Form No. 144

Jan.—Feb. 1946.

FEDERAL-STATE COOPERATIVE SNOW COVER SURVEYS

FEDERAL, STATE AND PRIVATE AGENCIES

SURVEY NOTES

Snow Surveying is completely explained in Miscellaneous Publication No. 380, United States Department of Agriculture.

Brief Directions and Suggestions for Snow Cover Sampling

(1) The usefulness of snow cover surveying depends primarly on the care and honesty of the men actually doing the field work.

(2) The work of the snow cover surveyor is often laborious, especially in stormy weather, and men willing to undertake such work can usually be depended upon to do their best and record the results faithfully.

DIRECTIONS FOR USING THE SNOW SAMPLER

A. **Care of Sampler:**

(1) In transporting sampler, extreme care should be used to guard it against injury; it can be easily dented.

(2) When sampling on steep slopes do not cling to the sampler to avoid sliding down hill; the tube is easily bent.

(3) Keep the sampler covered inside and out with a thin coating of shellac or paraffin. The inside coating can be applied by pulling through a swab soaked or wet with shellac.[1] This coating not only prevents corrosion but tends to keep moist snow from adhering to the tube.

(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

B. **Measuring for Samples:**

Always start measurements for sampling from the initial point as shown by the sketch map of the course and follow the spacing for samples as indicated. Note any irregular spacing between samples. Care should be used in spacing by tape measurements, so that the samples taken different years on the same course will be at the same spots.

(1) Plunging the tube should be avoided. In driving, a steady downthrust is preferable to twisting, because with the latter a small amount of snow enters the slots. However, a minimum amount of twisting aids in the driving and also facilitates the quick cutting of the thinner crusts. Plunging should be entirely unnecessary. In case the sampler sticks or freezes down, a light twist will usually release it.

(2) The presence of temperatures below 32 degrees F. in the snow, while the temperature of the air is above freezing, often causes the snow to adhere firmly to the orifice of the cutter after a depth of from 10 to 12 feet has been reached. This difficulty can be met in three ways.

(*a*) Withdraw the sampler when cutter becomes clogged and clean cutter and tube thoroughly. Push the tube rapidly through the snow without stopping until bottom is reached but do not plunge tube. Repeat until a complete core is obtained.[3]

(*b*) In case sampling is being done in the forest, keep the sampler in the shade as much as possible to keep it cold.

(*c*) The best method of all is to sample when the temperature of
is at or below freezing, or late in the season when the temper-
deep snow has risen to 32 degrees F. At these times
nd rapid.

No.....

STATE PRINTING OFFICE

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

C. **Weighing the Sample.**

Before taking the sample, place the empty sample tube in the cradle hanging from the scales. If the Mt. Rose scale is used, turn the pointer back to zero. If the standard tubular scale is used, record the weight empty in proper column in field book. When the sample has been taken, place the sampler in the cradle and record the weight for tube and core. For the Mt. Rose scale this reading equals the water content of the snow core. For the standard tubular scale the water content is given by the difference between the reading empty and the reading for tube and core. The zero setting in the case of the Mt. Rose scale, and the "empty" reading for the standard tubular scale should be checked at frequent intervals (not more than 5 measurements).

If dirt is picked up by the cutter it should be cleaned out with knife before weighing the sample, and proper deduction made before recording length of core or depth of snow.

D. **Recording:**

The snow cover survey sheets are made in pads of two sizes, the smaller being white and the larger pink. Only the white waterproof pads are to be used for field notes. The larger pink pads are to be used to make copies from the white field sheets as soon as possible after each survey. Instructions regarding the disposition of the pink copy sheets will be issued for each State and where necessary for each drainage basin, since the needs will require some variation in this respect.

Appropriate covers are to be provided for protection of field notes. Sketch maps showing points of observation are pasted to the inside of the covers.

Use pencil only for recording field measurements. Fill in complete description of course, party, date, etc.

If the depth of core is very much less than the depth of snow, the reason should be determined and noted under "Remarks." In case of doubt regarding the core, determine the density (water content divided by depth gives density) and compare with that of other adjacent measurements about which there is no doubt. "Remarks" should include special items as to the character of snow, nature and condition of soil or other bottom reached by the cutter, whether wet, dry, frozen, etc.

Any extended remarks as to weather conditions at the time of survey or shortly before the survey, unusual difficulties encountered, etc., may be placed on the back of the sheet, as one side only is to be used in recording the snow measurements.

---

[1] Or paraffin.

[2] If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[3] A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

for ...
any *irreg...*

No............of............she...

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Donner Lake

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Drip Tank								
		D Iron		1.35				
				1.4				
		Wood		2.2		= 1.45		
			Snow Survey					
	1 +	47.5	38	68	89	21		New snow 13 in.
	1a	51	47	"				
		-1	-1					
	2	48	44	68	87	19		New s. 12 But 1.4 in fluffy.
		-.6	-.6					
	Dye button							Thin crust ½ in

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	3	49	48.5	68	88	20		
		-1	-1					
	4	46	42	67.5	85.5	18		
		-1.3	-1.3					
	5+	55	53	67.5				N.S. 13.3
	5a	56	52	"	89.5	22		
		-.3	-.3					
	6	53.5	47	67.5	86	18.5		
		-1	-1					
	7	49.5	45	67	88	21		New snow 11½ Core taken 4 in apart
		-.5	-.5					

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State .....

Drainage Basin .....

Snow Course .....

Party .....

Date .....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	8	52	47	67	87.5	20.5		
	9	44.5		67	83	16		
	9a	44.5	43					
		-.5	-.5					
	10	43.5	40.5	68	84	16		
		-1.5	-1.5					
	11	+44	36	67	83.5	16.5		
	11a	43.5	42	"				
		-1.5	-1.5					
	12	45	40.5	67	85	18		
		-1	-1					
		571.3				226.5	39.7%	D

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks

— Dye —

Jan 25 — 4:15 pm

Dye planted. Did not turn!

Jan 31 —

(A) New snow 5 in

Dye green-purple 1/2" button

(B) New snow 1 in.

Dye green purple 1/3 in

No new planting.

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Truckee R.S.

Party J.J. and T.E.C. ([illegible])

Date Jan. 31/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	31	28	82	92.5	10.5		
		-.5	-.5					
	2	47		82				
	2a	34	28.5	"	94	12		
		-1.5	-1.5					
	3	39	36	82	94	12		Near a 9 in. crust [illegible]
		-.5	-.5					
	4	37	33	82	93	11		Coarse crystals
	5	37	36	82	96	14		
		-.4	-.4					

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State .....

Drainage Basin .....

Snow Course .....

Party .....

Date .....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
7		35	34	82	95	13		
		-1	-1					
6		34	28.5	82	92.5	10.5		
		-4	-4					
8		30	28	82	91.5	9.5		
		-1.5	-1.5					
					Bottom dry ground			
		27.62			92.5			
		33.9				11.6	34.2%	D

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks

— Dye — Jan 25 – 31?

Planted Jan. 25. after dark –
"Temp. was cold"

(a) New snow 1½ in –
Purple crust ½ in

(b) "

No new planting.

H–T running.
No check!

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STATE PRINTING OFFICE

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Calif

Drainage Basin: S. J. River

Snow Course: Summit

Party: Da Church P.E. + H Chase + J.J.

Date: 2-1-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	62	61			27		Dirt
Key	2	82	80			32,5		"
	3	86	85			31		Rock
Course	4	84	81			32		"
	5	81	78			32,5		Dirt
	6	82	79			33		Ice
	7	86,5	84			34,5		"
	8	82	80			34		N.DLES
	9	91	87			37		"
	10	86	85			36		"
	11	90	87			36,5		Dirt
	12	89	85			37		"
	13	82	78			32		Ice
	14	77	75			31		Dirt
	15	78	75			30,5		"
	16	79	76			31,5		Ice

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Calif

Drainage Basin: S. Y. River

Snow Course: Summit

Party: B Eddy & H Chase Dr. Church & J J

Date: Feb-1-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
17??	16	85	82			34.5	~~[illegible]~~	Ice
18??	17	89	86			35		"
19??	18	76	75			32		"
		1566.5				629.5		
		82.4				33.1		40.2% D
						73.2%		of N

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FORM 130

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING
SACRAMENTO

CALIFORNIA COOPERATIVE SNOW SURVEYS
SNOW SURVEY NOTES

Drainage Basin Yuba River

Snow Course 2099 Springs

Party D. Eddy, W. A. Chase

Date Feb. 1-46

*Description or Number of Course (1)	Sample Number (2)	Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 x (6)/(4) (7)	Remarks
	1	25	70	67	31		Dirt
	2		69	66	30		Ice
Key	3		66	66	32.5		Ice + Dirt
	4		66	65	31		
Course	5		67.5	65	31.5		Grass
	6		72	70	31		
	7		74	72	33		
	8		74	71	31.5		
	9		78	76	35		
	10		74.5	74	32.5		Dirt
			711		319		
Avg.			71.1		31.9	44.8 % D	

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 0° E," etc.

§ At times start measurements for sampling from the *initial* point as shown on the sketch map of the course and follow the spacing for samples indicated by the circles. Particular care should be taken to note irregular spacing between samples.

No. ..... sheets. Comp. by ..... checked by .....

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STATE PRINTING OFFICE

FORM 120

STATE OF
DEPARTMENT OF P.
DIVISION OF WATER R.
401 PUBLIC WORKS BUILD.
SACRAMENTO

CALIFORNIA COOPERATIVE SNOW SUR.
SNOW SURVEY NOTES

Drainage Basin S.F. River

Snow Course Forebay Flat

Party L. Eaby & A. Chase

Date Jan. 30 46

*Description or Number of Course (1)	Sample Number (2)	†Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 × (6)/(4) (7)	Remarks
	1	200	91	89	36		Dirt
	2		91	88	36		"
Key	3		92	87	36		"
	4		91	87	35		Grass
Course	5		90	93	34		"
	6		93	86	37		Dirt
	7		92	85	36		"
	8		90	84	35		Ice
	9		90	83	35		"
	10		91	85	35		"
	11		90	82	34		"
	12		91	84	34		Dirt
	13		91	83	34		"
	14		92	84	35		"
			1275		492		
Avg			91.1		35.1		38.6% D

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No. ..... of ..... sheets. Comp. by ..... checked by .....

State Calif.

Drainage Basin

Snow Course Donner Pass

Party Dr Church

Date 2-1-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	30	29			11,5		Rock
	2	34	33			14		"
	3	53	52			22.5		"
	4	74	73			34,5		"
	5	36	35			15		"
	6	44	42			18		"
(?)	7	148	101			71		Ice
		419				186.5		
		59.9				26.6	44.4% D	

Temp. —
All snow at all
Courses dry crushes.
See snow thermogram
1ft beneath surface of snow.

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Form No. 144 — January 1946 —

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(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

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(*b*) In case sampling is being done
in the shade as much as possible t

(*c*) The best method of a
the air is at or below freez
ature of the deep snow
sampling is easy and r

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

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---

[1]Or paraffin.

[2]If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[3]A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Soda Spgs No. 1

Party JJ + VEC

Date Jan. 10, 1946

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	70.5	57.5	82	105	23		
	2	85	77	82	117.5	35.5		
	3	80 -1.5	77 -1.5	81.5	114.5	33.0		
	4	77	72.5	82	117.2	35.2		Coarse crystals — Moist
	5	73	69.7 +1	82	112.2	30.2		
	6	71	69.5	82	112	30		
	7	83 -.5	81 -.5	82	116.5	34.5		

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No. 1 .... of .... sheets. Comp. by .... Checked by ....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	8	80	75	81	113	32	40	
		-.3	-.3					
	9	86	81.5	82	118	36		
	10	84	78.5	82	117	35		
		-1	-1					
	11	86	76.5	81.5	114.5	33.0		Bottom coarse. Dry crunchy. Soil barely moist
		-1.5	-1.5					
	12	82.5	80.5	82	113	31		Soil muddy
		-2.3	-2.3					
	13	90.5	80.5	82	117	35		
		-1.7	-1.7					

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No...........of...........sheets. Comp. by......................Checked by..............

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State

Drainage Basin

Snow Course Sodan Sfgs #1.

Party

Date Jan. 10, 1946.

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
		— Old	Snow		—			
	2	77.5	73.6	81.5	115.5			
		-.8	-.8					
	3	69	64.8	82	112			Dirt dried out
		-1.2	-1.2					
	6	68	61	81.5	112			Moist sod Warm snow frz to sampler.
		-1.2	-1.2					
	8	69		81				"

air temp. 24°F

Abandoned till Tomorrow.

Sam, Contractor at Castle Peak Creek, says bottom 8" of snow is still moist, but remainder dry, cold

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Truckee R.S.

Party ....

Date Jan 11, 1946.

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
1		— Dye Stations —						
Dec 29		30.5		8 in felt – in old snow				
Sheds	D, New snow				8 in.			10% intensity
Dec 29		40		Zone 1 ft above gd " 10%				
Same	D new snow				12 in			
			"		14 in above gd			
		Ice on bottom.						
Drip Tank				2.53 (?)			See Report –	
		Scant increase since						
		Dec. 29.						
		Tank capacity still large –						
		Only 2½ in. in 24 or 36.						

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ...... of ...... sheets. Comp. by .... Checked by ....

Quiet here but wind flurries on summit.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Donner Lake

Party ....

Date Jan. 11, 1946 7 pm.

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks

– Drip Pan –

D – 1.5 in. No increase at all.

– Dye –

Jan 3 (?) No color. Did we plant any?

D. 46.5 in. – Bottom cold. Dry crusher.

Orig. dye during rain. Dye to bottom. Still Red. Shows moist packs – a bit more under the tree canopy than the "dye of Jan 3" – No runoff here. Only slight at Truckee.

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......................Checked by.......................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Soda Spgs Pasture

Party J.E.C.

Date Jan 13/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core			
			Study of Cores					
No	5	66		First 1 in moist packs				
				" 36 in dry crushes				
				Remainder				
				moist crushes				
				and moist packs.				
				One crust refuses				
				to crush.				
	10	69	1/2 ft	Dry crushes				
			1 1/2 ft	Dry loose crystals				
			1 ft	Refuses to crush				
			1 ft	Dry crushes				
			1 ft	Refuses to crush				
			1 ft	Moist packs. Red				
				under pressure				

Dryness goes steadily down
then to damp ?

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

J. Marr

No..........of..........sheets. Comp. by....................Checked by....................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Soda Spgs #1

Party JEC

Date Jan 13/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
		— Dye —						
Stakes								
undated		65				No	color	
		64						
Dec 31/45		64				No	color	
						"	"	
		67						
Jan 3/46		78	11 in	down		(beneath		
		new snow)	an	ice		button		
		5%	red - 1 in	thick				
		~~[illegible]~~	Bottom	of core		in an	inkbl[illegible]	
Jan 3/46		83				No	color	
		Soil	moist -			Snow	crushes.	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.............of............sheets. Comp. by.......................Checked by.......................

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Soda Spgs No 1.

Party ....

Date Jan 14 | 46 Drift Snow —

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Drift	1	22.3	21.3	82	90	8	35.9%	New snow windblown
	2	22.3	22	82	90	8		Same spot

In cut made by bulldozer searching for drag.

— Dye —

Jan 13 Penetrated 2 in. 90% beneath surface. Gray at surface. Color Max temp. 52°F.

at 6 in purple at 19° F

— Temp —

at bottom from Jan 13 32°F

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by..........Checked by..........

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
— Drip Tank —								
Iron	15.78			Wood				
	15.90							
	15.80			16.53 = 15.80 in				
Now 4:40 pm								

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.......of.......sheets. Comp. by..........Checked by..........

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin S. Yuba

Snow Course Soda Spgs #1

Party J. E. and C. H.

Date Jan 15/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	62	67	82.4	104.2			Soil almost dry
	1a	78 -1	77 -1	"	112.5			
	2	82 -1.8	81 -1.8	no	115.5			Soil moist
	3	73 -1	71 -1	82	112.4	30.4		Soil almost dry Snow moist packs
	4	74 -0.4	70 -0.4	82	113.5			Bottom 2" wet moist packs

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 1 of .... sheets. Comp. by................ Checked by................

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin S. Yuba

Snow Course Soda Springs No. 1

Party Clyde Hamstead, J. E. C.

Date Jan. 15/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	5	70.5	64.5		114			Moist pears at bottom – Then refuses finally crushes
	6	75 -1.5	69.5 -1.5	82	113.5	31.5		moist ^ Dry turf
	7	79 -.4	71 -.4	"	116	34		Moist turf Snow refuses or crush – pears
	8	74 -1.5	71 -1.5	82	111			Sod wet

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 2 of ...... sheets. Comp. by .... Checked by ....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California
Drainage Basin S. Yuba
Snow Course Soda Spgs #1
Party Clyde Houston, JEC
Date Jan. 15/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	81	77	82				
	Snow freezes to outside of tube							
	9a	82	76.5		119	37		
	10	86 -1	78.5 -1	"	117	35		Soil moist
	Snow freezes to outside of tube							
	11	87 -1	78 -1	82	116			Sod damp
	12	78.5 -1.5	73 -1.5	"	113	31		Moist soil
	13	80 -.8	79 -.8	82	112.5	30.5		"

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 3 of .... sheets. Comp. by .... Checked by ....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin S. Yuba

Snow Course Soda Springs No. 1

Party Clyde Hanstate, J.E.C.

