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ROCKY MOUNTAIN NATIONAL PARK

1949 Glacier Report

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ROCKY MOUNTAIN NATIONAL PARK

1949 Glacier Report

General. August 30, 1949, the usual traditional measurements of the apparent fronts of Tyndall and Andrews Glaciers were made by Service personnel. The trip was made in conjunction with a naturalist field party, under the direction of Ranger Naturalist J. H. Heger, aided by Ranger Naturalists Razum and Slater. The route was via Flattop Mountain, Tyndall Glacier, and Andrews Glacier to the Loch and was made in one day, with clear weather and other favorable considerations. Messrs. Heger and Razum had made the 1948 observation and accordingly were familiar with the traditional routine.

Andrews Glacier. Measurements were made from Station X' and X''' as customary. Distance from X' was 164 feet and from X''' 64 feet to the presumed nearest glacier ice. The "glacier front" was the nearest to Station X' since 1942, and might well represent an advance of Andrews Glacier during the past seven years. Paradoxically the measurement from Station X''' to the "glacier front" is very close to that of the previous five years. The usual problem of determining whether or not the "nearest glacier ice" is truly a part of the glacier, or is merely a mass of stagnant, contemporary snow and ice overlay, was encountered. However, there is little doubt but that ice was appreciably closer to Station X' in this year than in the last few years. Photographs were made of the Andrews Glacier and are submitted in the second section of this report compared to nearly identical photographs made in 1948.

Tyndall Glacier. Here, again, the difficulty of determining the actual front of the glacier was encountered. Ice of unknown thickness lies below the entire basal area and the data are consequently as erratic as in previous years. Indeed the apparent advance of this "nearest glacier ice" can hardly be ascribed completely to movement of Tyndall Glacier. Examination of Table III at the end of this report will show that similar departures from previous years have been experienced since 1932 when these crude measurements were first undertaken. However, if the figures for last year, made from a different point, are disregarded and the 1949 distance of 106 feet is compared to the 1947 figure of 180 feet and the 1946 figure of approximately 113 feet, a certain degree of actual advance of the Glacier Front might be suggested.

Conclusions. As has been indicated in previous reports, the present, traditional, method of measuring the front of these glaciers is far from accurate or scientific. Until it is possible to assign more men to this project, with sufficient time to make accurate plane table topography and sections of each of these glaciers, there is little chance to improve the method of measurement.

49 JO-PA-3

As the photographs show, in part at least, none of the glaciers being considered are sufficiently developed in size to possess any clear cut front. It is the writer's suspicion that the actual front, so far as these glaciers approach such a development, lies well up above the presumed snout which has been measured during the past years for the Andrews Glacier. He also suspects that the front of the Tyndall Glacier is actually buried beneath a part of the terminal Moraine on which the reference marks have been established.

Tables. Tables I to IV following give calculations of the previous measurements of these two glaciers, as well as pertinent meteorological data. The past winter of 1948-49 was characterized by heavier snows and more precipatation in the Stations being considered than for several years in the past. It is reasonable to assume that these conditions obtained at the site of the two glaciers as well.

Illustrations. The last pages of this report give various views of the Andrews and Tyndall Glaciers taken from somewhat similar points this year compared to 1948.

