

**Cruise Report**  
**834<sup>th</sup> cruise FFS Solea, 08/05 to 16/05/2024**

**EEZ Survey North Sea – Natura2000 area Sylt Outer Reef and  
Amrumbank**

Cruise leader: Dr. Holger Haslob

**1. Summary**

**This cruise was part of the DAM pilot mission MGF North Sea 2. The objective of this project is to evaluate the potential effects on fish and epibenthic communities in the Natura2000 areas (German EEZ, North Sea) following the exclusion of bottom trawling since May 2023. Originally, this cruise aimed to implement and further test the monitoring concept for fish and epibenthic communities developed exactly for this task during the first phase of the DAM pilot mission. This concept includes the use of traditional monitoring methods, such as 3-meter and 2-meter beam trawls, to compare the results with baseline data on fish and epibenthos obtained during the first project phase and from monitorings by the Thünen Institute of Sea Fisheries since 2002 in those areas. However, due to uncertainties regarding exemptions for scientific trawl deployments, the Thünen Institute of Sea Fisheries, after consultations with the BfN, decided not to deploy beam trawls in the strictly protected areas. Consequently, the cruise program was adjusted, and only stations outside protected areas were sampled using bottom trawls. This adjustment was somewhat counterproductive to the project's goals, as it prevented direct comparison of trawl results from protected areas with those from areas where bottom-contact fishing gear is still permitted. Besides the use of beam trawls also BRUVs were deployed on selected stations (in cooperation with the University of Oldenburg), and water samples were taken for eDNA analysis. This will allow further comparisons of the classical monitoring methods with newly developed non-invasive methods.**

**Verteiler:**

Schiffsführung FFS „Solea“  
BA für Landwirtschaft und Ernährung (BLE) Fischereiforschung  
BM für Ernährung und Landwirtschaft (BMEL), Ref. 614  
BA für Seeschifffahrt und Hydrographie (BSH), Hamburg  
Deutscher Angelfischerverband e.V.  
Deutsche Fischfang-Union, Cuxhaven  
Deutscher Fischereiverband Hamburg  
Doggerbank Seefischerei GmbH, Bremerhaven  
Erzeugergemeinschaft der Deutschen Krabbenfischer GmbH  
Euro-Baltic Mukran  
GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel  
Kutter- und Küstenfisch Sassnitz

LA für Landwirtschaft, Lebensmittels. und Fischerei (LALLF)  
LFA für Landwirtschaft und Fischerei MV (LFA)  
Landesverband der Kutter- u. Küstenfischer MV e.V.  
Leibniz-Institut für Ostseeforschung Warnemünde  
Thünen-Institut - Institut für Fischereiökologie  
Thünen-Institut - Institut für Seefischerei  
Thünen-Institut - Institut für Ostseefischerei  
Thünen-Institut - Pressestelle  
Thünen-Institut - Präsidialbüro  
Thünen-Institut - Reiseplanung Forschungsschiffe, Dr. Rohlfs  
Fahrteilnehmer\*innen

## 2. Goal of the cruise

This cruise was part of the DAM pilot mission MGF North Sea 2. The objective of this project is to evaluate the potential effects on fish and epibenthic communities in the Natura2000 areas (German EEZ, North Sea) following the exclusion of bottom trawling since May 2023. Originally, this cruise aimed to implement and further test the monitoring concept for fish and epibenthic communities developed during the first phase of the DAM pilot mission. This concept includes the use of traditional monitoring methods, such as 3-meter and 2-meter beam trawls, to compare the results with (i) baseline data on fish and epibenthos obtained during the first project phase and from monitoring by the Thünen Institute of Sea Fisheries since 2002 in those areas, and (ii) to compare results from protected areas with results from areas where bottom trawling continues. However, due to uncertainties regarding exemptions for scientific trawl deployment, the Thünen Institute of Sea Fisheries, after consultations with the BfN, decided not to deploy beam trawls in the protected areas. Consequently, the cruise program was adjusted, and only stations outside protected areas were sampled using bottom trawls. This adjustment was somewhat counterproductive to the project's goals, as it prevented direct comparison of trawl results from protected areas with those from areas where bottom-contact fishing gear is still permitted. Stations outside the protected areas were fished with 3-meter and 7-meter beam trawl in parallel, to further compare the catchability of both gears. Additionally, important biological data of fish and epibenthic invertebrates were sampled (e.g., length and weight measurements of epibenthic invertebrates, biomass and abundance of fish and epibenthos, age structure of dab and plaice population).

Besides the use of beam trawls also BRUVs were deployed on selected stations (in cooperation with the University of Oldenburg), and water samples were taken for eDNA analysis. This will allow further comparisons of the classical monitoring methods with newly developed non-invasive methods.

## 3. Cruise schedule

The cruise started as scheduled on the 8<sup>th</sup> of May 8, 2024, from Cuxhaven, with station work beginning in the morning of the 9<sup>th</sup> May. The BRUVs and the 7-meter and 3-meter beam trawls were first deployed at the westernmost stations in the Sylt Outer Reef area (Stations 18, 20, 9, 11; Fig. 1). Favorable weather conditions allowed station work to continue in the Sylt Outer Reef and Eastern German Bight, using BRUVs, water samplers, CTD, and beam trawls until the 12<sup>th</sup> May (Stations 27, 33, 34; 32, 35, 42; 6, 14, 22, 25). On the 13<sup>th</sup> May, two remaining stations in the Eastern German Bight (50, 48) were fished using the 3-meter and 7-meter beam trawls. Later that day, the 3-meter beam trawl was deployed in the Amrumbank area, completing all planned six hauls there that same day. The following day, one remaining station in the Sylt Outer Reef area was fished with the 7-meter and 3-meter beam trawls (49). Then, the Amrumbank stations were fished with the 2-meter beam trawl that same day, achieving seven hauls, one of which was invalid. With the final 2-meter beam trawl station on the Amrumbank, all planned trawl stations for the modified cruise program were completed.

On May 15<sup>th</sup>, morning weather conditions permitted an additional BRUV deployment at the Amrumbank station AB05. Station work concluded when the BRUVs were recovered approximately two hours later. Due to increasing winds and an unfavourable weather forecast, no further BRUV stations were conducted, and the cruise ended on May 16<sup>th</sup> in Cuxhaven.

## 4. Preliminary results

### Haul composition

The haul composition of the 7-meter and 3-meter beam trawl was primarily dominated by dab (*Limanda limanda*) and plaice (*Pleuronectes platessa*) among the fish species. Other abundant fish species included dragonet (*Callionymus lyra*), solenette (*Buglossidium luteum*), and scaldfish (*Arnoglossum laterna*). In terms of epibenthic invertebrates, *Asterias rubens*, *Ophiura ophiura*, *Astropecten irregularis*, and *Pagurus bernhardus* were the dominant species. However,

species composition varied across different habitats, particularly for epibenthic invertebrates (Fig. 4 and Fig. 5). For instance, the westernmost stations (<40m bottom depth) were dominated by *Echinocardium cordatum*, which inhabits the muddy habitat found at that location.

