

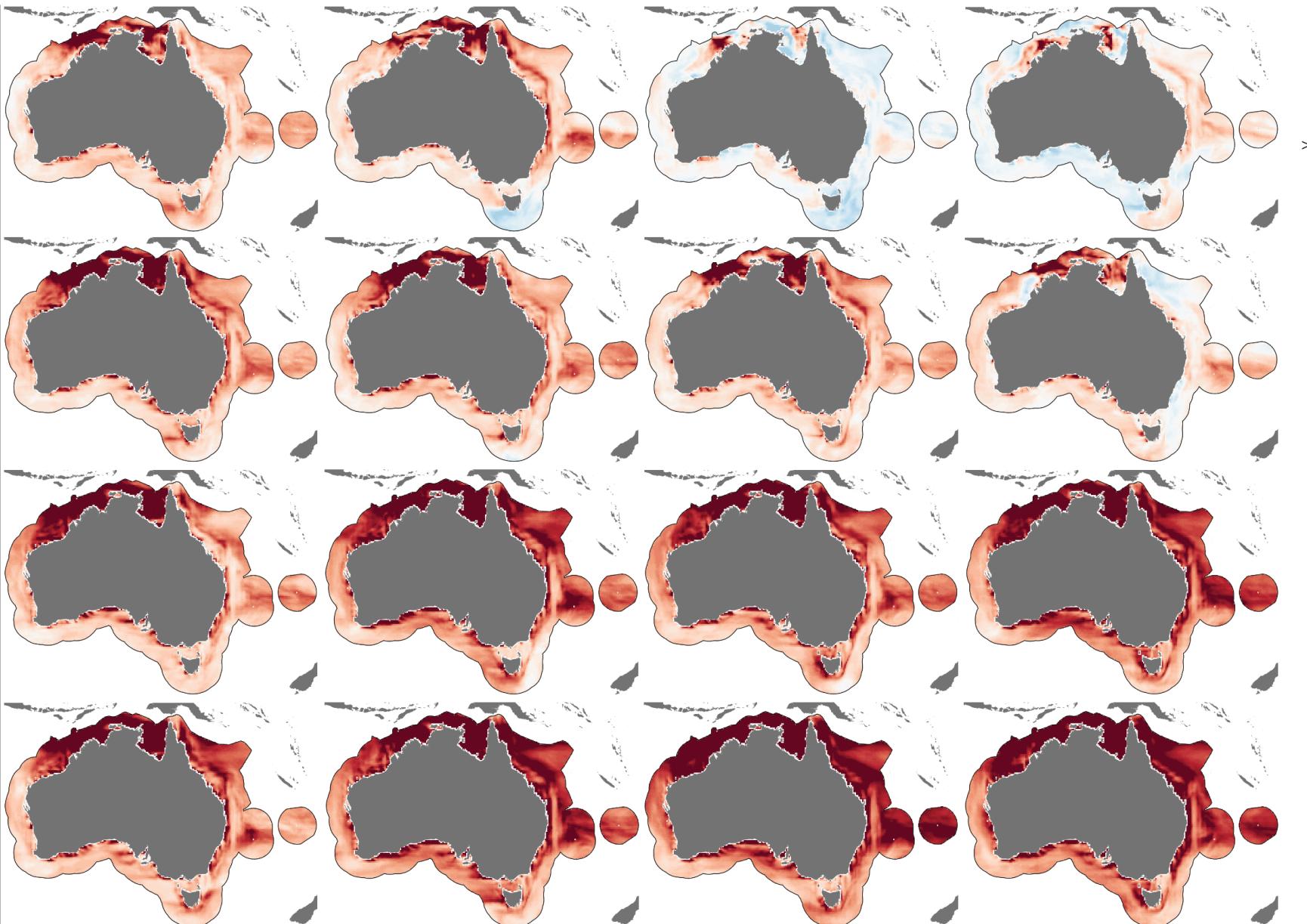
1 Supplementary figures

SSP1-2.6

SSP2-4.5

SSP3-7.0

SSP5-8.5



**Near-term**  
2021-2040

**Mid-term**  
2041-2060

**Intermediate-term**  
2061-2080

**Long-term**  
2081-2100

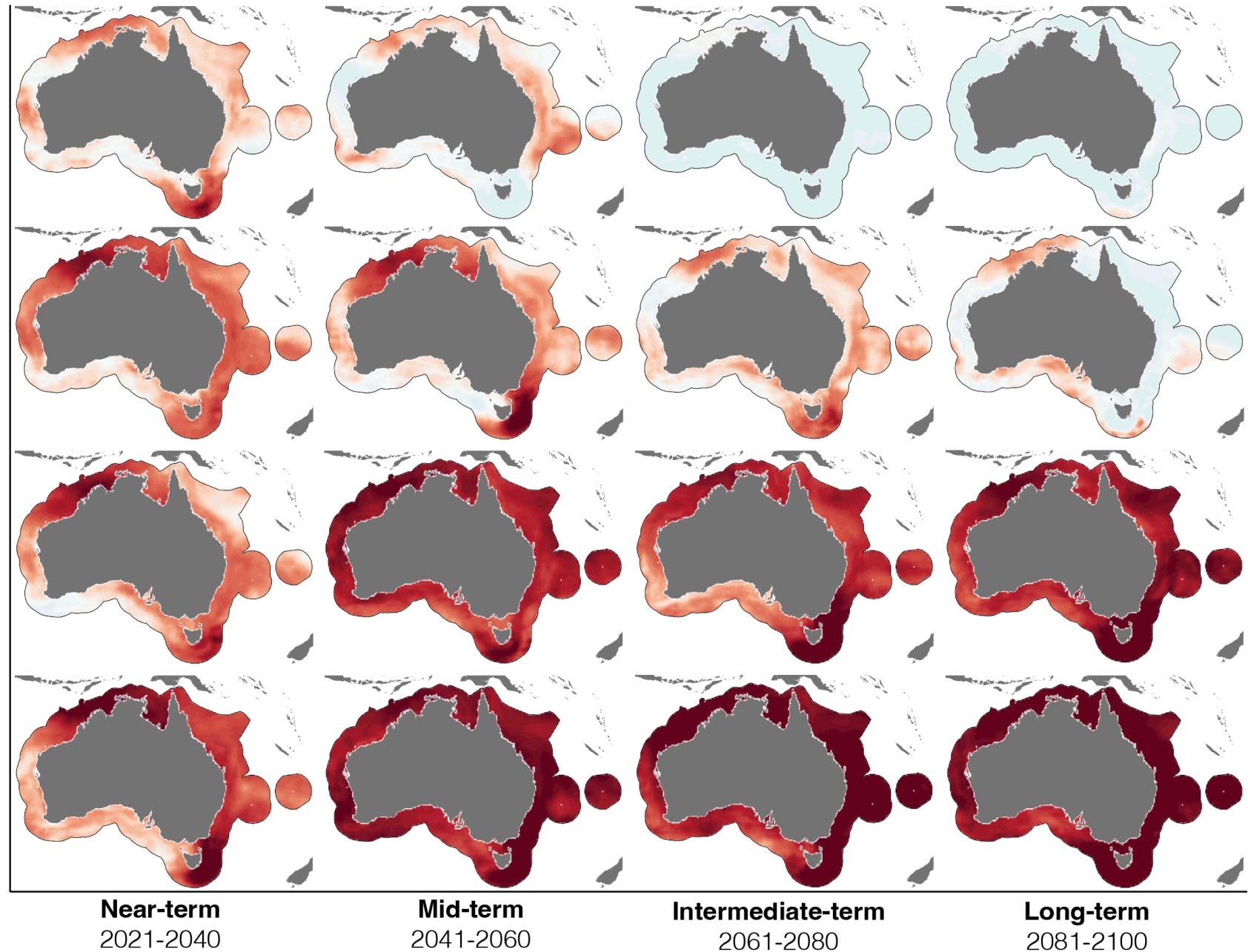
2 **Figure S1** The magnitude of ensemble median decadal climate velocity calculated from annual time series of ensemble medians for each reporting period under four IPCC AR6 emissions scenarios.

