Climate Change Adaptation in the Aotearoa New Zealand Tourism Sector

Report of a Cross-Sector Engagement Session

Debashish Munshi, Priya Kurian, Sandy Morrison, Lyn Kathlene, Raven Cretney, and Malcolm Doo
University of Waikato

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National SCIENCE Challenges
THE DEEP SOUTH
Te Kōmata o Te Tonga

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Cover image of Knoll Ridge Cafe by Chris Sisarich.

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INTRODUCTION

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Current research in the natural and social sciences points to significant impacts of climate change on tourism, an important economic lifeline for Aotearoa New Zealand. So how can people involved with the tourism sector manage risks to the sector? What ought to be some steps the government and the tourism sector can take in response to climate change threats? A team of researchers from the University of Waikato organized a citizen panel in Wellington on 9 November 2018 where climate scientists, social scientists, and policy makers interacted with tourism professionals to look at ways in which the tourism sector could manage risk in the wake of climate change and adopt sustainable practices.

AIMS AND OBJECTIVES

Photo by Tyler Lastovich. Lake Hauroko on Unsplash

The larger project has two broad aims.

1. To design a new and robust culture-centred public engagement framework that can open up clearer channels of communication between scientists working on climate adaptation and stakeholders, iwi and hapû, and community groups, thereby facilitating the uptake of climate science.

2. To develop a set of policy recommendations on risk management to strengthen science-based climate adaptation for sustaining NZ's economy and society. The new and innovative engagement framework will advance knowledge in the theory and practice of public engagement and improve decision-making on climate adaptation.

These aims align directly with the Deep South Challenge Mission of enabling 'New Zealanders to adapt, manage risk, and thrive in a changing climate' and with the Challenge's configuration as 'a framework that connects society with scientists'[i]. The project is designed to specifically relate to the Challenge's *Engagement*[ii] programme and build on research on public engagement on climate change adaptation.

The Citizen Panel in Wellington was a critical part of the larger project. Apart from generating data for analysis, the session fulfilled a significant Engagement objective of the Deep South Challenge to develop innovative methodologies that motivate target public groups to act on climate change adaptation. It also drew on and contributed to the *Vision Mâtauranga*[iii] programme of the Challenge by identifying and integrating Mâori perspectives into deliberations on collective actions on climate adaptation.

VISION MĀTAURANGA

Photo by Bryn Parish on Unsplash Picton Punga Fern

Whakataka te hau ki te uru
Cease the winds from the west

Whakataka te hau ki te tonga
Cease the winds from the south

Kia mākinakina ki uta
Let the breeze blow over the land

Kia mātaratara ki tai
Let the breeze blow over the ocean

E hī ake ana te atakura
Let the red-tipped dawn come with a sharpened air

He tio, he huka, he hau hū
A touch of frost, a promise of a glorious day

Tīhei mauri ora!

The Objective of the Deep South Challenge Vision Mâtauranga[iii] programme is:

- 'To strengthen the capacity and capability of iwi/hapû/whânau and Mâori business to support planning and decision-making about climate change risks, impacts and adaptation.'[iii]

The five strategic elements of the programme are[iv]:

- Kaupapa Mâori research principles
- Governance Mâori
- Engagement, collaboration and partnerships
- Research capability, capacity and leadership
- Transformative context and future-focused research

VISION MĀTAURANGA AND TOURISM[v]

- Kaitiakitanga: Guardians and protectors – Access to information and research to understand what climate change means for Mâori/iwi/hapû and determine and lead the best adaptation options
- Tangible impacts: Destruction of cultural sites (by sea-level rise, for example); the disappearance of spiritually important species and of plants and animals used for traditional food, medicine and other cultural practices; rapid changes to culturally-significant environmental patterns, indicators, and calendars; economic impacts on livelihoods
- Intangible impacts: Potential loss of mâtauranga Mâori (retention of knowledge in its many forms); spiritual and cultural toll as inability to practice cultural traditions that have been passed down through countless generations

WHY CLIMATE CHANGE AND TOURISM?

Okana River flood 2011 shona_mackintosh Flickr

Climate change is an increasingly urgent challenge for many industries, including the tourism sector. The projections for a changing climate in the 2018 Intergovernmental Panel on Climate Change (IPCC) report state that warming of approximately 1.0C has already occurred above pre-industrial levels[vi].

