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CRUISE REPORT

SYNERGY

RV Arni Fredriksson, Cruise SEA01-021,

18/06/2022 – 25/06/2022, Hafnarfjörður (Iceland) – Hafnarfjörður (Iceland)

James Jeffrey Waggitt (Chief Scientist).

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1 Summary

To investigate mechanistic links between oceanographic processes and seabird foraging decisions, the RV Arni Fredriksson collected simultaneous information on hydrology, prey and guillemot (Brunnichs *Uria lomvia*, common *Uria aalge*) foraging activities from 18 to 25/06/2022 in north-west Iceland. The 5 original transects of 60km length were completed, with each transect being replicated twice. An additional transect of ~ 40km length was performed in Arnarfjordur, because of its importance for Brunnichs Guillemot (Fig. 1). During transects, 2 observers recorded the 2D foraging distribution of all seabirds using European Seabird At-Sea (ESAS) methodology. At the same time, a scientific echosounder (Simrad EK80) operating at 5 frequencies (18, 38, 70, 120, 200 Khz) recorded the 3D distribution of fish and plankton. 22 trawls (plankton, midwater and demersal) were performed in response to fish and plankton detected in the scientific echosounder, providing insights into the species and size composition of these targets. 107 CTDs were performed at intervals along transects to measure 3D gradients in water column temperature, salinity, flourescene and turbidity. In addition to the data collected by SYNERGY, 8 Brunnichs and 6 common guillemots from the breeding colony at Látrabjarg were simultaneously equipped with GPS loggers and/or Time-Depth-Recorders (TDRs) by collaborators from the British Antarctic Survey (BAS).

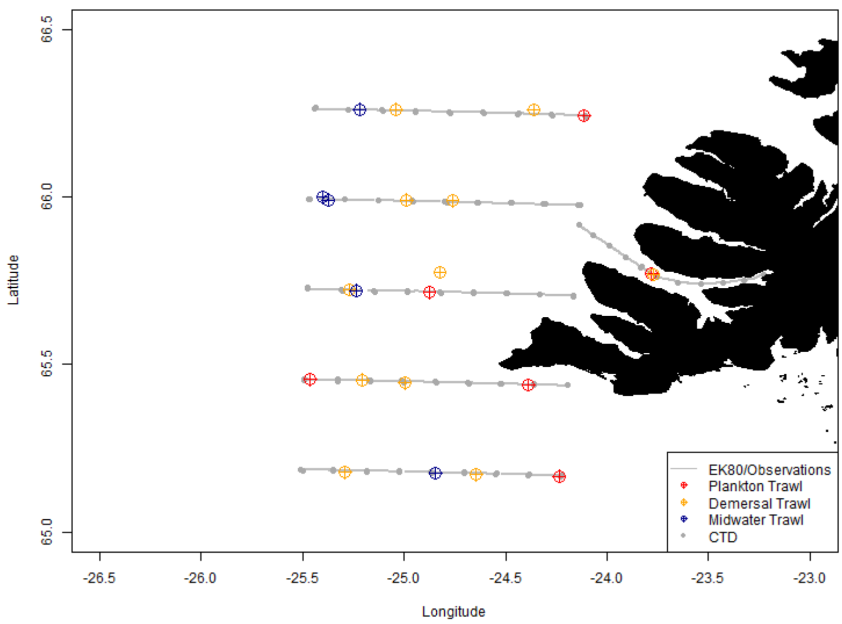

Figure 1: Locations of seabird observations, echsounder measurements, trawls and CTDs on the SYNERGY cruise between 18/06 and 25/06 in NW Iceland. Coordinartes are WGS84.

2 Research Programme/Objectives

The SYNERGY cruise aimed to increase our understanding of mechanistic links between hydrology, prey characteristics and foraging decisions of seabirds. In particular, SYNERGY aimed to better understand which 3D prey characteristics influence foraging seabirds, and how oceanography influences these prey characteristics. For example, SYNERGY is keen to investigate the relative influence of prey exploitability (school density, dimensions, prevelance), quality (size, energetic content) and accessibility (distance from breeding colonies, depth) in foraging decisions, and whether trade-offs occur amongst characteristics. The research vessel and study location is ideal for investigating these questions. Firstly, concurrent/simultaneous information on hydrology, prey and seabirds are needed for these investigations. The RV Arni Fredrikkson is equipped with modern echosounders, several trawls, and CTDs. Second, NW Iceland supports dense populations of Alcidae during summer months, particulary Brunnich guillemot *Uria lomvia* and common guillemot *Uria aalge*. Both Brunnichs and common guillemot are relatively short-ranging and deep-diving seabirds, meaning that foraging decisions are strongly influenced by 3D prey characteristics and hydrology immediately around their breeding colony. Data collected onboard RV Arni Fredrikkson during SYNERGY was complemented by simulatneous GPS Logger/TDR data from the British Antarctic Survey (BAS) to: (1) identify which prey aggregations were targeted by foraging seabirds, (2) propose what combination of prey characteristics (e.g. exploitability, quality, accessibilty) were favoured by animals, and (3) which hydrological properties promoted prey aggregations favoured by seabirds. By investigating the relative importance of energetic costs (prey accessibility) and gains (prey exploitabilty and quality) in foraging decisions, and linking these foraging decisions to hydrology, the project provides insights into animal responses to environmental change.

3 Narrative of the Cruise

The main station coordinates (those in the original cruise plan), additional station coordinates (those added whilst at-sea), and the narrative of activities are provided in tables below.

