Geosci. Model Dev. Discuss.,
https://doi.org/10.5194/gmd-2017-107-RC2, 2017
© Author(s) 2017. This work is distributed under
the Creative Commons Attribution 3.0 License.

Geoscientific Model Development Discussions

Interactive comment on "Sensitivity Analysis of a Coupled Hydrodynamic-Vegetation Model Using the Effectively Subsampled Quadratures Method" *by* Tarandeep S. Kalra et al.

Anonymous Referee #2

Received and published: 23 August 2017

General comments Indeed, this type of models are needed for coastal studies. And the general idea of having more efficient sensitivity analysis methods for this type of models is very attractive. But: the real benefits are not imminent from this MS, as the real details of both model and method are not described (i.e. not informative) - it is too easy to lay this MS aside as just another paper describing some sort of method. Remember that the people interested in using (the results of) this type of models are not necessarily interested in complicated sensitivity studies; what can you do to make their life easier?

COAWST contains the word sediment, but the effects of vegetation on sediment are

not mentioned in the abstract (or dealt with in the MS?)

The abstract describes the results very vaguely without any causality, and does not say anything we did not expect already.

For the demonstration of this technique, seagrass properties -which can be measured quite well, i.e. do not have large uncertainty- have been varied over a relatively small range, whereas the environmental conditions have not been varied. Rather than learning which details matter, it would be interesting to see when (under which conditions) these details matter; try to compare the combinations of veg parameters to literature on flow regimes, e.g. Mitul & Nepf 2013. My gut feeling says more uncertain parameters like C_d (=1 which is ok for a rigid cylinder, not for flexible, flat-bladed seagras!!) and z_0 can have stronger effects. Such considerations are mentioned in section 4.4, but should be discussed earlier to avoid loosing your public.

Why use pct change from the minimum value? That is a rather extreme situation.

Specific comments p2_l20 no drag coefficient or spatial density? Note that in the SWAN implementation (Suzuki et al), some parameters have exactly the same effect in the energy dissipation equations, see http://swanmodel.sourceforge.net/online_doc/swantech/node21.html. p3_l1-15 what is the overall message of these loose examples? p4 why not refer to Table 1 for the equations? p4_l29 , instead of ; p5_l28-31 is this the stem density or the leaf density? Typically, Zostera marina has multiple leaves, and as the stem is usually short it may be the leaves that interact with the flow. For leaf density, this is a very low number but it matches the diameter (=leaf width?). The thickness of the leaves is rather large in my opinion, given the small length of these plants. How has this been measured? With a caliper or estimated? (personal comm is not published data!)

p18, Table 2 What about ah (as in Nepf, 2012)? p20, Fig 1 Are the Drag force, mixing and streaming calculated by the vegetation module? I would think these are hydrodynamic properties computed by ROMS, based on the same set of veg parameters that

go to SWAN. p28, in caption: where can I find the condtions for these sims? I am surprised the classical S shape for flow in/over canopies is missing.

Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2017-107, 2017.