SODA SPRINGS

KEY COURSE

May 1

	Weight Empty	Weight with core	Depth	Core	Water Content	Dens. %
1	49.8	57.4	16.2	14.4	7.6	
2	"	58.9	14.8	14.8	9.1	
3	50.0	56.6	15.5	15.5	6.6	
4	50	62.1	21.0	21.0	12.1	
5	"	60.0	17.5	17.5	10.0	
6	"	57.9	15.0	15.0	7.9	
7	"	56.6	14.0	14.0	6.6	
8	"	60.6	20.2	18.2	10.6	
9	"	58.0	15.5	15.5	8.0	
10	"	60.3	22.2	21.0	10.3	
			171.9	167.3	88.8	
			17.2	16.7	8.9	51.7

$\frac{8.9}{42}$ = 21.2% of Normal 97.1% Cores

737 EVANS AVE.
TELEPHONE 1341-W

1943

H. P. BOARDMAN
CIVIL ENGINEER
RENO, NEVADA

Soda Springs
S. S.

4/30 SS by P.G.&E.
5/1 S.S. " Dr Church

Sample No.	Depth 4/30	Depth 5/1	W.C. 4/30	W.C. 5/1	Dens. 4/30	Dens. 5/1	①/②	③/④	③-④
1	23	16.2	13	7.6	67-	47-	1.42	1.71	4.4
2	16	14.8	10	9.1	63-	61+	1.08	1.10	0.9
3	17	15.5	12	6.6	71-	43-	1.10	1.82	5.4
4	22	21.0	13	12.1	59+	58-	1.05	1.07	0.9
5	22	17.5	12	10.0	55-	57+	1.26	1.20	2.0
6	18	15.0	10	7.9	56-	53-	1.20	1.26	2.1
7	23	14.0	13	6.6	57-	47+	1.64	1.97	6.4
8	25	20.2	13	10.6	52	52+	1.24	1.23	2.4
9	24	15.5	13	8.0	54+	52-	1.55	1.62	5.0
10	25	22.2	13	10.3	52	46+	1.13	1.26	2.7
avg.	21.5	17.2	12.2	8.9	56.7	51.7	1.25	137	3.3
	①	②	③	④					

$\frac{12.2}{42.0} = 29.0\%$ of Normal

		Temp max	Temp min
apr 28	Snow & rain	43°	30°
29		55°	19°
30		57°	35°
May 1		58°	40°
" 2		66°	27°
" 3		62°	30°
" 4		57°	31°
" 5	Snow gone	63	29°

DYES

May 2, 1943

8 a.m.

Planted dye (minimum temperature 28°F, present temperature 34°F) crust solid with frost.

Though pin points of moisture attach themselves to hand from frost, number 6 is dormant except on 3 tiny crystals-- even where scattered over frost spicules.

But slowly, after several minutes occasional flecks of crimson appear like stars in the evening sky. Now the flush of dawn in color as sun comes from thin clouds.

The color travels up the individual needles or spikes of the frost stars and does not jump across.

The frost is a tangle of rods.

Only the topmost rods are colored, evidently where moistened by the sun.

The grains of dye deeper in the frost are still dormant.

Now tiny sparkles flash where a frost rod has melted. Now they quicken and the crimson becomes more continuous as the water spreads--

Moisture in the Snow Cover

Depth 12½ inches
First 5½ inches frozen dry. Dye is dormant (minimum 28°F) below snow crushes but increases in moisture downwards. Test the calories.

The upper 5½ inches resists crushing but the dye assumes crimson from the pressure of my hand but only on the outer crystals.

Below, the color is well distributed through the core, which crushed readily and showed moisture throughout. Grain size 1 mm to clump sizes of 5.10 mm.

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State _____ Drainage Basin _____

Snow Course _____

Party _____ Date _____

Date and Weather	No. of test	Length of Core ins.	Dens. of snow %	Grain size mm	Temp. of snow oF	Moisture* W, M, D, P, C.	Mass hot water ins. (ozs)	Temp. hot water oC	Mass snow ins. (ozs)	Final temp. oC	Calories
May 3/43	8	Scraped up a trifle [Most nearly "latest heat"]		4-10 Corn snow Chunks of ice also		W	10.58	35.4	7.822	0.05 a few crystals still unmelted	58.7
	8a	4 or trifle upper part of snow	31.2	4 est		W	10.37	62.6	1.262 [Try larger amount]	49.5	84.1
May 7/43 Clear, sting breeze	9	3-5 in. Total 1.5	47.9	1-2 Max 4 (Compacted)	at 31½-32.5°F at 45½.. 0.4°C = 32.7°F	M-W C-P	10.342	54.0	7.181	10.4	67.2516
" Sunset	10	10.7	53.9	1-2	"	M-C the slightly W-P	10.059	51.0	5.77	13.0	69.38

Tests 9 and 10 from residual snow, Elsenthal ground base.
Had melted suddenly? 8 in. May , 0 May .

* W = wet; M = moist; D = dry

P = packs; C = crumbles

STATE PRINTING OFFICE

Latent Heat of Melting Ice but Melting Heat of Melting Snow.

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

Melting ice 79.6 cal. per gram.

State California Drainage Basin South Yuba

Snow Course Soda Springs No 1.

Party J.A. Church and Arthur Guilland Date April - May, 1943.

