

Ocean Sci. Discuss., referee comment RC1
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Comment on os-2021-49

Marta Marcos (Referee)

Referee comment on "Mean sea level and tidal change in Ireland since 1842: a case study of Cork" by David T. Pugh et al., Ocean Sci. Discuss.,
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This manuscript succeeds in providing information on long term changes on tides and mean sea levels at Cork using only a short set of data recovered from historical archives in combination with modern sea level observations. Many details are provided on the data collection and on the corrections applied to make old and new data comparable. This is the core of the paper. Once this is achieved and the remaining uncertainties are estimated, the analyses of tidal changes and mean sea level trends are straightforward. Results are consistent with other works that point at only small (and local) changes in tides over the past 200 years and with earlier estimates of mean sea level trends in the region. I think this work deserves publication and I am looking forward to seeing the comprehensive study that the authors are planning to carry out at many more sites around Ireland.

I provide below a list of questions and suggestions, followed by some typos:

- Sections 1, 2: I think it would be useful for the reader to summarise the information on stations and periods to facilitate the reading, together with Figure 1. It is easy to get lost in the text otherwise.
- Lines 134-135: how are 5-min readings converted into hourly? one value every hour has been kept and the other 5-min values disregarded, or have they been averaged?
- Page 6, 1st: if sea level is measured using a pressure gauge, then atmospheric pressure is probably also recorded. Air pressure observations are then mentioned in line 295.
- Section 4.1.1: Figure 4 shows, according to the caption, the seasonal cycle of the M2 modulation due to MA2 and MB2, but the text (line 190) refers to non-astronomical effects, which is contradictory.
- Line 216: estimation of the magnitude of the nodal modulation of M2 based on other sites. Are these listed somewhere?
- Line 233: what are these uncertainties ? according to the text after them, seems to refer to interannual variability, but is it not specified.
- Line 295: see my comment above on the air pressures...
- Lines 476-478: this seems a bit speculative since the 27 cm are an averaged value. It

would make more sense to compare with closest stations (averaged or not)

Typos:

- Line 147: is this reference to figure mistaken? Maybe figure 3...
- Line 231: "we to look"
- Lines 429-430: these two sentences are repetitive
- Lines 473-475: please use the same number of digits, for consistency.
- Line 476: 40.2 cm
- Reference Dwyer is incomplete
- Reference Hogarth (2021) is already published
- Reference Horsburgh (2020) doi is missing