

Supplementary Material

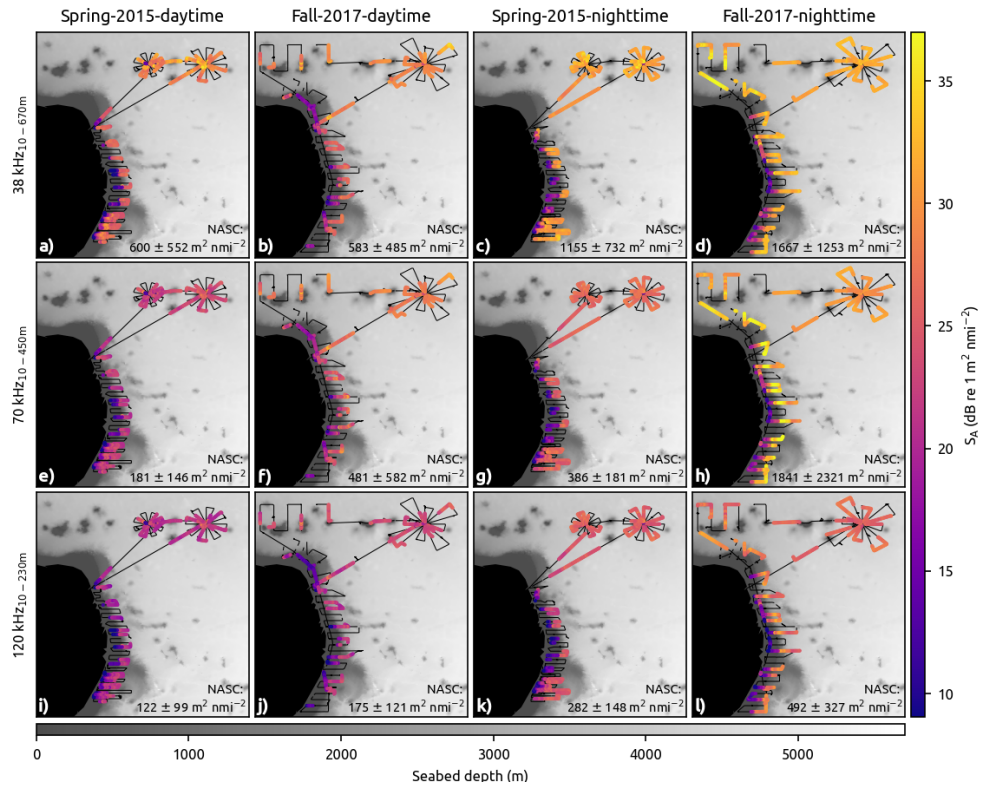


Figure S1: Nautical area scattering strength (S_A) at 38, 70, and 120 kHz, in Spring-2015 (a, c, e, g, i, k) and Fall-2017 (b, d, f, h, j, l), both during day (a, b, e, f, i, j) and night (c, d, g, h, k, l). S_A represents the vertical integration of acoustic backscatter and is used as proxy of animal biomass in the water column. Averaged values and the standard deviation are provided in the linear domain as nautical area scattering coefficient (NASC). Note the different integration range depth for each frequency, and due to varying seabed depth.

