



SCOTTISH AVALANCHE INFORMATION SERVICE
REPORT FOR WINTER 2013/14



Large Avalanche Ben Nevis north face



Mark Diggins - Co-ordinator

October 2014

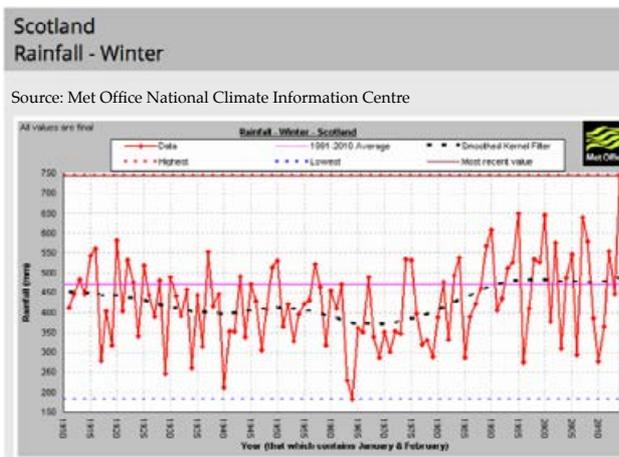
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The General Snowpack Situation - Winter 2013/14



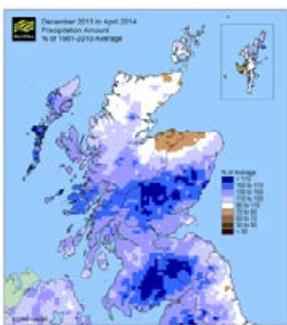
The winter of 2013/14 was notably marked for the continual storms and significant snowfall above 600 metres in many areas with “exceptional amounts” witnessed in Glencoe. Records from the Met Office National Climate Information Centre (See graph/maps below) indicate that the winter of 2014 (Dec 13 to April 14) was the wettest such period for Scotland overall for 100 years.



The first wave of storms arrived in late December 2013 bring the onset of storm force South to South-Westerly winds, these continued for most of the winter. Snow started to accumulate above 600 metres in all of the forecast areas, Escaping the snowfall, the glens and valleys of the highlands did not get the same levels of precipitation and it was perceived to be a mild and benign winter!

The first recorded avalanches took place in the latter part of November, one triggered by a person on foot and many others as a result of post storm thaws effecting the snowpack. Storms abated for a couple of days over the Christmas period with natural avalanche debris from storm period activity observed in many areas. Storms, snow and poor visibility returned again after this too brief respite, followed by a general thaw in all areas but cold temperatures soon

returned and the snowpack stabilised. The pattern of one or two days of calm followed by new storms, poor visibility and snowpack instability continued into March with many avalanches occurring, some human triggered, especially over the periods 17/18 Jan and 21-24 March (10 human triggered avalanches), these incidents were often associated with colder temperatures, poorly bonded layers and snow accumulation due to wind transportation forming unstable windslab.



Continual South and South-Westerly winds produced extremely large cornices overhanging many Northerly aspects throughout the highlands from January, becoming progressively larger as time went on, this presented a continual potential, but unpredictable situation regarding cornice collapse and the triggering of slopes. But their threat always remained!

The month of February presented a period of fluctuating warm and cold temperatures with snowfall and rain. No human triggered avalanches were recorded during this month, but many natural avalanches due to cornice collapse took place. March was generally stable in the early part with warmer temperatures and a diminishing snowpack in a number of areas,

slow downhill movement of the deep snow accumulations due to gravity produced ‘glide cracks’ on many slopes. From mid month, colder temperatures with blizzard conditions returned with new accumulations forming unstable windslab, a period of avalanche activity triggered by persons on foot and skiers/boarders occurred over a period of 4 days (see note above). The end of March and the beginning of April saw a significant calming of the weather, warmer temperatures and cold nights this brought the winter season quickly to an end.

In summary the winter was characterised by storms and a deep snowpack in many of the mountain regions. Snowpack instabilities and avalanche activity was common during and immediately after storms but the fluctuating temperatures quickly stabilised the snowpack and presented a reduced avalanche hazard. However, no respite was presented, new storms kept arriving and therefore did not allow any longer term stability.

SAIS Operation



Personnel

Avalanche Hazard information is provided on a daily basis in the 5 main mountain areas of Scotland. Avalanche hazard assessment is achieved by traveling in the mountains on foot or by ski and carrying out snow profiles and field observations, noting many factors which, when combined, provide an indication of the avalanche hazard. On return to base the weather forecast provided by the Met office forecaster team Aberdeen is used for further information. An avalanche hazard forecast is then determined, and after discussion between relevant SAIS forecasters an avalanche reports is published.