Projections suggest that rising temperatures will have an impact on a number of natural and human systems, including increases in mean temperature, heavy precipitation, and the probability of drought. There are a number of implications for tourism in Aotearoa New Zealand:

- Changing rainfall patterns, and a likely increase in 'very extreme rainfall' and flooding in all regions[vii]
- An increase in drought frequency and intensity in many regions[viii]
- A projected decrease in snowfall, with one scenario suggesting a reduction of 30 snow days or more per year by 2090[viii]
- Sea level rise in the Pacific region is expected to be around 10% higher than the global average due to local conditions[ix]

BACKGROUND TO THE CROSS-SECTOR ENGAGEMENT SESSION

Interviews

The research team interviewed 30 people across both North and South Islands of Aotearoa New Zealand on the impacts of climate change on the country with a strong focus on the tourism sector. The interviews, which were carried out face-to-face or via telephone, covered tourism operators, industry representatives, policy planners and analysts in central and local government institutions, and community organisations, including Mâori collectives, in Auckland, Christchurch, Queenstown, Thames, Waitomo, and Wellington. The interviews traversed a wide range of issues including specific economic, social, and cultural risks of a rapidly changing climate and the priorities on planning adaptation measures.

Our interviews showed that climate change was acknowledged as an issue by some participants more than others. Many participants appeared unaware of the wider potential implications of climate change for New Zealand and needed prompting to consider the impacts on tourism. The ski industry and coastal regions were the focus of some concern, but there was less cognisance of the potential for wider disruption of the tourism industry caused by climate change, such as sea level rise and severe weather events. Some felt that the tourism industry was not at risk from climate change despite generally accepting the premise that it is occurring.

However, when encouraged to think more about the impacts of climate change, participants pointed to issues around infrastructure. This was often connected to existing infrastructure concerns around tourist numbers and capacity. One of the challenges with this issue is that many tourism businesses are small or medium sized enterprises and do not have a stake in large infrastructure projects.

In relation to adapting to climate change, interviewees described the varying capacity of businesses to adapt, especially the limited resources of small businesses that tended to focus on short term goals.

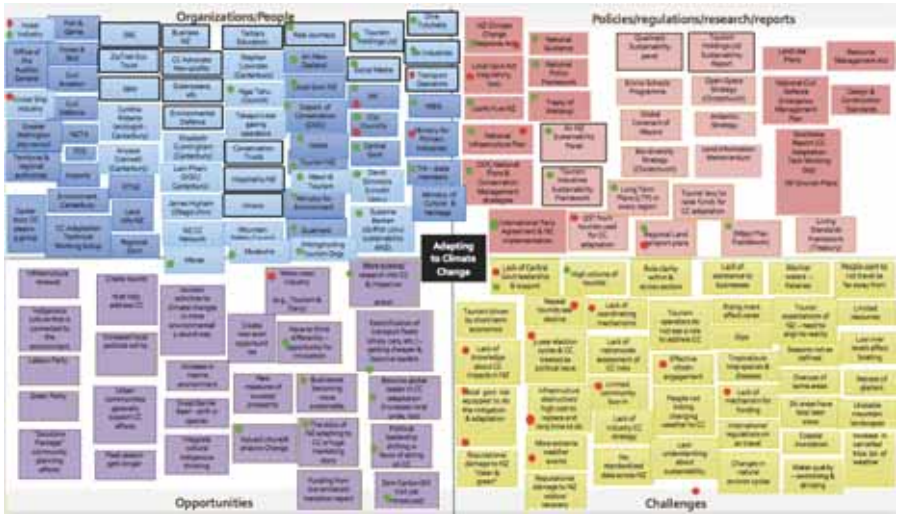
Some of the key points of concern expressed were:

- Lack of clearly delineated policies around climate change adaptation
- Inability of businesses to strike a balance between business profitability and environmental responsibility
- Blindspots created by the continued emphasis on short-term goals of profitability
- Differences between operators focused on high-volume tourism and high-quality tourism
- Lack of coordinated risk assessment strategies to systematically prepare for climate change adaptation
- Business as usual is the default setting

System mapping sessions

The findings from the interviews formed the basis for two system mapping sessions with 12 participants from the tourism sector (based in Auckland, the Coromandel Coast, Northland, and Rotorua in the North Island and Queenstown and Nelson in the South Island). These sessions were conducted over the Zoom virtual platform on 19 March and 12 September 2018. The maps emerging from the sessions provided a visual depiction of key actors and organizations that make up and/or influence a system, as well as their relationships to a given issue and to one another. The maps helped to distil some of the key issues around climate change and tourism and identify leverage points, opportunities for collaboration, and breakages that could undermine effective achievement of the goals of industry-specific climate adaptation strategies.