Edwin C. Alberts
Park Naturalist

4950-P04

TABLE I

Weather Statistics, August 1948 through July 1949

Month	Temperatures Average	Maximum	Minimum	No. of Days 32° or less	Precipitation Total	Snow Fall
		ESTES PARK				
Aug.1948	63.0	90	31	1	0.79	—
Sept.1948	57.9	89	31	4	0.77	—
Oct. 1948	47.8	78	-5	24	0.88	6.0
Nov. 1948	33.9	72	5	29	1.01	12.2
Dec. 1948	26.8	50	-18	31	2.31	26.0
Jan. 1949	18.8	50	-18	31	1.28	15.0
Feb. 1949	24.8	48	-4	27	.15	2.0
Mar. 1949	35.0	58	4	30	1.61	15.0
Apr. 1949	43.3	74	9	19	1.54	6.0
May. 1949	49.7	77	27	7	2.64	T
June 1949	56.4	82	31	1	5.01	—
July 1949	63.3	90	40	0	2.05	—
Average 1948-49 temperature			43.4	Total Days 204	20.04	
		GRAND LAKE				
Aug. 1948	55.6	84	30	6	1.29	—
Sep. 1948	51.8	83	23	21	.93	—
Oct. 1948	38.2	70	8	30	.53	3.0
Nov. 1948	21.8	54	0	30	1.75	29.5
Dec. 1948	15.4	45	-30	31	3.17	24.0
Jan. 1949	6.7	37	-34	31	.96	13.0
Feb. 1949	13.5	47	-27	28	.44	7.8
Mar. 1949	27.7	54	-7	31	2.19	33.0
Apr. 1949	34.7	67	-1	30	1.35	10.9
May. 1949	44.0	72	22	29	2.23	—
June 1949	51.0	81	26	18	1.61	—
July 1949	54.8	79	32	5	2.71	—
Average 1948-49 temperature			34.6	Total Days 290	19.16	121.2

1950-A25

TABLE II

Andrews Glacier

Year	X' to "Glacier Front"	X''' to "Glacier Front"
1932	48' 7"	
1933	58' 10"	
1934	139' 0"	
1935	66' 0"	(Station established
1936	No measurements	in 1938
1937	96' 10"	
1938	32' 3"	48' 11"
1939	92' 0"	23' 0"
1940	170' (est)	16' 9"
1941	212' 5"	54' 3"
1942	155' 8"	49' 1"
1943	No measurements	No measurements
1944	253' 0"	79' 2"
1945	210' 6"	65' 7"
1946	224' 9"	60' 8"
1947	201' 9"	66' 0"
1948	210' 0"	56' 0"
1949	164' 0"	64' 0"

Remarks: Judgment of the field party as to "nearest glacier ice" varies, this doubtless explains the erratic figures.

4950-P06

TABLE III

Tyndall Glacier

Year	Station X' to "ice"
1932	30' 8"
1933	63' 4"
1934	72' 5"
1935	38' 6"
1936	No measurements
1937	196' 9"
1938	62' 4"
1939	105' 4"
1940	56' 0"
1941	No measurements
1942	At ice
1943	No measurements
1944	56' 3"
1945	54' 4"
1946	112' 11"
1947	5' to ice 180' to possible "glacier ice"
1948	260' to "foot of glacier" (adjusted from an erroneous measurement from Station X, not X')
1949	106'

Remarks: (1) Station X, used in 1948 was 300' from "nearest glacier ice". In 1949 a line from this station measured but 126' (2) It is apparent from above table that measurements at Tyndall Glacier are highly erratic, with much variation in observor's judgment of actual glacier terminus.

