Probability of US Heat Waves Affected by a Subseasonal Planetary Wave Pattern

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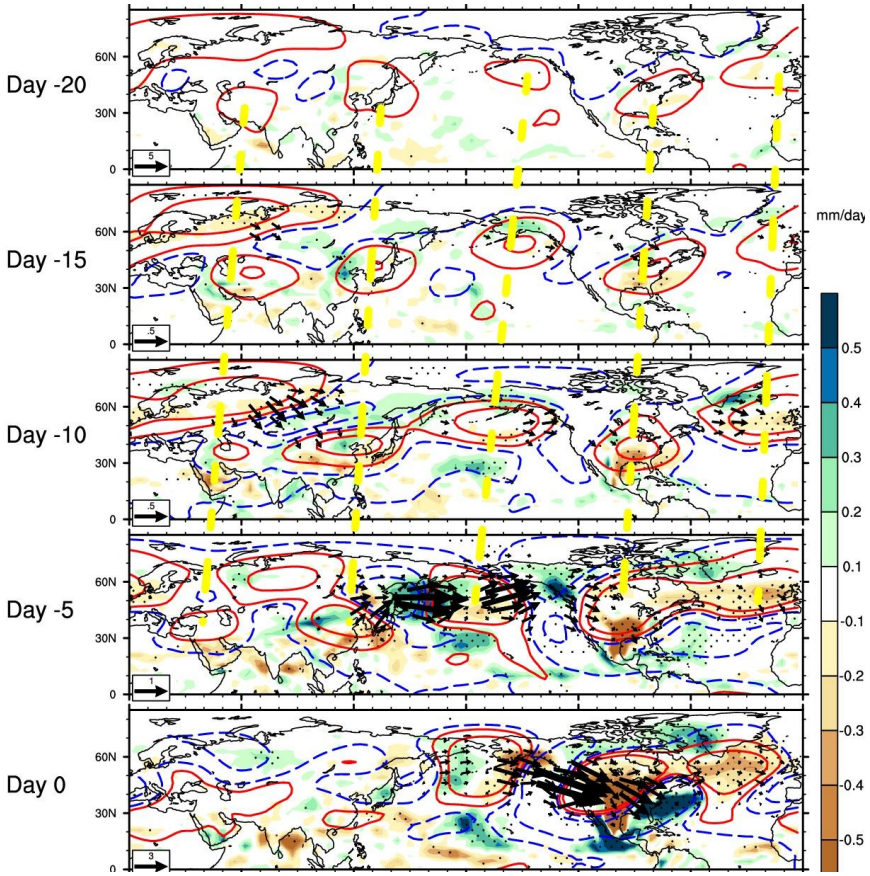

Contours: 300hPa streamfunction. Shading: precipitation.
Arrows: Plumb vectors indicating energy propagation

- Based on a 12,000-year integration of an atmospheric general circulation model CAM3, we identified a striking zonal wavenumber-5 Rossby wave pattern that is responsible for many US heat waves.
- This pattern can improve probability forecasts of US heat waves 15 days in advance in the model – a one or two standard deviation wave5 event makes a future heat wave twice or four times as likely to happen.
- This pattern resembles the leading pattern of subseasonal variability in nature. It has been associated with some historical droughts that lasted longer than subseasonal time scales (e.g. the 1952-1954 , 1988 droughts).

Teng, H., G. Branstator, H.Wang, G.A.Meehl, W.M.Washington, 2013: Probability of US heat waves affected by a subseasonal planetary wave pattern. Nature Geoscience, revised.

NASA NEWS — NASA ENERGY AND WATER CYCLE STUDY
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