Some reports of snowfall from fog during the UK winter of 2008/09

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Abstract: Snowfall during anticyclonic, non-frontal, and foggy conditions is surprising. Because it is often not forecast, it can present a hazard to transport and modify the surface albedo. In this report, we present some observations of snowfall during conditions of freezing fog in the UK during the winter of 2008/09.

Keywords: Snow fog, anthropogenic snowfall event, freezing fog.

Introduction

Snow falling from freezing fog† during non-frontal conditions has been reported elsewhere (e.g. Parungo and Weickmann 1978, Koenig 1981, Van den Berg 2008). In those cases, it appears that anthropogenically-produced particles were present and contributed to the snow production, hence these events are usefully labelled Anthropogenic Snowfall Events (ASEs). Two further such snowfalls that occurred during non-frontal freezing fog conditions in the UK during the winter of 2008/09 are reported here.

Event 1: 31 December 2008

Freezing fog was the sole weather reported at most synoptic stations across the UK and central Europe (radiosonde ascents showed a typical fog depth of 300–400 m) on 31 December 2008. Despite the absence of frontal activity (Figure 1) and cloud (Figure 2) over the UK, there were reports of snow at Hereford, Dudley, Gloucester, Watlington, Tadley, Eccles, and mentioned on the UK's BBC television weather forecast.

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† We propose that since snow grains falling from freezing fog are drizzle-like, we term the precipitation as *swizzle* (a contraction of the words 'snow' and 'drizzle').

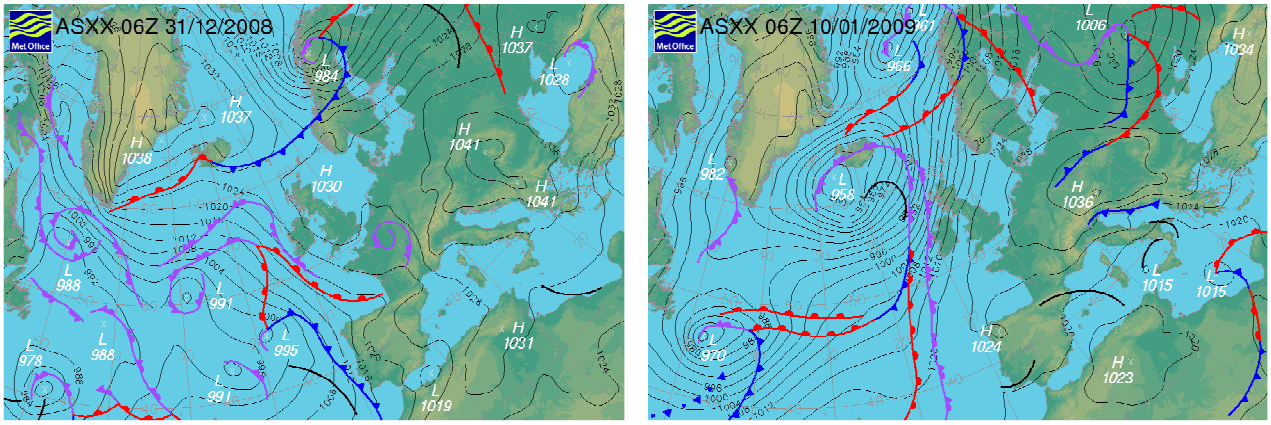

Figure 1: Synoptic analyses at 06 hours UTC, on 31 December 2008 (left) and 10 January 2009 (right). (With permission from the Met Office.)

