GRAPHIC AVALANCHE INFORMATION FOR THE NEW MEDIA

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ABSTRACT: As recently as ten years ago, the only way to deliver avalanche information to the public was through the recorded telephone advisory.   Most avalanche centers now utilize the Internet as the primary vehicle for the dissemination of their products. The Internet is an ideal medium because of its rich ability to display graphics. The Utah Avalanche Center has developed a number of graphics-based products for the public to not only communicate critical avalanche conditions, but to provide education about avalanche phenomenon, avalanche rescue procedures and safe travel techniques. The paper discusses the philosophy, development and implementation of these products as well as future trends.

Graphics-based avalanche products include:

- Avalanche advisory, which uses a mixture of graphics and text. Graphics include an aspect-elevation diagram, icons for various avalanche problems, likelihood of triggering, avalanche size and future trend.
- Avalanche encyclopedia, which uses text and graphics as a tutorial on various avalanche terms, concepts and procedures. Many of the graphics are flash animations that can clearly show complex phenomena such as temperature gradient metamorphism, wind loading, melt-freeze metamorphism, among others.
- Daily web photo gallery of backcountry avalanche conditions and avalanche phenomena.
- Video clips of avalanches and tutorials.
- Regular snow profiles displayed in a public-friendly graphical format.
- Avalanche danger ratings displayed graphically for cell phones and media outlets.
- Trailhead information posters.
- Podcasting of audio avalanche advisories for rebroadcast on radio stations.
- Possible future development of video podcasting, which will distribute video tutorials and daily avalanche advisories in TV weather forecast format.

We have found that the public is extremely enthusiastic about these new graphical products and we hope that their increased understanding of avalanche danger and avalanche phenomena will translate

KEYWORDS: Avalanche advisory, graphics, media, communication, avalanche hazard, public.

1. INTRODUCTION

The purpose of public avalanche information services, such as the Utah Avalanche Center, is to communicate critical avalanche information to the public in an attempt to prevent accidents and save lives. Therefore, one of our most important jobs is to find ways to communicate effectively and efficiently. In other words, even if all the information in an avalanche advisory is correct, if the public fails to consult it, perceive it or remember it, then we simply waste our efforts.

Personnel at avalanche information centers pride themselves on being able to deliver very accurate, timely information to the public. Yet the informal surveys we have conducted in the field indicate that even the backcountry travelers who have consulted the advisory that day have a poor understanding of the nature and distribution of the avalanche conditions that could kill them.   Likewise, an unpublished study in Germany and Austria found that only 1/3 of backcountry travelers could name the aspect and elevation of the avalanche hazard described in the bulletin (personal communication). Through the years, it has become increasingly obvious that even though our information was accurate, our old methods of delivering avalanche information do not work as well as we would like to believe.

As recently as ten years ago, telephone recordings were the main vehicle for dissemination of avalanche advisories. Text-

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based avalanche advisories work well for telephone recordings, but when the Internet came along, we suddenly had to adapt our products for a whole new medium. Nowadays, in Utah, our surveys find that only 13 percent of the public access the advisory over the telephone, in Sun Valley, their surveys showed 8 percent and in Canada, only one percent.

The rich graphical capabilities of the Internet are perfect for the dissemination of complex avalanche information. For instance, it's difficult to describe how avalanche danger varies by aspect and elevation using only words, but when you put the same information into an avalanche rose, it instantly becomes easy to perceive and remember. If you visit many of the popular web sites, you invariably find a mixture between graphics and bulleted text. Text-based advisories simply do not work well on the Internet. Graphics work better, especially graphics combined with short text blocks.

2. GRAPHIC-BASED PRODUCTS

For the 2002 Winter Olympic Games in Salt Lake City, we developed an advisory format which mixed graph icons with text. The product was well received by the public, but the interface the forecasters used was so time-consuming, that when our Olympic funding ended, we had to abandon the graphics-based forecast. We began planning the next generation of the graphics-based advisory.

We launched our new format during the 2005-06 season and it has received overwhelming rave reviews by the public. It utilizes an avalanche rose, which displays avalanche danger by aspect and elevation. It also features icons that indicate the various avalanche problems that someone is likely to encounter that day, and for each problem, it has icons to indicate the likelihood of triggering an avalanche, the expected size of the avalanche and the expected future trend (Figure 1).

