NOTIFICATION OF PROPOSED RESEARCH CRUISE

Part A: GENERAL

1. Name of research ship: **RV Pelagia** **Cruise number: 64PE474**

2. Cruise dates: 19 July 2020 – 18 August 2020

3.

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

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

4. Owner: NIOZ Royal Netherlands Institute for Sea Research

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
IMO nr:	9001461

6. Crew:

name of master:	J.C. Ellen / E. A. Puijman
number of crew:	12

7. Chief scientist:

name:	Dr. Rob Middag
addresses:	Department of Ocean Systems P.O. Box 59 1790 AB Den Burg The Netherlands
telephone:	+31369410
e-mail address:	rob.middag@nioz.nl

8. Geographical area in which the ship will operate:
(with reference in latitude and longitude)
Iceland basin, Irminger Sea and Greenland Sea in a region determined by the coordinates: 59°N, 40 °W – 67.8°N, 32°W - 70°N, 22°W – 69°N, 8°W – 63.5°N, 2°W - 59°N, 2°W -

9. Brief description of purpose of cruise:
Metals are often regarded as toxic contaminants. However, they also are essential nutrients for marine primary productivity. This cruise aims to study the cycling of metals over the full water column including the pore waters of the upper sediments. Additionally we aim to study the effect of Fe, light and nitrogen sources on phytoplankton.

10. Names and dates of intended ports of call:
Reykjavik, 18/19 July 2020 and 18/19 August 2020

11. Any special logistic requirements at ports of call:
none

Part B: DETAIL

1. Name of research ship: RV Pelagia

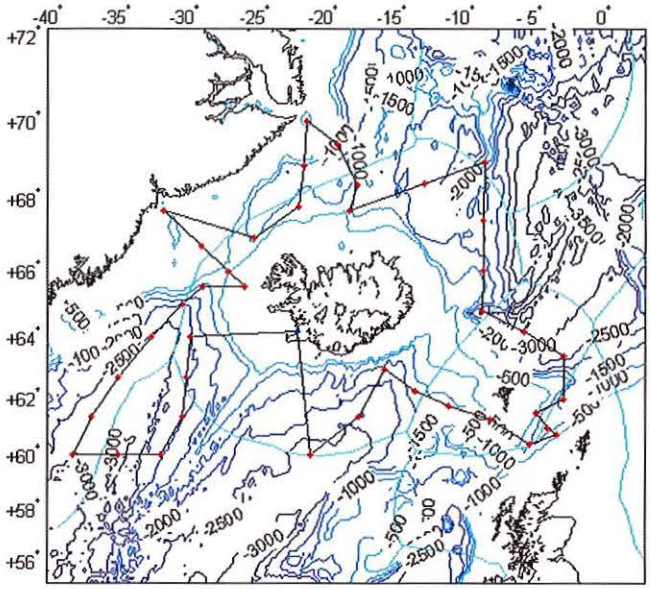
2. Cruise dates: 19 July 2020 – 18 August 2020

3. Purpose of research and general operational methods:
Metals are often regarded as toxic contaminants. However, they also are essential nutrients for marine primary productivity. In awareness of the importance of trace metals for the local ecosystem and the connections between local processes and global biogeochemical cycles we undertake an interdisciplinary and synergistic study to unravel the cycling of trace metals in the crucial GINS region and the connection to the Atlantic Ocean. This study addresses both a key region as well as crucial, insufficiently constrained processes in global marine biogeochemistry. While this study focusses on Fe, other (bio-essential) metals will be targeted as well to identify potential roles as co-limiting factors, actors in governing uptake and remineralisation ratios or tracers of biogeochemical processes.
The research is subdivided in three main objectives

1. To constrain the sources and sinks of trace metals and Fe-binding ligands to the GINS and North Atlantic
2. Determine the effects of changing Fe concentrations, temperatures, nitrogen sources and light levels on natural phytoplankton, their nutrient stoichiometry and protein expression in the field and in in bio-assays
3. Identify and quantify the effects of internal transformations on the trace metal, Fe-binding ligand and nutrient distributions in both the water column and the Benthic Boundary Layer (BBL)

This will be studied by taking water samples using a trace metal clean CTD rosette, a regular rosette and multi cores. Surface water will be incubated under various light and nutrient conditions to assess the response of the local phytoplankton community.

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



5.

5a. Type of samples required:
Water and upper sea floor sediments

5b. Methods by which samples will be obtained (including dredge/core/drill techniques):
CTD rosette with near bottom sampler and multi corer

6. Details of moored equipment:
N/A

7. Explosives:

N/A

8. Detail and reference of:

a. Any relevant previous/future cruises:
Cruise 64PE 319 aboard RV Pelagia in April/May 2010

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

Nielsdóttir, M.C., Moore, C.M., Sanders, R., Hinz, D.J. and Achterberg, E.P., 2009. Iron limitation of the postbloom phytoplankton communities in the Iceland Basin. Global Biogeochemical Cycles, 23(3): n/a-n/a.

