

NOTIFICATION OF PROPOSED RESEARCH CRUISE**PART A: GENERAL**

1. NAME OF RESEARCH SHIP: **R.V. MARIA S. MERIAN** CRUISE NO. **MSM110**
2. DATES OF CRUISE **from 7th August 2022, Reykjavik
to 29th August 2022, Reykjavik**
3. OPERATING AUTHORITY **Institute for Geology / University of Hamburg
Bundesstr. 55, D-20146 Hamburg, Germany
Tel.: +49-40-42838-3640 - Fax: +49-40-4273-10063**
4. OWNER (if different from n. 3) **Federal State Mecklenburg-Vorpommern,
Germany**
5. PARTICULARS OF SHIP
- | | |
|-----------------|------------------------|
| Name | MARIA S. MERIAN |
| Nationality | German |
| Overall length | 94.8 metres |
| Maximum draught | 6.5 metres |
| Nett tonnage | 1671 NT |
| Propulsion | Diesel Electric |
| Call sign | D B B T |
6. Crew
- | | |
|----------------|----------------------------|
| Name of master | <u>Ralf Schmidt</u> |
| Number of crew | <u>max. 23</u> |
7. SCIENTIFIC PERSONEL
- | | |
|--|---|
| Name and address of scientist in charge: | Prof. Dr. Helmuth Thomas
Helmholtz-Zentrum Hereon
Max-Planck-Str. 1
21502 Geesthacht
Germany |
| Tel.: | +49 4152 872805 |
| Fax: | +49 4152 8742805 |
| E-Mail: | Helmuth.thomas@hereon.de |
| Number of scientists: | <u>max.23</u> |

8. GEOGRAPHICAL AREAS IN WHICH SHIP WILL OPERATE

(with reference in latitude and longitude)

Denmark Strait Region:

66°12'N, 27°W

65°30'N, 28°W

65°N, 29°W

64°41'N, 30°W

67°30'N, 25°W

66°45'N, 30°W

Fjord Section:

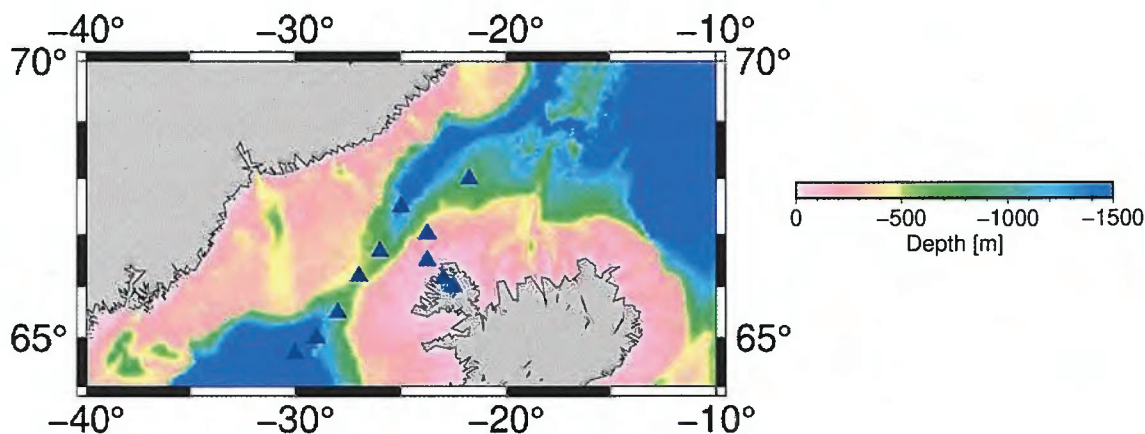
66°N, 22°30'W

66°09'N, 23°W

66°30'N, 23°45'W

67°N, 23°45'W

68°N, 21°45'W

9. BRIEF DESCRIPTION OF PURPOSE OF CRUISE

This application is submitted at short notice, because the current and expected ice conditions in the intended northern region of Greenland, Dove Bay, most likely will prevent research operations in the planned area, as the Dove cannot be accessed by the RV MARIA S. MERIAN.

