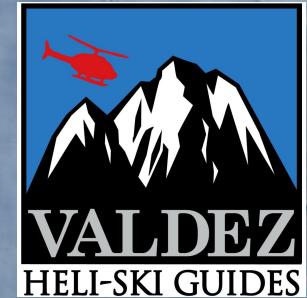
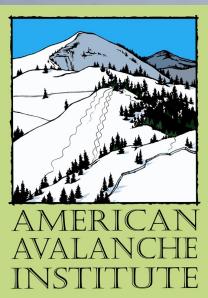


The 2014 Damnation Facets

Don Sharaf

SAAW, Anchorage, AK



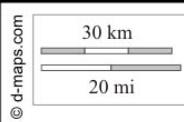
Format

Season History focused on the Damnation
Facets

Remarkable things about this weak layer

Lessons learned (and relearned)

Future forecasting and communication
considerations



Valdez/Eastern Chugach



Juneau/Coast Range



Thompson Pass MP 26

MP 35 Tsaina Lodge

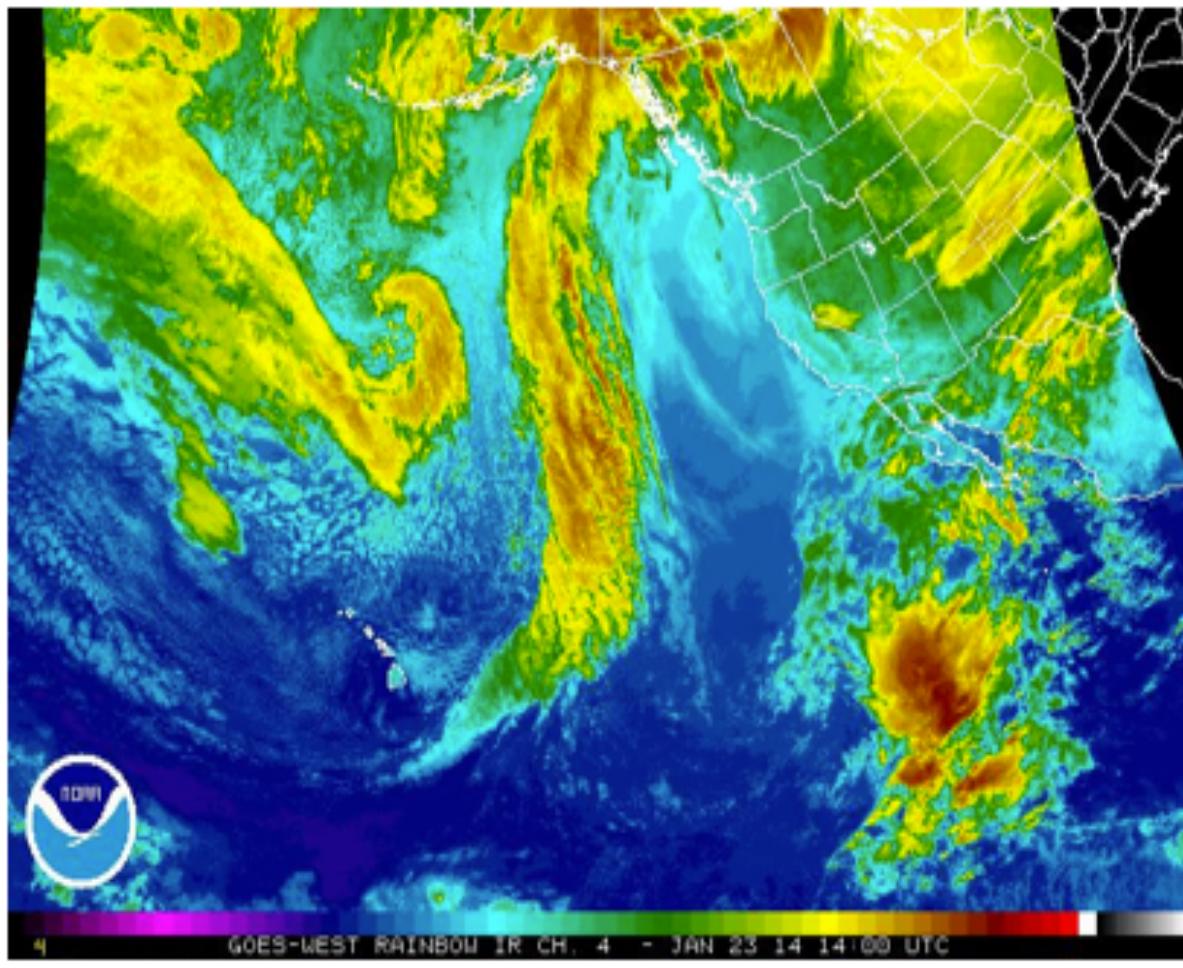
A horizontal timeline diagram on a dark blue background. A yellow line with vertical tick marks represents the timeline. Above the line, dates are listed diagonally from left to right. The first three dates are 'October', 'November', and 'December', followed by '2013'. The next date is 'January 17-25, 2014'. After a break, the timeline resumes with 'January 24-25', 'January 26 - February 13', 'February 13 - 18', and 'February 18 - March 2'. The timeline then continues with 'March 2-10', 'March 11-14', 'March 15-25', 'March 26 - April 11', 'April 12-23', 'April 23 - May 4', and 'May 4 ↗ ?'. The text is in a white sans-serif font.

October
November
December 2013
January 17-25, 2014
January 24-25
January 26 - February 13
February 13 - 18
February 18 - March 2
March 2-10
March 11-14
March 15-25
March 26 - April 11
April 12-23
April 23 - May 4
May 4 ↗ ?

NOT TO SCALE

Chris Martin Photography

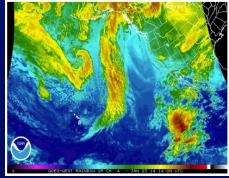






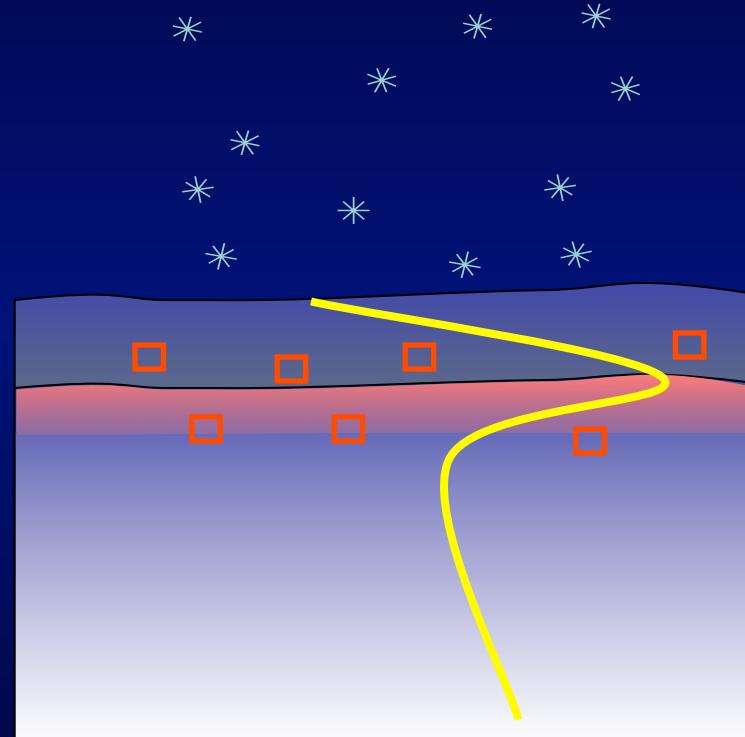
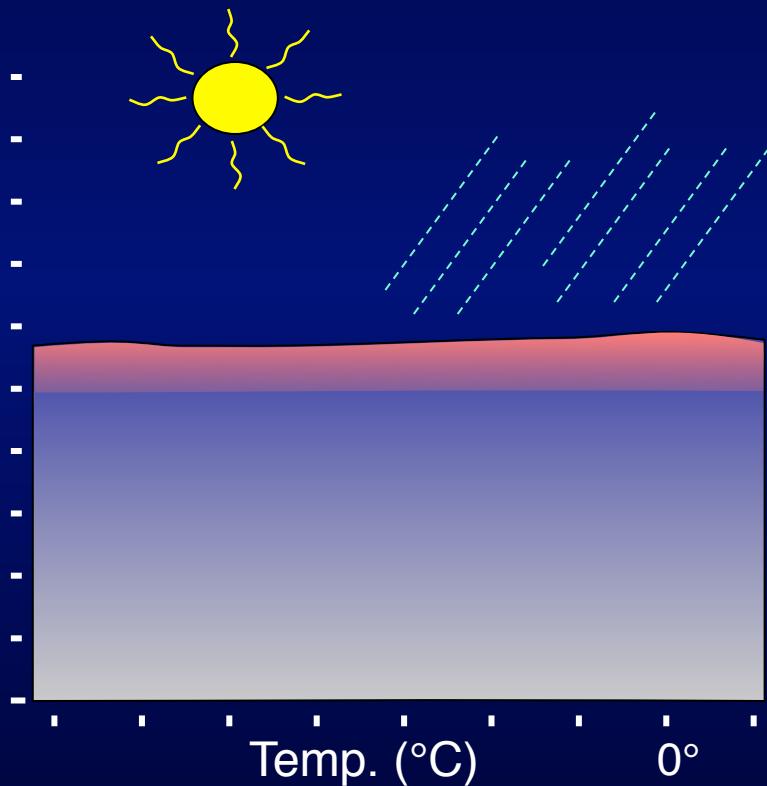


January 26 - February 13
February 13 - 18
February 18 - March 2
March 2-10
March 11-14
March 15-25
March 26 - April 11
April 12-23
April 23 - May 4
May 4 ↗ ?



