wgms
World Glacier Monitoring Service

A - GENERAL INFORMATION

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in cases of new glacier entries related to available fluctuation data[#]; for glaciers already existing in the FoG database, POLITICAL UNIT (A1), GLACIER NAME (A2) AND WGMS ID (A3) are to be used in data sheets B to F.

A1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (for 2 digit abbreviations, see ISO 3166 country code, available at www.iso.org).
Political unit is part of WGI key (positions 1 and 2).
Political unit is part of PSFG key (positions 1 and 2).

A2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters.
Format: max. 60 column positions.
If necessary, the name can be abbreviated; in this case, please give the full name under "A16 - REMARKS".

A3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the Fluctuations of Glaciers (FoG) database of the WGMS.
For new glacier entries, this key is assigned by the WGMS.

A4 - GEOGRAPHICAL LOCATION (GENERAL) *[alpha-numeric code; up to 30 digits]*
Refers to a large geographical entity (e.g. a large mountain range or large politcal subdivision) which gives a rough idea of the location of the glacier, without requiring the use of a map or an atlas.
Examples: Western Alps, Southern Norway, Polar Ural, Tien Shan, Himalayas.

A5 - GEOGRAPHICAL LOCATION (SPECIFIC) *[alpha-numeric code; up to 30 digits]*
Refers to a more specific geographical location (e.g. mountain group, drainage basin), which can be found easily on a small scale map of the country concerned.
Examples: Rhone Basin, Jotunheimen

A6 - LATITUDE *[decimal degree North or South; up to 6 digits]*
The geographical coordinates should refer to a point in the upper ablation area; for small glaciers, this point may lie outside the glacier.
Latitude should be given in decimal degrees, positive values indicating the northern hemisphere and negative values indicating the southern hemisphere.
Latitude should be given to a maximum precision of 4 decimal places.

A7 - LONGITUDE *[decimal degree East or West; up to 7 digits]*
The geographical coordinates should refer to a point in the upper ablation area; for small glaciers, this point may lie outside the glacier.
Longitude should be given in decimal degrees, positive values indicating east of zero meridian and negative values indicating west of zero meridian.
Longitude should be given to a maximum precision of 4 decimal places.

[#] *For new glacier entries, you may check the World Glacier Inventory (WGI) or the GLIMS database for existing information:*
+ WGI: http://nsidc.org/data/glacier_inventory/index.html
+ GLIMS: http://www.glims.org

A8 - CODE *[numeric code; 3 digits]*
Classification should be given in coded form, according to "Perennial Ice and Snow Masses"
(Technical papers in hydrology, UNESCO/IAHS, 1970). The following information should be given:

- Primary Classification   Digit 1
- Form   Digit 2
- Frontal Characteristics   Digit 3

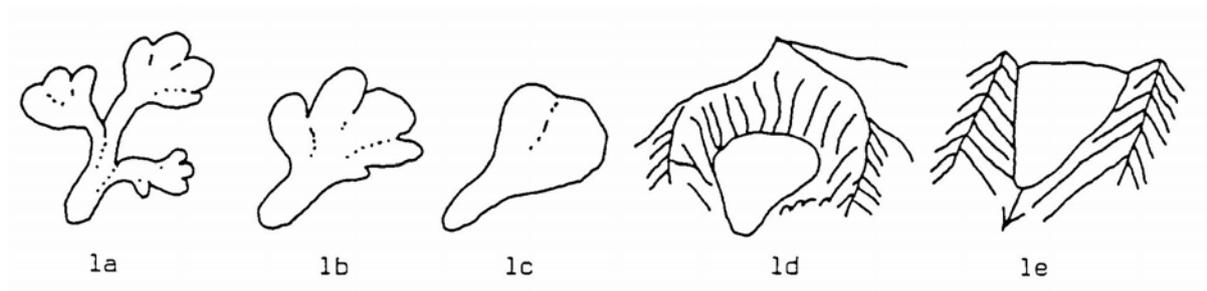## A8a - PRIMARY CLASSIFICATION - Digit 1

