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Supplemental Material

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1 SUPPLEMENTARY INFORMATION

2 Supplementary Figures for Dai and Tan, "On the role of the Eastern Pacific teleconnection in
3 ENSO impacts on wintertime weather over East Asia and North America"

4 This document includes the Supplementary Figures that are referred to in the main text.

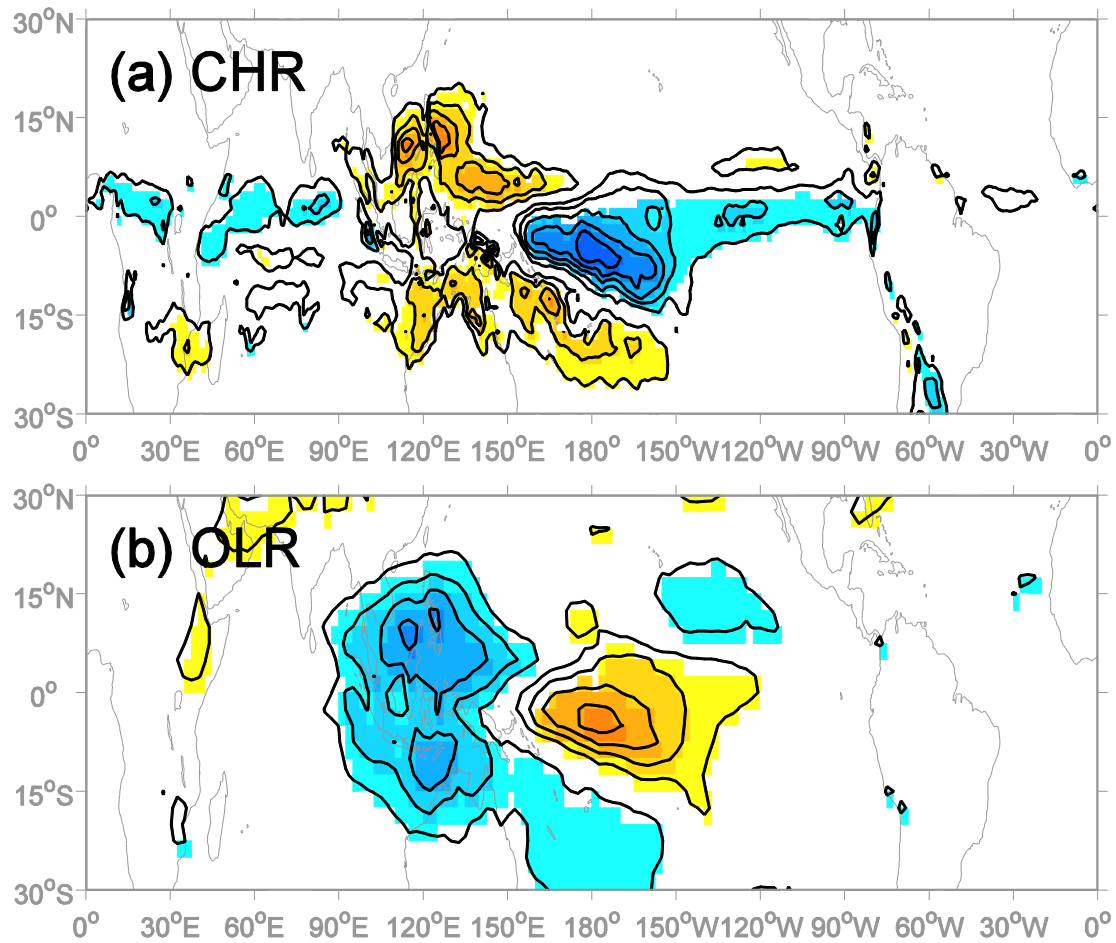
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6 **On the role of the Eastern Pacific teleconnection in ENSO impacts on**
7 **wintertime weather over East Asia and North America**