The investigations of Arctic fjords as well as of the connectivity between Arctic and subpolar marine ecosystems are important elements of the HORIZON-2020 supported project ECOTIP. ECOTIP aims at improving our understanding of anthropogenic changes in the biological production and diversity in the Arctic marine regions, and their effects on the ecosystem services. Special emphasis is put on evaluating whether a change in the lower trophic levels due to the increased temperature and freshwater outflow or other physico-chemical conditions can trigger an ecosystem tipping cascade that ultimately will change benthic-pelagic coupling, carbon sequestration and fisheries production. Due to changes in fundamental elements of the arctic marine ecosystem, there is a strong need for comprehensive field studies in these areas to support the assessment and modeling of biological changes under the future climate scenarios.

10. DATES AND NAMES OF INTENDED PORTS OF CALL- Reykjavik from 03.08.2022 to 07.08.2022 (*Approval UTN22020117/34.R.423*)

- Reykjavik from 29.08.2022 to 02.09.2022

11. ANY SPECIAL REQUIREMENTS AT PORTS OF CALL

Crew change, bunkering, freight handling.

NOTIFICATION OF PROPOSED RESEARCH CRUISE**PART B: DETAILS**

1. NAME OF RESEARCH SHIP **R.V. MARIA S. MERIAN**
CRUISE NO. **MSM110**
2. DATES OF CRUISE **Reykjavik, 07.08.2022 to Reykjavik, 29.08.2022**
3. a) **PURPOSE OF RESEARCH**

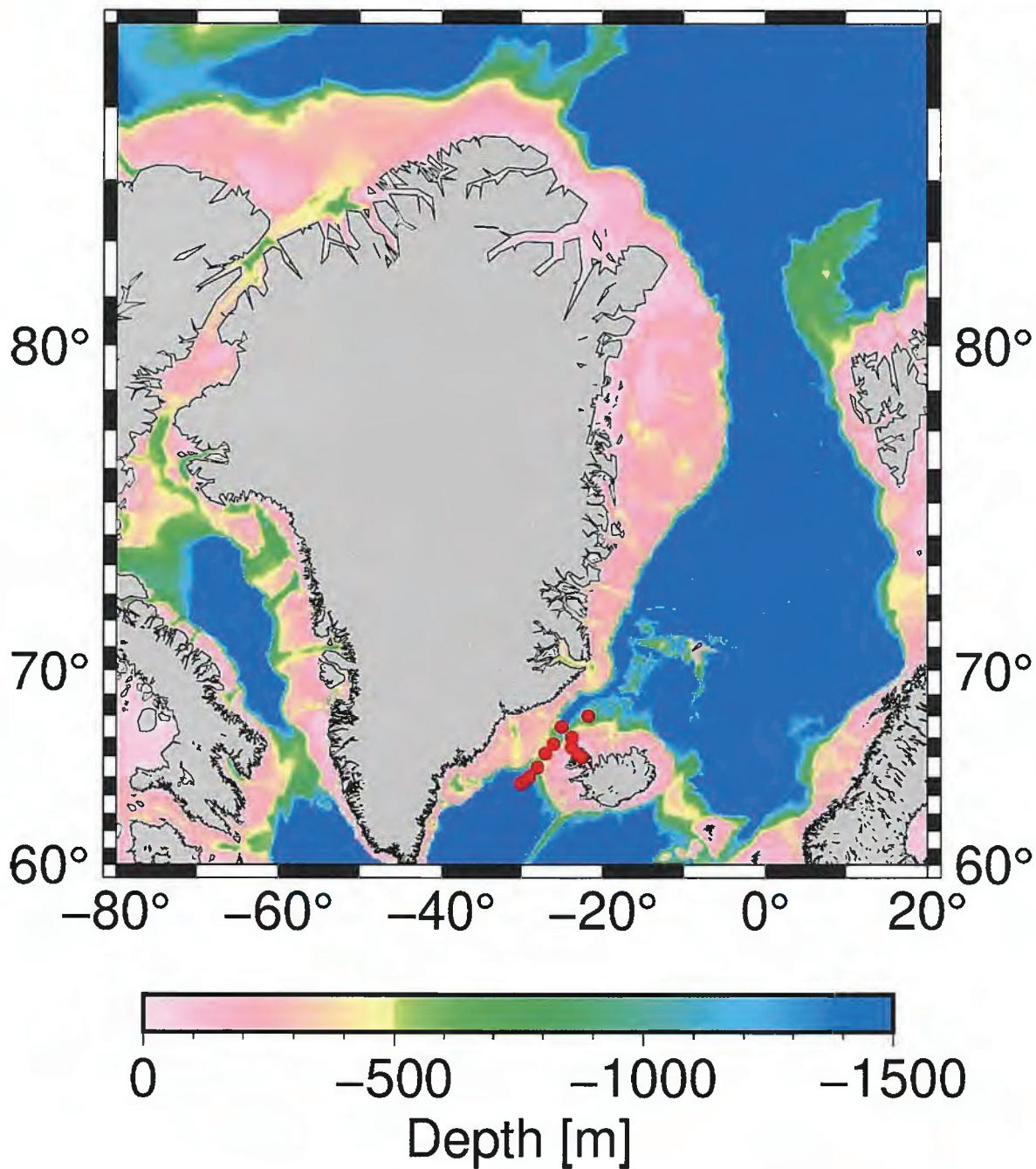
This application is submitted at short notice, because the current and expected ice conditions in the intended northern region of Greenland, Dove Bay, most likely will prevent research operations in the planned area, as the Dove cannot be accessed by the RV MARIA S. MERIAN.