## eDNA sampling and BRUV deployments

At 20 stations in the Sylt Outer Reef, water samples were collected alongside the 3-meter and 7-meter beam trawls and the BRUV deployments. Sylphium eDNA dual filter capsules were used for eDNA sampling. The goal was to push 2 liters of sampled seawater directly through the filter using a syringe (200 ml). While this method worked well at some stations, it was not possible to reach the 2-liter volume at others due to clogging. Therefore, for future deployments, pre-filtering is recommended to remove larger particles, such as phytoplankton, fish eggs, and gelatinous particles. The samples will be sequenced and further processed in the coming months, and no eDNA results are available yet.

BRUVs were deployed at eight stations, with three BRUVs at each station. The quality of the BRUV footage varied largely, with one station having zero visibility. Preliminary screening of the BRUV videos revealed mostly flatfish, either dab or plaice, although species-level identification was not possible during this initial analysis and will certainly be challenging in subsequent analyses. Other recorded fish species included whiting, grey gurnard, and one haddock. Epibenthic invertebrates observed were *Asterias rubens*, swimming crabs, and hermit crabs. At one western station (<40m, mud), a Norway lobster (*Nephrops norvegicus*) was recorded, a species not detected by beam trawling.

## 6. Participants

Lisanne Hoch	TI-SF	whole cruise
Felix Bügler	TI-SF	whole cruise
Katja Fiegener	University of Oldenburg	whole cruise
Michael Weinert	TI-SF	whole cruise
Dr. Hermann Neumann	TI-SF	whole cruise
Dr. Holger Haslob (CL)	TI-SF	whole cruise

## 7. Acknowledgements

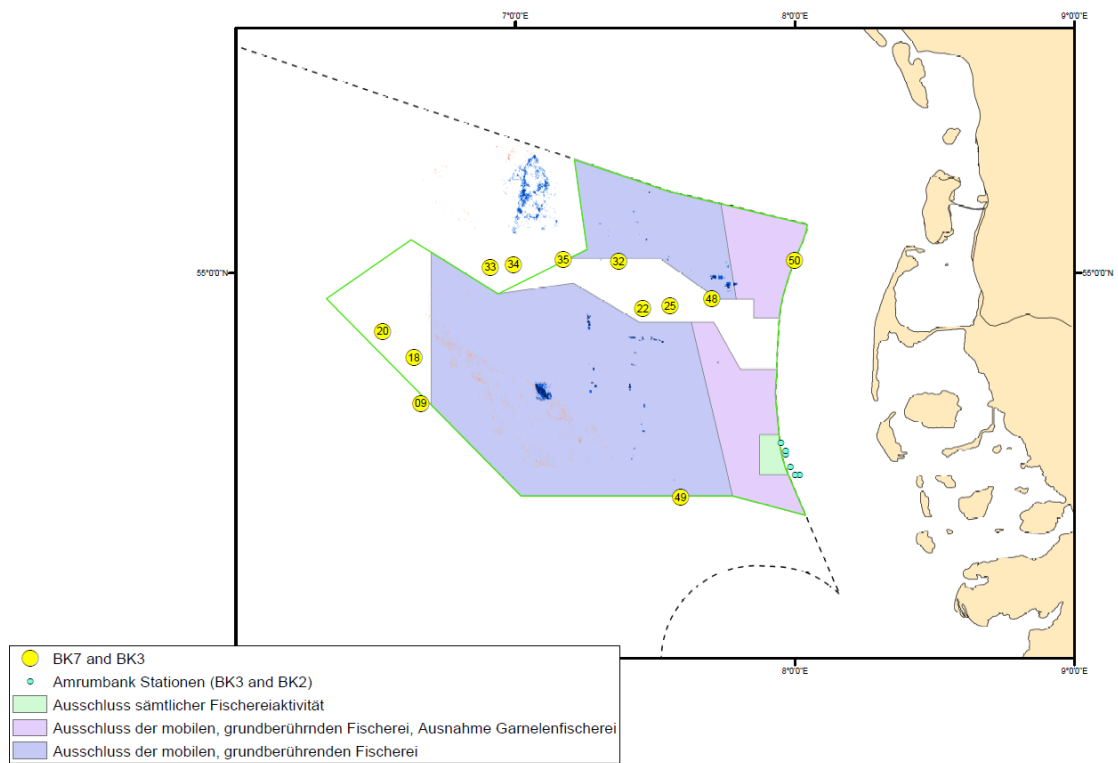
Thanks to Captain Koops and the crew of FFS Solea for their excellent support during the cruise.

Thanks to all cruise participants for their support and willingness to realize the sampling program.