8
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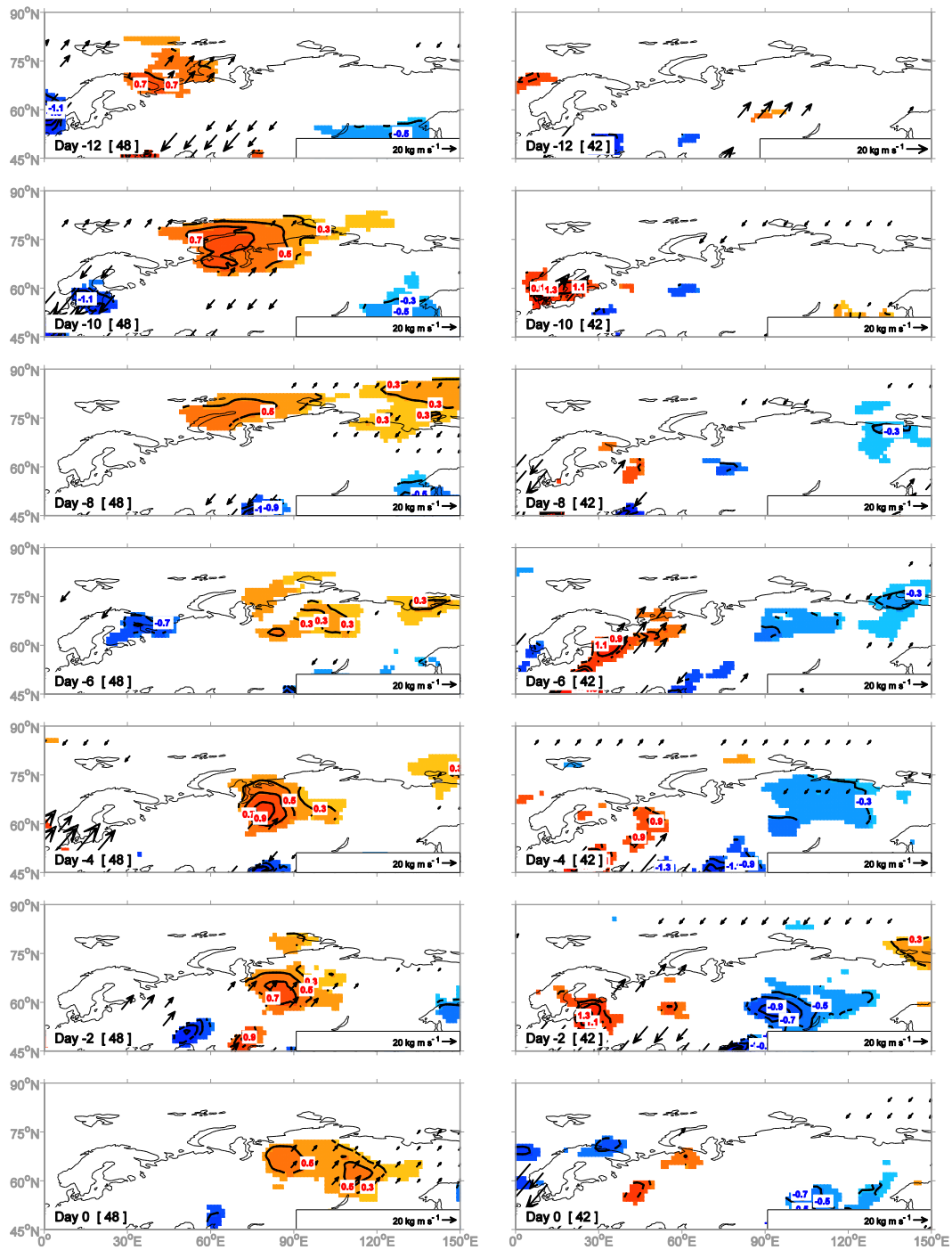
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21

22 **Figure S1.** The two-week mean (over the period from day -13 to day 0) of the
 23 lagged-regressions of unfiltered daily (a) 250 hPa convective heating rate (CHR) and
 24 (b) outgoing longwave radiation (OLR) anomalies against the EP index spanning
 25 1979/80-2014/15. For CHR anomalies, contours start from $\pm 0.1 \text{ K day}^{-1}$ with an
 26 interval of 0.1 K day^{-1} and zero lines are omitted. For OLR anomalies, contours start
 27 from $\pm 2 \text{ W m}^{-2}$ with an interval of 2 W m^{-2} and zero lines are omitted. Warm (cold)
 28 shadings indicate positive (negative) anomalies that are statistically significant at the
 29 $p < 0.01$ level as determined with a two-tailed Student's t test.

