

04/18/99 DYE-2 tasks

- Download new DYE prog
- retrieve last night's data.
- initialize dye GPS
- attach antenna
- attach GPS (+ wire)
- wind dir orientations
- other instr. orient.

DYE-2 DATA

awsJy299.dat

1998 JD 116, 1700

1999 JD 108, 1400

pit

cm	ft
0-10	3.35
20	3.09
30	3.52
40	3.53
50	3.77
60	4.36
70	3.00
80	4.20
90	~4.60

18 April
1999

also ~ 1.5 fm
Adg 2 + 2m fm
Adg 1

April 3 1999
04/03 Swiss pit

empty Kelly 713 gm

0.3 - 10.3

724 - 713

10.5 - 20.5

970

20 - 30

998

30 - 40

1061

40 - 50

1050

50 - 60

1100

60 - 65 + 168

427

R

Swiss sampled 250 gr/m³

177 g snow

80 cm mean snow depth

04/03

X

NMEA locations

↑ input

GPGGA h = in loc 40, min=41, sec=42

\$ = in loc 43

in 40 GPS status 1 = sat lock
= in loc 82

snow water equiv.

0-10 .211 g cm⁻³

10-20 .257

20-30 .285

30-40 .348

40-50 .337

50-60 .387

60-68

X

$$\frac{1.800 \text{ kg}}{0.6} = 3.0$$

300.

$$\frac{.917}{1000} \text{ ice}$$

water

04/16 Saddle Pit Densi
April 16 1999

pit ~ 70 cm E of
cutter 713 g
time 11:05 UTC

[cm]	char- acteristics	tare [g]	comm nts
0 - 10	ice	284	

fresh wind slab

10 - 20	"	324	
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20 - 30 - larger grains 306 sm w/it

30 - 40	wind slabs, sub mm 314	"	
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crusts

40 - 50	larger wind slab grains 337	"	
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50 - 60	Sugar finger hardiness, 313	"	
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depth hear

60 - 70	crust, firm, 2mm ice 349	"	
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6mm + $\frac{1}{2}$ mm at base, top

depth hear

70 - 80	3 mm + 1mm at base, soft 288	"	
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soft grains? > 1mm size

80 - 90	soft, soft, no layers 314	"	
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90 - 100	mtg. sugar, mtg. grain 344 + 364	"	
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beneath

Note: 53-57 ~ layers of depth hear

60-63 soft crust

1171

714

457

73-81

87-92

1077

714

714

1077

167-171 468 409 437 483

143-

depth [cm]	wt [g]	characteristics/ Notes
100 - 110	409	unit packed slab mixed grains 0.75m 3-4
110 - 120	391	" uniform
120 - 130	408	"
130 - 140	411	" harder
140 - 150	437	$\frac{1}{2}$ depth hear
150 - 160	463	$\frac{1}{3}$ depth hear
160 - 170	468	more layering
170 - 180	367	hard sugar
180 - 190	457	4-5 cm ab lens,

04/16 Saddle Pit Densities
April 16 1999

pit ~ 70 cm E of Adj 2

cutter 713 g

time 11:05 UTC

km	char.	tare cutter	comm. units
0-10	soft	[9]	284

fresh wind slab

10-20 " 324

20-30 - larger grains 306 sm void

30-40 wind slabs, sub mm 344 "

crusts

40-50 larger wind slab grains 337 "

50-60 Sugar, finger hardness 313 "

depth bar

60-70 crust, top, 2mm ice 344 "

6mm + 1/2 mm w/ lins, top

depth bar

70-80 3mm + 1mm w/ lins, sub 288 "

w/ lins? > 1mm out

80-90 soft, wet, w/ lins 314 "

90-100 wet, sugar, mat lins 344 + 364 "

benth

Notes: 53-57 ~ layers of depth bar, 714
60-63 soft snow 457

73-81

	10.23	9.23	WEI	1.577
27-92	10.23	9.23	WEI	1.577
	7.4	7.4	-7.4	7.4
157-169	167-172	468	409	437
143-				483

depth [m]	wt [g]	characteristics/ Notes
100-110	409	unit, form packed slab 3/4
110-120	291	formed grain, s. 0.5m "
120-130	402	" uniform
130-140	411	"
140-150	437	1/4 depth bar
150-160	463	1/3 depth bar
160-170	468	more layering
170-180	367	hard sugar
180-190	457	4-5 cm w/ 6cm,

