

ANNEXE I A LA LETTRE N° 017 /SHOM/DMI/PL/NP DU 21 JUILLET 2025
REQUEST FOR CONSENT FOR MARINE SCIENTIFIC RESEARCH IN WATERS UNDER THE
JURISDICTION OF REPUBLIC OF ICELAND

Date: 2025, July, 21st

1 GENERALITIES

1.1 CRUISE NAME

The cruise name is NARVAL2026

1.2 SPONSORING INSTITUTION

Name: Service Hydrographique et Océanographique de la Marine (Shom)

Address: Service hydrographique et océanographique de la Marine (Shom)

13, rue du Chatellier

CS 92803 – 29228 BREST cedex 2 – France

Director: Ingénieur Général de l'Armement Laurent Kerléguer

1.3 SCIENTIST IN CHARGE OF THE PROJECT

Name: Ronan Pronost

Address: BCRM de Brest - GHOA – CC61 - 29240 BREST CEDEX 9, France

Director: Ingénieur en chef de 1^{ère} classe des études et techniques de l'armement Ronan Pronost

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1.4 FRENCH SCIENTIST IN CHARGE OF CONDUCTING THE WORK AT SEA

Name: Ronan Pronost

Address: BCRM de Brest - GHOA – CC61 - 29240 BREST CEDEX 9, France

Director: Ingénieur en chef de 1^{ère} classe des études et techniques de l'armement Ronan Pronost

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1.5 REQUEST AUTHORITY

Name and address: Service hydrographique et océanographique de la Marine (Shom)

13, rue du Chatellier CS 92803 – 29228 BREST cedex 2 – France

Country: France

Phone: (+33) 2 56 31 23 24

Fax: (+33) 2 56 31 25 80

Telex : 940 861 (for Shom)

2 PROJECT DESCRIPTION

2.1 SCIENTIFIC OBJECTIVES

The objective of the campaign is to acquire knowledge of the marine environment in the Arctic region. This scientific campaign will be focused on the following themes: bathymetry, geophysics and physical oceanography.

In addition, the transits made during the campaign will give the opportunity to enhance the bathymetric, oceanographic and geophysical knowledge.

All these works will also allow the update of international marine charts, to improve safety of navigation.

The work will be carried out by the *Beautemps-Beaupré* hydro-oceanographic vessel (BHO).

2.2 PAST OR FUTURE SCIENTIFIC CRUISES IN THE SAME AREA

NARVAL2017, NARVAL2018, NARVAL2021, NARVAL2023

2.3 BIBLIOGRAPHY

- Florent Le Courtois, Anna Terrade, Gaultier Real, Bazile Kinda. *Capacité de détection de signaux acoustiques en présence en environnement incertain*. 16ème Congrès Français d'Acoustique, CFA2022, Société Française d'Acoustique; Laboratoire de Mécanique et d'Acoustique, Apr 2022, Marseille, France. ([hal-03847913](https://hal.archives-ouvertes.fr/hal-03847913))
- Alexandre L'her, Angélique Drémeau, David Dellong, Pierre-Antoine Dumont, Yann Stéphan. *Effect of frontal instabilities on underwater acoustic propagation : study of the Narval 2021 data*, Oceans Conference and Exhibition, June 2025, Brest, France

3 DESCRIPTION OF THE SHIP AND THE INSTRUMENTATION

3.1 SHIP INFORMATION

Ship name : BHO BEAUTEMPS-BEAUPRÉ

Flag : FRANCE

Owner : FRENCH NAVY

Operator : Shom (Groupe Hydrographique et Océanographique de l'Atlantique)

Length : 81 m

Maximum draught : 7 m

DWT : 2025 T

GRT : 3292 T

Propulsion : Diesel Generators connected to electric engine

Speed : 12 knots

Maximum speed : 14 knots

Indication : FABB

Hull number : A 758

Communications : VHF/UHF – HF BLU – INMARSAT B – VSAT

Ship Master : Cdr Dimitri Bertheau, Cdr Laurence Peltier

Crew : 29 (5 officers, 24 petty officers, and crew members), all with French nationality.

Scientific team : 21 (hydrographers, scientists and engineers), all with French nationality.