0	Miscellaneous	Any type not listed below (please explain)
1	Continental ice sheet	Inundates areas of continental size
2	Icefield	Ice masses of sheet or blanket type of a thickness that is insufficient to obscure the subsurface topography
3	Ice cap	Dome-shaped ice masses with radial flow
4	Outlet glacier	Drains an ice sheet, icefield or ice cap, usually of valley glacier form; the catchment area may not be easily defined
5	Valley glacier	Flows down a valley; the catchment area is well defined
6	Mountain glacier	Cirque, niche or crater type, hanging glacier; includes ice aprons and groups of small units
7	Glacieret and snowfield	Small ice masses of indefinite shape in hollows, river beds and on protected slopes, which has developed from snow drifting, avalanhcing, and/or particularly heavy accumulation in certain years; usually no marked flow pattern is visible; in existence for at least two consecutive years.
8	Ice shelf	Floating ice sheet of considerable thickness attached to a coast nourished by a glacier(s); snow accumulation on its surface or bottom freezing
9	Rock glacier	Lava-stream-like debris mass containing ice in several possible forms and moving slowly downslope

Note: The parent glacier concept (cf. A15 - PARENT GLACIER) can be used for the classification of complex glacier systems (e.g., ice cap or icefield with outlet glaciers) or of disintegrating/coalescing glaciers over time.

A8b - FORM – Digit 2

0	Miscellaneous	Any type not listed below (please explain)
1	Compound basins	Two or more individual valley glaciers issuing from tributary valleys and coalescing (Fig. 1a)
2	Compound basin	Two or more individual accumulation basins feeding one glacier system (Fig. 1b)
3	Simple basin	Single accumulation area (Fig. 1c)
4	Cirque	Occupies a separate, rounded , steep-walled recess which it has formed on a mountain side (Fig. 1d)

5	Niche	Small glacier in a V-shaped gulley or depression on a mountain slope (Fig. 1e); generally more common than genetically further-developed cirque glacier.
6	Crater	Occurring in extinct or dormant volcanic craters
7	Ice apron	Irregular, usually thin ice mass which adheres to mountain slope or ridge
8	Group	A number of similar ice masses occurring in close proximity and too small to be assessed individually
9	Remnant	Inactive, usually small ice masses left by a receding glacier

1a   1b   1c   1d   1e

A8c - FRONTAL CHARACTERISTICS – Digit 3

0	Miscellaneous	Any type not listed below (please explain)
1	Piedmont	Icefield formed on a lowland area by lateral expansion of one or coalescence of several glaciers (Fig. 2a, 2b)
2	Expanded foot	Lobe or fan formed where the lower portion of the glacier leaves the confining wall of a valley amd extends on to a less restricted and more level surface (Fig. 2c)
3	Lobed	Part of an ice sheet or ice cap, disqualified as an outlet glacier (Fig. 2d)
4	Calving	Terminus of a glacier sufficiently extending into sea or lake water to produce icebergs; includes- for this inventory- dry land ice calving which would be recognisable from the "lowest glacier elevation"