Date Jan. 15/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Drift		31	29.5	82	92	10		
W of Plat-form		33	32.5	"	93.5	11.5		

Drift or residual of eroded snow field?

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date Jan. 25 / 1946

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Donner Pass								
Drip Tan			D.	1.27			1.25	
				1.25			1.25	
				1.24				
				1.25				

Dye
Planted Jan 14
Jan 25 Covered by
8-9 in new snow
(green) cold, Snowfall
3 in - Dye descended
1/2 in - Purple, In an
ice stratum.

New dye Jan 25 - Surface
green in east wind
Sun oblique.

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......................Checked by....................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Donner Lake

Party ....

Date Jan 25/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Drip Tank								
			D,	0.145				
				0.145				
				0.145 (?)				
				0.145				

Dye Dec. 29.
Depth 38", Dye to bottom
very crushes
Pink-to purple *

New dye Jan 25
Green - Shade -
Sun down

* New dye on this core remains green -
Does it take much lower than 32°F to
turn red to purple or even green again?

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......................Checked by..........

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Donner Lake

Party ....

Date Jan 25/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	2	46	44	82	96	14		
	2a	46	45	82	101	19		
		-2	-2					
	3	48	46.5	82	104	22		
		-1.2	-1.2					

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No............of............sheets. Comp. by........................ Checked by........................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Truckee R.S.

Party By U.S.F.S.

Date Jan 25/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Drip Tank								
1946								
			Dpth					
Jan	4		2.2		.39	10:30 am		
	6		2.2			1:00 pm		
	9		2.21			2:15 pm		
	11		2.3			4:30 pm		
	16		2.3			9:00 am		
	24		2.35			9 am		
	Snow settled 4" in last							
3 days.						Jan 31 —		
	25		2.38			0.33.9 in		
New dye (Jan 25) remains green.								
snow hard and dry.								

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......... Checked by..........

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin Precip Gages

Snow Course ....

Party ....

Date Jan 26/46 3pm

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Pasture								
	No. 7		Reading sheet				8.23	
			(8)				Rewound.	
	8		D	8.6		W	10.18	
	6		D. 9.08			W	10.68	
			a thin disk of ice					
			6 in. diam					
Jan	27/46						12.55	
	9		D 10.0			W	12.55	
				Ice disk 7" diam				
	10		D. 8.9			W 11.30		
				Ice disk 7½" diam				

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date Jan 27/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	11. (Sacto)				D. 7.50 in			
Hotel	2 - Stevens (W)				D	15.85		
					Ice. Broke by jabbing			
	3	Engs. NE			D	17.4		
				Some ice but				
		pervious.						
	4	D. 9.6			W	11.59		
			Ice disk 5 in diam					
	SS (Stevens Swan)							
		D-9.38			W	14.17		
			No ice					
	2X8				D 9.1			
		No ice						
	4X8				D. 9.8			
			Trace of ice:					
		Liquid rides slowly on metal						

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc. rule

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples. Must be ... time

No. ....of..........sheets. Comp. by.......... Checked by..........

Jan. 31 – Feb. 15, 1946

TRU-LINE

WIRE-O

NOTES

No. 718

Planning a sun-box for batteries for Stevens W not lower than 0°F "Seems sensible". Double glass window and insulated box.

Case made by Fred Pierson in one day. $20.00

Thermocouple box rebuilt. Very convenient now. Cover removable.

Batteries only partly charged but a new trickle charger of 2½ amperes was obtained that in a single day has brought the batteries to efficiency

E. battery 1150 amps,
W battery 1145 amps.
Triple registers is
clearing entry tonight.
Supposed to be automatic.

Johnnie weighed all
the cans.
But No. 2 Stevens Wood
No 3 U.S. Engs were
frozen so solidly that
the warden measuring
stick was unable to
punch a hole thru,
while No. 11 Sacto did
not have a trace of
ice.

Reason No 11 was
charged much later
and there [illegible] therefore

Less dilution - 1
Query: Was the solution of No. 11 originally heavier?

Feb 1/46 - 7:30 am

14 Ft Check -3°F H-T -1.6

11 Ft check 3.6° H-T -5.5°
T -5.0°

Hyg. bad.

7 Ft Check -3°F H-T -1°

T(A) -6°F
B -10°F

11 am: 14 F. Check 37.8° H-T 36.5
11 Ft Check 39° H-T 37° T 38.5°

7 Ft Check 38.5 H-T 40°
T(A) 38° T(B) 38°!

Range poss or low at low temps.

Snow Survey - S. Spgs # 1

PG+E sampler too dull -
So Utah sampler used. Correction
1.02 x dial balance readings
Only 10 meas. made -

Drip Tank 10:30 am

\# Wood 17.4 in = 16.6
Iron 16.68 in

10:30 to 12 noon
Recording H-T + T reset
and checked.

7 Ft T (B) too low at zero °F
tho fair at 40°F.
Place in Black Box.
B.B. placed on railing of Pent
House. Less in way of other
insts.

Kiskis (Donner Summit)

1:45 pm New dyes (Feb. 1, 46)
spread thickly –
(a) In shade – 26 in between stakes
Still green between markers

(b) In sun – (30 in between stakes)
On soft frozen snow
Has turned red –

Old Dye (Dec. 31/45)
(a) In shade
Beneath 16 in snow –
Descended 3 in. (Purple)

(b) In sun
Below 2 in new snow &
1 in deep. Gray & green

Drip Pan –

Donner Pass Wood 15.5 = 14.75
or (1.55)

Iron 14.73

Did wood break thru ice? No obstruction to iron. But valve rod has been passed closer to standpipe.

Jan 14 – 6 in. below surface of new snow

Jan. 25/46 (a) stratum 1/2 in. (b) " 1 in – 5 purple

5 in beneath surface

2 strata purple dye in ice contiguous – Total 2 1/2 in thick

New dye - Feb 1 - (3:15 pm)

On powder snow - (very slippery)
Thick - In sun, but wind
10 mi - & cold - No change
Old dye - melted from grease in 15 min
3 ft down - Penetration 6"
Very faint - 5% intensity.

Soda 3pm Pasture 4:15 pm

7 Ft Check 36° F
H-T 37.5°
T(A) 34°
T(B) 35°

T(B) Removed & Black Box.
at 4:30 pm.

Snow 3 Ft below H-T.

5pm Hatch
Batteries
E 1200 W 1183
Coming up rapidly -

Need - (a) Quick return to inspect batteries -
(b) Chalk line for drip tank stick -
(c) Tiny screwdriver for Rent House for screw holding Forest Service sheet.
(d) More tiny screw driver for hygrometer hairs
(e) Ask Ashton to aid
(1) hygrometer
(2) sunshine recorder
(3) Simms N - contacts.
(f) copies for Gleason -

Monday Feb 4—

Low pressure Friday Feb 1
now rising—
Snow as far down
as Reno yesterday Feb 3.
Chains from Reno.
Trees loaded.
Donner Lake snow—
covered by still open in
center & western half.
Snow powdery and
blows from cornices
and wheels.
But on cornices snow
adheres somewhat.
Snow here on edge sun-

warmed, live wind
crust?
A splendid chance for
thermocouple in trees
and on knife-edge of
cornice to obtain temps.

Arrived Soda Spgs 11 am.

Batteries
E 1275 W 1275
Full charge. but the
triple register still seems to run

Need carrier for toilet paper
Stencil platforms & steps.

Lunch at J J's at 1 pm

Mr. Williams
Pac. Tel. & Tel. Auburn
Phone T & T for quick install-ation.

Standard platform
New snow 20 in.
Sunshine Recorder.
Set vertical, in soft filtering - sun, column 1 in above contacts - In full sun column rises even into upper bulb. What to do?

No. 2 (Stevens W) and No. 3 (Engs) are frozen firmly the free from walls of tank. A sugar loaf of snow in each half way to top.

NB—

All surveys Feb 1 at Soda Spgs #1, Donner Summit and Donner Pass made by Blair Eddy with our Utah cutter (1.48) and Mt Rose ~~Balance~~ 1.50. So apply correction 1.02 x to all readings or totals.

Plane for Johannesen by Feb 23 or earlier if possible.

Friday Feby 15/46 -

Happened to think Birthday.

Mild morning - Pt cldy till Noon, Then cldy to 5 pm.
Snow becoming weathered again.
Donner Lake snow covered except open spot now frozen over.
Exchanged sections of samplers for Clyde.

Battery

Under charge
E 1240   W 1235
Water up. [Full when 1275

Fri. Feb 22/46

4 Ft deep in snow (Max. therm.)
12:30 28.5 °F

8 in new snow –
Snow therm. 4 Ft down –

| 7 Ft H-T 20 in above
snow – But snow level
at Top of louvers.

Also 7 Ft Feb 15 – 20 in above
snow pit.

Photo 3 – Ski Door
4 – Black box

Feb 22 – 1 Ft beneath top
surface of snow – 12:45 pm
Snow thermog. placed

Drip tank

~~1.68~~
1.67.5
1.67
1.69
1.68 irreg.
1.675

Must get better metal -

Donner Pass

1946

Rock Tank

Jan 3	1,2.39 in	1.239
Jan 13	1,2.35	1.235 = 0
Jan 25	1.25	1.250 = .015
Feb. 1	1.473	1.473 = .223
Mar. 1	2.10	2.100 = .627
Mar. 5	2.15	2.150 = .050

January 10, 1946 —

Jan. 25, 1946.

Jan. 10 —

1946

TRU-LINE

WIRE-O

NOTES

No. 718

January 10, 1946

No. 10   8766.6 Km

" 2   2181.5 mi

" 9   9234.6 Km

" 11   769 mi

Ster Q —   5.8 in − 8.2 in

~~since being reset~~,

Ink 1/2 muddy?

strain of cables
under snow

Jan 11 –
Began work at Beacon Hill
Lodge – Breakfast.
Shelfoceed sampler –
Substituted Cyan cutter.

Batteries

E 1210   W 1212

Need refilling with water
[Jan. 12 – Refilled]

Drip Pan –
Rising! Some snow
moist packs, some dry
crushes.

Truckee

See Survey Book –
Record at Truckee. No time
to copy it

Sat, Jan. 12/46
4pm

Stevens S ice W 14.05 in
No. 4 ice W 11.47 in
4X8 D 9.32
Thin granular ice.

Sunshine Recorder
Shook down below contacts in shade. But climbed back and records even during night.
→ write Mr Thornthwaite.

Basement Entrance
Shovelled snow out of cut. Windblown but light to handle.

— Rule —
Inked 6 ft rule with Indian ink! Figures were very dim

Sunday Jan 13. –

Fixed 6 ft Tank rules.

7 Ft H-T snow 21-28 in above smart. Same shelter. At 6 ft snow level as high as H-T.

→ # Try thermog. same height in open

Humidity

D. 56.8
W. 43.4
13.4 = 28 apt %.

15 Ft	24 %	Max 47 Min 20
11 Ft	28 %	" 50 " 18.5 Need Cleaning?
7 Ft	28 %	" 51 20.5

Photo #2 Experiment
wind erosion on dune

Temp. by thermometer 38 in in snow 32°F

New temp at 7/5 in. Snow moist from at bottom

#

Jan 13/46 Dye

Red on snow - On slight angle towards sun turns red slowly and also one gray down. On slight angle away from sun still green, finally all red except where it is in tiny piles.

Later:

In shadow. Dye turns green at surface, but still red below.

8 pm –

Corrected T Tr by +1°F to 78°F

apply to earlier Tr records in Pasture

Also corrected Army T by −2°F to 78°F

Humidity at Hotel, 2

Get

- Toothpaste
- Baking soda
- mineral oil
- mirror
- thread

Hotel -

63% by A-T. Finally 62%

W 32°F

D 50°F!

18°

W 31°F

D 45.5

14.5 = 6% ?

Sun!

Merc. column into upper bulb.

Donner Pass
11:45 am #
Diptank 1,2,3,5
[Jan 3. 1,2,39]

— Dye —

1, Old Stakes (no data) dye lacking.
Too thin or blown away?

2. Jan 3.
To 86 in. no dye —
Blown away?

3 Jan. 14 - (Here) on drift snow - More dye than usual.
Means it soon —

↓ over

Turns slowly red except thinner dyes Reddens beneath

Deep Snow

↙ To top of brace of pole. Need 5 Ft extension on 1½ in pipe and at least 3 Ft of chain.

Jan 14/46

Pasture

Study wind-blown snow-Density when just fallen then after drifting.

at 6 pm. (dawn) erected frame work behind 7 Ft lumber to hold a T in the open at some level.

[See survey]

Tues.
Jan 15/46

7:30 am Before sunrise.
Snow creaks and
craunches beneath feet.

*
Pogonip over narrow
valley but does not reach
to forests of upper ski tow
or north of highway.
Feathers 1½ in.

- Temps -

Before Sunrise	
14 Ft	-2° F
11 "	-4°
7 " (Inside)	+0.5 (27 in)
App. 7 " (Outside)	-6° F (34 in)
Feathers on ↑	
1½ in.	-2 to -2.5° F

In exposed center of
snow bowl.

after sunrise but in shade.

7 Ft (Inside) HT +40°F (27 in)
" (Inside) Thermocouple +1°F

1½ in (Outside) 0.5°F

Shelter 7Ft seems to be more protected from air than # 11Ft and 14F. Has a pocket formed. 7Ft outside is coldest.

T. stopped early last evening. Oil? loaded with feathers as compared with 7Ft (inside).

Photo No. 6 - of T in open

Check of H-T°

7 Ft H-T 37.5°F T 36.5°F
38° 38°

Army T 38° 28°F *

* But feathers still one metal thermo.

11 Ft (2 fm) H-T 42.0 43.2

7 Ft (1 fm) { Army T 42.0 43°F
H-T 44.0

Washed humid hairs of 11 F

— Temp. —

at 12 in depth 35° F.

40 in " 31° F

Clyde here

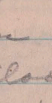
Max 43° F - Crust forming
Rye red.
Earth has melted ~~to~~
some yesterday -

Query: How much heat in
sun as comp. with shade?

Sacto Gage in Pasture
Diam. of bottom 35 in
Height 51
Copy ?

Width 31½ in.
Depth 27 in
Front Height 34 in
Rear " 30
2½ in 5 in

(corners)
Uprights, 2x4^s
Door reaches to bottom
of floor



Louvers slats -
1 in. apart in perpendic
Slats 1x4 approx. set
at 45° angle
1 in between floor slats.
Door with buttons &
slats for screen support

3pm. Dial 182 Mi.
Snow S. 76

—

Temp of Metal
Sampler stuck in snow runs
has snow cylinder or clusters

*Like snow frozen to needles or twigs melts loose.

frozen to it as if thrust into ice ~~cream~~ making machine. like Chisms.
Later after lying in sun heat penetrated to metal. Then the case split and peeled perfectly.*

~~Batteries~~

E 11 85

W 1260

Falling slightly.

The continuous drain of sunshine recorder?

Cut it out till recorder is normal.

* Height of Drip Tanks

Truckee R. S. 3 Ft
(Suggested clearance 33 in)

Donner Lake 4 Ft
(Sugg. clear. 45 in)

Donner Pass 3 Ft
(Sugg. clear 33 in.)

Soda Springs 4 Ft
(Sugg. clear 45 in)

Friday, Jan 25/46

8:30 am. Bus.

Road dry. Snow old.

Donner Lake frozen except for triangle in western half of lake broken and probably by recent heavy wind. Small fragments (hamburger fragments) of ice thrown up on ice to leeward by surf.

"Bus two days ago met wrecker across road and because of ice could not stop. So struck tree and overturned. A good driver".

At 11 am (a) reset all recorders. (H-T and T), (b) read anemoms. (c) meas. penetration of dye.

Triple register has stopped twice.

Jan 25

9 pm -

(a) Thermog. in rear of 7Ft

(b) " on level snow

Jan 26

7:40 am at sunrise

(a) Thermog. stopped

Min. +9°F Current 21°F

(b) Thermog. stopped.

Min +4°F Current 20°F

7Ft Min 16°F Current 25°F

Check therm. 25°F

NB. Lower clear 7F
is 1 1/2 °F lower
than 14 F.

14F H-T

Min + 13.5°F Current 24.5°F

Check Therm 26.5°F

Later recheck

7 Ft Check Therm 25°F

7 Ft H-T 26°F

(a) 21.5°F

(b) 21.5°

14 Ft

Check therm 26°

14 Ft H-T 24.5^{+0}

11 Ft -

11 Ft H-T Min 11°F Curr 23.0

Check Therm 26.2°

Saturday Jan 26

Thermog. No. 3. assembled for ~~test~~.

2 FT rule inked.

Phone from Brown-Milbery (by Capriotti)

"Batteries must be recharged and trickle-charger rebuilt from ½ amp. cap'y to 2 amps." Clyde H. will come if Clyde Arrington does not.

H-T & T's

Check 3pm.

