

Avalanche Analysis for France 2010-2011

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(minor updates: 19th November 2011)

During the 2010-2011 season in France there were 29 avalanche fatalities in 19 incidents. On the face of it a fairly typical year. However the overall figures hide a concentration of fatal avalanches in the border region with Italy and in the months of December and March which saw 58% of fatal incidents. Ski touring incidents as well as the seriousness of incidents both continued the recent upward trend.

Weather Conditions

Winter, if it can be said to have come at all, came early to the French mountains. It was possible to tour in the last week of October and by the end of November there was normal snow cover above 1800 meters. December saw weather systems bring both snow to low altitudes and rain to 2000 meters on the 6th and 19th December. The snowfall was accompanied by strong winds. January and February saw dry, anticyclonic conditions over France so that by the end of February the snow conditions were amongst the poorest for the last 50 years. On south facing slopes there was little cover below 2200 meters. However it was still possible to ski many routes in sheltered north facing valleys down to 1200 meters. Consulting the community ski touring websites a similar number of trips were logged for 2011 in the Savoie department as for the excellent 2010 season. Skiing conditions were generally “spring like”.

March saw something of a return to winter with some weak weather systems bringing fresh snow especially on the border with Italy and in the Southern Alps and Pyrenees. Winter sports were difficult in the Massif Central, Jura and to a lesser extent the Vosges from January. Only the Southern Alps can be considered to have had a “normal season” and then in the areas on the border with Italy.

April was hot, temperatures were around 4C above average so by the end of the month there was little snow cover below 2000m. Due to the poor cover and warm temperatures the end of the ski touring season arrived some 4 to 6 weeks early.

Snowpack

The good early season snow cover limited the formation of depth hoar except on the coldest north facing slopes and at altitude. There were also a number of thaws with rain at altitude. As a consequence most incidents occurred above 2400 meters in the Alps. The high altitude resorts of Val d'Isere and Tignes were particularly affected from December to mid January.

An anticyclone and strong temperature gradient transformed shaded slopes into faceted snow during January and February. South facing slopes, where they had any snow, generally experienced spring skiing conditions. This weak layer established during January and February led to an explosive situation along the Italian border in March which saw the best of the fresh snow in the middle of the month.

Incidents

The early snows brought the first incidents including one of the most serious of the season. On the 1st

November 3 climbers from the same family, including a guide and avalanche expert, were ascending a couloir above the village of Bessans in the Savoie. At 3100m, where the couloir reaches 38 degrees they triggered a relatively dense soft slab some 40 cm deep. The slab broke on a layer of depth hoar. The group was taken 800 meters and buried under 3 meters of debris. The scale of the accident triggered a major search and recovery operation. This was followed on the 11th by the death of a construction worker on the Iseran road pass which was closed for the winter. The crew had stopped their pickup due to the depth of snow when it was hit by the avalanche killing the driver. The rest of the month was calm with a thaw before a new storm cycle brought 50 to 80 cm in three falls over the final weekend. This was followed by cold and strong northerly winds. On the 3rd December Dominique Letang, director of the Anena (National Agency for the Study of Snow and Avalanches) was concerned enough to issue the following warning:

“Every winter there are three or four episodes which are particularly dangerous in the mountains. Our fear is that the good weather and fresh snow will encourage skiers to head into the high mountains while the risks of slab avalanches are really important.”

Saturday 4th December was something of a bonanza for winter sports enthusiasts but perhaps with Mr Letang's warning still fresh many skiers opted for lower lying ranges which were now covered in a meter of snow. They found blue skies, little wind and half a meter of fresh powder on a good base. That evening the forums were buzzing with photos of the amazing early season conditions.

Things couldn't have been more different on Sunday morning for those skiers who had missed Saturday's powder fest. They woke to grey skies, intermittent rain at altitude and a westerly that could blow the horns off a bull (as the locals say). Three ski tourers headed up to the Dome de Pravouta in the Chartreuse. This easily accessible 1700 meter summit is a favorite in such conditions. However the group left the normal route and started climbing the steep north-east slopes under the summit. A guidebook warns against these slopes when the conditions are suspect. The subsequent avalanche took the men into trees. Despite two of the group having airbags the consequences proved fatal. The police found a trip report from Saturday in the pocket of one of the victims.