5   Coalescing, non-contributing (Fig. 2e)

6   Irregular, mainly clean ice (mountain or valley glaciers)

7   Irregular, debris-covered (mountain or valley glaciers)

8   Single lobe, mainly clean ice (mountain or valley glaciers)

9   Single lobe, debris-covered (mountain or valley glaciers)
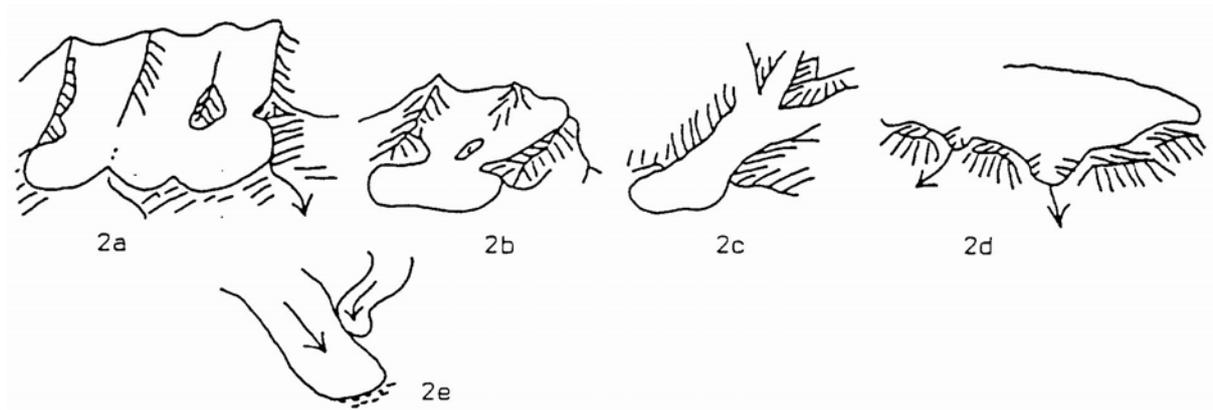
A9 - EXPOSITION OF ACCUMULATION AREA *[cardinal point; up to 2 digits]*
The main orientation of the accumulation area using the 8 cardinal points (8-point compass).

A10 - EXPOSITION OF ABLATION AREA *[cardinal point; up to 2 digits]*
The main orientation of the accumulation area using the 8 cardinal points (8-point compass).

A11 - PARENT GLACIER *[numeric code; 5 digits]*
Links separated glacier parts with (former) parent glacier, using WGMS ID (see "A3 - WGMS ID").

A12 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

A13 - GLACIER REGION *[alphabetic code; 3 digits]*
3-digit code assigning each glacier to one of 19 first-order regions. For new glacier entries, this key is assigned by the WGMS.

A14 - GLACIER SUBREGION *[alpha-numeric code; 6 digits]*
6-digit code assigning each glacier to one of 90 second-order regions. For new glacier entries, this key is assigned by the WGMS.

AA - GLACIER ID LOOKUP TABLE

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet is completed by the WGMS and aims at linking the WGMS_ID as used in the Fluctuations of Glaciers database to glacier identifiers in other databases, such as to the PSFG_ID, the WGI_ID, the GLIMS_ID, and the RGI_ID.

AA1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

AA2 - GLACIER NAME *[alpha-numeric code; up to 30 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

AA3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID"). This key is assigned by the WGMS.

AA4 - PSFG ID *[alpha-numeric code; 7 digits]*
7 digit key identifying glaciers in the Fluctuations of Glaciers publication series. The key was introduced by the "Permanent Service for the Fluctuations of Glaciers" (PSFG), one of the predecessor services of the WGMS. This key is assigned by the National Correspondents according to existing national glacier inventories or similar glacier numerations.

The PSFG ID consists of 7 digits, starting with 2-character political unit followed by 4 or, as an exception, 5 alpha-numerical digits. Empty spaces are filled with the digit 0.

AA5 - WGI ID *[alpha-numeric code; 12 digits]*
12 digit key identifying glaciers in the World Glacier Inventory. The key is assigned to the glaciers as defined by Müller (1978) combining the five following elements:
+ 2-character political unit
+ 1-digit continent code
+ 4-character drainage code
+ 2-digit free position code
+ 3-digit local glacier code

Empty spaces are filled with the digit 0. This key is assigned by WGMS and NSIDC. More information is found in Müller (1978) and on the WGI webpage:
http://nsidc.org/data/docs/noaa/g01130_glacier_inventory/

AA6 - GLIMS ID *[alpha-numeric code; 14 digits]*
14 digit key identifying glaciers in the GLIMS database. The identifier has the format *GxxxxxxEyyyyyΘ*, where *xxxxxx* is longitude east of the Greenwich meridian in millidegrees, *yyyyy* is north or south latitude in millidegrees, and *Θ* is N or S depending on the hemisphere. This key is assigned by NSIDC. More information is found on the GLIMS webpage: http://www.glims.org/MapsAndDocs/

AA7 - RGI ID *[alpha-numeric code; 14 digits]*
14 digit key identifying glaciers in the RGI database. The identifier has the format *RGIvv-rr.nnnnn*, where *vv* is the version number, *rr* is the first-order region number and *nnnnn* is an arbitrary identifying code that is unique with in the region. These codes were assigned as sequential positive integers at the first-order (not second-order) level, but they should not be assumed to be sequential numbers, or even to be numbers. In general the identifying code of each glacier, *nnnnn*, should not be expected to be the same in different RGI versions. This key is assigned by the RGI Working Group. More information is found on the RGI webpage: http://www.glims.org/RGI/index.html

AA8 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here.

