NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A: GENERAL

1. *NAME OF RESEARCH SHIP* RV Heincke *CRUISE NO.* HE195

2. *DATES OF CRUISE* From: 14/08/2003 To: 23/08/2003

3. *OPERATING AUTHORITY*

Alfred-Wegener-Institute for Polar and Marine Research,
P.O. Box 12 01 61,
D-27515 Bremerhaven,
Germany.

Telephone: +49 471 4831-0
Facsimile: +49 471 4831 1355
Telex: 238 695 polar d

4. *OWNER*
(if different from No. 3)

5. *PARTICULARS OF SHIP*

NAME:	Heincke
NATIONALITY:	German
OVERALL LENGTH:	55,20
MAXIMUM DRAUGHT:	4,16
NET TONNAGE:	396
PROPULSION:	diesel electric
CALL SIGN:	DBCK
REGISTERED PORT & NUMBER:	
(if registered fishing vessel)	Helgoland

6. *CREW*

NAME OF MASTER:	Wilfried Potts
NO. OF CREW:	45

7. *SCIENTIFIC PERSONNEL*

NAME AND ADDRESS OF SCIENTIST IN CHARGE:	Dr. Jurgen Patzold, Geoscience Department, University of Bremen, P.O. Box 330440, D-28334 Bremen,, Germany.
TEL./TELEX/FAX NO:	+49 421 218 3135/+49 421 218 3116
NUMBER OF SCIENTISTS:	10

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

Northern North Sea:

Area A (Fladen Ground) between 58deg 40'N - 59deg 40'N and 00deg 00'E - 01deg 00'E

Area B (southeast of Fair Isle Channel, Dutch Bank) between 59deg 00'N - 59deg 40'N and 01deg 00' W - 00deg 00'E

Area C (Bressary Ground) between 60deg 00'N - 60deg 45'N and 00deg 00'E - 01deg 30'E

See Attachment 1: Planned working areas in the northern North Sea

9. *BRIEF DESCRIPTION OF PURPOSE OF CRUISE*

This cruise is part of the activities of the Research Center Ocean Margins located at the University of Bremen, Germany, sponsored by the Deutsche Forschungsgemeinschaft (DFG). The scientific work is also part of a planned international collaborative project to reconstruct the environmental and climatic history of the North Sea during the late millenia (project partners are Germany, Netherlands, UK).

In the framework of this project the question is how the environmental, climatic and oceanographic conditions changed in the Northern North Sea during the last millennia (late Holocene). The aim of the cruise is to collect geological and biological samples from the Fladen Ground, the Dutch Bank southeast of the Fair Isle Channel, and the Bressay Ground, UK. Main focus will be given to the collection of mollusc shells of Arctica islandica, of surface sediment samples as well as sediment cores.

We will carry out echosounding profiles for the identification of geological sampling sites. Station work will focus on the collection of the shells of the mollusc, Arctica islandica (both living and dead specimens) for paleoenvionmental and paleoclimatic studies. Surficial sediment samples will be taken with a grab sampler, a small multi corer, a box corer. Sediment core samples will be collected to achieve the late Holocene sediment record from the northern North Sea for paleoclimatic studies (AMS 14C dating, logging methods, stable isotope analysis). Water samples will be obtained from a Niskin water sampler for analysis of stable isotopes (delta13C and delta18O) for calibration of geological proxy data (from shells and sediments).

10. *DATES AND NAMES OF INTENDED PORTS OF CALL*

No ports in UK

11. *ANY SPECIAL REQUIREMENTS AT PORTS OF CALL*

N/A

NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART B: DETAIL

1. *NAME OF RESEARCH SHIP* RV Heincke *CRUISE NO.* HE195

2. *DATES OF CRUISE* From: 14/08/2003 To: 23/08/2003

3. *a) PURPOSE OF RESEARCH*

The research project has been designed to study the climate variability in the northern North Atlantic during the late Holocene. The main goal for the proposed cruise is to collect shells of the mollusc Arctica islandica in the northern North Sea. Living and dead shells of Arctica islandica will be collected in order to establish a continuous growth chronology over the past millennium and from time windows during the late Holocene. Dead shells will be dated by precise AMS 14C dating.

