

# NOTIFICATION OF PROPOSED RESEARCH CRUISE

## GENERAL

### Part A

**1. Name of research ship:**

Arni Fridriksson

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**Cruise No.:** A-6-2024

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**2. Dates of cruises:**

From: 1 July 2024

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To: 3 August 2024

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**3. Operating Authority:**

Marine and Freshwater Research Institute, Hafnarfjordur, Iceland

Telephone: +354 575 20 00
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Telefax: +354 575 20 01
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**4. Owner (if different from par. 3):**

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**5. Particular of ship:**

Name: Arni Fridriksson

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Nationality: Icelandic

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Overall length: 69.9 meters

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Maximum draught (m): 7.5 meters

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Nett tonnage: 1200

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Propulsion: 4x1200 HP

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Call Sign: TFNA

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**6. Crew:**

Name of Master: Heimir Örn Hafsteinsson

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No. of Crew: 16

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**7. Scientific Personnel:**

Name and address of Scientist in charge: Anna H. Olafsdottir

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Telephone/Telefax: +354 575 20 44/575 20 01

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No. of scientists: 14

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

60° 00' N - 71° 00' N, 00° 00' E - 40° 00' W. The detailed operation within the Norwegian EEZ depends on allocation of trawl stations between research vessels from different nations during the survey.

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**9. Brief description of purpose of cruise:**

Goal of the survey is to estimate abundance of mackerel, herring, and blue whiting during the summer feeding season of these species in Nordic Seas. Another goal is to measure hydrographical condition and zooplankton abundance in the pelagic layer where these species feed. In 2024, whales will also be counted.

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**10. Dates and names of intended ports of call:**

None intended.

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**11. Any special logistic requirements at ports of call:**

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**NOTIFICATION OF PROPOSED RESEARCH CRUISE DETAIL  
DETAIL**

**Part B**

**1. Name of research ship**

Arni Fridriksson

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**Cruise No.**

A-6-2024

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**2. Dates of cruise:**

From: 1 July 2024

To: 3 August 2024

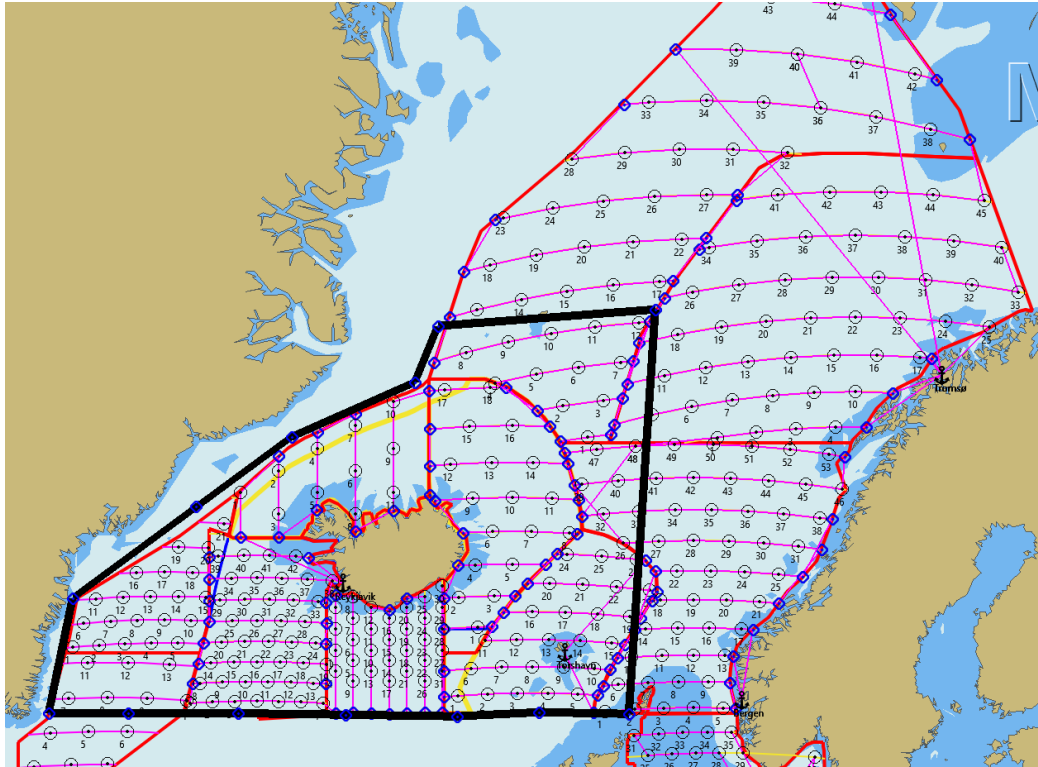
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**3. Purpose of research and general operational methods:**

