

Snow Survey of Great Britain: transcribed Scottish data (1945 to 2007)

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Abstract

Daily observations of snowline from the Snow Survey of Great Britain (SSGB) are available in txt files at 140 locations in Scotland between the years 1945 and 2007. The SSGB recorded the presence of the lowest snow cover in 150 m increments on hills visible from a given site. The purpose of this document is to describe the SSGB dataset as stored in the Environmental Information Data Centre.

Introduction

The SSGB is a voluntary observer collected dataset which recorded snowline, in metres above sea level, each winter (usually October to May) between 1937 and 2007. Volunteers were based at estates, the water authorities, Nature Conservancy (now Scottish Natural Heritage), energy companies, Forestry Commission, and others; they often also collected other weather observation data for use by the Met Office. The SSGB was used to produce the annual publication “Report on the Snow Survey of Great Britain” between 1947 and 1992. The initial aim of the SSGB was to “secure representative data relating to the occurrence of snow cover at different altitudes in the various upland districts over the period October to June” (Anon., 1947).

Paper copy Scottish data, between Autumn 1945 and Summer 2007, are stored in the Met Office archives in Edinburgh. These paper copies were transcribed to an electronic format and comprise the dataset described in this document. Spencer et al. (2014) summarise the transcribed SSGB data, some of the material from that article is repeated here for ease of reading.

This document briefly describes the dataset collection and transcription, followed by an explanation of the dataset structure and variables.

Data collection

The SSGB observers looked out on the hills that surrounded their location and noted at what level snow was lying. Elevations were grouped into 150 m bands from 0 to 1200 m ASL or 500 feet increments earlier in the record, with most stations supplying metric returns by the early 1980s. The observers were asked (taken from January 1992 instructions) to record at 09:00 GMT “or thereabouts” when snow or sleet was falling at station level and if snow was lying at station level, with depth. Lying snow was to be recorded at visible elevations when it covered greater than half the ground at a given elevation. Finally they were asked to record when fog or cloud obscured observation. These instructions are shown

in Figure 1. The results of this process can be seen in Figure 2, an example return card from Dalwhinnie; note the visible hills listed. Figure 1 also shows comments from the observer that for nine days they did not make observations from the station. This comment highlights a challenge of this dataset, that these observations are not standardised.

Data transcription

For each station encountered, metadata from the SSGB return sheets were noted. This information was: site name, elevation (m ASL), easting (m), northing (m), hills visible and comments. These data are useful for identifying sites and establishing what was visible from each location. The comments section was used to record notes on data quality. For example, Brig-O-Turk recorded the lowest lying isolated snow patch, not the level of snow cover greater than 50%. Brig-O-Turk also noted where continuous snow lay in the comments; this value was used in the transcription. Where noted, missing values occurring when an observation was obscured by poor visibility or the observer was absent were transcribed. However, these cannot always be distinguished from when there was no snow. The lowest snowline elevation from the paper copy returns were transcribed into a spreadsheet with each column representing a station and each row representing a day. Data transcription took approximately three months and approximately 16750 return sheets (one sheet for each station, each month) were input. Quality assurance was undertaken to check for typographical errors, but no further data checks were undertaken. Following transcription, data were uploaded to the Met Office managed database MIDAS (Met Office Integrated Data Archive System). These raw transcribed data are available through the British Atmospheric Data Centre¹.

The dataset presented with this document differs to that held by the British Atmospheric Data Centre by being issued with station meta-data and by the alterations laid out in this paragraph. When the locations and observing dates for the SSGB stations were examined, some were found to be the same station, but

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Snow Survey

— SECOND FOLD —

NOTES TO OBSERVERS

1. General: Observations of snow or sleet (rain or drizzle and snow) falling, snow lying and total depth of snow at station level should be made, if possible, at 09 GMT or thereabouts; if observations are made habitually at another time please specify this hour. Observations of snow lying in surrounding hills may be made at some other time depending on visibility. If no observation is made, e.g. due to sickness, leave all columns blank and write the word Absent against the date.
2. Snow or sleet at station level: Enter X on the days (midnight to midnight) on which snow or sleet is known to have fallen at any time in the vicinity of the station.
3. Total depth of snow at station level: When more than half the ground in the vicinity of the station is estimated to be covered with snow enter the total depth (specify inches or centimetres) of undrifted snow.
4. Snow lying: First strike through all heights for which observations of snow lying are never possible (e.g. for a station at 700 feet in a valley the lowest point visible might be the ground near the station and the highest point visible might be 3,200 feet, in which case the heights deleted would be the following: sea level, 500, 3,500 and 4000 feet). A tick (✓) should be entered at the level indicated when it is judged that more than half of the ground at that level is covered with snow, otherwise the space should be left blank. When fog or cloud obscure any particular level a dash (—) should be entered. In judging whether more than half of the ground at any level (other than station level) is snow covered, the observer should try to interpret what he actually sees in the light of his knowledge of the country at that level.