Date and Weather	No. of test	Length of Core ins.	Dens. of snow %	Grain size mm	Temp. of snow oF	Moisture* W, M, D, P, C.	Mass hot water ins. (ozs)	Temp. hot water oC	Mass snow ins. (ozs)	Final temp. oC	Calories per oz instead of per gram.
Apr. 25/43	1	3½ ?		2	32 ?	W	10.71	49	3.43	30.1	42.48
" 26	2	15	53.3	1-2 Ice 4	33	M - frag. in MC	9.921	50.2	8.0 -	6.4	61.31
" 27 Snow - rain	3			2		Firm W crust	9.921	20.9	1.5+	16.0+	16.39 [Don't play with small quantities]
May 2	4	17.3	58.0	2-4	35	W:C-P	10.248	61	10.04	5.8	63.75
May 3 Calm, pr. day	5	upper 6.5	69.4	2-3	33° 8 in. down	MC	9.880	58.6	4.51	24.9	67.1
"	6	lower 8.5	51.5	34	33 12 in down	MP	10.71	63.4	4.38	30	70.2
	Total pit 6	15.0	59.3					52?	8.89		
"	7 (5+6 comb.)	17.5 mat. in bottom	48.7			Soil dripping	10.285	62 ? Before cutting core	8.52 at 52	5.4	78.9 ? 64.03

*W = wet; M = moist; D = dry
P = packs; C = crumbles

STATE PRINTING OFFICE

$C = \frac{2.45 + \text{Hot water}}{\text{snow}} (\text{temp. hot water} - \text{final temp}) - \text{final temp.}$

1 oz = 28.35 grams. approx. 1 oz = 30 grams. {Calory the same whether oz or gram.

April 15 -

	No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8	No 9	No 10	Snow Stake
Apr. 16		13.16	13.18	10.1+	?	9.38	Apr 9:7in 6.98in	8.53	10.22	10.47	55 [50]
" 20		13.16	13.18	10.12		9.37		8.53	10.20	10.45	44 [41]
" 20				R. 2.705		R. 2.12	R. 0.97	R. 2.03	R. 2.80	R. 2.84	
" 26		13.18	13.3	3.02+.03 .345	1.17?	2.35 .23	1.13 [0.25]	2.26 .23	3.07 .27	3.13* .29	
Apr 27 Scale full. Pen jammed off. * Hearst replacement 3.10 instead of 3.13. Corr. +.03	May 1	13.62	13.75	5.58 [May 2. 5.55 by calibrated gage 2.56]		4.82+.03 2.50	3.6 [3.78]	4.57+.03 2.34	5.65 +.03 2.61	5.73 +.03? 2.63	
	" 7**	13.44 [13.62?]	14.06	5.58 0		4.84 +0.02	3.78	4.58 +0.01	5.65 0	5.73 0	
	June 1 0.8	13.3	14.23	7.93 2.35+.03		7.05 2.21+.03		6.62 2.04+.03	8.02 2.37+.03	8.12 2.39+.03	

** apply .03 in corr. after calibrating?

Suggestions

New and old snow? Snow is "new" when falling, but may become "old" the next day. Can one speak of "Fresh Accumulations" and "Old Deposits"? How long an interval must elapse between? The aging is continuous and may be acceletated.

Vibration To reduce vibration in both thermographs and precipitation registers, the instruments must be set on a concrete base and protected likewise possibly from strong air currents. The gradual and delicate precipitation trace is now hidden by the broad band caused by vibration.

Must return to Soda Springs at least by next Wednesday. Obtain a flash-light.

Paul Norboe sent the promised silver fir (promised for Christmas) the same day by truck and gave the truck driver an additional fir for compensation. He offered to send me another.
Take "Organized Water" to Paul Norboe and copy for Pauline.

Hygrothermograph from Salt Lake City and placed in Pasture bears serial number 1587.

Monday Dec. 28

By teletype
Donner Pass 31°F. Snowing
Probably rain and snow at Soda Springs

Wednesday Dec. 30

Left Reno at 7 a.m. Overcast toward mountains.

At Donner Lake film of dry snow on road surface makes interesting patterns in the swirl of air beneath the trucks. A Kaleidoscope of changing patterns. Akin in emotional effect was the milky-way patterns in the ice of Tassersuak II, Greenland.
Temperature enroute just astfreezing or slightly below. Hence snow dust in the air but moisture on the warm windshield.

No chains necessary.
Snow cover hard; some dry snow on tree crowns.

Soda Springs

Below freezing.
Triple register running. But right-hand wind direction pen sometimes sticks down and stop drum, or entire set lifts high in the air. A question of proper tension of the lifting-springs. Make delicate adjustment.

Resetting Instruments

10:30 a.m. Hotel — Dry bulb 32°F. Wet bulb 32°F ∴ humid 100%
Min. reset 29°F; Hygrothermograph 34°F

Stevens W- motor running.
Slight deposition of rime in orifice. Temp. just at freezing. No heat felt. Radiation effect? Frosting?

Snow Texture and Temperature Dec. 30th

9 p.m. Temp before Hotel.....32°F
But rain, slush, water.
No crust.

9 p.m. In therm. shelter
Min. reset 33°F; ~~ppychh~~ dry 35°F; H-T 38°F, 100%
Psych. 1/4 in. above wet snow 34°F
Air full of moisture.
Snow still wet and packs in hand.
Snow temp. almost as high as in shelter. Only 1°F lower. Previously crust formed when temp. in shelter was 35°F or higher. Why not now?

Query: Can the snow be so wet that latent heat of the water prevents the usual fall of temp? But is it wetter than on Dec. 23?

Setting All Gages

Dec. 9--Wed. Noon.

Numbers begin at natural approach of observer. All gages have number painted on them.

Back of Hotel:

No. 1--Standard unshielded Gage
No calcium chloride.
Can be weighed, but contents melted at present.