3.1. Main Station Coordinates

ID	Decimal Degrees		Degrees Decimal Minutes		Degrees Minutes Seconds	
Hafnarfjörður	64.06529	-21.9640	64 3.9174 N	21 57.84 W	64 3 55.044 N	21 57 50.3994 W
1	65.18588	-25.5051	65 11.1529 N	25 30.3049' W	65 11 9.174 N	25 30 18.294 W
2	65.1842	-25.345	65 11.0522 N	25 20.6993' W	65 11 3.132 N	25 20 41.958 W
3	65.18235	-25.1849	65 10.9412 N	25 11.0952 W	65 10 56.472 N	25 11 5.712 W
4	65.18033	-25.0249	65 10.8201 N	25 1.4926 W	65 10 49.206 N	25 1 29.556 W
5	65.17814	-24.8649	65 10.6886 N	24 51.8917 W	65 10 41.316 N	24 51 53.502 W
6	65.17578	-24.7049	65 10.547 N	24 42.2926 W	65 10 32.82 N	24 42 17.556 W
7	65.17325	-24.5449	65 10.3951 N	24 32.6955 W	65 10 23.706 N	24 32 41.73 W
8	65.17055	-24.385	65 10.233 N	24 23.1004 W	65 10 13.98 N	24 23 6.024 W
9	65.16768	-24.2251	65 10.0608 N	24 13.5076 W	65 10 3.648 N	24 13 30.456 W
10	65.43653	-24.1967	65 26.192 N	24 11.8009 W	65 26 11.52 N	24 11 48.054 W
11	65.43944	-24.3582	65 26.3664 N	24 21.4917 W	65 26 21.984 N	24 21 29.502 W
12	65.44218	-24.5197	65 26.5305 N	24 31.1849 W	65 26 31.83 N	24 31 11.094 W
13	65.44474	-24.6813	65 26.6843 N	24 40.8802 W	65 26 41.058 N	24 40 52.812 W
14	65.44713	-24.843	65 26.8277 N	24 50.5775 W	65 26 49.662 N	24 50 34.65 W
15	65.44935	-25.0046	65 26.9607 N	25 0.2768 W	65 26 57.642 N	25 0 16.608 W
16	65.45139	-25.1663	65 27.0834 N	25 9.9777 W	65 27 5.004 N	25 9 58.662 W
17	65.45326	-25.328	65 27.1957 N	25 19.6803 W	65 27 11.742 N	25 19 40.818 W
18	65.45496	-25.4897	65 27.2977 N	25 29.3843 W	65 27 17.862 N	25 29 23.058 W
19	65.72403	-25.474	65 43.4418 N	25 28.4427 W	65 43 26.508 N	25 28 26.562 W
20	65.72231	-25.3106	65 43.3385 N	25 18.6379 W	65 43 20.31 N	25 18 38.274 W
21	65.72041	-25.1472	65 43.2248 N	25 8.8347 W	65 43 13.488 N	25 8 50.082 W
22	65.71834	-24.9839	65 43.1006 N	24 59.0331 W	65 43 6.036 N	24 59 1.986 W
23	65.7161	-24.8206	65 42.9659 N	24 49.2333 W	65 42 57.954 N	24 49 13.998 W
24	65.71368	-24.6573	65 42.8207 N	24 39.4354 W	65 42 49.242 N	24 39 26.124 W
25	65.71108	-24.494	65 42.665 N	24 29.6397 W	65 42 39.9 N	24 29 38.382 W
26	65.70831	-24.3308	65 42.4989 N	24 19.8461 W	65 42 29.934 N	24 19 50.766 W
27	65.70537	-24.1676	65 42.3223 N	24 10.055 W	65 42 19.338 N	24 10 3.3 W
28	65.97419	-24.1378	65 58.4515 N	24 8.2687 W	65 58 27.09 N	24 8 16.122 W
29	65.97717	-24.3027	65 58.6304 N	24 18.1625 W	65 58 37.824 N	24 18 9.75 W
30	65.97998	-24.4676	65 58.7986 N	24 28.0587 W	65 58 47.916 N	24 28 3.522 W
31	65.9826	-24.6326	65 58.9562 N	24 37.9572 W	65 58 57.372 N	24 37 57.432 W

32	65.98505	-24.7976	65 59.1033 N	24 47.8579 W	65 59 6.198 N	24 47 51.474 W
33	65.98733	-24.9627	65 59.2397 N	24 57.7605 W	65 59 14.382 N	24 57 45.63 W
34	65.98942	-25.1278	65 59.3655 N	25 7.6651 W	65 59 21.93 N	25 7 39.906 W
35	65.99134	-25.2929	65 59.4806 N	25 17.5714 W	65 59 28.836 N	25 17 34.284 W
36	65.99309	-25.458	65 59.5852 N	25 27.4792 W	65 59 35.112 N	25 27 28.752 W
37	66.26213	-25.4416	66 15.7279 N	25 26.4931 W	66 15 43.674 N	25 26 29.586 W
38	66.26037	-25.2747	66 15.622 N	25 16.4798 W	66 15 37.32 N	25 16 28.788 W
39	66.25842	-25.1078	66 15.5054 N	25 6.4681 W	66 15 30.324 N	25 6 28.086 W
40	66.2563	-24.941	66 15.378 N	24 56.4582 W	66 15 22.68 N	24 56 27.492 W
41	66.254	-24.7742	66 15.2398 N	24 46.4502 W	66 15 14.388 N	24 46 27.012 W
42	66.25152	-24.6074	66 15.0909 N	24 36.4443 W	66 15 5.454 N	24 36 26.658 W
43	66.24885	-24.4407	66 14.9313 N	24 26.4407 W	66 14 55.878 N	24 26 26.442 W
44	66.24602	-24.274	66 14.7609 N	24 16.4394 W	66 14 45.654 N	24 16 26.364 W
45	66.243	-24.1073	66 14.5798 N	24 6.4407 W	66 14 34.788 N	24 6 26.442 W

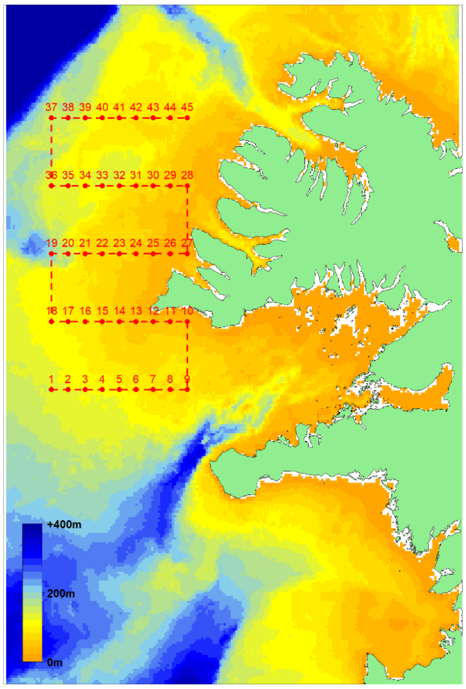

Figure 2: Locations of main stations and transects. Bathymetry is sourced from EMODNet.

