

Figure S1. Number of EcoMon plankton tows within each subregion by season and decade.

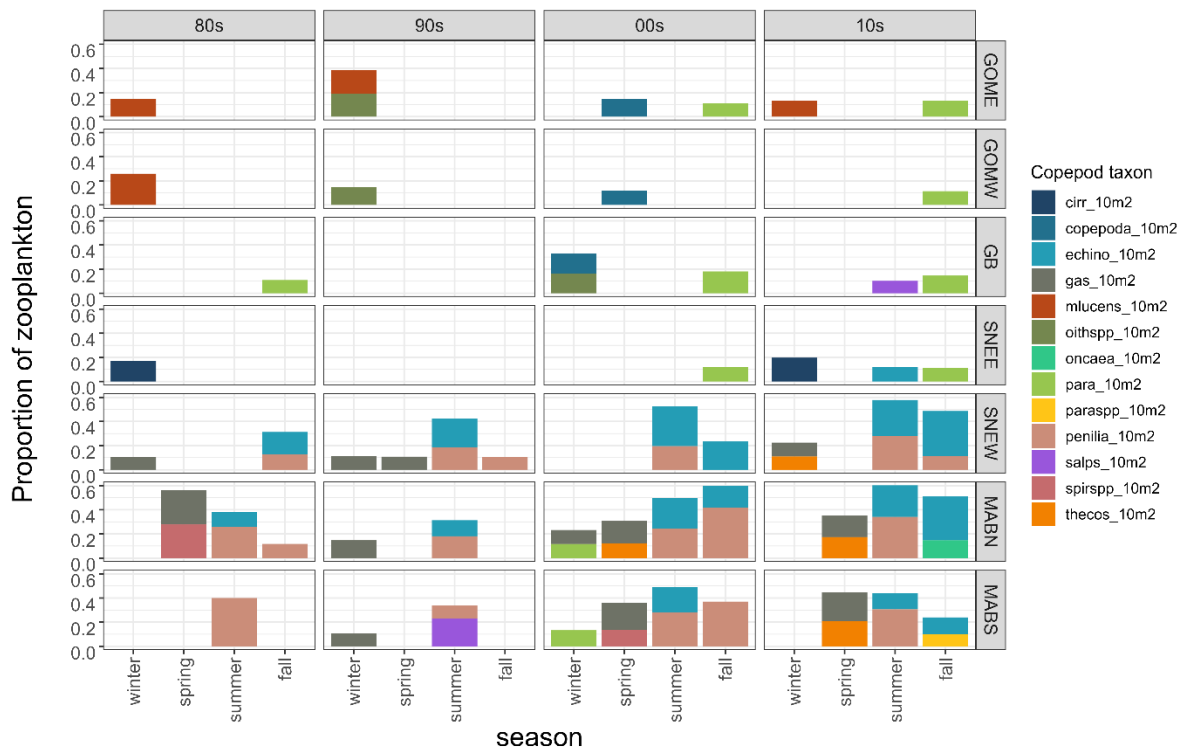


Figure S2. Zooplankton taxa which are not considered *E. glacialis* prey but that constituted >10% of zooplankton samples in the EcoMon dataset, split across subregions by season and decade.

