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Seven Scottish snow patches survive until winter 2016/17

Keywords

Snow patches, Scotland

Short title

Scottish snow patches 2016

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Here we present our twenty first annual report on the survival of Scottish snow patches, following the account for 2015 in Cameron *et al.* (2016).

Methods

The compilation of this year's paper was once again aided by the contributions from people – far too many to name individually – using social media; particularly Twitter and Facebook. For brevity, unattributed observations are by authors IC and AW, with information from others being personal communications. Measurements of patches give greatest length, breadth and depth in that order.

Weather in winter through to autumn

On the Scottish hills, less snow fell than over the previous three winters. It was the third-warmest winter for the UK in a series from 1910, behind those of 1989 and 2007¹. In Scotland, mean daily maximum temperatures were 0.5 – 1 deg C warmer across the whole country than the 1981-2010 mean. As a result of this, the hills of the Southern Highlands and Uplands, aligned with their lack of relative height, did less well in terms of snow accumulation than those above 3500 feet (1067 metres). (In Scotland, where the climate is dominated by maritime weather systems, the difference between rain and snow falling at 3000 feet (914 metres) can be only a degree-or-so.) On higher hills farther north, though, it was cold enough for build-ups of deep snow on favoured north-east facing aspects above 3500 feet.

Though April was cooler than normal – culminating in an extraordinary late fall to low levels in Fife and Stirlingshire – May and June were both milder, resulting in snow melting quickly at lower altitudes. Fresh snow was observed on only one day during June-September (at Ben Nevis on 1 July, D. Buckett), the lowest total since 2006, when none was observed (Watson *et al* 2007).

Patches in late spring, summer and autumn 2016

April–July

Southern Scotland

During a visit to Cramalt Craig and Broad Law in the Borders on 22 April, IC found many big wreaths, the largest of which, on the latter, being in excess of 150m long. On the former he found evidence of a significant avalanche, from which the two metre high crown wall was still visible. On 28 April a remarkable 12-hour snow-event occurred in eastern and central Scotland, with over 250 mm recorded on the Lomond Hills of Fife (B. Dolphin), and massive drifts up on the Ochils hills near Stirling (see Fig. 1). Though this unconsolidated snow melted rapidly in subsequent days, a patch endured until 9 May at Ben Cleuch in the Ochils (M. Johnson).

At Corserine in the Galloway Highlands, IC saw on 24 April, in astonishingly clear light from Ben Ledi, some 76 miles away, a large patch on its north-east flank. P. Woolverton observed the

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3 same snow on 11 May at closer quarters, and we estimate that it lasted until a few days later.
4 What we suspect to be the last snow in the Southern Uplands, a wreath on Talla East Side in the
5 Borders, melted shortly after 22 May.
6

7 *West and Central Highlands*

8
9 A small patch endured until 1 June on Mull's Ben More, which is unusually late for this hill (J.
10 Westland). Across Loch Linnhe, on Ben Cruachan, a few small patches were seen on 27 June,
11 but these would have gone before the end of the month. On the hills around Glen Coe, snow
12 melted earlier than in the previous few years. Meall a' Bhuiridh's last remnants disappeared on
13 28 July (A. Meldrum), with Bidean nam Bian's going approximately on the same date, having
14 been seen to be 'small' on the 23rd.

15 As usual, the last patch to disappear on the Ben Lawers range was on the north shoulder of An
16 Stuc. IC visited here on 8 July and saw it to be approximately 20 x 10 x 1 metres. We estimate
17 that this would have vanished by 16 July. The fragments of the well-known Cuidhe Chrom
18 ('curved wreath') of Ben More at Crianlarich were spotted in good light by A. Meldrum on 14
19 July, and he estimated a final melt date of 17 July. At Carn na Caim near Dalwhinnie snow
20 persisted to 16 July, far sooner than in the previous years, indicating a lack of easterly storms
21 over winter.
22

23 At Coire nan Con of Ben Wyvis, in the North-West Highlands, C. Anton saw a large patch of
24 50 x 10 x 2 metres on 23 July, but this would have melted in early August
25

26 *East Highlands*

27 The 41st annual survey of the north-east Highlands was undertaken on 1 July by AW and IC,
28 with help from Glenshee ski centre manager Graham McCabe, and Derek Pyper. All four went
29 to Meall Odhar, an excellent viewpoint. There, the weather quickly turned from sunshine to a
30 gale-driven blast of rain and sleet. AW had to be careful to prevent his saturated hand-written
31 notes from being blown away. Mist enshrouded all higher hills, but, one by one, each appeared
32 briefly, enabling AW to take notes and IC photographs of all the hills. Later, down in Deeside,
33 AW and DP observed Lochnagar and several other hills not visible from Meall Odhar.
34 Meanwhile IC completed the survey by taking photographs from Strath Don, Tomintoul and
35 Glen More, before climbing to Ben Macdui plateau in improving weather.
36

