Climate Change and Australian Tourism: A Research Bibliography

ACSBD Working Paper No. 1

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ACSB Working Paper No. 1 Climate Change and Australian Tourism
1. Climate Change and Australian Tourism: Review of Strategies and Research
Heather Zeppel and Narelle Beaumont

This research bibliography is about climate change impacts and responses in Australian tourism. It lists articles, reports, conference papers and website information published about climate change and Australian tourism from 1996 to 2010. It includes sections on climate change issues relevant to accommodation and aviation, carbon footprints of Australian tourism, carbon offsets in Australian tourism, conference papers and journal articles relating to climate change and tourism, along with research by the Sustainable Tourism Cooperative Research Centre (STCRC) about climate change impacts on destinations and reducing emissions in tourism accommodation. Further sections list climate change and tourism information produced by government tourism agencies and industry tourism organisations, followed by climate change impacts on the Australian Alps and Great Barrier Reef. The final section lists climate change and tourism items for each state or territory.

This bibliography on climate change and Australian tourism has been compiled to assist researchers, lecturers, students, consultants and government staff to locate resources on climate change topics. It considers both climate change adaptation and mitigation responses by the tourism industry. ‘Adaptation to climate change consists of initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects’ while ‘mitigation of climate change involves taking actions to reduce greenhouse gas emissions and to enhance sinks’ (STCRC, 2009b, p. 5). Adaptation actions aim to lessen the effects of climate change by building business and environmental resilience while mitigation actions aim to moderate the extent of climate change by reducing emissions and improving carbon sequestration (e.g. by planting trees). Australian tourism responses to climate change include both adaptation and mitigation strategies. Climate change adaptation includes increased use of air conditioning or heating, artificial snow making, rock walls and groynes on eroding beaches, risk management plans and tourism workshops. Mitigation includes energy, water and waste management to reduce emissions, and carbon offsetting. The next sections review the government, industry and research responses to climate change impacts on Australian tourism. It also identifies the tourism areas and topics requiring further investigation on climate change responses.

The Australian government response to climate change issues included a report on Climate change impacts and risk management (AGO, 2006) for business and government, and a National climate change adaptation framework (COAG, 2007) that included climate change threats for tourism. The Tourism Ministers’ Council also developed a specific strategy for the tourism industry and state tourism agencies to implement, Tourism and climate change – A framework for action (DRET, 2008). Climate change and tourism workshops were held around Australia in 2009 to launch The climate change guide: Mitigation and adaptation measures for Australian tourism operators (DRET, 2009). The World Tourism Organization has produced similar reports outlining global responses to climate change and tourism (Simpson et al., 2008; WTO, 2008). Climate change impacts on the Great Barrier Reef and its tourism industry, such as coral bleaching, were addressed in a climate change action plan, and in a reef tourism climate change action strategy (GBRMPA, 2007, 2009). Strategic tourism plans for Queensland (2006), Tasmania (2007), and the Northern Territory (2008) and sector strategies for nature tourism and environmentally sustainable tourism in Victoria (2008/09) addressed climate change impacts on destinations and operators (Zeppel & Beaumont, 2011). In Queensland, the Gold Coast also plans to become the Asia Pacific’s first ‘Carbon Lite Resort Destination’ by reducing their destination carbon footprint over time (GCTC, 2009). However, government tourism agencies for each state or territory vary in their climate change responses (see Table 1) (Zeppel & Beaumont, 2011).
Table 1 Response to climate change (CC) by state government tourism agencies

<table>
<thead>
<tr>
<th></th>
<th>Tourism Queensland</th>
<th>Tourism Victoria</th>
<th>Tourism Tasmania</th>
<th>Tourism WA</th>
<th>Tourism NT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Website</strong></td>
<td>‘Sustainability &amp; Climate Change’</td>
<td>‘Tourism Excellence’</td>
<td>‘Climate Change’</td>
<td>‘Climate Change’</td>
<td>‘Going Green’ ‘Outback Offsets’</td>
</tr>
<tr>
<td><strong>Programs</strong></td>
<td>Sustainable Regions Program (2009/10)</td>
<td>Tourism Destination Carbon Footprint study</td>
<td>Environmentally Sustainable Tourism Strategic Plan 2009-2012</td>
<td>Tourism 21 Strategic Business Plan 2007-2010</td>
<td>Five Year Tourism Strategic Plan 2008-2012</td>
</tr>
</tbody>
</table>

