



Review of New Snow Survey Procedures for WY 2015

November 3, 2015

John j. King P.E.

Outline

- “Roll Out” the New Snow Sampling Procedures Statewide
 - Review of the WY2015 Snow Notes
- Feedback Received of New Snow Sampling Procedures
- Anticipating Problems with Normal or Above Year Type

Roll Out the New Procedures



The Resources Agency of California
Department of Water Resources
California Cooperative Snow Surveys



Snow Survey Procedure Manual



October 2014



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UC Berkeley
Central Sierra Snow Laboratory
Soda Springs, California



Review of the 2015 Snow Notes

- Dates

Record Date As: YYYYMMDD

SNOW COURSE/SENSOR [REDACTED] COURSE/SENSOR NO. [REDACTED]
 SURVEYOR [REDACTED]
 DATE 2015/01/26 UNITS: INCHES CM

 THE RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF WATER RESOURCES
 CALIFORNIA COOPERATIVE SNOW SURVEYS
 SNOW SURVEY/SENSOR CONTROL NOTES

DRAINAGE BASIN [REDACTED]
 SNOW COURSE/SENSOR [REDACTED] COURSE/SENSOR NO. [REDACTED]
 SURVEYORS [REDACTED]
 DATE 1/28/2015 09:45 UNITS: INCHES CM

DISTANCE	CABLE	TAP	WEIGHT	REMARKS*

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DRAINAGE BASIN [REDACTED]
 SNOW COURSE/SENSOR [REDACTED] COURSE/SENSOR NO. [REDACTED]
 SURVEYORS [REDACTED]
 DATE 01/20/15 UNITS: INCHES CM

DISTANCE BETWEEN	SAMPLE #	CORE	TARE WEIGHT	WEIGHT TUBE +	SWE	CORE/HS	REMARKS* (OVER)

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 SURVEYOR [REDACTED]
 DATE 2015/01/27 UNITS: INCHES CM

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DRAINAGE BASIN [REDACTED]
 SNOW COURSE/SENSOR [REDACTED] COURSE/SENSOR NO. [REDACTED]
 SURVEYORS [REDACTED]
 DATE 20150201 UNITS: INCHES CM

DISTANCE BETWEEN POINTS	SAMPLE #	HS	CORE LENGTH	TARE WEIGHT	WEIGHT TUBE + CORE	SWE	CORE/HS	REMARKS* (OVER)
5'	1	29	22	57.0	67	10	176	

Review of the 2015 Snow Notes

- Cut Off
Perforated
Paper

THE RESOURCES AGENCY OF CALIFORNIA
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DRAINAGE BASIN TEAR AWAY
SNOW COURSE/SENSOR CUT PAPER COURSE (SENSOR NO.)
SURVEYORS ROCKY / PAT MAX
DATE 2015-11-01 UNITS: (INCHES) (CM)

DISTANCE BETWEEN POINTS	SAMPLE #	IS	CORE LENGTH	YEAR WEIGHT	WEIGHT	SNOW CORE	SW	TONNES	
50	1	30	28	38	43	5	.73		
50	2	35	35	1	38	0	100		
50	3	41	42		50	12	100		
50	4	17	16		45	7	94		
50	5	36	35		49	10	97		
50	6	42	40		40	2	96		
50	7	17	15		39	1	88		
50	8	10	18		45	7	90		
100	9	39	36		37	0	93		
100	10	16	14		38	0	87		
100	11	14	10		47	9	71		
100	12	13	12	✓	45	7	92		
TOTAL							321	60	
AVG							26.75	5	
ROUNDED							26.5	5	

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Review of the 2015 Snow Notes

- Bulk Sample

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DRAINAGE BASIN: [REDACTED] ✓

SNOW COURSE/SENSOR: [REDACTED] COURSE/SENSOR NO: [REDACTED]

SURVEYORS: [REDACTED]

DATE: 2015/11/25 RDD UNITS: INCHES CM

DISTANCE BETWEEN POINTS	SAMPLE #	HS	CORE LENGTH	TARE WEIGHT	WEIGHT TUBE + CORE	SWE	CORE/HS	REMARKS* (OVER)
70'	8	11	11	BULK	BULK		1	
60	7	12	12				1	
	6	8.5	8.5				1	
	5	7.5	7.5				1	
	4	7.0	7.0				1	
	3	13	12				12/13	
	2	7	7				1	
	1	7	7				1	
04	%							
				25	43	18		
		73.0						
		(91)						

SURVEYORS: [REDACTED]

