

Dear Editor,

We are thankful to the anonymous reviewer for the constructive comments and the appreciation of our work.

We addressed all the points raised by the reviewer. Detailed, point-to-point changes are listed below marked in blue.

We hope that these changes will increase the impact of the study and are happy to hear back from you in due time.

Sincerely,  
Damiano Baldan,  
on behalf of all co-authors

Answers to reviewer are marked in blue

Around line 45. Nice explanation overall. I do think there is an overuse of brackets that hamper the reading. I would separate out the sampling methods (peaks over threshold and block maxima) from the extreme value distributions (GEV, PP, GPD).

We rephrased the sentence to remove the brackets, and separated the sampling methods from the extreme value distributions. Now it reads : “The choice of the proper method to conduct the extreme sea level analysis is also a challenge. Several methods exist, both direct, based on fitting theoretical Probability Distribution Functions (PDFs) to the data, and non-direct, relying on mixtures of empirical and parametric PDFs. Extreme values in the data can be defined as either maxima over uniform blocks of data, or values that exceed a defined threshold (Coles et al. 2001). Several theoretical PDFs were derived accordingly: the Generalized Extreme Value distributions (Mudersbach and Jensen, 2010), the Generalized Pareto distributions (Wahl et al., 2017), and the Point Process (Boettle et al., 2016). Indirect methods such as the Joint Probability Method, or the Revised Joint Probability Method (Pugh and Vassie, 1978) also exist.”

Line 57. Isn't the comparison of different detrending techniques another objective?

We included the mention of the different detrending techniques in the second objective: “(ii) assessing which parametric method and detrending approach best accommodates non-stationary conditions”

Around lines 80. *We resampled all data recorded after 1989 to an hourly resolution with different Pugh filters.* Did you use more than one filter to resample the data? If not, which one did you use? Please, think about reproducibility.

We included the number of coefficients used in the Pugh filter, which depend on the temporal resolution of the data: “We used a filter with 27 coefficients for 10-minutes data, a filter with 18 coefficients for 15-minutes data, and a filter with 12 coefficients for 30-minutes data (Pugh, 1987).”

Line 90. Typo

Fixed.

Line 157. where =  $x + y$ . Is this a typo?

Fixed. Now it reads “ $z=x+y$ ”

Lines 173-174. *We used 1990-2019 hourly data from for Venice and 1968-2016 for Marseille (record length of 30 years for both stations).* Are these the years you have used to calculate the tidal coefficients? Please, indicate.

Yes, those data were used for the tidal coefficients. We added the information to the text: “The same time series were used to calculate the tidal coefficients for tide estimation.”

Line 183. What do these numbers mean?

We added the units: “We then corrected the estimated return levels with the extremal indices. We found extremal indices of 5.5 hours and 13 hours to be appropriate for Venice and Marseille, respectively.”

We also included a short explanation on how such extremal indices are used as correction factors in the estimation of the return periods in paragraph 2.3.7: “For the JPM and the RJPM we included the extremal index as a correction factor in the estimation of the return period  $Tr(z) = \theta^{-1}[1 - G(z)]^{-1}$ .”

Line 226. I don't understand Cheng et al 2014 reference here. You are talking about what you did.

We removed the reference from here.

Line 256. When, where

We removed “when”.

Results section is surprisingly short.

The overall length of the results section is 953 words, and we feel it describes the main results of the paper.

Line 304 to 308. Is this information based on your analysis? What results are you using to claim these conclusions?

This information is not directly related to our analysis, but rather an attempt of placing in a wider context our approach. We included a reference so the reader can refer to some literature on the use of statistical models in environmental management.

Line 368- 369. *Overall, we show that using different methods allows to critically examine strengths and weaknesses of each method and to critically evaluate the results to drive the choice of the method that best fits the specific case.* This is the objective of the present paper, right? I would remove the sentence from your paper. What valuable information are you providing by saying this?

We agree the sentence does not add value to the text, so we removed it.