



CSIC



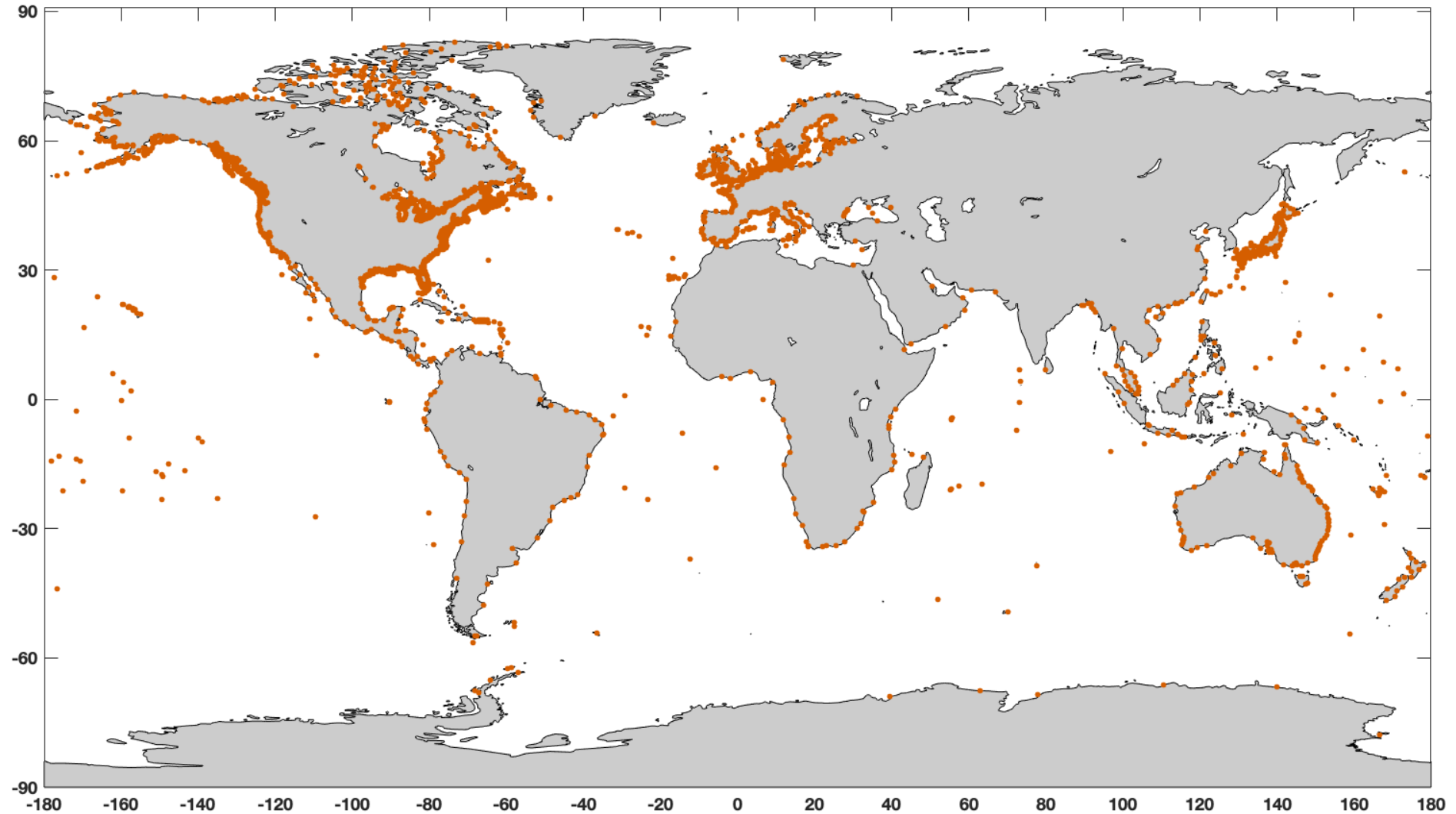
# The new GESLA-3 tide gauge data set and its quality control for tidal studies

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# The new GESLA-3 tide gauge data set

