

NOTIFICATION OF PROPOSED RESEARCH CRUISE

Part A: GENERAL

1. **Name of research ship:** RV Pelagia

2. **Cruise dates:** 25th October 2007-19th November 2007,
Galway /Ireland – Funchal, Madeira/Portugal

- 3a. **Operating authority:** Royal Netherlands Institute for Sea Research (NIOZ)
Telephone: (+31) (0)222-369300
Telefax: (+31) (0)222-319674

- 3b. **Operating agent:** Netherlands Institute for Sea Research (NIOZ)
Telephone: (+31) (0)222-369300
Telefax: (+31) (0)222-319674

4. **Owner:** Royal Netherlands Institute for Sea Research (NIOZ)

5. **Particulars of ship:**

name:	Pelagia
nationality:	Dutch
overall length:	66.00 meters
maximum draught:	4.00 meters
nett tonnage:	1553 NRT
propulsion:	2 diesel electric Elliot White Gill Bow Truster
call sign:	PGRQ

6. **Crew:**

name of master:	J. Ellen/C. de Graaff
number of crew:	10

7. **Chief scientist:**

name:	Dr. Dagmar Kieke
addresses:	University of Bremen Institute of Environmental Physics Otto-Hahn-Allee 28359 Bremen Germany
telephone:	(+49) (0)421-218-4562
telefax:	(+49) (0)421-218-7018
e-mail address:	dkieke@physik.uni-bremen.de

**8. Geographical area in which the ship will operate:
(with reference in latitude and longitude)**

48°N-66°N, 42°W-11°W

9. Brief description of purpose of cruise:

The aims of this cruise are

- to investigate whether a specific water mass, termed Upper Labrador Sea Water (ULSW) has formed in the Irminger Sea during winter 2006/2007
- to determine the inventories of chlorofluorocarbon (CFC) of the deep water components in the Irminger Sea and adjacent basins close to the Reykjanes Ridge.

10. Names and dates of intended ports of call:

Galway (Ireland), embarkment/loading on 25th October 2007

Funchal (Madeira/Portugal), disembarkment/unloading on 19th November 2007

11. Any special logistic requirements at ports of call:

No special logistic requirements needed.

A 20-foot container (~5000 kg) will be lifted on/off board by ship crane.

Part B: DETAIL

1. Name of research ship: RV Pelagia

2. Cruise dates: October 25th 2007 – 19th November 2007

3. Purpose of research and general operational methods:

- (1) Quantification of the formation of deep water components in the subpolar North Atlantic Ocean with special focus on the Irminger Sea and regions adjacent to the Reykjanes Ridge.
- (2) Investigation whether a specific water mass, termed Upper Labrador Sea Water (ULSW) has formed in the Irminger Sea during winter 2006/2007.

Measurements will comprise hydrographic casts carried out using a water sampler carroussel with attached water bottles, a CTD/O sensor unit, and a lowered ADCP. Water samples will be taken for the purpose of sensor calibration and analysis of chlorofluorocarbon (CFC) content.

4. Attach chart showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations/hydrographic sections:

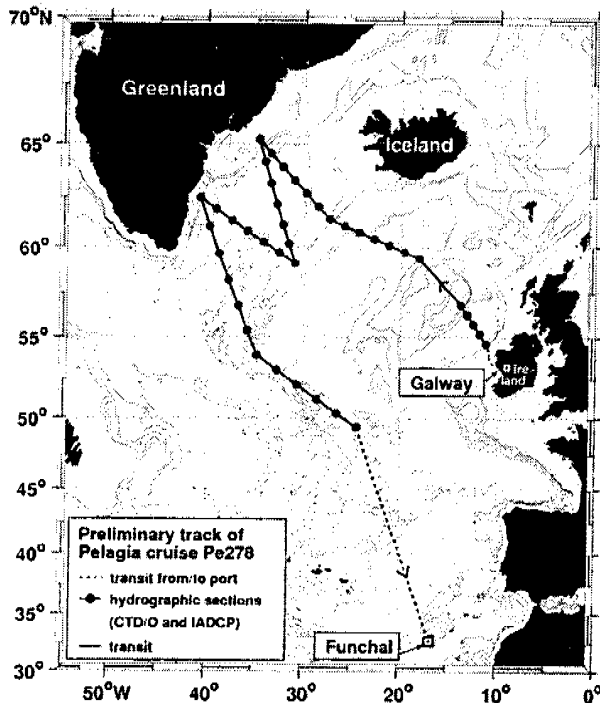


Figure 1: Intended track for cruise Pe278 with R/V Pelagia, 25th October 2007 – 19th November 2007, Galway (Ireland) to Funchal (Portugal).

5a. Type of samples required:

T, S, O₂, velocity, water samples for sensor calibration and CFC analysis, standard meteorological measurements, surface T,S

5b. Methods by which samples will be obtained (including dredge/core/drill techniques):

Types of samples And data	Methods to be used	Instruments to be used
T,S,O ₂	Profiling of CTD/O ₂	CTD/O ₂
Velocity	Profiling	Lowered ADCP attached to carousel
S, CFCs	Analysing water samples	10L bottles attached to carousel
Velocity	Vessel mounted ADCP	Vessel mounted ADCP
Depth	Echo sounder	Echo sounder
Surface T,S	Thermosalinograph	Thermosalinograph
Standard meteorological measurements	Meteorological sensors	Meteorological sensors

6. Details of moored equipment:

7. Explosives:

No explosives.

