

# Climate Change and Tourism

From policy to practice

Susanne Becken and John E. Hay



# CLIMATE CHANGE AND TOURISM

From policy to practice

Susanne Becken and John E. Hay





First published 2012

by Routledge

2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Simultaneously published in the USA and Canada by Routledge

711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2012 Susanne Becken and John E. Hay

The right of Susanne Becken and John E. Hay to be identified as authors of this work has been asserted by them in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data A catalog record has been requested for this book

ISBN: 978-1-84971-475-4 (hbk) ISBN: 978-1-84971-476-1 (pbk) ISBN: 978-0-203-12896-1 (ebk)

Typeset in Bembo by Cenveo Publisher Services



# **CLIMATE CHANGE AND TOURISM**

The contribution of tourism to climate change, and the likely consequences of climate change for key tourist destinations, has been well reported and discussed. Yet, there is a lack of evidence-based systematic practical advice as to how the tourism industry should respond to the challenge of climate change. Building on a sound conceptual understanding of the links between climate change and tourism, this book shows how the tourism sector might best respond. It not only focuses on the roles of supportive policies and institutions in ensuring a strong 'enabling environment' for practical responses, but also on the practical responses themselves.

This practical approach is presented through a large number of case studies and examples which illustrate how policy and industry initiatives have been implemented in tourism, and if or why they were successful. The majority of examples come from places such as the Caribbean, Spain, the Maldives, Nepal, and the UK, as well as Australia, New Zealand and other parts of the Pacific. The examples are presented within an overall framework that facilitates the translation of adaptation and mitigation policies into practice.

This book offers the tourism industry, students and academics the opportunity to advance from the earlier, more conceptual texts on tourism and climate change by taking a much more practical approach. Its global coverage, through the use of international case studies, fosters a cross-fertilization of ideas and initiatives. This text provides a detailed analysis of best practices in the face of climate change, across countries and geographically diverse tourist destinations and operations.

**Susanne Becken** is a Professor of Sustainable Tourism at Griffin University, Australia, and an Adjunct Professor at Lincoln University, New Zealand. She is also on the editorial boards of *Annals of Tourism Research*, the *Journal of Sustainable Tourism*, the *Journal of Policy Research in Tourism, Leisure and Events*, and the *Tourism Review*.

**John E. Hay** is owner and director of JEH & Associates. He is also Visiting Professor at Ibaraki University, Japan, and an Adjunct Professor at both Lincoln University in New Zealand and the University of the South Pacific; and a Lead Author for the Intergovernmental Panel on Climate Change (IPCC).

#### Tourism Environment and Development Series

Series Editor: Richard Sharpley

School of Sport, Tourism & The Outdoors, University of Central Lancashire, UK Editorial Board: Chris Cooper, Oxford Brookes University, UK; Andrew Holden, University of Bedfordshire, UK; Bob McKercher, Hong Kong Polytechnic University; Chris Ryan, University of Waikato, New Zealand; David Telfer, Brock University, Canada

#### Tourism, Development and the Environment

Beyond sustainability?

Richard Sharpley

#### **Tourism and Poverty Reduction**

Pathways to prosperity

Jonathan Mitchell and Caroline Ashley

#### Slow Travel and Tourism

Janet Dickinson and Les Lumsdon

#### Sustainable Tourism in Island Destinations

Sonya Graci and Rachel Dodds

#### Climate Change and Tourism

From policy to practice
Susanne Becken and John E. Hay

Please contact the Series Editor to discuss new proposals at: rajsharpley@uclan.ac.uk

John E. Hay dedicates this book to his wife, Eleni, who has joined him on a journey few can dream of, let alone experience.

### **ACRONYMS**

AICST APEC International Centre for Sustainable Tourism

APD British Air Passenger Departure Duty
APEC Asia-Pacific Economic Cooperation

CAST Caribbean Alliance for Sustainable Tourism

CERs Certified Emission Reductions

CFCs Chlorofluorocarbons

CSR Corporate social responsibility
ETS Emissions Trading Scheme

EU European Union GHG Greenhouse gas

IAPAL International Air Passenger Adaptation LevyIATA International Air Transport AssociationICAO International Civil Aviation Organisation

ICLEI International Council for Local Environmental Initiatives

IPCC Intergovernmental Panel on Climate Change

ICZM Integrated coastal zone management

KSI Key sustainability indicator
OTA Oceanic Tailored Arrivals
RES Renewable energy supply

