Supplement of Biogeosciences, 21, 5407–5433, 2024
https://doi.org/10.5194/bg-21-5407-2024-supplement

Biogeosciences Open Access EGU

Supplement of

Characterizing regional oceanography and bottom environmental conditions at two contrasting sponge grounds on the northern Labrador Shelf

Evert de Froe et al.

Correspondence to: Evert de Froe (evert.defroe@wur.nl)

Tables

Table S1: Overview of lander deployment locations and CTD cast locations.

station	instrument	date/period	latitude	longitude	depth
HSB_bl	benthic_lander	27-7-2018 to 2-7-2019	60.47	-61.29	410
LSB_bl	benthic_lander	27-7-2018 to 1-7-2019	59.38	-60.28	558
HSB_ctd1	CTD	2018-08-03 07:37:08	60.47	-59.26	2428
HSB_ctd2	CTD	2018-08-02 17:21:58	60.47	-60.38	1877
HSB_ctd3	CTD	2018-07-30 15:27:05	60.47	-61.30	391
HSB_ctd4	CTD	2018-07-30 07:31:07	60.46	-62.12	359
HSB_ctd5	CTD	2018-07-27 19:41:58	60.40	-62.90	289
LSB_ctd1	CTD	2018-07-29 04:30:19	59.53	-58.64	2563
LSB_ctd2	CTD	2018-07-28 23:25:52	59.48	-59.45	1938
LSB_ctd3	CTD	2018-07-28 09:52:11	59.38	-60.27	608
LSB_ctd4	CTD	2018-07-28 06:12:07	59.31	-61.02	192
LSB_ctd5	CTD	2018-07-28 03:10:24	59.22	-61.83	138

Table S2: Overview of rock dredge transects. HSB = high-sponge-biomass site, LSB = low-sponge-biomass site, (Coté et al., 2019).

Station Name	Start Lat	Start Long	End Lat	End Long	Logged bottom depth (m)	Time at bottom (min)	Length of cable out (m)	Max vessel speed (knots)	Comments
LSB_rd	59.38	-60.27	59.37	-60.29	552	10	1500	1	NA
HSB_rd	60.47	-61.28	60.48	-61.30	404	20	507	2	Small catch

Figures

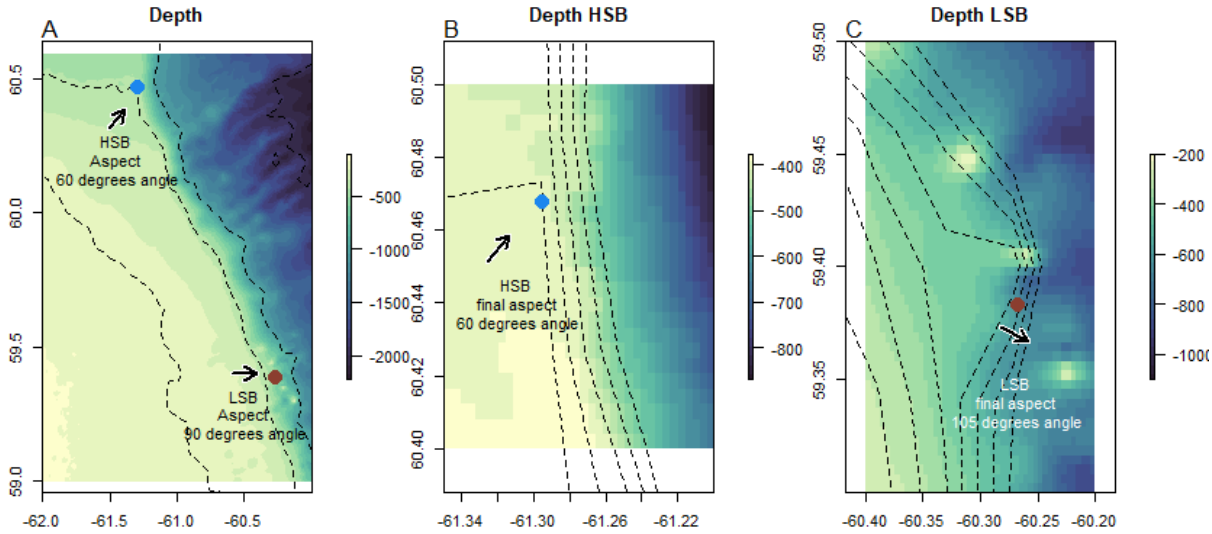
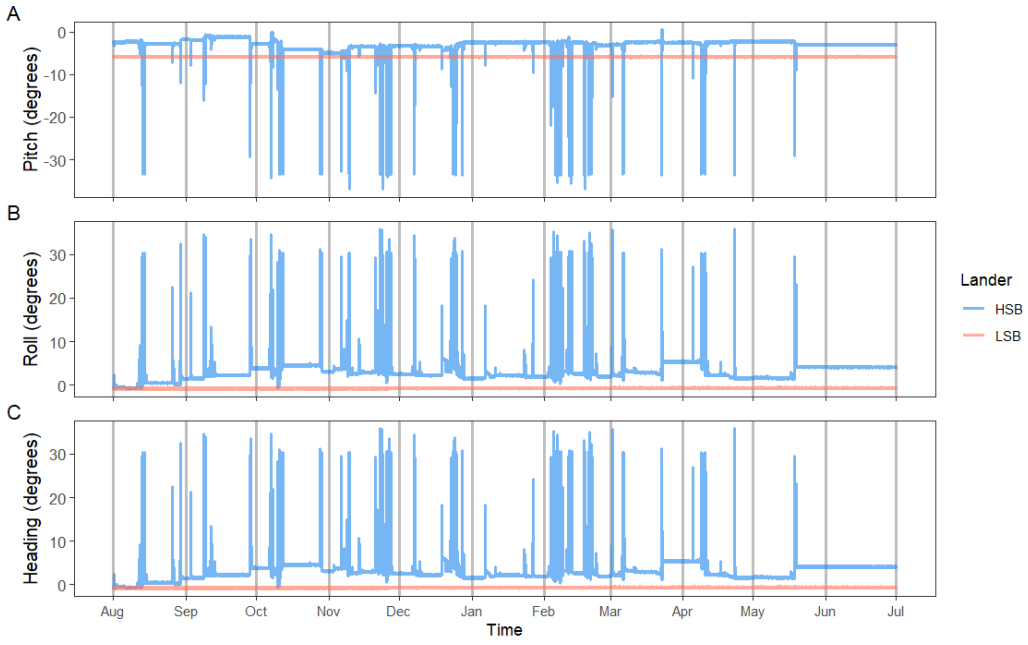