**SSP1-2.6**

**SSP2-4.5**

**SSP3-7.0**

**SSP5-8.5**



**Near-term**  
2021-2040

**Mid-term**  
2041-2060

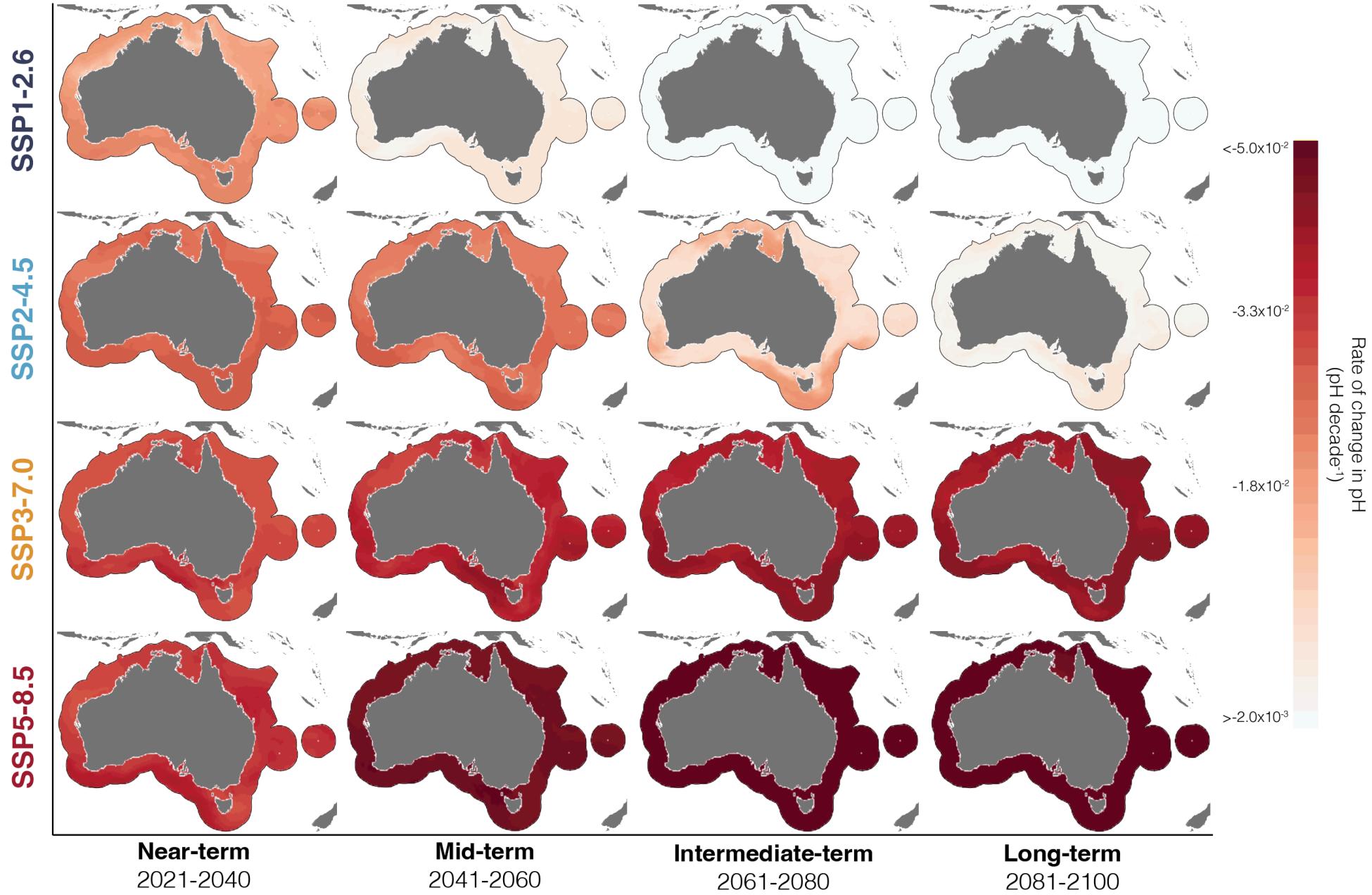
**Intermediate-term**  
2061-2080

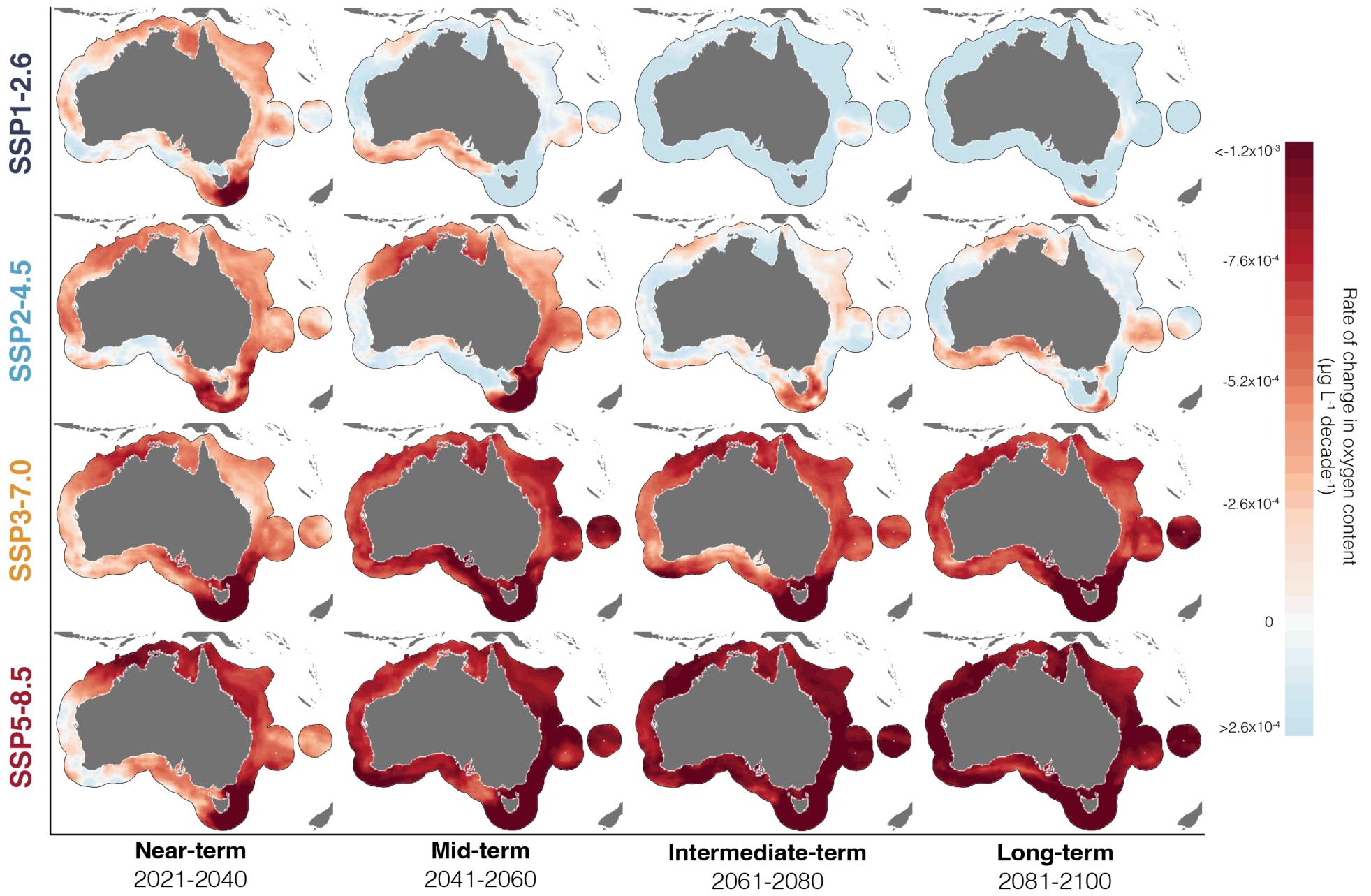
**Long-term**  
2081-2100

>0.3  
0.2  
0.1  
0  
<-0.04

Rate of change in sea surface temperature  
(°C decade<sup>-1</sup>)

3 **Figure S2** The decadal rate of change in ensemble median sea surface temperature anomalies, relative to the recent period, calculated from annual time series for each reporting period under four  
4 IPCC AR6 emissions scenarios.