Several other avalanche centers in the U.S. have adopted some of the graphics in their advisories or plan to adopt them in the near future. In conjunction with the Colorado Avalanche Information Center, we are developing the next generation of the advisory, with updated icons and an easier user-interface.

The idea behind the graphic-based advisory is two fold: first, to present avalanche information in an easier-to-understand graphical format and second, to de-emphasize the overall danger rating and concentrate instead on describing the nature of the avalanche problems that backcountry users will likely encounter on
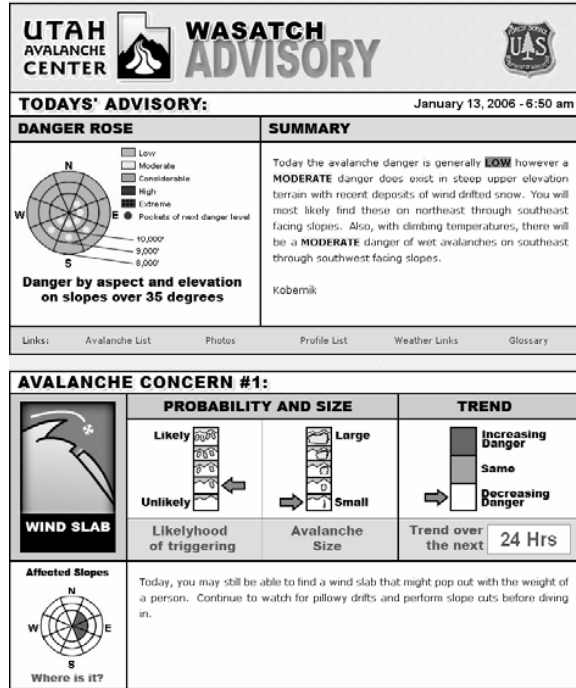
Figure 1,
A portion of a graphic-based avalanche advisory

that day and describe where they will likely find them. Many of these ideas came from the work of Canadian helicopter skiing guide, Roger Atkins. He found that professional guides made their critical route finding decisions based not on the stability rating for the day, but on the character of the avalanches they were likely to encounter (Atkins, 2004). Atkins came up with 27 different types of avalanche problems, which he grouped into five basic subgroups. He described their character, and how professional guides usually deal with them. We used similar groupings of basic avalanche problems: wind slabs, storm snow, persistent slabs, deep slabs, wet avalanches and loose snow. We developed an icon for each avalanche type. Other icons describe the expected likelihood of triggering, the expected size of the avalanche, the expected future trend of the instability and the aerial distribution of where you will likely find it by aspect and elevation. We are in the process of developing a clickable tutorial for each kind of avalanche type, which describes what it is, how it forms, how to recognize it and how to manage it in the backcountry.

3. AVALANCHE OURTREACH PROGRAM

We estimate that about 85 percent of avalanche fatality victims in Utah did not consult the avalanche advisory on the day of their accident. Moreover, most of Utah's fatalities occur on slopes rated as high danger in contrast to slopes rated as moderate and considerable danger for Canada and Europe, respectively. In other words, it seems that we have an even more fundamental problem than the graphic-based avalanche advisory was designed to address— that most avalanche victims in Utah simply don't have even the most basic avalanche information.

Two years ago, Craig Gordon, a forecaster with the Utah Avalanche Center spearheaded the *Know Before You Go* avalanche education program designed for young adults, which has been phenomenally successful (Gordon 2006). The 15-minute video, alone, has become standard fare in most avalanche classes throughout North America. But even though the program reaches 12,000 people per year, it's still a small percentage of the population. To reach everyone else, we received a grant from the Forest Service Centennial Grant program to design an outreach program for people who are either not aware of the avalanche advisory or who don't normally consult it before going out.

The first prong of that outreach program is to publish danger ratings in all the newspapers, television stations and radio stations in Utah. For years, we have resisted publishing overall danger ratings because we felt that the information was too general to be of much use. Instead, we felt that backcountry travelers really need to know the details to stay safe. But, it's hard to ignore the aforementioned statistics. We have finally realized that if people won't come to us; we have to go to them. We need to publish avalanche danger ratings in the media that most people already use—the newspapers, television and radio. In many cases, just one piece of information could prevent an avalanche accident. Also, as most experienced avalanche educators will tell you, when you try to capture avalanche novices, you have to first start with the basics, and then spark their interest so that their curiosity leads them to the Web site, a book or video where they can learn more. Eventually they will use the avalanche advisory on a regular basis.