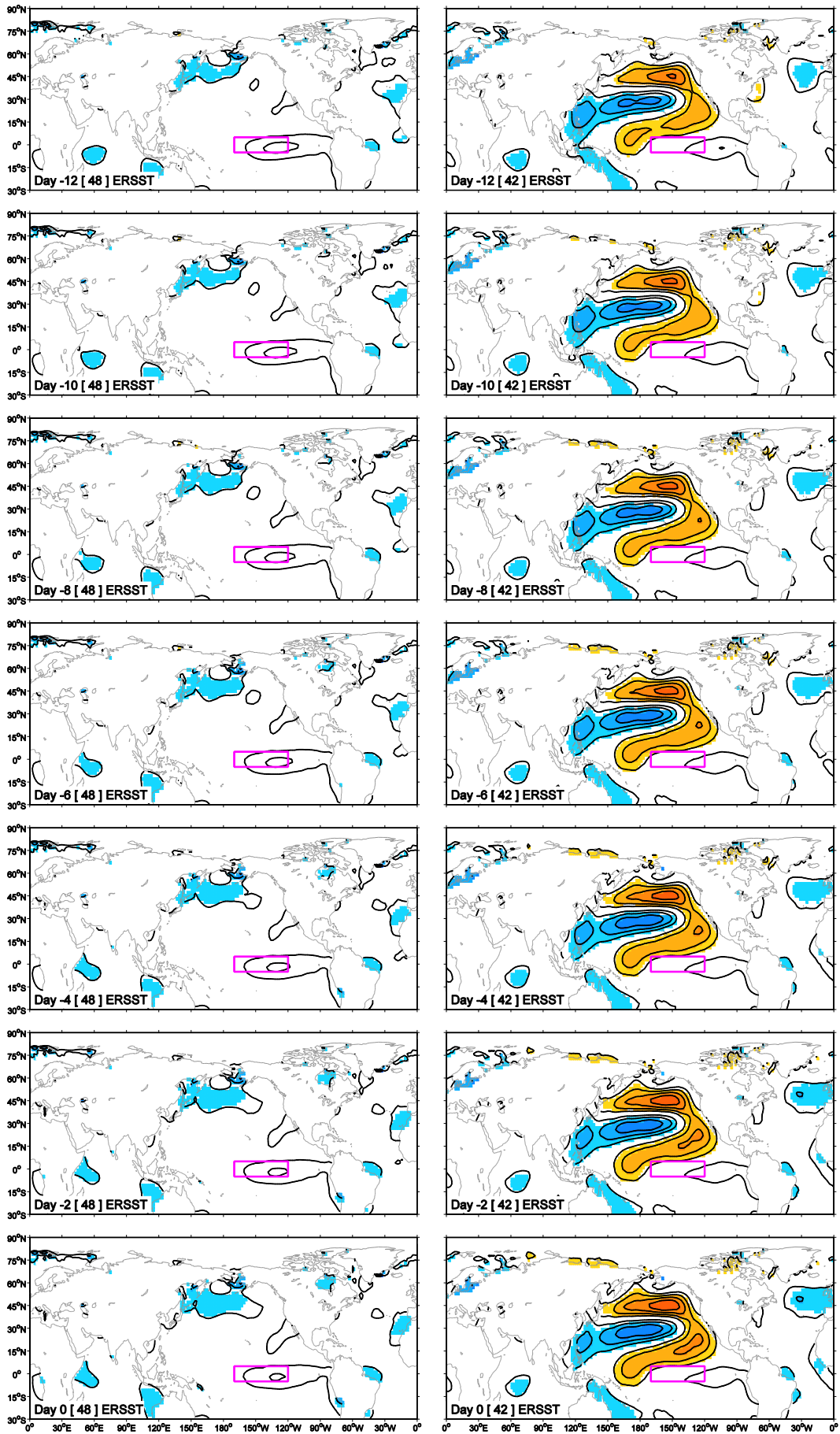
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