Supplementary information: Ocean and marine heatwaves responses to multiple net-zero worlds

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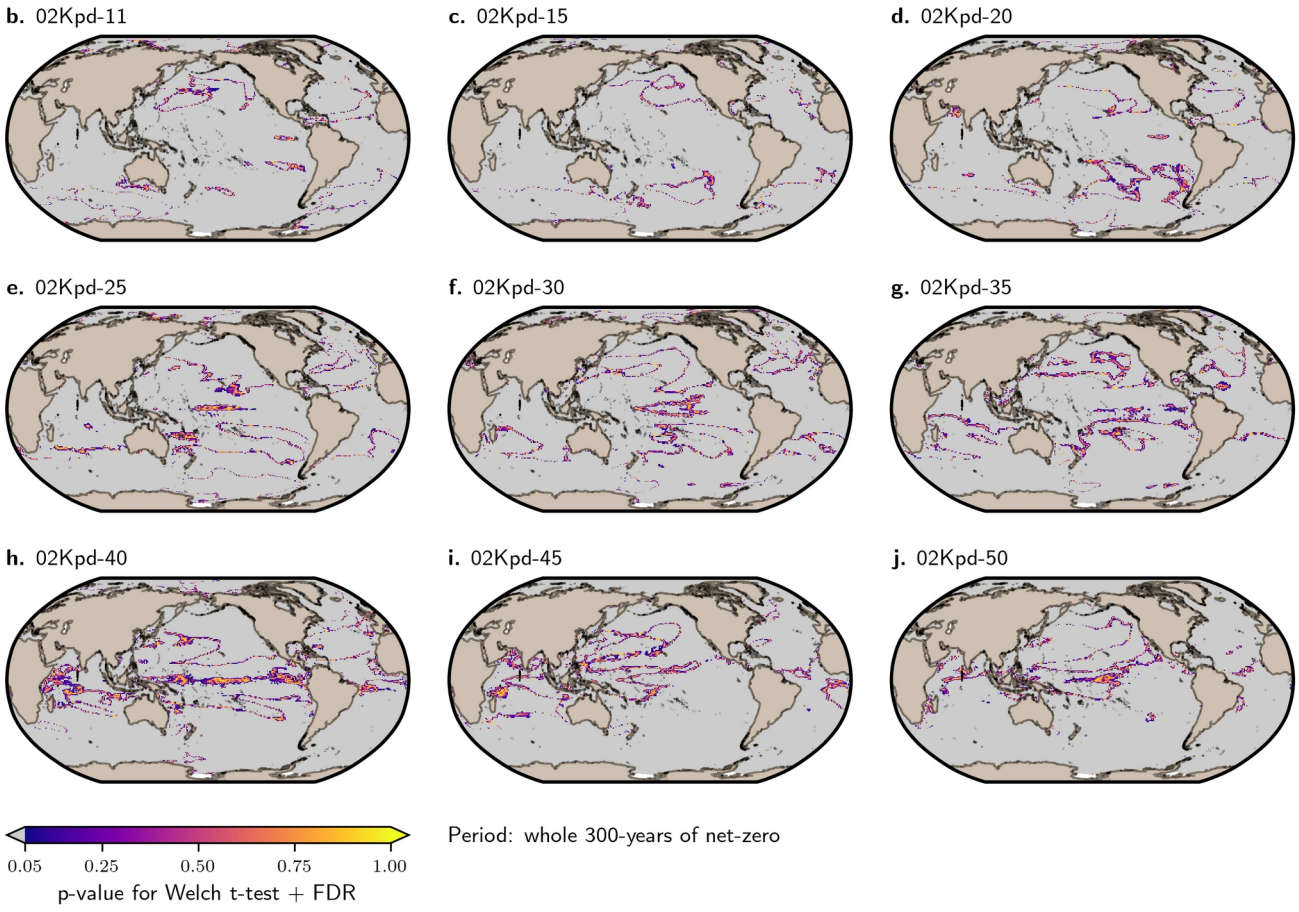

Figure S1. Welch t-test results for whole net-zero runs. The null hypothesis being that the SST anomalies distributions sampled from the 300-year stabilized simulations and from the transient baseline have statistically undistinguishable means and come from the same population. Here maps show the p-value corrected with FDR for all net-zero scenarios in panels (a-i). Grey areas indicate regions where the mean of the two samples are deemed statistically different according to a Welch t-test with a 5 % significance level.

