

Verification of decadal forecasts: The mid-latitude Atlantic meridional overturning circulation in a multi-model system

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Assessing the skill of the Atlantic meridional overturning circulation (AMOC) in historical predictions is hampered by a lack of observations for verification. Models are therefore needed to reconstruct the historical AMOC variability, but different model analyses have previously been inconsistent. Here we show that 10 recent model analyses provide a robust signal of AMOC variability at 45°N, with an increase from the 1960s to the mid-1990s and a decrease thereafter. Importantly, this signal matches observed variations of the North Atlantic Oscillation, sub-polar gyre strength, and Labrador Sea convection which are strongly related to the AMOC. Furthermore, we obtain skillful predictions of this AMOC signal up to 5 years ahead with initialized models. However, models driven only by external radiative changes are not skillful, suggesting a dominant role of natural internal variability during this period.