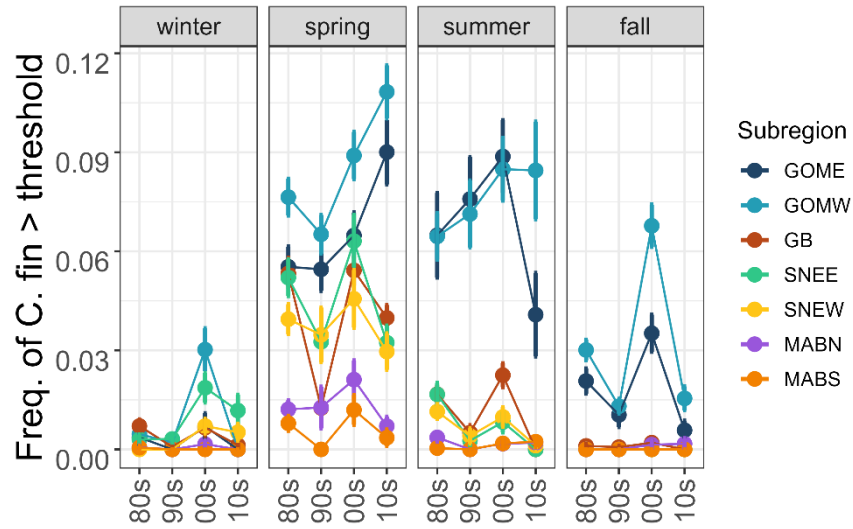


Figure S3. The proportion of EcoMon tows in each subregion, season, and decade that recorded *C. finmarchicus* abundance above the