



National Weather Service
Climate Prediction Center



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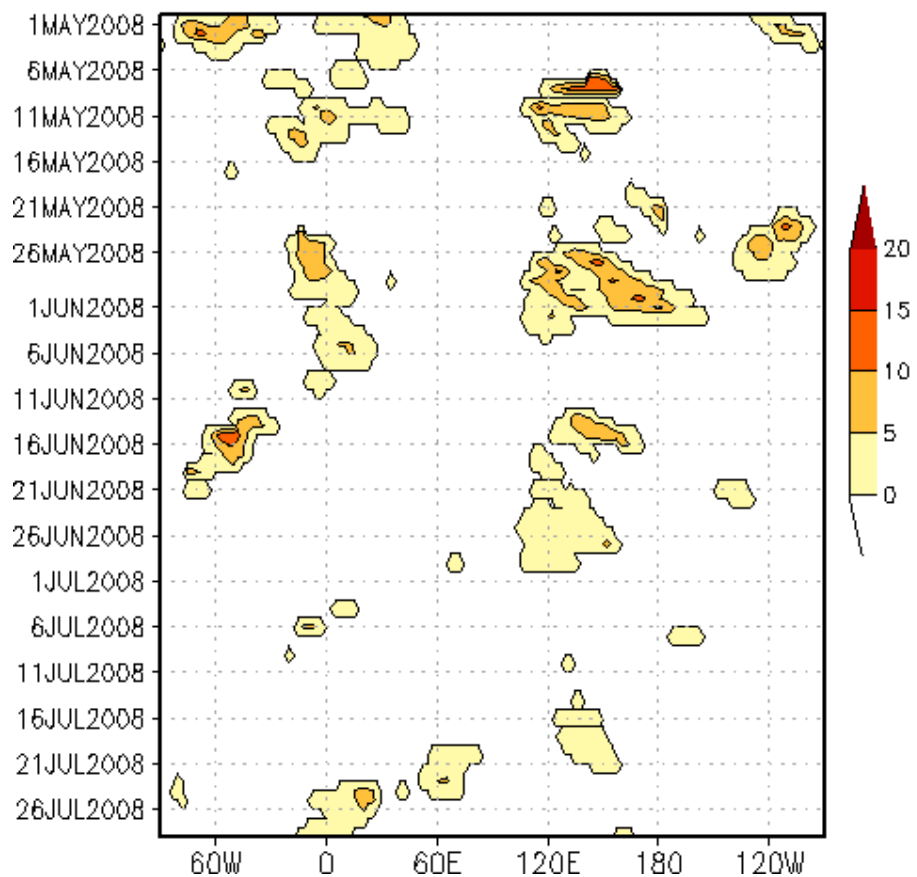
Blocking

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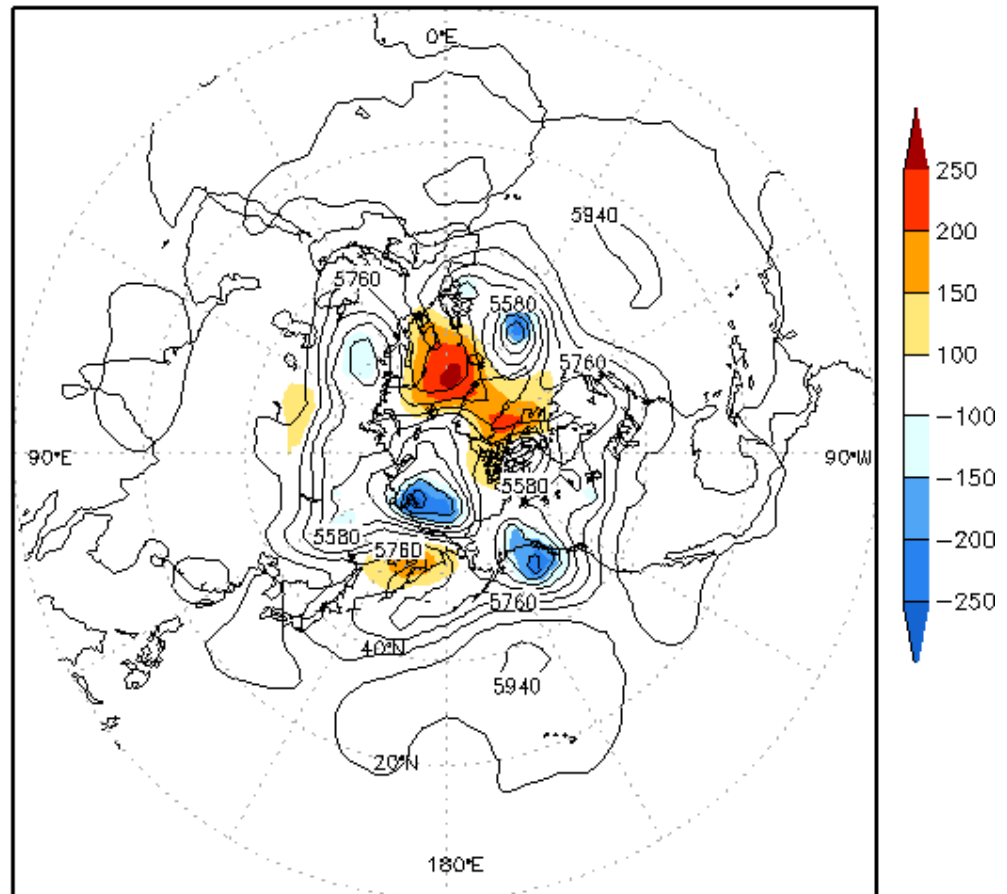
■ Current Conditions