The Systems Mapping sessions highlighted:



- A wide range of climate change impacts on the tourism sector, including season changes, severe weather events such as storms, droughts and floods, increase in weeds and bugs, deterioration of the quality of water bodies, access to caves, mountain safety, and changes to the landscape that attracts tourists to NZ
- Issues with funding, co-ordination, leadership and responsibilities for adaptation
- Inconsistencies between short term goals/growth and lack of long-term considerations in tourism industry
- Potential opportunities to upgrade infrastructure to meet climate change challenges while also improving the quality/capacity of tourism
- Need to think 'outside the box' to plan tourism opportunities for the future
- Need to see climate change adaptation and tourism from within Te Ao Mâori
- Opportunities for coordinated action plans involving central and local government, scientists, and the tourism sector

THE CITIZEN PANEL

Photo by Jefferson Santos on Unsplash Bethels Beach

Following the system mapping sessions, which highlighted climate scientists, government officials, tourism industry executives, and Mâori as among the key actors in developing climate adaptation strategies for the tourism sector, the research team organised a national citizen panel for representatives of the key actors to engage with tourism professionals and businesspersons.

The session was held at the Cliftons Convention Centre on 100 Willis Street, Wellington, on Friday, 9 November 2018, just a day after the annual Tourism Summit organised by Tourism Industry Aotearoa (TIA) in Wellington.

The session was attended by 32 participants, which included five climate scientists, four Tourism Industry Aotearoa (TIA) executives, three government officials, and representatives of a wide range of tourism enterprises from both North and South Islands. In addition, one tourism sector participant signed in via the Zoom virtual platform. About 25% of the participants identified as being of Mâori heritage.

The panel began with presentations by scientists and policy makers on climate change in Aotearoa New Zealand and its effects on tourism. Participants then discussed initial tourism sector insights obtained from interviews and system mapping sessions.

Tourism and climate change adaptation citizens panel at a glance

32 participants from the tourism sector, government and the research sector

97% were concerned or very concerned about climate change

60% felt high uncertainty regarding the impact of climate change on the tourism sector

Top challenge for Tourism: Lack of New Zealand climate change adaptation strategy

Top opportunity for Tourism: To think differently about climate change - an opportunity for innovation