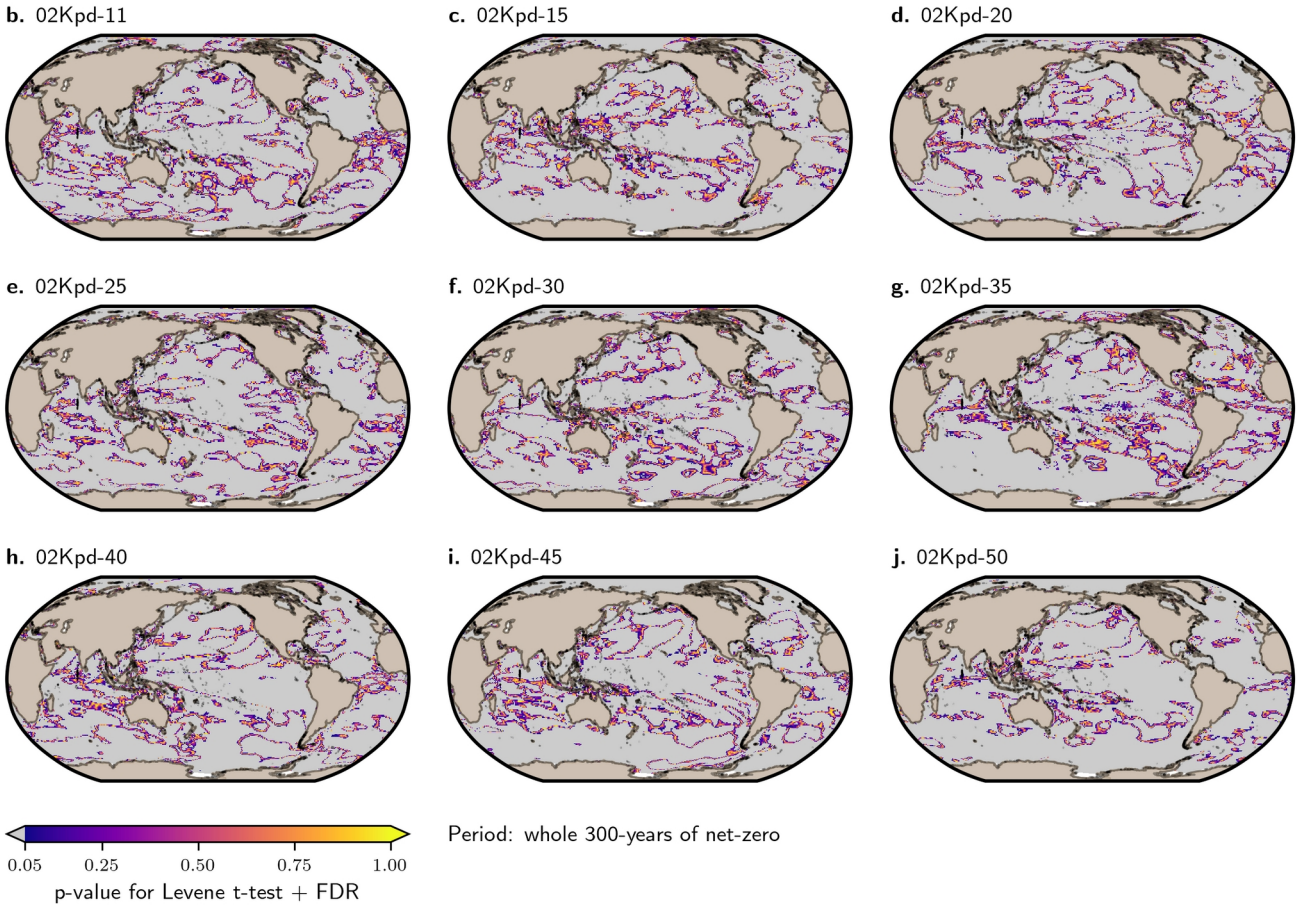

Figure S2. Levene results for whole net-zero runs. The null hypothesis being that the SST anomalies distributions sampled from the 300-year stabilized simulations and from the transient baseline have statistically undistinguishable means and come from the same population. Here maps show the p-value corrected with FDR for all net-zero scenarios in panels (a-i). Grey areas indicate regions where the mean of the two samples are deemed statistically different according to a Levene t-test with a 5 % significance level.