Released November 2021

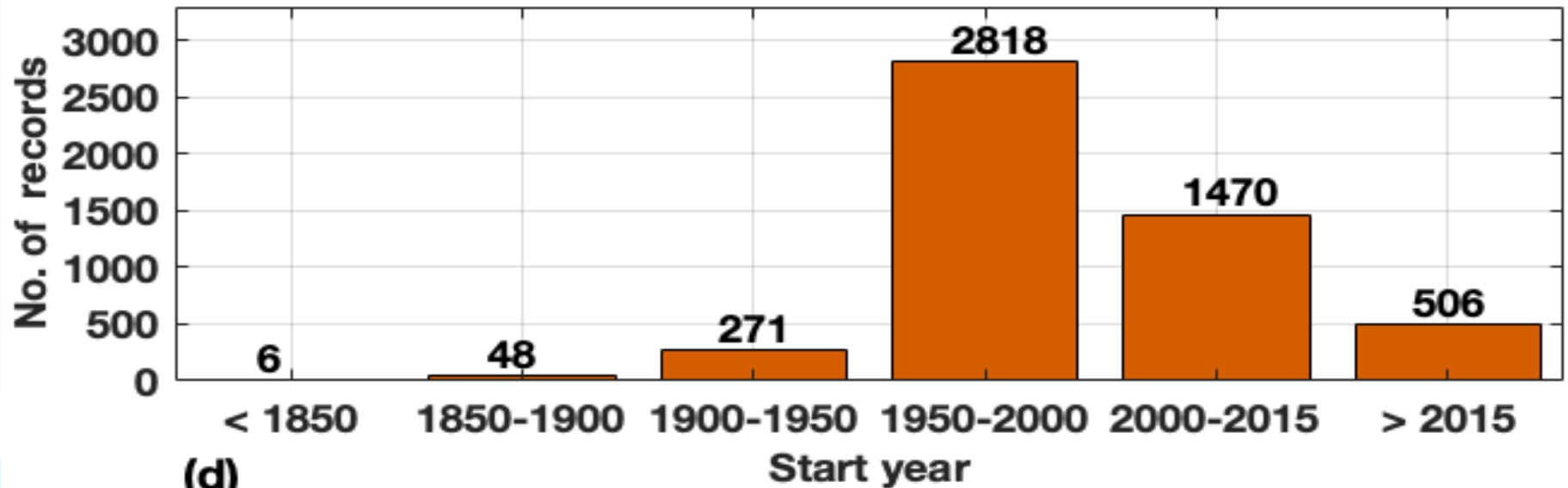
91,021 years from 5,199 records



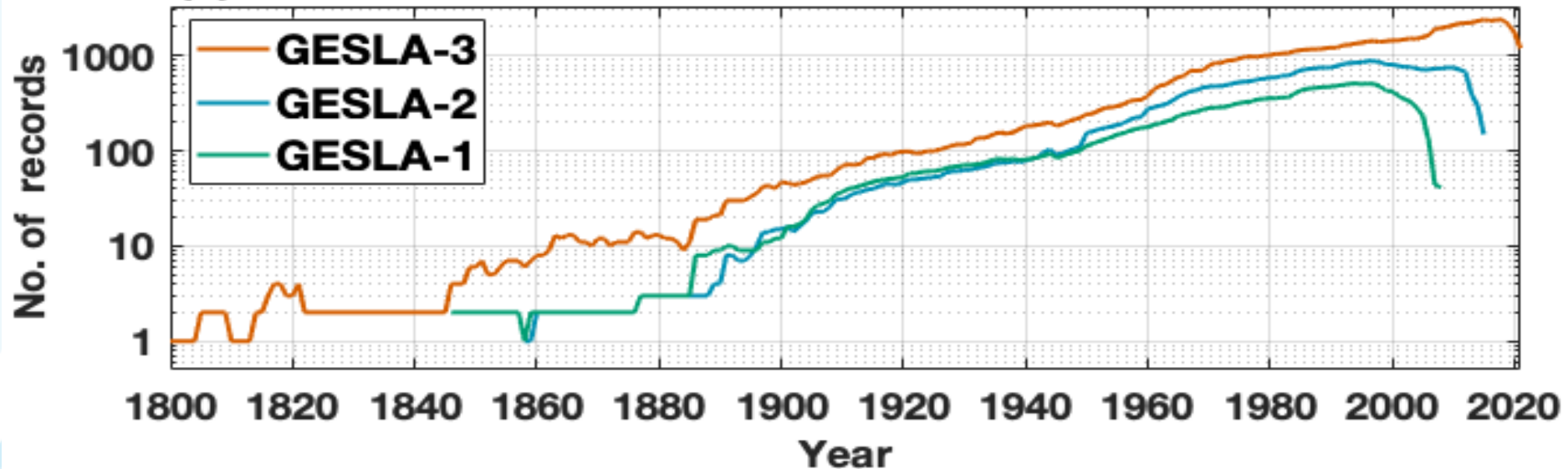
# The new GESLA-3 tide gauge data set

Temporal distribution

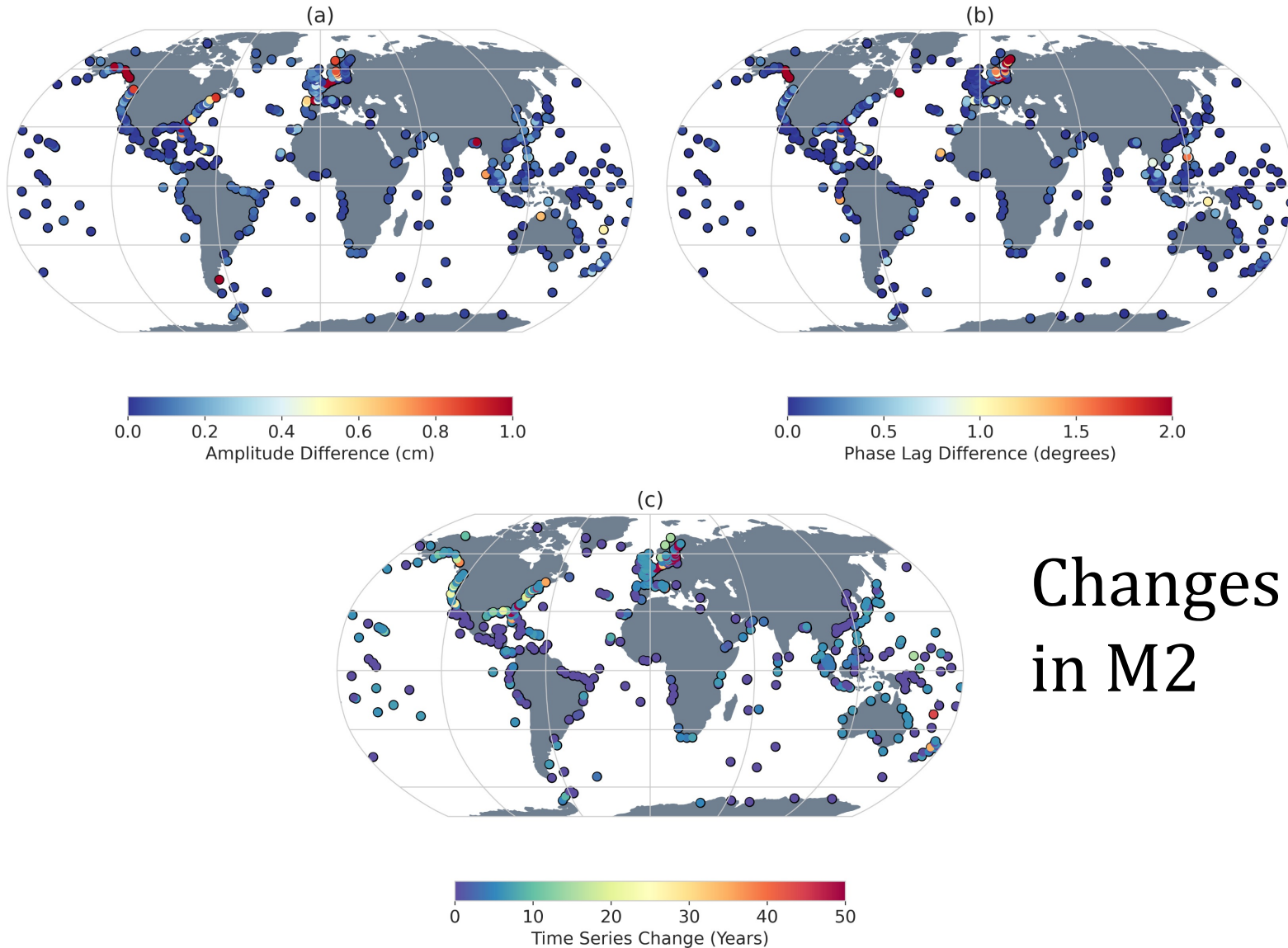
(c)



(d)