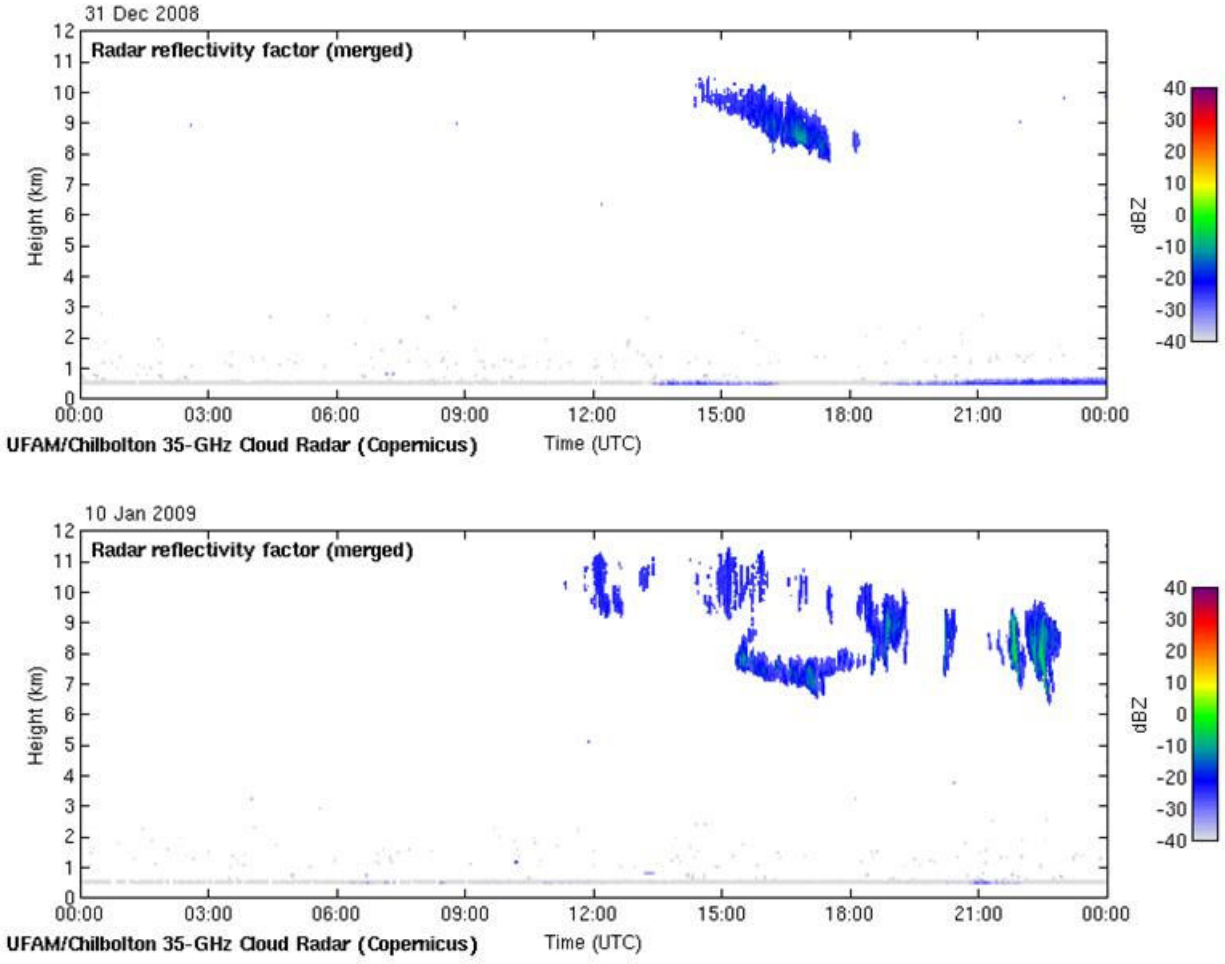

Figure 2: Cloud radar profiles for 31 December 2008 and 10 January 2009 at Chilbolton, Hampshire. In both cases no cloud was observed until after 12:00, and that was thin cirrus cloud above ~ 7 km. (With permission from CloudNet; www.cloud-net.org)

In Hereford, an opportunity presented itself to drive a car through and around Hereford to make observations of lying and falling snow, take photographs and record air temperature. The map (Figure 3) shows that most snow was observed within a kilometre of the city centre, and that towards the west there was snow observed several kilometres away in Breinton villages. The edges of the snow area were ascertained in all compass directions. Photos of falling and lying snow were taken at many of the locations (Figure 4), and the route and timings are listed in the Appendix.

