Foraging energetics and prey density requirements of western North Atlantic blue whales in the Estuary and Gulf of St. Lawrence, Canada

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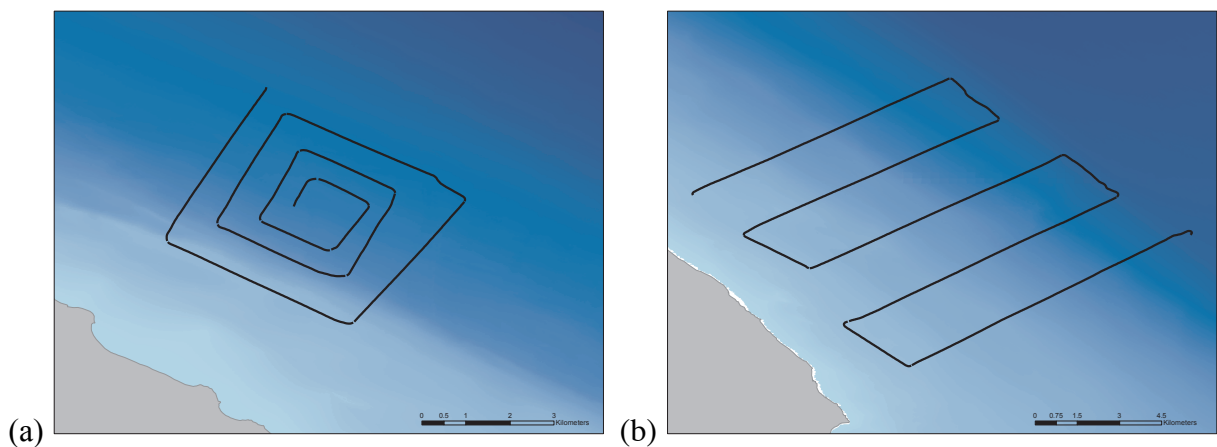*Corresponding author: marieguilpin@gmail.com

