Supplement of

Calving Front Machine (CALFIN): glacial termini dataset and automated deep learning extraction method for Greenland, 1972–2019

Daniel Cheng et al.

Correspondence to: Daniel Cheng (dlcheng@uci.edu)

The copyright of individual parts of the supplement might differ from the article licence.
1 Temporal Availability

| Year | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Key  | 0    | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    | 26   | 5    |

**Figure S1. Temporal Availability Chart.** Listed are the number of fronts per year, for all 66 glaciers in the CALFIN dataset.
2 Inter-model Comparison Table

Table S1. Consolidated validation set and inter-model error metrics.

| Validation Set       | Model     | Mean Distance | Median Distance | IoU Coastline | IoU Ice/Ocean |
|----------------------|-----------|---------------|-----------------|---------------|---------------|
| CALFIN-VS            | CALFIN-NN | 2.25 px, 86.76 m | 1.21 px, 44.59 m | 0.4884        | 0.9793        |
| CALFIN-VS-L7-none    | CALFIN-NN | 2.27 px, 81.65 m | 1.16 px, 44.01 m | 0.4880        | 0.9819        |
| CALFIN-VS-L7-only    | CALFIN-NN | 2.22 px, 91.93 m | 1.33 px, 49.24 m | 0.4888        | 0.9766        |
| M-VS                 | CALFIN-NN | 2.56 px, 97.72 m | 2.55 px, 97.44 m | 0.3332        | N/A           |
| M-VS                 | M-NN      | 1.97 px, 96.31 m | N/A             | N/A           | N/A           |
| Z-VS                 | CALFIN-NN | 2.11 px, 115.24 m | 1.65 px, 77.29 m | 0.3832        | 0.9761        |
| Z-VS                 | Z-NN      | 17.3 px, 104 m  | N/A             | N/A           | N/A           |
| B-VS                 | CALFIN-NN | 2.35 px, 330.63 m | 0.74 px, 112.75 m | 0.6451        | 0.9879        |
| B-VS                 | B-NN      | 2.69 px, 108 m  | N/A             | N/A           | 0.905         |

3 Dataset Metadata

Level 0 products consist of fjord boundary GeoTiff masks, the domain Shapefiles used for subsetting, and the Landsat scene name list text files. Level 1 product consists of a LineString Shapefile with 22678 features, and a Polygon Shapefile with 17771 features, grouped by glacial basin. Both Shapefiles share a feature schema derived from the MEaSUREs glacial terminus positions dataset (NSIDC-0642), as detailed in Table S2.

- Temporal resolution: sub-seasonal
- Spatial resolution: ~30 meters
- Spatial accuracy: <90 meters
- Projection: EPSG:3413 (WGS 84 / NSIDC Sea Ice Polar Stereographic North)
| 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.                                              | # ([281269, -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, w/ L7 SCE. See MEaSUREs NSIDC-0642) |
| Satellite        | Satellite/sensor of the digitized source image                               | LXSS ([LM01, LC08]) See https://www.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)                                                 |
Figure S2. Smoothed versus Raw Polyline The post-processing line smoothing operation turns the raw coastline (blue) into a smoothed data product polyline (orange), deviating by no more than 1 pixel from the raw coastline. Since the variations are on the sub-pixel scale, the error introduced is no more than the uncertainty of the base resolution, and well within the neural network uncertainty.
Figure S3. True mean distance error estimates per basin, in pixels. We estimate the true mean distance error per basin to lie between the above intervals with 95% confidence.

5 Training Data
Figure S4. CALFIN-NN training data. Show above is a subset of the 1872 CALFIN-NN training image/mask pairs. Not shown are the coastline masks, which are dynamically generated after performing data augmentation on the above masks, using Canny edge filters and dilation to a 3 pixel wide edge. Note blurred mask in uncertain areas, as in Sermeq Avannarleq 70 2000-07-02. Images are masked at a minimum resolution of 1024 pixels.
6 Validation Data

6.1 CALFIN Validation Set

Figure S5. CALFIN validation outputs, part 1.
Figure S6. CALFIN validation outputs, part 2.
Figure S7. CALFIN validation outputs, part 3.
6.2 Mohajerani et al. Validation Set

Figure S8. CALFIN validation outputs, part 4.

Figure S9. Mohajerani et al. validation outputs.
6.3 Zhang et al. Validation Set

![Figure S10. Zhang et al. validation outputs.](image)

Note that there are missing subsets where CALFIN did not detect any fronts, despite them being visible.

