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## The mean state and variability of the North Atlantic circulation: a perspective from ocean reanalyses

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The observational network around the North Atlantic has improved significantly over the last few decades with the advent of Argo and satellite observations, and the more recent efforts to monitor the Atlantic Meridional Overturning Circulation (AMOC) using arrays such as RAPID and OSNAP. These have shown decadal timescale changes across the North Atlantic including in heat content, heat transport and the circulation.

However there are still significant gaps in the observational coverage, and significant uncertainties around some observational products. Ocean reanalyses integrate the observations with a dynamically consistent ocean model and are potentially tools that can be used to understand the observed changes. However the suitability of the reanalyses for the task must also be assessed. We use an ensemble of global ocean reanalyses in comparison with observations in order to examine the mean state and interannual-decadal variability of the North Atlantic ocean since 1993. We assess how well the reanalyses are able to capture different processes and whether any understanding can be inferred. In particular we look at ocean heat content, transports, the AMOC and gyre strengths, water masses and convection.