In a second step this annual mollusc growth chronology will be studied for trace element (Mc/Ca, Sr/Ca) and stable isotope (delta13C, delta18O) composition. In order to retrieve a sedimentological record for the same period, surface sediment samples and sediment cores will be collected. Sediment work will include AMS 14C dating, logging techniques (MRF-scanner), Multi sensor core logger, stable isotope analysis on foraminifera. The geological sampling will be accomplished by biological sampling of the benthic invertebrates from surface sediments. The biological part of the work will study the occurrence and abundance of Arctica islandica in the top layers of the sediment. Sediment samples will be sieved over 0.5 mm to retrieve just settled Arctica.

The three sampling areas in the northern North Sea provide unique localities to reconstruct environmental, climatic and oceanographic changes during the past centuries and millennia. Through earlier studies, the Fladen Ground has been identified as an optimal study area to investigate growth chronologies of Arctica islandica. Additionally, two other areas northeast and northwest of Fladen Ground were chosen to study the impact of the East Shetland inflow and the impact of the Fair Island Current on the northern North Sea. In a latter stage, the analyses of shells from these two separate water masses might give information about alternating strengths of these two inflows.

The climate variability of the late Holocene will be reconstructed from the sediment records and the shell records. The impacts of climate modes like, e.g. the North Atlantic Oscillation, will be studied.

b) GENERAL OPERATIONAL METHODS
(including full description of any fishing gear trawl type, mesh size, etc.)

We intend to sample the water column and the seafloor in the Fladen Ground, southeast of the Fair Isle Channel and the Bressay Ground. Geological and biological sampling will be carried out in all three proposed areas. Water samples will be obtained from Niskin bottles while water conditions will be recorded by a CTD. A dredge and a beam trawl will be used to collect mollusc shells of Arctica islandica. Surface sediment samples will be collected by a grab sampler, a small multi-corer (mini-corer), a box corer. Sediment cores will be collected by using a gravity corer (3 - 6 m). No fish gear will be used.

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

Working areas A, B and C marked in attached map (see Attachment 1);

Fladen Ground (Working Area A): limited by 58deg 40’N - 59deg 40’N and 0degE - 1deg E;

Dutch Bank southeast of Fair Isle Channel (Working Area B): limited by 59deg 00’N - 59deg 40’N and 01deg 00’W - 00deg 00’W;

Bressay Ground (Working Area C): limited by 60deg 00’N - 60deg 45’N and 00deg 00’E - 01deg 30’E.

5. *a) TYPES OF SAMPLES REQUIRED*
   (e.g. Geological/Water/Plankton/Fish/Radionuclide)

   Water;

   Geological samples: surface sediments, sediment cores;

   biological sampling: benthic invertebrates (molluscs, Arctica islandica) (no fish).

   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, quantify of fish to be retained on board)

   CTD/water sampler (about 10 stations);

   Dredging (dredge and beam trawl) for collection of Arctica islandica (about 20 stations);

   Collection of surface samples by grab sampler, box corer, multiple corer (30 cm sediment cores) (altogether about 30 stations);

   Collection of sediment cores by gravity corer (maximum 6 m length) (about 10 stations).

6. *DETAILS OF MOORED EQUIPMENT*

   No moored equipment planned

Laying	Recovery	Description	Depth	Latitude	Longitude

7. *ANY HAZARDOUS MATERIALS*
   (Chemicals, Explosives, Gases, Radioactive etc)
   (use separate sheet, if necessary)

   None.

   a) TYPE AND TRADE NAME

   b) CHEMICAL CONTENT (& FORMULA)

   c) IMO IMDG CODE REFERENCE & UN. NO.

   d) QUANTITY & METHOD OF STOWAGE ON BOARD

   e) IF EXPLOSIVES GIVE DATE(S) OF DETONATION

   - *Method of detonation*
   - *Position of detonation*
   - *Frequency of detonation*
   - *Depth of detonation*
   - *Size of explosive charge in Kgs*