3.2. Additional Station Coordinates

ID	Latitude	Longitude
F1	65 55.109 N	24 08.263 W
F2	65 53.142 N	24 03.954 W
F3	65 51.379 N	23 59.196 W
F4	65 49.278 N	23 54.584 W
F5	65 47.567 N	23 49.838 W
F6	65 45.683 N	23 45.089 W
F7	65 44.726 N	23 38.966 W
F8	65 44.418 N	23 32.207 W

F9	65 44.660 N	23 25.751 W
F10	65o 45.134 N	23 19.338 W
F11	65o 46.200 N	23 13.550 W

3.3 Activities

The order of activities during the research cruise is shown below. The 'Y' indicates that a continuous activity (EK80, Observations) was performed, whilst the numbers indicate how many times a discrete activity was performed during this time. For further details of activities, see Section 7. Each of the main stations and transects were performed twice, whilst the additional locations were visited once.

Date	Start	End	Station	Observations	EK80	CTDs	Trawls
18/07/2022	17:00	04:00	Hafnarfjörður to 1	-	Y	-	-
19/07/2022	00:00	04:04	Hafnarfjörður to 1	-	Y	-	-
	04:04	12:05	1 to 9	Y	Y	9	2
	12:05	14:23	9 to 10	-	Y	-	-
	14:23	21:50	10 to 18	Y	Y	9	2
	21:11	04:19	18 to 19	-	Y	-	-
20/07/2022	04:19	12:31	19 to 27	Y	Y	9	2
	12:31	14:31	27 to 28	-	Y	-	-
	14:31	22:06	28 to 36	Y	Y	9	2
	22:06	04:08	36 to 37	-	Y	-	-
21/07/2022	04:08	11:37	37 to 45	Y	Y	9	2
	11:37	14:15	45 to F1	-	Y	-	-
	14:15	20:38	F1 to F11	Y	Y	11	1
	20:38	23:59	F11 to F4	-	Y	4	1
	23:59	04:07	F4 to 45	-	Y	-	-
22/07/2022	04:07	15:26	45 to 37	Y	Y	9	2
	15:26	17:16	37 to 36	-	Y	-	-
	17:16	23:25	36 to 32	Y	Y	5	2
23/07/2022	04:08	06:37	32 to 28	Y	Y	5	-
	06:37	08:22	28 to 27	-	Y	-	-
	08:22	15:54	27 to 19	Y	Y	9	2
	15:54	17:50	19 to 18	-	Y	-	-
	17:50	20:21	18 to 16	Y	Y	3	1
24/07/2022	04:06	09:02	16 to 10	Y	Y	7	1
	09:02	10:46	10 to 9	-	Y	-	-
	10:46	18:40	9 to 1	Y	Y	9	2
	18:40	00:00	1 to Hafnarfjörður	-	Y	-	-
25/07/2022	00:00	07:00	1 to Hafnarfjörður	-	Y	-	-

4 Preliminary Results

Data from observations, the EK80, trawls, CTDs and GPS Loggers/TDRs are currently being processed. A summary is provided below, although this is relatively qualitative at the moment.

4.1 Seabird Observations

A summary of Alcidae seabird sightings, including Brunnichs and common guillemots, during the first main station/transect replicate and the additional locations in Arnarfjordur are shown in Fig. 2-4.

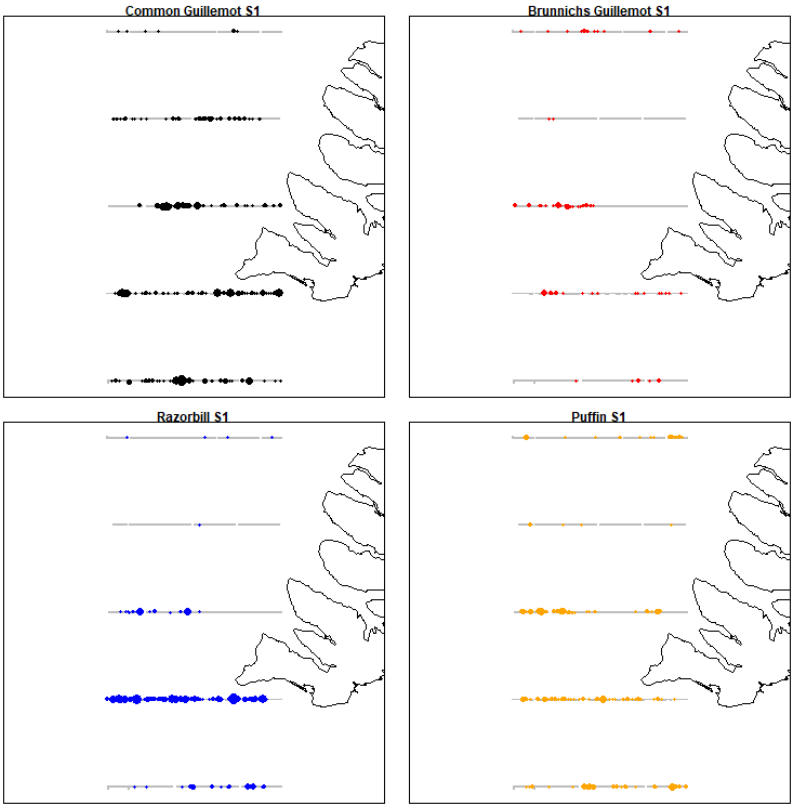

Figure 2: Sightings of Alcidae seabirds likely to be foraging (i.e. sitting on the sea surface) during the 1st station/transect replicate. The size of the circle is representative of the number of animals.