UNEP United Nations Environment Programme

UNWTO The United Nations World Tourism Organisation

WMO World Meteorological Organisation WTTC World Travel and Tourism Council

# **CONTENTS**

	t of plate t of acro	es, figures and tables nyms	x xvi
1	Introd	luction	1
	1.1	Tourism and climate change 1 Rationale and structure of the book 4	
2	2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9	Climate change science 8 The climate change debate 11 Policy for climate change and tourism 12 Measuring greenhouse gas emissions by tourism 15 Supply-side responses to climate change 18 The environmental behaviour of tourists 20 Tourist perceptions of climate and weather 23 Local impacts and destination-level adaptation 25 Future-oriented analyses 28 Conclusion 30	8
3	3.1	Entroduction 31 Ensuring a strong enabling environment 33 Incorporating managing climate risks into national policies and plans 35	31

4.

5.

6.

7.

3.4	Adaptation policy making and planning at the sub-national and business levels 41	
3.5	Adaptation policy making and planning at multi-country and international levels 50	
3.6	Conclusion 52	
Ada	ptation Practice	55
4.1	-	
4.2	Incentive to travel, and appeal of potential destinations 57	
4.3	Transport infrastructure and services used by tourists 64	
4.4	Managing tourism's resource base 72	
4.5	Managing tourist satisfaction, health and safety 83	
4.6	Managing the sustainability of facilities, operations	
	and destinations 95	
<b>4.</b> 7	Conclusion 101	
Miti	gation Policy	103
5.1	Introduction 103	
5.2	Business level mitigation policies 105	
5.3	Local mitigation policies 112	
5.4	National mitigation policies 116	
5.5	Regional level mitigation policy 124	
5.6	International mitigation policy for tourism 130	
5.7	Conclusion 137	
Miti	gation Practice	139
6.1	Introduction 139	
6.2	Destination appeal 141	
6.3	Transportation 149	
6.4	Mitigation at facilities and in operations 163	
6.5	Tourist behaviour and mitigation 172	
6.6	Conclusion 177	
Asse	ssing Performance, and Learning	180
7.1	Introduction 180	
7.2	Assessing the performance of mitigation policies and plans for the tourism sector 182	
7.3	Assessing the performance of adaptation policies and plans for the tourism sector 191	
7.4	Maladaptation in the tourism sector 198	
	Knowledge sharing and learning 199	
7 (	Cardada 200	

8.	Integrated Responses to Clima	te Change	203
	8.1 Introduction 203		
	8.2 Climate change mitigation ar	nd adaptation 204	
	8.3 Sustainable development and	climate change response 212	
	8.4 Disaster risk reduction and a	SO A )	
	8.5 'Peak oil' and climate change		
9.	Conclusion		235
No	ites		240
Re	ferences		242
Geographical Index		266	
General Index		268	

Contents ix

# PLATES, FIGURES AND TABLES

Information for tourists on road conditions after a heavy

Plates
--------

	snowfall event in Wanaka, New Zealand.	35
3.2	Tourist beach-scene in Ocho Rios, Jamaica, on a windy day.	38
		20
3.3	Damage caused to the Barcelo Maya Resort, Quintara Roo,	
	Mexico, as a result of Hurricane Wilma.	39
3.4	Australia's Gold Coast, the recently announced host city for	
	the 2018 Commonwealth Games.	43
3.5	A (former) restaurant destroyed by Category 5 Hurricane	
	Wilma in October 2005, Cozumel, Mexico.	47
3.6	Sagarmatha National Park (Mt Everest) seen from the Tibet	
	side. Increased melting potentially affects climbing and other	
	tourist operations.	52
4.1	Climate change is expected to result in intolerably hot	
	conditions for mid-summer sunbathers, such as these on the	
	coast of Croatia.	60
4.2	Rail line subject to high levels of leaf fall and resulting low	
	adhesion.	68
4.3 a	and 4.4 Coastal tourism is important to the economy and livelihoods,	
	but also vulnerable to climate change, whether in part of a large	
	country, such as Santa Monica, United States (top) or a small	
	island, such as Aitutaki, Cook Islands (bottom).	74
4 =	A	7.7
4.5	Traditional tourist accommodation in Samoa is being threatened	
	by accelerated coastal erosion.	76
4.6	Artificial (i.e. man-made) hotel beach at Coconut Bay, Tobago;	
	the beach is approximately 200 m in length and 60 m in width,	