7 Ft H-T 38° Check 36°
T No. 1 (A) 34° " 36°
T No. 2 (B) 34° " 36° F

11 Ft H-T 36 " 36° F
T No. 3 (C) { 38° " 36° F
{ 36.5° " 36° F

14 Ft, 33° F Min 33° F Check 36.5°

NB - Colder at 14 Ft than at 11 Ft and 7 Ft

Precip. Gages

(See Snow Survey Book)

4:30 pm

Wind No. 2 260 mi
S. Stake 74 in

5:30 pm –
Set T's outside.
T 1 (A) on snow 2 in up.
T 2 (B) on back of 7 Ft.
T 3 (C) on back of 11 Ft.
Framework for 11 Ft provided.
|| Check for 7 Ft 21°F.
But No. 1 on snow soon at +8°F

—

Dye of Jan 25.
Green at 4 pm except in protected saucers 2 in deep.
at 6 pm all turned green or black.
But at 3 in. a stratum (1 in) of red dye 90% intensity. Snow apparently soft and moist.

Test dye in morning —

→ Temp. 2 in above surface +8°F. How deep will cold penetrate?

Take → Photos of 6 N-T° + T°.

→ for color film for snow drainage.

Sunday Jan 27

7:30 - Test of N-T° + T°

Check by mercury thermo.

Outside

1-2 in above snow 12° 13°F

7 Ft - - - - 16° 18°

For readings of T°, see sheets on insets.

T No. 1 an snow stuffed. Dirty in war service?

Inside shelters

11 Ft

Check 23° (merc.)	H-T	20°F
	T (3)	20°
7 Ft 22.5° (merc.)	H-T	23.5°F
	T (2)	17.5
	T (1)	17.5

Note: Temp. lower at 7 Ft than at 11 Ft.

Temp. changing too rapidly for careful comparison and adjusting T's - T's far slower to change than merc. thermos.

* Make check at maximum temp. of day also.

Dye of Jan. 25

(a) Surface fully dark or green this morning even in Lancers.

(b) The red stratum at 3 in depth is now purple. Show coarse powdery. Is this reason for dye spreading and being so red?

No trace of penetration below this stratum.

Read drip tank.

11 a.m.

Drip Tank

\# 1.66

1.672

Wood stick 1.66

Visit with service meteor. student under Willits. and opponent of Dr. Crick. Served in England.

Dye of Jan 25

2 p.m.

Dye now red deep into saucers and labyrinths. Follows slant of sun like pits.

\# Red being opaque melts more rapidly than white snow.

So snow (adjacent) is

more weathered like pits. Snow surface white is still fairly firm, the dirty traction snow is moist.

Temp. (aft. max today) is 38°F.

Check of H-T° and T°
3pm

↓ 14 Ft H-T 38° Min 39°F

11 Ft H-T 41° T 44°F
Check 43.5°

7 Ft H-T 43.8°
T(1) 39.9 T(2) 40°
Check 42°

Cylinder of T(1) removed for cleaning.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So. Fork Yuba River

Snow Course Soda Springs

Party J. Johansen Jr & Johansen

Date 2-28-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	29	23			12.5		Ice
	2	33	26			13.5		″
	3	30	24			14		Dirt
	4	37	30			15.5		✓
	5	39	32			16		Grass
	6	39	30			15		✓
	7	41	33			16.5		✓
	8	35	30			14.5		Dirt
	9	36	29			13.5		✓
	10	35	28			12.5		✓
	11	35	29			13.5		✓
	12	39	31			15		✓
	Tot	428				172		
	Av	35.7				14.3	40.1%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Soda Springs

Party J & E Johansen & PG&E men

Date 3-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	36	29			13,5		Dirt
	10	35	28			12,5		"
	11	35	29			13.5		"
	12	39	31			15		"
	12)	428				172		
		35.7				14.3		40.0%

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Soda Springs

Party J & E Johansen & P G & E men

Date 3-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	29	23			12,5		Ice
	2	33	26			13,5		"
	3	30	24			14		Dirt
	4	37	30			16,5		"
	5	39	32			16		Grass
	6	39	30			15		"
	7	41	33			16,5		"
	8	35	30			14,5		Dirt

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin S. Fork Yuba River

Snow Course Kiski

Party J. Johansen & E. Johansen

Date 2-28-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	37	30			13.5		Dirt
	2	40	34			16		✓
	3	43	36			17		Gravel
	4	47	38			17.5		Dirt
	5	52	44			19		✓
	6	50	42			18		✓
	7	55	46			19.5		✓
	8	55	45			18.5		✓
	9	52	46			19		✓
	10	49	40			18.5		✓
	11	48	40			19		✓
	12	39	30			18		✓
	13	44	38			18.5		✓
	14	46	41			19		✓
	15	50	46			20		✓
	16	54	46			22		OVER →

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OVER

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Calif

Drainage Basin So Fork Yuba

Snow Course Kiski or Summit

Party J & E Johansen & P.G. & E Surveyors

Date 3-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	37	30			13.5		Dirt
	2	40	34			16		Gravel
	3	43	36			17		"
	4	47	38			17.5		Dirt
	5	51	44			19		"
	6	50	42			18		"
	7	55	45			18.5		"
	8	55	46			19.5		"

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Fork Yuba

Snow Course Kirkwood or Summit

Party J. & E. Johansen & P G & E men

Date 3-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	52	46			19		Dirt
	10	49	40			18.5		"
	11	48	40			19		"
	12	39	30			18		"
	13	44	38			18.5		"
	14	46	41			19		"
	15	50	46			20		"
	16	54	48			22		"
	16	761				293		

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47.6 18.3 38.4 %

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So. Fork Yuba River

Snow Course Donner Summit

Party J. Johansen & S. Johansen

Date 2-28-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	24	22			10		Rock
	2	27	24			10.5		"
	3	30	25			11.5		"
	4	35	30			13		"
	5	48	40			17.5		"
	6	40	34			15		"
	7	70	60			25.5		Dirt
	Tot	274				103		
	Ave	39.1				14.7	37.7%	

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Calif

Drainage Basin So Fork Yuba & Jay Peaks Summit?

Snow Course Donner Pass

Party J & E Johansen & P G & E Surveyors

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	24	22			10		Rock
	2	27	24			10.5		"
	3	30	25			11.5		"
	4	35	30			13		"
	5	48	40			17.5		"
	6	40	34			15		"
	7	70	60			25.5		Dirt
	7)	274				103		
		39.1				14.7		37.6 %

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†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Donner Lake

Party J. Shaeffer & E. Shaeffer

Date March 5, 1947

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	38.0	34.5	23	36.0	13		-1" 2" ice
	2	37.0	35.0	23	36.0	13		-.5" 2" ice
	3	36.5	36.5	23	38.0	15		-.5 4" ice
	4	31.0	31.0	23	33.0	10		-.5 2" ice
	5	39.0	34.5	23	35.5	12.5		3" ice
	6	38.0	34.0	23	35.0	12		-1" 1" ice
	7	42.5	35.5	23	37.0	14		-1" 2" ice
	8	38.0	34.0	23	35.0	12		1" ice
	9	39.5	31.0	23	35.0	12		-1" 2" ice
	10	34.0	33.0	23	34.0	11		2" ice
	11	33.0	30.0	23	34.0	11		1" ice
	12	38.5	36.0	23	35.0	12		3" ice
	13	31.5	29.0	23	33.5	10.5		2" ice
	Tot	476.5				158.0		
	Av.	36.7				12.2	33.2%	

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Soda Springs

Party J & E Johansen

Date 3-26-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	42.0	36.0	23	43	20		Dirt
	1a	42.5	40.5	23	43	20		"
	2	42.5	32.5	23	43	20		"
	3	45	34.5	23	42.5	19.5		"
	4	45	32	23	45	22		Sample driven in
	4a	47	37	23	48	25		Truckee Road
	5	41	32	23	45.5	22.5		Tractor tracks
	6	49	30	23	42	19		
	7	46	34.5	23	43.5	20.5		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin S. Yuba

Snow Course Soda Springs

Party J. B & E Johansen

Date 3-26-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	8	52	37.5	23	44.5	21.5		-2.5" Dirt
	8a	49	37	23	43.5	20.5		-2" "
	9	46	34	23	39	16		"
	10	45	32.5	23	42.5	19.5		-1" "
	11	44	33.5	23	43.5	20.5		
	12	44	33.5	23	43.5	20.5		
	13	52.5	33.5	23	43	20		
								596.5
13)		591				264.5		-5.5
								591.0
		45.5				20.3		44.6%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Soda Springs

Party J & E Johansen

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	53	46			21		Ice
	2	51	43			20,5		"
	3	54	49			21,5		"
	4	52	43			20,5		Mud
	5	55	49			22		"
	6	54	49			22		Grass
	7	54	51			23		"
	8	52	44			20,5		"

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Soda Springs

Party J & E Johansen & PG&E men

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	52	46			21		Dirt
	10	54	51			23,5		"
	11	53	50			22,5		Grass
	12	58	53			24,5		"
12	)	642				262.5		
		53.5				21.9		40.9 %

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Kirkwood or Summit

Party J & E Johansen & PG & E men

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	53	46			20,5		Dirt
	2	58	52			22		"
	3	74	66			30,5		Gravel
	4	68	62			30		Dirt
	5	75	67			30,5		"
	6	74	64			30		"
	7	79	71			32,5		"
	8	76	68			30,5		"

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Kistai or Summit

Party J & E Johansen & PG&E men

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	75	66			29.5		Fort
	10	73	66			29		"
	11	70	62			28		"
	12	66	58			27.5		"
	13	57	51			24.5		"
	14	59	54			25		"
	15	66	59			27.5		"
	16	63	56			26.5		"
	16) 1086					444		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

67.9 27.8 40.9 %

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Donner Pass (Summit)

Party J. & E. Johansen

Date 3-24-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	39	33	23	40	17		Rock
	2	43.5	42.5	23	44	21		"
	3	43	37	23	42	19		"
	3a	42	36	23	42	19		"
	4	25	22.5	23	34	11		"
	5	68	43	23	52.5	29.5		Dirt
	5a	68	41	23	48.5	25.5		"
	6	38.5	27	23	38.5	15.5		Rock
	6) 257					113		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

42.8 18.8 43.9 %

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Donner Pass

Party J & E Johansen

Date 3-31-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	46	39			19,5		Rock
	2	64	55			25,5		"
	3	49	41			20		"
	4	47	40			20		"
	5	69	58			30,5		"
	6	43	37			17,5		"
	7	115	103			53,5		Dirt
	7)	433				186,5		
		61,8				26,6		43,0%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Donner Lake

Party J. & E. Johansen

Date 3-24-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	17	16	23	31	8		Dirtice
	2	23	22	23	37	14		"
	3	25	25	23	36	13		"
	4	18	19	23	32	9		"
	5	25.5	24.5	23	35	12		"
	6	26.5	23.5	23	34.5	11.5		"
	7	26	23	23	36	13		
	8	21	21	23	36	13		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Donner Lake

Party J. & E. Johansen

Date 3-24-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	30	27	23	37	14		Dirt
	10	22	21.5	23	34	11		"
	11	23	23	23	36	13		"
	12	23	22	23	34	11		"
	13	16	17	23	33.5	10.5		"
	This course has 3 inches							
	of Ice on the top of the Dirt							
(5)	29.6					15.4		
		22.8				11.8		51.8%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Calif.

Drainage Basin Truckee River

Snow Course Donner Lake

Party J. & E. Johansen

Date 4-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	13	12			7		Dirt
	2	22	18			11		
	3	24	22			12.5		
	4	24.5	23.5			13		
	5	17	17			9		
	6	26	26			13		
	7	27	20.5			11.5		
	8	21	16.5			9.5		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State Calif

Drainage Basin S Truckee River

Snow Course Donner Lake

Party J & E Johansen

Date 4-1-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	29	25			14.2		Dirt
	10	21.5	20.5			10.5		
	11	24	23			13		
	12	22	19.5			10		
	13	12	12			6		
	3 inches on the top of							
	the dirt all over this course							
	13)	283				138.5		
		21.8				10.7		49.1 %

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin So Yuba

Snow Course Donner Pass Cornice

Party J. & E Johansen

Date 3-27-47

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	71,0	68			35,5		Dirt
	2	82,5	75,5			38		Pack
	3	97	95			42		"
	4	175	134			70		Dirt
This cornice is all drifted								
			Snow					
4)		426				185,5		
		106,5				46,4		43,6 %

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

V. Vonsild

The Physics of Snow-Melt

1. The problem of elevation of instruments.
2. Radiation, a major phase.
   (a). Nocturnal freezing.
   (b). Thus frequently even in overcast.
3. Melting from above.. subject to temp. of air.
4. Descent of melt-water Gravitational pull vs the capillarity suspension,

Freezing of Surface.

Green at upper edge.
Red one crystal down.

Radiation from surface or deeper?

Is red due to water film and hence delay in freezing?

July 1946

1946-47

Soda Springs
July 28, 1946.

3 pm

SS.	D.	17.46
	W.	21.92
No. 4	D	18.55
	W	20.90
2X8		16.50

Need cal. chloride
300#

No. 3 - Army	Center	22.61
	NE edge	22.61
No. 2 -	Center	19.2
Stevens W	NW	19.2
4 X 8	E	16.11
	W	16.30
	S	16.20
	N	16.26
	Center	16.45

Sucto No. 1 D, 9.50

No. 9 (3ft gage) W 20.83
D 18.41

No. 10 W 21.11
D 18.52

No. 8 W 17.52
D 15.80

No. 6 W 18.40
D 16.93

Drip Tank .077

Stevens Q. 14.8 =
0.60[4]

Oiled Anemometer
at No. 11 - Sucto Gage.
Rattling ceased.

Aug. 19 (Monday)

Phone from "Whitey". Can paint platforms at Soda Spgs tomorrow.

Caught 6:30pm bus. Colorful sunset.
Many passengers Reno to Truckee. Some at Truckee. Two girl observers also for Donner Pass Observatory.

8pm. arrived & to bed.
Phoned Johnny but did not come.
Trains no bother.

Fare 70¢
Bags 87¢
Lunch 15¢ + 1¢
Dinner 45¢

Aug. 20

Replaced anemometer record on triple register but Ashton had probably done so earlier. Wind almost calm.

Gave 1 gal. white paint
1 gal + 2 qts sky gray

9:15 am
Max. tem 79°F
Min 44° (Reset 73°)

Sep 22
Fare $1.09
Sep 23
Bkft 87¢
3 lunches $2.55

Need —
Shaving cream
Felt for wind direction
#16 pen
Mirror

Clean course at Pass
Black paint + Chinese red
1 camel hair's brush — Trimming brush

Get Hat, jug, suit.

Monday Sep. 23/46.

Came last night at 8:15 am.
Called Johnnie

Up at 6 am.

Stevens S. Gage 12.52 in
Sep. 2 11.60
~~Gain 0.92~~
~~Snow 6 in.~~ 0.92
No. 1 — (With ~~funnel~~)

Stevens Dr. 0.38 in

~~Wind direction~~
~~Sunshine~~ —
sometimes records, sometimes not for entire 24 hrs.
This morning column

Monday, Sep. 30/46.

9 am.

Battery being charged 1235

Water O.K.

With Eleanor -

To Truckee.

10:30 am Changed to winter sheet.

Humid Dry 64° F.

Wet 51° Diff 13

= 38%

Temp. - H-T ? approx

Therm ? 1½° F off.

Tank still full - above scale. Tight now?

Donner Pass

H-T 54° Therm 55.5°

Still 1 day slow - Ten

farther to right.

→ Can jewelers shorten hair spring?

Pipes need straightening & vertical -

Ground should be raked.

Pasture - 2 pm

H-T 51.5

T - 51°

Dry 52.0

Wet 47.5 = 70%

But later

D. 48

W 47 } = 93%

Raining H-T diff. 87-97%

See graphs

Laid out black painting for Eleanor. More painting
4pm — Sky 1 f.

Replaced hairs in H-T at Hotel.
Too dry to record high at once.

Battery 4:30pm 1250
Still charging.

Expenses
Fare $2.01
Bkft 77¢
Lunch 85¢

Book case.

Height 5 ft
Width (outside) 2 ft 4 in
Between shelves 13 in.
Depth — ?

Thundershowers

Triple Register

4:30pm, Darkly overcast.
Column of sunshine recorder still ½ in. above contacts.
But line still straight.
What's loose?

New fine pad put on wind-direction pens by Arthur Caillard.

Friday Oct 4.

Eleanor brought H-T (Pasture 11 Ft) to Reno to drive out pin and insert new humidity heiver

Brought also the thermograph from Power Pass for regulation and took back the rebuilt thermographs

Tues. October 8

Eleanor reported that new humidity hairs were failing to work.

Johnnie is testing all drip tanks. All are now full. 10 x the recent rain and rain.

So have postponed trip to bring down the gauges and valves.

Promised to come up Oct 14 —

Sunday Oct 13/46.

Expenses

Ticket	2.01
Bus	1.02
Phone	20¢
Lunch	82¢

Brought to Soda Edge by the Sandorfs (Irvin and Norma) after talk to Campus Club

9pm —

Called Johnsons

Have pumped pans. Pasture pan emptied — ready.

→ Wishes to test others during week.

"Battery found dry but refilled. Apparently dead, at least no reading. Trickle charger plugged in".

Immediate test by me gave

5 cells 1275

1 cell 1240.