NOT TO SCALE

Melt-layer Recrystallization



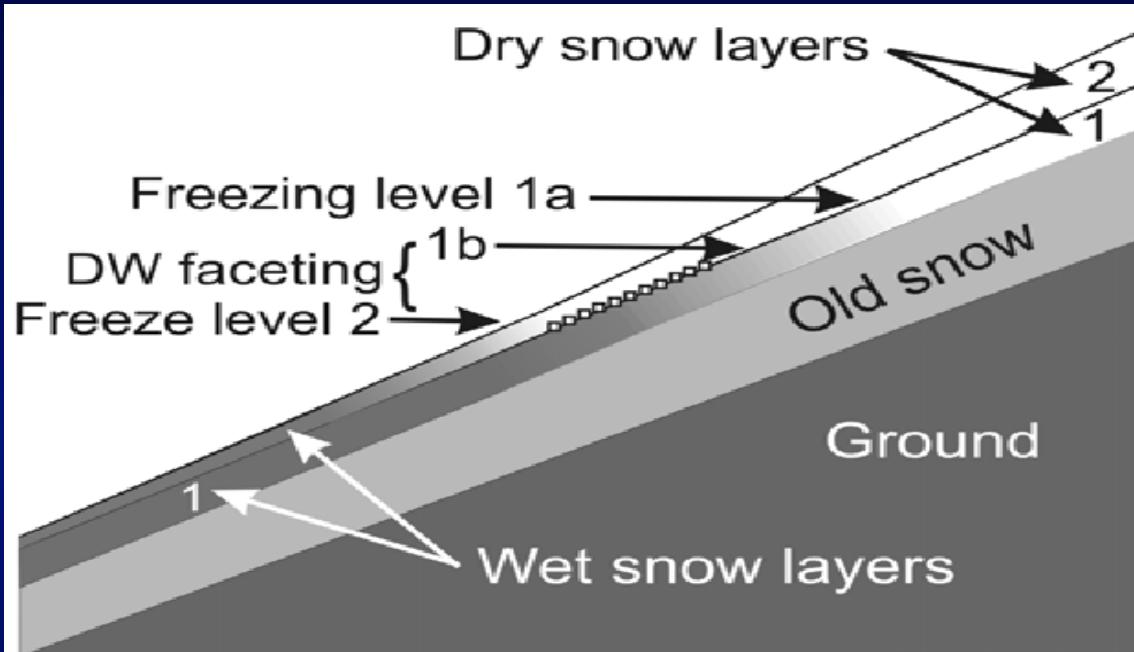


Fig. 4. Diagram showing that favourable conditions for dry-on-wet (DW) faceting occurs within a elevation band that is less than the difference in freezing levels in two consecutive

Graphic from Jamieson and Langevin, 2004

7202'

2195 m

4500'

1372m

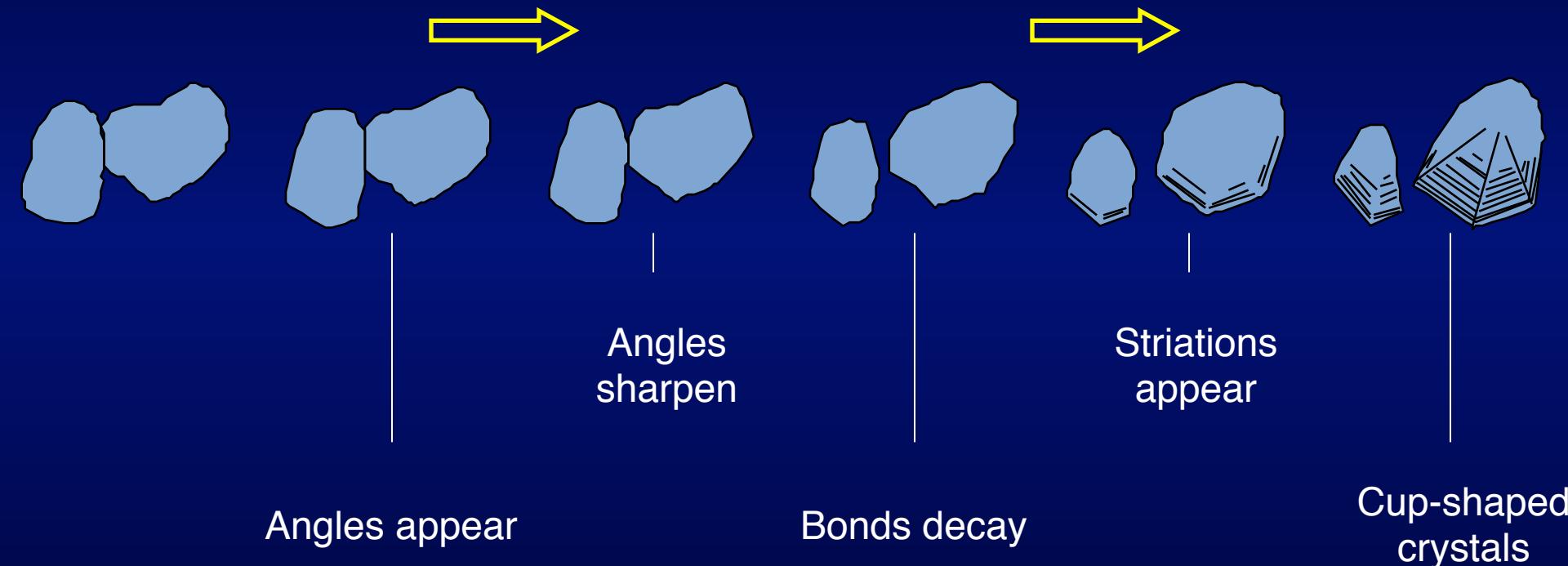
2500'

762 m

1600'

487 m







Wendy Wagner



Photo: Eric Poore

Dam Facets Grain Classification

□

▢

▢

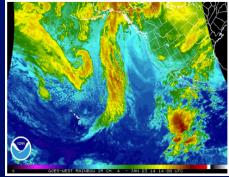
△

△

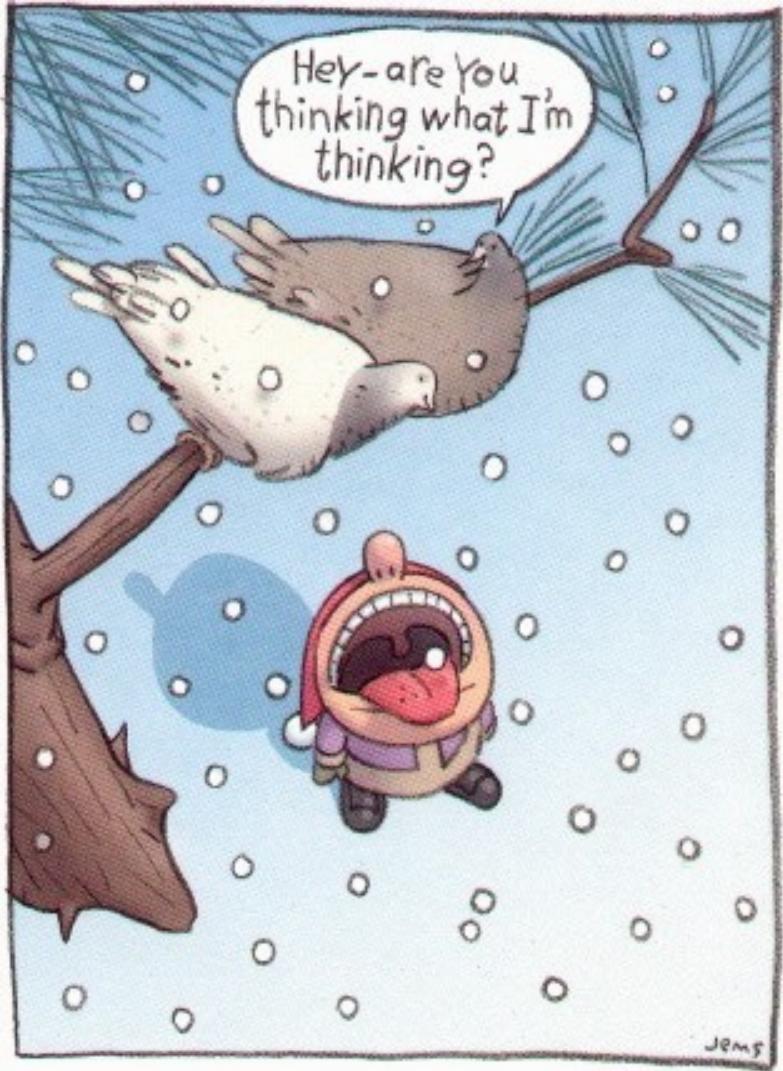
△



February 13 - 18
February 18 - March 2
March 2-10
March 11-14
March 15-25
March 26 - April 11
April 12-23
April 23 - May 4
May 4 ↑ ?



