Calving Front Machine (CALFIN): Glacial Terminus Dataset for East/West Greenland, 1972-2019 Usage Notes

Spatio-temporal Coverage

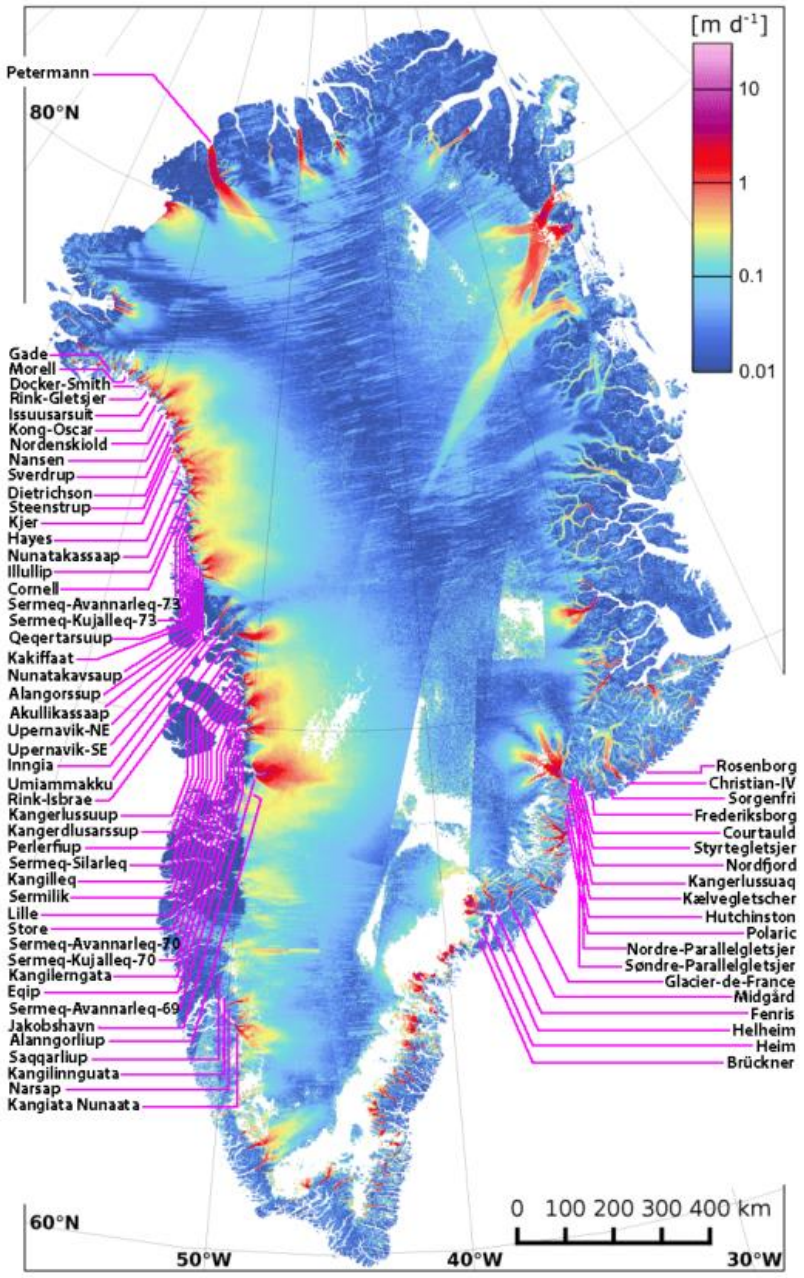


Figure 1. Spatial Coverage Map: Spatial distribution of 66 selected Greenlandic glaciers. The velocity map is taken from Nagler et al. (2015).