— SECOND FOLD —

— FIRST FOLD —

General remarks on the snowfall of the month as a whole

20-29 DECEMBER, OBSERVATIONS FROM MY HOME 2 MILES
FROM STN. OR BASED ON MY LOCAL DRIVER'S OBSERVATIONS
DURING THIS PERIOD.

— FIRST FOLD —

Met. O. Carto/D. O. /1523

Signed Observer

Figure 1: Example SSGB instructions. Contains Met Office data ©Crown copyright and database right 2016.

METEOROLOGICAL OFFICE

SNOW SURVEY RETURN

Observations of snow for the month of OCTOBER 1980 from Station No. 17

Station DALWHINNIE County INVERNESS NGR 839 841 Height 1158

Bearing, Height and Distance of main snow-receiving hills (these details need be given on the October return only) ...

CHARIVAR CHAM 3,087 3 MILES SOUTH EAST NORTH FACE

TRAFALGAR 2,986 2 MILES N.W. SOUTH SLOPES

BEN ALDER 3,757 12 MILES EAST FACE

Day	Snow or sleet falling at the station	TOTAL SNOW DEPTH AT STATION	SNOW LYING							REMARKS
			DEPTH ENTER IN FOR SNOW DEPTHS FOR CENTIMETRES	at Station Level	at 1000 feet (300 metres)	at 1500 feet (450 metres)	at 2000 feet (600 metres)	at 2500 feet (750 metres)	at 3000 feet (900 metres)	
1										Shower of rain, gales
2										Fair, sunny periods
3										Heavy continuous rain
4										Clear at first, fair later
5										Heavy showers of rain
6										Heavy showers of rain, calm
7	X									Showers of rain & sleet
8										Showers of rain
9	X									Cold with showers of rain & sleet
10										Stagnant rain, cold
11										Fair with sunny periods
12	X									Showers of rain & sleet
13										Clear at first, cloudy, fair
14										Fair, sunny periods
15	X									Showers of sleet & snow
16	X									Heavy showers of rain, sleet & snow
17	X									Showers of sleet & snow
18	X									Clear at first, showers of sleet & snow later
19	X	1 1/2 IN								Clear at first, showers of sleet & snow
20	X									Clear at first, showers of sleet & snow later
21	X									Showers of rain sleet & snow
22										Cold, showers of rain
23										Showers of rain
24	X									Showers of rain & sleet
25										Clear at first, heavy showers later
26										Fair at first, showers rain later
27										Cloudy fair mild
28										Heavy showers of rain at first, sunny later
29										Heavy showers of rain
30										Clear at first, sunny periods later
31										Fair, cloudy, sunny periods later

* Delete units not used

For guidance in completing this form see Notes to Observers overleaf

Figure 2: Example SSGB return from Dalwhinnie in October 1980. Contains Met Office data ©Crown copyright and database right 2016.

Table 1: SSGB dataset files.

File name	Description	No. of files
<i>Station_details.txt</i>	A description of the SSGB stations	1
<i>SSGB_year_xxxx.txt</i>	SSGB data contained in files split by year	62
<i>SSGB_st_yyyy.txt</i>	SSGB data contained in files split by station	140

with a name change - presumably through different volunteers having different opinions. The following changes were made (showing years reported under that name): Shin (1964) into Cassley Power Station, Ardclach (1946) into Glenferness, Tarfside (1958) into Glen Esk. These three stations were straightforward to combine as they were geographically very close and the longer running stations had missing data when the shorter running ones were recording. There is a possibility that Dykecrofts and Newcastleton are the same station, however this is less clear as there is a distinct name change, so perhaps the station moved within the village. Figure 3 shows the spatial distribution of the recording stations, with each station colour graded to indicate its record length. In the SSGB paper records, when snow lay at the station this was recorded with a 'st' observation. For the version of the dataset presented here, these values have been converted to the nearest 150 m elevation band that the station lies in.

Data structure

The SSGB dataset presented here is split into three file groups, as described in Table 1. Each of these files are delimited by a pipe (|), to avoid confusion where commas appear in the description. The variables in each file type are described in Tables 2 and 3. The potential snow elevation variables are shown in Table 4.

