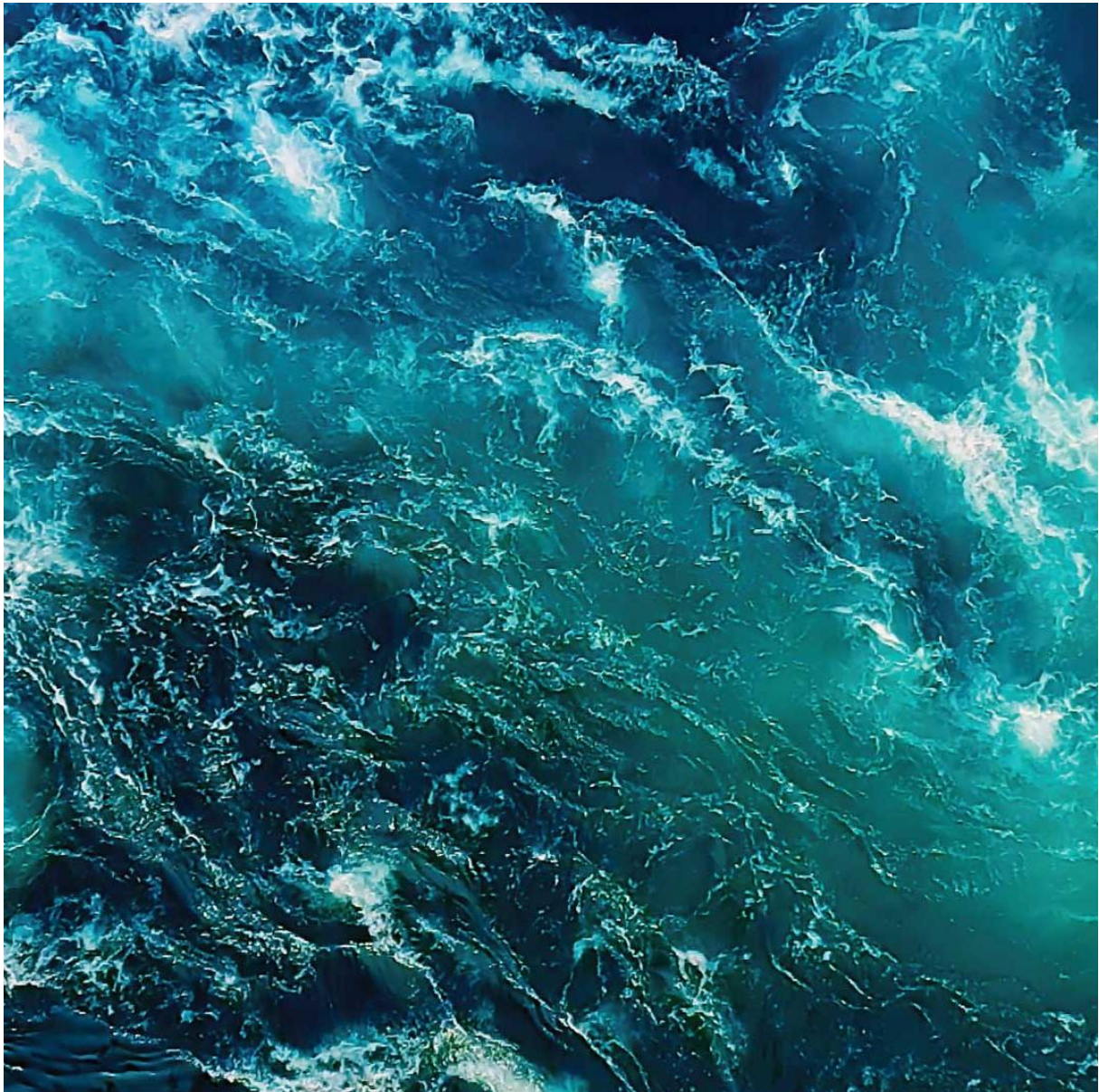


C-survey at Hringsdalur (fallow period), May 2025

Arnarlax ehf

Akvaplan-niva AS Report: 2025 66687.01



Arnarlax ehf. C-Survey at Hringsdalur (fallow period), May 2025.

Author(s)	Hans-Petter Mannvik, Snorri Gunnarsson
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Arnarlax ehf	
Contact person	Silja Baldvinsdóttir
Address	Strandgötu 1, 465 Bíldudalur

Summary

The results from the monitoring at the farming site Hringsdalur in May 2025 showed that the sediment was somewhat loaded with organic carbon and the copper level in the sediment at C1 was elevated (78.1 mg/kg) and is categorized into environmental limit III or "in the upper limit of natural values". EMB concentration was 150 ng/kg and thus lower than the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is fulfilling the "good status standard". The phosphorus levels varied between 850 to 1510 mg/kg.

Some load effect was recorded in the fauna at all and faunal index nEQR at the stations was around 0.6. The diversity index H' varied from 3.62 to 4.36. The NS 9410:2016-assessment of the community in the local impact zone (C1) showed environmental condition 1 (Very good). A pollution indicator species was found among the most dominant species at C1, C2 and C3, but not at the other stations.

The redox measurements (pH/Eh) gave point 0 acc. Appendix D in NS 9410:2016 for all the sampling stations. The oxygen saturation in May was good in the whole water column with 83 % in the bottom water.

Approval



Project leader

Quality control

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Preface

Akvaplan-niva carried out a type C (NS 9410:2016) environmental survey at the Hringsdalur site. It includes pH/redox measurements (Eh), hydrography, geochemical analyses, and analyses of the bottom fauna from six stations at the fish farming site. The following personnel contributed:

Snorri Gunnarsson	Akvaplan-niva	Field work, report, project leader.
Hans-Petter Mannvik	Akvaplan-niva	Identification of bottom fauna (Echinodermata). Report, professional assessments, and interpretations.
Rune Palerud	Akvaplan-niva	Identification of bottom fauna (Crustaceans). Statistics. QA report, professional assessments, and interpretations.
Jesper Hansen	Akvaplan-niva	Identification of bottom fauna (Varia and Mollusca).
Marina V. Alonso	Akvaplan-niva	Identification of bottom fauna (Polychaeta).
Anne Tårånd Aasen	Akvaplan-niva	Hydrographical vertical profiles
Kristine H Sperre	Akvaplan-niva	Coordination of sorting of bottom fauna.
Lisa Torske	Akvaplan-niva	Coordination of geo-chemical analyses.

Akvaplan-niva would like to thank Arnarlax ehf and Silja Baldvinsdóttir for good cooperation.

Accreditation information:

The survey was carried out by Akvaplan-niva AS with ALS Laboratory Group (Czech Republic) as a sub-contractor.



Akvaplan-niva AS is accredited under NS-EN ISO/IEC 17025 by Norwegian Accreditation for field sampling of sediments and fauna, analyses of TOC, TOM, TN, particle size and macrofauna, and for professional evaluations and interpretations. Our Accreditation number is TEST 079.

Czech Accreditation
Institute (Lab nr 1163)

ALS Laboratory Group is accredited by the Czech Accreditation
Institute (Lab nr 1163) for copper analyses.

Non-accredited services: Analyses of emamectin benzoate, hydrographical measurements and mapping of bottom topography (Olex).

1 Data Summary

Client information			
Report title:	C-Survey at Hringsdalur (fallow period), May 2025.		
Report nr.	2025 66687.01	Site:	Hringsdalur
Municipality:		Map Coordinates (construction):	65°44,416 N 23°45,777 V
MTB permitted:	8.275 tons	Operations manager:	Sija Baldvinsdóttir
Client:	Arnarlax ehf		

Biomass/production status at time of survey (15.05.2025)			
Fish group:	A. Salmon	Biomass on examination:	0
Feed input:	0	Produced amount of fish:	0
Type/time of survey			
Maximum biomass:		Follow up study:	
Fallow (resting period):	X	New location:	

Results from the C study /NS 9410 (2016) – Main results from soft bottom fauna			
Faunal index nEQR (Miljødirektoratet, 2025)		Diversity index H' (Shannon-Wiener)	
Fauna C1 (impact zone)	0.584	Fauna C1 (impact zone)	4.22
Fauna C2	0.603	Fauna C2	4.36
Fauna C3	0.576	Fauna C3	4.02
Fauna C4 (deep area)	0.507	Fauna C4 (deep area)	3.62
Fauna C5	0.605	Fauna C5	4.27
Fauna C6	0.602	Fauna C6	4.17
Date fieldwork:	(15.05.2025)	Date of report:	08.10 2025
Notes to other results (sediment, pH/Eh, oxygen)		nTOC from 30.1 to 52.4 Copper 78.1 mg/kg at C1 Eh positive at all stations O ₂ -conditions were good throughout the water column.	

2 Introduction

2.1 Background and aim of the study

On behalf of Arnarlax ehf, Akvaplan-niva completed a survey (type C) for a fish farming site at Hringsdalur (Figure 1). The survey fulfils the requirements of the Icelandic authorities for bottom surveys according to ISO 12878 and the requirements for environmental bottom surveys (according to Vöktunaráætlun). An environmental study was simultaneously undertaken, with reference to Chapter 5.0 in NS 9410:2016 which follows the methodology for C- study. A survey (type C) is aimed at studying the environmental conditions of the bottom sediments along a transect sector from the fish farm that extends from the local, to the intermediate and to the regional impact zones. The main emphasis is on the study of the soft bottom fauna which is conducted according to standards ISO 5567-19:2004 and ISO 16665:2014. The obligatory parameters that are included in the survey are described in NS 9410:2016.

A classification or threshold values for this type of survey have not been developed by Icelandic officials, so it is not possible to strictly apply the classification based on Norwegian threshold values to Icelandic conditions. We do however report the results with these same indexes with reference to Norwegian threshold values, but it should be emphasized that some of these (such as NSI) are developed according to Norwegian conditions. For further descriptions of these indexes see details in Appendix 1 and guidelines from Miljødirektoratet (2025).