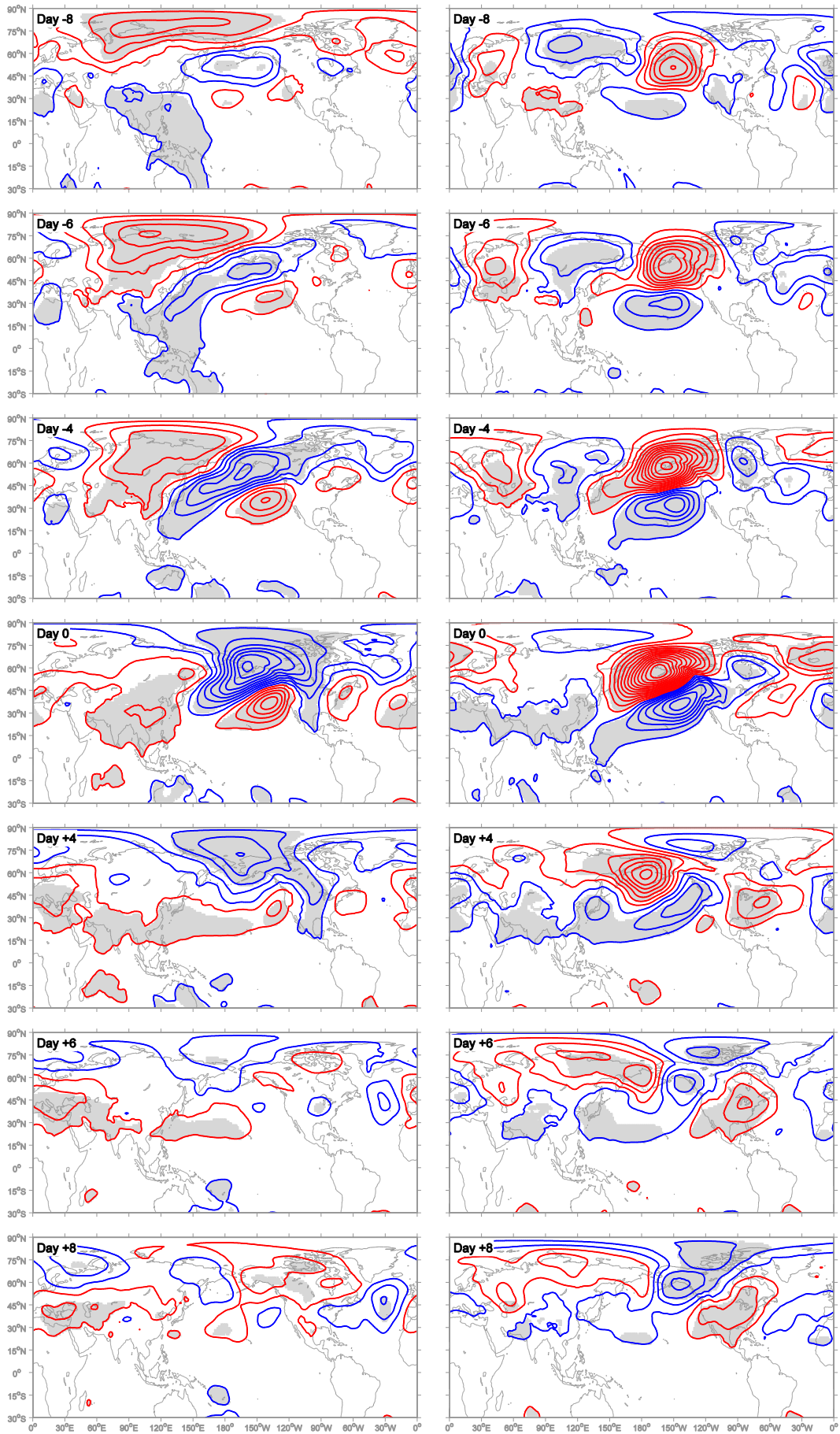
31