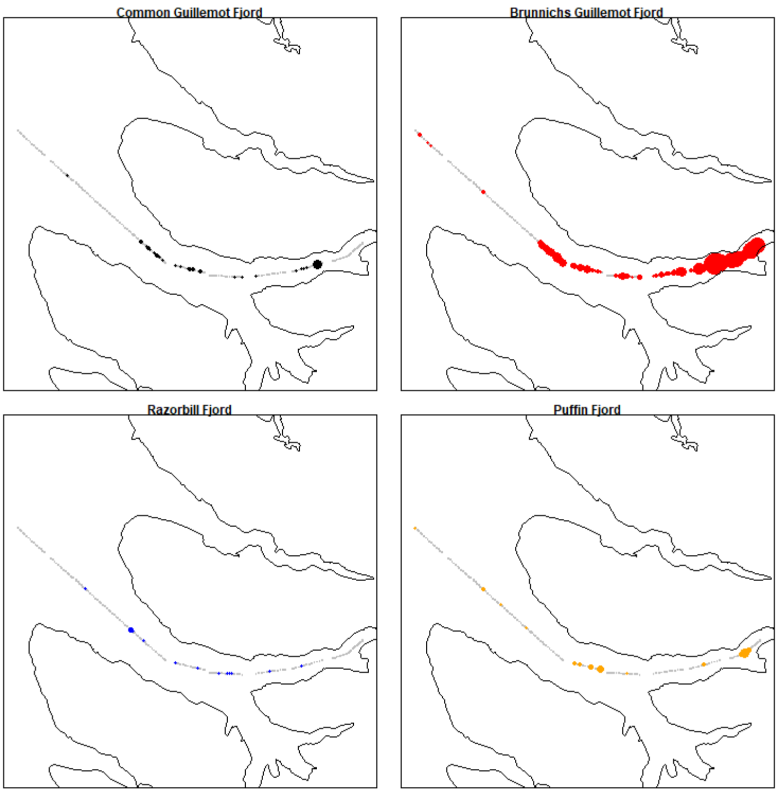

Figure 3: Sightings of Alcidae seabirds likely to be foraging (i.e. sitting on the sea surface) in Arnarfjordur. The size of the circle is representative of the number of animals.

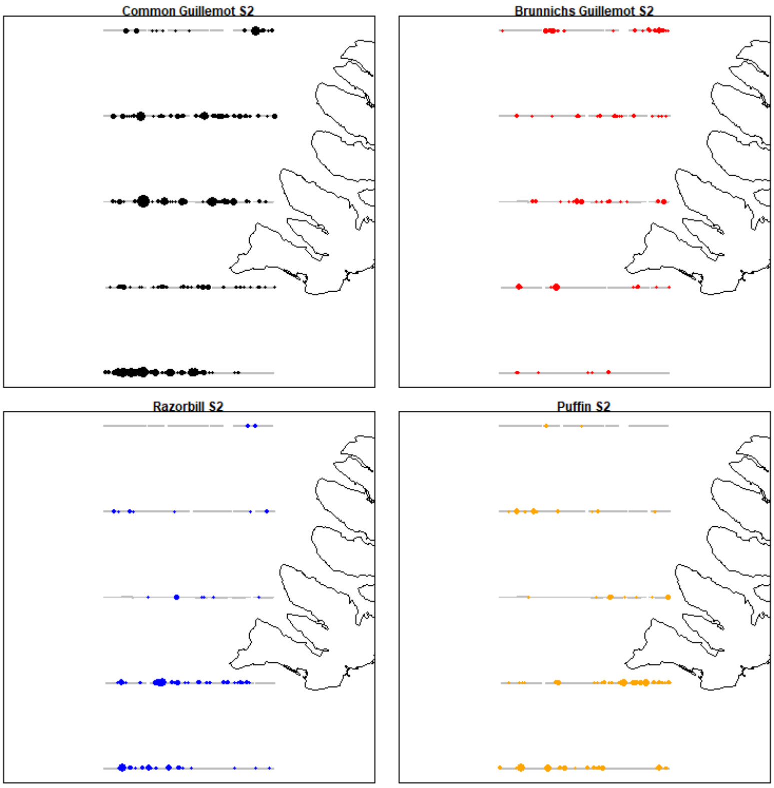

Figure 4: Sightings of Alcidae seabirds likely to be foraging (i.e. sitting on the sea surface) during the 2nd station/transect replicate. The size of the circle is representative of the number of animals.

4.2 Echosounder / Trawling

Examples of EK80 data is shown in Figure 5-8. The echosounder detected layers, scattered schools and dense schools. Trawling found that scattered schools near the seabed were often mixed aggregations of *gadidae* and redfish. Amogst these aggregations were medium sized (<30cm) Norway Pout *Trisopterus esmarkii*, the smallest of which may be taken by guillemots. Dense schools in the water column were likely large sized (+30cm) herring *Clupea harengus* and mackerel *Scomber scombrus*, which are not taken by guillemot. Layers were dominated by larval fish (*gadidae*, flatfish, capelin *Mallotus villosus*) in most cases, although krill *Euphausiacea* dominated in Arnarfjordur. The latter represents prey of guillemot. It is possible however, that larval fish and zooplakton are taken by guillemot when self-provisioning. Sandeel *Ammodytidae* are believed to be a main prey of guillemot in the region, although these were only captured in good numbers once, and were not associated with an acoustic signature in the EK80 data. Similary, few herring and capelin of consumable size were captured. However, as they exploit zooplankton and larval fish, the layers may be a good good proxy for the presence of these species. Analyses will concentrate on identifying relationships between acoustic signatures in the EK80 data and associated trawl samples, befoore using these relationships to quantify the 3D distribution of different prey across transects.

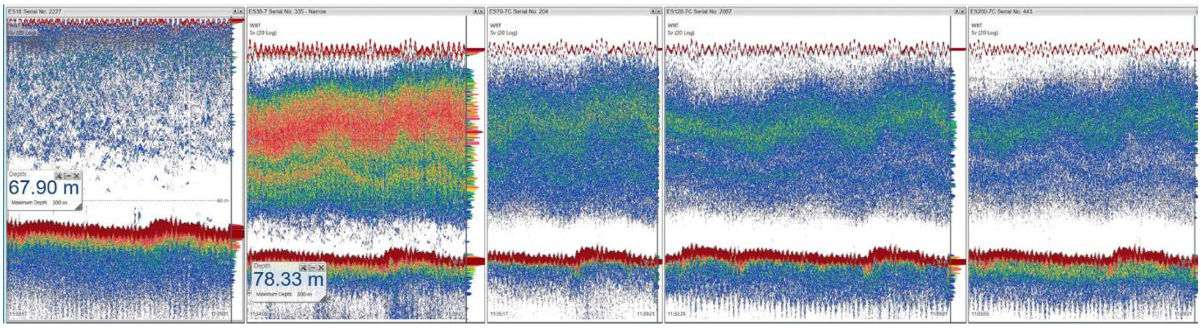

Figure 5: Example of expansive layer detected in the echosounder, showing strongest backscatter in the 38Khz frequency. Associated plankton trawls captured larval gadids, flatfish and capelin.