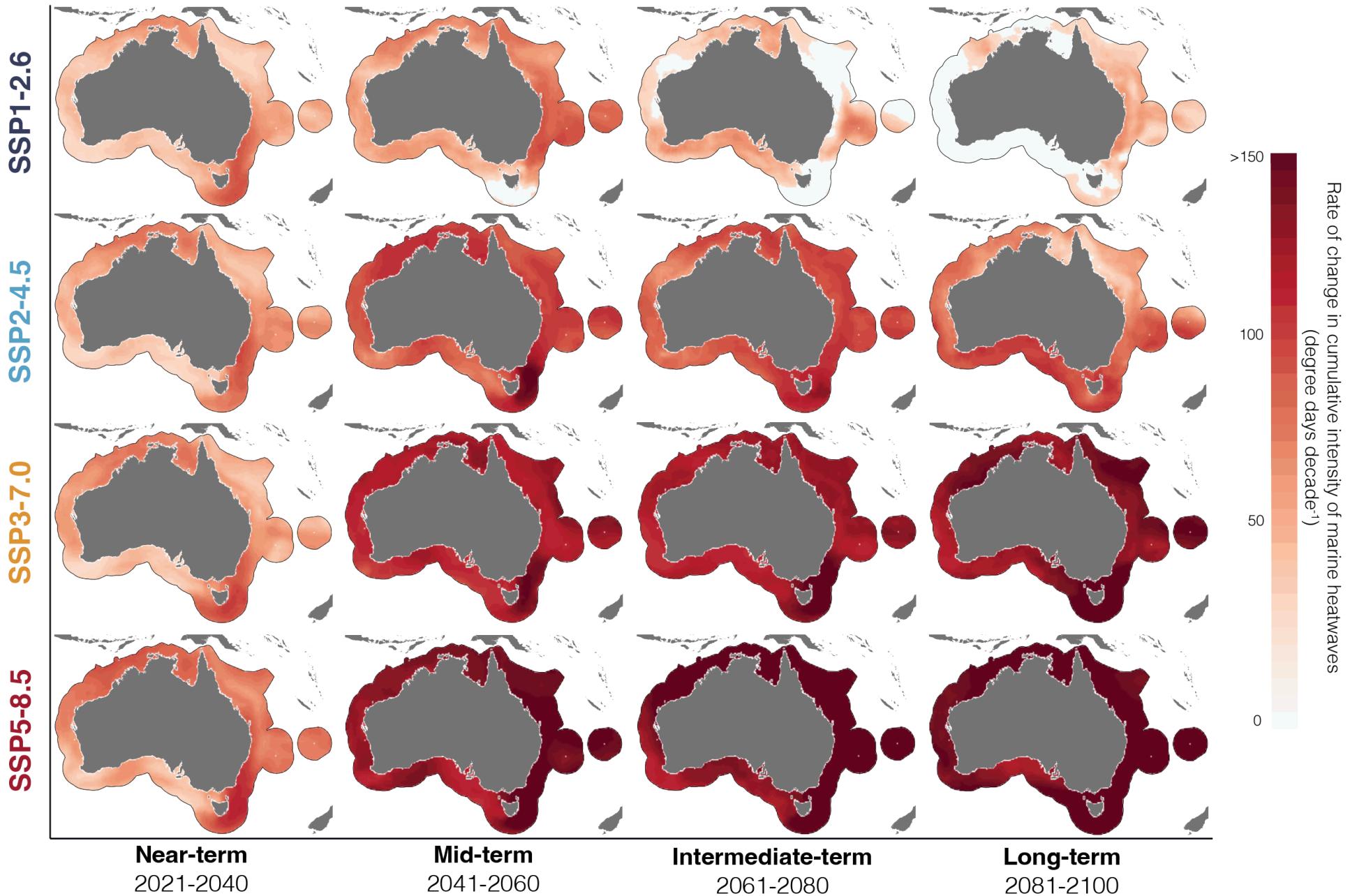




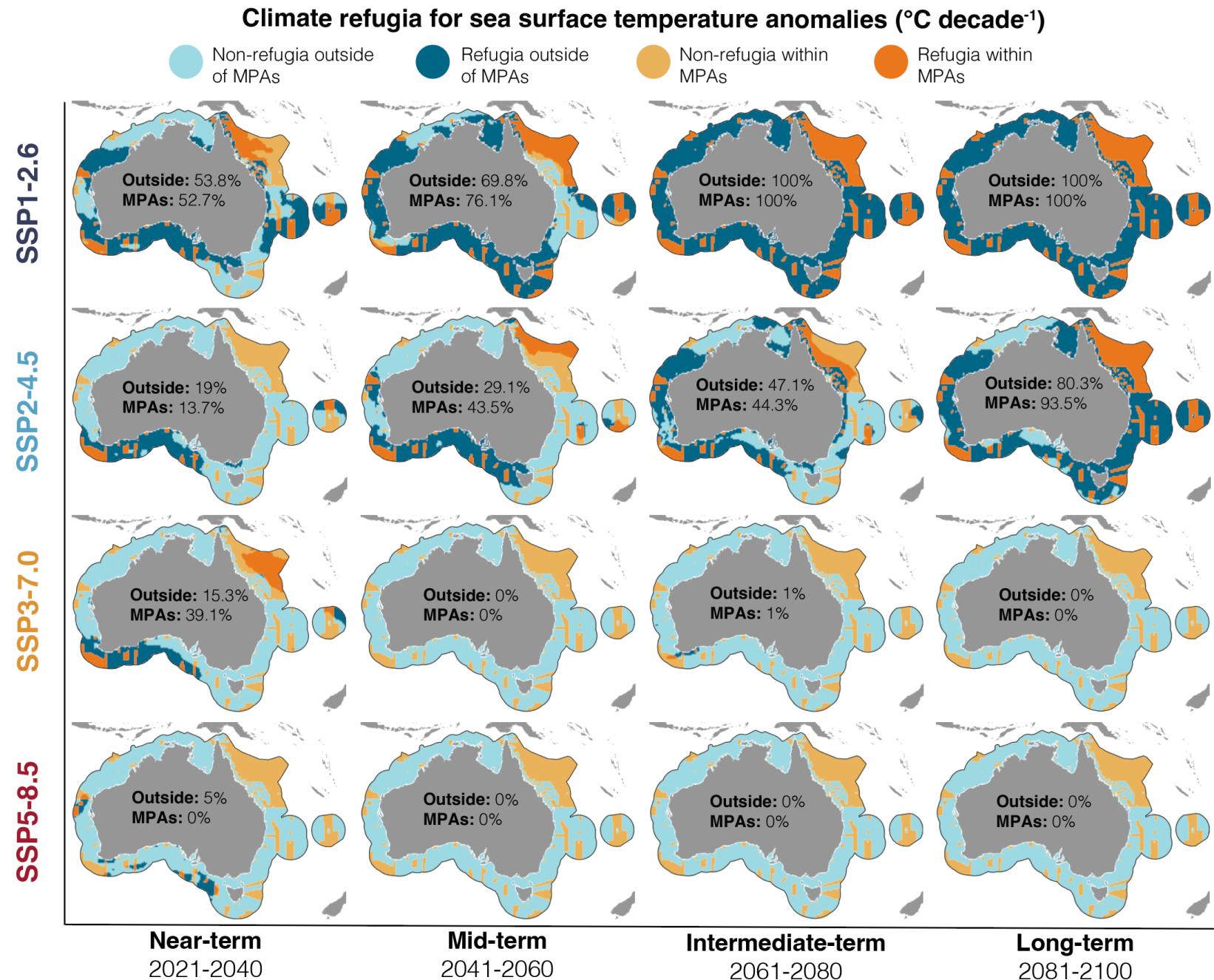
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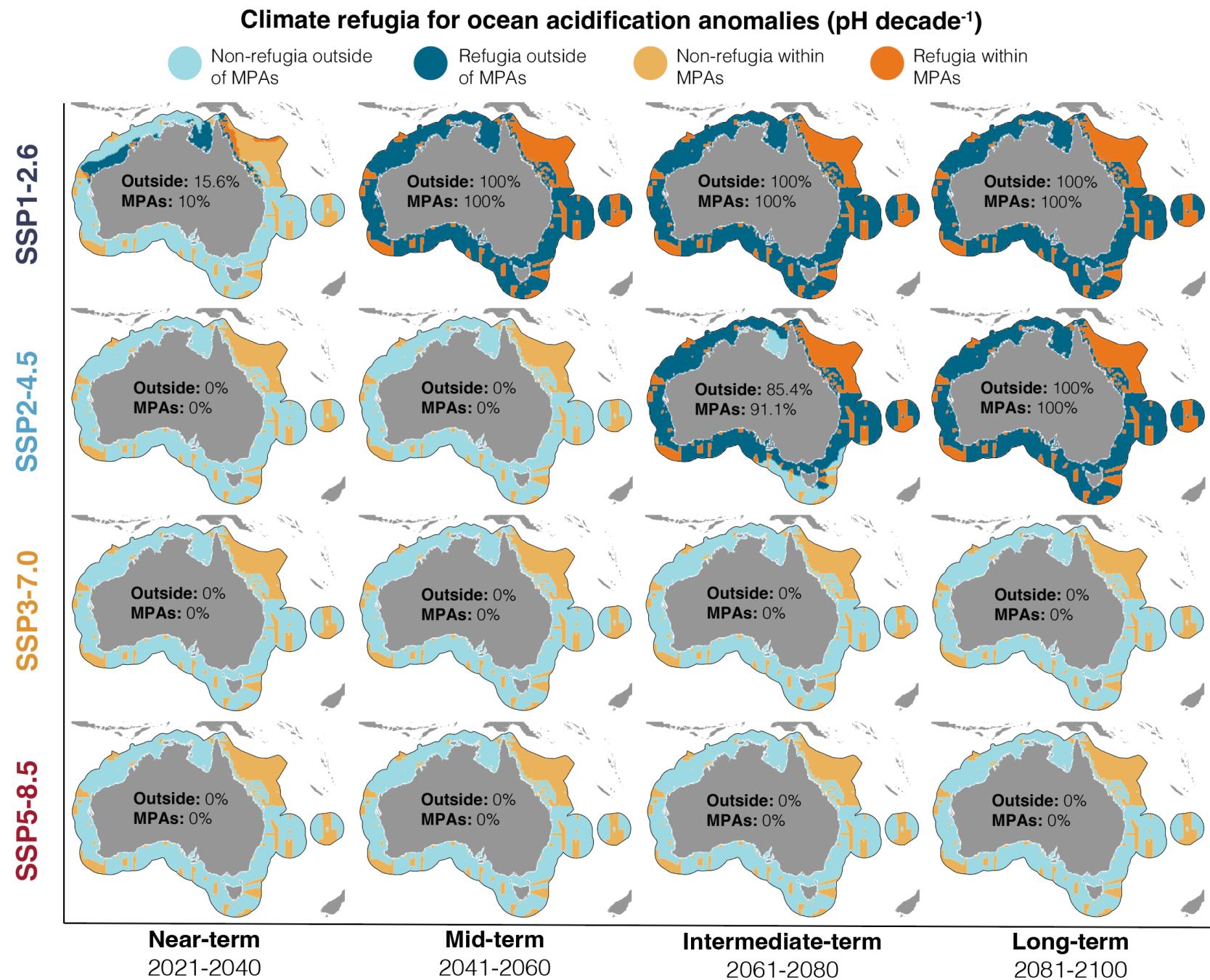
**Figure S4** The decadal rate of change in the ensemble median oxygen content, relative to the recent term, calculated from annual time series for each reporting period under four IPCC AR6 emissions scenarios.