NOT TO SCALE





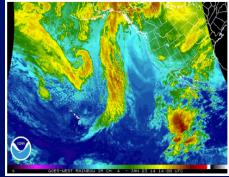
February 18 – March 2
March 2-10

March 11-14

March 15-25

March 26 – April 11
April 12-23

April 23 – May 4
May 4 ↑ ?



NOT TO SCALE



Snow Pit Profile

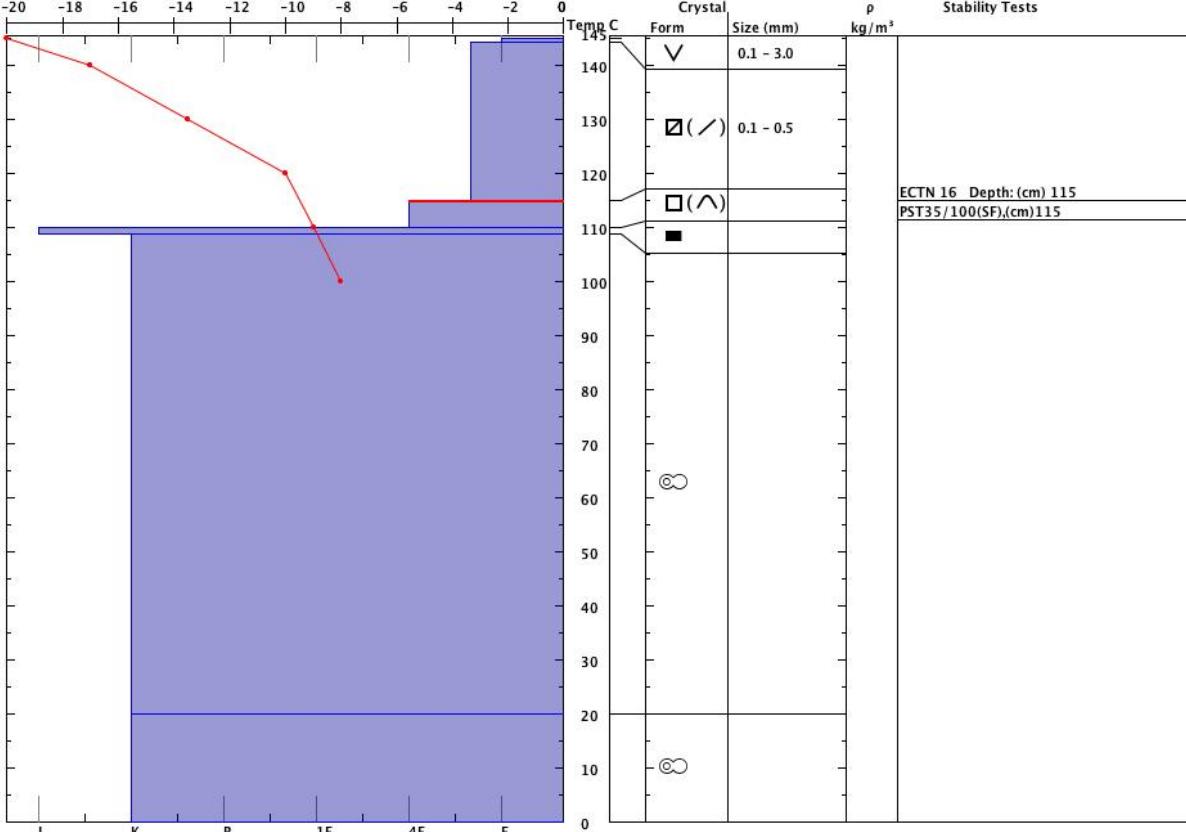
Observer: **Don Sharaf**
Stairway:2nd Bench Gully Mon Feb 24 16:05:00 AKST 2014
Chugach, AK Co-ord: N W
Elevation (ft) 2650 Slope: 31
Aspect: 350 Wind loading: previous

Stability on similar slopes: **Fair**
Air Temperature: -11.5 °C
Sky Cover: **Clear**
Precipitation: **None**
Wind: **Calm**

PF30 HS145
Stability Test Notes:
115: ECTP 14 SC nearby
115: same result X3

Layer notes:
110-115: Problematic Layer
tiny perc columns
0-20: alders in this layer

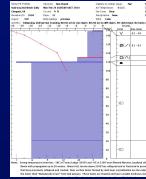
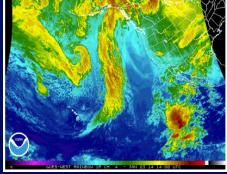
Specifics: **Collapsing, widespread. Cracking. Recent act on sim slopes. Recent act on diff slopes. We skied slope. Ski tracks on slope. Snowmobile tracks on slope.**



Notes: Strong temperature inversion. -18°C at Tsaina Lodge (1630') and -6°C at 3100' near Dimond Moraine. Localized collapses became widespread collapses above Second Bench with propagation up to 20 meters. Almost ALL terrain above 2500' has collapsed and or fractured in previous week. We were getting collapses in areas that have previously collapsed and cracked. Near surface facets formed by melt layer crystallization are the culprit and they lie 20-30 cm down on top of the meter thick "Damalanch Crust" from mid January. These facets are chained and have variable hardness, but most are striated and heading towards cups



March 2-10
March 11-14
March 15-25
March 26 – April 11
April 12-23
April 23 – May 4
May 4 ↑ ?



NOT TO SCALE



Photo: thebrigade.com

Snow Pit Profile

Cold Smoke-under LZ

Chugach, AK

Elevation (ft) 6200

Aspect: 320

Observer: Valdez Heli Ski Guides

Thu Mar 06 15:30:00 AKST 2014

Co-ord: N W

Slope: 33

Wind loading: previous

Stability on similar slopes: Fair

Air Temperature: -12.5 C

Sky Cover: Clear

Precipitation: None

Wind: Calm

PF50 HS385

Stability Test Notes: 49-49.2: 2mm thick

23: PC

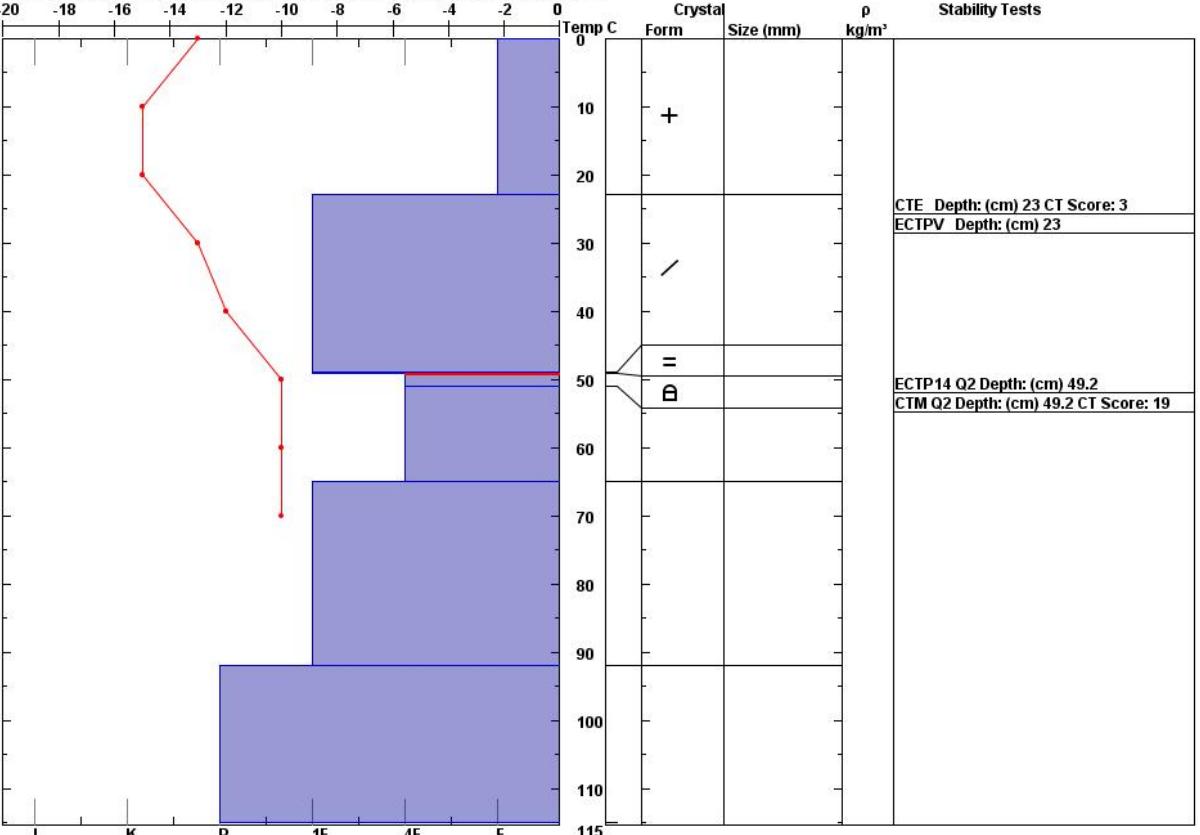
23: 8 taps

49.2: RP

Layer notes:

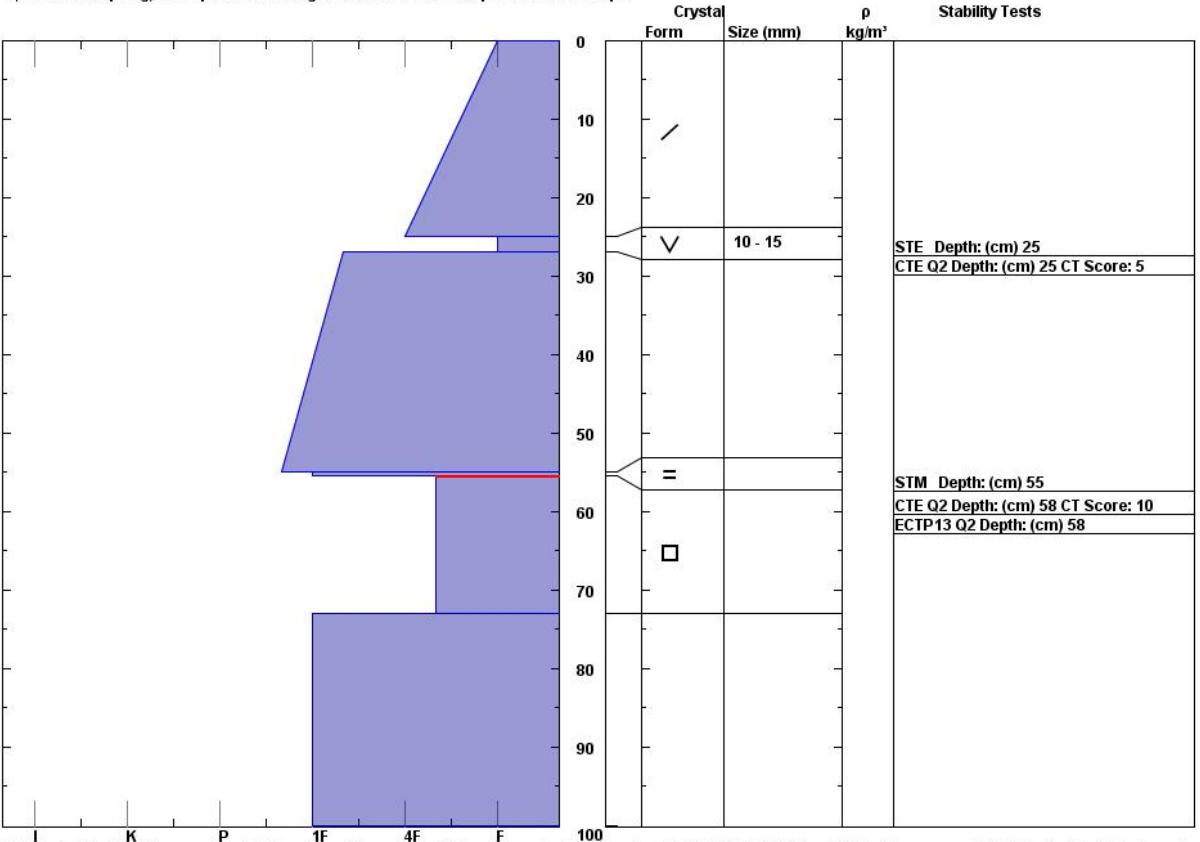
49.2-51: Problematic Layer

Specifics: Collapsing, localized. Cracking. Recent act on diff slopes. We skied slope.



Notes: Pit dug four meters below LZ. 38 degree slope cracked after third skier, but did not move. Skied lower angles the rest of the way down. Two remotely triggered avalanches running in buried SH and on Damnation Facets below 3500'. See pit from same day called Cold Smoke Lowers for more details.

Snow Pit Profile Observer: **Valdez Heli Ski Guides** Stability on similar slopes: **Poor**
Cold Smoke Lowers **Thu Mar 06 15:50:00 AKST 2014** Air Temperature: **C** PF60 HS237 Layer notes:
Chugach, AK Co-ord: **N W** Sky Cover: **Clear** Stability Test Notes: **55-55.5: decomposing**
 Elevation (ft) **3880** Slope: **33** Precipitation: **None** **55.5-73: Problematic Layer**
 Aspect: **10** Wind loading: **no** Wind: **Calm**
 Specifics: **Collapsing, widespread. Cracking. Recent act on sim slopes. We skied slope.** **73-100: 100 bottom of obs**



Notes: Quick pit on the way down to the valley. Two minutes later we remotely triggered a SS-ASr-R2-D1.5-O from 200 meters away. It failed in the facets but most of what ran was only as deep as the buried surface hoar 25cm down. Another 4m pocket pulled out on the way down and ran across very low angle terrain on the way to the valley bottom ~1200'. Sensitive snowpack overall particularly below 3500'. No buried SH in the pit below the LZ at 5900'



© Don Sharaf



© Don Sharaf



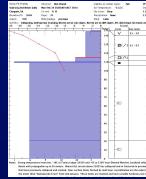
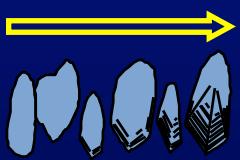
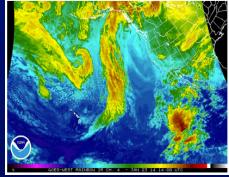
© *Don Sharaf*



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March 11-14
March 15-25
March 26 – April 11
April 12-23
April 23 – May 4
May 4 ↑ ?



NOT TO SCALE

Snow Pit Profile

Stairway: 3rd Bench

Chugach, AK

Elevation (ft) 2700

Aspect: 005

Observer: Valdez Heli Ski Guides

Tue Mar 11 11:05:00 AKDT 2014

Co-ord: N W

Slope: 32

Wind loading: previous

Specifics: Collapsing, localized. Cracking. Recent act on sim slopes. We skied slope.

Stability on similar slopes: Fair

Air Temperature: 0 C

Sky Cover: Fog

Precipitation: Snow - 2 cm/hr

Wind: S Light Breeze

PS40 HS155

Stability Test Notes:

25: twice

35: twice

91: SC both times

Layer notes:

0-25: rimed

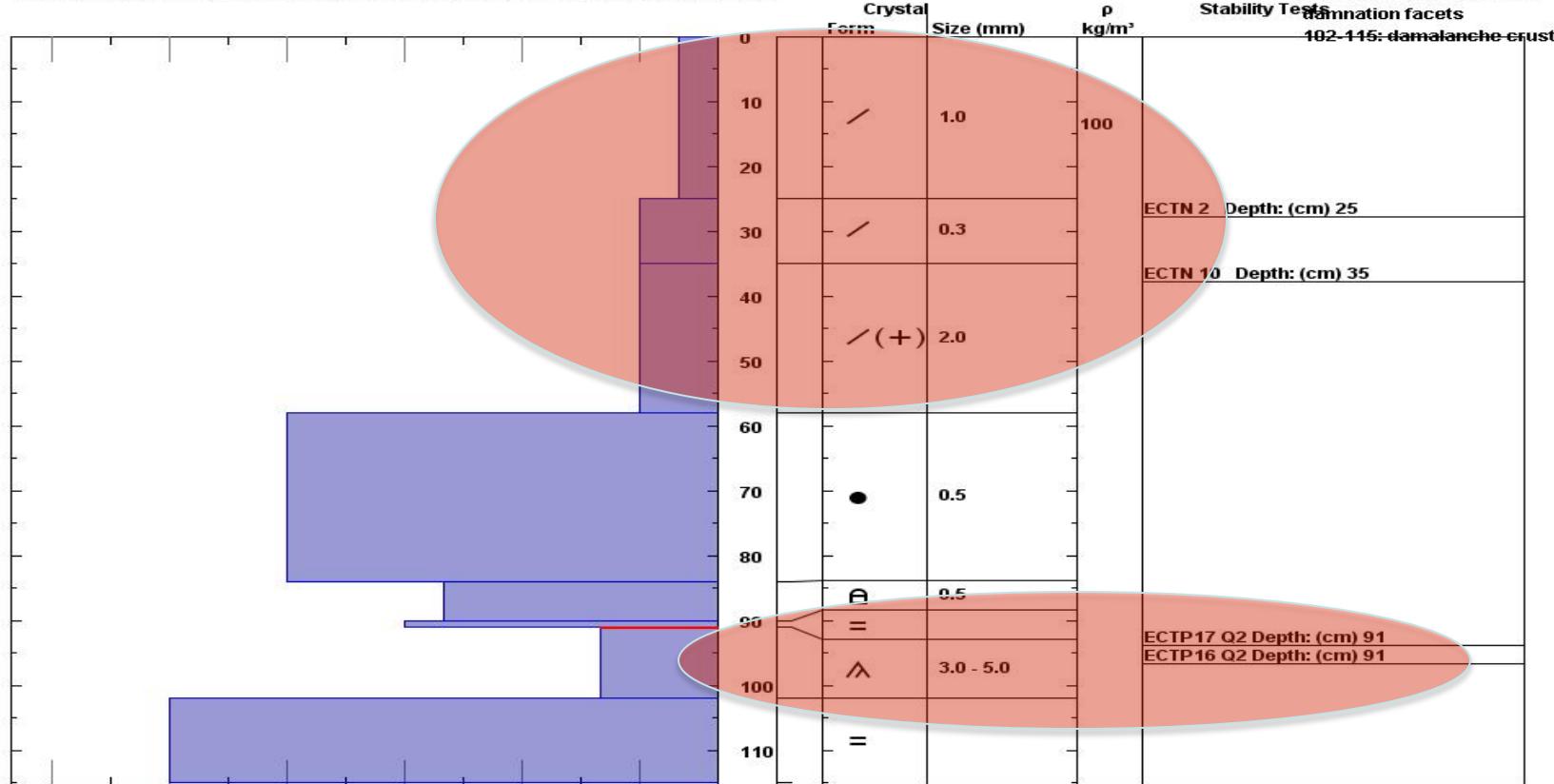
25-35: rimed

58-84: wind slab from 3/8

90-91: decomposing

91-102: Problematic Layer
damnation facets

102-115: damalanche crust



Notes: Localized four meter collapse and crack (dropped 2cm). Dug above the crack and found that it collapsed in the "damnation facets". Skiing on 3rd Bench

produced cracks, but no release on angles to 38 degrees. Second Bench a small pocket released on the fourth skier (65cm deep to dam facets) and only storm snow was moving on First Bench. HST from 1630 to 3000' averaged between 40 and 50cm. Estimated HSTW at base wa ~1.7" of water. Bottom of pit at 115 but "Damalanche Crust" continued to base of snowpack.

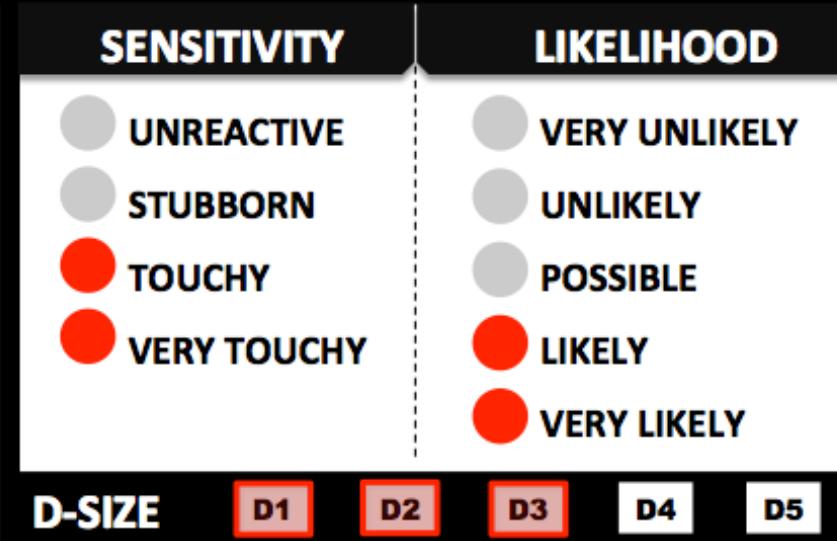
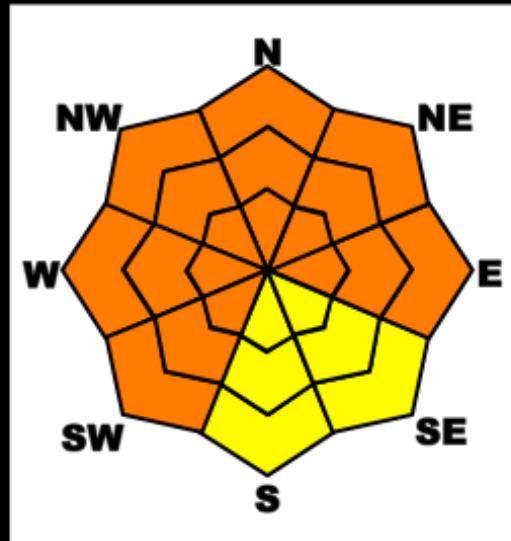


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CONCERN: Persistent

high  Confidence low

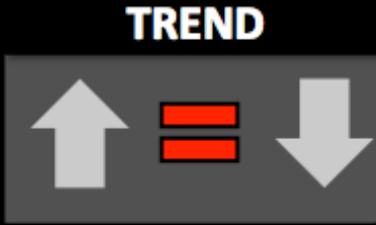


Buried 1-2cm tall surface hoar down 50-85cm overlies
Damnation Facets 5-15cm thick down 60-120 cm from the surface

Poor structure (4-5 Lemons), Moderate Strength,
Variable Friction (Angle and Slab Stiffness dependent)
High Continuity (Widespread Distribution)

Greatest Depths on W/NW/N
Most sensitive between 2500' and 4500'

DEPTH 60-120 cm



SUMMARY: CONCERNs

PROBABILITY

Sensitivity & Spatial Distribution

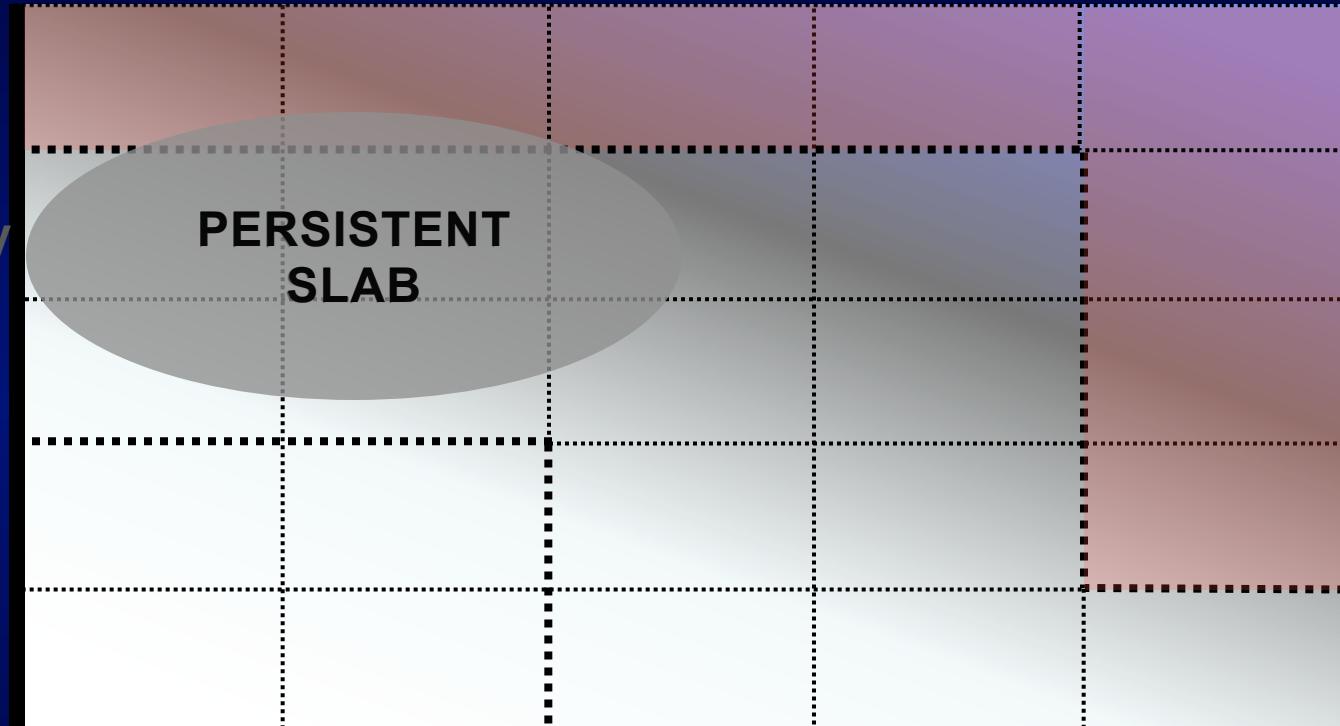
Very Likely

Likely

Possible

Unlikely

Very Unlikely



D1

D2

D3

D4

D5

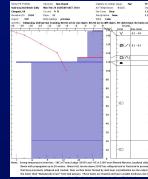
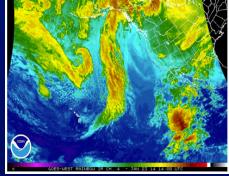
CONSEQUENCE







March 15-25
March 26 – April 7
April 7-23
April 23 – May 4
May 4 ↑ ?