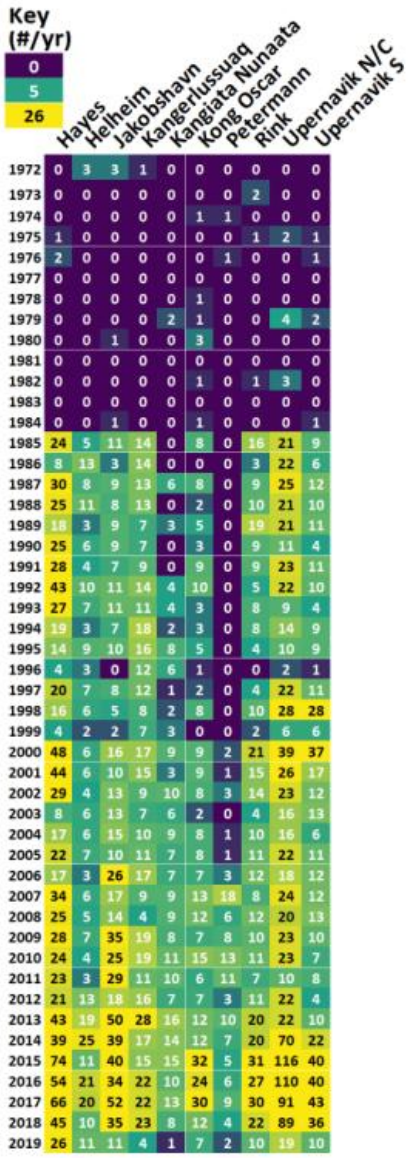


Figure 2. Temporal Coverage Map: Number of fronts per year from 1972-2019 for 10 high drainage volume basins. For the full temporal coverage map, see attached Supplement, Fig. S1.

Data Product Description

We provide two levels of data products.

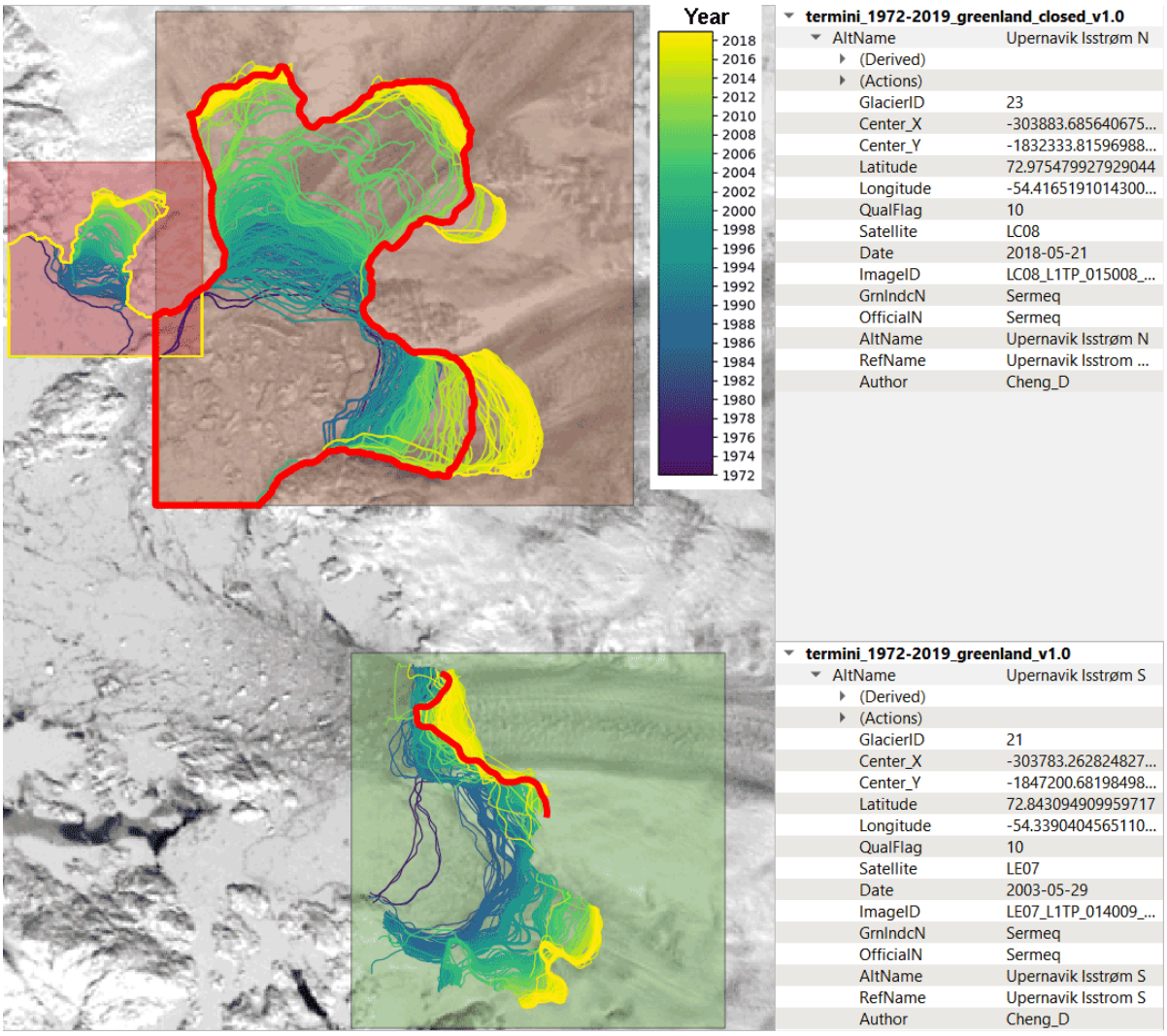
- Level 0 products consist of fjord boundary GeoTiff masks, the domain Shapefiles used for subletting, a glacier names reference Shapefile, and the Landsat scene name ID list.
- Level 1 product consists of LineString Shapefiles with 22678 total features, and Polygon Shapefiles with 17,771 total features. Polygons are ocean masks that are constructed from merged calving front Line Strings, fjord boundaries, and domain boundaries. Both Shapefiles share a feature schema derived from the MEaSUREs glacial terminus positions dataset (NSIDC-0642), as detailed in Table S2:
    - level-1_shapefiles-domain-termini-closed.zip
        - Polygon Shapefiles from 1972-2019, separated by glacial domain
    - level-1_shapefiles-domain-termini.zip
        - LineString Shapefiles from 1972-2019, separated by glacial domain
    - level-1_shapefiles-greenland-termini-closed.zip
        - Polygon Shapefiles from 1972-2019, containing all features in one file
    - level-1_shapefiles-greenland-termini.zip
        - LineString Shapefiles from 1972-2019, containing all features in one file