# Impact of record length in tidal computation



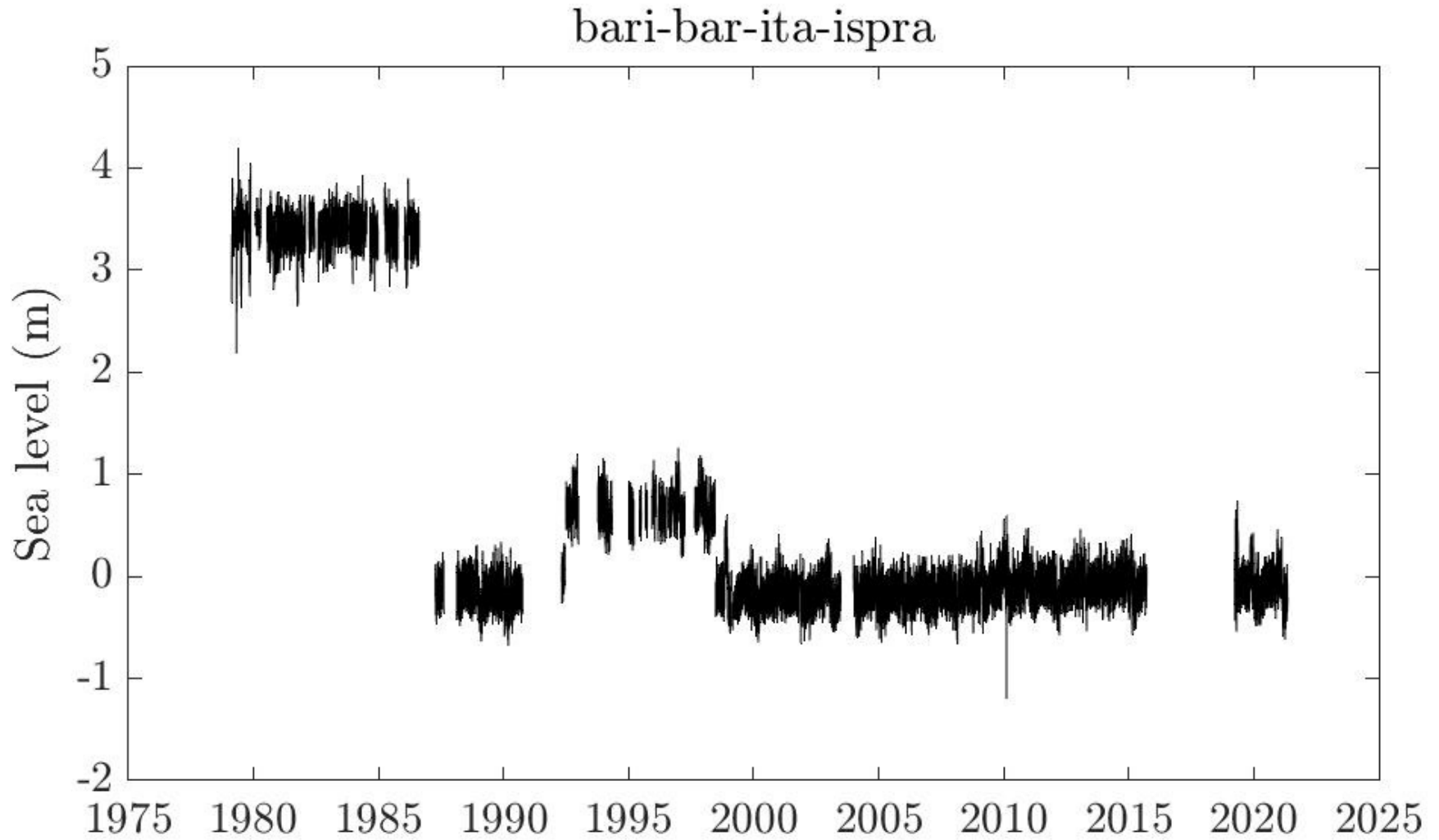
Changes  
in M2



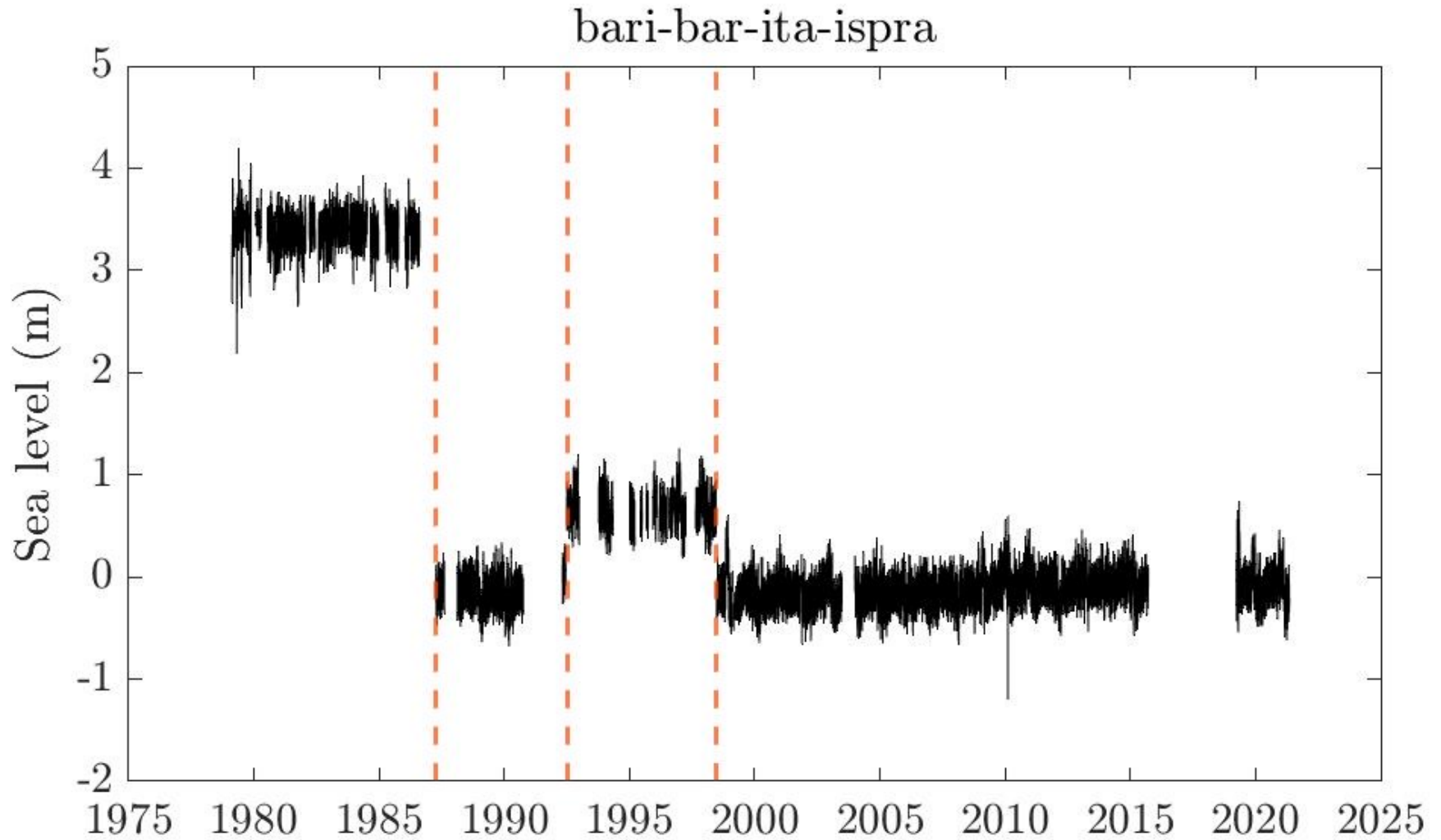
Quality control of tide gauge records

Impact of errors on estimates of tidal  
amplitudes  
[along European coastlines]

