

Supplementary Material for: Sea-ice ridges are a major reservoir of Arctic sea-ice export through the Fram Strait

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1 Supplementary Figures

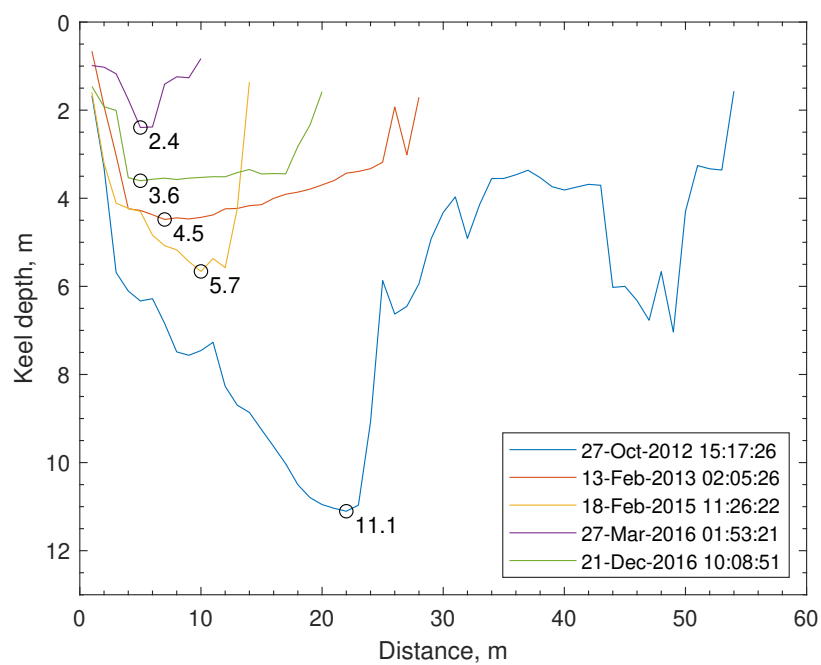


Figure S1. Examples of ice ridge keel profiles identified in the series of sea-ice drafts from the F11 mooring during the study period. Caption shows the timings of the maximum keel drafts, also highlighted by black circles on the ridge profiles together with the maximum keel drafts.