NOT TO SCALE



VHSG AVALANCHE AND STABILITY SUMMARY

DATE MARCH 14, 2014

Regions Skied: Heli #1 Backcountry

Heli #2

Heli #3

GUIDE:	JZ/DS	KAK	DW	JKW			RCCON
RUN 1	BII-W	SWY W	BII W	SWY-W			REINSTEIN
RUN 2	KARAT 1	"	KARAT 3	"			
RUN 3	SWY-W	PERCH W	KARAT 2				
RUN 4			SWY P.W.				
RUN 5							
RUN 6							
RUN 7							
RUN 8							
RUN 9							
RUN 10							
RUN 11							

Comments can include avalanche activity, ski and boot pen., new snow depths, surface snow type, areas of recent wind load...

AVALANCHE LIST F/RECON

① RFS EXIT GULLY SS-AA-R1-D1.5
② CI SPLITTER RIDGE ENE
SS-N-R2-D2-0-80cm^t

③ C.I. FAR SKIERS (2) ^{W/S}
NORMAL POCKET
SS-N-R2-D2-0

④ CHERRY COULOIR
SS-N-R1-D1.5-0
Lower $\frac{1}{3}$ of couloir

⑤ ⑥ NICK'S
CENTER DOME
SS-N-D1.5-0-NE
SS-N-D2-0-NW

⑦ SHALLOW 15-20cm
WIND SLABS
ABOUT STEEP CAMPS
HS-N-R1-D1 x3

⑧ RFS LOWER
SS-ASW-R2-D1.5-0
DIC. 9 B.C. 150-200m away

⑨ STAIRWAY 4th Bench
SS-ASW-R4-D2-0 60-80
triggered from 2 miles away
MARCH 13, 2014 1500

⑩ Back 14 in Moraines
SS-N-R2-D2-0 60ft (x4)

⑪ Skier's (2) ^{W/S} of SWY-W COULOIR
SS-N-R1-D1.5-0 living storm

⑫ PROPOSED LAND-MIDDLE COULOIRS
SS-N-R1-D2-0 60ft

⑬ MARCH 12 - CAT E ROAD
SS-ASW-R3-D1.5-0 60-100 x2
DIC. 9 B.C. 150-200m away

⑭ RFS BOULZ
SS-N-R2-D2-0 60ft

⑮ BLACK HOLES
SHOTS - NO RESULTS
X3 MAGIC KINGDOM
JUDGES STAND







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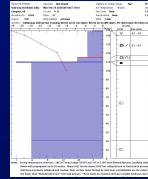
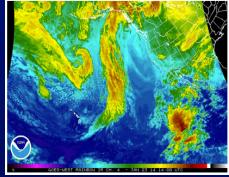


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March 26 – April 7
April 7-23
April 23 – May 4
May 4 ↑ ?



NOT TO SCALE



ARE WE GOOD, OR ARE WE LUCKY?

Defensive terrain choices have been important

Defendable ski cuts have been important

Recon has helped – dig as we move into new areas

High elevations have helped – be wary of runs with no high pick-up options

Don't be afraid to back off.

Remember persistent layers are persistent for a reason





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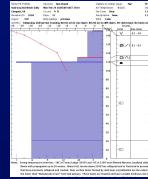
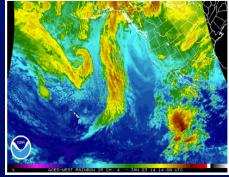


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April 12-23
April 23 - May 4
May 4 ↑ ?

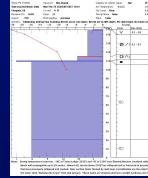
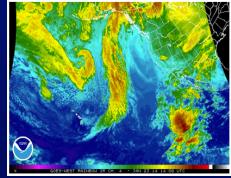


NOT TO SCALE





April 23 – May 4
May 4 → ?

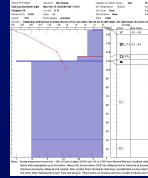
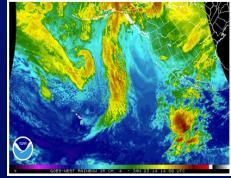


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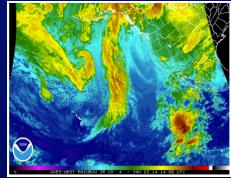


May 4 ↗?



NOT TO SCALE



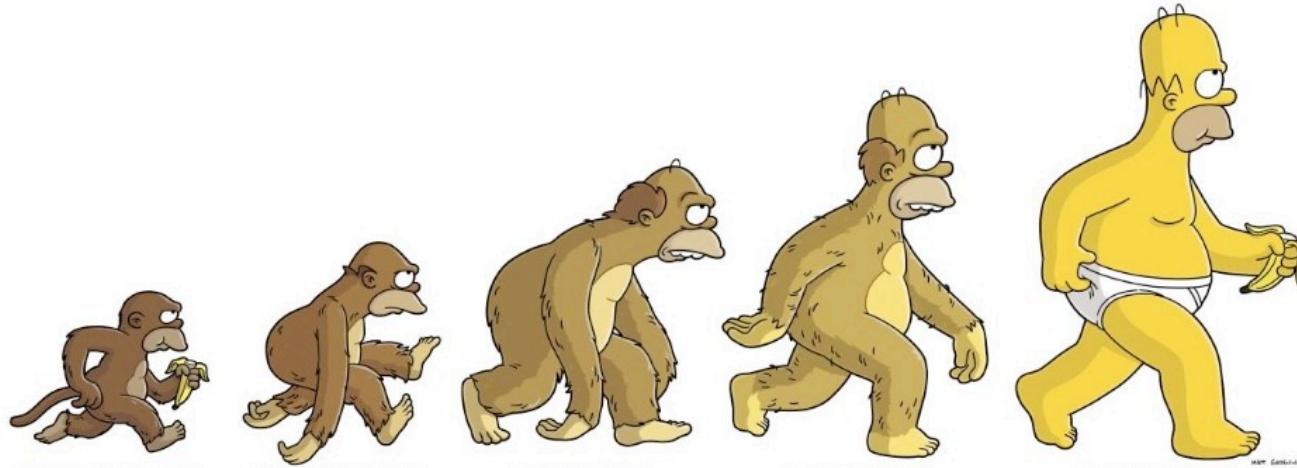


NOT TO SCALE

Forecasting Lessons



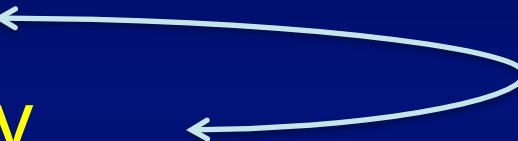
Evolution of a Weak Layer



HOMERSAPIEN

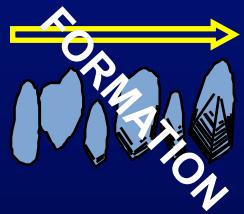
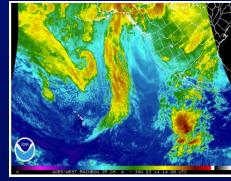
Evolution of a Weak Layer

- Formation
- Activity
- Dormancy
- Inactivity
- Removal

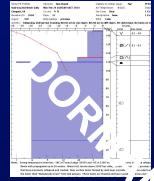




REMOVAL



FORMATION



ACTIVITY (#2)
DORMANCY (#1)



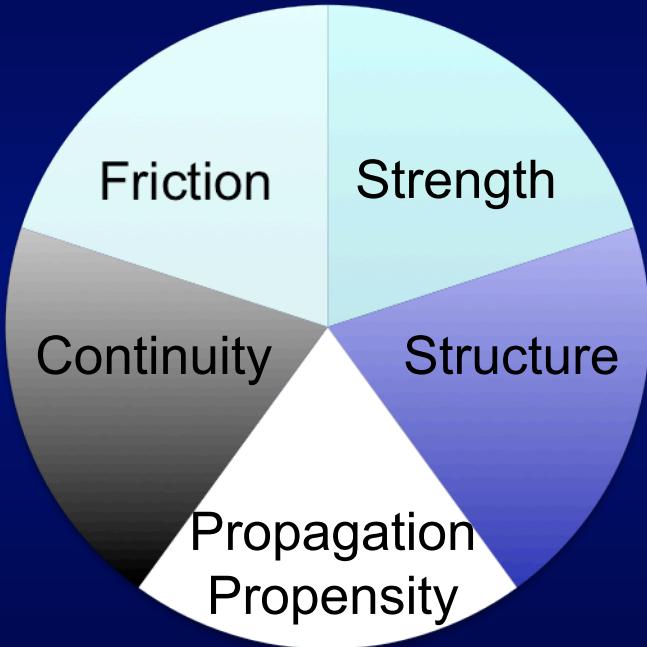
DORMANCY (#1)



ACTIVITY (#3)

NOT TO SCALE

Avalanche Release



What was consistent

Strength remained moderate for the vast majority of stability tests. Only far into the third dormant period did the strength move into the “hard” realm.