No. 2--Stevens Type W. Seasonal

Present advance of pen 13.8
- 0.4*
13.4 in.

*Correction if measured from base line -0.4 in.

But minor oscillations frequent and pronounced. Load on platform and perhaps wind throw weighing bar into action.

Recharged--4 cartons of calcium already in tank; 6 more with equal volume of water added. No freezing had occurred but lack of stirring and further dilution might permit excess of fresh water and attendant freezing.

Waited overnight for oscillation from recharging to cease before marking the new position of the pen**

Evidence of heat at orifice of can felt by the hand at 2 p.m.. So batteries active but they will be tested.

**Startled because weighing beam did not immediately record when new solution was poured into can. Did not realize that clock had broken the circuit. Pen oscillated abundantly later.

Dec. 9--No. 3--Army Gage (U.S.Engineers)
Capacity approximately 67 in.
Solution prepared from Codd's graph.

Calcium chloride (net weight) 12.7 in.
by U.S.W.B. scale for 8 in. cans

Water..... 17.2
Oil..... 0.5
30.4

Present water drained from gage through valve at edge of platform floor. Water residue not drawn off is datum level for measuring seasonal catch.

Charge sufficient for the season.

Measure with stick monthly and stir thoroughly to break up stratification.

Net weight of solution as reweighed in 8-inch can and poured into gage.

13.00 in.
15.65 in (incl. oil)
Total 28.65 in. (net) Residual capacity 38 in. approx.
Rather small for Soda Springs?

Depth from rim to solution (point of Meas. marked on outside of rim)

Depth of can 59-3/8 in.
Depth of solution 4 in.
Ask Engineers for table of contents at various depths.

Dec. 9--No. 4--Shielded Standard Gage
for checking No. 3. Monthly capacity only.

Charged 2.19 in.* (gross)

*Dec. 13 (eve) 2.22 in. Condensation due to frost two nights or so ago? Possibly due to light rain this evening.

No. 5--Friez Reconnaissance (4 day chart; clock 7 day, but should be wound more frequently.**

**Only water in the pail, snow entirely melted. "Tower too frail. Outer shell of recorder too loose and rattles. Boarding on tower obstructs wind, ladder and produces vibration, damping cup has only a single simple disk. Liquid used for baffle is really Prestone."--Seidentopf.

Pasture Lot

No. 6--Shielded Monthly Standard (north end of trestle)
Charged 3.76 in (gross)

No. 7--Stevens Shielded Monthly Recorder Type Q
Total catch 14.4 in.
(Seasonal Type W. 13.4 in.)

Snow core at last observation projected into chimney orifice, but has now shrunk into bucket due apparently to heat today.

However, contents of bucket are still half snow. Only a trace of oil on water surface. Ice free from sides and bottom of bucket.

Depth 3-3/4 in. but pocket in bottom of ice is filled with petal-like crystals of ice.

In place of 1 carton, substituted 2 cartons of calcium chloride and 1-1/2 carton-lids of oil.

Started pen on new sheet at 1.2 in. above bottom. Recharged at 4 p.m.

Dash Pot

Dec. 9--Changed Transil Oil to Tydal (SAE 10) in splash pot. Watch results.

Stopping of clock?

Stoppage only apparent. Really due to accumulation and sudden fall of snow down orifice tube. This explains action of Friez recorder also and extreme upward and downward movement of pen.

Nothing else could have done it. Ashton Codd has actually seen such happen.

See trace of Dec. 7
when snow was seen reaching into orifice and evidently by our shaking the tower caused the snow to break free. Later it melted down.

But trace Nov. 11-Dec. 9 is 3 days short! However, Friez recorder lost no time and has been running accurately.

Check time of Stevens Q. Regulate clock if possible. Later: clock did stop for a total of 2 days. Which days?

Overflow pipe

Planned to carry excess catch past the clock and discharge it below. Codd has invented a siphon to perform the same service but likewise record the amount of spilled water and thus keep the record accurate even during torrential rains. (See earlier details)

The overflow pipe gives down draft but no snow found inside.

Record Sheets

Dec. 9--"Better keep inside case so as to have the same moisture content as the air. Indoor sheets may be too dry and so may expand unevenly." Seidentopf.

No. 8--Near south end of trestle. Unshielded standard gage (Monthly).
Charge 4.03 in. (gross)
Need footstool to remove it.

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

Hydroclimatic Section
462 Flood Building
San Francisco 2, California
August 22, 1944

Mr. J. E. Church
University of Nevada
Agricultural Experiment Station
Reno, Nevada

Dear Mr. Church:

The daily catch by Friez gage at Soda Springs for July 14 to August 1, 1944 is as follows:

July 14 - .25
July 24 - .02
July 25 - .07
July 26 - .69
Total -1.03

The inner tube and funnel were sent July 1, by the Climatological Division.

Mr. Polos left this station on May 30, 1944 for his new position in Atlanta, Georgia.

Any time that I may be of assistance to you in these matters do not Hesitate to write.

Yours truly,

Roy A. Wells

ROY A. WELLS
Hydroclimatic Supervisor

RAW:H

The routine snow surveys by the Calif. Coop. Snow Survey at Summit and Soda Springs March 1 and April 1 are as follows:

	Summit			Soda Springs		
Snow Survey	Snow in	Water Equiv. in.	Dens. %	Snow in	Water Equiv. in.	Dens. %
March 1	105.0	27.40	26.1	101.7	27.30	26.8
Precip. No. 5 (Twin) Gage Soda Spgs for March		3.84			3.84	
		est. 31.24 in. gain.			est. 31.14 in. gain.	
April 1	65.3	30.0	47.2	56.1	25.9	46.2
Loss		1.24 in.			5.24 in.	

