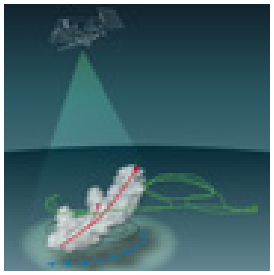

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Verification of warm conveyor belts in ECMWF IFS reforecasts

Thursday, 12 March 2020 08:55 (20 minutes)

Subseasonal weather prediction bridges the gap between weather forecasting and climate projection and is receiving increasing attention across various socio-economic sectors. Predictability on subseasonal timescales is gained from slower climate modes such as the MJO or stratosphere. Thus synoptic-scale activity might project initially small error on the large-scale circulation and dilute forecast skill in the medium- and extended-range. We hypothesize that an indequate representation of WCBs in subseasonal forecast systems may explain their often poor skill beyond week 2. With this study, we aim to quantify the overall predictability of WCBs on subseasonal timescales and the current forecast skill in extended-range numerical weather prediction models. We first focus on the ECMWF extended-range reforecasts (1997-2017) initialised from ERA-Interim reanalysis that are available through the S2S (subseasonal-to-seasonal) database. In order to identify WCBs in the forecast model, we use a recently developed global multivariate logistic model that is trained on a combination of meteorological parameters from ERA-Interim and which is designed for the inflow, ascent and outflow phase of WCBs. We explore forecast skill and model biases of the WCB for different regions and seasons of the year. Overall, the reforecasts depict frequencies of WCBs across seasons relatively well. A correction of biases in the meteorological parameters for the logistic model partly removes existing biases in the reforecast WCB climatology. However, the actual forecast skill still rapidly decays leaving useful skill only up to around day 8. These results corroborate that synoptic-scale activity might hinder accurate forecasts into subseasonal time scales for the extra-tropical large-scale circulation. Future work will elucidate if and in which situation poor skill for WCBs also dilutes skill for Atlantic-European weather regimes on subseasonal time scales.

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