REVIEWER1: General Remarks on the Article:

1. *The article is well formed and works on a significant issue. As there are so many water level stations throughout the world. Many stations have missing data or long gaps. The proposed method can help fill these gaps, especially with neighboring water level stations.*

Thank you for your review and general positive comments about our study. We gave our responses below marked in red.

1. *One general negative comment is that, while talking about extreme sea levels, the authors do not talk about the storm surge or similar phenomena. Or in general if the authors are dealing with which extreme sea level events.*

Lines 39. / 40. Hypothesis tides are not large enough in the areas and therefore we did not take them into account. (storm surges and extreme sea levels are assumed to be almost the same water levels). We added a reference to Svansson, 1975. We initially did study the tides on the West Coast of Sweden, but found them to be small in the Southern part which we focus on here.

1. *I would suggest a change in the title of the manuscript. The current title suggests that the main focus is going to be about Machine Learning. However, when the overall manuscript is considered, it feels more statistical (as per the topic) than the ML part.*

We agree and have adjusted the manuscript with the new following title: “Extending sea level time series for extremes analysis with statistical methods and neighbouring station data”.

1. *As mentioned below, I believe the geographical location of the stations are very important. Hornbeck and Viken stations are constricted in a channel. In a tidal setting this will change how the water level behaves. This might be a big difference even in the characteristics of the water level time series. I believe this should be mentioned in the manuscript (event if it is not considered in the analysis).*

You are right and the following sentence has been added in the section 2.1: “The geographical location of the stations is important as it can change how the water level behaves, for example, if the stations are constricted in a channel as for Viken and Hornbaek. Here, ESL are defined as the total highest measured sea level including tides and storm surges, this choice is motivated because of the low tidal range in the area (Svansson, 1975).”.

1. *Between L39-50 authors mention many different methods and analysis. It would have been quite good to mention, how good the presented method compared to some of these studies.*

It is difficult to say as this would need to compare those presented methods between each other on a systematic framework which is quite extensive work to achieve. Each method would also need to be described which would make such a manuscript significantly longer. We think that this is outside of the scope of this technical note but could bring a great value to another study.

Small Remarks on the Article:

1. *In the abstract there are many vague words, that has to do with the definition of the time series or quality of the outcome. For example, "Reasonable" is one of them. It would have been better to define the quantity and statistical measure.*

To keep the abstract short, I did not want to go to deep and define the quantity and statistical measures. But we agree with your comment to be clearer and more precise about things and in the revised manuscript we hope to have clarified a number of issues brought up by especially reviewer 2.

1. *Between L30-40 there is a small definition of the data time series. Although the length is defined, there is no indication of the interval of the data until the section 2.1. It would be better to define the interval of the data, since it will also provide insight on the number of data points.*

I understand your comment but would rather keep it this way as the introduction is, I think, introducing the field and general background behind the study. The data are then introduced in more detail in section 2.1

1. *Also in the same part, the highest record of 235 cm is given. It would have been a good idea to explain the event, as mentioned in the previous comment. Is it a storm surge or happened during spring tide etc.?*

It is difficult to understand exactly what happened for this particular event and therefore to introduce it in the paper, I think. According to Johansson, 2018, this event was mainly due to local conditions leading to a sea level increase of 50 to 100 cm in comparison with neighbouring stations as Viken, the second one is a seiche effect which could add around 25 cm to the total sea level. We have now briefly described this in the manuscript and referred to the reference (Johansson 2018) that studied this extreme event.

1. *In the methods part it is not clear which data is used for LR for QRF methods. Is it the hourly data or the daily data? In case if it is the hourly data, how good a good a fit is obtained using LR method to a tidally harmonic data?*

As mention in section 2.1, the daily data are used throughout the full analyses and precision has been added in this section 2.2.

1. *In L100 the sentence says the LR model is trained, but since it is a Least Squares Method, I don't thing "trained" is the correct word. It would be better to say "the LR model is fitted".*

We agree and have adjusted the manuscript.

1. *If Figure 3 is showing the Setup Period 1 (as far as understood, it should be noted in the caption).*

We agree and have adjusted the manuscript.

1. *In Section 3.1 one of the metrics is RMSE. Although it is a good metric, for example 6 cm RMSE in a 200 cm water level vs 30 cm water level is quite different. I suggest to use either a normalized RMSE or giving the range of the water level within Table 2.*

On suggestion from reviewer 2, we chose to not normalize it but introduced a bit more details about the time series for each station in section 2.1. Also, the figure 2 permits, we think, to get an overall understanding of the time series behaviour.

1. *In general, and discussed in between L150-160, there are two sets of stations with very significant geographical differences. Hornbeck and Viken stations lie inside of a channel (almost at the entrance). However, compared to these stations, other stations are on the open coast. Maybe this is what's meant in L159-160 by the physical grounds, but this might be a big difference even in the characteristics of the water level time series.*

This has been added to the paper, thank you.

1. *L194 and Table3 Andersson is given two different dates (2001, 2021).*

We agree and have adjusted the manuscript.

1. *In Figure 4 the colors of the stations are over washed by the shadow colors. Different color scheme or changing the line properties might help.*

We agree and changed the line properties, it is however quite difficult to find a good color scheme. We are happy to continue to work more on these technical aspects of improving the quality of figures if needed during the later stages of the review process.