3.2 DESCRIPTION OF THE INSTRUMENTATION

Type of the data collected	Acquisition type	Systems
Bathymetry	Along shiptrack	Multibeam sensors: EM124 (12 kHz) and EM712 (40-100 kHz) Single-beam sensor EA640 (12 kHz – 33 kHz – 210 kHz)
Geophysical measurements	Along shiptrack	Towed magnetometer
	Onshore	Scintrex portable gravimeter
Sedimentology	Along shiptrack	SBP29 sub-bottom profiler (2-9 kHz)
Current measurements	Along shiptrack	VM-ADCP (Acoustic Doppler Current Profiler) 38kHz and 150 kHz.
	Glider (0-1000m)	Oceanographic glider SeaExplorer: ADCP (1 MHz)
Hydrology measurements	Along shiptrack or In station	Hull mounted thermosalinometer Expandable bathythermographs probes (XBT, XCTD) Sound velocity profiler RapidCAST Hull mounted celerimeter
	Glider (0-1000m)	Oceanographic glider (CTD)
Weather measurements	Along shiptrack	Onboard weather station

3.3 DANGEROUS CHEMICAL

No harmful substances are used.

3.4 DRILLING

No drilling will be carried out.

3.5 EXPLOSIVE

No explosives will be used.

4 EQUIPMENTS AND INSTALLATIONS

4.1 PHYSICAL MEASUREMENTS

Echosounders will be used in order to measure bathymetry in the area with an accuracy compatible with the requirements of the International Hydrographic Organization (IHO).

The sub-bottom profiler will be used in order to improve bottom knowledge in the area.

The hull-mounted ADCPs will measure the current throughout the water column during the operations.

Hydrology measurements will be done to provide the necessary sound velocity vertical profiles for multibeam echosounder signal processing (inversion of time into vertical distance taking into account the acoustic ray paths). These measurements will also enable the study of the spatio-temporal variations of oceanographic phenomena in the area.

Drifting floats of the ARVOR, WOCE and SLDMB types may be deployed throughout the entire area covered by the campaign. These floats, CTD casts, current measurements by glider and oceanographic measurements from hull mounted sensors will be used for water masses characterization and regional circulation understanding, in support of oceanographic modeling research work.

A sea magnetometer will be used to measure the changes in geophysical signals (anomalies in particular) in the survey area.

4.2 GEOPHYSICAL MEASUREMENTS DURING PORTCALLS

The SCINTREX portable gravimeter (see annex II) is used to measure gravity at points close to the ship linked to the IGSN71 network. These are passive measurements and do not emit radio signals.

Request for authorization to carry out these measurements will be also detailed in the letter to be addressed for requesting the authorization for the call.

5 GEOGRAPHICAL AREAS

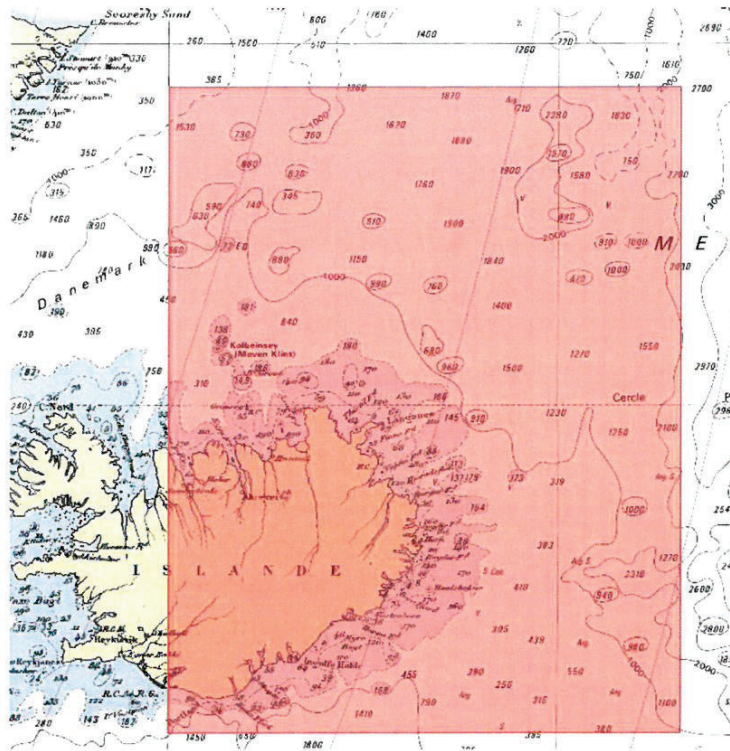
5.1 DESCRIPTION OF THE AREAS OF THE SURVEY (WGS84)

The work will be conducted by the BHO *Beautemps-Beaupré* within a limited area of the polygon shown below, outside of territorial waters.