B - STATE

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report length, area and elevation range of glaciers with available fluctuation data.

B1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

B2 - GLACIER NAME *[alpha-numeric code; up to 30 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

B3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

B4 - YEAR *[year]*
Year of present survey.

B5 - MAXIMUM ELEVATION OF GLACIER *[m a.s.l.]*
Altitude of the highest point of the glacier.

B6 - MEDIAN ELEVATION OF GLACIER *[m a.s.l.]*
Altitude of the contour line which halves the area of the glacier.

B7 - MINIMUM ELEVATION OF GLACIER *[m a.s.l.]*
Altitude of the lowest point of the glacier.

B8 - ELEVATION UNCERTAINTY *[m]*
Estimated random uncertainty of reported elevations.

B9 - LENGTH *[km]*
Maximum length of glacier measured along the most important flowline (in horizontal projection).

B10 - LENGTH UNCERTAINTY *[km]*
Estimated random uncertainty of reported length.

B11 - AREA *[km^2]*
Glacier area (in horizontal projection) in the survey YEAR.

B12 - AREA UNCERTAINTY *[km^2]*
Estimated random uncertainty of reported area.

B13 - SURVEY DATE *[numeric; 8 digits]*
Date of present survey.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "B16 - REMARKS"

B14 - SURVEY PLATFORM & METHOD *[alphabetic code; 2 digits]*
The survey platform and method should be given using the following alphabetic code:

Platform (first digit, lower case)
t: terrestrial
a: airborne
s: spaceborne
c: combined
x: unknown

Method (second digit, upper case)
R: reconstructed (e.g., from landforms)
M: derived from maps
G: ground survey (e.g., GPS, tachymetry, tape)
P: photogrammetry
L: laser altimetry or scanning
Z: radar altimetry or interferometry
C: combined (explain under B16 REMARKS)
X: other (explain under B16 REMARKS)

B15 - INVESTIGATOR *[alpha-numeric; 255 digits]*
Name(s) of the person(s) or agency doing the field work and/or the name(s) of the person(s) or agency processing the data.

B16 - SPONSORING AGENCY *[alpha-numeric; 255 digits]*
Full name, abbreviation and address of the agency where the data are held.

B17 - REFERENCE *[alpha-numeric; 255 digits]*
Reference to publication related to above data and methods.
Use short format such as: Author et al. (YYYY); Journal, V(I), X-XX p.

B18 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here as well as short references to related publications. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

C - FRONT VARIATION

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report glacier length change records mainly from in-situ and remote sensing measurements.*

C1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

C2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

C3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

C4 - YEAR *[year]*
Year of present survey.

C5 - FRONT VARIATION *[m]*
Variation in the position of the glacier front (in horizontal projection) between the previous and present survey.

Positive values: advance
Negative values: retreat

C6 - FRONT VARIATION UNCERTAINTY *[m]*
Estimated random uncertainty of reported front variation.

C7 - QUALITATIVE VARIATION *[alphabetic code; 2 digits]*
If no quantitative data are available for a particular year, but qualitative data are available, then the front variation should be denoted using the following symbols. They should be positioned in the far left of the data field.

+X   : Glacier in advance
-X   : Glacier in retreat
ST   : Glacier stationary
SN   : Glacier front covered by snow making survey impossible.

Qualitative variations will be understood with reference to the previous survey data, whether this data is qualitative or quantitative.