DATE: 2015/01/27 UNITS: INCHES CM

DISTANCE BETWEEN POINTS	SAMPLE #	HS	CORE LENGTH	TARE WEIGHT	WEIGHT TUBE + CORE	SWE	CORE/HS	REMARKS* (OVER)
				33				Postpile
100	1	9	6	32	34.5	2.5		Sampler
50	2	7	6		34.5	2.5		Scale
50	3	3	3					with
50	4	2	2					Bag
50	5	2	2					
50	6	6	6					
50	7	9	9					
50	8	8	7					
50	9	13	11					
					33	54	21	
							2.9	
				6.5			2.3	
				6.5			2.5	

Review of the 2015 Snow Notes

- Bulk Sample

DATE		UNITS: <u>INCHES</u>					
DISTANCE BETWEEN POINTS	SAMPLE #	HS	CORE LENGTH	TARE WEIGHT	WEIGHT TUBE + CORE	SWE	CORE/HS
	1/1						
	1	6.5	4				
	2	8	7				
	3	5	5				
	4	5	5				
	5	5	5				
	6	2	2				
	7	6	6				
	8	7	7				
	9	2	2				
	10	6	6				
				21	33	12	
Total		52.5				12	
Average		5.25				1.2	
Rounded		<u>5.0</u>				<u>1.0</u>	

Review of the 2015 Snow Notes

- Round Off

Rounding Procedure
Round to the nearest half-inch

All Data rounded to half inch
excluding Core Length

avg	22.8			8.6			
Total	86	47	94	27			
AVER	8.6			2.7			
	5.7			2.4			

0-.2 is rounded to 0

.3-.7 is rounded to .5

.8-1.0 is rounded to 1.0

Review of the 2015 Snow Notes

Data DWR Revised to New Rounding Procedure

- Round Off

Date	Number of Snow Courses Measured	Number of Snow Courses HS Rounded by DWR	Number of Snow Courses SWE Rounded by DWR	Number of Snow Courses Zero SWE caused by Round-Off
20150201	179	109	101	0
20150301	192	84	88	2
20150401	228	58	57	3
20150501	174	10	11	3

Feedback of New Procedures

- Why is HS, Tear Weight, Weight Tube+Core, SWE, Average HS, Average SWE rounded to the nearest .5 inch?
- Why is Core Length not rounded to the nearest .5 inch?
- Why are Weights recorded to the nearest half inch if there is no graduation mark for it?

Anticipating Problems with Normal or Above Year Type

- Multiple Sampled Points



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DRAINAGE BASIN FAST RUNNING RIVER

SNOW COURSE/SENSOR PINE MEADOW COURSE/SENSOR NO. 999

SURVEYORS D. STERHUBER, KIRCHNER

DATE 20130401 UNITS: (INCHES) CM

DISTANCE BETWEEN POINTS	SAMPLE #	HS	CORE LENGTH	TARE WEIGHT	WEIGHT TUBE + CORE	SWE	CORE/HS	REMARKS* (OVER)
			29	15	33	18		
			19	↓	27	12		
			46	↓	43	28		
50	8	120.0	94			58	.78	X
<i>MULTIPLE SAMPLES</i>								
TOTAL:		1245.0				510		
AVERAGE:		155.6				63.8		
ROUNDED AVERAGE:		155.5				64		

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PLEASE COMPLETE THE FOLLOWING OBSERVATIONS WHILE IN THE FIELD.
CIRCLE ALL THAT APPLY.

SURVEY START TIME: 0800 END TIME: 1300

CLEAR P. CLOUDY OVERCAST RAIN (SNOW) (BLOWING SNOW) (FREEZING)
THAWING SLEET HAIL THUNDER/LIGHTNING RIME FOG

SNOW SAMPLES OBTAINED WITH:
EASE MODERATE DIFFICULTY* (GREAT DIFFICULTY)*

SNOW SURFACE: SUPPORTABLE WET RAIN RUNNELED HOAR GLASSY

GROUND UNDER SNOW: FROZEN DRY DAMP (WET)

SNOW IS MELTING ON: N and/or E SLOPES S and/or W SLOPES

EVIDENCE OF RECENT AVALANCHES: (YES) NO

WATER IN SMALL STREAMS IS: RUNNING (FROZEN) PARTIALLY FROZEN
CLEAR MUDDY (BRIDGED BY SNOW)

*REMARKS: SNOWING SY ALL DAY. DENSE, HARD SNOW LAYERS REQUIRED MULTIPLE SAMPLING. NEW-SNOW AVALANCHES OBSERVED ON STEEP N-FACING TERRAIN.

SENSOR CONTROL

MANOMETER READINGS UNITS: (INCHES) CM

SNOW: 70.2

PRECIPIT: 91.1

AIR TEMPERATURE UNITS: (°F) °C

CURRENT: 24.0

MAXIMUM: 48.1

MINIMUM: 19.5

Ex. Pg. 25
of Procedure