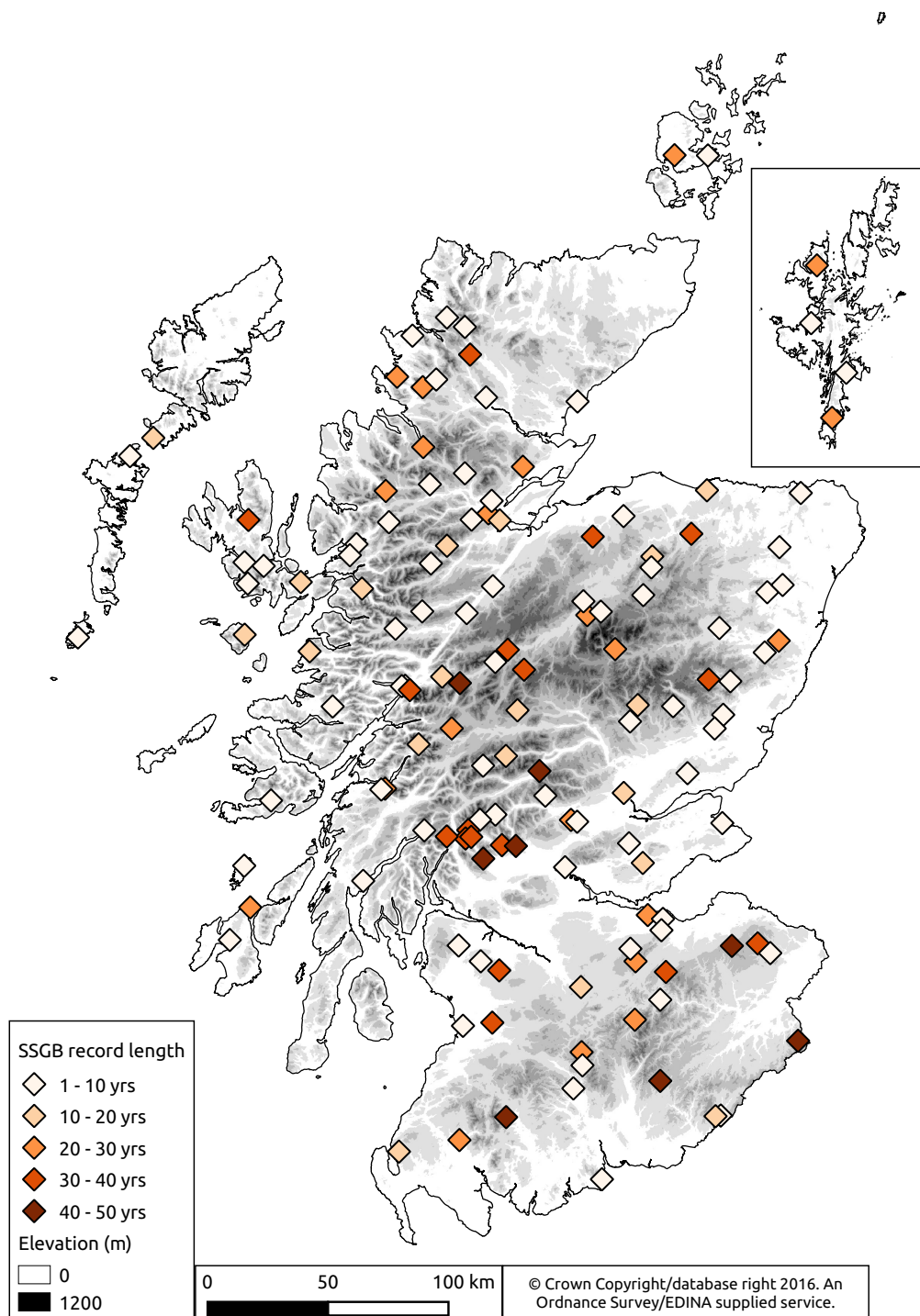


Figure 3: Location of Scottish SSGB stations colour graded by record length in years.

Table 2: Description of columns in *Station_details.txt* file.

Column header	Description	Units
KeyName	Unique station identifier	NA
Place	Long station name (occasionally multiple)	NA
Easting	British National Grid easting	metres
Northing	British National Grid northing	metres
HillsVisible	Visible hills, as listed by the observer	NA
Comments	Details noted during transcription	NA

Table 3: Description of columns in *SSGB_year_XXXX.txt* and *SSGB_st_YYYY.txt* files.

Column header	Description	Units
Date	Date of observation	yyyy-mm-dd
KeyName	Unique station identifier (see Table 2)	NA
Snowline	Snowline elevation as recorded by the observers	metres
SnowlineElev	As Snowline, but “st” is replaced with station elevation	metres

Table 4: Potential values of the Snowline and SnowlineElev variables in the *SSGB_year_XXXX.txt* and *SSGB_st_YYYY.txt* files.

Value	Description
0	Snowline at sea level
150	Snowline at 150 m
300	Snowline at 300 m
450	Snowline at 450 m
600	Snowline at 600 m
750	Snowline at 750 m
900	Snowline at 900 m
1050	Snowline at 1050 m
1200	Snowline at 1200 m
n	No snow observed
st	Snow at the station elevation (only in Snowline column)
99	Missing observation (e.g. observer absence, cloud)

References

- Anon. Snow survey of the British Isles. *Journal of Glaciology*, 1:32–32, 1947.
- Spencer, M., Essery, R., Chambers, L., and Hogg, S. The historical snow survey of Great Britain: Digitised data for Scotland. *Scottish Geographical Journal*, 130(4):252–265, December 2014.