	and was constructed using limestone sand imported from Guyana.  Note also the groyne, constructed in an attempt to slow down the	
	rate of sand loss. The developer of the hotel, John Jefferis, thought of the concept and subsequently designed and constructed	77
	the beach.	76
4.7	The Giant Panda in China is a symbol of global nature	
	conservation (e.g. the Worldwide Fund for Nature), and	
	climate change is seen as one factor that puts the species at risk.	77
4.8	Rwenzori Mountains National Park, Uganda. Snow	
	cover on the mountain is already reduced as a result of global	
	warming.	79
4.9	Trail map – the trail network and associated infrastructure are being	-
	modified as a result of changes in the climate.	79
4.10	Hotel pool on Denarau Island, Fiji.	86
4.11	Wanaka on a sunny winter day.	88
4.12	A recent trend in the Caribbean is to use white rock when	
	constructing groynes and other forms of coastal protection,	
	in order to improve the aesthetics while also endeavouring to	
	ensure the beach has adequate sand cover.	96
4.13	Russian icebreaker Kapitan Khlebnikov - retrofitted for	
	passengers in Pond Inlet, Nunavut, Canada, in August 2010.	100
5.1	Eurostar in Brussels.	110
5.2	One of about 600 Safa Tempos in Kathmandu.	115
5.3	Passengers at Gatwick Airport, London. It is the UK's second	
	largest airport and the busiest single-runway airport in the world. It	
	serves over 200 destinations for around 33 million passengers a year.	121
5.4	Solar lamp, lighting the garden environments in a hotel in Tobago.	127
5.5	Greenpeace at the 2007 UNFCCC Climate Summit in Bali,	
	Indonesia.	131
6.1	Mountain landscape around Queenstown and Glenorchy, often	
	used in Tourism New Zealand imaging and branding.	142
6.2	Biking in Kangaroo Valley, Australia.	146
6.3	City bikes for tourists in Oslo, Norway.	148
6.4	One of four double-decker coaches which commenced	
	operations in 2007. It meets Euro 3 Emission Standards.	
	The bus is the largest in New Zealand, and is estimated to	
	carry 23,725 passengers per year - the equivalent of removing	
	47,000 private vehicle journeys from the roads each year.	156
6.5	Cycle tourism on small country roads in South Germany.	158
6.6	Solar panels on an Ecoventura cruise vessel in Ecuador.	160
6.7	Fahrtziel Natur advertisement by the Deutsche Bahn.	162
6.8	Solar hot water on tourist accommodation in Suva, Fiji.	164
6.9	The Hytte in Northumberland, self-catering accommodation	
	(with turf roof).	165

#### xii Plates, figures and tables

6.10	Whistler Blackcomb gondola.	167
6.11	Carbon offsetting project by Atmosfair: Cow dung is fermented	
	in underground biogas digesters, producing an almost odourless and	
	high-energy content gas.	176
7.1	Promotion of 'low carbon health promotion' accommodation	404
7.0	at Bangkok airport.	181
7.2	Overwater bungalows are an important part of the brand of	106
0.1	tourism in the Maldives.	196
8.1	Wind turbine installed at the Jiminy Peak Mountain	207
0.3	Resort.	206
8.2	Intercontinental Resort and Thalasso Spa in Bora Bora, French	
	Polynesia. The pipeline carrying cold ocean water from 900 m	
	depth runs across the reef flat (foreground) to a building located	
	just above the shoreline. As is evident, the installation has no	208
0.2	significant visual impact. Beach of La Brée-les-Bains, Île d'Oléron, France. Note how the	208
8.3	erosion control works limit the useable area of beach.	221
8.4	View from tourist accommodation at Hermanus.	227
8.5		233
0.0	Aviation fuel pump in a regional airport in Germany.	233
Figu	res	
1.1	International tourist arrivals (in millions)	
	(*2010 are preliminary results).	2
1.2	Focus of the book: policy and practice.	4
1.3	Structure of the book: adaptation responses.	6
1.4	Structure of the book: mitigation responses.	6
2.1	Observed changes in components of the global	
	climate system. © American Meteorological Society.	
	Reprinted with permission.	9
2.2	Observed changes in snow cover and glaciation.	
	© American Meteorological Society. Reprinted with permission.	10
2.3	Annual global average temperature anomalies (relative to 1961-1990)	
	from 1850 to 2010 from the Hadley Centre/CRU (HadCRUT3)	
	(black line and grey area, representing mean and 95% uncertainty	
	range), the NOAA National Climatic Data Center (light grey);	
	and the NASA Goddard Institute for Space Studies (dark grey).	11
2.4	Six-step approach to assessing the climate change impacts on	
	tourism and identifying adaptation options.	24
3.1	The adaptation process, highlighting the importance of a strong	
	enabling environment for effective adaptation in the tourism sector.	32
3.2	Structure and content of Saint Lucia's National Climate Change	
	Adaptation Policy and Strategy.	36