This is a coordinated ecosystem survey investigating the pelagic ecosystem in Nordic Seas during summer. The survey participants are research institutes in Iceland, Faroe Island, Greenland, Norway, and Denmark. Goal of the survey is to estimate abundance of mackerel, herring and blue whiting using surface trawling and acoustic methods. Fish is sampled from catch in the surface trawl. Environmental variables, such as temperature and salinity are measurements by CTD. Zooplankton abundance is determined by sampling by WP2-plankton nets. In 2024, whales will also be counted, by scientists with binoculars, along survey lines to provide data for stock assessment.

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



Maps shows proposed sampling stations and survey tracks for all nations participating in the IESSNS 2024. Geographical work area of the Icelandic vessel is within the area delineated by the black polygon. Locations of surface trawl stations, CTD and plankton sampling (open circle with a dot in centre), survey track (pink line), survey track turn (open blue diamond), survey strata boundary (red line) and EEZ lines between Iceland-Greenland-Faroe Islands which do not overlap with strata boundaries (yellow line).

**5. Types of samples required, e.g. Geological/Water/Plankton/Fish/Radioactivity/ Isotope and methods by which samples will be obtained (including dredging/coring/drilling):**

Fish sampled by pelagic trawl for biological data and abundance estimate. Pelagic trawling will be done in the surface at predetermined stations and opportunistically on acoustical registrations along the survey transects, trawl depth from surface to 500m depth. At predetermined surface trawl stations, water samples will be collected at various depths between surface and 500 m to measure salinity, nutrient concentration, and phytoplankton. Zooplankton sampling by WP-2 plankton net, surface to 200m, will also be conducted at all predetermined surface trawl stations. In 2024, Whales will be counted along survey transect by scientists with binoculars.

**6. Details of moored equipment: Not applicable**

Dates:

Longitude:

Latitude:

Description:

Recovery:

Laying:

**7. Explosives: Not applicable**

(a) Type and Trade name:

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(b) Chemical content:

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(c) Dept of Trade class and storage:

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(d) Size:

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(e) Depth of detonation:

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(f) Frequency of detonation:

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(g) Position in latitude and longitude:

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(h) Dates of detonation:

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**8. Detail and reference of:**

**(a) Any relevant previous/future cruises:**

Similar cruises have been carried out annually since 2009 in Icelandic, Faroese, Norwegian, Greenlandic (since 2013), Denmark (since 2018), and international waters, in cooperation between marine research institutes in these countries.

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**(b) Any previously published research data related to the proposed cruise (Attach separate sheet if necessary):**

There is an annual survey report, including results from all participating vessels, that is submitted to ICES working group on widely distributed stocks (WGWIDE) in the autumn 2023 (ICES (2023). Working Group on Widely Distributed Stocks (WGWIDE). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.24025482.v1>), and in January 2024 to ICES Working Group for International Pelagic Surveys (WGIPS), report not published when application prepared February 10th, 2024. The WGWIDE report is available at [www.ices.dk](http://www.ices.dk). Norwegian scientists actively participate in survey planning, survey execution, and contribute to report writing. The executive summary for the 2023 IESSNS survey report, published as working document to the WGWIDE 2023 report, is attached to the current application, see Appendix 1.

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**9. Names and addresses of scientists of the coastal state in whose waters the proposed cruises takes place with whom previous contact has been made:**

Hector Pena, Institute of Marine Research, Bergen,

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**10. State:**

**(a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable:** Not applicable as no calls to port are planned.

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**(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, please contact cruise leader.

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

Results will be reported in fall 2024 to ICES WGWIDE and in January 2025 to ICES WGIPS. Coastal state scientists, from Faroe Islands, Norway and Greenland, also

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participate in the ICES work. Reports are available for ICES home page ([www.ices.dk](http://www.ices.dk)).

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## SCIENTIFIC EQUIPMENT

11. **Complete the following table** - SEPARATE COPY FOR EACH COASTAL STATE (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	Within Fishing Limits	On Continental Shelf	DISTANCE FROM/COAST			
			Within 3 NM	Between 3-12 NM	Between 12-50 NM	Between 50-200 NM
Pelagic trawling, echo sounders, CTD and plankton net (WP2)	Yes	Yes	No	No	Yes	Yes

**Appendix 1:** Executive summary from IESSNS survey report 2023 (ICES (2023). Working Group on Widely Distributed Stocks (WGWIDE). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.24025482.v1>).