32 **Figure S2.** Lagged-composites of anomalous total column precipitable water (TCPW)
 33 fields for non-convective (left panels) positive EP events and (right panels) negative
 34 EP events, respectively. Composites are performed for the period from lag day -12 to
 35 day 0 with a time interval of 2 days. Contours start from $\pm 0.1 \text{ kg m}^{-2}$ with an interval

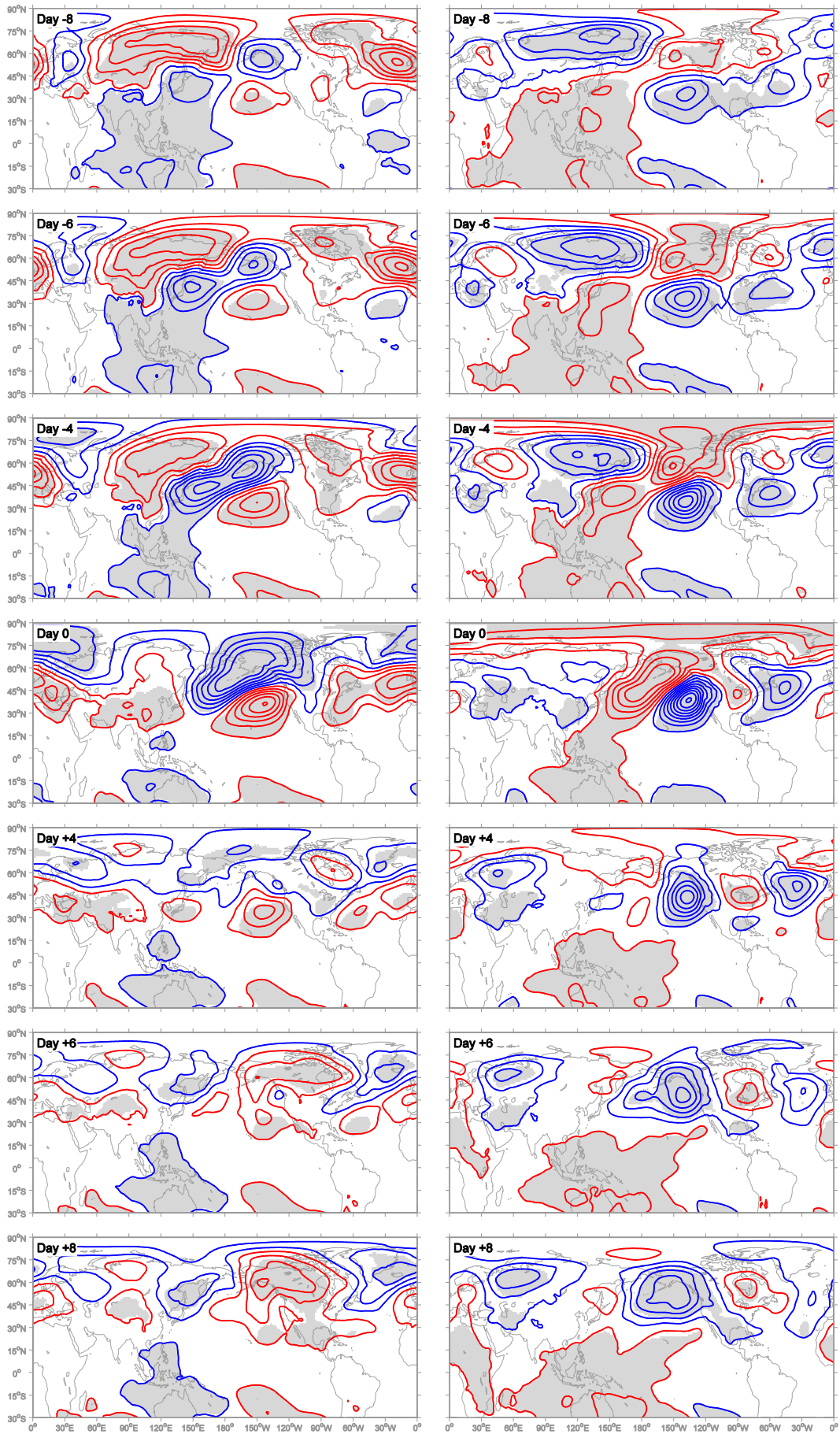
36 of 0.2 kg m^{-2} and zero lines are omitted. Red (blue) shadings indicate positive
37 (negative) anomalies that are statistically significant at the $p < 0.10$ level on a
38 two-tailed Monte-Carlo test. Arrows represent anomalous total column horizontal
39 water vapor fluxes that are statistically significant at the $p < 0.10$ level for at least one
40 component on a two-tailed Monte-Carlo test. Scaling for fluxes is given at
41 bottom-right corner for each panel (units: kg m s^{-1}).
42



43 **Figure S3.** Lagged-composites of anomalous SST fields for non-convective (left
44 panels) positive EP events and (right panels) negative EP events, respectively.
45 Composites are performed for the period from lag day -12 to day 0 with a time
46 interval of 2 days. Contours start from ± 0.1 K with an interval of 0.1 K and zero lines
47 are omitted. Red (blue) shadings indicate positive (negative) anomalies that are
48 statistically significant at the $p < 0.10$ level on a two-tailed Monte-Carlo test. The
49 magenta rectangular box over the tropical Pacific (5°S - 5°N , 120° - 170°W) denotes the
50 Niño-3.4 region. For the entire 57-winter period (1958/59-2014/15), daily SST
51 anomalies are constructed from linear interpolation of the monthly ERSST.v4 data.
52