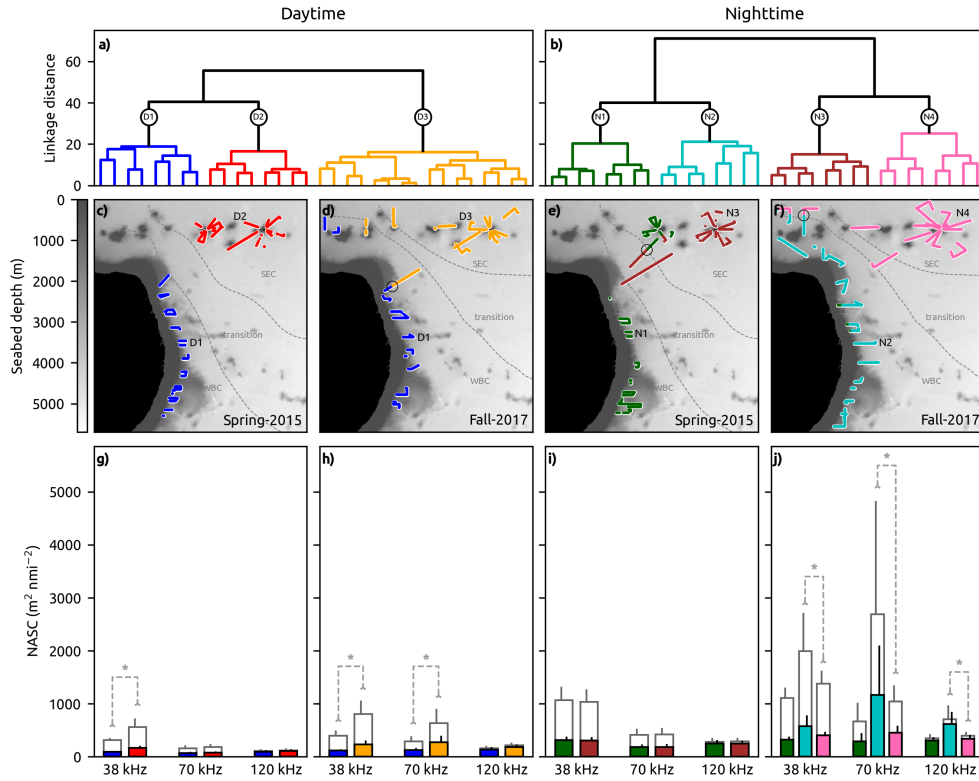


Figure S2: Classification (a-b), distribution (c-f), and mean Nautical area scattering coefficient NASC (g-j) of echoregions. The Western boundary current (WBC) and the South equatorial current (SEC) systems are delineated according to Assunção et al. (2020). Daytime (D1, D2, and D3) and nighttime (N1, N2, N3, and N4) echoregions are indicated. Mean NASC was computed from 10 to 200 m depth (coloured bars) or to the maximum depth available: 670, 450, and 230 m depth at 38, 70, and 120 kHz, respectively (white bars). Lines on the top of the bars indicate the standard deviation, and asterisks indicate pairs of NASC values significantly different (Kruskal-Wallis test, $p < 0.01$).

