

Chapter 3

The Evolution of the Climate Change Issue in the Tourism Sector

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Introduction

Although tourism and recreation are considered to be a climate-sensitive sector of the economy, a number of researchers have lamented that few investigations have examined the relationships between climate and tourism and, as a consequence, the vulnerability of individual tourism industries and destinations to climate variability remains largely unknown (de Freitas, 1990, 2003; Smith, 1990; Perry, 1997). Similarly, several authors (Wall, 1992; Wall & Badke, 1994; Abegg *et al.*, 1998; Perry, 2000; Agnew & Viner, 2001; Scott, 2003) have expressed concern that our understanding of the potentially profound consequences of global climate change for the tourism sector remains equally limited and that research in this field is still in its infancy. Nonetheless, many that are new to the field, are not aware that there is 30 years of relevant climate and tourism research to draw on and that the earliest work to consider the implications of climate change and tourism is almost 20 years old.

The purpose of this chapter is to review the chronological development of scientific inquiry into the implications of global climate change for tourism. A comprehensive bibliography of the English language literature was developed in order to examine the amount and nature of scientific inquiry related to climate-weather and tourism-recreation over time. The methods used to develop this bibliography are presented in the following section. Through analysis of this bibliography and the authors' combined experiences in this field, four distinct phases are identified in the evolution of this field of inquiry. The remainder of this chapter describes each of these eras and provides an overview of some of the major initiatives that have contributed to the development of research on global climate change and tourism. The intent was not to conduct a thorough meta-analysis and therefore the chapter does not critically assess and synthesize the available body of literature. Such an analysis was beyond the scope of this chapter, but would be a very useful contribution.

Evolution of the Literature on Climate-Weather and Tourism-Recreation

In order to provide a quantitative measure of the level of research activity in the field of weather and climate, and tourism-recreation over time, a detailed literature search was undertaken and a bibliography containing over 250 items was developed. The criteria for inclusion in the bibliography were for the term 'tourism' or 'recreation' and either 'weather', 'climate', 'climate change', or 'global warming' to appear in the title, keywords or abstract of the publication. The bibliography contains several types of publications, including peer-reviewed journal articles, reports (by government, industry, non-governmental organizations, academic institutions), book chapters and papers in conference proceedings. The choice of publications deemed relevant for the bibliography is somewhat subjective. In some instances publications that were obviously suitable for the bibliography based on their titles, but which were missing one of the terms in the above criteria, were included. One example would be a publication on climate change and skiing that did not specifically use the terms recreation or tourism in its title, keywords or abstract. The bibliography is considered reasonably comprehensive for the English language literature, particularly for the peer-reviewed journal category, where all major tourism, recreation and climatology journals were searched from the period 1970 to the present. The bibliography is available to researchers through the University of Waterloo (www.fes.uwaterloo.ca/u/dj2scott) and because some omissions have undoubtedly occurred, the authors invite readers, especially those who have published in other languages, to submit additional publications to the authors in order to make this bibliographical resource as comprehensive as possible.

The bibliographical data in Figures 3.1 and 3.2 illustrate the overall pattern of published research in the climate-weather and tourism-recreation literature over the past 40 years. The general pattern revealed is an initial period of activity in the 1960s and 1970s, which has been labelled the 'formative stage,' followed by a decade when very little research was published ('period of stagnation'). The first peer-reviewed journal publications on the implications of climate change for tourism or recreation appeared in 1986 (Harrison *et al.*, 1986; Wall *et al.*, 1986). These publications signify the start of a third phase ('emergence of climate change') and pre-dated the formation of the United Nations Intergovernmental Panel on Climate Change (IPCC) by two years. A decade later, the number of peer-reviewed journal publications with a climate change focus exceeded those with a climate-weather focus by approximately a 3:1 ratio (Figure 3.1). The final era is labelled 'maturity' reflecting the tremendous growth in the volume of publications in

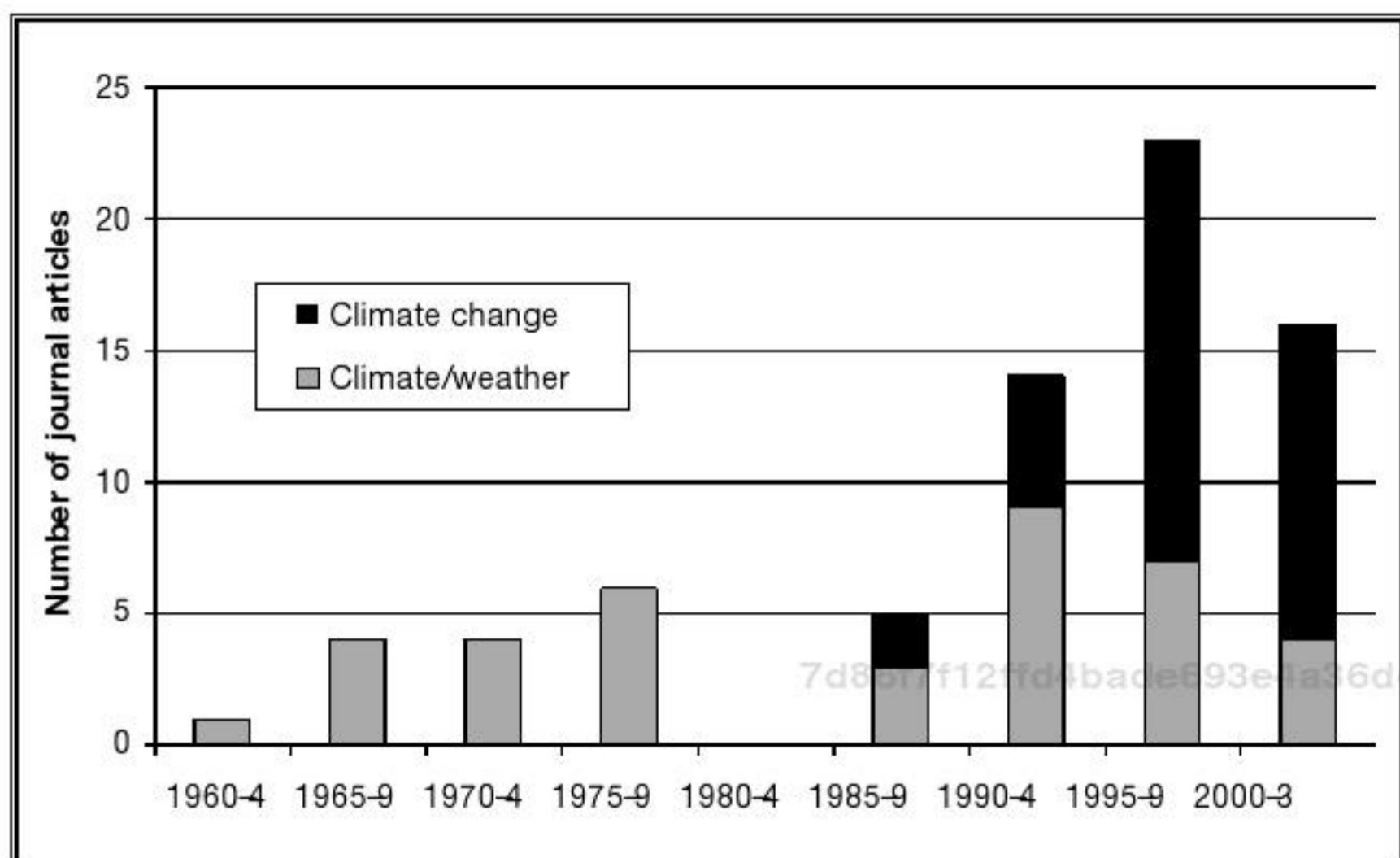


Figure 3.1 Journal articles on climate-weather and tourism-recreation

Note: only articles published as of 30 Sept. 2003 are recorded in the 2000-3 period.

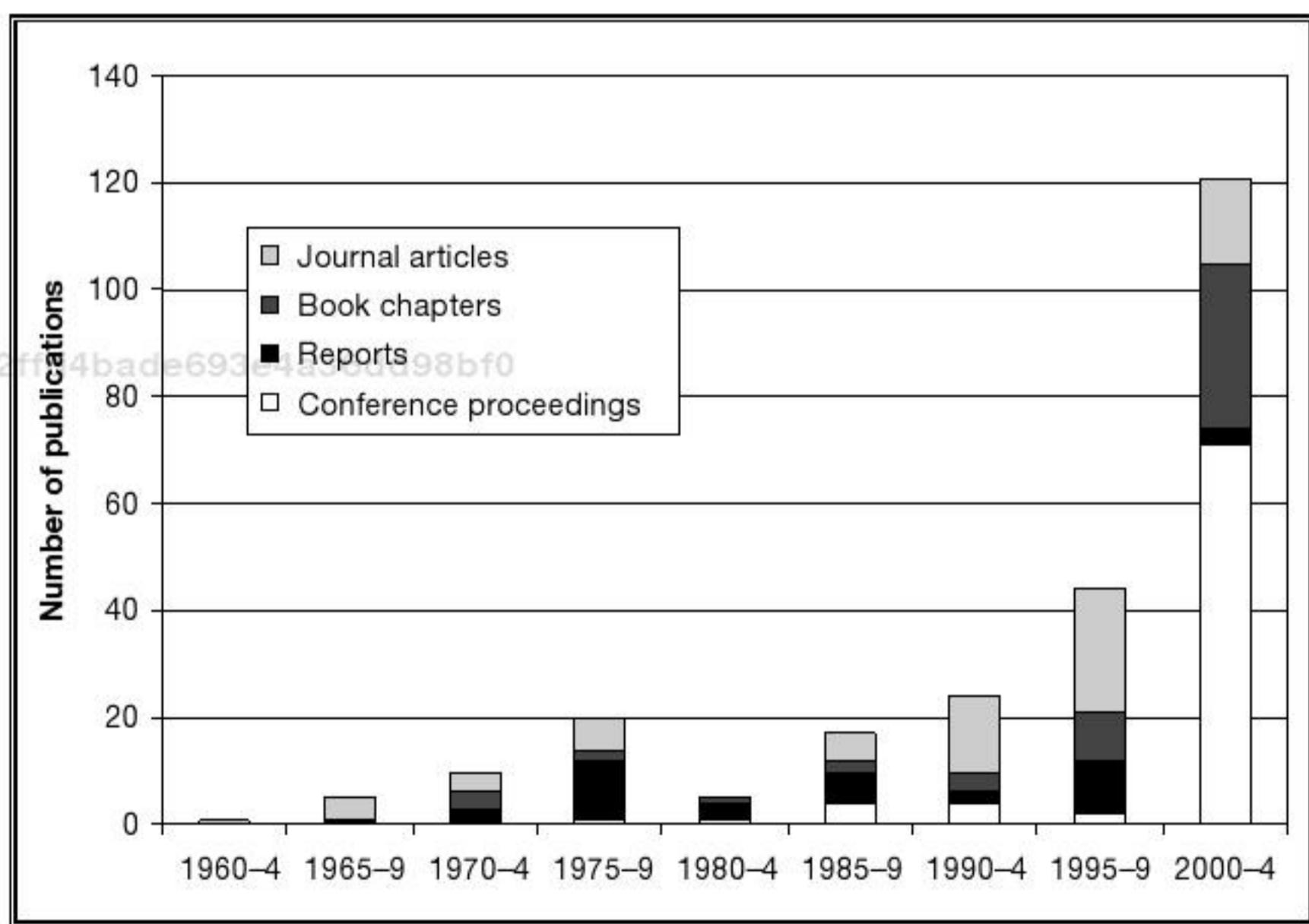


Figure 3.2 Volume of publications on climate-weather and tourism-recreation

Figure 3.2, the increasing level of organization among researchers in this field (specialized conferences and establishment of collaborative research networks), and the increasing interest and support from national and international agencies for research in this field. The following sections will discuss each of these phases in sequence, although the majority of the discussion will focus on the latter two eras that pertain specifically to climate change.

