

**‘Last Chance Tourism’ at the
Franz Josef and Fox Glaciers,
Westland *Tai Poutini* National Park:
A survey of visitor experience**

**Jude Wilson
Stephen Espiner
Emma Stewart
Heather Purdie**

**LEaP Research Report No. 33
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Executive Summary

This visitor survey represents Stage 2 of a project investigating Last Chance Tourism at the Franz Josef and Fox Glaciers, Westland *Tai Poutini* National Park. Visitor data were collected from 500 visitors during two data collection phases: late December 2013 to early January 2014, and February 2014.

Altogether, 84.5 per cent of the sample were international visitors and 15.4 per cent were New Zealand residents. The largest group of international visitors were from the UK (19% of the total sample), followed by Australia (18.8%), the USA (11.8%) and Germany (8.8%). A further 16.2 per cent of the total sample came from other European countries. Almost a third of all visitors were aged 20-29 years and just over a third were aged 50 years or over. The majority (84%) of respondents were visiting Westland *Tai Poutini* National Park for the first time. Just under half of New Zealand residents surveyed had been to the glaciers before. Almost a third of visitors who had visited previously thought that the glacier had changed, with the majority of these reporting seeing a smaller glacier/less ice on their current visit.

Just over half of all respondents were travelling southwards and a third were travelling northwards. The majority stayed either one night (39.6%) or two nights (42.5%) in the glacier region. Franz Josef attracted roughly twice as many respondents as Fox Glacier for overnight stays. Half of the respondents had either visited or planned to visit both glaciers. The most popular glacier activity was the walk to the final rope barrier in the glacier valleys: 118 respondents reported walking up both glacier valleys; 115 walked up the Franz Josef valley only; and 85 walked up the Fox Glacier valley only.

Altogether, 259 respondents had done at least one commercial activity whilst at the glaciers with the largest single group ($n=87$) participating in a guided glacier walk (foot access) at Fox Glacier. A third of all respondents (33.6%, $n=168$) did a glacier activity involving a flight, with scenic flights accounting for over half of these (55%) and guided glacier hikes at Franz Josef and heli-hikes at both glaciers accounting for the remainder. Participation in commercial activities was highest for international visitors and for younger visitors. The most popular of the non-glacier activities were Lake Matheson, the hot pools at Franz Josef and bush walks (other than those in the glacier valleys). Almost a third of all respondents (29.2%, $n=146$) reported that they had not participated in any other activities (other than those at the glaciers).

As expected, the glacier featured strongly as a memorable aspect of respondents' visits, with flights and other glacier-specific activities noted many times. Beyond the glaciers, the broad natural environment and scenery experienced was also a memorable feature of respondents' experiences. 'Seeing the glacier' ($\bar{x}=6.25$ on a 7-point scale) was very important to visitors surveyed. More specifically, the three highest ranked reasons selected for visiting the region were 'to see a natural feature that may disappear in the future' ($\bar{x}=6.01$); 'to be close to nature' ($\bar{x}=5.71$); and 'to view an easily accessible glacier' ($\bar{x}=5.61$).

Approximately half of the respondents reported that: the glacier was not as big as expected (50.1%); visually the ice looked as they expected (47.4%); and the glacier matched their overall expectations in terms of how spectacular it was (46.5%). Satisfaction with these aspects of the glacier experience was high, and a statistically significant relationship was found between expectation and satisfaction (showing that those whose expectations were exceeded were more likely to report satisfaction).

The majority of respondents (67%) had seen images of the glacier before visiting and over half (54.6%) thought these images were accurate. A statistically significant relationship was found between reporting that images seen prior to visit were accurate and satisfaction with aspects of the glacier experience. The majority of respondents reported getting some information in advance of their visit with tourism websites, brochures and guidebooks particularly popular. Those who participated in a commercial glacier activity were much more likely to collect information in advance than those who did not participate in a commercial glacier activity.

Expectation and satisfaction with five aspects of glacier visits were tested. These data showed that in respect of getting close to the glacier there was a roughly even split between getting closer, getting as close as expected and being further away.

Roughly half of all respondents reported that the other visit aspects were as they had expected: number of people (42.2% as expected); peacefulness (53.6% as expected); interpretation and information (50.5% as expected) and development of valley facilities (60.3% as expected).

While satisfaction with getting close to the glacier was high (\bar{x} =5.49 on a 7-point scale), this was influenced by the number of respondents who had been on the glacier during a commercial activity. The other visit aspects tested all had mean satisfaction scores above 5. A statistically significant relationship between expectation and satisfaction was found for four of the five visit aspects (the exception was development of glacier valley facilities); in each case satisfaction was highest for those who had lower expectations (i.e., that they would be further away from the glacier, for it to be more crowded and noisier with less detailed interpretation and information).

The majority of respondents (73.6%) thought that climate change was happening; when asked about the causes of climate change, however, 49.4 per cent agreed with the statement that natural causes were to blame while 80.5 per cent agreed with the statement that human activity was to blame. More than a third of all respondents (34.1%) reported being extremely concerned about climate change. The majority of respondents (84%) thought that over the next 20 years the glaciers would get smaller. The remainder were equally divided between those who thought the glacier would fluctuate or stay the same in size, and those who did not know what would happen to the glacier.

More than a third of respondents (34.2%) would be prepared to take a flight onto/over the glacier if it was not easily accessible by foot, while a fifth (21.1%) would definitely not do so. If the glacier was only accessible by helicopter 35.7 per cent would still visit and 15 per cent would not. When asked if they would still visit if they knew they might not be able to see the glacier, responses were more mixed with the largest percentage (22%) indicating they would definitely not visit and the remainder more evenly distributed. Going elsewhere to see a glacier (if respondents had not been able to see one here) was more strongly supported (\bar{x} =5.25) and more than a third (37.5%) of the respondents indicated that they would definitely go elsewhere to see a glacier.

Chapter 1

Introduction

Changes in climate attributable to increased concentrations of greenhouse gases in the atmosphere have already had significant environmental and socio-economic impacts globally (IPCC, 2007). These impacts include, inter alia: (1) physical effects, such as sea level rise, floods, droughts, and glacial retreat; (2) biological effects, such as increases in disturbances, shifts in species distribution, changes in the timing of natural events, and species extinctions; and, (3) socio-economic effects, such as impacts on tourism, infrastructure, and human health and safety.

It was recently concluded that greenhouse gas induced global mean temperature change is irreversible on human timescales, meaning that the climate system will continue to be altered into the future regardless of immediate or near-term emissions control efforts (Gillett et al., 2011). It is unsurprising therefore that climate change has emerged as a key environmental issue in the 21st century for agencies responsible for the management of biodiversity and protected areas (IUCN-WCPA, 2011).

As locations established to conserve representative and often rare and/or threatened physical features and natural and cultural heritage, protected areas are vulnerable to the shifting climate envelopes induced by climate change (Lemieux et al., 2011). The rapidly changing nature of key resources housed within protected natural areas present significant challenges for park managers who need to consider both conservation and visitor use mandates. As Jones and Scott (2006) emphasised, any changes to the resource base brought about by changes in climate will have considerable implications for visitation, as well as related aspects of park management.

1.1 Westland *Tai Poutini* National Park

Considering a relatively large proportion of rare and/or threatened natural and geographical resources are being conserved in New Zealand's protected areas, managers could expect significant shifts in visitor behaviour associated with climate-induced changes to biophysical resources and tourism assets (e.g., increase in demand and evolving product and destination preferences). Nowhere in New Zealand are these changes more apparent than at the Franz Josef and Fox glaciers in Westland *Tai Poutini* National Park (Figure 1). These twin glaciers feature in many global 'Top-10 glacier lists' (see, for example, '*10 most amazing glaciers in the world*', '*Top 10 incredible glaciers*, and '*10 most beautiful glaciers*'). Within New Zealand they are regarded as one of the South Island's most iconic tourism destinations (Wilson et al., 2012). Evidence of this claim is that guided hikes on the Fox Glacier and the Franz Josef Glacier were ranked 64 and 73 (respectively) on the 2012 '101 Must-do's for Kiwis' list published by AA Travel (2012). Glacier tourism contributes significantly to the regional economy. In the year ending December 2013, a total of 418,466 international tourists visited the wider West Coast RTO region (Statistics New Zealand, 2014), the majority of whom are thought to have visited the glaciers. Domestic travel data show that in the year ending December 2012 there were 283,374 overnight trips to the West Coast RTO region (MBIE, 2013).

The Fox and Franz Josef glaciers are amongst the most accessible in the world. They are situated on the western flanks of the Southern Alps, which form a barrier to prevailing westerly atmospheric circulation, resulting in high annual precipitation (Griffiths & McSaveney, 1983). Both glaciers have a large, broad accumulation area situated above 1900

metres, well placed to take advantage of the large precipitation input. Ice from the accumulation areas flows down steep narrow tongues and the glaciers terminate in lush rainforest less than 300 metres above sea level.

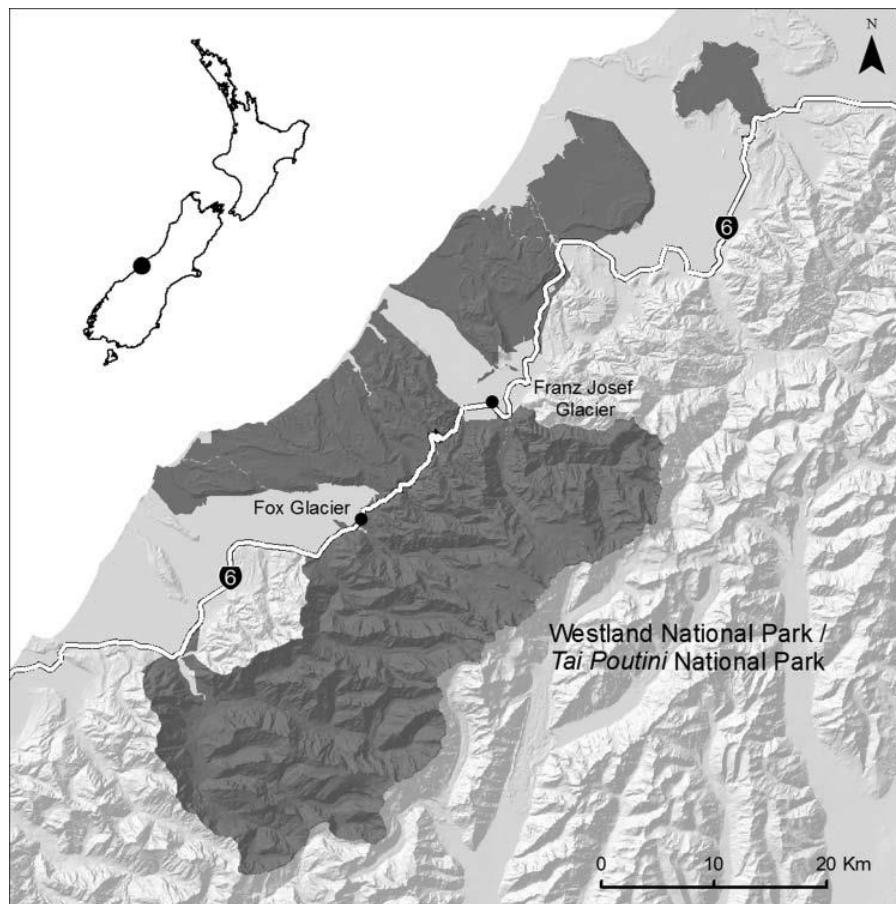


Figure 1 Location of Westland *Tai Poutini* National Park (Espiner & Becken, 2013)

The glaciers themselves are highly dynamic, sensitive to changes in climate and have a history of rapid advance and retreat (Purdie et al., In Press). Currently the glaciers are retreating at a rate climate scientists describe as 'remarkable' (DOC, 2013). Since the culmination of the most recent advance phase in 2009, Fox Glacier has lost 470 metres in length, and ice in the lower reaches has thinned by 180 metres (Purdie et al., 2014). Similar losses have occurred at Franz Josef Glacier, and recent climate-glacier modelling indicates that, by 2100, the Franz Josef glacier will recede from a length of 11 km to 6.4 km and shed 62 per cent of its volume (Anderson et al., 2008). An image of the Franz Josef Glacier, taken in 2013, is shown in Photograph 1: the lighter coloured rock in the glacial valley indicates the extent of ice volume loss over the last decade.



**Photograph 1 Franz Josef Glacier in retreat
(Photo Credit: Emma Stewart)**

In addition to shortening and thinning, retreating glaciers exhibit other physical changes. For example, the region of the Fox Glacier that is heavily utilised for tourism is becoming increasingly debris-covered. This is due to melt-out of englacial debris and increased rockfall from the surrounding recently exposed valley slopes. With thinning, the previously convex glacier cross-profile has flattened and modelling has demonstrated that falling rocks can now travel at up to 50 metres further out onto the glacier surface – potentially into regions utilised for guided glacier walks (Purdie et al., 2014). Such rapid changes have been recognised by the Department of Conservation's recent (February 2013) partial review of the Park's Management Plan specifically focusing on visitor access options to both glacier valleys.



**Photograph 2 Sign in Franz Josef Glacier valley alerting visitors to changes
(Photo Credit: Jude Wilson)**

1.1.1 The current visitor experience

An easy drive and walk from the nearby tourist villages brings visitors to viewpoints close to the terminal face of each glacier, while commercial companies also guide visitors to the face of the glaciers. In the summer 2013/14 season, access at Franz Josef Glacier was possible to within 500 metres of the terminal face, whilst at Fox Glacier visitors could walk to within 200 metres, to a viewpoint above the glacier face. At Fox Glacier this 200 metre limit was sometimes extended to 600 metres after periods of heavy rain. Commercial companies offer scenic flights (many involving a glacier-landing on the upper reaches of the glaciers) as well as guided hikes on the glaciers themselves.

In the past, the companies taking visitors on guided hikes were able to access the glaciers by foot from the glacier valley below, but the collapse of the front 70 metres of the Franz Josef Glacier in mid-2012 made foot access unsafe and access is currently only possible by air. Foot access onto the Fox Glacier was still possible during the 2013/14 summer season, however, in the months since this research was undertaken, a change in the river flow at the base of the glacier has necessitated the use of river rafts and all-terrain vehicles for access, a change which has severely curtailed the length of time these guided visitors are able to spend on the ice. Although both glaciers are still able to be accessed by air, this is highly weather-dependent, presenting both commercial/business challenges and issues surrounding customer satisfaction.

Given these changes, it is both critical and timely to examine how climate change-induced biophysical changes to the glaciers will affect visitor access and scenic amenity (Purdie, 2013). While not all changes are necessarily negative, they are generally considered as part of a broad field of interest labelled 'last chance tourism'. Various terms have been used interchangeably to describe 'last chance tourism' within media and academia (e.g., catastrophe tourism, extinction tourism, and doom tourism) but illustrations are consistent and include, for example, the desire to observe, photograph, and interact with threatened animals or physical features that may be threatened or rare (Dawson et al., 2011a). As Lemieux and Eagles (2011) pointed out, protected areas are called for under the United Nations' Convention on Biological Diversity (Article 8) and many 'last chance tourism' attractions are fundamentally located within the world's protected areas estate. Examples include rare or endangered species and/or ecosystems (e.g., polar bears, coral reefs), species whose distributions are highly influenced by climate (e.g., migratory species, such as birds and other wildlife), and valued assets that extend beyond the biological realm (e.g., glaciers).

The overarching aim of this research project is to better understand how climate change-induced biophysical changes to resources housed within Westland *Tai Poutini* National Park will:

- affect visitor behaviour;
- stimulate a change in nature-based tourism products and destinations within protected areas; and
- affect management decisions and policies pertaining to conservation and visitor use.

The research comprised two stages of data collection. The first part of the study, undertaken in August-September 2013, sought local stakeholder perspectives (Wilson et al., 2014). Stage two of the research, reported here, was a surveyor-administered questionnaire exploring the visitor experience at the glaciers during the 2013/14 summer season.

The visitor experience at Franz Josef and Fox Glaciers has attracted considerable research attention over the years, primarily through a series of Department of Conservation (DOC)

initiated monitoring reports. Since 2000, for example, there have been eight aircraft monitoring surveys (assessing independent visitor reaction to aircraft at the glaciers) undertaken at both glacier valleys; a ninth iteration (in the 2013/14 summer) focused only on the Franz Josef valley (Espiner & Wilson, 2013a). Alongside these, a survey to measure the quality of the free independent traveller (FIT) visitor experience at Franz Josef Glacier was undertaken in 2009 (following similar surveys at Franz Josef 2006 and 2007 and at Fox Glacier in 2008). A fourth iteration of the Franz Josef visitor survey – initiated in response to the 2012 changes in glacier access – was undertaken during the 2012/13 summer season (Espiner & Wilson, 2013b).

Research attention at the glaciers has also focused on a variety of sub-topics associated with the visitor experience, with perceptions of, and the management of 'risk' of particular interest. Espiner (2001) examined the phenomenon of risk and its management in the natural resource recreation and tourism setting of the glaciers; more recently Espiner and Weiss (2010) evaluated aspects of hazard awareness, safety message effectiveness and behavioural complicate among visitors to the glaciers. A number of studies investigating the impact of weather and climate on tourists/tourism in New Zealand have either focused on (Wilson et al., 2012) or included the glaciers (Becken et al., 2010).

These surveys provided useful background information in respect of our understanding of the glacier visitor experience; more directly, they partially informed the question development and methodology used in this survey project.

Chapter 2 Methods

A questionnaire survey approach was devised to allow the collection of data from a large number of tourists. The survey collected information on:

- visit characteristics of tourists in the glacier region (i.e., their length of stay, nights stayed, direction of travel)
- the glacier experience (i.e., where they visited, participation in glacier-related and other activities in the glacier region)
- reasons for visiting
- expectations and satisfaction with aspects of the glacier experience and visit
- prior awareness of the glacier (i.e., previous visits, exposure to imagery, collection of information)
- attitudes towards climate change and its potential impact on the visitor experience
- basic demographic information (i.e., age, country of residence, gender and highest education level)

Those tourists selected to participate in the research were given a spiral bound booklet (laminated for longevity) including the questions, as well as the various scales used to record responses. This booklet also included images designed to be used as prompts for some of the survey questions. Each page of the booklet was printed in a different colour to make it more appealing to visitors and help direct them through the survey. The surveyor asked the questions and recorded respondents' verbal responses (in the most part these were simply numerical selections, for any open-ended questions participants' responses were recorded verbatim). The reason for surveying this way was: to reduce the compliance burden on participants (i.e., they were not required to fill in the surveys themselves); to ensure all questions were understood and that data was recorded accurately (previous experience of a similar visitor survey at the glaciers indicated that it is difficult to get accurate responses when asking about activities undertaken at the glacier); and to ensure that no questions were missed by participants. The laminated booklet was also a practical approach for surveying in an area where rain is not uncommon, and was printed using a large typeface (to assist those who did not have glasses with them). The survey was conducted in English, with the consequential limitation of excluding non-English speaking visitors. The survey took approximately 15 minutes to complete.

The survey was piloted during November 2013 to ensure the booklet method worked and that the question order was logical. The complete survey form and laminated booklet are contained in Appendix 1 and 2. More detail of the survey sites, survey periods and sampling are provided below.

2.1 Survey sites

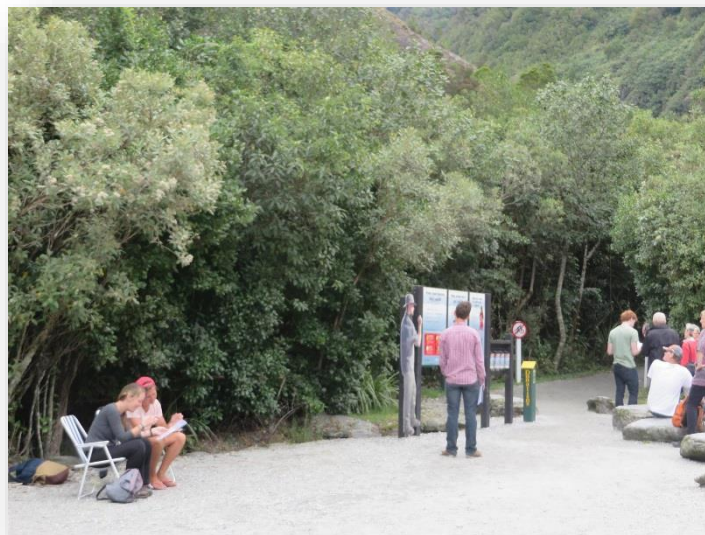
A sampling framework was designed to capture the range of visitor activities associated with glacier tourism. This included those visitors independently walking in the glacier valleys to various glacier viewpoints, as well as visitors returning from commercial activities, such as guided glacier hikes and scenic flights. An overall sampling quota aimed for 500 surveys, split equally between the two glaciers and between those participating in commercial glacier activities and those visiting independently. Within the commercial activity group, a more detailed sampling quota was devised to ensure that all types of glacier activity were represented.

Surveying was undertaken at both Franz Josef and Fox Glaciers. In both locations a single pre-determined glacier valley site (identified during the survey pilot) was used; in the glacier villages a variety of sites were used, dependent on which type of commercial glacier activity was being sampled. It was easier to intercept (and identify) customers from each of the commercial activities in the Franz Josef village, although these all required favourable weather in order to operate. In contrast, the Fox Glacier village presented a much 'messier' survey location, but offered commercial glacier products that were not so weather dependent.

To enable interception of visitors using the valley floors, a safe and suitable location was identified (in conjunction with DOC) in the vehicle-free buffer zone between the car park and the entrance/start point of the valley walking track at each glacier. Visitor groups exiting the walking tracks were approached and asked if they were willing to participate in the survey; the script set out on the first page of the questionnaire was used in these approaches (see Appendix 1). Only one person aged 15 or older in each travel group/party was asked to complete the survey. In order to recruit the participant, the group was asked to identify the person with the next birthday. An information sheet was offered to participants which provided a full explanation of the research, outlined what was involved in survey participation and gave contact details of the researchers (see information sheet in Appendix 3). Chairs were available for those visitors wishing to sit down to complete the survey; umbrellas were also available for shelter in wet conditions. When the interview was completed, two minutes was allowed to lapse before approaching the next group to exit the walking tracks. Specific details and photographs of the two survey sites are provided below.

2.1.1 Franz Josef Glacier valley

The survey site was in the car park at the point where visitors exited the glacier valley and Sentinel Rock viewpoint track. This site was spacious, was separated from the vehicle-way and had some flat rocks on which the surveyors and respondents could comfortably sit. Surveying during the afternoon was difficult at this site as it offered very little shade (Photograph 3).



**Photograph 3 Survey site Franz Josef Glacier valley
(Photo Credit: Jude Wilson)**

2.1.2 Fox Glacier valley

Surveys were undertaken in the open area between the car park and the beginning/end of the glacier valley walk. The site was spacious, close to the toilets and offered some flat rocks on which to sit (Photograph 4). However, similar to Franz Josef the site was exposed to the sun in the afternoon.

While independent walkers are usually able to walk to a viewpoint 200 metres from the terminal face of the Fox Glacier, this track crosses an area which becomes dangerous after heavy rain and the track is often roped off at a point 600 metres from the terminal face. During Survey Period 1 there were three days in which public access was possible only to this point; a further two days had restricted access (600 metres) in the morning, with full access (200 metres) possible in the afternoon once water levels had gone down.



**Photograph 4 Survey site Fox Glacier valley
(Photo Credit: Jude Wilson)**

To intercept visitors returning from commercial activities at each of the glaciers, survey posts were set up in several locations in the Franz Josef and Fox Glacier villages. With the permission of commercial operators (many of whom participated in stage one of the project through stakeholder interviews), participants were surveyed upon return from their activities on the premises of the operator (such as at the Glacier Guides and the airstrip used by the fixed-wing scenic flight company). Some participants were intercepted in public spaces (e.g., on footpaths and beside car parking areas). The procedure for recruiting participants followed the glacier valley approach outlined above. Participants were reminded that this was an independent project, but with the full support of the operator and of DOC. Specific details of the village survey sites are provided below.

2.1.3 Franz Josef village

Those returning from scenic flights were intercepted on the roadway and in the public car park at the point where the paths to the two helipads led off (Photograph 5). Heli-hike customers were surveyed at the two respective changing areas. The Ice Explorer and guided valley customers were intercepted and surveyed in the Franz Josef Guides building where seating and shelter were available. Fixed-wing scenic flight passengers were surveyed at the company building located at the airstrip ten kilometres outside the Franz Josef village.



**Photograph 5 Franz Josef village survey site for visitors returning from scenic flights
(Photo Credit: Jude Wilson)**

2.1.4 Fox Glacier village

The majority of surveys in the Fox Glacier village were undertaken in, and around, the building which houses the Fox Glacier guiding company. This offered a covered porch area or (when it was not too busy) an indoor changing room with seating that could be used for surveying. Passengers from guided valley walks, guided glacier walks and heli-hikes all returned to this area after their trips. While the surveyors took care not to get in the way of groups leaving and returning on trips, there were a number of occasions when the area was too busy to facilitate surveying. It proved more difficult to intercept people returning to the Fox Glacier village from scenic flights because the helipads are located out of town and customers are returned by minivan to the main street, with the vans parking wherever they can find space close to their respective offices. After establishing the approximate times that vans were due to return, surveyors could station themselves nearby and hope to intercept passengers, although the area was busy with other visitors and it was not always possible to identify those who had done a scenic flight. The grassy area in front of the tourist photo point shown in Photograph 6 had several picnic tables which could be used for surveying once respondents had been identified.



**Photograph 6 Tourist photo point in Fox Glacier village
(Photo Credit: Jude Wilson)**

2.2 Survey periods

The surveys were undertaken during two ten-day survey periods:

- SP1 – from 27th December 2013 to 5th January 2014
- SP2 – from 4th to 13th February 2014

The decision to split the surveying into two phases was based on a number of considerations:

- Having two survey periods minimised the potential effects of encountering an extended adverse weather pattern that spanned the survey period.
- Ensuring representation of New Zealand visitors in the immediate post-Christmas period.
- Logistical issues relating to the implementation of the survey over a single extended period.
- Variations in both visitor numbers and usual weather conditions across the two survey periods (i.e., early January coincides with high visitor numbers, whilst February is usually characterised by more settled, and better, weather).

The same approach, with similar dates, was used in two glacier visitor surveys undertaken by the Department of Conservation in 2013 (see Espiner & Wilson, 2013a & 2013b).

Surveying was undertaken on nine days of each survey period with specific survey locations selected dependent on sample quotas, the weather conditions and surveyor availability. A full record of completed surveys by date, location and weather conditions is provided in Appendix 4. Altogether, 207 surveys were completed in Survey Period 1 and 293 in Survey Period 2 (Table 1). Sample data and results are reported throughout as either numerical or percentage figures (in all instances, n =number completing the particular question).

Table 1 Number of surveys by survey period

	Survey Period 1	Survey Period 2	Total
Franz Josef	123	117	240
Fox Glacier	84	176	260
Total	207	293	500

2.3 Sampling

Altogether, just over half of all surveys were completed at the two Fox Glacier survey sites (52%, $n=260$) and just under half at the Franz Josef survey sites (48%, $n=240$) (Table 1, Figure 2).

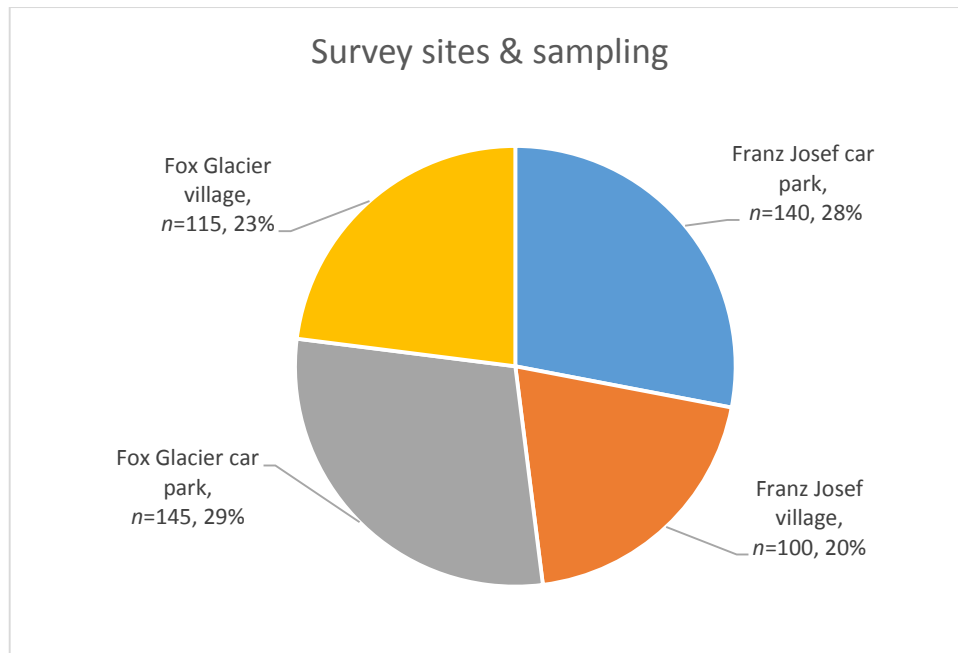


Figure 2 Survey sites and sampling

Figure 2 also shows that 57 per cent ($n=285$) of all surveys were completed in the two glacier car parks (i.e., with visitors walking independently to view the glaciers) and 43 per cent ($n=215$) were completed in the two glacier villages (i.e., with visitors doing a commercial glacier activity).

