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DRAINAGE BASINS

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Antarctica and Greenland Ice Sheet Drainage Basins

IMBIE 2016 uses two sets of grounded ice area and drainage basin definitions for Antarctica and Greenland. The first set, m were used in IMBIE 2012 and are retained for consistency. The second set, mapped by rignot *et al.* (2016), are an updated de first time. All participants are required to post their results on both sets of drainage basins.

Zwally Basins

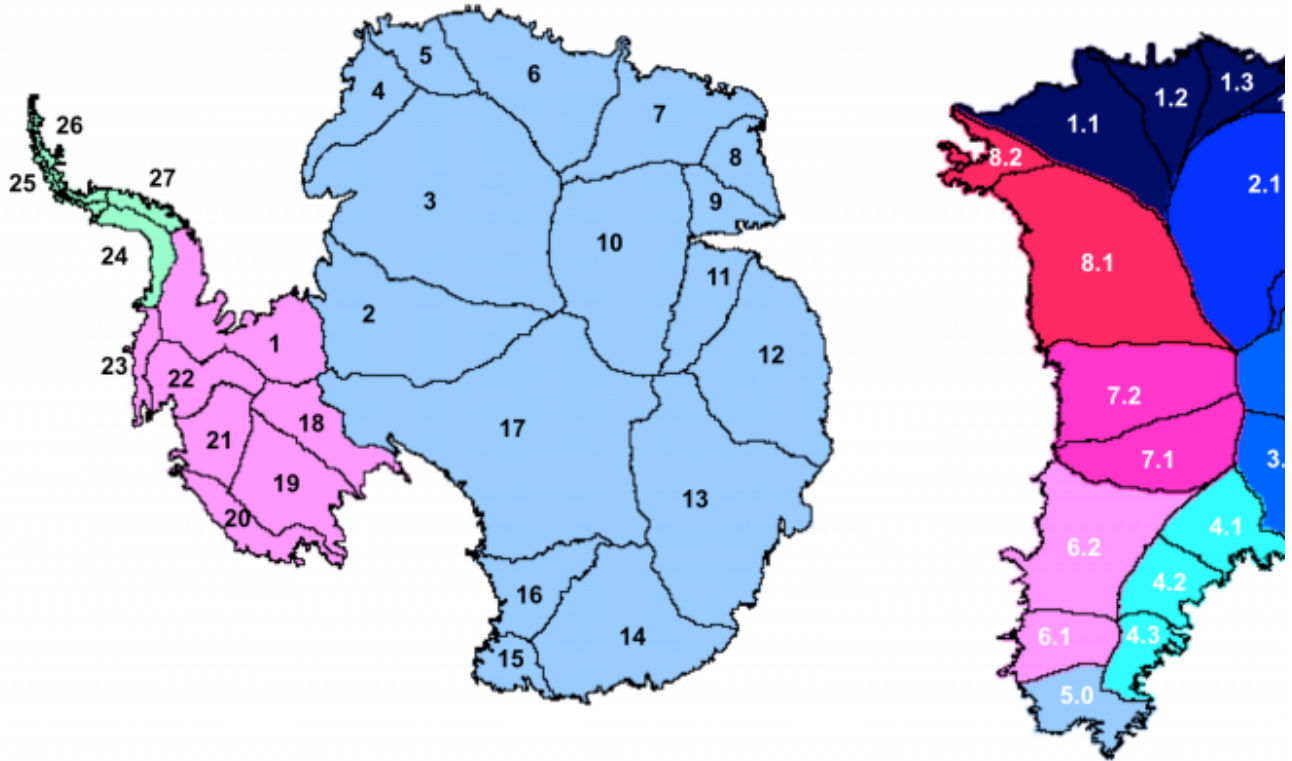
The maps were created using surface elevation data derived from ICESat, with the drainage basins delineated based on ice include 27 basins in Antarctica and 19 basins in Greenland that cover areas of 12,377,790 km² and 1,722,572 km², respectively Antarctic Ice Sheets (EAIS and WAIS, respectively) are separated approximately along the Trans-Antarctic Mountains, with t the WAIS into seven and the Antarctic Peninsula into four. The 19 basins in Greenland are grouped into eight separate regio 3-East, 4-South-East, 5-South, 6-South-West, 7-West, 8-North-West). These delineations are shown in the figures below.