Evidently dry cells had quickly recovered.

Night call from Ashton Co Ltd.

1. agrees on continuity of records at Mt Charleston.

Wants to compare flood of artesian wells with precip. on Mt. C.

Can provide precip. can and spring balance from Snow Laboratory.

2. Doubtful about going to Lamoille Canyon.

3. Well dry at Snow Lab. Only 2 ft deep in "solid rock"!! Fed thru fissures. Must refill it from streams.

— Soil Priming —

4. Creek dry in August. First storm of approx. 1½ in. water failed to affect it But second storm of 0.95 in. caused it to flow.

Was there enough 2½ in. water prime the soil for snow melt? Soil is shallow; snow is normally deep. So factor is small.

— Melting by Slopes —

Two more flumes being put in to measure tiny basins — one tilted toward sun and the other away from sun.

A good move. Present flume represents too many aspects toward sun. Must specialize — like our dip tanks.

Has abundance of 3/4 in. cups needed for test of tanks.

Talked about India. Some day he may be able to go to Spain or Iran, or China or Korea. The future broadens out.

Monday Oct. 14

Battery

Selected cell 1275

Weak cell now 1.260.

Shall plug them in for a long time more.

With Eleanor at 8 am to reset all thermoms.

She has become adept.

Leaves early for Warin—

Need

X bicycle wrench

hammer

larger screwdriver

pliers

Sunshine recorder.

Needs tiny roundheaded screw for locking contact wire.

Contacts tightened, but no response. Column far up tube. Need ammeter?

Wed. October 23/46.

To Donner Pass and Donner Lake for drip pans.

Walter Bedell and Soil Conservation truck and J.F.C.

Clouds over Pass but broke up.

Some water and shell ice in drip pan. Also some ice in valve, Tank full of water.

Black pan was warm and had melted ice somewhat.

→ So keep pan black.

at Donner Lake difficult to unscrew valve because sleeve over valve was soldered down and could not be drawn over parallel with intake pipe.

→ Use an extra coupling - also more graphite and tar paint.

Lunch at Truckee.

Trip 9 am — 2 pm.

Costs Gasoline 15 ¢

Lunch 1.28 ¢

With Walters

Oct 31

3:30 pm Donner Lake

Pumped down to 1394

~~Refilled~~ ~~1.19~~

Flushed car thoroly.

Refilled 1.19 No oil

~~Needed~~

Sleeve & pipe 6 in.

1½ in. pipes

2 pipe wrenches 12 & 24 in.

1 crescent wrench 8 in.

Donner Pass

Brought sand and cement. Pipes too short.

Need 1½ in - 2 ft and air pipe ½ in - 12 in.

Valve rod found broken in transit.

Oct 31

Costs —

2 Lunch 2.20

2 Dinner 1.60

Nov. 1 Fare $1.09 Sacramento

Lunch 2.00

Dinner 1.90

Nov 2, Truckee-Reno .75

Breakfast 1.40

Lunch 1.10

Brought ladders for new tanks and book case.

Home with Walters.

Reno 7:30 pm.

Friday

Nov. 1 — Bus at 9 am

Brought pipes from Jack Ryan.

Mild -

Flushed Donner Pass tanks and connected it up -

Building stone pier under pipe from pan to tank.

Pipe bent by weight of snow. Also pan by resting on two points of rock.

Remained all night at Hotel.

Saturday Nov. 2

Wind strong during night.

Stronger this morning 25 mi. an hour.

Too wild to go to Pass.

Tree blown down this morning at 9 AM lights and heat off.

Repair men gone toward Ice Lake.

Selected sites for drip pans.

1. South of river on sawmill site

2. At point of timber South of Filling Station half way to railroad.

→ Slopes similar but mild.

Army Eng. gage 18/8 in lower than Stevens W. Must raise it to same level.

Removing Russian wind shield to make room for 2x8 in gage.

On its site will be placed the California storage gage (Revised U.S. Engineers from Fred Paget). Desire to study snow cap formations

---

Gages SS and No. 4 frozen solid.
Nos. 2 (Stevens W) has possible trace of floating ice; No. 3 (U.S.E. C.) entirely liquid.

Monday Nov 4

Reno - Soda Spgs.

Calm, clear, cold.
Reset insts in Pasture

— Expenses —

Nov 4. Reno - Soda Spgs.	1.09
Lunch	1.10
Dinner	1.50
Nov. 5. ~~Bfst~~ 1.00 Lunch	1.10

Nos 3 and 4 and SS and 6, 7, 8 - all liquid again!
Only 1 fair day,

Eleanor reset Pass and Donner lake.

Hairs better but trace still confined.

At Donner Pass

Finally got valve

Sunday - Nov 17/46

Paid

Expenses

5 bundles marsers 6.00

1 Bkft (Reno) .35

2 Lunches (Truckee) 2.47

Left Reno 8 am,

3 Drip tanks etc

Johnnie called last night.

He will erect all

3 pans and tanks

His hot water pipe froze on?

Batteries 12.25

Placed tanks on location.

"Mrs Whitey" offered

me for Dennis

the dinner off the

hotel kitchen for

same rate as for

present bedroom.

Steam heat, basement

toilet. He would like

to make a suite

of my room and

rooms adjoining.

But cable cannot

be moved and

much readjustments

necessary. Going to

India. Must wait

until next summer.

2 x 8 pres. gage being moved.

Fred Paget brings Scoto gage up on Wed.

Paraffin -

Planned to pour paraffin around rough outlet of old pans.

1. But Pasture ~~Pans~~ has slush and water in it. Overflowing?

2. Donner Pass Pan has water over the throat.

Some particles of ice floated out of throat. Valves not frozen.

Frozen? Overfull?

→ Must measure and pump both.

Phone Johnnie.

Keep intake uncovered or deeply covered?

Fill with calc. Chlor. and water above outlet until permanent snow falls?

Be sure valve is carried wide open.

Donner Lake -

Pan empty but layer of snow in it. Snow only slightly wet. All buried & Ground soft.

Forgot -
Rake, oil can

Saturday Dec. 7

Into the clouds with Walter Bedell.
Took Thermog.,
Sacto Tank, 5 sacks calcium chloride.
7 covers for drip pans.
Brought back to Reno the rake.
Need snow shovel.
Lunch for 2 - $1.60
Water low again.

Ashton Codd brought his snow motor to unload our truck -
→ aided in raising Engs Gage 17 in. to height of Stevens W.

→ left Thermog. to exchange for Thermog. at Donnybrook.

"Four smaller cans recharged Dec. 14 (?) - No ice in them."

Should have had cover plates for the cover pans. Melting snow a problem by freezing in feed pipe.

Sacto Gage -

Painted dead black with paraffine overlay. No hanging apron for that.

Double thick wind-shield.

Adhesion of Snow

Ashton has noticed that the black cans collect no snow but the galvanized cans do.

Evidently even the sun filtering thru the thin cloud heats up the black metal.

Ashton desires to borrow the Donycos Bridge for the year.

Walter Wilson came to Laboratory last

week and came over to see me.

* Forrest Rhodes has been made Coordinator of Snow Research for the Army Engineers.

Sunday Jan 5/47

On Friday Jan 3, Colton and Marie called at Reno. They want more home life and chance to educate their children.

[illegible] has resigned the Weather Bureau.

[illegible] by Ralph Brown [illegible] me view of [illegible] Burma Road [illegible]ted and open [illegible] year. So fast it be low. [illegible] Road only [illegible]led and began [illegible]ash out at [illegible] monsoon.

Dec 5, 1946

Recharge 4-55-6-8

gage.	wt. out.	Depth out.	wt in.	depth in.
4	24.87	Full	8.19	6.5
S.S.	30.60	22.75	11.75	6.75
6.	24.46	23.25	8.55	7.1
8	23.35	21.5	8.01	6.75

9 recd.
J. Johnson

week and came over to see me.

* Forrest Rhodes has been made Assistant [illegible]

Sunday Jan 5/47

On Friday Jan 3, Ashton and Marie called at Reno. They want more home life and chance to educate their children.

So he has resigned from the Weather Bureau.

Today Ralph Dronin brought me views of India, Burma Road asphalted and open entire year. So past must be law.

Ledo Road only graveled and began to wash out at last monsoon.

He will forego an entire semester for the chance to go with me.

Jan 5 — Expenses —

Taxi	45¢
Fare & 5.5 pgs	2.10
Ski mittens	3.50

Jan 6

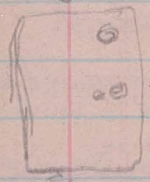
Bkfst	1.10
Gas	2.39
Lunch	1.55
Fare ride to Reno	

Purchased —

Clothing for India —

— Need —

1 Gen Calendar Pad 1947



Strong east wind —

Bus at 3:25 pm.

Road dry all way.
Continuous snow
only at foot of Donner Lake.
Thin ice for large
areas of Lake. Water
drawn considerably
down.

Two buses - a third
one at Summit to
gather up the skiers
and more Special Buses
at Soda Sp[r]gs. Now ad-
ing skiers.

Hotel active - Want
more snow -
Office full - Johnie
and Eleanore are happily
busy - in ski school.
but are planning to

carry on my work -
Mrs Whitey happy this
cold spell with our
electric heater. A life
saver during cold
period. Will add a
new coil for me.

Cold? At Reno
Friday 5 am 7°F
Saturday " 8°F
Sunday " 14°F
"Will it snow now?" Said Taxi Dinner

Office used as
accident operating room.

Jan. 6 -
Barometer going
down steadily. Snow?
Strong E wind (30 mi)
even from Truckee upward

thru Pass.
Too windy to test thermometers and humidity.
So purchased ski clothing. at Soda Spgs and Harden. Webs at Truckee.
Eleanor brought me to Reno.
Brought Thermog, + snow thermog from S. Springs and H-T from Truckee for cleaning.

Monday Feb 3 /47

Clyde Houston took black box and sampler to Soda Springs.

Snow sampler from Fred Paget but extra section taken with auger

Tues Aug 22?

Lions game at Hinsdale
Hot at 80°F?

Haxies -
Out - In U.W.

Gum Turpentine

(John ?)

Col. Faulkner
U.S.E. Division off. -
South Pacific Division
Calif + Someone
Balfour Bldg., S.F.

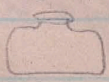
Kolk of U.S.F.
went to M.I.T.
Wm Cassidy took Kolk's place.

ode.

1 Faulkner
2 O.J. Stanley -
3 Wm Cassidy.
4 W.T. Wilson + Miller P.+A.

light in bathroom
Milk glass – porcelain

—

Back door light.
Card. 

—

Reflector lights
Drill —

Canvas strips for
chairs

—

Ruth Kerr
Reprints from Tea House
Lock-box Keys

—

Form No. 144

May 13 1946

FEDERAL-STATE COOPERATIVE SNOW COVER SURVEYS

FEDERAL, STATE AND PRIVATE AGENCIES

SURVEY NOTES

Snow Surveying is completely explained in Miscellaneous Publication No. 380, United States Department of Agriculture.

Brief Directions and Suggestions for Snow Cover Sampling

(1) The usefulness of snow cover surveying depends primarly on the care and honesty of the men actually doing the field work.

(2) The work of the snow cover surveyor is often laborious, especially in stormy weather, and men willing to undertake such work can usually be depended upon to do their best and record the results faithfully.

DIRECTIONS FOR USING THE SNOW SAMPLER

A. Care of Sampler:

(1) In transporting sampler, extreme care should be used to guard it against injury; it can be easily dented.

(2) When sampling on steep slopes do not cling to the sampler to avoid sliding down hill; the tube is easily bent.

(3) Keep the sampler covered inside and out with a thin coating of shellac or paraffin. The inside coating can be applied by pulling through a swab soaked or wet with shellac.[1] This coating not only prevents corrosion but tends to keep moist snow from adhering to the tube.

(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

B. Measuring for Samples:

Always start measurements for sampling from the initial point as shown by the sketch map of the course and follow the spacing for samples as indicated. Note any irregular spacing between samples. Care should be used in spacing by tape measurements, so that the samples taken different years on the same course will be at the same spots.

(1) Plunging the tube should be avoided. In driving ... countered, etc., may be ... t is preferable to twisting, because with ... only is to be used in recording ... nters the slots. However, a mi... ing and also facilitates ... should be entirely ... n, a light t... or badly worn, send first tube section with cutter attached to ... preserve survey office for repair or replacement.

[2] A co... e is evidenced when length of core compared to snow depth is approximately the same throughout a course.

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

C. **Weighing the Sample.**

Before taking the sample, place the empty sample tube in the cradle hanging from the scales. If the Mt. Rose scale is used, turn the pointer back to zero. If the standard tubular scale is used, record the weight empty in proper column in field book. When the sample has been taken, place the sampler in the cradle and record the weight for tube and core. For the Mt. Rose scale this reading equals the water content of the snow core. For the standard tubular scale the water content is given by the difference between the reading empty and the reading for tube and core. The zero setting in the case of the Mt. Rose scale, and the "empty" reading for the standard tubular scale should be checked at frequent intervals (not more than 5 measurements).

If dirt is picked up by the cutter it should be cleaned out with knife before weighing the sample, and proper deduction made before recording length of core or depth of snow.

D. **Recording:**

The snow cover survey sheets are made in pads of two sizes, the smaller being white and the larger pink. Only the white waterproof pads are to be used for field notes. The larger pink pads are to be used to make copies from the white field sheets as soon as possible after each survey. Instructions regarding the disposition of the pink copy sheets will be issued for each State and where necessary for each drainage basin, since the needs will require some variation in this respect.

Appropriate covers are to be provided for protection of field notes. Sketch maps showing points of observation are pasted to the inside of the covers.

Use pencil only for recording field measurements. Fill in complete description of course, party, date, etc.

If the depth of core is very much less than the depth of snow, the reason should be determined and noted under "Remarks." In case of doubt regarding the core, determine the density (water content divided by depth gives density) and compare with that of other adjacent measurements about which there is no doubt. "Remarks" should include special items as to the character of snow, nature and condition of soil or other bottom reached by the cutter, whether wet, dry, frozen, etc.

Any extended remarks as to weather conditions at the time of survey or shortly before the survey, unusual difficulties encountered, etc., may be placed on the back of the sheet, as one side only is to be used in recording the snow measurements.

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[1] Or paraffin.

[2] If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[3] A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Calif.
Drainage Basin Truckee River
Snow Course Donner Lake
Party W. D. Johnson
Date 5-1-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	0				0		
	2	0				0		
	3	15	14	20	27	7		
	4	0				0		
	5	0				0		
	6	5	5	20	22	2		
	7	0				0		
	8	21	20.5	20	30	10		- 0.5
	9	5.5	5.5	20	22	2		- 0.25
	10	7	7	20	23	3		- 0.25
	11	0				0		
	12	0				0		
	12	53.5			12	24		
		4.5				2.0		44.4 %

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Donner Lake

Party J. Johnson & E. Johnson

Date 5/17/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1				0	0		
	2				0	0		
	3	8.5	8.5	18	23.5	5.5		
	4				0	0		
	5				0	0		
	6	5	5.5	18	22	4		~ 1cm
	7				0	0		
	8	11	11	19	26			
	8A	14		20.5	27	6.5		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Donner Pass

Party J. Johnson & E. Johnson

Date 5/13/46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	9	5	5	21	22	1		1.5
	10	4	4.5	19	24	.5		-1
	11				0	0		
	12				0	0		
	1/2	33.0			1/2	22		
		2.8				1.9		67.8 %

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N S E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: California
Drainage Basin: South Fork Yuba
Snow Course: 5 Sample Cornice Donner Pass
Party: J. I. Johansen
Date: 5-18

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	126	99,5	34	105	71		Not to ground. Solid ice
	2	129	127	34	114,2	70.2		Rock
	3	154	137	34	127,5	93.5		not ground solid ice
	4	160	132,5	34	125	91		wood & Rock
		172	136,5					
	5	172	136,5	34	126	92		Rocks & needles
	5)	741			5)	417.7		
		148.2				83.5		56.3%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course Donner Pass

Party J. J. and J. E. C.

Date May 21, 1946.