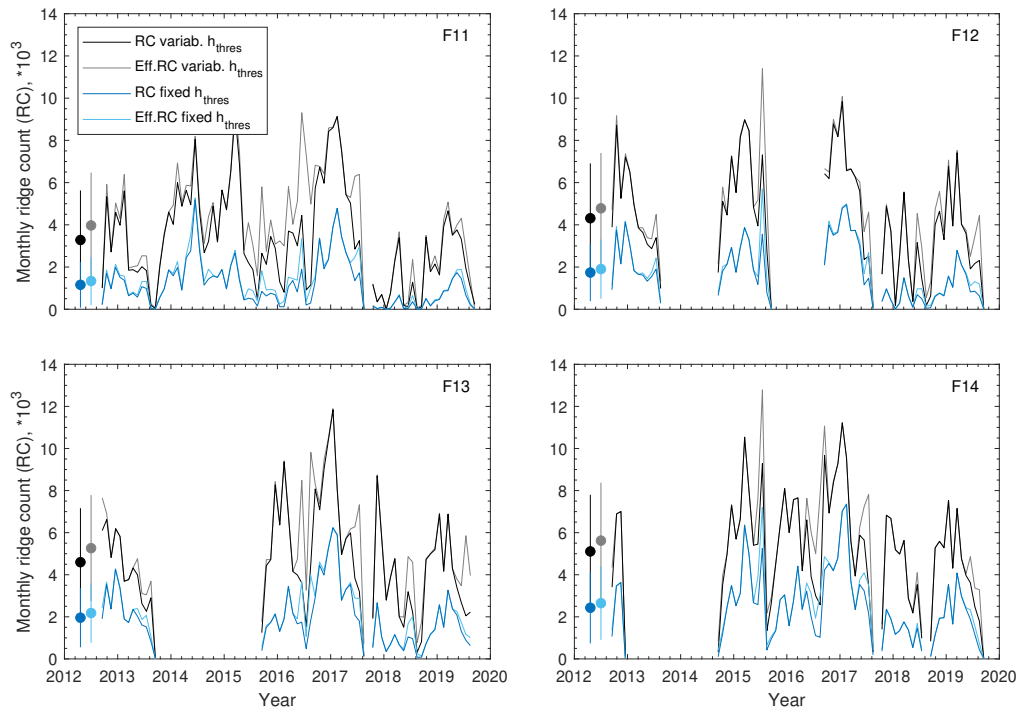


Figure S2. Monthly ridge count (black solid line), monthly effective ridge count (i.e. ridge count scaled by sea-ice concentration; gray solid line) for a ridge detection scheme with a variable level ice draft threshold. Monthly ridge count (blue solid line), monthly effective ridge count (light blue solid line) for a ridge detection scheme with a fixed level ice draft threshold of 2.5 m and a minimum ridge keel draft of 5 m. Filled circles with vertical lines show the respective multiannual means and standard deviations for these variables over the period of 2012-2019.