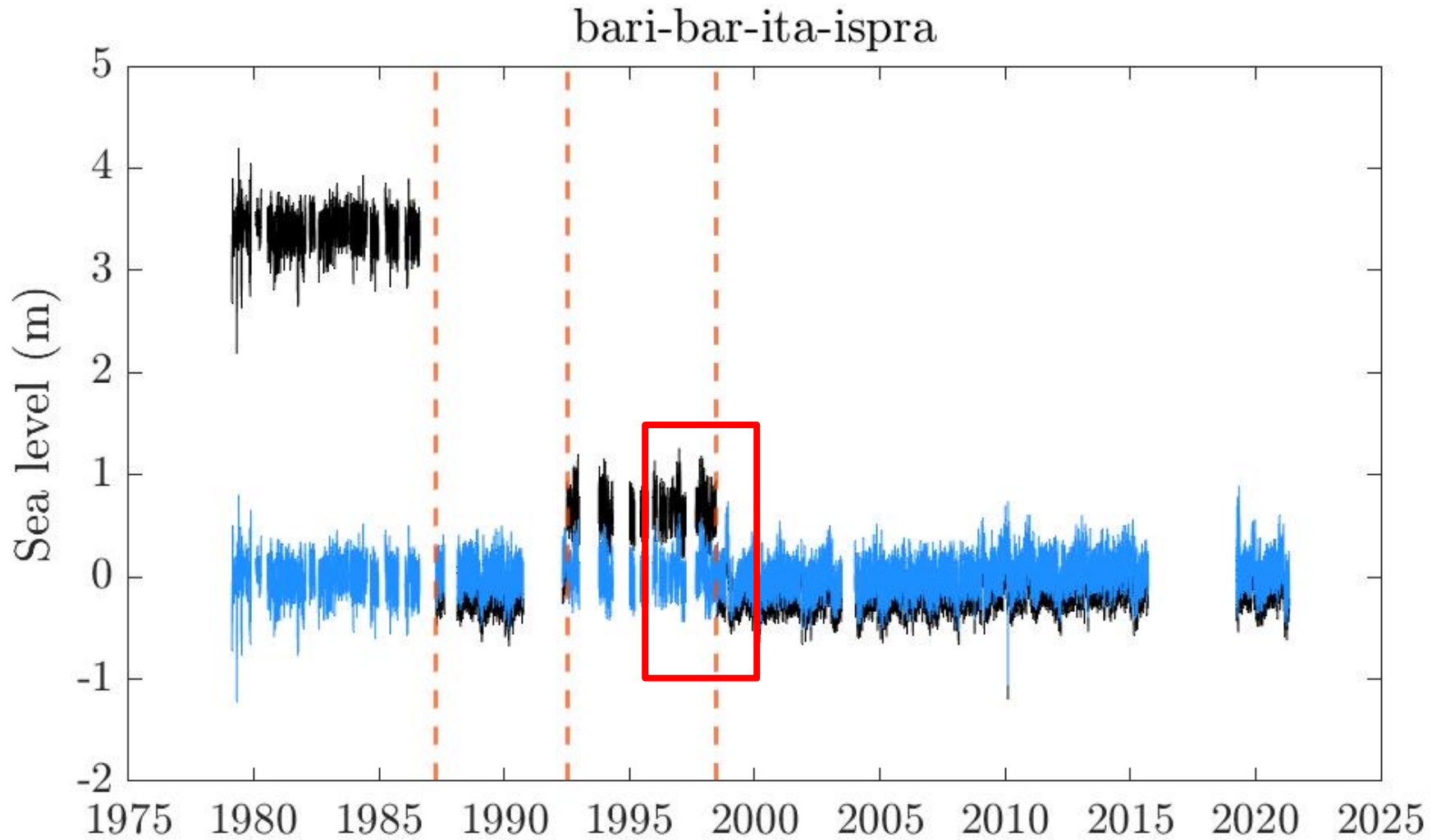
# Corrections of datum jumps



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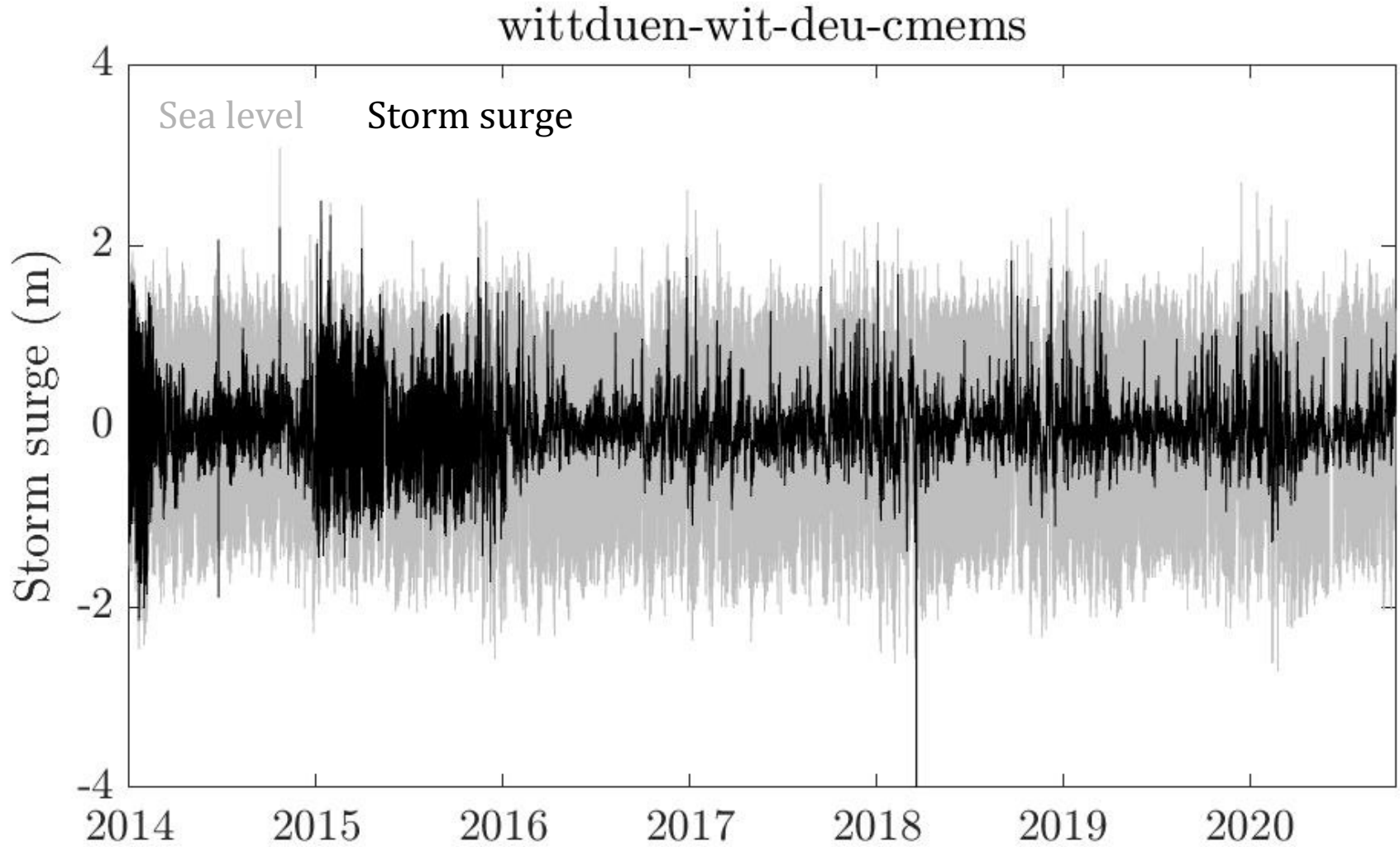