More detail of the distribution of completed surveys across the commercial activities, and by glacier village, is shown in Figure 3. While the sampling framework employed aimed for an equal distribution of these across the two sites, this was adjusted for logistical reasons during surveying (as noted above):

- Franz Josef village proved to be an easier location in which to intercept those returning from scenic flights;
- More 'guided valley hike' visitors were surveyed in Fox Glacier village as these surveys could be done under cover during wet weather;
- Ice Explorer trips only applied in Franz Josef and 'guided glacier walks' only in Fox Glacier; more of the latter were completed as they continued despite the weather (Ice Explorer was dependent on weather conditions suitable for flight activity).

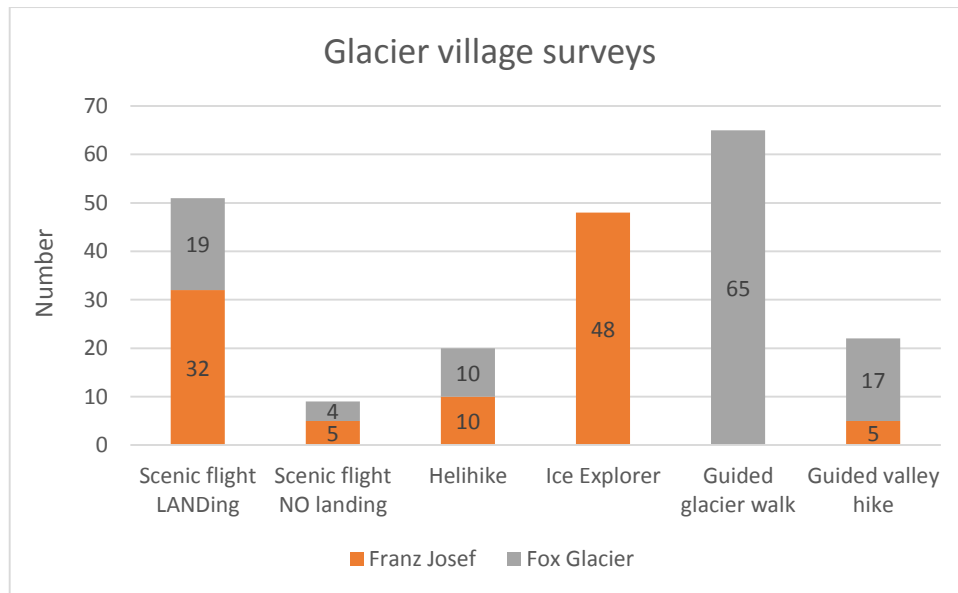


Figure 3 Glacier village surveys by type of commercial activity (n=215)

NB. These figures represent the sampling distribution only and do not equate with the activity data reported later as some visitors surveyed in the valleys also did commercial activities, and vice versa.

2.4 Sample size and margin of error

The total sample ($n=500$) gives a margin of error of ± 4.38 per cent. This means that we can say with 95% confidence that any result presented falls within an 8.76 per cent range of the proportions calculated from the total sample.

2.5 Analysis and reporting of results

Survey data were entered into an Excel spreadsheet and then uploaded into SPSS for quantitative analysis. In the case of open-ended questions, or those where respondents were requested to provide their own examples, responses were recorded verbatim on the spreadsheet, manually post-coded and analysed.

Data were first analysed for frequencies and relationships between variables explored using cross-tabulation and comparison of means (where appropriate). The demographic data were also analysed by survey period.

Because the data collection method was interviewer-administered, the data set was complete. There were, however, several questions which did not apply to some respondents (e.g., those who had only experienced the glacier/s by air had no experience of the facilities in the glacier valleys, those who had only done a scenic flight with no landing had no experience encountering other people during their visit).

Chapter 3 Results

This section first presents the results drawing on the respondents' demographic data, followed by findings related to the visitor experience and climate change and its impacts. Within each sub-section, individual questions are reported in the order in which they appeared in the survey. The results section is followed by a concluding discussion in which key results are analysed within the broader context of the visitor experience of the Glaciers as it relates to 'last chance tourism'.

3.1 Demographic data

These data describe the survey sample by age, gender, highest education level, usual residence and survey period.

3.1.1 Age

Almost a third of all visitors surveyed were aged 20-29 years (29.2%, $n=146$) and just over a third were aged 50 years or older (35.8%, $n=179$) (Figure 4). This age distribution is very similar to that reported in the Franz Josef Visitor Survey undertaken in 2013 (Espiner & Wilson, 2013b).

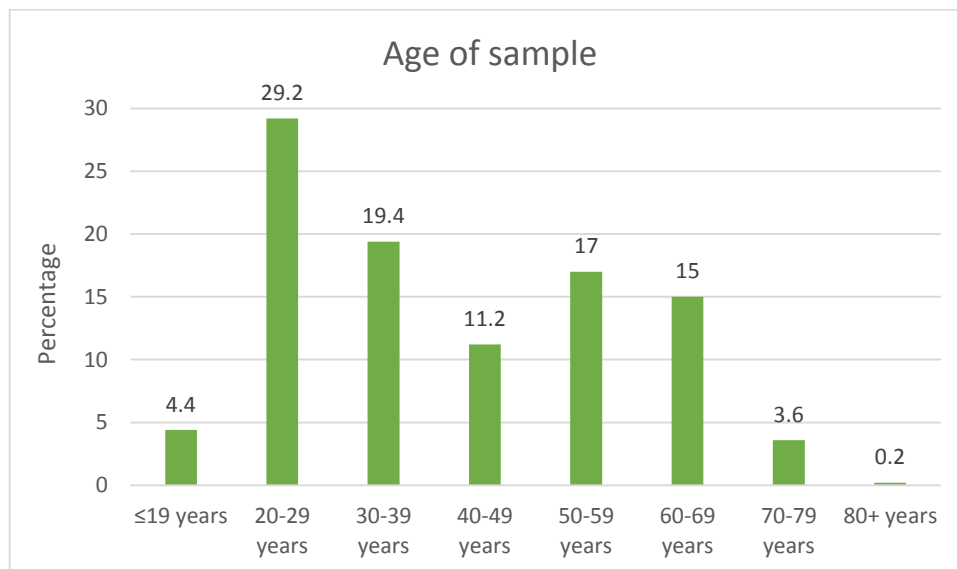


Figure 4 Age of sample ($n=500$)

Figure 5 shows the age distribution of the sample by survey period, and demonstrates that Survey Period 1 was skewed towards younger visitors, whereas Survey Period 2 had a bi-modal age distribution with a similar number of young visitors, but a much larger representation in the 50-69 year age groups. The higher percentage of respondents aged 30-49 years encountered in Survey Period 1 (46.4% compared to 19.5% of the sample in Survey Period 2) reflects the fact that this was the school and Christmas holiday period when more families were visiting. The 2013 Franz Josef Visitor Survey (in which the same two survey period methodology was used) reported a similar difference in the age distribution of visitors across survey periods (Espiner & Wilson, 2013b).

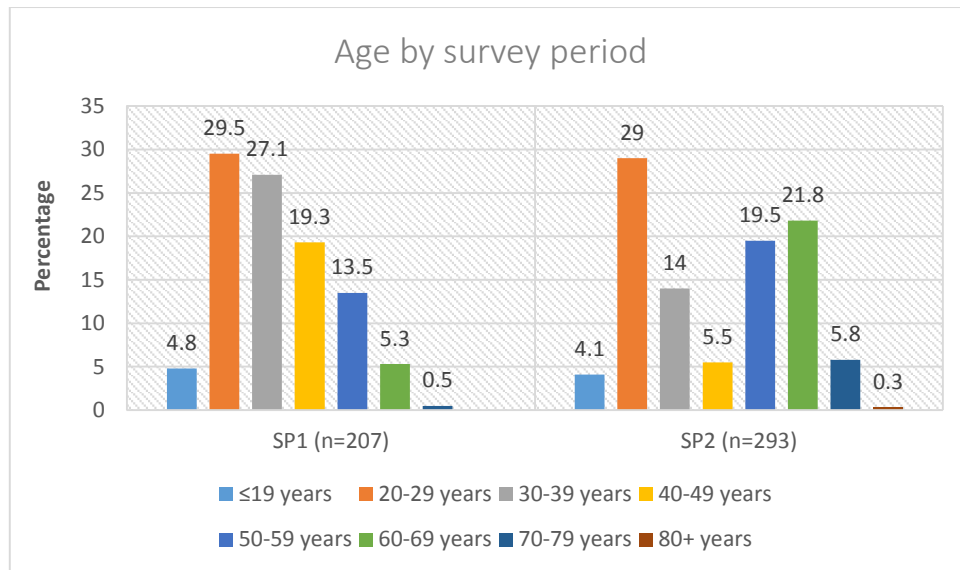


Figure 5 Age by survey period (total sample n=500)

3.1.2 Gender

Overall, a roughly equal gender split was achieved across the two survey periods although more men were surveyed in Survey Period 1 and more women in Survey Period 2 (Figure 6).

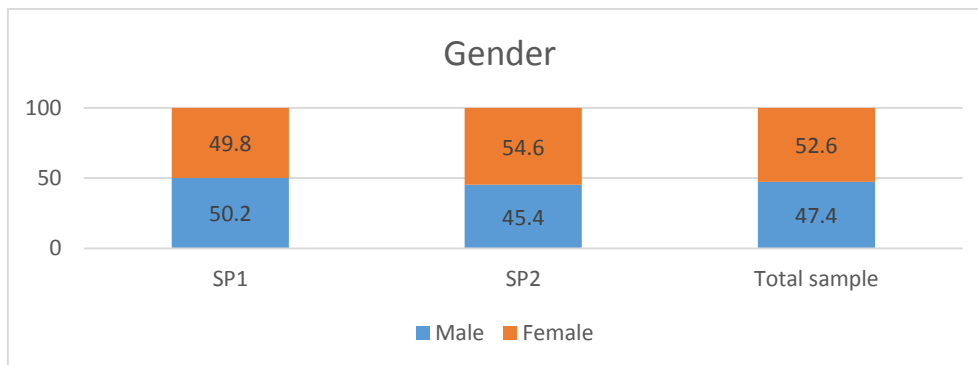


Figure 6 Gender by survey period and total sample (n=500)

3.1.3 Highest education level

Altogether, over two-thirds of all respondents (67%, $n=334$) reported having a university education (Figure 7). There was a link between age and highest education level with over half of those with a university education aged 20-39 years (59.6%, $n=199$). In the other categories, 77.3 per cent of those whose highest education level was secondary/high school were aged 19 years or under, and almost a third of those who had a training/trade qualification (32%, $n=22$) were aged 60 years or over. Almost twice as many males ($n=45$) had trade/training qualifications as females ($n=26$). No further details were asked from those who indicated having an 'other' highest education level although the surveyors found that that a number of those who initially indicated having an 'other' education level were actually university educated (but sought to indicate in some way that they had achieved a higher level of university qualification than undergraduate).

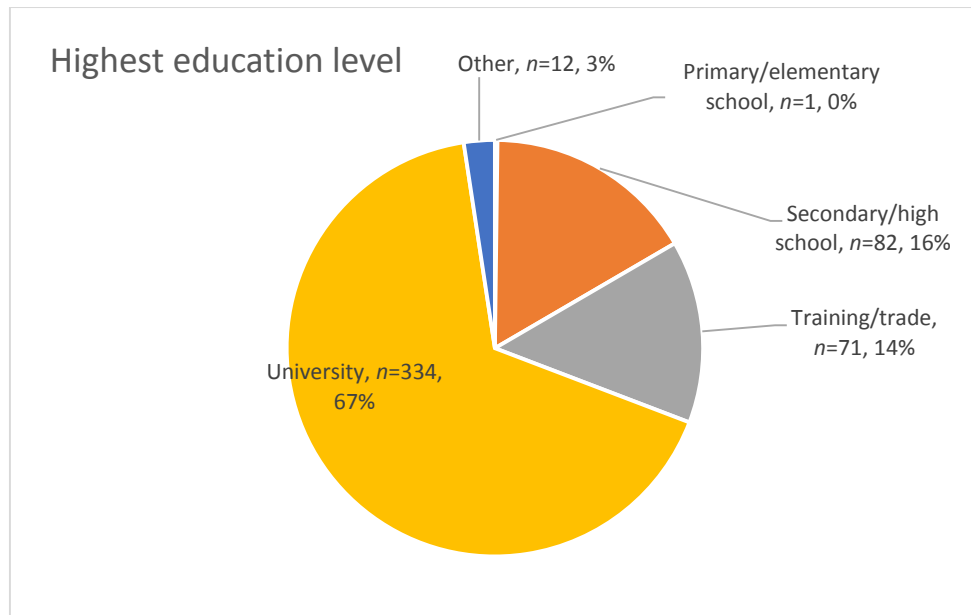


Figure 7 Highest education level (n=500)

3.1.4 Usual residence

International visitors accounted for 84.6 per cent ($n=423$) and New Zealand residents 15.4 percent ($n=77$) of the total sample. The largest single country of residence for international visitors was the UK (19% of total sample, $n=95$) followed by Australia (18.8%, $n=94$), the USA (11.8%, $n=59$) and Germany (8.8%, $n=44$) (Figure 8). A further 81 respondents (16.2% of the total sample) came from other European countries with Switzerland ($n=16$), the Netherlands ($n=16$), Denmark ($n=13$) and France ($n=12$) the most common. Altogether, respondents represented 13 European countries (excluding Germany and the UK).

Twenty-two of the 25 visitors from 'Other Americas' were from Canada with the others from Guatemala ($n=2$) and Brazil ($n=1$). Asian visitors represented seven countries with the most common being Singapore ($n=7$) and India ($n=6$). The other Asian countries represented were Malaysia ($n=2$), and one respondent each from Hong Kong, Thailand, Nepal and China. The six respondents classified as 'Other' in Figure 8 were from Israel ($n=5$) and New Caledonia ($n=1$).

A full list of respondents' countries of residence is shown in Appendix 5.

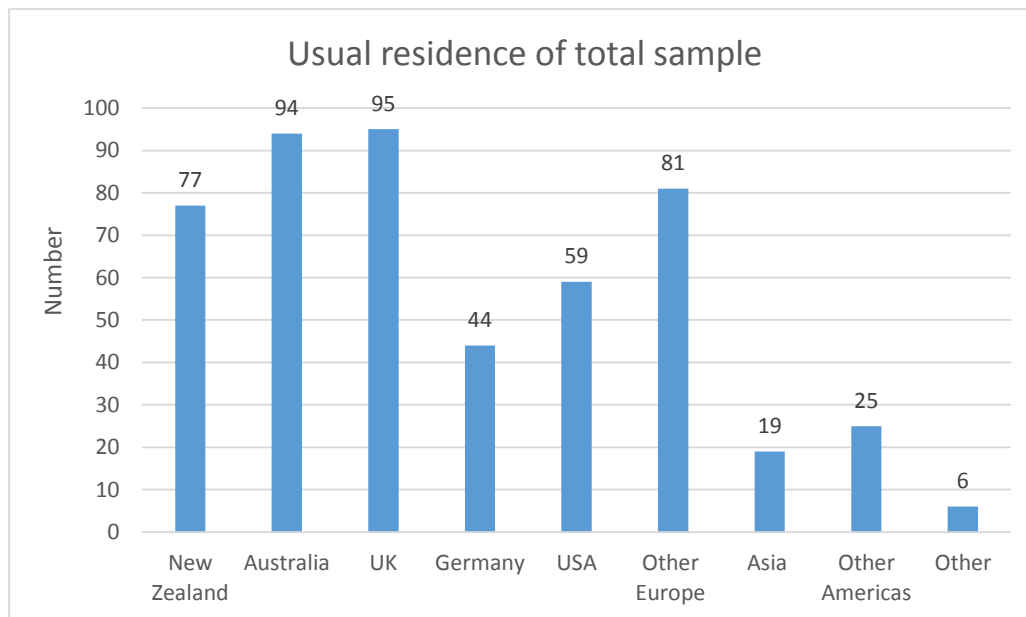


Figure 8 Usual residence of total sample (n=500)

Table 2 shows the distribution of international visitors by their country of residence for this survey sample, the 2013 Franz Josef Visitor Survey sample, and international visitor arrivals for all of New Zealand in the Year ending March 2014 (IVS data). The country of residence profile of this sample is similar to that reported in the 2013 Franz Josef Visitor Survey (Espiner & Wilson 2013b). In 2014, there was a slightly higher percentage of respondents from New Zealand (15.4% compared to 14.7% in the 2013 survey). By comparison to the IVS data, however, visitors from Australia, and Asia were under-represented in the survey sample whilst visitors from the UK, Germany, other Europe and the USA were over-represented.

Table 2 Country of residence for international visitors (n=423)

	Survey Sample: International visitors (n=423)	International visitors: 2013 Franz Josef survey (n=447)	International Visitor Arrivals to Year Ending March 2014 (n=2,752,257)
UK	22.5	21.5	7.0
Australia	22.2	19.5	44.4
Germany	10.4	16.8	2.7
USA	13.9	12.3	7.5
Other Europe	19.1	21.0	5.9
Asia	4.5	2.9	20.9
Other Americas	5.9	4.7	2.8
Other	1.4	1.3	5.0

When analysed by survey period, the country of residence data show some significant differences in respect of visitors from Australia and the UK (Figure 9). Almost three times as many Australians were surveyed in the first survey period compared to the second which most probably relates to the Christmas/school holiday period; this also accounts for the slightly higher percentage of New Zealand residents and visitors from the USA surveyed in Survey Period 1. By contrast, UK visitors were almost three times as likely to be encountered in Survey Period 2; a number of reasons may account for this including these visitors avoiding travel in

New Zealand during what they know to be the New Zealand summer/school holidays. Furthermore, many of these visitors represent the VRF market and may leave their travel around New Zealand until after their New Zealand friends/family have returned to school/work.

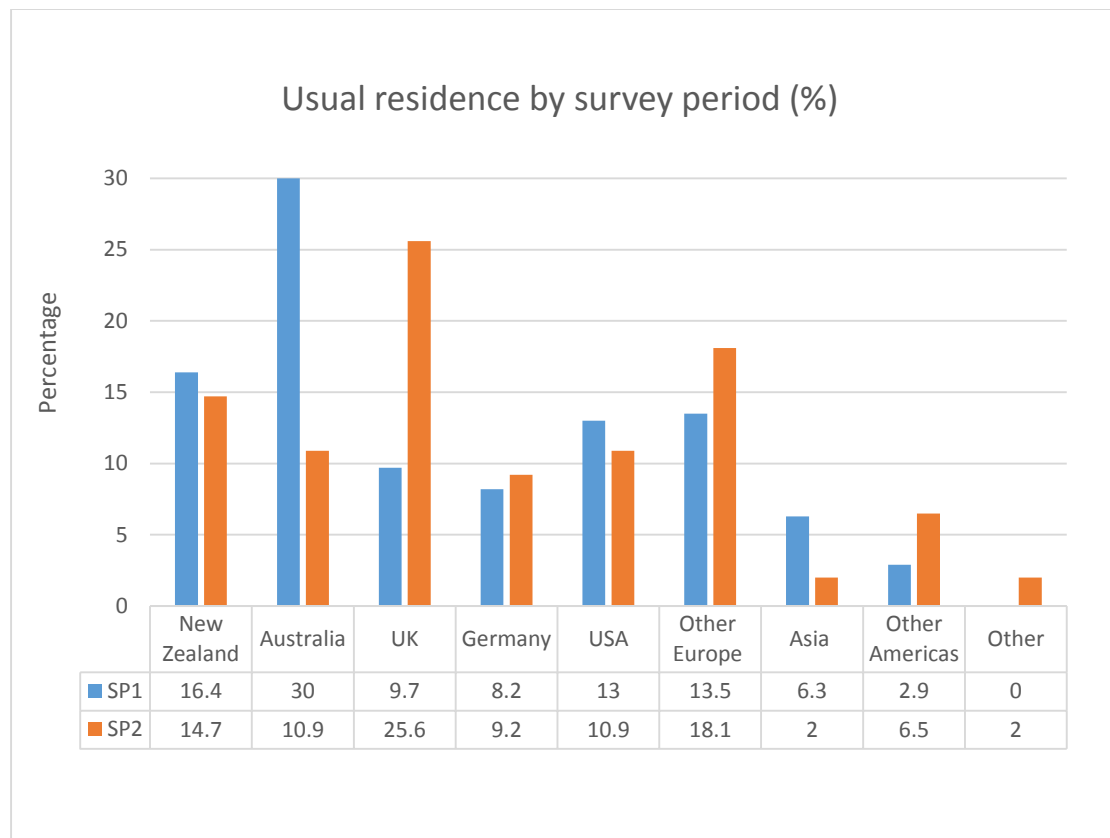


Figure 9 Usual residence by survey period (n=500)

3.1.5 Usual residence of New Zealand visitors

Those respondents who reported living in New Zealand were also asked in which region they lived (Figure 10). As might be expected, the two most common source regions reported were the nearby region of Canterbury (37.7%, $n=29$) and the populous Auckland region (24.7%, $n=19$). The survey period differentiation (also shown in Figure 10) shows that an equal number of North Island visitors were surveyed in each period, although a wider array of North Island regions were represented in Survey Period 1. In contrast, 25 of the 41 South Island visitors (61%) were surveyed in Survey Period 2.

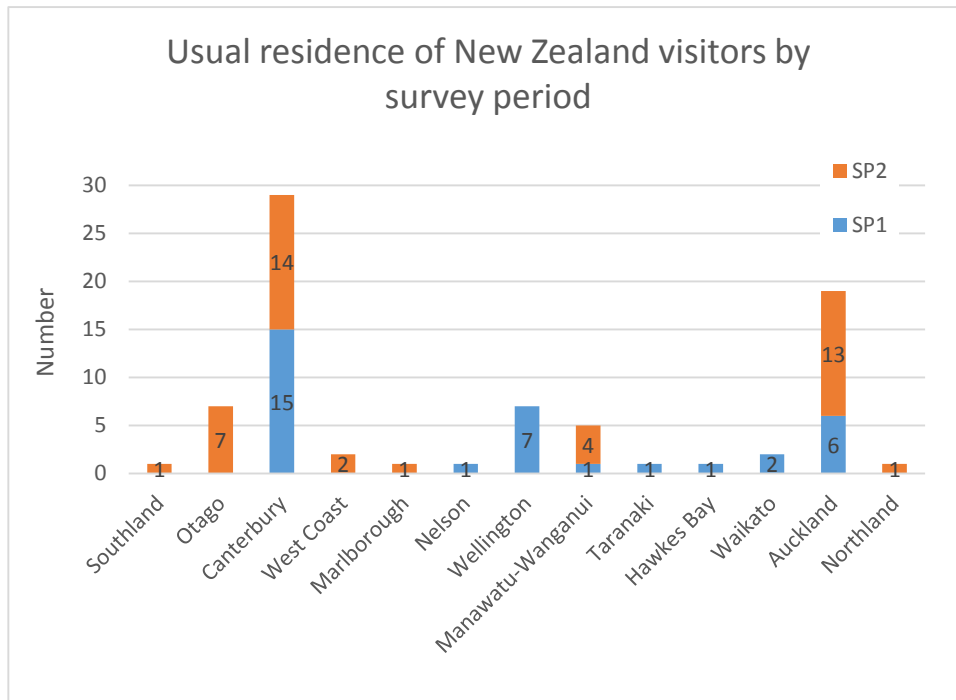


Figure 10 Usual residence of New Zealand visitors by survey period (n=77)

3.2 The visitor experience

The focus of the survey was on the visitor experience at the glacier region, which was explored through 16 questions. The first set of questions asked respondents about any previous visits to the glaciers (Q1) and collected data on their current visit including: where they stayed and direction of travel (Q2, Q3); duration of visit (Q4); where they visited (Q5); and participation in both glacier (Q7) and non-glacier activities (Q8). The importance of the glaciers (Q10) and other reasons for visiting were explored through both open-ended (Q6) and closed questions (Q11). Q9 asked respondents what the most memorable aspect of their visit had been. Data were also collected about previous exposure to images of the glacier (Q13), the accuracy of these images (Q14) and the collection of information in advance of visiting (Q15). Other questions asked about expectations and satisfaction with various aspects of the glacier (Q12) and respondents' glacier visits (Q16).

3.2.1 First or repeat visit

The majority of respondents (84%, n=421) were on their first visit to the glaciers (Figure 11). The 2013 Franz Josef Visitor Survey found 78.7 per cent of visitors to be there for first time (Espiner & Wilson, 2013b).

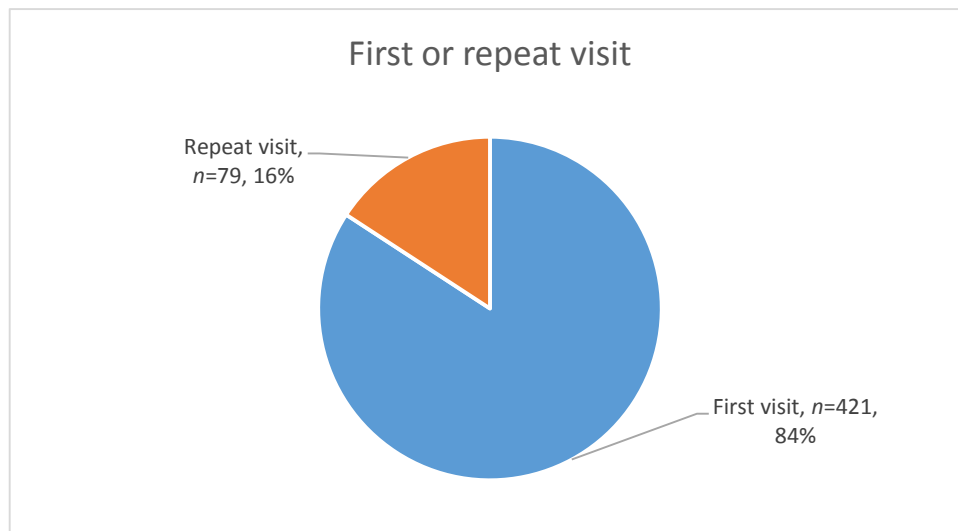


Figure 11 First or repeat visit (n=500)

Just under half of the New Zealand residents surveyed had been to the glaciers before (49.4%, $n=38$). The largest proportion of repeat international visitors came from Australia (13.8% of whom had been before) followed by Germany (13.6% visited previously), the USA (11.9% visited previously), the UK (11.6% visited previously) and Other European countries (4.9% visited previously). There were no repeat visitors from the Other Americas, Asia or Other countries.

Those who had visited before were asked details of their previous visit/s including when that visit had been, which glacier they had visited and what they recalled about the glacier/s from that visit.

The earliest previous visit reported was in 1973 and the most recent previous visit was in 2013. The year of each respondent's previous visit was classified according to six time periods encapsulating variations in the condition of the glacier/s (i.e., their state of advance/retreat and size). According to this classification, just over a third (34.2%, $n=27$) of the previous visits occurred between 1991 and 2003, during a period when the glaciers were at their largest and 27.8 per cent ($n=22$) previous visits had been during the most recent period of retreat (since 2010) (Figure 12).

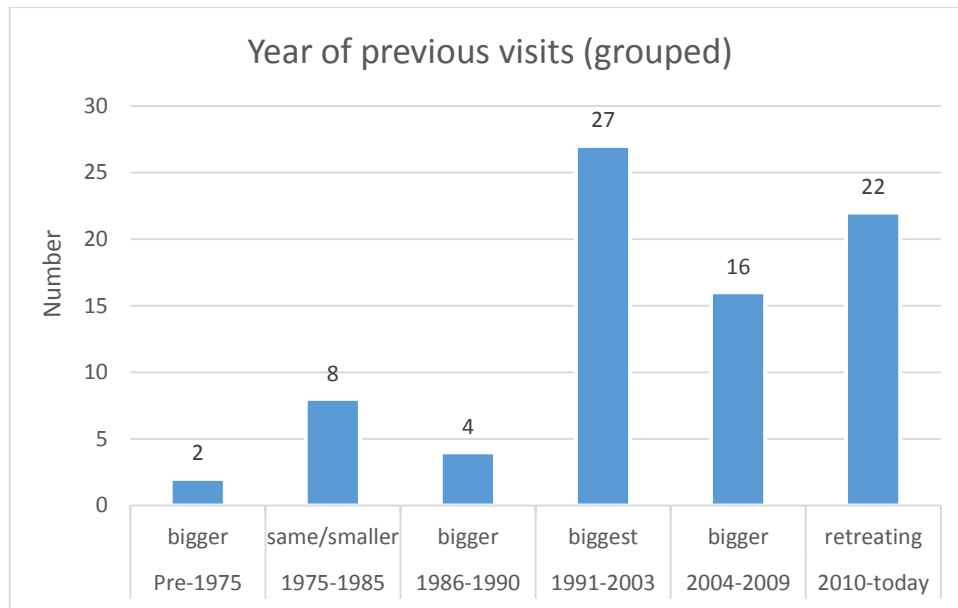


Figure 12 Year of previous visit (grouped) (n=79)

When asked what they remembered from their previous visit to the glacier/s a range of responses were given and these were coded into six broad groups describing:

- changes in the glacier (e.g., *'has shrunk a bit and track went further this time'*, *'less ice now'*, *'much further down the valley'*);
- an aspect of their visit experience that was different (e.g., *'went on a heli-hike'*, *'walked right up to it'*);
- a specific glacier characteristic (e.g., *'the glacier moving'*, *'the sound of ice cracking'*, *'stunningly beautiful'*);
- no recall of previous visit;
- something about the weather (e.g., *'rain'*, *'worse weather'*, *'bad weather'*);
- an unchanged glacier (e.g., *'similar to this'*, *'looked much the same'*).

