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# Divergence in CMIP6 projections of future Arctic Ocean stratification

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The Arctic Ocean is strongly stratified by salinity gradients in the uppermost layers. This stratification is a key attribute of the region as it acts as an effective barrier for the vertical exchanges of Atlantic Water (AW) heat, nutrients, and CO2 between intermediate depths and the surface of the deep Eurasian and Amerasian Basins (EB and AB). Observations show that from 1970 to 2017, the stratification in the AB has strengthened, whereas, in parts of the EB, the stratification has weakened. The strengthening of the stratification in the AB is linked to a freshening and deepening of the halocline. The weakened stratification in parts of the EB is linked to a shoaling, warming, and lack of freshening of the halocline (Atlantification). Future simulations from a suite of CMIP6 models project that under a strong greenhouse-gas forcing scenario (SSP585), the AB and EB surface freshening and AW warming continues. To meaningfully compare hydrographic changes in the simulations, we present a new indicator of stratification. We find that within the AB, there is agreement among the models that the upper layers will become more stratified in the future. However, within the EB models diverge regarding future stratification. We discuss and detail some mechanisms responsible for these simulated discrepancies.