NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A: GENERAL

1. Name of research ship **RV BELGICA** Cruise N° **2019/13**

2. Dates of cruise From **07 May 2019** To **17 May 2019**

3. Operating Authority

Belgian Navy under contract for Belgian Ministry of Science Policy
Royal Belgian Institute for Natural Sciences (RBINS)
Operational Directorate Natural Environment, Measurement Services Ostend
3de en 23ste Linieregimentsplein, B-8400 Ostend
✆+ 32(0)59 70 01 31 • 🖷: + 32(0)59 70 49 35 • ✉ mso@naturalsciences.be
odnature.naturalsciences.be/belgica

4. Owner **Belgian state represented by Minister for Science Policy**

5. Particulars of ship

Name	**Belgica**
Nationality	Belgian
Overall length	51 meters
Maximum draught	4,5 meters
Nett tonnage	232NRT
Propulsion	Diesel
Call Sign	ORGQ
Telephone	INMARSAT 00870 76 218 73 27
Facsimile	INMARSAT 00870 32 052 18 12
Email	**rvbelgica@naturalsciences.be**

6. Crew

Name of master	**Commander (BeN) Ludwig Damman**
N° of Crew	**15**

7. Scientific Personnel

Name and address of scientist in charge :

Dr. Maikel DE CLERCQ
Ghent University – Department Geology
Krijgslaan 281, 9000 Ghent, Belgium
☎ +32-496 755 740 • ✉ maikel.declercq@ugent.be
www.rcmg.ugent.be

Dr. Tine MISSIAEN
Flanders Marine Institute (VLIZ)
Wandelaarkaai 7, 8400 Ostend, Belgium
☎ +32-474-512 021 • ✉ tine.missiaen@vliz.be
www.vliz.be

N° of scientists : **10**

(A nominall roll of all personnel other than nationals of the applicant (flag) state is required)

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

The survey will be carried out across the British and Dutch continental shelves; in between geographic longitude1°58'E – 3°52' and latitudes 52°26'N – 54°32'N (see Table 1 and Figure 1 in annexes)

9. Brief description of purpose of cruise

Mapping the buried paleolandscapes of the late Quaternary in the southern/central North Sea: river systems, proglacial lake(s) and their possible outflow towards the Dover Strait. After a first reconnaissance survey in 2018 which largely focused on the Brown Bank area this follow-up survey in 2019 intends to further map the surrounding region as well as to perform detailed mapping of certain targeted areas with archaeological potential.

10. Port of Call. Dates. Reasons

Zeebrugge	**07/05/2019**	**Departure homeport. Start of research cruise RV Belgica 2019/13**
Zeebrugge	**17/05/2019**	**Arrival homeport. End of research cruise RV Belgica 2019/13**

11. Any special logistic requirements at ports of call (other than water, fuel provisions, etc.) **N.A.**

NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART B: DETAIL

1. Name of research ship **RV BELGICA** Cruise N° **2019/13**

2. Dates of cruise From **07 May 2019** To **17 May 2019**

3. Purpose of research and general methods. (If the research work is being taken on behalf of a research institution of a third state, it is the responsibility of that state to obtain prior permission; it is essential that written confirmation that this has been done is obtained and quoted in this application.

   In April 2018, a seismic reconnaissance survey (Belgica 2018/09) was carried out in the southern North Sea (larger Brown Bank area). The objectives of that campaign were: (1) to investigate the drainage pattern of the palaeo-fluvial systems that traversed the SNS during the Last Glacial Age (including the presence/absence of large proglacial lake/s), and (2) to model the late Quaternary palaeolandscape of the SNS in the span Late Pleistocene – early Holocene and its possible impact on the human occupation of this area. The 2018 survey generated a unique dataset of unprecedented quality, but, due to the vastness of the study area, further seismic/geophysical data are necessary to characterize it. The main aims of the follow-up survey of 2019 are to (1) fill up data gaps for geomorphologic/palaeogeographic study, (2) investigate the further link with the drowned 'Doggerland', and (3) perform detailed seismic investigations in well-chosen sub-areas for archaeological studies.

4. Attach chart(s) 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. Attach chart with list of positions (+ geographical references)

   See Annex 1 (Chart)
   See Annex 2

5. Types of samples required, e.g. Geological / Water / Plankton / Fish / Radioactivity / Isotope ….

   geological

   and methods by which samples will be obtained (including dredging/coring/drilling).