Fig. S1. Illustrations of hydroacoustic survey designs. (a) Rectangular "spirals" (concentric lines of increasing distance and length from the central starting point). (b) "Grid" (parallel equidistant lines). The size of "grids" and "spirals" varied among survey designs, locations, and within and between years.
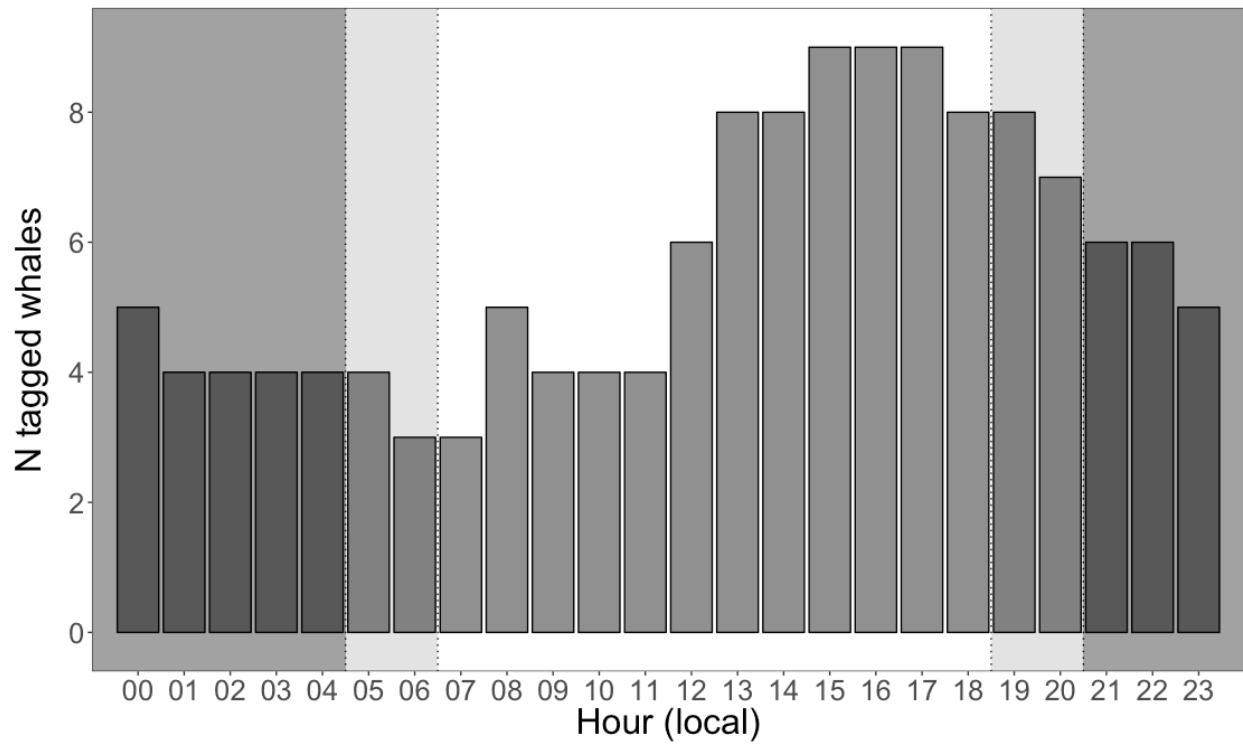
Fig. S2. Diel distribution of tag deployments. Shaded areas are for nighttime (dark grey), dusk and dawn (light grey), and daytime (white).
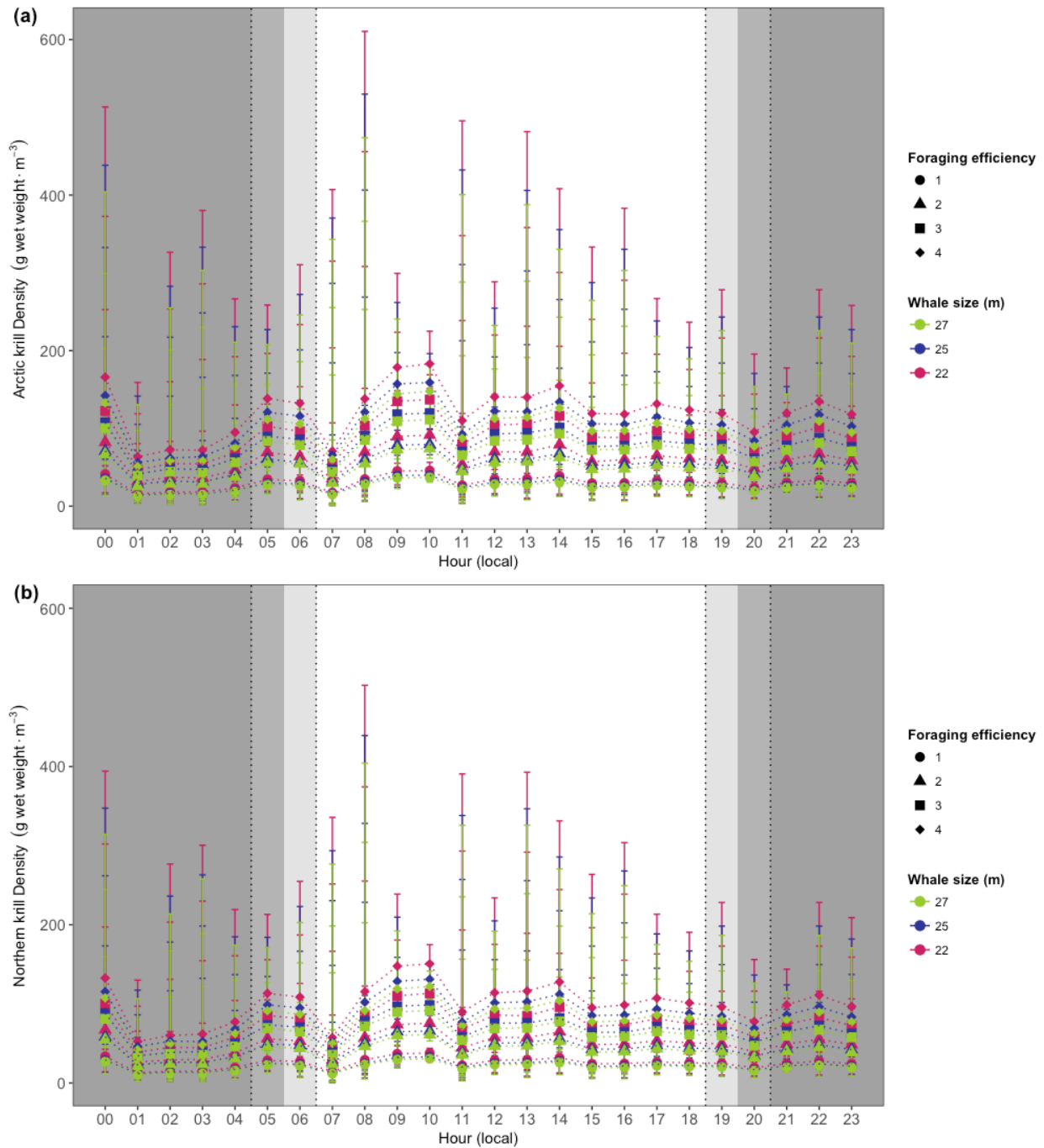
Fig. S3. Diel distribution of densities for (a) Arctic krill, and (b) northern krill required by three sizes of whales (colors for 22, 25, and 27-m) at foraging efficiencies varying from 1 to 4 (symbols). Curves and bars represent the median and 90% confidence interval, respectively. Shaded areas are for nighttime (dark grey), dusk and dawn (overlapping light grey), and daytime (white). The offset between the different size is a result of the positive allometric scaling of engulfment volume with body size.