The complexes of loss at these two adjacent stations provide incentive for detailed study by snow surveys with ... at frequent intervals with of shelter against erosion, evaporation, and melting. ... than latter

Because of the opportunity approx. 1,000 feet lower a snow course at Donner Lake, with studies of temp., snow texture, and melting, approximately 1,000 feet lower will afford a

(provides opportunity to apply compare snow ripening and melting at higher and lower altitudes

	No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8	No 9	No. 10.
~~June~~										
June 1	2.23	—	14.25 (or 14.50?)	7.93	6.06	7.05		6.62	8.02	8.12
June 25	0.40	—		8.70 in +0.26 in precip. July 1-2 =0.17	0.37 See chart	7.80 0.75		7.30 0.68	8.80 0.78	8.90 0.78
July 10	0.25		Dpth 14.60	8.95	0.21	8.04		9.56 10.56	9.05	9.15
July 25	0.39		Dpth 14.60	9.13	0.35	8.15	7.01	7.67	9.15	9.28⁻ Loss 0.13 in. Prec. 0.14 in
July 27 Recharge	0.39	Wt 30.89 Dpth 4.8 in	Dpth 4.45 = 24.0 Wt 29.66							
Sept. 1		0 Dpth 4.60 loss 0.2?	Dpth 4.33 loss 0.12 in	9.12 loss 0.01 in		8.12 loss 0.03		7.66 loss 0.01	9.15 loss 0	9.27 Loss 0.01⁻
Sept. 24 My A.C.				9.11		8.11		7.65⁻	9.13	9.25
Oct 1		Dpth 4.60	Dpth 4.50 =24.0	9.15 [Oct 4 - 9.09 + in]		8.12⁻	No loss	7.65⁺?	9.13	9.25
Nov. 1	2.64	Dpth 4.82 Wt 2.42 in. Since July 27	Dpth 4.90 =25.15	12.03 [R 5.80]	2.80	10.91⁺ [R. 5.95]	Wt 2.88	10:20 [R. 4.61⁻]	12.08⁻ [R. 4.77]	12.22 [R. 4.58]
For October Wt	2.64	2.42	Dpth 2.03	2.91	2.74	2.79	2.90	2.54	2.93⁻	2.95
~~Nov. 17~~			Read Dpth 15.2 Wt 90.50 in							
Nov 16-17	0.06	Straight line. Too little prec.			0.07 0.08		0.08			
Nov. 19-22	1.29	1.28			1.71					
Nov. 1-22	1.35	2.08			1.78					
Dec. 1	1.94	2.72	Dpth 15.3 =1 in	2.55	2.42	2.41	2.50 ~~2.64~~	2.21⁺	2.63	2.65
Jan. 1	~~2.44~~ 2.82		Dpth 15.9	11.40	2.55	11.25	2.93	9.25	10.55	10.33
Jan. 17	3.38		" 17.6	16.10	2.95?	15.70		12.32	15.27	15.13
Feb 4	~~6.06~~ 5.54		Dpth 20.6 =	22.13		21.42	10.36	17.34	21.87	21.73
~~Feb 10~~	~~1.37~~			[Recharge 6.48]		[Recharge 6.44 in]		[Recharge 6.70 in]		
Feb 10	1.37		Dpth 19.5	8.07		7.78	1.51 [Recharge 5.84 in]	7.72	23.67 [Recharge 6.83]	23.32 [Recharge 6.92]

Rubber	Plastic	Retaining Collar
10.55	8.77	19.70
11.76	10.14	20.45

Comparison of Precipitation Gages

at Jade Springs near Donner Summit (Cont.)

(Inches. Water Equiv.)
Parenthesis indicate Total

See blue sheet.

Date 1943-44 WINTER	Accum. Snowfall (Max.)	No.1 Unshielded	No.2. Stevens W Recorder	No.3 Army Engt	No.4. Cheer	No.5. Friez Recorder	Stevens S Unshielded	Plastic Collar Unshielded	Reducing Collar	Prestone Unshielded
Nov.1-Dec.1		1.94	2.48	Nov.16-Dec.1 1.0(15.2)	2.55	2.42				
Nov.16-17		0.06	0			0.07				
Nov.19-22	(5)	1.29	1.88			1.71				
Dec.1-Jan.1		2.82	Removed	3.0(15.9)	3.05	2.79				
Dec.5		0.035	0			0.07				
Jan.1-Feb.4		8.92		18.0(20.6)	10.73(11.1)	10.38				
Jan.1-17	Jan.2,(26) ·6,(40) ·17,(29)	3.38		6.0(17.6)	4.70(4.5)	4.51 Reckgd.				
Jan.17-Feb.4	Jan 23 and 30, (8) Feb 4.,(9)	5.54		12.0(20.6)	6.03 (6.6) Reckgd	5.87		Jan 29-Feb 4 4.67(2.6)	Jan.25-Feb.4 2.55(2.86)	Jan 20-Feb 4 5.75(5.45)
Feb.4-Mch.1		5.73		5.0(22.0)	6.41	7.65		5.06	6.66	4.69
Feb.4-10	Feb.8(15)	1.37	Siphon pen and cross-section paper installed	-4.0(19.5)	1.59(1.9)	1.61		1.37(1.5)	0.75(1.52)	1.21(1.4)
Feb 10-22	Feb 21 and 22,(10)	1.26	1.60(?)	5.0(20.8)	1.99	1.91		1.29	2.10	1.16
Feb 22-Mch.1	Feb 28(26) ·29(20) Mch 1(11)	3.10	4.20	4.0(22.0)	2.83	4.18		2.40	3.81	2.32
Mch 1-Apr.1		2.70	—	4.0(23.2)	4.0	3.71		1½ in. below rim	Capacity	1-2 in. below.
Mch 4-	(19)	1.65	(Wet ice)	(Wet ice)	(Snow 2 ft. below rim)	(Can fully; water in rec.)				
Mch 5-	(3)	0.24	(Wet slush)	(all slush)	(16; ice slush)	(9-10 below rim)		Snow 10½ in. below rim		dry snow w. slush 7 in. down.
Mch 1-6		1.89	3.64	3.0(22.9)	3.16	2.56 Recharged		1.09	0.57 Mch 8. found leaving.	0.73
Mch 12		0.45	0.50			0.17				
Mch 6-16	(Mch 9: Ice in all cans melted)	0.81	1.02	1.0(23.2)	0.80 Reckgd	0.86		0.62(0.50) Reckgd	Repeat	0.67(0.61) Reckgd with calc. chl.
Mch. 16-Apr.1	(No.18 oil)	0	0*	0 (23.22)	+0.04(-0.02)	0	Sat	0.75(0.30)	0	-0.01(-0.04)
Nov.1-Apr.1		22.11		D. 28.0	26.74	26.95				