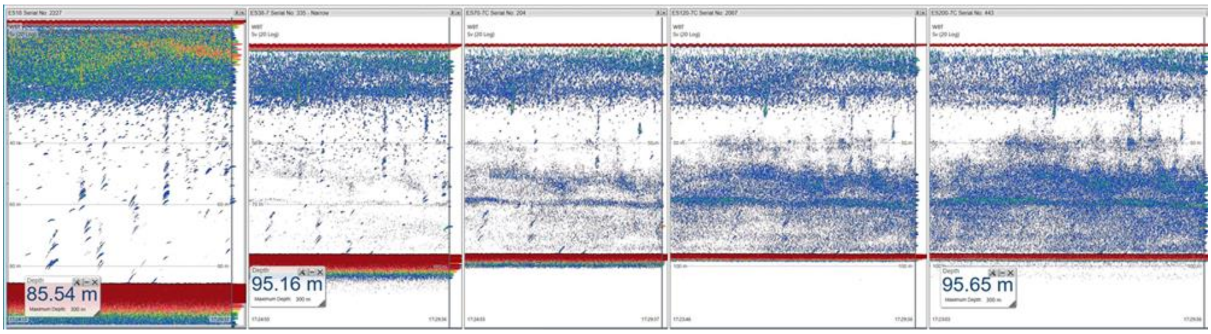

Figure 6: Example of a deep layer detected in the echosounder, showing strongest backscatter in the 200Khz frequency. Associated plankton trawls captured krill.

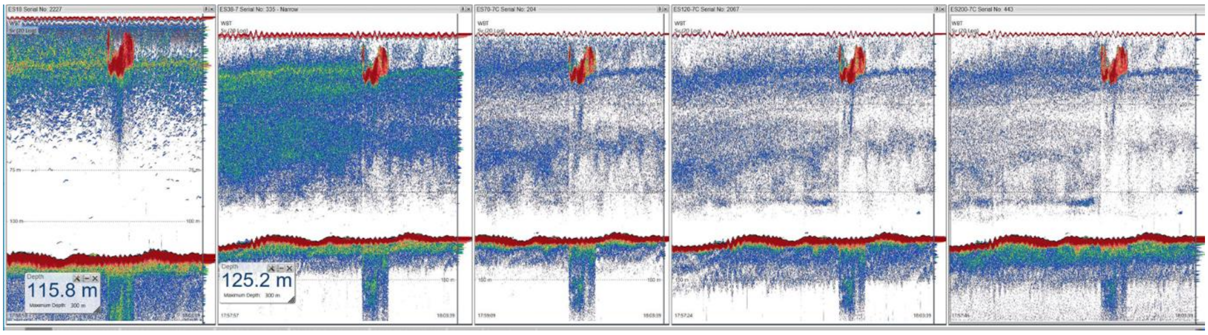

Figure 7: Example of dense midwater schools in the echosounder, showing strong backscatter across all frequencies. Associated midwater trawls captured large (>30cm) herring and mackerel.

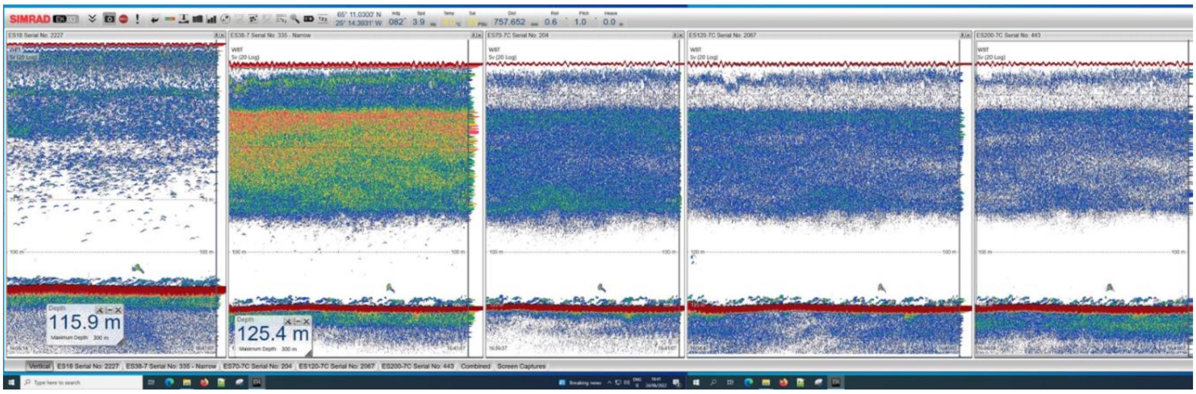

Figure 8: Example of scattered demersal schools in the echosounder, showing moderate backscatter across all frequencies. Associated midwater trawls captured small to medium (<30cm) Norway Pout.

4.3 CTD

CTD data is summarised in Fig 9-11. The water was largely stratified, with decreases in temperature in northern transects. Flourescene, an indicator of primary productivity, was strongest in the southern and northernmost transects, and subtle differences were seen between station replicates.

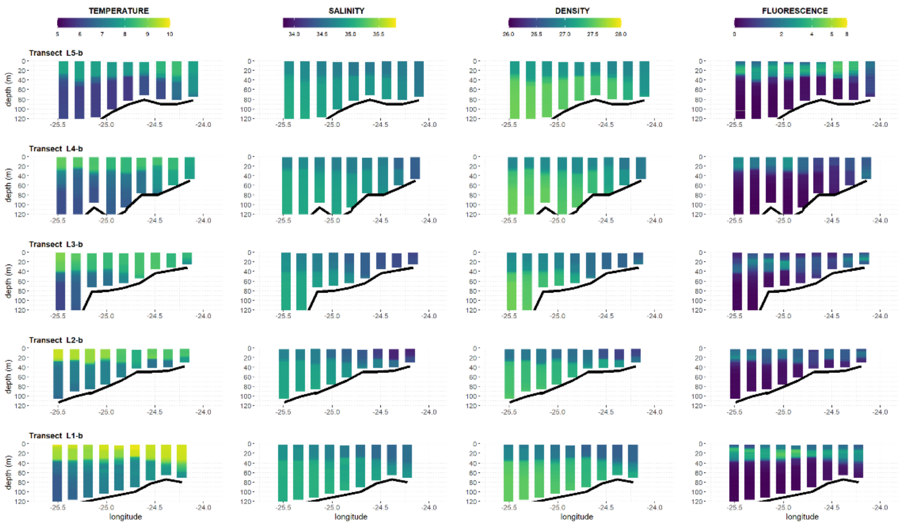

Figure 9: CTD casts in the first replicate. Transects are displayed from north to south.

