

MECHANISMS OF SUBPOLAR GYRE VARIABILITY IN CMIP6

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The subpolar gyre (SPG) has been indicated as one of the earth system's tipping elements that is closest to crossing its threshold due to global warming. This is based on studies looking at abrupt shifts in temperature in the SPG region, combined with a conceptual understanding of the mechanisms. In this talk I will discuss how well these mechanisms of SPG variability are represented in CMIP6 models using causal inference. This method goes beyond correlation, by taking into account common drivers and other possible confounding factors, to establish causal links between variables. We find that the interaction between convection and density is well represented in most models, whereas a link of both to the circulation strength of the gyre is captured by fewer models. These results provide valuable information on the capability of CMIP6 models in capturing SPG tipping, and form a starting point for investigating possible links with the AMOC.