The avalanche reports are provided by SAIS Avalanche forecasters who have many years experience of avalanche hazard assessment, (in most cases over 15yrs) who have undergone an SAIS verification process, meet the relevant SAIS observer and forecaster standards and undergo continual professional development. Additionally, forecasters are very experienced and committed climbers, skiers and outdoor enthusiasts who are competent in all the skills necessary for safe travel in the most challenging of winter conditions. The team comprise Mountain Guides, instructors and avalanche experts from many countries, their experience and professionalism is integral to providing the best avalanche forecasting service possible to all persons that engage with the winter mountain environment of Scotland.

The SAIS team



SAIS forecaster below crown wall of cornice triggered avalanche - Lochaber

Paul Moores - Glencoe	Kathryn Grindrod
Arthur Paul - Glencoe	Keith Millar
Tom Rugar- Creag Meagaidh	Blair Fyffe
Wes Sterrit - Creag Meagaidh	Sandy Allan
Sam Noble - Southern Cairngorms	Colin Bruce
Paul Noble - Southern Cairngorms	Alistair Cain
Graham Moss - Lochaber	Iain Peter
Mark Diggins - Northern Cairngorms	
Alan Dennis - SAIS	

Avalanche Hazard Information Reports

The charts below show avalanche hazard levels as a percentage of the number of SAIS operational days in the six SAIS forecast areas during the winter 2013/14.

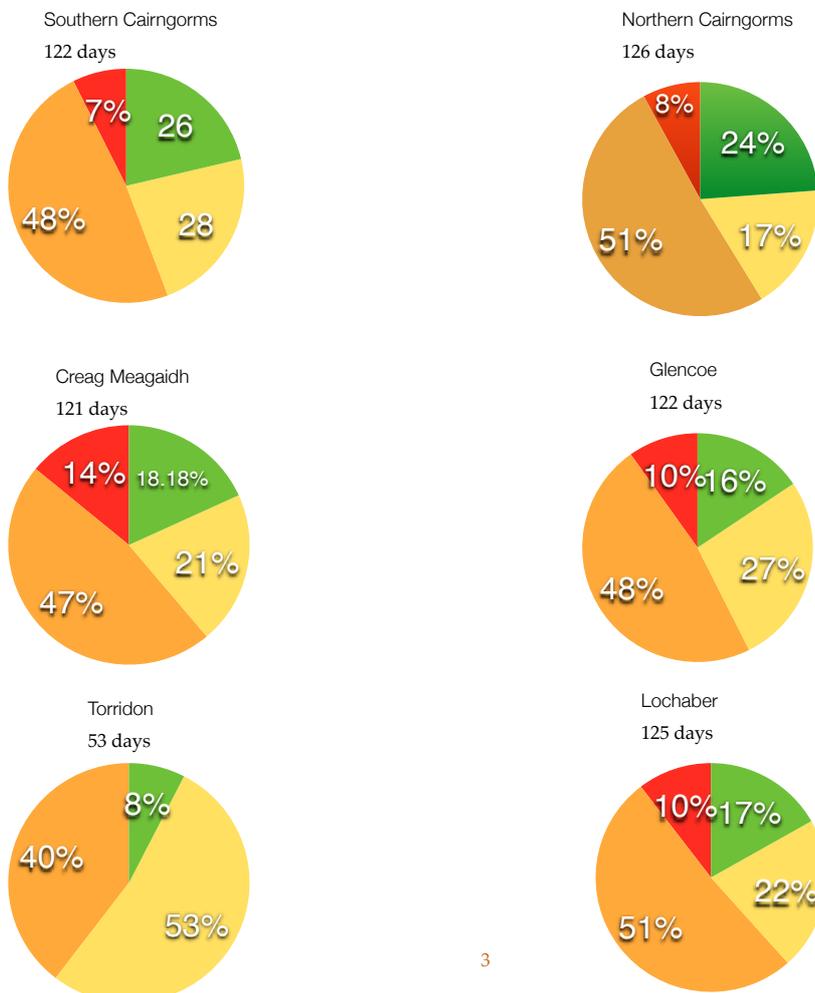
The most significant difference of this winter to that of 2012/13 is the reduced number of operational days, 133 last winter to 125 for the winter 2013/14. This year (2014) the snowpack diminished rapidly and stability improved greatly with a warm spring arriving earlier than the previous year (early April rather than May).

