Table S1. Attribute information for Landsat scenes used for delineation. Abbreviations correspond to those given in “Sheet1” tab in “paper_supple_data.xlsx”.

Abbreviation	Note
path	Landsat path number in WRS2
row	Landsat row number in WRS2
granule	Granule ID of Landsat scene
date	Acquisition date of Landsat scene

Table S2. Attribute information for GGI. WRS2 is Worldwide Reference System. Abbreviations correspond to those given in "Sheet2" tab in "paper_supple_data.xlsx".

Abbreviation	Note	Unit
id	Glacier ID in GGI	-
path	Landsat path number in WRS2	-
row	Landsat row number in WRS2	-
granule	Granule ID of Landsat scene	-
date	Acquisition date of Landsat scene	-
operator	Operator name*	-
area	Glacier area	km^2
lon	Longitude	°
lat	Latitude	°
mean	Mean elevation	m
median	Median elevation	m
max	Maximum elevation	m
min	Minimum elevation	m
range	Elevation range between maximum and minimum	m
mid	Mid elevation	m

*Abbreviations of operator names. SO: Satoshi Omiya; ST: Shun Tsutaki; AK: Aki Kozawa; YH: Yu Hoshina; DL: Damodar Lamsal; KT: Keisuke Taniguchi; PT: Phuntsho Tshering; AS: Akiko Sakai; HN: Hiroto Nagai; TN: Takayuki Nuimura; KT: Kae Tsunematsu.

Table S3. Revision record of the GAMDAM Glacier Inventory. Abbreviations of operator and reviser names are the same as for Table S2. WRS2 is Worldwide Reference System. Technical abbreviations correspond to those given in “Sheet3” tab in “paper_supple_data.xlsx”.

Abbreviation	Note
path	Landsat path number in WRS2
row	Landsat row number in WRS2
operator	Operator name
revise1	Reviser name (first revision)
revise1_date	End date of first revision
revise2	Reviser name (second revision)
revise2_date	End date of second revision
revise3	Reviser name (third revision)
revise3_date	End date of third revision
revise4	Reviser name (fourth revision)
revise4_date	End date of fourth revision