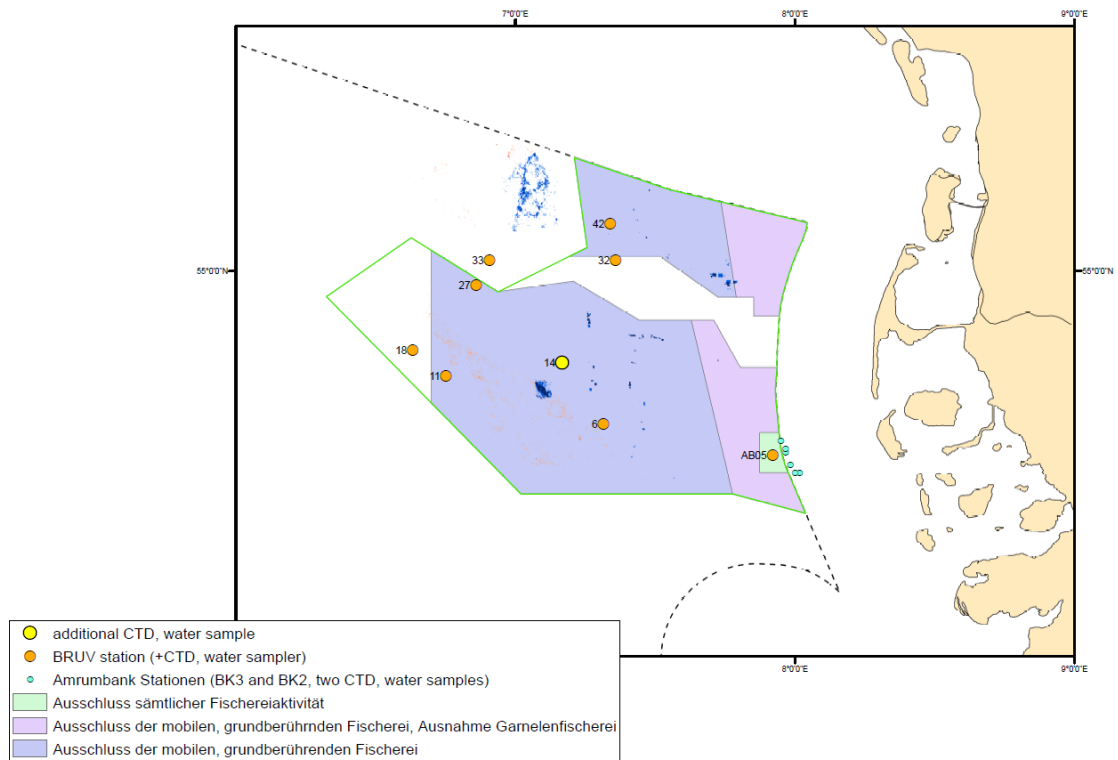
Dr. Holger Haslob



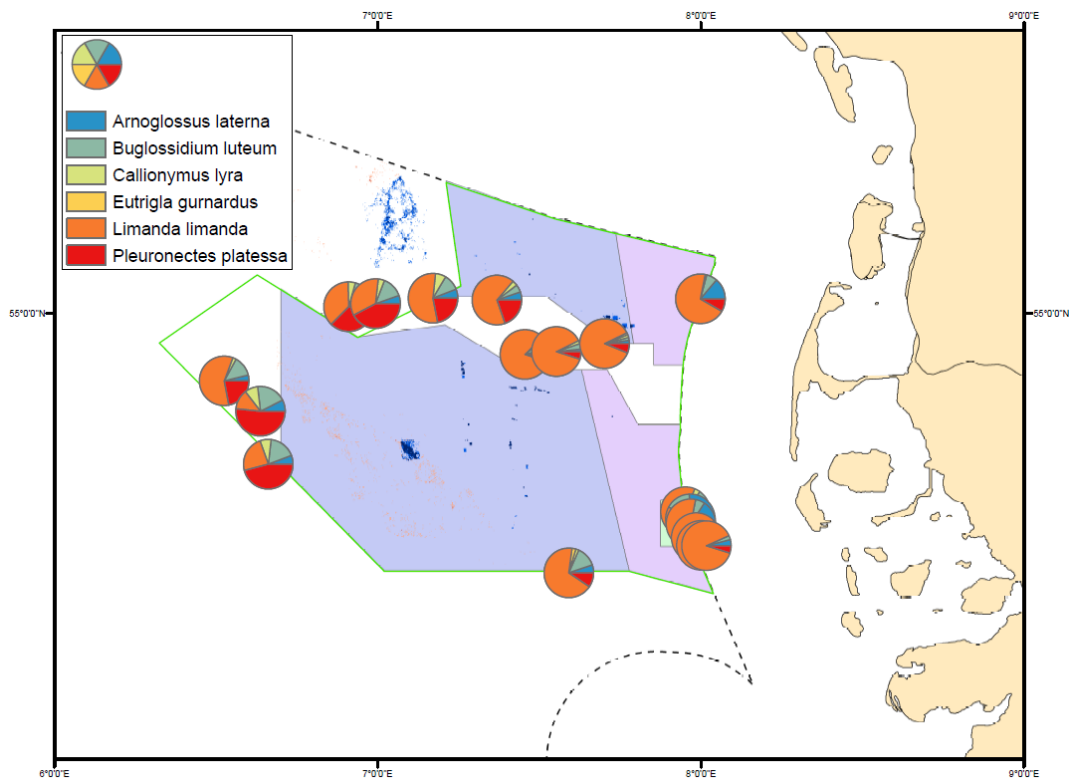
## 8. Figures and tables



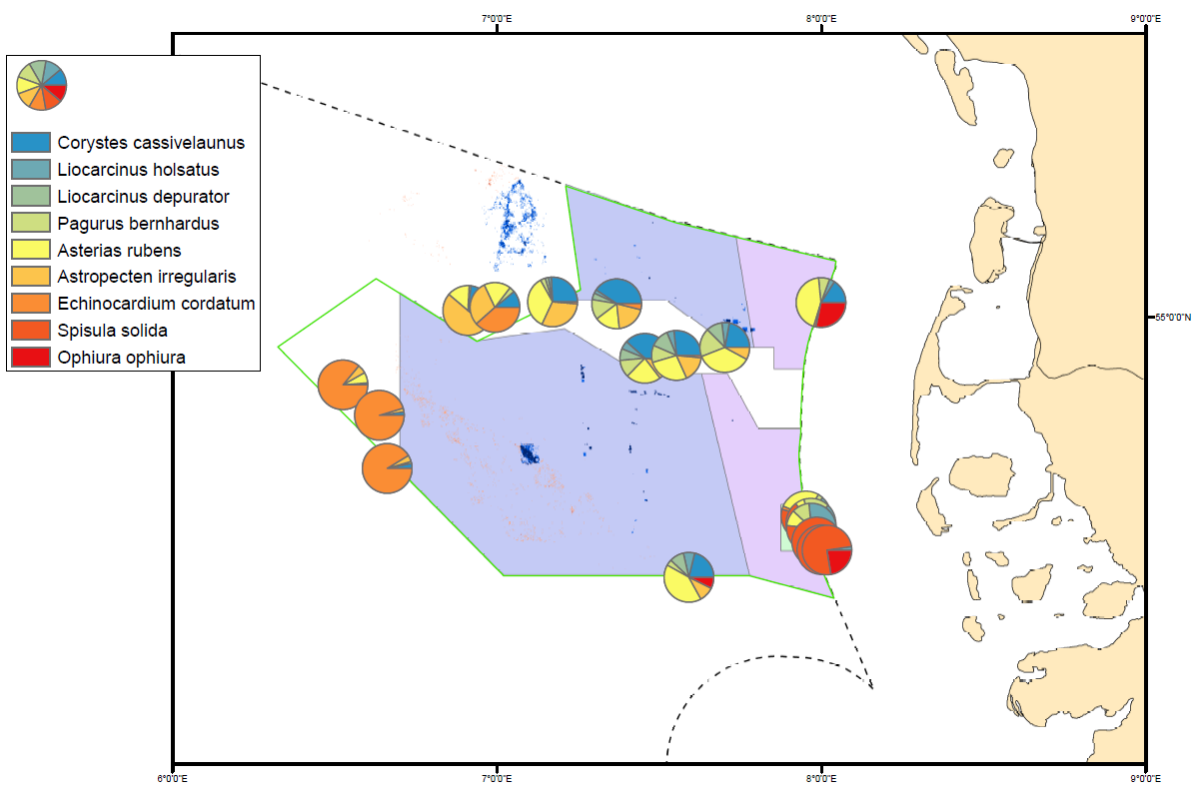
**Fig. 1:** Station overview Sylt Outer Reef, Eastern German Bight and Amrumbank with 7-meter and 3-meter beam trawls (BK7 and BK3).



**Fig. 2:** Station overview Sylt Outer Reef, Eastern German Bight and Amrumbank with BRUV and CTD stations for eDNA sampling.



**Fig. 3:** Distribution of the most abundant fish species obtained by the 7-meter beam trawl (in kg/15min).



**Fig. 4:** Distribution of the most abundant epibenthos species obtained by the 7-meter beam trawl (in kg/15min).



**Fig. 5:** BRUVs. Left image showing a BRUV shortly before deployment. Right image showing an image taken by one of the BRUV GoPro cameras.