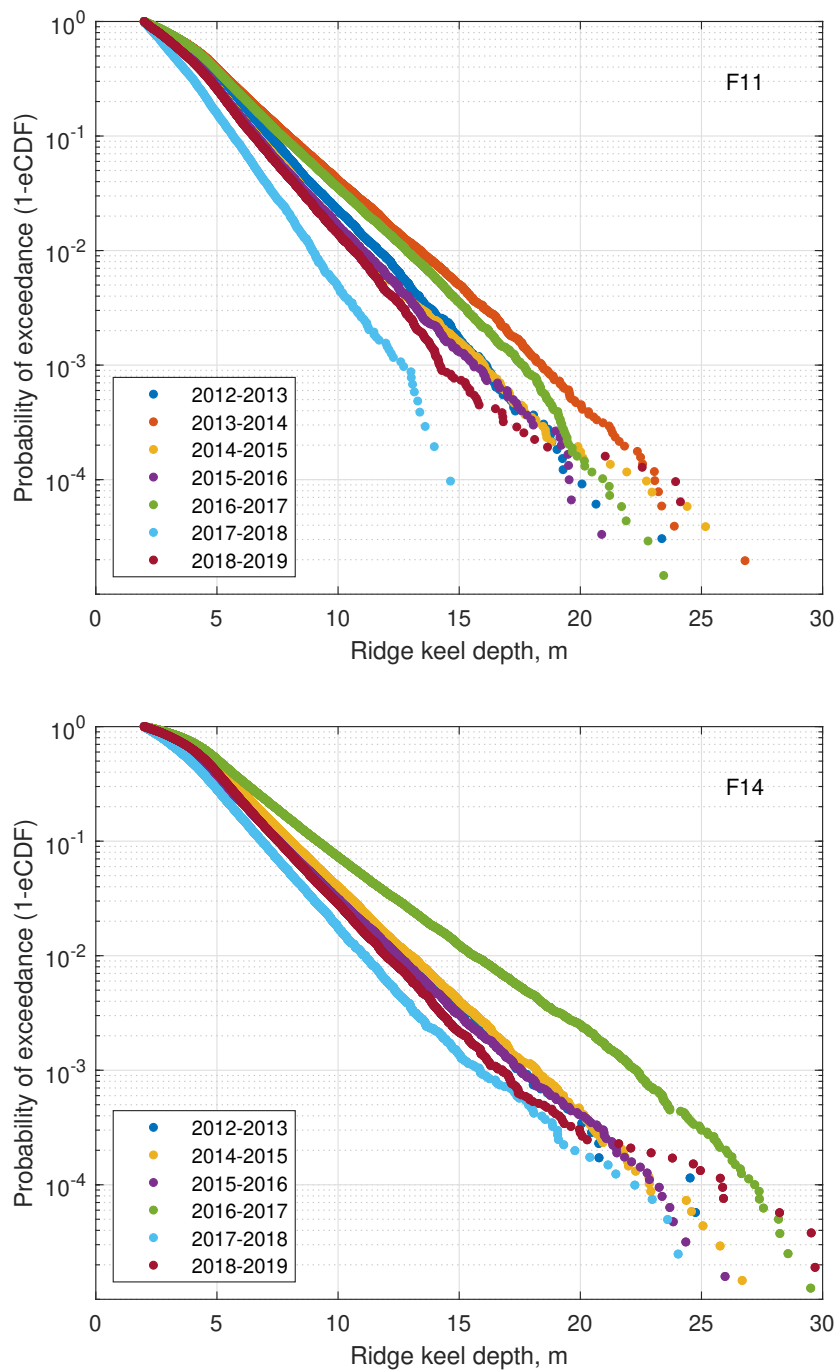


Figure S3. Deployment season-based probability for an individual ridge keel to exceed a specific depth, expressed as (1-CDF), for F11 (top) and F14 (bottom) mooring locations.

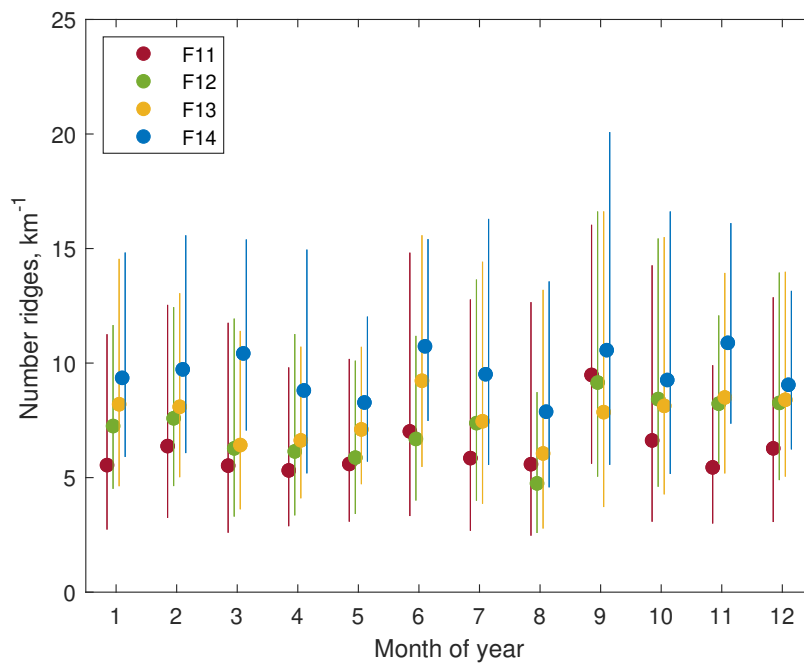


Figure S4. Seasonal (monthly) variability of the effective ridge density at the four mooring locations during 2012-2019. Filled circles and vertical lines show median ridge densities and the 68% prediction intervals, respectively, calculated from the log-normal probability distribution fitted to the data.

