Supraglacial debris cover dataset v1.0
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Abstract
This dataset is supplementary to the article of Scherler et al. (2019), in which the global distribution of supraglacial debris cover is mapped and analyzed. For mapping supraglacial debris cover, we combined glacier outlines from the Randolph Glacier Inventory (RGI) version 6.0 (RGI consortium, 2017) with remote sensing-based ice and snow identification. Areas that belong to glaciers but that are neither ice nor snow were classified as debris cover. This dataset contains the outlines of the mapped debris-covered glaciers areas, stored in shapefiles (.shp).

Dataset description
For creating this dataset, we used optical satellite data from Landsat 8 (for the time period 2013-2017), and from Sentinel-2A/B (2015-2017). For the ice and snow identification, we used three different algorithms: a red to short-wavelength infrared (swir) band ratio (RATIO; Hall et al., 1988), the normalized difference snow index (NDSI; Dozier, 1989), and linear spectral unmixing-derived fractional debris cover (FDC; e.g., Keshava and Mustard, 2002). For a detailed description of the debris-cover mapping and an analysis of the data, please see Scherler et al. (2019).

This dataset includes debris cover outlines based on either Landsat 8 (LS8; 30-m resolution) or Sentinel 2 (S2; 10-m resolution), and the three algorithms RATIO, NDSI, FDC. In total, there exist six different zip-

files that each contain 19 shapefiles. The structure of the shapefiles follows that of the RGI version 6.0 (RGI consortium, 2017), with one shapefile for each RGI region. The original RGI shapefiles provide each glacier as one entry (feature) and include a variety of ancillary information, such as area, slope, aspect (RGI Consortium 2017a, Technical Note p. 12ff). Because the debris-cover outlines are based on the RGI v6.0 glacier outlines, all fields of the original shapefiles, which refer to the glacier, are retained, and expanded with four new fields:

- DC_Area: Debris-covered area in m². Note that this unit for area is different from the unit used for reporting the glacier area (km²).
- DC_BgnDate: Start of the time period from which satellite imagery was used to map debris cover.
- DC_EndDate: End of the time period from which satellite imagery was used to map debris cover.
- DC_CTSmean: Mean number of observations (CTS = COUNTS) per pixel and glacier. This number is derived from the number of available satellite images for the respective time period, reduced by filtering pixels due to cloud and snow cover.

Spatial extent

The dataset has a global extent and covers all of the glaciers in the RGI v. 6.0, but it exhibits poor coverage in the RGI region Subantarctic and Antarctic, where the debris cover extents are based on very few observations.

References

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Scherler, D., H. Wulf, and N. Gorelick (submitted), Global Assessment of Supraglacial Debris Cover Extents.

ftp://datapub.gfz-potsdam.de/download/8de831f7f643b4548784400680c863cc