04/21
04/22

04/21

light

04/22

NASA SE - Pit

nearby Agg 1 + 2
~ 1 - 1.5 m

04/21
21 April
1999

cm	g kg ⁻¹ m ⁻³
0 - 10	336
20	339
30	339
40	356
50	360
60	340
70	342
80	346
90	360
100	354
110	334
120	324
130	322
140	346
150	356
160	360

see Nic's field
book for orig +
stratigraphic notes.

05/03 April May GITs P. + 2
3 1999

~ 20 m from AWS.

depth	density	kg m^{-3}
0 - 10	330	
10 - 20	339	
20 - 30	319	270 - 280 405
30 - 40	324	285 - 290 396
40 - 50	351	270 - 300 420
50 - 60	343	
60 - 70	373	
70 - 80	282	
80 - 90	380	
90 - 100	390	
100 - 110	362	
110 - 120	310	
120 - 130	373	
130 - 140	321	
140 - 150	390	
150 - 160	383	
160 - 170	392	
170 - 180	385	
180 - 190	346	
190 - 200	403	
200 - 210	382	
210 - 220	387	
220 - 230	362	
230 - 240	370	
240 - 250	365	
250 - 260	398	
260 - 270	411	

GITS	PIT	I	04/29
Depth [cm]			kg/m ³
0 - 10	323		
20	313		
30	306		
40	343		
50	356		
60	315		
70	319		
80	347		
90	382		
100	444		
110	385		
120	362		
130	364		
140	353		
150	370		
160	364		
170	384		
180	428		
190	420		
200	418		

at 011

1400

flag

5 depth

shallow

from
remove

04/05 Humboldt Pt 4 May
depth [cm] P 1999

0 - 10	218
10 - 20	279
20 - 30	295
30 - 40	321
40 - 50	355
50 - 60	365
60 - 70	331
70 - 80	321
80 - 90	276
90 - 100	365
100 - 110	377
110 - 120	352
120 - 130	349
130 - 140	368
140 - 150	356

Strat

wind pack	0 - 15 cm
Depth hear	16 - 19 cm
melt layer	25 cm
soft slab	26 - 35 cm
melt layer	36
slab	36 - 48
2 cm melt layers	56, 61, 67
soft sugar	68 - 79 cm

nd, no

in 1 hr!

180 cm

4
1.
3
1
1.5
.5

Summit Pit.		112	May 12 1999
strat	z f		
0	0-10	311	
soft, some wind layers	20	324	
43	30	329	
more hard, winter	40	307	
56	50	341	
dense + sugar	60	251	
63	70	259	
re-crystallized	80	307	
69	90	336	
DH oar	100	358	
72	110	359	
re-crystallized	120	328	
finger band	130	326	
	140	314	
	150	332	
	160	366	
	170	365	
DH oar	180	384	
re-crystallized			
180			
from Nic's field book.			

DYE-2 Density

May 12
2000

	S.	
0	10	265
	20	367
	30	355
	40	338
	50	349
	60	322
	70	330
	80	326
	90	321
	100	285
	110	390
	120	397
	130	401
	140	410
	150	410
	160	410

D
Snow Pt 05/24
Swiss camp May 24
2000

0-7	fresh new snow	91-105	wp	ice crusts
7-15	wind pack (wp)	105-106	ice lenses	
15-	crust 0.5 mm	106-112	wp	sugary
15-19	wp	112.5 120	dh	sugary
19.5-21	Ice lenses	120	2mm	ice crust
21-27	wp	120-135		sugary pack
27	crust 1mm	137-142	dh	
27-35	wp			densities
36-38.5	Ice lenses as above	0-10	214	70-100
38.5-48	wp	20	250	110
48-50	Ice lenses as above	30	377	120
50-60	wp	40	393	130
60-70	wp hard	50	355	140
70-72	depth hear (dh)	60	374	
72-78	wp (hard)	70	348	
78-80	dh	80	365	

NGRIP

snow pit

06/15
2000

~ 50 cm

0 - 10

10 - 20

20-30

205

30 - 40
cm

1022 - 714 =

missing surface
measurements
:-)

May 13

Swiss Camp of snow pit cm

2, Koni did one.