Normals
Precip. Nov.1-Mch 31 35.98 in. (No.1 gage) = 61.5%
Snow Cover Apr.1 38.60 in. " " = 67.1%

* 0.38 in but moved forward by Ernie Maser while testing batteries.

Comparison of Precipitation Gages at Soda Springs near Donner Summit (Conc.)

Pasture

Date WINTER 1943-44	accum. Snowfall (Mdt.)	No. 6 Check	No. 7 Recording Stevens Q	No. 8 Unshielded	No. 9 - 3 Ft. dep	No. 10 3 Ft dep	Snow Stake or Snow Survey
Nov. 1 - Dec. 1		2.41	2.50	2.21+	2.63	2.65	(0)
Nov. 16-17			0.08				
Nov. 19-22	(5)		1.65				
Dec. 1 - Jan. 1		2.89	2.97	2.43	3.15	3.10	(15)
Dec. 5			0.04				
Jan. 1 - Feb. 4		9.97	10.36	8.09	11.32	11.40	
Jan. 1-17	Jan. 2 (26) ; 6 (40) ; 17 (29)	4.25 (4.0)	4.26	3.07 (3.9)	4.72 (4.8)	4.80 (4.3)	(29)
Jan. 17 - Feb. 4	Jan. 23 and 30 (8) ; Feb. 4 (9)	5.72 (4.6) Reckpd	6.10	5.02 (5.2) Reckpd	6.60 (7.3)	6.60 (ice)	(Feb 1) 12.2 (48.7)
Feb. 4 - Mch. 1		5.84	8.62	4.87	7.77	7.75	(Mch. 1) 27.3 (101.7)
Feb 4-10	Feb. 8 (15)	1.34 (1.6)	1.56	1.02 (1.1)	1.80 (ice) Reckpd	1.59 (ice) Reckpd	(Feb 11) 18.1 (57.5)
Feb. 10-22	Feb. 21 and 22 (10)	1.97	1.96 Mb.	1.58	2.01	2.08	(66)
Feb. 22 - Mch 1	Feb 28 (26) ; " 29 (20) ; Mch 1 (11)	2.53	5.10	2.27	3.96	4.08	(101.7)
Mch 1 - Apr. 1		2.28	4.91	1.98	3.46	3.82	(Apr. 1/2) 5.9 (56.1)
Mch 4	(19)	Snow to top	Tall chimney gives additional range	can sight down	1 foot to spare	1 foot to spare	
Mch. 5	(3)	1/2 in. snow; then slush.	34 in. to floating ice and slush	11 1/2 in. to snow remnant	21 in. to snow	15 1/2 in. to ice and snow	
Mch 1-6		1.42	3.75	1.31	2.55	2.70	(103)
Mch. 12			0.46				
Mch 6-16	(Mch. 9: 3 cm in all cans melted)	0.85 (0.70)	0.75	0.67 (1.8)	0.88 (0.90)	1.09 (1.35)	
Mch 16 - Apr 1		0.01 (-0.12)	-0.05 Reset (Apr. 2. reckpd)	0 (-0.20)	0.03 (0.10)	0.03 (0)	
Nov. 1 - Apr. 1		23.39	29.36	19.58+	28.33	28.72	25.90

Normals

Precip. Nov 1 - Mch 31 35.98 in.

Snow Cover Apr. 1 38.60 in.