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	111 −.8	90	34	98	64		1.7 in. wet ice at bottom above Sand
						Crust hard.		
	2	121	114.5 +1.5	34	104	70		Snow not crushes
	3	143	139	34	124	90		Snowing
	4	142	126	34	122	88		Ice ie waterlogged snow 1/4 in
	5	159	150 +1.7	34	123.7	89.7		On rocks
		Easiest drive						No crusts
						(89.7		
	5)	875.2			5) 401.7			
		175.0				80.3		45.9%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.........of.........sheets. Comp. by.................... Checked by....................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples taken for comparation
Drainage Basin weight morning and night
Snow Course at Johansens house
Party Soda Springs
Date 5-24-46 10 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of Tube and Core	Water Content Inches	Density Per Cent	Remarks
-0,8	1	36	36	13	32	19		376 gram
-1,0	2	35	35	13,5	32	18 5/8		373 "
	3	32	32	13,8	32	18 2/8		375 "
	4	35	35	13,8	32,5	18 7/8		381 "
	5	35 173	35	13,8	33,9	20 1/8 19,2		391,2 "
West	6	35,5	35,5	13,8	34 1/2	20,4		398,3 "
	7	35	35	13,8	33	19,2		385,5 "
	8	34,5	34,5	13,8	32	18,2		370,0 "
	8	277,2		6	152,3	38		3050
		346		19,0		54,7		381,3

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N. S." E." etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Sampler Tandem to compare weights
Drainage Basin morning and night
Snow Course at Johnson House
Party Soda Springs
Date 5-24-46 6 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Dirt	(1)	34.0	33.5	32	142	18.6		365.6 Gr.
Dirt	(2)	33.5	33.2	31.5	138	17.2		365.5 Gr.
Dirt.	(3)	35.5	34.5	31.2	138	17.2		365.0 Gr.
Dirt.	(4)	35.0	33.2	31.2	138	17.2		366.7 Gr.
Rock	(5)	33.5	34.5	30.5	138	16.2		364.1 Gr.
		1736			5	87.4		182.63
		34.7			175	50.4 %		346.3

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples taken to compare
Drainage Basin weight morning and night
Snow Course near Johansen House
Party Soda Springs
Date 5-25-46 10 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
-1.5	1	39	37.5	13.8	33	19.2		383.5 gr
Rock	2	37.5	37.5	13.8	33	19.2		384.5 "
-0.9	3	38	38	13.8	32	18.2		377.5 "
-0.7	4	38	38	13.8	33	19.2		378.6 "
Rock	5	37	37	13.8	33	19.2		379.7
	6	37	37	13.8	33	19.2		383.0
	7	38	37	13.8	32.5	18.7		378.5
	8	36	36	13.8	32.2	18.4		378
	8)	297.4			8)	152.3		3042.3
		37.2				19.0		380.2

*Show number & description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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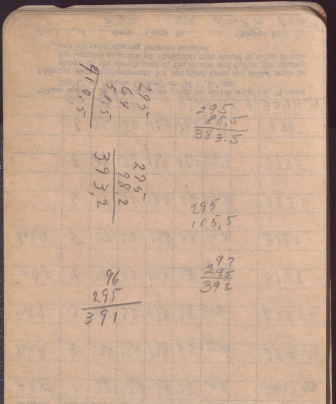

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples Taken to compare weights
Drainage Basin opening and heights of
Snow Course Johnson's House
Party
Date 5-27-46 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	42	42	14	36	22		410,5 gms
-0,5	2	39	39	14	34	20		394,5 "
-1,7	3	41	40,5	14	34	20		393,2 "
	4	40	39	13,8	34	20,2		396,- "
	5	39	38	13,8	34,1	20,2		400,5 -
-0,8	6	39	39	13,8	33,8	20,0		391,-
	7	29	38	13,8	33,8	20,0		392,- "
-0,8	8	38,5	38,0	13,9	33	19,2		383,5

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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8) 213:7 / 39:2 8) 160.0 20,0

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples taken to compare weights

Drainage Basin: morning & night at

Snow Course: Johnston Ranch Soda Springs

Party: J. W. Johnson

Date: 5-27-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	41	41	13.8	35 21.2			411.0 gr.
	2	40	37	13.8	34 20.3			397.0 "
	3	39.5	38.5	13.8	33.8 20.0			388.0 "
	4	37.5	37	13.8	32.5 18.7			383.0 "
	5	38.5	38	13.8	33.5 19.7			387
	5	196.5			5) 98.4	5)	19.6	
		39.3			20.0	50.7%		393.2

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples Taken to compare weights
Drainage Basin morning and night at 5
Snow Course Johnson House to Soda Springs
Party
Date 5-29-46 9:30 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	39	39	14.2	31	16.8		393.5 yr.
	2	38	38	14.2	34	19.8		399.5 "
	3	35	37	14.2	35	20.8		395 - "
	4	37	37.5	14.2	36	21.8		413 - "
	5	34.5	34.5	14.2	33	18.8		372.2
	6	32.5	32	14.2	31.5	17.3		356.5
	7	35	35.5	14.2	33.5	19.3		381.5
	8	33.5	32.5	14.2	31.5	17.3		367.6

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

1) 393.5 2) 399.5 3) 395 4) 413 5) 372.2 6) 356.5 7) 381.5 8) 367.6

96.5 / 295 / 391.5

101 / 295 / 396

56.5 / 295 / 351.5

85 / 295 / 380

67 / 295 / 362

48.5 / 295.0 / 343.5

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State Samples taken to compare weights

Drainage Basin morning and night at

Snow Course Johansen house soda springs

Party

Date 5-29-46 6^30 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	36	36	14.1	35	20.9		396 gr.
	2	38	37	14.1	34	19.9		391.5 "
	3	37	36	14.1	33.5	19.0		380.5 "
	4	35	34	14.1	32.5	18.4		380. "
	5	35	34	14.1	32.5	18.4		380. – "
	6	33	32	14.1	32	17.9		362. – "
	7	31	30	14.1	31	16.9		351.5
	8	30	29	14.1	30	15.9		343.5

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.......... of .... sheets. 34.4 Comp. by 18.4 53.5% Checked by 373.1

8) 275 8) 147.3 8) 2985

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State: Samples taken to compare weight

Drainage Basin: morning and night fr

Snow Course: In Church at Johansen hauser

Party: Soda Springs

Date: 5-30-46   9 30 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	36,5	36,5	14.2	35	20.8		391,5 gr.
	2	36,5	35,5	14.2	33,8	19.6		382,- "
	3	34,5	34,5	14,2	33	18.8		378,5 "
	4	34	34	14,2	33	18.8		373,6 "
	5	32,5	32	14,2	32	17.8		364,5 "
	6	30	29	14,2	31	16.8		352,- "
	7	28	27,5	14,2	29	14.8		338,7 "
	8	27	27	14.2	29	14.8		337, "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

32.4   17.8   54.9   365.6

No.........of.........sheets. Comp. by.................Checked by.................

8) 259   8) 142.2   8) 2924.8

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State Sample taken to compare

Drainage Basin weight morning and night

Snow Course for Mr. Church

Party

Date 5-30-46 6 30

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	34,5	34	14,2	32,5	18.3		372,0 gr
	2	32,5	33,5	14,2	32	17.8		370,0 "
	3	33	32	14,2	32	17.8		364,— "
	4	32	30	14,2	31	16.8		360,5 "
	5	30	29	14,2	30	15.8		354,— "
	6	24,5	24	14,2	29,9	15.7		344,5 "
	7	26	25	14,2	30	15.8		351,— "
	8	26	24,5	14,2	29,0	14.8		336,— "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

29.9 16.6 55.5% 356.5

No..........of..........sheets. Comp. by.................Checked by.................

8) 239.5 8) 132.8 8) 2852

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples taken to compare
Drainage Basin: straight morning and night
Snow Course: by Johansen House
Party:
Date: 5-31-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
-0.7	1	33	33	14.2	32	17.8		362. gr.
-0.5	2	32	32	14.2	31.8	17.6		360.8 "
-0.5	3	32	30	14.2	30.5	16.3		350.0 "
	4	31	30	14.2	30.5	16.3		350.4 "
	5	29	28	14.2	30	15.8		345.0 "
	6	28	27.5	14.2	30	15.8		342.5 "
	7	26	26	14.2	28	13.8		331.6 "
-0.8	8	25	25	14.2	28	13.8		329. "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ____ of ____ Sheets. Comp. by ____ Checked by ____

69.6
295
364.6

72
295
367

63.2
295
358.2

65.5
295
360.5

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples taken to compare
Drainage Basin weight morning and
Snow Course night at Johansen house
Party Soda Springs
Date 5-31-46 5:30 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	32.5	31.5	14.2	31.9	17.7		359.4 gr.
	2	33.5	32	14.2	32.1	17.9		366.-
	3	33	32.5	14.2	31	16.8		372
	4	32	31	14.2	33	14.8		370.8
	5	32	30	14.2	33	13.8		367.
	6	31	30	14.2	31.9	17.7		358.2
	7	32	31	14.2	31.9	17.7		360.5
-.06	8	33	32.5	14.2	32	17.8		364.6

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

32.3 16.8 52.0% 364.8

No.......... of.......... sheets. Comp. by.................... Checked by....................

8)258.4 8)134.2 8)2918.5

69.5 + 295 = 364.5
68.5 + 295 = 363.5
85.5 + 295 = 380.5
90.5 + 295 = 385.5
55.2 + 295 = 350.2
70 + 295 = 365
70.5 + 295 = 365.5
67 + 295 = 362

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples tae compare weight
Drainage Basin morning and night
Snow Course at Johdusen house soda
Party Springs
Date 6-1-46 9 A M

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	32,5	32,5	14,2	32	17.8		364,5 gr.
	2	32	32	14,2	31,9	17.7		363,5 "
	3	33	33	14,2	33,6	19.4		380,5 "
	4	34	34	14,2	34	19.8		385,5 "
	5	31,5	31	14,2	30,5	16.4		350,2 "
	6	33	33	14,2	32	17.8		365,– "
	7	32	32	14,2	32	17.8		365,5 "
	8	32	31,5	14,2	31,9	17.7		362,0 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ...... of 32.5 sheets. Comp. by 18.0 55.4% ...... Checked by 367.0

8) 260   8) 144.4   8) 2936.7

63.4 74.8 78.3 66.7 76.5
295 295.- 295.- 295.- 295
358.4 369.8 373.3 361.7 371.5

67 64.- 48.-
295 295 295
362.- 359.- 343

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples taken to compare
Drainage Basin: weight morning and night
Snow Course: at Hansen House
Party: Soda Springs
Date: June 2-46 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	30.5	30	14.2	31.9	17.7		358.4 gr.
	2	31	30.5	14.2	32	17.8		369.8 "
	3	31	31	14.2	33	18.8		373.3 "
	4	30.5	30.5	14.2	31.9	17.5		361.7 "
	5	31.5	31.5	14.2	33	18.8		371.5 "
	6	30.5	30.5	14.2	31.9	17.7		362.- "
	7	30	30	14.2	31.9	17.7		359.- "
	8	30	30	14.2	31.9	17.7		343.- "

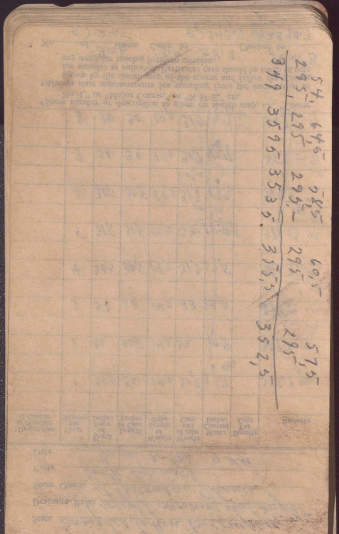
*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

30.6 18.0 58.8 362.3

No.......of.......sheets. Comp. by.............. Checked by..............

8) 245 8) 143.7 8) 2898.7



FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples to compare weight

Drainage Basin: morning and night taken

Snow Course: at Johnson Lake

Party: Sadd Spencer

Date: 6-24-46 7PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	29	28	14.2	30.5	16.3		349-92
	2	30	29	14.2	31	16.8		353.5 "
	3	30.5	30.5	14.2	30.9	16.7		353.5 "
	4	29	29	14.2	31	16.8		353.5 "
	5	29	29	14.2	31	16.8		352.5
	5)	147.5		5)		83	5)	1770.0
		29.5			15.7	16.6		354.0

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily at

Drainage Basin Donner Pass control for

Snow Course Dr Church

Party J. I. Johansen

Date 6-2-46 10 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	86	77	34	85	51		Dirt
	1a	82	74.5	34	91.9	57.9		
	2	93	90	34	91.-	57		
	3	114.5	110	34	108	74		
	4	120	107	34	111.5	77.5		Dirt
	5	126	120	34	113	79		
	5)	535.5			5)	345.4		
		107.1			69.1	64.5%		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.........of.........sheets. Comp. by.................... Checked by....................

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State 5 Samples at Donner Pass Co

Drainage Basin taken daily for Dr. Ch

Snow Course

Party J. S. Johansen

Date 6-1-46 1PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent
	1	83	82	34	87,9	3.9	
	2	106	95	34	96	62	
	3	110	102,5	34	111	77	
	4	127	114	34	118	84	
	5	136	128	34	117	83	

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily

Drainage Basin on Donner Pass for Dr Church

Snow Course

Party J. I. Johansen

Date 5-31-46 4 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	89	82,5	34	88,1	54.1		
	2	96,5	92,5	34	94	60		-1,0
	3	114	106,5	34	109,5	75.5		wood
	4	122	120	34	112	78		
	5	131	104	34	113	79		
	5)	552.5			5) 346.5			
		110.5			69.3		62.7%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily at

Drainage Basin Donner Pass Tomick for

Snow Course To Church

Party .....

Date 5-30-46 2 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	96	91	34	98	64		-1.5
	2	92	88	34	91.9	57.9		
	3	130	112	34	115	81.5		
	4	136	109	34	112.0	78.0		-1.6
	5	138	134	34	116	82		
	(5)	588.9		(5)	363.4			
		117.8			72.7	61.7	%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.....of.....sheets. Comp. by.....Checked by.....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily at
Drainage Basin Donner Pass Tunnel
Snow Course for Dr Church
Party J. R. Johansen
Date 4-5-29-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	93	80	34	91	5.7		
	3	115	86	34	103	6.9		
	2	106	104	34	99	6.5		
	4	140	125	34	121.5	8.5		
	5	151	144	34	123.5	9.5		
	5)	605.						
	121				5)	36.8		
		121.0		73.6		6.18	%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily for
Drainage Basin Dr. Church at
Snow Course Upper Pass Course
Party J. Johansen
Date 5-27-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	99	97	34	93	5.9		
	2	118	118	34	100	5.5	46.5	
	3	140	136	34	117	8.3		
	4	134	123	34	119	5.5	5	
	5	154	150	34	122	8.8		
	5)	675		5)	372			
		1290		74.4		57.7%		

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily

Drainage Basin N. Fk. Church

Snow Course Donner Pass

Party J. Johnson

Date 1-27-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	109	102	34	97	63		
	2	128	119	34	105	71		-1.0
	3	132	130	34	115	81		
	4	141	135	34	120	86		
	5	156	144	34	120	86		
	5)	666			5)	387		
		1332				774	58.1	%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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Form No. 144

May 2, 1946

FEDERAL-STATE COOPERATIVE SNOW COVER SURVEYS

FEDERAL, STATE AND PRIVATE AGENCIES

SURVEY NOTES

Snow Surveying is completely explained in Miscellaneous Publication No. 380, United States Department of Agriculture.

Brief Directions and Suggestions for Snow Cover Sampling

(1) The usefulness of snow cover surveying depends primarly on the care and honesty of the men actually doing the field work.

(2) The work of the snow cover surveyor is often laborious, especially in stormy weather, and men willing to undertake such work can usually be depended upon to do their best and record the results faithfully.

DIRECTIONS FOR USING THE SNOW SAMPLER

A. **Care of Sampler:**

(1) In transporting sampler, extreme care should be used to guard it against injury; it can be easily dented.

(2) When sampling on steep slopes do not cling to the sampler to avoid sliding down hill; the tube is easily bent.

(3) Keep the sampler covered inside and out with a thin coating of shellac or paraffin. The inside coating can be applied by pulling through a swab soaked or wet with shellac.[1] This coating not only prevents corrosion but tends to keep moist snow from adhering to the tube.

(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

B. **Measuring for Samples:**

Always start measurements for sampling from the initial point as shown by the sketch map of the course and follow the spacing for samples as indicated. Note any irregular spacing between samples. Care should be used in spacing by tape measurements, so that the samples taken different years on the same course will be at the same spots.

(1) Plunging the tube should be avoided. In driving, a steady downthrust is preferable to twisting, because with the latter a small amount of snow enters the slots. However, a minimum amount of twisting aids in the driving and also facilitates the quick cutting of the thinner crusts. Plunging should be entirely unnecessary. In case the sampler sticks or freezes down, a light twist will usually release it.

(2) The presence of temperatures below 32 degrees F. in the snow, while the temperature of the air is above freezing, often causes the snow to adhere firmly to the orifice of the cutter after a depth of from 10 to 12 feet has been reached. This difficulty can be met in three ways.

(*a*) Withdraw the sampler when cutter becomes clogged and clean cutter and tube thoroughly. Push the tube rapidly through the snow without stopping until bottom is reached but do not plunge tube. Repeat until a complete core is obtained.[3]

(*b*) In case sampling is being done in the forest, keep the sampler in the shade as much as possible to keep it cold.

(*c*) The best method of all is to sample when the temperature of the air is at or below freezing, or late in the season when the temperature of the deep snow has risen to 32 degrees F. At these times sampling is easy and rapid.

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

C. **Weighing the Sample.**

Before taking the sample, place the empty sample tube in the cradle hanging from the scales. If the Mt. Rose scale is used, turn the pointer back to zero. If the standard tubular scale is used, record the weight empty in proper column in field book. When the sample has been taken, place the sampler in the cradle and record the weight for tube and core. For the Mt. Rose scale this reading equals the water content of the snow core. For the standard tubular scale the water content is given by the difference between the reading empty and the reading for tube and core. The zero setting in the case of the Mt. Rose scale, and the "empty" reading for the standard tubular scale should be checked at frequent intervals (not more than 5 measurements).