3.3	The approach used in the ARICC Project to identify priority adaptation strategies and measures to increase the weather and	
	climate resilience of rail infrastructure and operations.	51
4.1	Forced and planned adaptation – the two categories of actions	31
т. т	designed to reduce the consequences of climate change.	
	Also shown for completeness is mitigation, the third response	
	to climate change.	56
4.2	Adaptation initiatives northern European tourists and	30
7.2	Mediterranean tourism service providers might take as a	
	result of an increase in the number of unacceptably hot	
	summer days at Mediterranean destinations.	61
4.3	Weather and related phenomena that can be influential for	01
7.5	given phases of flight operations.	69
4.4	Causes of weather-related delays at Heathrow Airport,	0,7
7.7	for the period January, 2001 to May, 2006.	70
4.5	A real time FACET graphical display showing convective weather	7.0
7.3	around Chicago O'Hare International Airport on July 23, 2010.	
	FACET integrates weather and air traffic information, allowing	
	operators to reroute flights to maintain safety and minimize delay.	72
4.6	Winter precipitation trends in the Mediterranean region for the	1.4
4.0	period 1902–2010, shown as departures from the long-term average.	73
4.7	Matrix of approaches to responsible marketing of tourism services	13
4.7	in the context of climate risks and their management.	84
10		04
4.8	Impact of Hurricanes Hugo and Marilyn on room capacity, visitor arrivals and tourist expenditure in the United States	
		90
4.9	Virgin Islands, 1988 to 1997.  Example of tourism advisory related to a hurricane approaching	90
4.9		92
1.10	the Florida Keys.	93
4.10		
5.1	Risk-based framework for developing GHG mitigation policies.	106
5.2	Accor Hotels Environment Charter.	107 109
5.3	Six Senses Virtuous Circle.	
5.4	Corporate Plan 2009–2011 of the Sunshine Coast Council (Australia).	113
5.5	Energy policies of the European Union.	126
5.6	IATA Conceptual Emission Reduction Scenario.	135
5.7	The four pillars to climate change mitigation by IATA.	135
6.1	(a and b) Cycle paths and tourist attractions in Växjö, Sweden.	144
7.1	The role of monitoring and evaluation in the context of mitigation	
	and adaptation, and of mitigation as a source of financial resources	101
7.0	to support adaptation.	181
7.2	The carbon intensity of travel options – a webcomic. Reprinted	102
7.7	with permission from Ecometrica.	183
7.3	The three scopes of the Greenhouse Gas Protocol in the	40.
	context of tourism.	184

#### xiv Plates, figures and tables

7.4	Diagram of the supply chains of Emirates Wolgan Valley Resort in	
	Australia, showing sources of emissions, and highlighting those	
	units that are included in the GHG inventory.	189
7.5	The two main categories of indicators for monitoring and	
	evaluating adaptation to climate change, with examples based on	
	Snowbowl Ski Resort in Arizona, U.S.	194
7.6	Overview of the activities and intended outcomes and impacts of a	
-	regional monitoring and evaluation (M&E) system for disaster risk	
	management (DRM) climate change adaptation Caribbean Disaster	
	Emergency Management Agency (CDEMA) and Coordination	
	Unit (CU) in the Caribbean tourism sector.	195
7.7	Illustration of the contrast between maladaptation and actions to	
	protect and restore wetlands to facilitate adaptation to climate change.	198
8.1	Synergies and trade-offs arise when tourism responds to climate	
	change in an integrated manner.	204
8.2	Responses to climate change, from climate change-focused	
	(left) to development-focused (right), with illustrative examples for	
	adaptation, mitigation and the two combined.	205
8.3	Diagrammatic representation of the deep ocean water-cooling system	
	at the Intercontinental Resort and Thalasso Spa in Bora Bora,	
	French Polynesia. (Richard Bailey, Pacific Beachcomber SC Company,	
	Tahiti, French Polynesia)	209
8.4	Pacific Resort Rarotonga, Cook Islands.	214
8.5	Excerpt from the Lusaka Declaration on Sustainable Tourism	
	Development, Climate Change and Peace.	216
8.6	Media coverage of cyclone Wilma (2005) in the Christchurch	
	Press, New Zealand. The coverage focuses on negative aspects	
	and safety concerns for tourists.	225
8.7	Hierarchical framework for oil price increase impacts on tourism.	231
Tab	les	
1.1	Domestic and international tourist volumes (2005) worldwide for	
	same-day and overnight visitors.	2
1.2	Natural disasters in 2010 compared with the average of 2000–2009:	2
2.1	floods, mass movements (wet) and storms.	3
2.1	Climate change impacts, policy gaps and planned policies	4.7
2.2	for tourism.	14
2.2	Contribution of tourism to global greenhouse gas emissions.	15
2.4	Energy consumption for a wide range of transport modes.	17
3.1	Range of adaptation measures appropriate for ski fields.	21
3.1	New Zealand Tourism and Climate Change Plan: priority areas	34
	and actions related to strengthening the enabling environment.	54

