

Interactive comment on “Projected impact on wave-driven harbour agitation due to climate change – application to the Catalan ports” by J. P. Sierra et al.

Anonymous Referee #3

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General Comments

The paper studies Port agitation in 13 Catalan Harbors using a combination of different projected global and regional circulation models. Waves are obtained with SWAN modeling and selected waves propagated to the Harbor entrance using linear theory and within the Harbor using a Boussinesq-type of model (BTM). The paper is quite well-written except at very specific confusing places. The paper is descriptive without many thoughts given to physical meaning and interpretations of the results. I suppose the information might eventually be practically useful but the authors should provide error estimates of the model results.

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Specific comments

The work uses a BTM for wave propagation inside the ports. However the model is not presented and thus the characteristics (i.e. the performance) of the model (i.e., fully or weakly non linear?, fully dispersive?, etc) can not be evaluated. No information is given about the different ranges (for each harbor) for $\mu = kA/h$ and $\epsilon = a/h$ (also for the intermediate waters when the linear theory is used).

The main drawbacks of the paper are: i) From DW to SW the propagation is made using linear theory. This is a critical aspect, specially 1) for large ϵ and 2) for those areas where refraction/diffraction are important- ii) The incoming direction is avoided in the analysis. A slight change in the wave vector angle will largely modify the results.

Specific comments

i) Page 5 line 209. How H_s is computed from the model results? BTM solve the phase and therefore H_s will depend on the length of the simulation. This is a critical issue especially for resonant cases. ii) Page 5. I am confused about the methodology presented. Why the authors did not use directly the DW characterization instead of grouping the waves?. iii) The graphics show in general a banded behavior for H_s inside the harbors. My guess is that this a consequence of the methodological process (average (H_s) of averages (cases)).

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