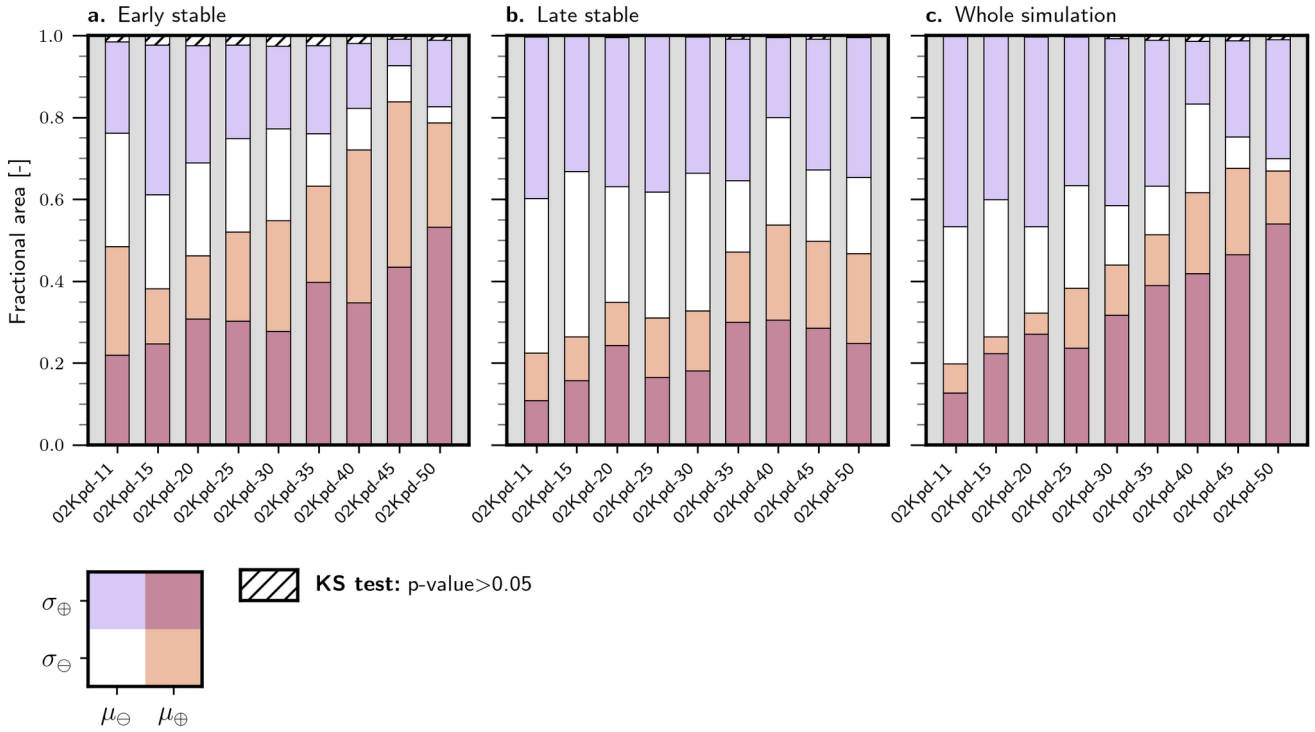

Figure S3. Fractions of the global ocean facing single or compound increases in the mean or variance of the SST distributions over the whole net-zero simulations. For (a) the early stable period, (b) the late stable period and (c) the whole net-zero runs. Co-occurring increases (*resp.* decreases) in both the mean and variance are shown in red (*resp.* white). The color scheme is summarized by the bivariate color map. Hatching indicates the fraction of the ocean where changes are not deemed significant judging by the result of a Kolmogorov-Smirnov statistical test. Each bar sums up the information for each net-zero run.