The accident came shortly after Don Sharaf highlighted the risks of being carried in the debris flow when using airbags in an article for *The Avalanche Review*. It was the second fatal incident involving the use of airbags in France in 2010 and it would not be the last. On the 1st January 2010 three skiers, including a local high mountain guide were killed by a massive avalanche in les Arcs. They had actuated their ABS but were buried under 6 - 10 meters of snow. This season has seen airbag use move into the mainstream by both off piste skiers and ski tourers and the deaths should be set against a number of successful outcomes through the rest of the season.

Over the next month avalanche incidents were centered on the Val d'Iser/Tignes area. Close to the Italian border, these areas were picking up snow from depressions over the Mediterranean which had trouble moving further into France. In total 7 people would die in 4 incidents, three of the groups were instructor led. In one incident a victim was wearing an airbag but was unable to actuate it before being buried. The most serious incident occurred on the 11th of January when a group of 7 skiers were hit by large avalanche, killing 4. There had been light snow over the previous 24 hours and the risk was given as 2 rising to 3 later in the day due to a thaw. There would be one further fatality in January, a member of the French Alpine Club on a tour in the Queyras region close to the Italian border. The avalanche risk was 2 but there had been considerable fresh snow and wind on the border with slab warnings issued.

Unusually there were just two incidents with fatalities in the whole of February. There was fresh snow in the Southern Alps and Pyrenees around the 17th with a series of non fatal incidents over the following weekend in those areas culminating in the disappearance of two snow shoers on a long

traverse above the lac d'Oô in the Pyrenees on the 22nd. Their bodies were only found in April by relatives who had continued to search the area. Three teenage off piste skiers were also hit by a slide at the ski resort of Corrençon in the Vercors. They were not equipped with beacons and the delay in recovering one of the young men was probably fatal.

The anticyclone that had been sitting above France since the start of January bringing clear skies had created a very strong temperature gradient in the snow pack. 10 to 20C over the 30/50cm of snow depth at 2250 meters. By the start of February the whole snow pack was comprised of facets on slope aspects from WNE through to NE. That there were no more fatalities during the February winter holiday period was down to an almost complete absence of fresh snow, at least in the Northern Alps. The next major storm cycle came during the first half of March and yet again was largely confined to the Italian border region and the Pyrenees, a classic pattern with Mediterranean depressions. Some of the fresh snow was accompanied by strong winds from the south-east forming new slabs close to summits and ridges. These slabs were then covered by further snowfall. The trap was in place.

With up to a meter of new snow word of the great touring conditions in the Queyras was relayed across *Interweb* and a number of skiers traveled to the area looking for that fix of powder that was all too rare in 2011. Conditions on some routes were described as “crowded”. In one notable instance a group of 8 skiers, including an eye witness of the Chartreuse avalanche in December, were avalanched on the Chapeau de Gendarme by another group of 25 skiers descending above them. Our eye witness was able to ride out the slide after triggering his airbag and survived with just the loss of his new skis.



Illustration 1: Mont Vallon avalanche (<http://www.flickr.com/photos/sunsnowguy/>)

The period from the 18th to 20th March saw the worst three day period since the 20th February, 2006 leaving 9 dead in 7 incidents. Rescue services were stretched as they mounted back to back missions in

a line from Val d'Isere in the North to the epicenter of events in th Queyras in the south. The body of a Russian skier, buried in the popular Mont du Vallon's itinerary in Méribel, was only recovered in June. A reminder that European inbounds is not avalanche controlled.



Illustration 2: Pointe de l'Argentière (3 053 m) 22/March/2011

In the most serious incident a group of 4 skiers were caught on the north-west side of the Col de Beaubarnon in the Queyras. One of the group was able to free himself from the slide but was unable to save his friends. Later the same day piste patrollers at the nearby ski resort of les Molines were caught by an avalanche on an off piste route killing one.

