Dear Professor Huthnance,

Many thanks for considering our paper titled 'A newly reconciled data set for identifying sea level rise and variability in Dublin Bay'. We have fixed all the identified typos and badly-worded sentences. We have also address all the other issues identified in the previous round of reviews.

We hope that you now find the paper suitable for publication. If you have any further queries please do not hesitate to get in contact with me.

Yours sincerely,

Amin Shoari Nejad

Line 7. I think CI should be defined as “confidence interval”.

In the revised manuscript we are more explicit by stating "credible interval" which is the uncertainty interval calculated from the posterior distribution of a Bayesian model, whereas "confidence interval" is associated with the traditional Frequentist statistical models.

Line 48. You refer to “Annual high and low water . . . for the period 1938 to 2001” but lines 49 to 51 only mention the datum for data up to 1988 and line 54 refers to only “two overlapping years”. Why ignore the annual data for 1989-2001?

In line 51 the period "1978-1988" and "two overlapping years" were mistakenly specified. In the revised manuscript the following changes are applied:

"1978-1988" to "from 1978"

"two overlapping" to "the overlapping 15 years (1987–2001)"

Line 74. “The second-high tide”. As Reviewer 1 said, on some days there is only one high tide. You should say what procedure allowed for this.

We added the following sentence in line 75 of the revised manuscript to explain the procedure:

"In the case where the time window went into the next calendar day, only a single high tide was recorded for that day."

Table 1. I miss the definition of MTL. Please also give an explicit definition of mean sea level (MSL) so that the difference between MTL and MSL is clear.

Line 49: We added the following line defining MTL:

"Mean tide level (MTL) was calculated by averaging mean high and low waters. "

> Line 78. Elsewhere (line 62, Table 1) the NTGN dataset only begins in 2007 giving only three years overlap. Please be consistent.

We corrected the line by replacing the "four" with "three".

> Line 82. ". . no overlaps . ." but Table 1 shows Port Authority monthly completely covering Harbourmaster. Likewise Figure 1: why does the Port Authority stop at 2001 or 2002 whereas in Table 1 it continues to 2017?

The end date 2017 was mistakenly stated in Table 1. We have corrected it by changing the end date of the Port Authority Monthly dataset from 2017 to 2001.

> Table 2. I think this should include the tide gauge type (radar?) as implicitly asked for by Reviewer 1. For the Dublin gauges, I think some of the detail sought by Reviewer is still lacking: "calibration method used to level it in such that low waters were accurate?" "why were high waters less reliable?" "density (and maybe gravity) assumed", "manufacturer?" "absolute or differential sensor?"

Unfortunately we do not have any evidence of a systematic levelling that would make the low waters more accurate but our cross comparison indicates a high level of accuracy between sites. We discuss this in Section 3 of the paper.

Regarding the instruments installed at Arklow, Howth Harbor, Newlyn, and Brest we added the following sentence in line 93:

"The Arklow and Howth Harbour data sets are derived from bubbler gauges. The Newlyn and Brest data are gauges with a long history of use in sea level studies (Bradshaw et al. (2016); Woppelmann et al. (2006))"

We could not find any further information on the manufacturer or other specifications of the tide gauges.

> Line 99. ". . malfunction of the Dublin tide gauge . ." (the reader needs to know which tide gauge)

In line 102 of the reviseed manuscript we specified the Dublin Port tide gauge.

> Lines 120 and two lines before 145. "mean process" is "statistical mean" or "mean of the process" or simply "mean"?

The expected value of MSL is a stochastic process which is why it is referred to as a mean process. However, we changed the terminology in the revised manuscript to simply "mean" to avoid confusion for the readers of the journal.

> Lines 137-138. "Due to the lack of atmospheric data for Dublin Port before 1948, we removed the atmospheric effects after correcting for MSL." This sentence is very unclear. How do you remove atmospheric effects without atmospheric data? What does "correcting for MSL" mean (is it a reference to some procedure in section 3)? Please be explicit.

We clarified our procedure by revising the lines 142-145 as follows:

"The MSL data from Brest is missing between 1944 to 1952, so we decided to limit our SLR rate estimation to 1953-2016 during which the data for all three sites were complete. We first removed the inverse barometer and wind effects on sea level at each site following Frederikse et al. (2017) and Diabate et al. (2021) (we omitted this step in the previous section due to lack of atmospheric data during 1938-1948). "

In Section 3, we explain adjusting MSL using MLW during 1938-2016. Our atmospheric dataset only covers 1948-2016 so if we wanted to account for the atmospheric effects before adjusting MSL then we had to throw away 10 years of data from 1938 to 1948. We examined these 10 years of data and decided that its exclusion would dramatically increase the residual standard deviation in the model. Hence we decided to first adjust the MSL using all data we have and then in Section 4, where we estimate the SLR rates, remove the atmospheric effects for periods post 1952.

Why do figure 6 and Table 5 only start in 1953? Line 137 refers to atmospheric data from 1948.

As explianed above, that is due to lack of MSL data from Brest pre-1953.