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# Enhancing projections of sea-level rise with changing seasonality

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There is evidence to show that anthropogenically-driven climate change will alter large-scale atmospheric circulation in the future. However, limited research has been conducted to explore how these atmospheric changes will impact seasonal sea-level change. The majority of global to local sea-level projections are made on multi-annual timescales, meaning important sub-annual changes in sea level driven by climatic oscillations are not being accounted for. Sea level on the Northwestern European Shelf (NWES) has been shown to vary in response to fluctuations in the North Atlantic Oscillation (NAO). We examine how seasonal sea level may change on the NWES in response to changes in the NAO in the near future (2023-2053). The work uses a statistical approach that incorporates the inverse barometer effect to produce projections of seasonal sea-level change. The main objectives include quantifying the sensitivity of sea level to the NAO over the 20$^{th}$ century using tide gauge and satellite altimetry data in combination with historical records of the NAO index. Projections of mean sea-level change are then updated to account for seasonal variability that may occur on the NWES using CMIP5 and CMIP6 model outputs of sea-level change and the NAO for the period 2023-2053. The research aims to improve understanding of short-term drivers of future sea-level change and explore the ability of a statistical method to accurately detect and project seasonal patterns.