proposed feeding threshold of 40,000 ind/m<sup>2</sup>.

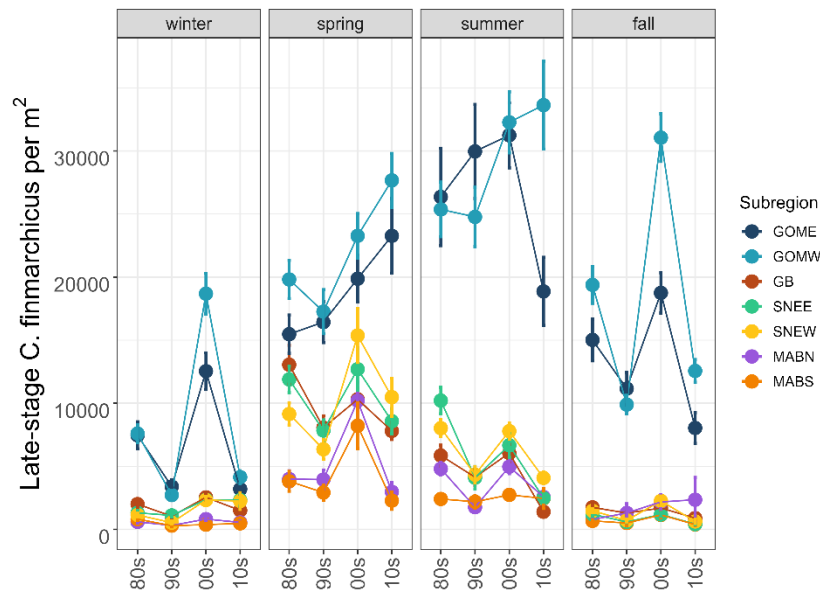
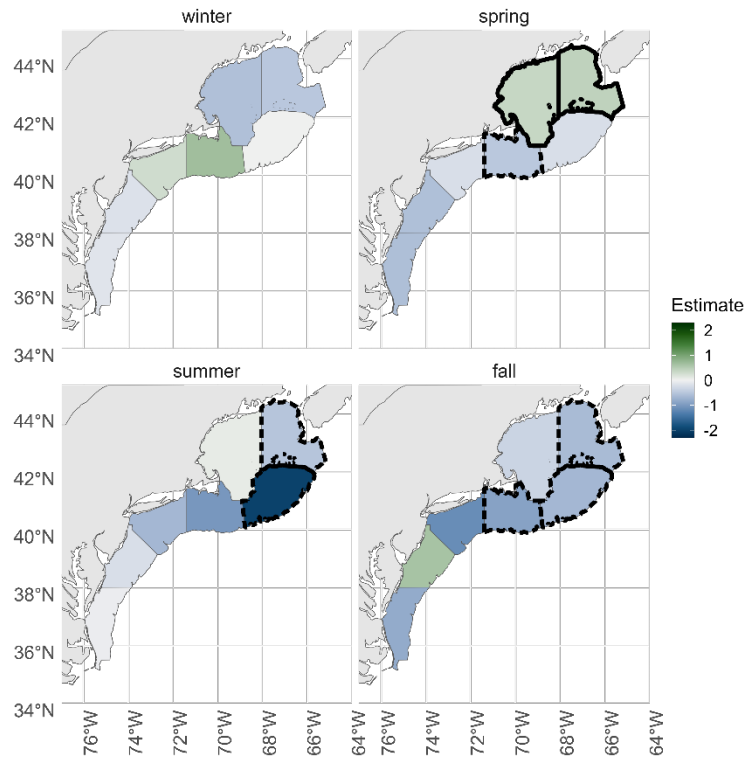
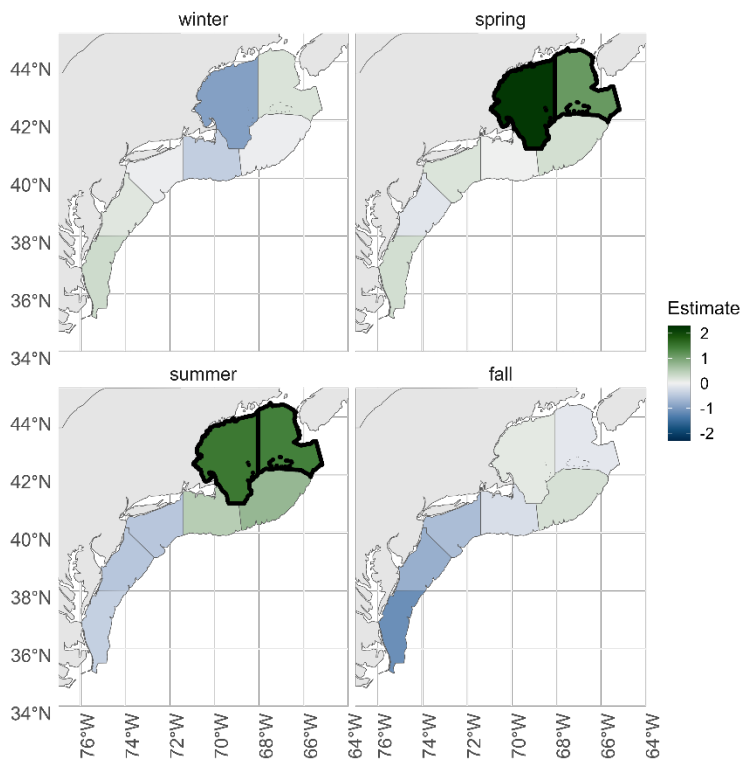