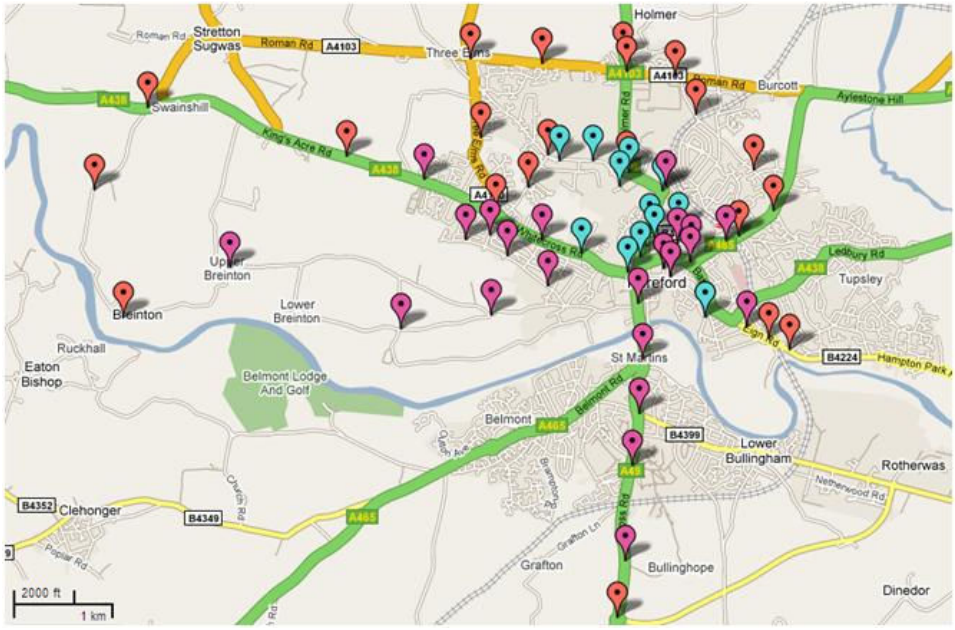

Figure 3: Central Hereford (map constructed using Google Maps), 31 December 2008 from 13:20–17:00. Blue pins are where falling snow was observed, purple pins are where lying snow was observed, and red pins are where there was no evidence of snow at all.