CLIMATE SCIENCE AND TOURISM

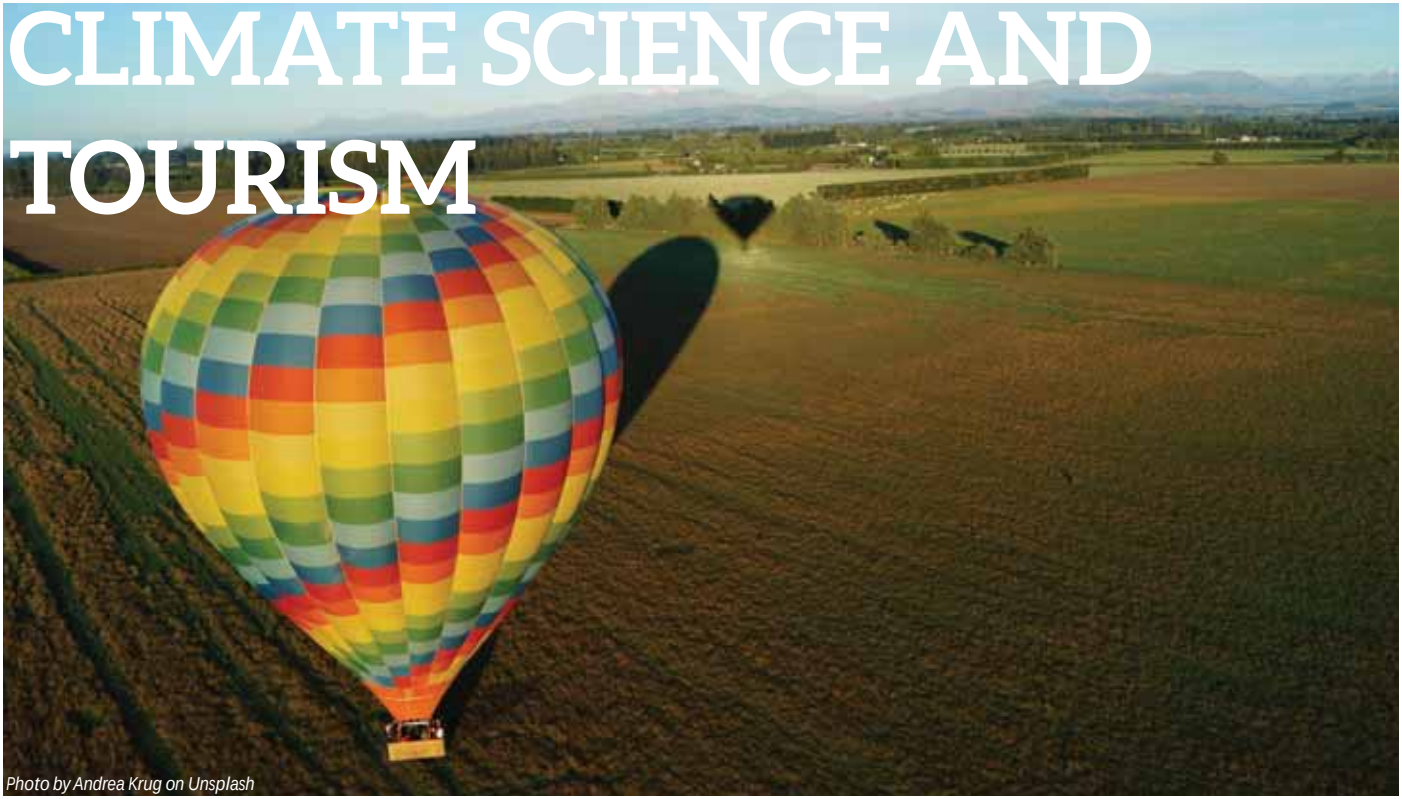


Photo by Andrea Krug on Unsplash

Climate Scientists Andrew Tait and Olaf Morgenstern (NIWA) and Inga Smith and Shona Mackie (University of Otago) presented snapshots of research on scientific tracking of climate change, including climate-modelling exercises, to the citizen panel. They communicated to the audience the global context of climate science and tourism and the need for urgent action on climate change adaptation.

Some of the impacts of climate change already felt and likely to be exacerbated in the coming years include:

- Sea-level rise, storm surges, and flash flooding damaging infrastructure, especially in coastal areas, and transport systems
- Warmer climate threatening biodiversity and increasing spread of pests, weeds, and diseases
- Changing climate affecting Aotearoa New Zealand's landscape which is a major draw for tourists

Among the issues raised was also the impacts of tourism on climate change and how these impacts could be addressed.

THE NEED FOR ADAPTATION

Photo by Tim Marshall on Unsplash Maori Bay

As the climate changes, it is crucial that Aotearoa New Zealand and industries such as those in the tourism sector are able to respond and adapt. Climate change adaptation refers to both short- and long-term strategies that respond to actual or expected impacts from climate change in socio-ecological systems[x]. Changing climatic conditions are likely to impact the tourism industry. Past weather events give an indication of the type of challenges that tourism businesses might face in the future, including severe weather events, road and walking track closures, cancellation of activities and reduced tourist stays due to bad weather[xi].

An interactive polling tool helped gather live information on the perspectives of the participants at the citizen panel. The Slido software used facilitated real-time responses throughout the proceedings. While not all participants responded to each question, the overall responses formed the basis for preliminary findings.

Moving into interactive breakout sessions, participants brainstormed adaptation strategies for the tourism sector, including how individual organisations could develop their own specific adaptation efforts. Participants then voted on the strategies using the live polling tool.

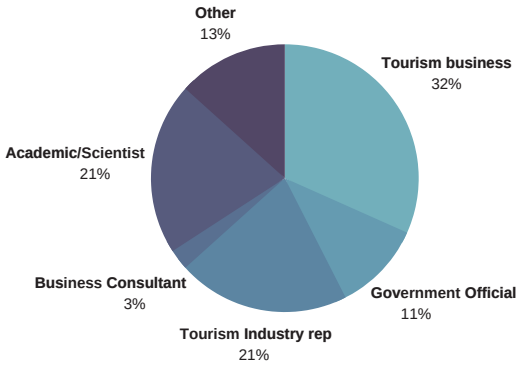
The citizen panel wrapped up with a discussion on strategies for adaptation in the tourism sector and reflections on actions that could be taken as next steps.