1. Other TQ fact sheets on climate change/CO₂ emissions: The Sustainability Checklist; Sustainability, Triple Bottom Line & ‘Greenwash’; Comparing Environmental Benchmarking and Certification Programs; Tourism Environmental Indicators; Your Regulatory Requirements; Reducing Energy Use, Queensland Environmental Indicators 2010
Four tourism agencies implemented specific programs addressing climate change impacts and emissions reductions by tourism operators (Qld, WA, NT, Tas). Tourism Queensland implemented a Sustainable Regions Program during 2009 based on improving the environmental performance and emissions reductions of tourism operators. It also developed a set of Tourism Environmental Indicators and undertook a benchmark survey of 986 tourism operators throughout the state in 2010 to determine percentages that had implemented climate change responses, such as measuring their carbon footprint, purchasing carbon offsets, and implementing energy saving initiatives. Tourism WA conducted a Carbon Footprint Pilot Study of four West Australian tourism businesses in 2009, measuring emissions on three aspects – (1) vehicle fuel, (2) electricity, and (3) consumables, waste disposal, business and staff travel. A pilot carbon offset program ‘Outback Offsets’ was implemented by Tourism NT to measure the carbon footprint of three tour operators and support them to become carbon neutral during 2008/09. The program provided carbon offsets at no cost to the consumer and a survey of over 4500 customers of the three operators was undertaken to test consumer responses to the program. Tourism Tasmania supported a Green TEA (Tourism Environmental Audit) of 35 tourism operators in the Huon Valley region, conducted by EC3 Global. A larger Green Tourism project, established in 2010, involves 85 Tasmanian tourism operators.

Key industry reports have addressed Australian tourism and climate change (Hoegh-Guldberg, 2008), A flight risk? Aviation and climate change in Australia (Macintosh & Downie, 2007) and Responding to climate change: Tourism and transport sector position paper (TTF, 2008). The Queensland Tourism Industry Council (QTIC) produced a series of climate change reports about the Potential impacts on Queensland’s tourism industry; Offsetting air travel emissions; Climate change: A brief guide for tourism (QTIC, 2008); and a Climate change response manual for Great Barrier Reef Marine Park operators. QTIC, the Tourism and Transport Forum (TTF) and the Australian Tourism Export Council (ATEC) were three organisations that provided submissions in 2008 to the federal government’s proposed Carbon Pollution Reduction Scheme and its effects on tourism. There has been no research evaluating climate change policy or strategic responses by tourism industry groups in Australia.

The main research program in Australia addressing climate change tourism impacts was run through the Sustainable Tourism Cooperative Research Centre (STCRC) from 2002 to 2010. This climate change research covered carbon footprints of tourism, economic impacts of climate change on tourism, and climate change impacts on key Australian tourism destinations – Cairns, Kakadu, Blue Mountains, Victorian Alps, Barossa Valley, and Margaret River (STCRC, 2009b) (see Table 2). Allied research covered renewable energy sources in tourism, and green tourism accommodation (energy auditing, clean technology). In 2007, two major STCRC climate change projects were reported in Climate change and Australian tourism (STCRC, 2007). Buultjens, White and Willacy (2007) undertook a scoping study of climate change and Australian tourism, which analysed the impacts of both tourism on climate change and climate change on tourism, together with consumer and government responses to such impacts. The other study by Forsyth, Dwyer and Spurr (2007) focussed on the economic impact on Australian tourism of government climate change policies such as mandatory restrictions, carbon taxes and a proposed Emissions Trading Scheme (ETS). Similarly, Hoque et al. (2009) assessed the economic impacts on the Australian tourism industry of carbon pricing policies, using a dynamic computable general equilibrium (CGE) modelling approach. In 2008, Forsyth et al. measured the carbon footprint of Australian tourism using both production-based and expenditure-based estimates of direct and indirect greenhouse gas emissions. Hoque et al. (2010) used the same methodology to measure the carbon footprint of Queensland tourism. An extensive study of six key tourism destinations – Kakadu, Cairns, Blue Mountains, Victorian Alps, Barossa Valley, and Margaret River – examined the potential physical, social and economic impacts of climate change on those destinations and explored various adaptation and mitigation strategies that might be needed to respond to changing conditions (Jones et al., 2010; STCRC, 2009b; Turton, Hadwen & Wilson, 2009).
Other ongoing climate change research examines energy, water and waste practices in Australian hotels (Arcodia & Dickson, 2008). Victoria University also has a dedicated tourism and climate change research group with projects on tourism planning for climate change impacts on the Great Ocean Road, and climate change adaptation frameworks for regional tourism destinations (CTSR, 2010; Jopp, DeLacy & Mair, 2010). Other research on climate change and Australian tourism assesses sustainability in business events (Mair & Jago, 2009), purchasing carbon offsets for flights (Mair, 2011; Mair & Wong, 2010), and tourist views on climate change (Prideaux, Coghlan & McKercher, 2009).

