

Table S1. The selected glaciers of the study, their areal extents, and GLIMS reference IDs. The areal extents were calculated from the delineated shapefiles using the geometry calculator in ArcGIS.

Region	Glacier	Areal Extent in km ² .	GLIMS Reference ID
<i>Ny-Ålesund Svalbard</i>	Vestre Brøggerbreen	2.89	G011694E78906N
	Austre Lovénbreen	4.64	G012161E78870N
	Austre Brøggerbreen	8.08	G011895E78886N
	Midtre Lovénbreen	4.75	G012039E78878N
	Edithbreen	3.27	G012119E78852N
	Botnfjellbreen	4.82	G012405E78843N
	Pedersbreen	5.87	G012286E78855N
	Uvérsbreen	13.85	G012520E78787N
<i>Chandra–Bhaga basin Himalayas</i>	Samudra Tapu	76.00	G077426E32511N
	CB 1	27.70	G077376E32671N
	CB 2	12.44	G077368E32619N
	CB 3	37.43	G077369E32564N
	CB 4	12.05	G077421E32604N
	CB 5	24.93	G077485E32394N
	CB 6	16.65	G077438E32563N

Table S2. Abbreviations/nomenclature of processing schemes used in the current study. AC: Advanced Classifiers; CC: Conventional Classifiers.

Nomenclature/Abbreviation	Description/Definition
<i>DOS</i>	DOS-corrected
<i>FLAASH</i>	FLAASH-corrected
<i>QUAC</i>	QUAC-corrected
<i>GS_DOS</i>	DOS followed by GS sharpening
<i>GS_FLAASH</i>	FLAASH followed by GS sharpening
<i>GS_QUAC</i>	QUAC followed by GS sharpening
<i>HCS_DOS</i>	DOS followed by HCS sharpening
<i>HCS_FLAASH</i>	FLAASH followed by HCS sharpening
<i>HCS_QUAC</i>	QUAC followed by HCS sharpening
<i>DOS_AC/CC</i>	DOS followed by AC or CC classification
<i>FLAASH_AC/CC</i>	FLAASH followed by AC or CC classification
<i>QUAC_AC/CC</i>	QUAC followed by AC or CC classification
<i>GS_DOS_AC/CC</i>	DOS followed by GS followed by AC or CC classification
<i>GS_FLAASH_AC/CC</i>	FLAASH followed by GS followed by AC or CC classification
<i>GS_QUAC_AC/CC</i>	QUAC followed by GS followed by AC or CC classification
<i>HCS_DOS_AC/CC</i>	DOS followed by HCS followed by AC or CC classification
<i>HCS_FLAASH_AC/CC</i>	FLAASH followed by HCS followed by AC or CC classification
<i>HCS_QUAC_AC/CC</i>	QUAC followed by HCS followed by AC or CC classification
<i>DOS_Rule Set 1/2/3</i>	DOS followed by classification by any of the three rule sets
<i>FLAASH_Rule Set 1/2/3</i>	FLAASH followed by classification by any of the three rule sets
<i>QUAC_Rule Set 1/2/3</i>	QUAC followed by classification by any of the three rule sets
<i>GS_DOS_Rule Set 1/2/3</i>	DOS followed by GS followed by classification by any of the three rule sets
<i>GS_FLAASH_Rule Set 1/2/3</i>	FLAASH followed by GS followed by classification by any of the three rule sets
<i>GS_QUAC_Rule Set 1/2/3</i>	QUAC followed by GS followed by classification by any of the three rule sets
<i>HCS_DOS_Rule Set 1/2/3</i>	DOS followed by HCS followed by classification by any of the three rule sets
<i>HCS_FLAASH_Rule Set 1/2/3</i>	FLAASH followed by HCS followed by classification by any of the three rule sets
<i>HCS_QUAC_Rule Set 1/2/3</i>	QUAC followed by HCS followed by classification by any of the three rule sets
<i>BGRN1</i>	Spectral subset containing blue, green, red, and NIR 1
<i>CYRN2</i>	Spectral subset containing coastal, yellow, red edge, and NIR 2
<i>VNIR</i>	Spectral subset containing coastal, blue, green, yellow, red, red edge, NIR 1, and NIR 2
<i>VNIR_SWIR</i>	Spectral subset containing coastal, blue, green, yellow, red, red edge, NIR 1, NIR 2, SWIR 1, SWIR 2, SWIR 3, SWIR 4, SWIR 5, SWIR 6, SWIR 7, SWIR 8
AC: <i>ACE/CEM/MF/MTMF/MTTCIMF/OSP/TCIMF</i>	Individual processing schemes are followed by the abbreviations for each advanced classifier
CC: <i>MHD/MXL/MD/SAM/MTA</i>	Individual processing schemes are followed by the abbreviations for each conventional classifier

Table S3. Measures of accuracy used in the current study. TP: Samples are those that are in the positive class and are correctly classified, TN: Samples that are correctly classified as negative, FP: Samples that are not truly of the positive class but are incorrectly mapped as positive. FN: Samples that are mapped as negative when, they are positive [49].

Accuracy Measure	Equation
<i>Precision</i>	$\frac{TP}{TP + FP}$
<i>Recall</i>	$\frac{TP}{TP + FN}$
<i>F1-Score</i>	$\frac{2 \times Precision \times Recall}{Precision + Recall}$
<i>Overall Accuracy</i>	$\frac{Total\ TP}{TP + FP + FN + TN}$
<i>Error Rate</i>	$1 - Overall\ Accuracy$
<i>Specificity</i>	$\frac{TN}{TN + FP}$