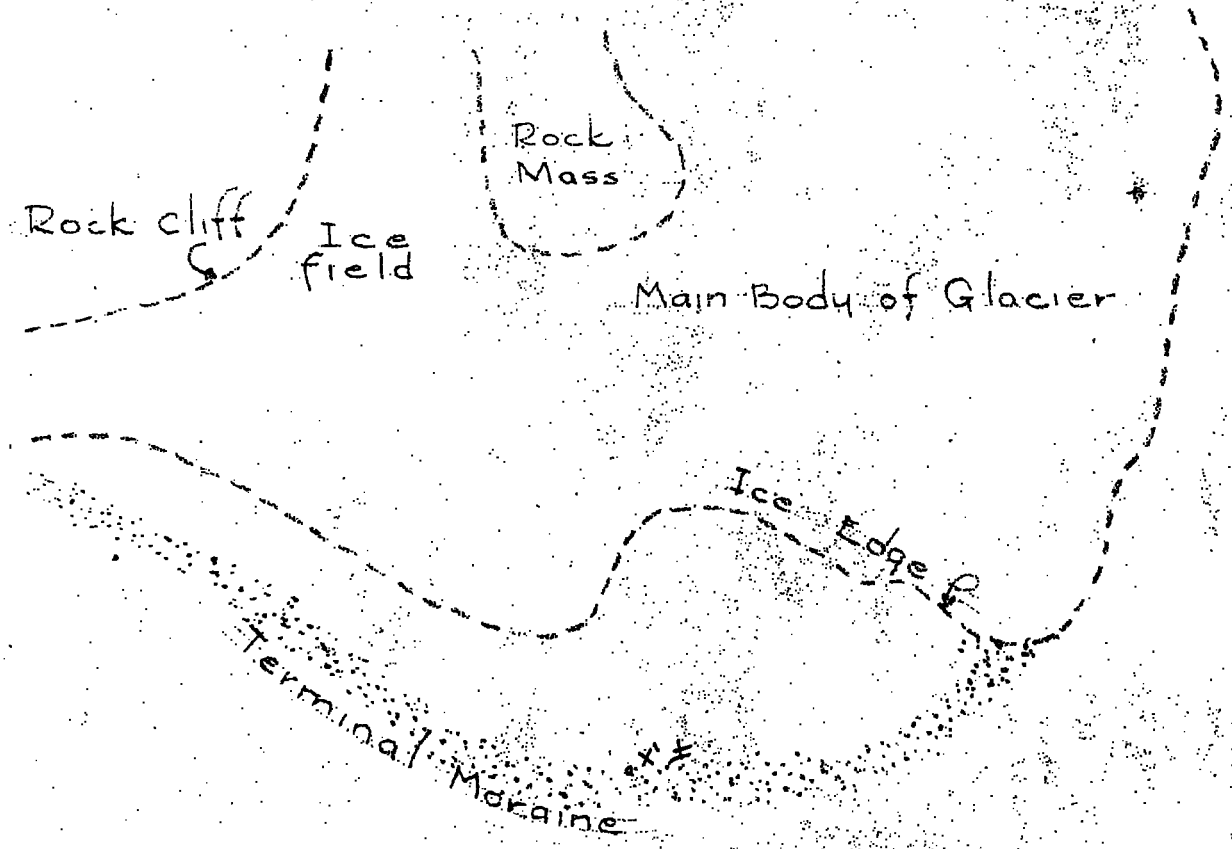
49JO-P27

FIGURE 4

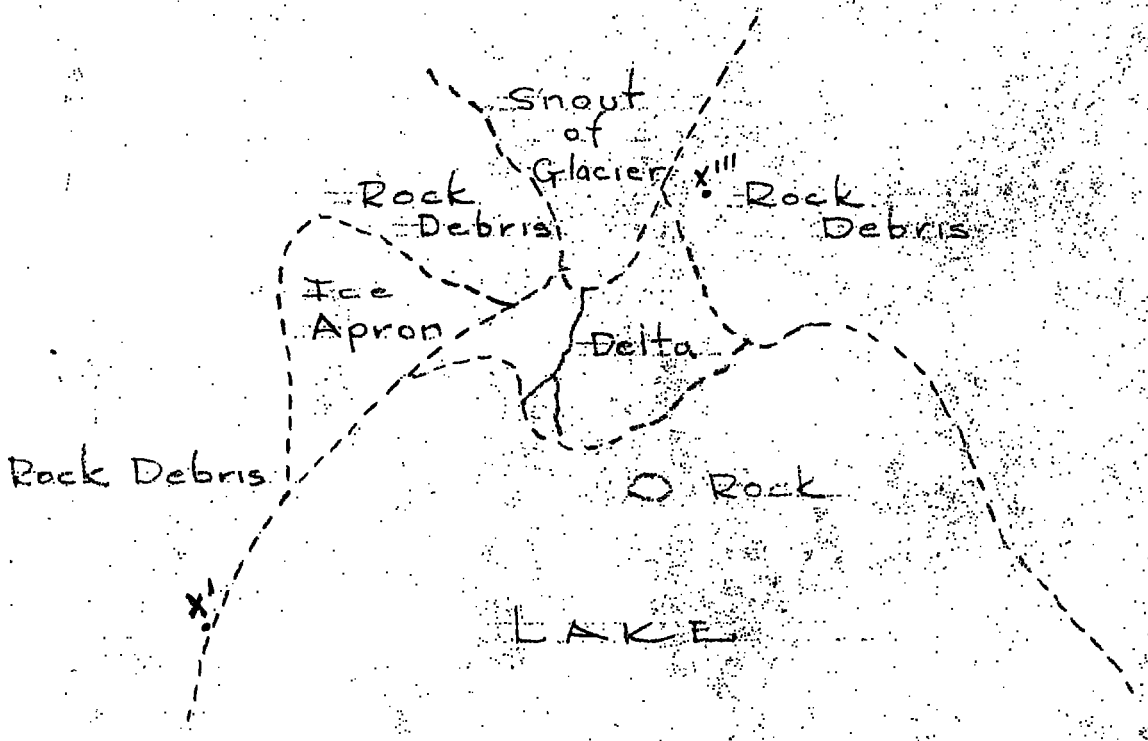
SNOW DEPTHS AND WATER CONTENT FOR PARK

Station	Dates	1949 Snow D.	1949 H_2O	1948 Snow D.	1948 H_2O	1947 Snow D.	1947 H_2O	10 Year Mean Snow D.	10 Year Mean H_2O
Hidden Valley	Feb.1	40.6"	11.0	33.5"	7.3	38.4	7.7	23.5	5.2
	Mar.1	43.1	12.5	50.1	10.3	44.0	10.3	36.7	8.6
	Apr.1	64.0	17.8	49.8	13.0	50.0	14.2	42.8	11.8
	May.1	44.9	15.6	41.3	12.7	50.8	16.1	43.5	13.0
Lake Irene	Feb.1	57.1"	19.4			54.6	13.6	47.0	12.6
	Mar.1	66.7	26.1	70.1	19.5	69.4	13.4	58.3	17.1
	Apr.1	83.1	28.9	75.1	23.8	71.8	23.2	64.8	21.0
	May.1	62.6	26.1	63.9	24.8	71.4	27.1	63.4	23.7
Wild Basin	Feb.1	43.2"	14.4			35.7	8.4	30.1	7.0
	Mar.1	45.5	15.5	46.2	11.1	50.3	11.3	38.6	9.8
	Apr.1	61.4	19.6	51.6	13.2	49.8	15.8	44.5	13.2
	May.1	42.2	15.9	36.1	12.2	45.4	15.6	38.2	13.4