7



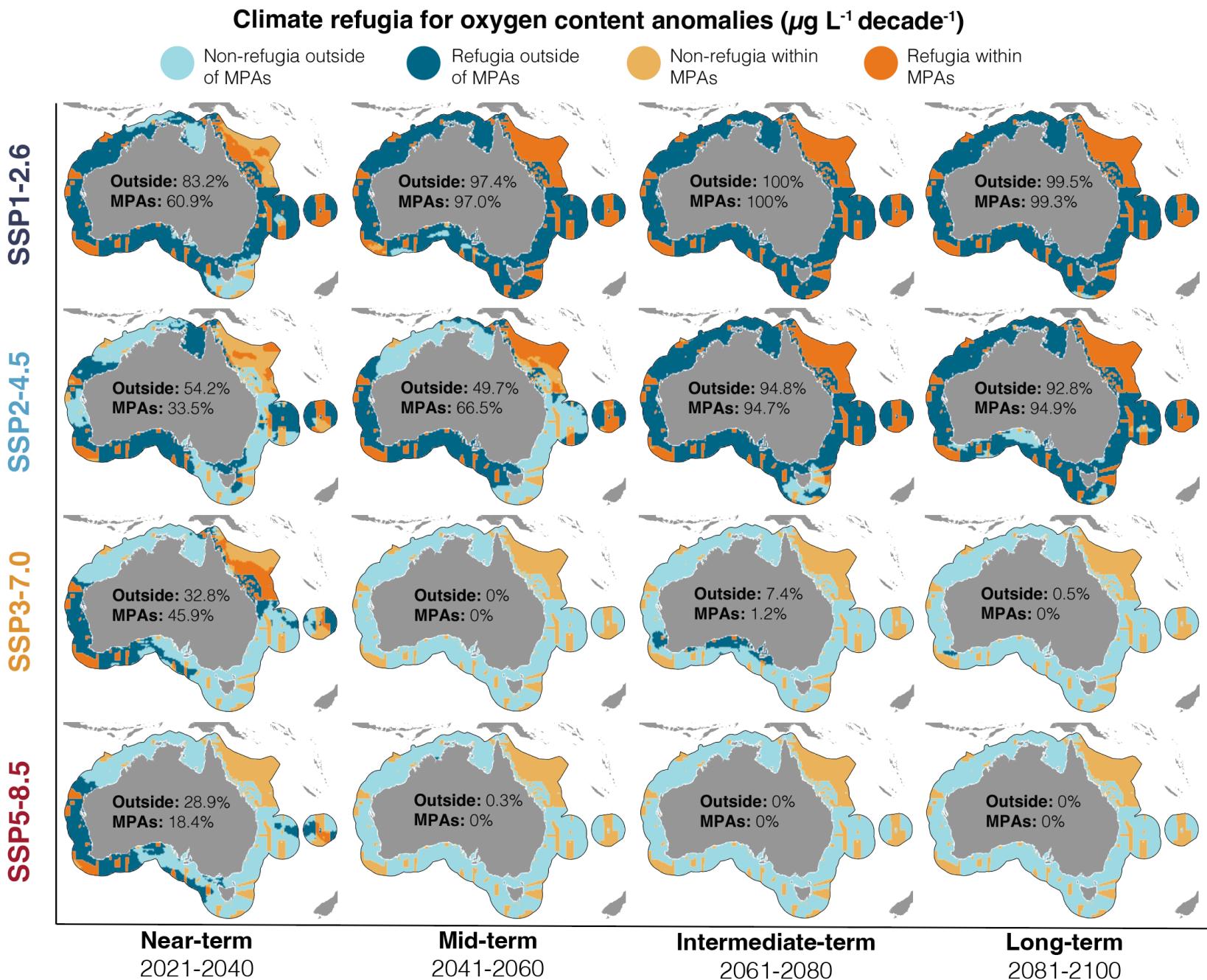
8 **Figure S5** The decadal rate of change in the ensemble median cumulative intensity of marine heatwaves, relative to the recent period,  
9 calculated from annual time series for each reporting period under four IPCC AR6 emissions scenarios.