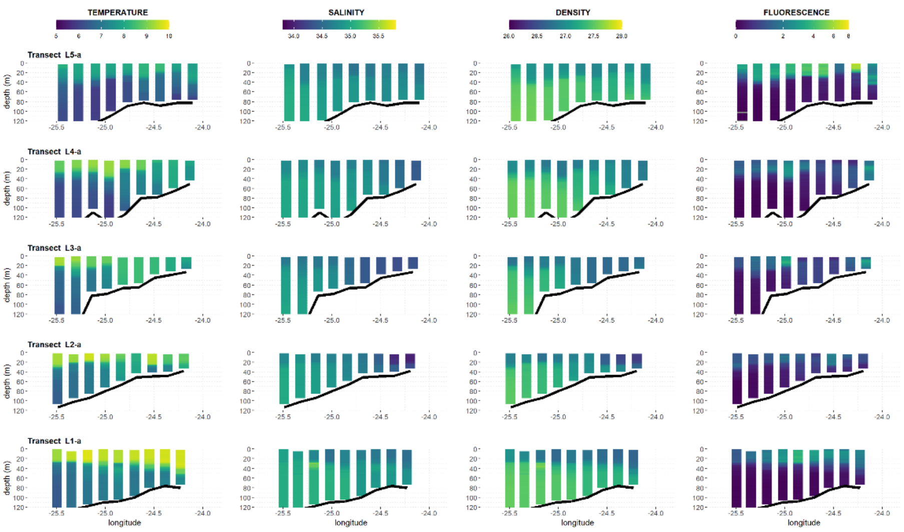

Figure 10: CTD casts in the second replicate. Transects are displayed from north to south.

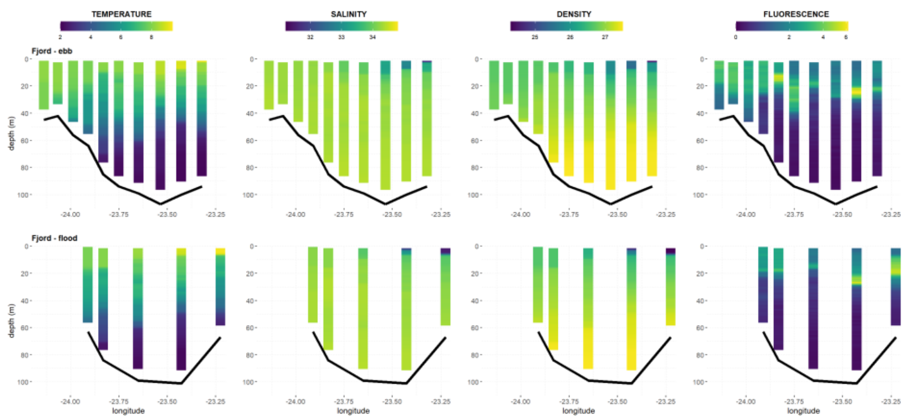

Figure 11: CTD casts at the additional stations in Arnarfjordur . 10 stations were sampled during the flood tide, and 4 stations were sampled in both ebb and flood tides.

4.4 GPS Loggers / TDR

8 Brunnich and 6 common guillemots were succesfully equipped with GPS loggers / Time-Depth Recorders (TDR) at the breeding colony of Látrabjarg, adjacent to the study area. Figure 10 summarizes the foraging trips recorded from these animals, overlaid with seabird observation/echosounder transects. Some animals made long foraging trips beyond the study area, although most remained within or alongside this region. In particular, Brunnich guillemots foraged extensively in Arnarfjordur, and several common guillemots fed alongside the colony.

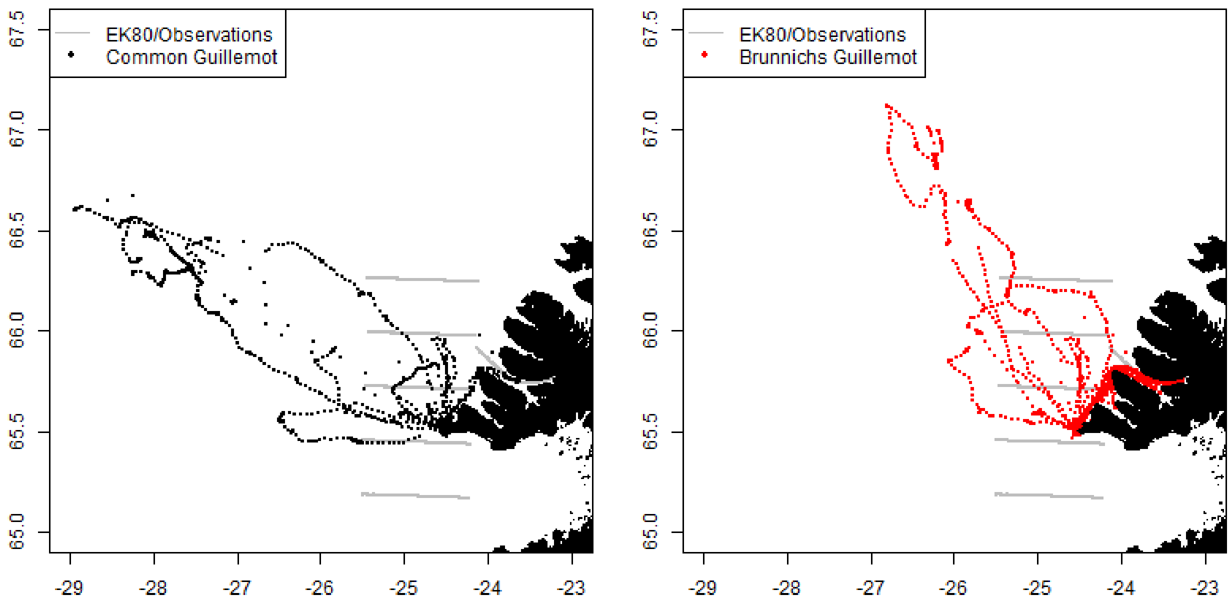

Figure 10: Foraging movements of 8 Brunnichs and 6 common guillemots equipped with GPS Loggers and/or TDR at Látrabjarg. Also shown are the seabird observation and EK80 transect.