If dirt is picked up by the cutter it should be cleaned out with knife before weighing the sample, and proper deduction made before recording length of core or depth of snow.

D. **Recording:**

The snow cover survey sheets are made in pads of two sizes, the smaller being white and the larger pink. Only the white waterproof pads are to be used for field notes. The larger pink pads are to be used to make copies from the white field sheets as soon as possible after each survey. Instructions regarding the disposition of the pink copy sheets will be issued for each State and where necessary for each drainage basin, since the needs will require some variation in this respect.

Appropriate covers are to be provided for protection of field notes. Sketch maps showing points of observation are pasted to the inside of the covers.

Use pencil only for recording field measurements. Fill in complete description of course, party, date, etc.

If the depth of core is very much less than the depth of snow, the reason should be determined and noted under "Remarks." In case of doubt regarding the core, determine the density (water content divided by depth gives density) and compare with that of other adjacent measurements about which there is no doubt. "Remarks" should include special items as to the character of snow, nature and condition of soil or other bottom reached by the cutter, whether wet, dry, frozen, etc.

Any extended remarks as to weather conditions at the time of survey or shortly before the survey, unusual difficulties encountered, etc., may be placed on the back of the sheet, as one side only is to be used in recording the snow measurements.

---

[1]Or paraffin.

[2]If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[3]A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California
Drainage Basin South Fork Yuba
Snow Course Soda Springs #11
Party J. S. Goldsmith
Date 1-2-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	21	17.5	35	48	13		
	2	22	17.5	35	46	11		
	3	23	17.5	35	47	12		
		23	20	35				
	4	23	20	35	50	15		
	5	23	20.5	35	50	15		
	6	22.5	18	35	47	12		
	7	22	18.5	35	47	12		
	8	21	17.5	35	46	11		

8 samples taken 9 A.M.

8)101
12.6

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

8)101
12.6

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Sopatel Fork Yuba

Snow Course Soda Springs #1

Party J. S. Holtermann

Date 5-2-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	19	15	36	45.5	9.5		
		1'			47			
	2	19.5	16.5	36	47	11		
	3	19	16.5	36	47.5	11.5		
	4	18.5	16	36	47	11		
	5	18	15.5	36	46	10		
	6	18	15	36	46	10		
	7	19	15	36	46	10		
	8	20	14	36	45	9	80	820 / 1025

Samples taken 2 Pits

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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8 751 / 1849 / 1012 / 5410

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Sout Fork Yuba

Snow Course Soda Springs #1

Party J. J. Johansen

Date 5-2-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Sampling done at 5 PM / temp in shade +46	1	16	14	36	45	9		-0.25
	2	17	14	36	45	9		-0.25
	3	17	14	36	45	9		-0.25
	4	17	15	36	46	10		-0.25
	5	18	15	36	45	9		-0.25
	6	18.5	14.5	36	45	9		-0.25
	7	18	14	36	45	9		-0.25
	8	17.5	13.5	36	43.5	7.5		-1

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

52.4%

8) 71.5 / 8.9 8) 71.5 / 8.9

No..........of..........sheets. Comp. by.................. Checked by..........

8) 136.3 / 17.0 Total loss 3.7 Loss 1.9

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Fork Yuba

Snow Course Soda Springs #1

Party J. I. Johansen

Date 5-3-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Samples taken 9 AM	1	17	17	35	44	9		-1,7
	2	17	15,5	35	45	10		-0,2
	3	15,5	12	35	42,5	7,5		-0.8
	4	15	9	35	41	6		-0,2
	5	17	13,5	35	45	10		-1,5
	6	17	16,5	35	46	11		-0,8
	7	17	16,5	35	46	11		-0,5
	8	18	16.5	35	46	11		8) 75.5 / 9.4

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

Gain +0,5

No..........of..........sheets. Comp. by.................... Checked by....................

8) 127.8 / 16.0 / 9.4 / 58.8

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Fork Yuba

Snow Course Soda Springs #1

Party J.J. Johansen E. Johansen

Date 1-3-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	13	11	35	43	8		-0.25
	2	13	10.5	35	43	8		
	3	12	12	35	42	7		-.02
	4	12	11.5	35	42.5	7.5		
	5	13	11	35	43	8		
	6	14	11.5	35	43.5	8.5		
	7	13	12.5	35	44	9		-.25
	8	13	13	35	44.5	9.5		2) 6.5 x 13 = 8.5
	8)	103	12.9		8.2	8.2		

Samples taken at 3 PM

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

Loss 1.2 in

No. ..... of ..... sheets. Comp. by ..... Checked by .....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California
Drainage Basin South Fork Yuba
Snow Course Soda Springs #1
Party J. I. Johansen
Date 5-3-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Samples taken at 6 PM	1	12	10,5	35	43	8		
	2	12,5	9,5	35	41	6		
	3	13	11,5	35	42	7		
	4	14	13	35	43	8		
	5	14	15	35	44	9		
	6	13,5	12,5	35	42	7		
	7	13	11,5	35	43	8		
	8	14	10,5	35	42,5	7,5		8) 60,5
	8)	111	13,9		7.6		54.7 %	7.6

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

Loss 0,6

No..........of..........sheets. Comp. by.................... Checked by....................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: California
Drainage Basin: South Fork Yuba
Snow Course: Soda Springs #1
Party: J. I. Johansen / J. Church
Date: 5-4-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Samples taken at 10.15 AM	1	16	16.5	35	45	10		
	2	16	18	35	47	12		-1.0
	3	15	17	35	45.5	10		
	4	17	17	35	47	12		
	5	15	16	35	45.5	10.5		-1.0
	6	15	15	35	45	10		
	7	15	18	35	45.5	10.5		-2
	8	15.5	15	35	44.5	9.5		8) 84.5 / 10.6
	8)	120.5	15.1			10.6	70.2%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

Gain 3"!

No.........of.........sheets. Comp. by.................. Checked by..................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Fork Yuba

Snow Course Soda Springs #1

Party J. D. Johansen

Date 5-4-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	12	13	35	45	10		-0.25
	2	13	13.5	35	45	10		-0.25
	3	13	13	31	44	9		-0.5
	4	13	13.5	35	45	10		-0.4
	5	13	13.5	35	46	10		-1.0
	6	13.5	14.5	35	46	11		-0.9
	7	13	12	35	43	8		
	8	12	13.3	35	44	9		-0.4
	8	98.8	12.4			9.6	77.4%	

Samples Taken 6 P.M.

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

Loss 10%

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date See further

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
								↓

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.................... Checked by....................

Form No. 144

June 3, 1946

FEDERAL-STATE COOPERATIVE SNOW COVER SURVEYS

FEDERAL, STATE AND PRIVATE AGENCIES

SURVEY NOTES

Snow Surveying is completely explained in Miscellaneous Publication No. 380, United States Department of Agriculture.

Brief Directions and Suggestions for Snow Cover Sampling

(1) The usefulness of snow cover surveying depends primarly on the care and honesty of the men actually doing the field work.

(2) The work of the snow cover surveyor is often laborious, especially in stormy weather, and men willing to undertake such work can usually be depended upon to do their best and record the results faithfully.

DIRECTIONS FOR USING THE SNOW SAMPLER

A. **Care of Sampler:**

(1) In transporting sampler, extreme care should be used to guard it against injury; it can be easily dented.

(2) When sampling on steep slopes do not cling to the sampler to avoid sliding down hill; the tube is easily bent.

(3) Keep the sampler covered inside and out with a thin coating of shellac or paraffin. The inside coating can be applied by pulling through a swab soaked or wet with shellac.[1] This coating not only prevents corrosion but tends to keep moist snow from adhering to the tube.

(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

B. **Measuring for Samples:**

Always start measurements for sampling from the initial point as shown by the sketch map of the course and follow the spacing for samples as indicated. Note any irregular spacing between samples. Care should be used in spacing by tape measurements, so that the samples taken different years on the same course will be at the same spots.

(1) Plunging the tube should be avoided. In driving, a steady downthrust is preferable to twisting, because with the latter a small amount of snow enters the slots. However, a minimum amount of twisting aids in the driving and also facilitates the quick cutting of the thinner crusts. Plunging should be entirely unnecessary. In case the sampler sticks or freezes down, a light twist will usually release it.

(2) The presence of temperatures below 32 degrees F. in the snow, while the temperature of the air is above freezing, often causes the snow to adhere firmly to the orifice of the cutter after a depth of from 10 to 12 feet has been reached. This difficulty can be met in three ways.

(*a*) Withdraw the sampler when cutter becomes clogged and clean cutter and tube thoroughly. Push the tube rapidly through the snow without stopping until bottom is reached but do not plunge tube. Repeat until a complete core is obtained.[3]

(*b*) In case sampling is being done in the forest, keep the sampler in the shade as much as possible to keep it cold.

(*c*) The best method of all is to sample when the temperature of the air is at or below freezing, or late in the season when the temperature of the deep snow has risen to 32 degrees F. At these times sampling is easy and rapid.

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

C. **Weighing the Sample.**

Before taking the sample, place the empty sample tube in the cradle hanging from the scales. If the Mt. Rose scale is used, turn the pointer back to zero. If the standard tubular scale is used, record the weight empty in proper column in field book. When the sample has been taken, place the sampler in the cradle and record the weight for tube and core. For the Mt. Rose scale this reading equals the water content of the snow core. For the standard tubular scale the water content is given by the difference between the reading empty and the reading for tube and core. The zero setting in the case of the Mt. Rose scale, and the "empty" reading for the standard tubular scale should be checked at frequent intervals (not more than 5 measurements).

If dirt is picked up by the cutter it should be cleaned out with knife before weighing the sample, and proper deduction made before recording length of core or depth of snow.

D. **Recording:**

The snow cover survey sheets are made in pads of two sizes, the smaller being white and the larger pink. Only the white waterproof pads are to be used for field notes. The larger pink pads are to be used to make copies from the white field sheets as soon as possible after each survey. Instructions regarding the disposition of the pink copy sheets will be issued for each State and where necessary for each drainage basin, since the needs will require some variation in this respect.

Appropriate covers are to be provided for protection of field notes. Sketch maps showing points of observation are pasted to the inside of the covers.

Use pencil only for recording field measurements. Fill in complete description of course, party, date, etc.

If the depth of core is very much less than the depth of snow, the reason should be determined and noted under "Remarks." In case of doubt regarding the core, determine the density (water content divided by depth gives density) and compare with that of other adjacent measurements about which there is no doubt. "Remarks" should include special items as to the character of snow, nature and condition of soil or other bottom reached by the cutter, whether wet, dry, frozen, etc.

Any extended remarks as to weather conditions at the time of survey or shortly before the survey, unusual difficulties encountered, etc., may be placed on the back of the sheet, as one side only is to be used in recording the snow measurements.

---

[1]Or paraffin.

[2]If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[3]A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

58 - 56,5 - 58,5 - 61,5 - 72,5 - 82,5 - 70,5
295 - 295 - 295 - 293 - 295 - 295 - 295
353 - 351,5 - 353,5 - 356 - 367,5 - 377,5 - 365,5

64
295
359

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to compare weights
Drainage Basin morning and night taken
Snow Course at Johansen house Soda Springs
Party
Date 6-3-46

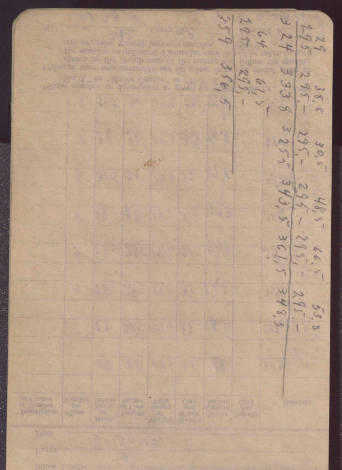
*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	29	28	14.2	31	16.8		353 - gr.
	2	29	28,5	14,2	31	16.8		351,5 "
	3	29	28,5	14,2	31	11,8		353,- "
	4	28,5	28,5	14,2	31	16.8		353,5 "
	5	29	28	14.2	31.5	17.3		356,- "
	6	30,5	30	14.2	32	17.8		367,5 "
	7	32	32	14.2	33	18.8		377,5 "
	8	31,5	31	14.2	32	17.8		365,5 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.........of 29.7 sheets. Comp. by 16.0 53.4 % Checked by 359.5

8) 237.5 8) 133.9 8) 2876.5



FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to compare weight

Drainage Basin sweeping and night taken

Snow Course at Johnson Meadow Soda Springs

Party

Date 6-4-46 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	23	23	14.2	27.9	13.7	324.-	52.
	2	25	25	14.2	29	14.8	333.8	"
	3	24.5	24	14.2	28	13.8	325.5	"
	4	24.5	24.5	14.2	29.5	15.3	343.5	"
	5	27	27	14.2	31.9	17.7	361.5	"
	6	27	27	14.2	30.5	16.3	348.3	"
	7	27.5	27.5	14.2	31.2	17.5	396.-	"
	8	27.5	27.5	14.2	31.5	17.3	391.5	"

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ..... of ..... sheets. Comp. by ..... Checked by .....

8) 196 8) 1264 8) 2774

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to compare weight
Drainage Basin morning and night taken
Snow Course at Johansen house
Party
Date 6-4-24 6 30

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	29	29	14,2	30,5	16.3		372,6 gr
	2	~~28~~ 28,5	28,5	14,2	31,9	17.7		361,5 "
	3	28	27	14,2	30	15.8		352,5 "
	4	28	26,5	14,2	29	9.8		338 "
	5	27	26,5	14,2	29	14.8		344,7 "
	6	26	25	14.2	29	14.8		338,6 "
	7	25,5	25,5	14.2	29	14.8		237,5 "
	8	32	28	14.2	32	17.8		367,- "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 28.0 of ...... sheets. 15.2 Comp. by 54.3% Checked by 339.0

8) 224 8) 121.8 8) 2712.4

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State Samples to compare weight

Drainage Basin morning and night taken

Snow Course at Johansen house

Party

Date 6-5-46 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	28	28	14,2	30	15.8		345,5 gr.
	2	27,5	27	14,2	29,9	15.7		345,5 "
	3	28	27,5	14,2	29,5	15.2		339,4 "
	4	28	28	14,2	30,2	16.0		351,- "
	5	28	28	14,2	30,5	16.3		315,5 "
	6	29	28	14,2	30	15.8		347,- "
	7	27,5	27,5	14,2	29	14.8		240,7 "
	8	26	26	14,2	29,9	15.7		343,6 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

27.0 15.7 58.1% 328.5

No..........of..........sheets. Comp. by..................Checked by..................

8) 222.3 8) 125.3 8) 2628.2

38 / 295 / 333 — 30 / 295 / 325 — 37,5 / 295,- / 332,5 — 49,5 / 295,- / 344,5

44,2 / 295 / 339,2 — 58 / 295 / 353 — 49,- / 295,- / 344 — 37,8 / 295 / 332,8 — 30,7 / 295,- / 325,7

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State Samples to compare weight
Drainage Basin morning and night taken
Snow Course at Johansen house
Party
Date 6-5-46 5 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	26	26	14,2	29	14.8		333,- gr.
	2	26,5	24,5	14,2	28	13.8		325,- "
	3	25,5	25	14,2	29	14.8		332,5 "
	4	27	26	14,2	30	15.8		344,5 "
	5	27	25,5	14,2	29,9	15.7		339,2 "
	6	26	26	14,2	31	16.8		353-"
	7	25,5	25,5	14,2	30	15.8		344,- "
	8	24,5	24,5	14,2	29	14.8		332,8 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.........of 26.0 sheets. Comp. by 15.3 58.8% Checked by 310.6

8) 208 8) 122.3 8) 2704

435
295,-
3385

39,-
295,-
334

33,4
295,
328,4

30,7
295,-
325 7

26,5
295,-
321,5

31,-
295
326,-

18,-
295,-
313,-

27,8
295,-
322,8

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to compare weight
Drainage Basin morning and night taken
Snow Course at Johansen House
Party
Date 6-6-46 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	26	27	14,2	29,5	15.3		338,5 gr
	2	25,5	25	14,2	28,5	14.3		334,- "
	3	25	25	14,2	28	13.8		328,4 "
	4	25	26	14,2	28	13,8		325,7 "
	5	25,5	25,5	14,2	27	12,8		321,5 "
	6	24,5	25,5	14,2	27,5	13,3		326,- "
	7	23	23	14,2	26,5	12,3		313,- "
	8	24	24	14,2	27	12,8		322,8 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.......of.......sheets. Comp. by.......Checked by.......

24.8 13.6 54.8% 326.2

8) 198.5 8) 108.4 8) 2609.9

295

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples to compare weight
Drainage Basin: morning and night
Snow Course: taken at Johansen house
Party: Soda Springs
Date: 6-6-46 6[30] PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
-.5	1	25	25	14.2	29.9	15.7		335.5
	2	25	23	14.2	28	13.8		326.5
-1	3	25	25	14.2	29	14.8		338
-.5	4	25	24.5	14.2	28.5	14.3		343.5
	5	25	23	14.2	29	14.8		336.5
	6	24	23	14.2	27	12.8		317.0
-.04	7	24.5	24	14.2	27	12.8		319.8
	8	23.5	22	14.2	26.5	12.8		313.6

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

24.4 13.9 57.0% 328.8

No.........of.........sheets. Comp. by.................Checked by.................