# Corrections of datum jumps



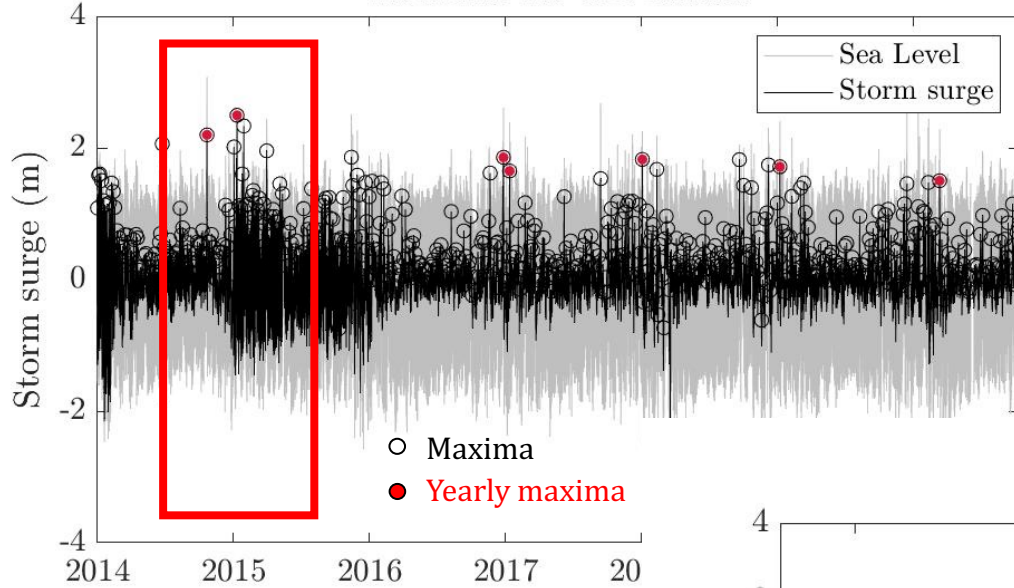


# Corrections of time shifts

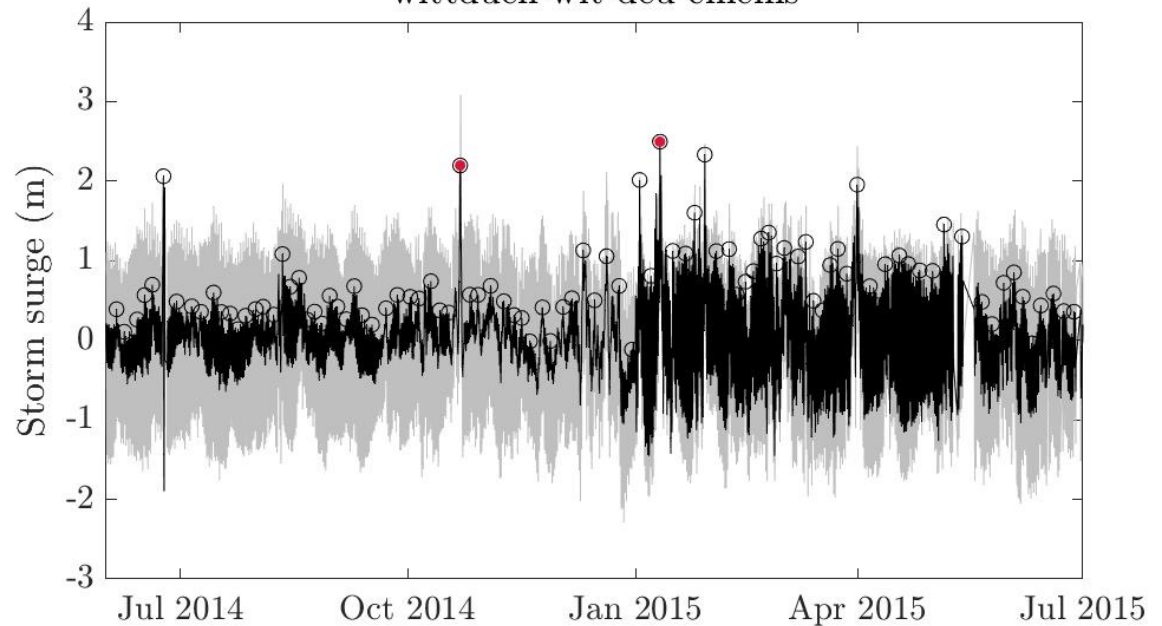


# Corrections of time shifts

wittduen-wit-deu-cmems

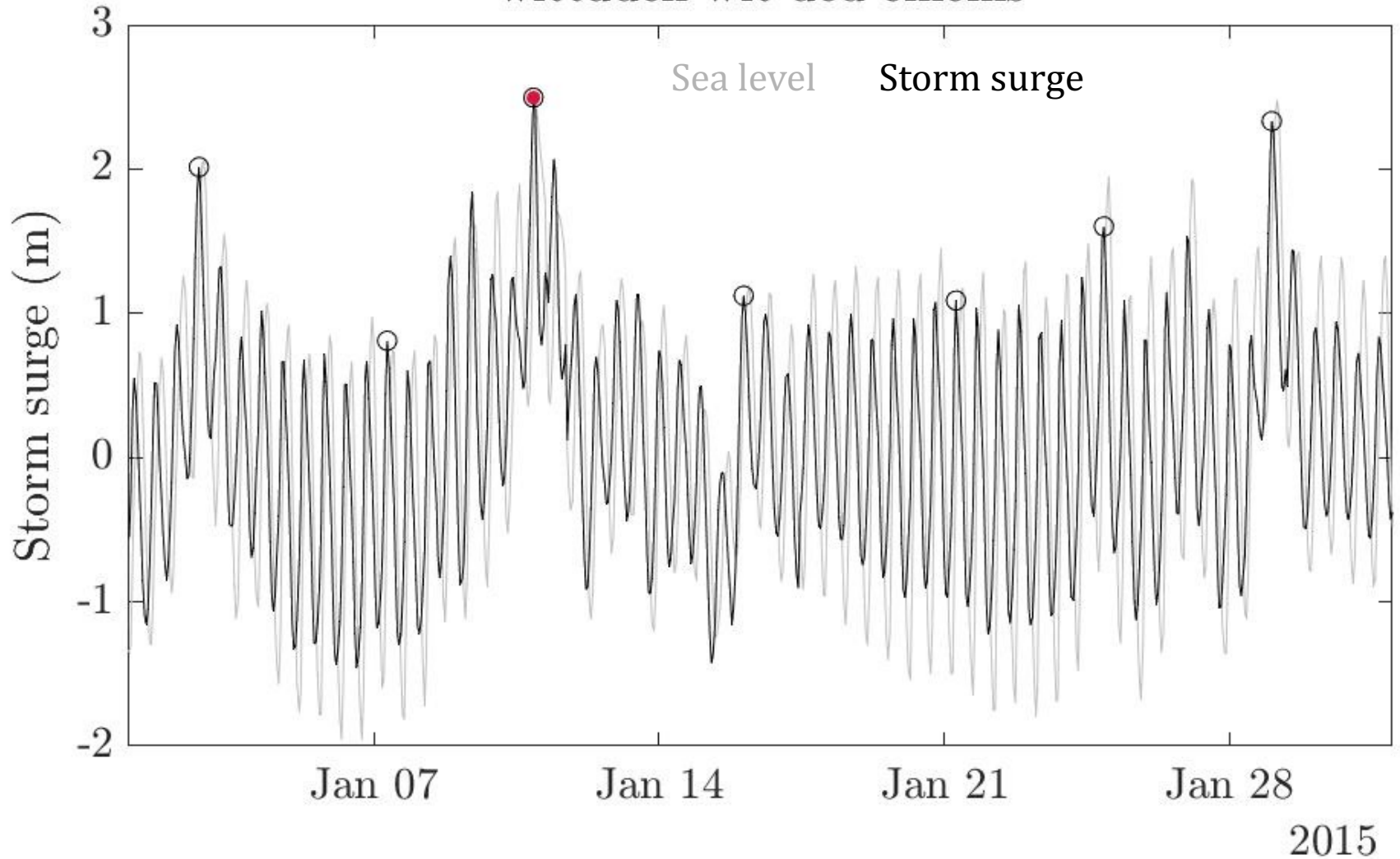


wittduen-wit-deu-cmems

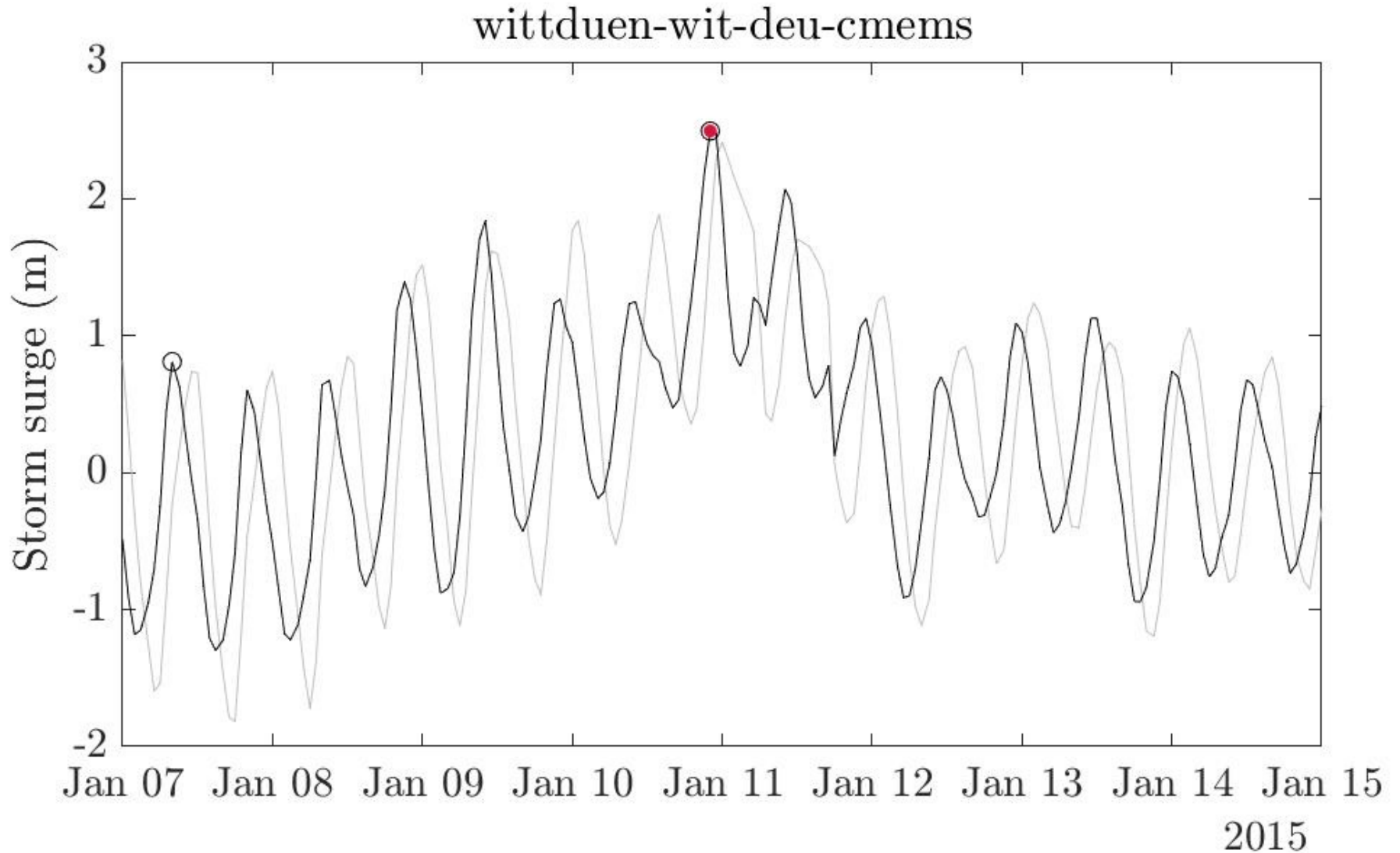


# Corrections of time shifts

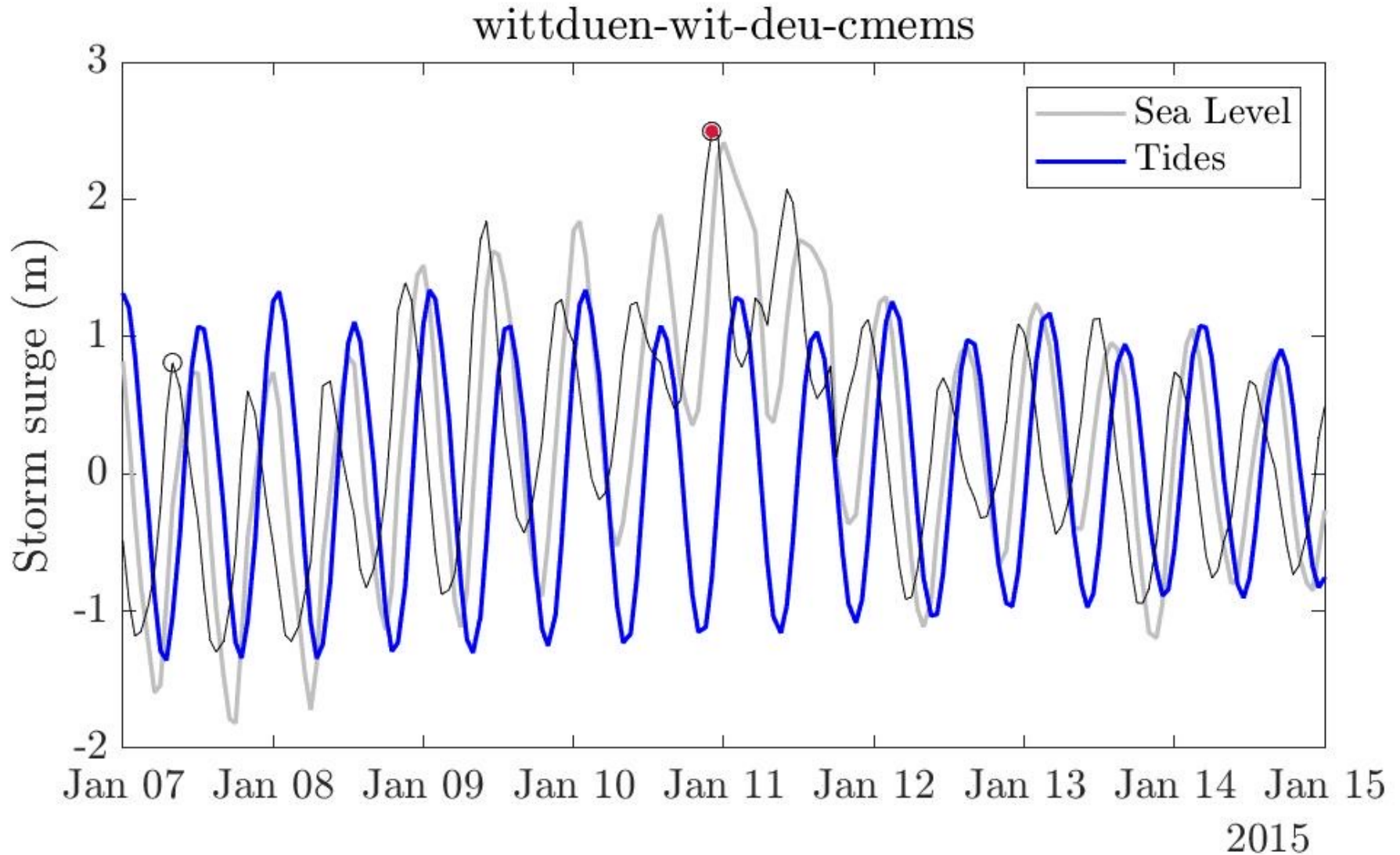
wittduen-wit-deu-cmems