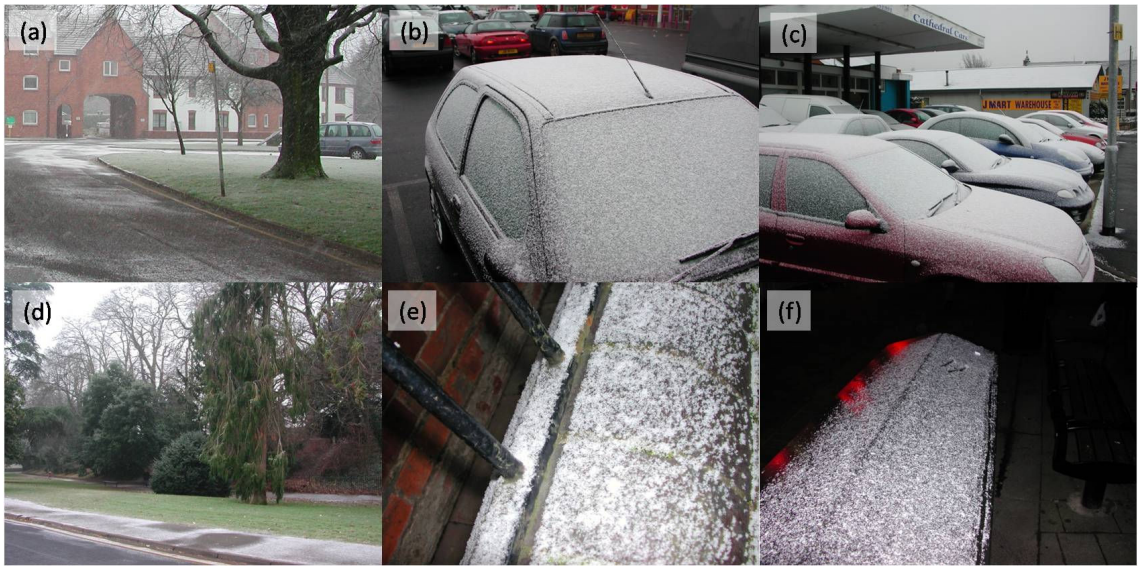

Figure 4: Photographs around Hereford on 31 December 2008 at times 13:34, 13:50 14:10, 14:25, 16:00, and 16:30 (the locations can be inferred from the Appendix). Note the falling snow in photograph (a).

In Gloucester, the maximum temperature was –1.2°C and the minimum was –5.9°C (Severn Tales Weather Station, Figure 5). Snow was seen falling at about 08:30 for 10 minutes in the Brooklands Park area of Longlevens (Bennett 2009), as marked on Figure 6.