Figure S1: slope direction or aspect estimation for HSB and LSB. A) map of study area with estimated slope aspects of 60º and 90º angle for HSB and LSB, respectively. Contour lines at 200, 400, and 1000 metre is shown. B) expanded detail on HSB shows angle of 60º is a good estimate. Contour lines at 400, 425, 475, 500 are shown. C) expanded detail on LSB site shows angle of 105º is better estimate. Contour lines at 450, 475, 500, 525, 550, 575, 600 metre depth are shown. Note the different colour scales for depth. Locations of lander is indicated by coloured dots, with HSB = blue, and LSB = brown/red.



15 **Figure S2: Pitch (A), Roll (B), and Heading (C) data of the ADCPs from both benthic landers.**

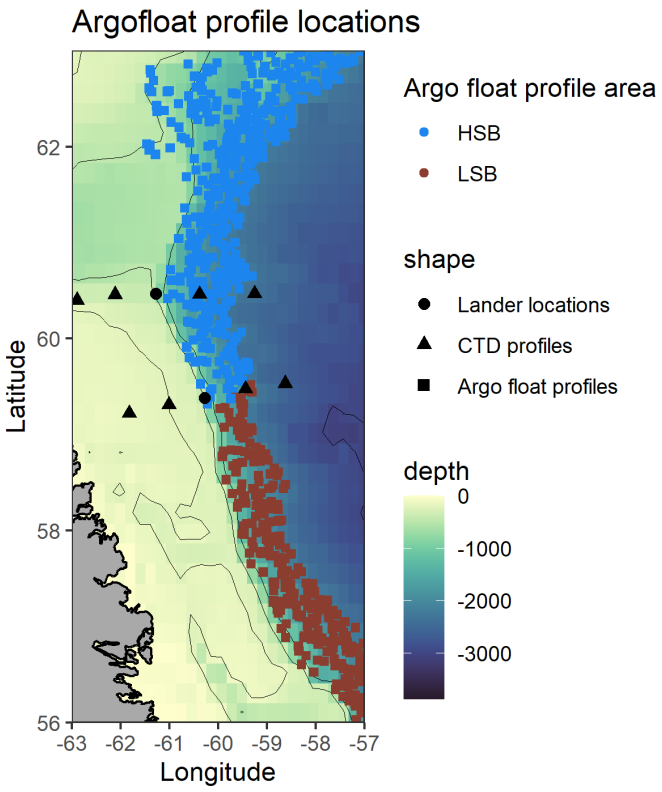
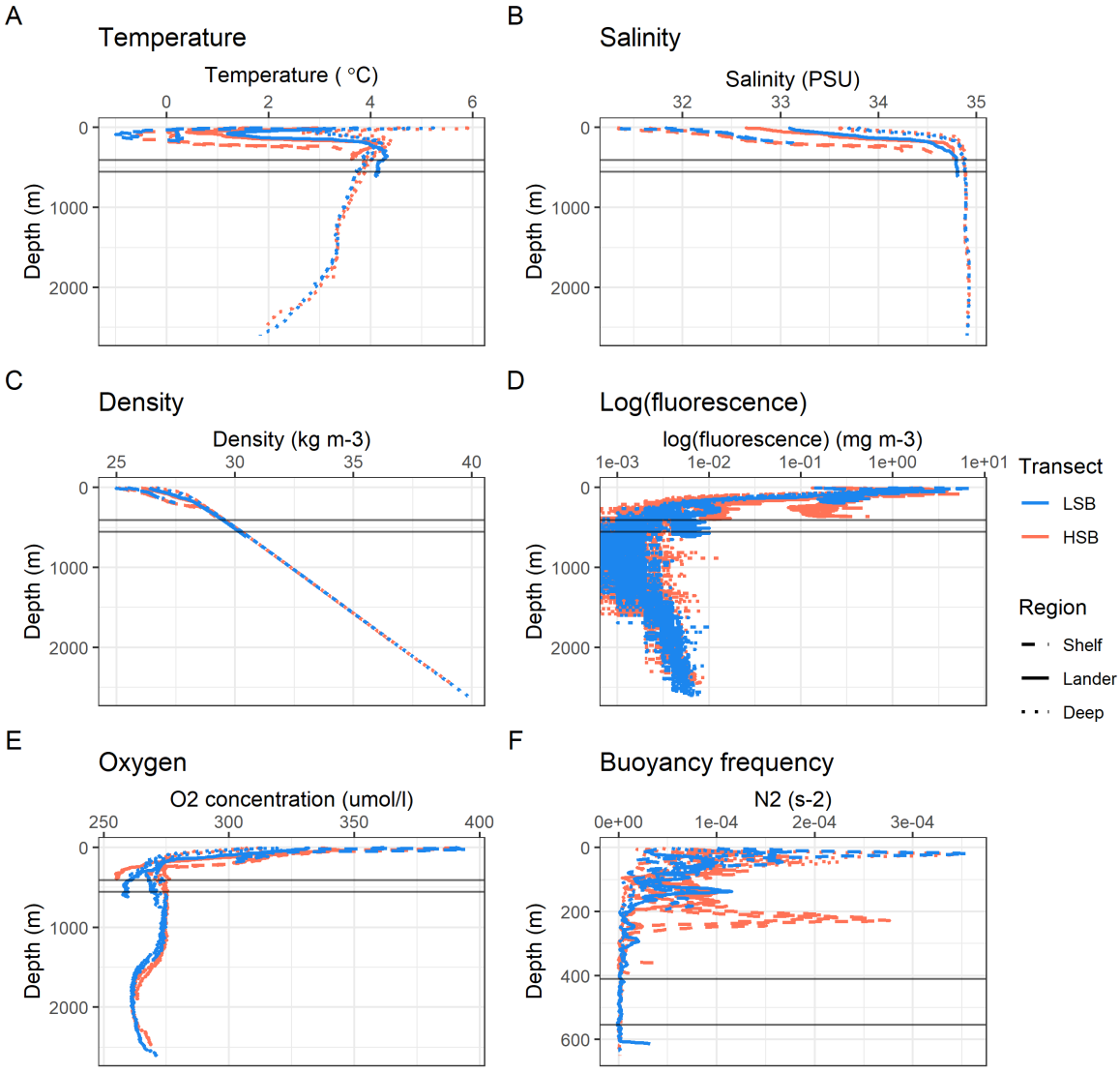
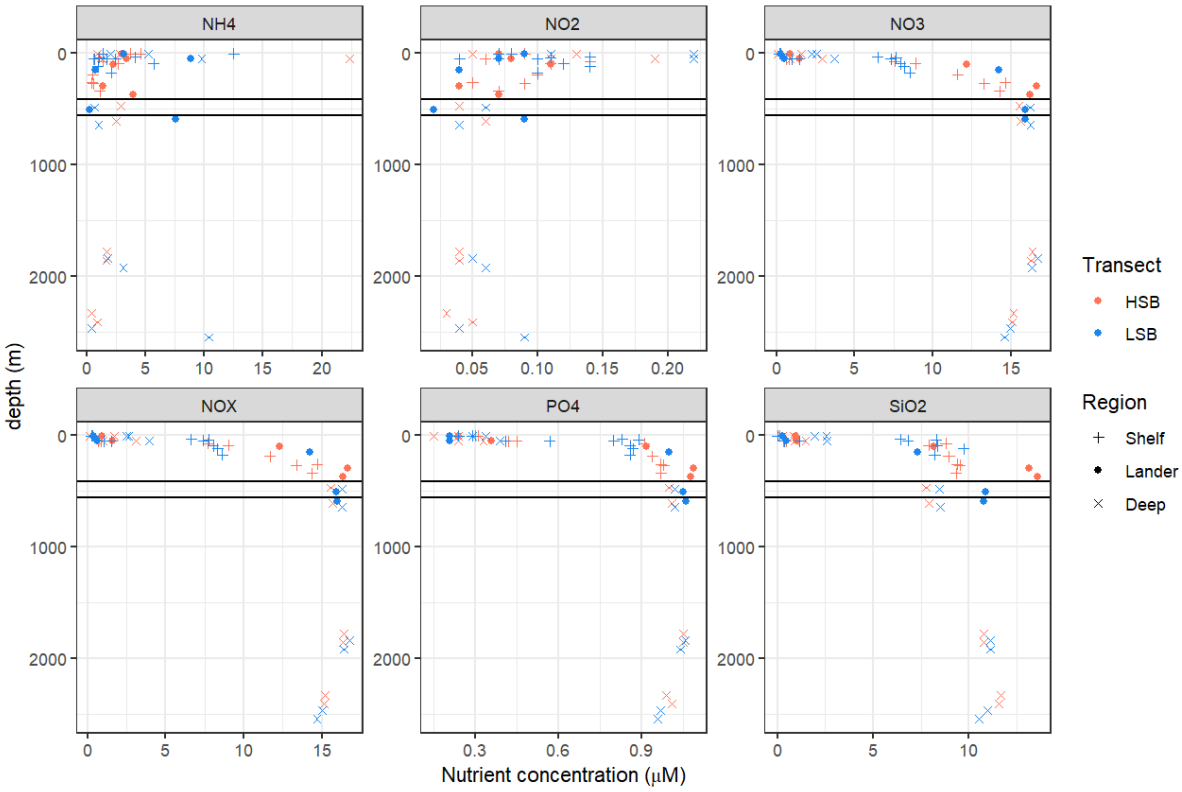


Figure S3: Locations of Argo float profiles used for assessing the regional oceanography. Coloured squares indicate Argo float profiles, and black triangles/dots the location of CTD profiles/benthic lander location.