6.4 Baumhoer et al. Validation Set

![Figure S11. Baumhoer et al. validation outputs, part 1.](image)

Large errors originate from Ekstrom-1, Gillet, Land, and other similar domains.
Figure S12. Baumhoer et al. validation outputs, part 2. Note that Wordie and Voyeykov, among others, have not been fully nor confidently detected.
7 CALFIN Validation Set Scene ID List

Table S3: CALFIN Validation Set Scene ID List. A list of all 162 images used in the CALFIN-VS.

| Domain         | Scene ID                                                                 | Domain         | Scene ID                                                                 |
|----------------|--------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------|
| Akullikassaap  | LE07_L1TP_014009_20000317_20170212_01_T1                                 | Akullikassaap  | LE07_L1TP_017008_20090619_20161221_01_T1                                 |
| Alangorssup    | LC08_L1TP_016008_20150418_20170409_01_T1                                 | Alangorssup    | LE07_L1TP_017008_20090619_20161221_01_T1                                 |
| Alangorliup    | LE07_L1TP_009011_20010707_20170212_01_T1                                 | Alangorliup    | LE07_L1TP_010011_20130715_20161123_01_T1                                 |
| Brückner       | LT05_L1TP_231014_19930610_20180228_01_T2                                 | Cornell        | LC08_L1TP_019007_20130722_20170503_01_T1                                 |
| Cornell        | LE07_L1TP_019007_20020411_20170131_01_T1                                 | Cornell        | LT05_L1TP_019007_19990418_20170130_01_T1                                 |
| Courtauld      | LE07_L1TP_231012_20060724_20170109_01_T1                                 | Courtauld      | LT05_L1TP_231012_19870813_20170211_01_T1                                 |
| Dietrichson    | LC08_L1TP_023006_20160811_20170322_01_T1                                 | Dietrichson    | LE07_L1TP_023006_20080423_20161229_01_T1                                 |
| Docker-Smith   | LC08_L1TP_025006_20170422_20170501_01_T1                                 | Eqip           | LC08_L1TP_010001_20180907_20180912_01_T1                                 |
| Eqip           | LE07_L1TP_009011_20100529_20161215_01_T1                                 | Fenris         | LE07_L1TP_232013_20120901_20161128_01_T1                                 |
| Frederiksborg  | LE07_L1TP_229012_20040906_20170119_01_T1                                 | Frederiksborg  | LT05_L1TP_230012_19860819_20170216_01_T1                                 |
| Gade           | LE07_L1TP_025006_20090611_20161219_01_T1                                 | Hayes          | LC08_L1TP_018007_20150416_20170409_01_T1                                 |
| Hayes          | LC08_L1TP_080237_20160607_20170324_01_T1                                 | Hayes          | LE07_L1TP_019007_20060406_20170110_01_T1                                 |
| Helheim        | LC08_L1TP_233013_20130412_20170505_01_T1                                 | Helheim        | LC08_L1TP_232014_20140729_20170420_01_T1                                 |
| Helheim        | LC08_L1TP_233013_20151011_20170403_01_T1                                 | Helheim        | LC08_L1TP_233013_20160911_20170321_01_T1                                 |
| Helheim        | LC08_L1TP_232013_20180606_20180615_01_T1                                 | Helheim        | LE07_L1TP_232014_20140719_20170420_01_T1                                 |
| Helheim        | LE07_L1TP_232013_20020517_20170130_01_T1                                 | Helheim        | LE07_L1TP_232013_20030808_20170124_01_T1                                 |
| Helheim        | LE07_L1TP_232013_20060512_20170109_01_T2                                 | Helheim        | LE07_L1TP_232013_20100405_20161215_01_T2                                 |
| Helheim        | LE07_L1TP_232013_20110627_20161208_01_T1                                 | Helheim        | LE07_L1TP_232013_20130803_20161123_01_T2                                 |
| Helheim        | LT05_L1TP_232014_19860817_20170216_01_T1                                 | Helheim        | LT05_L1TP_232013_19880907_20170206_01_T1                                 |
| Helheim        | LT05_L1TP_233013_19910603_20180228_01_T2                                 | Helheim        | LT05_L1TP_232013_20191017_20180228_01_T2                                 |
| Helheim        | LT05_L1TP_232013_19920529_20180228_01_T2                                 | Helheim        | LT05_L1TP_232013_201920614_20180228_01_T2                                |
| Helheim        | LT05_L1TP_232013_19920902_20180228_01_T1                                 | Helheim        | LT05_L1TP_232013_19930430_20180228_01_T2                                |
| Helheim        | LT05_L1TP_233013_19930608_20180228_01_T2                                 | Helheim        | LT05_L1TP_232013_19940830_20170113_01_T2                                |
| Helheim        | LT05_L1TP_232013_19950420_20180228_01_T2                                 | Helheim        | LT05_L1TP_232013_19950420_20180228_01_T2                                |
| Helheim        | LT05_L1TP_232014_19950826_20180228_01_T1                                 | Helheim        | LT05_L1TP_232013_19960702_20180228_01_T1                                |
| Helheim        | LT05_L1TP_232013_19970511_20180228_01_T2                                 | Helheim        | LT05_L1TP_232013_19970628_20180228_01_T1                                |
| Domain          | Scene ID                                                                 | Domain          | Scene ID                                                                 |
|----------------|--------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------|
