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Earth System Dynamics
Discussions

Interactive comment on "Inter-annual variability of mean sea level and its sensitivity to wind climate in an inter-tidal basin" *by* Theo Gerkema and Matias Duran-Matute

Anonymous Referee #2

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The author investigated the relationship between the annual wind records from a weather station and annual mean sea level in an inter-tidal basin, the Dutch Wadden Sea. They found that the inter-annual variability of mean sea level can be largely explained by the west-east component of the net wind energy vector. By correcting observed values of annual mean level for meteorological factors, they further found the margin of error reduces by about a factor of three in the trends of the 20-year sea level record. Their results illustrated the regional variability in annual mean sea level and its inter-annual variability and highlighted the sensitivity of sea level on wind direction over the Dutch Wadden Sea.

This study is interesting and contributes to the understanding of regional climate

change. However, I have two major concerns to be addressed before I can recommend publication of the manuscript. I have detailed my comments below.

1. A mechanism is needed of winds on inter-annual variability sea level variability in this particular small region. The analysis so far is a good start, whereas the authors need to explore the physical processes and mechanism via a regional climate model.

2. Is this regional change of winds and sea level related to large-scale atmosphere and ocean changes? What is the atmosphere circulation pattern associated with the wind change over the Dutch Wadden Sea? Some effects from the westerly jet shift or ENSO?

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