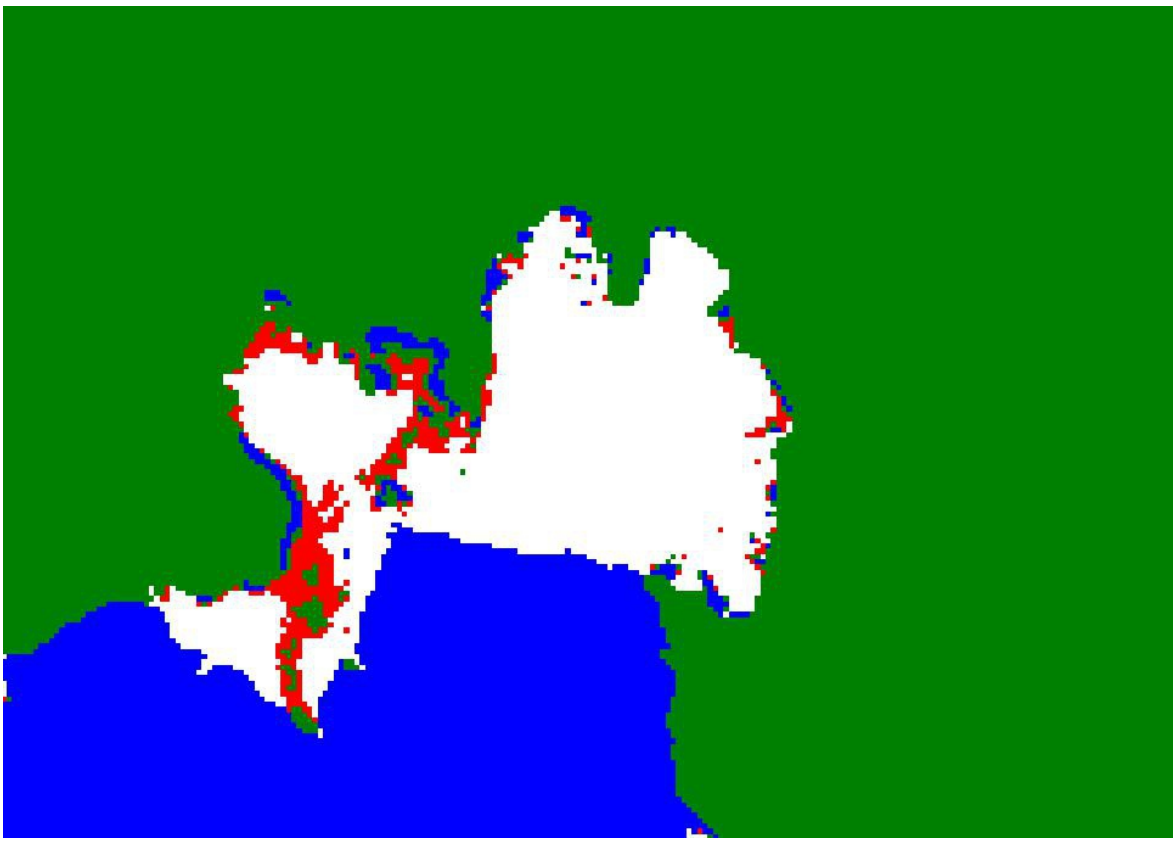
This is a very important paper providing an extremely useful dataset for anybody working on the Antarctic ice sheet. This is also extremely pertinent (and brave) to see such a publication in an open-discussion journal as potential users can test the beta version of the dataset and help to improve it. I kindly thank the authors for that initiative.

My main research interest is the modeling of ice-sheet flow and I played a bit with the surface (S) and bedrock (B) elevations together with the thickness (H) data. The following comments may therefore be a bit narrow, but I believe remain important for an efficient use of the dataset by any ice-flow modeler.

