**Supplementary materials**

**Figure S1. (a) Butterworth filtered PC 1 (EOF mode 1) for SST (oC) and the West Pacific (WP) climate index, (b) cross spectral power between PC 1 for SST (oC) and WP at given spectral frequency bands, (c) coherence showing correlation coefficients for SST and WP at spectral frequency bands, (d) cross-correlation function with respect to lags explaining phase-shifts. Horizontal dashed lines represent upper limits of 95% (light black) and 99% (dark black) confidence interval. Vertical grey dashed line represents phase-shift zero.**

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**Figure S2. (a) Butterworth filtered PC 1 (EOF mode 1) for Chl-a (mg m-3) and the West Pacific (WP) climate index, (b) cross spectral power between PC 1 for Chl-a (mg m-3) and WP at given spectral frequency bands, (c) coherence showing correlation coefficients for Chl-a and WP at spectral frequency bands, (d) cross-correlation function with respect to lags explaining phase-shifts. Horizontal grey dashed lines represent upper limits of 95% confidence interval. Vertical grey dashed line represents phase-shift zero.**

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