1520Z - ~ 1630Z

0-10

384

20

401

401

Temperature (analog gauge)

30

385

40

423

50

418

60

918

70

376

80

359

90

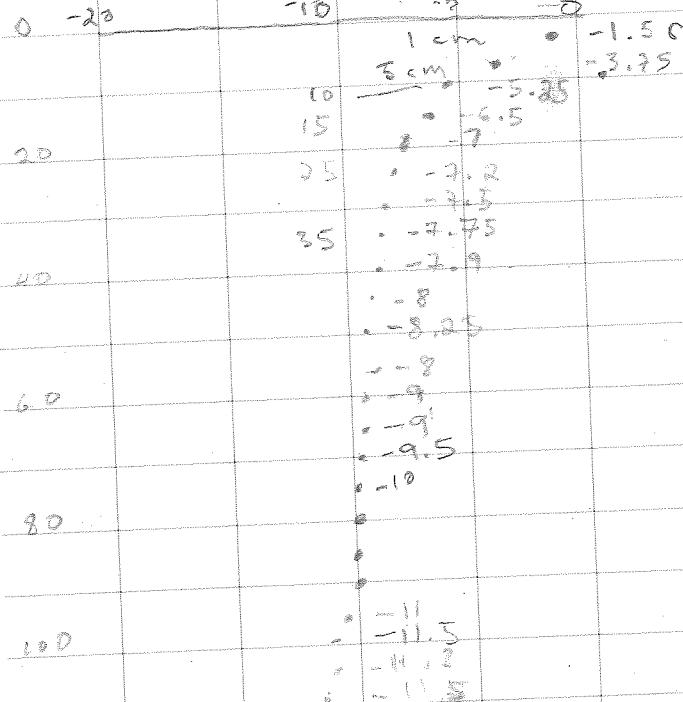
384

100

386

110

382



May 13, 2002

134 cm

deep snow

DYE 2 pit 5/26/05
May
~142

0-3 cm fresh snow,
surrounding surface is
smooth.

11-12 inclined crust

38 thin wind crust

55 chunky crust ~5mm

65 crust

70 "

97-101 hoar sugar

interval @ 110

117-120 hoar

120 + below = solid

melt layer at Δ
depth = ?

bonded
pits

Dye 2 Pit densities

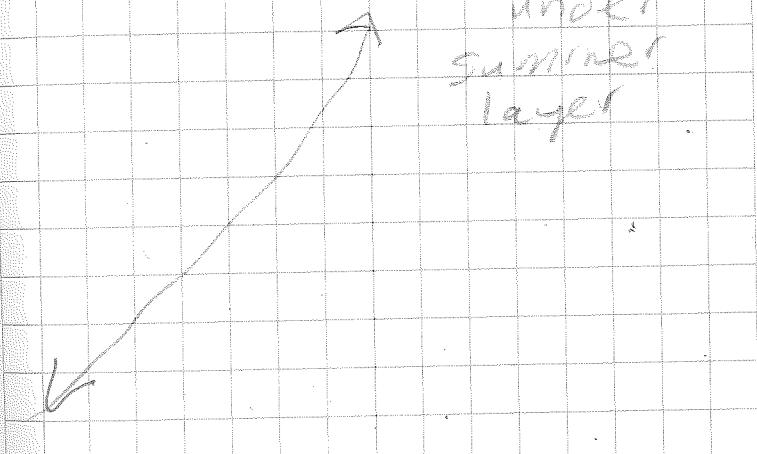
J. Box

5/26/05

	g/l
0 - 10	258
20	337
30	320
40	297
50	340
60	385
70	365
80	363
90	342
100	290
110	353
120	366
130	480