   High resolution marine seismic (sparker, single channel streamer, parametric echosounder) and multibeam

6. Details of moored equipment : **N.A.**

Dates Laying	Recovery	Description	Latitude	Longitude

7. Explosives **N.A.**

(a) Type and Trade Name	(b) Chemical content
(c) Dept of trade class and stowage	(d) Size
(e) Depth of detonation	(f) Frequency of detonation
(g) Dates of detonation	

8. Details and reference of

(a) Any relevant previous/future cruises

Belgica cruises 2018/09 (10-20/04/2018)

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

García-Moreno, 2017. Origin and geomorphology of Dover Strait and southern North Sea palaeovalleys and palaeo-depressions. PhD thesis, Ghent University, Ghent, Belgium.

Gupta, S., Collier, J.S., García-Moreno, D., Oggioni, F., Trentesaux, A., Vanneste, K., De Batist, M., Camelbeeck, T., Potter, G., Van Vliet Lanoe, B., and Arthur, J.C.R., 2017. Making Britain: Two-stage catastrophic opening of the Dover Strait. Nat. Commun. 8, doi: 10.1038/ncomms15101.

Sejrup, H. P., Clark, C. D., and Hjelstuen, B. O., 2016. Rapid ice sheet retreat triggered by ice stream debuttressing: Evidence from the North Sea. Geology. 44, 355–358.

Toucanne, S., Zaragosi, S., Bourillet, J. F., Marieu, V., Cremer, M., Kageyama, M., Van Vliet-Lanoë, B., Eynaud, F., Turon, J-L, and Gibbard, P. L., 2010, The first estimation of Fleuve Manche palaeoriver discharge during the last deglaciation: evidence for Fennoscandian ice sheet meltwater flow in the English Channel ca 20–18ka ago, Earth and Planetary Science Letters, v. 290, v. 459–473.

Toucanne, S., Soulet, G., Freslon, N., Jacinto, R. S., Dennielou, B., Zaragosi, S., Eynaud, F., Bourillet, J-F., and Bayon, G., 2015. Millennial-scale fluctuations of the European Ice Sheet at the end of the last glacial, and their potential impact on global climate. Quaternary Science Reviews, 123, 113-133.

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

UNITED KINGDOM:
Prof. Vince Gaffney and **Dr. Simon Fitch**, School of Archaeological Sciences, University of Bradford, Richmond Road, Bradford BD7 1DP, UK (V.Gaffney@bradford.ac.uk; S.Fitch@bradford.ac.uk)

THE NETHERLANDS:
Dr. Sytze Van Heteren, TNO, Princetonlaan 6, 3584 CB Utrecht, The Netherlands (sytze.vanheteren@tno.nl).

10. State :

(a) Whether visits to the ship in port by scientists 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, cfr. part A § 10

(c) When research data from intended cruise is likely to be made available to the coastal state and if so by what means. (If the final report is likely to be delayed beyond 12 months, interim progress reports are required.

Cruise report within 1 month by request to the chief scientist

Part C: SCIENTIFIC EQUIPMENT

COASTAL STATE : **UNITED KINGDOM**

(Indicate "YES" or "NO")

LIST SCIENTIFIC WORK BY FUNCTION EG. MAGNETOMETRY : GRAVITY DIVING : SEISMICS: YES BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING : WATER SAMPLING U/W T.V. : 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 CHARACTERISTICS	DISTANCE FROM COAST		
				WITHIN 12 NMS	BETWEEN 12-200 NMS	CONTINENTAL SHELF WORK ONLY BEYOND 200 NM BUT WITHIN THE CONTINENTAL MARGIN
Seismics/Multibeam bathymetry	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**