To provide a complete picture of all principal elements associated in ~~runoff~~ streamflow - such as winter temperature, precipitation, and runoff, ~~spring~~ spring water table, and snow cover, summer runoff and precipitation - the following table has been prepared by the junior author:

	No. 1	Stevens 5	No. 3	No. 4	No. 5	Reducer	Prestone	Plastic Collar	No. 6	No. 7(4)	No. 8	No. 9	No. 10	Snow on Ground / Snow Stake	Snow Survey
apr. 1 – May 9	5.08		7.5 (25.28) (24.7?)	6.12 (6.04) 6.10	5.79	~~6.40~~ ~~5.40~~ 6.48	5.18 (5.24) 5.16	~~5.34~~ (5.3) 5.66 (5.6)	5.35 (5.32) 5.33	~~4.36 (4.5)~~ 5.57	4.36 (4.5) 4.34	6.27 (6.1) 6.25	6.27 (6.25) 6.25	(18)	12.3 (27.2)
May 7 – July 2	3.42	3.77	4.0 (26.7)	4.11 (4.18)	3.89	4.57 ~~3.4~~	3.65 (3.5)	4.44 4.19 (4.1)	3.90 (3.9)	W. 3.88	3.42 (3.4)	4.20 (4.2)	4.35 (4.15)		
July 2 – Aug. 1	0.35	1.11 (1.12)	1.5 1.5 (27.2)	1.13 (1.12)		0.95 0.5+	1.03 (0.9)	1.20 (1.3) 1.135 (1.2)	1.24 (1.2)	—	1.055 (1.04)	0.99 (1.0)	1.04 (1.1)		
Aug. 1 – Sep. 1	0	−0.02 (−0.12)	0.0 (27.2) to aug. 18?	0.01 (−0.02)	0.0	−0.19 −0.1×	To Aug. 18	−0.026 (−0.02) −0.025 (−0.02)	0.01 (−0.02) +0.13*		0.005 (0.01)	0.0 (0.0)	0.01 (−0.1)		
apr. 1–16	3.14	—	1.50 (24.7)	3.85 (3.72)	3.64	4.11? D (4.95)	3.20 (3.14)	3.38+ (3.29) 3.19+ (3.1)	3.30 (3.41)	* Wrecked June 24; next July 19. Accuracy impaired? 3.24	2.66 (2.84)	3.93 (3.84)	3.99 (3.88)	(54)	
apr. 16–21	1.12	1.22	1.2 (25.1)	1.34 (1.4)	1.33	(0.3)	1.05 (1.4)	1.24 (1.48) 1.17 (1.1)	1.17 (1.21)	1.21	0.99 (1.06)	1.42 (1.36)	1.41 (1.32)	(60)+	26.0 (59.8)
apr. 21 – May 7	0.82	0.85	1.0 (25.28)	0.91 (0.92)	0.82	0.95	0.91 (0.7)	1.02 0.96 (0.85) (0.8)	0.86 (0.7)	0.72	0.69 (0.6)	0.90 (0.9)	0.85 (1.05)	(18)	12.3 (27.2)

Reducing Collar:
Divide depth by 0.525 to get true depth, as in an 8-in. can.

	Apr. 1		Apr. 16	Apr. 21	Apr. 28	May 1
apr. 1-	Stevens S 9.18	D. 5.1	(new refl) 11.70	12.92 D. 9.1	13.10	
	No. 3	D. 23.22	D. 24.7	D 25.1		
	No. 4 5.44	D. 4.28	9.29 D. 8.0	10.65 D. 9.4		
	Reducer 16.7	D. 4.60	20.83 −0.03 D. 7.2	D. 7.5		
	Prestone Nit 4.64	D. 3.96	7.84 D. 7.1	8.91 −0.03 D. 8.5		
	Plastic C. 5.4	D. 4.3	8.61 −0.03 (D. 7.4) (corr. — acct?)	9.78 D. 8.8		
	No. 6 5.26	D. 4.18	8.58 −0.03 D. 7.59	9.75 8.8		
	No. 8 5.25	D. 4.1	7.93 −0.03 D. 6.94	8.92 8.0		
	No. 9 7.03	D. 5.1	10.98 −0.03 D. 8.94	12.40 10.3		
	No. 10 8.53	D. 6.1	12.54 −0.03 D. 9.98	13.95 11.3		
april 2-	No. 7(Q) reachgd - Zero 2.95 in.			3.90		
	Snow Survey (51.1) 23.8 in.					
	Stevens W			8.13		
april 5-	Stevens S 9.20					
	No. 1 0.35					
	No. 5 0.30					
	No. 7 0.28					
	Snow. survey 0.20 (new) (51.2) 23.5		(57.0) 24.66			
april 12	Stevens Q		3.14			
	No. 1 (apr. 1-16)					
15	Stevens Q 0.03 (chart 6.20)		6.55 (=0.35)			
	No. 1 0.03					
	Stevens W 0					
	Snow Stake (56)					
	Snow - Survey		(57.0) 24.66*			

Correct. for 3.14 precip.
Melting (ex el. of snow) 2.28 in.
(8 stormy days ant. of 16)

	Apr. 16	Apr. 21	Apr. 28	May 1
Apr. 22	(59.8) 26.0	Apr. 29 (45.6) 22.5		
		Loss 3.5 in.		
		Prec. No. 1 0.13 in		
Stevens S (apr. 16-22) 1.22 in				
No. 1 1.12				
Stevens Q 1.25				
Stevens W 1.60				
Apr. 16 24.7 in				
No. 7 precip 1.25				
25.95 in.				
Apr. 22 26.0 in.				

No loss? yes, but new precip. Loss in 6 days 1.25 in. 3 days in 6 stormy.

No. 1 - Apr. 1 - May 1 4.39
" 7 (Stevens Q.) 4.90

May 1 (Eddy and Chase) (42.5) 22.0 "Short"
May 2 (P&C) (38.6) 19.9
Loss 2.6 Daily 0.87 in.

		Loss
Apr. 29	(45.6)	22.5
May 1	(42.5)	22.0 0.5
May 2	(38.6)	19.9 2.1
	Total loss	
	(7.0)	2.6

Depth approx. twice water equiv.