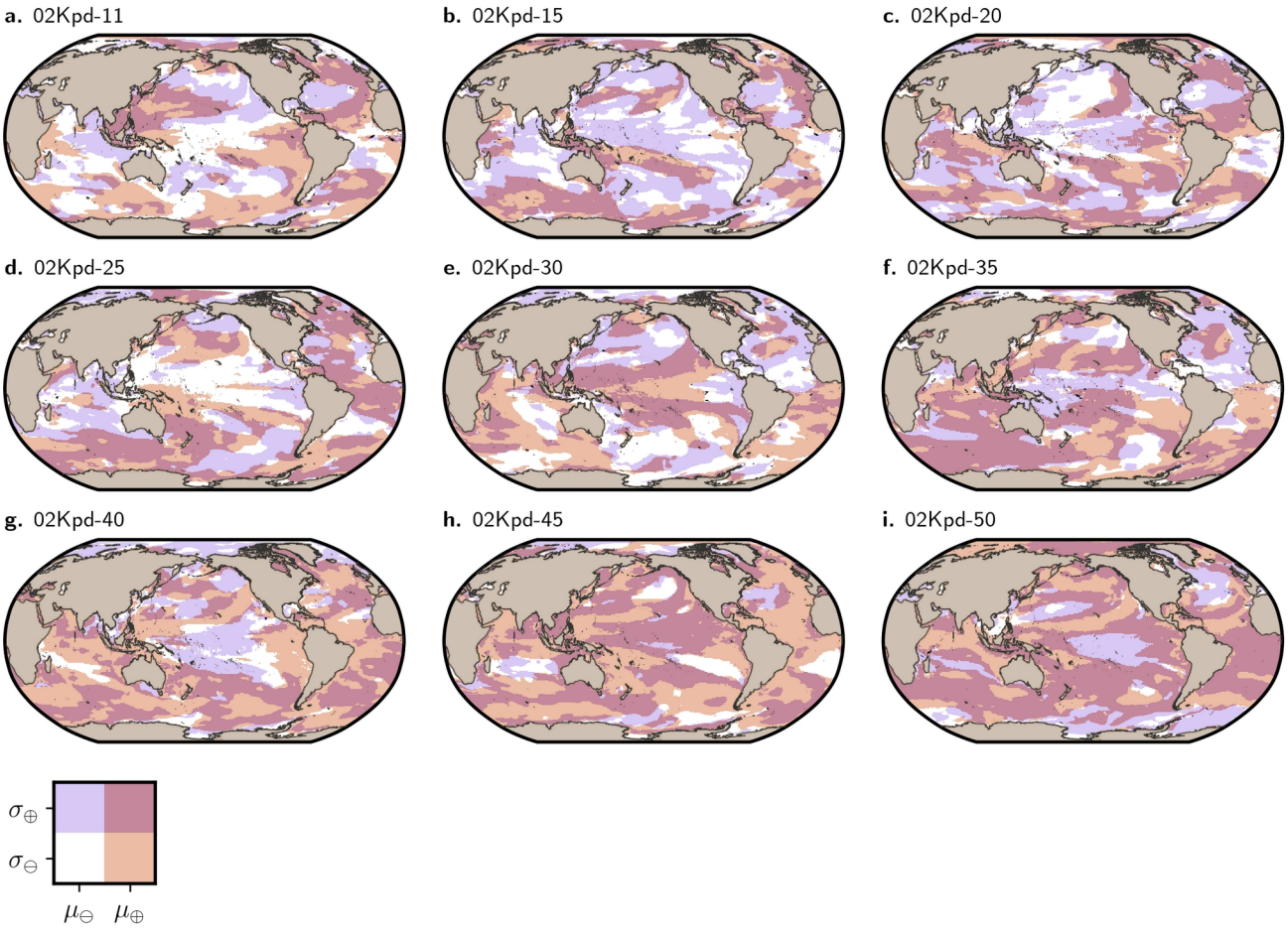

Figure S4. Regional changes in the mean and variance of the local SST anomaly distributions for the early-stable period relative to transient baselines. The maps highlight regions where the mean (μ) and (σ) the variance of SST distributions calculated over the whole net-zero simulations are increasing or decreasing relative to their respective transient baseline. Panels (a-i) decline the information for each net-zero run. Increases in the mean (*resp.* variance) only are shown in orange (*resp.* purple). Co-occurring increases (*resp.* decreases) in both the mean and variance are shown in red (*resp.* white). The color scheme is summarized by the bivariate color map.

