aim to create new knowledge of how the vertebrate immune system has developed in form and function and to relate this to the occurrence and evolution of disease-causing agents (pathogens). Fish comprise the greatest group of vertebrate species and they have adapted to many different habitats such as the Arctic, the tropics and the deep sea. In the same time, fish represent the earliest class of vertebrates possessing the molecular key elements and functions of an adaptive immune system as known in higher vertebrates such as mammals, including man. By identification and characterisation of key molecules of the fish immune

system in a variety of both primitive and advanced fish species adapted to different life conditions, we will display the molecular spectrum of the immune system in this early class of vertebrates and hereby discover how the basic elements of the immune system known in mammals today have evolved. Since hosts and pathogens have developed hand in hand, we will also analyse the origin of the pathogens associated with the fish. The project will create a scientific background for a better understanding of how the immune system is able to defend vertebrates against infections, and hereby provide valuable information for improvement of disease prophylaxis in cultured fish, terrestrial husbandry animals and man.
16K: Collection of seagrasses and sediments from 0-15 m´s water depth in the coastal zone. Incubation of seagrasses at shallow locations.
16L: Marine geological investigations using multi-channel seismics, subbottom profiler, and sediment coring with focus on the study of 1) plate tectonics and sediment instability, and 2) paleoceanographic and climate changes. In addition, hydrographic work with CTD/water sampling will be carried out by the University of the Virgin Islands at St. Thomas. Plankton tows are also envisaged.
16M: Identify and isolate novel fluorescent protein in marine organisms.
17H: To study the distribution of newly hatched European and American eel larvae in relation to hydrographical parameters; to study the genetic population structure of European and American eel, using DNA analyses of sampled larvae; to identify eel eggs and describe their distribution in the water column; to catch spawning eels and provide a final confirmation that the Sargasso Sea is the spawning site of European and American eel.

b) GENERAL OPERATIONAL METHODS (including full description of any fish gear, trawl type, mesh size, etc.)
15A: **Sampling strategy**
Over the entire cruise track, continuous measurements of salinity, temperature and chlorophyll a and fast repetition rate fluorescence (for determination of photosynthetic capacity) will be carried out on surface water. Atmospheric CO2 fluxes, particle concentrations and concentration of nitrogen containing gases will also be measured continuously along the route. In addition, point measurements of nutrients, and plankton composition will be made and analyzed in the laboratories. On deck, air- and optical measurements will be carried. These measurements will not require stopping the ship. At selected intervals, CTD-casts with concurrent collection of water chemistry and plankton sampling will be taken. These will provide information on the hydrographic conditions and the biological activity deeper in the water column. Net and pump collection of zooplankton as well as trawl fishing for after zooplanktivore fish will also be carried out at selected intervals. These sampling programs require the stopping of the ship and their frequency can be decided in cooperation with other activities on board. On some transects an undulating platform carrying different instruments will be towed after the ship collecting measurements from 0-400 m.
15C: Water samples will be collected using Niskin bottles. The samples will be separated into algal/particulate samples (retained by a 5 µm filter) and water samples. Each of these will be analysed for content of culturable, antagonistic bacteria and fungi. Also, procaryotic DNA will be isolated from the samples. A copy of all samples will be stored in glycerol at -80°C for analyses after the cruise. In terms of equipment, the project depends on a number of standard laboratory facilities (autoclave, incubator, freezer, microwave oven etc.) and a number of reagents.
15D: Measuring Hg in the atmosphere in all cases based on cold vapour atomic fluorescence spectroscopy.
15E: 2 m wide bottom dredge (mesh size: ~1 cm),
Sediment box core or haps (diameter: ~30 cm),
Baited traps (boxes with dead fish as bait): 10 stk (40*30*25 cm each), marked with flagboyo, se figure in 6.
Manual sampling of invertebrates onshore
15G: automatic optical remote sensing measurements of atmospheric composition and UV radiation, scientist-operated balloon-borne in-situ measurements of ozone, temperature, and pressure (classified as LIGHT free balloons according to international air traffic regulations which do not require launch authorizations).
15H: Sea turtles are caught from rubber boat with of big dip net (Diameter 60 – 120 cm). The rubber boats will be equipped with a platform to get a better view. The view from Vædderen will also be used, using the rubber boats to catch any spotted sea turtles. We will also try to sail in front of Vædderen and catch sea turtles from the rubber boats alone, with a cruising speed of 6-8 knots.
15I: Passive measurements on ship, with gravimeter meounted near center of mass, and GPS/laser equipment high on ship. It is possible to operated the gravity and GPS equipment unmanned for limited periods.
15J: Trawl for fishing in various depths, mesh size 5x5 cm – 10x10 cm,
Net/dragnet/seine suitable for catching pelagic species, similar mesh size.
Net-trap suitable for fishing i costal waters (optional), similar mesh size
16K: Collection of plants and sediments by snorkling or scuba diving by use of hands or sediment cores.