5 Data and Sample Storage / Availability

A summary of data is provided in the table below. All data is currently stored and backed-up across local drives, but additional storage will be sought when processing has been completed.

Activity	File Type	Approx Size	Avaliability
Coordinates / Ship Log	.000	<1MB	Open
Seabird Observations	.XLSX	<1MB	Open
Trawls	.XLSX	<1MB	Open
EK80	.raw	1TB	Open
CTD	.bl .hdr, .hex, .nav, .xmlcom	30MB	Open

6 Participants

No.	Name	Early career	Gender	Affiliation	On-board tasks
1	James Waggitt	Y	M	Bangor University	Chief Scientist, Seabird Observations.
2	Jan Hiddink	N	M	Bangor University	Trawling, Assist Seabird Observations.
3	Shaun Fraser	Y	M	UHI Shetland	Echosounder, Trawling.
4	Samantha Cox	Y	F	University College Cork	CTD.
5	Lilian Lieber	Y	F	Queens University Belfast	Echosounder, Trawling.
6	Stef Krafft (MRes Student)	Y	F	Bangor University	Trawling, Seabird Observations,
7	Bregan Brown (MSci alumi)	Y	M	Bangor University	Seabird Observations.
8	Claire Szostek	Y	F	Exeter University	Trawling, Assist Seabird Observations.
9	Charlotte Colvin (PhD Student)	Y	F	Bangor University	Trawling, Assist Seabird Observations.
10	Francesca Fehlberg (BSc Student)	Y	F	Bangor University	Trawling, Assist Seabird Observations.
11	Thea Moule (MRes Student)	Y	F	Bangor University	Trawling, Assist Seabird Observations.

All SYNERGY cruise participants were completely funded by EUROFLEETS+. GPS Logger and TDR data was collected by Norman Ratcliffe (BAS, UK), Yann Kolbeinsson and Þorkell Lindberg Þórarinsson (NNA, Iceland) using external funding.

7 Station List

Seabird observations and EK80 measurements occurred continuously along transects. Activities which involved discrete sampling locations and times (CTDS, Trawls) are listed in the tables below.

7.1. Trawling

Station	Date	Start	End	Length	Trawl	Longitude	Latitude
5	19/06/2022	07:31	07:52	00:21	Midwater	-24.8453	65.17602
8-9	19/06/2022	11:34	12:05	00:31	Plankton	-24.2356	65.16694
15-16	19/06/2022	18:22	18:45	00:23	Demersal	-24.9981	65.44576
17-18	19/06/2022	21:28	21:50	00:22	Plankton	-25.4622	65.45506
20-21	20/06/2022	05:56	06:17	00:21	Midwater	-25.2369	65.72097
23	20/06/2022	09:13	09:37	00:24	Demersal	-24.8236	65.77542
32	20/06/2022	17:13	17:34	00:21	Demersal	-24.7609	65.98882
35-36	20/06/2022	20:32	21:19	00:47	Midwater	-25.375	65.99091
38-39	21/06/2022	05:32	05:54	00:22	Midwater	-25.2194	66.26087
45	21/06/2022	11:26	11:37	00:11	Plankton	-24.113	66.24302
F5-F6	21/06/2022	17:23	17:43	00:20	Plankton	-23.78	65.77092
F6	21/06/2022	22:50	23:05	00:15	Demersal	-23.7713	65.76826
43	22/06/2022	09:44	10:00	00:16	Demersal	-24.3629	66.26028
39-40	22/06/2022	13:14	13:29	00:15	Demersal	-25.0391	66.26114

36-35	22/06/2022	18:02	18:25	00:23	Midwater	-25.4015	65.999
34-33	22/06/2022	21:40	21:58	00:18	Demersal	-24.9872	65.99054
23	23/06/2022	11:30	11:50	00:20	Plankton	-24.8748	65.71487
21-20	23/06/2022	14:07	14:22	00:15	Demersal	-25.2687	65.72327
17-16	23/06/2022	19:34	19:44	00:10	Demersal	-25.2061	65.45414
11	24/06/2022	07:47	08:08	00:21	Plankton	-24.3874	65.43952
7-6	24/06/2022	12:50	13:05	00:15	Demersal	-24.6454	65.17123
2-1	24/06/2022	16:21	16:44	00:23	Demersal	-25.2919	65.17831

7.2. CTDs

Station No.	Date	Time	Latitude	Longitude	Depth (m)
1	19/06/2022	04:04	65 11.080 N	25 29.934 W	136
2	19/06/2022	04:45	65 10.939 N	25 21.036 W	125
3	19/06/2022	05:34	65 10.808 N	25 11.134 W	118
4	19/06/2022	06:18	65 10.678 N	25 01.394 W	110
5	19/06/2022	08:32	65 10.631 N	24 51.949 W	108
6	19/06/2022	09:12	65 10.548 N	24 42.056 W	100
7	19/06/2022	09:51	65 10.336 N	24 32.858 W	85
8	19/06/2022	10:29	65 10.181 N	24 23.281 W	76
9	19/06/2022	11:07	65 10.018 N	24 13.681 W	80
10	19/06/2022	14:23	65 26.298 N	24 11.698 W	38
11	19/06/2022	15:01	65 26.290 N	24 21.479 W	48
12	19/06/2022	15:41	65 26.477 N	24 31.142 W	49
13	19/06/2022	16:22	65 26.616 N	24 40.992 W	51
14	19/06/2022	17:03	65 26.744 N	24 50.591 W	67
15	19/06/2022	17:46	65 26.868 N	25 00.242 W	80
16	19/06/2022	19:41	65 26.962 N	25 09.959 W	94
17	19/06/2022	20:24	65 27.080 N	25 19.549 W	102
18	19/06/2022	21:09	65 27.226 N	25 29.488 W	113
19	20/06/2022	04:19	65 43.727 N	25 28.438 W	197
20	20/06/2022	04:59	65 43.244 N	25 18.298 W	151
21	20/06/2022	07:08	65 43.064 N	25 08.614 W	82
22	20/06/2022	07:51	65 42.940 N	24 59.170 W	78
23	20/06/2022	08:33	65 42.763 N	24 49.230 W	66
24	20/06/2022	10:47	65 42.908 N	24 39.484 W	65
25	20/06/2022	11:22	65 42.750 N	24 29.638 W	45
26	20/06/2022	11:57	65 42.581 N	24 19.733 W	39