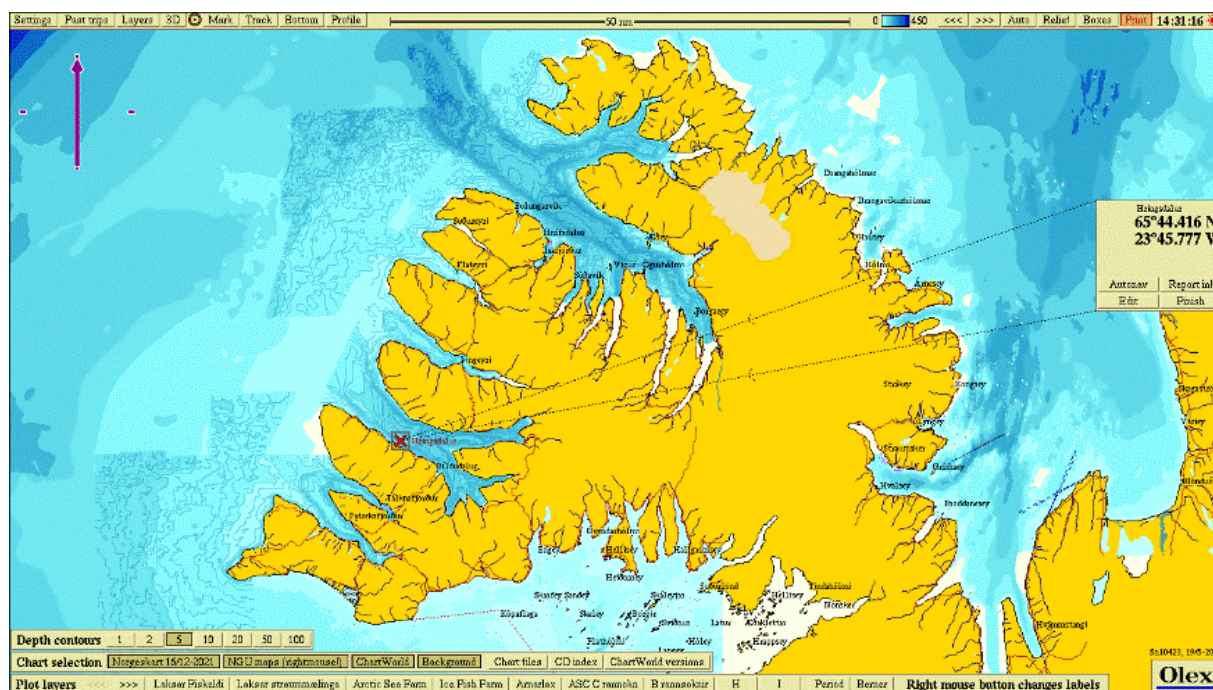


Figure 1 Overview of Arnarfjörður with the farming site Hringsdalur (red cross). The map coordinates for the midpoint of the farming site are given to the right.

2.2 Site operation and feed use

The plant is a single frame mooring with a total of eighteen 200 metre circumference cages in a 2 x 9 configuration. Previously there has been farmed one generation salmon at the site after the frame was extended (from 6 to 18 net-pens) and moved approximately 300 m eastwards. At the

previous placement of the frame there were farmed two generations fish. The fallow period started on the 3rd of November 2024.

In Iceland, the MTB (maximum allowed biomass) limit is not given a site level as in Norway. The MTB limit determines how much live fish the holder of the permit can have standing in the sea at any one time. In Iceland the allowed production is regulated at two levels, site level and company level. For this site the estimated maximal standing biomass for the next generation is 8.275 tonnes, used as MTB here (Baldvinsdóttir 2025, pers reference).

2.3 Previous surveys

An overview of previous C-surveys carried out at Hringsdalur is shown in Table 1.

Table 1: Previous C-surveys at Hringsdalur.

Survey date	Report reference (author, year)	Production (tonnes)
15.05 2025	APN 66687.01 (Mannvik and Gunnarsson, 2025)	0
29.09 2023	APN 65250.02 (Mannvik and Gunnarsson, 2023)	8.361
26.04 2022	APN 64042.02 (Mannvik and Gunnarsson, 2022)	0
19.11 2019	APN 61656.02 (Mannvik and Gunnarsson, 2020)	6.479
16.05 2018	APN 60320.01 (Mannvik and Gunnarsson, 2019)	0
01.11 2017	APN 9187.01 (Velvin and Gunnarsson, 2018)	4.000

3 Materials and methods

3.1 Survey program

The choice of study parameters, placement of sampling stations and other criteria for the study is based on descriptions in NS 9410 (C-surveys). An overview of the planned professional program is given in Miljødirektoratet (2025). Veileder for klassifisering av miljøtilstand i kyst- og ferskvann.

Table 2.

Akvaplan-niva is accredited for field work, analyses of samples and for the professional evaluation of results in accordance with applicable standards and guidelines ("Veiledere"). For implementation and follow through, the following standards and quality assurance systems were used:

- ISO 5667-19:2004: *Guidance on sampling of marine sediments*.
- ISO 16665:2014. *Water quality – Guidelines for quantitative sampling and sample processing of marine soft-bottom macro fauna*.
- NS 9410:2016. *Miljøovervåking av bunnpåvirkning fra marine oppdrettsanlegg*.
- Internal procedures. *Quality Manual for Akvaplan-niva*.
- Miljødirektoratet (2025). *Veileder for klassifisering av miljøtilstand i kyst- og ferskvann*.

Table 2: Survey program for the C-survey at Hringsdalur, 2025. TOC = total organic carbon. GSA = grain size analysis sediment. TOM = total organic material. TN = total nitrogen. Cu = Copper. P = phosphorous. EMB = emamectin benzoate. pH/Eh = acidity and redox potential.

Station	Type analyses/parameters
C1 (local impact zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. Cu. P. pH/Eh.
C2 (transition zone outer)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.
C3 (transition zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.
C4 (transition zone, deep area)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. Hydrography/O ₂ . pH/Eh.
C5 (transition zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. EMB. pH/Eh.
C6 (transition zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.

Field work was completed on 15.05.2025.

Placement of stations and local conditions

The number of stations was calculated with reference to the sites estimated maximal standing biomass for the first generation which is 8.275 tonnes (used as MTB here). According to the standard six sampling stations should be examined. Depth and position of the stations are given in Table 3 and shown in Figure 2. The stations were placed in the direction of the main oceanic current direction at 60 m depth (Moe, 2014).

Table 3: Depth, distance between the nearest frame of the fish farm and sampling stations and coordinates for C-stations at Hringsdalur, 2025.

Station	Depth, m	Distance from frame, m	Position	
			N	W
C1	71	25	65°44.171	23°45.414
C2	66	500	65°44.010	23°44.930
C3	72	120	65°44.142	23°45.311
C4	84	225	65°44.352	23°45.266
C5	70	245	65°44.097	23°45.186
C6	70	370	65°44.075	23°45.055

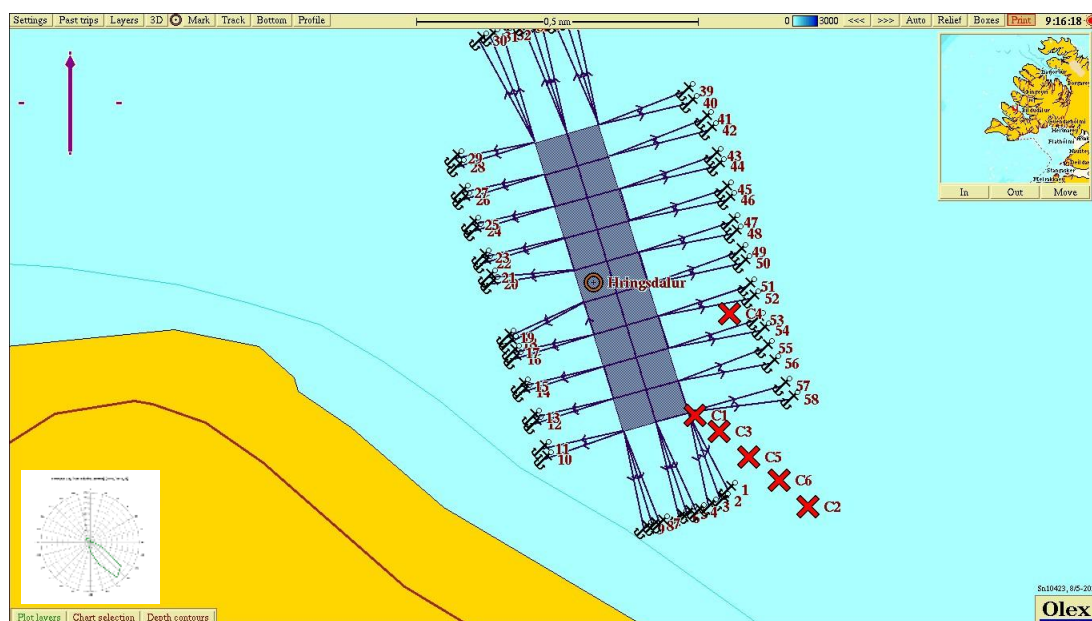


Figure 2. Map showing the sampling stations for the C-survey at Hringsdalur, 2025. Current measurements used were from 60 m depth (Moe, 2014).

3.2 Hydrography and oxygen

At station C4, hydrographic measurements, salinity, temperature, density, and oxygen saturation were taken for vertical surface to bottom profiles using a Sensordata CTDO 204 probe.

3.3 Soft bottom sampling and analyses

3.3.1 Fieldwork

Sediment samples were collected with a 0.1 m² bottom grab (van Veen). The sample material was collected through inspection openings. Samples for TOC, TN and Cu were taken from the top 1 cm layer of the sediment and for TOM and grain size analyses from the top 5 cm using a hollow pipe. Only samples with an undisturbed surface were used. The samples were frozen prior to further processing in the laboratory.

3.3.2 Total organic material (TOM)

The amount of TOM in sediment was determined by weight loss after combustion at 495 °C. The percent weight loss was calculated. The reproducibility of the TOM analyses is checked during the analyses by using a standard sediment that contains TOM with a known level. Standard calcium carbonate was burned together with the samples as a control of the amount of carbonate that was not burned in the analyses process.

3.3.3 Total nitrogen (TN)

After drying the samples at 40°C, the amount of total nitrogen (TN) was quantified by electrochemical determination using Akvaplan niva internal method that is based on NS-EN 16168:2012 (Slam, behandlet organisk avfall og jord. Bestemmelse av totalnitrogen ved bruk av tørrforbrenning).