8. Detail and reference of:

a. Any relevant previous/future cruises:

R/V *Meteor*, cruises M59/1 and M59/2, 30.06.-27.08.2003
N/O *Thalassa*, cruise SUBPOLAR, 04.06.-12.07.2005
R/V *Maria S. Merian*, cruise MSM-05/1, 06.04.-16.05.2007
R/V *Maria S. Merian*, cruise planned in July 2008

**b. Any previous published research data relating to the proposed cruise:
(Attach separate sheet if necessary)**

A list of publications which are related to the proposed cruise is given in the References section.

9. Names and addresses of scientists of the coastal state in whose waters the proposed cruise takes place with whom previous contact has been made:

10. State:

a. Whether visits to the ship in port by scientist of the coastal state concerned will be acceptable:

Yes

b. Whether it will be acceptable to carry on board an observer from the coastal state for any part of the cruise and dates and ports of embarkation/-disembarkation:

Yes.

c. When research data from intended cruise is likely to be made available to the coastal state and if so, by what means:

The data will be made available through a scientific publication.

SCIENTIFIC EQUIPMENT

11. Complete the following table - include a separate copy for each coastal state (indicate "Yes" or "No" if applicable)

Marine scientific equipment used	water depth (m)	fisheries research	distance of research to coast in nautical miles			
			< 3	3-12	12-50	50-200
Mobile equipment: water sampler carroussel with attached CTD/O ₂ and IADCP	Top to bottom	No	No	No	No	Yes
Water bottles: CFCs and salinity	Top to bottom	No	No	No	No	Yes
Permanent surface water sampling and pumping (incl. therosalinograph)	Surface	No	No	No	No	Yes

List of intended sampling stations during Pelagia cruise

Locations of profiles are indicated in attached map, see Figure 1, Part B, Section 4.
 ~43 CTD/O₂ profiles with attached IADCP, taken top to bottom
 22 water samples per profile

References

(peer-reviewed)

Kieke, D., M. Rhein, L. Stramma, W.M. Smethie, D.A. LeBel, and W.Zenk (2006), Changes in the CFC inventories and formation rates of Upper Labrador Sea Water, 1997-2001. *Journal of Physical Oceanography*, Vol. 36(1), 64-86.

Kieke, D., and M. Rhein (2006), Variability of overflow transport in the western subpolar North Atlantic, 1950-1997. *Journal of Physical Oceanography*, Vol. 36(3), 435-456.

Kieke, D., M. Rhein, L. Stramma, W.M. Smethie, D.A. LeBel, and J. Bullister (2007), Changes in the pool of Upper Labrador Sea Water in the subpolar North Atlantic. *Geophysical Research Letters*, Vol. 34, L06605, doi:10.1029/2006GL028959.

Rhein, M., J. Fischer, W. M. Smethie, D. Smythe-Wright, R. F. Weiss, C. Mertens, D.-H. Min, U. Fleischmann, and A. Putzka (2002), Labrador Sea Water: Pathways, CFC inventory, and formation rates. *Journal of Physical Oceanography*, Vol. 32(2), 648-665.

Rhein, M., D. Kieke, and R. Steinfeldt (2007), Ventilation of Upper Labrador Sea Water, 2003-2005. *Geophysical Research Letters*, Vol. 34, L06603, doi:10.1029/2006GL028540.

Stramma, L., D. Kieke, M. Rhein, F. Schott, I. Yashayaev, and K.P. Koltermann (2004), Deep water changes at the western boundary of the subpolar North Atlantic during 1996 to 2001. *Deep-Sea Research I*, Vol. 51(8), 1033-1056.

(Submitted)

Haine, T. C. W. Böning, P. Brandt, J. Fischer, A. Funk, D. Kieke, E. Kvaleberg, and M. Rhein (2007), North Atlantic Deep Water Transformation in the Labrador Sea, Recirculation through the Subpolar Gyre, and Discharge to the Subtropics. Contribution to the *ASOF Science Book*, submitted.

LeBel, D. A., W. M. Smethie Jr., M. Rhein, D. Kieke, R. A. Fine, J. L. Bullister, D.-H. Min, W. Roether, R. F. Weiss, C. Andrie, D. Smythe-Wright, and E. P. Jones (2007), The distribution of CFC-11 in the North Atlantic during WOCE: Inventories and calculated water mass formation rates. *Deep-Sea Research. I*, submitted.

Smethie Jr., W. M., D. A. LeBel, R. A. Fine, M. Rhein, and D. Kieke (2007), Strength and variability of the deep limb of the North Atlantic meridional overturning circulation from chlorofluorocarbon inventories. In: *Past and Future Changes of the Ocean's Overturning Circulation: Mechanisms and Impacts on Climate and Ecosystems*, AGU monograph, edited by A. Schmittner, J. Chiang, and S. Hemming, submitted.