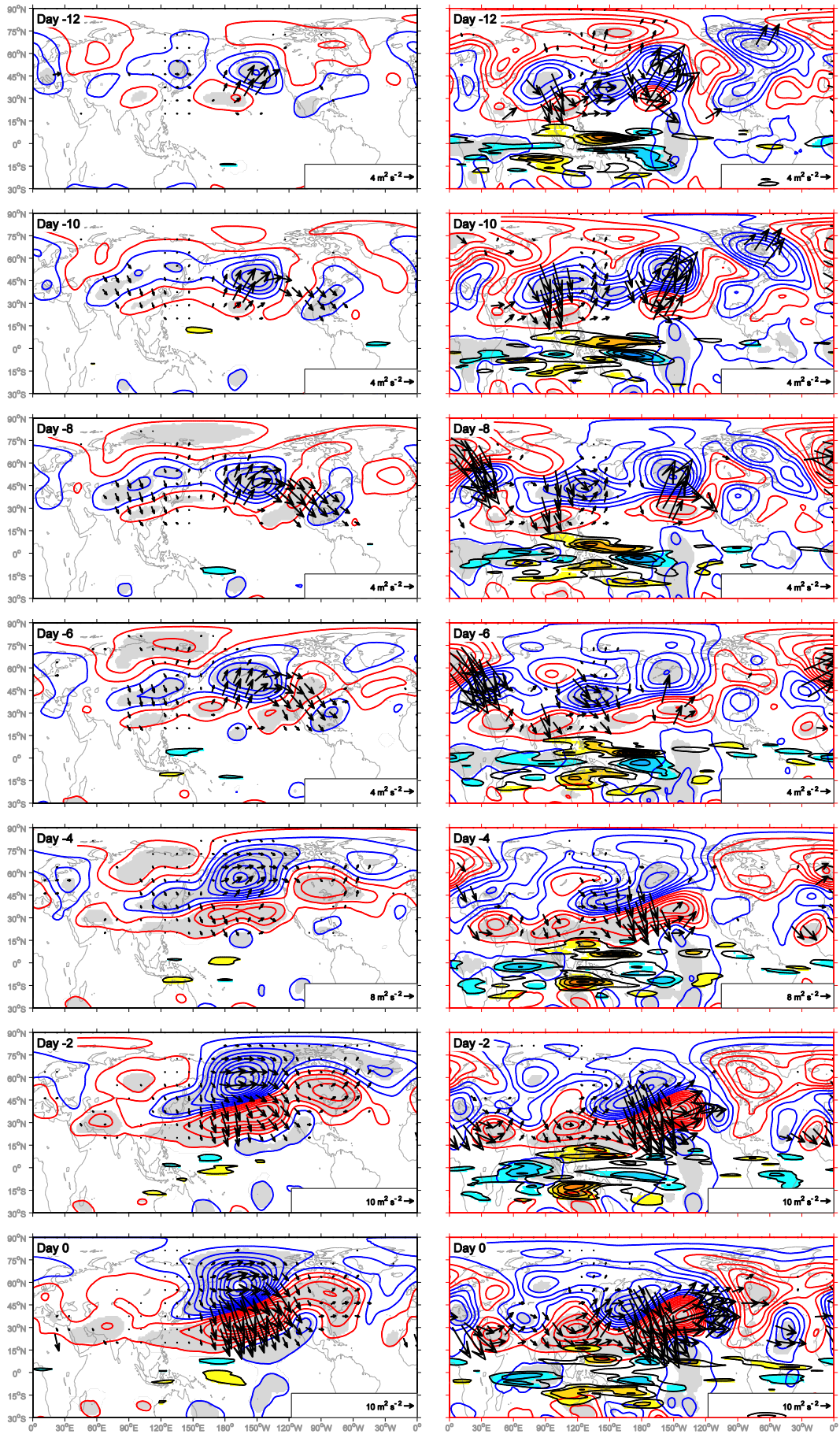


54 **Figure S4.** Lagged-composites of anomalous geopotential height at 850 hPa based on
55 based on the non-convective (left panels) positive EP events and (right panels)
56 negative EP events from day -8 to day +8 with the lag days labeled in upper-left
57 corner of each panel. Red (blue) contours denote positive (negative) anomalies.
58 Contours start from ± 5 m with an interval of 10 m for right column. Grey shadings
59 indicate anomalies that are statistically significant at the $p < 0.10$ level as determined
60 with a two-tailed Monte-Carlo test.
61

