Supplementary Material: Benefits and challenges of dynamic sea-ice for weather forecasts

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Figure S1: timeseries of day-9 Integrated Ice Edge Error (IIEE) of all forecasts for the whole northern hemisphere (a), the Nordic Seas (b) and the Labrador/East Atlantic (c) and the Sea of Okhotsk regions (d). These regions are shown in Fig 1c & f.



Figure S2: Lead-time averaged (a, c) and day 3 time series (b, d) Integrated Ice Edge Error (IIEE), Absolute Extent Error (AEE) and Misplacement Error (ME) for the Nordic Seas (a,b) and the Labrador/East Atlantic (c,d) regions.



Figure S3: Composite of forecast error during periods of ice retreat in the Nordic Sea: Day-3 sea ice concentration bias along with composite-mean winds at 925hPa (a), T+72 925hPa temperature and horizontal wind bias (d) and specific humidity and horizontal wind bias (g) for the pres-SIC forecasts and the change in the bias for the obs-SSTSIC (b, e and h) and coup-SSTSIC (c, f and i). The change in the turbulent heat flux (sensible+latent accumulated between T+48 and T+72) is shown in the blue and red contours in b and c. In panels (d)-(i), saturated colours indicate mean differences that are statistically significant at the 5% level.



Figure S4: Composite of forecast error during periods of ice advance in the Labrador Sea and Baffin Bay: Day-3 sea ice concentration bias along with composite-mean winds at 925hPa (a), T+72 925hPa temperature and horizontal wind bias (d) and specific humidity and horizontal wind bias (g) for the pres-SIC forecasts and the change in the bias for the obs-SSTSIC (b, e and h) and coup-SSTSIC (c, f and i). The change in the turbulent heat flux (sensible+latent accumulated between T+48 and T+72) is shown in the blue and red contours in b and c. In panels (d)-(i), saturated colours indicate mean differences that are statistically significant at the 5% level.



Figure S5: Composite of forecast error during periods of ice retreat in the Sea of Okhotsk: Day-3 sea ice concentration bias along with composite-mean winds at 925hPa (a), T+72 925hPa temperature and horizontal wind bias (d) and specific humidity and horizontal wind bias (g) for the pres-SIC forecasts and the change in the bias for the obs-SSTSIC (b, e and h) and coup-SSTSIC (c, f and i). The change in the turbulent heat flux (sensible+latent accumulated between T+48 and T+72) is shown in the blue and red contours in b and c. In panels (d)-(i), saturated colours indicate mean differences that are statistically significant at the 5% level.