

## ***Interactive comment on “Itzi (version 16.8): An open-source, distributed GIS model for dynamic flood simulation” by Laurent Guillaume Courty et al.***

**Anonymous Referee #1**

Received and published: 11 January 2017

This journal paper presents details of the development of an open source hydrodynamic numerical model, named “Itzi”. It aims to allow easy integration of a simplified inertial form of the shallow water equations for the generation and routing of rainfall flooding on a topographical grid. The paper describes the implementation of the inertial equations developed as part of the LISFLOOD-FP model within a GIS framework, using the PYTHON programming language and integrated within GRASS GIS. Extensive testing is demonstrated through three levels of implementation; analytical, conceptual and an actual flood. Results demonstrate reliable and reproducible outcomes for the purpose of flood routing. This is a well written and clear description of the model background, its development, implementation and testing. All relevant details are covered

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without being unnecessarily verbose. Moreover, the full code and supporting documentation have also been made available as open source for full transparency. Whilst the implementation of the inertial form of the shallow water equations has been reported in other models, the unique development here is the integration within a GIS framework allowing easy and reliable application with multi resolution datasets for terrain, landuse and rainfall inputs. The open-source aspect also allows further collaborative contributions to develop the model in the future. This contribution has the potential to enable wider access to robust hydrodynamic 2D modelling flood modelling. I would recommend publication with only the following minor optional changes.

Page 2, Line 28: “presented an flood inundation model” should read “presented a flood inundation model”

Page 2, Line 32: “low values of Manning’s” – please define.

Page 3, Line 28: “scheme to sole” should read “scheme to solve”

Page 6, Line 13: “It consist of” should read “It consists of”

Page 8&9: potentially combine Fig 3 and 4 into 3a and 3b?

Page 11, Line 11; “Hull University” should be “University of Hull”

Page 12, Line 4: “advantageous” might be a better word here than “handy”

Page 14, Figure 12: I did not find this figure very clear, could it be improved for clarity. Maybe make the background image grey so the three different colours stand out better. What is orange? The overlap?

Page 14, Line 4: Can you provided a brief description of these skill scores for those unfamiliar with them and maybe highlight one or two that provide an indication of the fit.

Page 14, Line 7: “sensible” should be “sensitive”

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Page 14, Line 20: “for” should be “of”

Page 16, Line 7: “proven” is probably too strong a word here, maybe “demonstrated” is better?

Page 17, Line 4: “been then” should read “then been”

Page 17, Line 6: “global dataset” should read “global datasets”

Figure Captions: My biggest problem is with the figure captions, as they tend to be over short and not describe the figures very well, resulting in a bit of cross-referencing with the text, rather than functioning stand alone. I would prefer to see more detail on all the figure captions. (eg figure 6 what are the crosses and numbers.

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Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-283, 2016.