**Table 1:** Station overview and gear deployment in the order of execution.

DSHIP Station	StationID	Gear	Time and Date (UTC)	Action	Depth (m)	Speed (kn)	Course (°)	Wind Dir. (°)	Wind Velocity (m/s)	Air Temperature (°C)	Latitude N (dez.)	Longitude E (dez.)
SOL834_1-1	Station 18	BRUV	09.05.2024 05:57	in the water	43	2	182	235	6	11.7	54.837	6.633
SOL834_1-1	Station 18	BRUV	09.05.2024 05:58	on ground	43	2	192	234	6.3	11.7	54.836	6.633
SOL834_1-1	Station 18	BRUV	09.05.2024 10:45	off ground	43	1	128	232	7.8	11.2	54.838	6.635
SOL834_1-1	Station 18	BRUV	09.05.2024 10:46	on deck	44	1	111	235	8.1	11.3	54.837	6.636
SOL834_1-2	Station 18	BRUV	09.05.2024 06:03	in the water	43	3	213	243	5.6	11.7	54.833	6.631
SOL834_1-2	Station 18	BRUV	09.05.2024 06:04	on ground	43	2	213	241	4.9	11.7	54.833	6.630
SOL834_1-2	Station 18	BRUV	09.05.2024 11:05	off ground	44	1	329	239	9.1	11.2	54.833	6.632
SOL834_1-2	Station 18	BRUV	09.05.2024 11:06	on deck	44	0	30	241	8.8	11.3	54.834	6.632
SOL834_1-3	Station 18	BRUV	09.05.2024 06:08	in the water	43	2	205	240	5	11.7	54.831	6.629
SOL834_1-3	Station 18	BRUV	09.05.2024 06:09	on ground	43	2	206	244	5.6	11.8	54.831	6.628
SOL834_1-3	Station 18	BRUV	09.05.2024 11:25	off ground	43	1	271	226	7.9	11.2	54.831	6.629
SOL834_1-3	Station 18	BRUV	09.05.2024 11:25	on deck	43	1	271	226	7.8	11.2	54.831	6.629
SOL834_2-1	Station 20	Seabird	09.05.2024 06:45	in the water	43	1	104	236	6.3	11.5	54.880	6.516
SOL834_2-1	Station 20	Seabird	09.05.2024 06:53	on deck	43	1	91	234	7.1	11.9	54.880	6.520
SOL834_2-2	Station 20	7m+3m Kurre	09.05.2024 07:14	in the water	44	5	128	232	5.9	11.2	54.883	6.517
SOL834_2-2	Station 20	7m+3m Kurre	09.05.2024 07:18	on ground	43	5	125	241	5.9	12.1	54.880	6.525
SOL834_2-2	Station 20	7m+3m Kurre	09.05.2024 07:33	off ground	43	3	129	226	6.6	12.1	54.873	6.540
SOL834_2-2	Station 20	7m+3m Kurre	09.05.2024 07:42	on deck	43	7	133	221	6.4	11.4	54.866	6.555
SOL834_3-2	Station 09	7m+3m Kurre	09.05.2024 08:54	in the water	41	7	125	226	6.9	11	54.734	6.654
SOL834_3-2	Station 09	7m+3m Kurre	09.05.2024 08:58	on ground	41	4	124	220	6.4	11.4	54.731	6.661
SOL834_3-2	Station 09	7m+3m Kurre	09.05.2024 09:13	off ground	41	3	109	214	5.5	11.9	54.725	6.681
SOL834_3-2	Station 09	7m+3m Kurre	09.05.2024 09:17	on deck	41	3	109	220	5.3	12	54.724	6.685
SOL834_3-1	Station 09	Seabird	09.05.2024 09:29	in the water	41	1	103	216	5.9	11.9	54.722	6.696
SOL834_3-1	Station 09	Seabird	09.05.2024 09:33	on deck	41	1	102	218	6	11.8	54.722	6.699
SOL834_4-1	Station 18	Seabird	09.05.2024 11:33	in the water	44	1	123	235	6.9	12.2	54.830	6.634

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SOL834_4-1	Station 18	Seabird	09.05.2024 11:40	on deck	43	1	92	231	6.8	12	54.830	6.636
SOL834_4-2	Station 18	7m+3m Kurre	09.05.2024 11:47	in the water	43	4	155	227	7.3	11.4	54.830	6.632
SOL834_4-2	Station 18	7m+3m Kurre	09.05.2024 11:51	on ground	43	4	138	226	7.4	11.9	54.826	6.637
SOL834_4-2	Station 18	7m+3m Kurre	09.05.2024 12:06	off ground	43	3	123	227	6	12.2	54.818	6.656
SOL834_4-2	Station 18	7m+3m Kurre	09.05.2024 12:10	on deck	43	3	123	221	7	12.4	54.817	6.660
SOL834_5-1	Station 11	Seabird	09.05.2024 13:19	in the water	43	0	101	230	8.1	12.2	54.783	6.750
SOL834_5-1	Station 11	Seabird	09.05.2024 13:25	on deck	43	0	22	234	6.9	12.4	54.784	6.750
SOL834_5-2	Station 11	BRUV	09.05.2024 13:31	in the water	43	2	168	231	7.4	12.1	54.784	6.751
SOL834_5-2	Station 11	BRUV	09.05.2024 13:32	on ground	43	2	165	229	7.4	12.1	54.783	6.751
SOL834_5-2	Station 11	BRUV	10.05.2024 05:25	off ground	42	1	142	293	4.7	10.4	54.784	6.750
SOL834_5-2	Station 11	BRUV	10.05.2024 05:31	on deck	42	0	283	288	4.4	10	54.784	6.749
SOL834_5-3	Station 11	BRUV	09.05.2024 13:36	in the water	42	2	165	236	7.7	12	54.781	6.753
SOL834_5-3	Station 11	BRUV	09.05.2024 13:37	on ground	43	2	165	240	7.2	12	54.780	6.753
SOL834_5-3	Station 11	BRUV	10.05.2024 05:47	on deck	42	1	6	288	4.7	9.7	54.782	6.751
SOL834_5-4	Station 11	BRUV	09.05.2024 13:41	in the water	42	2	166	239	7.2	12.3	54.779	6.753
SOL834_5-4	Station 11	BRUV	09.05.2024 13:41	on ground	43	2	165	243	7.4	12.3	54.778	6.754
SOL834_5-4	Station 11	BRUV	10.05.2024 06:03	on deck	42	1	15	277	4.9	9.8	54.780	6.752
SOL834_6-1	Station 27	BRUV	10.05.2024 07:21	in the water	35	2	18	271	4.4	11	54.970	6.859
SOL834_6-1	Station 27	BRUV	10.05.2024 07:22	on ground	36	2	16	287	5.3	11	54.971	6.859
SOL834_6-1	Station 27	BRUV	10.05.2024 10:13	on deck	35	1	126	315	7.4	12.1	54.969	6.862
SOL834_6-2	Station 27	BRUV	10.05.2024 07:28	in the water	36	2	7	283	5.7	11	54.974	6.860
SOL834_6-2	Station 27	BRUV	10.05.2024 07:29	on ground	36	2	5	285	6	11	54.974	6.860
SOL834_6-2	Station 27	BRUV	10.05.2024 10:29	off ground	36	0	349	310	5.9	12.9	54.973	6.861
SOL834_6-2	Station 27	BRUV	10.05.2024 10:37	off ground	37	2	77	315	5.3	11.6	54.974	6.863
SOL834_6-2	Station 27	BRUV	10.05.2024 10:37	on deck	37	2	79	314	5.3	11.6	54.974	6.863
SOL834_6-3	Station 27	BRUV	10.05.2024 07:32	in the water	36	2	20	275	5.7	11	54.976	6.861
SOL834_6-3	Station 27	BRUV	10.05.2024 07:33	on ground	37	2	21	285	5.8	11.1	54.977	6.861
SOL834_6-3	Station 27	BRUV	10.05.2024 10:52	off ground	37	1	95	312	4.7	11.8	54.975	6.863