3.3.4 Total organic carbon (TOC) and grain size

The proportion of fine material, the fraction less than 63 µm, was determined gravimetrically after wet sieving of the samples. The results are presented as proportion of each fraction on a dry weight basis (Bale & Kenny, 2005).

After drying the samples at 40 °C, the content of total organic carbon (TOC) was determined by NDIR-detection in accordance with NS EN 17505:2022 (Investigation of solids – Temperature-dependent differentiation of total carbon (TOC₄₀₀, ROC, TIC₉₀₀)). To classify the environmental conditions based on the content of TOC, the measured concentrations are normalized for the proportion of fine substance (nTOC) using the equation: $nTOC = TOC + 18 (1 - F)$, where TOC and F represent a measured TOC value and the proportion of fine substance (%) in the sample (Aure *et al.*, 1993).

3.3.5 Metal analysis - copper (Cu)

The samples for metal analysis were freeze-dried before being placed in a microwave oven in a sealed Teflon container with concentrated ultrapure nitric acid and hydrogen peroxide. The concentration of copper (Cu) was determined by means of ICP-SFMS. The levels of copper are classified in accordance with Icelandic regulation 769:1999.

3.3.6 Emamectin benzoate (EMB)

The sediments were lyophilized prior to solvent extraction. The actual quantification was determined by high-resolution liquid chromatography coupled to tandem mass spectroscopy (HPLC-MS/MS). The LOD and LOQ are determined in accordance with the guidelines of the EU's reference laboratories for pesticide analyses, SANTE/2020/12830, 24/02/2021. The results are evaluated according to the Scottish Environmental Protection Agency (SEPA) standards (SEPA, 2022 & 2023).

3.3.7 Phosphorus (P)

Following a pre-treatment, the samples were quantified according to ČSN 720116-1 (720116) where phosphoruspentaoxide, P₂O₅ forms a phosphorusmolybden-vanadiumcomplex. The samples for

metal analysis were freeze-dried before being placed in a microwave oven in a sealed Teflon container with concentrated ultrapure nitric acid and hydrogen peroxide.

3.3.8 Redox- and pH measurements

At all the stations, a quantitative chemical examination of the sediment was carried out. Acidity (pH) and redox potential (Eh) were measured using electrodes and the YSI Professional Plus instrument. In accordance with the manual of the instrument, 200 mV was added to the measured ORP (the Oxidation Reduction Potential) value.

3.4 Soft bottom fauna investigation

3.4.1 About effect of organic material on bottom fauna

The emission of organic material from fish farms can contribute to the deterioration of conditions for many of the organisms living in the bottom sediment. Negative effects in the bottom fauna can best be assessed through quantitative bottom fauna analyses. Many soft bottom species have low mobility, and the fauna composition will largely reflect the local environmental conditions. Changes in the bottom fauna communities are a good indication of unwanted organic loads. Under natural conditions, the communities typically consist of many species. High number of species (diversity) is, amongst other things, that is dependent on favourable conditions for the fauna. However, moderate increases in organic load can stimulate the fauna and result in an increased number of species found. Larger organic loads can result in less favourable conditions where opportunistic species increase their individual numbers, while the species not suited are knocked out resulting in a reduced diversity of species. Changes in species diversity near emission points of feed and faecal matter can, to a large degree, be attributed to changes in organic content (from the feed and faecal matter) in the sediment.

3.4.2 Sampling and fixation

All the bottom fauna samples were taken with a 0.1 m² van Veen grab. Only grab samples where the grab was completely closed and the surface undisturbed were approved. The contents were washed through a 1 mm sieve and the remaining material fixed with 4 % formalin with Bengal Rose dye added and then neutralized with borax. In the laboratory, the animals were sorted from the remaining sediment.

3.4.3 Quantitative bottom fauna analysis

At all stations, two samples (replicates) were collected in accordance with guidelines in NS 9410 (2016). After sorting the sample material was processed quantitatively. The bottom fauna was identified to the lowest taxonomic level possible and quantified by specialists (taxonomists). The quantitative lists of species were statistically analysed. See Appendix 1 for description of analysis methods.

The following statistical methods were used to describe community structure and to assess the similarity between different communities:

- Shannon-Wiener diversity index (H')
- Hurlberts diversity index (ES_{100}) – expected number of species pr. 100 individuals
- Pielou's evenness index (J)
- Sensitivities index (Ømfintlighet) (ISI_{2018}), unsuitable at low individual/species number
- Sensitivity index (NSI_{2018})
- Composite index for diversity of species and sensitivity (NQI1)
- Sensitivities index which is included in NQI1 (AMBI)
- Normalized EQR (nEQR)
- Number of species plotted against the number of individuals in geometric classes
- Cluster analyses
- The ten most dominant taxa per station (top-ten)

4 Results

4.1 Hydrography and oxygen

The hydrographical profile for the deep station C4 in May 2025 is presented in Figure 3.

Temperature dropped from 6 °C at the surface to 2 °C in the bottom layer. Oxygen saturation was 117 % in the upper layer and 83 % in the bottom layer.

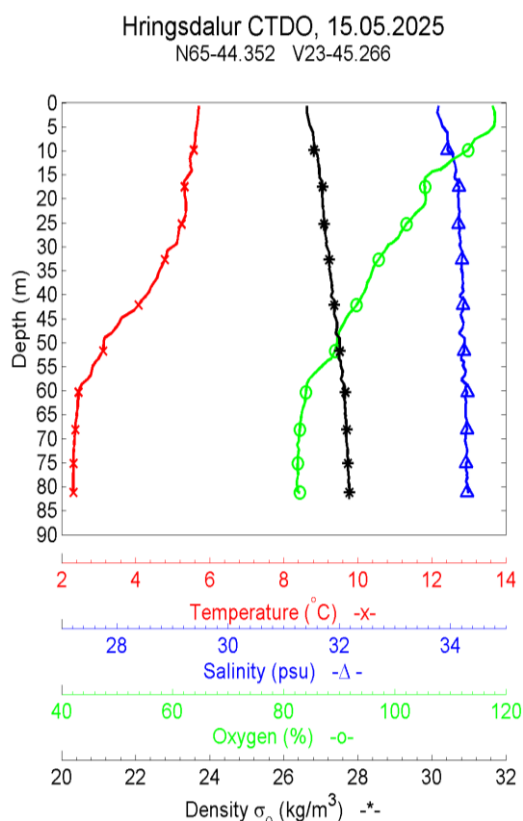


Figure 3. Vertical profiles. Temperature, salinity, density, and oxygen at C4 at Hringsdalur, 2025.

4.2 Sediment

4.2.1 TOC, TOM, TN, C/N, grain size and pH/Eh

Levels of total organic material (TOM), total organic carbon (TOC), total nitrogen (TN), C/N-relationship, grain size distribution in sediment (pelite) and pH/Eh in the sediment are presented in Table 4.

TOM-levels varied from 6.7 to 13.0 %. TN-levels were low (3.2 – 5.2 mg/g) as was the C/N-ratio. TOC was rather high at all stations and nTOC varied from 30.1 to 52.4. The bottom sediments grain size was coarse to moderately fine with a pelite ratio ranging from 34.4 to 67.3 %.

Redox measurements (pH/Eh) gave a point of 0 for all the sampling stations according to Appendix D in NS 9410:2016.

Table 4. Sediment description, TOM (%), TOC (mg/g), TN (mg/g), C/N, grain size distribution (pelite ratio % <0,063 mm) and pH/Eh. Hringsdalur, 2025.

St.	Sediment description	TOM	TOC	nTOC	TN	C/N	Pelite	pH/Eh
C1	Olive green mud. Some black dead algae mixed in mud.	6.7	18	30.1	5.2	3.5	34.4	7.5/ 192
C2	Olive green mud. Some black dead algae mixed in mud.	9.4	39	46.1	3.6	10.8	60.1	7.5/ 369
C3	Olive green mud. Some black dead algae mixed in mud.	9.3	45	52.4	4.6	9.7	58.7	7.6/ 168
C4	Olive green mud. Some black dead algae mixed in mud.	13.0	44	49.6	3.9	11.4	67.3	7.5/ 186
C5	Olive green mud. Some black dead algae mixed in mud.	8.4	29	37.0	3.2	9.1	53.1	7.5/ 196
C6	Olive green mud. Some black dead algae mixed in mud.	9.1	37	44.3	4.0	9.1	59.3	7.6/ 283

4.2.2 Copper

Levels of copper in bottom sediment at C1 are shown in Table 5. The level of copper was 78.1 mg/kg or in the upper limit of natural values (limit III) according to environmental limits in Icelandic regulation nr. 796/199 (Regulation on prevention of water pollution nr. 796/1999).

Table 5. Copper (Cu), mg/kg DS. Hringsdalur, 2025.

St.	Cu
C1	78.1

4.2.3 Emamectin benzoate

Concentration of emamectin benzoate in sediment at C5 is presented in Table 6. Station C5 is located 245 m from the cage edge and is thus placed outside the mixing zone (SEPA 2022).

EMB concentration was 150 ng/kg and thus lower than the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is fulfilling the "good status standard".

Table 6. Emamectin benzoate in the sediment at C5, ng/kg. Hringsdalur, 2025.

St.	Emamectin benzoate
C5	150

4.2.4 Phosphorus

Levels of phosphorus in bottom sediments at Hringsdalur are shown in Table 7. The level of phosphorus varied from 850 mg/kg (C2) to 1510 mg/kg (C3).

Table 7. Phosphorus (P), mg/kg DS. Hringsdalur, 2025.

St.	P
C1	860
C2	850
C3	1510
C4	1350
C5	1340
C6	1360

4.3 Soft-bottom fauna

4.3.1 Faunal indices

Results from the quantitative soft bottom faunal analyses at the C-stations are presented in Table 8.

The number of individuals varied from 859 (C4) to 1624 (C1) and number of species from 31 (C4) to 61 (C1). The diversity H' varied from 3.62 to 4.36. At the stations, the overall index of nEQR varied from 0.507 to 0.605. The nEQR values indicate a somewhat poor faunal condition at the stations.

J (Pielous evenness index) is a measure of how equally individuals are divided between species and will vary between 0 and 1. A station with low value has a "crooked" individual distribution between the species, indicating a disturbed bottom fauna community. The index varied from 0.73 to 0.80 which indicates an even distribution.