27	20/06/2022	12:30	65 42.222 N	24 10.084 W	33
28	20/06/2022	14:13	65 58.586 N	24 08.028 W	51
29	20/06/2022	14:51	65 58.782 N	24 18.133 W	66
30	20/06/2022	15:30	65 58.918 N	24 28.012 W	78
31	20/06/2022	16:08	65 59.077 N	24 37.942 W	80
32	20/06/2022	16:45	65 59.227 N	24 47.880 W	113
33	20/06/2022	18:24	65 59.341 N	24 57.730 W	132
34	20/06/2022	19:02	65 59.458 N	25 07.668 W	109
35	20/06/2022	19:41	65 59.573 N	25 17.614 W	136
36	20/06/2022	22:02	65 59.648 N	25 28.074 W	135
37	21/06/2022	04:08	66 16.019 N	25 26.280 W	150
38	21/06/2022	04:50	66 15.600 N	25 16.716 W	149
39	21/06/2022	06:43	66 15.380 N	25 06.248 W	125
40	21/06/2022	07:25	66 15.268 N	24 56.610 W	109
41	21/06/2022	08:07	66 15.074 N	24 46.396 W	89
42	21/06/2022	08:49	66 14.963 N	24 36.300 W	82
43	21/06/2022	09:33	66 14.783 N	24 26.354 W	88
44	21/06/2022	10:15	66 14.603 N	24 16.237 W	83
45	21/06/2022	10:59	66 14.414 N	24 06.205 W	82
F1	21/06/2022	14:15	65 55.109 N	24 08.263 W	45
F2	21/06/2022	14:49	65 53.142 N	24 03.954 W	42
F3	21/06/2022	15:17	65 51.379 N	23 59.196 W	56
F4	21/06/2022	15:46	65 49.278 N	23 54.584 W	64
F5	21/06/2022	16:18	65 47.567 N	23 49.838 W	85
F6	21/06/2022	16:54	65 45.683 N	23 45.089 W	94
F7	21/06/2022	18:37	65 44.726 N	23 38.966 W	99
F8	21/06/2022	19:06	65 44.418 N	23 32.207 W	107
F9	21/06/2022	19:32	65 44.660 N	23 25.751 W	100
F10	21/06/2022	19:59	65 45.134 N	23 19.338 W	94
F11	21/06/2022	20:35	65 46.200 N	23 13.550 W	67
F9	21/06/2022	21:23	65 44.557 N	23 25.686 W	101
F7	21/06/2022	22:09	65 44.737 N	23 39.065 W	99
F5	21/06/2022	23:27	65 47.424 N	23 49.938 W	84
F4	21/06/2022	23:57	65 49.230 N	23 54.660 W	63
45	22/06/2022	04:07	66 14.671 N	24 06.374 W	82

44	22/06/2022	04:50	66 14.869 N	24 16.531 W	90
43	22/06/2022	05:31	66 14.953 N	24 26.173 W	90
42	22/06/2022	10:47	66 15.110 N	24 36.666 W	81
41	22/06/2022	11:29	66 15.276 N	24 46.561 W	91
40	22/06/2022	12:09	66 15.418 N	24 56.551 W	107
39	22/06/2022	13:59	66 15.566 N	25 06.511 W	128
38	22/06/2022	14:40	66 15.690 N	25 16.574 W	150
37	22/06/2022	15:20	66 15.808 N	25 26.532 W	150
36	22/06/2022	17:16	65 59.654 N	25 27.761 W	136
35	22/06/2022	19:38	65 59.568 N	25 17.640 W	136
34	22/06/2022	20:28	65 59.364 N	25 07.742 W	106
33	22/06/2022	22:38	65 59.214 N	24 57.256 W	130
32	22/06/2022	23:20	65 59.112 N	24 48.096 W	114
32	23/06/2022	04:08	65 59.071 N	24 47.418 W	108
31	23/06/2022	04:43	65 59.030 N	24 38.298 W	80
30	23/06/2022	05:20	65 58.896 N	24 28.408 W	80
29	23/06/2022	05:59	65 58.721 N	24 18.756 W	66
28	23/06/2022	06:35	65 58.518 N	24 08.455 W	50
27	23/06/2022	08:22	65 42.298 N	24 09.947 W	32
26	23/06/2022	08:54	65 42.554 N	24 19.992 W	38
25	23/06/2022	09:32	65 42.688 N	24 29.771 W	44
24	23/06/2022	10:09	65 42.839 N	24 39.505 W	64
23	23/06/2022	10:47	65 42.974 N	24 49.372 W	74
22	23/06/2022	12:34	65 43.182 N	24 59.124 W	80
21	23/06/2022	13:12	65 43.276 N	25 09.048 W	82
20	23/06/2022	15:03	65 43.452 N	25 18.787 W	152
19	23/06/2022	15:48	65 43.582 N	25 28.474 W	197
18	23/06/2022	17:50	65 27.370 N	25 29.646 W	113
17	23/06/2022	18:33	65 27.342 N	25 19.748 W	101
16	23/06/2022	20:16	65 27.091 N	25 10.110 W	93
16	24/06/2022	04:06	65 27.173 N	25 10.250 W	95
15	24/06/2022	04:47	65 27.102 N	25 00.647 W	82
14	24/06/2022	05:25	65 26.903 N	24 50.908 W	68
13	24/06/2022	06:03	65 26.762 N	24 41.234 W	50
12	24/06/2022	06:40	65 26.642 N	24 31.706 W	49

11	24/06/2022	07:16	65 26.460 N	24 21.785 W	47
10	24/06/2022	09:01	65 26.252 N	24 11.758 W	38
9	24/06/2022	10:46	65 10.085 N	24 13.373 W	80
8	24/06/2022	11:22	65 10.356 N	24 23.084 W	74
7	24/06/2022	12:01	65 10.504 N	24 32.698 W	83
6	24/06/2022	13:40	65 10.678 N	24 42.367 W	100
5	24/06/2022	14:22	65 10.757 N	24 52.238 W	107
4	24/06/2022	15:04	65 10.908 N	25 01.556 W	113
3	24/06/2022	15:44	65 11.056 N	25 11.192 W	119
2	24/06/2022	17:18	65 11.188 N	25 20.869 W	125
1	24/06/2022	18:35	65 11.270 N	25 30.460 W	137

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