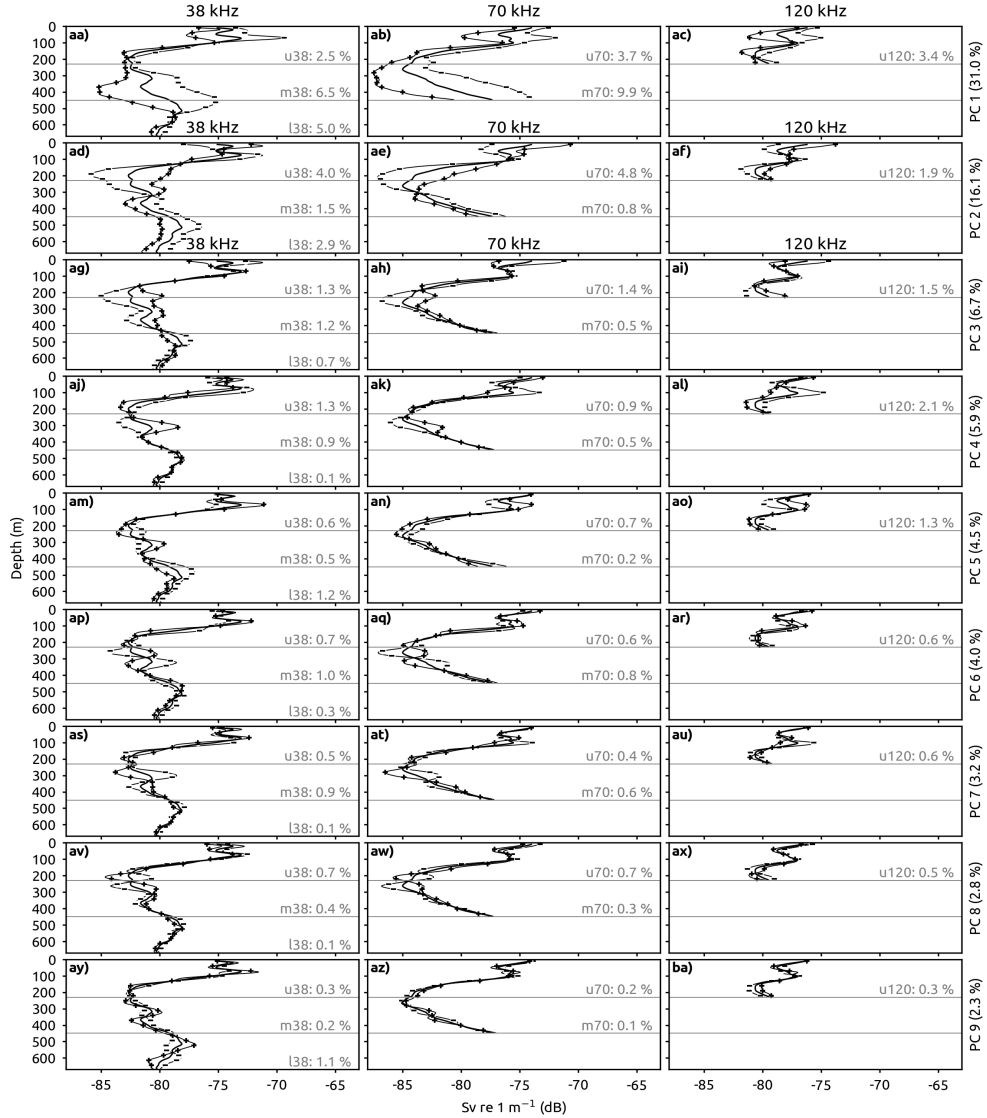


Figure S3: Along-depth S_v variance explained by the first nine principal components (PCs), for the average daytime profiles at 38, 70 and 120 kHz. The percentage of variance is indicated on the right side of plots for each PC, as well as for the contribution of each variable (u38, u70, u120, m38, m70, and l38), which is indicated in grey inside the plots. Lines with plus or minus symbols represent the effect of adding (+) or subtracting (-) a multiple of each PC, respectively.

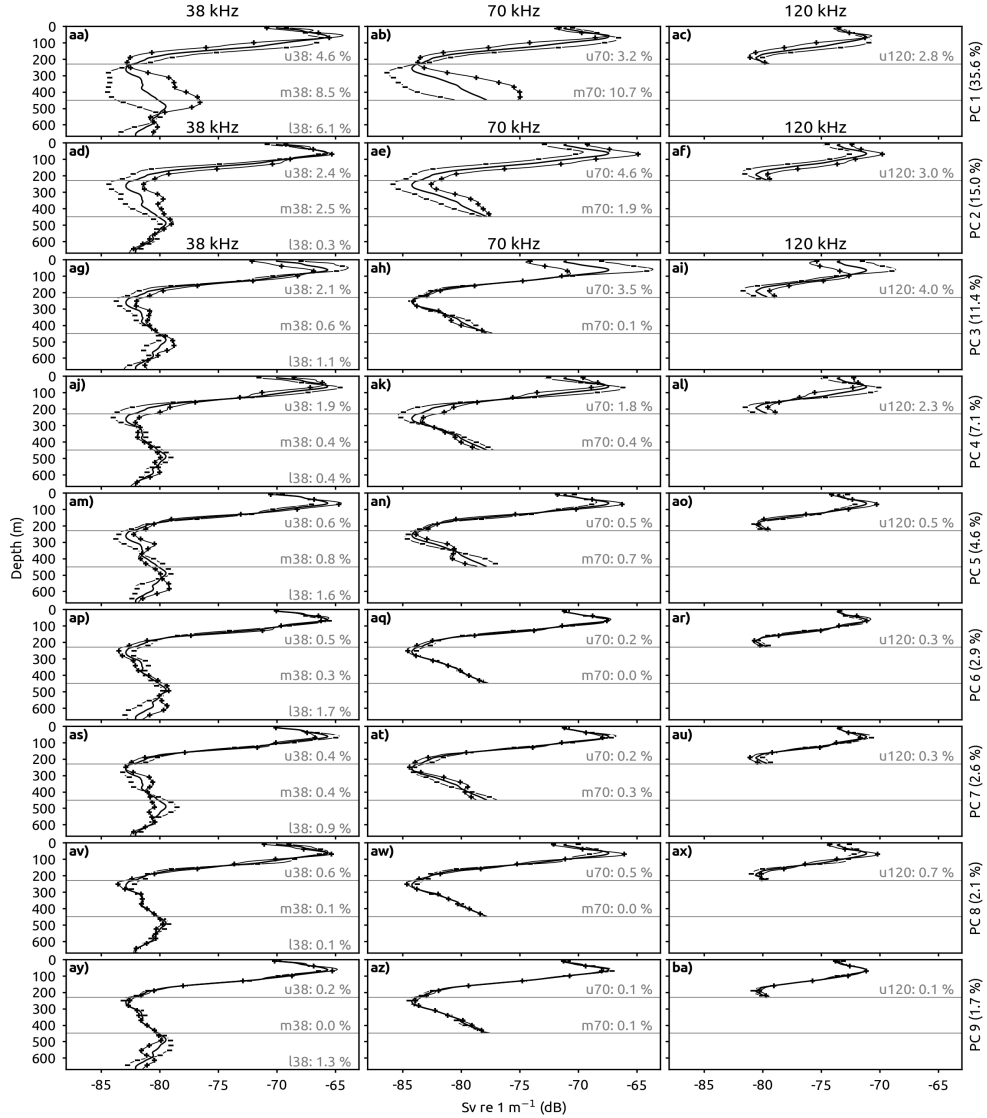


Figure S4: Along-depth S_v variance explained by the first nine principal components (PCs), for the average nighttime profiles at 38, 70 and 120 kHz. The percentage of variance is indicated on the right side of plots for each PC, as well as for the contribution of each variable (u38, u70, u120, m38, m70, and l38), which is indicated in grey inside the plots. Lines with plus or minus symbols represent the effect of adding (+) or subtracting (-) a multiple of each PC, respectively.