Incubations are done with cores equipped with a plastic bag. A small benthic lander with microelectrodes is deployed by scuba diver.
16L: - multi-channel sleevegun and high-resolution (14 KJ) sparker seismics
- subbottom profiling (1 – 10 kHz)
- sediment coring with 1) 12-m piston corer, 2) 6-m gravity corer, 3) box corer and multi-corer, and 4) 6-m vibrocorer (optional, < 100 m water depth).
- CTD SeaBird SBE-25 hydrographic measurements also including water sampling
- plankton tows
16M: Manual collection of samples during diving.
17H: Trawling for adult eels using a large trawl based on a commercial trawler. Mesh size not yet determined. Sampling of eel larvae and other plankton using large plankton nets (9 m^2 IKMT, 3-5 m^2 ring-net), zooplankton nets, water samplers, multiple opening closing nets (Multinet).

4. ATTACH CHART showing (on an appropriate scale) the geographical area of intended work, positions of intended stations, tracks of survey lines, positions of moored/seabed equipment, areas to be fished

a) TYPES OF SAMPLES REQUIRED (e.g., geological/water/plankton/fish/radionuclide)

5. **15A**: Air, water, plankton, fish.
15B+C: samples of seawater
15E: Surface sediment: ~1 kg per station,
Invertebrates: ~10 kg per station,
Fish: ~20 individuals per station
15H: DNA tissue samples in DMSO
15J: Fish of various species, adapted to different habitats (bottom dwelling, pelagic, climatic extremes (like low and high temperatures), high depth.
16K: seagrass, sediment and water.
16L: - geological (sediment cores, surface sediments) samples
- water
- plankton
16M: Plankton and marine species of the genus cnidaria (e.g. sea anemones, jellyfish, corals)
17H: Newly hatched eel larvae, eel eggs, other plankton samples, samples of adult spawning eels.

b) METHODS OF OBTAINING SAMPLES (e.g., dredging/coring/drilling/fishing, etc. When using fishing gear, indicate fish stocks being worked, quantity of each species required, and quantity of fish to be retained on board).
15A: The air is monitored online
Water samples are collected using a CTD rosette system at depths between 0 and 4000m.
Continuous measurements are done on the surface ocean water using the bow intake of the ship. On stations, a separate peristaltic pump will be used to obtain clean, undisturbed surface water for analysis.
The properties of the mixed layer and upper thermocline are continuously monitored at selected sections using a towed undulating vehicle capable of reaching a depth of 500m (SeaSoar Mk II form Chelsea Tech. Group, UK). The vehicle carries physical and bio-optical sensors only.
Acoustic Doppler current measurement of the upper ocean current shear will be carried out throughout the cruise. In addition, acoustic echo sounding for fish stocks is carried out.
Samples of zooplankton are obtained using a towed net.
Small mesopelagic fish (Myctophidae etc.) and Crustaceans will be collected using a mid-water trawl.
Fish are collected for the purpose of stomach analyses and tissue stable isotopic samples.
15B: CTD-rosette.
15C: Niskin bottles.
15E: 2 m wide bottom dredge: invertebrates (e.g. molluscs, polychaetes, crustaceans, ~10 kg) and bottom fish (~20 individuals).
Sediment box core: surface sediment (~1 kg)
Baited traps: Gastropods and crustaceans (~5 kg)
Manual sampling of invertebrates (~5 kg) onshore.
15H: Biopsy from the rear flipper of the sea turtles.
15J: Fishing and subsequent sampling of blood and tissues from representatives among the caught fish. After sampling the carcasses will be returned to the sea, except for a few voucher specimens. The project does not focus on particular species but aim at sampling representatives from as many different species/groups of species (within the teleost fish in particular) as possible. Small specimens (<1 kg) will be preferred. Depending prevalence, between 10 and 200 individuals of each species will be sampled. The lager numbers relates to the most prevalent species caught and with the aim of screening for viruses and parasites).
16K: Coring of sediments – about 50-100 sediment cores will be retrieved
Collection of seagrasses – about 200 individual plants will be collected.
16L: Sediment sampling by piston- and gravity coring, box- and multi-coring, and optional: vibrocoring