Table 2: Key reports on climate change and Australian tourism (Sustainable Tourism CRC)

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy sources for the Australian tourism industry</td>
<td>Baldock et al. (2006)</td>
</tr>
<tr>
<td>Climate change and Australian tourism</td>
<td>STCRC, 2007</td>
</tr>
<tr>
<td>Climate change policies and Australian tourism – scoping study of the economic aspects</td>
<td>Forsyth, Dwyer &amp; Spurr (2007)</td>
</tr>
<tr>
<td>Climate change and Australian tourism – a scoping study</td>
<td>Buultjens, White &amp; Willacy (2007)</td>
</tr>
<tr>
<td>The carbon footprint of Australian tourism</td>
<td>Forsyth et al. (2008)</td>
</tr>
<tr>
<td>Economic impacts of greenhouse gas reduction policies on the Australian tourism industry: A dynamic CGE analysis</td>
<td>Hoque et al. (2009)</td>
</tr>
<tr>
<td>The impacts of climate change on Australian tourism destinations: Developing adaptation and response strategies</td>
<td>STCRC, 2009</td>
</tr>
<tr>
<td>Clean technology applications in tourism accommodation: A best practice manual</td>
<td>Daly et al. (2010)</td>
</tr>
<tr>
<td>The impact of climate change on the Margaret River wine region: Developing adaptation and response strategies for the tourism industry</td>
<td>Jones et al. (2010)</td>
</tr>
<tr>
<td>The carbon footprint of Queensland tourism</td>
<td>Hoque et al. (2010)</td>
</tr>
</tbody>
</table>

By geographic region, the main research on climate change and Australian tourism has been conducted in the Australian Alps (Victoria, NSW), Cairns and Great Barrier Reef (Qld), Kakadu (NT), and the three other STCRC case study regions – Blue Mountains (NSW), Barossa Valley (SA) and Margaret River (WA). These are all areas vulnerable to the impacts of higher temperatures as a result of climate change, resulting in loss of snow cover in alpine areas, bleaching of coral reefs, bushfires, drought and reduced rainfall. The Australian Ski Areas Association (n.d.) is one of few to have a specific climate change policy, with climate change action plans also devised for the Great Barrier Reef (GBRMPA, 2007, 2009). Other climate change tourism research has been conducted in Byron Bay (NSW), Tasmanian Wilderness World Heritage Area, and Victoria’s Surf Coast. Operator responses to climate change in tourism include Kangaroo Valley (NSW) as a carbon neutral destination, and Big Cat Green Island Cruises and Hidden Valley Cabins as carbon neutral operators in North Queensland. There is a paucity of research in other areas of Australia about the impacts and responses to climate change by the tourism industry.