Drainage basin and ice sheet outlines in lat/lon vector format can be downloaded from the following links:

[Zwally Antarctic Drainage Basins](#)[Zwally Greenland Drainage Basins](#)[Zwally Antarctic Ice Sheets](#)[Zwally Greenland Ice Sheets](#)

If required, further information on these drainage basin definitions may be found at:

http://icesat4.gsfc.nasa.gov/cryo_data/ant_grn_drainage_systems.php



Antarctica (left) and Greenland (right) drainage basin and ice sheet definitions, produced by Zwally *et al.*, (2012) IMBIE 2016

Reference

1. Zwally, H. Jay, Mario B. Giovinetto, Matthew A. Beckley, and Jack L. Saba, 2012, *Antarctic and Greenland Drainage Systems*, Laboratory, at http://icesat4.gsfc.nasa.gov/cryo_data/ant_grn_drainage_systems.php.

Rignot Basins

Antarctica is separated into WAIS, EAIS and AP based on historical definitions plus information from modern-day DEM and Ronne to the east and George VI to the west. WAIS and EAIS are divided along the Transantarctic range; WAIS drains into R. The basin boundaries are defined with a posting of ~ 150m. Within these three ice sheet regions, subregions A, B, C, Cp, etc. nomenclature (Giovinetto and Zwally, 2000) plus modern DEM and ice velocity data, and adjusted to match the drainage bc shelves. Grounding lines, area, ice fronts of all ice shelves are based on (Rignot *et al.*, 2013). The interior basins rely on an El the 2011 velocity mosaic (flow direction) near the coast. The basins are close to an earlier definition (Rignot *et al.*, 2011a) who can be used for altimetry, gravity and mass-budget alike. Grounding lines are InSAR 2011 (NSIDC). Surrounding glaciers and shape file. Sub-sub-divisions are not included at this stage.