The main objectives of research focusses on:

- **The link between environmental (climatic) conditions and the biodiversity and productivity of pelagic and benthic ecosystems**
- **The processes of biological pump, pelagic-benthic coupling, sediment and land-ocean fluxes, microbial processes and lipid accumulation under different community composition (biodiversity) and environmental conditions**
- **Long-term changes in biodiversity, through the comparison to historical data and through new paleo-oceanographic sampling.**
- **Connectivity between ecosystems of the Arctic Ocean and of the subpolar North Atlantic Ocean**
- **Investigating the climate-induced changes in biodiversity and the resulting changes in the major biological processes in the Arctic marine ecosystem.**
- **The use of new measurements and process understanding for estimating the sensitivity of functional traits at different trophic levels to environmental conditions, as well as linking the observed traits of the natural communities to ecosystem functions and services.**
- **We apply the following operational methods: continuous surface water sampling, discrete water column sampling, plankton sampling using nets, sediment sampling using sediment traps (shortterm, not longterm moorings) and coring devices**

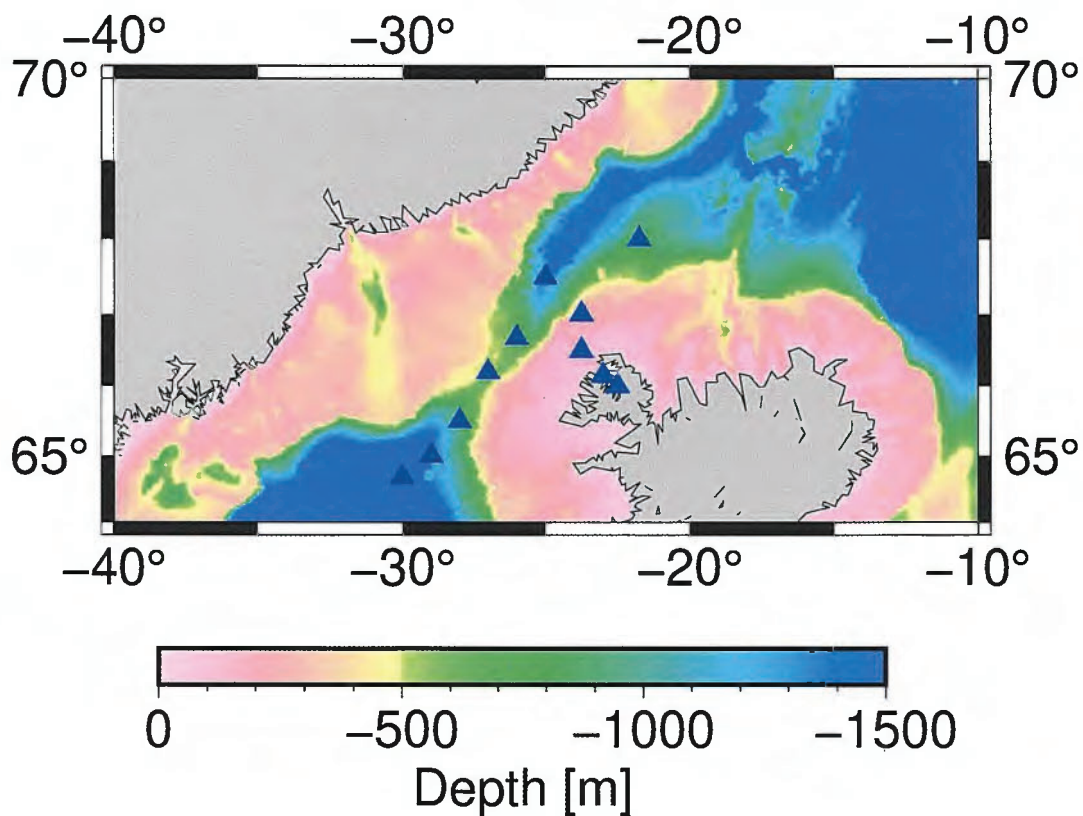
4. ATTACH CHART showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations, tracks of survey lines, positions of moored / seabed equipment.

Overview about larger working area



Detailed station map