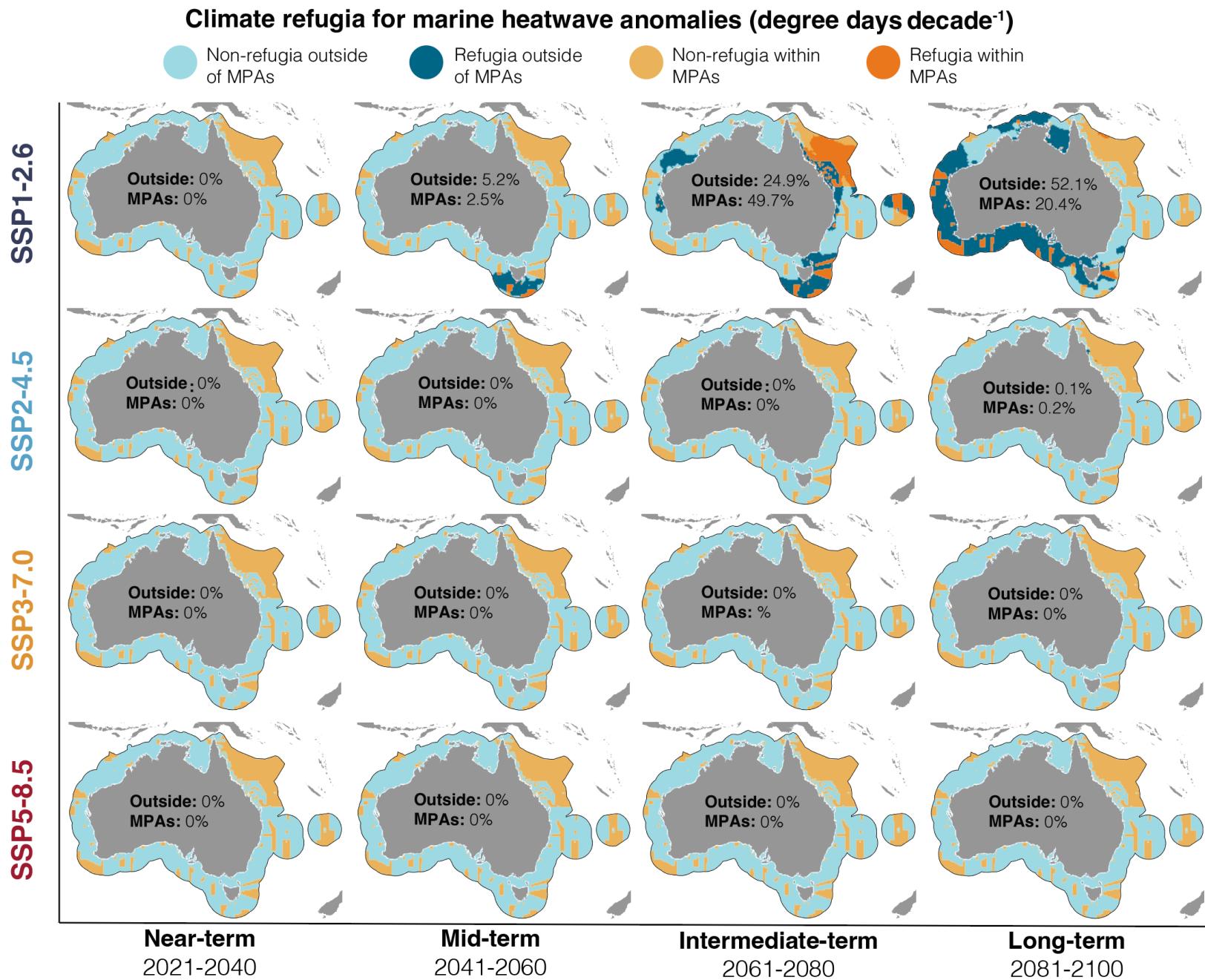


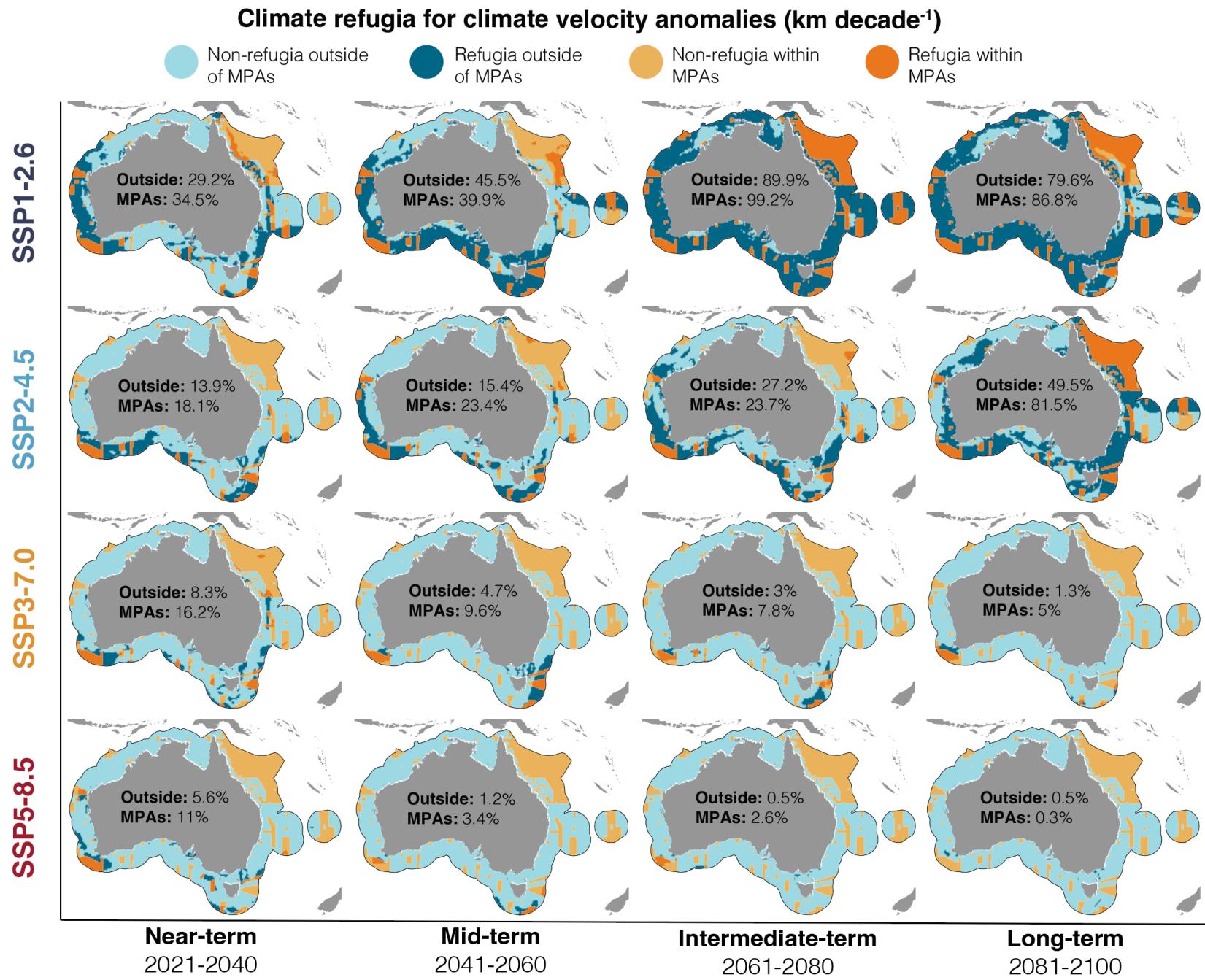


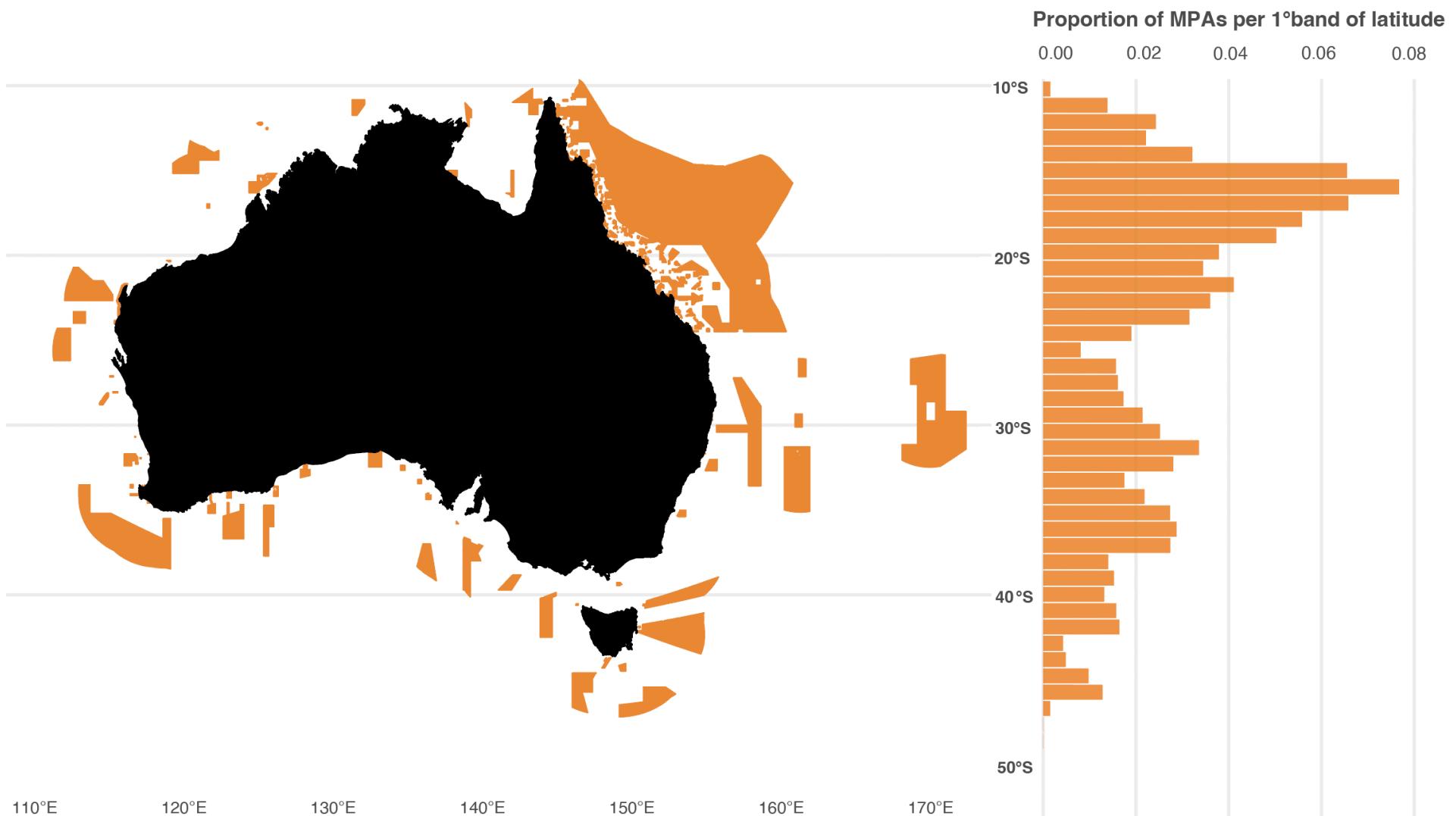
12 **Figure S7** Climate refugia for the decadal rate of change in ocean pH anomalies, and the percentage of each zone that are considered climate refugia. Climate refugia are defined as  $\leq 30^{\text{th}}$  percentile of