Figure S4. Decadal mean abundance of late-stage (C5-6) *C. finmarchicus* within each season and subregion.

A. *C. finmarchicus*



B. *C. typicus*



C. *Pseudocalanus* spp.

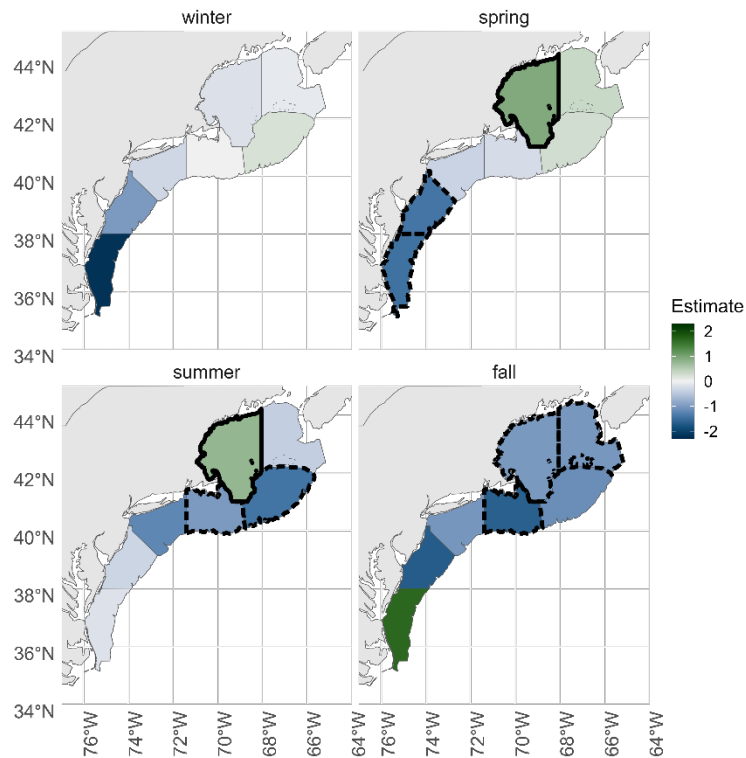


Figure S5. Changes in seasonal mean abundance (in  $\ln(\text{ind. per m}^2)$ ) of a) *C. finmarchicus* b) *C. typicus* and c) *Pseudocalanus* spp. within subregions in the 2010s vs 1980s-2000s estimated using Generalized Linear Models. Solid bold borders indicate strong evidence of an increase in abundance in the 2010s compared to previous decades, dashed bold borders indicate strong evidence of a decrease (i.e. 95% CI does not cross 0).