# Corrections of time shifts

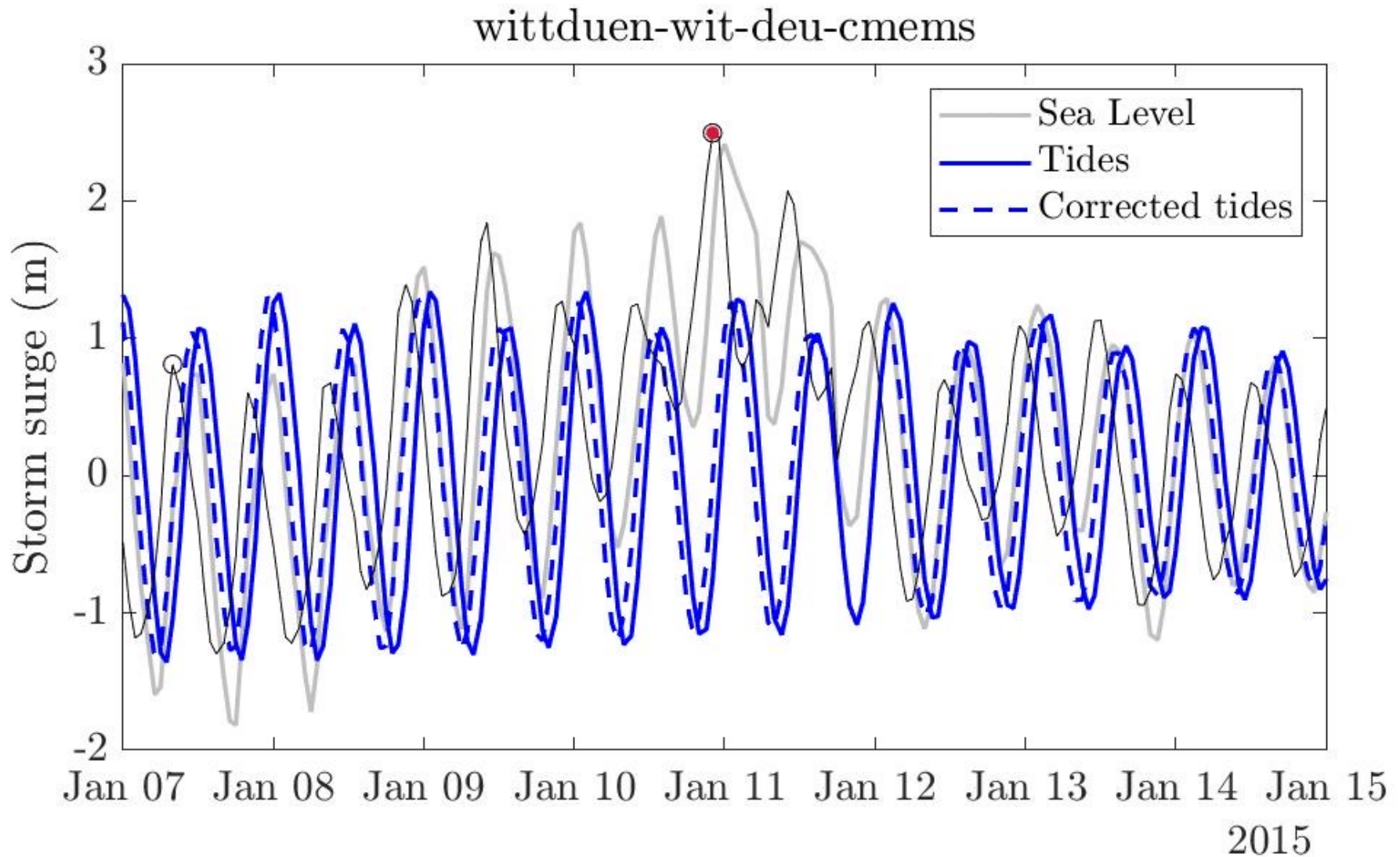


# Corrections of time shifts

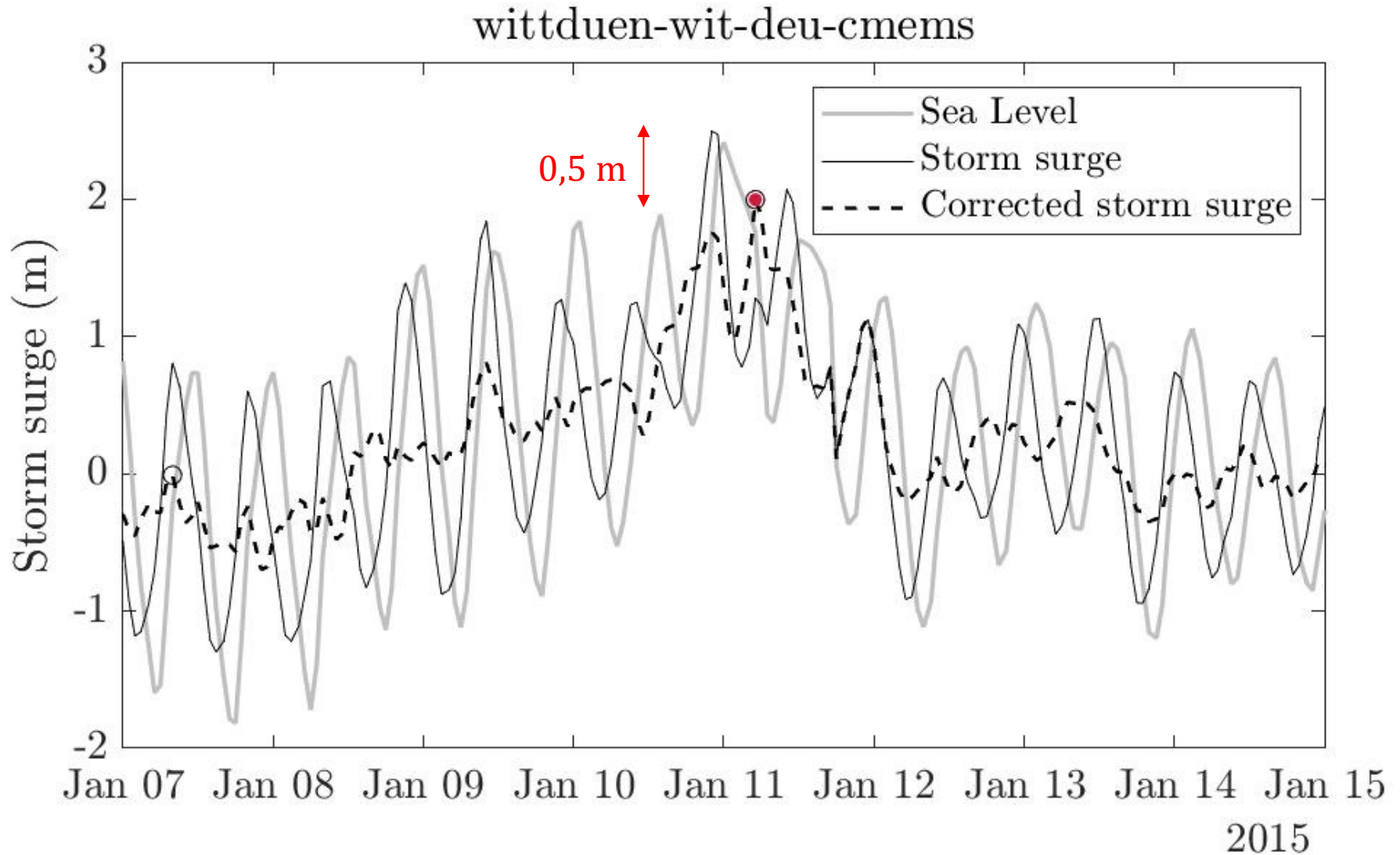




# Corrections of time shifts



# Corrections of time shifts



## **DATUM JUMP CORRECTIONS**

Tide gauge records with datum jumps	219/1022 (21%)
Average (median) magnitude of max jump	1,5 m

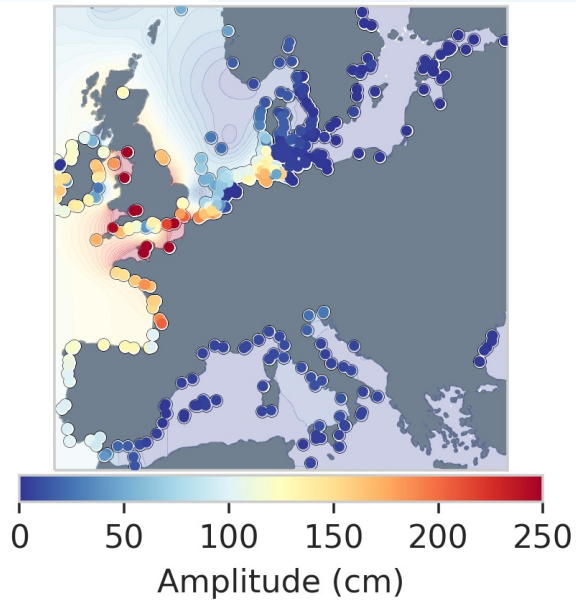