Phantom Valley	Feb.1	37.8"	10.3	32.6	7.3	24.4	4.8	24.2	5.4
	Mar.1	36.6	10.8	41.4	9.4	36.9	8.4	32.2	8.0
	Apr.1	45.4	13.1	39.7	10.7	34.1	10.8	33.2	9.3
	May.1	17.2	6.1	17.5	5.6	27.6	10.5	16.4	5.9
Grand Lake	Feb.1	35.4"	8.7	Not measured Previously					
	Mar.1	36.2	9.9						
	Apr.1	43.4	11.4						
	May.1	12.5	4.4						
North Inlet	Feb.1	33.4"	9.2			24.9	5.7	23.6	5.3
	Mar.1	29.5	7.9	40.5	10.1	42.5	8.9	30.7	7.4
	Apr.1	42.1	12.6	39.4	11.4	39.2	13.7	32.4	9.3
	May.1	17.8	5.2	21.5	6.3	34.8	10.9	22.2	7.3
Copeland Lake	Feb.1	20.9	6.5	Not measured Previously					
	Mar.1	19.5	5.8						
	Apr.1	23.8	7.3						
	May.1	1.9	0.6						
Deer Ridge	Feb.1	26.7	7.5	Not measured Previously					
	Mar.1	25.9	8.0						
	Apr.1	32.4	8.7						
	May.1	6.0	2.3						

TYNDALL GLACIER



ANDREWS GLACIER



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