Rijkenberg, M.J.A., Middag, R., Laan, P., Gerringa, L.J.A., van Aken, H.M., Schoemann, V., de Jong, J.T.M. and de Baar, H.J.W., 2014. The Distribution of Dissolved Iron in the West Atlantic Ocean. Plos One, 9(6).

Ryan-Keogh, T.J., Macey, A.I., Nielsdóttir, M.C., Lucas, M.I., Steigenberger, S.S., Stinchcombe, M.C., Achterberg, E.P., Bibby, T.S. and Moore, C.M., 2013. Spatial and temporal development of phytoplankton iron stress in relation to bloom dynamics in the high-latitude North Atlantic Ocean. Limnology and Oceanography, 58(2): 533-545

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:

N/A

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, but preferably not due to limited berths

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

All data will be made publicly available by the end of the project, 4 years after the cruise in appropriate international data bases as well as the NIOZ Data Archive System (DAS). The metal data will be submitted in the final project year to the GEOTRACES International Data Management Centre (www.bodc.ac.uk/geotraces/) which is linked to other international databases. Proteomic data will be deposited into the publically available databases ProteomeXchange and the Ocean Protein Portal

SCIENTIFIC EQUIPMENT

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

COASTAL STATE: UK

Marine scientific equipment used	**water depth (m)**	**fisheries research**	**distance of research to coast in nautical miles**			
			< 3	**3-12**	**12-50**	**50-200**
CTD	Full depth	no	no	no	yes	yes
Multicore	Full depth	no	no	No	Yes	yes
Near bottom sampler	Full depth	no	No	no	Yes	yes
Towed Fish	~2 m	no	no	No	yes	yes
In situ pump	Full depth	No	Non	No	Yes	Yes

List of intended sampling stations during Pelagia cruise

Expected work in various EEZ (see table for more details): Iceland: 20/07/2020-17/08/2020; Greenland: 23/07/2020-06/08/2020; Norway (Jan Mayen): 03/08/2020 - 09/08/2020; Faroe Islands: 05/08/2020 -15/08/2020; UK: 06/08/2020 -14/08/2020.

Station	Latitude	Longitude	Water Depth(m)	EEZ	Date range
1	64.00	-29.65	1991	Iceland	20/07-22/07
2	62.67	-29.90	2002	Iceland	20/07-22/07
3	61.33	-30.25	2006	n/a	
4	60.00	-31.80	1995	n/a	
5	60.00	-34.95	2988	n/a	
6	60.00	-38.26	3002	Greenland	23/07-30/07
7	61.33	-36.87	2802	Greenland	23/07-30/07
8	62.67	-34.95	2743	Greenland	23/07-30/07
9	64.00	-32.50	2609	Greenland	23/07-30/07
10	65.00	-30.23	2099	Greenland	23/07-30/07
11	65.53	-28.72	1133	Iceland	26/07-01/08
12	65.50	-25.70	107	Iceland	26/07-01/08
13	65.95	-26.91	409	Iceland	26/07-01/08
14	66.70	-28.82	313	Greenland	28/07-03/08
15	67.68	-31.60	481	Greenland	28/07-03/08
16	66.92	-25.04	883	Iceland	29/07-04/08
17	67.81	-21.81	749	Iceland	29/07-04/08
18	68.87	-21.45	1364	Greenland	31/07-06/08
19	70.00	-21.22	537	Greenland	31/07-06/08
20	69.45	-19.03	1341	Greenland	31/07-06/08
21	68.37	-17.50	1324	Iceland	02/08-08/08
22	67.70	-18.11	901	Iceland	02/08-08/08
23	68.43	-12.67	1799	Iceland	02/08-08/08
24	68.99	-8.33	826	Norway (Jan Mayen)	03/08-09/08
25	67.43	-8.43	1634	Iceland	04/08-10/08
26	65.98	-8.43	1253	Iceland	04/08-10/08
27	64.78	-8.45	2514	Iceland	04/08-10/08
28	64.13	-5.45	3440	Faroe Islands	05/08-11/08
29	63.37	-2.59	2623	Faroe Islands	05/08-11/08
30	**61.96**	**-2.66**	**1646**	**UK**	**06/08-12/08**
31	61.48	-4.60	497	Faroe Islands	07/08-13/08
32	**60.98**	**-3.75**	**1112**	**UK**	**08/08-14/08**
33	**60.73**	**-3.12**	**487**	**UK**	**08/08-14/08**
34	60.37	-5.05	955	Faroe Islands	09/08-15/08
35	61.22	-7.89	904	Faroe Islands	09/08-15/08
36	61.69	-10.96	1237	Faroe Islands	09/08-15/08
37	62.23	-13.36	1266	Iceland	10/08-17/08
38	62.94	-15.55	1783	Iceland	10/08-17/08
39	61.33	-17.49	2403	Iceland	10/08-17/08
40	60.00	-20.93	2728	Iceland	10/08-17/08