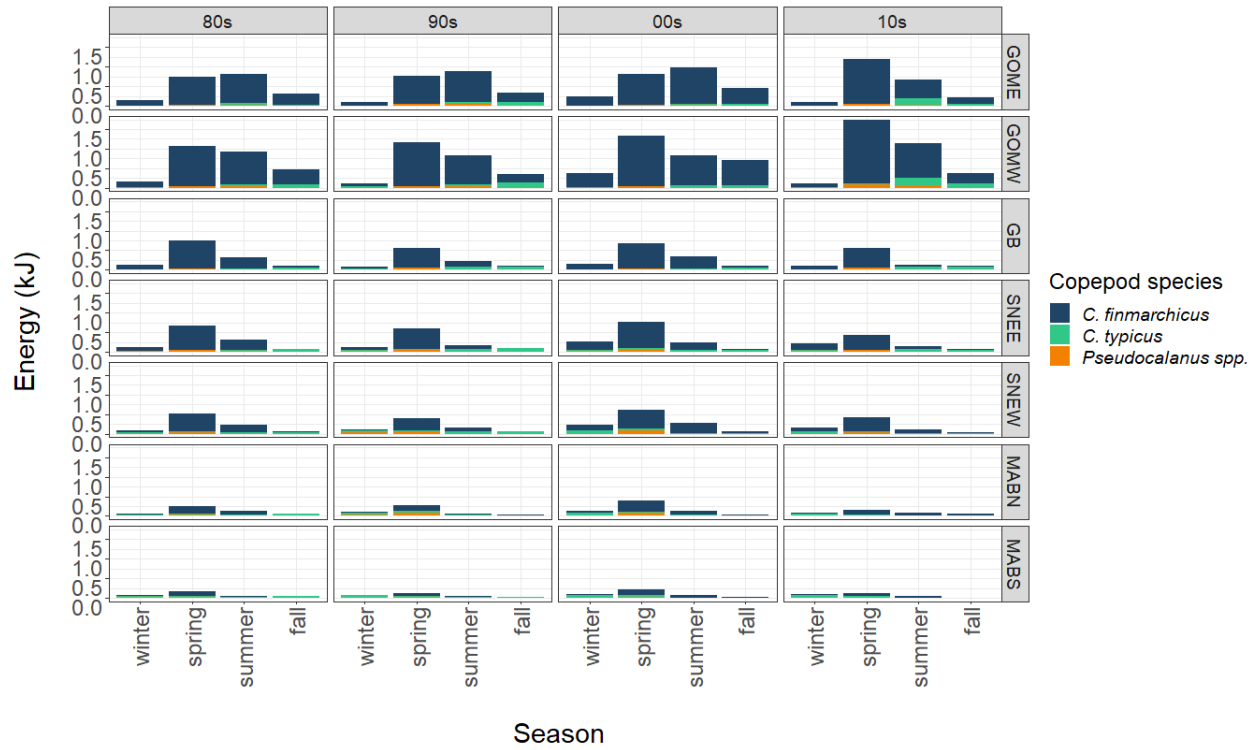
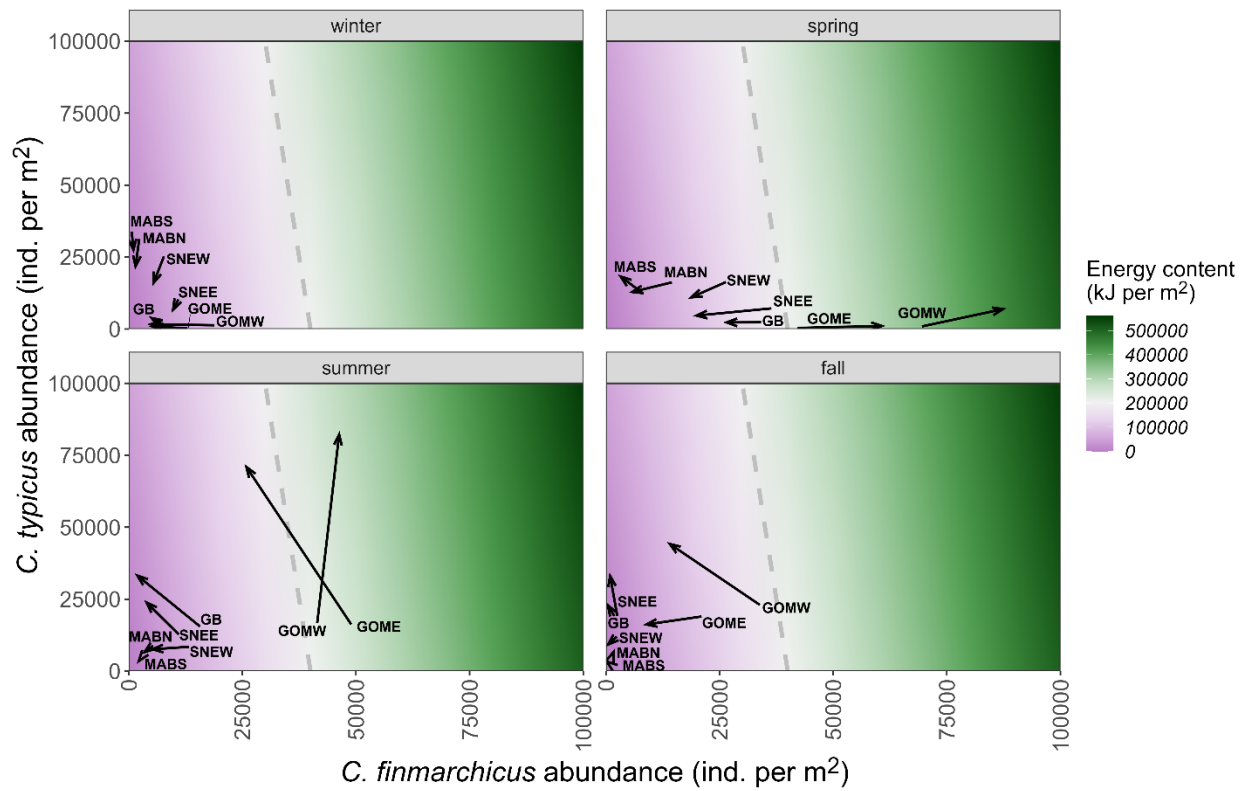