Table 8. Number of species and individuals pr. 0,2 m². H' = Shannon-Wiener's diversity index. ES_{100} = Hurlberts diversity index. $NQI1$ = overall index (diversity and sensitivity). ISI_{2018} = sensitivity index. NSI = sensitivity index. J = Pielous evenness index. $AMBI$ = AZTI marine biotic index (part of $NQI1$). $nEQR$ = normalized EQR (excl. DI). C-stations at Hringsdalur, 2025.

St.	No. of individuals.	No. of species	H'	ES_{100}	$NQI1$	ISI_{2018}	NSI	nEQR	AMBI	J
C1	1624	61	4.22	25.6	0.652	5.40	18.73	0.584	3.14	0.75
C2	984	51	4.36	26.2	0.670	5.54	19.59	0.603	2.93	0.80
C3	1573	58	4.02	22.9	0.645	5.50	18.84	0.576	3.13	0.73
C4	859	31	3.62	16.2	0.595	4.47	18.48	0.507	3.26	0.78
C5	1597	59	4.27	23.8	0.670	5.78	20.00	0.605	2.80	0.78
C6	1063	53	4.17	23.7	0.679	5.59	20.33	0.602	2.71	0.78

4.3.2 NS 9410 Evaluation of the bottom fauna at station C1 (local impact zone).

According to NS 9410 the classification of the environmental status in the local impact zone can also be evaluated based on the number of species and their dominance in the bottom faunal community (see Chapter 8.6.2 in NS 9410:2016).

The soft bottom communities were classified to environmental condition 1 "Very good". The criteria for condition 1 are that there are at least 20 species/0.2 m² and that none of these are in numbers exceeding 65 % of the individuals (Table 9).

Table 9. Classification of the environmental status of the soft bottom fauna at station C1 at the Hringsdalur site 2025.

Station	Site name	Num. species	Dominating taxa	Environmental condition-NS 9410
C1	Hringsdalur	61	Mediomastus fragilis – 21 %	1 – Very good

Geometric classes

Figure 4 shows the number of species plotted against the number of individuals, where the number of individuals is divided into geometric classes. For an explanation of the concept of geometric classes is given in Appendix 1.

The curve at C4 started lowest (8 species) and C5 highest (21 species) and all curves stretched out in varying degrees towards higher classes. These did not give any clear indications of fauna condition.

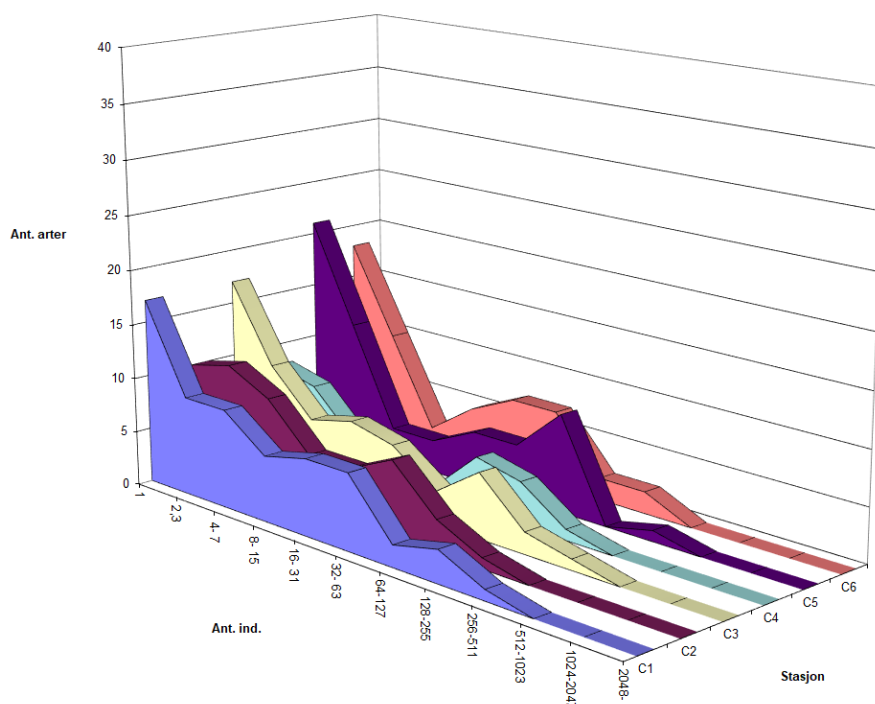


Figure 4. The soft bottom fauna shown as number of species against number of individuals pr. species in geometric classes. Hringsdalur, 2025.

4.3.3 Cluster analyses

To investigate the similarity of the faunal composition between the sampling stations, the multivariate technique cluster analysis was used. The results of this are presented in dendrogram in Figure 5.

The fauna composition at five of the station was more than 67 % similar and C4 was 53 % similar to the other stations.

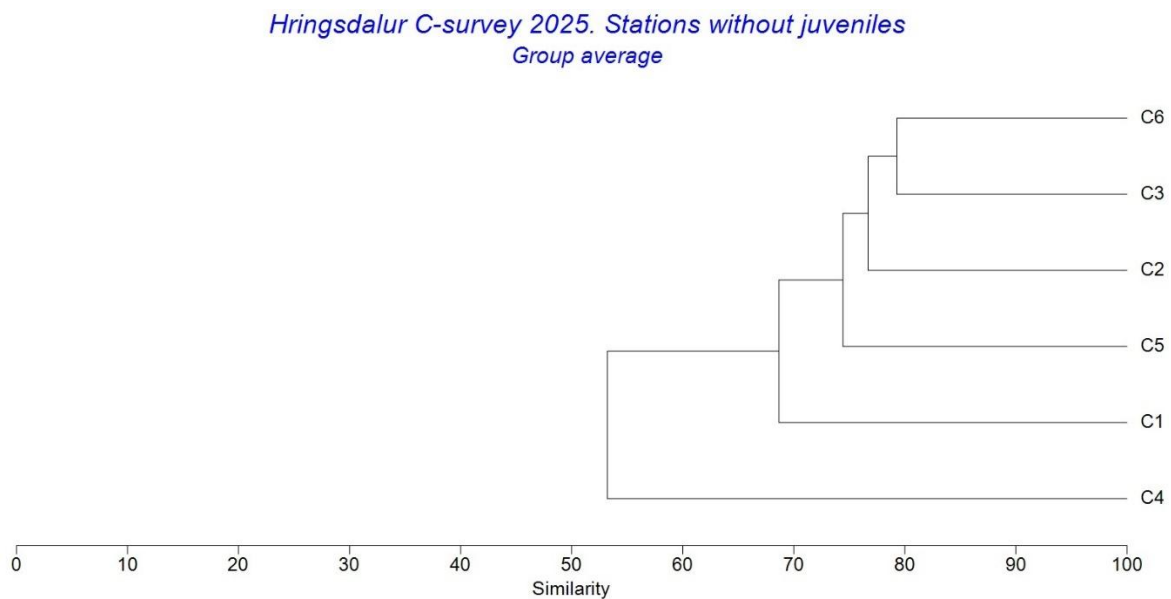


Figure 5. Cluster diagram for the soft bottom fauna at the C- sampling stations at Hringsdalur, 2025.

4.3.4 Species composition

The main features of the species composition are shown in the form of a top ten species list from each station in Table 10.

In Borgersen *et al.* (2020) the species are divided into five ecological groups (EG) based on the value of the sensitivity index. These groups run from sensitive species (EG I) to pollution indicators (EG V).

The fauna at C4 was dominated by the opportunistic polychaete *Chaetozone setosa* with 18 % of the individuals. The other most dominant species at the stations were tolerant and opportunistic species.

At the other stations, the fauna was dominated by the opportunistic polychaete *Mediomastus fragilis* with between 15 and 22 % of the individuals. The other most dominant species at these stations were mainly a mixture of neutral, tolerant, and opportunistic species.

The pollution indicator species *Capitella capitata* (polychaete) were among the top-10 at C1, C2 and C3 but not at the other stations.

Table 10. Number of individuals, cumulative percentage, and ecological group* for the ten most dominant species at the C stations. Hringsdalur, 2025.

C1	EG	Ant. ind.	Kum.
Mediomastus fragilis	IV	334	21 %
Capitella capitata	V	155	30 %
Chaetozone setosa	IV	148	39 %
Ennucula tenuis	III	135	48 %
Ampharete borealis	IV	114	55 %
Owenia sp.	II	70	59 %
Axinopsida orbiculata	Ik	60	63 %
Leitoscoloplos mammosus	IV	58	66 %
Oligochaeta indet.	IV	57	70 %
Thyasira sarsii	IV	51	73 %
C3	EG	Ant. ind.	Kum.
Mediomastus fragilis	IV	342	22 %
Chaetozone setosa	IV	199	34 %
Ennucula tenuis	III	133	43 %
Oligochaeta indet.	IV	108	50 %
Capitella capitata	V	91	55 %
Axinopsida orbiculata	Ik	85	61 %
Ampharete borealis	IV	84	66 %
Thyasira sarsii	IV	75	71 %
Leitoscoloplos mammosus	IV	66	75 %
Owenia sp.	II	61	79 %
C5	EG	Ant. ind.	Kum.
Mediomastus fragilis	IV	312	20 %
Chaetozone setosa	IV	124	27 %
Ennucula tenuis	III	122	35 %
Ampharete borealis	IV	108	42 %
Thyasira sarsii	IV	101	48 %
Oligochaeta indet.	IV	90	54 %
Leitoscoloplos mammosus	IV	76	58 %
Owenia sp.	II	70	63 %
Axinopsida orbiculata	Ik	69	67 %
Galathowenia oculata	III	69	71 %
C2	EG	Ant. ind.	Kum.
Mediomastus fragilis	IV	151	15 %
Ennucula tenuis	III	117	27 %
Leitoscoloplos mammosus	IV	96	37 %
Thyasira sarsii	IV	82	45 %
Oligochaeta indet.	IV	54	51 %
Chaetozone setosa	IV	41	55 %
Laphania boeckii	II	41	59 %
Capitella capitata	V	40	63 %
Parougia nigridentata	Ik	39	67 %
Galathowenia oculata	III	36	71 %
C4	EG	Ant. ind.	Kum.
Chaetozone setosa	IV	153	18 %
Ophelina acuminata	III	110	31 %
Ampharete borealis	IV	94	42 %
Mediomastus fragilis	IV	90	52 %
Thyasira sarsii	IV	67	60 %
Scalibregma inflatum	III	56	66 %
Parougia nigridentata	Ik	54	73 %
Axinopsida orbiculata	Ik	52	79 %
Oligochaeta indet.	IV	48	84 %
Prionospio steenstrupi	IV	46	90 %
C6	EG	Ant. ind.	Kum.
Mediomastus fragilis	IV	165	16 %
Ennucula tenuis	III	153	30 %
Thyasira sarsii	IV	116	41 %
Chaetozone setosa	IV	65	47 %
Oligochaeta indet.	IV	60	53 %
Leitoscoloplos mammosus	IV	55	58 %
Laphania boeckii	II	52	63 %
Axinopsida orbiculata	Ik	48	67 %
Ampharete borealis	IV	35	70 %
Galathowenia oculata	III	35	74 %

*Ecological groups: EG I = sensitive species. EG II = neutral species. EG III = tolerant species. EG IV = opportunistic species. EG V = pollution indicator species. From Borgersen et al., 2020. Ik = ecological group unknown.