| Helheim        | LT05_L1TP_232013_19980530_20161224_01_T1                                | Helheim        | LT05_L1TP_232013_19980903_20161222_01_T1                                |
| Hutchinson     | LE07_L1TP_230012_20050831_20170114_01_T1                                | Hutchinson     | LE07_L1TP_230012_20130501_20161124_01_T1                                |
| Illullip       | LE07_L1TP_021007_20010422_20170206_01_T1                                | Illullip       | LE07_L1TP_019007_20130527_20161124_01_T1                                |
| Innngia        | LC08_L1TP_014009_20180615_20180703_01_T1                                | Innngia        | LT05_L1TP_013009_20050425_20170115_01_T1                                |
| Innngia        | LE07_L1TP_014009_20070406_20170104_01_T1                                | Innngia        | LT05_L1TP_013009_19850917_20170218_01_T1                                |
| Jakobshavn     | LC08_L1TP_008012_20131029_20170429_01_T1                                | Jakobshavn     | LC08_L1TP_008012_20050812_20170113_01_T1                                |
| Jakobshavn     | LE07_L1TP_010011_20010324_20170206_01_T1                                | Jakobshavn     | LT05_L1TP_008011_19860512_20170218_01_T1                                |
| Kangerdluarssup| LC08_L1TP_013009_20170723_20170809_01_T1                                | Kangerdluarssup| LE07_L1TP_011010_20130519_20161124_01_T1                                |
| Kangerlussuaq  | LE07_L1TP_231012_20030427_20170125_01_T2                                | Kangerlussuaq  | LE07_L1TP_231012_20120419_20161202_01_T2                                |
| Kangerlussuaq  | LT05_L1TP_229012_19970607_20180227_01_T1                                | Kangerlussuaq  | LE07_L1TP_012010_20030920_20170124_01_T1                                |
| Kangerlussuaq  | LE07_L1TP_014009_20090902_20161220_01_T1                                | Kangerlussuaq  | LT05_L1TP_011010_20090617_20161025_01_T1                                |
| Kangiata-Nunaata| LC08_L1TP_005015_20170613_20170628_01_T1                                | Kangiata-Nunaata| LE07_L1TP_005015_20020815_20170114_01_T1                                |
| Kangiata-Nunaata| LT05_L1TP_006015_19950405_20170109_01_T1                                | Kangilleq      | LE07_L1TP_011010_20060703_20170109_01_T1                                |
| Kong-Oscar     | LC08_L1TP_019007_20150914_20170404_01_T1                                | Kong-Oscar     | LE07_L1TP_019007_20020411_20170131_01_T1                                |
| Kog-Oscar      | LT05_L1TP_019007_19870613_20170212_01_T1                                | Kog-Oscar      | LE07_L1TP_022006_20060918_20170107_01_T1                                |
| Kælvegletscher | LC08_L1TP_023006_20160608_20170324_01_T1                                | Kælvegletscher | LE07_L1TP_229012_20140809_20170420_01_T1                                |
| Kælvegletscher | LT05_L1TP_024006_19980326_20161225_01_T1                                | Kælvegletscher | LE07_L1TP_231012_20120825_20161129_01_T1                                |
| Kælvegletscher | LE07_L1TP_231012_20050603_20170114_01_T2                                | Kælvegletscher | LE07_L1TP_231012_20120825_20161129_01_T1                                |
| Kælvegletscher | LT05_L1TP_230012_19970614_20180227_01_T1                                | Lille          | LE07_L1TP_009011_20200405_20170131_01_T1                                |
| Kælvegletscher | LC08_L1TP_023006_20160608_20170324_01_T1                                | Midgård        | LT05_L1TP_232013_19950927_20180228_01_T1                                |
| Kong-Oscar     | LT05_L1TP_024006_19980326_20161225_01_T1                                | Nansen         | LE07_L1TP_022006_20060918_20170107_01_T1                                |
| Kong-Oscar     | LT05_L1TP_024006_19980326_20161225_01_T1                                | Nansen         | LE07_L1TP_022006_20060918_20170107_01_T1                                |
| Kong-Oscar     | LT05_L1TP_024006_19980326_20161225_01_T1                                | Narsap         | LT05_L1TP_005015_19870915_20170211_01_T1                                |
| Kong-Oscar     | LT05_L1TP_024006_19980326_20161225_01_T1                                | Narsap         | LT05_L1TP_005015_19870915_20170211_01_T1                                |
| Kongsenskiold  | LE07_L1TP_022006_200110718_20170204_01_T1                                | Narsap         | LT05_L1TP_005015_19870915_20170211_01_T1                                |
| Nordfjord      | LE07_L1TP_231012_20030427_20170125_01_T2                                | Nordfjord      | LE07_L1TP_231012_20120606_20161202_01_T1                                |
| Nordfjord      | LT05_L1TP_229012_19960722_20180227_01_T1                                | Nordfjord      | LE07_L1TP_231012_20120606_20161202_01_T1                                |
| Nordfjord      | LT05_L1TP_229012_19960722_20180227_01_T1                                | Nordre-Parallelgletsjer | LE07_L1TP_230012_20040625_20170120_01_T1                                |
| Nordfjord      | LT05_L1TP_229012_19960722_20180227_01_T1                                | Nordre-Parallelgletsjer | LE07_L1TP_230012_20040625_20170120_01_T1                                |
| Nordnatsaap    | LE07_L1TP_011010_20130519_20161124_01_T1                                | Nordnatsaap    | LE07_L1TP_011010_20130519_20161124_01_T1                                |
| Nordnatsaap    | LE07_L1TP_021007_20020831_20170128_01_T1                                | Nordnatsaap    | LE07_L1TP_011010_20130519_20161124_01_T1                                |
| Nordnatsaap    | LC08_L1TP_015008_20150630_20170407_01_T1                                | Nordnatsaap    | LE07_L1TP_011010_20130519_20161124_01_T1                                |