The number of operational days in Torridon was much less during this pilot year. The Torridon area escaped the majority of the snowfall as dominant South and South Westerly winds deposited precipitation on the more Southerly mountain ranges.

Creag Meagaidh reported the most high hazard days, its geographical location on the border between west and east weather systems and steep mountain topography present a significant set of factors. Hazard level proportions between all 5 full operation areas were fairly consistent with Considerable or High Hazard avalanche reports being issued between 55% to 61% of the operational days.

The moderate level of hazard occurred for approximately 20-30% (circa 50% in Torridon) of the winter days. Human triggered avalanches are still a possibility at this level and it is often considered by many national avalanche warning agencies that the Moderate level of hazard presents strong potential for catching people out, the mountain traveller may be off guard, the areas of instability are often more limited in location and may only be present in isolated, steep places, usually high up in corries. Additionally, although the snowpack may be moderately stable and or limited in area, the size of a group and its spacing is critical in how people can load a snowpack with their weight and the triggering of an avalanche becoming possible. Moderate levels of hazard therefore still require vigilance, and a good spacing out of group members in order to minimise the loading on a slope.

The five hazard levels are defined by the European Avalanche Hazard Warning Scale which is also the recognised scale worldwide.



Avalanche Occurrences

Recorded Avalanche Occurrences for the Winter of 2013/14



Avalanche on Ben Nevis

Recorded avalanches are a compilation of observed avalanche occurrences from a number of different sources, namely;- SAIS observers in the 5 areas of operation, submitted reports from winter mountain activists and non mountain users.

The SAIS avalanche reporting facility on the website has helped greatly with the public being able to send details of avalanche occurrence observations which, once verified, provides good information. Observations however require good visibility and human identification, in this respect avalanche occurrences are recorded only where people can travel in the mountains or can see clearly from roads and paths. There are many places in the mountain areas where people do not travel or cannot see when the weather is poor. Therefore it can be assumed that a greater number of avalanche occurrences have taken place than have been recorded.

The recording of avalanche occurrences is the best indicator of the immediate short term snow stability situation. Avalanche occurrence location and the reporting of avalanche incidents is therefore very valuable in enabling the SAIS to pass on good information to the public, provide snowpack stability verification and to illustrate the extent of avalanche occurrences.

The Total number of avalanche occurrences recorded by the SAIS for the winter of 2013/14 was **350**. Of this number, **325** were natural and/or cornice release and **25** were incidents triggered by persons. Of the 25 triggered by persons: **3** avalanche occurrences were purposefully triggered by ski patrol or SAIS observers during the avalanche hazard assessment process, **9** were triggered by skiers and boarders. **16** were triggered by people on foot. In total, **44** persons were involved in avalanche incidents, **20** (9 on ski or board, 11 on foot) were carried down in the avalanche, no fatalities.

Human Triggered Avalanche Incidents for Winters 2009 - 2013

	2009/10	2010/11	2011/12	2012/13	2013/14
triggered incidents	36	18	28	18	25
fatalities	5	1	0	8	0

Reaching the Public

SAIS AVALANCHE REPORTS

SAIS Avalanche Reports are accessible with mobile phone, tablets and online systems and summaries via twitter feed and Facebook. They are also posted in a variety of locations such as ski stations, tourist offices and retail outlets.

Avalanche Report views for the period between Dec 2013 and April 2014 was **450,684**

Avalanche reports are viewed at locations throughout the UK and proportionally they are as follows

England 49.86% Scotland 46.99% Northern Ireland 1.47% Wales 1.55%

SAIS Blogs

Blogs are used by the public to access information about mountain conditions and snow cover, SAIS forecasters are on the mountains daily and can

therefore provide information which enables people to make choices about where their next excursion into the mountains could be. During the winter period the blogs were

viewed 396,136 times.



SAIS Blog Activity

The information placed on the blog is additional to the observations that the SAIS forecasters carry out on the hill in order to compile the daily avalanche hazard reports.

We recognise that even one picture can provide a wealth of information, additionally, if information such as field observations and experiences can be provided too then this can help the public best decide where to go. However this may not be possible every day due to visibility and the time available.

For the winter period 2013/14 the area blogs were viewed **516,303** times.