The frequency and distribution of these responses by time period are shown in Figure 13. Altogether, almost a third (31.6%, $n=25$) of the 79 respondents who had visited previously thought that the glacier had changed. The majority of respondents' recall of these changes in the glacier described seeing smaller glacier/s and less ice on their current visit. The details of changes in the glaciers described did not always agree with the actual glacier conditions visitors would have encountered however. For example, the four respondents who had previously visited in the 1975-1985 time period (when the glaciers were smaller than today) reported that the glacier had been bigger or that there had been more ice on their previous visit. Only one respondent (who last visited in 1997) thought that the glacier was bigger on their current visit. Five respondents whose previous visit had been since 2010 reported changes in the glacier with one noting that it had *'changed dramatically'*.

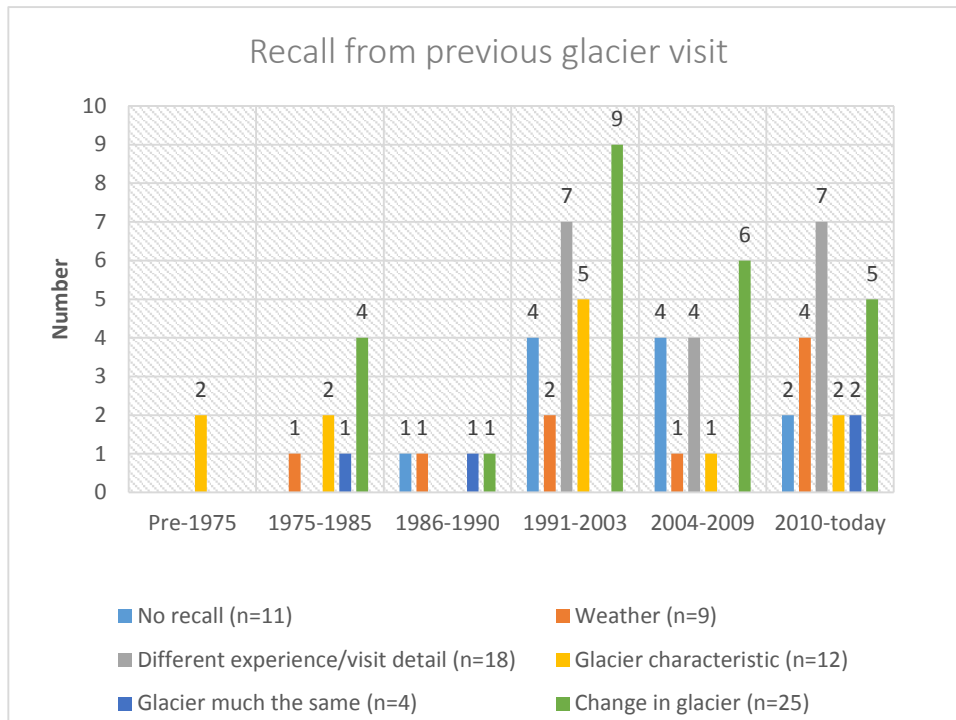


Figure 13 Recall from previous glacier visit by grouped category & time period (n=79)

The second largest group of recall comments related to respondents having had a different experience or some detail of their visit being different on their previous visit. A number of these comments also alluded to a change in the size (or extent) of the glacier and, in particular, how close they had been able to get to the glacier on their previous visit. Half of the people who reported a different experience or visit detail had last visited since 2010; the majority of these people reported having done a different activity on their previous visit (e.g., ‘*did a flight*’, ‘*did a walk one last year*’) while some reported something particularly memorable from their previous visit (e.g., ‘*incredible guiding mother daughter experience*’, ‘*helicopter broke down on glacier*’).

3.2.2 Previous night’s stay

Altogether, 79.6 per cent (n=398) of the visitors surveyed had stayed the previous night in the glacier region, with Franz Josef accommodating almost two thirds (65%, n=258) of those visitors (Figure 14). Just under a quarter stayed at Fox Glacier (23.6%, n=118); Gillespies Beach was the most popular other location in the glacier region attracting 2.2 per cent (n=11) of the visitors surveyed.

The remainder of the visitors were split almost equally between locations north (10.4%, n=52) and south (10%, n=50) of the glaciers. The two most popular locations north of the glacier region were Hokitika (n=26) and Greymouth (n=16). The three most popular southern locations were Haast (n=25), Wanaka (n=11) and Lake Paringa (n=10). Two respondents who had stayed north of the glaciers were unsure where exactly they had stayed.

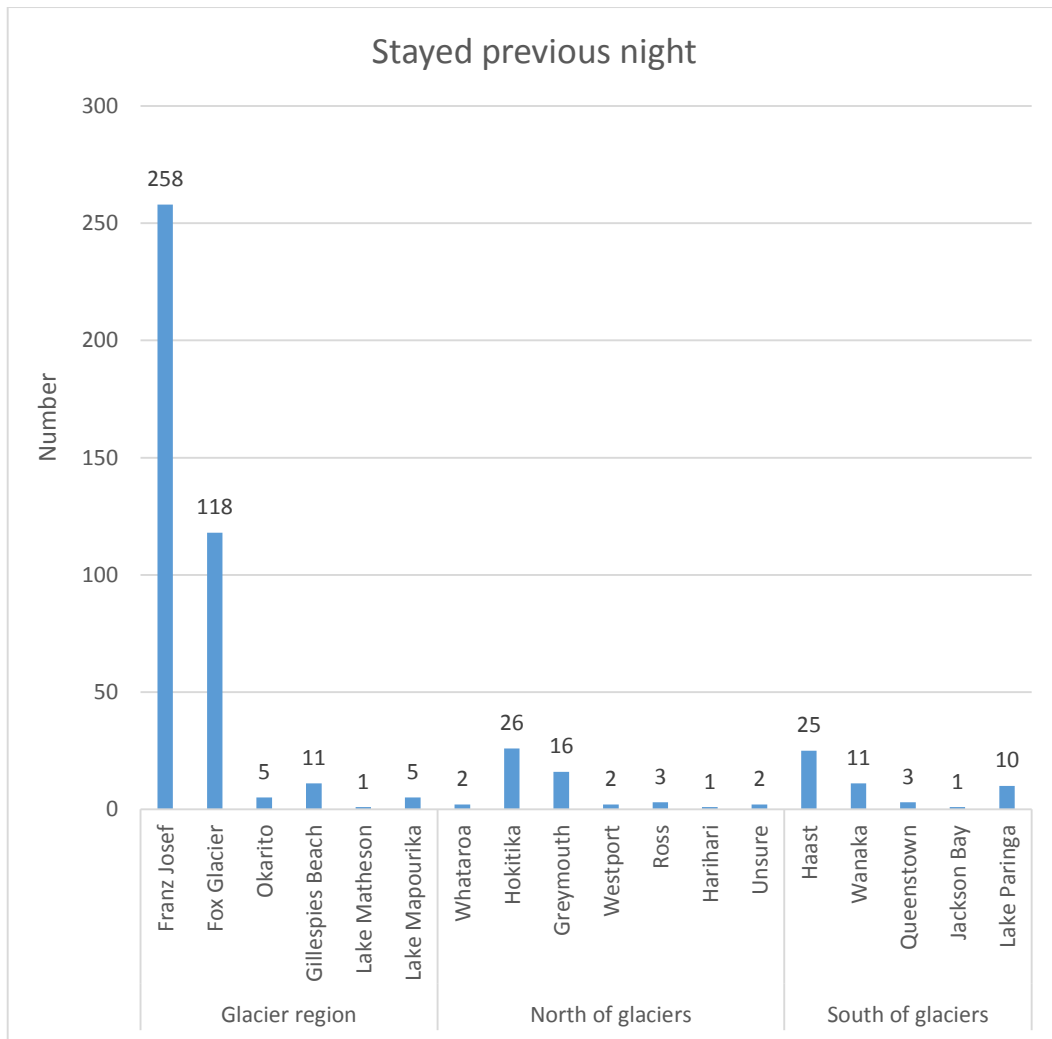


Figure 14 Previous night's stay (n=500)

3.2.3 Current night's stay

Just over half of visitors surveyed (55.3%, $n=275$) were staying that night in the glacier region and 222 (44.7%) were leaving the glacier region that day; three respondents were unsure whether they were staying or leaving. Of those staying in the glacier region, 70.5 per cent ($n=194$) were staying in Franz Josef and 25.8 per cent ($n=71$) were staying at Fox Glacier (Figure 15).

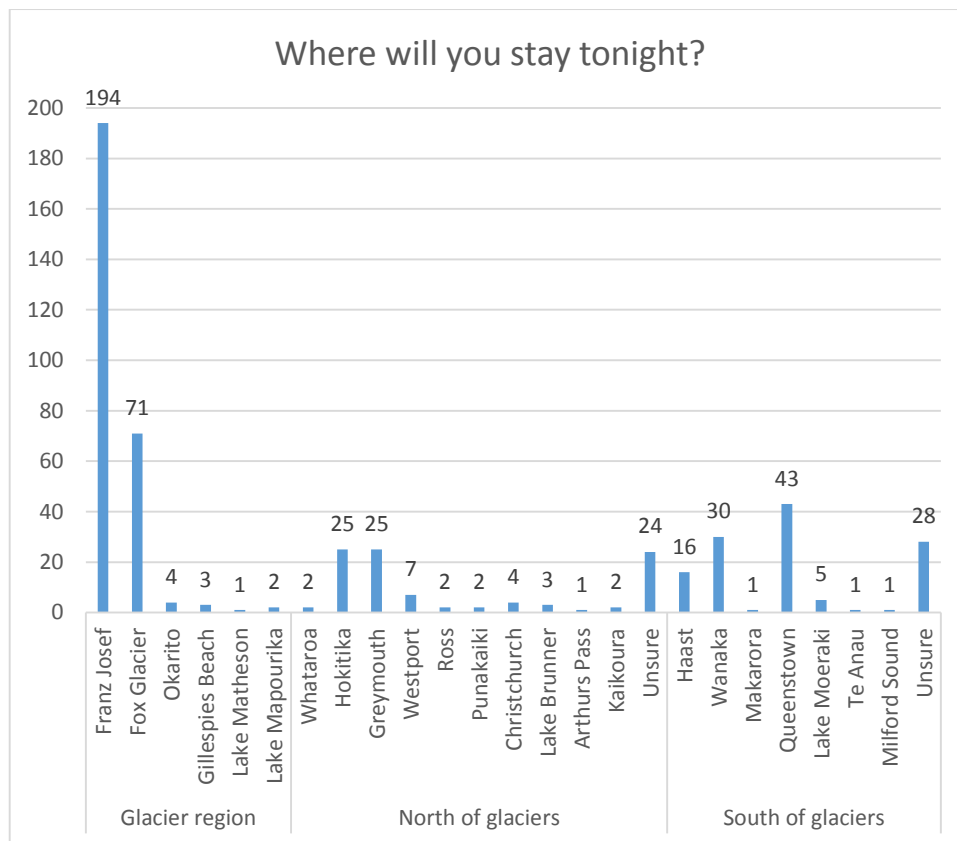


Figure 15 Current night's stay (n=500)

Altogether, 97 respondents planned to stay somewhere north of the glaciers with Hokitika (25.8%, $n=25$) and Greymouth (25.8%, $n=25$), once again, being the most popular locations; 24 respondents (24.7%) travelling north were unsure of where they would stay that night. For the 125 respondents travelling south, the most popular locations were Queenstown (34.4%, $n=43$), Wanaka (24%, $n=30$) and Haast (12.8%, $n=16$); 28 respondents (22.4%) travelling south had not decided where they would stay that night.

Direction of travel

A specific direction of travel question was added after surveying began in order to capture itinerary data from those visitors who reported staying both previous and current nights in the glacier region. The collection of these data also provided a useful cross-check for the location of stay data reported above.

As Figure 16 shows, over half of all respondents (52.4%, $n=262$) were travelling south and just over a third (34.6%, $n=173$) were travelling north; of the remainder, 14 were returning north, eight were returning south and four lived in the glacier region. Direction of travel data was not collected from 39 respondents (7.8%).

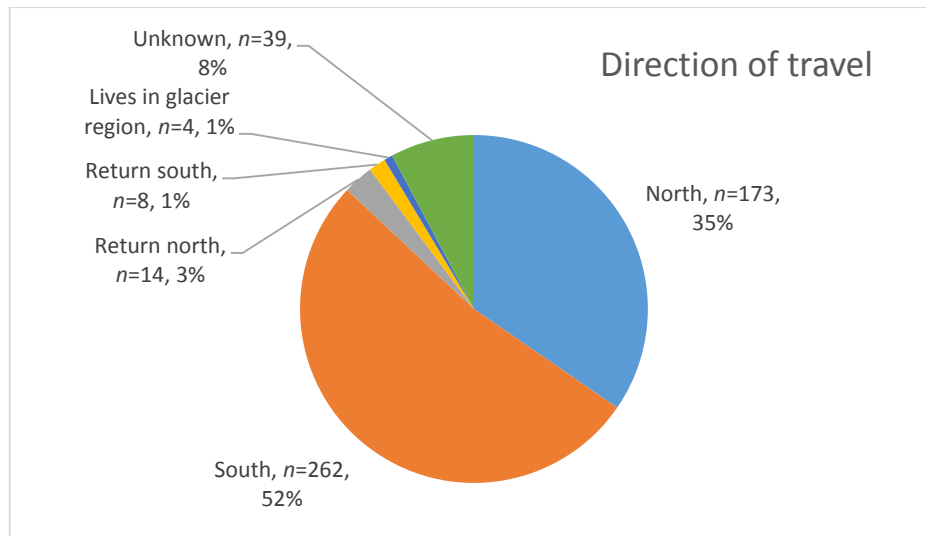


Figure 16 Direction of travel (n=500)

The popularity of Franz Josef over Fox Glacier (shown by the location of stay data in Figure 14 and 15) reflects the larger number of accommodation options available in Franz Josef village; the larger percentage of tourists travelling in a southerly direction (Figure 16) probably also impacts on this as Franz Josef is the first glacier village encountered.

3.2.4 Time in glacier region

This question was designed to capture data on the amount of time respondents were spending in the glacier region. It became obvious during the first few surveys that the original categories devised for length of stay did not fully capture the actual time visitors had spent in the region and Q4 was asked in two parts to establish:

- the number of nights spent in the glacier region.
- the length of visit time (\approx daylight hours) spent in the region.

Nights spent in the glacier region

Of the 492 respondents who answered this question, the majority stayed either one (39.6%) or two nights (42.5%) in the glacier region; a further 8.7 per cent ($n=43$) stayed three nights and 7.7 per cent ($n=38$) did not stay overnight in the glacier region (Figure 17). Surveyors did not collect this data from four respondents; four others lived in the glacier region and so the question was not relevant. All respondents did, however, provide details of their length of visit time at the glaciers.

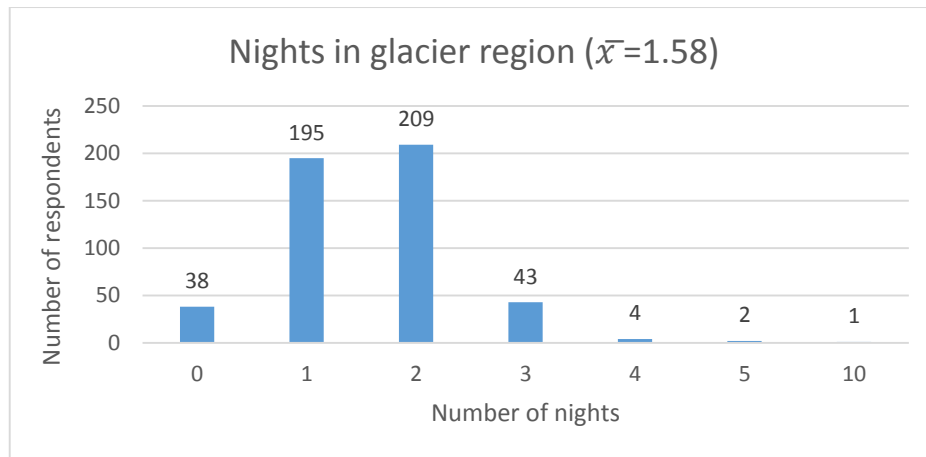


Figure 17 Nights in glacier region (n=492)

Length of visit time

Four 'length of visit time' categories were used to record how long respondents spent at the glaciers – this essentially equated to daylight hours spent on their visit. To ensure data accuracy, these data were verbally cross-checked with what respondents reported in relation to their previous and current night location of stay. A variety of length of visit scenarios were possible. For example, if a respondent had stayed the previous night in Franz Josef, and planned to stay that night in Haast, they were also asked at what time they had arrived in Franz Josef the previous day. Depending on their response to this question, they could have been staying less than 4 hours, a half day or a full day at the glaciers. Likewise, if a respondent had stayed two nights in the glacier region, his or her glacier visit may have lasted for either one full day or more than one day.

As Figure 18 shows, the most common length of stay was a full day (39%, n=193) followed by more than one day (34%, n=172); together these two length of stay categories accounted for almost three quarters of respondents (73%, n=365). Of the remainder, the majority were staying at least half a day (22%, n=110) while only five per cent (n=24) were staying less than four hours. One respondent was unsure how long they were staying in the region.

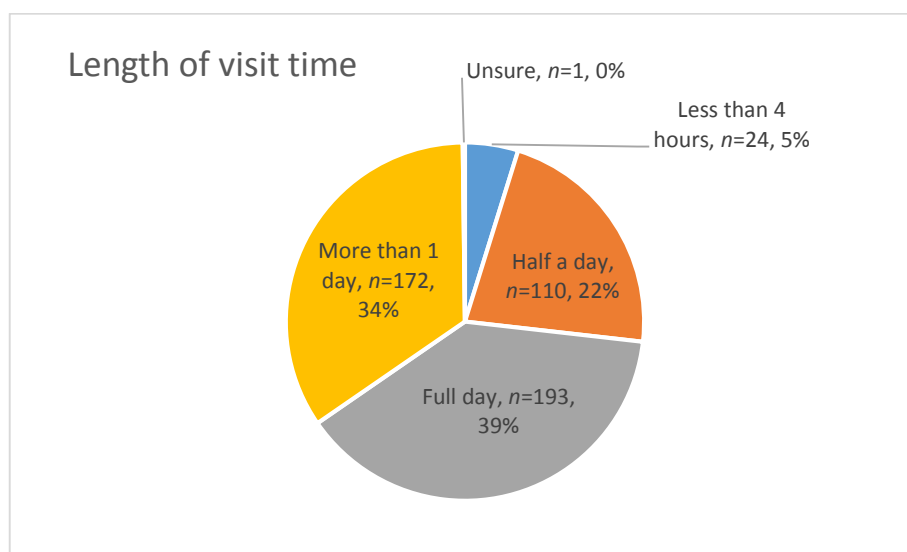


Figure 18 Length of visit time (n=500)

Figure 19 shows length of visit time by direction of travel for those who knew how long they were staying and the four travel directions reported. Those staying less than four hours were much more likely to be travelling north, whereas those staying either half a day or more than one day were more likely to be travelling south. There was a more even split in travel direction for those staying one full day. As might be expected those staying less than four hours were also more likely to be returning either north or south (with a return north almost three times as common as a return south).

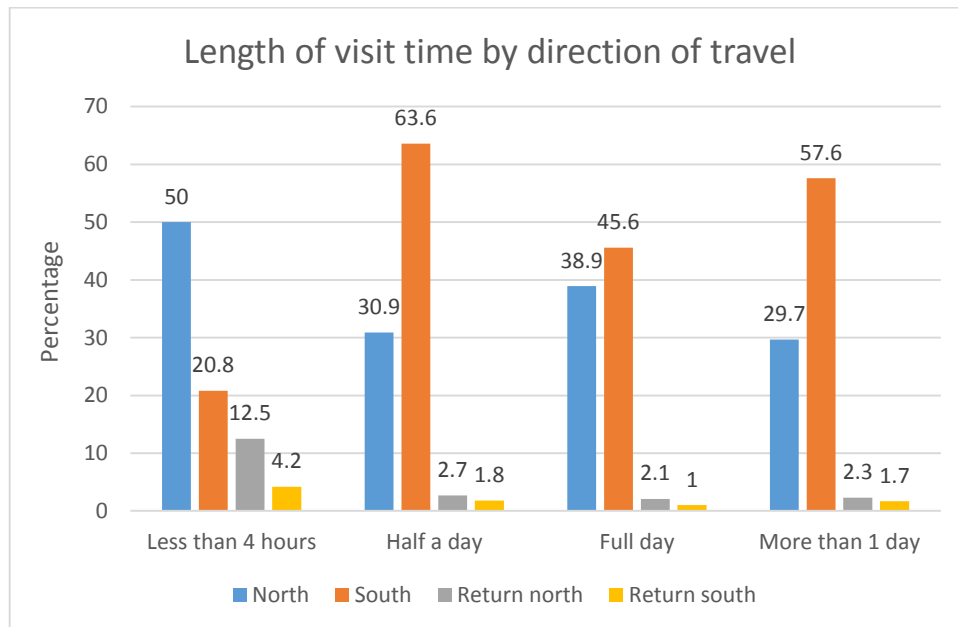


Figure 19 Length of visit time by direction of travel (n=499)

At the time of the research, visitors' travel plans had to accommodate the overnight closure of the Haast Pass road (as a result of a large landslide that occurred in November 2013). The road was closed between 6pm and 7am each night which meant that those visitors coming from either Wanaka or Queenstown either arrived in the glacier region quite late in the day or, if driving south to Wanaka or Queenstown, had to depart by early afternoon.

3.2.5 Visit details

Altogether, half of all respondents (n=250) reported that they had either visited, or intended to visit, both glaciers while in the glacier region; the number reporting either visiting or intending to visit only one of the glaciers was almost identical and a very small percentage of respondents reported being undecided (Figure 20). Almost half of the sample surveyed by Espiner and Weiss (2010) reported having visited both glaciers.

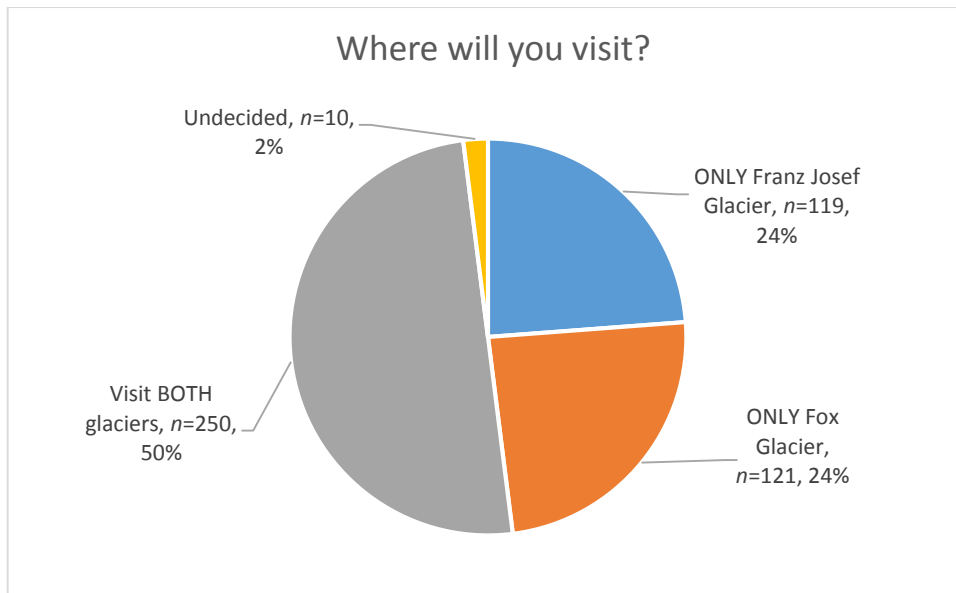


Figure 20 Glacier visits (n=500)

These data more likely reflect the sampling methodology of the survey than provide evidence of the relative popularity of either glacier.

3.2.6 Reason for visiting the glacier region

This open-ended question simply asked respondents why they had come to the glacier region, and some respondents gave multiple reasons (n=580). These were coded according to eight overarching categories (Figure 21). The category labelled 'glacier-specific' was the only one in which the word glacier/s was specifically noted; the glaciers were, however, a central theme across a number of the other categories.

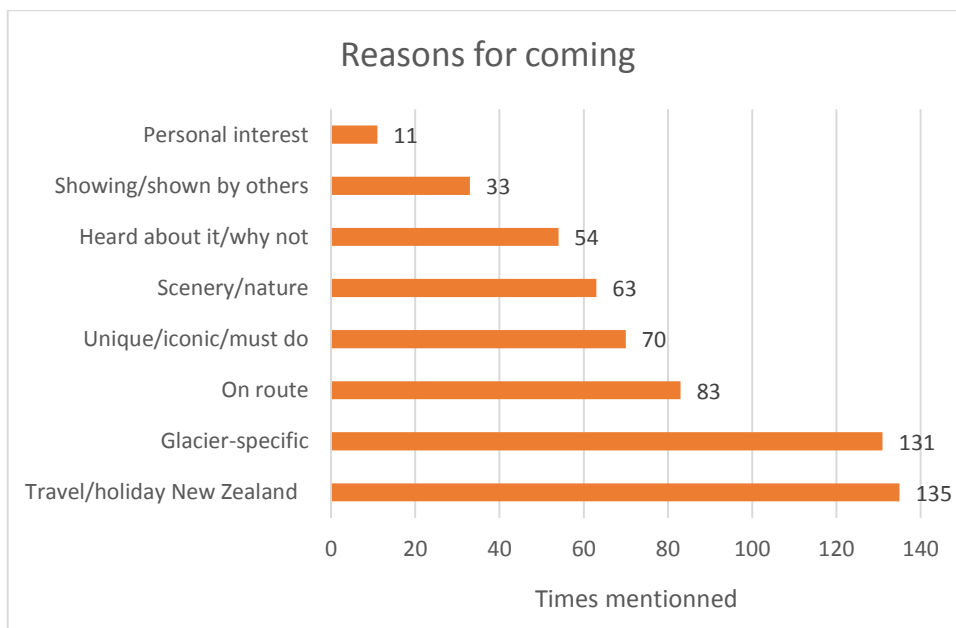


Figure 21 Reasons for coming to glacier region (n=580)

The most common set of reasons given ($n=135$) referred to generic 'travel around New Zealand' or being 'on holiday in New Zealand' with no mention of the glaciers as a specific draw card. Other phrases used including 'seeing New Zealand', 'having a look', 'sightseeing' and 'summer holidays'. Glacier-specific reasons were reported 131 times with the majority (54.2%, $n=71$) simply stating that they wanted to 'see the glacier/s'. Table 3 shows the full range of glacier reasons given, and the number of times each was reported.

Table 3 Glacier-specific reasons given for visiting ($n=131$)

Reason given	Times
Generic e.g., 'See it' or simply 'glacier'	71
Wanting to do a glacier activity e.g., 'walking on ice', 'heli-hike'	19
Never seen a glacier before	17
Interested in glaciers/like glaciers/love glaciers	9
Wanted to see a specific glacier/compare glaciers/see unique glacier	7
Seeing glaciers before they are gone/see glaciers under threat	5
Seeing easily accessible glacier/s	3

A third category of reasons for visiting ($n=83$) related to the glaciers' location on the respondents' touring route (these differed from the more generic holiday travel comments in that they made specific reference to the glaciers being 'on route' or included as part of the tour route they were following).

A further 70 reasons given for visiting related to the glacier region being a travel destination within New Zealand that was unique, iconic or 'must do'. The comments reported most probably do relate to the glaciers, although none specifically mentioned the glaciers: these included seeing 'a major natural sight', 'could not come to New Zealand without seeing it', the glacier region being an 'iconic place to visit' and wanting to 'see as much of New Zealand as possible'.

The next most common category of reasons for visiting ($n=63$) included all those people who made generic statements about liking mountains, scenery, beautiful places, and so on. The 'heard about it/why not' category ($n=54$) included comments about having 'read about it', 'heard about it', 'have seen pictures', and 'heard it was good' although, again, none specifically mentioned the glaciers. Six respondents merely stated 'why not' when asked why they had come to the region. Showing and being shown by others ($n=33$) includes having been brought by others, bringing family, showing friends, and so on.