C8 - SURVEY DATE *[numeric; 8 digits]*
Date of present survey.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "C14 - REMARKS"

C9 - SURVEY PLATFORM & METHOD *[alphabetic code; 2 digits]*
The survey platform and method should be given using the following alphabetic code:

Platform (first digit, lower case)	Method (second digit, upper case)
t: terrestrial	R: reconstructed (e.g., historical sources, geomorphological evidence, dating of moraines)
a: airborne	M: derived from maps
s: spaceborne	G: ground survey (e.g., GPS, tachymetry, tape)
c: combined	P: photogrammetry
x: unknown	L: laser altimetry or scanning
	Z: radar altimetry or interferometry
	C: combined (explain under C14 REMARKS)
	X: other (explain under C14 REMARKS)

C10 - REFERENCE DATE *[numeric, 8 digits]*
Date of previous survey
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "C14 - REMARKS"

C11 - INVESTIGATOR *[alpha-numeric; 255 digits]*
Name(s) of the person(s) or agency doing the fieldwork and/or the name(s) of the person(s) or agency processing the data.

C12 - SPONSORING AGENCY *[alpha-numeric; 255 digits]*
Full name, abbreviation and address of the agency where the data are held.

C13 - REFERENCE *[alpha-numeric; 255 digits]*
Reference to publication related to above data and methods.
Use short format such as: Author et al. (YYYY); Journal, V(I), X-XX p.

C14 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here as well as short references to related publications. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

* For the submission of front variation series mainly based on reconstruction methods (e.g., paintings, drawings, written sources, photography, maps, and moraine dating), please contact the WGMS staff.

D - CHANGE

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report changes in thickness, area and volume from geodetic surveys and/or area data of glaciers with available fluctuation data.

D1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

D2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

D3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

D4 - YEAR *[year]*
Year of present survey.

D5 - LOWER BOUNDARY *[m a.s.l.]*
Lower boundary of altitude interval.
If refers to entire glacier, then lower bound = 9999.

D6 - UPPER BOUNDARY *[m a.s.l.]*
Upper boundary of altitude interval
If refers to entire glacier, then upper bound = 9999.

D7 - AREA SURVEY YEAR *[km^2]*
Glacier area of each altitude interval (in horizontal projection) in the survey YEAR.

D8 - AREA CHANGE *[1000 m^2]*
Area change for each altitude interval.

D9 - AREA CHANGE UNCERTAINTY *[1000 m^2]*
Estimated random uncertainty of reported area change.

D10 - THICKNESS CHANGE *[mm]*
Specific ice thickness change for each altitude interval.

D11 - THICKNESS CHANGE UNCERTAINTY *[mm]*
Estimated random uncertainty of reported thickness change.

D12 - VOLUME CHANGE *[1000 m^3]*
Ice volume change for each altitude interval.

D13 - VOLUME CHANGE UNCERTAINTY *[1000 m^3]*
Estimated random uncertainty of reported volume change.

D14 - SURVEY DATE *[numeric; 8 digits]*
Date of present survey.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "D21 - REMARKS"

D15 - SURVEY DATE PLATFORM & METHOD *[alphabetic code; 2 digits]*
The survey platform and method applied at the survey date should be given using the following alphabetic code:

Platform (first digit, lower case)	Method (second digit, upper case)
t: terrestrial	R: reconstructed (e.g., from landforms)
a: airborne	M: derived from maps
s: spaceborne	G: ground survey (e.g., GPS, tachymetry, tape)
c: combined	P: photogrammetry
x: unknown	L: laser altimetry or scanning
	Z: radar altimetry or interferometry
	C: combined (explain under D21 REMARKS)
	X: other (explain under D21 REMARKS)

D16 - REFERENCE DATE *[numeric; 8 digits]*
Date of previous survey.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "D21 - REMARKS"

D17 - REFERENCE DATE PLATFORM & METHOD *[alphabetic code; 2 digits]*
The survey platform and method applied at the reference date should be given using the alphabetic code given under D15.

D18 - INVESTIGATOR *[alpha-numeric; 255 digits]*
Name(s) of the person(s) or agency doing the fieldwork and/or the name(s) of the person(s) or agency processing the data.

D19 - SPONSORING AGENCY *[alpha-numeric; 255 digits]*
Full name, abbreviation and address of the agency where the data are held.

