Earth Syst. Sci. Data Discuss., 3, C60–C69, 2010
www.earth-syst-sci-data-discuss.net/3/C60/2010/

Earth System Science Data Discussions

Interactive comment on "An improved Antarctic dataset for high resolution numerical ice sheet models (ALBMAP v1)" *by* A. M. Le Brocq et al.

M. Thoma (Referee)

malte.thoma@awi.de

Received and published: 6 July 2010

##
##
General comments:

* I consider this data collection very valuable to any ice sheet/shelf modeller, and hence, it should be published. However, I have some minor comments and suggestions which might help to improve the manuscript as well as the dataset.

* Although I am not a native speaker, I have given some suggestions where I find the original text hard to understand. Feel free to ignore my comments in this cases if they are not appropriate.

##
##
Specific comments to the manuscript: ##

Abstract: * l4 & l14: The authors use the expression "high resolution [numerical] ice sheet modelling" twice, without explaining what "high resolution" means. Please be more specific.

1 Introduction

p197

* l4p The authors write: "However, these models are only as good as the data that are input" I don't think this is correct, or to be more precisely this is about the definition of the term 'model'. If you consider a 'model' to be a computer program only, you don't change its 'good'ness by the quality of the input data. Hence, I would reformulate: " However, the RESULTS of these models are only as good as the quality of the input data"

* l6p You should also mention that SICOPOLIS and ELMER/Ice are also available under reasonable software licences can be downloaded as well.

* l10 remove 'the'

* l17 I don't understand this statement "BEDMAP unsuitable for the current generation of ice sheet models" Either BEDMAP is not good enough for any ice sheet model or it can be used if it is modified (as the authors did). Without a definition of 'current generation' this expression is not clear.

* l24 remove 'a'

* l25p ... used for other purposes, the user should be aware ...

p198

* l2 ... includes the most up-to-date versions of boundary conditions required to ...

* l9 If this sentence "... is available in the documentation file provided with the data." refers to this document http://doi.pangaea.de/10013/epic.34211.d001 I have to admit, that I don't feel comfortable with it. The structure of that document (from February 2010 is VERY similar to the manuscript. Actually I think this is a former version of the manuscript itself and not the proclaimed 'More specific detail'. I am very sorry, but as a reviewer with a limited amount of time I don't have the capability to read the former version of the same manuscript, too. I strongly suggest to remove the February version from Pangaea and add a simple README file, which only contains ADDITIONAL information and does not repeat anything already described in the manuscript.

* l17 I have to admit, that I (as a proponent of open source software) do have my caveats to suggest the commercial software in this manuscript. There are many many free tools to read netcdf data (which is a free format anyway). Hence I would recommend to remove Matlab and ArcGIS from the manuscript. It could be replaced with: "Many tools are available to convert the data. For example >ncdump<, >ncks<, and nco< can be used to extract ASCII data, >ncview<, >panoply<, and >GMT< could be used to view the data and mathematical operations can applied with >nco< or >GMT<. In addition some commercial programs are also able to interpret netcdf files."

* l19p I appreciate that the parameters for the projection are given. But the lat/lon information belongs also into the netcdf file (see above).

p 199

2 Masks:

* In this section you describe the masks >mask< >mask+< (or >mask_plus<), and >glmask<. What about >umask< and >bmask<? They should be described, too.

* l25 What is the bases for the velocity? Is it observed (source) or is it modelled (how)? OK, this is explained on p200l9. However, I suggest to reorder this information.

p200

* l18 The expression >ice plain< is not well known and should be explained in detail. Is it defined as >ice sheet< or >ice shelf<, or is it a third type of ice? (see above)

* l22 (10 s km) is the 's' a typo?

* l21 The authors use the expression 'often' and then refer to PIG and Slessor Gl. I wouldn't consider two glaciers as 'often'. I'm sure there are more >wrong< GL, hence I'm not sure if 'notably' is the correct expression here.

p201

* l1 'perhaps' is not a good wording in a scientific paper, from my point of view. Don't speculate, but make your statement! No one will blame you if you have good arguments ;-)

3 Ice sheet configuration

3.1.1 Grounded Ice

* I disagree with the order of the presentation in this subsection. It is hard to understand. Please reformulate. Suggestion: 1. Describe which datasets are used 2. How they are merged 3. What is the difference between lsrf and topog 4. What is the difference to 2

* l13 The 50m seems to be arbitrary. Where does this value come from?

3.1.2 Floating Ice

p204

* l7 A firn correction over the ocean seems useless. This should be removed from the dataset and filled with NAN (-9999)

* l8 I do understand the meaning of H_i, but is the sentence in the brackets good English? I find it hard to understand.

p205

* l20 The authors describe in detail how the ice thickness has been calculated, however, in the netcdf only >usrf< and >lsrf[2]< are included. Therefore it is not clear to me what is meant with " actual ice thickness ... is incorporated into the dataset" For my example figure I subtracted lsrf from usrf.

3.2 Ice surface

* p206 What is JLB/JAG ?

p207

* 1. It may be only 0.1% of the grounded cells, but these are all(!) along the grounding line and/or below ice shelves. This changes the 544 grid cells to a significant amount! This should be mentioned.