(shallow water < 100 m)
16M: Manual collection of samples during diving of single or a few specimens of each organism.
17H: European and American eel larvae will be sampled using plankton nets. We hope to be able to sample 200-1000 eel larvae (c. 5 mm) covering as large a geographical area as possible. For adult spawning eels we will be more than happy if we can sample just a single specimen, as spawning eels have never previously been observed.

6. DETAILS OF MOORED EQUIPMENT

Dates Laying	Recovery	Description	Depth	Latitude	Longitude

7. ANY HAZARDOUS MATERIALS (chemicals/explosives/gases/radioactives, etc.)
(Use separate sheet if necessary)
15C: For laboratory work, the project will need absolute ethanol.
If possible, extractions of algal samples will be done. This will require a limited amount of organic solvents (e.g. ethylacetate)
15G: -no hazardous material
-lidar of type Nd-Yag (wavelength 532 nm, pulse energy less than 2 micro-Joule at pulse frequency of 1 kHz, regarded of no hazard to air traffic).
15H: Small amounts of epoxy, small amounts of DMSO, AA-cell batteries

a) Type and trade name

15A: 14CO2 for primary production determination, purchased at Danish Hydrology Institute, Hørsholm, Denmark
N2 gas, AirLiquid A/S
CO2 (402 ppm) gas, AGA
15C: Ethanol, anhydrous 99.9% (V&S Distillers)
Ethyl acetate (VWR)
15D: Messer Griessheim, CO Standard cylinders 40 Litre, NO standard cylinders 40 Litre
Ar cylinders
15J: Ethanol, methanol, acetone, mercaptoethanol*, formalin, ethidium bromide*
*These are optional, depends on whether the related analysis can be performed during the cruise
16K: Sulfur-35

b) Chemical content (and formula)

15A: Aqueous solution of sodium bicarbonate with radionecleotide, $NaH^{14}CO_3$, N2, CO2 in N2
15B: ^3H-labels thymidine, radioactive, total activity 5 mCi
^{14}C-labels leucin, radioactive, total activity 250 μCi
15C: C_2H_5OH (Ethanol)
$CH_3COOCH_2CH_3$ (Ethylacetate)
15D: 99.99999 % synthetic air with trace of CO
99.999999 % N_2 with trace of NO
99.998 % Ar
15H: Dimethylsulfoxide $(CH_3)_2SO$
Epoxy: two component glue
Composition example:

Navn	EF nr.	Konc. % w/w	Symbol	R-sætninger
Bisphenol-A-diglycidether, reaktionsprodukt, middelmolvægt <700	-	75-100	Xi, N	36/38-43-51/53
1,6-Hexandiolglycidether	-	5-10	Xi, N	36/38-43-51/53
Ethanol	200-578-6	1-5	F	11
2-Butanol	201-158-5	1-5	Xi	36/37/38
Solventnaphta (petroleum) let aromatisk	265-199-0	0,1-1	Xn, N	10-37-65-66-67-51/53
Benzylalkohol	202-859-9	5-10	Xn	20/22

Tegnforklaring Tx=Meget giftig, T=Giftig, C=Ætsende, Xn=Sundhedsskadelig, Xi=Lokalirriterende, E=Eksplosiv, O=Brandnærende, Fx=Yderst brandfarlig, F=Meget brandfarlig, N=Miljøfarlig, Mut=Mutagen, Carc=Kræftfremkaldende, Rep=Reproduktionstoksisk

NiMh batteries
16K: Radioactive sulfate

c) IMO IMDG code (reference and UN no.)

