

INFORMATION AND WARNING PROGRAMS FOR BACK COUNTRY TRAVELLERS

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Avalanches and weather in the back country can cause serious problems--usually to the uninformed. The responsibility for educating back country users as to the hazards and problems they may encounter falls upon these people who are involved in avalanche work and those who are associated with winter recreationists. The goal of this paper is to assist in meeting this responsibility. Subjects to be discussed are:

1. current problems we face with winter back country travellers;
2. how back country users find out about the hazards they may face;
3. how effective these information methods are; and
4. how we can increase the effectiveness of our information and warning programs for those using the back country.

Current Problems

Statistics, compiled by Betsy Armstrong, on people who were totally buried in avalanches (excluding those in vehicles or structures) reveal some interesting facts about recovery of victims. From 1967 through 1980, of those found alive, 61 percent were rescued by members of their parties. Unfortunately, this is not always the case. Therefore, survival chances are much better if people in the party have some knowledge of avalanche and basic rescue techniques.

It is interesting to note that from 1974 to 1979, cross-country ski use in the National Forests in the United States has increased 2.3 times. In analyzing the winter seasons from 1976 to 1980, Betsy Armstrong found that of the avalanche fatalities, 76 percent were recreationists and only 24 percent were work-related. She also found that of the recreation fatalities, 79 percent involved back country users: climbers, ski tourers, and snowmobilers. Thus we are faced with an increased back country use, often by persons with little knowledge of rescue techniques. Many of these back country users come from large cities and may not

have had the opportunity to learn about or even be aware that hazards exist. Studies reported in the Mazama climbing bulletin found that even "experienced" people often had a low level of useable knowledge about hazards.

### Dissemination of Hazard Information

Many people, unfortunately, first learn that hazards exist in back country when a problem develops. Others fail to use the hazard information that is available to them from numerous sources. Some of the more common methods used to inform people of back country hazards include: talks to groups, slide shows, movies, and publications including pamphlets, magazine articles and books. There are a number of class outlines, slide shows, movies, and publications available for use in informing and teaching people about back country hazards (see Appendix). Other methods used to inform people include: public service announcements on radio and television, avalanche closure signs, posters, and avalanche hazard advisory systems.

The objective of avalanche hazard advisory systems is to minimize avalanche-related casualties through effective warnings and advisories. Such programs are one of the most effective techniques of acquainting people with avalanche conditions.

The Swiss have the oldest forecasting service, one which originated over 30 years ago. The data collection network consists of local officials such as postmasters, mayors, and others who collect the weather and avalanche information and send this data to several Regional centres. The Regional centres in turn teletype the information to the Federal Avalanche Institute at Weissfluhjoch. The Institute issues forecasts every Friday and on other days as needed. These forecasts go mainly to the news media, and are used by ski areas, resorts and back country users.

In Austria, the Provinces of Tyrol, Vorarlberg and Salzburg each have their own separate service. The Austrians use basically the same technique of gathering data as the Swiss.

In the United States there are two avalanche advisory programs. The first program was initiated in 1973 in the State of Colorado, and is conducted by the Rocky

Mountain Forest and Range Experiment Station headquartered in Fort Collins, Colorado. Field observations are gathered from over 60 sites scattered throughout the mountains of Colorado. This information is sent to the Avalanche Warning Centre in Fort Collins.

The other avalanche advisory program covers the Pacific Northwest from the North Cascades in the State of Washington south to Mt. Hood, in Oregon, and also includes the Olympic Mountains in western Washington. This program is jointly sponsored by the U.S. Forest Service, National Park Service, and the Washington State Department of Transportation. Daily field observations are sent to the forecasting headquarters in the National Weather Service office in Seattle.

Avalanche advisories are issued daily from both of these forecasting centres. Avalanche warnings will be updated several times during the day if conditions warrant. Field observers in these systems report information including the time of the observation; the present weather; maximum, minimum, and current temperatures; snow depth; new snowfall and water equivalent; wind speed and direction; descriptions of fresh avalanches; and an estimate of the avalanche danger at that station. All advisories contain the statement that the hazard does not apply to developed ski areas.

The avalanche hazard advisories and warnings are sent to news wire services and the National Weather Service, and are put on recorded telephone messages. The telephone number for these recorded messages is well advertised in daily newspapers, outdoor publications, climbing bulletins, ski club bulletins, and special Sunday newspaper supplements. The hazard advisories are then disseminated to the public by VHF weather radio broadcasts, radio stations, newspapers, and the recorded telephone messages. Again, it should be stressed that the avalanche advisory is for areas outside of developed ski resorts.

Parks Canada issues daily avalanche warnings for Banff and Jasper National Parks. Warnings are posted at ski areas and Wardens' Information offices. It is hoped that avalanche hazard advisory programs can be expanded in Canada, and established in the Sierra Nevada Mountains of California and additional Rocky Mountain states. Before initiating a hazard advisory service, your agency attorney

or solicitor should be consulted. In the United States, a legal precedent regarding liability for forecasts has been established as a result of a lawsuit involving the National Weather Service. This precedent is applicable to avalanche hazard forecasting, and states that the forecasting agency is not legally liable for a missed forecast as long as the forecast is issued in good faith and using state-of-the-art techniques.

### Effectiveness

Betsy Armstrong, in her analysis of avalanche accident statistics, has found that the number of people caught, buried and killed in snow avalanches over the last nine winters has remained relatively stable. However, the number of people engaged in winter recreation, particularly cross-country skiers, has increased heavily. Since many of the winter recreationists are in areas where avalanches do occur, it could be assumed that the winter recreationists are better informed of the potential hazards than in the past. If this is true, then the information programs on winter back country hazards must have some degree of effectiveness. More study is needed to determine what level of knowledge of back country hazards the winter recreationists have and how they receive their knowledge.

The three major methods of disseminating information are newspapers, radio, and television. In the United States, there are 441 million radio sets, and 115 million television sets, while the newspaper circulation is approximately 62 million. While radio reaches more people than any other medium, an independent survey showed that about 50 percent of the nation's people rank television as the most believable news source, followed by radio and newspapers.

The May 18, 1980 volcanic eruption of Mount St. Helens provided a rare chance to study the diffusion of important information through a society in a single day. Washington State University's Information Office conducted a study to determine the prime communications networks that people used to find out about the volcano.

The eruption occurred at 8:32 a.m. on May 18, 1980. By noon, after a period of only three and one half hours, 61 percent of the people interviewed knew of the eruption. Within nine hours, or by 6 p.m. on that day,

97 percent of the people interviewed knew of the eruption. Fifty-two percent of the respondents first learned of the eruption from another person, thirty-three percent were informed by radio, and 12 percent learned about the event through television.

These same people were asked where would they go for news and information. Fifty-six percent said they would rely on radio, 24 percent said television, and 12 percent said both radio and television. Less than 1 percent said they would rely on newspapers. Seven percent said they would rely on other sources such as magazines.

This information shows that:

1. When a major event occurs over 50% of people learn of it from another person--and this news travels fast.
2. Of the three major news sources, radio reaches significantly more people than television or newspapers, but some people feel television is the most believable source.

In providing information to the news media, it is important that the text be brief and summarize the message. This is particularly important for radio and television where their messages must be concise. If the message is too wordy or contains unnecessary information, it may be edited so that pertinent information is omitted, misleading the listener.

An advantage of recorded telephone messages--which are an excellent way to get a message to the public--is that people will be listening to an accurate message that you record. These messages should also be concise. The recorded avalanche advisory telephone message in Seattle received 10,000 calls in four months from January through April of 1980. In one day, over 400 calls were received.

#### Methods to Increase Effectiveness

Though the accident rate the last few years has remained stable, while back country use has increased, our goal should be to decrease the number of people involved in back country problems. To do this, we need to make more people aware of winter back country hazards. We need to inform people of where they can get information on current avalanche conditions and acquaint themselves with basic avalanche rescue methods. Increased effectiveness in

getting this information to the back country users can be achieved by the usual methods discussed earlier, but also by some different and innovative approaches. Consider the following:

1. At winter sports fairs or shows: hand out brochures; give a three- to four-minute slide presentation or offer a 20- to 30-minute short course on back country problems and solutions; conduct a simulated rescue.
2. Many communities have adult education classes sponsored through local colleges or universities. Teach a class covering the various subjects, or if an outdoor winter recreation class is offered during a term, offer to teach one night of it.
3. Some utilities such as telephone, electric, or natural gas companies will allow a flyer or small pamphlet to be inserted with their monthly bills. Take the opportunity to do so.
4. Be a guest on local television or radio talk shows.
5. Put a short message on the "scanner" channel on the local cable television. The "scanner" channel usually has information on weather and sometimes snow conditions and often a short public message. This is a very good place to put the telephone number which people can call to obtain winter back country information.
6. Convince those working in the winter sports field such as ski instructors, tour guides, ski resort managers, ski lodge managers, and law enforcement personnel of the importance of spreading this information, and enlist their help.
7. In addition to making presentations to clubs and organizations, call a public meeting in a resort town to discuss winter back country problems and their solutions. Presentations can also be made at ski lodges.
8. Talk to leaders of nordic, snowmobile, and climbing clubs, and urge that they have club members contact people in the back country. This can be an effective way of getting a message to those not belonging to clubs because people of "their own kind" are talking to them.

9. Write a letter to the editor of your local paper explaining where information can be obtained and who can be contacted for special programs.
10. If authors of books or magazine articles contact you, ask them to include information on winter back country hazards and rescue techniques.
11. Write a short article for newsletters of various organizations such as ski clubs, ski associations, and sporting goods stores.
12. In addition to issuing news releases, write a news article or contact a reporter about an article in the daily newspaper or in the special sections of the Sunday paper. Describing a successful avalanche rescue is a good way to make people aware of hazards and proper rescue techniques.
13. Talk to individual persons. During our working and leisure hours we often have opportunities to visit with people. Examples of such opportunities are riding up chairlifts, meeting cross-country skiers on trails, riding buses, and attending social gatherings. This is an excellent way to informally but effectively disseminate information about winter back country problems and solutions.

Some of these suggestions may be practical in one area and some may not; but the effort should be made since it may reduce our back country problems. The challenge before us, then, is to reduce the average annual number of people caught in avalanches during the next five years. If we all do our part, I believe we can meet the challenge.

AppendixSelected Teaching Aids - November 1980

Listings are compiled from the National Ski Patrol System, the World Data Center A for Glaciology (Report GD-1), and personal knowledge. Please call any errors or omissions to the attention of Dale Gallagher (Information Office, U.S.F.S.; Pacific NW Region, P.O. Box 3623, Portland, Oregon 97208) so that the corrections can be included in the next edition of the bibliography.

Abbreviations: U.S.F.S = U.S. Forest Service; N.S.P.S. = National Patrol System

SOURCES

(See addresses at end of bibliography)

MOVIES

- "Avalanche Control"; 16 mm, 40 min.  
U.S.F.S. Causes of avalanches  
and control methods. (2)
- "Avalanche"; 16 mm, 20 min. C.B.S. -  
A TV documentary presented on  
C.B.S. "60 Minutes" program.  
Causes of avalanches, rescue, etc. (2)(3)
- "Avalanches"; 16 mm, 45 min. BBC  
(British Broadcast Corp.). Causes  
of avalanches, control, rescue, etc.
- "In Winter's Domain"; 16 mm, 25 min.  
Gates Co. and NSPS. Winter back  
country skills and hazards (2)(3)
- "By Nature's Rules"; 16 mm, 25 min.  
SAFECO Hypothermia - causes,  
symptoms, treatment (2)(3)
- "Avalanches"; Super 8 mm, 5 min.  
E. LaChapelle, Univ. of  
Washington. Types of avalanches (2)(3)(4)



SOURCES

- "Metamorphism"; Super 8 mm, 10 min.  
Available after 3/1/81. Hotchkiss,  
NSPS. Probing techniques for  
avalanche rescue. (2)(3)
- "Lavine"; 15 mm, 25 min. Montana State  
Univ. Avalanche Control at Bridger  
Bowl, Montana. (2)(3)
- COLOR SLIDES
- "Module I" 70 slides, N.S.P.S. - 1980  
Avalanche Awareness. Primarily for  
instructing. (2)(3)
- "Module II" 80 slides. N.S.P.S. - 1980  
Avalanche Rescue. Primarily for  
instructing. (2)(3)
- "Module III" 100 slides. N.S.P.S. - 1980  
Avalanche Safety. Primarily for  
instructing. (2)(3)
- "Mountain Weather" 45 slides. N.S.P.S. (2)(3)
- "Terrain" 35 slides. N.S.P.S. Avalanche  
Terrain (2)(3)
- "Route Finding" 35 slides. N.S.P.S.  
Route finding in avalanche terrain (2)(3)
- "Rescue" 27 slides (Gallagher)  
Recap of avalanche rescue techniques (2)(3)
- "Rescue" 60 slides. N.S.P.S. - 1979  
Rescue techniques (2)(3)
- "Mountain Snowpack" 60 slides. N.S.P.S.  
- 1979 (2)(3)
- "Contributory Factors" 24 slides.  
N.S.P.S. (2)(3)
- "Avalanche Defenses" 40 slides. N.S.P.S.  
Defense structures for retaining or  
diverting avalanches (2)(3)

	<u>SOURCES</u>
"Control" 40 slides. N.S.P.S. Avalanche control methods	(2)(3)
"Starter Slide Set" 70 slides. N.S.P.S. Slides covering various avalanche topics, from which a talk can be illustrated	(2)(3)
"Avalanche" 137 slides. (Heapes). Public presentation with script. Avalanche awareness, route selection, rescue	(2)(3)
"Back Country" 160 slides. (McConell). Public presentation. Back country hazards, rescue, etc., for snow- mobilers, skiers.	(2)(3)

#### MANUALS

N.S.P.S. - AVALANCHE INSTRUCTORS MANUAL Basic and advanced course outlines and other teaching information	(2)
N.S.P.S. - TEACHING. Helpful hints on instructing winter sports related courses	(2)
N.S.P.S. - MOUNTAINEERING MANUAL. Course outlines and basic knowledge on winter mountaineering needed for rescues. Not a technical mountain climbing manual	(2)
N.S.P.S. - NORDIC MANUAL. Course outlines for teaching Nordic ski patrolling	(2)
N.S.P.S. - WINTER FIRST AID. Covers special treatment of injured people in a winter situation such as ski patrolling, rescues, etc.	(2)
N.S.P.S. - EXTENDED FIRST AID. Medicine to carry on back country trips.	(2)
N.S.P.S. - WINTER EMERGENCIES. Manual on handling a variety of emergencies during the winter	(2)

SOURCES

- U.S.F.S. - (Perla) AVALANCHE RESCUE.  
Avalanche rescue techniques. (1)(2)
- U.S.F.S. - (Gallagher) USE OF A SIMULATION  
MACHINE FOR AVALANCHE RESCUE TRAINING,  
PLANNING SKI AREAS, ETC. (1)(2)

PAMPHLETS

- "WINTER RECREATION GUIDE" (1978)  
U.S.F.S. - U.S. Ski Ass'n. Hazards and  
precautions for winter recreation (1)(5)
- "SNOW AVALANCHE" (1980)  
U.S.F.S. General rules for avoiding and  
surviving snow avalanches (2)
- "AN ACCIDENT IN THE MOUNTAINS"  
The Mountaineers and Washington State Dept.  
of Emergency Services. A form to be carried  
by back country users, to be filled out at  
time of an accident and sent out with the  
person going for help. (6)
- "AVALANCHES" (1980)  
Outdoor Recreation Council of British  
Columbia. Basic information on avalanche  
causes, route selection, rescue, and first  
aid (7)

SOURCES OF INFORMATION

- (1) SNOW/AVALANCHE RESEARCH  
U.S. FOREST SERVICE RKY. MTN. FOR. EXPER. STAT.  
240 W. PROSPECT ST.  
FORT COLLINS, CO 80521
- (2) BILL HOTCHKISS  
NAT'L. AVALANCHE ADVISOR  
NAT'L. SKI PATROL SYSTEM  
2901 SHERIDAN BLVD.  
DENVER, CO 80214

(3) NATIONAL SKI PATROL SYSTEM  
DIVISIONAL AVALANCHE ADVISORS

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## EASTERN DIVISION

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Rochester, NY 14618

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1634 O-Nell Dr.  
Petaluma, CA 94952

## NORTHERN DIVISION

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Bozeman, MT 59715

## ROCKY MOUNTAIN DIVISION

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1806 Cheyenne Blvd.  
Colorado Springs, CO  
80906

## CENTRAL DIVISION

Lew Krimen  
N.S.P.S. Avalanche  
Advisor  
228 W. Witchwood  
Lake Bluff, IL 60044

## EUROPEAN DIVISION

Dick Reppard  
N.S.P.S. Avalanche  
Advisor  
USAREUR-ODCSOPS  
APO - NY 09403

## INTERMOUNTAIN DIVISION

Dick Epley  
N.S.P.S. Avalanche  
Advisor  
745 E. 5400 So.  
Ogden, UT 84403

## PACIFIC NW DIVISION

Bill Morgan  
N.S.P.S. Avalanche  
Advisor  
6521 Beach Dr. SW  
Seattle, WA 98136

## SOUTHERN DIVISION

Ron Geist  
N.S.P.S. Avalanche  
Advisor  
1605 Damon Ct.  
Dunwoody, GA 30338

(4) For sale by:

Department of Atmospheric Sciences, AK-40  
University of Washington  
Seattle, WA 98195

- (5) Information Office  
U.S. Forest Service - Pacific NW Region  
P.O. Box 3623  
Portland, OR 97208
- (6) The Mountaineers  
P.O. Box 122  
Seattle, WA 98111
- (7) Outdoor Recreation Council of British Columbia  
1200 Hornby Street  
Vancouver, British Columbia  
Canada  
V6Z 2E2

DiscussionSpear:

Climbers seem to be a most difficult audience for education in avalanche safety, and more and more of them are caught in avalanches. Many climbers are very experienced in climbing but are negligent with respect to avalanches.

Smutek:

A study showed that climbers have a low level of experience with avalanches.

Geisler:

I would like to see more articles about what it is like to participate in a rescue. Taking part in a couple of rescues where you had to either work all night or freeze was a very strong educational force for me.

Widell:

We have a lot of trouble with snowmobilers running up and down the chutes. I have talked to them of these fellows and warned them but they don't seem to listen. They think it is great fun to come down these chutes and to go up them. How do you get to these people?

Gallagher:

We found it very effective to let snowmobilers talk to other snowmobilers, rather than have a snow ranger or cross-country skiers trying to talk to snowmobilers. The same technique can be applied to educating climbers and cross-country skiers.