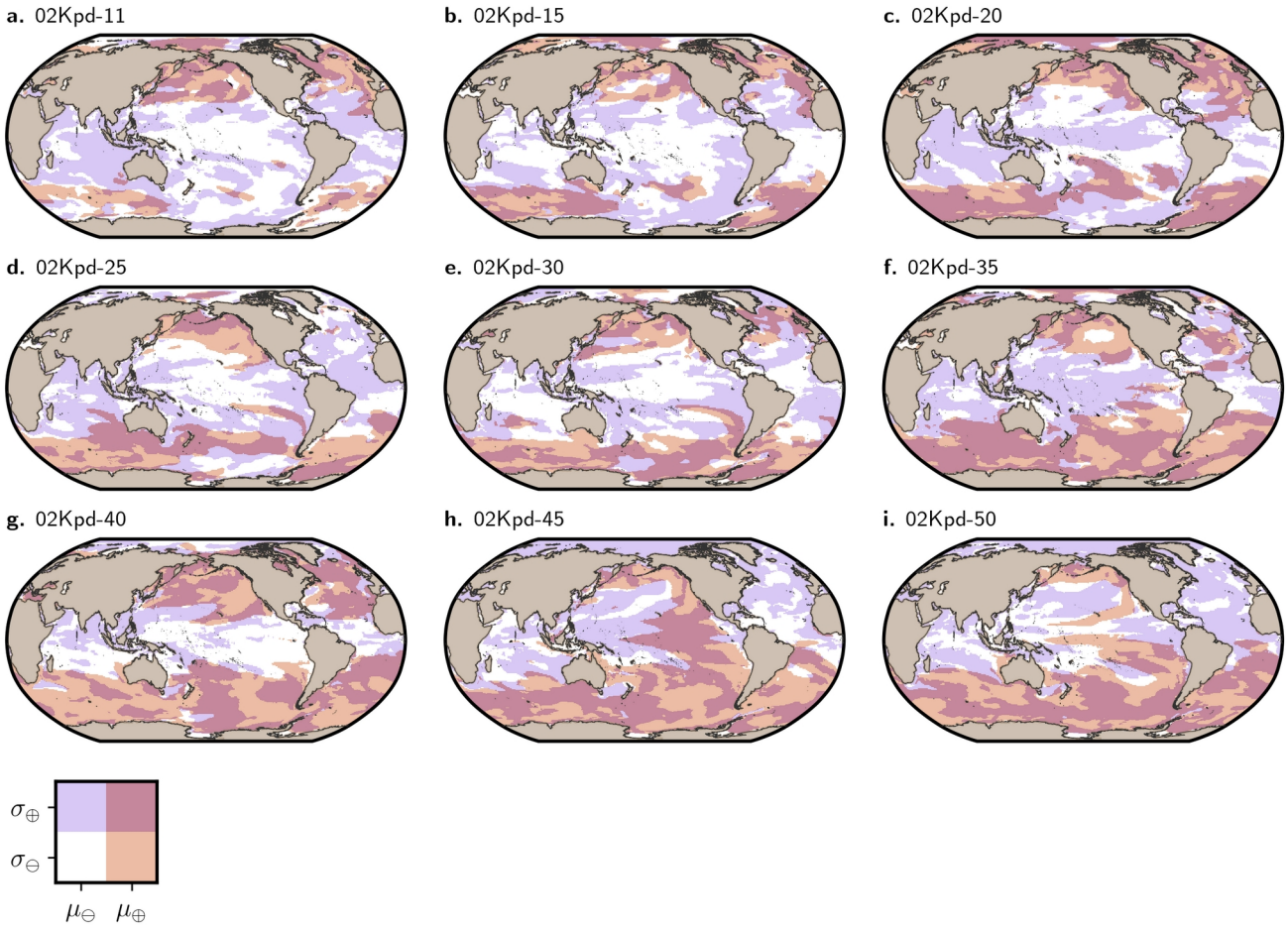

Figure S5. Regional changes in the mean and variance of the local SST anomaly distributions for the late-stable period relative to transient baselines. The maps highlight regions where the mean (μ) and (σ) the variance of SST distributions calculated over the whole net-zero simulations are increasing or decreasing relative to their respective transient baseline. Panels (a-i) decline the information for each net-zero run. Increases in the mean (*resp.* variance) only are shown in orange (*resp.* purple). Co-occurring increases (*resp.* decreases) in both the mean and variance are shown in red (*resp.* white). The color scheme is summarized by the bivariate color map.