20

Figure S4: CTD profiles with temperature (A), salinity (B), density (C), Fluorescence (D), Oxygen (E), Buoyancy frequency (F). LSB = Low-sponge-biomass transect, HSB = High-sponge-biomass transect. Buoyancy frequency is smoothed over 15 m for visibility, and the plot only shows top 650 m of the water column, as deeper waters have values close to zero.



25 **Figure S5: nutrient profiles for the two transects over the complete depth. HSB = high-sponge-biomass, LSB = low-sponge-biomass.**

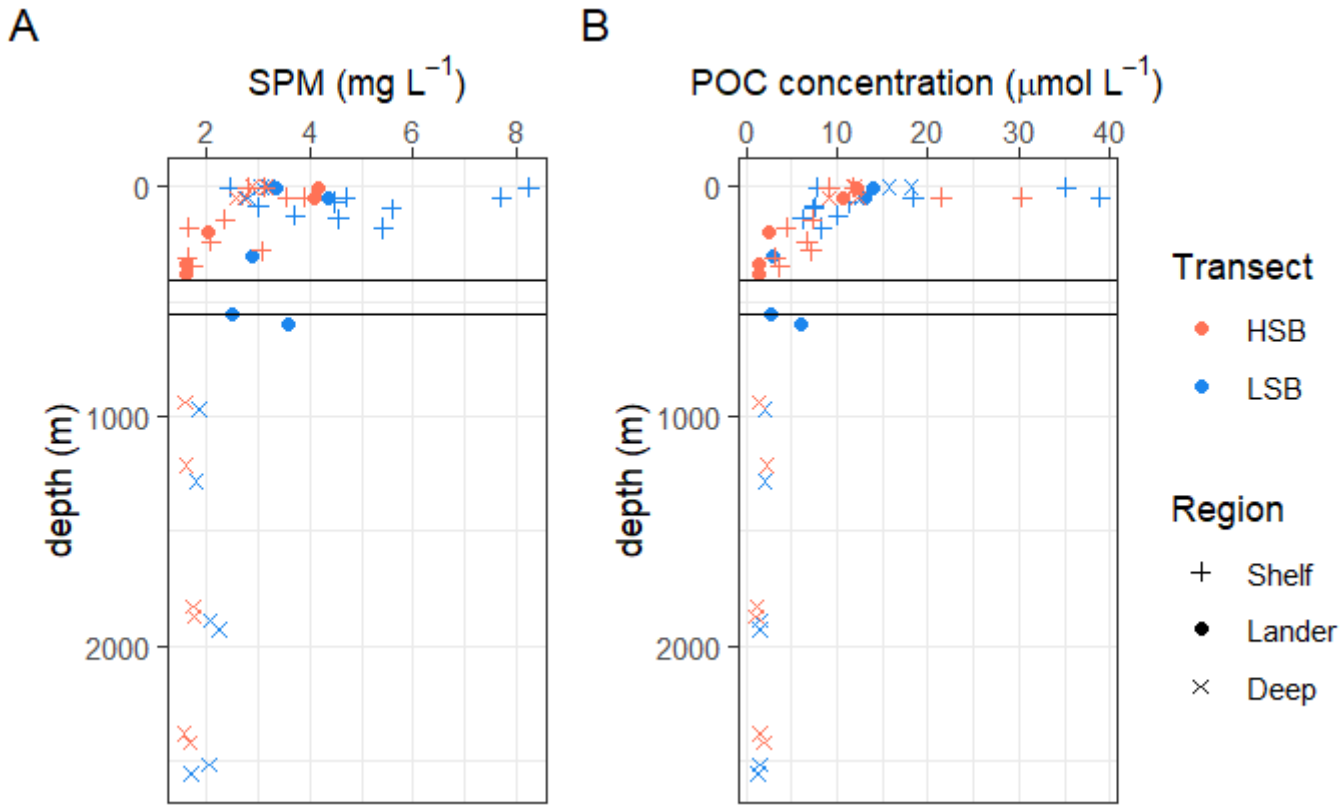


Figure S6: A) Suspended particulate matter (SPM) concentration and B) particulate organic carbon concentration of the CTD the two transects. HSB = high-sponge-biomass transect, LSB = low-sponge-biomass transect. The horizontal lines resemble depth of benthic landers, where the top line is the HSB lander depth, and lowest line resembles LSB lander depth.

