Geosci. Model Dev. Discuss.,
doi:10.5194/gmd-2016-85-RC3, 2016

Geoscientific Model Development Discussions
Open Access
EGU

Interactive comment on "A computationally efficient depression-filling algorithm for digital elevation models applied to proglacial lake drainage" *by* Constantijn J. Berends and Roderik S. W. van de Wal

L. Tarasov (Referee)

lev@mun.ca

Received and published: 30 September 2016

reviewer comment: This study contrasts with my approach, briefly described in T P 2006 that focused on coarsening the hydrological DEM resolution to the resolution of the ice sheet grid while preserving routing pathways. It would be worth a few sentences comparing the two approaches with respect to computational speed and accuracy given the different tradeoffs between the two approaches and the contextual accuracy of the ice margin.

#author response: We agree that a comparison of the two methods in terms of com-

Printer-friendly version

Discussion paper

putational speed is of added value to the manuscript. Although we don't have the code from T P 2006, we worked along the concepts of their algorithm during the start of our project, but quickly concluded that this approach was computationally more expensive. This is mainly because the drainage pointer approach must be applied to the whole region, meaning that, although it has a larger scope, it needs to operate on every grid cell. Our approach only treats the flooded grid cells of a designated drainage basin. For the case considered our code is a factor 5 faster. This will be described in a separate section in the manuscript

#Reviewer response to above: You've lost me. My model computes mean (ie over past 100 years) surface drainage every 100 years over a glacial cycle with less than a 30 minute computational overhead (for surface drainage) for the whole run. Is your approach really 5 times faster than this? You seem to be addressing my drainage pointer algorithm instead of my approach of surface DEM upscaling that preserves drainage routing (with an accuracy displayed in the original 2006 QSR paper).

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-85, 2016.

Printer-friendly version

Discussion paper