The final category of reasons includes all those respondents who expressed a personal interest in the region ($n=11$): these included being interested in geography, geology and ecology; having enjoyed visiting on a previous occasion; several respondents reported personal work-related reasons for visiting.

3.2.7 Experiencing the glaciers

Respondents were shown a set of illustrations depicting different ways in which visitors experience the glaciers and were talked through what they had done (or what they intended to do) with respect to their current glacier visit. The survey form used by the surveyors included a table with the different glacier activity options available which were then checked off. Multiple answers were possible (Figure 22).



**Photograph 7 Visitors walking in Franz Josef Glacier valley
(Photo Credit: Jude Wilson)**

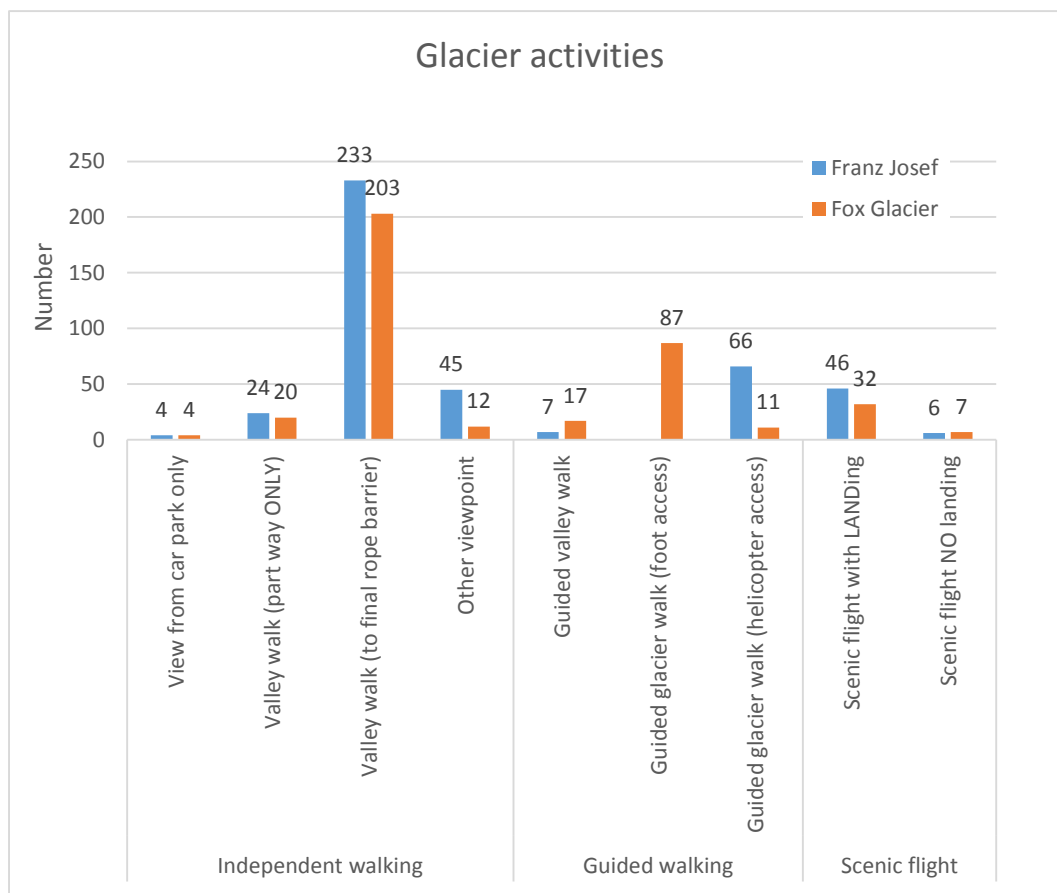


Figure 22 Glacier activities (n=500), multiple responses possible

Walking up the glacier valleys as far as the final barrier was the most common glacier activity reported with 233 people doing this at Franz Josef Glacier (see Photograph 7) and 203 at Fox Glacier. Altogether, 118 respondents walked up both valleys (to the final barrier) while 115 walked only the Franz Josef valley and 85 walked only the Fox Glacier valley.

Altogether, 24 respondents had done a guided walk in the two glacier valleys, while 87 had done a guided glacier hike with foot access (only possible at Fox Glacier) and 77 had participated in a guided glacier hike with helicopter access (both glaciers). Of the 66 respondents who had done a guided glacier walk (helicopter access) at Franz Josef, ten had also walked to the final rope barrier in the Franz Josef valley and 16 had also walked to the final rope barrier at in the Fox Glacier valley.

Of the 87 respondents who had joined a glacier hike on the Fox Glacier (foot access only, Photograph 8), three had also walked independently to the final rope barrier in the Fox Glacier valley and 21 walked to the final rope barrier in the Franz Josef valley. Ninety-one respondents had done a scenic flight at the glaciers, 85.7 per cent ($n=78$) of which included a snow landing (Photograph 9).



**Photograph 8 Tourists on a guided walk on Fox Glacier
(Photo Credit: Fox Glacier Guides)**

While multiple responses to this question were possible, two categories of activity were created: flight/non-flight and commercial/non-commercial. These two categories were used in subsequent analyses.

Altogether, a third of all respondents (33.2%, $n=166$) did at least one glacier activity involving a flight (includes all guided glacier hikes at Franz Josef, Fox Glacier heli-hikes and all scenic flights). Two respondents reported doing two flight activities. Of those who took a flight, 90.4 per cent were first time visitors and just under half (47.6%) were aged 20-39 years; 36.6 per cent of international visitors had taken a flight, compared with only 14.3 per cent of the New Zealand residents. Of the international visitors, those from Asia were more likely to take a flight (e.g., 63.2% of Asians took a flight compared to 42.6% of Australians, 36.4% of Germans and 35.8% of those from the UK).

Altogether, just over half of all respondents (51.8%, $n=259$) had participated in a commercial glacier activity of some kind. This included guided walks in the glacier valleys, guided walks and heli-hikes onto the glaciers, and scenic flights. The majority (92.3%, $n=239$) of respondents participating in commercial activities were international visitors, although there was considerable variation in participation by country of residence (Figure 23). The majority of respondents (90.3%, $n=234$) participating in commercial activities were first time visitors. Commercial activities were more popular with younger respondents; almost three quarters of those aged 19 or under (72.7%) participated, compared to only 47.1 per cent of those aged 60 or over.

Over half (55.6%, $n=144$) of those who had done at least one commercial activity also visited either one or both of the glacier valleys independently, with the majority walking to the final rope barrier ($n=72$ at Franz Josef, $n=51$ at Fox Glacier).

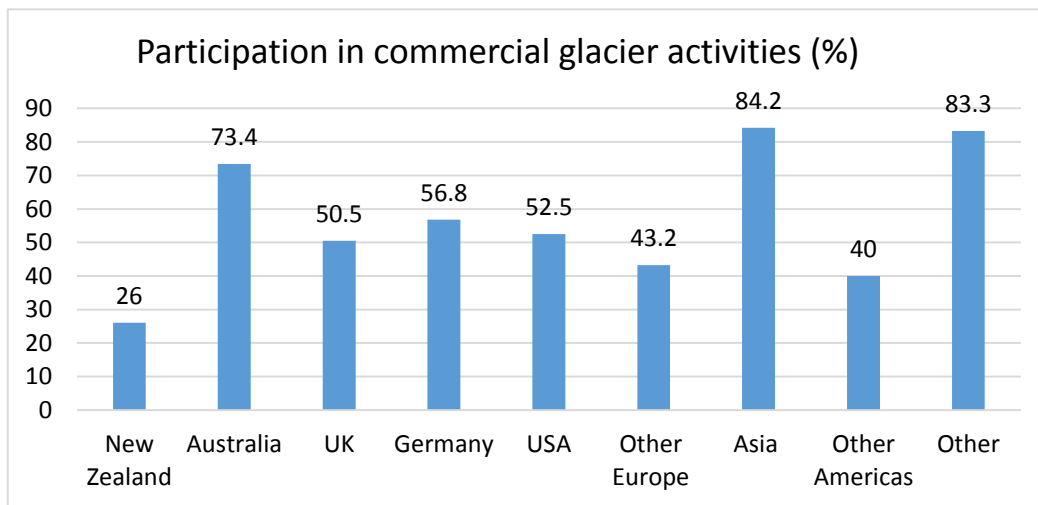


Figure 23 Participation in commercial glacier activities by country of residence ($n=259$)



**Photograph 9 Scenic flight with snow landing
(Photo Credit: Jude Wilson)**

3.2.8 Other activities in the glacier region

Respondents were asked to indicate (from a list shown) which other glacier region activities they had done or intended doing. Multiple answers were possible. Altogether 354 respondents (70.8%) indicated that they had done or intended to do at least one other activity; 146 respondents (29.2%) reported doing none of these activities. Figure 24 shows that the most popular non-glacier activities were a visit to Lake Matheson (33.8%, $n=169$, Photograph 10) followed by the hot pools (31.4%, $n=157$) and other bush walks (23%, $n=115$).

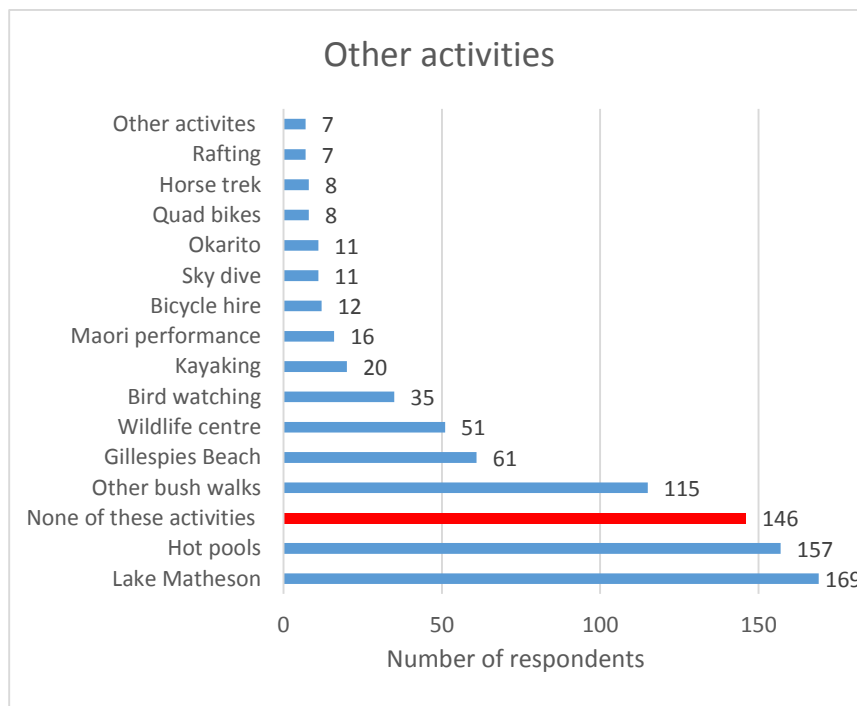


Figure 24 Other activities in the glacier region ($n=500$)

There is a possibility that some respondents reported both Lake Matheson and 'other nature walks' as separate activities when these were actually the same activity. The popularity of the hot pools is likely to be related to its inclusion as part of the guided glacier hike products in Franz Josef. Two-thirds (66.7%, $n=44$) of those who did a guided glacier walk on the Franz Josef glacier also visited the hot pools.

Other popular activities included visits to Gillespies Beach (12.2%, $n=61$) and the wildlife centre (10.2%, $n=51$) and bird watching (7%, $n=35$). There is also a possibility that participation in activities such as rafting and horse trekking were over reported (i.e., by respondents who had done these activities in other parts of New Zealand, rather than in the glacier region).

Hunting was the only activity option listed that was not reported by any respondents. In the original activity list shown to respondents Okarito was not specifically identified; during data entry all those who reported visiting Okarito ($n=11$) as an 'other activity' were coded as such. The six remaining 'other' activities reported included four people who fished, one who visited the Aoraki/Mt Cook lookout point and one who reported shopping as an activity.



**Photograph 10 Lake Matheson: The most popular non-glacier activity
(Photo Credit: Jude Wilson)**

3.2.9 Most memorable aspect of visit

Altogether, the 500 respondents identified 569 'most memorable' things from their visit. These were coded into two broad categories, relating to whether or not they related to glacier-specific or non-glacier visit aspects, with each broad category then further coded to represent sub-categories (Figure 25).

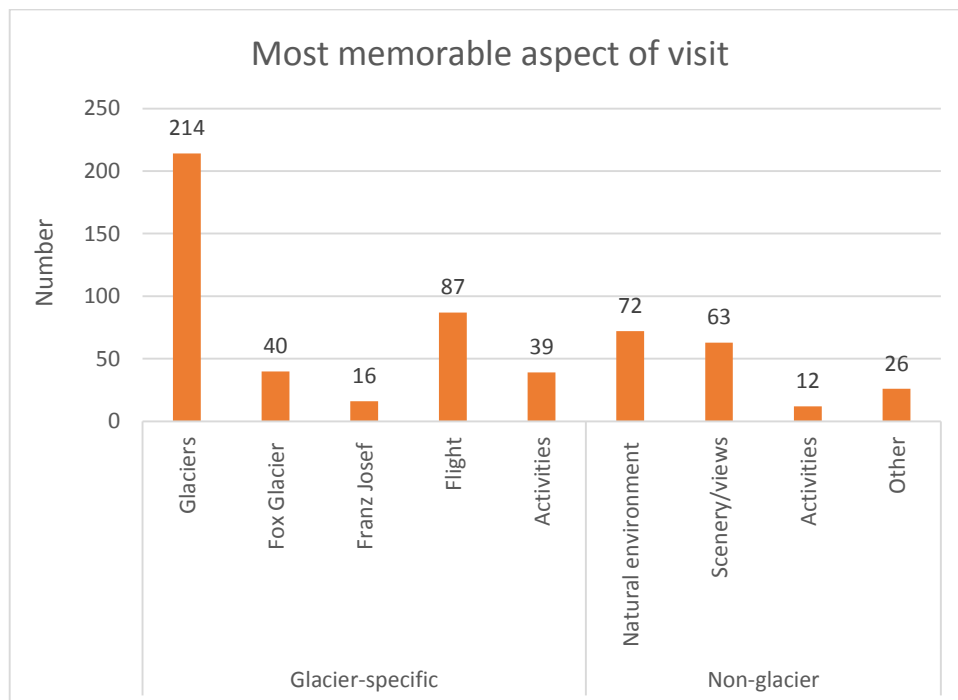


Figure 25 Most memorable aspect of visit (n=569)

Of the 569 memorable aspects reported, 396 (69.6%) related specifically to the glaciers:

- The largest category of these comments ($n=214$, 54% of all the glacier-specific comments) were generic, with many respondents simply reporting the '*glacier*', '*the top*', '*the ice*', or '*walking on the glacier*' as being the most memorable aspect of their visit;
- The Fox Glacier was specifically mentioned 40 times; the Franz Josef Glacier was specifically mentioned 16 times;
- The 'Flight' category includes memorable aspects of the glacier experience in which flight activities were reported. These included '*landing on the glacier*', the '*helicopter flight*', the '*heli-hike*', and so on;
- The fourth glacier-specific category included all those who reported other activities (i.e., non-flight ones) associated with the glacier as the most memorable aspects of their visit. The most common of these was enjoyment with the walk up to the glacier, variously reported as '*the valley walk*', '*this hike*', '*the walk today*', and so on.

The other 173 memorable aspects reported (30.4%) were non-glacier related (i.e., the glacier was not specifically mentioned by these respondents, and the memorable aspects reported did not focus on the glacier/s):

- 'Natural environment' aspects reported ($n=72$, 41.6% of all non-glacier comments) includes other features of the natural environment such as waterfalls (see Photograph 11), rocks, rivers;
- The 'Scenery/views' category included 63 more generic and bigger picture comments about the '*scenery*', '*nature*', '*the views*', '*the mountains*', and so on;
- The 'Activities' category included 12 most memorable visit aspects that were not associated in any way with the glacier or glacier valley experience such as, for example, the hot pools (see Photograph 12), kayaking and other bush walks;
- The final 'Other' category represented 26 comments in which respondents reported liking '*everything*', or reported something memorable about the weather or some part of their social experience at the glaciers (e.g., being with family).



**Photograph 11 Visitors enjoying Trident falls whilst walking up Franz Josef Glacier valley
(Photo Credit: Jude Wilson)**



Photograph 12 Hot pools Franz Josef village
(Photo Credit: Jude Wilson)

3.2.10 Importance of seeing the glacier

Almost two thirds of all respondents (61.6%, $n=308$) reported that seeing the glacier was a very important part of their decision to visit the glacier region (Figure 26).

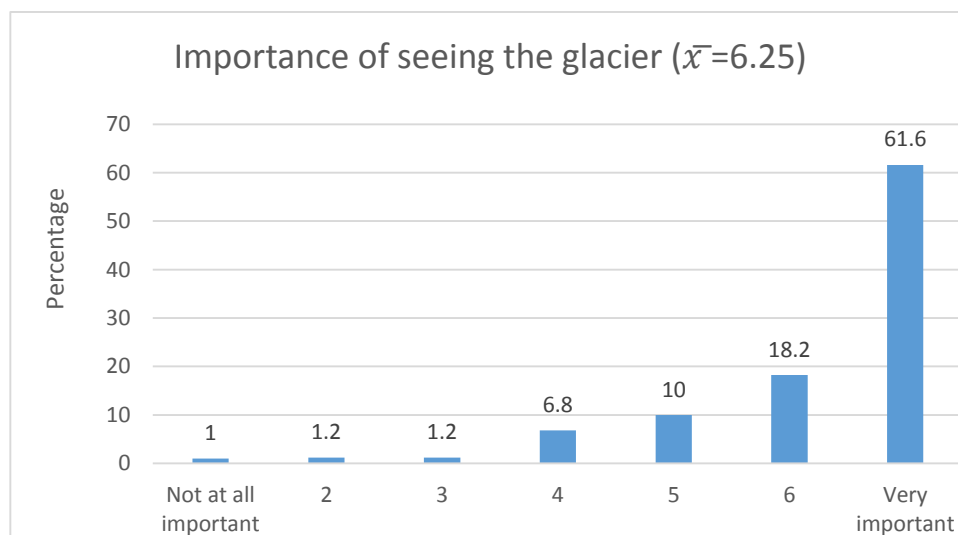


Figure 26 Importance of seeing the glacier (n=500)

Overall, only 51 respondents (10.2%) scored '4' or lower on the importance scale (indicating that they were either neutral, or that the seeing the glacier was not important to them). Cross-tabulation analysis of these respondents with the age, country of residence and first or repeat visit variables showed that:

- Older visitors were more likely to report that seeing the glacier was 'not important' (13.3% of those aged 60-69 years and 38.9% of those aged 70-79 years reported that seeing the glacier was not important to them);
- New Zealand visitors were more likely to report that seeing the glaciers was 'not important' to them (14.3% reported this compared to only 9.5% of the international visitors surveyed);
- When looked at by individual countries and regions of origin, seeing the glaciers was slightly more likely to be reported as 'not important' by visitors from the USA (16.9%), Other Europe (16%) and Germany (13.6%). One third of visitors from 'Other' countries also reported that seeing the glaciers was not important, but this only represented two respondents;
- By contrast, all the visitors surveyed from Asia, 96.8 per cent of Australian visitors, 96 per cent of visitors from Other Americas, and 94.7 per cent of UK visitors reported that seeing the glaciers was important;
- Those who were neutral or not interested in seeing the glacier were slightly more likely to be repeat visitors (12.7% of repeat visitors reported seeing the glacier as not important compared to 9.7% of first time visitors).

3.2.11 Possible reasons for visiting the glacier region

Respondents were shown a list of 12 possible reasons for visiting the glacier region and asked to indicate the importance of each one in respect of their own decision to visit. Importance was measured on a Likert-type scale (1=not important at all; 7=very important) and the mean scores calculated for each item. The items (reasons) scoring the three highest and three lowest mean scores are shown in Table 4; for ease of comprehension, the individual graphs showing the percentage distribution of scoring for each item are shown contiguously (Figure 27) and discussed further below.

Table 4 Reasons for visiting – 3 highest and 3 lowest mean scores

Reason for visiting	Mean
To see a natural feature that may disappear in the future	6.01
To be close to nature	5.71
To view an easily accessible glacier	5.61
To experience a rainforest	4.34
To be with friends and family	4.16
To experience solitude	3.94

Wishing 'to see a natural feature that may disappear in the future' had the highest mean score and almost half of all respondents (48.8%, $n=244$) reported that this was a very important reason for visiting; 87 per cent ($n=435$) of all respondents reported that this was important (i.e., scored this item above '4') (see graph in Figure 27). Cross tabulation of the importance of this item by age, country of residence and first or repeat visit variables showed no statistical relationships between these variables and only minimal differences between respondents.

Wishing 'to view an easily accessible glacier' was the only other glacier item to have a mean score in the top three. Altogether, 79.4 per cent of respondents ($n=397$) reported that this was an important reason for visiting, and just over a third (36.2%, $n=181$) indicated that it was very important. While there were no statistical differences when analysed by age, country of residence and first or repeat visit, cross tabulation showed that this reason was:

- Slightly more likely to be important for first time visitors (important for 79.9%) and slightly less likely to be important for repeat visitors (Important for 77.2%);

- Slightly more important for New Zealand visitors (important for 83.1%) than for international visitors (important for 78.7%);
- Less important for visitors from Germany (59.1% reported this item as important) and Other Europe (59.3%).

Of the glacier-specific reasons given for visiting in the open-ended responses to Question 6, however, 'seeing a glacier before it was gone' was only mentioned five times, and 'seeing an easily accessible glacier' only mentioned three times.



**Photograph 13 'Seeing a natural feature that may disappear in the future': Franz Josef Glacier from Sentinel Rock viewpoint
(Photo Credit: Jude Wilson)**



**Photograph 14 'Viewing an easily accessible glacier': Public viewpoint at Fox Glacier
(Photo Credit: Jude Wilson)**

Figure 27 Graphs showing scale distribution (%) for each reason item (n=500)

Reason for visiting	Thinking about your decision to come here how important was each of these? (%)																
To be close to nature $\bar{x}=5.71$	<table border="1"> <thead> <tr> <th>Scale</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>2</td></tr> <tr><td>3</td><td>3.2</td></tr> <tr><td>4</td><td>9.6</td></tr> <tr><td>5</td><td>23.4</td></tr> <tr><td>6</td><td>24.8</td></tr> <tr><td>7</td><td>36</td></tr> </tbody> </table>	Scale	Percentage (%)	1	1	2	2	3	3.2	4	9.6	5	23.4	6	24.8	7	36
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To experience natural quiet $\bar{x}=4.76$	<table border="1"> <thead> <tr> <th>Scale</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>4.4</td></tr> <tr><td>2</td><td>8</td></tr> <tr><td>3</td><td>9.4</td></tr> <tr><td>4</td><td>18.2</td></tr> <tr><td>5</td><td>23.2</td></tr> <tr><td>6</td><td>19</td></tr> <tr><td>7</td><td>17.8</td></tr> </tbody> </table>	Scale	Percentage (%)	1	4.4	2	8	3	9.4	4	18.2	5	23.2	6	19	7	17.8
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To experience a sense of discovery $\bar{x}=5.42$	<table border="1"> <thead> <tr> <th>Scale</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>1.4</td></tr> <tr><td>2</td><td>2</td></tr> <tr><td>3</td><td>7</td></tr> <tr><td>4</td><td>14</td></tr> <tr><td>5</td><td>21.8</td></tr> <tr><td>6</td><td>25.6</td></tr> <tr><td>7</td><td>28.2</td></tr> </tbody> </table>	Scale	Percentage (%)	1	1.4	2	2	3	7	4	14	5	21.8	6	25.6	7	28.2
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Reason for visiting	Thinking about your decision to come here how important was each of these? (%)																
<p>To have a story to tell</p> <p>$\bar{x}=4.79$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>5.8</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>3</td> <td>11.4</td> </tr> <tr> <td>4</td> <td>15.4</td> </tr> <tr> <td>5</td> <td>22</td> </tr> <tr> <td>6</td> <td>20.2</td> </tr> <tr> <td>7 (Very important)</td> <td>19.2</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	5.8	2	6	3	11.4	4	15.4	5	22	6	20.2	7 (Very important)	19.2
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<p>To be with friends and family</p> <p>$\bar{x}=4.16$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>26</td> </tr> <tr> <td>2</td> <td>6.4</td> </tr> <tr> <td>3</td> <td>5.2</td> </tr> <tr> <td>4</td> <td>10.6</td> </tr> <tr> <td>5</td> <td>14.6</td> </tr> <tr> <td>6</td> <td>14.6</td> </tr> <tr> <td>7 (Very important)</td> <td>22.6</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	26	2	6.4	3	5.2	4	10.6	5	14.6	6	14.6	7 (Very important)	22.6
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<p>To see a natural feature that may disappear in the future</p> <p>$\bar{x}=6.01$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>1.4</td> </tr> <tr> <td>2</td> <td>2.4</td> </tr> <tr> <td>3</td> <td>1.2</td> </tr> <tr> <td>4</td> <td>8</td> </tr> <tr> <td>5</td> <td>12</td> </tr> <tr> <td>6</td> <td>26.2</td> </tr> <tr> <td>7 (Very important)</td> <td>48.8</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	1.4	2	2.4	3	1.2	4	8	5	12	6	26.2	7 (Very important)	48.8
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<p>To experience places I have read about</p> <p>$\bar{x}=5.38$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>3.2</td> </tr> <tr> <td>2</td> <td>5.4</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>12.4</td> </tr> <tr> <td>5</td> <td>18.8</td> </tr> <tr> <td>6</td> <td>25.4</td> </tr> <tr> <td>7 (Very important)</td> <td>30.8</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	3.2	2	5.4	3	4	4	12.4	5	18.8	6	25.4	7 (Very important)	30.8
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Reason for visiting	Thinking about your decision to come here how important was each of these? (%)																
<p>To learn about glaciers</p> <p>$\bar{x}=4.71$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>4.6</td> </tr> <tr> <td>2</td> <td>7.4</td> </tr> <tr> <td>3</td> <td>12</td> </tr> <tr> <td>4</td> <td>17.8</td> </tr> <tr> <td>5</td> <td>22.8</td> </tr> <tr> <td>6</td> <td>17.2</td> </tr> <tr> <td>7 (Very important)</td> <td>18.2</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	4.6	2	7.4	3	12	4	17.8	5	22.8	6	17.2	7 (Very important)	18.2
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7 (Very important)	18.2																
<p>To learn about the impacts of climate change on glaciers</p> <p>$\bar{x}=4.72$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>6</td> </tr> <tr> <td>2</td> <td>6.2</td> </tr> <tr> <td>3</td> <td>11</td> </tr> <tr> <td>4</td> <td>18.8</td> </tr> <tr> <td>5</td> <td>21</td> </tr> <tr> <td>6</td> <td>18.4</td> </tr> <tr> <td>7 (Very important)</td> <td>18.6</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	6	2	6.2	3	11	4	18.8	5	21	6	18.4	7 (Very important)	18.6
Importance Rating	Percentage (%)																
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5	21																
6	18.4																
7 (Very important)	18.6																
<p>To view an easily accessible glacier</p> <p>$\bar{x}=5.61$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>3</td> </tr> <tr> <td>2</td> <td>3</td> </tr> <tr> <td>3</td> <td>4.6</td> </tr> <tr> <td>4</td> <td>10</td> </tr> <tr> <td>5</td> <td>14.8</td> </tr> <tr> <td>6</td> <td>28.4</td> </tr> <tr> <td>7 (Very important)</td> <td>36.2</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	3	2	3	3	4.6	4	10	5	14.8	6	28.4	7 (Very important)	36.2
Importance Rating	Percentage (%)																
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7 (Very important)	36.2																
<p>To experience a rainforest</p> <p>$\bar{x}=4.34$</p>	<table border="1"> <thead> <tr> <th>Importance Rating</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>1 (Not at all important)</td> <td>11.6</td> </tr> <tr> <td>2</td> <td>10</td> </tr> <tr> <td>3</td> <td>11.2</td> </tr> <tr> <td>4</td> <td>15.8</td> </tr> <tr> <td>5</td> <td>18.8</td> </tr> <tr> <td>6</td> <td>16.2</td> </tr> <tr> <td>7 (Very important)</td> <td>16.4</td> </tr> </tbody> </table>	Importance Rating	Percentage (%)	1 (Not at all important)	11.6	2	10	3	11.2	4	15.8	5	18.8	6	16.2	7 (Very important)	16.4
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1 (Not at all important)	11.6																
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3	11.2																
4	15.8																
5	18.8																
6	16.2																
7 (Very important)	16.4																

The individual graphs for each reason for visiting item in Figure 27 show that 'to be with friends and family' had a bi-modal distribution whilst the other two items of the three lowest scoring items had more evenly distributed scores. The two other glacier items ('to learn about glaciers' and 'to learn about the impacts of climate change on glaciers') had similar mean scores (4.71 and 4.72, respectively) and very similar scoring distribution.