13 change in pH, relative to the recent period, calculated from annual time series for each reporting period under four IPCC AR6 emissions scenarios.

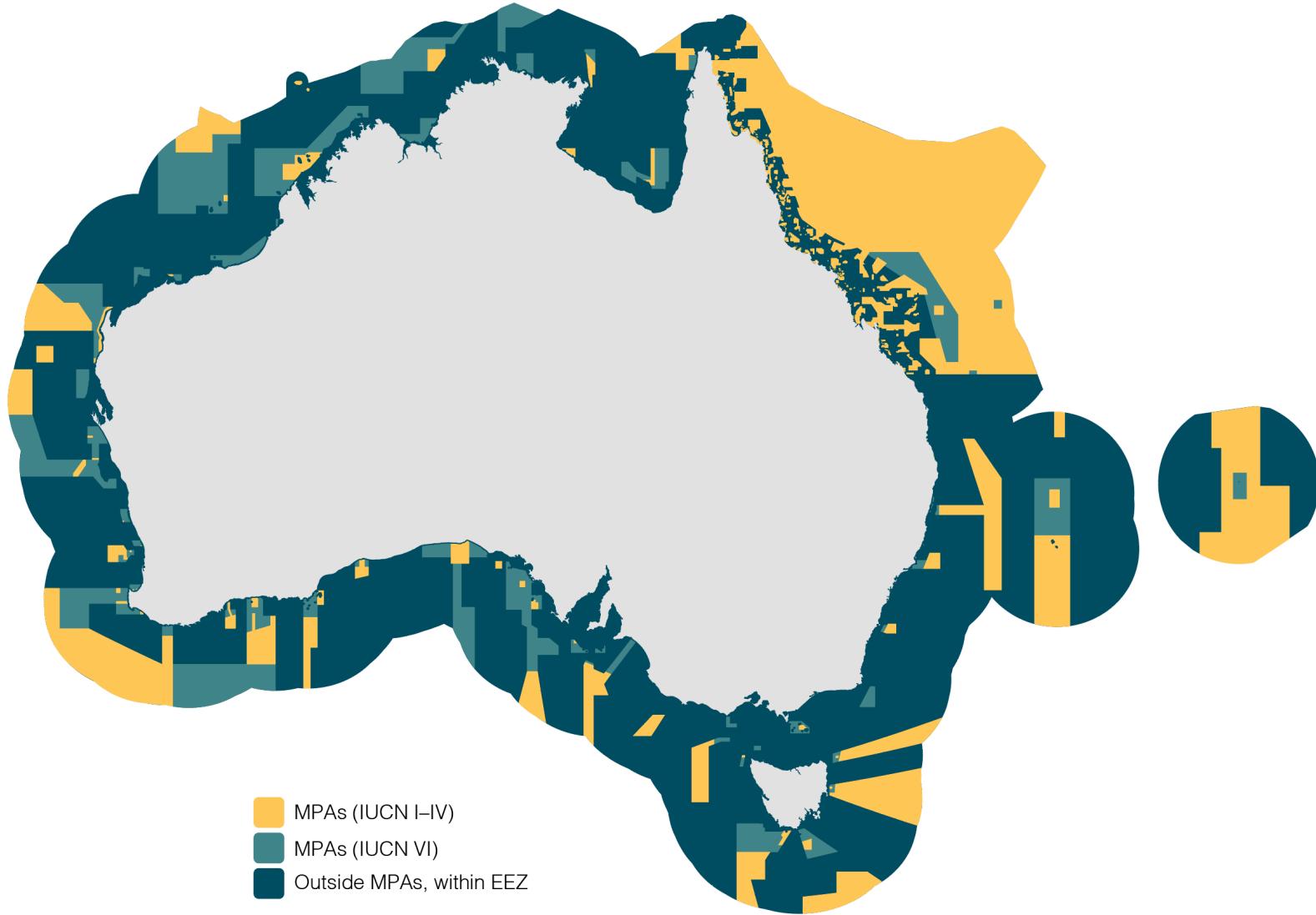








22 Figure S11 Proportion of the MPA network that is located within each 1° band of latitude.



**Figure S12** MPAs and their IUCN classifications. MPAs used in this study were limited to IUCN classifications I–IV (yellow), and excluded classifications of VI (green/dark grey).