CAC Spring Advisory
April 30, 2010

Danger Ratings:
In spring, danger is generally closely related to four factors:

1. *Air temperatures* above the freezing point produce melting and free water, which weakens the snowpack and increases instability. As a result, danger goes up. When air temperatures drop below zero the snowpack may freeze (although it can take several hours before a decent freeze occurs). Once frozen, the snowpack strengthens and instability decreases. As a result, danger goes down.
2. *Solar radiation* melts the snow, creating free water, which weakens the snowpack and increases instability. As a result, danger goes up. When the sun goes off a slope, the snowpack may freeze (although it can take several hours before a decent freeze occurs). Once frozen, the snowpack strengthens and instability decreases. As a result, danger goes down.
3. *Rain* adds heat, free water, and load to the snowpack, all of which are destabilizing influences resulting in rising danger. It can take a day or two after rain stops for the snowpack to freeze or adjust to the new load so it may take some time after a rain event ends before danger decreases
4. *New snowfall*s create new layers on the surface and add load to the snowpack. New snow may not bond to the old surface, especially if that surface is a smooth crust. Added load can destabilize existing weak layers below the surface. Winds strong enough to transport snow during or after the storm make these problems worse. It can take two or three days after a significant snowfall (30cm or more) before the new snow settles and bonds.

When more than one of these factors occur at the same time or in close succession, danger is likely to rise more rapidly and increase to higher levels than if only one factor is in play.

People often underestimate how variable danger can be and how quickly danger can rise in spring conditions. Slope elevation, aspect, and incline strongly influence avalanche danger. A steep north slope at high elevation can have relatively low danger while at the same time a low elevation, steep, south facing slope presents high danger. Rising temperatures and strong solar radiation can change danger from LOW to HIGH in 30 minutes or less.

People often underestimate danger above and how far avalanches can run. The sun may hit slopes and cornices at high elevations sooner and stay on them longer than low elevation slopes. Upper elevation temperatures can be warmer than lower elevations due to differential heating by the sun and temperature inversions (warmer air lying over top of colder). Avalanches that start high on the mountain due to these or other factors can run right to the valley bottom and even into mature timber.

Primary Concerns:
The following avalanche conditions are the "usual suspects" in spring conditions. When and where you will find which problem will vary over time and over the terrain.

1. *Loose Wet Avalanches:* Wet loose-snow avalanches can be a significant hazard in themselves. They can also trigger or "step-down" to unstable layers deeper in the snowpack.
2. *Cornice:* Falling cornices are a significant hazard, and they can also trigger unstable layers deeper in the snowpack.
3. *Wet Slabs:* Wet snow that remains cohesive but has a weak layer (often slush or water) or smooth layer (often a crust or relatively smooth ground) below can produce very destructive slab avalanches. The weak or smooth layer may be deeply buried and invisible or unobvious from the surface.

In addition, the following concerns may exist in certain places and/or at certain times:

4. *Deep Slabs:* Deeply buried persistent weak layers (PWLs) exist in some areas making deep slab avalanches possible. While the chance of triggering a deep slab is low, if one does start it will likely be very large and destructive so consequences are high. Read this article for more information. Deep slabs are possible in the following areas:
    - North Rockies: entire region most likely on high elevation, north aspects.
    - North Columbia: entire region most likely on high elevation, north aspects.
    - South Columbia: entire region most likely on high elevation, north aspects.
    - Kootenay-Boundary: entire region most likely on high elevation, north aspects.
    - South Coast region: South Chilcotin Mountains most likely on high elevation, north aspects.
5. *Storm Snow Avalanches:* Storm snow avalanches are more likely to be a concern when:
    - There's more than 30cm of accumulation.
    - New snowfall is accompanied by wind.
    - The storm starts with cold, light, dry snow followed by warmer, heavier, wetter snow.
    - New snowfall is followed by warm temperatures, strong sun, or rain.
    - There is a smooth crust on the surface when the new snow starts.

Special Message:
This is not an avalanche forecast. Please consult with knowledgeable, local sources to obtain information about current conditions before venturing into the backcountry. We suggest these sources for recent snowpack and avalanche observations:

- CAC discussion forum
- Telemarktips
- Backcountry Skiing Canada
- Biglines
- Prince George Backcountry Recreation Society
- SnoWest
- Snow and Mud
- ACMG mountain conditions report

You can get additional general information at the CAC's and avalanche image gallery and our spring ski-traverse page.