3.2.12 Expectation of, and satisfaction with, the glacier experience

Using a 7-point Likert-type scale, respondents were asked to indicate their expectations and satisfaction with three aspects of the glacier experience: the glacier size; the appearance of the ice; and how spectacular the glacier was overall. A 'don't know' option was possible in respect of each expectation question (*n*=the number of respondents who indicated a 1-7 score on the Likert-type scale). The selection of these glacier aspects was based on data collected via open-ended questions in two visitor surveys undertaken at the glaciers over the summer of 2012/13 (Espiner & Wilson, 2013a and 2013b). In these earlier surveys, when asked to identify the most and least liked aspects of their glacier visit, many respondents indicated some dissatisfaction with the size of the glaciers (i.e., smaller than expected), the colour and cleanliness of the ice (i.e., duller/dirtier than expected) and the overall experience of seeing the glaciers (i.e., less spectacular than expected).

Figure 28 shows the mean scores for the three glacier experience factors tested. The expectation scores of around 4 suggests that the glacier came close to matching expectations, while the satisfaction scores of over 5 indicate a positive experience. Individually, the overall appearance of the glacier had the lowest expectation score (i.e., respondents expected it to be marginally less spectacular than it was) and the highest satisfaction score. Expectation scores were very similar in respect of the look of the ice and the size of the glacier (with respondents expecting the ice to be a little cleaner and the glacier to be little bigger than it was). Satisfaction was lowest for the size of the glacier.

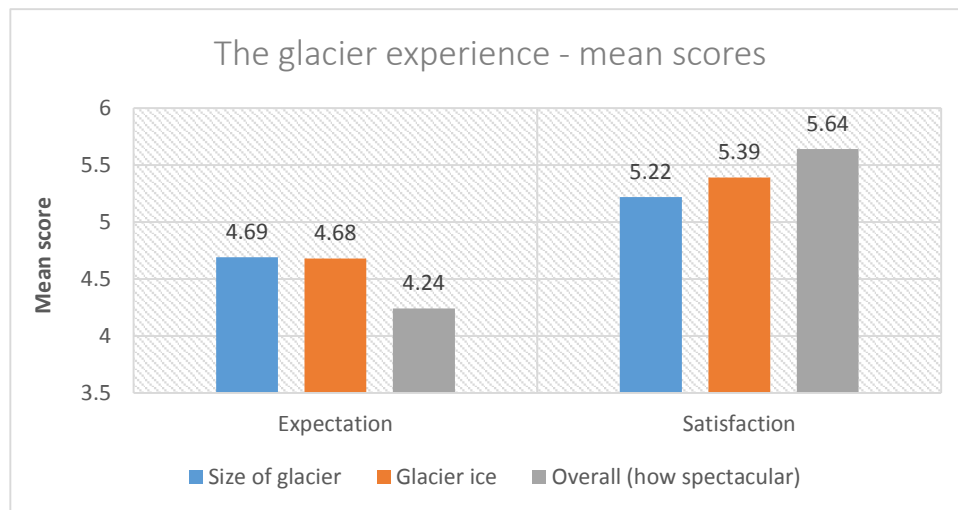


Figure 28 The glacier experience – mean scores

Size of the glacier

Half (50.1%, $n=226$) of respondents indicated that the glacier was not as big as they expected (i.e., they recorded a score above the centre point of '4' on the scale), 39.5 per cent ($n=178$) indicated it was the size they expected and the remainder (10.5%, $n=47$) expected it to be smaller than what they encountered (Figure 29). Forty-nine respondents reported that they had no expectations with respect to the size of the glacier.

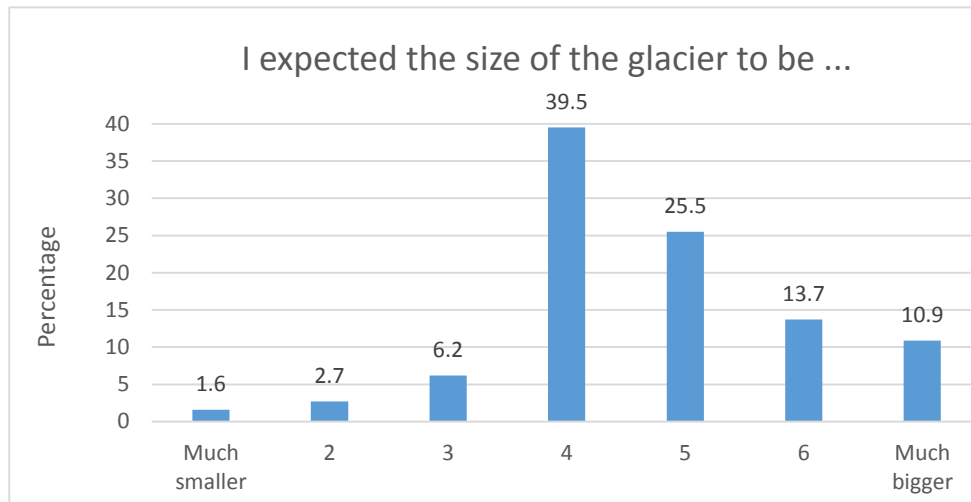


Figure 29 Expectation of the glacier size ($n=451$)

Despite the expectation of a larger glacier reported above, satisfaction was still high and 140 respondents (28%) reported being very satisfied with the size of the glacier (Figure 30). Altogether, two-thirds of respondents (66%, $n=330$) scored satisfaction above the central point of the scale. Only 62 respondents (12.4%) reported being dissatisfied with the size of the glacier.

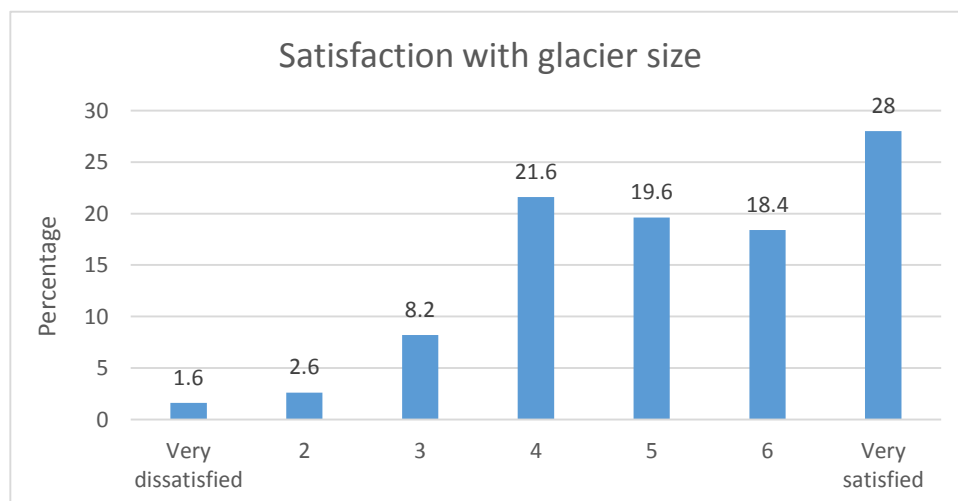


Figure 30 Satisfaction with glacier size ($n=500$)

Glacier ice

Almost half of all respondents reported that the glacier ice was how they expected it would be (47.4%, $n=223$), while 44.7 percent ($n=210$) expected that the ice would be cleaner and 7.9 per cent ($n=37$) thought it would be dirtier (Figure 31). Thirty respondents reported that they did not know what the ice would be like.

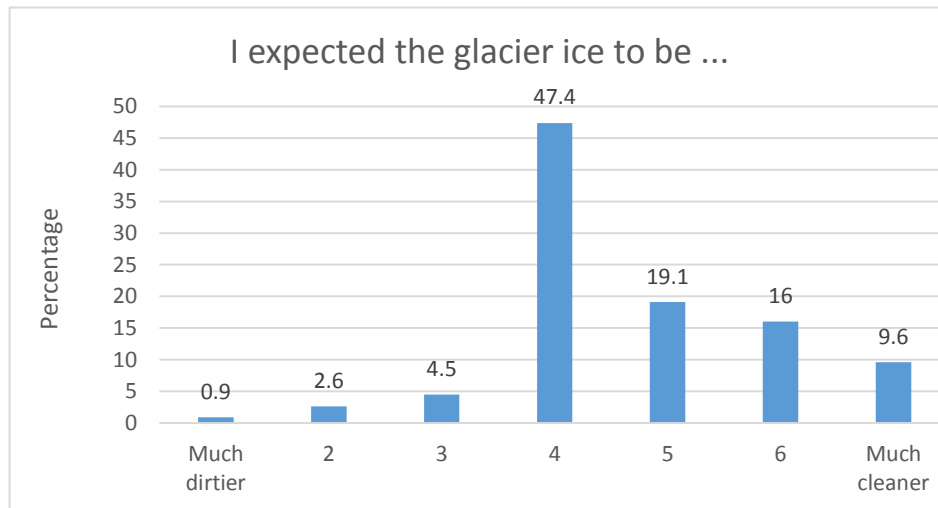


Figure 31 Expectation of the glacier ice ($n=470$)

Almost a third of respondents (31.6%, $n=158$) were very satisfied with the visual appearance of the glacier ice and altogether, 69.8 per cent of respondents ($n=349$) scored satisfaction above the centre point of the scale. Only 43 respondents (8.6%) reported being dissatisfied with the appearance of the ice (Figure 32).

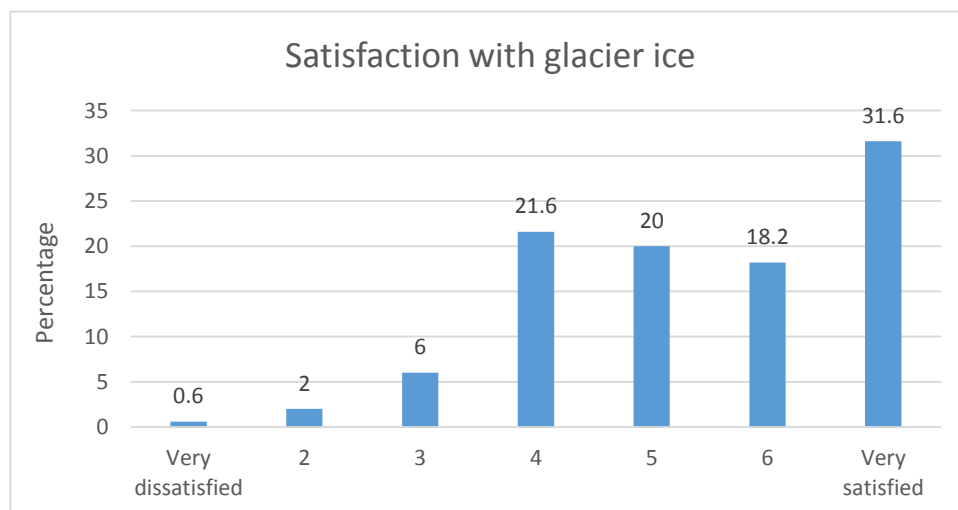


Figure 32 Satisfaction with glacier ice ($n=500$)

The glacier overall

Just under half of all respondents (46.5%, $n=220$) reported that the overall look of the glacier was as spectacular as they expected, 35 per cent ($n=166$) expected it to be more spectacular and 18.4 per cent ($n=87$) expected it to be less spectacular (Figure 33). Twenty-seven respondents did not know what to expect.

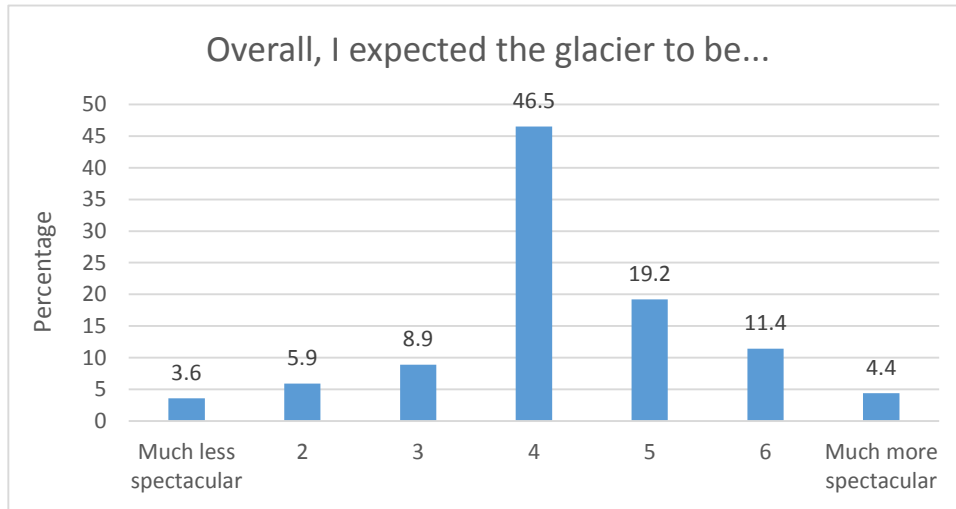


Figure 33 Overall glacier expectation ($n=473$)

Satisfaction with the overall glacier experience was high with 36 per cent ($n=180$) reporting that they were very satisfied with how spectacular the glacier was overall (Figure 34). Altogether 78.6 per cent of respondents ($n=393$) scored satisfaction above the centre point of the scale. Only 28 respondents (5.6%) reported being dissatisfied.

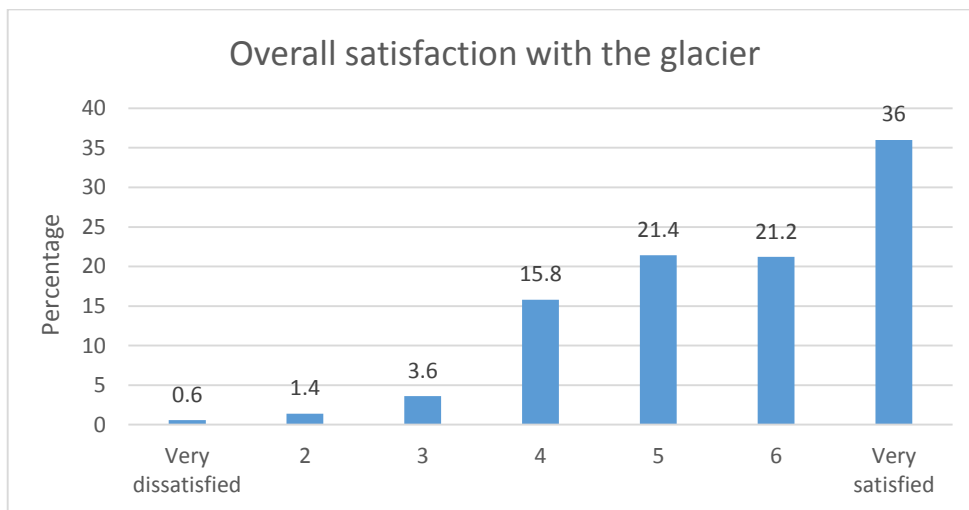


Figure 34 Satisfaction with the glacier overall ($n=500$)

Relationship between expectation and satisfaction

For all three measures, a comparison of mean scores for three expectation scenarios (expected worse, as expected, expected better) and three satisfaction scenarios (satisfied, neutral, and dissatisfied) returned statistically significant results. As Figure 35 shows, satisfaction was highest for those who had expected a smaller glacier¹, dirtier ice² or a less spectacular glacier³. Satisfaction was lowest for those who had expected a bigger glacier, cleaner ice, or a more spectacular glacier.

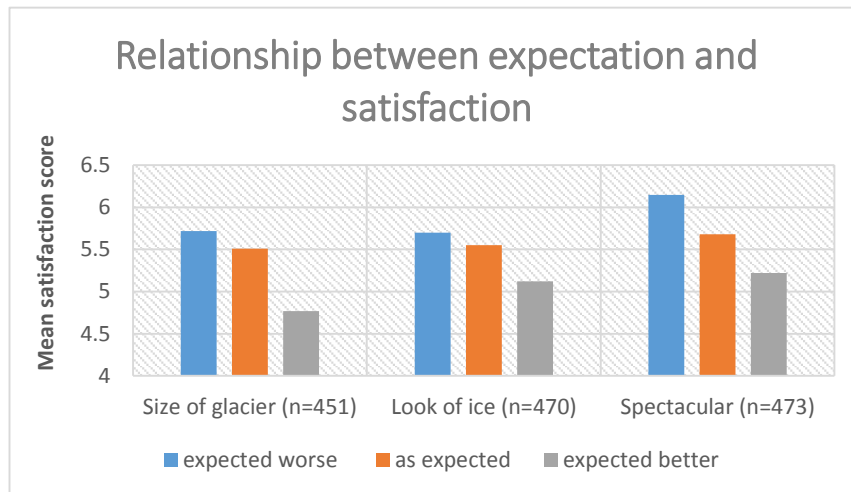


Figure 35 Relationship between expectation and satisfaction for glacier aspects (n=varied)

3.2.13 Seeing images of the glacier prior to visit

The majority of respondents (67%, n=337) had seen images of the glacier before their visit (Figure 36). International visitors were slightly more likely to have seen images before visiting (68.1% had seen images compared to 63.6% of the New Zealand visitors).

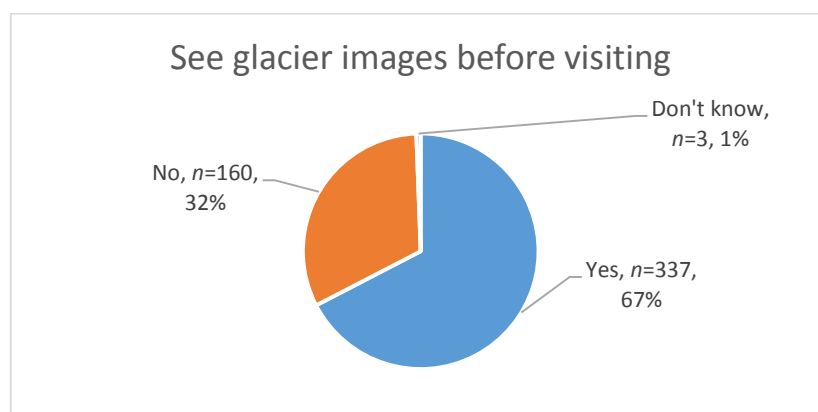


Figure 36 See images of glacier before visiting (n=500)

1 F=16.74, df=2, p<.001

2 F=6.16, df=2, p<.01

3 F=15.39, df=2, p<.001

3.2.14 Accuracy of images

The 337 respondents who had seen images of the glaciers before their visit were asked how accurate the portrayal of the glaciers were in these images (Figure 37). Altogether, approximately half of these respondents (54.6%, $n=184$) thought that the images of the glaciers were accurate (i.e., scored above the midpoint of '4' on the scale) while 26.4 per cent ($n=89$) thought they were inaccurate.

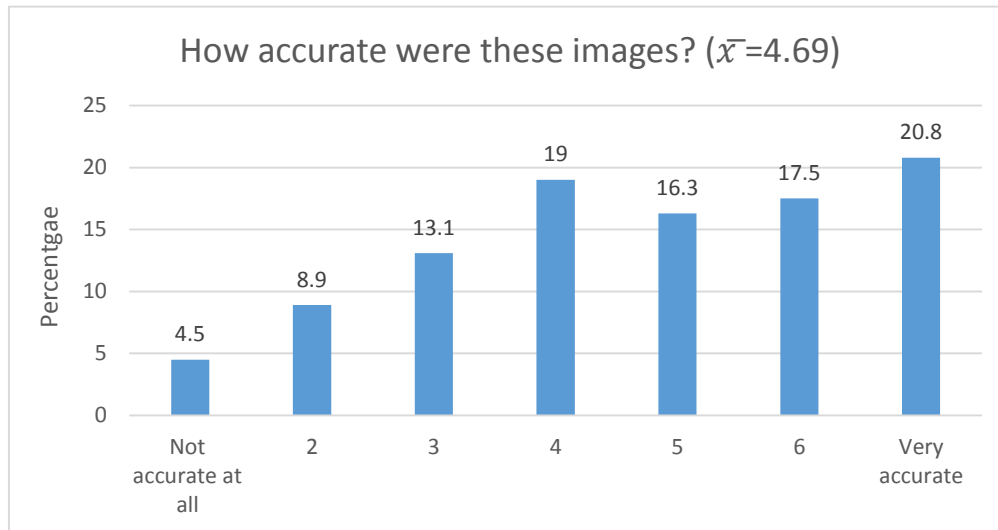


Figure 37 Accuracy of glacier images in respect of current glacier condition ($n=337$)

A comparison of means of grouped scores for image accuracy (not accurate, somewhat accurate, and accurate) with the three glacier experience features tested in Question 12 was statistically significant. Those who reported that the images they had seen were accurate, were also more likely to report satisfaction with the size of the glacier⁴, the look of the ice⁵ and with how spectacular the glacier was overall⁶ (Figure 38).

4 $F=24.61$, $df=2$, $p<.001$

5 $F=25.7$, $df=2$, $p<.001$

6 $F=37$, $df=2$, $p<.001$

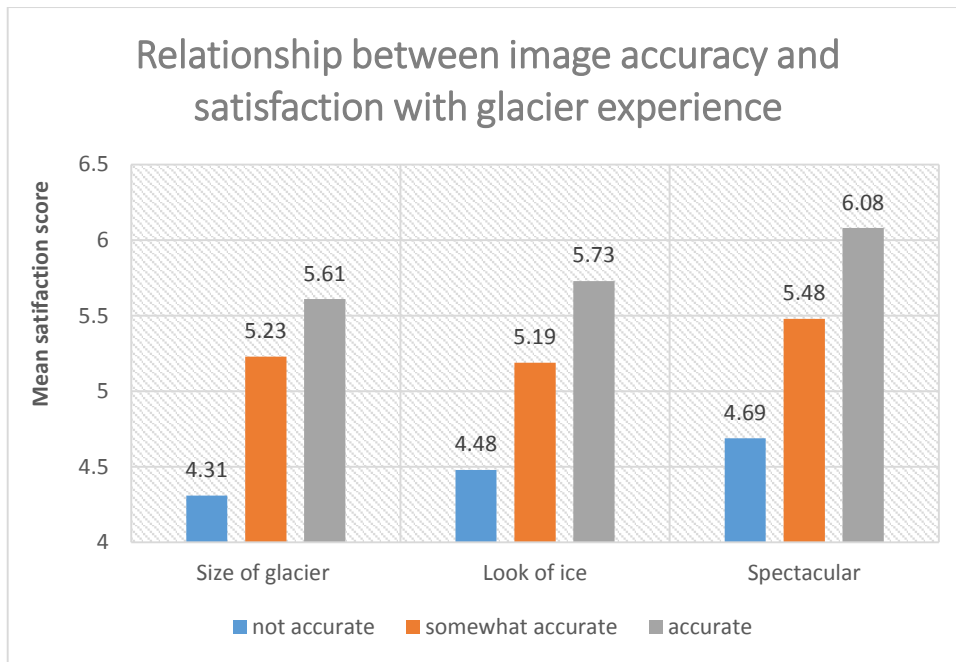


Figure 38 Relationship between image accuracy and satisfaction with glacier experience (n=337)

3.2.15 Collecting information prior to visit

Almost three quarters of respondents (71%, n=353) reported getting some information about activities they could do in the glacier region in advance, 20 per cent (n=100) did not get any information and the remainder (9%, n=47) reported that they already knew what they could do at the glacier region (Figure 39).

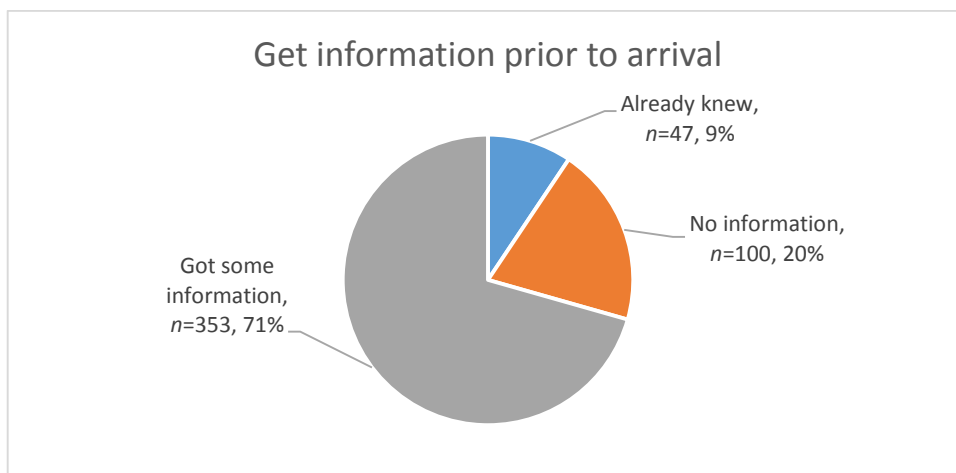


Figure 39 Information prior to arrival (n=500)

Altogether, 76.5 per cent of first time visitors obtained information in advance compared to only 40.5 per cent of repeat visitors; 45.6 per cent of repeat visitors reported that they already knew what activities they could do at the glaciers.

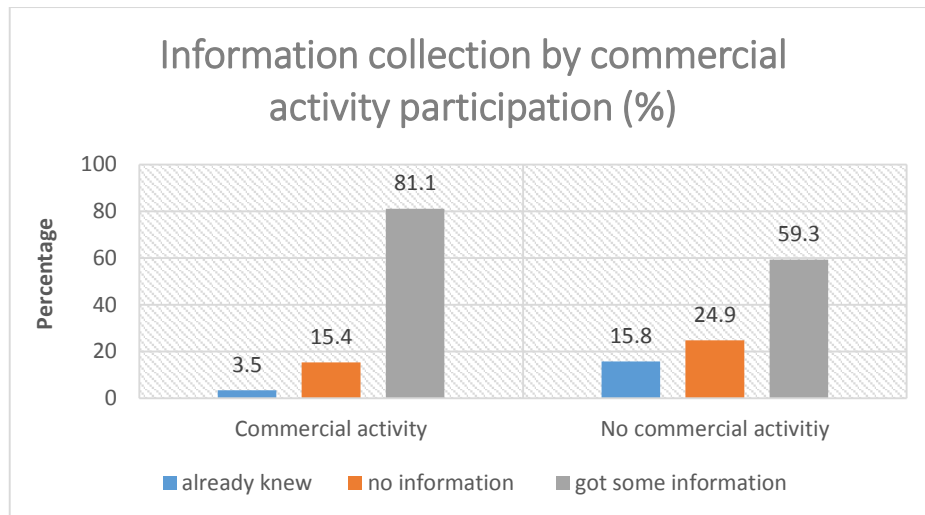


Figure 40 Information collection by commercial activity participation (n=259)

Figure 40 shows that those who participated in a commercial activity were much more likely to have collected information in advance of their visit.

Where did you get this information from?

Those respondents who sought information in advance of their visits were asked where they got this information from. Many respondents reported consulting multiple sources and a wide array of actual sources were identified. Sources can be categorised according to three information channels: the internet, personal communications and printed materials. Specific information sources used included:

- Internet generic (e.g., websites, internet and google) and specific (e.g., tourism websites, guide company websites, DOC website);
- Social network sites and other forms of communication technology (e.g., blogs, Facebook, Trip Advisor, phone Aps);
- i-SITEs – sometimes with specific branches noted;
- Brochures;
- Word of mouth (e.g., other tourists, family, friends);
- Guidebooks, generic (e.g., guidebooks, travel guides) as well as specific publications (e.g., Lonely Planet, Rough Guide);
- Accommodation providers (e.g., hotels, camping, hostels);
- Travel agents;
- Transport/tour companies (e.g., Kiwi Experience, Contiki Bus, Stray Bus).

Figure 41 presents the information sources used as a word cloud graphic (the size of each word represents the number of times each individual information source was reported). While tourism websites and the internet are important, the most common information sources used were the more traditional guidebooks and brochures. Personal communication is still important with other tourists, i-SITEs and tour guides on travel companies such as Kiwi Experience featuring strongly along with the collection of information and feedback from other tourists via internet medium such as Trip Advisor.



Figure 41 Word cloud showing information sources reported (created with tagxedo.com)

3.2.16 Expectation of, and satisfaction, with aspects of glacier visit

Using a 7-point Likert-type scale, respondents were asked to indicate their expectations and satisfaction with five aspects of their glacier visit: how close they were able to get to the glacier; how many people there were; how peaceful it was; how detailed the information and interpretation they saw/received was; and how developed facilities in the glacier valleys were.

Figure 42 shows the mean scores for each of the visit aspects tested. The mean scores for expectation were all moderate (i.e., around the middle score of '4') with peacefulness scoring the highest (indicating that a slight majority of respondents had expected a quieter experience). The lowest mean scores were reported in respect of getting close to the glacier (i.e., slightly in favour of getting closer than expected) and the facilities in the glacier valley (which were slightly more developed than expected).

The mean satisfaction scores were all above 5, indicating a high level of satisfaction (Figure 42). The highest level of satisfaction (with a mean score of 5.59) was with the facilities in the glacier valleys, the lowest level of satisfaction (mean score 5.19) was with the number of people present during respondents' visits.