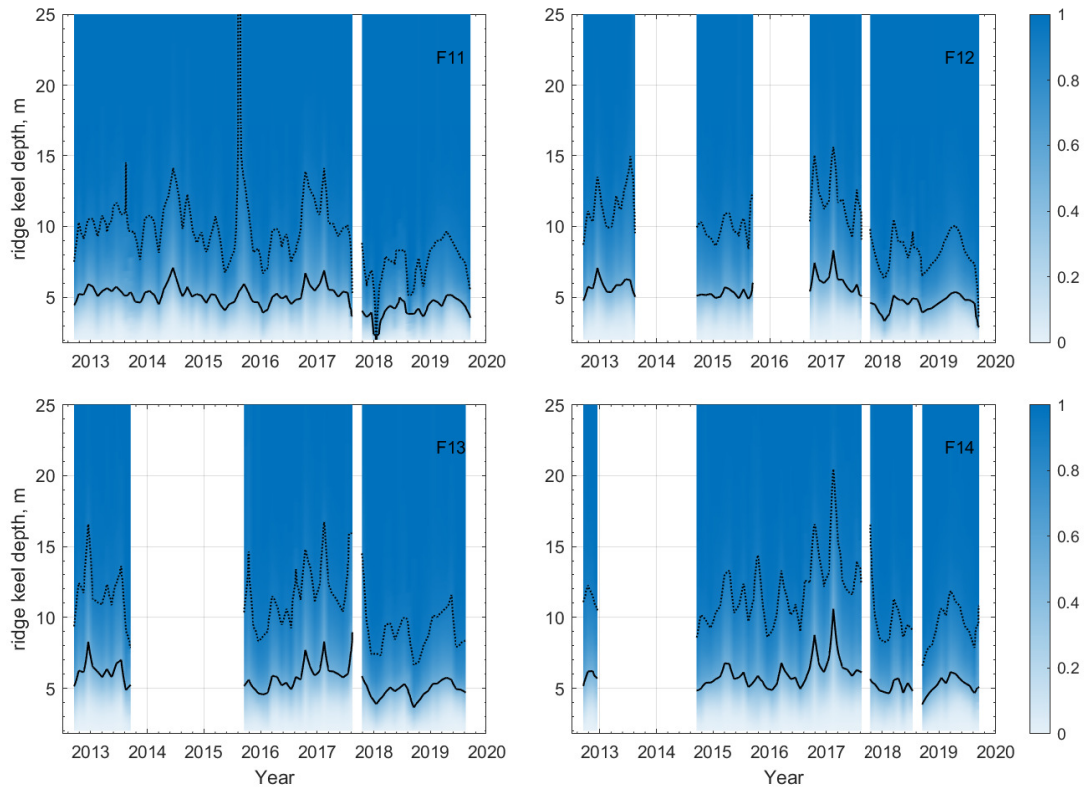


Figure S5. Monthly variations in contribution of ridges with different keel drafts into a monthly total volume of ridged ice shown as CDF of fractional ridge volume for the four moorings during 2012-2019 (shown as blue shading). Solid black and dashed lines highlight the 50% and 90% cumulative probabilities, indicative of the variability in the maximum keel drafts for ridges that contain 50% and 90% of ridged ice volume, respectively, assuming zero ridge keel macroporosity.

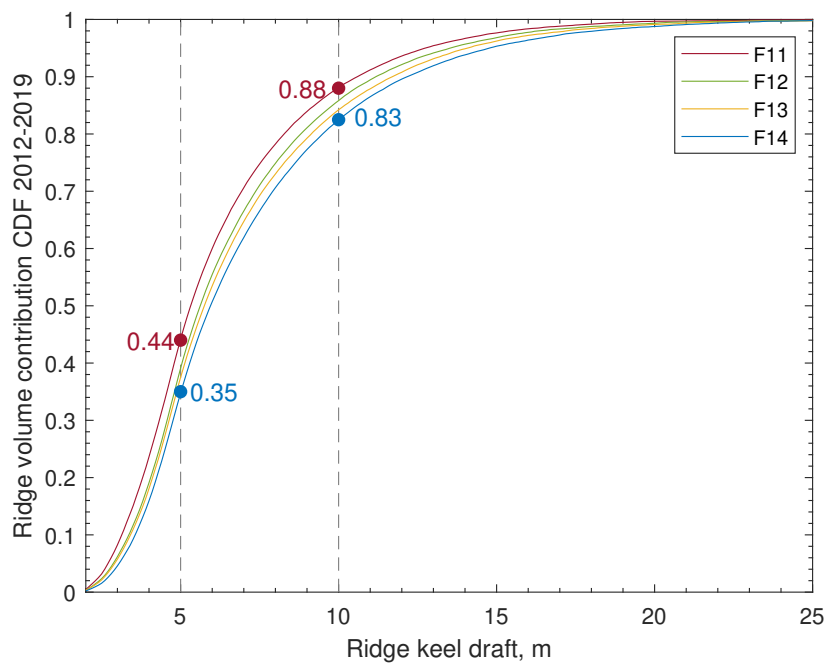


Figure S6. Contribution of ridges with different keel drafts into a total volume of ridged ice shown as CDF of fractional ridge volume for the four moorings during 2012-2019. Points with text marks highlight the contributions of ridges with keel drafts less than 5 m and 10 m for F11 (shown red) and F14 (shown blue).