DSHIP Station	StationID	Gear	Time and Date (UTC)	Action	Depth (m)	Speed (kn)	Course (°)	Wind Dir. (°)	Wind Velocity (m/s)	Air Temperature (°C)	Latitude N (dez.)	Longitude E (dez.)
SOL834_6-3	Station 27	BRUV	10.05.2024 10:52	on deck	37	1	97	312	4.7	11.8	54.975	6.863
SOL834_6-4	Station 27	Seabird	10.05.2024 07:37	in the water	36	1	96	279	5	11.3	54.977	6.864
SOL834_6-4	Station 27	Seabird	10.05.2024 07:44	on deck	37	1	97	286	4.9	11.5	54.977	6.866
SOL834_7-1	Station 33	Seabird	10.05.2024 08:13	in the water	33	1	123	298	5.8	11.7	55.010	6.905
SOL834_7-1	Station 33	Seabird	10.05.2024 08:20	on deck	33	1	109	296	5.7	11.8	55.009	6.908
SOL834_7-2	Station 33	7m+3m Kurre	10.05.2024 08:27	in the water	33	3	8	307	6.1	11.4	55.008	6.908
SOL834_7-2	Station 33	7m+3m Kurre	10.05.2024 08:31	on ground	33	4	17	308	6.2	11.2	55.012	6.910
SOL834_7-2	Station 33	7m+3m Kurre	10.05.2024 08:46	off ground	35	3	7	307	5.9	11.2	55.025	6.913
SOL834_7-2	Station 33	7m+3m Kurre	10.05.2024 08:50	on deck	35	3	4	311	5.2	11.2	55.028	6.914
SOL834_8-1	Station 34	Seabird	10.05.2024 11:31	in the water	33	1	150	310	7.1	12.1	55.015	6.989
SOL834_8-1	Station 34	Seabird	10.05.2024 11:38	on deck	33	1	141	313	6.4	12.4	55.013	6.991
SOL834_8-2	Station 34	7m+3m Kurre	10.05.2024 11:43	in the water	33	4	357	310	6.7	11.6	55.014	6.994
SOL834_8-2	Station 34	7m+3m Kurre	10.05.2024 11:46	on ground	33	4	353	322	6	11.6	55.017	6.993
SOL834_8-2	Station 34	7m+3m Kurre	10.05.2024 12:01	off ground	34	3	345	328	4.9	11.6	55.031	6.988
SOL834_8-2	Station 34	7m+3m Kurre	10.05.2024 12:05	on deck	35	3	346	331	5.1	11.4	55.033	6.987
SOL834_9-1	Station 33	BRUV	10.05.2024 12:39	in the water	35	2	223	323	5.9	12	55.023	6.908
SOL834_9-1	Station 33	BRUV	10.05.2024 12:40	on ground	35	2	227	322	6.2	12.1	55.022	6.907
SOL834_9-1	Station 33	BRUV	11.05.2024 06:13	on deck	35	1	252	45	2.9	13.1	55.023	6.906
SOL834_9-2	Station 33	BRUV	10.05.2024 12:49	in the water	35	3	72	357	4.7	11.6	55.021	6.904
SOL834_9-2	Station 33	BRUV	10.05.2024 12:50	on ground	35	3	73	355	4.1	11.5	55.022	6.905
SOL834_9-2	Station 33	BRUV	11.05.2024 05:52	on deck	34	0	171	42	3.8	11.2	55.021	6.904
SOL834_9-3	Station 33	BRUV	10.05.2024 12:56	in the water	35	2	244	345	4.1	12.2	55.020	6.901
SOL834_9-3	Station 33	BRUV	10.05.2024 12:57	on ground	35	2	243	338	4.5	12.2	55.020	6.900
SOL834_9-3	Station 33	BRUV	11.05.2024 05:34	off ground	34	0	140	32	2.6	10.9	55.020	6.901
SOL834_9-3	Station 33	BRUV	11.05.2024 05:35	on deck	34	0	153	32	2.7	11	55.020	6.901
SOL834_10-1	Station 32	BRUV	11.05.2024 08:02	in the water	31	2	311	46	2	11.4	55.022	7.359
SOL834_10-1	Station 32	BRUV	11.05.2024 08:02	on ground	31	2	313	40	2.2	11.3	55.022	7.358
SOL834_10-1	Station 32	BRUV	11.05.2024 10:39	off ground	31	1	149	348	2.3	12	55.022	7.361