37 To conclude, Lochnagar, hills east of Glen Tilt, and the eastern Cairngorms held far less snow
38 than usual. In almost every year, the longest wreath in Scotland at the start of July is in the
39 Snowy Corrie of Ben Macdui, often more than 1km long. In 2016, however, it was easily
40 surpassed by a deep and long (more than 400m) patch in Garbh Uisge Beag further north (see
41 Fig. 2). Garbh Choire Mor on Braeriach held large wreaths, the biggest one darkened by
42 boulders and earth that had come down the snow from the cliffs above. Far less snow than usual
43 lay in Ciste Mhearad of Cairn Gorm. Melting had been increased there by large hollows dug by
44 parties practising snow-holing for winter survival, and such hollows also occurred on the snow
45 of Garbh Uisge Beag.
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48 **August and September**

49 *All-Scotland survey in late August*

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51 The ninth all-Scotland survey since 2008 took place on 20 and 21 August. A total of 82 patches
52 was observed across the country. Their location and numbers were as follows: Ben Nevis, 23;
53 Aònach Mòr, 10; Aònach Beag, 8; Geal-Charn (Ben Alder), 2; Ben Macdui/Cairn Gorm, 19;
54 Beinn a' Bhuid, 1; Braeriach, 9; Creag Meagaidh, 7; An Riabhachan, 2; Beinn Dearg
55 (Ullapool), 1. In the eight previous years (2008–2015) the number of patches had been 77, 35,
56 34, 36, 72, 81, 281 and 678.
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3 *North-West Highlands*

4 On the high hills around Loch Mullardoch, C. Anton saw most of the last snows north of the
5 Great Glen, and noted their disappearance. At Tom a' Choinich on 14 August he saw a tiny patch
6 and estimated its demise to be less than 24 hours away. At nearby An Riabhachan he observed
7 an additional two patches on 21 August, both of which would have succumbed shortly thereafter.
8 On Beinn Dearg near Ullapool, A. Rowan saw a patch approximately 12 metres wide on 21
9 August, with final melting likely to be before the end of the month. Were it not for the fact that
10 this patch was firm from the previous year, we judge it would have melted sooner than it did.
11
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13 *West and Central Highlands*

14 Large patches persisted across the Ben Nevis range of hills on 20 August. IC, B. Fyffe, M.
15 Atkinson and B. Boyes visited the range on this date and saw one 147 metres long at
16 Observatory Gully, with upwards of eight metres depth. At the adjacent Point 5 Gully a deep
17 patch was noted, complete with impressive sculptures and ablation hollows (see Fig. 3). During
18 a climbing trip on 15 September A. Halewood saw both these patches, with the latter looking
19 small.
20

21 IC visited Aònach Mòr's Coire an Lochain on 18 September and observed a couple of tiny
22 remnants at the protalus rampart ridge. These would have melted a day or so later. There were a
23 couple of larger patches at the so-called Piranha location (named after the rock-climb above it)
24 100 metres to the north, but these would have succumbed by 25 September.
25

26 *East Highlands*

27
28 The noted long-lying snow on Beinn Mheadhoin's north flank disappeared on the unusually
29 early date of 1 August (N. Bullivant), in contrast to 2014 when it persisted till 11 November.

30 Snow-patch enthusiast S. Grant as usual monitored the north and west side of the Cairngorms
31 from his house in Inverdrue. He informs us that the last snow had gone at Cairn Gorm's Cuithe
32 Chròm on 7 August and Coire an Lochain on 23 August, and at Braeriach's Coire an Lochain on
33 26 August.
34

35 At Lochnagar above Deeside, G. Jones confirmed that no snow was left on that massif by 14
36 August, another unusually early date. IC went to Creag Meagaidh on 6 August with B. Dolphin
37 and saw a massive remnant in Coire Ardair's Easy Gully, and a small patch at Raeburn's Gully,
38 the latter being almost three years old, having survived the previous two winters. The Easy
39 Gully patch was seen again on 21 August by E. Boyle, much reduced but still large, and would
40 have lasted until at least the second week in September.
41

42 On the Cairn Gorm/Ben Macdui plateau, Coire Domhain's last snow disappeared on 6
43 September. At Garbh Uisge Beag, a patch of 53 x 14 x 2 metres was seen by IC on 3 September,
44 and would have persisted until the middle of that month. Ciste Mhearad's last wreath vanished
45 on 11 September (N. Bullivant).