The Canadians realized they had the same problem after two high-profile accidents in 2002-03. They started publishing a 3-level "advisory rating" in newspapers during the 2004-05 season in which they rate the conditions as "Good, Serious or Poor". This is the first tier of avalanche information, designed to provide only the most basic avalanche information to the public so they can plan where to conduct their outing. They feel the program has been

Figure 2,
A mockup of a ski area backcountry access gate sign. The sign contains electronics, which flash a light and an audio signal if it detects a transmitting beacon.

successful. They continue to provide the traditional 5-level danger ratings in the avalanche bulletins as tier 2 information (for people with some avalanche education).

We debated whether we should adopt the Canadian 3-level public advisory system for the newspapers, television and radio, or go with the international standard 5-level danger scale of Low, Moderate, Considerable, High and Extreme. We received feedback from both the Canadians and Europeans, but we eventually decided to stick with the international standard 5-level scale, based on a nearly unanimous vote by all the avalanche center personnel at an annual meeting of all the U.S. avalanche centers.

In other words, we are providing a tiered approach in which we present several levels of complexity, depending on what the user needs. Tier 1 information include the basic, one-word avalanche danger ratings will go out to the mass media, trailhead information posters, a 30-second video PSA, which plays on television and in movie theaters before the movie starts, and "Are You Beeping?" signs at ski area backcountry access gates, which feature an electronic sensor to test whether someone has a transmitting beacon and web-based tutorials for beginners to learn about avalanches (Table 1).

Tier 2 information is for people with at least some level of avalanche education. It includes the graphic-based avalanche advisories, avalanche advisories on the radio stations,

	Products provided	Who it's for:
Tier 1	Overall Danger Ratings in news-papers, TV and radio, trailhead displays, ski area boundary dis-plays, PSAs on television and in movie theaters.	Uneducated users: Boy Scout troops, hikers, hunters, dog walkers, resort ski-ers, etc.
Tier 2	Graphic Avalanche Advisory, radio avalanche advisory, pod-casts of avalanche advisory, photos and an avalanche ency-clopedia.	Educated users who regularly use the backcountry: snowmobilers, snowsho-ers, backcountry skiers, backcountry snowboarders, climbers, etc.
Tier 3	Avalanche lists, snow profiles, automated weather data,	Hard-core backcountry users, guides, snow safety personnel, snow geeks and Web-surfers

Table 2

poscasts of the advisory as well as an "avalanche encyclopedia" which describes avalanche terms in much more detail than an ordinary glossary (you can find the link on our avalanche advisory).

And finally, we provide detailed lists of avalanche activity and technical snow profiles for hard-core users.

4. WHAT IS IN THE FUTURE?

Ten years ago, most our office time centered on the telephone—talking with all the other avalanche professionals and observers and recording the telephone hotlines. Now, we spend most of our time on the computer, monitoring conditions and updating our Web products. And, as we look into the crystal ball even 5 years from now, we see a different kind of avalanche forecaster—one who not only needs the usual arsenal of avalanche and communication skills, but someone who also can design Web sites, create graphics, edit videos and still photos, manage databases, manage Web servers and master all the other technologies that will come along in the mean time.   It's an exciting new world.

Finally, for years, we have all watched the TV meteorologists and salivated that someday, we could use the same technology to give an avalanche report. Think of it; We all would have an inexpensive broadcast studio in our office, and we would stand in front of the green screen and point out weak layers on slick snow profiles graphics, show video clips of the day's avalanches, zoom in on terrain color-coded by avalanche danger and interview various avalanche pundits for their pearls of wisdom. "That's the avalanche news from our neck of the

Figure 3,
An animated entry in the web-based Avalanche Encyclopedia.

woods. Now back to you Evelyn."

That world has already arrived with the rise in popularity and ease of video podcasting. With just a

video camera on a tripod and the right software, even a one-person operation could easily publish their own video avalanche bulletin each day. All that is required is a little more time and money—something that most avalanche centers sadly lack.

It's an exciting because we are figuring out the best way to communicate the

characteristics and complexities of avalanche danger to the public using a whole new medium. Words are probably not the best tools for the job. Instead, it will probably require something like 80 percent graphics, photos, videos and animations, which are much more expensive to produce than hiring a lone avalanche geek to type on the computer at 4:00am. But before any of this can come about, we will have to figure out how to finance it, and that will be the most difficult challenge of all.

5. REFERENCES

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