

Impact of the North Atlantic atmospheric circulation on the Northern European mean sea level

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Here, we focus on the drivers and the mechanisms of sea level variability in the North Sea and along the Norwegian coast. Our attention is on the atmospheric contribution and, more precisely, on the impact of the North Atlantic large-scale atmospheric variability during winter (when winds are stronger and, therefore, have a more significant effect on the Northern European sea level). This topic has been analysed in the past (e.g., Wakelin et al., 2003, and Chafik et al., 2017), with the large-scale atmospheric circulation described in terms of the empirical orthogonal functions (such as the North Atlantic Oscillation). Here we follow a different approach: we describe it in terms of the jet clusters. Four jet clusters are used, with each jet cluster representing a recurrent and persistent atmospheric pattern over the North Atlantic. With respect to the methods previously used, the jet clusters have the advantage of being more closely related to the 2D structure of the jet stream and more easily associated to the wind pattern over the North Atlantic. Using altimetry data, an attempt is made to understand how each jet cluster individually affects the sea level variability over the Northern European continental shelf both on a few-day and on inter-annual timescales.