

**APPLICATION FOR THE CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH IN AREAS UNDER NATIONAL JURISDICTION OF ICELAND**

Date: 31/01/2023

**1. General information**

**1.1 Cruise name and/or number:** CE23011 SiTrAc - Signal Tracking to unveil Arctic Climate variability

**1.2 Sponsoring institution:**

**Name:** Marine Institute

**Address:** Rinville  
Oranmore  
Co. Galway  
Ireland

**Name of Chief Executive:** Dr. Paul Connolly

**1.3 Scientist in charge of the project:**

**Name:** Dr Audrey Morley  
**Address:** Office 109, Geography  
National University of Ireland Galway  
University Road  
Galway, Ireland H91TK33

**Telephone:** +353 851162224

**Telefax:**

**1.4 Scientist(s) from ICELAND involved in the planning of the project**

**Name(s):** none

**Address:**

**1.5 Submitting officer:** Tricia McManus

**Name and address:**

Rinville  
Oranmore  
Co. Galway

**Country:** Ireland

**Telephone:** 00 353 91 387200

**Telefax:** 00 353 91 387201

**2. Description of project (Attach additional pages as necessary)**

**2.1 Nature of objectives of the project:**

1. We will collect spatial and temporal data of climate-relevant gases from Polar Seas to improve our knowledge of ocean acidification, deoxygenation, and warming for one of the most sensitive areas for the formation of deep-water and climate change.
2. We will assess modern and past deep water mass exchanges between the Arctic and Nordic Seas, which are crucial contributors to dynamical heat transport by the ocean and play an important role in setting the climate in Ireland and the circum-North-Atlantic region.
3. We will constrain the modern spatial distribution of major elements and their isotopes (Mg, Na, B, Sr, Ca) in the Nordic Seas to improve reconstructions of past seawater in commonly used climate proxies of Essential Climate variables.
4. We will measure Air-Sea CO<sub>2</sub> fluxes using the eddy covariance method. This will allow us to test the signal contribution of productivity versus Air-Sea CO<sub>2</sub> fluxes recorded in the geochemical composition of foraminifera
5. Using fly ash particles, we will develop novel chronological approaches to improve age models for recently deposited sediments.

## **2.2 Relevant previous or future research cruises:**

In 2020 research cruise CE20009 aimed to collect living foraminifera and sedimentary archives from Icelandic Waters however due to poor weather conditions we were not able to deploy equipment and therefore were not able to achieve our goals.

## **2.3 Previously published research data relating to the project:**

A cruise Report for CE20009 was submitted to the Marine Institute of Ireland and is available upon request.

## **3. Methods and means to be used**

### **3.1 Particulars of vessel**

**Name:** Celtic Explorer

**Nationality:** Irish

**Owner:** Marine Institute

**Overall length:** 65.5m

**Maximum draught:** 5.7m

**Net tonnage:** 727

**Propulsion:** 2 x 1530 KW, 1000Rpm, 1 x 1020 KW, 1000 Rpm

**Cruising speed:** 10 Kts

**Call sign:** EI GB

**Method and capability of communication –**

**Vsat Satellite Broadband**

**Imarsat –c**

**HF**

**VHF**

**Mini –M**

**Name of master:** Antony Hobin/Denis Rowan

**Number of crew:** 15

**Number of scientists on board:** 21

**3.2 Aircraft or other craft to be used in the project:** N

**3.3 Particulars of methods and scientific instruments**

<b>Types of samples and data</b>	<b>Methods to be used</b>	<b>Instruments to be used</b>
Water	Collection of water samples and sensors	CTD & Rosette
Plankton	Plankton Tows (mesh size 100 and 200µm)	MultiNet Type Midi
Sediment	Surface sediments and recent archive	4 -tube multicorer (max penetration of 60cm) and gravity corer (max penetration of 6m)
Gases and Currents	ASIP is an autonomous microstructure vertical profiling instrument that provides data from a maximum depth of 100m to the ocean surface.	Air-Sea Interaction Profiler