Part C: SCIENTIFIC EQUIPMENT

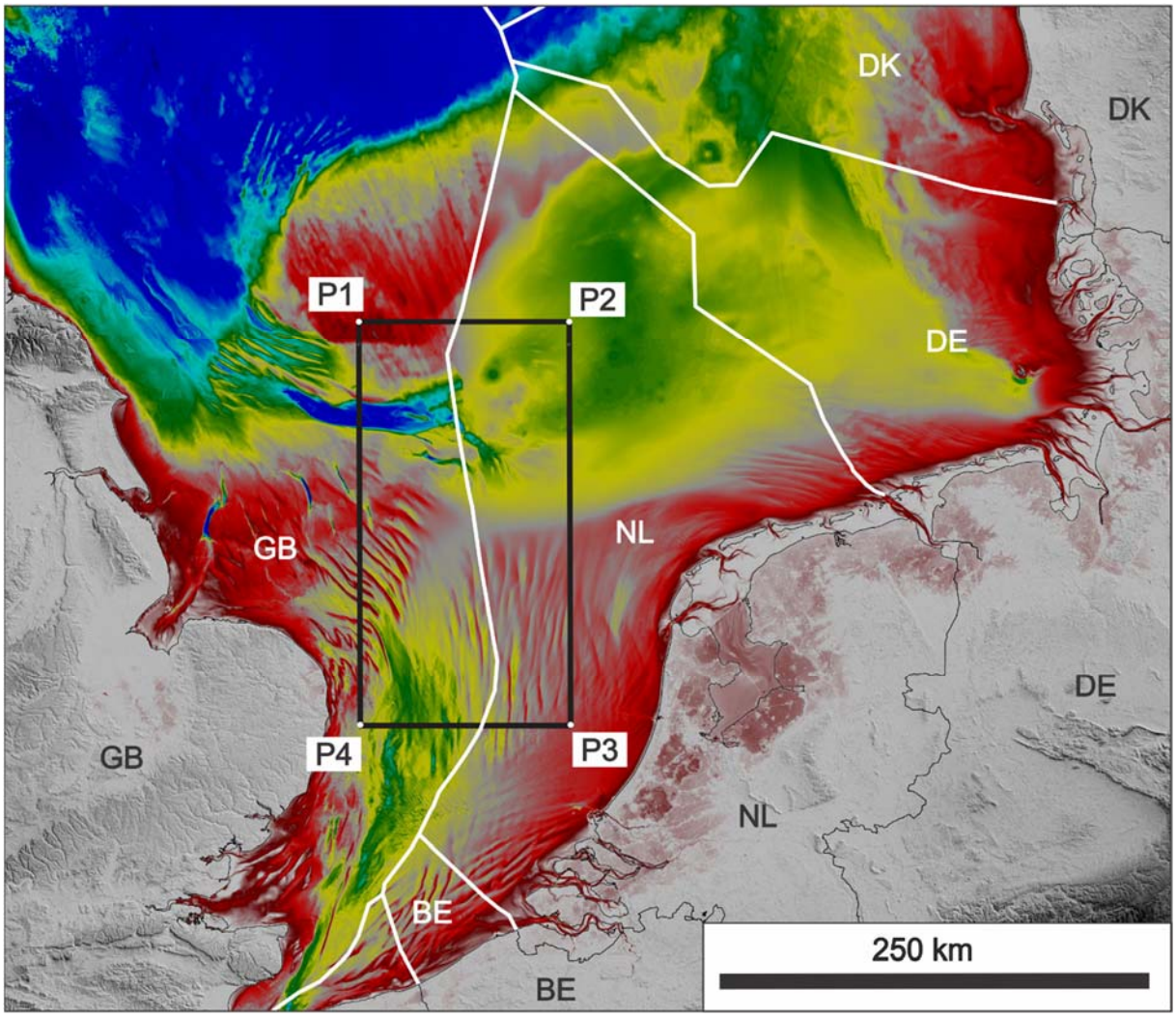
COASTAL STATE : **THE NETHERLANDS**

(Indicate "YES" or "NO")

LIST SCIENTIFIC WORK BY FUNCTION EG. MAGNETOMETRY : GRAVITY DIVING : SEISMICS: BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING : WATER SAMPLING U/W T.V. : 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 CHARACTERISTICS	DISTANCE FROM COAST		
				WITHIN 12 NMS	BETWEEN 12-200 NMS	CONTINENTAL SHELF WORK ONLY BEYOND 200 NM BUT WITHIN THE CONTINENTAL MARGIN
Seismics/Multibeam bathymetry	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**

Annex 1:

Belgica campaign 2019/13: chart



ANNEX 2

Table 1

Corner	LONG (dd°mm.mm')	LAT (dd°mm.mm')	LONG (dd.dd)	LAT (dd.dd°)
P1	1° 57.78' E	54° 31.98' N	1.96° E	54.53° N
P2	3° 51.84' E	54° 31.98' N	3.86° E	54.53° N
P3	3° 51.84' E	52° 26.39' N	3.86° E	52.43° N
P4	1° 57.78' E	52° 26.39' N	1.96° E	52.43° N

Geographic coordinates of corners defining the survey area proposed for this study.