8. *DETAIL & REFERENCE OF*

   a) ANY RELEVANT PREVIOUS/FUTURE CRUISES

   Several cruises have been carried out by UK and NL scientists to the northern North Sea (Fladen Ground) to collect shells of the mollusc Arctica islandica. A most recent cruise to the Fladen Ground has been carried out by Dutch colleagues from the NIOZ, Texel, NL, with RV Pelagia in July 2000 (Dr. Rob Witbaard). An extensive pre-site survey has been carried out by Dr. Rob Witbaard throughout the North Sea to map the distribution of Arctica Islandica in the Fladen Ground. This map will be used to sample selected sites during the planned cruise with RV Heincke (HE 195) in August 2003. Additional cruises have been carried out by our colleagues from the University of Wales (Bangor) for the same reason. A joint international research project with

participation of UK NL D scientist is currently being considered to combine the expertise and results from the different working groups currently working on the reconstruction of environmental conditional from growth rings of the mollusc Arctica islandica.

b) ANY PREVIOUSLY PUBLISHED DATA RELATING TO THE PROPOSED CRUISE

Witbaard, R. (1997). Tree of the sea. The use of internal growth lines in the shell of Arctica islandica (Bivalvia, Mollusca) for the retrospective assessment of marine environmental change. PhD thesis, Rijksuniversiteit Groningen, 149 pp.

Forsythe, G.T.W., J.D. Scourse, I. Harris, C.A. Richardson, P. Jones, K. Briffa and J. Heinemeier (2003). Towards an absolute chronology for the marine environment: the development of a 1000-year record from Arctica islandica. EGS-AGU-EUG Joint Assembly, Nice, France, 06-11 April 2003, EAE03-A-06044; CL21-1MO030-006, p 107.

Weidman, C.R. and G.A. Jones (1993). A shell-derived time history of bomb 14C on Georges Bank and its Labrador Sea implications. J. Geophys. Res., 98 (c8): 14577-14588.

Weidman, C.R., G.A. Jones and K.C. Lohmann (1994). The long-lived mollusc Arctica islandica: A new palaeoceanographic tool for the reconstruction of bottom temperatures for the continental shelves of the northern north Atlantic Ocean. J. Geophys. Res. 99; 18305-18314.

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*

Dr. James Scourse,
School of Ocean Sciences,
University of Wales (Bangor),
Menai Bridge,
Anglesey,
LL59 5EY

Direct: +44 (0) 1248 382876
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Email: j.scourse@bangor.ac.uk

10. STATE

a) WHETHER VISITS TO THE SHIP IN PORT BY SCIENTISTS OF THE COASTAL STATE CONCERNED WILL BE ACCEPTABLE

Yes

b) PARTICIPATION OF AN OBSERVER FROM THE COASTAL STATE FOR ANY PART OF THE CRUISE TOGETHER WITH THE DATES AND PORTS FOR EMBARKATION/DISEMBARKATION

Yes

c) WHEN RESEARCH DATA FROM THE INTENDED CRUISE IS LIKELY TO BE MADE AVAILABLE TO THE COASTAL STATE AND BY WHAT MEANS

Cruise Summary Report; scientific publications; literature

PART C: SCIENTIFIC EQUIPMENT

COASTAL STATE: Great Britain
PORT CALL:
DATES:

11. *COMPLETE THE FOLLOWING TABLE - SEPARATE PAGE FOR <u>EACH</u> COASTAL STATE (indicate "Yes" or "No")*

				DISTANCE FROM COAST		
LIST SCIENTIFIC WORK BY FUNCTION e.g. MAGNETOMETRY GRAVITY DIVING SEISMICS BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING WATER SAMPLING U/W TV MOORED INSTRUMENTS TOWED INSTRUMENTS	*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 CHARACTER-ISTICS*	*WITHIN 3 NM*	*BETWEEN 3 AND 12 NM*	*BETWEEN 12 and 200 NM*
Echo=sounding (<50 kHz)	Yes	No	Yes	No	No	Yes
CTD/Rosette	Yes	No	Yes	No	No	Yes
Dredge	Yes	No	Yes	No	No	Yes
Beam trawl	Yes	No	Yes	No	No	Yes
Grab sampler	Yes	No	Yes	No	No	Yes
Box Corer	Yes	No	Yes	No	No	Yes
Multicorer	Yes	No	Yes	No	No	Yes
CTD/Rosette	Yes	No	Yes	No	No	Yes
Gravity corer	Yes	No	Yes	No	No	Yes

(On behalf of the Principal Scientist)

Dated 04/06/2003

N.B. 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.