By type of tourism enterprise, the main information about industry responses to climate change relates to the accommodation, aviation, tour operators, and events sectors, and associations (see Table 3). This largely relates to energy efficiency, emissions reduction or carbon offsetting initiatives by individual operators or associations. Responses by the accommodation sector include a range of initiatives such as carbon offsetting, energy efficiency, fuel reduction, and alternative energy sources such as solar and geothermal. For aviation, this mainly involved carbon offsetting options for air passengers and staff travel by the three main national airlines, Jetstar, Qantas, and Virgin Blue, along with a charter flight operator, Independent Aviation. For tour operators, state and territory tourism agencies provide sustainability case study summaries of selected climate change emissions reduction.
Tourism Northern Territory profiled three Central Australian safari tour operators in their Outback Offsets program (2008/09). In the events sector, recent research has addressed climate change and business events in Melbourne (Mair & Jago, 2009). Some state tourism agencies provided information on greening events and summarised a few carbon offset initiatives of events and festivals (e.g. Tas, Qld, Vic, WA, NT). There is no research about the impacts of climate change on sports events and music festivals. Apart from one presentation about Zoos Victoria, there is no research about how theme parks and tourist attractions are responding to climate change impacts on their businesses. State tourism agencies profiled emissions reduction and carbon offsetting initiatives by just two attractions: Daintree Discovery Centre (Queensland) and Cullen Wines (WA). The industry associations addressing climate change impacts included ski areas, one accommodation group (NSW), one charter boat group (Qld), and three tourism industry councils (Qld, Vic, Tas).

Table 3 Australian tourism industry response to climate change impacts, by sector

<table>
<thead>
<tr>
<th>Accommodation</th>
<th>Tour Operators</th>
<th>Events</th>
<th>Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accor Hotels</td>
<td>Big Cat Green Island Cruises (Qld)</td>
<td>Australian Formula 1</td>
<td>AAA Tourism</td>
</tr>
<tr>
<td>Alto Hotel on Bourke (Vic)</td>
<td>Go West Tours (Vic)</td>
<td>ING Grand Prix (Vic)</td>
<td>Australian Ski Areas</td>
</tr>
<tr>
<td>Brush Ski Lodge Park Mt Hotham (Vic)</td>
<td>Hobart Cruises (Tas)</td>
<td>Hilton Australasia</td>
<td>Association</td>
</tr>
<tr>
<td>Hidden Valley Cabins (Qld)</td>
<td>Wayoutback Desert Safaris (NT)</td>
<td>Melbourne Convention + Visitors Bureau (Vic)</td>
<td>Caravan &amp; Camping Industry Association NSW</td>
</tr>
<tr>
<td>Holiday Inn Cairns (Qld)</td>
<td>Connections Safaris (NT)</td>
<td>Taste Festival (Tas)</td>
<td>Ecotourism Australia</td>
</tr>
<tr>
<td>Lady Elliot Island Resort (Qld)</td>
<td>Adventure Tours Australia (NT)</td>
<td>WOMADelaide (SA)</td>
<td>Gold Coast Tourism Corporation</td>
</tr>
<tr>
<td>Lane Cove River Tourist Park (NSW)</td>
<td></td>
<td></td>
<td>Keep Winter Cool</td>
</tr>
<tr>
<td>Raddison Resort Gold Coast (Qld)</td>
<td></td>
<td></td>
<td>Queensland Tourism Industry Council</td>
</tr>
<tr>
<td>Rainbow Retreat (Tas)</td>
<td></td>
<td></td>
<td>Tasmania</td>
</tr>
<tr>
<td>Tortoise Head Guest House (Vic)</td>
<td></td>
<td></td>
<td>Victorian Tourism</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Industry Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Whitsunday Charter Boat Industry Association</td>
</tr>
</tbody>
</table>

Sources: State and territory tourism agencies and tourism industry association websites.

By topic area, the main focus of climate change and tourism research in Australia has been on destinations or regions adapting to the impacts of climate change (see Table 4). This climate change adaptation and planning has been led by federal, state and local governments, industry groups, and the STCRC. Government strategies and plans also address climate change mitigation to reduce emissions. The other key focus on the carbon footprint of tourism has calculated emissions from transport and accommodation at the national and state level and, to a lesser extent, individual tour operators. There have been studies on the greenhouse gas emissions of accommodation, aviation, and marine tours, with energy audits completed for eco-certified accommodation and other resorts. There has been a limited focus on carbon offsetting for meetings and business events, airline travel (Frew & Winter, 2008) and tourism operators. Curtis (2002) addressed carbon trading to offset emissions by hotels and resorts in North Queensland. There is a limited research emphasis on tourism enterprises or destinations becoming carbon neutral by reducing and offsetting emissions from travel.

