

Ocean Sci. Discuss., referee comment RC2
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Comment on os-2021-49

Anonymous Referee #2

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.,
<https://doi.org/10.5194/os-2021-49-RC2>, 2021

Review of 'Mean Sea Level and Tidal Change in Ireland since 1842: A case study of Cork'

In this paper, the authors present the results from a tide-gauge data digitization effort in Cork, Ireland: data from a large field campaign in 1842 is digitized, and a levelling campaign has been undertaken to compare the historical measurements with present-day observations. The authors find a sea-level rise of about 40 cm over 177 years and a small but significant change in the amplitude and phase of the semi-diurnal tide.

I have enjoyed reading the paper, and the manuscript has taught me a lot on all the processes and uncertainties that are involved in tide-gauge data rescue efforts. I recommend publication in Ocean Sciences, and I'm convinced that the digitized records will have many use cases in the oceanic and geophysical community.

I have some (very) minor comments:

L41: The word 'Marigraphs', which I think refers to automatic tide gauges, might need a quick explainer.

L420ff: an alternative to estimating the range of inter-annual variability could be to exploit the coherent interannual and decadal variability around the British Isles, as shown in Hogarth et al. 2021. The surveying period might have been during a period of below-average MSL values around the British Isles, or the other way round. Not sure how large this effect is though.

L474: GIA uncertainty might be large in this region. For example, the GIA model from Caron et al.(2018) predicts a relative sea-level rise of 0.6 mm/yr for the region around Cork. This model is far from optimized for this region, as it's not using a sophisticated local deglaciation history, but the GIA signal might be a major reason for the difference between the rate from Hogarth et al. 2021 and the number found here.

Figures 1 and 6: R. Lee, does that refer to the river Lee?

Finally, I'd encourage the authors to deposit the digitized time series and levelling information in a public repository, for example PSMSL or Zenodo.