



PACIFIC REGION TECHNICAL NOTES

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P.W.C. MOUNTAIN FORECAST PROGRAM 1977/78: NOTE 1

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WITH THE OPENING OF THE ROGERS PASS (ON THE TRANS CANADA HIGHWAY #1) IN 1962, A PRIME REQUIREMENT OF THE AVALANCHE WARNING SERVICE (AWS) LOCATED AT THE PASS SUMMIT, WAS FOR THE DAILY INPUT OF A RELIABLE WEATHER FORECAST FOR THE AREA. THEIR PRIORITIES AND PRIME CONCERN WERE SNOWFALL AMOUNTS, TIMING AND DURATION OF SNOWFALL, TEMPERATURE VARIATIONS AND WIND DIRECTION AND SPEED. INITIALLY THE AWS MADE USE OF THE PUBLIC FORECAST, BUT IT BECAME EVIDENT VERY QUICKLY THAT THIS FORECAST WAS TOTALLY INADEQUATE FOR THE MOUNTAINS. A SPECIAL MOUNTAIN FORECAST PROGRAM WAS ESTABLISHED AND BEGAN FOR THE WINTER OF 1964/65. THE FORECASTS WERE ISSUED BY THE PUBLIC FORECASTER. THIS EVENTUALLY LED TO THE CREATION OF A SPECIAL WEATHER ADVISORY TEAM (SWAT) IN 1974/75, WHICH NOW HANDLES ALL SPECIALIZED USER REQUIREMENTS. THOUGH THE INITIAL SUPPORT OF THE MOUNTAIN FORECAST WAS FOR THE ROGERS PASS AWS, THERE HAS BEEN A STEADY EXPANSION IN SERVICE TO COVER MOST AREAS OF THE PROVINCE HAVING AN INTEREST IN THE SPECIALIZED FORECAST PARAMETERS. WITH THE INCREASE IN COVERAGE, THERE HAS ALSO BEEN AN INCREASE IN THE NUMBER OF USERS. THESE USERS NOW INCLUDE THE BC DEPT OF HIGHWAYS, SKI RESORTS, YOHU PARK, B.C. HYDRO, AND GRANDUC MINES. IN ALL CASES THE COMMON CONCERN WAS WITH POTENTIAL AVALANCHE CONDITIONS AND THEREFORE PUBLIC SAFETY.

THE MORE OBVIOUS CONTRIBUTING FACTORS IN ARRIVING AT AN AVALANCHE HAZARD EVALUATION ARE:

- A) A PROLONGED AND/OR HEAVY SNOWFALL WITH A FALL OF 30 CM OR MORE IN 24 HOURS. THIS CONDITION IS CONSIDERED IMMEDIATELY DANGEROUS AND MORE SO IF COINCIDENT WITH HIGH WINDS OR IF OCCURRING AFTER A PROLONGED COLD SNAP
- B) CRITICAL WIND SPEEDS ARE VARYING WITH THE AREA, A SPEED AS LOW AS 30 KMH (15 KTS) CAN BE SIGNIFICANT. IN SKI AREAS WINDS OF 80 KMH (40 KTS) OR MORE ARE CRITICAL FOR LIFT OR GONDOLA OPERATIONS
- C) A SUDDEN WARMING OR PROLONGED INVERSION SITUATION, ESPECIALLY IF TEMPERATURES ARE ABOVE FREEZING AT THE RUPTURE ZONES IE THE AREA WHERE AN AVALANCHE STARTS TO SLIDE OR WHERE THE BULK OF SNOW ACCUMULATES

D) SNOW METAMORPHISM IE CHANGING PROPERTIES OF THE SNOW AND SNOW PACK ITSELF. TO DETERMINE SNOW STABILITY, SNOW PITS ARE DUG IN OR NEAR AVALANCHE PRONE AREAS OR IN OR NEAR RUPTURE ZONES, WHICH ALLOWS THE OBSERVER TO DETERMINE ON AN ONGOING BASIS;

- 1) SNOW CRYSTAL CHANGES
- 2) SNOW DENSITY
- 3) WATER EQUIVALENT
- 4) PRESSURE PENETRATION
- 5) STRATIFICATION
- 6) SHEAR TEST

THE AVALANCHE FORECASTER HAS TWO OTHER IMPORTANT, YET SUBJECTIVE, TOOLS TO AID IN EVALUATING CONDITIONS;

- 1) A VISUAL IDENTIFICATION OF SNOW MOVEMENT
- 2) TO SKI TEST(SLOPE TEST) THE AREA

THE MORE CRITICAL AVALANCHE PRONE AREAS IN B.C. ARE;

- A) ROGERS PASS: 75-80 MAIN AVALANCHE PATHS OVER A SPAN OF 27 MILES, THE LARGEST BEING HANDLED BY SNOWSHEDS
- B) SKEENA VALLEY: ABOUT 30 PATHS WITH THE PRIME DANGER ARE EXTENDING FROM 45 TO 85 KM WEST OF TERRACE
- C) FRASER CANYON: ABOUT 50 PATHS THROUGH WOODED SLOPES ALL IN THE SOUTHERN HALF OF THE CANYON IE FROM BOSTON BAR SOUTH
- D) SALMO CRESTON: THE KOOTENAY SKYWAY THROUGH THE SELKIRK MOUNTAINS HAS 5 PATHS-3 MILES EITHER SIDE OFF THE PASS
- E) YOHU NATIONAL PARK: MAIN AREA OF CONCERN IS MT. BOSWORTH, NEAR WAPTA LAKE, JUST WEST OF THE KICKING HORSE PASS

AVALANCHE CONTROL MEASURES ARE:

- 1) GUN FIRE: ROGERS PASS HAS AN ONGOING PROGRAM IN SEASON. IT WILL SOON TO BE EXPANDED TO THE SALMO CRESTON HIGHWAY
- 2) EXPLOSIVE CHARGES: SET BY-
 - 1) HELICOPTER
 - 2) SKI PATROL
 - 3) AVA LAUNCHERS
- 3) SNOW SHEDS
- 4) MOUNDS, DIVERSIONS, FENCES ETC

BASICALLY, CONDITIONS FOR AVALANCHES ARE LOTS OF SNOW AND STEEP SLOPES WITH MOST AVALANCHES OCCURRING ON SLOPES BETWEEN 30 AND 45 DEGREES. ANYTHING STEEPER DOES NOT ALLOW THE SNOW TO ACCUMULATE AND ANY SLOPE LESS THAN 30 DEGREES ALLOWS THE SNOW TO ACCUMULATE BUT NOT SLIDE (LESS THAN 1% OF AVALANCHES OCCUR ON SLOPES LESS THAN 30 DEGREES). THE MOST COMMON TYPE OF AVALANCHE IN THE COLDER BC INTERIOR IS THE 'DRY' AVALANCHE WHILE ON THE COAST MOUNTAINS (WESTERN SLOPES) THE MORE FREQUENT IS THE 'WET' AVALANCHE. THE ROGERS PASS IS NOTED FOR HAVING ONE OF THE WORLDS WORST AVALANCHE HAZARDS BUT THEIR AVALANCHE WARNING SERVICE IS RECOGNIZED AS ONE OF THE BEST IN THE WORLD. THE MOST RECENT EXAMPLE OF A COAST MOUNTAIN "WET" AVALANCHE WAS THE ONE WHICH OCCURRED IN THE SKEENA VALLEY WEST OF TERRACE IN JANUARY, 1974 WHICH TOOK 7 LIVES. IT WAS IMMEDIATELY AFTER THIS THAT A PROVINCIAL TASK FORCE WAS SET UP AND THEIR RECOMMENDATIONS LED TO INCREASED LIASON BETWEEN A.E.S.

AND THE DEPT OF HIGHWAYS. THEY MAKE DAILY USE OF THE MOUNTAIN FORECAST, IN SEASON, AND PROVIDE DAILY OBSERVATIONS FROM AN EXPANDED OBSERVATIONS NETWORK WHOSE STATIONS INCLUDE:

- DEPT OF HIGHWAYS - 46 STATIONS
- SKI RESORTS - 15 STATIONS
- NATIONAL PARKS - 5 STATIONS
- B.C. HYDRO - 1 STATION
- GRANDUC MINES - 1 STATION

IN ALL A SUCCESSFUL PROGRAM AND A GOOD EXAMPLE OF COOPERATION AND LIASON BETWEEN USER AND PROVIDER OF SERVICE.