A rapid thaw followed with just two “out of season” incidents. One killing an avalanche instructor leading a club group in the Pyrenees on the 8th May and the other, on the 4th of June when a German climber was killed on Mont Blanc. In both cases small slides took their victims over cliffs.

Summary

The 2010/2011 season saw 29 fatalities in 19 incidents. The number of fatalities is slightly above the median figure¹ of 28.5 (ave 31.3) but the number of incidents is lower than the median of 20 (ave 22).

On average there were 1.56 fatalities per incident, above the average of 1.46. There were four incidents

¹ Measures since 89/90

with 3 or more victims. The last six seasons have seen a slight up-tick in the seriousness of incidents after a sustained decrease.

There may be a number of factors for the decrease in the seriousness of incidents that was observed up to 2006: better avalanche awareness and group management, improved self rescue and faster intervention by the rescue services with improved medical techniques especially for hypothermia.

So why a reversal in the trend? Well the last five years have also seen ski touring take over from off piste skiing as the principal activity concerned with avalanche fatalities. 2010/11 was no exception with 10 incidents involving fatalities to ski touring groups compared to 6 for off piste skiing. A detailed analysis of French incidents by Fred Jarry of the ANENA analyzed 440 accidents between October 1999 and September 2007. He concluded that ascending groups, and therefore ski tourers as well as snow shoers and alpinists, were nearly twice as likely to be involved in multiple burial scenarios. The increasing popularity of ski touring has also led to some routes getting overcrowded, especially in a poor snow year. Typical being the incident on the Chapeau de Gendarme mentioned above. Group management, spacing between skiers as well as being aware of other groups on the slope are important factors to take into consideration.

Where an avalanche bulletin was issued (roughly from the second week of December to the end of March) there were 14 fatal accidents in France. 14% at risk 2 (av. 8%), 72% at risk 3 (av. 49%) and 14% at risk 4 (av. 38%). Compare this to Switzerland where there were 15 fatal accidents, 40% at risk 2 (av. 29%) and 60% at risk 3 (av. 54%).

Last season the number of fatal incidents by department is skewed towards the Northern and Hautes Alpes and then towards the border zone with Italy when compared to the long term average. Between 1980 – 2010 The Savoie, Haute-Savoie, Isere and Hautes-Alpes departments saw 80% of fatal accidents. Last season the figure was 92%. This concentration reflects the poor conditions in the Massif Central, Jura and Vosges as well as the Pyrenees except for the period from mid-February to the end of March.

The most deadly month was March with 37% of incidents compared to an average 17%. This was followed by December with 21%. January and February saw just 21% of incidents overall when normally they would total 46.5%. The stable high pressure that established itself over France for much of the January – February period is responsible. February is the main winter holiday period for France with 6 weeks of staggered vacations. It is the busiest time for ski resorts and for off piste skiing. The weather conditions were probably partly responsible for the lower number of off piste incidents compared to ski touring this season.

The overall poor season led to frustration for some ski tourers and maybe an increase in risk as they searched for good conditions. Talking of the Chapeau de Gendarme incident, avalanche expert Daniel Goetz commented:

“the group leader noted purges on similar aspects to their chosen route as well as a weak layer when probing the snowpack with his baton... this information should have incited them to either change their route or turn back. However the north facing slopes were the only ones to offer good snow which tempted skiers to ski them especially as any slabs were hidden by a layer of fresh powder”.

References

http://www.data-avalanche.org/static/dataavalanche/joomla/index.php?option=com_wrapper&view=wrapper&Itemid=134&aval_id=50000535 – Bessans Avalanche 1st November 2010

Sharaf, D. The Avalanche Review, Vol 29. No 1. October 2010.

Jarry F. When do we dig? Snow and Avalanches, no 121, April 2008 <http://www.anena.org>

Jarry F. Avalanche Accident 2009/2010 report. Snow and Avalanches, no 131, October 2010

Goetz D. Avalanche on the Chapeau de Gendarme. Snow and Avalanches, no. 134, June 2011

Additional information from <http://www.data-avalanches.org> and <http://www.anena.org>