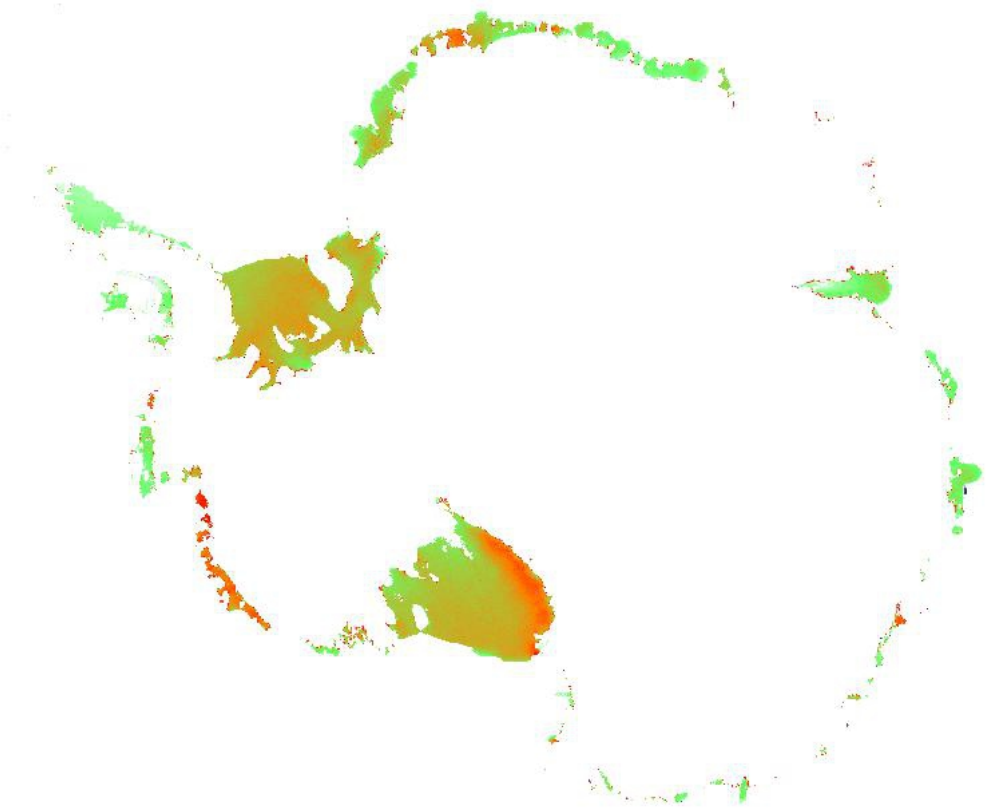
1. Opening the geotiff files provided it appears that S, H and B does not have the same origin (but the same 1-km resolution). Locations of the cells of the various rasters are therefore different. This forbids any trivial operation between raster without interpolation (see comment 3). I would recommend to have strictly the same extend, or at least the exact same positions of cells from one raster to the other.

2. Models requires that S>B. But on (some?) nunatak S<B which of course make no sense, and would crash any ice flow model if directly plugged in. I think this needs to be fixed and S should be superior or equal to B.

3. On grounded regions S-H-B should be equal to 0. Making this simple operation using QGIS gives the following map for the Pine Island region (Green 0, blue < 0, 0< red<10, white > 10). Positive values indicate floating ice region, so red and white are fine. But blue values mean that the lower ice surface is below the bedrock, this has no sense. This may comes from interpolation because raster cells are not perfectly aligned. Using the output directly will crash any ice flow model.



4. Most ice-sheet models assume hydrostatic equilibrium of the ice shelf. In the map below is plotted ISeq = H + rho_w/(rho_w-rho_i)*S, rho_w being the ocean water density (1030) and rho_i ice density (917). ISeq should be equal to 0 if hydrostatic equilibrium is respected. As can be seen on the map (white is grounded or hydrostatic equilibrium) below none of the ice shelf is in equilibrium, and any ice-sheet model will have to readjust the thickness accordingly. As stated in the manuscript, the ice shelf thickness available in bedmap 2 is a physical ice thickness rather than ice-equivalent thickness. But ice sheet modelers would need a firn correction. Could this be provided as well?



This remains an impressive improvement from the initial version of bedmap! Thanks a lot for that tremendous work.