Continued on next page
| Domain               | Scene ID                                                                 | Domain               | Scene ID                                                                 |
|---------------------|--------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------|
| Perlerfiup          | LC08_L1TP_011010_20170709_20170717_01_T1                               | Perlerfiup          | LT05_L1TP_011010_19890407_20170204_01_T1                               |
| Polaric             | LE07_L1TP_230012_20120412_20161202_01_T2                              | Polaric             | LT05_L1TP_229012_19960722_20180227_01_T1                               |
| Qeqertarsuup        | LE07_L1TP_017008_20090806_20161218_01_T1                               | Rink-Gletsjer       | LE07_L1TP_025006_20000415_20170212_01_T1                               |
| Rink-Isla          | LC08_L1TP_011010_20140412_20170423_01_T1                               | Rink-Isla           | LT05_L1TP_012010_19900519_20170130_01_T1                               |
| Rink-Isla           | LT05_L1TP_013009_19860616_20170217_01_T1                               | Rink-Isla           | LT05_L1TP_012010_19900519_20170130_01_T1                               |
| Rosenborg           | LT05_L1TP_229012_19970420_20180227_01_T2                               | Saqqarliup          | LE07_L1TP_009011_20060721_20170109_01_T1                               |
| Sermeq-Avannarleq   | LC08_L1TP_008012_20181011_20181030_01_T1                               | Sermeq-Avannarleq   | LE07_L1TP_008011_20090823_20161218_01_T1                               |
| Sermeq-Avannarleq   | LC08_L1TP_011010_20140428_20170423_01_T1                               | Sermeq-Avannarleq   | LE07_L1TP_009011_20080811_20161225_01_T1                               |
| Sermeq-Avannarleq   | LT05_L1TP_010011_19940516_20170115_01_T1                               | Sermeq-Avannarleq   | LE07_L1TP_016008_20010505_20170205_01_T1                               |
| Sermeq-Avannarleq   | LT05_L1TP_019007_19910507_20180221_01_T2                               | Sermeq-Kujalleq     | LE07_L1TP_010011_20040908_20170119_01_T1                               |
| Sermeq-Kujalleq     | LE07_L1TP_011010_20130706_20161123_01_T1                               | Sermeq-Kujalleq     | LC08_L1TP_018008_20180510_20180517_01_T1                               |
| Sermeq-Kujalleq     | LT05_L1TP_017008_19870412_20170213_01_T1                               | Sermeq-Silarleq     | LE07_L1TP_012010_20130323_20161124_01_T1                               |
| Sermilik            | LE07_L1TP_011010_20040510_20170120_01_T1                               | Sermilik            | LE07_L1TP_012010_20130323_20161124_01_T1                               |
| Sorgenfri           | LE07_L1TP_229012_20000319_20170212_01_T2                               | Sorgenfri           | LE07_L1TP_229012_20120726_20161130_01_T1                               |
| Steenstrup          | LC08_L1TP_020007_20160416_20170326_01_T1                               | Steenstrup          | LE07_L1TP_021007_20010828_20170203_01_T1                               |
| Steenstrup          | LT05_L1TP_019007_19910523_20180221_01_T1                               | Steyrtegletsjer     | LE07_L1TP_229012_20000420_20170212_01_T2                               |
| Steyrtegletsjer     | LE07_L1TP_229012_20100416_20161214_01_T1                               | Steyrtegletsjer     | LT05_L1TP_230012_19910529_20180227_01_T1                               |
| Sverdrup            | LC08_L1TP_024006_20170821_20170911_01_T1                               | Sverdrup            | LE07_L1TP_022006_20100508_20161214_01_T1                               |
| Søndre-Parallelgletsjer | LE07_L1TP_231012_20010405_20170205_01_T2           | Søndre-Parallelgletsjer | LE07_L1TP_231012_20120708_20161130_01_T1                               |
| Umiamakku           | LC08_L1TP_015009_20170331_20170414_01_T1                               | Umiamakku           | LE07_L1TP_013009_20050409_20170115_01_T1                               |
| Umiamakku           | LE07_L1TP_014009_20110620_20161209_01_T1                               | Upernavik-NE        | LC08_L1TP_015008_20130928_20170502_01_T1                               |
| Upernavik-NE        | LC08_L1TP_082235_20160708_20170323_01_T1                               | Upernavik-NE        | LC08_L1TP_082236_20190514_20190521_01_T1                               |
| Upernavik-NE        | LE07_L1TP_014009_20040616_20170120_01_T1                               | Upernavik-NE        | LT05_L1TP_017008_19950909_20180220_01_T1                               |
| Upernavik-SE        | LC08_L1TP_016008_20160506_20170326_01_T1                               | Upernavik-SE        | LE07_L1TP_014009_20090427_20161222_01_T1                               |
Figure S13. Terminus Advance and Retreat Over Time for Hayes Gletsjer. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.

