

**Cruise Report**  
**FRV "Walther Herwig III"**  
**Cruise 463**  
**04.01.-13.01.2023**

Cruise Leader: Dr. Norbert Rohlf

**International Herring Larvae Survey in the North Sea**

**Summary**

The cruise is part of the German contribution to the international herring larvae surveys in the North Sea (IHLS). These surveys are conducted during the autumn and winter herring spawning activity. The ICES coordinated studies monitor the spatial distribution and abundance of herring larvae on an annual basis. Survey results gives information about herring spawning stock biomass and the contribution of different spawning components on the overall hatching success. The results provide valuable information for herring stock assessment and the fixation of fishing quotas.

The cruise suffered from technical failures and unfavourable weather conditions. Thus, only a minority of the stations could be sampled as planned.

The samples yielded 1,870 herring larvae in total. Due to the low survey coverage, this number is not comparable to previous year's estimates (in the range of 12,000-26,000 larvae, except of low estimates in 2017).

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**Verteiler:**

TI - Seefischerei

**per E-Mail:**

BMEL, Ref. 614

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Bundesanstalt für Landwirtschaft und Ernährung, Hamburg

Schiffsführung RV „Dana“

Schiffsführung FFS "Walther Herwig III"

Präsidialbüro (Michael Welling)

Personalreferat Braunschweig

TI - Fischereiökologie

TI - Ostseefischerei Rostock

FIZ-Fischerei

TI - PR

MRI - BFEL HH, FB Fischqualität

Dr. Rohlf/SF - Reiseplanung Forschungsschiffe

Fahrtteilnehmer

Bundesamt für Seeschifffahrt und Hydrographie, Hamburg

Mecklenburger Hochseefischerei GmbH, Rostock

Doggerbank Seefischerei GmbH, Bremerhaven

Deutscher Fischerei - Verband e. V., Hamburg

Leibniz-Institut für Meereswissenschaften IFM-GEOMAR

H. Cammann-Oehne, BSH

Deutscher Hochseefischerei-Verband e.V.

DFFU

## **2. Research programme**

The cruise is a component of the international herring larvae surveys in the North Sea. Parts of ICES area 27.4.c and 27.7.d should be sampled by double oblique tows of the "Nackthai" (modified GULF sampler), resulting in herring larval abundance estimates and spatial distribution as well as bycatch of other Ichthyoplankton, especially plaice eggs.

As an additional task, the winter benthos species composition in Box A should be examined.

## **3. Narrative**

The cruise began on Wednesday, 01/04/23. The vessel left port of Bremerhaven at noon and steamed into the German Bight, where we expected to start our benthos sampling in Box A on Thursday. Wind speed was already around 9 Beaufort.

However, technical problems occurred on Thursday morning, which couldn't be solved while out at sea. Thus, we steamed back to Bremerhaven, where repairs took place until Saturday evening. The cruise was re-started on Sunday morning, 2am. Unfortunately, one participant had to disembark previously due to illness.

The vessel steamed into the English Channel to conduct the herring larvae survey. The area under investigation was reached Monday morning, 01/09/23. Wind speed was 7-8 Beaufort, and stayed relatively high during the remaining days of the cruise.

In the western part of the English Channel, Wind speed was even higher, around 10 Beaufort. None of the stations planned here could be fished.

In addition, the Belgian coastguard declared the cruise's permission to work in Belgian coastal waters as invalid. This was later withdrawn by Belgian authorities, but then the cruise had already ended. So, stations in Belgian waters could not be covered this year.

All accessible IHLS stations were sampled on Tuesday evening, 01/10/23. Nine additional stations were added to check for larvae drift and growth rates. These were finalized the next morning.

Subsequently, RV Walther Herwig steamed into Box A, trying to conduct the benthos sampling, but weather conditions were found to be too poor. Cruise WH 463 was concluded in Bremerhaven on Friday, 01/13/23.

## **4. Preliminary results**

In total, 27 plankton tows were done within the IHLS framework and nine additional stations to account for larvae drift. Plankton sampling was achieved according to the manual of the herring larvae surveys. Fish eggs and larvae were sorted from the plankton samples after the end of the cruise. Herring larvae were counted, length measured and their abundance per square metre estimated.

The samples yielded in total 1,870 herring larvae. Due to the low survey coverage, this number is not comparable to previous year's estimates (in the range of 12,000-26,000 larvae, except low estimate in 2017). Species identification of none clupeid fish eggs and larvae has not been completed yet, but most fish eggs are already identified as plaice eggs (*Pleuronectes platessa*).

Information on sampling positions and abundance estimates are listed in Table 1.