## **TIME SHIFT CORRECTIONS**

Median percentage of corrected periods	8%
How many records with corrections in yearly maxima?	342/1022 (33%)
From those, how many maxima corrected (median)?	9%

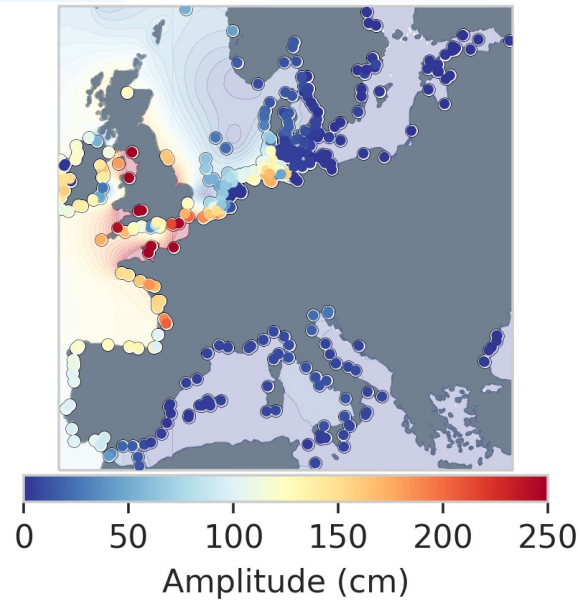


# Amplitude of the main tidal constituents with and without time shift corrections

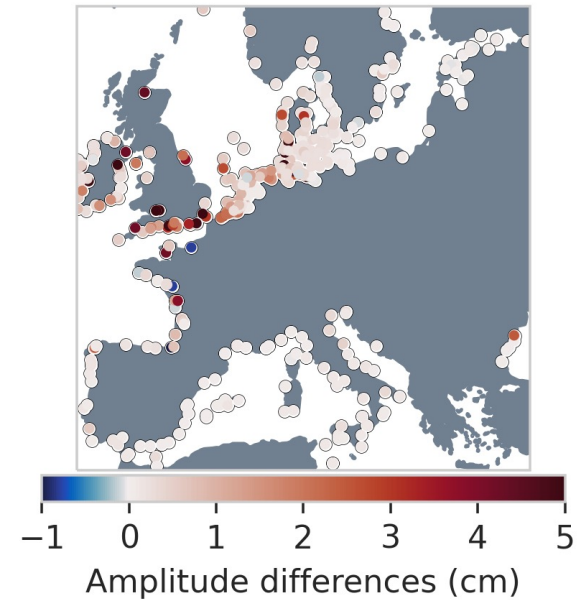
Uncorrected



Corrected



Difference



## To conclude:

- GESLA 3 improves temporal and spatial coverage → updated tidal constituents at tide gauge sites (soon to be released through GESLA website)
- A non-negligible number of tide gauge stations display timing problems that alter the tidal computation.
- Tidal amplitudes of M2 show differences of the order of  $\sim 1$  cm (up/down) when corrections for time shifts are applied.