DSHIP Station	StationID	Gear	Time and Date (UTC)	Action	Depth (m)	Speed (kn)	Course (°)	Wind Dir. (°)	Wind Velocity (m/s)	Air Temperature (°C)	Latitude N (dez.)	Longitude E (dez.)
SOL834_10-1	Station 32	BRUV	11.05.2024 10:39	on deck	32	1	145	343	2.2	12	55.022	7.361
SOL834_10-2	Station 32	BRUV	11.05.2024 08:06	in the water	31	2	313	62	2.6	12.2	55.024	7.356
SOL834_10-2	Station 32	BRUV	11.05.2024 08:06	on ground	31	2	315	64	2.2	12.3	55.024	7.355
SOL834_10-2	Station 32	BRUV	11.05.2024 10:53	off ground	32	1	82	359	1.6	13.2	55.024	7.357
SOL834_10-2	Station 32	BRUV	11.05.2024 10:54	on deck	33	1	86	353	1.5	13.1	55.024	7.358
SOL834_10-3	Station 32	BRUV	11.05.2024 08:10	in the water	31	2	313	50	2.4	12.5	55.026	7.353
SOL834_10-3	Station 32	BRUV	11.05.2024 08:10	on ground	31	2	315	63	2.3	12.6	55.026	7.352
SOL834_10-3	Station 32	BRUV	11.05.2024 11:05	off ground	32	1	38	6	1.7	13.1	55.025	7.354
SOL834_10-3	Station 32	BRUV	11.05.2024 11:05	on deck	32	1	37	6	1.7	13.1	55.025	7.354
SOL834_10-4	Station 32	Seabird	11.05.2024 08:13	in the water	31	1	327	58	2	12.7	55.027	7.351
SOL834_10-4	Station 32	Seabird	11.05.2024 08:22	on deck	31	1	356	50	2	11.9	55.027	7.351
SOL834_11-1	Station 35	Seabird	11.05.2024 08:56	in the water	33	1	148	55	1.5	12	55.026	7.175
SOL834_11-1	Station 35	Seabird	11.05.2024 09:04	on deck	34	1	110	36	1.7	11.6	55.025	7.178
SOL834_11-2	Station 35	7m+3m Kurre	11.05.2024 09:11	in the water	34	5	285	23	1.1	12.5	55.026	7.176
SOL834_11-2	Station 35	7m+3m Kurre	11.05.2024 09:15	on ground	34	4	286	24	1.3	12.3	55.027	7.171
SOL834_11-2	Station 35	7m+3m Kurre	11.05.2024 09:30	off ground	34	3	294	359	0.8	13.1	55.032	7.150
SOL834_11-2	Station 35	7m+3m Kurre	11.05.2024 09:35	on deck	34	4	292	85	0.6	13	55.033	7.143
SOL834_12-1	Station 32	Seabird	11.05.2024 11:13	in the water	32	1	118	27	1.5	12.9	55.025	7.357
SOL834_12-1	Station 32	Seabird	11.05.2024 11:18	on deck	32	1	133	34	1.5	13.4	55.024	7.359
SOL834_12-2	Station 32	7m+3m Kurre	11.05.2024 11:22	in the water	32	4	101	7	1.7	12.3	55.025	7.362
SOL834_12-2	Station 32	7m+3m Kurre	11.05.2024 11:25	on ground	31	4	109	21	2.3	12.1	55.024	7.369
SOL834_12-2	Station 32	7m+3m Kurre	11.05.2024 11:40	off ground	31	3	109	341	1.6	11.9	55.020	7.390
SOL834_12-2	Station 32	7m+3m Kurre	11.05.2024 11:43	on deck	31	3	114	350	2	11.9	55.019	7.394
SOL834_13-1	Station 42	BRUV	11.05.2024 12:26	in the water	26	2	326	353	2.8	13.6	55.096	7.339
SOL834_13-1	Station 42	BRUV	11.05.2024 12:27	on ground	27	2	325	5	3.2	13.6	55.096	7.339
SOL834_13-1	Station 42	BRUV	11.05.2024 14:21	off ground	26	1	268	359	3.1	13.7	55.096	7.339
SOL834_13-1	Station 42	BRUV	11.05.2024 14:21	on deck	26	1	277	358	2.8	14.2	55.096	7.339
SOL834_13-2	Station 42	BRUV	11.05.2024 12:30	in the water	27	2	326	8	3.1	13.7	55.098	7.337

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SOL834_13-2	Station 42	BRUV	11.05.2024 12:30	on ground	27	2	328	1	3.3	13.7	55.098	7.336
SOL834_13-2	Station 42	BRUV	11.05.2024 14:34	off ground	26	1	197	10	3.3	13.6	55.097	7.337
SOL834_13-2	Station 42	BRUV	11.05.2024 14:35	on deck	26	1	199	9	3.1	13.9	55.097	7.336
SOL834_13-3	Station 42	BRUV	11.05.2024 12:33	in the water	26	2	327	359	2.9	13.9	55.100	7.335
SOL834_13-3	Station 42	BRUV	11.05.2024 12:34	on ground	27	2	328	345	2.3	13.8	55.100	7.334
SOL834_13-3	Station 42	BRUV	11.05.2024 14:50	off ground	26	1	107	1	4.1	13	55.099	7.335
SOL834_13-3	Station 42	BRUV	11.05.2024 14:51	on deck	26	1	101	359	4.5	12.9	55.099	7.335
SOL834_13-4	Station 42	Seabird	11.05.2024 12:37	in the water	27	1	32	355	2.8	13.3	55.102	7.332
SOL834_13-4	Station 42	Seabird	11.05.2024 12:45	on deck	27	0	129	20	3.2	12.5	55.102	7.334
SOL834_14-1	Station 6	BRUV	12.05.2024 05:30	in the water	24	1	132	104	8.7	12.9	54.684	7.314
SOL834_14-1	Station 6	BRUV	12.05.2024 05:31	on ground	24	1	125	106	8.8	12.9	54.684	7.315
SOL834_14-1	Station 6	BRUV	12.05.2024 07:29	off ground	24	1	221	107	11.1	10.5	54.684	7.313
SOL834_14-1	Station 6	BRUV	12.05.2024 07:30	on deck	24	1	241	105	12.6	10.6	54.683	7.313
SOL834_14-2	Station 6	BRUV	12.05.2024 05:35	in the water	24	2	118	108	8.5	12.9	54.682	7.318
SOL834_14-2	Station 6	BRUV	12.05.2024 05:35	on ground	24	2	125	106	8.2	12.9	54.682	7.318
SOL834_14-2	Station 6	BRUV	12.05.2024 07:47	off ground	24	1	278	101	9.7	10.9	54.683	7.315
SOL834_14-2	Station 6	BRUV	12.05.2024 07:48	on deck	23	1	283	103	9.8	10.8	54.683	7.315
SOL834_14-3	Station 6	BRUV	12.05.2024 05:41	in the water	25	2	123	108	9.9	12.9	54.681	7.321
SOL834_14-3	Station 6	BRUV	12.05.2024 05:42	on ground	25	2	120	109	9.4	12.9	54.681	7.322
SOL834_14-3	Station 6	BRUV	12.05.2024 08:02	off ground	24	1	280	104	9.8	11.1	54.681	7.320
SOL834_14-3	Station 6	BRUV	12.05.2024 08:03	on deck	24	1	294	102	10.1	11.1	54.681	7.319
SOL834_14-4	Station 6	Seabird	12.05.2024 05:49	in the water	24	2	306	108	9.9	13.2	54.682	7.323
SOL834_14-4	Station 6	Seabird	12.05.2024 05:55	on deck	24	2	296	105	9.4	13.4	54.683	7.319
SOL834_15-1	Station 14	Seabird	12.05.2024 09:00	in the water	25	0	268	105	8.8	12.8	54.810	7.169
SOL834_15-1	Station 14	Seabird	12.05.2024 09:07	on deck	25	1	289	104	9.3	12.5	54.811	7.167
SOL834_16-1	Station 22	Seabird	12.05.2024 10:15	in the water	26	1	45	91	10.8	13	54.921	7.445
SOL834_16-1	Station 22	Seabird	12.05.2024 10:21	on deck	25	0	286	91	7	13.4	54.922	7.445
SOL834_16-2	Station 22	7m+3m Kurre	12.05.2024 10:29	in the water	25	4	46	90	11.2	13.3	54.925	7.451