15A: UN no 2910
15D: CO UN 1002 or UN1956
NO UN 1066
Ar UN 1006

d) Quantity and method of storage on board

15A: 1000 1 ml bottles with activity 20.67 µCi per cm3, Total activity: 20670 µCi, stored in locked and radioioactivity marked cupboard
20 x 250 l cylinders (200bar)
CO2: 250 l cylinder (200bar)
15C: 2-4 litres of each
15D: 3 CO Standard cylinders 40 Litre.
3 NO standard cylinders 40 Litre. 8 Ar cylinders of 40 Litre, quality 4.8.
15H: Special plastic suit case in cabin (70 batteries, 1 litre of DMSO, 2 litres of epoxy)
15J: Ethanol (<1l) , methanol(<1l), acetone (<0.5l) mercaptoethanol (<5ml), formalin(<1l), ethidium bromide (<1mg)
Storage: fire-safe cabinet/box
16K: 37 MBq
16L: Compressors for sleevegun seismics
High-voltage (14 KJ) unit for sparker seismics.

e) If explosives give dates of detonation

- Method of detonation
- Position of detonation
- Position of detonation
- Frequency of detonation
- Depth of detonation
- Size of explosive charge in kg.

8. DETAIL AND REFERENCE OF

a) Any relevant previous/future cruises

15B: Stedmon, C. & S. Markager (2003) Behaviour of the optical properties of CDOM under conservative mixing. *Estuarine and Coastal Shelf Science*, **57**, 973-979.
Stedmon, C.A., S. Markager & R. Bro (2003) Tracing dissolved organic matter in aquatic environments using a new approach to fluorescents spectroscopy. *Marine Chemistry*, **82**, 239-254.
Kowalczuk, P., C. A. Stedmon, & S. Markager (accepted) Modelling absorption by CDOM in the Baltic Sea from season, salinity and chlorophyll. *Marine Chemistry*, **xx**, xxx-xxx.
15H: 2004 and 2005: Cruises around Faial at the Azores collecting sea turtles. The sea turtles were equipped with satellite transmitters.
15I: DNSC has done similar measurements with Danish Defense ships on numerous occasions since 1991, primarily in connection with oil exploration off Greenland (Nunaoil KANUMAS project, 1991-97). DNSC has pioneered the use of similar measurements in small aircraft, and has done numerous major survey campaigns in the Arctic (Greenland and Svalbard), as well as major international campaigns (e.g, Malaysia 2002-3, Mongolia 2004-5).
15J: During 1995-2002, cruises with the Danish research vessel "Dana" were performed, aiming at determination of the prevalence of virus infections in wild marine fish in the Scandinavian and North Atlantic marine waters.
16L: Previous cruise: RV Chapman (Puerto Rico) , November 2003, in collaboration with the University of the Virgin Islands, St. Thomas (Prof. Roy A. Watlington).
17H: There have been previous cruises to the Sargasso Sea investigating the spawning biology and larval ecology of eels, notably by Prof. Johannes Schmidt (Denmark) from 1900-1920, in the 1970s by Profs. Friedrich-Wilhelm Tesch and Hans Fricke (Germany), and in the 1980s by Prof. James McCleave (USA)

b) Any previously published research data relating to the proposed cruise

15H: First transatlantic crossing by a juvenile loggerhead sea turtle monitored by satellite telemetry (submitted).
15I: First global transect with gravity. Numerous regional publications, see www.dnsc.dk

15J: Einer-Jensen K, Ahrens P, Forsberg R, Lorenzen N. Evolution of the fish rhabdovirus viral haemorrhagic septicaemia virus. *J Gen Virol.* (2004) 85:1167-79.

16L: Nyberg, J., Kuijpers, A., Malmgren, B.A., Kunzendorf, H., 2001. Late Holocene changes in precipitation and hydrography recorded in marine sediments from the northeastern Caribbean Sea. Quaternary Research 56, 87-102

Nyberg, J., Malmgren, B.A., Kuijpers, A., Winter, A., 2002. A centennial-scale variability of tropical North Atlantic surface hydrography during the late Holocene. Palaeogeography, Palaeoclimatology, Palaeoecology, 183, 25-41.

