

Ocean Sci. Discuss., author comment AC3
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Reply on CC1

David T. Pugh et al.

Author 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-AC3>, 2021

We would like to thank Professor Matthews for his comments on the paper and would like to take the opportunity to respond to the scientific critiques contained therein.

There are therefore two conflicting theories competing in this paper.

We disagree that there are two competing theories in the paper. The paper presents a consistent analysis of tides and mean sea level in Cork. There is no model verification in the paper and Ph etc. are not the subject of this paper.

Solar 11-year harmonic cycles and climate change

The influence of the 11 year harmonic cycle is an interesting query. Our co-author Philip Woodworth has previously published on this topic in 1985. Firstly, we note that the amplitude that was found in this study of 10–15 mm is much smaller than the 40 cm of mean sea level rise that we have observed. Secondly, 1842 was 4 years post peak solar cycle and 2019 was 5 years post peak solar cycle so our interval occurs at approx. the same point in the solar cycle and therefore little effect would be expected (maybe 20% of 10–15 mm).

Woodworth, P.L. 1985. A worldwide search for the 11-yr solar cycle in mean sea-level records. *Geophysical Journal of the Royal Astronomical Society*, 80, 743-755.

Climate and Sea level from Pre-industrial pre Ice ages

We have made note of large changes in sea level in the past in the paper but this timescale of change is not pertinent to the present study.

Sensitivity Theory and Evaporation

This study does not address climate sensitivity.

Regards, Gerard McCarthy (on behalf of all co-authors)