5 Summary and Conclusions

5.1 Summary

The results from the environmental monitoring (type C) at Hringsdalur, 2025, can be summarised as follows:

- The hydrography measurements showed good oxygen conditions throughout the water column with 83 % saturation in the bottom layer in May 2025.
- TOC was rather high at all stations and nTOC varied from 30.1 to 52.4. TOM-levels varied from 6.7 to 13.0 %. TN-levels were low (.2 – 5.2 mg/g) as was the C/N-ratio. The level of copper was 78.1 mg/kg or in the upper limit of natural values (limit III) according to environmental limits in Icelandic regulation nr. 796/199. EMB concentration was 150 ng/kg and thus lower than the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is fulfilling the "good status standard". The phosphorus levels varied between 850 to 1510 mg/kg. The bottom sediments grain size was coarse to moderately fine with a pelite ratio ranging from 34.4 to 67.3 %. The redox measurements (pH/Eh) gave point 0 acc. Appendix D in NS 9410:2016 for all the stations.
- The number of individuals varied from 859 to 1624 and number of species from 31 to 61. The diversity H' varied from 3.62 to 4.36. At the stations, the overall index of nEQR varied from 0.507 to 0.605. The nEQR values indicate a somewhat moderate faunal condition at the stations.

5.2 Conclusions

The results from the monitoring at the farming site Hringsdalur in May 2025 showed that the sediment was somewhat loaded with organic carbon and the copper level in the sediment at C1 was elevated (78.1 mg/kg) and is categorized into environmental limit III or "in the upper limit of natural values". EMB concentration was 150 ng/kg and thus lower than the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is fulfilling the "good status standard". The phosphorus levels varied between 850 to 1510 mg/kg.

Some load effect was recorded in the fauna at all and faunal index nEQR at the stations was around 0.6. The diversity index H' varied from 3.62 to 4.36. The NS 9410:2016-assessment of the community in the local impact zone (C1) showed environmental condition 1 (Very good). A pollution indicator species was found among the most dominant species at C1, C2 and C3, but not at the other stations.

The redox measurements (pH/Eh) gave point 0 acc. Appendix D in NS 9410:2016 for all the sampling stations. The oxygen saturation in May was good in the whole water column with 83 % in the bottom water.

In comparison with results from previous C-survey at fallow period (Mannvik and Gunnarsson, 2022) there are indications that the environmental conditions have somewhat deteriorated during the farming of the last generation at the site. In the 2022 survey the faunal index nEQR was at or above 0.6 at all sampling stations (ranged 0.590 – 0.699) but is around and below 0.6 at all stations in

the current survey (range 0.507 – 0.605). The diversity index H' is however trending higher, ranged from 2.91 – 4.52 in the 2022 survey but is in the range from 3.62 to 4.36 in the 2025 survey. In the 2022 survey there were no pollution indicator species recorded at any of the sampling stations but in the 2025 survey pollution indicator species (*Capitella capitata*) was found among the most dominant species at stations C1, C2 and C3.

6 References

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7 Appendix (in Norwegian)

7.1 Bunndyrsindekser og artslister

Diversitetsmål

Diversitet er et begrep som uttrykker mangfoldet i dyre- og plantesamfunnet på en lokalitet. Det finnes en rekke ulike mål for diversitet. Noen tar mest hensyn til artsrikheten (mål for artsrikheten), andre legger mer vekt på individfordelingen mellom artene (mål for jevnhet og dominans). Ulike mål uttrykker derved forskjellige sider ved dyresamfunnet. Diversitetsmål er "klassiske" i forurensningsundersøkelser fordi miljøforstyrrelser typisk påvirker samfunnets sammensetning. Svakheten ved diversitetsmålene er at de ikke alltid fanger opp endringer i samfunnsstrukturen. Dersom en art blir erstattet med like mange individer av en ny art, vil ikke det gjøre noe utslag på diversitetsindeksene.

Shannon-Wieners indeks (Shannon & Weaver, 1949) er gitt ved formelen:

$$H' = - \sum_{i=1}^s \frac{n_i}{N} \log_2 \left(\frac{n_i}{N} \right)$$

der n_i = antall individer av art i i prøven
 N = total antall individer
 s = antall arter

Indeksen tar hensyn både til antall arter og mengdefordelingen mellom artene, men det synes som indeksen er mest følsom for individfordelingen. En lav verdi indikerer et artsfattig samfunn og/eller et samfunn som er dominert av en eller få arter. En høy verdi indikerer et artsrikt samfunn.

Hurlberts diversitetskurver

Grafisk kan diversiteten uttrykkes i form av antall arter som funksjon av antall individer. Med utgangspunkt i total antall arter og individer i en prøve søker man å beregne hvor mange arter man ville vente å finne i delprøver med færre individer. Diversitetsmålet blir derved uavhengig av prøvestørrelsen og gjør at lokaliteter med ulik individtetthet kan sammenlignes direkte. Hurlbert (1971) har gitt en metode for å beregne slike diversitetskurver basert på sannsynlighetsberegning.

ES_n er forventet antall arter i en delprøve på n tilfeldig valgte individer fra en prøve som inneholder total N individer og s arter og har følgende formel:

$$ES_n = \sum_{i=1}^s \left[1 - \frac{\binom{N-N_i}{n}}{\binom{N}{n}} \right]$$

der N = total antall individ i prøven
 N_i = antall individ av art i
 n = antall individ i en gitt delprøve (av de N)
 s = total antall arter i prøven

Faunaens fordelingsmønster (Clusteranalyse)

Variasjoner i faunaens fordelingsmønster over området beskrives ved å sammenligne faunasamfunnet på hver stasjon. Til dette brukes multivariate klassifikasjons- og ordinasjons-analyser.

Analysene i denne undersøkelsen ble utført ved hjelp av programpakken PRIMER. Inngangsdata er individantall pr. art, pr. prøve. Prøvene kan være replikater eller stasjoner. Det tas ikke hensyn til hvilke arter som opptrer. Forut for klassifikasjons- og ordinasjonsanalysene ble artslistene dobbelt kvadratrot-transformert. Dette ble gjort for å redusere avviket mellom høye og lave tetthetsverdier og dermed redusere eventuelle effekter av tallmessig dominans hos noen få arter i datasettet.

For å sammenligne prøvene ble Bray-Curtis ulikhetsindeks benyttet (Bray & Curtis, 1957):

$$d_{ij} = \frac{\sum_{k=1}^n |X_{ki} - X_{kj}|}{\sum_{k=1}^n (X_{ki} + X_{kj})}$$

der n = antall arter sammenlignet
 X_{ki} = antall individ av art k i prøve nr. i
 X_{kj} = antall individ av art k i prøve nr. j

Indeksen avtar med økende likhet. Vi får verdien 1 hvis prøvene er helt ulike, dvs. ikke har noen felles arter. Identiske arts- og individtall vil gi verdien 0. Prøver blir gruppert sammen etter graden av likhet ved å bruke "group-average linkage". Forholdsvis like prøver danner en gruppe (cluster). Resultatet presenteres i et tredigram (dendrogram).

Sensitivitet og tetthet

NSI (Norwegian Sensitivity Index; Rygg og Norling 2013) er utviklet med basis i norske faunadata og innført i 2012 og oppdatert i 2018 (Borgersen *m. fl.*, 2019). Hver art av i alt 583 arter er tilordnet en sensitivitetsverdi). En prøves NSI-verdi beregnes ved gjennomsnittet av sensitivitetsverdiene av alle individene i prøven. Formelen for utregning er gitt ved:

$$NSI = \sum_i^S \left[\frac{N_i * NSI_i}{N_{NSI}} \right]$$

ISI₂₀₁₈ (Indicator Species Index; Rygg og Norling 2013) en sensitivitetsindeks. Grunnlaget for beregningen av ISI (Rygg 2002) ble utvidet og artsnomenklaturen standardisert i 2012 og oppdatert i 2018 (Borgersen *m. fl.*, 2019). Hver art er tilordnet en ømfintlighetsverdi. ISI er en kvalitativ indeks som tar hensyn til hvilke arter som er tilstede, men ikke individtallet av dem. En prøves ISI-verdi beregnes ved gjennomsnittet av sensitivitetsverdiene av artene i prøven hvor ISI_i er ISI_{2018} verdien for arten i og S_{ISI} er antall arter tilordnet sensitivitetsverdier.

$$ISI = \sum_i^S \left[\frac{ISI_i}{S_{ISI}} \right]$$

AMBI (Azti Marine Biotic Index; Borja *m.fl.* 2000) er en sensitivitetsindeks (egentlig en toleranseindeks) der artene tilordnes en toleranseklasse (økologisk gruppe, EG). EG I = sensitive arter, EG II = "indifferente" arter, EG III = tolerante arter, EG IV = opportunistiske arter, EG V = forurensningsindikerende arter. I Norge brukes AMBI bare i kombinasjonsindeksen NQI1 og har derfor ingen egen klassifisering. AMBI er en kvantitativ indeks som tar hensyn til individtallet av artene.