D20 - REFERENCE *[alpha-numeric; 255 digits]*
Reference to publication related to above data and methods.
Use short format such as: Author et al. (YYYY); Journal, V(I), X-XX p.

D21 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here as well as short references to related publications. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

E - MASS BALANCE OVERVIEW

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report glacier mass balance data measured by the direct glaciological method.

E1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

E2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

E3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

E4 - YEAR *[year]*
Year of present survey.

E5 - TIME MEASUREMENT SYSTEM *[alphabetic code; 3 digits]*
The time measurement system should be given using the following 3 digit alphabetic code:

FLO = floating-date system
FXD = fixed-data system
STR = stratigraphic system
COM = combined system; usually of STR and FXD according Mayo et al. (1972)
OTH = other

Please give floating survey dates in E6-E8 for all time systems and explain methodological details (e.g., fixed calendar dates and correction methods) under "E23 - REMARKS".

Note that FLO was newly introduced in 2011 in order to reduce earlier ambiguities. Before that, mass balance results based on the floating-date system were (at least theoretically) reported as OTH. For definitions of the above time measurement systems and more details see Cogley et al. (2011).

E6 - BEGINNING OF SURVEY PERIOD *[numeric; 8 digits]*
Date on which survey period began.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "E23 - REMARKS"

E7 - END OF WINTER SEASON *[numeric; 8 digits]*
Date of end of winter season.
If known, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "E23 - REMARKS"

E8 - END OF SURVEY PERIOD *[numeric; 8 digits]*
Date on which survey period ended.
For each survey, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "E23 - REMARKS"

E9a - ELA PREFIX *[alphabetic code, 1 digit]*
Prefix denoting if the equilibrium line was below ("<") or above (">") the minimum or maximum elevation of the glacier, respectively. Leave this field empty if the mean altitude of the equilibrium line was within the glacier elevation range.

E9b - EQUILIBRIUM LINE ALTITUDE *[m a.s.l.]*
Mean alititude (averaged over the glacier) of the end-of-mass-balance-year equilibrium line (ELA). Give glacier minimum or maximum elevation if the ELA was below or above the elevation range of the glacier, respectively.

E10 - ELA UNCERTAINTY *[m]*
Estimated random uncertainty of reported ELA.

E11 - MINIMUM NUMBER OF MEAS. SITES USED IN ACCUMULATION AREA *[numeric]*
The minimum number of different sites at which measurements were taken in the accumulation area. Repeat measurements may be taken for one site, in order to obtain an average value for that site, but the site is still only counted once. Minimum and maximum values can be used to indicate different numbers of measurements carried out for (i) winter and annual balance surveys or (ii) for different accumulation measurement types (e.g., snow pits versus snow probings).

E12 - MAXIMUM NUMBER OF MEAS. SITES USED IN ACCUMULATION AREA *[numeric]*
The maximum number of different sites at which measurements were taken in the accumulation area. Repeat measurements may be taken for one site, in order to obtain an average value for that site, but the site is still only counted once. Minimum and maximum values can be used to indicate different numbers of measurements carried out for (i) winter and annual balance surveys or (ii) for different accumulation measurement types (e.g., snow pits versus snow probings).

E13 - MINIMUM NUMBER OF MEAS. SITES USED IN ABLATION AREA *[numeric]*
The minimum number of different sites at which measurements were taken in the ablation area. Repeat measurements may be taken for one site, in order to obtain an average value for that site, but the site is still only counted once. Minimum and maximum values can be used to indicate different numbers of measurements carried out for (i) winter and annual balance surveys.

E14 - MAXIMUM NUMBER OF MEAS. SITES USED IN ABLATION AREA *[numeric]*
The maximum number of different sites at which measurements were taken in the ablation area. Repeat measurements may be taken for one site, in order to obtain an average value for that site, but the site is still only counted once. Minimum and maximum values can be used to indicate different numbers of measurements carried out for (i) winter and annual balance surveys.

E15 - ACCUMULATION AREA *[km^2]*
Accumulation area in horizontal projection.

E16 - ACCUMULATION AREA UNCERTAINTY *[km^2]*
Estimated random uncertainty of reported accumulation area.