46 The UK's snowiest place, Garbh Choire Mòr of Braeriach, was visited on 13 August by IC.
47 The two most durable patches there, Sphinx and Pinnacles, were still conjoined. In a subsequent
48 visit on 10 September it was seen that they had split, measuring 20 x 15 x 2.5 metres and 38 x 15
49 x 2.5 metres respectively.
50

51 **October and November**

52 *West Highlands*

53 All snow in the West Highlands in October and November was confined to just Ben Nevis and
54 its neighbour, Aònach Beag. At the former's Point 5 Gully, a 'tiny sliver' was seen by G.
55 Hodgson on 8 October, and would have vanished that day or the next. Higher up Observatory
56 Gully on 14 October, IC saw a large patch enduring, with significant depth. Its irregular shape
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3 and poor weather made measurement difficult, but we estimate it to have been over 50 metres
4 long. This patch was seen again on 24 October by A. Halewood, and had split into six pieces. He
5 confirmed our suspicion that the fresh snow which fell on 17 October did not reach the older
6 remnants. Heavy snow with drifting came to this location on 2 November, and buried the four
7 extant patches. This snow proved to be lasting.*

8
9 When visited on 5 November by IC and B. Fyffe, the large patch (55 x 27 x 4 metres) below
10 Aònach Beag's north-east face was covered in new snow that had fallen on the previous day.
11 The old snow dwarfed all other patches in Scotland in both length and volume. In addition to its
12 size, the upper levels of the snow were very hard firm, as might be expected given its three-year
13 age. Cool temperatures and subsequent heavy snow would have buried this patch in the coming
14 days, and although there was a period of mild weather thereafter, we do not think the snow
15 which fell on 4 November would have resurfaced, and estimate this as the date when lasting
16 snow arrived.

17 *East Highlands*

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19 On a visit to Braeriach's Garbh Choire Mòr on 1 October, IC and B. Boyes measured the Sphinx
20 and Pinnacles patches at 14 x 12 x 3 metres and 28 x 7 x 1 metres respectively. No other old
21 snow persisted anywhere else in the Cairngorms during October and November. G. Hodgson
22 saw these patches reduced in size when he observed them on 6 October from Ben Macdui. The
23 last confirmed sighting of them was just over a week before heavy snow fell on 1 November.
24 Drifting was in evidence at Cairn Gorm and Braeriach on this date, and we judge this snow
25 would have buried the old. As with Ben Nevis and Aònach Beag, subsequent mild weather
26 would not have stripped this new snow, and we consider it to have been lasting.

27 **Conclusions**

28
29 Seven patches survived until the following winter's snows. Four were on Ben Nevis, one on
30 Aònach Beag, and two on Braeriach. Lasting snow came to the Braeriach patches on 1
31 November, Ben Nevis on 2 November, and Aònach Beag on 4 November.

32 **Acknowledgements**

33
34 Special thanks are due to Mark Atkinson, Alex Barbour, Helen Rennie, Eddie Boyle, Colin
35 Miller and Blair Fyffe for repeated visits. We also thank Calum Anton, Ben Boyes, David
36 Buckett, Nic Bullivant, George Charles, Brian Findlay, Andrew John Finimore, Seumas Grant,
37 Alan Halewood, Gary Hodgson, Mark Johnson, Glyn Jones, Graham McCabe, Ruari
38 Macdonald, Alan Mackay, Mick McKie, Andy Meldrum, George Paton, Derek Pyper, James
39 Westland and Peter Woolverton.

40
41 * – *Lasting* snow is that which falls on an old snow patch, and which subsequently fails to melt,
42 even if it does not bury it at that time.

43 **References**

44
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46
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55 *Dr Adam Watson, adamwatson@uwclub.net*

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57 © *Royal Meteorological Society, 2017*

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3 *Figure 1. The wreath known locally as Lady Alva's Web, formed after unusually heavy snow fell*
4 *on 28-29 April. Sunset on 29 April. (© Iain Cameron)*

5
6 *Figure 2. Evening light partially bathes the summit cone of Ben Macdui on 1 July, with the 400*
7 *metre long wreath of Garbh Uisge Beag stretching across the middle of the picture. (© Iain*
8 *Cameron)*

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10 *Figure 3. Ben Boyes and Blair Fyffe stand underneath an impressive snow arch at Point 5 Gully,*
11 *Ben Nevis on 20 August. The tall rock wall in the background is Tower Ridge. (© Iain Cameron)*
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Figure 1. The wreath known locally as Lady Alva's Web, formed after unusually heavy snow fell on 28-29 April. Sunset on 29 April. (© Iain Cameron)

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Figure 2. Evening light partially bathes the summit cone of Ben Macdui on 1 July, with the 400 metre long wreath of Garbh Uisge Beag stretching across the middle of the picture. (© Iain Cameron)

306x204mm (180 x 180 DPI)

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Figure 3. Ben Boyes and Blair Fyffe stand underneath an impressive snow arch at Point 5 Gully, Ben Nevis on 20 August. The tall rock wall in the background is Tower Ridge. (© Iain Cameron)

306x204mm (180 x 180 DPI)

Graphical table of contents

Article title	Seven Scottish snow patches survive until winter 2016/17
Authors' names	Cameron, Iain. Watson, Adam
Summary of key findings	Seven patches of snow survived on the hills of Scotland from the winter of 2015/16 to the winter of 2016/17
Figure	

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