All colored regions in the hovmoller plot below depict regions where the flow is blocked according to the [blocking index](#). The color scheme denotes the strength of the blocked flow as determined from the 500 hPa geopotential height gradient measured from the blocking ridge equatorward (denoted GHGS in blocking index definition). The presence of an intense cutoff low equatorward of the blocking ridge can act to enhance the blocking strength.

BLOCKING STRENGTH GHGS [m(deglat)⁻¹]-OBSERVATIONS
UPDATED THROUGH 29Jul2008



500 hPa Geopotential Height and Anomalies 00Z29JUL2008



- [Observed Southern Hemisphere Blocking](#)
- Blocking Climatology [Northern Hemisphere](#) and [Southern Hemisphere](#)

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■ Outlooks

- [GFS Hovmoeller \(NH\)](#)
- [GFS 500 mb Days 1-4 \(NH\)](#)
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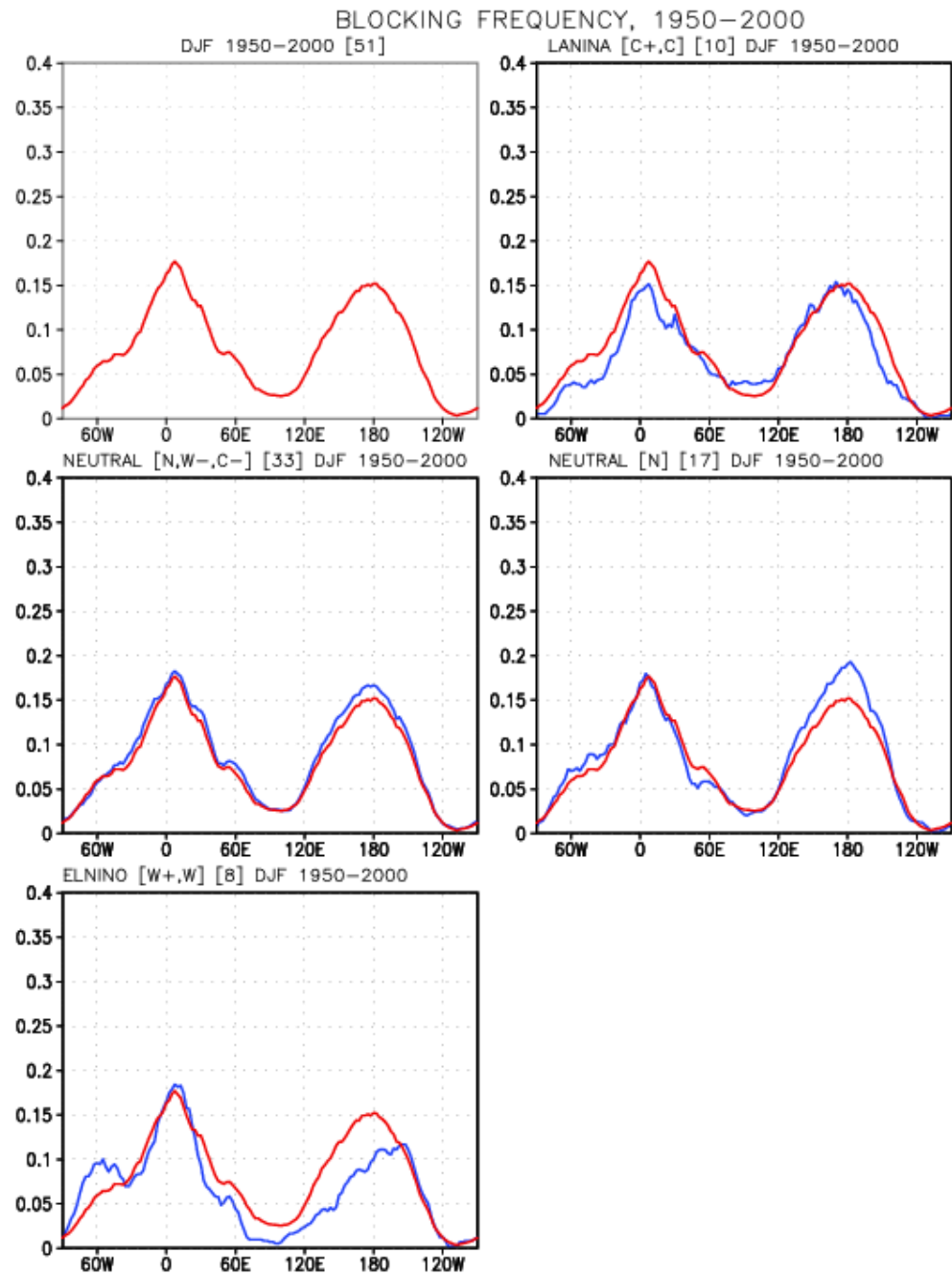
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■ Expert Discussions

