

Sensitivity of Prominent Teleconnection Patterns to Base Point Perturbations

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Prominent teleconnection patterns are investigated for stability characteristics. The point-correlation technique used here reveals significant variations of the patterns when the base point is slightly perturbed. The North Atlantic Oscillation (NAO) dipole may teleconnect to the eastern third of the U.S. as well as to Northern China, or stand alone over the western North Atlantic or the eastern North Atlantic, all depending on a small change of position of the North Atlantic large anomaly. The prominent Pacific/North America (PNA) circulation pattern in its positive phase is well known to exhibit a negative center over the inter-mountain region of the North America and a positive over the Southeast of the U.S. However, its negative center is found to be very unsettled, varying its position widely from Alaska to Hudson Bay depending on a small shift of the PNA's north Pacific large anomaly. In contrast, the positively teleconnected center over the Southeast U.S. is found to be very stable, holding its position regardless of a substantial change of the location of the North Pacific large anomaly. The implication is, during a prominent PNA circulation regime, the predictability of the U.S. Southeast region is much higher than the negatively teleconnected inter-mountain region of the North America. For the Arctic anomaly teleconnected pattern, the stability is much less. Our point-correlation analysis does not yield a major North Pacific negative center depicted by an EOF analysis. Instead, a northeastern China to Siberia negative center is sometimes likely to develop.