



The pacemaker of major climate shifts

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Models and data suggest that the interplay of major climate modes may result in climate shifts. More specifically it has been shown that when the network of North Atlantic Oscillation (NAO), Pacific Decadal Oscillation (PDO), El Nino/Southern Oscillation (ENSO) and North Pacific Index (NPI) synchronizes, an increase in the coupling between these oscillations destroys the synchronous state and leads the climate system to a new state. These shifts are associated with significant changes in global temperature trend and in ENSO variability. Here we probe the details of this network's dynamics to investigate if a certain oscillation is the culprit in these shifts. From a total of 12 synchronization events observed in three climate simulations and in observations we find that the instigator of these shifts is NAO. Without exception only when NAO's coupling with the Pacific increases a shift will occur. Our results suggest a dynamical sequence of events in the evolution of climate shifts which is consistent with recent independent empirical and modeling studies.