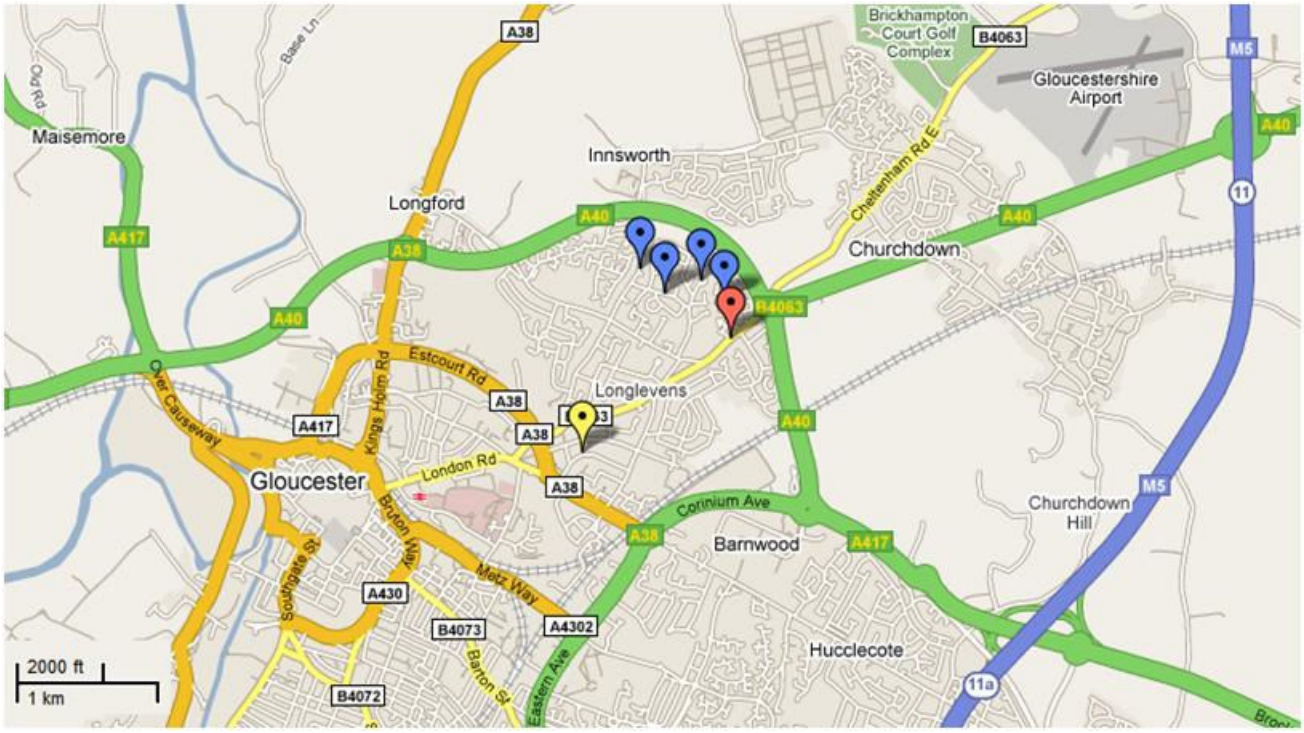

Figure 5: Gloucester (map constructed using Google Maps) on 31 December 2008. Blue pins are where snow was reported, the red pin is where there was no evidence of snow at all, and the yellow pin is SevernTales Weather Station.

Figure 6: Photographs around the Longlevens area of Gloucester of the 31 December 2008 event of snowfall from fog. (With permission from Dave Bennett [a–d] and the Gloucester Citizen [e–f].)

Event 2: 10 January 2009

Conditions were of freezing fog across southern UK (again in the absence of cloud (Figure 2) and frontal activity (Figure 1)), and temperatures until noon varied between –5.5 and –2.6°C at the University of Reading's Atmospheric Observatory (www.met.rdg.ac.uk/~fsdata/obshome.html). Following a general email around the Meteorology Department, responses were compiled to reveal the extent of falling and lying snow in and around Reading (Figure 7). There was sufficient snow to require car windscreens to be cleared and to remain lying all day. Almost all observers volunteered that they thought the snow was very slight, consisting of small flakes and 'like desiccated coconut'. A photograph was taken of the snow deposits on some garden furniture (Figure 8). Snowfall times varied slightly between observers, but most reports were at the times of 06:00, 09:00–10:00, and 11:00–12:00.

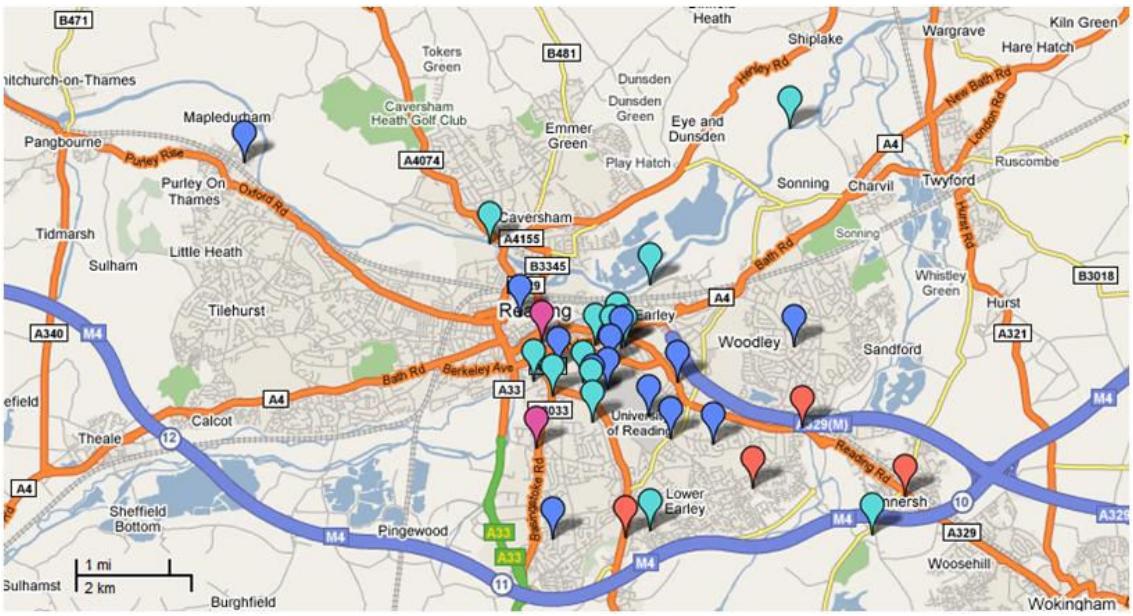

Figure 7: Reading (map constructed using Google Maps) on 10 January 2009. Dark blue pins are lying snow, light blue pins are falling snow, purple pins are very light falling snow, and red pins are where there was no evidence of snow at all.