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SOL834_16-2	Station 22	7m+3m Kurre	12.05.2024 10:32	on ground	25	4	50	96	9.9	13.3	54.927	7.455
SOL834_16-2	Station 22	7m+3m Kurre	12.05.2024 10:47	off ground	25	3	37	94	9.6	13.4	54.937	7.469
SOL834_16-2	Station 22	7m+3m Kurre	12.05.2024 10:49	on deck	25	2	25	93	8.6	13.8	54.939	7.470
SOL834_17-1	Station 25	Seabird	12.05.2024 11:56	in the water	24	0	345	89	6.3	15.1	54.935	7.558
SOL834_17-1	Station 25	Seabird	12.05.2024 12:04	on deck	24	0	354	90	6.6	14.9	54.936	7.558
SOL834_17-2	Station 25	7m+3m Kurre	12.05.2024 12:08	in the water	24	5	229	90	6	14.1	54.934	7.556
SOL834_17-2	Station 25	7m+3m Kurre	12.05.2024 12:10	on ground	24	3	229	92	7.3	14.1	54.932	7.553
SOL834_17-2	Station 25	7m+3m Kurre	12.05.2024 12:25	off ground	24	3	234	91	7	14.1	54.924	7.535
SOL834_17-2	Station 25	7m+3m Kurre	12.05.2024 12:28	on deck	24	3	241	92	7.5	14.1	54.924	7.533
SOL834_18-1	Station 50	Seabird	13.05.2024 05:23	in the water	18	1	341	112	10.3	12.6	55.024	7.999
SOL834_18-1	Station 50	Seabird	13.05.2024 05:29	on deck	18	1	330	116	10.5	13.1	55.026	7.997
SOL834_18-2	Station 50	7m+3m Kurre	13.05.2024 05:39	in the water	18	4	191	115	11	12.7	55.027	7.999
SOL834_18-2	Station 50	7m+3m Kurre	13.05.2024 05:41	on ground	18	3	189	118	11.2	12.7	55.026	7.998
SOL834_18-2	Station 50	7m+3m Kurre	13.05.2024 05:56	off ground	18	3	191	109	11.3	12.7	55.013	7.995
SOL834_18-2	Station 50	7m+3m Kurre	13.05.2024 05:58	on deck	18	3	197	111	11.2	12.7	55.012	7.994
SOL834_19-1	Station 48	7m+3m Kurre	13.05.2024 07:21	in the water	22	3	88	110	10.8	13.3	54.946	7.698
SOL834_19-1	Station 48	7m+3m Kurre	13.05.2024 07:23	on ground	22	4	80	112	10.3	13.6	54.946	7.702
SOL834_19-1	Station 48	7m+3m Kurre	13.05.2024 07:39	off ground	22	3	82	111	10.6	13.9	54.949	7.727
SOL834_19-1	Station 48	7m+3m Kurre	13.05.2024 07:41	on deck	21	3	69	110	9.2	13.9	54.949	7.729
SOL834_19-2	Station 48	Seabird	13.05.2024 07:51	in the water	22	1	277	109	10.1	13.9	54.951	7.731
SOL834_19-2	Station 48	Seabird	13.05.2024 07:58	on deck	22	1	306	108	10.9	13.9	54.952	7.728
SOL834_20-1	AB 11	3m Kurre	13.05.2024 10:01	in the water	13	5	174	106	11.6	15.8	54.649	7.951
SOL834_20-1	AB 11	3m Kurre	13.05.2024 10:03	on ground	13	5	162	109	11.5	15.7	54.646	7.952
SOL834_20-1	AB 11	3m Kurre	13.05.2024 10:18	off ground	14	3	165	106	10.3	15.6	54.633	7.956
SOL834_20-1	AB 11	3m Kurre	13.05.2024 10:22	on deck	13	4	161	106	10.4	15.6	54.630	7.958
SOL834_21-1	AB 18	3m Kurre	13.05.2024 11:09	in the water	14	4	235	112	8.2	16.1	54.635	7.968
SOL834_21-1	AB 18	3m Kurre	13.05.2024 11:10	on ground	13	4	195	107	7.7	15.7	54.633	7.967
SOL834_21-1	AB 18	3m Kurre	13.05.2024 11:25	off ground	13	3	129	109	7.6	15.6	54.621	7.973

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SOL834_21-1	AB 18	3m Kurre	13.05.2024 11:26	on deck	13	3	123	110	7.5	15.7	54.620	7.974
SOL834_23-1	AB 17	3m Kurre	13.05.2024 12:09	in the water	14	4	172	116	8.8	16.1	54.626	7.967
SOL834_23-1	AB 17	3m Kurre	13.05.2024 12:11	on ground	14	4	144	116	8.3	16	54.624	7.969
SOL834_23-1	AB 17	3m Kurre	13.05.2024 12:26	off ground	13	3	104	119	7.4	16.6	54.617	7.987
SOL834_23-1	AB 17	3m Kurre	13.05.2024 12:28	on deck	12	3	98	119	6.8	16.8	54.617	7.989
SOL834_24-1	AB 14	3m Kurre	13.05.2024 13:03	in the water	12	5	170	122	8.3	16.1	54.602	7.984
SOL834_24-1	AB 14	3m Kurre	13.05.2024 13:05	on ground	12	4	161	120	8.2	16.1	54.600	7.985
SOL834_24-1	AB 14	3m Kurre	13.05.2024 13:20	off ground	12	3	98	99	7.1	16.4	54.590	8.001
SOL834_24-1	AB 14	3m Kurre	13.05.2024 13:21	on deck	12	3	86	114	7.6	16.6	54.590	8.002
SOL834_24-2	AB 14	Seabird	13.05.2024 13:25	in the water	12	1	23	115	7	17.3	54.591	8.006
SOL834_24-2	AB 14	Seabird	13.05.2024 13:29	on deck	12	1	38	116	7.3	17.1	54.592	8.006
SOL834_25-1	AB 13	3m Kurre	13.05.2024 13:56	in the water	12	5	211	113	7.6	16.4	54.588	8.002
SOL834_25-1	AB 13	3m Kurre	13.05.2024 13:58	on ground	12	3	195	119	8.2	16.7	54.586	8.001
SOL834_25-1	AB 13	3m Kurre	13.05.2024 14:13	off ground	12	3	182	119	7.7	16.2	54.573	7.999
SOL834_25-1	AB 13	3m Kurre	13.05.2024 14:14	on deck	12	3	174	119	7.7	16.2	54.572	7.999
SOL834_26-1	AB 12	3m Kurre	13.05.2024 14:40	in the water	12	6	174	110	8.9	16.7	54.588	8.016
SOL834_26-1	AB 12	3m Kurre	13.05.2024 14:42	on ground	12	3	174	111	8.7	16.6	54.585	8.017
SOL834_26-1	AB 12	3m Kurre	13.05.2024 14:57	off ground	13	3	169	109	8.8	16.5	54.572	8.020
SOL834_26-1	AB 12	3m Kurre	13.05.2024 14:58	on deck	12	3	171	104	8.4	16.5	54.571	8.021
SOL834_27-1	AB 5	Seabird	14.05.2024 05:26	in the water	14	1	324	110	13.1	14.4	54.617	7.918
SOL834_27-1	AB 5	Seabird	14.05.2024 05:32	on deck	13	2	320	112	11.1	14.6	54.619	7.915
SOL834_28-1	Station 49	Seabird	14.05.2024 06:43	in the water	25	2	333	124	9.9	14.8	54.527	7.610
SOL834_28-1	Station 49	Seabird	14.05.2024 06:51	on deck	25	2	313	117	9.9	15	54.530	7.605
SOL834_28-2	Station 49	7m+3m Kurre	14.05.2024 07:01	in the water	26	4	297	121	11.4	16	54.535	7.596
SOL834_28-2	Station 49	7m+3m Kurre	14.05.2024 07:04	on ground	26	3	305	117	11.3	15	54.536	7.591
SOL834_28-2	Station 49	7m+3m Kurre	14.05.2024 07:19	off ground	27	3	279	114	10.8	14.3	54.540	7.566
SOL834_28-2	Station 49	7m+3m Kurre	14.05.2024 07:22	on deck	27	4	294	115	10.6	14.6	54.541	7.563
SOL834_29-1	AB 11	Seabird	14.05.2024 09:07	in the water	14	1	274	104	12.1	16.1	54.650	7.948