The cruise track is given in Figure 1, and the spatial distribution of herring larvae in Figure 2. Figure 3 depicts the length-frequency of herring larvae. Distribution of near-bottom temperature is given in Figure 4.

## 5. Participants

<b>Name</b>	<b>Institution</b>	<b>Function</b>
1. Dr. Norbert Rohlf	TI-SF	Cruise leader
2. Birgit Suer	TI-SF	Technician
3. Friederike Beußel	TI-SF	Technician
4. Valeria Schütte-Adrian	TI-SF	Technician
5. Jana Bäger	TI-SF	Technician
6. Svea Winning	TI-SF	Technician
7. Aaron Cordes	TI-SF	Student

## 6. Acknowledgement

Thanks to Captain Stefan Meier and FRV "Walther Herwig III" crew members for their excellent support and hospitality and to all participants for their reliable and responsible teamwork.



(Dr. Norbert Rohlf)

## 7. Tables and Figures

Table 1: Main data of Ichthyoplankton hauls made during WH 463.

Stat. Nr.	Haul Nr.	Lat	Long.	Date (UTC)	Time (UTC)	Duration (min)	Water depth (m)	Catch depth (m)	Flow (m <sup>3</sup> )	Hela (n/m <sup>2</sup> )	Bottom temp. (°C)	Bottom Salinity (psu)
1	1	52°25.18N	003°30.00E	09.01.23	04:18	3.47	29	27	21.7	92	9.74	34.76
2	2	52°25.01N	003°10.49E	09.01.23	05:38	6.07	41	38	33.1	31	10.21	34.88
3	3	52°25.27N	002°50.40E	09.01.23	06:57	5.47	40	37	32.7	141	10.74	35.10
4	4	52°15.15N	002°49.68E	09.01.23	08:01	5.21	41	38	32.5	100	10.75	35.10
5	5	52°15.00N	003°08.61E	09.01.23	09:09	4.59	37	34	29.7	107	10.14	34.85
6	6	52°14.98N	003°29.61E	09.01.23	10:27	3.03	27	24	17.3	130	9.58	34.64
7	7	52°12.57N	003°43.31E	09.01.23	11:19	3.06	28	25	16.4	56	9.20	34.65
8	8	52°05.17N	003°50.51E	09.01.23	12:09	3.15	25	22	21.1	6	8.54	34.28
9	9	52°05.00N	003°30.79E	09.01.23	13:24	2.40	32	29	10.5	119	8.62	34.35
10	10	52°05.28N	003°10.46E	09.01.23	14:50	5.11	34	31	29.1	176	10.05	34.84
11	11	52°05.01N	250°39.00E	09.01.23	16:18	5.16	37	34	28.3	187	10.77	35.13
12	12	52°05.14N	002°30.21E	09.01.23	17:47	5.47	41	37	30.9	58	11.02	35.15
13	13	51°55.08N	002°29.95E	09.01.23	18:55	5.20	43	39	28.1	47	11.02	35.14
14	14	51°55.00N	002°49.47E	09.01.23	20:05	4.54	39	36	25.6	128	10.75	35.11
15	15	51°54.95N	003°09.71E	09.01.23	21:22	3.20	29	26	18.0	68	10.11	34.83
16	16	51°57.27N	003°23.97E	09.01.23	22:38	3.13	30	27	15.4	56	9.31	34.35
17	17	51°44.77N	003°10.32E	10.01.23	00:24	3.33	29	25	21.4	37	9.60	34.50
18	18	51°45.95N	002°49.93E	10.01.23	02:16	3.14	28	25	17.5	30	10.57	35.03
19	19	51°45.06N	002°30.11E	10.01.23	04:06	6.17	41	39	35.1	37	10.97	35.11
20	20	51°45.08N	002°10.12E	10.01.23	05:31	8.22	51	48	47.8	4	11.10	35.12
21	21	51°35.23N	002°10.29E	10.01.23	06:38	6.11	41	38	35.6	52	11.17	35.14
22	22	51°35.10N	001°50.22E	10.01.23	07:53	5.08	38	35	28.4	1	10.81	35.10
23	23	51°25.02N	001°50.09E	10.01.23	08:55	4.50	40	37	25.9	2	11.13	35.17
24	24	51°15.32N	001°49.82E	10.01.23	09:51	4.02	41	38	19.4	146	11.25	35.15
25	25	51°05.73N	001°50.23E	10.01.23	14:45	4.29	34	31	28.4	81	10.68	34.99
26	26	51°15.07N	002°10.22E	10.01.23	15:57	6.32	43	39	37.0	321	10.65	34.92
27	27	51°24.70N	002°09.58E	10.01.23	16:54	5.55	38	35	31.2	329	11.15	35.13
28	28	51°45.95N	002°49.46E	10.01.23	23:28	4.28	31	28	28.1	40	10.48	35.00
29	29	51°54.72N	002°49.80E	11.01.23	00:29	4.38	34	27	29.3	107	10.63	35.10
30	30	51°54.87N	003°09.72E	11.01.23	01:39	4.37	32	28	28.2	78	10.04	34.83
31	31	52°05.05N	003°10.03E	11.01.23	02:59	5.28	36	33	31.4	117	9.97	34.84
32	32	52°04.89N	003°29.63E	11.01.23	04:04	4.42	31	28	27.8	94	9.19	34.39
33	33	52°15.00N	003°30.01E	11.01.23	05:10	4.21	31	28	23.9	117	9.52	34.57
34	34	52°15.11N	003°09.74E	11.01.23	06:38	5.48	40	37	33.8	133	10.12	34.94
35	35	52°24.65N	003°09.27E	11.01.23	07:32	6.50	46	43	39.9	62	10.10	34.87
36	36	52°24.99N	003°29.78E	11.01.23	08:44	3.51	30	27	23.1	140	9.75	34.70