PRELIMINARY FINDINGS

Photo by Aleks Dahlberg on Unsplash Piha

We started the citizen panel by asking several questions relating to demographics and perceptions of climate change. Panel participants represented a range of business and community interests, including tourism businesses and industry representatives, tourism support businesses, iwi representatives, scientists, academics and business consultants. The majority of participants were very concerned (97% were "concerned" or "very concerned"). The levels of concern were significantly higher than at the interviews stage, possibly because the participants who chose to attend the citizen panel were mainly those who were actively thinking about climate impacts on tourism. Overall, however, there was a high level of uncertainty regarding how climate change would impact the tourism sector as a whole as well as individual tourism businesses.

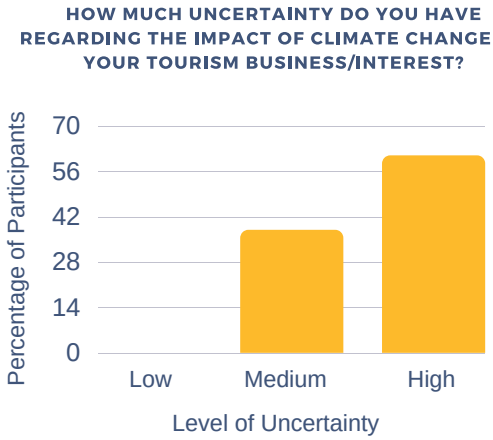
Who Attended?

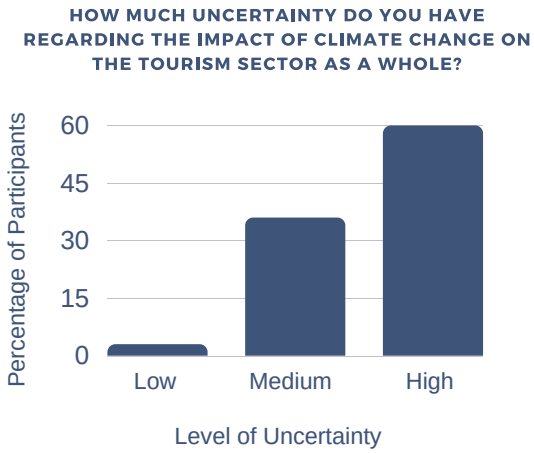


53%
WERE VERY CONCERNED ABOUT CLIMATE CHANGE

44%
WERE CONCERNED ABOUT CLIMATE CHANGE

3%
WERE NOT VERY CONCERNED ABOUT CLIMATE CHANGE





After the expert presentations, we asked participants to discuss and vote on the top five challenges and opportunities in the sector. These challenges and opportunities were generated through the systems mapping process (see 'Background Section'). The top challenges for the sector centred around public policy, financing, and science including the lack of a New Zealand climate change adaptation strategy and a perceived lack of knowledge about the impact of climate change on New Zealand. On the other hand, the opportunities to the tourism sector included the potential for businesses to work together across industries and to become more sustainable. Participants also highlighted the opportunity to think differently about climate change and devise innovative interventions.

TOP 5 CHALLENGES FOR THE TOURISM SECTOR

- LACK OF NZ CLIMATE CHANGE ADAPTATION STRATEGY
- INFRASTRUCTURE DESTRUCTION OCCURRING/INCREASING DUE TO CLIMATE EVENTS/ HIGH COST TO REPLACE
- LACK OF KNOWLEDGE ABOUT CLIMATE CHANGE IMPACTS IN NZ
- LACK OF COORDINATING MECHANISMS TO ADDRESS CLIMATE CHANGE
- LACK OF MECHANISM FOR CLIMATE CHANGE FUNDING

TOP 5 OPPORTUNITIES FOR THE TOURISM SECTOR

- HAVE TO THINK DIFFERENTLY ABOUT CLIMATE CHANGE – AN OPPORTUNITY FOR INNOVATION
- MORE CROSS INDUSTRY COLLABORATION (E.G., TOURISM & DAIRY)
- POLITICAL LEADERSHIP IS SHIFTING IN FAVOUR OF ACTING ON CLIMATE CHANGE
- INTEGRATE CULTURAL INDIGENOUS THINKING
- BUSINESSES BECOMING MORE SUSTAINABLE