	May 6	May 7	May 9	May 12	
	Stevens S. 13.69 (Gain 0.58)	S. 13.77 D. 10.0			
	No. 1 " 0.60	D. 25.28			
	" 7(Q) " 0.47?	11.56 D. 10.32			
		D. 8.0			
		9.82 D. 9.2			
		10.74 D. 9.6			
		10.61 D. 9.5			
		9.61 D. 8.6			
		13.30 D. 11.2			
		14.80 D. 12.35			
		7.52	8.68		

May 6. Max. 60°F +-
(24.2) 13.1
Loss May 2-6
4 days = (14.4) 6.8 in.
Daily (3.6) 1.7 in
Depth twice water (Evans. 54.1%)

May 6 - Survey 13.1
May 6 - Hail + rain. 0.67
May 7 (22.2) 12.3 13.77
12.3
12.9 1.47 in
Loss 1 day Snow 2 in.

May 9 - — May 12 —
(16.3) (8.7) (3.3) 1.8
Loss (5.9) 3.6 loss (13.0) 6.9
3 days 1.8 in. 3 days daily 2.3 in
See Summary
May 2-9. in water hog

May 6	May 7	May 9	May 12	June 23	July 2	July 14	July 19	Aug. 1	Aug. 18	Sept. 1
Stevens S. 13.69 (Gain 0.59)	S. 13.77 D. 10.0				17.54	6.88		7.99 D. 4.32	8.0	7.97 D. 4.52
No. 1 " 0.60	D. 25.28				Rockyd 6.88 D. 3.7					
" 7(Q) " 0.47?					D. 26.7			27.2		
	11.56 D. 10.32				15.67 D. 14.5			3.98 D. 3.32		3.99 D. 3.3
	D. 8.0				Rockyd 2.85 D. 2.2+			10.9+		D. 10.8
	9.82 D. 9.2				D. 10.4			14.5 D. 13.6		
	10.74 D. 9.6				13.47 D. 12.7 Decided not to do rockyd.			4.375 D. 3.8		4.35 D. 3.78+
	10.61 D. 9.5				14.93 D. 13.7 Rockyd 3.24 D. 2.6			3.67 D. 3.2		3.68 D. 3.18+
	9.61 D. 8.6				14.51 D. 13.4 Rockyd 2.43 D. 2.0			3.605 D. 3.04		3.61 D. 3.05
	13.30 D. 11.2				13.03 D. 12.0 Rockyd 2.55 D. 2.0			3.75 D. 2.8		3.75 D. 2.8
	14.80 D. 12.35				17.50 D. 15.4 Rockyd 2.76 D. 1.8			4.48 D. 3.3		4.49 D. 3.2
	7.52	8.68		12.34	19.15 D. 16.5 Rockyd 3.44 D. 2.2 Exploded!	Pen cannot be found.	Rockyd Rockyd Part at 1.0 in	1.59	1.70	1.73

Stevens W 0.98

May 6. Max. 60°F +-
(24.2) 13.1

Loss May 2-6
4 days = (14.4) 6.8 in.
Daily (3.6) 1.7 in

Depot twice water (Gain 54.1%)

May 6 - Sunset 13.1
May 6 - Hail + rain.
May 7 0.67 13.77
(22.2) 12.3 12.3
12.97 1.47 in
Loss Sunset 2 in.
1 day

May 9 - - May 12 -

(16.3) (8.7) (3.3) 1.8

Loss (5.9) 3.6 Loss (13.9) 6.9
3 days Daily 1.8 in. 3 days Daily 2.3 in
See Summary

May 2-9.
in water bag

Comparison of Precipitation Gages
at Soda Springs near Donner Summit,
California
(Inches water equivalent)

Date 1942-43	Hotel				Pasture					
WINTER (Summary) Nov. 1-Apr. 1	No. 1 Unshielded	No. 2 Stevens W	No. 3 Army Engrs.	No. 4 Check	No. 5 Friez	No. 6 Check	No. 7 Stevens Q	No. 8 Unshielded	No. 9 3 ft. deep	No. 10 3 feet deep	Snow Survey
	51.03 = 141.8% of normal (Nov.-Mch.)	Batteries failed			56.25		53.51				38.4= 98.2% of Apr. normal
Dec. 1-June 1 Adjusted	43.05 = 137.3% of normal (Dec.-Mch.)		47.66 wt.	45.42	48.33	50.62	47.05	42.67	50.18	51.54	0
SUMMER											
April	2.60		2.50 dpth.	~~41.55~~ 4.16	3.83	3.87	3.72	3.55	4.09	4.15	11.8
May	2.23		2.88 dpth.	2.38	2.34	2.23	2.22	2.05	2.37	2.39	0

Comparison of Precipitation Gages
at Soda Springs near Donner Summit (Continued)

(Inches water equivalent)

Date 1943	Hotel								Pasture			
SUMMER (Cont.)	No. 1 Unshielded	No. 2 Stevens W.	No. 3 Army Engrs.	No. 4 Check	No. 5 Friez	No. 6 Check	No. 7 Stevens Q	No. 8 Unshielded	No. 9 3 feet deep	No. 10 3 feet deep	Snow Survey	Remarks
June 2-25	0.40			0.77	0.42	0.75	0.60	0.68	0.78	0.78		
June 26-July 10	0.25		2.0 (D. 14.60) July 10	0.25	0.21	0.24	0.20	2.26!	0.25	0.25		No evap.
July 11-25 27	0.14	Reset	Recharged (dpth. 4.45 in.) July 27		0.14		0.03					
July 27 26-Sept. 1	0	0	-0.12 (dpth. 4.33	-0.01		-0.03	+0.02	-0.01	0	+0.01		Slight evap.
Sept. 2-24	0	0		-0.01	0	-0.01	0	-0.01	-0.02	-0.02		"
Sept. 25-Oct. 1	0	0	+1.0 (dpth. 4.50)	+0.04	0	+0.01	0	+ T	0	0		"
Oct. 2-Nov. 1	2.64	2.56	+1.0 (dpth. 4.90)	2.88	2.80	2.79	2.88	2.55	2.95	2.97		
Apr. 1-Nov. 1	8.26		9.26	10.46	9.74	9.85	9.67	11.07(?)	10.42	10.53		

