**Major Expansion of Marine Forests in a Warmer Arctic**

**Supplementary Information**

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Chart, bar chart

Description automatically generated

Figure S1. Significant spatial autocorrelation of each environmental predictor used in the niche models developed for (a) intertidal and (b) subtidal macroalgae and for (c) eelgrass.

Chart

Description automatically generated

Figure S2. Partial dependency functions depicting the effect of each environmental predictor on the response of the species distribution modelling developed for subtidal macroalgae.

Chart

Description automatically generated

Figure S3. Partial dependency functions depicting the effect of each environmental predictor on the response of the species distribution modelling developed for intertidal macroalgae.

Graphical user interface, chart

Description automatically generated

Figure S4. Partial dependency functions depicting the effect of each environmental predictor on the response of the species distribution modelling developed for eelgrass.

Chart, radar chart

Description automatically generated

Figure S5. Permanent sea ice concentration for the present and future times (2090-2100) under contrasting scenarios of greenhouse gas emissions (RCP2.6 and RCP 8.5). Ensemble of multiple atmospheric-ocean general circulation models from the Climate Model Intercomparison Project: CCSM4, GFDL-ESM2G, HadGEM2-ES, IPSL-CM5A-LR, MIROC-ESM.

Table S1. Warming rate (ºC decade-1) and permanent sea ice loss (km2 decade-1) projected for the pan-Arctic region and by Arctic sector for future times (2090-2100) under contrasting scenarios of greenhouse gas emissions (RCP2.6 and RCP 8.5). Ensemble of multiple atmospheric-ocean general circulation models from the Climate Model Intercomparison Project: CCSM4, GFDL-ESM2G, HadGEM2-ES, IPSL-CM5A-LR, MIROC-ESM.

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| --- | --- | --- | --- | --- |
|  | RCP26 | | RCP85 | |
| Region | Warming (ºC decade-1) | Ice loss (km2 decade-1) | Warming (ºC decade-1) | Ice loss (km2 decade-1) |
| ﻿Pan-Arctic | 0.17 | 217.08 | 0.75 | 464.71 |
| E.Greenland | 0.20 | 14.06 | 0.70 | 27.98 |
| W.Greenland | 0.08 | 0.84 | 0.49 | 1.08 |
| Iceland | 0.09 |  | 0.49 |  |
| Svalbard | 0.29 | 16.32 | 0.84 | 22.38 |
| N.Norway | 0.25 |  | 0.70 |  |
| Russia | 0.24 | 117.82 | 0.84 | 241.76 |
| Alaska | 0.18 | 19.46 | 0.77 | 65.47 |
| Canada | 0.10 | 34.78 | 0.76 | 70.48 |
| Faroe Islands | 0.10 |  | 0.42 |  |