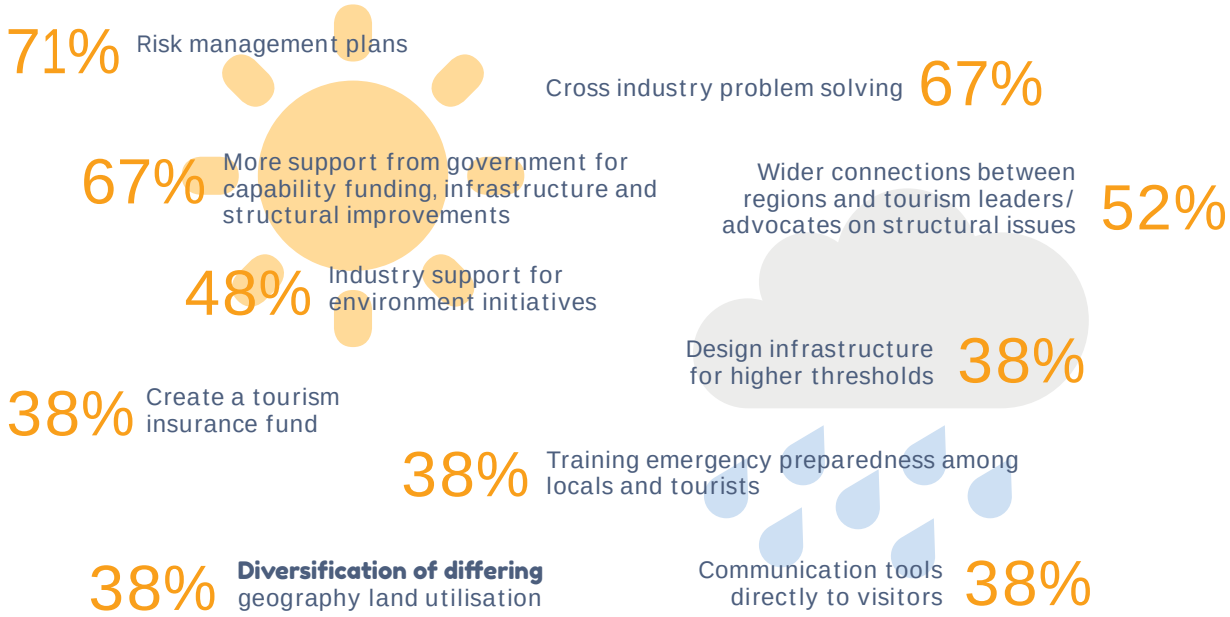
Following the live polling, breakout groups focussed on discussing adaptation strategies for the tourism sector for three climate change challenges – loss of snow and ice cover, sea level rise, and an increase in frequency and duration of floods and droughts. All of the suggested strategies were then collected and uploaded to Slido. Participants were able to view all the suggested strategies, discuss them, and vote for the ones they thought were good ideas for adaptation.

The infographics below present a summary of the adaptation strategies generated and discussed by groups and the percentage of votes for each strategy. There was no limit to the votes able to be cast.

Themes that emerged across the three challenges include:

- A focus on technological solutions and assistance
- The kinds of actions the tourism sector can take to lead the way
- The need for government support and guidance

ADAPTATION STRATEGIES FOR AN INCREASE IN FREQUENCY AND DURATION OF DROUGHTS AND FLOODS



ADAPTATION STRATEGIES FOR LOSS OF SNOW & ICE COVER

81% Diversifying experience and alternative winter tourism

54% Innovate and work together to design experiences that work within constraints

46% Electric/solar/circular/ renewable energy economy planning and implementation

46% **Look into how countries have historically adapted** and evolved when ice has disappeared

42% **Snow machines run off renewable** energy and are carbon neutral

Greater water storage 31%

31% **Virtual experiences to tell the** story of glaciers

Increase mountain biking 27%

Move to grass skiing 19%

19% **Environmentally friendly additives for** snowmaking at warmer temperatures

ADAPTATION STRATEGIES FOR SEA LEVEL RISE

62% Working as an industry with authorities on early and long term regional and national planning

52% **Climate change modelling** used to inform waterfront development decisions

52% Build and replace infrastructure to higher land, including strengthening and moving key assets

48% Invest in storm water infrastructure

43% **Good modelling for** coastal impacts

Become a world leader in showcasing new and innovative ways of dealing with sea level rise 42%

33% Create new products as opportunities arise to get ahead of the curve

33% Airport adaptation for coastal cities

33% Manage endemic species to survive

Some of the technological solutions suggested included technology for environmentally-friendly snow making, increased uptake of electric vehicles, and virtual tourism experiences.

