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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "The concept of credible duration for the Regional Frequency Analysis including historical data: application of the FAB method to a skew storm surge database" *by* Roberto Frau et al.

Anonymous Referee #1

Received and published: 30 November 2017

This manuscript is clearly structured and presents an approach to reduce uncertainty associated with the estimation of return periods; an analysis often used to define events of different severity for coastal management purposes. A method to combine historical data with gauge data is presented that may be informative for other studies. The title is descriptive, but very long. If possible, could this be shortened? Below are some minor suggestion to improve the clarity of the manuscript. After revisions are made I would recommend a thorough proof read to catch remaining grammatical errors, some are listed below. The term FAB is not given in full within the manuscript what does it stand

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for? Why is FAB not a keyword if this is the approach used? It must be a key method to be in the title and initiate the start of the conclusion.

In the abstract return periods up to 1000 years are mentioned, is there a reference for this level being used for rare events that can be added. The need for cost effective defence to withstand this level of event is required in the introduction. Skew storm surge can simply be referred to as skew surge throughout. However, the term needs to be defined with reference in the introduction. P1, L28, delete 'The' and start the sentence 'Flood risk is'. P2, L1, suggested updates to text: In the past, return level combinations have . . . . . recorded at a single. . . .... P2, L6, move 'together' from before 'all' to after 'data'. P2, L18, 'compared with a' P2, L29, 'In particular. . . ..' This sentence is unclear please reword. P2, L30-31, suggested updates to text: . . . and look for information during. . .. P2, L32, 'sea level measurements' P3, L2, replace 'whichever' with 'applying a' P3, L6, delete 'the support of' P3, L9, suggested update to text: is a key step. . .. P3 L10, this paragraph describes how data gaps in historical data suggest there were no extremes. Previously gaps in gauge data were associated to instrument failure during extremes. Ensure there is always clarity about which data is being discussed throughout the paper, historical data or gauge data. P3, L14, add 'the' estimate 'of' the coverage. P3, L14, reword: the exhaustively of the. P3, L19, 'assess' might be more appropriate than 'guess'. P3, L24, suggest updating text: gauges positioned along the UK, French and Spanish coasts. . .. P3, L29, update 'called systemic'. P3, L30, add This allows 'us' to. . .. P3, L30, Is the duration of the biggest event only considered as the duration after theat event until the next, or is if the window over that event that falls midway between this event and an earlier/later event? Please clarify. P3, 30, 'been the biggest events' P3, L33, 'exceedance'. P4, L8, suggested update to text: alters the duration of the systematic events. P4, L9, 'that occur in' P4, L11, 'tide gauge data with' P4, L25, reword 'trend lack on skew surge frequency'. It is unclear what is meant at present. P4, L26, introduce Fig 7 at this point so the reader knows the region that is being considered. P4, L27, suggested updates to text: The lack of trend in skew surge frequency also means there is a lack of trend in storm frequency. P4, L28, can

you provide a reference as an example in the literature. P4, L33, Update the brackets so the authors' names are within the sentence. P5, L5, this sentence 'If frequency . . .' is unclear. Please reword. P5, L5-10, UKCP09 should be referenced as a source of climate information for the European shelf seas. P5, L29 & P6, L9, u is not used in any equations so does not need to be defined. P6, L1, the random locations should be presented as example locations and the place names given in the figure captions. P6, L12, The four cases need to be linked to a table and the figures. P6, L15 &L16, the word 'more' needs replacing. Moreover might be more appropriate. P6, L24-32, the cases need to be introduced before L29 and Fig. 5. This information could be moved to follow the paragraph that end L5 so the four cases are introduced. P8, L11, if the RFA and FAB method are the same why is FAB used in the title when RFA is introduced/discussed in more detail. What does FAB stand for? I suggest RFA is used throughout with 1 introduction to FAB as an alternative name, giving the name in full and as the acronym. P9, L9, 'by Ward's' P9, L29, suggest updates to text: A regional sample is formed of normalised . . . are divided by. . . . P9, L30 & P10, L28, 'enables us to'. P10, L1, 'a storm's frequency' P10, L1, 'equal at all' P10, L10, 'visual look of the regional' P10, L16, 'years at each' P11, L25, The conclusion starts with the FAB method, when the RFA terminology is used more frequently in the paper. Try to consistently use 1 terminology, only indicating it could also have another name once. P11, L25, 'trend in storm frequency'. P12, L7, 'of storm frequency'. Figures 1-4, where there is no data there should be no line joining the periods of data collection. This space should be left empty to indicate no data.

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