$AMBI = (0 * EG I) + (1,5 * EG II) + (3 * EG III) + (4,5 * EG IV) + (6 * EG V)$ hvor EGI er andelen av individer som tilhører gruppe I, etc. Tallene angir toleranseverdiene.

Formelen for beregning av en prøves AMBI-verdi er gitt ved:

$$AMBI = \sum_i^s \left[\frac{N_i * AMBI_i}{N_{AMBI}} \right]$$

Sammensatt indeks

NQI1 (Norwegian Quality Index; Rygg 2006) inneholder indikatorer som omfatter sensitivitet (AMBI), og artsmangfold (S = antall, N = antall individer) i en prøve. NQI1 er interkalibrert mellom alle land som tilhører NEAGIG. NQI1 er gitt ved formelen:

$$NQI1 = \left[0,5 * \left(1 - \frac{AMBI}{7} \right) + 0,5 * \left(\frac{\left[\frac{\ln(S)}{\ln(\ln(N))} \right]}{2,7} \right) * \left(\frac{N}{N+5} \right) \right]$$

I prøver som har veldig lave individtall (færre enn seks), kan ikke NQI1 brukes. Det er i slike tilfeller mulig å bruke N+2 i stedet for N i formelen for å unngå uriktige indeksverdier (Rygg et al. 2011).

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7.2 Statistical results Hringsdalur, 2025

Benthos indices per replicate

st.nr.	tot.	C1_01	C1_02	C2_01	C2_02	C3_01	C3_02	C4_01	C4_02	C5_01	C5_02	C6_01	C6_02
no. ind.	7700	859	765	501	483	766	807	511	348	847	750	470	593
no. spe.	103	47	50	44	43	48	42	30	21	47	44	41	42
Shannon-Wiener:		4,2	4,2	4,2	4,5	4,1	3,9	3,8	3,5	4,2	4,3	4,2	4,2
Pielou		0,76	0,75	0,78	0,82	0,74	0,73	0,77	0,79	0,76	0,79	0,78	0,77
ES100		25	26	25	27	24	22	18	15	23	25	23	24
SN		2,02	2,07	2,07	2,07	2,04	1,97	1,86	1,72	2,02	2,00	2,04	2,02
ISI-2018		5,40	5,41	5,53	5,54	5,31	5,69	4,59	4,34	5,85	5,72	5,87	5,30
AMBI		3,191	3,081	3,082	2,776	2,618	3,643	3,386	3,126	2,943	2,651	2,886	2,526
NQI1		0,64	0,66	0,66	0,68	0,69	0,60	0,60	0,59	0,66	0,68	0,67	0,69
NSI		18,3	19,1	19,1	20,1	20,4	17,3	18,4	18,6	19,5	20,5	20,1	20,6

Geometrical classes

int.	cla.	C1	C2	C3	C4	C5	C6
1	1	17	10	17	8	21	18
2,3	2	9	11	10	7	12	10
4-7	3	9	9	6	3	3	2
8-15	4	6	5	7	2	3	5
16-31	5	7	5	6	1	5	7
32-63	6	7	7	3	5	5	7
64-127	7	2	3	6	4	9	2
128-255	8	3	1	2	1	0	2
256-511	9	1	0	1	0	1	0
512-1023	10	0	0	0	0	0	0
1024-2047	11	0	0	0	0	0	0
2048-	12	0	0	0	0	0	0

7.3 Species lists

Artsliste pr stasjon

Hringsdalur C-survey 2025

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
Stasjonsnr.:	C1							
NEMERTINI								
			Nemertea indet.		3	3	-	6
PRIAPULIDA								
			Priapulus caudatus		2	3	-	5
ANNELIDA								
	Polychaeta							
		Orbiniida						
			Aricidea laubieri		5	11	-	16
			Leitoscoloplos mammosus		27	31	-	58
			Levinsenia gracilis		14	26	-	40
			Scoloplos armiger		11	3	-	14
		Cossurida						
			Cossura longocirrata		17	20	-	37
		Spionida						
			Chaetozone setosa		58	90	-	148
			Prionospio steenstrupi		4	3	-	7
			Spio limicola		5		-	5
		Capitellida						
			Capitella capitata		130	25	-	155
			Euclymeninae indet.		3		-	3
			Mediomastus fragilis		143	191	-	334
			Praxillella praetermissa		12	15	-	27
			Rhodine gracilior			1	-	1
		Opheliida						
			Ophelina acuminata		9	18	-	27
			Scalibregma inflatum		11	3	-	14
		Phyllodocida						
			Eteone flava/longa		12	10	-	22
			Gattyana cirrhosa		1		-	1
			Microphthalmus sp.			1	-	1
			Nephtys ciliata		4		-	4
			Nephtys paradoxa		1	1	-	2
			Nephtys pente		2	2	-	4
			Pholoe assimilis		2	1	-	3
			Pholoe baltica			1	-	1
			Phyllodoce groenlandica			1	-	1
			Polynoidae indet.			1	-	1
			Syllis cornuta		2		-	2
			Syllis sp.			1	-	1
		Eunicida						
			Parougia nigridentata		9	8	-	17
		Oweniida						
			Galathowenia oculata		4	9	-	13
			Myriochele malmgreni/olgae		2	1	-	3
			Owenia sp.		51	19	-	70
		Terebellida						
			Ampharete borealis		49	65	-	114
			Ampharete finmarchica		1		-	1
			Ampharete octocirrata		2		-	2
			Ampharete petersenae		18	24	-	42
			Lagis koreni		3	6	-	9
			Lanassa venusta			1	-	1
			Laphania boeckii		1	1	-	2
		Sabellida						
			Chone sp.		1		-	1
			Euchone elegans			1	-	1
			Euchone papillosa		10	21	-	31
	Oligochaeta							

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Oligochaeta indet.		17	40	-	57
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.		3	3	-	6
		Amphipoda						
			Byblis gaimardii			1	-	1
			Dulichidae indet.			2	-	2
			Lysianassidae indet.		2	7	-	9
			Metopa sp.			1	-	1
			Oedicerotidae indet.			2	-	2
			Phoxocephalidae indet.		1		-	1
MOLLUSCA								
	Opisthobranchia							
		Cephalaspidea						
			Philinissima denticulata			1	-	1
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		106	29	-	135
			Nuculana pernula		6	4	-	10
			Yoldia hyperborea		2	3	-	5
		Veneroida						
			Axinopsida orbiculata		38	22	-	60
			Macoma calcarea		5		-	5
			Thyasira gouldii		18	11	-	29
			Thyasira sarsii		31	20	-	51
ECHINODERMATA								
	Ophiuroidea							
		Ophiurida						
			Ophiocten affinis			1	-	1
			Ophiura albida		1		-	1
				Maksverdi:	143	191		334
				Antall arter/taxa:	47	50		61
				Sum antall individ:				1624

Stasjonsnr.: C2
NEMERTINI

ANNELIDA	Polychaeta	Orbiniida	Nemertea indet.		6	16	-	22
			Aricidea laubieri		4	7	-	11
			Leitoscoloplos mammosus		55	41	-	96
			Levinsonia gracilis		23	11	-	34
			Scoloplos armiger		1	1	-	2
		Cossurida						
			Cossura longocirrata			4	-	4
		Spionida						
			Chaetozona setosa		18	23	-	41
			Prionospio steenstrupi		8	10	-	18
			Spio decorata		1		-	1
		Capitellida						
			Capitella capitata		28	12	-	40
			Euclymene droebachiensis			1	-	1
			Euclymeninae indet.		4	1	-	5
			Mediomastus fragilis		86	65	-	151
			Praxillella gracilis		6	8	-	14
			Praxillella praetermissa		3	6	-	9
			Rhodine gracilior		2	2	-	4
		Opheliida						
			Scalibregma inflatum		1		-	1
		Phyllodocida						
			Bylgides groenlandicus		1		-	1
			Eteone flava/longa		5	3	-	8
			Nephtys ciliata		1		-	1
			Pholoe assimilis		2	1	-	3
			Pholoe baltica		1	2	-	3
			Sphaerodoridium sp.			1	-	1

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
		Eunicida	Syllis cornuta		1	2	-	3
			Lumbrineris mixochaeta			2	-	2
			Parougia nigridentata		18	21	-	39
		Sternaspida	Sternaspis scutata			2	-	2
		Oweniida	Galathowenia oculata		14	22	-	36
			Myriochele malmgreni/olgae		7	19	-	26
		Flabelligerida	Lamispina falcata		1	2	-	3
		Terebellida	Ampharete borealis		14	13	-	27
			Lagis koreni		2	1	-	3
			Laphania boeckii		18	23	-	41
		Sabellida	Euchone incolor		4		-	4
			Euchone papillosa			2	-	2
		Oligochaeta	Oligochaeta indet.		36	18	-	54
CRUSTACEA		Ostracoda	Ostracoda indet.			1	-	1
		Malacostraca						
		Cumacea	Diastylis scorpioides		1		-	1
			Leucon sp.		2	3	-	5
		Amphipoda	Bathymedon obtusifrons		1	1	-	2
			Lysianassidae indet.		1		-	1
			Oedicerotidae indet.		2	1	-	3
			Phoxocephalus holbolli		2	3	-	5
MOLLUSCA		Bivalvia						
		Nuculoida	Ennucula tenuis		67	50	-	117
			Nuculana pernula		1	6	-	7
			Yoldia hyperborea		3	3	-	6
		Veneroida	Axinopsida orbiculata		8	12	-	20
			Macoma calcarea		4	2	-	6
			Thyasira gouldii		5	9	-	14
			Thyasira sarsii		32	50	-	82
ECHINODERMATA		Ophiuroidea						
		Ophiurida	Ophiura albida		1		-	1
				Maksverdi:	86	65		151
				Antall arter/taxa:	44	43		51
				Sum antall individ:				984
Stasjonsnr.:	C3							
NEMERTINI								
			Nemertea indet.		9	7	-	16
PRIAPULIDA								
			Priapulus caudatus		2	6	-	8
ANNELIDA		Polychaeta						
		Orbiniida	Aricidea laubieri		7	7	-	14
			Leitoscoloplos mammosus		26	40	-	66
			Levinsenia gracilis		11	23	-	34
			Paraonides nordica			2	-	2
			Scoloplos armiger		1		-	1