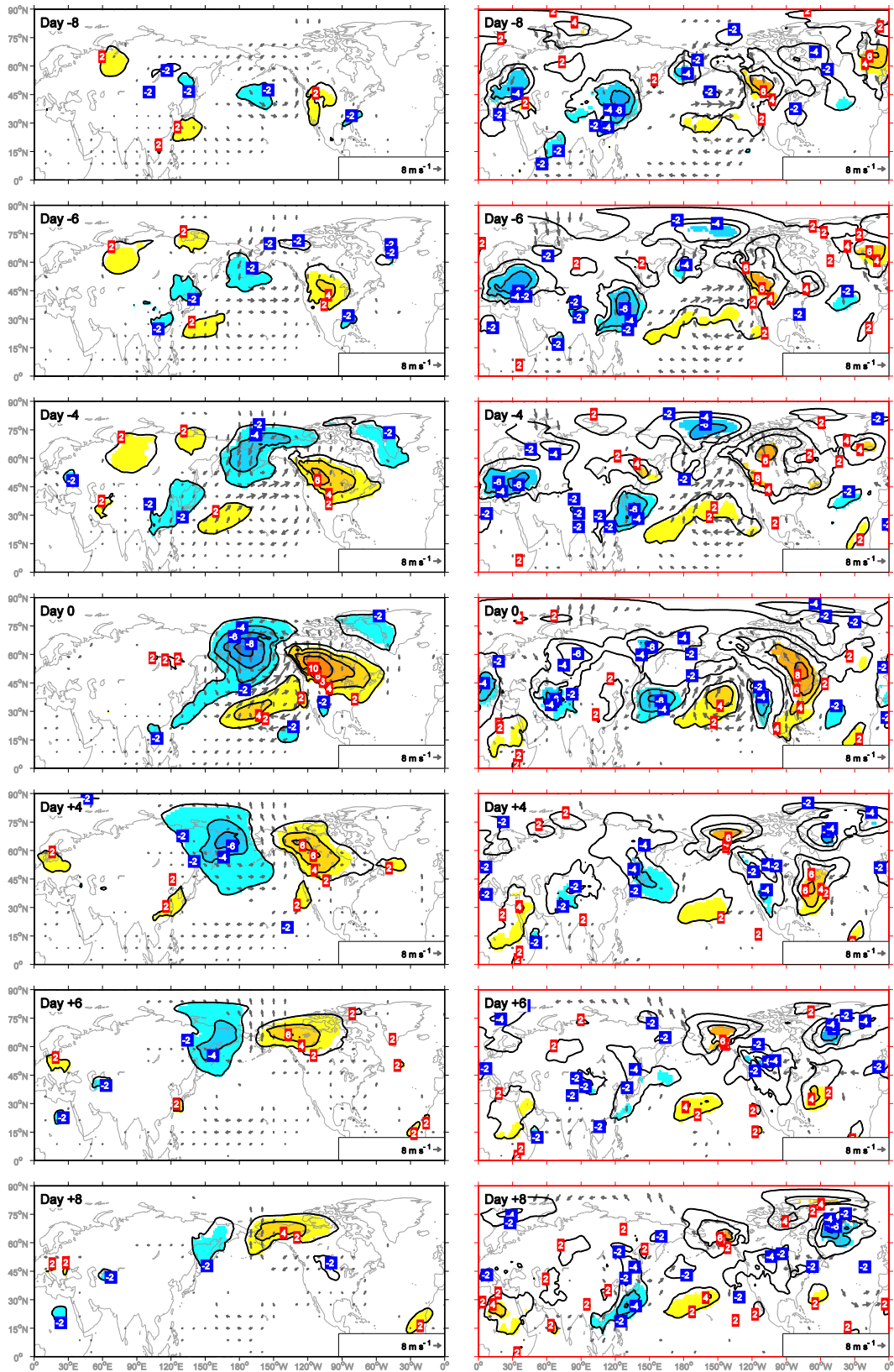


62 **Figure S5.** Same as Fig. S4 except for the convective EP events.

63



65 **Figure S6.** Lagged-composites of anomalous 250 hPa geopotential height based on
66 (left) non-convective EP/neutral events and (right) convective EP/neutral events
67 (subtracting negative EP/neutral from positive EP/neutral composites) from day -12 to
68 day 0 with the lag days labeled in upper-left corner of each panel. Red (blue) contours
69 denote positive (negative) anomalies. Contours start from ± 20 m with an interval of
70 40 m. Grey shadings indicate anomalies that are statistically significant at the $p < 0.10$
71 level as determined with a two-tailed Monte-Carlo test. Black contours indicate
72 anomalous convective heating rates. Contours start from ± 1.0 K day⁻¹ with an interval
73 of 1.0 K day⁻¹. Warm (cold) shadings indicate positive (negative) anomalies that are
74 statistically significant at the $p < 0.10$ level as determined with a two-tailed
75 Monte-Carlo test. Arrows represent wave activity fluxes that are statistically
76 significant at the $p < 0.10$ level at least for one component on a two-tailed
77 Monte-Carlo test. Scaling for wave activity fluxes is given at bottom-right corner for
78 each panel (units: m² s⁻²).
79