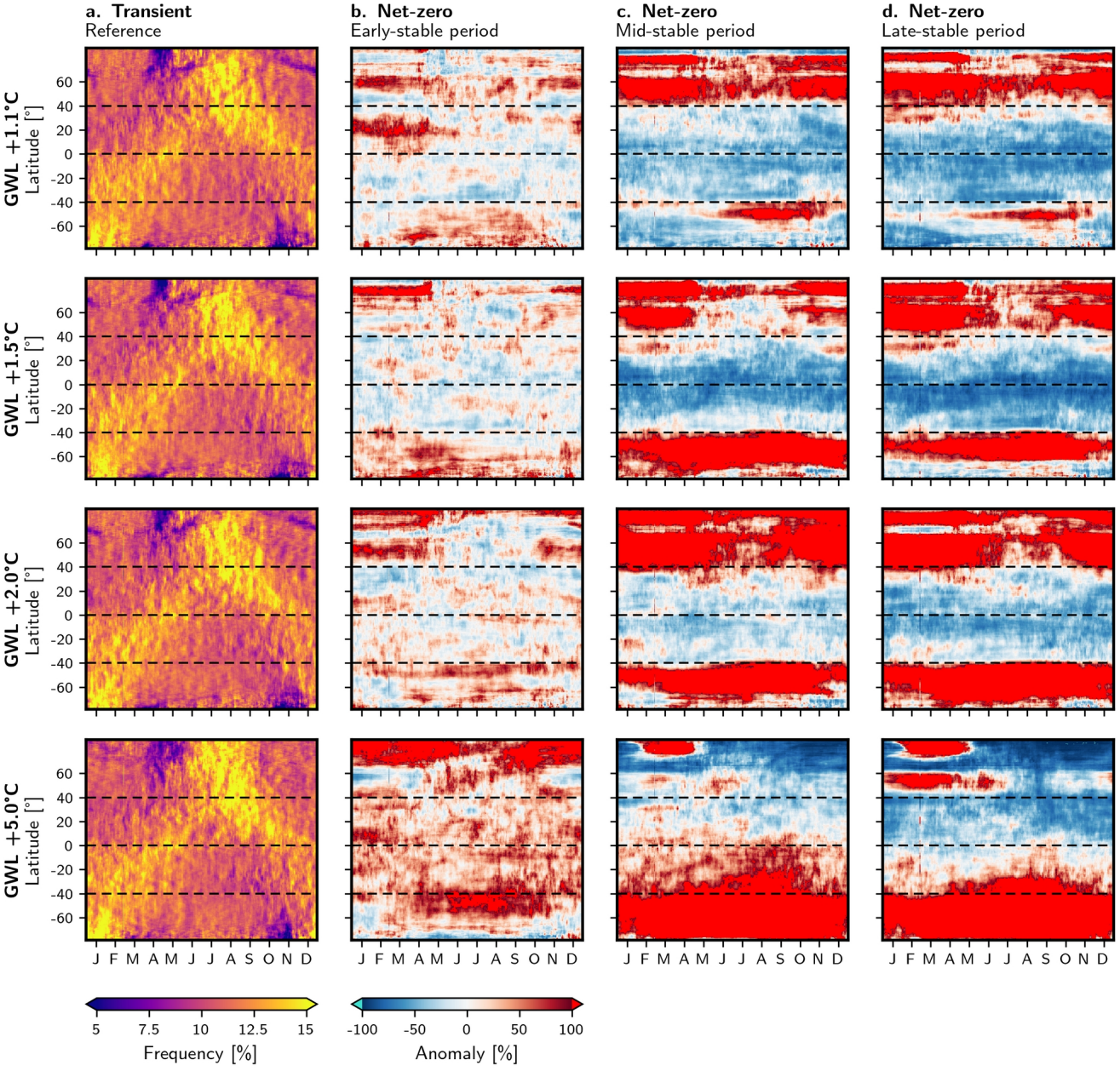

Figure S6. Seasonal cycle of marine heatwaves frequency and projected relative anomalies. Each line of panels stands for a given net-zero run stabilizing the global climate around the following global warming levels (GWL) : +1.1 °C, +1.5 °C, +2.0 °C and +5.0 °C. (a) The first column indicates the seasonal cycle of the zonal mean MHW's frequency over the TWL period. (b-d) Following columns give the projected absolute anomalies in the net-zero runs for the early-, mid- and late-stable periods relative to the TWL period. Red stands for higher frequency of MHW in net-zero whereas blue indicates a lower frequency than in the transient framework.

