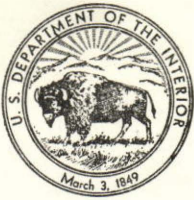


File

UNITED STATES
DEPARTMENT OF THE INTERIOR
National Park Service

Rocky Mountain National Park

1963 Glacier Measurement Report



UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

Rocky Mountain National Park

and

Shadow Mountain National Recreation Area
P.O. Box 1080, Estes Park, Colorado, 80517

IN REPLY REFER TO:

N3031

October 31, 1963

1963 Glacier Measurement Report
Rocky Mountain National Park

by

James W. Larson, Park Naturalist

ANDREWS GLACIER

Party members: William Jensen, Civil Engineer; Russell Betts,
Park Ranger; James Larson, Park Naturalist

Weather: Clear skies, temperature about +30°F to +40°F,
wind up to 30 mph.

Ice and snow conditions: Light skiff of snow at higher elevations,
some drifts on the glacier but not enough to affect
surveying measurements. Extent of glacier is exag-
gerated very slightly on photographs. Glacier sur-
face was generally very firm and required use of
crampons and ice axes. Crevasses at upper end of
glacier did not hamper travel.

Methods of Measurements: Distance and vertical angles were determined
by use of transit and stadia. Surveys were made from
Reference Point "A" to R.P. "B" and from R.P. "D" to
R.P. "C". A slight offset was made at the lower end
of the "D" to "C" survey to carry the survey through
the center of the glacier snout. X' measurements to
glacier tip were made by tape. Location of X''' was
indefinite but measurements were made from a point
considered possible as X'''. In addition, several
photographs were taken.

Narration of trip: The party members left Glacier Gorge Junction at
6:30 a.m. for Andrews Glacier. We arrived at Andrews
tarn at 9:45 a.m. A few photographs were taken be-
fore ascending the glacier.

We stopped at R.P. "A" and surveyed across the glacier to R.P. "B". We then continued the ascent and arrived on top where we located the beginning reference point or R.P. "D". Jensen determined azimuth, distance, and elevation of the S.E. lower corner of the meteorological shelter house.

We surveyed down the glacier nearly to the terminus when the survey line ran off the glacier. By offsetting our survey line, we continued the survey down through the center of the snout.

Tape measurements of X' and X''' (?) were made following the longitudinal survey of the glacier. The measuring was completed by 3:45 p.m.

Results of survey: The glacier decreased about 35 feet in length since 1962. The loss is all at the terminus. The average depth loss since 1962 was 15 feet.

The 1962 glacier size was well above average and the 1963 glacier size is slightly below the minimum size recorded in 1958. We can conclude that the glacier recession was very great this year. This comes as no surprise as the snow accumulation was unusually low in winter 1962-63 followed by a relatively long, warm summer in 1963.

As of October 25, 1963, the glacier was 1568 feet long and 764 feet wide measured from "B" to "C".

Recommendations for future trips:

1. Attempt to make the trip about the latter half of September. Prior to this ablation probably has not stopped. Later than September new snow is possible and the sun angle for photos is disadvantageous.
2. Three party members are optimum.
3. The lower approach is easier and faster than over Flattop Mountain.
4. The amount of equipment needed does not warrant use of a pack horse as long as there are at least three members and they are in reasonably good physical condition.
5. Drop measurements from X' and X''' and create a realistic base line from which to measure the glacier terminus.

TYNDALL GLACIER

Party member: James Larson, Park Naturalist

Weather: Cloudy, temperature about freezing, extremely windy, snow squalls.

Snow conditions: Light skiff of snow at high elevations, some drifts on glacier which have a slight effect on extent of glacier as seen in photos.

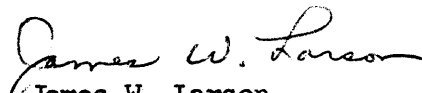
Method of measurement: Photos only

Narration of trip: I left Bear Lake at 7:40 a.m. and arrived at the hitching post about 9:45 a.m. I spent about $1\frac{1}{4}$ hours locating points and photographing the glacier. Returned to Bear Lake at 12:35 p.m. at which time it started to rain and snow heavily.

Results: Photographs indicate a substantial decrease in size.

Recommendations:

1. Photograph during end of September
2. I was able to locate only one point so I suggest that the other two points be more conspicuously established.


James W. Larson
Park Naturalist

cc:
Mr. Sam Outcalt
Regional Director, Midwest Region



Andrews Glacier and Point "D"



Andrews Glacier from Point "D"



Longitudinal Traverse on Andrews Glacier
Red line represents offset of survey at lower end of glacier. (See survey statistics)



Snout of Andrews Glacier
Red line represents glacier terminus



Andrews Glacier and Andrews Tarn



Andrews Tarn and Glacier from Point "C"



Tyndall Glacier
from Station "a", near hitching rack on Flattop Mountain



Tyndall Glacier
from vicinity of Station "b"



Tyndall Glacier
from Station "c"