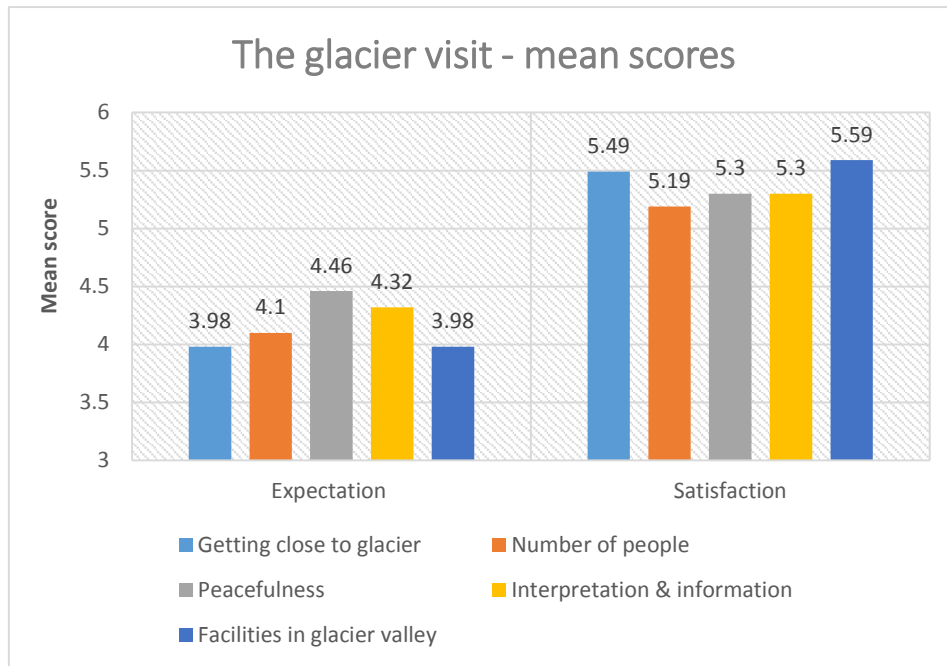


Figure 42 The glacier visit – mean scores (n=varied)

The graphs below compare the distribution of scores for the five glacier visit aspects in respect of expectation and satisfaction. A 'don't know' option was possible in respect of each expectation question (n=the number of respondents who indicated a 1-7 score on the Likert-type scale).

Getting close to the glacier

As Figure 43 shows, almost a third of respondents (29.1%, n=142) got as close to the glacier as they had expected. Of the remainder, 37.4 per cent (n=183) expected to get closer and 33.3 per cent (n=163) did not expect to get as close as they did. Twelve respondents indicated that they did not know what to expect in respect of getting close to the glacier. Getting close to the glacier had the lowest equal (along with facilities in the glacier valley) mean expectation score (\bar{x} =3.98).

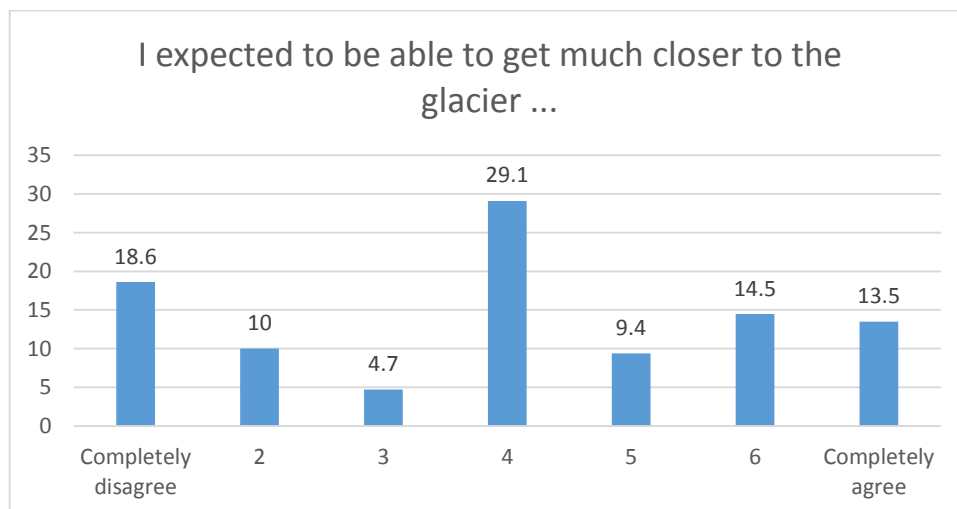


Figure 43 Expectation of getting close to glacier (n=488)

Analysis of these expectation data, in relation to the respondents who walked to the final barrier in each glacier valley, showed that 44.6 per cent of those going to the final barrier in the Franz Josef Glacier valley and 49 per cent of those going to the final barrier in the Fox Glacier valley expected to get closer than they did to the glacier.

Despite not getting as close to the glacier as expected, satisfaction was still high and 209 respondents (41.8%) reported that they were very satisfied with this aspect of their glacier visit (Figure 44). Altogether, almost three quarters of respondents (72.2%, $n=361$) scored satisfaction above the central point of the scale. Seventy respondents (14%) reported being dissatisfied with how close they got to the glacier. Getting close to the glacier had a mean satisfaction score of 5.49 (the second highest).

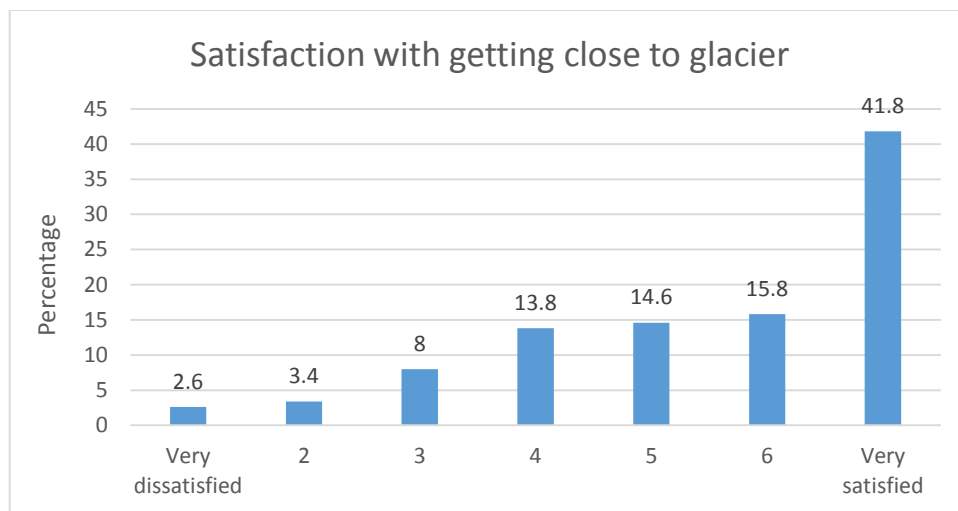


Figure 44 Satisfaction with getting close to glacier ($n=500$)

As might be expected, a large percentage of those respondents who had been on the glacier (either on guided hike or scenic flight) were very satisfied with how close they were able to get. When analysed by glacier valley activity, these satisfaction data showed that 31.8 per cent of those respondents who walked to the final rope barrier in the Franz Josef Glacier valley (see Photograph 15) were very satisfied with how close they got to the glacier; in the Fox Glacier valley 30 per cent of respondents going to the final rope barrier were very satisfied with how close they got to the glacier. There were 16 respondents surveyed at Fox Glacier on one of the five days when access was only possible to 600 metres of the terminal face; of these, 93.8 per cent expected to get closer and 75.1 per cent reported being not satisfied with how close they were able to get.



**Photograph 15 Final rope barrier in Franz Josef Glacier valley
(Photo Credit: Jude Wilson)**

Number of other people present

Altogether, under half (42.2%, $n=190$) of those who answered this question encountered the number of people they expected, 30.9 per cent ($n=139$) encountered more people, and 26.9 per cent ($n=121$) encountered fewer people than expected (Figure 45). Forty-four respondents did not answer the question and six respondents were not asked as they had not done any glacier activities in which they would encounter other people. The mean expectation score was $\bar{x}=4.1$.

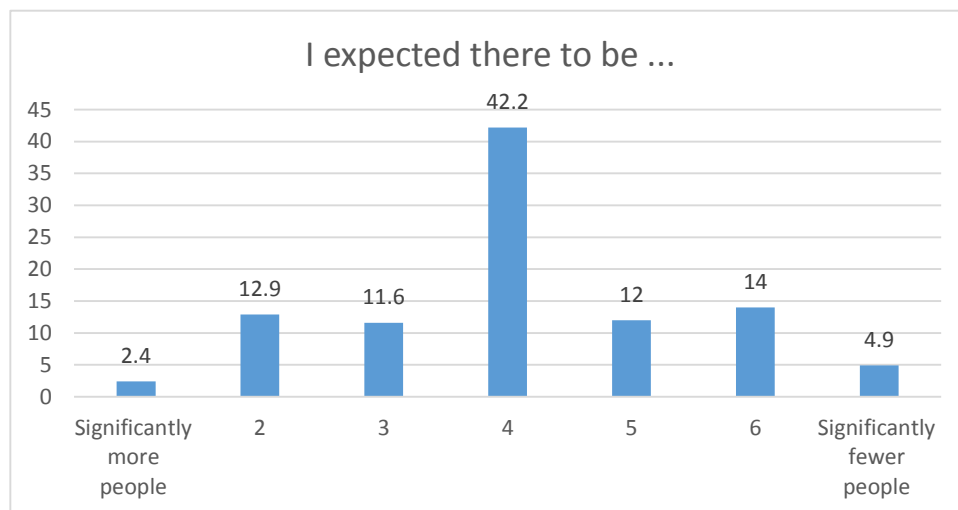


Figure 45 Expectation of number of people encountered during glacier visit ($n=450$)

A quarter of respondents (24.3%, $n=120$) were 'very satisfied', and 10.7 per cent ($n=53$) 'dissatisfied' with the number of people encountered during their visit (Figure 46). Altogether, 65 per cent ($n=321$) recorded a satisfaction score above the midpoint on the scale. 'Number of people' had the lowest mean satisfaction score ($\bar{x}=5.19$).

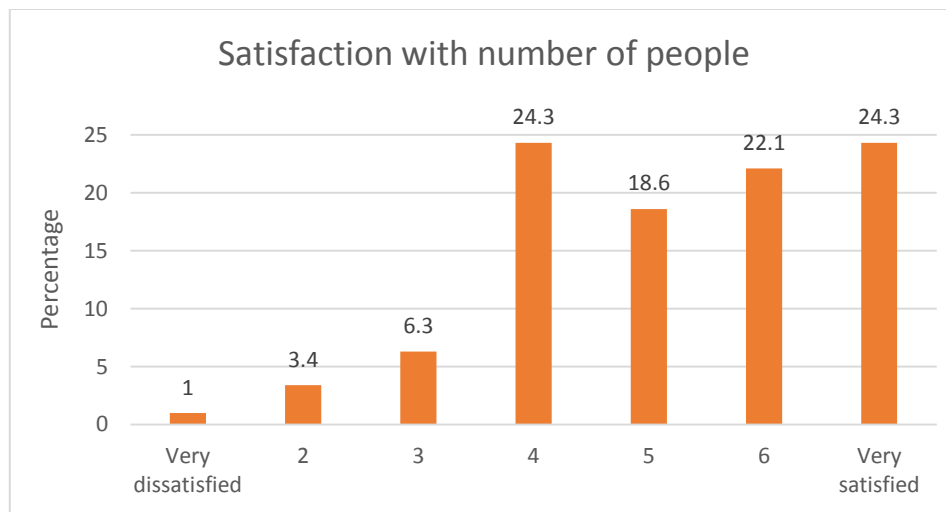


Figure 46 Satisfaction with number of people encountered ($n=494$)



**Photograph 16 Visitors in Fox Glacier valley: Independent walkers (left and centre) and guided glacier hikers (right)
(Photo Credit: Jude Wilson)**

Peacefulness

Over half of all respondents reported an expected level of peacefulness (53.6%, $n=252$); a third (33.9%, $n=159$) expected their experience to be quieter and the remainder (20.7%, $n=59$) expected it to be noisier than it was (Figure 47). Altogether, 24 people did not answer this question and six people were not asked (as they had neither been in the glacier valley nor had they landed on the glacier). Peacefulness had the highest mean score for expectation ($\bar{x}=4.46$).

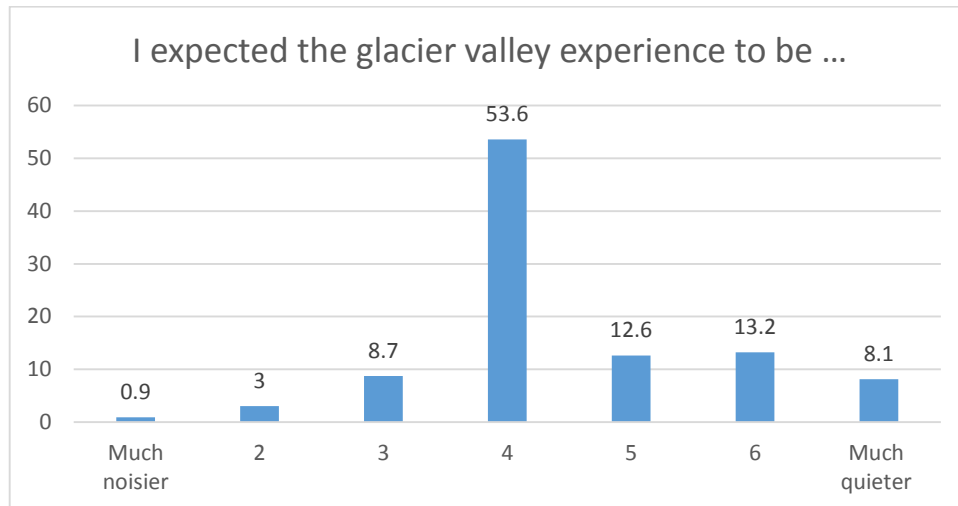


Figure 47 Expectation of peacefulness in glacier valley ($n=470$)

Satisfaction with peacefulness was high with more than a quarter of respondents (26.3%, $n=129$) reporting that they were 'very satisfied'. Of the remainder 20.2 per cent ($n=100$) were neutral and 11.1 per cent ($n=55$) were dissatisfied (Figure 48). The mean score for peacefulness was $\bar{x}=5.3$.



Figure 48 Satisfaction with peacefulness in the glacier valley ($n=494$)

Interpretation and information

Half of the respondents (50.5%, $n=237$) indicated that the interpretation and information about the glaciers that they had seen/been given was as detailed as expected; 34.5 per cent ($n=162$) expected it to be more detailed and 15 per cent ($n=70$) expected it to be less detailed (Figure 49). Thirty-one respondents did not know what to expect. The mean score for expectation of interpretation and information was $\bar{x}=4.32$.

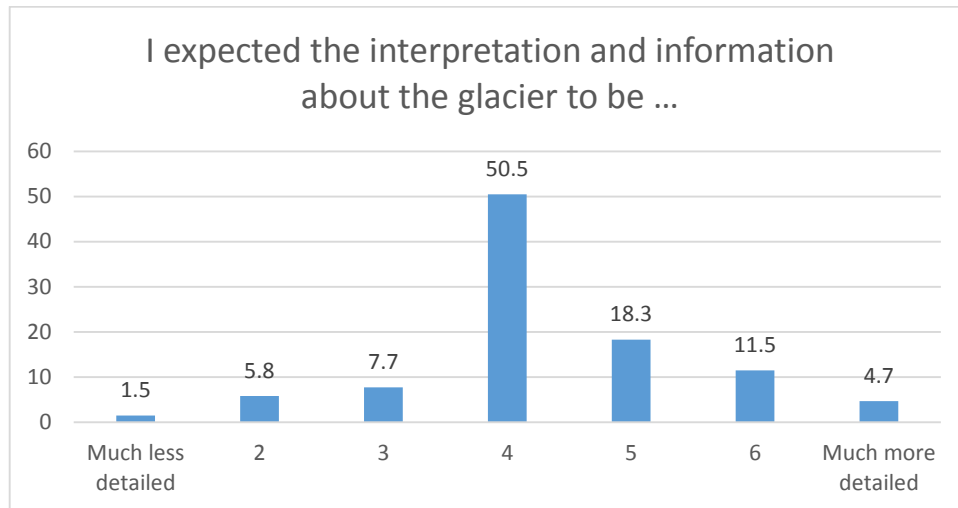


Figure 49 Expectation of interpretation and information ($n=469$)

Altogether, 70 per cent of respondents ($n=350$) reported that they were satisfied with the interpretation and information about the glaciers, 18.8 per cent ($n=94$) were neutral and 11.2 per cent ($n=56$) were dissatisfied (Figure 50). Satisfaction with interpretation and information had a mean score of $\bar{x}=5.3$.

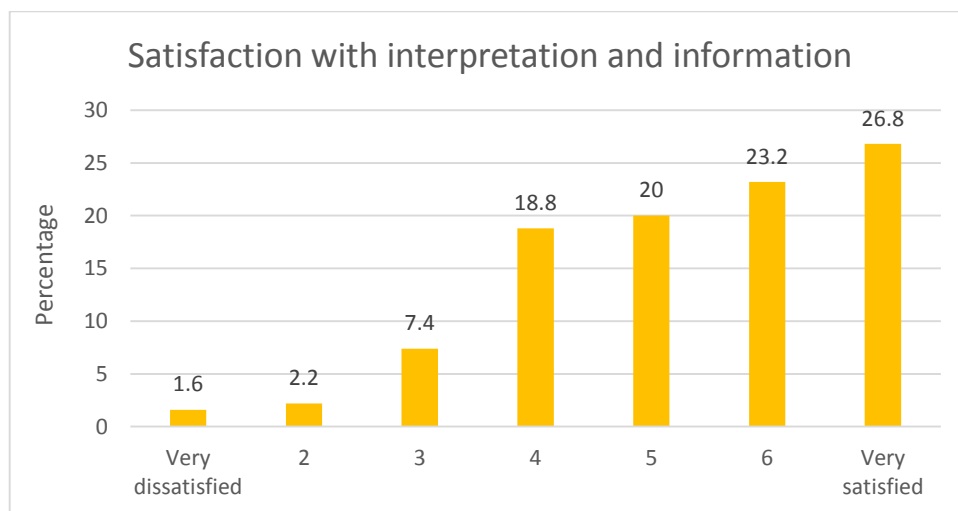


Figure 50 Satisfaction with interpretation and information about glaciers ($n=500$)

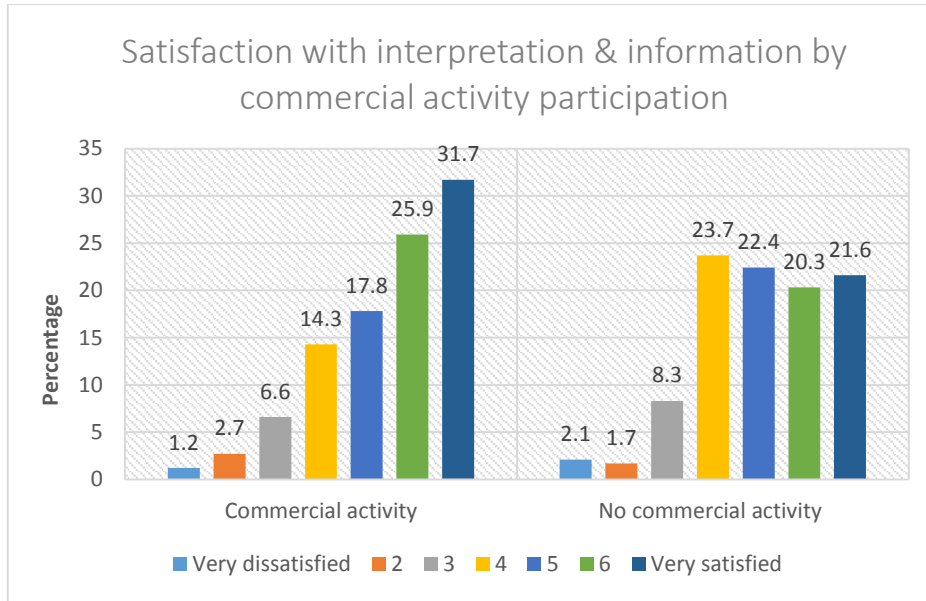


Figure 51 Satisfaction with interpretation and information by participation in commercial activities (n=500)

Figure 51 shows that, when compared to those who undertook no commercial activities at the glaciers, those who participated in commercial activities reported a higher level of satisfaction with the interpretation and information they encountered/received.

Facilities in the glacier valley

More than half of the respondents (60.3%, n=223) reported that the facilities in the glacier valley were as developed as they expected; 20.5 per cent (n=76) expected the valley facilities to be less developed, and 19.2 per cent (n=71) expected them to be more developed (Figure 52). Twenty nine respondents did not know what to expect and 101 respondents were not asked this question as they had not visited either of the glacier valleys. The mean score for expectation of facilities was \bar{x} =3.98 (equal lowest).

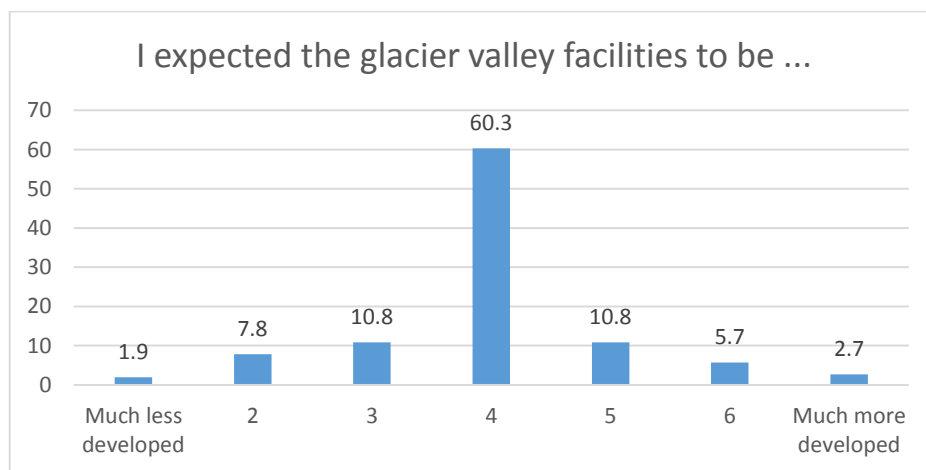


Figure 52 Expectations of how developed glacier valley facilities would be (n=370)

The question on facilities differed from the other visit aspects measured in that there was not necessarily a clear alignment between developed/undeveloped facilities and a positive or

negative rating (i.e., for some people a more developed valley may have been better, while for others this would have been a worse option). Nonetheless, satisfaction with the level of development had the highest mean satisfaction score ($\bar{x}=5.59$) with more than three-quarters reporting satisfaction (77.4%, $n=309$); a further 20.1 per cent ($n=80$) were neutral and only 2.5 per cent ($n=10$) were dissatisfied (Figure 53).



Figure 53 Satisfaction with facilities (n=399)

Figure 54 presents a comparison of the distribution of satisfaction scores for each of the glacier visit aspects tested and shows the similarities in distribution of scores for each item. The higher proportion of respondents indicating that they were 'very satisfied' with how close they got relates directly to the number of respondents who had actually been onto the glacier/s.

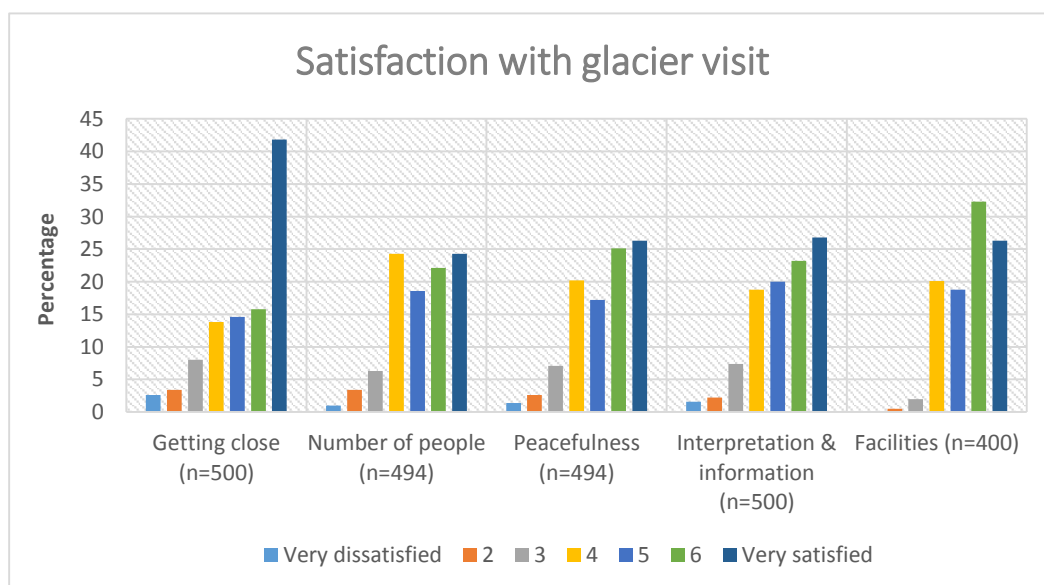


Figure 54 Satisfaction with glacier visit for all visit aspects measured

Relationship between expectation and satisfaction

The selection of these glacier visit aspects was based on data collected via open-ended questions in two visitor surveys undertaken at the glaciers over the summer of 2012/13 (Espiner & Wilson, 2013a and 2013b). When asked, in these earlier surveys, to identify the most and least liked aspects of their glacier visit, many respondents indicated some dissatisfaction with how close they were able to get to the glaciers, how many other people were present during their visit, the noise levels they encountered and with how much interpretation and information on the glaciers was available. These findings suggested that an ideal glacier visit experience was one in which visitors were able to get close to the glacier, was enjoyed in the company of only a few other people and occurred quiet and peaceful surroundings with some degree of interpretation and information provided. Based on these findings, expectation was classified as 'expected worse', 'as expected' and 'expected better' for four of the visit aspects tested. Thus, for example, those who 'expected worse' in respect of getting close to the glacier actually got closer than they expected.

A comparison of mean scores analysis undertaken for three expectation scenarios (e.g., expected worse, as expected, expected better) and three satisfaction scenarios (satisfied, neutral, and dissatisfied) was significant for the four visit aspects tested.



Figure 55 Relationship between expectation and satisfaction for visit aspects

These results show that satisfaction was highest for those who: did not expect to get as close to the glacier⁷ as they did; expected there would be more people⁸; expected a less peaceful experience⁹; and expected less detailed interpretation and information¹⁰(Figure 55).

As noted above, the fifth visit aspect – how developed the glacier valley facilities were – did not have a clearly defined better or worse option. As a result, there was no significant relationship between expectation and satisfaction with how developed facilities in the glacier valley were.

7 F=141.66, df=2, p<.001

8 F=6.05, df=2, p<.01

9 F=17.6, df=2, p<.001

10 F=45.91, df=2, p<.001

3.3 Climate change and its impacts

The final set of survey questions asked respondents about climate change and its potential impacts on the visitor experience at the glaciers. Question 17, Q18 (in two parts) and Q19 measured opinions about the existence, causes and level of concern about climate change; Q20 was open-ended and asked respondents what they thought might happen to the glacier over the next 20 years. A final set of four questions (Q21-24) related to impacts climate change might have for visitors like themselves. With the exception of Q20, all climate change questions were measured on 7-point Likert-type scales and included a 'don't know' option (n =the number recording an answer on the Likert-type scale for each question).

3.3.1 Opinion on climate change

Almost three quarters (73.6%, $n=359$) of respondents agreed that climate change is 'definitely happening' (Figure 56). Twelve respondents indicated that they 'don't know' if climate change is happening.

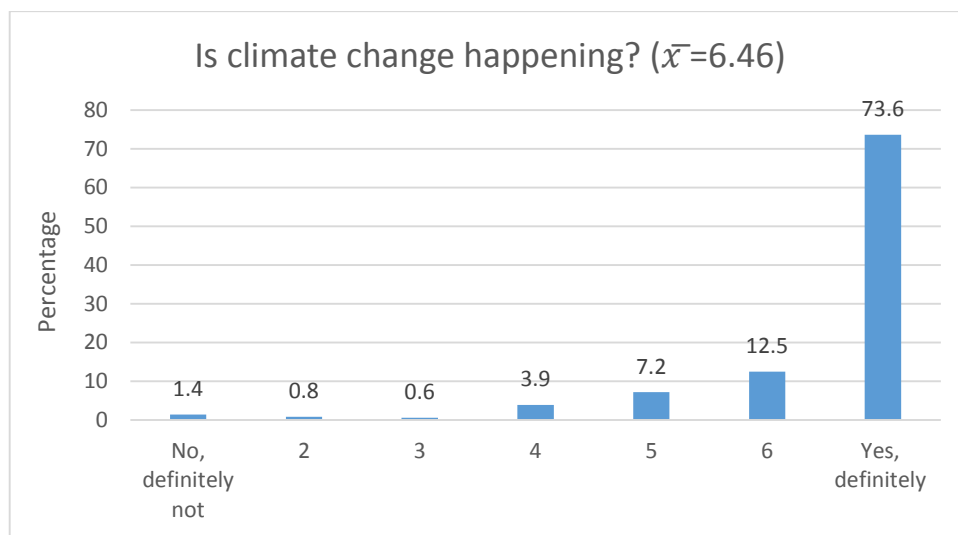


Figure 56 Is climate change happening? ($n=488$)

Examination of those respondents who indicated that climate change was definitely happening showed that visitors from Asia had the highest level of agreement (89.5% of whom scored '7' on the scale) while visitors from 'Other' countries, Australia and New Zealand had the lowest level of agreement (40%, 61.4% and 67.5% scoring '7', respectively). By age, the highest level agreement was from those aged 40-49 years (83.6% of whom scored a '7') and the lowest from those aged 70-79 years (52.9% scoring a '7'). There were minimal differences according to education levels: 76.5 per cent of those with university education and 64.9 per cent of those with secondary/high school qualification scored a '7'.