rough sample
of chunks

under
grainier
layer



densities		
swiss camp	T °C	g
	10	-8.1 1115
	20	-8.9 1031
	-30	-9.0 1058
	40	-9.4 1101
	50	-10.5 1125
	60	-10.5 1166
	70	-11.1 1203
	80	-11.4 252
	90	-11.1 247
	100	-11.1 251
	110	= 11.3 278
	120	-11.8 269 "This is totally
	130	-11.8 262 fucking sucks!"
	140	-11.6 260 N. Molotch
	150	-11.5 268
	160	-11.3 261
	170	-11.1 265
	180	-10.9 238
	185	g. 239
		1115 = 1031

pg 1 pg 2

swiss camp snow pit May 05 '05
 J. Box N. Molotch

0 new snow deposited yesterday
 - 8.5 - 12 cm wavy faint layer
 fresh snow

- 17 cm sugary
 - 21.5 cm

21 - 31 cm pencil hard wind
 jack
 underlain by ~ 8 mm hoar
 recrystallized, soft
 sugary down to 54 cm
 below 54 cm q melt
 layers each 1 - 2.5 mm
 thickness, separated by J. Box
 snow. See dig photo pg 5
 lowest layer soft in > 64 cm

densities
swiss camp 05/05/05 15' 2110, swiss camp snow pit

T°C	g	5 May 2005
0 - 10	-8.1	1115
10 - 20	-8.9	1031
20 - 30	-9.0	1058
30 - 40	-9.4	1101
40 - 50	-10.5	1125
50 - 60	-10.5	1166
60 - 70	-11.1	1203
70 - 80	-11.8	252
80 - 90	-11.1	247
90 - 100	-11.1	251
100 - 110	-11.3	278
110 - 120	-11.8	269
120 - 130	-11.8	262
130 - 140	-11.6	260
140 - 150	-11.5	268
150 - 160	-11.3	261
160 - 170	-11.1	265
170 - 180	-10.9	238
175 - 185	g	239

@ bolfoia, i.e. top

an later, T_{surf} 1° of corn
ice.
= -11.5

Time end. 21:30 Z

May 05 '05
J. Bok
N. Molotch

new snow deposited yesterday
- 8.5 - 12 cm wavy faint layers
fresh snow
- 17 cm sugary
- 21.5 cm

21 - 31 cm pencil hard wind
pack
underlain by n 8mm hoar
recrystallized, soft
surfing down to 54 cm
below 54 cm 9 melt
layers each 1 - 2.5 mm
thickness, separated by J. Bok
snow. See digi photo PA05
lowest layer soft firm = 64 cm

vague layer @ 75 cm, snow
above and below to
vague horizon @ 91 cm

5/9/05

SMS | maintenance

tower lean angle
= 12.5 using clinometer

36 cm = distance from
snow surface to junction

upper mast length = 224 cm

10 : Distance to sonic)

23.5 m distance to profile

arm & sonic side

$$\text{wind } 1 = 265 \text{ cm}$$

after lowering instrum.

$$wind = 126 \text{ cm}$$

$$T/H = 112 \text{ eV}$$

after

SMS 1 snow pit ^{M&J} 9/05
18%

<u>depth</u>	<u>g insl.</u>	<u>cutter</u>	T °C
0-10	2 3 2	-	0.6 @ 10 cm
20	2 4 1	-	0.4
30	2 5 3	-	9.2
40	2 4 3	-	9.5
50	2 6 2	-	9.6
60	2 7 2	-	9.8
70	2 6 4	-	10.0
80	2 6 5	-	10.0
90	2 6 0	-	10.0
100	2 6 0	-	10.0
110	2 5 8	-	10.0
120	2 6 9	-	10.0
130	2 6 5	-	9.9
140	2 6 8	-	9.8
150	2 4 6	-	9.7
160	2 5 5	-	9.7
170	2 6 7	-	9.7
180	2 6 2	-	9.6

Tsurf @ 18:55 = +12:5

pg 1
of 2

now
 plan is to extend
 NASA-U, collect data
 at NGRIP, extent @
 summit, overnight there.
 ~ NASA-U ~~~~~
 in 22:54 departure,
 3h25 m ground
 time.

before:

47 cm lower arm
 80 cm profile T/H 1

-21 cm = junction
 bottom of top mast

after:

367 = profile arm
 80
 $\frac{367}{27}$

NASA-U pit. May 5/25/2005
 S. Box 7ddg empty

depth	weight	z
0 - 10 cm	10	11
20	10	58
30	10	64
40	10	53
50	10	55
60	11	11
70	10	64
80	10	90
90	10	82
100	10	69
110	10	59
(120)	10	39
130	10	81
140	10	65
150	10	98
160		
170		

125 summer
layer

continued
on
next
pages

NGRIP

5/25/05

clock 1 min slow

cables causing lean

towards NNE 20° W
of mag N
 ~ 80 m
meas-
ured.

heights

bottom of profile: 30 cm

T/H 1 38 cm 78 cm 79.5

Wind 1 72.5

profile separation 121

T/H 2 198

Wind 2 +42 from
bottom

191 cm

NGRIP Pit 5/25/05

 $\sim 23:45\text{z}$

tare wt	717 g	$^{0.9}$ cutter
- 10	307	
- 20	361	
- 30	345	
- 40	314	
- 50	278	!
- 60	288	
- 70	407	
- 80	65-75	334
70-80	80-90	350
- 90		335
80-100		360
- 100		332
110		325
120		

layering; PIX taken

crust @ 8 cm; wind no? @ 15

1 mm white crust @ 36

soft snow above to 32

thin crusts 38, 39, 40

lg soft grains 52-55

top of summer @ ~~57~~ 57

thick crust @ 72

crust @ 85, 91

summer 2003 @ 105 117
dh @ 110, 2 cm dLQ

Summit Pit

5/26/05 ~52
 depth may cutter w
 0-10 986-714
 20 325
 30 363
 40 351
 50 301
 60 358
 70 335
 80 311
 90 294 ← summer '94
 100 324
 110 330 sugar.
 120 383 sugar.
 130 326 sugar.

Summit Stratg.

5/26/05

0-10 soft fresh
 10-15 layer
 15-24 layer
 24-46 wind crust incl
 46-58 fine, all fine above
 64 wind crust
 64-72 larger grains
 70-75 soft
 84 2 cm depth hor
 90 interface
 102 1.5 mm white
 crust, inclined.
 below 102 grains again
 larger.

summer layer @ 86?
 grains > 1 mm below 86
 " > 1.5 mm. @ 102

NASA - SE

- 0.8 cm fresh (g & sty)
- 0.8 - 1 changed) Fresh snow
- 1-2 metamorphic layer
- 15 cm weak layer
- 27-30 " "
- 42 crust
- 46-49 weak layer
- 67-68 harder weak lay,
- 105 wind crust
- 124-125 weak hard layer
- 139 chunky crust
- 150 hard surface
- 160 another harder



5/26/05

Jasin, Ross & Koni @ NASA SE

Depth Mass

0

10 1013 = 716

20 315

30 286

40 345

50 347

60 380

70 377

80 398

90 377

100 4100

110 363

120 370

130 1067 = 715 Depth base in lower 1/2

140 3597 just above crust & base

150 413 lower 1/2 base & ice layer

160 " " layer

Below 160 = melt complex & debris

Thick effort

debris Below melt complex

SADDLE Snow Pit
3/26/05

S. Box, R. H. ff

wind crusts ~ @ 16, 25, 34
37, and 52 cm depth.

Snow otherwise lacking
lack of stratigraphic
features above 50 cm

52 cm layer 2 mm
melt layer?

79 - 80 cm soft layer

86 cm soft layer

96 cm crust layer

107 - 108, 5 hoar layer

113 - 115 " "

hard firn @ 120 cm

121 - 125 melt complex

Depth	wt%	wt%
0	297	(311 corrected for buoyancy)
10	367	
20	337	
30	398	
40	346	
50	353	
60	394	
70	339	
80	371	water added
90	351	calibrated
100	373	water added
110	260	- 110 ft
120	222	
130	244	depth 312 ft

136 cm depth 312 ft

measured weight

- 121 - 125

below 125 cm

125 - 135 ~ 113

melt complex ~

0-10 cm 311 kg/m³
-20 367
-30 332
-40 398, 346
-50 353
-60 394
-70 390
-80 337
-90 351
-100 352
-110 260
-120 260 hoar
snow depth 122 cm