Industry driven strategies included developing risk management plans, leading environmental initiatives and creating new products to get ahead of the curve. However, some strategies required working with local and central government on regional planning and structural issues.

Tourism sector participants highlighted the need for capability funding from the government to boost climate change initiatives.

Several participants across the board focused on diversifying or changing tourism products in addressing each climate change challenge scenario. These included:

- Strategies for diversifying land utilisation in response to droughts and floods
- Strategies for diversifying tourism experiences to include grass skiing, mountain biking and virtual experiences in relation to loss of snow and ice cover
- Use of climate change modelling data to inform waterfront development to meet threat of sea level rise

Photo by Grumpylumixuser

QUESTIONS, RESPONSES, AND INSIGHTS

1. What additional climate change data/information does the tourism sector need to consider adaptation strategies?

Climate Change Information Needed	What will it take to get the data/ information?	Timeframe
The current data need to be communicated better	Outreach from science/environmental communities Awareness raising of publicly accessible data, e.g, summaries of IPCC reports, easily-digestable climate science reports	1 year
Updated projections on changes to snow cover/ice cover	Dissemination of data from current projects on snow/ice	1 year
Region-specific data as well as projections on sea-level rise, humidity, precipitation, wind velocities, etc.	Reports from climate scientists	1-2 years
Tailored integrated information for end users/decision makers	Making scientists available for end-users to consult with	2-3 years
Reliable data on tourist inflow and outflow to various regions and related footprints		2-3 years

Photo by James & Carol Lee on Unsplash Fox Glacier

2. What policies/funding/government support is required to help the tourism sector adapt to climate change?

Nature of support	What will it take to make progress?	Timeframe
Communication plan for tourism sector on impact of Climate Change	Government initiatives	1 year
Setting long term goals/certainty	Zero carbon Bill	1 year
Collaboration of policy makers with businesses/ NGOs	Government initiatives	1-2 years
National Plan for adaptation efforts	Government initiatives	2-3 years
Stronger policies on climate change adaptation	Government initiatives and cross-party collaboration	2-3 years
Encourage innovation	Policy change mechanisms	3+ years
Removing barriers to innovative changes	Review of regulations and legislation on adaptation/ innovation/change	3+ years
Measuring progress	Central and local-level evaluation and monitoring	3+ years

Photo of Kâwhia by Raven Cretney

3. What strategies/steps will tourism businesses consider in meeting the challenges of climate change adaptation?

Adaptation Strategy	What is needed to implement it?	Timeframe
Promotion of NZ Tourism Sustainability Commitment (TSC) within the industry	Apply TSC to measure, manage, reduce and offset carbon use	Now ongoing
Moving offices closer to public transport		Now underway
Waste reduction and recycling		Now underway
Implementation of Framework for Sustainable growth for Tourism 2025 and Beyond	TIA will place climate change mitigation and carbon reduction in the industry in the framework	Framework to be released in 2019
Education of tourism operators regarding impacts of climate change	A steering group that is action based Be able to give examples of realistic, practical, and cost-effective ideas of how businesses can adapt to climate change	1 year
Marketing and promotion of cultural tourism	Focus on Rangatiratanga, Katiakitanga, Manaakitanga	1 year
Carbon offsets for air travel	Change of internal policies	1 year
Videoconferencing for meetings	Technology/equipment	1 year
Community engagement on sustainable transportation	Advocacy on value of rail to NZ	1 year
Capability building within the tourism industry	Information- based support system for tourism operators across the country Identify challenges and opportunities for businesses Feed these findings into an ongoing action plan Identify the differences between operator and visitor responsibilities using a co-design approach for strategies and actions	2-3 years
Education for visitors	Spaces for visitor education on climate change impacts	2-3 years
Energy sources	Solar panels on roofs	2-3 years
Collaborating with local communities and Iwi	Action plans for collaborations	2-3 years
Shifting to electric vehicles and installing charging points in tourist regions	Change in fleet planning	2-3 years
Diversification of tourist experiences	New ideas, initiatives and innovative planning to incorporate climate change adaptation	2-3 years
Exploring virtual tourism options to complement real experiences	Research and trials on virtual technologies	3+ years
Altering traditional seasonal planning	Cross-industry planning to adapt to changing seasons	3+ years