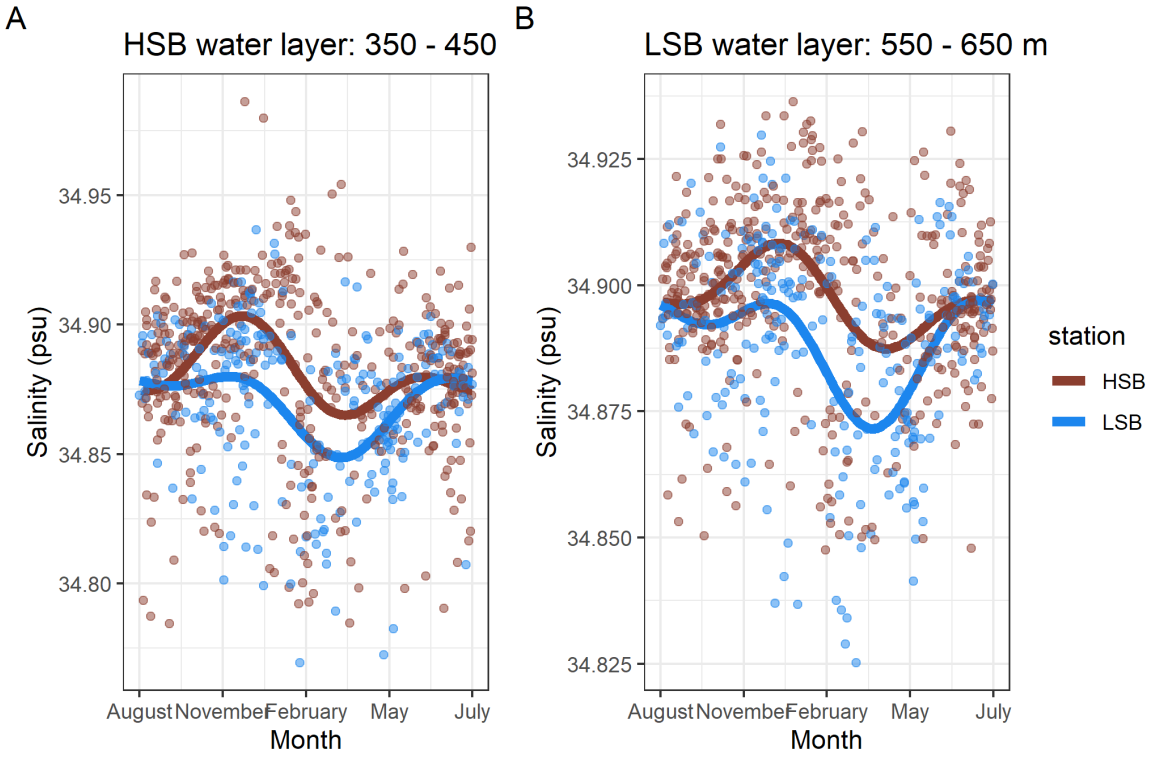


Figure S7: A) seasonal salinity, from Argo float data, of the water layer in which HSB lander is located. B) seasonal salinity of the water layer in which LSB is located.