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
		Cossurida	Cossura longocirrata		2	20	-	22
		Spionida	Chaetozone setosa		84	115	-	199
			Prionospio steenstrupi		3	6	-	9
		Capitellida	Capitella capitata		2	89	-	91
			Euclymene droebachiensis		2		-	2
			Mediomastus fragilis		149	193	-	342
			Praxillella gracilis		5	3	-	8
			Praxillella praetermissa		1	2	-	3
			Rhodine gracilior			1	-	1
		Opheliida	Ophelina acuminata			2	-	2
			Scalibregma inflatum			1	-	1
		Phyllodocida	Eteone flava/longa		6	5	-	11
			Nephtys ciliata		1		-	1
			Nephtys pente			1	-	1
			Pholoe assimilis		5	1	-	6
			Pholoe baltica		1		-	1
			Syllis cornuta		3		-	3
		Eunicida	Lumbrineris mixochaeta		1		-	1
			Parougia nigridentata		12	13	-	25
		Sternaspida	Sternaspis scutata		1		-	1
		Oweniida	Galathowenia oculata		8	8	-	16
			Myriochele malmgreni/olgae		14	9	-	23
			Owenia sp.		34	27	-	61
		Terebellida	Ampharete borealis		57	27	-	84
			Ampharete petersenae		2	1	-	3
			Lagis koreni		2		-	2
			Laphania boeckii		9	5	-	14
			Melinna cristata			1	-	1
		Sabellida	Euchone incolor		1	3	-	4
			Euchone papillosa		1	1	-	2
		Oligochaeta	Oligochaeta indet.		35	73	-	108
CRUSTACEA								
	Malacostraca							
		Cumacea	Leucon sp.		4		-	4
		Amphipoda	Bathymedon obtusifrons		1		-	1
			Byblis gaimardii			1	-	1
			Dulichiiidae indet.			3	-	3
			Hippomedon sp.			1	-	1
			Lysianassidae indet.		1	4	-	5
			Metopa sp.		2		-	2
			Phoxocephalus holbolli		7	4	-	11
			Westwoodiella caecula			1	-	1
MOLLUSCA								
	Prosobranchia							
		Mesogastropoda	Onoba aculeus		1		-	1
		Neogastropoda	Curtitoma trevilliania		1		-	1
	Opisthobranchia							
		Nudibranchia	Cladobranchia indet.		1		-	1
	Bivalvia							
		Nuculoida	Ennucula tenuis		91	42	-	133
			Nuculana pernula		23	9	-	32
			Yoldia hyperborea		4		-	4
		Veneroida	Abra nitida		1		-	1
			Axinopsida orbiculata		63	22	-	85

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Macoma calcarea		4	1	-	5
			Thyasira gouldii		12	5	-	17
			Thyasira sarsii		53	22	-	75
			Maksverdi:		149	193		342
			Antall arter/taxa:		48	42		58
			Sum antall individ:					1573

Stasjonsnr.: C4

PRIAPULIDA

			Priapulus caudatus		4		-	4
ANNELIDA								
	Polychaeta							
		Orbiniida	Scoloplos armiger		1		-	1
		Cossurida	Cossura longocirrata		5	1	-	6
		Spionida	Chaetozone setosa		103	50	-	153
			Prionospio steenstrupi		17	29	-	46
		Capitellida	Capitella capitata		18	6	-	24
			Mediomastus fragilis		37	53	-	90
		Opheliida	Ophelina acuminata		67	43	-	110
			Scalibregma inflatum		30	26	-	56
		Phyllodocida	Eteone flava/longa		10	2	-	12
			Nephtys hystericis			1	-	1
			Syllis cornuta		1		-	1
		Eunicida	Lumbrineris mixochaeta		1		-	1
			Parougia nigridentata		40	14	-	54
		Terebellida	Ampharete borealis		45	49	-	94
			Cistenides hyperborea		1		-	1
			Proclea graffii		1		-	1
	Oligochaeta							
			Oligochaeta indet.		39	9	-	48
CRUSTACEA								
	Malacostraca							
		Cumacea	Leucon sp.		1	1	-	2
		Amphipoda	Dulichiiidae indet.		1		-	1
			Gammaridea indet.		2	1	-	3
			Lysianassidae indet.		3		-	3
			Metopa sp.		1	3	-	4
		Decapoda	Hyas coarctatus		1	1	-	2
MOLLUSCA								
	Bivalvia							
		Nuculoida	Ennucula tenuis		10	4	-	14
			Yoldia hyperborea		1	1	-	2
		Mytiloida	Mytilus edulis		1		-	1
		Veneroida	Axinopsida orbiculata		36	16	-	52
			Macoma calcarea		3		-	3
			Thyasira gouldii		1	1	-	2
			Thyasira sarsii		30	37	-	67
			Maksverdi:		103	53		153
			Antall arter/taxa:		30	21		31
			Sum antall individ:					859

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
Stasjonsnr.:	C5							
NEMERTINI								
			Nemertea indet.		11	9	-	20
PRIAPULIDA								
			Priapulus caudatus			3	-	3
SIPUNCULIDA								
			Phascolion strombus			1	-	1
ANNELIDA								
	Polychaeta							
		Orbiniida						
			Aricidea laubieri		9	7	-	16
			Leitoscoloplos mammosus		44	32	-	76
			Levinsonia gracilis		17	9	-	26
		Cossurida						
			Cossura longocirrata		2	1	-	3
		Spionida						
			Chaetozone setosa		79	45	-	124
			Prionospio steenstrupi		2	5	-	7
			Spio limicola			1	-	1
		Capitellida						
			Capitella capitata		24	21	-	45
			Euclymene droebachiensis		1	4	-	5
			Maldane sarsi			3	-	3
			Mediomastus fragilis		172	140	-	312
			Praxillella gracilis		1	7	-	8
			Praxillella praetermissa		2	10	-	12
			Rhodine gracilior		2	1	-	3
		Phyllodocida						
			Eteone flava/longa		12	9	-	21
			Microphthalmus sp.		1		-	1
			Pholoe assimilis		2		-	2
			Pholoe baltica			2	-	2
			Phyllodoce maculata/mucosa		1	1	-	2
			Syllis cornuta			1	-	1
		Amphinomida						
			Paramphinome jeffreysii			1	-	1
		Eunicida						
			Parougia nigridentata		29	21	-	50
		Sternaspida						
			Sternaspis scutata		1		-	1
		Oweniida						
			Galathowenia oculata		35	34	-	69
			Myriochele malmgreni/olgae		24	36	-	60
			Owenia sp.		32	38	-	70
		Flabelligerida						
			Brada sp.		1		-	1
		Terebellida						
			Ampharete borealis		59	49	-	108
			Anobothrus gracilis		1		-	1
			Cistenides hyperborea		1	1	-	2
			Lagis koreni			1	-	1
			Lanassa venusta		1		-	1
			Laphania boeckii		35	25	-	60
			Melinna cristata		2		-	2
			Pectinaria belgica		1		-	1
			Pectinariidae indet.			1	-	1
		Sabellida						
			Euchone incolor		1		-	1
	Oligochaeta							
			Oligochaeta indet.		62	28	-	90
CRUSTACEA								
	Ostracoda							
			Ostracoda indet.		1		-	1
	Malacostraca							

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
MOLLUSCA		Cumacea						
			Leucon sp.		2	2	-	4
		Amphipoda						
			Bathymedon obtusifrons			1	-	1
		Decapoda	Phoxocephalus holbolli		7	5	-	12
			Hyas coarctatus		2	1	-	3
			Paguridae indet.		1		-	1
		Gastropoda						
			Melanochlamys diomedea		1		-	1
		Opisthobranchia						
		Nudibranchia						
		Bivalvia	Doto sp.			1	-	1
		Nuculoida	Ennucula tenuis		57	65	-	122
			Nuculana pernula		11	22	-	33
			Yoldia hyperborea		1	2	-	3
		Mytiloida						
			Mytilus edulis		1		-	1
		Veneroida						
			Abra nitida		1		-	1
			Axinopsida orbiculata		33	36	-	69
			Macoma calcarea		2		-	2
			Thyasira gouldii		11	15	-	26
			Thyasira sarsii		49	52	-	101
ECHINODERMATA		Ophiuroidea						
		Ophiurida						
			Ophiura albida			1	-	1
				Maksverdi:	172	140		312
				Antall arter/taxa:	47	44		59
				Sum antall individ:				1597

Stasjonsnr.: C6
NEMERTINI

PRIAPULIDA			Nemertea indet.		22	4	-	26
ANNELIDA			Priapulus caudatus			4	-	4
		Polychaeta						
		Orbiniida	Aricidea laubieri		6	5	-	11
			Leitoscoloplos mammosus		31	24	-	55
			Levinsenia gracilis		11	7	-	18
			Paraonides nordica			2	-	2
			Scoloplos armiger		1		-	1
		Spionida	Chaetozone setosa		40	25	-	65
			Malacoceros vulgaris			1	-	1
			Prionospio steenstrupi		5	4	-	9
			Spio limicola			1	-	1
		Capitellida						
			Capitella capitata		14	7	-	21
			Capitellidae indet.		1		-	1
			Euclymeninae indet.		1		-	1
			Mediomastus fragilis		58	107	-	165
			Praxillella gracilis		5	4	-	9
			Praxillella praetermissa			2	-	2
			Rhodine gracilior		1	2	-	3
		Phyllodocida						
			Eteone flava/longa		8	8	-	16
			Nephtys ciliata		1	1	-	2
			Nephtys hystericis		1		-	1

