

Interactive comment on “Integration of Geographic Information System frameworks into domain discretisation and meshing processes for geophysical models” by A. S. Candy et al.

Anonymous Referee #2

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1 General comments

This manuscript presents an approach to meshing geophysical domains by integrating general-purpose meshing tools with GIS software. It makes a timely and practical contribution to the literature on this subject: the techniques presented have the potential to facilitate mesh generation for a range of geophysical models, and will serve to make the process more robust and reproducible. In these respects, it is a very worthwhile manuscript, and I find that it is well suited to publication in Geoscientific Model Development.

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The main weakness of the paper is in the organisation of material, and in the way the reader is led through them. Before publication, I suggest that the authors undertake a thorough revision and reorganisation to address these issues. Specifically:

- Most of the way through, it is unclear to the reader whether the authors are describing a general approach/philosophy to the use of GIS in the meshing process, or whether they have specific new tools to describe. The abstract refers to a “verified implementation”, but it is only at the very end (in the Appendix) that the software developed by the authors is explicitly referred to. In my view, it is essential for the text to be revised so it is clear from the outset which elements represent a novel putting-together of existing tools, and which involve new code.
- More generally, there is a structural problem in distinguishing between what one might term “current practices” in mesh generation — with their attendant limitations — and the new and better practices which the authors are seeking to promote. Sections 3.1.1 and 3.1.2 need to be better introduced in this context.
- It would be good to introduce the over-arching approach adopted and the tools used before getting stuck into the example from the UK coastline. In particular, it would be very helpful to present an overview of the workflow/tool-chain, with a discussion of the extent to which it represents a generalised solution to the problem of mesh generation.
- There are times when the “level” of the text seems to change abruptly, perhaps indicating that the authors need to think carefully about the intended audience of the paper. My suspicion is that it will be of practical interest to a wide range of scientists and engineers who are making use of unstructured models, but who may not have the background in the mathematical intricacies of mesh generation. Some of the mathematical terms used may need a little more introduction to be readily digestible by this broader audience.

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2 Specific comments

Most of the text is well written and easy to understand. There are few occasional problems with grammar and punctuation:

- 5996/18: Does GSHHS stand for anything particular?
- 5998/24 and 5999/1: These sentences don't work grammatically with the framing context of "...requires the following". For example, point 5 could be rephrased as "Efficient drafting and prototyping tools".
- 6002/26: This is actually two sentences, which should therefore be joined either by a colon or a semicolon after "problems".
- 6011/26: The same problem occurs here — something other than a comma is required after "accurately". There are a number of similar instances elsewhere in the text.

Interactive comment on Geosci. Model Dev. Discuss., 7, 5993, 2014.