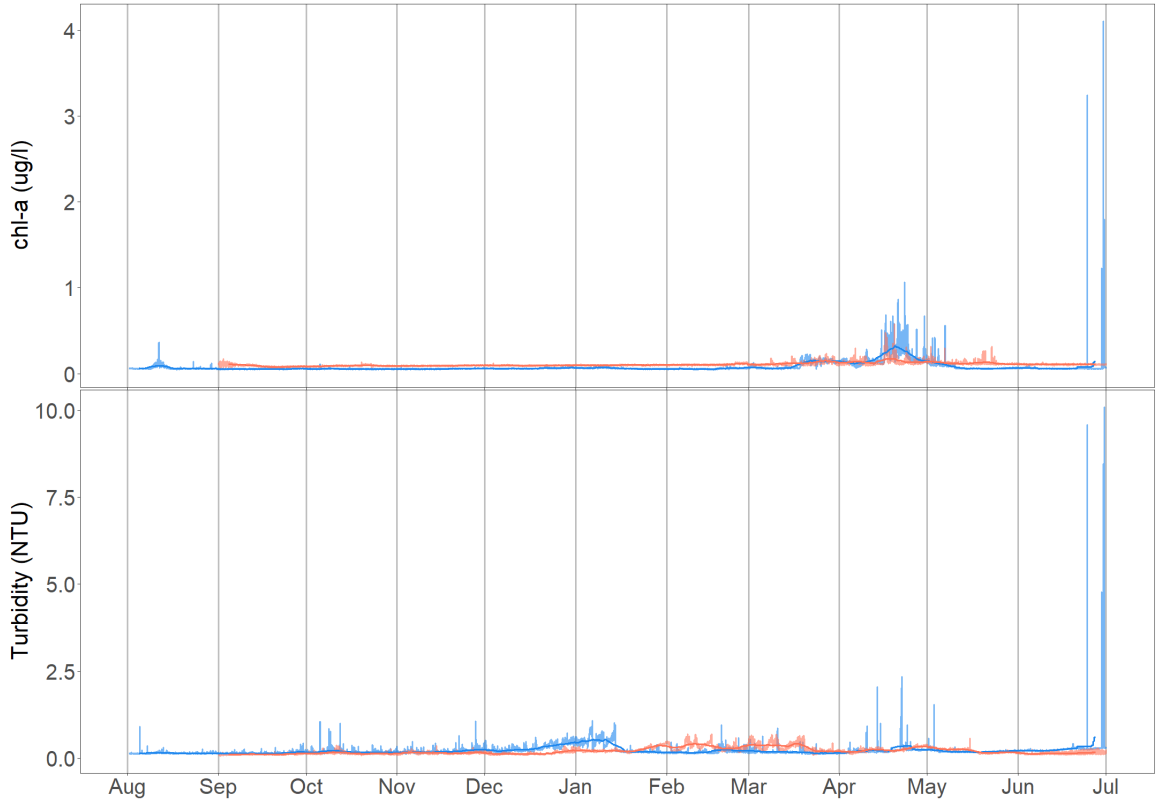


Figure S8: Chlorophyll-a and turbidity data without cutting the y-axis at 1.25 µg L $^{-1}$, and 2.5 NTU, respectively.