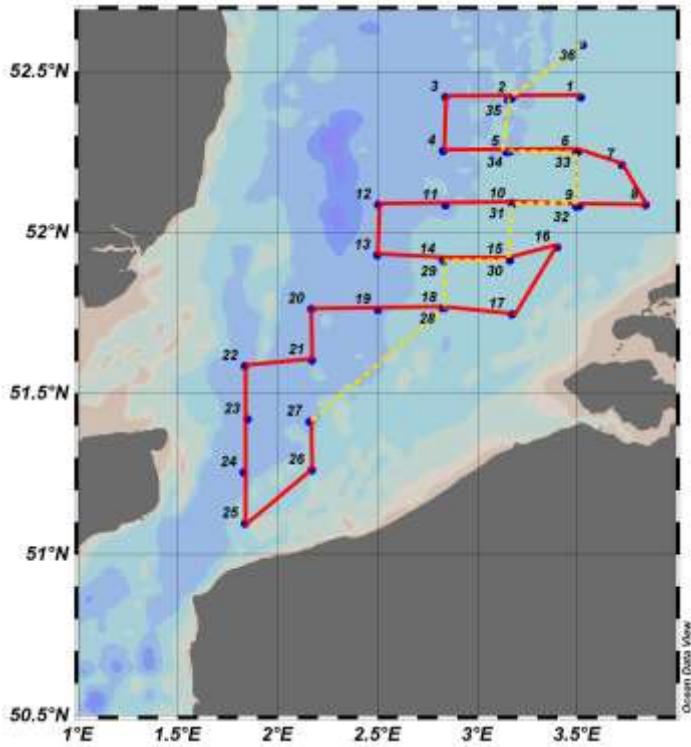


Figure 1: Positions of herring larvae stations in the southern North Sea. Cruise track at regular IHLS stations is indicated by the red line, while additional stations are given in yellow.

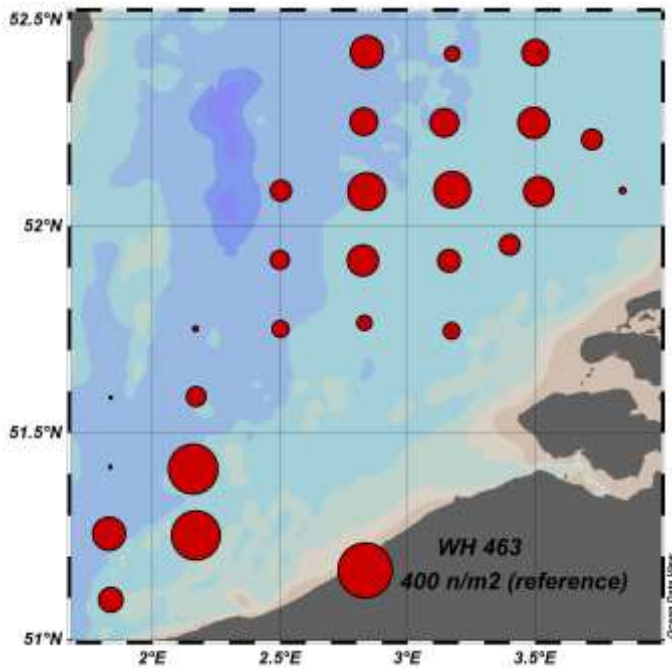


Figure 2: Distribution and abundance of herring larvae ( $n/m^2$ , all length classes) in the southern North Sea. The circle size indicates the equivalent to 400 larvae per square metre.