**3.4 Indicate whether harmful substances will be used:**

- No harmful substances will be used

**3.5 Indicate whether drilling will be carried out:**

- No drilling will take place

**3.6 Indicate whether explosives will be used**

- No explosives will be used

#### **4. Installations and equipment**

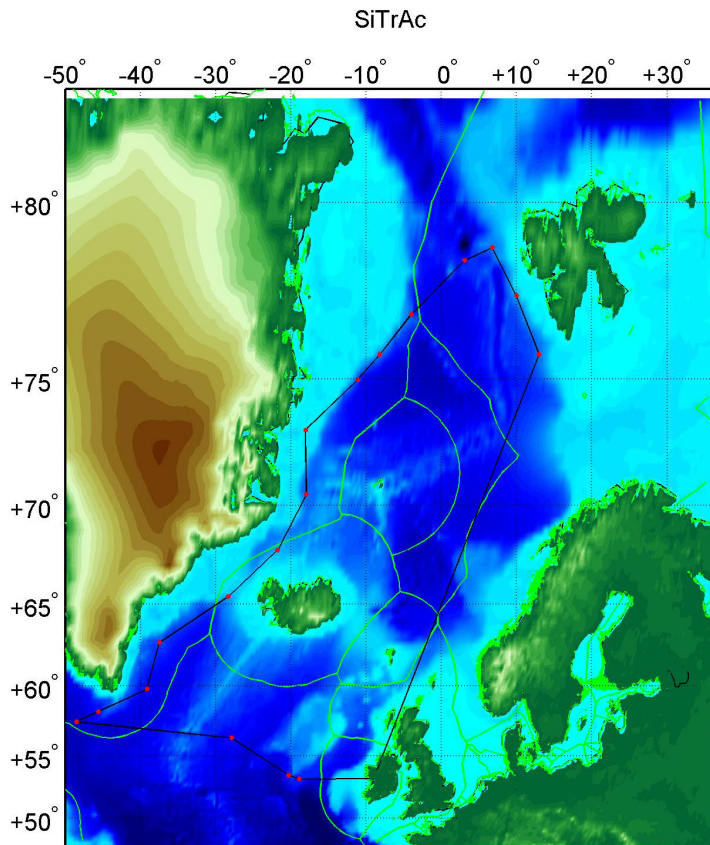
- No equipment will be installed

#### **5. Geographical areas**

**5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude):**

- We are planning to survey in Icelandic Waters at two stations. One south and the other north of the Denmark Strait at (1) 65.4160N -28.3310E and (2) 67.8670N -21.7653E respectively.

**5.2 Attach chart(s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.**



## 6. Dates

### 6.1 Expected dates of first entry into final departure from research area of the research vessel:

- 02.08.2023 – 04.08.2023

### 6.2 Indicate if multiple entry is expected:

- Multiple entries are not expected

## 7. Port calls

### 7.1 Dates and names of intended ports of calls in ICELAND:

- No port calls are anticipated

### 7.2 Any special logistical at ports of call:

- none

### 7.3 Names/ Address / Telephone of shipping agent (if available)

## 8. Participation

### 8.1 Extent to which ICELAND will be able to participate to be represented in research project:

- We intend to make all dataset publicly available to the scientific community (see section 9). Beyond this no scientific collaboration with researchers from Iceland is anticipated.

## **8.2 Proposed dates and ports for embarkation / disembarkation:**

- Galway (21.07.2023) to Galway (21.08.2023)

## **9. Access to data, samples and research results**

### **9.1 Expected dates of submission to ICELAND preliminary reports which should include the expected dates of submission of the final results:**

- A cruise report including a detailed report of daily operations and datasets recorded will be available within 3 months of the completion of the survey (21.11.2023)

### **9.2 Proposed means for access by ICELAND to data and samples:**

- We intend to share our dataset in the publicly accessible disciplinary repository, PANGAEA, using descriptive metadata as required/provided by that repository. The information system PANGAEA is operated as an Open Access library aimed at archiving, publishing and distributing georeferenced data from earth system research. The system guarantees long-term availability of its content through a commitment of the hosting institutions the Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research (AWI) and the Center for Marine Environmental Sciences, University of Bremen (MARUM).

### **9.3 Proposed means to provide ICELAND with assessment of data, samples and research results or provide assistance in their assessment or interpretation:**

- All data will become available after publication of the results in journal articles. There will be no embargo period. The data can be re-used by other scientists in the broad fields of Physical and Chemical Oceanography, Marine Geology, Marine Ecology, etc. Neighbouring disciplines and interdisciplinary research groups might also be interested, because of the importance of Arctic climate for entire ecosystems and hemispheric wide climate change.

### **9.4 Proposed means of making research results internationally available:**

- The use of PANGAEA is free of charge and we intend to publish in Open Access internationally peer reviewed journals, so that access to research results is universal.

## **10. Scientific Equipment**

**COMPLETE THE FOLLOWING TABLE-  
SEPARATE PAGE FOR EACH COSTAL STATE:**

INDICATE YES OR NO

LIST SCIENTIFIC WORK BY FUNCTION Eg: MAGNETOMETRY: GRAVITY DIVING SEISMICS BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING WATER SAMPLING U/W TV MOORED INSTRUMENTS TRAWLING ECHO SOUNDING WATER SAMPLING	Water column including sediment sampling of the Seabed	Fishes research within fishing limits	Research concerning the natural resources of the continental shelf or its physical characteristics	DISTANCE FROM COAST		
				Within 12nms	Between 12-200nms	(Continental shelf work only)  Beyond 200nm but within the continental margin
WATER SAMPLING	YES	NO	NO	NO	YES	NO
PLANKTON SAMPLING	YES	NO	NO	NO	YES	NO
SEDIMENT SAMPLING	YES	NO	NO	NO	YES	NO
PROFILING INSTRUMENT	YES	NO	NO	NO	YES	NO

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(On behalf of the Principle Scientist)

Dated 31/01/2023