

IMMEDIATE REPORT
AERIAL SNOWLINE SURVEY OF INDEX GLACIERS, 1994

T. J. Chinn and P. J. Forsyth

File No.: NZ/729
Date: 10/11 March 1994
Location: Entire Southern Alps
Keywords: Snowline, glacier fluctuations, climate change.

INTRODUCTION

This aerial survey continued a glacier/climate monitoring programme commenced in 1977 for the New Zealand Glacier Inventory, where the position (altitude) of the end-of-summer snowline is photographed annually on a set of some 48 selected glaciers arranged in transects across the Southern Alps. Glacier snowline altitudes give a direct value for glacier health and balance, whereas glacier frontal positions are modified by response times and glacier dynamics. During the flight various additional geological and geomorphological features were photographed, including flood damage of early January. This year the survey was unique in that for the first time all of the index glaciers, ranging from southern Fiordland to the Inland Kaikoura mountains of the Southern Alps, were photographed.

METHOD

The method involves taking simple oblique photographs of the position of the end-of-summer glacier snowlines which are later converted to altitude. A folder of maps showing the glacier locations, together with copies of past photos of each glacier is held by the "navigator" seated beside the pilot. The past photos were used to closely duplicate the position from where previous photos were taken. The "photographer" operates from the back seat, shooting from both sides of the aircraft. This year, glaciers not previously photographed for the NZ Glacier Inventory, were also photographed. These were listed from "find - no photos" on the inventory computer database, and entered on the folder maps. Finally, to accurately locate these glaciers, a full set of 1-inch-to-

1-mile copies of the inventory maps was carried and consulted by the 'photographer' during the flight. The flight was made at 10,000 ft altitude which has been found to give the best angle on the glacier snowlines.

PREPARATIONS

The flight should be made on the elusive "last perfect day before the first winter snowfall", at the end of significant summer melt. The flight was planned for the first clear weather after February and took the opportunity of an antyclone which moved over the country on 9 March, ahead of a low in the central Tasman Sea. The flight was made in Cessna DAO, a Cardinal 177, chartered from Aspiring Air at Wanaka airfield. This high wing aircraft is eminently suitable as it has no obstructing wing struts and a relatively high cruising speed. The pilot was Andy Woods who has in the past worked on glaciology in NZ and as a mountaineer, had a wide knowledge of the mountains. Jane Forsyth was the navigator and there were very few ranges she was not familiar with. Trevor Chinn was the photographer. The combined detailed mountain knowledge of the party permitted direct "front window" navigation without any flying time lost to searching for our positions on the maps.

ITINERARY

The flight commenced on the morning of Thursday 10 March, from Wanaka airfield in cloudless still weather. To forestall the imminent westerly weather, Fiordland was chosen to be covered first. The Shotover-Arawata section south to southern Fiordland and return was completed in 3.5hr.

The Alps west of the Main Divide were then covered to Arthurs Pass in 3 hrs, and an overnight stop made at Hokitika.

On Friday 11 a blanket of cumulus cloud covered both the west and east of the Divide at about 6000 feet, but this was below the level of the glaciers. The flight to Lewis Pass was made beneath the cloud, when an altitude of 10,000 ft was regained to

cover the Nelson Lakes glaciers and the Inland Kaikouras, then south to refuel at Rangiora after 2.5 hrs.

The remaining eastern glaciers from Whitcombe Pass to Hawea were covered in 2.2 hrs with cloud spilling over the Divide from the west. A set of geological photographs in the upper Rangitata were taken for M. Turnbull.

RESULTS

For the first time, all of the South Island index glaciers were covered for the year. This took a total of 11.2 hrs flying time. About 1 hr of this time would be from small diversions to photograph 65 of the some 75 glaciers not previously photographed for the glacier inventory. This leaves only about 10 of the 3153 inventoried glaciers left un-photographed. Panoramic photographs were taken each side of the Havelock River to supplement the geological work being carried out by I. Turnbull. A number of slips and geomorphic events from the January floods were photographed. The event used 4 slide films, nine 35mm print films and 13 ten-shot 120 films.