8) 195.0 8) 111.3 8) 2630.4

0,5 + 295, = 295,5

40 + 295 = 335

20 + 295 = 315

63,5 + 295,- = 258,5

49,7 + 295 = 342,7

50,5 + 295,- = 345,5

35,4 + 295 = 320,4

35,3 + 295,- = 330,3

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State: Sampler to compare weight

Drainage Basin: morning and night

Snow Course: taken at J Johansen House

Party:

Date: 6-7-46 9AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	21	21	14,2	25	10.8		295,5 gr
	2	24	25	14,2	29	14.8		335,- "
	3,	21,5	22	14,2	27	12.8		315,- "
	4	25,5	25,5	14,2	31,5	17.3		258,5 "
	5	25,	24,5	14,2	30	15.8		342,7 "
	6	24	26,5	14,2	30	15.8		345,5 "
	7	24,5	24,5	14,2	29	14.8		329,4 "
	8	24	24	14,2	28,5	14.3		330,3 "

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 23.7 of ...... sheets. Comp. by 14.6 61.6% 330.3 Checked by ......

8)189.5 8)116.4 8)2642.9

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to Compare Weight

Drainage Basin Morning & Night.

Snow Course taken by John Johnson

Party

Date 6/7/46 6:45 PM.

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Grams Remarks
Dirt.	1	22.5	22.5	20.	30	10		324.5 GR.
No Dirt	2	22.5	22.5	20	30.5	10.5		324.5
No Dirt	3	22.5	22.5	20	33	13		325.–
No Dirt	4	23.	22	20	32	12		321.5
No Dirt	5	20	18	20	30.1	10.1		233.8
Bottom	6	21	21	20	33.5	13.5		263.8
Bottom	7	21.5	19.5	20	31.5	11.5		244.7
Bottom	8	22.0	21.5	20	32.1	12.1		258.3
		21.9			11.2	51.1%		287.0
	8)	175.0			8) 92.7		8)	2296.1

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.........of.........sheets. Comp. by....................Checked by....................

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples to compare weight
Drainage Basin: morning and night taken
Snow Course: at Johansen house
Party: Soda Springs
Date: 6-8-45 9 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	22	22	20	32	12		250,0 gr
	2	22	23	20	33	13		261,7 "
	3	22	22	20	32	12		248,2 "
	4	21,5	23	20	32	12		251,7 "
	5	21	23	20	30	10		257,6 "
	6	22	23	20	32	12		246,1 "
	7	21	21	20	32	12		246,6 "
	8	21,5	22	20	32	12		252,4 "

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.......... of 21.6 sheets. Comp. 11.9 by 55.1 % Checked by 251.7

8) 173 8) 95 8) 2014.3

2

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: Samples to compare weight
Drainage Basin: morning and night
Snow Course: taken at Johnsten house
Party: Soda Springs
Date: 6-8-46 6 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	19.5	19.5	20	37	17		239.2
	2	19	19	20	37	17		235.2
	3	17	17	20	35.9	15.9		220.5
	4	20	20	20	37.9	17.9		241.0
	5	19.5	19	20	37.9	17.9		240.0
	6	19.5	19.5	20	38	18		244.2
	7	18.5	18.5	20	37	17		230.3
-.5	8	19	19	20	36	16		230.4

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

Error?

No........of 17.8 sheets. Comp. by 17.1 96.1% Checked by 235.1

8)151.5 8)136.7 8)1880.8

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Samples to compare weight
Drainage Basin taken at Johansen house
Snow Course Soda Springs
Party 5 PM
Date 6-19-46 ~~noon~~

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	20	22	32	45	13		Dirt
	2	30	30	32	50	18		Dirt
	3	45	46½	32	61	29		Dirt
	4	42	44	32	62	30		Rock
	5	60	52	32	63	31		Dirt
	5.)	197			5.)	121		
		39.4			24.2		61.4	%

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......................Checked by.......................

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin Samples

Snow Course Donner Summit

Party J. Johansen + E. Hansen

Date 6-16-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	23	22	32	46	14		
	2	32	32	32	51.5	19.5		
	3	54	45	32	59.5	27.5		
	4	61	58	32	70	38		
	5	74	65	32	72	40		-1
	5)	244			5)	139		
		48.8				27.8	57.0%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 1 of 1 sheets. Comp. by .... Checked by ....

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin

Snow Course

Party

Date 6-17-46 9AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	20	19	32	42	10		Dirt
	2	15	17	32	41	9.5		
	3	36	41	32	58	26		Solid ice
	3a	42	48	32	58	26	✓	— " —
	4	66	53	32	66	34	✓	Dirt
	4a	67	45	32	61	29		"
	5	66	64	32	72	40		"
	5)	307		5)	128.5			
		468		25.7		61.5%		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State .....

Drainage Basin .....

Snow Course .....

Party .....

Date ..... 6-16-46 4 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	30	30	32	51 1/2	9.5		Decomposed granite
	2	38	36	32	54	7.2		Rock
	3	62	61½	32	72	4.0		Too much dirt over
	3a	63	56	32	68	3.6		Dirt
	4	66	64	32	73	4.1		Rock
	5	86	73	32	77	4.5		Rock
	5)	282		5)		16.75		
		56.4				33.5	59.4	%

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N. S. E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily for
Drainage Basin De Chutes at T. C.
Snow Course Lower Pass Course
Party J. S. Johansen
Date 1-6-13-46 5 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	2	46	43	32	58	26		
	1	29	27	32	49.5	17.5		
	3	73	58	32	67.5	37.5		
	3a	57	57	32	67	35		
	4	70	69.5	32	77	45		
	5	72	72	32	78	46		
	5	290			5)	172		
		58.0			34.4	59.3%		

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily for

Drainage Basin Tr church at

Snow Course Donner Pass Cornice

Party J. I. Johansen

Date 6-12-46 11 AM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	30	29	32	49	17		Rock
	2	62	48,5	32	63	31		
	3	55	57,5	32	70	38		Hard Ice in many layers
	4	74	76,5	32	85	53		Too much dirt in not clean
	4a	80	75	32	80	48		Rock
	5	77	78,5	32	83	51		Rock
	5)	298			5)	190		
		59.6				38.0	63.8%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily

Drainage Basin at Donner Pass [illegible]

Snow Course Dr. Church

Party J. I. Johansen

Date 6-11-46 5 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1,	41	41,5	33	57	24		
	2	49	49	33	62	29		
	3	65	47	33	62	29		
	3a	77	77	33	80	47		
	4	79	79	33	84	51		
	5	95	87	33	87	54		
	5)	341			5)	205		
		68.2			41.0		60.1 %	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: 5 samples taken daily for

Drainage Basin: In Church at

Snow Course: Tonquer Pass

Party: J. I. Johansen

Date: 6-10-46

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	32	32	32	50	18		
	2	48	48	32	60	28		
	3	59	58	32	72	46		
	4	82	33.5	32	85	53		
	5	91	81	32	81	49		
	5							
	5a	91	90	32	88	56		
	5)	312			5)	201		
		62.4			40.2		64.4%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State .....

Drainage Basin 5 sample Course.

Snow Course Donner Summit.

Party Johansen, Cadd, Romien

Date June 9, 1946

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	(1)	51	50 5/8	58	95	32	62 7	Rock
	(2)	62	62	53	92 5/8	39 5/8	63 7	Rock
	(3)	89	89	53	105	52	64 5	Dirt
	(3A)	71	71	53	102	49	69 3	Ice
	(4)	91	90	53	115	62	68 4	Dirt
	5	85	84	53	106	53	62 2	Rock
	5	370		5	238.5			
		74.0			47.7		64.4 %	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State: 5 Samples taken Daily.

Drainage Basin: at Donner Pass Corbrice

Snow Course:

Party: J. I. Johansen

Date: 6-7-4   4 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	50	49	13	43.5	30.5		Rock
	2	63	62	13	51	38		—"—
	3	74	73	13	64	56		
must have	3a	83	71.5	13	61	48		Rock
lost some core	3b	98	72	13	61			Dirt hit bottom
	4	93	92.5	13	75	62		Rock
	5	104	101	13	79	66		Dirt
		76.8			50.5		65.8%	
	5)	384			5) 252.5			

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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COOPERATIVE SNOW SURVEYS

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily

Drainage Basin at Donner Pass Corridor

Snow Course

Party J. D. Johansen

Date 6-16-40 4PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	59	53	35	69.5	24.5		Dirt
	a	53	52	35	66			Rock
	2	73	71	35	79.9	44.9		
	3	86	86	35	82.5	47.5		
	4	102	98	35	100	65		Dirt
	5	107	98	35	100	65		
	5)	427		5)	260.9			
		85.4			52.2	61.1	%	

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples Taken Daily

Drainage Basin at Donner Pass Truckee

Snow Course

Party J. J. Jensen

Date 6-5-46 4 PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	63	59	35	72	37		
	2	71	70.5	35	80	45		
	3	98	92.5	35	86	51		
	4	98	96.5	35	98	63		
	5	Pin Dropped out of 7.						
Using wrench not more sampling till required								
		82.7			51.5	62.6	%	

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 4) 329 of sheets. Comp. by Checked by

4) 206

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 Samples taken daily for
Drainage Basin Dr. Church
Snow Course Donner Summit
Party J. D. Johnson
Date 6-4-46 4PM

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Strong Meadow	1	69	67	36	78	42		
	2	76	75	36	81.9	45.9		
	3	110	85.5	36	89	53		
	4	115	107.5	36	107	71		
	5	120	111.5	36	106	70		mushy
	5)	490		5)	281.9			
		98.8			56.4	57.1%		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State 5 daily samples

Drainage Basin Connecticut

Snow Course 5 samples

Party [illegible]

Date April 3, 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	73	70	31	79	45		
	2	94	88	34	99	65		
	3	80	79	34	84	50		
	4	106	100	34	101	67		-1.5
	5	114	106	35	108	73		-1.5
	5)	117	117	35	109	74		
	5)	494		5)	309			
		99.0		61.8		62.4	%	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

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December 1946

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Anemometers 1	512.0			723.5	760.1	804.0	835.7	868.2	938.2	100.0	222.9	281.0	339.7	365.5	420.0	539.0
2	755.0			037.2	106.1	142.6	186.7	238.0	284.0	484.0	637.4	695.2	722.0	755.0	796.0	937.5
9	6939.0			7355.3	7451.4	7521.3	7598.9	7667.8	7752.6	8059.3	8265.2	8346.7	4391.7	8442.4	8512.8	8724.0
10	5504.0			5800.9	5847.3	5863.0	5900.1	5925.4	5976.9	6264.8	6456.5	6493.5	6508.4	6530.3	6565.5	6736.9
11	002.0			302.5	368.8	405.5	486.5	501.5	570.0	—	—	003.0	042.5	079.0	123.0	261.0
Temperatures																
Hotel	+40°			+33.5°	+31.2°	+29°	+24°	+32.5°	-	-	—	+33.5°	+51°	+51°	—	+34°
Max	+43°			+40°	+36°	+33°	+34.5°	+42°	+42°	+46°	+54°	+55°	+55°	+56°	+46°	+43°
Min	+26°			+33°	+32°	+26°	+11	+26°	+16°	+22°	+18°	+11°	+13°	+14°	+23°	—
Pasture	+37			+32°	+30°	+27°	+21.5°	+29.5°	-	-		+29°	+46°	+48.5°	—	+31.5°
Max	+44°			+38°	+34°	+30°	+30.5°	+41°	+55°	+42°	+47°	+50°	+51°	+53°	+42°	+40°
Min	+22°			+30°	+30°	+22°	+8°	+24°		+20°	+15°	+7.5°	+7°	+9.5°	+18°	—
Snowstick	13"			23"	26"	30"	29"	38"	28"	26	25"	26"	25"	25"	25"	24"

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Anemometers 1	741.0	897.0	134.0	302.1	347.5	365.8	487.7	598.7	639.0	678.0	777.5	852.0	883.8	146.5	239.2
2	125.6	303.2	608.2	815.0	869.0	903.7	035.0	142.1	196.4	250.2	361.4	415.9	455.6	804.7	913.5
9	8994.3	9244.9	9227.5	0050.0	0130.6	0196.2	0361.5	0539.3	0618.8	0683.3	0879.0	1943.0	1026.6	1545.3	1715.7
10	7000.4	7269.9	7696.3	8008.0	8052.8	8090.3	8231.1	8389.8	8446.5	8487.6	8606.9	8626.5	8660.8	9148.4	9309.4
11	452.7	634.7	—	165.5	218.5	262.2	375.4	498.5	551.3	608.7	750.2	812.3	850.0	223.6	344.0
Temperatures															
Hotel	+25°	+34°		+49°	+42°	+40°	+40°	+32.5°	+34°	+32°	+23°	+25°	+23°	+22°	+34°	
Max	+30°	+43°	47	+55°	+48°	+50°	+55°	+34°	+48°	+36°	+30°	+38°	+31°	+28°	+50°	
Min	+18°	+14°	28	+32°	+19°	+31°	—	+29°	+20°	+26°	+23°	+2°	+18°	+16°	+30°	
Pasture	+24°	+33°	—	+48°	+41°	+40°	+35°	+31°	+32°	+28°	+22°	+23°	+20°	+18.5°	+30°	
Max	+27°	+38°	44	+52°	+47°	+48°	+46°	+34°	+47°	+35°	+30°	+40°	+30°	+25°	+45°	
Min	+17°	+12°	24	+29°	+15°	+29°	—	+28°	+19°	+25°	+22°	+0°	+16°	+13°	−1°	
Snowstick	24"	—	24"	25"	21"	22"	21"	22"	24"	27"	31"	31"	35"	30"	29"	

January 1947

Anemometers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	307.6	625.0	798.2	941.0	032.6	279.4	378.1	449.0	516.3	580.3	612.4	707.7	843.2	002.5	129.3	351.7
2	001.6	402.6	555.5	699.4	767.6	034.0	184.1	234.3	271.7	353.4	383.6	455.9	614.2	720.3	974.6	194.6
9	1837.0	2459.2	2680.4	2891.4	2991.6	3368.3	3598.3	3680.4	3764.2	3855.0	3897.5	4032.8	4277.9	4544.8	4892.1	5219.4
10	9409.7	0032.5	0250.7	0453.8	0519.8	0882.8	1094.5	1119.8	1153.4	1201.3	1222.5	1313.7	1546.9	1775.8	2085.4	2439.9
11	412.8	848.7	003.5	151.1	214.0	473.1	630.0	695.2	753.2	832.4	856.4	950.0	143.3	337.2	566.0	794.8
Temperature																
Hotel	+28°	+26°	+25°	+41°	+40°	+33°	+34°	+36°	+30°	+40°	+36°	+19°	+15°	+17°	+20°	+28°
Max	+36°	+30°	+37°	+47°	+57°	+37.5°	+51°	+55°	+59°	+53°	+50°	+28°	+22°	+23°	+30°	+39°
Min	+22°	+14°	+10°	+19°	+18°	–	+22°	+12°	+8°	+15°	+15°	+19°	+15°	+17°	+2°	+16°
Pasture	+26°	+21.5°	+22°	+34°	+33°	+30.5°	+37.5°	+35°	+27°	+35°	+32°	+17°	+13°	+14°	+19.5°	+25°
Max	+31°	+25°	+34°	+43°	+53°	+34°	+50°	+52°	+54°	+48°	+46°	+26.5°	+18°	+18°	+22°	+33°
Min	+18°	+12°	+8°	+16°	+14°	–	+18°	+7°	+9°	+11°	+10°	+12°	+13°	+13°	+5°	+14°
Snowstick	29"	27"	27"	–	26"	26"	26"	25"	25"	24"	24"	26"	30"	34"	32"	30"

Anemometers	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	449.8	535.5	607.5	705.8	779.2	855.0	923.4	970.0	056.5	183.2	284.3	461.5	516.1	627.0	683.2
2	298.6	341.4	408.8	514.4	606.1	615.4	676.9	737.9	814.6	940.4	056.6	192.7	307.5	382.0	435.4
9	5362.8	5456.4	5552.4	5717.4	5796.6	5885.8	5979.4	6051.9	2993.9	6874.7	6551.4	6776.8	6964.8	7150.5	7243.1
10	2557.3	2614.5	2656.5	2760.5	2802.3	2839.0	2875.7	2918.2	6176.2	3121.3	3242.4	3428.0	3587.1	3750.0	3830.3
11	880.0	955.0	032.0	147.0	—	288.0	354.2	420.0	500.0	646.0	782.0	988.3	097.2	241.7	314.7
Temperature															
Hotel	+33°	–	+33°	+41°	+30°	+48°	+43°	+44°	+40°	+35°	+19°	+15°	+17.5°	+25°	+31°
Max	+45°	+56°	+48°	+46°	+57°	+53°	+53°	+50°	+48°	+41°	+28°	+21°	+28°	+31°	+39°
Min	+1°	+3°	+4°	–	+4°	+6°	+14°	+21°	+11°	+31°	–	+15°	+17.5°	+14°	+4°
Pasture	+29°		+32.5°	+35°	+21.5°	+45°	+42°	+41°	+37°	+33.5°	+17°	+13°	+13°	+22°	+27°
Max	+48°	+51°	+41°	+40°	+51°	+46°	+48°	+44°	+42°	+37°	+25°	+18°	+20°	+26°	+32°
Min	-1°	-1°	-1.5°	–	-1°	-6°	+6°	+15°	+4°	+28°	–	+13°	+13°	+8°	-1°
Snowstick	30"	–	29"	29"	28"	28"	28"	27"	26"	27"	34"	–	50"		–