RECOMMENDATIONS AND NEXT STEPS

Photo by Tim Swaan on Unsplash Whangarei Falls

Based on information, conversations, deliberations, and expression of priorities at the session, we offer the following recommendations.

Recommendation	Actions
1. Government should provide political and policy leadership on climate change adaptation for the tourism sector	Action 1: Set up a steering group comprising climate policy experts, climate scientists, tourism industry representatives, iwi/community leaders, and academic researchers to develop a climate change adaptation strategy specifically for the tourism sector in New Zealand. Action 2: Regularly review legislation, policies and regulations relating to the tourism sector and amend existing ones/enact new ones, where necessary, to facilitate adaptation, innovation, and change in the sector. Action 3: Identify funding mechanisms to facilitate climate adaptation in tourism, including upgrading tourism infrastructure with climate change in mind. Action 4: Actively involve Mâori in coordinated action on climate change adaptation based on insights from Te Ao Mâori. Action 5: Look at issues of climate change mitigation and adaptation holistically in planning new tourism initiatives for the country.

2. Tourism sector should develop deeper understanding of the challenges and opportunities for the sector in a climate changed world	Action 6: Industry leaders should set up cross-sector networks for businesses to work together on sustainability initiatives that specifically identify risks and incorporate climate change adaptation measures. Action 7: Diversify visitor experiences including a sharper focus on cultural tourism alongside landscape tourism. Action 8: Move away from traditional seasonal patterns for tourism planning to more flexible and resilient patterns of planning. Action 9: Look beyond immediate and short-term goals to plan for the future. Action 10: Build an environment of innovative thinking, including virtual tourism possibilities, to make New Zealand a world leader in climate-sensitive tourism.
3. Climate change researchers should facilitate knowledge-policy-tourism interface	Action 11: Create climate change scenarios using climate science data to allow development of appropriate adaptation strategies for the tourism sector. Action 12: Translate climate projections data into adaptation action plans. Action 13: Work with indigenous insights into climate change issues alongside scientific data. Action 14: Involve the tourism sector in co-designing research projects.

i. Deep South Challenge: http://deepsouthchallenge.co.nz/

ii. Deep South NSC Engagement Strategy: http://www.deepsouthchallenge.co.nz/sites/default/files/2016-12/Dec2016-DSC-Engagement-Strategy-executive-summary_0.pdf

iii. Deep South Challenge Vision Matauranga: https://www.deepsouthchallenge.co.nz/programmes/vision-matauranga

iv. National Science Challenges: Deep South – Research and Business Plan 2014. https://www.deepsouthchallenge.co.nz/sites/default/files/2016-07/Deep%20South%20NSC_Final%2019%20Dec%202014.pdf

v. This section is from a presentation made at the citizen panel by Sandy Morrison, Vision Mâtauranga Programme Leader, Deep South National Science Challenge.

vi. IPCC, "Global Warming of 1.5°C," Summary for Policy Makers (Incheon, Republic of Korea: Intergovernmental Panel on Climate Change, 2018).

vii. Ministry for the Environment, "Climate Change Projections for New Zealand: Atmospheric Projections Based on Simulations Undertaken for the IPCC 5th Assessment, 2nd Edition" (Wellington: Ministry for the Environment, 2018).

viii. Ministry for the Environment.

ix. Ministry for the Environment, Preparing for Coastal Change: A Summary of Coastal Hazards and Climate Change Guidance for Local Government., 2017, http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-summary.pdf.

x. S. C. Moser and J. A. Ekstrom, "A Framework to Diagnose Barriers to Climate Change Adaptation," Proceedings of the National Academy of Sciences 107, no. 51 (December 21, 2010): 22026–31,

xi. Susanne Becken, Jude Wilson, and Andy Reisinger, "Weather, Climate and Tourism: A New Zealand Perspective," Land Environment and People Research Report No. 20 (Lincoln University, New Zealand, 2010).

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