Papers about climate change and tourism topics in Australia have mainly been presented at Ecotourism Australia’s national conference, the annual Council of Australian University Tourism and Hospitality Education (CAUTHE) conference and at the Tourism Futures National Conference. The 2002 ecotourism international conference in Cairns included presentations about climate change impacts on alpine resorts, and the use of biodiesel by tourism operators. The 2007 ecotourism conference had presentations about carbon offsetting by Conservation Volunteers Australia, and
Table 4 Key research topics on climate change and Australian tourism

| Climate change adaptation (COAG, DRET, LGAQ, Margaret River, Queensland Government, Qld Climate Change Centre of Excellence, STCRC, Victorian Alps, VTIC, Victoria’s Surf Coast) |
| Climate change mitigation (DRET, GBRMPA, LGAQ) |
| Carbon footprint (Australia, Queensland, Tourism NT, Tourism Victoria, Tourism Western Australia) |
| Carbon neutral (GBRMPA, Hidden Valley Cabins, Kangaroo Valley, Qantas, Virgin Blue) |
| Carbon offset (Earthcheck, Hilton Australasia, Jetstar, QTIC, Tourism NT, Tourism Qld, Tourism Victoria) |
| Energy audit/footprint (eco-accommodation, Brush Ski Lodge Park Mt Hotham, Lady Elliott Island Eco Resort) |
| Greenhouse gas emissions (accommodation, aviation, marine tours) |


becoming carbon neutral by Carbon Balance Consulting and Intrepid Travel. This event became the Inaugural Conference on Green Travel, Climate Change and Ecotourism in 2008 and was then rebranded as the Global Eco Asia-Pacific Conference from 2009. The ecotourism conferences since 2007, and the 2009 Tourism Futures National Conference, have included specific sessions or forums on 'sustainability and climate change' issues. Climate change was a key issue in the responses of delegates at the 2008 Tourism Futures National Conference (see Table 5). The Tourism and Transport Forum also held a Tourism and Transport Climate Change Summit in 2007.

Table 5 Climate change responses by Tourism Futures delegates, 2008

| Issues Analysis 2008 (n=114) |
| Issues for National Tourism Strategy: Climate change (16%), Sustainability (4%) |
| Climate Change: Policy (40%); Others (33%) [benchmarking, education, long-haul travel], Carbon offset (17%), Accreditation (10%) |

| Tourism Futures Survey 2008 (n=270) |
| Main issues and challenges facing Australia in the next year |
| Climate change/global warming: 8% (2006), 15% (2008) [+7%] (prompted responses) |
| Climate change/global warming: 3% (2006), 7% (2008) [+4%] (unprompted responses) |
| Carbon emissions from planes/long haul flights: 2% (2008) (unprompted responses) |

| Main issues and challenges facing Australia in the next ten years |
| Climate change/global warming: 35% (2006), 42% (2008) [+7%] (prompted responses, #1 issue) |
| Climate change/global warming: 9% (2006), 17% (2008) [+8%] (unprompted responses) |
| Pollution/carbon emissions/environmental degradation: 11% (2008) (unprompted responses) |
| Carbon emission trading schemes: 2% (2008) (unprompted responses) |

| Reduction of carbon footprint by organisation |
| Commenced implementing measures to reduce carbon footprint (42%) |
| Development of strategy to reduce carbon footprint (35%) |
| Audit to determine size of carbon footprint (21%) |
| Have not undertaken any steps (20%) |
| Ongoing monitoring of carbon footprint size (20%) |
| Other actions (recycling, energy efficiency, renewable energy) (11%) |

Sources: Tourism Futures Survey 2008 (Roy Morgan Research), & Tourism Futures National Conference 2008 Issues Analysis (Tony Charters and Associates)

Case studies of climate change impacts and responses at these conferences include the Great Barrier Reef, Hidden Valley Cabins, Kangaroo Valley, and Lady Elliott Island Resort. The 2009 Alpine Resorts Sustainability Forum included presentations about mitigation measures at Lane Cove River Tourist Park (NSW) and geothermal heating at Brush Ski Lodge Park Mt Hotham (Vic). The findings from
STCRC climate change tourism projects on destination impacts and carbon footprints were presented at the CAUTHE National Conference in 2009 and 2010 and in the UK at *Travel & Tourism in the Age of Climate Change* in 2009. Other papers presented at these conferences were about carbon offsetting flights (Mair & Wong, 2010) and tourist views on climate change (Prideaux et al., 2009).