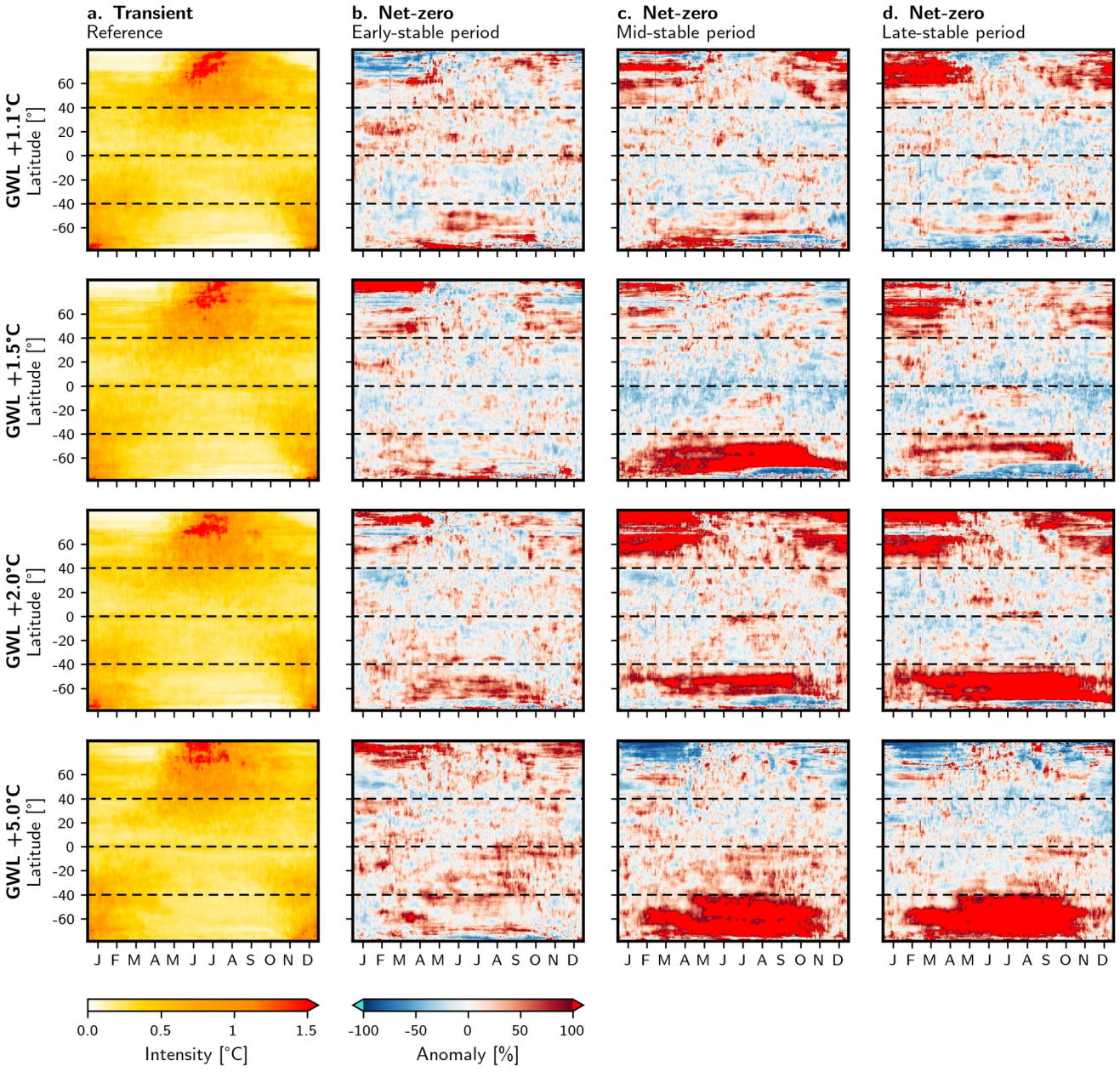

Figure S7. **Seasonal cycle of marine heatwaves intensity and projected relative anomalies. Each line of panels stands for a given net-zero run stabilizing the global climate around the following global warming levels (GWL) : +1.1 °C, +1.5 °C, +2.0 °C and +5.0 °C. (a) The first column indicates the seasonal cycle of the zonal mean MHW intensity over the TWL period. (b-d) Following columns give the projected absolute anomalies in the net-zero runs for the early-, mid- and late-stable periods relative to the TWL period. Red stands for higher intensity of MHW in net-zero whereas blue indicates a lower intensity than in the transient framework.**