Geophysical Research Abstracts
Vol. 15, EGU2013-7536, 2013
EGU General Assembly 2013

Ensemble prediction of transitions of the North Atlantic eddy-driven jet

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The consistency of three global medium-range ensemble prediction systems with the observed transition behaviour of a three-cluster model of the North Atlantic eddy-driven jet is examined. The three clusters consist of a mid jet cluster taken to represent an undisturbed jet and two clusters representing southward and northward shifts of the jet. The mean probabilities of transitions between the clusters calculated from the ensemble forecasts are compared with those calculated from a 23-extended-winter climatology taken from the European Centre for Medium-Range Weather Forecasts 40-Year Re-analysis (ERA40) dataset. No evidence of a drift with increasing lead time of the ensemble forecast transition probabilities towards values inconsistent with the 23-extended-winter climatology is found. The ensemble forecasts of transition probabilities are found to still have positive Brier Skill at 15 day lead times. However forecasts initialised with the jet in the northward shifted cluster are generally less skilful than those initialized in the other clusters. This may suggest the presence of systematic flow dependent predictability of the jet.