February - 1947

Anemometers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	738.6	774.0	871.9	953.3	040.7	133.8	194.0	252.2	296.3	—	424.6	582.4	595.3	662.3	727.5
2	452.5	500.0	602.3	668.9	729.5	846.0	908.6	981.2	020.7	077.5	145.0	285.7	356.5	433.3	492.0
9	7262.3	7343.2	7477.5	7568.3	7652.0	7810.2	7902.3	7988.4	8054.3	8124.6	8226.8	8484.5	8527.5	9636.5	8737.0
10	3848.2	3896.0	3996.3	4060.7	4101.2	4242.9	4206.9	4365.0	4307.7	4419.7	4482.8	4647.8	4607.0	—	4766.2
11	351.6	403.4	503.3	574.3	637.0	759.0	810.0	870.4	928.2	992.7	077.2	216.6	281.2	368.7	429.0
Temperature															
Hotel	+40°	+42°	+41°		+36°	+45°	+40°	+42°	+32°		+34°	+34°	+46°	+45°	+39°
Max	+51°	+48°	+55°	+58°	+48°	+57°	+52°	+47°	+34°		+35°	+40°	+49°	+54°	+47°
Min	+4°	+20°	—	+12°	+18	+25°	+20°	+18°	+32°		+15°	+32°	+20°	+20°	+22°
Pasture	+33.5°	+36°	+39°		+36.5	+45°	+40°	+37.5	+39.5	+33°	+33°	+32.5°	+42	+43°	+37.5
Max	+43°	+42°	+50°	+54°	+51	+50°	+46°	+42°	+32°	+36°	+41°	+37°	+44	+48°	+42°
Min	-1°	+14°	—	+6°	+12	+22°	+14°	+12°	+28°	+24	+8°	+29°	+16°	+17°	+18
Snow Depth	48"	46"		41"	40"	38"	38"	37"	41"	42"	41"	43"	42"	41"	40"

	16	17	18	19	20	21	22	23	24	25	26	27	28
Anemometer 1	608.3	871.0	984.0	037.8	155.4	229.4	309.6	413.1	525.0	597.8	698.4	826.0	945.0
2	588.2	689.7	804.0	871.8	032.4	105.1	175.5	342.5	475.2	527.4	654.0	803.0	933.4
9	8869.1	9005.2	9191.9	9293.4	9572.1	9629.3	9752.2	9975.8	0169.2	0301.7	0446.1	0667.3	0880.0
10	4857.0	4957.9	5126.9	5189.2	5391.2	6477.4	6554.6	5747.0	5906.6	6007.7	6120.0	6295.7	6447.5
11	533.4	639.8	—	820.9	991.3	136.7	159.5	321.8	457.5	558.4	660.0	819.2	983.8
Temperature													
Hotel	+28°	+35°	+47°	+48°	+43°	+44°	+47°	+50°	+50°	+58°	+32°	+28	+34°
Max	+34°	+40°	+52°	+52°	+45°	+54°	+50°	+52°	+56°	+57°	+44°	+32	+39°
Min	+28°	—	+27°	+13°	+25	+18°	+20.5°	+09°	—	+19°	+22°	+28	+25°
Pasture	+26.5°	—	+45°	+42°	+36°	+40°	+45°	+46°	+47°	+43°	+28°	+26	+30°
Max	+32°	—	+46°	+46°	+38°	+45°	+45°	+47°	+47°	+47°	+38	+28	+34°
Min	+26°	—	+23°	+8°	+20°	+13°	+16°	+25°		+14°	+16°	+26	+21°
Snow Depth	43"	43"	41"	40"	39"	39"	39"	38"	38"	36.5"	36"	37"	36"

March 1947

Anemometers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	983.0	099.5	201.3	236.8	353.6	434.0	482.5	562.0	632.0	840.0	900.4	102.6	247.0	351.0	409.0	504.3
2	972.5	109.2	242.6	298.5	440.3	535.1	495.0	687.0	752.1	989.0	050.5	252.4	402.8	516.2	595.4	714.8
9	0289.7	1139.4	1333.4	1428.8	1643.8	1785.0	1878.8	2021.1	2150.6	2447.4	2596.1	2898.3	3098.4	3273.8	3388.5	3546.9
10	6481.7	6627.1	6771.5	6816.7	7007.0	7137.0	7200.5	7297.7	7375.1	7573.6	7688.6	7996.0	8178.0	8331.3	8412.7	8540.0
11	022.6	177.0	316.0	373.4	529.3	639.3	700.2	811.0	900.3	100.5	200.3	433.1	580.0	705.3	784.1	882.0
Temperature																
Hotel	+33°	+28°	+26°	+30°	+30°	+32°	+28°	+30°	+31°	+30°	+33°	+44°	+47°	+45.5°	+45°	+51°
Max	+36°	+32°	+30°	+33°	+33°	+44°	+37°	+34°	+34°	+38°	+46°	+49°	+52°	+55°	+62°	+57°
Min	+30°	+37°	+26°	+24°	+20°	+10°	+15°	+24°	+22°	—	+15°	+30°	+17	+14°	+32°	+23°
Pasture	+30°	+26°	+24°	+26°	+26°	+29°	+25°	+28°	+29°	+29°	+32°	+41°	+41°	+41°	+38°	+47°
Max	+32°	+28°	+27°	+28°	+29°	+37°	+30°	+30°	+30°	+33°	+38°	+43°	+46°	+49°	+55°	+50°
Min	+25°	+22°	+24°	+22°	+19°	+6°	+8°	+21°	+18°	+18°	+8°	+25°	+23°	+22°	+27°	+18°
Snow Depth	40"	45"	65"	60"	58"	55"	56"	54"	58"	65"	64"	64"	60"	57"	55	53"
		17	18	19	30	21	22	23	24	25	26	27	28	29	30	31
1		559.5	638.6		884.1	935.5	027.3	136.5	—		314.1	350.0	367.5	443.5	545.0	—
2		781.0	842.9		189.1	279.5	334.5	459.7	525.3		657.6	710.0	751.3	639.7	937.5	027.3
9		3642.0	3726.9		4206.5	4340.8	4441.8	4632.0			4919.0	5000.0	5065.0	5408.1	5347.1	5474.9
10		8593.9	8639.6		9073.5	9170.2	9280.0	9325.4			9497.4	9589.0	9550.6	9637.3	9721.9	9800.0
11		950.2	028.7		327.3	460.1	530.0	680.0	740.0		880.5	936.3	991.8	090.1	205.5	285.6
Temperature																
Hotel		+57°	+39°			+52°	+39°	+32°			+49°	+37°	+34°	+32°	+32°	
Max			+58°		+54°	+62°	+44°	+37°			+59°	+41°	+40°	+38°	+38°	
Min			+22°		+25°	+28°	+26°	+26°			+22°	+28°	+32°	+32°	+28°	
Pasture		+53°	+32°			+47°	+38°	+30°	+34°		+45°	+37°	+33°	+30°	+32°	
Max			+52°		+47°	+55°	+40°	+32°	+47°		+55°	+37°	+34°	+33°	+34°	
Min			+18°		+20°	+20°	+25°	+23°	+2°		+18°	+25°	+28°	+28°	+24°	
Snow Depth		50"	48"		47"	44"	40"	46"	44"		42"	42	39"	—	52"	50"

April 1947

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Anemometers 1			818.0	916.0	018.1	063.4	152.9	232.3	309.8	344.0	535.3	798.3	966.0	057.0	138.0
2			280.0	337.0	439.9	502.7	6063	671.6	763.5	780.7	952.8	387.0	649.5	705.7	788.0
9			5816.0	5976.4	6137.5	6219.9	6370.5	6487.9	6611.6	6658.1	7038.7	7519.4	7802.4	7954.6	8073.5
10			0031.7	0162.8	0290.9	0338.8	0461.7	0539.7	0637.0	0700.4	1002.1	1464.8	1730.3	1845.7	1925.5
11			542.0	659.5	776.0	833.2	948.4	030.9	120.0	154.3	413.0	769.2	975.3	095.0	175.0
Temperatures															
Hotel			+26°	+32	+30°	+43°	+38°	+31	+43°	+50°	+48°	+50°	+48°	+63°	+45°
Max			+33°	+40	+41°	+46°	+45°	+40	+45°	+26°	+50°	+58°	+62°	+66°	+69°
Min			+24°	+4	+28°	+28°	–	+31	+24°	+26°	+28°	+39°	+45°	–	+17°
Pasture			+27°	+30	+30°	+39°	+33°	+30	+40°	–	+47°	+51°	+45°	+64°	+48°
Max			+28°	+32	+36°	+45°	+40°	+35	–	–	+47°	+52°	+57°	+65°	+62°
Min			+19°	-1	+24°	+25°	–	+28	+17°	–	+24°	+33°	+41°	–	+20°
Snowstick			60"	–	55"	50"	53"	–	50"	–	48"	45"	42"	39"	35"

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Anemometers 1	207.0	307.0	366.4	436.7		601.0	667.3	731.2		819.5	009.1	237.7	301.0	367.1	474.0
2	871.0	013.0	057.0	138.1		322.2	427.0	510.6		613.9	888.7	162.6	240.8	338.5	450.0
9	8195.1	8346.8	8455.1	85703		8854.5	8994.0	9100.2		9245.2	9633.6	0013.6	0131.5	02506	1368.0
10	2008.9	2100.4	2214.4	2306.5		2578.5	2639.9	2708.5		2824.4	3200.4	3527.5	3601.0	3685.3	3773.2
11	261.5	333.5	445.3	533.6		744.3	850.0	–		056.3	340.5	619.6	704.0	790.5	871.0
Temperatures															
Hotel	+60°	+43°	+54°	+58°		+34°	+45°	+52°		+44°	+48°	+38°	+42°	+49°	+47°
Max	+67°	+52°	+57°	+60°		+45°	+47°	+54°		+53°	+50°	+58°	+50°	+54°	+68°
Min	+28°	+30°	+18°	+17°		–	+26°	+23°		+27°	+34°	+29°	–	+29°	+30°
Pasture	+57°	+40°	+58°	+34°		+32°	+44°	+47°		+40°	+47°	+37°	+41°	+47°	+65°
Max	+60°	+48°	+58°	+54°		+41°	+44°	+49°		+46.5°	+47°	+50°	+47°	+49°	+65°
Min	+23°	+27°	+23°	+24°		–	+22°	+18.5°		+23°	+32°	+26°	–	+26°	+26°
Snowstick	33	30	–	24		24"	20"	17"		12"		6"	3"	0"	

Soda Springs

Anemometer &

Temp. Readings

for

Dec. 1946

Jan, Feb, Mar, Apr.

1947

Dear Winifred.

Here are the anemometer readings. Hope they are O.K. The ship track readings will come soon.

Eleanor

Form No. 144

FEDERA

FI

Snow Surveying

Brief Directi

(1) The us
care and honest
(2) The w
cially in storm
usually be depe

DIRECT

A. Care of Sa

(1) In tra are should be used to guard it against injury; it can be easily dented.

(2) When sampling on steep slopes do not cling to the sampler to avoid sliding down hill; the tube is easily bent.

(3) Keep the sampler covered inside and out with a thin coating of shellac or paraffin. The inside coating can be applied by pulling through a swab soaked or wet with shellac.[1] This coating not only prevents corrosion but tends to keep moist snow from adhering to the tube.

(4) Since ice and rock sound and feel alike when struck by the sampler, be careful to determine what the substance is; ice will not blunt the cutter, rocks will.

(5) Keep the cutter sharp and the orifice true to its original diameter (1½ inches inside in case the Mt. Rose Steel Tube is used; and 1.485 in case the improved Utah Aluminum Tube is used).[2]

B. **Measuring for Samples:**

Always start measurements for sampling from the initial point as shown by the sketch map of the course and follow the spacing for samples as indicated. Note any irregular spacing between samples. Care should be used in spacing by tape measurements, so that the samples taken different years on the same course will be at the same spots.

(1) Plunging the tube should be avoided. In driving, a steady downthrust is preferable to twisting, because with the latter a small amount of snow enters the slots. However, a minimum amount of twisting aids in the driving and also facilitates the quick cutting of the thinner crusts. Plunging should be entirely unnecessary. In case the sampler sticks or freezes down, a light twist will usually release it.

(2) The presence of temperatures below 32 degrees F. in the snow, while the temperature of the air is above freezing, often causes the snow to adhere firmly to the orifice of the cutter after a depth of from 10 to 12 feet has been reached. This difficulty can be met in three ways.

(*a*) Withdraw the sampler when cutter becomes clogged and clean cutter and tube thoroughly. Push the tube rapidly through the snow without stopping until bottom is reached but do not plunge tube. Repeat until a complete core is obtained.[3]

(*b*) In case sampling is being done in the forest, keep the sampler in the shade as much as possible to keep it cold.

(*c*) The best method of all is to sample when the temperature of the air is at or below freezing, or late in the season when the temperature of the deep snow has risen to 32 degrees F. At these times sampling is easy and rapid.

In some cases, where not too far from a night's lodging, time can be saved by taking the samples in the morning or evening instead of during the warm part of the day.

C. **Weighing the Sample.**

Before taking the sample, place the empty sample tube in the cradle hanging from the scales. If the Mt. Rose scale is used, turn the pointer back to zero. If the standard tubular scale is used, record the weight empty in proper column in field book. When the sample has been taken, place the sampler in the cradle and record the weight for tube and core. For the Mt. Rose scale this reading equals the water content of the snow core. For the standard tubular scale the water content is given by the difference between the reading empty and the reading for tube and core. The zero setting in the case of the Mt. Rose scale, and the "empty" reading for the standard tubular scale should be checked at frequent intervals (not more than 5 measurements).

If dirt is picked up by the cutter it should be cleaned out with knife before weighing the sample, and proper deduction made before recording length of core or depth of snow.

D. **Recording:**

The snow cover survey sheets are made in pads of two sizes, the smaller being white and the larger pink. Only the white waterproof pads are to be used for field notes. The larger pink pads are to be used to make copies from the white field sheets as soon as possible after each survey. Instructions regarding the disposition of the pink copy sheets will be issued for each State and where necessary for each drainage basin, since the needs will require some variation in this respect.

Appropriate covers are to be provided for protection of field notes. Sketch maps showing points of observation are pasted to the inside of the covers.

Use pencil only for recording field measurements. Fill in complete description of course, party, date, etc.

If the depth of core is very much less than the depth of snow, the reason should be determined and noted under "Remarks." In case of doubt regarding the core, determine the density (water content divided by depth gives density) and compare with that of other adjacent measurements about which there is no doubt. "Remarks" should include special items as to the character of snow, nature and condition of soil or other bottom reached by the cutter, whether wet, dry, frozen, etc.

Any extended remarks as to weather conditions at the time of survey or shortly before the survey, unusual difficulties encountered, etc., may be placed on the back of the sheet, as one side only is to be used in recording the snow measurements.

---

[5]Or paraffin.

[6]If the cutter is broken or badly worn, send first tube section with cutter attached to your regional snow survey office for repair or replacement.

[7]A complete core is evidenced when length of core compared to snow depth is approximately the same throughout a course.

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date Feb 20

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	8	77	69.2	82	~~116~~ 116	634		Soil moist pieces, also snow which becomes gray, much squeezing
		-1	-1					
	~~Temp +0.1°C~~							
	9							
	Rest of core also compact but is not so moist							
	9	75.5	50.3	82	108.2			Ice moist [illegible] roots [illegible] turned in
		-1	-1					
Ram		75.5	66.2	82	116			Coarse crystals
	~~Temp +0.2°C - Core in way~~							
At 31 in.	Temp, 0°C							

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by.......... Checked by..........

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
To 1 crust			2 ½ in.		Surface 2–3 mm			
			& [illegible]					
		2.5	cc	82	83	Moist pack		
To 2nd crust			~~[illegible]~~ in			1 mm		
			37 in			Dry pack		
		37	36.8	82	95.6	13.6		
To 3rd		~~13~~	13	82	88	6		
				2–3 mm icy				
To 4th			23.3	82	94.6	12.6		Too frozen
			–.8					to pack
			1–3 mm		but frozen			much
		in larger						
Total depth			74.5					

*Show number or description as given on sketch map, *i.e.,* "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No.............of............sheets. Comp. by.................Checked by..............

Sunset

Surface becoming

Dry

Overcast

6:20 Crust frozen

3/8 in. Temp at trestle 41.5

HT 41

Cat just in from Super B

In sealed tube;
On surface of snow
still moist +0.6°C
On frozen crust +0.6 To 0.5
radiation from porous
crystals

Snow stake 73 in

Need a splicing

pin

"Feb 14 — and
has done ...
5:45 6640 ...

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS