

# **An event-based approach to understanding decadal-scale variability in the Atlantic Meridional Overturning Circulation and associated climate impacts**

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Many coupled climate models exhibit natural decadal-scale variability in the strength of the Atlantic Meridional Overturning Circulation (AMOC), with detectable climatic impacts, and there is some evidence that suggests this type of variability may also exist in the real ocean. As part of the RAPID-WATCH RAPIT (Risk Assessment, Probability and Impacts Team) project, we aim to improve our understanding of AMOC variability and its impacts by examining the largest discrete unforced decadal-scale AMOC events in a variety of coupled climate models.

A multi-model comparison of discrete AMOC fluctuation events is carried out, exploring characteristics such as their magnitude and meridional coherence. We then identify climatic impacts associated with the events, and assess their robustness across the events in each model, and between the different models. We determine whether the impacts of the largest events differ from the impacts inferred from simple regression analysis, and explore the causes of asymmetries between the impacts of strengthening and weakening AMOC events.