Coordinates :

Latitude	Longitude
69°37'N	20°W
69°37'N	6° 50 ' W
63°N	6° 50 ' W
63°N	20°W

5.2 CHART OF THE AREA WHERE THE SURVEY WILL BE CARRIED OUT



Working area (outside of territorial waters) - extract from marine chart FR5417

6 CHRONOLOGY

6.1 ACTUAL STARTING AND FINISHING DATES OF THE PROJECT

Entry date: April 26, 2026 at the earliest

Exit date: September 30, 2026 at the latest

The duration of the works has not yet been precisely determined, as it depends on the rest of the "Beautemps-Beaupré" activity program currently under construction. The maximum duration of work currently envisaged is around 2x2 months during the above period.

6.2 MULTIPLE ENTRIES

Multiple inputs and outputs will be required.

7 PORT OF CALL

7.1 DATES AND PLACES OF PORT OF CALL

Ports of call will be defined later.

7.2 LOGISTICS NEEDS DURING THE CALL

The letters for potential port call will specify the logistical needs and the scientific work planned on land.

7.3 NAME, ADDRESS AND PHONE OF THE AGENT

None.

8 PARTICIPATION

8.1 SPECIFY THE EXTENT TO WHICH THE COASTAL STATE WILL BE ABLE TO PARTICIPATE OR BE REPRESENTED IN THE RESEARCH PROJECT

The work carried out by Shom in the area can be presented during a potential port call, or by videoconference.

The work carried out by Shom in the area may give rise to the embarkation of an observer on board the vessel.

8.2 DATES AND HARBOURS POSSIBLE FOR EMBARKING AND DISEMBARKING AN OBSERVER

It will be possible to embark and disembark at the scheduled ports of call (see 7.1). Should there be no port of call, the embarkation and disembarkation arrangements for observers must be discussed with the authorities.

9 ACCESS TO DATA AND RESULTS OF THE CRUISE

9.1 PRELIMINARY REPORT OF THE CRUISE

The final campaign report will be sent within 6 months of the end of the campaign.

9.2 ACCESS TO DATA AND SAMPLES

The hydro-oceanographic data from the campaign will be provided in electronic form with the report.

9.3 ACCESS TO INFORMATION NEEDED TO INTERPRET OR QUALIFY THE QUALITY OF THE DATA

The cruise report describes the methods applied to collect data and gives necessary information to evaluate the quality of numerical data.

9.4 INTERNATIONAL DIFFUSION OF INFORMATION

Some scientific results may be presented at international oceanography conferences and published in A-rank peer-reviewed journals.

The data will be used by Shom and sent to the authorities in order to update nautical publications (including charts) according to International Hydrographic Organization: see resolution 1/2006 from M-3 publication and rules A-402.1 and B-635.4 from S-4 publication available on IHO web site at: <https://iho.int/en/iho-publications>.

ANNEXE II A LA LETTRE N°017/SHOM/DMI/PL/NP DU 21 JUILLET 2025
ONSHORE GRAVITY MEASUREMENTS

A portable SCINTREX gravimeter is used for gravity measurements on land. The aim is to determine the difference in gravity between a reference station and a point close to the boat. These are passive measurements, and therefore do not emit radio signals.



Scintrex Gravimeter

The main steps are:

- Gravity measurement on the dock near the ship (approx. 10 min);
- Move to the gravity reference station (on foot, car rental, ...);
- Gravity measurements exactly on the location of the reference station as defined by the International Gravity Office (about 10 minutes);

Move back to the ship and new gravity measurements on the dock near the ship (about 10 minutes).