Some 22 journal articles have been published about Australian climate change tourism topics up to 2010. The first article in 1996 was about ‘climate change and snow-cover duration in the Australian Alps’ (Whetton, Haylock & Galloway, 1996). These climate change articles focus on alpine ski resorts (n=4), carbon footprints, economic impacts on tourism destinations, energy use at accommodation, renewable energy, greenhouse gas emissions of marine tours, coastal tourism impacts, resilient reef tourism, carbon trading at hotels and resorts, tourism climate change assessment, local government planning responses, tourist responses to climate change (n=3), and green tourists. These articles appear in tourism journals including: *Current Issues in Tourism, Journal of Ecotourism, Journal of Sustainable Tourism, Tourism and Hospitality Planning and Development, Tourism and Hospitality Research, Tourism Recreation Research*, and *Tourism Review International*. Two of these journals have produced special issues on climate change and tourism: *Journal of Sustainable Tourism*, 2010, 18(3) and 2006, 14(4), and *Tourism and Hospitality Planning and Development*, 2010, 7(3). Other articles on climate change and Australian tourism appear in a range of environmental journals. These include: *AMBIO, Australian Journal of Environmental Management, Climatic Change, Geographical Research*, and *Renewable Energy*. The articles relate to ski resorts (n=4), carbon trading, and energy.

Research on climate change and Australian tourism has increased since 2006 in response to government strategies and research programs addressing the biophysical and economic impacts on tourism as a key industry. The main research program by STCRC suggested key actions and priority areas for climate change and Australian tourism over the next decade: 2010-2020 (see Table 6). Climate change actions were listed for government, businesses, industry and communities (STCRC, 2009b), mainly related to assisting businesses to reduce carbon footprints across the tourism sector.

These actions indicate the scope of further research on climate change issues in Australian tourism.

*In the long term climate change is a formidable challenge and Australia, and its icon destinations, is particularly at risk. Tourism is both a significant contributor to, and as a nature based destination, at a high risk from, climate change. Concerted effort, agreed mitigation and adaptation strategies, will be required to shape long term policy and planning control.* (STCRC, 2009a, p. 6).

This bibliography lists research about climate change adaptation and mitigation by the Australian tourism industry. It profiles industry, government and tourist responses to climate change and it suggests topics and areas where further research is required on climate change tourism responses. By consolidating this information about climate change in Australian tourism, the bibliography will assist researchers to locate resources and implement projects that address climate change issues. This will assist the tourism industry and government agencies to respond to climate change impacts.
Table 6 Key actions and priority areas for climate change and Australian tourism (STCRC, 2009a, b)

- Conduct climate change risk assessments of natural assets and develop strategies to minimise risk
- Reduce carbon footprint across the (tourism) sector
- Consider how the new carbon market could impact business practices
- Develop new tourism products/experiences that have low carbon footprints – improve existing products/experiences to offset climate change impacts
- Develop and market Australian destinations as ‘clean green’ – particularly targeting international markets sensitive to the carbon costs of travel such as Europe
- Work with marketers, agencies and tourism operators to coordinate the region’s response to climate change
- Develop and deliver visitor information outlining how a region is tackling climate change including the promotion of operators engaging in good business practice
- Reduce energy use, water use and carbon footprint
- Demonstrate new sustainable technologies
- Consolidate information on sustainable development and climate change
- Effectively monitor and evaluate climate change impacts
- Increase credibility and awareness that climate change is occurring to provide motivation to avoid risk or take up opportunities
- Develop mitigation strategies
- Establish an emissions trading scheme that includes aviation

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Where the bloody hell are we?

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2. CLIMATE CHANGE AND AUSTRALIAN TOURISM

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Tremblay, P. (2010). Integrating tourism and climate knowledge for destination adaptation: Challenges in the identification of knowledge gaps at the regional level. In CAUTHE 2010


2.7 Journal Articles on Climate Change and Australian Tourism


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