Strength had poor correlation with avalanche activity.

What was consistent

Structure was the most remarkable part of following this PWL.

Structure was “horrible” for months and more than any other factor demanded the continue wariness that we gave it.

As the structure changed VERY slowly it had poor correlation with avalanche activity.

What was consistent

Propagation lasted far longer than the avalanche activity.

The PST was helpful in discerning why we were often seeing propagation, but not release.

For this particular PWL, propagation in the ECT's was not a great index for avalanche release.

What was consistent

Continuity for this weak layer was exceptional.

Beware of Melt-Layer Recrystallization
distribution

Continuity of the slab was 'average'

Beware of times with high slab continuity

What was consistent

Friction was more dependent on slab stiffness and slope angle than on weak layer thickness, size, and shape.

Friction appeared to correlate with avalanche activity, but could not be viewed independently.

The Difference Between a Whumph and an Avalanche:

Why some avalanches need steeper slopes to run

Story by Ron Simenhois, Alec van Herwijnen and Karl Birkeland

Many avalanche-minded folks have noticed that new snow avalanches and old snow avalanches tend to prefer different slope angles. In fact, in Colorado – where many avalanches release on persistent weak layers – the Colorado Avalanche Information Center tends to remind people traveling in avalanche terrain to be cautious on slopes steeper than 30 degrees. The slope-angle thresholds used by avalanche centers increases as you travel west, and the avalanche problem migrates from wind and persistent slabs to storm slabs. Ian McCammon (2009) already pointed out that the minimum slope angle for avalanching is not the same for different weak layers. However, he does not explain the cause behind this phenomenon. Thus, the reasons why storm-slab avalanches typically run on steeper slopes than wind- and persistent-slab avalanches has remained elusive. We decided to take a few measurements and see what we could find.

For an avalanche to release, two things must happen. First, a crack must propagate through a weak snowpack layer over a large area. Second, the gravitational pull on the detached slab

Date	Slab hardness	Slab type	Weak layer	Friction coefficient [μ]	Sliding angle [deg]	Avalanche activity
19 Dec. 2011	1F-	RGwp	DF	0.65	33	High
14 Feb. 2012	P	RGwp	PP	0.57	30	None
14 Feb. 2012	P	RGwp	PP	0.60	31	None
21 Feb. 2012	4F+	DFbk	PP	0.80	39	High
21 Feb. 2012	4F+	DFbk	PP	0.79	38	High
22 Feb. 2012	4F	RGwp	DF	0.79	38	None
22 Feb. 2012	4F	RGwp	DF	0.75	37	None
11 Feb. 2013	1F	DFbk	DF	0.82	39	None
18 Feb. 2013	4F	DFbk	DF	0.88	41	High
21 Feb. 2013	4F+	DFbk	PP/DF	0.82	39	High

Table 1. Snowpack characteristics, related avalanche activity, and friction coefficient from the Kachemak mountain range in Southeast Alaska.

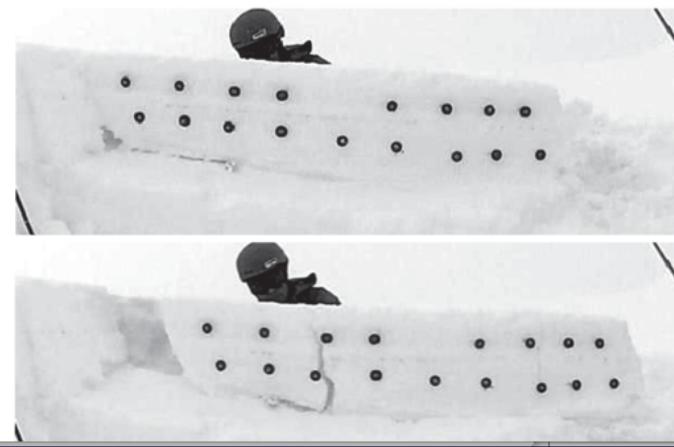
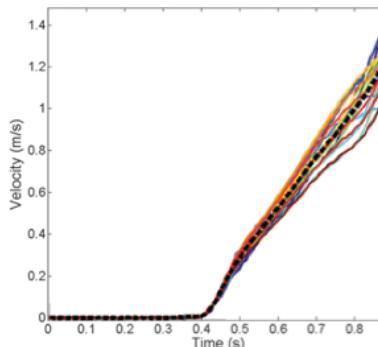
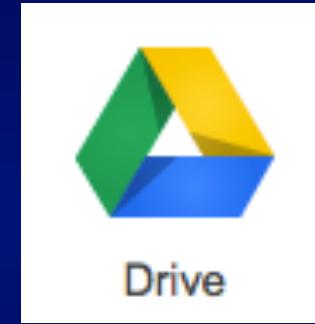
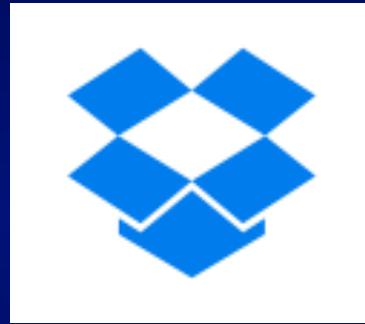


Figure 1. Right: Field setup of PST-like tests with markers. The images on the right are from a video sequence we used to obtain the friction coefficient. The top image is the last image before a fracture sets in,

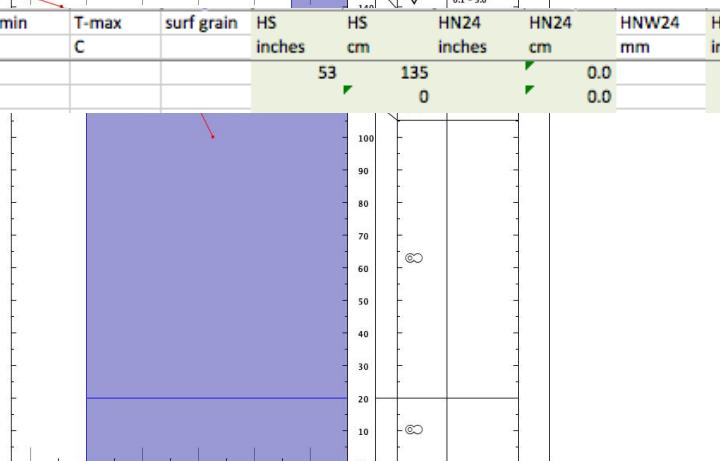
File Sharing



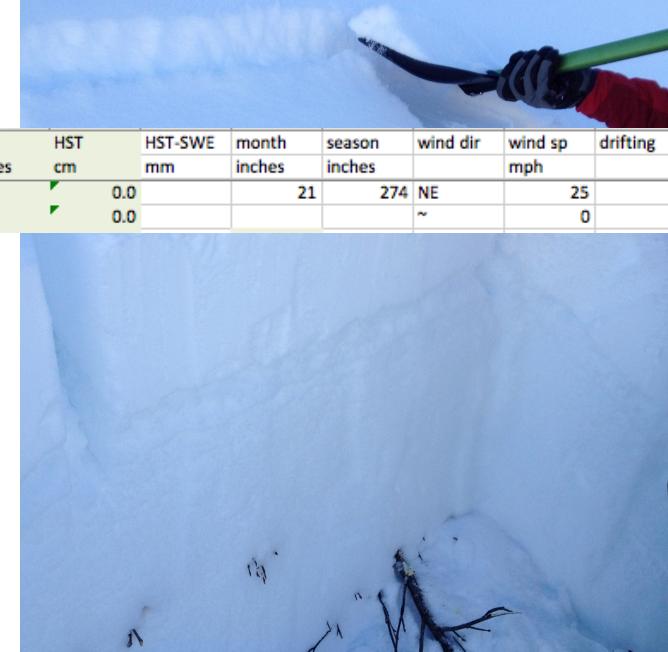
Keep a narrative account of the season

Date	time	sky	precip	temp	
Depth	Grain			Depth	Time
140224	600	CLR	Nil	-5	F
	1800	CLR	Nil	5	C
110	J	PST 35/100 SF	110 10.0		
109		X3	110 -9.0		
			100 -8.0		
20	K (2) 2.0	W 45 E			
	N.0				
0					
3100	E	80° PST 10/100 SF			
		16.20m 0.0, 17.27			
1726 @ 3100	O	0.4/10m W			
		16.02 TS=20 HF=26			
Widespread CO, CR up to 20m					
can be "porous" collapsed					
areas					
				GND	
Snow stability at this location:	F Very Good	4F Good	1F Fair	P Poor	K Very Poor