Shapefile Feature Schema Attribute Table

Data Field	Description	Format (Values)
GlacierID	Numerical ID assigned to each glacier (as derived from MEaSUREs NSIDC-0642)	# ([1, 246])
Center_X	Mean X coordinate in EPSG:3413.	# ([-463626, 682313])
Center_Y	Mean Y coordinate in EPSG:3413.	# ([-2821269, -906747])
Latitude	Latitude of center.	# ([64.29, 81.24])
Longitude	Longitude of center.	# ([-63.17, -28.21])
QualFlag	Quality flag to indicate digitization conditions	# (0 - Manually digitized, 3 - Manually digitized, w/ L7 SCE, 10 - Automatically digitized, 13 - Automatically digitized, w/ L7 SCE. See MEaSUREs NSIDC-0642)
Satellite	Satellite/sensor of the digitized source image	LXSS ([LM01, LC08]) See usgs.gov/faqs/what-naming-convention-landsat-collections-level-1-scenes
Date	Date of the digitized source image	YYYY-MM-DD ([1972-09-06, 2019-06-25])
ImageID	Source image file name.	LXSS_LLLL_PPPRRR_YYYYMMDD_yyyymmdd_CC_TX (LC08_L1TP_026006_20170702_20170715_01_T1, etc.)
GrnlndcN	Greenlandic glacier name	NAME (New_Greenl names from Bjørk et al., 2015 database of Greenland glacier names)
OfficialN	Officially recognized glacier name	NAME (Official_n names from Bjørk et al., 2015 database of Greenland glacier names)
AltName	Alternative, Foreign, Old Greenlandic, or other glacier names	NAME (Foreign_na, Old_Greenl, Alternative names (Bjørk et al., 2015), or other names)
RefName	Reference glacier name, non-authoritative names used in CALFIN to denote grouped/unnamed glaciers	NAME (New_Greenl, Official_n, Foreign_na, Old_Greenl, Alternative names (Bjørk et al., 2015), or other names)
Author	Digitization author's name	LastName_FirstInitial (Cheng_D)

- Both Shapefile types are separated by domain, and share the following schema with that used by MEaSUREs:
  - Time Series: Sept. 1972 - June 2019
  - Temporal resolution: sub-seasonal
  - Spatial resolution: 30 meters
  - Spatial accuracy: <90 meters
  - Projection: EPSG:3413 (WGS 84 / NSIDC Sea Ice Polar Stereographic North)

Sample Data Record Usage



Example usage of the consolidated Polygon and LineString Shapefiles in QGIS.