

North Atlantic Oscillation impact on tropical north Atlantic winter atmospheric variability

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Abstract. The dominant mode of windspeed variability in the wintertime tropical north Atlantic (TNA) is represented by the North Atlantic Oscillation (NAO). For the December-January-February (DJF) season the leading principal component of TNA windspeed (representing 46% of the total variance) exhibits a 0.68 correlation with the NAO timeseries. We show that the NAO impact on TNA trade winds peaks in January and is statistically significant at the 99% level for each month from November through to April. This association arises through the meridional pressure gradient equatorward of the Azores high pressure covarying with the NAO. We also show that the winter NAO index determines monthly precipitation levels across the northern Caribbean throughout the following year. We suggest this rainfall impact is due to long lasting, DJF forced perturbations in the north Atlantic sea surface temperature tripole characteristic of the NAO signal.

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