Figure S6. Estimated energy content of the three main copepod taxa across decades by season and subregion.

A.



B.

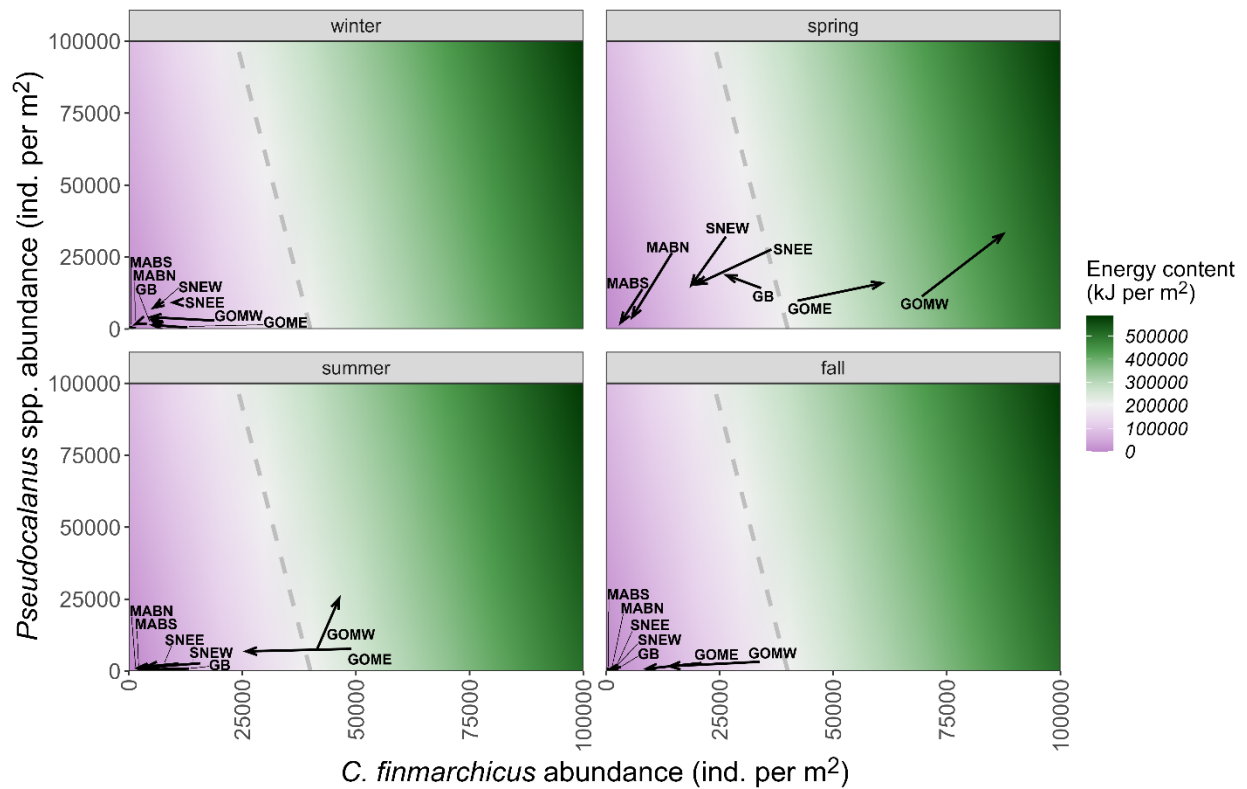


Figure S7. Estimated energy content of copepod prey across the range of observed copepod abundances from Figure 3 (0-100,000 individuals) based on abundance of *C. finmarchicus* and *A. C. typicus* B. *Pseudocalanus* spp.. The color gradient represents the summed energy content (kJ/m<sup>2</sup>) for a given abundance of *C. finmarchicus* and small copepod taxa. The dashed line indicates the hypothesized threshold that needs to be exceeded to sustain significant right whale foraging, equivalent to the energy contained in 40000 *C. finmarchicus* (Mayo and Marx, 1990; Record et al., 2019). Arrows indicate decadal changes in estimated summed energy density within each subregion and season from the 2000s (the base of the arrow) to the 2010s (the point of the arrow).

Table S1. Estimated carbon content averaged across all stages for each main prey copepod (from DeLorenzo Costa et al., 2006) and calculated average energy content using conversion factor from Salonen et al., 1976.

<b>Taxa</b>	<b>Carbon content (mg C)</b>	<b>Energy density (kJ/individual)</b>
<i>C. finmarchicus</i>	110	5.06
<i>C. typicus</i>	11	0.506
<i>Pseudocalanus</i> spp.	18	0.828

#### LITERATURE CITED

- DeLorenzo Costa A, Durbin EG, Mayo CA (2006) Variability in the nutritional value of the major copepods in Cape Cod Bay (Massachusetts, USA) with implications for right whales. *Mar Ecol* 27: 109–123 <https://doi.org/10.1111/j.1439-0485.2006.00087.x>
- Mayo CA, Marx MK (1990) Surface foraging behaviour of the North Atlantic right whale, *Eubalaena glacialis*, and associated zooplankton characteristics. *Can J Zool* 68: 2214–2220 <https://doi.org/10.1139/z90-308>
- Record NR, Runge JA, Pendleton DE, Balch WM and others (2019) Rapid climate-driven circulation changes threaten conservation of endangered North Atlantic right whales. *Oceanography* (Wash DC) 32: 162–169 <https://doi.org/10.5670/oceanog>