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■ Composites

Using the [blocking index](#) of Tibaldi and Molteni (1990) we can consider the frequency of DJF "blocked days" for [Neutral, Warm and Cold](#) episodes as defined by the magnitude of the SST anomalies in the tropical Pacific. Cold episodes are defined as [C+,C], warm episodes [W+,W], and neutral episodes as [W-,C-,N]. For each panel the number of DJF seasons is shown in square brackets. We have also included in the middle panel on the right-hand side a plot of the neutral episodes defined simply as [N]. This can be compared with the middle left-hand side panel where neutral episodes have been defined as [W-,C-,N]. In each panel the DJF 51 year average has been plotted in red for ease of comparison.



- [Individual Neutral DJF Seasons \[W-,C-,N\]](#)
- [Individual Warm DJF Seasons \[W+,W\]](#)

- [Individual Cold DJF Seasons \[C+,C\]](#)

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■ Linkage to Weather

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■ Educational Material

Atmospheric blocking is commonly referred to as the situation when the normal zonal flow is interrupted by strong and persistent meridional flow. The normal eastward progression of synoptic disturbances is obstructed leading to episodes of prolonged extreme weather conditions. On intraseasonal time scales the persistent weather extremes can last from several days up to a few weeks, often accompanied by significant temperature and precipitation anomalies. Examples of the 500 hPa height and anomaly fields associated with mature blocking episodes over the [northeastern Atlantic](#) and the [North Pacific](#). These two regions are preferred areas for atmospheric blocking during the [northern hemisphere cold season](#).

A common finding among scientific studies is that these long-lived weather extremes are associated with recurrent atmospheric flow anomalies. Numerous studies have found that the poor forecast skill beyond a few days results principally from the inability of numerical weather prediction models to simulate the onset and evolution of blocking flows.

- Definition of [Blocking Index Definition](#)

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■ Publications

Carrera, M. L., R. W. Higgins, and V. E. Kousky, 2004: Downstream weather impacts associated with atmospheric blocking over the Northeast Pacific. *J. Climate*, in press.

Chen, W. Y., and H. M. Van den Dool, 1995: Low-frequency anomalies in the NMC MRF model and reality. *J. Climate*, 8, 1369-1385.

Chen, W. Y., and H. M. Van den Dool, 1997: Asymmetric impact of tropical SST anomalies on atmospheric internal variability over the North Pacific. *J. Atmos. Sci.*, 54, 725-740.

Chen, W. Y., and H. M. Van den Dool, 1999: Significant change of extratropical natural variability and potential predictability associated with the El Nino/Southern Oscillation. *Tellus*, 51A, 790-802.

Higgins, R. W., and S. D. Schubert, 1994: Simulated life cycles of persistent anticyclonic anomalies over the North Pacific: Role of synoptic-scale eddies. *J. Atmos. Sci.*, 51, 3238-3260.

Higgins, R. W., and S. D. Schubert, 1996: Simulations of persistent North Pacific circulation anomalies and interhemispheric teleconnections. *J. Atmos. Sci.*, 53, 188-207.

Higgins, R. W., and K. C. Mo, 1997: Persistent North Pacific circulation

anomalies and the tropical intraseasonal oscillation. J. Climate, 10, 223-244.

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