Snow Pit Profile	Observer:	Don Sharaf	Stability on similar slopes:	Fair	PF30 HS145	Layer notes:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Star 2 way/2nd Bench Gully	Mon Feb 21 14:08:50 AEST 2014		Air Temperature:	-11.5 °C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Chugach, AK	Co-ord:	N W	Sky Cover:	Clear	Stability Test Notes:	11-11.5° Problematic Layer																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Elevation (ft)	2650	Slope: 31	Precipitation:	None	11:5° ECT/14.5° nearby	tiny percol columns																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Aspect:	350	Wind loading:	previous	Wind:	Calm	10-12° alders in this layer																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Specifics:	Collapsing, widespread, cracking. Recent action on sim slopes. Recent action on diff slopes. We skied slope. Ski tracks on slope. Snowmobile tracks on slope.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190	192	194	196	198	200	202	204	206	208	210	212	214	216	218	220	222	224	226	228	230	232	234	236	238	240	242	244	246	248	250	252	254	256	258	260	262	264	266	268	270	272	274	276	278	280	282	284	286	288	290	292	294	296	298	300	302	304	306	308	310	312	314	316	318	320	322	324	326	328	330	332	334	336	338	340	342	344	346	348	350	352	354	356	358	360	362	364	366	368	370	372	374	376	378	380	382	384	386	388	390	392	394	396	398	400	402	404	406	408	410	412	414	416	418	420	422	424	426	428	430	432	434	436	438	440	442	444	446	448	450	452	454	456	458	460	462	464	466	468	470	472	474	476	478	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580	582	584	586	588	590	592	594	596	598	600	602	604	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700	702	704	706	708	710	712	714	716	718	720	722	724	726	728	730	732	734	736	738	740	742	744	746	748	750	752	754	756	758	760	762	764	766	768	770	772	774	776	778	780	782	784	786	788	790	792	794	796	798	800	802	804	806	808	810	812	814	816	818	820	822	824	826	828	830	832	834	836	838	840	842	844	846	848	850	852	854	856	858	860	862	864	866	868	870	872	874	876	878	880	882	884	886	888	890	892	894	896	898	900	902	904	906	908	910	912	914	916	918	920	922	924	926	928	930	932	934	936	938	940	942	944	946	948	950	952	954	956	958	960	962	964	966	968	970	972	974	976	978	980	982	984	986	988	990	992	994	996	998	1000	1002	1004	1006	1008	1010	1012	1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054	1056	1058	1060	1062	1064	1066	1068	1070	1072	1074	1076	1078	1080	1082	1084	1086	1088	1090	1092	1094	1096	1098	1100	1102	1104	1106	1108	1110	1112	1114	1116	1118	1120	1122	1124	1126	1128	1130	1132	1134	1136	1138	1140	1142	1144	1146	1148	1150	1152	1154	1156	1158	1160	1162	1164	1166	1168	1170	1172	1174	1176	1178	1180	1182	1184	1186	1188	1190	1192	1194	1196	1198	1200	1202	1204	1206	1208	1210	1212	1214	1216	1218	1220	1222	1224	1226	1228	1230	1232	1234	1236	1238	1240	1242	1244	1246	1248	1250	1252	1254	1256	1258	1260	1262	1264	1266	1268	1270	1272	1274	1276	1278	1280	1282	1284	1286	1288	1290	1292	1294	1296	1298	1300	1302	1304	1306	1308	1310	1312	1314	1316	1318	1320	1322	1324	1326	1328	1330	1332	1334	1336	1338	1340	1342	1344	1346	1348	1350	1352	1354	1356	1358	1360	1362	1364	1366	1368	1370	1372	1374	1376	1378	1380	1382	1384	1386	1388	1390	1392	1394	1396	1398	1400	1402	1404	1406	1408	1410	1412	1414	1416	1418	1420	1422	1424	1426	1428	1430	1432	1434	1436	1438	1440	1442	1444	1446	1448	1450	1452	1454	1456	1458	1460	1462	1464	1466	1468	1470	1472	1474	1476	1478	1480	1482	1484	1486	1488	1490	1492	1494	1496	1498	1500	1502	1504	1506	1508	1510	1512	1514	1516	1518	1520	1522	1524	1526	1528	1530	1532	1534	1536	1538	1540	1542	1544	1546	1548	1550	1552	1554	1556	1558	1560	1562	1564	1566	1568	1570	1572	1574	1576	1578	1580	1582	1584	1586	1588	1590	1592	1594	1596	1598	1600	1602	1604	1606	1608	1610	1612	1614	1616	1618	1620	1622	1624	1626	1628	1630	1632	1634	1636	1638	1640	1642	1644	1646	1648	1650	1652	1654	1656	1658	1660	1662	1664	1666	1668	1670	1672	1674	1676	1678	1680	1682	1684	1686	1688	1690	1692	1694	1696	1698	1700	1702	1704	1706	1708	1710	1712	1714	1716	1718	1720	1722	1724	1726	1728	1730	1732	1734	1736	1738	1740	1742	1744	1746	1748	1750	1752	1754	1756	1758	1760	1762	1764	1766	1768	1770	1772	1774	1776	1778	1780	1782	1784	1786	1788	1790	1792	1794	1796	1798	1800	1802	1804	1806	1808	1810	1812	1814	1816	1818	1820	1822	1824	1826	1828	1830	1832	1834	1836	1838	1840	1842	1844	1846	1848	1850	1852	1854	1856	1858	1860	1862	1864	1866	1868	1870	1872	1874	1876	1878	1880	1882	1884	1886	1888	1890	1892	1894	1896	1898	1900	1902	1904	1906	1908	1910	1912	1914	1916	1918	1920	1922	1924	1926	1928	1930	1932	1934	1936	1938	1940	1942	1944	1946	1948	1950	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028	2030	2032	2034	2036	2038	2040	2042	2044	2046	2048	2050	2052	2054	2056	2058	2060	2062	2064	2066	2068	2070	2072	2074	2076	2078	2080	2082	2084	2086	2088	2090	2092	2094	2096	2098	2100	2102	2104	2106	2108	2110	2112	2114	2116	2118	2120	2122	2124	2126	2128	2130	2132	2134	2136	2138	2140	2142	2144	2146	2148	2150	2152	2154	2156	2158	2160	2162	2164	2166	2168	2170	2172	2174	2176	2178	2180	2182	2184	2186	2188	2190	2192	2194	2196	2198	2200	2202	2204	2206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Notes: Strong temperature inversion. -18°C at Tsaina Lodge (1630) and -6°C at 3100' near Diamond Moraine. Localized collapses became widespread collapses above Second Bench with propagation up to 20 meters. Almost ALL terrain above 2500' has collapsed and/or fractured in previous week. We were getting collapses in areas that have previously collapsed and cracked. Near surface facets formed by melt layer crystallization are the culprit and they are 20-30 cm down on top of the meter thick "Dalmatian Chrome" crust from mid January. These facets are chained and have variable hardness, but most are striated and heading towards cups



20140224 – Clear and cold (-20 C). Light NW wind. No transport today. Backyard tour to 3100' on E. Dimond Moraine. Widespread CO (up to 20m prop.) above 2nd Bench. Widespread evidence of avalanche cycle at end of 2/14 storm –D1.5 avalanches and widespread old cracks even on low 30 degree terrain. Slab has disintegrated with NSF, so even though there is prop in some pits, it doesn't appear to be ready to avalanche currently (high friction?). FC/DH ABOVE Damalanche Crust are large, sharp, and striated. This layer will seemingly be with us for a long time. No other concerns other than this PWL. Want to see how this layer is distributed by elevation and throughout our other circuits.



Tracking weak layers

Pay attention to “All the pie slices”

Distill your observations into patterns and outliers. The narrative can help here

Document/Photo/Record the weird stuff.

Get out when “nothing” is happening.

Thank You

Mike Janes

John Fitzgerald

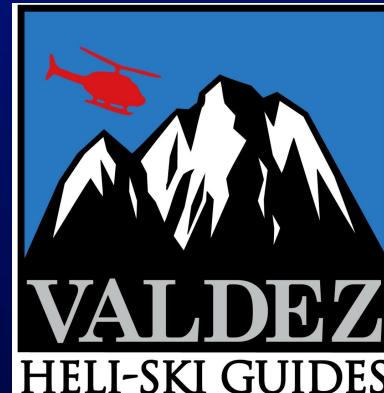
Doug Krause

Peter Carter

Ron Simenhois

Karl Birkeland

Andy Lapkass



QUESTIONS



Photo: Mark Bedenbender