Figure 8: Snow grains about 5 mm long, on garden furniture in Woodley (east of Reading town centre) at 09:00 on 10 January 2009. (With permission from Mike Blackburn.)

Closing remark

These observations presented evidence for snowfall from freezing fog during non-frontal, anticyclonic conditions. There are growing numbers of reports of these events in the UK.

Acknowledgements

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References

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Appendix

Below is the route taken to make the observations in Hereford, 31 December 2008. Times in hours UTC.

13:20	**A49 North**	No evidence of snow, -1.5°C outside city
13:30	**Homer Road**	No evidence of snow
13:34	**Whitecross Common**	Falling and settled snow
13:35	**Chave Court Place**	Falling and lying snow
13:37	**The Vines**	Falling and lying snow
13:38	**Grandstand Road**	Very light falling snow
13:39	**Yazor Road**	No snow
13:40	**Sherrington Drive**	No snow
13:41	**Baggallay Street**	Snow stopped falling
13:42	**Plough Lane**	Falling snow, 1°C

13:43	**Friar Street**	Lightly falling snow, 1.5°C
13:44	**Edgar Street**	Heavier snow falling
13:45	**Penhaligon Way**	Very slight falling snow
13:49	**Newtown Road**	Very very slight falling snow
13:50	**PC World**	No falling snow, snow on some cars and posts
14:10	**Widemarsh Street**	Lying snow; no falling snow to start, then light falling snow
14:12	**Blackfriars Street**	Light falling snow, lying snow, 2.5°C
14:20	**Blueschool Street**	No falling snow, snow on ground
14:25	**Cantilupe Street**	Intermittent light snowfall, lying snow
14:30	**Bartonsham Road**	Lying snow
14:31	**Outfall works road**	No snow, 3.5°C
14:32	**Hampton Park Road**	No snow
14:35	**Station approach**	Lying snow
14:36	**Rockfield Road**	No snow, 4.5°C
14:38	**Aylestone Hill**	No snow
14:39	**Venn's Lane**	No snow
14:41	**Old School Lane**	No snow
14:42	**Roman Road / Old Sch**	No snow
14:44	**Starting Gate**	No snow
14:45	**Roman Road / Kempton**	No snow
14:46	**Canon Pyon Road / Roman**	No snow
14:48	**Bakers Lane**	No snow
14:49	**Three Elms Road**	No snow
14:50	**Wordsworth Road**	Lying snow, 0.5°C
14:51	**Barrie Road**	Lying snow
14:53	**Emlyn Avenue**	Lying snow
14:55	**Westfaling Street**	Lying snow
15:00	**Breinton Road**	Lying snow, 0.5°C
15:05	**Upper Breinton**	Lying snow
15:10	**Breinton**	No snow
15:15	**Swainshill South**	No snow
15:17	**Swainshill**	No snow
15:22	**Bramley Court**	No snow
15:23	**Cotswold Drive**	Lying snow (very patchy)
15:35	**Barton Road**	Lying snow
15:37	**ASDA**	Lying snow
15:39	**Ross Road / Holme Lacy**	Lying snow
15:40	**Ross Road / Bullingham**	Lying snow
15:42	**Ross Road**	Lying snow
15:44	**Rotherwas Relief Road Roundabout**	No snow
16:00	**Coningsby Street**	Lying snow
16:30	**High Town**	Lying snow
17:00	**School**	Playground covered in snow