3.3.2 Climate change as a result of natural causes

When asked if they thought climate change was a result of natural causes, approximately one fifth of respondents (18.1%, $n=87$) 'completely agree' that climate change is a result of natural causes and a similar percentage (18.5%, $n=89$) indicated a neutral opinion (i.e., a score of 4 on the Likert-type scale); less than 10 per cent (8.1%, $n=39$) 'completely disagree' (Figure 57).

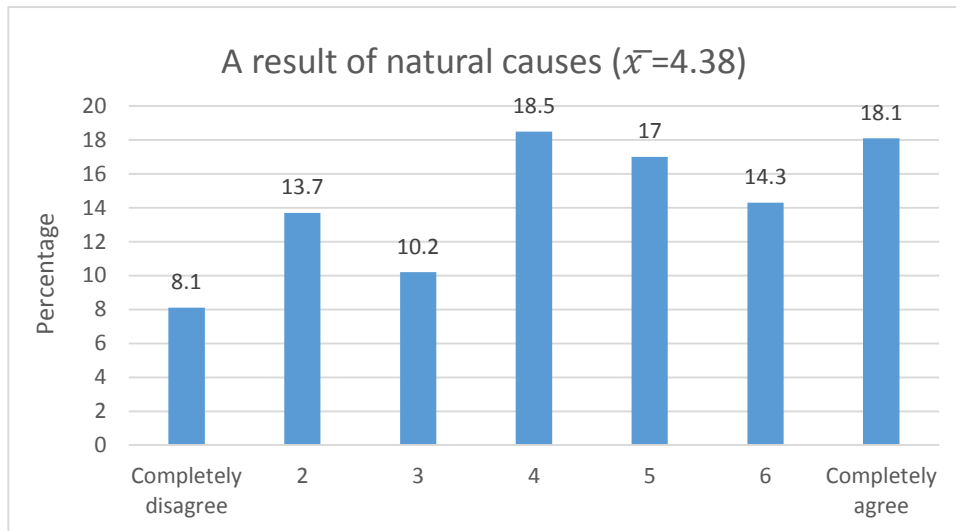


Figure 57 Climate change as a result of natural causes ($n=481$)

3.3.3 Climate change as a result of human activity

There was a higher level of agreement in respect of climate change being a result of human activity with 38.8 per cent of respondents ($n=187$) 'completely agreeing' and less than a fifth (19.6%, $n=94$) being either neutral or disagreeing (Figure 58).

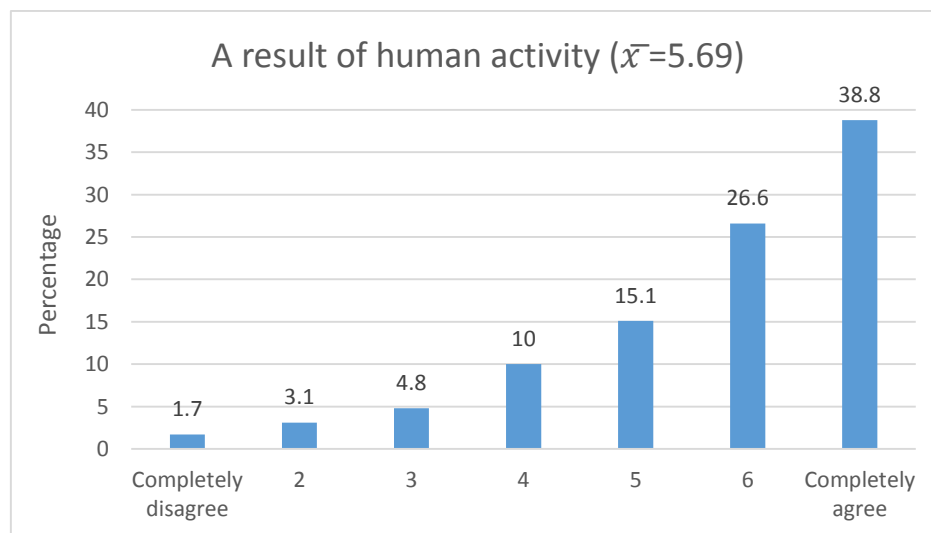


Figure 58 Climate change as a result of human activity ($n=482$)

Figure 59 shows the responses grouped into those who disagreed (scoring 1-3), those who were neutral (4) and those agreeing (5-7) with each of the climate change cause options.

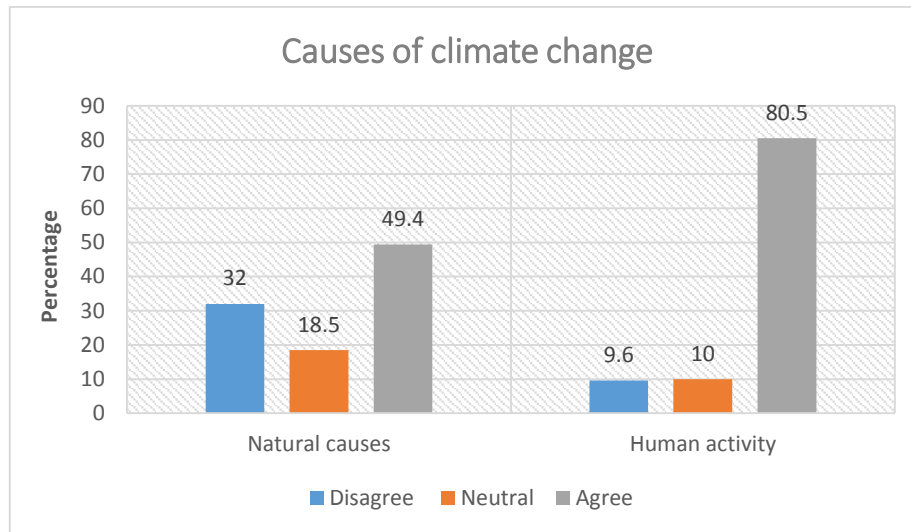


Figure 59 Causes of climate change (grouped) (n=varied)

The highest level of agreement with the 'natural causes' statement (grouped scores) was by visitors from 'other countries' (60% agreed), UK (59.6% agreed), Asia (55.6% agreed) and New Zealand (53.3% agreed). Visitors from USA had the lowest level of agreement (41.4%). The highest percentage of disagreement was reported by visitors from Germany (43.2% disagreed) and Other Europe (33.3%); the lowest levels of disagreement were reported by visitors from 'other countries' (20%), UK (20.2%) and New Zealand (25.3%).

The highest level of agreement with the 'human activity' statement was by visitors from Asia (94.4% agreed), USA (93% agreed) and Germany (90.9% agreed). Visitors from 'other countries' (60%), UK (71.1%), New Zealand and Australia (both 75%) had the lowest level of agreement (and conversely the highest levels of disagreement) with this statement.

Older visitors were slightly more likely to agree that climate change was caused by natural causes and disagree that it was caused by human activity. Younger visitors were more likely to report the opposite. When examined by gender, agreement on climate change causes was almost identical, however, males were slightly more likely to disagree that climate change is a result of human activity (11.1% disagreed, compared to 8.2% of females) while females more likely to be neutral (19.9% neutral compared to 16.9% of males) about climate change as a result of natural causes.

3.3.4 Concern about the effects of climate change

Over a third of respondents (34.1%, $n=168$) reported that they were extremely concerned about climate change, while less than a tenth (8.1%, $n=40$) reported no concern (Figure 60).

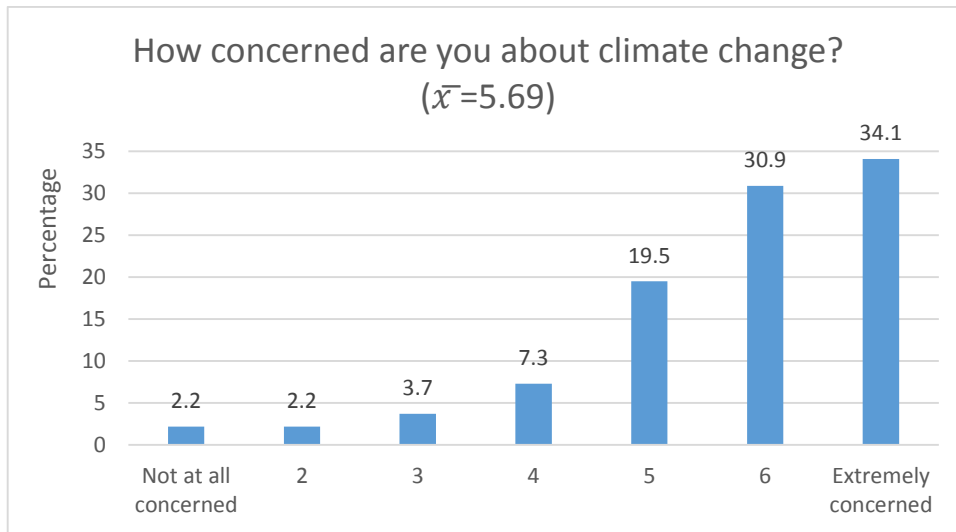


Figure 60 Concern about the effects of climate change (n=492)

Analysis by country of residence for grouped scores (unconcerned, neutral and concerned) showed that visitors from Other Americas and Asia reported the highest level of concern about climate change (100% and 94.7% were concerned, respectively). Visitors from Other countries (60%) and Australia (75.5%) were the least likely to report that they were concerned, with a roughly equal percentage of each reporting that they were not concerned or neutral.

Men (80%) were less likely than women (89%) to be concerned about climate change. Differences by age were less clear cut, although it appeared that older visitors were more likely to be unconcerned and younger ones more likely to be concerned about climate change.

3.3.5 Change in the glacier over the next 20 years

When asked what they thought would happen to the glacier over the next 20 years the majority of respondents (84%, n=419) indicated that it would get smaller and a further 15 per cent thought that it would either fluctuate, or stay the same, or did not know what would happen to it (Figure 61).

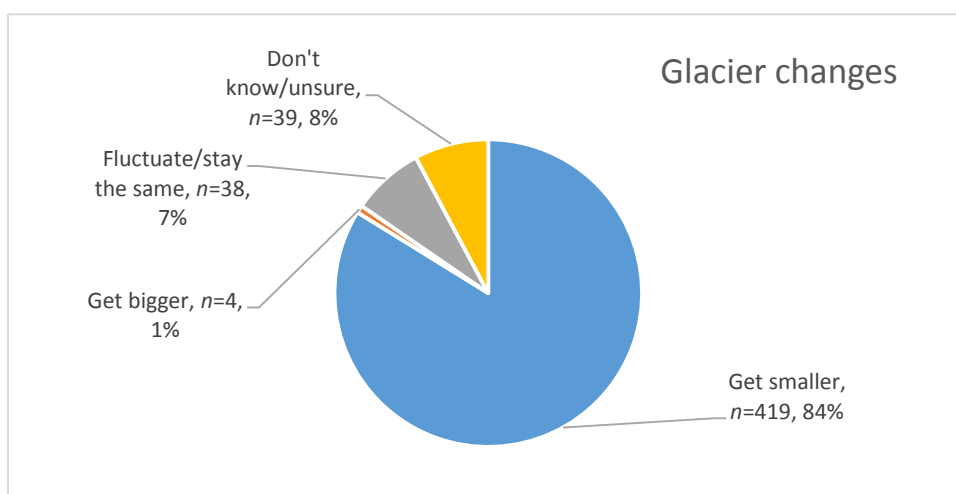


Figure 61 Glacier changes over 20 years (n=500)

visitors, cost was a prohibitive factor in respect of taking a flight; for some, fear of flying also influenced their response to this question. Twelve respondents did not know if they would take a flight.

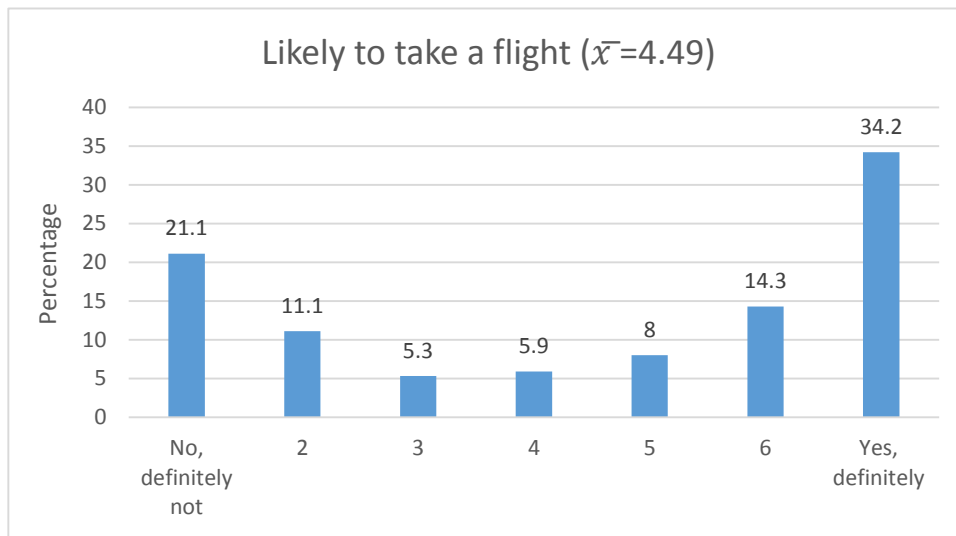


Figure 63 Likelihood of taking a flight (n=488)

3.3.7 Still visit if only way to see the glacier was by helicopter

More than a third of respondents (35.7%, $n=174$) also reported that they would definitely have still visited the glacier region if they knew the only way to see the glacier region was by helicopter (72.2% of these respondents also indicated in Q21 that they would definitely take a flight) (Figure 64). Twelve respondents did not know if they would still visit.

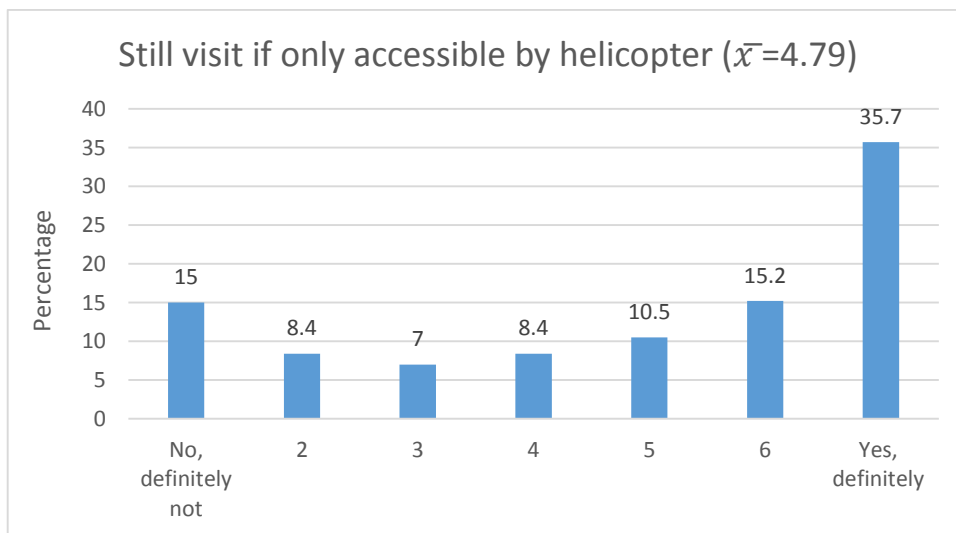


Figure 64 Visit if only accessible by helicopter (n=488)

Thirty-seven per cent of international visitors indicated that they would definitely still visit the glacier region if the only way to see the glacier was by helicopter compared to only 28 per cent of the New Zealand visitors.

3.3.8 Still visit if there was a possibility of not seeing the glacier

While just over a fifth of respondents (22%, $n=108$) claimed they would 'definitely not' have visited the glacier region if they knew they might not be able to see the glacier, responses to this question were more mixed than in the previous two questions (Figure 65). Altogether, almost half (45.6%, $n=224$) of the respondents indicated that they would not come (1-3 on the scale), 8.4 per cent ($n=53$) were neutral, while the remaining 43.7 per cent ($n=214$) indicated that they would still visit (5-7 on the scale). Nine respondents did not know if they would still visit.

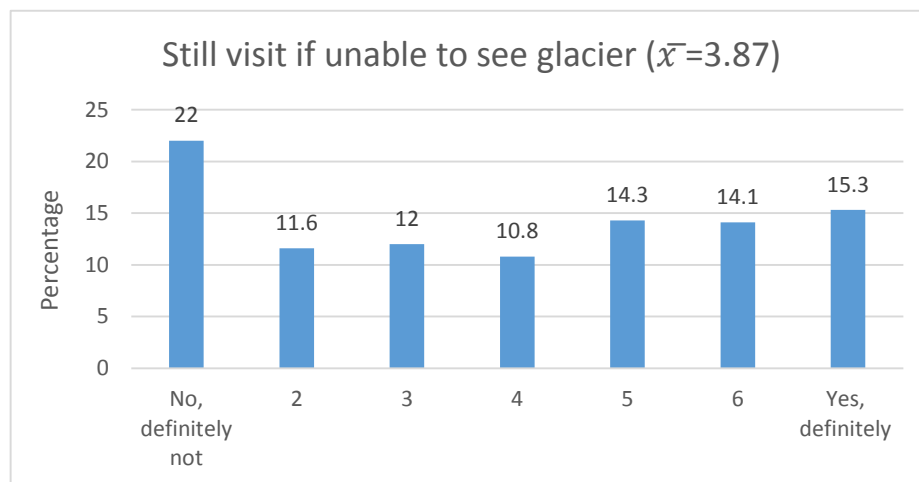


Figure 65 Visit if unable to see glacier ($n=491$)

3.3.9 Likelihood of going elsewhere to see a glacier

More than a third of respondents (37.5%, $n=182$) indicated that they would definitely go elsewhere to see a glacier, while only 7 per cent ($n=34$) would definitely not go elsewhere to see one (Figure 66). Fifteen respondents did not know if they would go elsewhere to see a glacier.

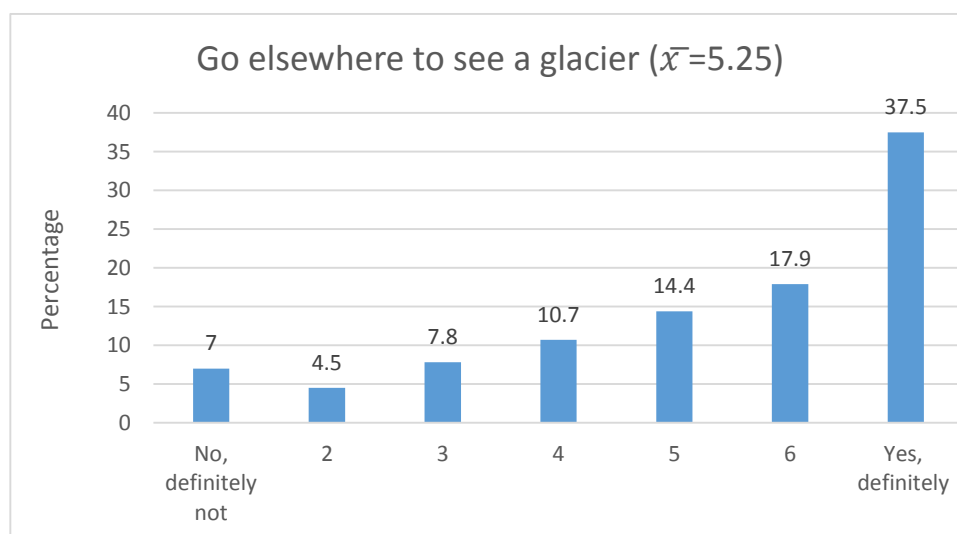


Figure 66 Go elsewhere to see a glacier ($n=485$)

3.4 Discussion

This study was designed to capture details of the visitor experience at the glaciers and to examine the importance of the glaciers as a 'last chance tourism' destination. The following discussion section brings together the results of the survey under four headings: glacier tourism, importance of the glaciers, the current glacier experience and implications of climate change on visitors' experience at the glaciers. Before beginning, however, we present a brief assessment of the survey methodology employed and the challenges encountered whilst surveying at the glaciers.

3.4.1 Surveying at the glaciers

The survey was undertaken during two survey periods in the busy summer tourist season. The surveys themselves took around 15 minutes to complete, which is probably the maximum time researchers can expect to detain visitors. The booklet method, with the surveyor filling in the survey data worked well, and took some of the survey burden off respondents. Importantly, this approach ensured that the data set was complete and accurate. Future visitor surveys of this nature planned for the glaciers (or indeed elsewhere in New Zealand) should include a 'length of stay' question asked in the two-pronged way we used here, so as to collect the most accurate visitor data possible. The most problematic question – in respect of tourists' recall, the recording of their responses and analysis of these data – related to information sources. Questioning visitors about the information sources they may have consulted is challenging as a result of the wide array of means used to connect to the internet and tourists increasing connectivity more generally. The propensity of many tourists to collect information 'organically' whilst travelling is also very difficult to measure.

The main limitation associated with surveying in the glacier region is the weather; while the conditions experienced during this research were relatively benign (in that there were no major weather events) the weather did disrupt surveying to a considerable degree. Following a pre-defined sample quota and sampling timetable is simply not possible when dealing with multiple glacier activities and with survey sites affected by changeable, and often localised, weather conditions. The logistics of operating surveys from a variety of survey sites is also challenging on a day-to-day basis. While clear weather was a pre-requisite for all the glacier activities involving aircraft, these conditions also presented the best time to survey visitors in the two glacier valleys. Some survey sites were better at certain times of the day: the two glacier valley sites, for example, were better in the mornings while they still offered some shade. Even on good weather days, many of the air-based glacier activities were also busier in the mornings, as it often clouded over during the afternoon; Franz Josef, however, was subject to morning fog (preventing any air activity) on a number of the good weather days during the second survey period.

Logistically, it was very helpful to have the support of the various commercial activity companies during the research, although considerable care had to be taken to ensure that respondents did not think the surveys were associated with that company in any way. The same caveat applied with respect to DOC when surveying in the glacier valleys. Permission to survey in the indoor/covered premises of the two glacier guiding companies, in particular, enabled surveying to continue even when conditions were marginal in the glacier valleys. The continuing operation of the Fox Glacier Guides trips in wet weather offered a useful wet weather surveying option; care was taken, however, to ensure that some of visitors surveyed had done this activity in good weather.

Any feedback relevant to DOC and the various commercial companies was passed on during the fieldwork; it is our intention to more formally present the survey results to any interested parties at the glaciers in late 2014.

3.4.2 Glacier tourism

The glaciers of Westland *Tai Poutini* National Park attract visitors from all around New Zealand and from a wide array of international countries. This research sample has a similar profile to the visitors sampled in the Franz Josef Visitor Survey undertaken the previous summer, giving confidence in the representativeness of the survey sample in respect of visitors to the glacier region. However, there were some marked differences in distribution of visitors according to their country of residence when compared to the IVS (see Table 2). A variety of reasons may account for the under-representation of visitors from Australia, Asia and Other countries and, conversely, the over-representation of visitors from the UK, the USA and Europe in our sample:

- the propensity of Australian visitors to make short stay and multiple return visits to New Zealand and to spread out more regionally, rather than touring the country in its entirety;
- language difficulties associated with surveying Asian visitors, alongside their tendency to be on tours (participants of which are logistically difficult to survey);
- the high number of visitors from Oceania included in the 'other country group' in the IVS, many of whom are VFR visitors rather than holiday visitors;
- the distance factor associated with visitors from the UK, Europe and the Americas, for whom a trip to New Zealand is often a '*once in a lifetime*' holiday which involves '*seeing*' or '*touring New Zealand*' and inevitably includes visits to the most recognisable and iconic tourism sites.

This last point is supported by the fact that half of the reasons given to the open-ended question asking why respondents had come to the glacier region were that they were travelling/on holiday in New Zealand, the glaciers were on-route or that it was an iconic or 'must-do' place to visit.

The vast majority of respondents (84%) were first time visitors to the glaciers, a figure highly consistent with previous research findings. For example, the 2009 and 2013 Franz Josef visitor surveys reported 79 per cent and 78.7 per cent of first time visitors, respectively; the 2010 Fox Glacier/Franz Josef survey found 86.2 per cent of respondents to be first time visitors. However, almost half of the New Zealand visitors surveyed had been to the glaciers before.

The exact patterns of travel (and length of stay in glacier region) were determined by the location of places to stay/destinations either side of the glacier region and once again, these data also support the popularity of the 'touring New Zealand' itinerary followed by many tourists. Tourism Flow data from 2005 indicates that the traffic flow between Hokitika and Franz Josef is 40 per cent heavier southbound (Vuletich & Becken, 2007), a pattern supported by these data (52% of the sample were travelling south). Wilson et al. (2012) also reported that around 60 per cent of the visitors calling at the Hokitika i-SITE were travelling south.

Three quarters of respondents travelling onward (in both north and south directions) on the day they completed the survey knew where they were travelling to, which suggests a high degree of pre-planning with respect to travel itineraries. Inflexible travel plans, alongside the most common length of stay at the glaciers of only one or two days leaves visitors vulnerable in respect of the weather they encounter during their visits, and allows little scope for weather-related adjustments to itineraries. Research into the impact of the weather on tourist travel in New Zealand in the 2009/10 summer found that the West Coast was mentioned most

often in respect of weather-related itinerary changes, and both air- and land-based activities at the glaciers were frequently disrupted by the weather (Becken et al., 2010).

3.4.3 Importance of the glaciers

Assessing the importance of the glaciers – either being able to see them or interact with them in some way – for visitors was of key interest in this research and the survey included questions which both specifically focused on, and more tangentially collected data on, glacier importance. These data suggest that the glaciers are very important to current visitors. In the open-ended question (Q6) about why they came to the glacier region, respondents specifically mentioned the 'glacier/s' 131 times and they were implicit in the majority of other responses (e.g., those about seeing '*must-do*' or '*iconic places*', having '*heard about it*', '*wanting to see all of New Zealand*', and so on). The majority of responses to the open-ended question which asked about the most memorable aspect of visits were also strongly glacier-related: roughly half of the respondents who specifically mentioned the glaciers referred to either scenic flights or their enjoyment of other glacier activities (such as hikes on the glacier and in the glacier valleys) suggesting that active consumption or engagement with the of the glacier/s is important to many visitors.

When specifically asked, almost two thirds of all respondents (61.6%, $n=308$) reported that seeing the glacier was 'very important' in respect of their decision to visit the glacier region; the mean score for this question was $\bar{x}=6.25$ (out of a possible 7). Respondents were also given a list of 12 possible reasons for visiting the glacier region and asked how important each was to them. Four of the twelve reasons related to the glaciers, with 'to see a natural feature that may disappear in the future' and 'to see an easily accessible glacier' scoring the highest and third highest mean scores ($\bar{x}=6.01$ and $\bar{x}=5.61$, respectively). This finding suggests that tourism to the Fox Glacier and Franz Josef glaciers is already, at least in the minds of many visitors a 'last chance tourism' destination. As Dawson et al. (2011b) note, last chance tourism requires both a perception of vulnerability (or rarity) of a tourism feature, as well as motivation amongst tourists to experience what is vulnerable. There was less interest in wishing 'to learn about glaciers' ($\bar{x}=4.71$) and 'to learn about the impact of climate change on glaciers' ($\bar{x}=4.72$), however, suggesting that interest in the glaciers is relatively superficial.

3.4.4 The current glacier experience

Half of the visitors surveyed visited both glaciers, a figure considerably less than the 71.8 per cent surveyed by Espiner (2001), but consistent with the 44.3 per cent surveyed in 2010 by Espiner and Weiss (2010). In 2001, Espiner also reported that if visiting only one glacier, most were likely to choose Franz Josef because of its higher profile and the fact that it is the first glacier encountered by those travelling south. Our data suggests an equal split between glaciers for the single glacier visitors, which might be indicative of changing visitation patterns. It is plausible that where the two attractions are more time-consuming or expensive to visit than they were in the past, visitors are probably less inclined to visit both destinations.

The sampling methodology used also impacts to some degree on the reported frequencies of participation in glacier activities, with those doing commercial activities over represented. Wilson et al. (2012) reported that around 500,000 people visit the glacier valleys and the walk up the glacier valley/s to view the glaciers independently is the most popular activity. Our data show that of the 259 respondents who did at least one commercial activity, 87 had also independently visited the Franz Josef valley and 57 had visited the Fox Glacier valley.