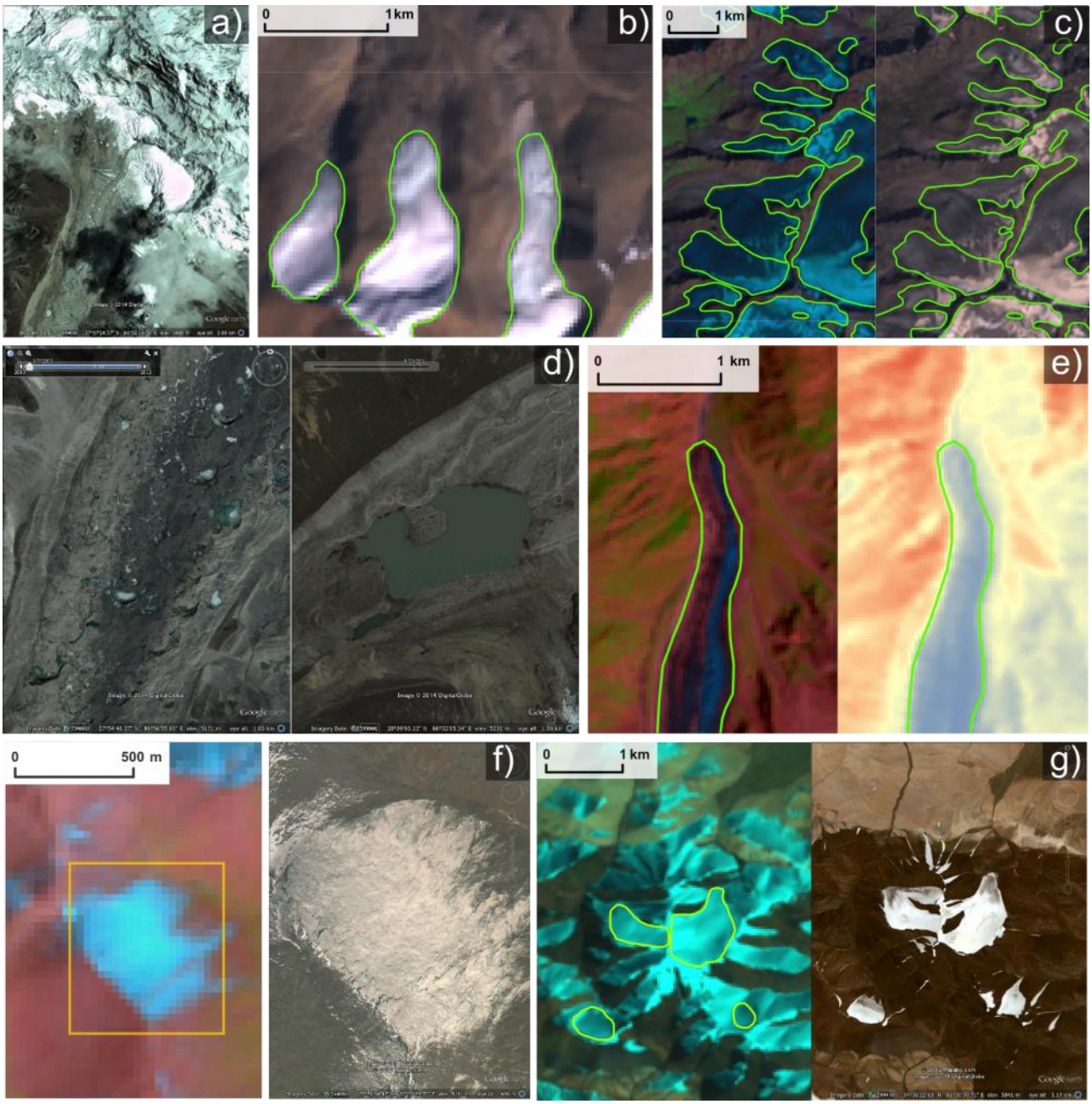

Fig. S1. Examples of the delineation of glacier from non-glacier areas. **(a)** Steep headwall is not included as glacier. **(b)** Clean glacier surfaces are readily delineated with true-colour composite scenes, whereas false-colour composite imagery **(c)** is required to delineate thinly debris-covered surfaces. **(d)** Thermokarst features and supra-glacial lakes with ice cliffs (left), and a non-glacial lake surrounded by smooth terrain (right) are used to identify debris-covered glacier surfaces. **(e)** The full extent of debris-covered glacier surfaces can be identified using thermal band imagery. **(f)** Glacier-like seasonal snow cover is distinguishable from glacier ice **(g)** using Google Earth™ imagery.

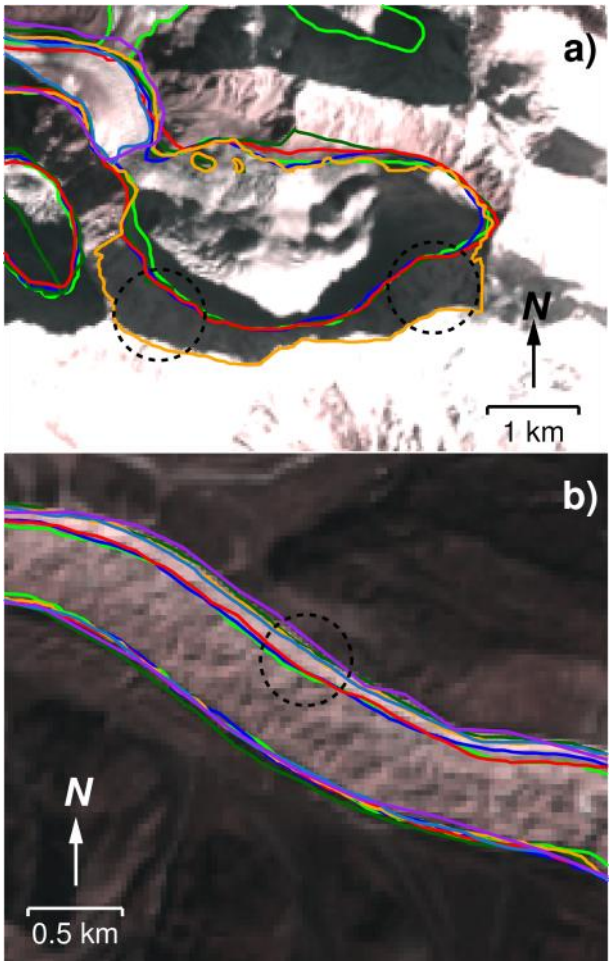

Fig. S2. Two examples of delineation tests showing **(a)** accumulation zones and **(b)** debris-covered ablation zones. Coloured lines represent glacier outlines delineated by different operators. Dotted circles indicate areas misidentified as glacier ice. Background images are true-colour composites of the Landsat ETM+ scenes.

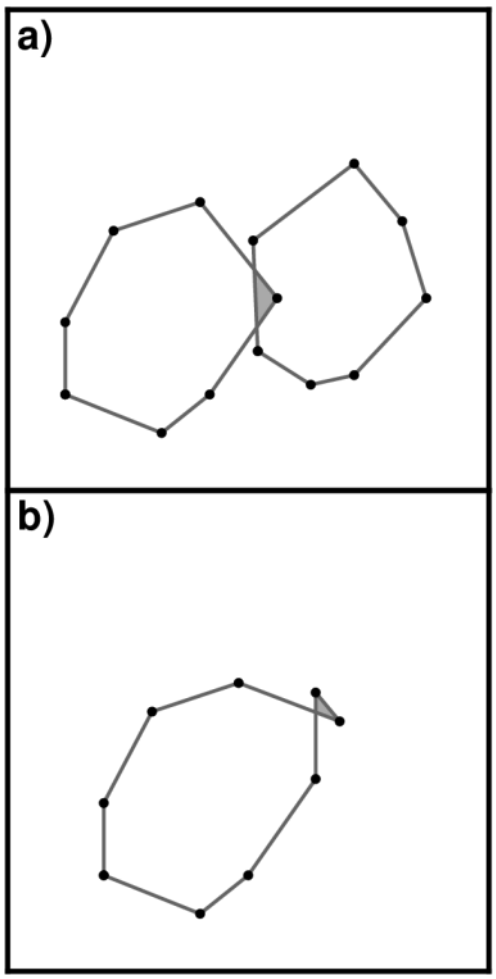

Fig. S3. Examples of topological violations: **(a)** overlapping polygons and **(b)** an irregular polygon. Violated areas are shaded grey.