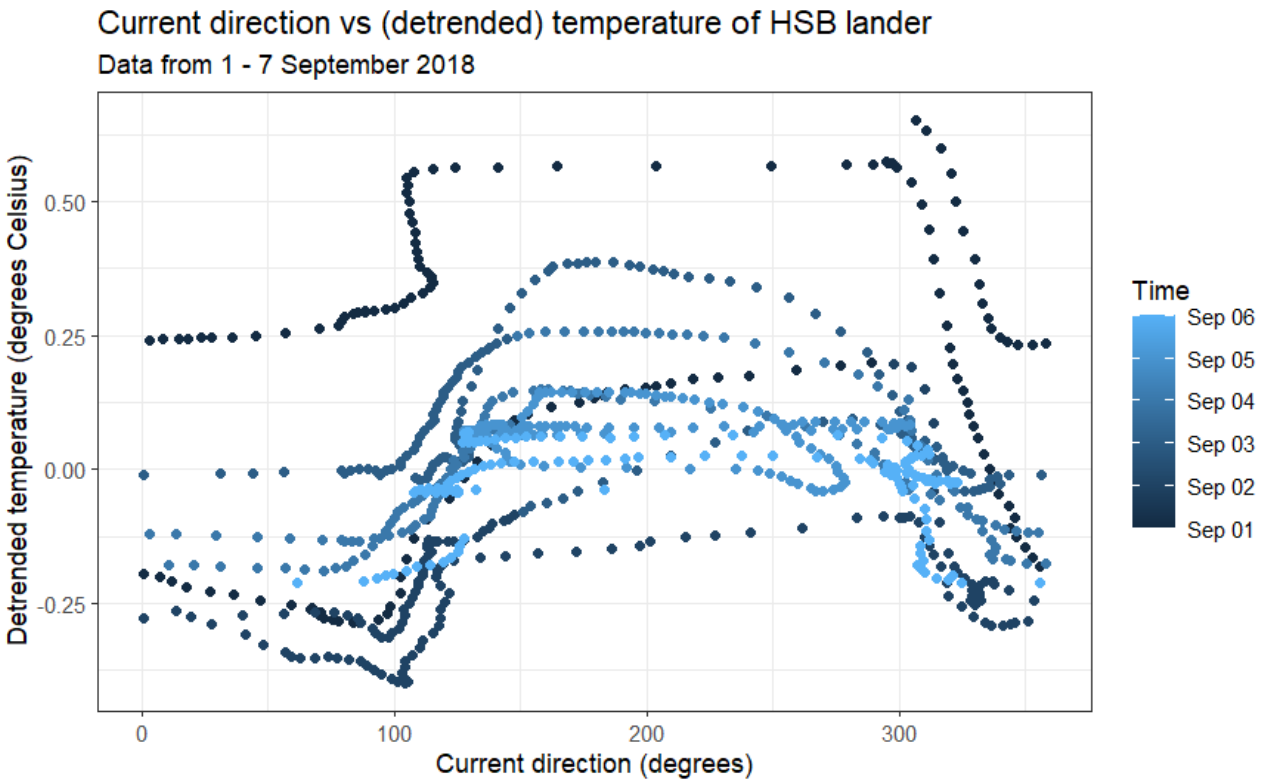
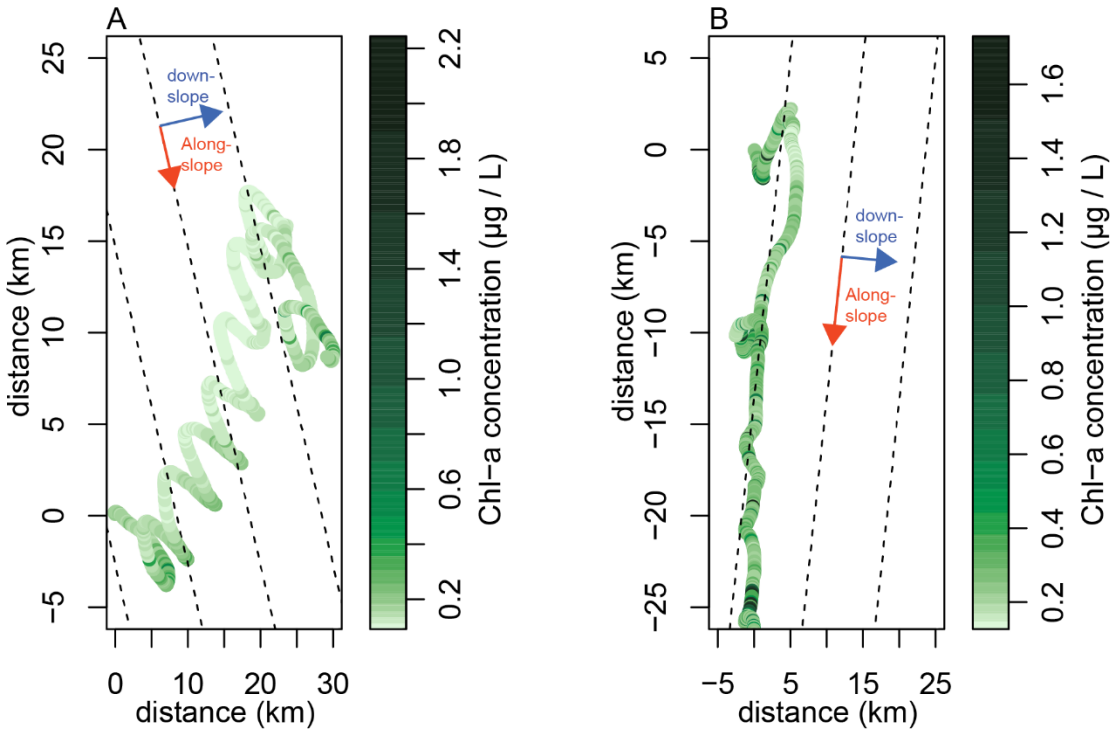
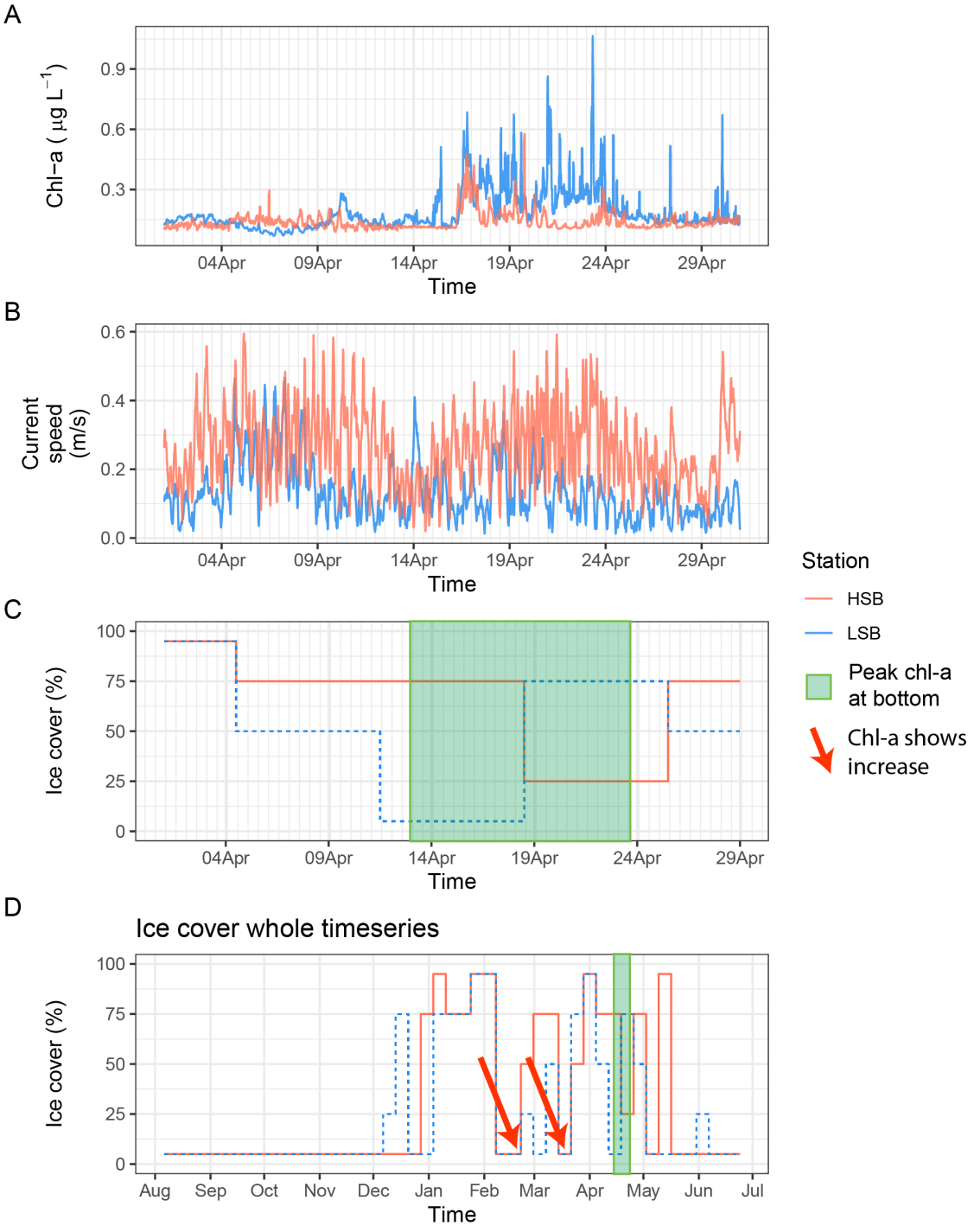


Figure S9: bottom current direction and (detrended temperature at the HSB lander with data from 1 - 7 September 2018.