Working with Agencies and Groups

Snow and Avalanche Foundation Of Scotland (SAFOS)



SAFOS, originally formed in 2001, provides important guidance to the SportsScotland Avalanche Information Service. The group comprise representatives from, Scottish National Outdoor Training Centre, The Met Office,, Mountaineering Council of Scotland , Scottish Mountain Training, Universities of Edinburgh, Heriot Watt and Glasgow, sportsScotland, sportsScotland Avalanche information service forecasters and co-ordinator. SAFOS has a number of roles including:

- The provision of advice to sportsScotland on the sportsScotland Avalanche Information Service;
- Providing a forum for discussion of, and support for, research on avalanches in Scotland;
- Promoting a better understanding of the avalanche problem amongst all who use the hills in winter conditions in conjunction with representative bodies.
- Giving advice on course content and syllabi for all levels of avalanche training and supporting appropriately qualified providers.

Further information of the role of SAFOS and seminars can be found on the [SAFOS website](#)

SAFOS Seminar April 2013 at Glenmore Lodge

Organised by the Snow and Avalanche Foundation for Scotland (SAFOS) with assistance from the sportsScotland Avalanche Information Service, attendees travelled from all over the UK to take stock of the current state of avalanche education in the UK and look at the potential for future developments. The focus was on getting the basic principles of safe travel in the mountains in winter across to mountain users in a clear and succinct way.

The seminar was attended by representatives from across the mountaineering sector – including Scottish Mountain Rescue, the Mountaineering Council of Scotland, the British Mountaineering Council, British Mountain Guides, Association of Mountaineering Instructors, British Association of Ski Patrollers, Mountain Training UK, Mountain Training Scotland, Glenmore Lodge and Plas y Brenin (the national mountaineering centres of Scotland and England and Wales respectively), and the sportsScotland Avalanche Information Service (SAIS) and Swiss Avalanche Foundation SLF.

The meeting built on work initiated at a seminar on decision making in avalanche terrain held in autumn 2011. The result of this collaboration is the 'Be Avalanche Aware' leaflet which outlines the process for decision making in the winter mountains. This was launched during winter 2014.

Pdf copies can be downloaded from the [SAIS](#) website or collected from the BMC and MCoFS and some outdoor retail outlets.



European Avalanche Warning Service



The SAIS is member of the European Avalanche Warning Service which comprises 16 countries that provide avalanche information services. The organisation meets annually in order to develop harmonisation, exchange information, ideas, methods and findings, it also provides a useful portal through its website www.avalanches.org to access national avalanche reports, multilingual information and glossaries. The ISSW is predominantly hosted in North America (a conference was held for the first time in 2009 at Davos Switzerland,) it exists to facilitate the interdisciplinary exchange of ideas and experiences between snow science researchers and practitioners, who attend from throughout the world.

International Snow Science Workshop

Representatives from the SAIS have presented papers at both ISSW and EAWWS conferences. for many years and attendance at the seminars provides an essential opportunity to keep abreast of worldwide developments and initiatives. This enables the SAIS to remain at the forefront of avalanche forecasting and snowpack knowledge. This information can be utilised both in forecasting methods, public avalanche reports, education and the dissemination of new developments to agencies and individuals.

Mountaineering Organisations

Throughout the winter season the SAIS provides information with agencies and organisations such as: the Scottish Government, the Mountaineering Council of Scotland and the Scottish Mountain Safety Forum, National Outdoor Training Centres and Joint services providing important avalanche hazard information and advice which can then be provided to the public and other agencies. Additionally presentations on Scottish Avalanche Hazard and associated subjects have been presented to the following groups.

British Association of Ski Patrollers. - Scotland
Association of Mountaineering Instructors - Glenmore Lodge
Mountain Training UK association
RAF and Joint Services Training
Scottish Mountain Rescue Avalanche Training - Braemar
British Mountain Guides

Met Office

Throughout the winter, daily forecasts are provided to us by the Met Office which we use for the creation of the avalanche hazard forecasts. The weather information has been designed especially for us by the Met Office, with data from their super-computer being supplied to the Met office team of weather forecasters in Aberdeen. We liaise daily with the Aberdeen team in order to get the most up to date information.



In addition to the daily weather forecasts a number of further areas of collaboration are being carried out:

- Delivery of public awareness messages at key times
- Improved links to the avalanche hazard assessments from Met Office mountain forecasts
- Use of other media, including video, to visually depict the conditions in the mountains so that the potential impact of weather, visibility and underfoot conditions can be presented to the public.