If you know of other good sources of spring or summer avalanche information that should be listed here, please send a link to: kklassen@avalanche.ca.

Confidence:
Conditions vary, often significantly, from one place to another within a given region and over time. The information provided here offers general advice for making informed decisions and managing risk in spring conditions. We'll begin issuing regular forecasts again next November.

Weather:
Spring weather is variable and often changes quickly. Weather forecasts at this time of year are often inaccurate more than a day in advance and significant local variation can occur on any given day in a large region. Be prepared for a variety of conditions including hot sunny days, cold nights, extended periods where it doesn't freeze, rain, and intense squalls or storms (generally short-lived) that produce significant local snowfalls and wind. Each of these weather conditions will affect the snowpack differently and rapid weather changes can quickly produce major changes in avalanche danger.

Avalanche Activity:
Expect either dry or wet avalanches and both could come down as loose-snow or slab avalanches. Avalanche activity is often cyclical in nature with the action increasing later in the day as temperatures and solar radiation peaks. Smaller slides or tumbling cornice chunks can trigger bigger slab avalanches. Very deep, even full-depth avalanches are possible, especially during extended periods of thawing without overnight refreezes or if significant rainfall soaks the snowpack. Anticipate avalanche activity during and shortly after storms or squall activity, when solar radiation is strong, when temperatures are rising, and when the snowpack is thawing. Recent or new avalanche activity is a clear signal that a high degree of caution is required. **Spring slides can run farther and gather more mass than expected**, often producing large, destructive, and even climax events where the entire snowpack avalanches right to the ground cleaning out the whole avalanche path from side to side and top to bottom.

Travel Advisory:
Plan to start and finish your trip early in the day. Be prepared to alter plans, adjust routes to avoid avalanche terrain, or even turn around and go back if you see signs of increasing danger, such as more than 5cms or so of wet/slushy surface snow, pinwheeling, and snowballing. It's possible for danger to rise from LOW to HIGH in 30-60 minutes or less and as early as 10:00 a.m. or sooner. Danger often increases more quickly and earlier on steep, high elevation, sunny slopes and ridge top cornices than on low elevation shaded slopes with less snow on them. A sluff, a loose wet slide, or a cornice failure from above could hit you or trigger an avalanche even if you are on a shaded slope that feels cold and frozen at the time. Be vigilant and keep an eye on what's going on above you at all times. Spring avalanche danger is often greatest and deteriorates most quickly in shallow snow or areas where snow depth is highly variable, especially where facets or depth hoar are found at or near the base of the snowpack.

If it snows, avalanche danger is generally highest during and shortly after storms or squalls, especially in lee and cross-loaded terrain and if more than 20-30cm of new snow lies on smooth, hard crusts.

The various persistent weak layers that formed in some areas over the winter are largely dormant at this time but we expect they will reactivate later in the spring. **A high degree of caution is advised in places where deep snow is interspersed with shallow or windswept areas and where rocks or small trees are visible above the surface of the snow. Be especially vigilant on high north facing slopes.**

If there's any doubt about avalanche danger, use travel techniques that minimize risk: go across or down steep slopes one at a time; spread out when crossing runout zones; regroup in dense timber or on high ground; and travel on ridges whenever possible while giving cornices a wide berth.

Always have a probe and shovel in your pack, wear your transceiver at all times, and practice rescue techniques regularly. If you are buried in an avalanche, you will likely not survive if your companions are not able to quickly find and dig you out.

Snowpack:
Melt-freeze conditions dominate the snowpack at most elevations and aspects. These crusts are generally thicker and stronger on sunny aspects, more so at low to moderate elevations. On shaded aspects, especially at high elevations, these crusts are less well developed. Where melt-freeze crusts exist, stability generally goes through cycles driven by air temperatures and solar radiation: when crusts are frozen stability is good, when they are thawed stability is poor. On steep, high elevation, shaded slopes melt-freeze conditions might not exist and dry settled snow may be found. Deeply buried, persistent weak layers may still exist in some locations and could be affected by large triggers, such as falling cornices, stuck sledders spinning their tracks and digging deep, people grouping-up, or smaller avalanches stepping down. In shallow snowpack areas, basal facet or depth hoar layers are probable and produce the potential for full depth spring avalanches. New snowfalls of more than about 30cm may not bond well to old snow for several days after storms.