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Pholoe assimilis		1	2	-	3
			Pholoe baltica			3	-	3
			Sphaerodoridium sp.			1	-	1
			Syllis cornuta			3	-	3
		Eunicida	Lumbrineris mixochaeta		1		-	1
			Parougia nigridentata		16	19	-	35
		Sternaspida	Sternaspis scutata		1		-	1
		Oweniida	Galathowenia oculata		17	18	-	35
			Myriochele malmgreni/olgae		2	12	-	14
			Owenia sp.		4	12	-	16
		Flabelligerida						
			Brada sp.		1		-	1
		Terebellida						
			Ampharete borealis		1	34	-	35
			Laphania boeckii		36	16	-	52
			Melinna cristata		1		-	1
		Oligochaeta						
			Oligochaeta indet.		31	29	-	60
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Eudorella sp.		1	1	-	2
			Leucon sp.		1	1	-	2
		Amphipoda						
			Bathymedon obtusifrons		1		-	1
			Byblis gaimardii		1		-	1
			Dulichidae indet.		2	1	-	3
			Metopa sp.			1	-	1
			Phoxocephalus holbolli		4	5	-	9
MOLLUSCA								
	Prosobranchia							
		Mesogastropoda						
			Euspira pallida			1	-	1
	Opisthobranchia							
		Cephalaspidea						
			Philinissima denticulata			1	-	1
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		69	84	-	153
			Nuculana pernula		2	20	-	22
			Yoldia hyperborea		2	3	-	5
		Veneroida						
			Abra nitida		1		-	1
			Axinopsida orbiculata		28	20	-	48
			Macoma calcarea			1	-	1
			Thyasira gouldii		4	17	-	21
			Thyasira sarsii		36	80	-	116
			Maksverdi:		69	107		165
			Antall arter/taxa:		41	42		53
			Sum antall individ:					1063

7.4 Analytical report



ANALYSERAPPORT



Kunde: Arnarlax
Kundemerking: Hríngsdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Lab-id. P250051-01

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C1			66687 - Hríngsdalur 2025 C and B survey at fallow	Mye skjell i 2mm i prøven, hvilket reduserer andel av pelitt i kornfordelingen. TNb verdier > 5 mg/g TS er utenfor akkreditert måleområde.	2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC	18	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±1.8
TNb	*5.2	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±1.2
nTOC	30.1		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	*3.5		2025-07-01	2025-07-01	Beregning TOC:TN	
TOM	6.7	% TS	2025-06-05	2025-06-10	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	2.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	0.4	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	0.8	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.250 mm - <0.500 mm	2.0	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	13.9	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.4
Vekt% 0.063 mm - <0.125 mm	46.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±4.0
Vekt% <0.063 mm	34.4	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±3.4
Pelitt	*34.4	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±3.4

Tabellen fortsetter på neste side...

* = Ikke akkreditert resultat

Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 1 av 9

Kunde:	Arnarlax	Rapport nr.:	P250051
Kundemerking:	Hringsdalur	Rapportdato:	2025-07-01
Kontaktperson:		Ankomst dato:	2025-05-30
Prosjektnr.:	66687		

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
Sand	*63.3	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±3.1
Grus	*2.3	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
Kobber (Cu) ^a	78.1	mg/kg TS	2025-06-09	2025-06-09	Intern metode	
P (Fosfor) ^a	860	mg/kg TS	2025-06-12	2025-06-12	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Lab-id. P250051-04

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C2	ASC2		66687 - Hringsdalur 2025 C and B survey at fallow	TOC er et gjennomsnitt av tre enkeltresultater, variasjonskoeffisient er oppgitt	2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC Variasjonskoeffisient	*28.1	%	2025-07-01	2025-07-01	Beregning (standard-avvik/gjennomsnitt x 100)	
TOC	39	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±3.9
TNb	3.6	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±0.79
nTOC	46.1		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	*10.8		2025-07-01	2025-07-01	Beregning TOC:TN	
TOM	9.4	% TS	2025-06-05	2025-06-10	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	0.6	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	

Tabellen fortsetter på neste side...

* = Ikke akkreditert resultat

Akvaplan-niva
Framsenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 2 av 9

Kunde: Arnarlax
Kundemerking: Hringsdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
Vekt% 1 mm - <2 mm	0.1	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	0.8	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.250 mm - <0.500 mm	2.0	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	7.7	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.063 mm - <0.125 mm	28.6	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±2.5
Vekt% <0.063 mm	60.1	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±5.9
Pelitt	*60.1	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±5.9
Sand	*39.3	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±2.0
Grus	*0.6	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
P (Fosfor) ^a	850	mg/kg TS	2025-06-12	2025-06-12	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Lab-id. P250051-07

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C3	ASC3		66687 - Hringsdalur 2025 C and B survey at fallow		2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC	45	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±4.5
TNb	4.6	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±1.0

Tabellen fortsetter på neste side...

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Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 3 av 9

Kunde: Arnarlax
Kundemerking: Hringisdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
nTOC	52.4		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	+9.7		2025-07-01	2025-07-01	Beregning TOC:TN	
TOM	9.3	% TS	2025-06-05	2025-06-10	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	1.1	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	0.1	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	0.8	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.250 mm - <0.500 mm	2.0	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	8.7	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.3
Vekt% 0.063 mm - <0.125 mm	28.6	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±2.5
Vekt% <0.063 mm	58.7	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±5.8
Pelitt	+58.7	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±5.8
Sand	+40.2	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±2.0
Grus	+1.1	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
P (Fosfor) ^a	1510	mg/kg TS	2025-06-12	2025-06-12	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

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Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 4 av 9

Kunde:	Arnarlax	Rapport nr.:	P250051
Kundemerking:	Hringsdalur	Rapportdato:	2025-07-01
Kontaktperson:		Ankomst dato:	2025-05-30
Prosjektnr.:	66687		

Lab-id. P250051-10

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C4	ASC4		66687 - Hringsdalur 2025 C and B survey at fallow	Agglomerering i siktene i kornfordelingsanalysen.	2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC	44	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±4.4
TNb	3.9	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±0.85
nTOC	49.6		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	*11.4		2025-07-01	2025-07-01	Beregning TOC:TN	
TOM	13.0	% TS	2025-06-05	2025-06-10	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% >2 mm	0.2	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	0.9	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	2.2	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	12.0	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.4
Vekt% 0.125 mm - <0.250 mm	5.4	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.063 mm - <0.125 mm	11.9	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±1.0
Vekt% <0.063 mm	67.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±6.7
Pelitt	*67.3	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±6.7
Sand	*32.4	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±1.6

Tabellen fortsetter på neste side...

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Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 5 av 9

Kunde:	Arnarlax	Rapport nr.:	P250051
Kundemerking:	Hringsdalur	Rapportdato:	2025-07-01
Kontaktperson:		Ankomst dato:	2025-05-30
Prosjektnr.:	66687		

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
Vekt% 0.063 mm - <0.125 mm	32.7	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±2.8
Vekt% <0.063 mm	53.1	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±5.3
Pelitt	*53.1	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±5.3
Sand	*44.4	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±2.2
Grus	*2.5	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
P (Fosfor) ^a	1340	mg/kg TS	2025-06-12	2025-06-12	Intern metode	
Emamectinbenzoat ^b	*150	ng/kg TS	2025-06-24	2025-06-24	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

^b Prøvingen er utført av eksternt laboratorium, NIVA

Lab-id. P250051-16

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C6	ASC6		66687 - Hringsdalur 2025 C and B survey at fallow		2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC	37	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±3.7
TNb	4.0	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±0.89
nTOC	44.3		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	*9.1		2025-07-01	2025-07-01	Beregning TOC:TN	

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Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 7 av 9

Kunde: Arnarlax
Kundemerking: Hringisdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
Grus	±0.2	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
P (Fosfor) ^a	1350	mg/kg TS	2025-06-12	2025-06-12	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Lab-id. P250051-13

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C5	ASC5		66687 - Hringisdalur 2025 C and B survey at fallow		2025-05-30

Analyseresultat						
Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOC	29	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 17505:2023)	±2.9
TNb	3.2	mg/g TS	2025-06-24	2025-06-28	Intern metode (NS-EN 16168:2012)	±0.69
nTOC	37.0		2025-07-01	2025-07-01	Miljødirektoratet 2025	
C/N - forhold	±9.1		2025-07-01	2025-07-01	Beregning TOC:TN	
TOM	8.4	% TS	2025-06-05	2025-06-10	Vektlap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	2.5	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	0.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	0.5	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.250 mm - <0.500 mm	1.4	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.125 mm - <0.250 mm	9.4	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.3

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Akvaplan-niva
Fransenteret
Postboks 6606 Stakkevollan
9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 6 av 9

Kunde: Arnarlax
Kundemerking: Hringsdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato-	Standard	Måleusikkerhet
TOM	9.1	% TS	2025-06-05	2025-06-10	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	0.8	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	0.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	0.7	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.250 mm - <0.500 mm	2.0	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	7.6	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.063 mm - <0.125 mm	29.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±2.5
Vekt% <0.063 mm	59.3	wt% TS	2025-06-05	2025-06-12	Intern metode (Bale/Kenny 2005)	±5.9
Pelitt	+59.3	wt% TS	2025-06-05	2025-06-12	Fraksjonen <0.063 mm	±5.9
Sand	+39.8	wt% TS	2025-06-05	2025-06-12	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±2.0
Grus	+0.8	wt% TS	2025-06-05	2025-06-12	Fraksjonen ≥2 mm	
P (Fosfor) ^a	1360	mg/kg TS	2025-06-12	2025-06-12	Intern metode	

^a Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

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Framsenteret
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9296 Tromsø

kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

Analysereporten er digitalt undertegnet av:
Lisa Torske

lit@akvaplan.niva.no

Side 8 av 9

Kunde: Arnarlax
Kundemerking: Hringsdalur
Kontaktperson:
Prosjektnr.: 66687

Rapport nr.: P250051
Rapportdato: 2025-07-01
Ankomst dato: 2025-05-30

Analyseansvarlig:

Oda Sofie Bye Wilhelmsen

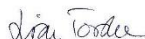
Signatur:



Lisa Torske

Underskriftsberettiget:

Signatur:



Analysene gjelder bare for de prøver som er testet. De oppgitte analyseresultat omfatter ikke feil som måtte følge av prøvetagningen, inhomogenitet eller andre forhold som kan ha påvirket prøven før den ble mottatt av laboratoriet. Rapporten får kun kopieres i sin helhet og uten noen form for endringer. En eventuell klage skal leveres laboratoriet senest en måned etter mottak av analyseresultat. Nærmere informasjon om analysemetodene (måleusikkerhet, metodeprinsipp etc.) fås ved henvendelse til Akvaplan-Niva AS

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Akvaplan-niva
Framsenteret
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kjemi@akvaplan.niva.no
www.akvaplan.niva.no

tel: +47 77 75 03 00
NO 937 375 158 MVA

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Lisa Torske

lit@akvaplan.niva.no

Side 9 av 9