



Running hot and cold: Decadal fluctuations in planetary wave forcing modulate global warming in late boreal winter.

J. Cohen and D. Salstein

AER, Inc., Lexington, MA, United States (jcohen@aer.com)

A warming trend in global surface temperatures over the last forty years has been well established, consistent with anthropogenic increases in greenhouse gases. Over the last two decades, this trend appears to have accelerated. In contrast to this general behavior, however, here we show that trends during the boreal cold months in the recent period have developed a marked asymmetry, with vigorous warming in October-December followed by a reversal to a neutral/cold trend in January-March. This observed asymmetry in the cold half of the boreal year is linked to a two-way stratosphere-troposphere interaction and a negative trend in the NAM index, which is strongest in the Northern Hemisphere during late winter and is related to variability in Eurasian land surface conditions during autumn. This link has been demonstrated for year- to-year variability and used to improve seasonal-timescale winter forecasts; here, this coupling is shown to strongly modulate the warming trend, with implications for decadal-scale temperature projections.