3.2	Saint Lucia's National Strategy for Adaptation to Climate Change	
	by the Tourism Sector.	37
3.3	Examples of adaptation actions of relevance to the tourism sector.	44
3.4	Examples of specific adaptation actions and time frames included in	
	the Kakadu National Park Climate Change Strategy 2010–2015.	46
4.1	Changes in climate and their possible consequences for transportation.	65
4.2	Asset and operational risks to Network Rail due to heat, including	
	exacerbation by climate change.	67
4.3	Adaptation measures being used by tourism operators in Wanaka	
	and Queenstown.	88
4.4	Managing tourist satisfaction, health and safety.	94
5.1	Examples of emission reduction targets relevant to tourism.	104
5.2	Descriptions of selected GHGs abatement policy instruments.	118
5.3	Climate change mitigation policies in Australia.	119
5.4	APD rates of duty from 1 November 2009.	122
5.5	Impacts of the suggested energy policies for Barbados, based on	
	detailed energy audits and analysis.	128
6.1	Examples of mitigation measures for tourism.	140
6.2	Overview of mitigation technologies and practices from the	
	transport sector (non-technological measures such as lifestyle	
	changes are not included).	149
6.3	Aviation's contribution to anthropogenic climate change.	150
6.4	Emission reductions with technologies currently available.	152
6.5	Biofuel flights undertaken by various airlines.	154
6.6	Comparison of offset providers from New York to the Caribbean.	175
7.1	National GHG account for tourism, Australia.	186
7.2	Elements of the energy system that determine energy	
	consumption and GHG emissions in Whistler, Canada.	188
7.3	Proposed climate change related indicators for sustainable	
	tourism destinations in the Caribbean.	195
7.4	Extract from the Results Framework for the Project	
	'Increasing Climate Change Resilience of Maldives through	
	Adaptation in the Tourism Sector'.	197
8.1	Energy Balance Sheet for Jiminy Peak Mountain Resort,	
	Massachusetts, US.	207
8.2	Summary of strategic directions for the beach destination	
	scheme of the Oléron Island Beach Plan.	219

#### INTRODUCTION

#### 1.1 Tourism and climate change

There is increasing awareness of the importance of climate change for tourism, but detailed understanding is still limited, as are practical and effective responses. Tourism is now back on its path of growth, while at the same time the adverse consequences of climate change are accelerating. The United Nations World Tourism Organisation (UNWTO) reports that, after a significant drop in international tourism due to the global recession, global arrivals in 2010 exceeded the historic high of 2008. 2010 saw 935 million international tourists worldwide (Figure 1.1). This recovery was much faster than initially expected. The recovery has been led by emerging economies, especially in Asia, with growth rates of 8 per cent relative to 2008, compared with only 5 per cent for advanced economies (e.g. in Europe). Interestingly, tourist expenditure has not recovered at the same level, indicating that those tourists deciding to travel internationally are less willing or able to spend the amounts they did before the global financial crisis. The 2011 events of devastating floods in Australia, the Christchurch (New Zealand) earthquake and the Japanese earthquake, tsunami and nuclear crisis, as well as increasing fuel prices, are likely to have influenced tourist arrivals and flows for 2011, and beyond.

Global tourism statistics typically focus on international tourism, but Table 1.1 below shows that domestic tourism is the main contributor to the size of the sector, globally. Added together, there were about 9.8 billion tourist arrivals worldwide in 2005 (no later comprehensive assessment is available), of which only 1.75 billion were international in nature. The sheer volume of global tourism indicates its relevance for climate change, in terms of both its contribution to greenhouse gas (GHG) emissions and its potential vulnerability to adverse weather and climate impacts. As evident in earlier research (e.g. Becken, 2007, 2008a, 2008b; Gössling et al., 2002), the main concern about tourism's GHG emissions relates to transport. When considering