The three aspects of the glacier experience and the five glacier visit aspects examined were identified from responses to most- and least-liked aspects of glacier visits explored through

open-ended questions in previous surveys (Espiner & Wilson, 2013a and 2013b); this research presents a robust statistical analysis of these aspects of the glacier experience and visit and provides clear evidence of a relationship between expectation and satisfaction. Satisfaction is greatest when visitor experience exceeds expectation; in the case of the glacier experience, this is encountering a larger glacier, cleaner ice and a more spectacular image than expected.

Given the importance of the seeing the glacier/s as a reason to visit, it was not surprising that almost 70 per cent of respondents had seen images of the glacier before their visit. What may concern some tourism operators and destination managers, however, was that just over a quarter of these respondents reported that the images they had seen were not accurate. A clear relationship was also found between the accuracy of glacier images and satisfaction with each of the three aspects of the glacier experience tested (size, the look of the ice and the look of the glacier overall).

Almost three quarters of respondents also reported having collected some information on what they could do at the glaciers prior to their arrival. Many had consulted multiple sources, and these could be grouped according to three methods of delivery: the internet, printed matter and personal communications. While these information sources were not explored in any detail, a number of respondents reported having been exposed to glacier-specific information from a variety of sources. These included having read about the region in guidebooks, being given information by tour guides/bus drivers, collecting activity brochures, consulting glacier company websites and being given personal recommendations by friends, family and other tourists. Any recommendation that is passed on is underpinned by that tourist's satisfaction with what they had encountered.

In terms of the experience, the qualities sought by visitors are opportunities to get close to the glacier/s, conditions that are not 'crowded' or too noisy and some engagement with interpretation and information. For each of these visit aspects, a significant relationship was found between expectation and satisfaction. Maintaining access routes to these glaciers is an on-going management issue and the provision of visitor access is vulnerable to adverse weather conditions. During this survey a clear relationship was found between satisfaction and getting close to the glacier; satisfaction was much lower for visitors who walked up the Fox Glacier valley track on those days when the track was shortened after heavy rain. Likewise, the 2013 Franz Josef Visitor Survey (Espiner & Wilson, 2013b), found that reports of crowding increased on the two days when the valley track was closed as a result of flooding. Espiner and Wilson (2013a) also reported that annoyance levels related to aircraft noise in the Franz Josef valley had increased significantly (since the previous monitor in 2009) as a result of the increase in the number of over-flights facilitating access for guided hikers after the terminal face collapse in mid-2012.

3.4.5 Implications of climate changes on visitor experience at the glaciers

Although there was a high level of agreement that climate change is happening, opinions over the cause of climate change were mixed. There was considerable uncertainty over the role of natural causes, with half agreeing and one third disagreeing. By comparison, just over 80 per cent agreed that climate change was a result of human activity. Levels of concern about climate change were also high, with 84.5 per cent of respondents reporting that they were concerned. A similar percentage (84%) thought that, over the next 20 years, the glaciers would get smaller as a result of climate change.

While over half of Becken et al.'s (2010) respondents did not know if weather patterns in New Zealand would change in the future, when asked to indicate how desirable a number of

specific weather and climate-related changes might be for tourists in New Zealand, the item 'reduction of snow cover and glaciers' had a mean score of only 2.07 (1=not at all desirable). When asked in an open-ended question what they thought the most important climate change-related issue for New Zealand would be, the reduction of snow cover/glaciers was one of six coded themes and 'glacier melting' was specifically noted 13 of the 19 times this was reported (Becken et al., 2010).

In the current research, the open-ended question about changes in the glacier over the next 20 years generated mostly generic comments (e.g., it will shrink, get smaller). There were, however, a number of specific references to the impact of glacier changes on the visitor experience. These all related to the independent valley walking experience, with a worst case scenario of a glacier that was no longer accessible. The more optimistic, but still potentially undesirable, impact was that the glacier/s would not be visible from current viewpoints, necessitating a longer walk for visitors. However, the 2013 Franz Josef Visitor Survey found that 80 per cent of respondents would be happier to walk further to see the glacier (Espiner & Wilson, 2013b).

If walking access to the glacier was no longer possible, over half of our respondents (56.5%) indicated that they would be prepared to take a flight, whilst more than a third (37.5%) would not; cost appeared to be the biggest influencing factor in this. More positively, almost two-thirds of respondents (61.4%) indicated that they would still visit the glacier region if they knew the glaciers were only accessible by helicopter. However, when asked if they would have still visited the glacier region if they knew they might not be able to see the glacier, a slightly larger percentage of respondents indicated that would not visit (45.6%), compared to those who would still visit (43.7%). This response appears to relate to the importance of glaciers as a visitor attraction more generally. More than two-thirds of all respondents (69.8%) said that they would go elsewhere to see a glacier if they had not been able to see one in the Westland *Tai Poutini* National Park indicating that destination substitution might be high in this regard (a finding also reported in recent studies on polar bear viewing (Dawson et al., 2010)).

While slightly more than 70 per cent of respondents reported doing at least one other activity whilst visiting the glacier region, almost a third did nothing else. With the exception of the hot pools (which was included with many of the commercial activity tickets available at Franz Josef), the most popular non-glacier activities were those that can be enjoyed for free. The most popular of these was a visit to Lake Matheson which is easily accessible from Fox Glacier village; visitors to the lake are able to take an easy circular bush walk, visit an award-winning café and souvenir shop, but it is best-known for the reflective views of the Southern Alps it offers (on a clear day). The limited interest visitors had in doing other activities suggest that it may be difficult to continue to attract visitors to the region if the glacier/s and associated glacier-activities were to become less accessible indicating that activity substitution may be low in this regard.

3.5 Future research

This New Zealand glacier research adds empirical data to a growing body of work addressing the last chance tourism paradox (see, for example, Lemelin et al., 2010). To date, researchers (including ourselves) have been cautious about asking 'leading' questions relating to last chance tourism, and questions still remain over whether tourists themselves perceive a particular destination as last chance tourism opportunity and the extent to which this actually drives visitation. Perhaps it is time to ask visitors more directly if they had seen media or advertising material alluding to 'last chance tourism' prior to visiting.

Another area of interest for future research is the concept of destination and activity substitution. In New Zealand, for example, the glaciers of Aoraki/Mt Cook National Park, located on the eastern side of the main divide, also offer glacier tourism experiences. Research into visitation at these glaciers would help us understand the extent to which visitors are able to substitute the glacier experiences they seek with alternatives. Also, of interest in respect of glacier tourism is the substitutability of glaciers on a global scale. Activity substitution – examining interest and likelihood of tourist engagement with new or changed glacier experiences – is also an important area of research given the current rapidity of glacier change.

Tourists' perceptions of the climate change impacts resulting from their own travel remains a fascinating area of research – especially those perceptions of international visitors to New Zealand, many of whom travel long distances to get here, and yet strongly believe that climate change is caused by human activity and express a high level of concern about climate change. Further, while the free walk is the most popular way to experience these glaciers at present, more than half would be prepared to take a flight if the walk was not possible. This gap between personal belief and tourist behaviour warrants closer analysis.

The speed of bio-physical change at these glaciers in recent years and the impact this has had on the visitor experience necessitates regular monitoring. A three-pronged research approach, examining the bio-physical changes, management and business responses and adaptation to glacier changes, as well as the impact of these on the visitor experience is required.

Chapter 4 Conclusion

This visitor survey presents a comprehensive snapshot of glacier tourism in the Westland *Tai Poutini* National Park during the 2013/14 summer season. The rapid and significant biophysical changes occurring at both Franz Josef and Fox Glacier challenge these data already, as significant access issues have arisen at Fox Glacier in the short time since fieldwork was completed, potentially changing the visitor experience. While our data do not capture these latest changes, this survey provides baseline data on the current visitor experience of the glaciers.

The glacier/s are the primary reason for visiting the region and, despite reports that current marketing images of the glaciers are not completely accurate, and that individual aspects of the glacier do not always match expectations, satisfaction levels with the glacier experience were still high. The significant relationships found between expectation and satisfaction on each the glacier experience and visit aspects tested emphasises the importance of managing visitor expectations. The prevalence of word of mouth (whether via tour guides, other tourists or internet sites such as Trip Advisor) as a source of information on the glaciers also highlights the importance of ensuring on-going visitor satisfaction.

For visitors, most of whom are in the glacier region for the first time, the concept of 'last chance tourism' may not be immediately relevant as they accept the conditions they encounter, rather than plan in advance for what they might be able to do. However, when asked to indicate the importance of a variety of reasons for visiting, the highest scoring of the non-glacier reasons were to be close to nature, to experience a sense of discovery and to experience places I have read about. In this respect, having accurate information on the glaciers and activities available is of utmost importance and presents significant challenges given the rapid changes in glacier access that have occurred in recent years.

In both glacier valleys, walking independently to the final rope barriers was the most popular activity and 'facilities in the glacier valleys' and 'getting close to the glacier' attracted the highest satisfaction ratings. As such, it is not surprising that future concerns are based around visitors' continuing ability to access the glacier in the same ways as currently possible. It is clear that the glaciers are icon visitor attractions, and bring significant numbers of tourists to the glacier region. While the vast majority do not pay to do commercial glacier activities, their visits do generate a lot of income for the glacier region economy as they stay one or two nights in paid accommodation during their visit. Although a wide range of non-glacier activities are available in the region, these do not appear to be very important to visitors with the exception of those that are non-commercial (and therefore free of charge).

From the tourism destination perspective, the ability to continue to attract visitors is vital to destination survival. Managing visitor expectations is difficult when conditions are changing rapidly and those responsible for supplying the glacier tourism experience face significant challenges associated with maintain appropriate access, visitor safety and operational costs. These business and management challenges, along with responses and adaptations to glacier change, were explored via a series of stakeholder interviews conducted in Stage 1 of this 'Last Chance Tourism' and Westland *Tai Poutini* National Park project.

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Appendices

Appendix 1 Survey form



New Zealand's specialist land-based university

Glacier Region Visitor Survey

Hello, I am from Lincoln University and I am doing a survey of visitors to the glacier region.

The survey has questions about your visit, including:

- the activities you are doing while at the glaciers
- your reasons for visiting
- your expectations and satisfaction

We also have some questions about climate change

Your involvement in this survey is completely voluntary and the survey will take around 15 minutes.

The survey is anonymous and you may withdraw your participation, including withdrawal of any information you have provided up until the completion of the survey. If you complete the survey, however, it will be understood that you have consented to participate in the project and consent to publication of the results of the project with the understanding that anonymity will be preserved.

If you require any further information about this project I have an information sheet I can give you, including our contact details.

To make it easier for you I will fill the survey form out - I have some laminated pages here for you to use which will help you with your responses to the questions.

Part A: *The first few questions are about your visit*

1. Is this your first visit to the glacier region?

1 Yes 2 No

If NO, when did you visit previously?

Which glacier did you visit?

What do you recall about the glacier(s) from that visit?

Year/time	FJ	FX	Recall/memory of visit

2. Where did you stay last night? _____

3. Where will you stay tonight?

4. How much time will you spend here in the glacier region (i.e., Franz Josef, Fox, Okarito, Gillespie's beach)?

1	A few hours (less than 4 hours)	Number of nights?
2	Half a day	
3	A full day, but I will not stay over night	
4	Stay one night	
5	Stay more than one night	
6	Unsure	

5. Where will you go on this visit?

1	ONLY Franz Josef Glacier
2	ONLY Fox Glacier
3	Visit BOTH glaciers
4	I will not see/visit the glaciers (village/carpark ONLY)
5	I have not decided yet

6. Why have you come to the glacier region?

7. How have you experienced the glacier(s)? (Multiple answers possible)

	FJ	FX
View from the car park ONLY		
Valley walk (part way ONLY)		
Valley walk (to final rope barrier)		
Walk to other glacier viewpoints (not valley)		
Guided hike on valley floor (not onto glacier)		
Guided hike onto glacier (walking access)		
Guided hike onto glacier (helicopter access)		
Scenic flight over glaciers (with snow landing)		
Scenic flight with no snow landing		
View film about the glaciers		
Other?		
I will not be seeing/visiting the glaciers		

8. Do you plan to do (or have you done) any of these other activities HERE AT THE GLACIERS?

Sky dive	Bicycle hire
Hot pools	Other bush walks (NOT glacier valleys)
Wildlife centre	Lake Matheson
Quad bikes	Gillespies Beach
Rafting	Maori performance
Kayaking	Other?
Hunting	
Horse trek	
Bird watching	NONE of these things

9. Of all the things you have done so far on this visit to the glacier region what has been the most memorable? (YELLOW PAGE)

10. How important was seeing the glacier in your decision to visit the glacier region?

1	2	3	4	5	6	7
Not at all important						Very important

11. These are some possible reasons given for visiting the glacier region. Thinking about your decision to come here how important was each of these?

		Not at all important					Very important	
		1	2	3	4	5	6	7
1	To be close to nature	1	2	3	4	5	6	7
2	To experience natural quiet	1	2	3	4	5	6	7
3	To experience solitude	1	2	3	4	5	6	7
4	To experience a sense of discovery	1	2	3	4	5	6	7
5	To have a story to tell	1	2	3	4	5	6	7
6	To be with friends and family	1	2	3	4	5	6	7
7	To see a natural feature that may disappear in the future	1	2	3	4	5	6	7
8	To experience places I have read about	1	2	3	4	5	6	7
9	To learn about glaciers	1	2	3	4	5	6	7
10	To learn about the impacts of climate change on the glaciers	1	2	3	4	5	6	7
11	To view an easily accessible glacier	1	2	3	4	5	6	7
12	To experience a rainforest	1	2	3	4	5	6	7

12. What did you expect the (glacier they have most experience of) to be like and how satisfied were you with what you saw? (PURPLE PAGE)

			Very dissatisfied					Very satisfied								
			1	2	3	4	5	6	7							
I expected the size of the glacier to be...	1	much smaller	1	2	3	4	5	6	7							
	2															
	3															
	4															
	5	much bigger no idea								1	2	3	4	5	6	7
	6															
	7															
	8															
I expected the glacier ice to look	1	much dirtier	1	2	3	4	5	6	7							
	2															
	3															
	4															
	5	much cleaner no idea								1	2	3	4	5	6	7
	6															
	7															
	8															

Overall, I expected the glacier to be	1	much	less								
	2	spectacular									
	3										
	4										
	5				1	2	3	4	5	6	7
	6										
	7										
	8	much	more								
	spectacular										
	no idea										

13. Did you see any images of the glacier before your visit today?

1 Yes 2 No (go to Q15) 3 Don't know

14. In these images, how accurate was the portrayal of the current condition of glacier?

1	2	3	4	5	6	7
Not at all accurate						Very accurate

15. Prior to your arrival in the glacier region, did you obtain any information about what activities you could do here?

1	I already knew about the glaciers from my own personal experience
2	I got no information about the glaciers in advance
3	Yes, I did get other information about the glaciers - from where?



Brochures	Guide books	Travel blogs
Tourism websites	Trip Advisor	Other tourists

16. What did you expect from your glacier visit and how satisfied were you? (GREEN PAGE)

			Very dissatisfied					Very satisfied	
a. Getting close to glacier I expected to be able to get much closer to the glacier ...	1	Completely disagree							
	2								
	3								
	4								
	5		1	2	3	4	5	6	7
	6								
	7	Completely agree did not know /NA							
	8								
b. Number of people I expected there to be ...	1	significantly more							
	2								
	3								
	4								
	5		1	2	3	4	5	6	7
	6								
	7	significantly fewer did not know							
	8								
c. Peacefulness in the valley I expected the glacier valley experience to be....	1	much noisier							
	2								
	3								
	4								
	5		1	2	3	4	5	6	7
	6								
	7	much quieter did not know							
	8								
d. Interpretation and information I expected the interpretation and information about the glacier to be....	1	much less detailed							
	2								
	3								
	4								
	5		1	2	3	4	5	6	7
	6								
	7	much more detailed did not know							
	8								
e. Facilities in the glacier valley I expected the glacier valley facilities to be....	1	much less developed							
	2								
	3								
	4								
	5		1	2	3	4	5	6	7
	6								
	7	much more developed did not know							
	8								

Part B: *These questions are about climate change and its impacts*

17. Do you think climate change is happening? (PINK PAGE)

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	Don't know

18. To what extent do you agree or disagree with the following

a. Climate change is a result of natural causes

1	2	3	4	5	6	7	8
Completely disagree						Completely agree	Don't know

b. Climate change is a result of human activity

1	2	3	4	5	6	7	8
Completely disagree						Completely agree	Don't know

19. How concerned are you about the effects of climate change?

1	2	3	4	5	6	7	8
Not at all concerned						Extremely concerned	Don't know

20. What do you think will happen to the glacier over the next 20 years?

The next four questions are about what changes in the glacier might mean for visitors like you

- 21. If the glacier was NOT easily accessible by foot would you be more likely to take a flight onto/over the glacier?**

1	2	3	4	5	6	7	8	
No, definitely not							Yes, definitely	Don't know

- 22. If you knew the ONLY way to see the glacier was by helicopter would you have visited the glacier region?**

1	2	3	4	5	6	7	8	
No, definitely not							Yes, definitely	Don't know

- 23. Would you have visited the glacier region if you knew you might not be able to see the glacier?**

1	2	3	4	5	6	7	8	
No, definitely not							Yes, definitely	Don't know

- 24. If you had not been able to see a glacier here, would you go elsewhere to see one?**

1	2	3	4	5	6	7	8	
No, definitely not							Yes, definitely	Don't know

Part C: *To finish I just have a few questions about you* (BLUE PAGE)

25. Age

1	≤19 years	5	50-59 years
2	20-29 years	6	60-69 years
3	30-39 years	7	70-79 years
4	40-49 years	8	80+ years

26. Gender

1	Male
2	Female

27. What is your highest education level?

1	Primary/elementary school
2	Secondary/high school
3	Training/trade
4	University
5	Other

28. Where do you normally live?

1	New Zealand (go to Q 29)	
2	Australia	
3	United Kingdom	
4	Germany	
5	United States	
6	Other	Which country?

29. If you live in New Zealand - which region?

1	Southland	9	Manawatu-Wanganui
2	Otago	10	Taranaki
3	Canterbury	11	Hawkes Bay
4	West Coast	12	Gisborne
5	Marlborough	13	Bay of Plenty
6	Nelson	14	Waikato
7	Tasman	15	Auckland
8	Wellington	16	Northland

SURVEY RECORDS

Date	Franz Josef	Car park	Company
Surveyor	Fox Glacier	Village	

Appendix 2
Laminated answer booklet



New Zealand's specialist land-based university



Glacier Region Visitor Survey

PART A: ABOUT YOUR VISIT

Q1 Is this your first visit to the glacier region?



Q2 Where did you stay last night?

Q3 Where will you stay tonight?

Q4 How much time will you spend here in the glacier region?

Q5 Where will you go on this visit?















1	ONLY Franz Josef Glacier
2	ONLY Fox Glacier
3	Visit BOTH Franz Josef & Fox Glaciers
4	I will not see/visit the glaciers
5	I have not decided yet

Q6 Why have you come to the glacier region?

Q7 How have you experienced the glacier(s)?



Q8 Other activities in the glacier region

1		Sky dive	8		Horse trek
2		Hot pools	9		Bird watching
3		Wildlife centre	10		Bike hire
4		Quad bikes	11		Other bush walks
5		Rafting	12		Lake Matheson
6		Kayaking	13		Gillespies Beach
7		Hunting	14		Maori performance

Q9 Of all the things you have done so far on this visit to the glacier region what has been the most memorable?

Q10 How important was seeing the glacier in your decision to visit the glacier region?

1	2	3	4	5	6	7
Not at all important						Very important



Q11 Possible reasons for visiting the glacier region

		Not at all important					Very important	
		1	2	3	4	5	6	7
1	To be close to nature	1	2	3	4	5	6	7
2	To experience natural quiet	1	2	3	4	5	6	7
3	To experience solitude	1	2	3	4	5	6	7
4	To experience a sense of discovery	1	2	3	4	5	6	7
5	To have a story to tell	1	2	3	4	5	6	7
6	To be with friends and family	1	2	3	4	5	6	7
7	To see a natural feature that may disappear in the future	1	2	3	4	5	6	7
8	To experience places I have read about	1	2	3	4	5	6	7
9	To learn about glaciers	1	2	3	4	5	6	7
10	To learn about the impacts of climate change on the glaciers	1	2	3	4	5	6	7
11	To view an easily accessible glacier	1	2	3	4	5	6	7
12	To experience a rainforest	1	2	3	4	5	6	7

Q12 Expectations & satisfaction with the glacier

I expected the **size of the glacier** to be

1	2	3	4	5	6	7	8
Much smaller						Much bigger	Don't know

How satisfied were you with the **size** of the glacier?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

I expected the **glacier ice** to look

1	2	3	4	5	6	7	8
Much dirtier						Much cleaner	Don't know

How satisfied were you with what the **glacier ice** looked like?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

Overall, I expected the glacier to be

1	2	3	4	5	6	7	8
Much less spectacular						Much more spectacular	Don't know

How satisfied were you with the **overall look of the glacier**?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

Q13 Did you see any images of the glacier before your visit today?

Yes (go to Q14) No (go to Q15)

Q14 In these images, how accurate was the portrayal of the current condition of the glacier?

1	2	3	4	5	6	7
Not at all accurate						Very accurate

Q15 Prior to your arrival in the glacier region, did you obtain any information about what activities you could do here?

1	I already knew about the glaciers from my own personal experience
2	I got NO information about the glaciers in advance
3	YES, I did get other information about the glaciers



Where did you get this information from?

Q16 Expectations & satisfaction with your glacier visit

a. I expected to be able to get much closer to the glacier ...

1	2	3	4	5	6	7	8
Completely disagree						Completely agree	Don't know

How satisfied were you with how **close** you were able to get?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

b. Number of people - I expected there to be

1	2	3	4	5	6	7	8
Significantly more people						Significantly fewer people	Don't know

How satisfied were you with the **number of people** at the glacier?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

c. Peacefulness in the valley - I expected the glacier valley experience to be

1	2	3	4	5	6	7	8
Much noisier						Much quieter	Don't know

How satisfied were you with the level of **peacefulness in the glacier valley**?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

d. I expected the **interpretation and information** about the glacier to be

1	2	3	4	5	6	7	8
Much less detailed						Much more detailed	Don't know

How satisfied were you with the **interpretation and information**?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

e. **Facilities in the glacier valley** - I expected the glacier valley facilities to be

1	2	3	4	5	6	7	8
Much less developed						Much more developed	Don't know

How satisfied were you with the **facilities** in the glacier valley?

1	2	3	4	5	6	7
☹ Very dissatisfied						☺ Very satisfied

PART B: CLIMATE CHANGE AND ITS IMPACTS

Q17 Do you think climate change is happening?

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	
							Don't know

Q18 To what extent do you agree or disagree with the following ...

a. Climate change is a result of natural causes

1	2	3	4	5	6	7	8
Completely disagree						Completely agree	
							Don't know

b. Climate change is a result of human activity

1	2	3	4	5	6	7	8
Completely disagree						Completely agree	
							Don't know

Q19 How concerned are you about the effects of climate change?

1	2	3	4	5	6	7	8
Not at all concerned						Extremely concerned	
							Don't know

Q20 What do you think will happen to the glacier over the next 20 years?

Q21 If the glacier was NOT easily accessible by foot would you be more likely to take a flight onto/over the glacier?

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	Don't know

Q22 If you knew the ONLY way to see the glacier was by helicopter would you have visited the glacier region?

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	Don't know

Q23 Would you have visited the glacier region if you knew you might not be able to see the glacier at all?

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	Don't know

Q24 If you had not been able to see a glacier here, would you go elsewhere to see one?

1	2	3	4	5	6	7	8
No, definitely not						Yes, definitely	Don't know

PART C: ABOUT YOU

Q25 What age bracket are you in?

1	≤19 years
2	20-29 years
3	30-39 years
4	40-49 years
5	50-59 years
6	60-69 years
7	70-79 years
8	80+ years

Q26 Your gender

Q27 What is your highest education level?

1	Primary/elementary school
2	Secondary/high school
3	Training/trade
4	University
5	Other

Q28 Where do you normally live?

1	New Zealand (go to Q29)
2	Australia
3	United Kingdom
4	Germany
5	United States
6	Other (which country?)

Q29 If you live in New Zealand - which region?

1	Southland	9	Manawatu-Wanganui
2	Otago	10	Taranaki
3	Canterbury	11	Hawkes Bay
4	West Coast	12	Gisborne
5	Marlborough	13	Bay of Plenty
6	Nelson	14	Waikato
7	Tasman	15	Auckland
8	Wellington	16	Northland

Thank you very much for doing our survey - we hope you enjoy the rest of your stay

Appendix 3 Research information sheet

Lincoln University
Environment, Society and Design Faculty



Research information sheet

You are invited to participate as a subject in a project entitled:

Glacier Tourism and Westland Tai Poutini National Park: Stage Two (Visitor Perspectives)

The aim of the research is to better understand how climate-induced change at both Fox and Franz Josef glaciers affect visitor behaviour; stimulate a change in tourism products and affect management decisions and policies relating to conservation and visitor use. The research is being undertaken independently by staff at Lincoln and Canterbury universities and is funded through the Lincoln University Research Fund. This project is part of a wider international comparative project with case studies also taking place in Canada and Australia.

Your participation in this project will involve an interviewer administered survey of approximately 15 minutes duration. This interview will include questions about your experiences of the glacier(s) and the nature of environmental change and implications for the glaciers. Your participation in this project is voluntary and you may also decline to answer any question. You may withdraw from the research at any time during the survey.

Some of the results of the project may be compared with the data collected from the other international case studies. The results may also be presented at an academic conference and be published (such as a Research Report or an academic journal), but you may be assured of your anonymity in this investigation.

We thank you for your participation in the project

The fieldwork component of the project is being carried out by:

Dr Jude Wilson, Senior Research Officer, Lincoln University jude.wilson@lincoln.ac.nz
Tel: (03) 423 0502

Dr Emma Stewart, Senior Lecturer, Lincoln University emma.stewart@lincoln.ac.nz
Tel: (03) 423 0500

Dr Stephen Espiner, Senior Lecturer, Lincoln University stephen.espiner@lincoln.ac.nz
Tel: (03) 423 0485

We will be pleased to discuss any concerns you have about participation in the project or you may contact the Dean of our Faculty at Lincoln University:

Dr Greg Ryan, Dean, Faculty of Environment, Society & Design, Lincoln University
greg.ryan@lincoln.ac.nz Tel: (03) 423 0401

The project has been reviewed and approved by the Lincoln University Human Ethics Committee.

Appendix 4 Survey records

Survey Period 1 (shaded) & Survey Period 2: dates, weather conditions & survey totals

Date	Weather	Franz Josef valley	Franz Josef village	Fox Glacier valley	Fox Glacier village	Total
27-Dec	Sunny, clear	9	-	-	-	9
28-Dec	Sunny, clear	-	-	2	34	36
29-Dec	Morning good, heavy afternoon rain, then clear	-	35	-	-	35
30-Dec	Heavy morning rain, clearing afternoon	-	-	-	-	-
31-Dec	Sunny morning, cloud in afternoon	11	28	-	-	39
1-Jan	Rain all day	-	-	-	15	15
2-Jan	Rain all day, heavy in morning	-	-	-	14	14
3-Jan	Rain all day, heavy in morning	-	-	-	3	3
4-Jan	Cleared during morning, then mostly sunny	40	-	-	-	40
5-Jan	Some sunny spells, then heavy showers with thunder & lightning	-	-	16	-	16
4-Feb	Drizzle & low cloud all day	-	-	-	-	-
5-Feb	Fine all day	-	-	32	-	32
6-Feb	Hot, sunny day	9	-	-	-	9
7-Feb	Clear morning, afternoon cloud	-	-	66	4	70
8-Feb	Morning fog, clear afternoon	18	29	-	-	47
9-Feb	Morning fog, clear afternoon	20	8	-	-	28
10-Feb	Clear day	-	-	15	16	31
11-Feb	Mixed conditions, not clear enough for flights	33	-	-	7	40
12-Feb	Mixed, some heavy rainfalls	-	-	-	17	17
13-Feb	Mixed, some short clear spells	-	-	14	5	19
Total		140	100	145	115	500

Appendix 5 Countries of residence of survey sample

	Country of residence	Number of respondents (N=500)
Australasia & Oceania	New Zealand	77
	Australia	94
	New Caledonia	1
Europe	UK	95
	Germany	44
	Netherlands	16
	Switzerland	16
	Denmark	13
	France	12
	Ireland	8
	Sweden	6
	Belgium	3
	Finland	2
	Czech Republic	1
	Austria	1
	Spain	1
	Poland	1
	Malta	1
Americas	USA	59
	Canada	22
	Guatemala	2
	Brazil	1
Asia	Singapore	7
	India	6
	Malaysia	2
	China	1
	Thailand	1
	Hong Kong	1
	Nepal	1
Middle East	Israel	5