40

Figure S10: progressive vector plots with chlorophyll-a as colour variable from 19 to 24 April 2019. With A) the high-sponge-biomass (HSB) lander and b) the low-sponge-biomass (LSB) lander. Dotted lines represent the along slope direction at the respective sites. Note colour is in log-scale.



45 **Figure S11: Spring Chlorophyll-a (A), bottom current speed (B), ice cover (C),during the spring bloom period (1 April-1 May, 2019), and ice cover for the whole deployment length (D). Green squares indicate peak bottom chl-a concentrations measured (Figure 9 in the paper), red arrows indicate moment after which chl-a increases at both landers (Figure 9 in paper).**

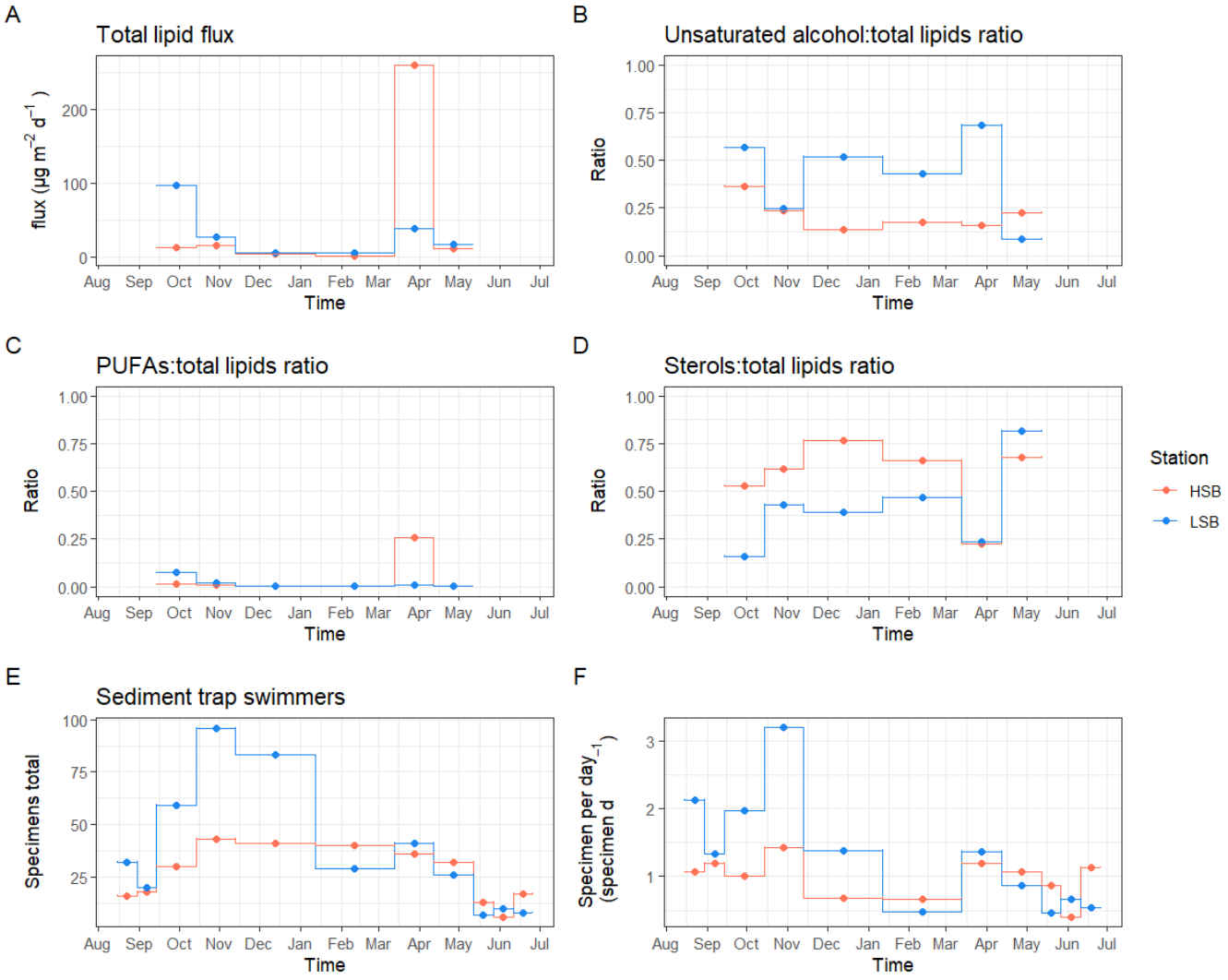


Figure S12: Sediment trap lipid fluxes. A) Total lipid flux, B) unsaturated alcohol:total lipids ratio, C) poly-unsaturated fatty acid:total lipids ratio, D) sterol:total lipids ratio. E) Swimmers inside sediment trap bottles F) Swimmmers per bottle divided by days that bottle was open.