Blue triangles indicate the process stations. Depths greater than 1500m are not resolved by the color scale. At all stations we will carry out: CTD work, water column sampling, sediment coring work, short-term (24h) deployment of sinking particle traps, ecosounding work to define sediment properties at respective stations. Between the stations surface water samples will be taken continuously and discrete from the ship's surface pumps for hydrographic and hydrochemical parameters.



Station listDenmark Strait Region:

66°12'N, 27°W

65°30'N, 28°W

65°N, 29°W

64°41'N, 30°W

67°30'N, 25°W

66°45'N, 26°W

Isafjardardiup Fjord Section:

66°N, 22°30'W

66°09'N, 23°W

66°30'N, 23°45'W

67°N, 23°45'W

68°N, 21°45'W

At all stations we will carry out: CTD work, water column sampling, sediment coring work, short-term (24h) deployment of sinking particle traps, ecosounding work to define sediment properties at respective stations. Between the stations surface water samples will be taken continuously and discrete from the ship's surface pumps for hydrographic and hydro chemical parameters.

5. a) TYPES OF SAMPLES REQUIRED

(e.g. geological/ water/ plankton/ fish/ radionuclide)

water, hydroacoustic data, sediment coring, DIC, alkalinity, selected trace elements, non-traditional isotopes, 223Ra, 224Ra, 226Ra, 228Ra, nutrients, plankton samples, sinking particle traps, acoustic sampling (echosounder, no detonations)

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, and quantity of fish to be retained on board).

Surface water pumping, hydroacoustic measuring, CTD, nets, box-corer, sediment traps, Rumohr corer, gravity corer

6. DETAILS OF MOORED EQUIPMENT

no long-term moorings, only 24 hours deployment of sediment traps with recovery after 24 hours.