17H: Schmidt, J. (1922). The breeding places of the eel. *Philosophical Transactions of the Royal Society, London, Series B: Biological Sciences*, **211,** 179-208.

Wirth, T. & Bernatchez, L. (2001) Genetic evidence against panmixia in the European eel. *Nature*, **409**, 1037-1040

Kleckner, R.C. & McCleave, J.D. (1988). The northern limit of spawning by Atlantic eels (*Anguilla* spp.) in the Sargasso Sea in relation to thermal fronts and surface water masses. *Journal of Marine Research*, **46**, 647-667.

McCleave, J.D., Kleckner, R.C. & Castonguay, M. (1987). Reproductive sympatry of American and European eels and implications for migration and taxonomy. *American Fisheries Society Symposium*, **1**, 286-297.

9. NAMES AND ADDRESSES OF SCIENTISTS OF THE COASTAL STATE(S) IN WHOSE WATERS THE PROPOSED CRUISE TAKES PLACE WITH WHOM PREVIOUS CONTACT HAS BEEN MADE

16L: Prof. Roy A. Watlington, University of the Virgin Islands (UVI), # 2 John Brewer's Bay, St. Thomas, US Virgin Islands 00802-9990, Tel. (340)693-1230, Fax (340)693-1245
Email rwatlin@uvi.edu, www.uvi.edu
Prof. Nancy Grindlay, University of North Carolina (UNC), USA
Prof. Delia Oppo, Woods Hole Oceanographic Institution, USA

Saba Bank (NL) sector:
Cdr. J. Appelman / W.A. van Kammen, Hydrographic Office of the Royal Netherlands Navy
MPC 13A, Badhuisweg 167, 2597 JN Den Haag, The Netherlands
Tel. +31-703162825, Fax +31-703162843

10. STATE

UK Virgin Islands

a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable (Yes/No)
Yes
16L: Scientists and students from UVI and UNC have been invited to participate in the cruise; participation by UVI (R. A. Watlington & students) for contributing with hydrographic measurements has been confirmed.

b) Participation of an observer from the coastal state for any part of the cruise together with the dates and the ports for embarkation and disembarkation
Yes

c) When research data from the intended cruise are likely to be made available to the coastal state and by what means
After publication, data will in general be available upon request. Data will be published in international scientific journals.

PART C. SCIENTIFIC EQUIPMENT

Complete the following table each coastal state

Coastal state UK Virgin Islands
Port of call Charlotte Amalie & Frederiksstead

Dates 15-18 & 26-28 March 2007

Indicate "YES" or "NO"

				DISTANCE FROM COAST		
List scientific work by function e.g.	Water column including sediment sampling of the seabed	Fisheries research within fishing limits	Research concerning the natural resources of the continental shelf or its physical characteristics	Within 4 nm	Between 4-12 nm	Between 12-200 nm
Magnetometry	no	no	no	no	no	no
Gravity	yes	no	no	no	no	yes
Diving	Yes	Yes	Yes	no	no	Yes
Seismics	Yes	no	no	no	no	Yes
Seabed sampling	Yes	Yes	Yes	no	no	Yes
Bathymetry	Yes	Yes	no	no	no	Yes
Trawling	Yes	Yes	no	no	no	Yes
Echo sounding	Yes	Yes	no	no	no	Yes
Water sampling	Yes	no	Yes	no	no	Yes
U/W TV	Yes	no	no	no	no	no
Moored instr.	Yes	Yes	no	no	no	Yes
Towed instr.	Yes	Yes	no	no	no	Yes
Fishing with dip net	At the surface	Yes	No	no	no	Yes
Remote sensing measurements	Down to 20 m	no	no			
Balloon-borne in-situ measurements				Atmospheric composition & UV radiation	Atmospheric composition & UV radiation	Atmospheric composition & UV radiation

Susanna Graabæk Dated 20 February 2007
(On behalf of the Principal Scientist)

NB IF ANY DETAILS ARE MATERIALLY CHANGED REGARDING DATES/AREA OF OPERATION AFTER THIS FORM HAS BEEN SUBMITTED, THE COASTAL STATE AUTHORITIES MUST BE NOTIFIED IMMEDIATELY