Supplementary

- SV1: Video EL19 acoustic data collection continuously between 25 Feb. 2019, 18:30 UTC and 26 Feb. 2019, 16:00 UTC (transects T18-T37, Table ST1), collocated MSS data exist and are shown for T37 in Figures 2,4 as well as included in Figures 8,9.
- SV2: Video 1, EL20 acoustic data collection continuously between 4 March 2020, 21:30 UTC and 5 March 2020, 14:30 UTC (transects T28-T39, Table ST2), collocated MSS data exist and are included in Figures 8,9.
- SV3: Video 2, EL20 acoustic data collection continuously between 5 March 2020, 17:20 UTC and 6 March 2020, 04:30 UTC, transects only sampled with EK80 and ADCP, no collocated MSS data due to problems with MSS profiler.

SMHI wind data from station Örskär (60.5256 °N, 18.3729 °E) in the vicinity of the study region

![Graph](image)

**Figure S1:** Measured wind direction and wind speed at SMHI station Örskär during the time of cruise EL19-IGV01. Grey shaded area marks time when transect T37 was measured, which is shown in Fig. 2 of the main manuscript.
Figure S2: Measured wind direction and wind speed at SMHI station Örskär during the time of cruise EL20-IGV01.

ADCP mooring data collected during the times of all three movies are shown in Figures 6,7 for EL19 and EL20, respectively.

Figure S3: Validation parameters of mooring ADCP deployed during EL19.

Table ST1: All MSS microstructure transects during EL19-IGV01.

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Table ST3: MSS casts near sill during EL19-IGV01. Used in Figures 8 and 9.
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