



Atlantic Multidecadal Oscillation and Northern Hemisphere's climate variability

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Multidecadal signal with a periodicity of 50 to 80 years has been previously identified in a variety of 400–800-yr-long proxy records of the Northern Hemisphere's and global climate; this signal also characterizes the instrumental record. Modeling studies rationalize this variability in terms of intrinsic dynamics of the Atlantic Meridional Overturning Circulation, hence the name of Atlantic Multidecadal Oscillation (AMO). By analyzing lagged covariance structure of a network of climate indices, this study details the ways the AMO signal propagates throughout the Northern Hemisphere via a sequence of atmospheric and lagged oceanic teleconnections, which the authors term the "stadium wave." In particular, initial changes in the North Atlantic temperature anomaly associated with the AMO are found to culminate, slightly short of half the AMO's period later, in an oppositely signed hemispheric climate signal. Furthermore, a shorter-term, interannual-to-interdecadal climate variability changes character according to the stadium-wave induced prevailing hemispheric climate regime; these changes manifest in both intensity and dominant time scale of tropical–extratropical teleconnections within the Pacific, with indications of ensuing changes in the Atlantic sector's climate variations. The present results suggest that the AMO plays a more important role in the hemispheric and, by inference, global climate variability than previously thought, which has numerous implications for climate-change attribution and prediction.