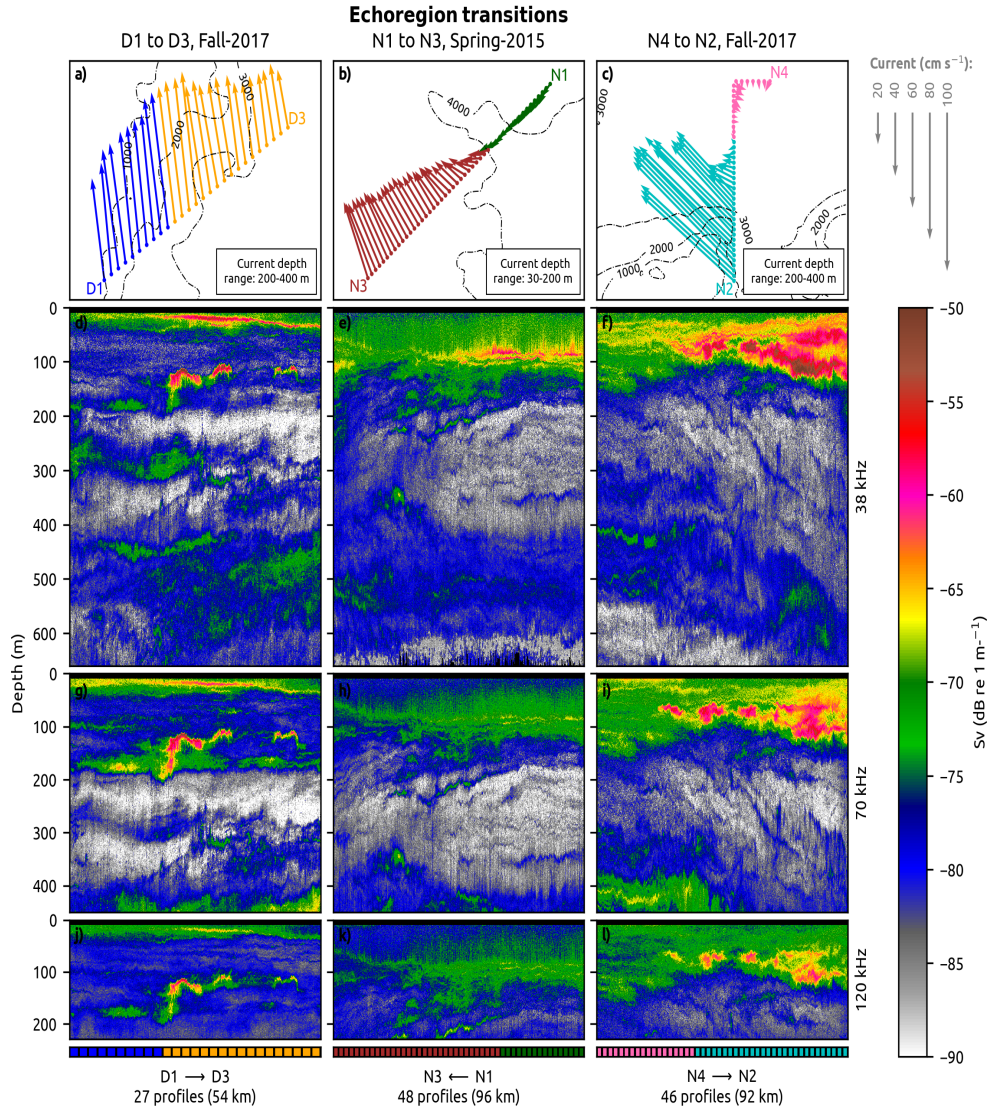


Figure S5: Examples of transitions between echoregions. Ship tracks are represented (a-c), arrows indicate the mean current velocity and direction at particular depth ranges, colors indicate the echoregion to which each position belongs, and dashed lines indicate the isobaths (see Fig. 4e and Fig. 5d,e to find the location of transitions in a wider view). Echograms are provided at 38 (d-f), 70 (g-i) and 120 kHz (j-l).