(a) 2009_G1_Estuary

(b) 2009_G2N_Estuary

(c) 2009_G2S_Estuary

(d) 2012_S_Gulf

(e) 2012_G_Gulf

(f) 2012_S2_Gulf

(g) 2012_G2_Gulf

(h) 2014_G_Gaspe Bay

(i) 2015_S_Gulf

(j) 2015_G_Gulf

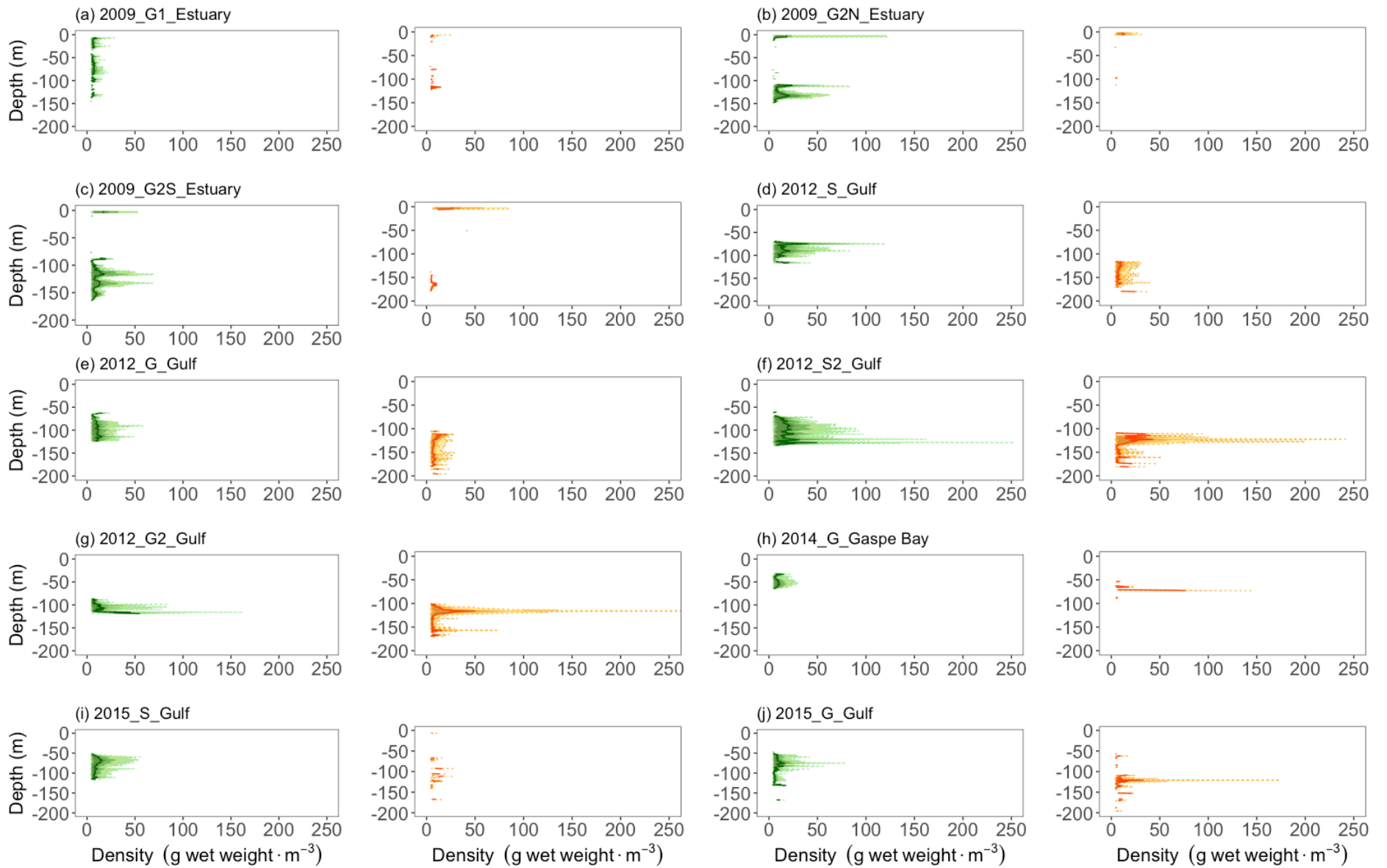Density (g wet weight $\cdot$ m^{-3})

Depth (m)

4

Fig. S4. Vertical density profiles for Arctic krill (green) and northern krill (orange) for each hydroacoustic surveys. Vignettes (a) to (j) indicate the survey year, the hydroacoustic survey design (either grid [G] or spiral [S]) and the general location (either the Estuary or northern Gulf of St. Lawrence — called 'Estuary' and 'Gulf', respectively — or the Gaspé Bay, also in the northern Gulf of St. Lawrence). Solid line represents the mean, whereas the darker ribbon is 25–75% quantiles, medium ribbon is the 10–90% quantiles, and the light ribbon and dotted line are the 1-99% quantile