

Synoptic-Scale Precursors of East Asia/ Pacific Teleconnection Responsible for Persistent Precipitation Extremes in the Yangtze River Valley

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Synoptic-scale precursors of East Asia/ Pacific (EAP) teleconnection responsible for persistent precipitation extremes (PPEs) in the Yangtze River Valley (YRV) are investigated based on a composite analysis. About one week prior to PPEs, a blocking high develops near the Sea of Okhotsk owing to upstream energy dispersion and further strengthens due to a poleward energy dispersion. Subsequently, a meridional tripole structure of typical EAP pattern becomes well established by this blocking and westward-migrated negative/positive anomalies at mid/lower latitudes. In the lower troposphere, a westward-progressive anticyclone-cyclone pair contributes to strong moisture convergence with a magnitude anomaly over 3 standard deviations above normal. An equatorward-displaced westerly jet associated with the EAP pattern and the eastward-extended South Asia High combine to provide favorable upper-level divergence. Correspondingly, strong ascent of low-level warm/moist air along a quasi-stationary front leads to PPEs in the YRV.

Actually, these precursors with lead time of about one week are mainly modulated by 10-25-day (biweekly) oscillations. The biweekly components may account for about 50% of PPEs and show higher predictability. Despite small contributions to PPEs, the intraseasonal oscillations (30-60 days) act to provide favorable stationary backgrounds for biweekly oscillations development, while high-frequency oscillations (3-6 days) promote the phase transition of the biweekly component from negative to positive regime through an upscale feedback mechanism.

Key words: Teleconnection, Persistent precipitation extremes, Biweekly oscillations

References

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