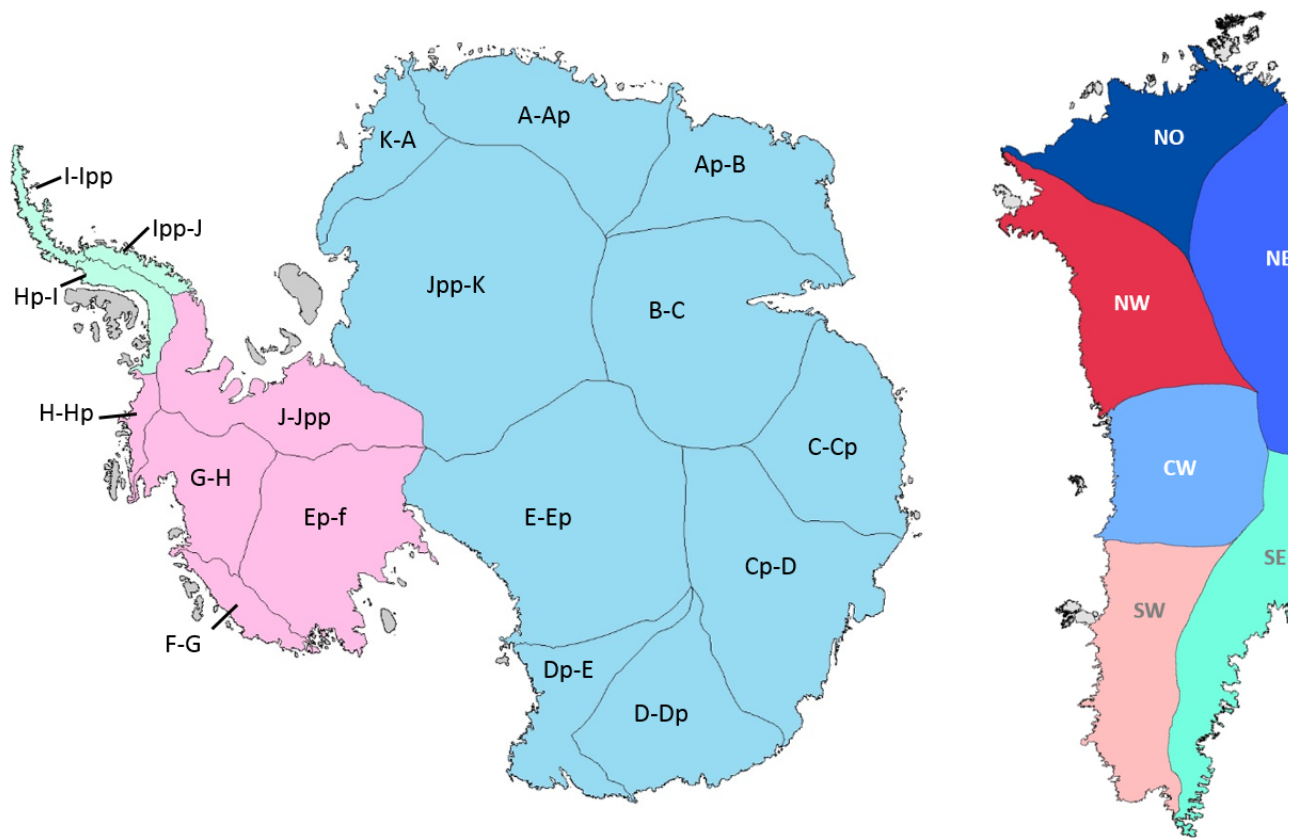
Greenland ice drainage units are based on historical usage (Rignot et al., 2011b). The regions are separated based on glacier dominance versus land-terminating) and SMB (dry vs wet). NW and CW has a clear basin boundary near Rinks. CW to SW is tidewater to land-terminating. SE vs NE is at a major transition in SMB with a well-defined divide inland. Our delineation uses velocity data set (Rignot and Mouginot, 2012). All surrounding ice caps and glaciers are in one shape file “islands”. Ice margin divisions are not included.

Rignot Antarctic Drainage Basins

Rignot Greenland Drainage Basins

Rignot Antarctic Ice Sheets

Rignot Greenland Ice Sheets



Antarctica (left) and Greenland (right) drainage basin and ice sheet definitions, produced by E. Rignot and J. used by IMBIE 2016.

References

1. Giovinetto, M.B. and H.J. Zwally, 2000. Spatial distribution of net surface accumulation on the Antarctic ice sheet. *Annals of*

2. Rignot, E., J. Mouginot, and B. Scheuchl, 2011a. Antarctic Grounding Line Mapping from Differential Satellite Radar Interferometry. *Letters*, 38, L10504, DOI: [10.1029/2011GL047109](https://doi.org/10.1029/2011GL047109)
3. Rignot, E., Velicogna, I., Van Den Broeke, M. R., Monaghan, A., Lenaerts, J., 2011b. Acceleration of the contribution of the Greenland ice sheet to sea level rise, *Geophysical Research Letters*, 38 (5), art. no. L05503, DOI: [10.1029/2011GL046583](https://doi.org/10.1029/2011GL046583)
4. Rignot, E., Mouginot, J., 2012. Ice flow in Greenland for the International Polar Year 2008-2009, *Geophysical Research Letters*, 39, L05103, DOI: [10.1029/2012GL051634](https://doi.org/10.1029/2012GL051634)
5. Rignot, E., S. Jacobs, J. Mouginot, and B. Scheuchl, 2013. Ice Shelf Melting Around Antarctica. *Science*, 341(6143): 266-270. DOI: [10.1126/science.1234567](https://doi.org/10.1126/science.1234567)

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