Snow Stake data — Snow

Weights of Cans

	No. 1	No. 2	No. 3	No. 4	No. 5
Feb 4			D. 20.6	Wt. 22,13 D. 21.0 Wt reset W. 6.48 D. 5.1	W. 6.09
Feb 10	Feb 5-10 1.37	Installed siphon inner-pen and cross-section chart.	D. 19.5	W. 8.07 D. 7.0 1.59 1.9	1.61
Feb 22	Feb 11-22 1.26	0.8" from base line	D. 20.8	W. 10.06	2.03
March 1	Feb. 23-Mch 1 3.10	2.90" "	D. 22.0	W. 12.89	Feb 29. 3.56
Mch 4 - Snow heights in Cans.					
March 4	Dpth of Snow 24.0	Wet ice	Wet ice	Snow 2 in. below rim	Can full. Snow in neck.
March 5 106 in		Wet slush	yielding slush.	Floating ice 8 in. below rim	9-10 in. below rim.
March 6	Mch 2-6 1.89	Mch 3-6 3.64 approx.	D 22.9	W. 16.05	Mch 7 Total 2.50 Reched
		Mch 12-14 0.32			
March 16	Mch. 6-16 0.81	W. 10.46 in can but 0 is where?	D. 23.2	W. 16.85 D. 15.5 Reset W. 5.40 D. 4.03	

Comparison of Precipitation Gages
at Soda Springs near Donner Summit (Conc.)
(Inches Water Equiv.)
Parenthesis indicates stick-depth of snow and in case of individual gages the stick depth of the water or slush contents.

- Pasture -

Date 1943- 44 WINTER	Accum. Snowfall (Max.)	No. 6 Check	No. 7 Recording Stevens Q	No. 8 Unshielded	No. 9 3 feet deep	No. 10 3 feet deep	Snow Stake or Snow Survey
Nov. 1 - Dec. 1		2.41	2.50	2.21+	2.63	2.65	(0)
Nov. 16-17			0.08				
Nov. 19-22	(5)		1.65				
Dec. 1 - Jan. 1		2.89	2.97	2.43	3.15	3.10	(15)
Dec. 5			0.04				
Jan. 1 - Feb. 4		9.97	10.36	8.09	11.32	11.40	
Jan. 1-17	Jan. 2, (26) " 6, (40) " 17, (29)	4.25 (4.0)	4.26	3.07 (3.9)	4.72 (4.8)	4.80 (4.3)	(29)
Jan. 17 - Feb. 4	Jan. 23 and 30 (8) Feb. 4 (9)	5.72 (6.6) Rechgd.	6.10	5.02 (5.2) Rechgd.	6.60 (7.3)	6.60 (ice)	(Feb. 1) 12.2 (48.7)
Feb. 4 - Mch. 1		5.84	8.62	4.87	7.77	7.75	(Mch. 1) 27.3 (101.7)
Feb. 4 - 10	Feb. 8 (15)	1.34 (1.6)	1.56	1.02 (1.1)	1.80 (ice) Rechgd.	1.59 (ice) Rechgd.	(Feb. 11) 18.1 (57.5)
Feb. 10-22	Feb. 21 and 22 (10)	1.97	1.96 ~~opp.~~	1.58	2.01	2.08	(66)
Feb. 22-Mch.1	Feb. 28 (26) Feb. 29 (20) Mch. 1 (11)	2.53	5.10	2.27	3.96	4.08	(101.7)
Mch. 1-Apr. 1		2.28	4.39 ~~4.39~~ 4.39	1.98	3.46	3.82	(Apr. 1) 25.9 (56.1)
Mch. 4	(19)	Snow to top	Tall chimney gives additional room	Can shake down	1 foot to spare	1 foot to spare	
Mch. 5	(3)	1/2 in. snow; then slush	34 in. to floating ice and slush	11-1/2 in. to snow remnant	21 in. to snow	15-1/2 below rim	
Mch. 1-6		1.42	3.75	1.31	2.55	2.70	(103)
Mch. 12			0.46				
Mch. 6 - 16	(Mch. 9: Ice in all cans melted)	0.85 (0.70)	0.75	0.67 (1.8)	0.88 (0.90)	1.09 (1.35)	
Mch. 16-Apr.1		0.01 (-0.12)	-0.05 Reset (Apr. 2 rechgd.)	0 (-0.20)	0.03 (0.10)	0.03 (0)	
Nov. 1- Apr. 1		23.39	28.34 ~~28.34~~ 28.84	19.58+	28.33	28.72	25.90 - 67.1%

Normals
Precip. Nov. 1-Mch. 31 35.98 in.
Snow Cover Apr. 1 38.60 in.

f Recharge in March

April 1 — May

April 5 Rocky. 0.28 or 0.30? 23.3 (5.12) Daily 0.20

" 8 0.60

" 11 1.25 (59)

~~4-12~~ " 12 2.88

14 0.03

1 — 15 3.30 (3.41) 2.66 (2.84) 3.93 (3.84) 4.01 (3.88) 24.7 (54.7)