7. ANY HAZARDOUS MATERIALS (chemicals/ explosives/ gases/ radionuclides, etc.)

no material will be release to the sea

a) Type and trade name:b) Chemical content (and formula):c) IMO IMDG Code (reference and UN no.):d) Quantity and method of storage on board:e) If explosives give dates of detonation**NO EXPLOSIVES**

Method of detonation

Position of detonation

Frequency of detonation

Depth of detonation

Size of explosive charge in kg.

8. DETAIL AND REFERENCE OFa) Any relevant previous / future cruises

**MFRI autumn capelin survey (mid-September 2022)
DANA July 2021**

b) Any previously published research data relating to the proposed cruise

Data have been collected in 2021 during the Danish DANA 2021 expedition to West Greenland. Data are currently under validation and evaluation.

9. NAMES AND ADDRESSES OF SCIENTISTS OF THE COSTAL STATE(S) IN WHOSE WATERS THE PROPOSED CRUISE TAKES PLACE WITH WHOM PREVIOUS CONTACT HAS BEEN MADE

Dr Warsha Sing, Marine and Freshwater Research Institute Iceland (MFRI). Dr Sing is ECOTIP project partner

10. STATEa) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable (Yes/No)

Yes, after discussion and depending on COVID-19 situation.

b) Participation of an observer from the coastal state for any part of the cruise together with the dates and the ports for embarkation and disembarkation

No, because the cruise MSM110 is already running, currently in Greenlandic waters.

c) When research data from the intended cruise are likely to be made available to the coastal state and by what means

- **Cruise Report three months after finishing the research cruise**
- **Scientific publication within the following three years**
- **CTD data will be integrated into PANGAEA and made available immediately after the cruise. Biogeochemical data and their evaluation, processing of water, suspension, and sediment samples may take up to three years, as these may be part of PhD theses. The results will be integrated into the HZG Webportal CoastMap, and the newly established Helmholtz Coastal Data Center (HCDC), allowing sustainable data management by complying with the generally accepted FAIR principles (Findable, Accessible, Interoperable, Re-usable). Publication of the data is integral part of the respective PhD theses, but the final responsibility of data archiving in Pangaea and CoastMap remains with the principal scientists. In addition, all data will be released according to the funding agency's (European Commission) rules.**

PART C: SCIENTIFIC EQUIPMENT

Complete the following table

Coastal state **Iceland**Port of call **Reykjavik, no further port call planned in Iceland other than begin and end of expedition**Cruise Dates **Reykjavik 07.08.2022 - Reykjavik 29.08.2022**

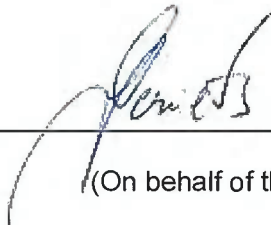
Indicate "YES" or "NO"

List of all major Marine Scientific Equipment it is proposed to use and indicate waters in which it will be deployed	Fisheries Research within Fishing Limits	Research concerning Continental Shelf out to Coastal State's Margin	Within 3 NM	Between 3 - 12 NM	Between 12 - 50 NM	Between 50 - 200 NM
a) vessel mounted systems:						
Hydroacoustic mapping / measuring (incl. ADCP, Parascound and multibeam EM712, EM122)	NO	NO	YES	YES	YES	YES
Permanent surface water sampling / pumping (incl. Thermosalinograph)	NO	NO	YES	YES	YES	YES
CTD water sampling, plankton sampling, surface sediment sampling, coring	NO	NO	YES	YES	YES	YES
b) mobile equipment:						
Meteorological sensors, disdrometer, sun photometer, cloud camera.	NO	NO	YES	YES	YES	YES

Hamburg, 08.08.2022

Dated

(On behalf of the Principal Scientist)


Universität Hamburg
 GEN Centrum für Erdsystemforschung und Nachhaltigkeit
 Leibniz-Institut für Meereswissenschaften
 Bundesstr. 55
 D-20146 Hamburg
 - Germany -

NB 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