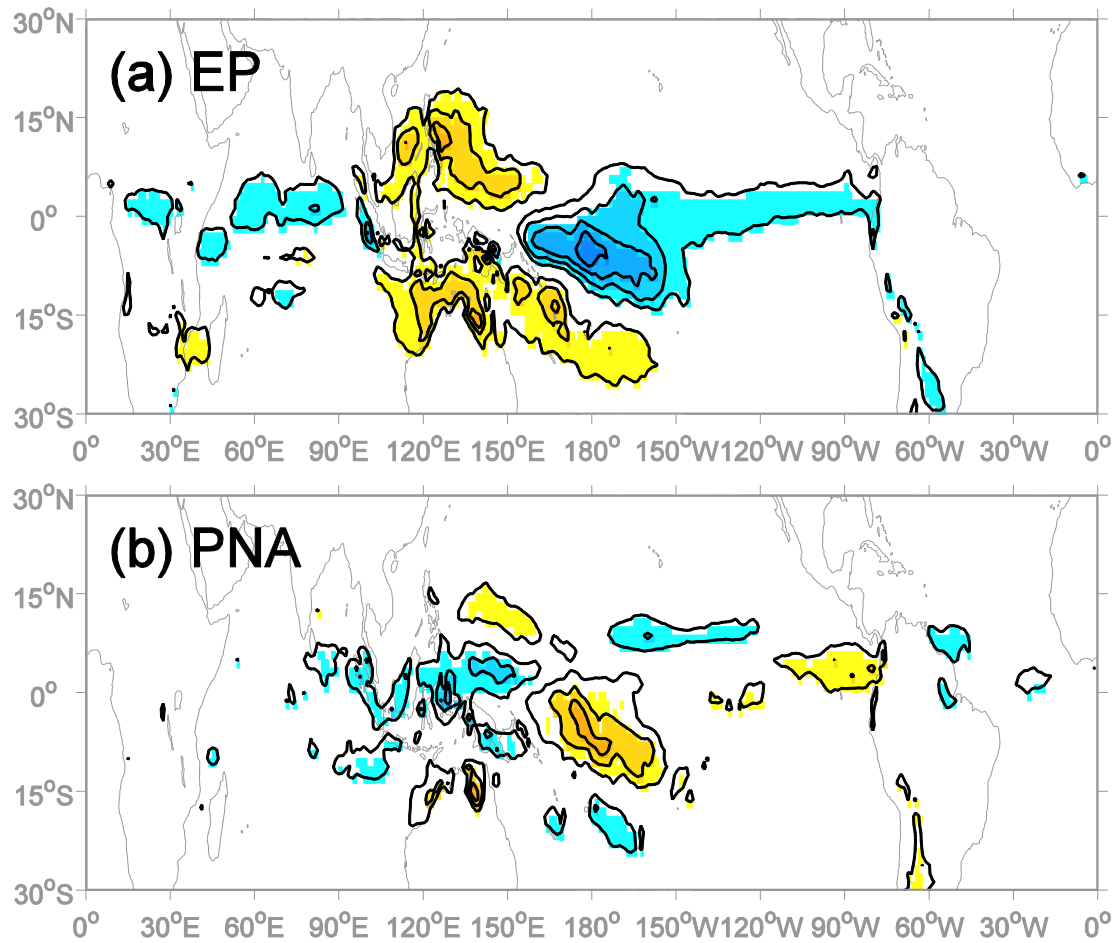


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81 **Figure S7.** Lagged-composites of anomalous 850 hPa air temperature (contours and
 82 shading) based on (left) non-convective EP/neutral events and (right) convective

83 EP/neutral events (subtracting negative EP/neutral from positive EP/neutral
84 composites) from day -8 to day +8 with the lag days labeled in upper-left corner of
85 each panel. Contours start from ± 2.0 K with an interval of 2.0 K. Warm (cold)
86 shadings indicate positive (negative) anomalies that are statistically significant at the
87 $p < 0.10$ level as determined with a two-tailed Monte-Carlo test. Arrows represent
88 anomalous 850 hPa winds that are statistically significant at the $p < 0.10$ level for at
89 least one component on a two-tailed Monte-Carlo test. Scaling for winds is given at
90 bottom-right corner for each panel (units: m s^{-1}).

91



92

93 **Figure S8.** Two-week mean (over the period from day -13 to day 0) of
 94 lagged-regressions of unfiltered daily 250 hPa convective heating rate anomalies
 95 against (a) the EP index and (b) the PNA index. Contours start from $\pm 0.1 \text{ K day}^{-1}$ with
 96 an interval of 0.1 K day^{-1} and zero lines are omitted. Warm (cold) shadings indicate
 97 positive (negative) anomalies that are statistically significant at the $p < 0.01$ level as
 98 determined with a two-tailed Student's t test. The PNA pattern in this study refers to
 99 the first Empirical Orthogonal Function (EOF) of the daily non-standardized anomaly
 100 fields of 250 hPa zonal wind for the extended winters (November-March) from
 101 1958/59 through 2014/15 over the North Pacific (0° - 88.75°N , 120°E - 105°W). The
 102 daily 250 hPa zonal wind anomaly fields are projected onto the PNA pattern, and the

103 obtained time series is normalized and used as the daily PNA index.