E17 - ABLATION AREA *[km^2]*
Ablation area in horizontal projection.

E18 - ABLATION AREA UNCERTAINTY *[km^2]*
Estimated random uncertainty of reported ablation area.

E19 - ACCUMULATION AREA RATIO *[%]*
Accumulation area divided by the total area, multiplied by 100. Given in percent.

E20 - INVESTIGATOR *[alpha-numeric; 255 digits]*
Name(s) of the person(s) or agency doing the fieldwork and/or the name(s) of the person(s) or agency processing the data.

E21 - SPONSORING AGENCY *[alpha-numeric; 255 digits]*
Full name, abbreviation and address of the agency where the data are held.

E22 - REFERENCE *[alpha-numeric; 255 digits]*
Reference to publication related to above data and methods.
Use short format such as: Author et al. (YYYY); Journal, V(I), X-XX p.

E23 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here as well as short references to related publications. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

EE - MASS BALANCE

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report glacier mass balance data with values related to the data given in data sheet E.

EE1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

EE2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

EE3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

EE4 - YEAR *[year]*
Year of present survey.

EE5 - LOWER BOUNDARY OF ALTITUDE INTERVAL *[m a.s.l.]*
If refers to entire glacier, then lower bound = 9999.

EE6 - UPPER BOUNDARY OF ALTITUDE INTERVAL *[m a.s.l.]*
If refers to entire glacier, then lower bound = 9999.

EE7 - ALTITUDE INTERVAL AREA *[km^2]*
Area of each altitude interval (in horizontal projection).

EE8 - SPECIFIC WINTER BALANCE *[mm w.e.]*
Specific means the total value divided by the total glacier area under investigation.
Specific winter balance equals the net winter balance divided by the total area of the glacier.

EE9 - SPECIFIC WINTER BALANCE UNCERTAINTY *[mm w.e.]*
Estimated random uncertainty of reported winter balance.

EE10 - SPECIFIC SUMMER BALANCE *[mm w.e.]*
Specific means the total value divided by the total glacier area, in this case, it is the net summer balance divided by the total area of the glacier.

EE11 - SPECIFIC SUMMER BALANCE UNCERTAINTY *[mm w.e.]*
Estimated random uncertainty of reported winter balance.

EE12 - SPECIFIC ANNUAL BALANCE *[mm w.e.]*
Annual mass balance of glacier divided by the area of the glacier.

EE13 - SPECIFIC ANNUAL BALANCE UNCERTAINTY *[mm w.e.]*
Estimated random uncertainty of reported annual balance.

EE14 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here. Comments about the uncertainty of the numerical data may be made, including quantitative comments. Only significant decimals should be given.

EEE - MASS BALANCE POINT

NOTES ON THE COMPLETION OF THE DATA SHEET

This data sheet should be completed in order to report point mass balance data.
Values related to glacier-wide balances (cf. data sheet EE) need to be denoted
in EEE13 BALANCE_CODE.

EEE1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

EEE2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

EEE3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

EEE4 - YEAR *[year]*
Year of present survey.

EEE5 - FROM DATE *[numeric; 8 digits]*
Date on which survey period began.
Please indicate the complete date in numeric format YYYYMMDD.
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note
under "E23 - REMARKS"

EEE6 - TO DATE *[numeric; 8 digits]*
Date on which survey period ended.
Please indicate the complete date in numeric format YYYYMMDD.
Note: the first four digits of TO DATE correspond to EEE4 YEAR.
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note
under "E23 - REMARKS"

EEE7 - POINT ID *[alpha-numeric; 4 digits]*
4 digit key indentifying the stake or pit.

EEE8 - POINT LATITUDE *[decimal degree North or South; up to 6 digits]*
Latitude of stake or pit given in decimal degrees, positive values indicating the northern hemisphere
and negative values indicating the southern hemisphere.
Latitude should be given to a maximum precision of 4 decimal places.

EEE9 - POINT LONGITUDE *[decimal degree East or West; up to 7 digits]*
Longitude of stake or pit given in decimal degrees, positive values indicating east of zero meridian and
negative values indicating west of zero meridian.
Longitude should be given to a maximum precision of 4 decimal places.