The International Ecosystem Summer Survey in the Nordic Seas (IESSNS) was performed within approximately 5 weeks from July 1st to August 3rd in 2023 using five vessels from Norway (2), Iceland (1), Faroe Islands (1) and Denmark (1). The main objective is to provide annual age-segregated abundance index, with an uncertainty estimate, for northeast Atlantic mackerel (*Scomber scombrus*). The index is used as a tuning series in stock assessment according to conclusions from the 2017 and 2019 ICES mackerel benchmarks. A standardised pelagic swept area trawl method is used to obtain the abundance index and to study the spatial distribution of mackerel in relation to other abundant pelagic fish stocks and to environmental factors in the Nordic Seas, as has been done annually since 2010. Another aim is to construct a new time series for blue whiting (*Micromesistius poutassou*) abundance index and for Norwegian spring-spawning herring (NSSH) (*Clupea harengus*) abundance index. This is obtained by utilizing standardized acoustic methods to estimate their abundance in combination with biological trawling on acoustic registrations. The time series for blue whiting and NSSH now consists of eight years (2016-2023).

The total swept-area mackerel index in 2023 was 4.30 million tonnes in biomass and 10.67 billion in numbers, a decline by 42% for biomass and 39% for abundance compared to 2022. In 2023, the most abundant year classes were 2020, 2019, respectively. The cohort internal consistency improved compared to last year, particularly for ages 4-7 years. The catch curves showed clear year effects, and that mackerel of ages 1, 2 and to some extent also age 3, are not completely recruited to the survey. Most of the surveyed mackerel are still distributed in the Norwegian Sea. However, they were more easterly and northeasterly distributed compared to 2022. The distribution of mackerel in the Norwegian Sea retracted compared to the last decade, particularly withdrawal from the northernmost part was observed. The zero-line was reached for the whole survey area, north of latitude 60°N.

Norwegian spring-spawning herring had 4% higher abundance and 30% lower biomass in 2023 compared to 2022. The 2016 year-class (7-year-olds) dominated in the stock and contributed 45% and 28% to the total biomass and total abundance, respectively. The 2016 year-class is fully recruited to the adult stock.

The zero-line of the distribution of the mature part of NSSH was considered to be reached in all directions. The group considered the acoustic biomass estimate of herring in 2023 to be of the similar quality as in the previous survey years. The herring was mainly observed in the upper surface layer as relatively small schools.

The biomass index of blue whiting was similar in 2023 compared to 2022. Estimated stock abundance (ages 1+) was 20.8 billion in 2023 compared to 27.5 billion in 2022. Age 2 and 3 respectively, dominated the estimate in 2023 as they contributed to 41% and 23% (abundance) and 45% and 29% (biomass), respectively. The group considered the acoustic biomass estimate of blue whiting to be of good quality in the 2023 IESSNS as in the previous survey years.



Other fish species were also monitored such as lumpfish (*Cyclopterus lumpus*), capelin (*Mallotus villosus*), polar cod (*Boreogadus saida*), and Atlantic salmon (*Salmo salar*). Lumpfish were caught at 76% of surface trawl stations distributed across the surveyed area from southwestern part of Iceland, central part of North Sea to southwestern-western part of the Svalbard. Both size and abundance were greater north of latitude 72°N compared to southern areas. Capelin were caught in the surface trawl on 29 stations along the cold fronts: north of Iceland, north- and northwest of Jan Mayen, northwest of Bear Island and west of Svalbard. There were more trawl stations with catches of capelin in the west and north of Jan Mayen than previous years. The polar cod were caught in larger areas in the north and northeast of Iceland compared to the time-series. A total of 62 North Atlantic salmon were caught in 24 stations both in coastal and offshore areas from 62°N to 74°N in the upper 30 m of the water column. The salmon ranged from 0.084 kg to 2.7 kg in weight, dominated by post-smolt and 1 sea-winter individuals. We caught from 1 to 12 salmon during individual surface trawl hauls. The length of the salmon ranged from 21 cm to 82 cm, with the highest fraction between 21 cm and 29 cm.

Satellite measurements of sea surface temperature (SST) in the Northeast Atlantic in July 2023 show that the northern regions of the Nordic Seas were slightly warmer than the average, while the East Greenland Current was cooler than the long-term average. The SST in the Irminger Sea and Iceland Basin were slightly warmer than the average.

The average zooplankton biomass increased in the Norwegian Sea and in Icelandic waters compared to 2022. Zooplankton showed patchy distribution throughout the area.