* What about subglacial lakes, in those areas, the ice is also floating. What does the algorithms indicate there? And how is this treated?

3.4 Sub Ice-shelf bathymetry

* l21 I disagree with this sentence. To my knowledge there are some ice shelves with a reasonable bathymetry. E.g. Amery, Fimbulisen, GeorgeIV. I don't suggest to include all this data, I only suggest to reformulate this sentence.

* l22pp The sentence " In BEDMAP, ... that were used led to ... which did not ..." It hard to follow.

p 208

* l13 From my point of view the PIG is part of the Amundsen Sea.

* l15 This paragraph is surly worth to note! If BEDMAP has a shift and an offset (how much?) this is important to pronounce! However, it does not only refer to this section, hence move it to a more appropriate place. Did the authors found the shift values

(dx=3134m, dy=1866m) as an analytical result from comparing different projections or are they just found by trial and error?

p210

* l26 The original dataset is discussing this issue is Galton-Fenzi, B.K., Maraldi, C., Coleman, R., and Hunter, J.: The cavity under the Amery Ice Shelf, East Antarctica. Journal of Glaciology, 54 (188), 881-887, 2008. (Ralph Timmerman, personal communication ;-)) Please adjust the citation.

p212

* l11 On which ground do the authors claim "...which should be below sea level ..."?
* l19 "...ice thickness above buoyancy..." I'm not sure what the authors mean with this expression. If the ice is 1000 m thick and we assume an ice density of 918 kg/mˆ3 and a water density of 1028 kg/mˆ3, than the 'buoyancy'-level would be at 1000 m * 918/1028 = 893 m. Hence, the 'ice thickness above buoyancy' would be 1000 m - 893 m = 107 m. However, I don't see the meaning in this value.

p214

* I don't understand this sentence: "The data were provided in lat-lons, but are also based on a geographic grid." From my point of view a 'geographic grid' implies lat-lon.

p215

* l9 Remove "It is hoped that"

* l10 Period after "community." and remove the second part of the sentence.

* l12 replace ", as with" with ", as well as"

* l14 remove "the"

##
##

Tables:

Table 1:

* I wouldn't consider a >Name< a >Data Source< perhaps the column title could be adjusted?

* An additional column containing the section where a specific field is described in detail would be nice.

* mask+ is named mask_plus in the netcdf file

Table 2:

* mask+ contains also values of 1 and 2. What do they mean?

##
##
Figures:

General:

Most figures are to small to identify the details. I am aware that this is most probably a (bad) limitation of the ESSDD-pdf. I would encourage the author as well as the editor to discuss this repeating problem with the publisher.

Fig.1

* What is >ipmask<?

* The expression >ice plain< is not well known and should be explained in detail. Is it defined as >ice sheet< or >ice shelf<, or is it a third type of ice? (see above)

Fig.2

* I really like the idea behind this flow diagram. However, it is nearly unreadable. Please ensure that it is reproduced larger in the final version.

Fig.3

* Caption: d) is not consistent with bold (a)-(c)

* b) The data contains values up to 42.4 m of firn. Adjust the color scale accordingly (and remove the firn thickness over the ocean). * I'm not convinced by the color scale of a), c), and d). I attached an example showing much more details. This should be changed for all subfigures.

Fig.6

* See comment above to p212, l19

##
##
Specific comments to the dataset (netcdf):

* -9999 is used as a >missing_value<, however, they missed to add this standardised attribute to the variables. The following command executed from a shell will fix this bug for each variable very easily:

> ncatted -a missing_value„o,f,-9999 ALBMAPv1.nc

* The geographical coordinates (lat/long) for each grid coordinate should be included into the dataset.

* The ice thickness could be included, too. This would make life easier for some modellers.

* I'm missing some >global attributes< and would suggest to add some, e.g.:

> ncatted -a Authors,global,c,c,"A.M. Le Brocq, A.J. Payne, and A. Vieli" ALBMAPv1.nc

> ncatted -a resolution_dx,global,c,f,5.0 ALBMAPv1.nc

> ncatted -a resolution_dy,global,c,f,5.0 ALBMAPv1.nc

> ncatted -a rho_ocean,global,c,f,"1028 km/mˆ3" ALBMAPv1.nc

> ncatted -a rho_ice,global,c,f,"918 km/mˆ3" ALBMAPv1.nc

* Finally you might want to remove the >history<

> ncatted -a history,global,d,, ALBMAPv1.nc

##
##
##

Interactive comment on Earth Syst. Sci. Data Discuss., 3, 195, 2010.

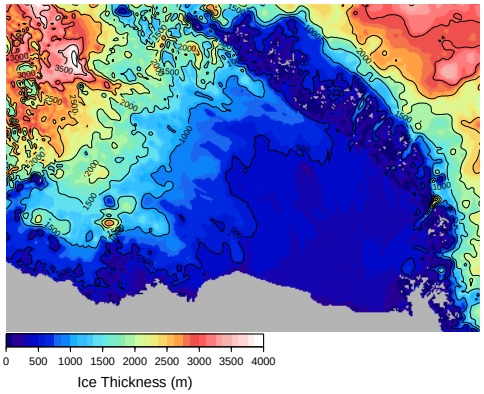

Fig. 1. Ross Ice Shelf