EEE10 - POINT ELEVATION *[m a.s.l.]*
Elevation above sea level of stake or pit.

EEE11 – POINT BALANCE [mm w.e.]
Mass balance at this observation point between FROM DATE and TO DATE.

EEE12 – POINT BALANCE UNCERTAINTY *[mm w.e.]*
Estimated random uncertainty of reported point balance.

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EEE13 – DENSITY *[kg m⁻³]*
Measured or assumed density used to convert the height readings (in mm) to point balances (in mm w.e.).

EEE14 – DENSITY UNCERTAINTY *[kg m⁻³]*
Estimated random uncertainty of reported density.

EEE15 - BALANCE CODE *[alphabetic code; 2 digits]*
Code used to denote point balances used for the calculation of glacier-wide balances:
BW   = winter balance (cf. data sheet EE8)
BS   = summer balance (cf. data sheet EE10)
BA   = annual balance (cf. data sheet EE12)
IN   = balance at index point not used for glacier-wide balance calculations

EEE16 - REMARKS *[alpha-numeric]*
Any important information or comments not included above, such as type of point location (e.g. ablation stake, snow probing, snow pit).

F - SPECIAL EVENT

NOTES ON COMPLETION OF THE DATA SHEET

This data sheet should be completed in cases of extraordinary events, especially concerning glacier hazards and dramatic changes in glaciers.

F1 - POLITCAL UNIT *[alphabetic code; 2 digits]*
Name of country or territory in which glacier is located (cf. "A1 - POLITICAL UNIT").

F2 - GLACIER NAME *[alpha-numeric code; up to 60 digits]*
The name of the glacier, written in CAPITAL letters. Use the same spelling as in
"A2 - GLACIER NAME".

F3 - WGMS ID *[numeric code; 5 digits]*
5 digit key identifying glaciers in the FoG database of the WGMS (cf. "A3 – WGMS ID").

F4 - EVENT DATE *[numeric; 8 digits]*
Date of event.
For each event, please indicate the complete date in numeric format (YYYYMMDD).
Missing data: For unknown day or month, put "99" in the corresponding position(s) and make a note under "F6 - EVENT DESCRIPTION".
For events lasting for several days, please indicate the date of the main event, and describe the sequence of the event under "F6 - EVENT DESCRIPTION".

F5 - EVENT TYPE *[binary code; 6 digits]*
Indicate the involved event type(s) using 1 = event type involved and 0 = event type not involved for the following event types:

F5a - GLACIER SURGE
F5b - CALVING INSTABILITY
F5c - GLACIER FLOOD (including debris flow, mudflow)
F5d - ICE AVALANCHE
F5e - TECTONIC EVENT (earthquake, volcanic eruption)
F5f - OTHER

F6 - EVENT DESCRIPTION *[alpha-numeric]*
Please give quantitative information wherever possible, for example:

- Glacier surge: Date and location of onset, duration, flow or advance velocities, discharge anomalies and periodicity;

- Calving instability: Rate of retreat, iceberg discharge, ice flow velocity and water depth at calving front;

- Glacier flood (including debris flow, mudflow): Outburst volume, outburst mechanism, peak discharge, sediment load, sediment load, reach and propagation velocity of flood wave or front of debris flow / mudflow;

- Ice avalanche: Volume released, runout distance, overall slope (ratio of vertical drop height to horizontal travel distance) of avalanche path;

- Tectonic event: Volumes, runout distances and overall slopes (ratio of vertical drop height to horizontal travel distance) of rockslides on glacier surfaces, amount of geothermal melting in craters, etc.

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F7 - DATA SOURCE *[alpha-numeric]*
Please indicate at least one reference or source which could help the reader to locate more detailed information, or give the name(s) of contact person(s) who would be able to supply additional information.

F8 - REMARKS *[alpha-numeric]*
Any important information or comments not included above may be given here. Comments about the uncertainty of the numerical data may be made, including quantative comments. Only significant decimals should be given.

The amount and/or kind of possible destruction, particular technical measures taken against glacier hazards, or special studies carried out in connection with the event may be given.