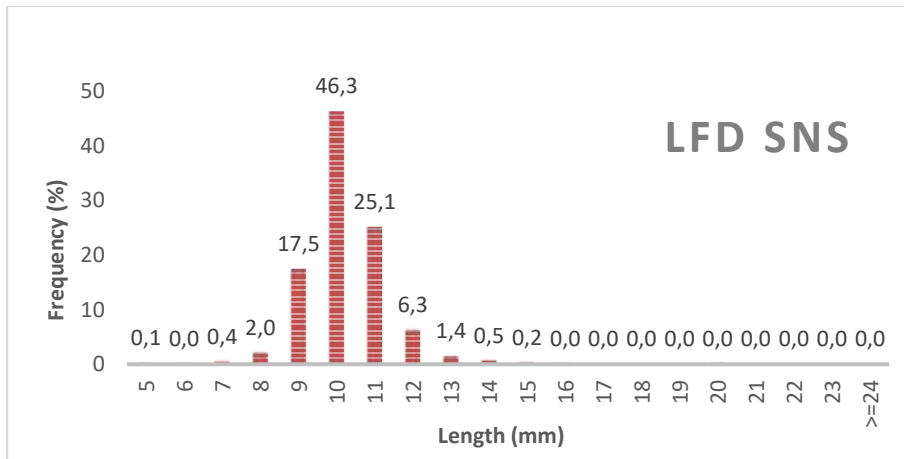


Figure 3: Length-frequency plot of herring larvae obtained during WH 463. The percentage per length class is given on top of each bar (LFD SNS = length frequency distribution southern North Sea).

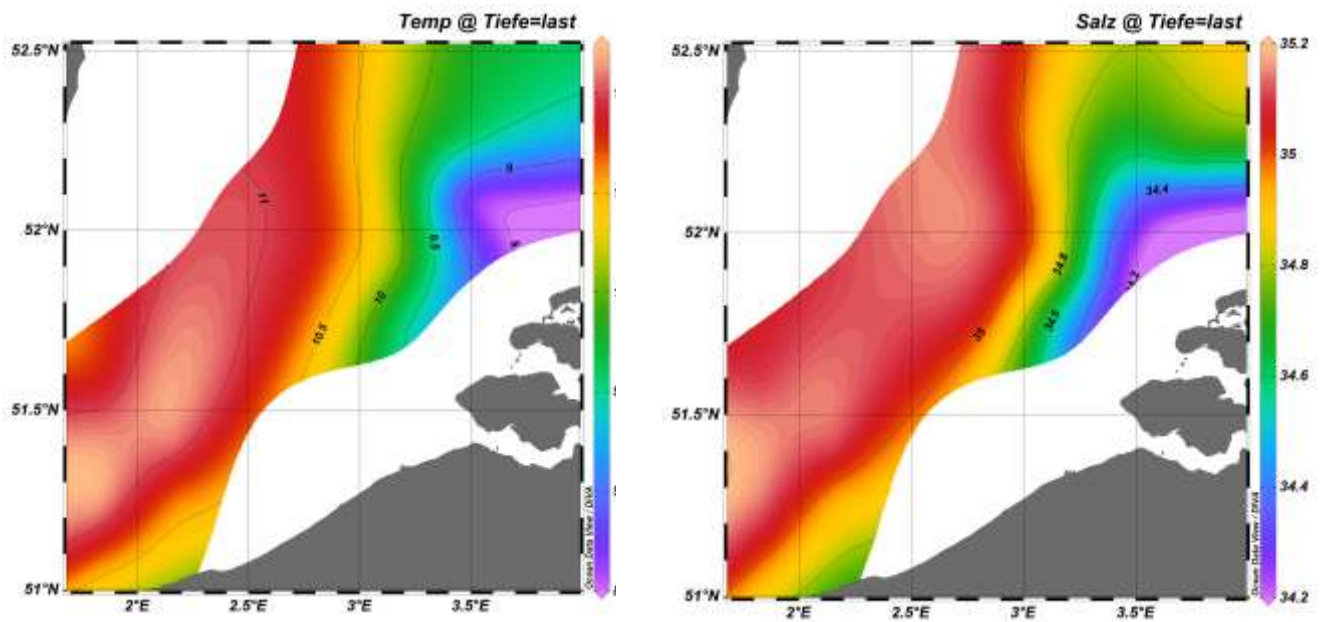


Figure 4: Distribution of near-bottom temperature (°C, left panel) and salinity (psu, right panel) in the area under investigation