Figure S14. Terminus Advance and Retreat Over Time for Upernavik Isstrom N-C. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S15. Terminus Advance and Retreat Over Time for Upernavik Isstrom S. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.

Figure S16. Terminus Advance and Retreat Over Time for Rink Isbrae. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S17. Terminus Advance and Retreat Over Time for Jakobshavn Isbrae. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.

Figure S18. Terminus Advance and Retreat Over Time for Petermann Gletsjer. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S19. Terminus Advance and Retreat Over Time for Kong Oscar Gletsjer. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.

Figure S20. Terminus Advance and Retreat Over Time for Kangerlussuaq Gletsjer. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S21. Terminus Advance and Retreat Over Time for Helheim Gletsjer. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.

Figure S22. Terminus Advance and Retreat Over Time for Kangiata Nunaata Sermia. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S23. Regional Terminus Advance and Retreat Over Time for Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S24. Regional Terminus Advance and Retreat Over Time for NW Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S25. Regional Terminus Advance and Retreat Over Time for CW Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S26. Regional Terminus Advance and Retreat Over Time for CE Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S27. Regional Terminus Advance and Retreat Over Time for SE Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.
Figure S28. Regional Terminus Advance and Retreat Over Time for SW Greenland. Dotted lines from 1972-1985 that indicate a lack of seasonal observations.