SAIS Developments

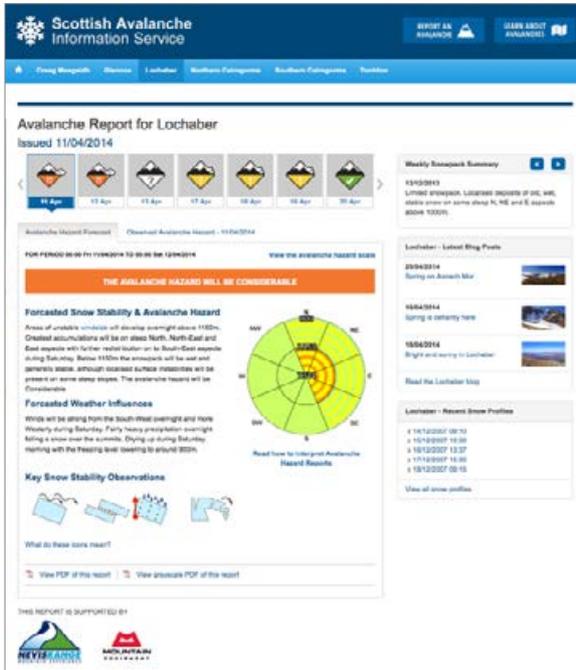
Torridon - a pilot avalanche forecasting service for 2013/14



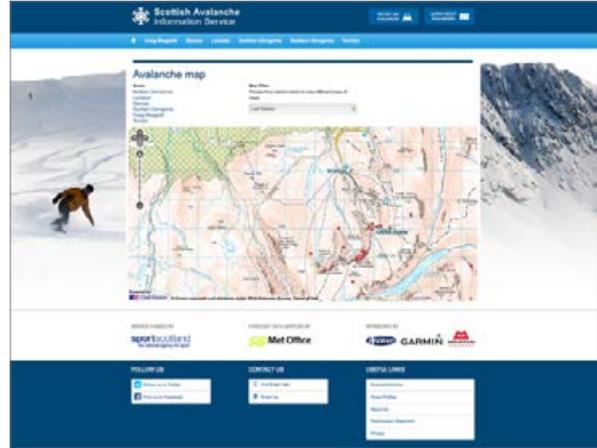
Following the initial launch during 2012/13 and the provision of avalanche hazard reports for peak periods during winter the season. The SAIS will be continuing with this service in the North-West Highlands but on a more regular basis with hazard forecast provision during peak holiday periods and every weekend throughout the winter. The SAIS are grateful for the co-operation from SNH who will be supporting us with base facilities at Kinlochewe.

SAIS launches new website

The SAIS reviews how it presents information on a continual basis, gathering feedback and developing new ideas, these have been incorporated into the new website which will be launched for this winter



Information regarding snowpack history, ready access to the most recent avalanche reports, mountain condition information via blogs and weather forecasts will all be accessible from one location. The website has been reactively designed for optimisation with desktop computers, tablets and smartphones.



Avalanche maps have been upgraded and continue to provide up to date information on the location of avalanche activity, providing key information on snow stability in respect of altitudes, aspects, and locations. A great resource to add to the avalanche reports.



Snow profiles are upgraded with additional information which will help interpretation. Info icons will appear when the hardness of layers or temperature gradients become potentially significant.



The 'Be Avalanche Aware' initiative is available on the website both as an interactive programme and as a pdf download. This will be accessible via the "Learn About Avalanches" tab.

Support and Sponsorship

The SAIS are supported by many agencies and organisations who provide help in many ways, equipment and clothing, the provision of facilities from where we carry out our operation, mountain access and with support from many individuals who recognise the service that we provide to the public. We are very grateful for all the help we are given and would like to thank all those who provide support and enable us to carry out our work for the avalanche service in a more effective way.



In the field we rely on good quality clothing and equipment to carry out our task and to remain safe. Therefore careful consideration is given to sponsors who provide us with our essential gear.



We are pleased to continue our relationship with Mountain Equipment who provide us with well designed and functional equipment that works well in all the weather conditions experienced in a Scottish winter. This allows us to carry out our job with confidence, comfort and with protection from the elements.



Collaboration continues with WL GORE & Associates, our work environment providing appropriate diverse weather conditions and the variety of mountain activities needed for the field testing of GORE-TEX & Wind-stopper fabrics and the development of the GORETEX PRO fabric. Real world feedback from the SAIS forecast team is used as part of their research and development process for developing next generation technologies.



Avalanche transceivers, shovels and avalanche probes are provided to the SAIS by Back Country Access through their UK distributors ANATOM and are used daily by the SAIS forecasting team when carrying out field observations



We are provided with media resources to enable us capture images and movie clips which are used to enhance condition reports and for other public information initiatives.