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SOL834_29-1	AB 11	Seabird	14.05.2024 09:12	on deck	13	1	254	104	10.7	16.4	54.650	7.945
SOL834_29-2	AB 11	2m Kurre	14.05.2024 10:03	in the water	13	3	143	108	11.4	16.9	54.649	7.949
SOL834_29-2	AB 11	2m Kurre	14.05.2024 10:05	on ground	13	3	143	110	11.8	17	54.647	7.951
SOL834_29-2	AB 11	2m Kurre	14.05.2024 10:10	off ground	13	2	150	109	11.8	16.9	54.645	7.953
SOL834_29-2	AB 11	2m Kurre	14.05.2024 10:12	on deck	13	2	153	110	11.6	17	54.644	7.954
SOL834_30-1	AB 18	2m Kurre	14.05.2024 10:55	in the water	14	2	143	109	11	17.4	54.634	7.965
SOL834_30-1	AB 18	2m Kurre	14.05.2024 10:58	on ground	13	4	130	107	11.4	17.4	54.632	7.968
SOL834_30-1	AB 18	2m Kurre	14.05.2024 11:13	off ground	12	2	142	108	10.3	17.4	54.625	7.978
SOL834_30-1	AB 18	2m Kurre	14.05.2024 11:16	on deck	12	2	138	111	10.6	17.4	54.624	7.980
SOL834_31-1	AB 17	2m Kurre	14.05.2024 11:43	in the water	14	3	148	105	9.8	17.2	54.624	7.967
SOL834_31-1	AB 17	2m Kurre	14.05.2024 11:45	on ground	14	4	143	103	9.1	17.2	54.622	7.969
SOL834_31-1	AB 17	2m Kurre	14.05.2024 12:00	off ground	13	2	146	105	9.6	17.1	54.614	7.977
SOL834_31-1	AB 17	2m Kurre	14.05.2024 12:01	on deck	13	2	146	105	9.5	17.2	54.614	7.978
SOL834_32-1	AB 14	2m Kurre	14.05.2024 12:37	in the water	12	3	158	103	9.4	17	54.601	7.982
SOL834_32-1	AB 14	2m Kurre	14.05.2024 12:39	on ground	12	4	157	102	9.1	16.9	54.599	7.984
SOL834_32-1	AB 14	2m Kurre	14.05.2024 12:54	off ground	12	2	126	99	8.5	17	54.592	7.992
SOL834_32-1	AB 14	2m Kurre	14.05.2024 12:55	on deck	11	2	111	103	9.2	17.4	54.591	7.993
SOL834_33-1	AB 13	2m Kurre	14.05.2024 13:29	in the water	11	3	176	106	8.4	16.9	54.585	7.999
SOL834_33-1	AB 13	2m Kurre	14.05.2024 13:31	on ground	11	3	168	107	7.5	16.7	54.583	8.000
SOL834_33-1	AB 13	2m Kurre	14.05.2024 13:46	off ground	12	2	135	97	8.9	17	54.577	8.007
SOL834_33-1	AB 13	2m Kurre	14.05.2024 13:48	on deck	12	2	110	107	8	17.2	54.576	8.009
SOL834_34-1	AB 12	2m Kurre	14.05.2024 13:57	in the water	12	4	154	107	8.5	17.5	54.583	8.016
SOL834_34-1	AB 12	2m Kurre	14.05.2024 13:59	on ground	13	3	146	104	9	17.5	54.581	8.018
SOL834_34-1	AB 12	2m Kurre	14.05.2024 14:14	off ground	16	2	132	119	5.7	16.7	54.575	8.028
SOL834_34-1	AB 12	2m Kurre	14.05.2024 14:15	on deck	16	2	119	119	4.3	16.5	54.575	8.028
SOL834_35-1	Station 11	2m Kurre	14.05.2024 14:49	in the water	15	3	169	95	10.5	17.9	54.650	7.950
SOL834_35-1	Station 11	2m Kurre	14.05.2024 14:51	on ground	15	3	146	92	10.4	17.5	54.648	7.951
SOL834_35-1	Station 11	2m Kurre	14.05.2024 15:06	off ground	15	2	122	125	5.5	16.6	54.642	7.962

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SOL834_35-1	Station 11	2m Kurre	14.05.2024 15:07	on deck	15	2	95	123	5.5	16.8	54.642	7.963
SOL834_36-1	AB 05	BRUV	15.05.2024 05:56	in the water	14	2	66	98	11.3	14.8	54.619	7.920
SOL834_36-1	AB 05	BRUV	15.05.2024 05:56	on ground	14	2	61	98	11.1	14.9	54.619	7.920
SOL834_36-1	AB 05	BRUV	15.05.2024 08:07	off ground	14	1	246	85	10.4	15.3	54.618	7.918
SOL834_36-1	AB 05	BRUV	15.05.2024 08:08	on deck	13	1	269	87	11	15.3	54.618	7.917
SOL834_36-2	AB 05	BRUV	15.05.2024 05:59	in the water	13	3	75	99	11.4	15.1	54.619	7.924
SOL834_36-2	AB 05	BRUV	15.05.2024 05:59	on ground	13	4	77	99	10.9	15.1	54.620	7.925
SOL834_36-2	AB 05	BRUV	15.05.2024 08:25	off ground	13	2	214	88	11.3	15.5	54.619	7.922
SOL834_36-2	AB 05	BRUV	15.05.2024 08:26	on deck	13	1	204	93	11.9	15.5	54.618	7.922
SOL834_36-3	AB 05	BRUV	15.05.2024 06:01	in the water	13	2	68	97	11.1	15.1	54.620	7.927
SOL834_36-3	AB 05	BRUV	15.05.2024 06:02	on ground	13	2	53	100	11	15.2	54.620	7.928
SOL834_36-3	AB 05	BRUV	15.05.2024 08:39	off ground	13	1	233	90	10.7	15.7	54.619	7.926
SOL834_36-3	AB 05	BRUV	15.05.2024 08:40	on deck	13	1	241	95	10.8	15.6	54.619	7.926
SOL834_36-4	AB 05	Seabird	15.05.2024 06:07	in the water	13	2	322	101	10.5	15	54.622	7.931
SOL834_36-4	AB 05	Seabird	15.05.2024 06:13	on deck	13	2	315	98	9.6	15	54.624	7.928