Formative Phase (1960-79)

The earliest research on the relationship between climate-weather and tourism-recreation began during what Lamb (2002) calls the 'climate revolution' during the 1960s and 1970s. Lamb (2002: 4) indicates that, 'climatology was neither respected nor valued in the 1950s and early 1960s'. Technological advances, such as improved radar, satellites, communications and computers, significantly improved climate modelling, forecasting and archiving. Extensive publicity of several extreme climate events (e.g. Sahel drought and famine, Soviet crop failures, and very cold North American winters) prompted substantive government investment in climate research programmes.

During this period, applied climatologists expanded their research to a wide range of socio-economic sectors, including tourism and recreation. The 15 journal articles and larger number of government reports during this formative period were polarized into two areas with distinct spatial, temporal and substantive concentrations. The influence of weather on recreation activities at the local scale was one focus (i.e. the effect of short-term weather on specific recreation activities like skiing, ballooning, beach visits). The second focus was the interaction of climate and tourism at the global scale, most often developing approaches to assess the suitability of climate for tourism and recreation. While the notion of variability was acknowledged in the former, climate was considered a static resource and notions of climatic 'change' were not incorporated in either set of studies. Virtually all of this work was conducted by climate scientists or geographers and, with two exceptions, published in climate or geography journals. As de Freitas (1990: 89) noted, 'much of the research in recreation climatology appears to be motivated by the potential usefulness of climatological information within planning processes for tourism and recreation'.

At the end of this formative phase, Masterton (1980) noted several factors that limited the number of detailed studies on climate-weather and tourism-recreation: (1) insufficient awareness of the significance of weather and climate for tourism; (2) studies on weather and climate are complicated; and (3) weather and climate data are not available in sufficient spatial and temporal resolution for detailed study. Interestingly,

the availability of tourism and recreation data at appropriate temporal and spatial scales was not identified as a research barrier. This can be attributed, in part, to the fact that several of the studies completed during this period did not use tourism or recreation data to establish relationships with climate and weather. This lack of field investigation was a central criticism of de Freitas (1990). Abegg *et al.* (1998) levelled similar criticisms at some of the research from this period for its 'climate-deterministic viewpoint' and over simplification of the complexities of the climate-weather and tourism-recreation relationship.

Period of Stagnation (1980s)

Following growth in the level of research activity on climate-weather and tourism-recreation throughout the 1970s, there was a notable decline in research during the following decade. Publication of research in this field almost stopped during the early 1980s (Figures 3.1 and 3.2) and did not regain the level of activity of the late 1970s until the 1990s. Interestingly, of the five Ph.D. dissertations from North America that were identified as falling within this field during the formative phase, none of the researchers went on to continue research in the field or published beyond their dissertation research.

A possible explanation for the lack of continued development in the 1980s was that climate scientists, who predominately did the early research in this field, were deflected into new, salient and better funded atmospheric science issues, such as acid rain, ozone depletion and the re-emergence of air pollution issues as attempts were made to weaken environmental legislation for atmospheric protection (e.g. the *US Clean Air Act*). In addition, the concept of anthropocentric global warming was not yet widely accepted in the early 1980s and applied climatologists were therefore wary of suggesting implications for economic sectors.

Emergence of Climate Change (1990s)

Although the first publications to examine the implications of climate change for tourism and recreation appeared in 1986, global climate change only emerged as a salient international political issue in the late 1980s. The United Nations IPCC was founded in 1988 and published its First Assessment Report (FAR) in 1990 (IPCC, 1990). Tourism and recreation were not mentioned in this report. As Wall (1998: 65) indicated, 'Since [the FAR] was based on a compilation and evaluation of existing knowledge ... this was a reflection of the paucity of attention given by tourism researchers to climate and, similarly, by climatologists to tourism.' Figure 3.1 further illustrates this point, for, in the decade preceding the FAR, only five peer-reviewed journal articles on climate and tourism-recreation

were available for the IPCC to draw on, with only two addressing the possible implications of climate change specifically.

An important contribution to the literature was made by Wall and Badke (1994). In late 1989, they conducted a survey with national tourism and meteorological organizations on climate change and tourism. The survey was completed before the release of the IPCC FAR and therefore provides a baseline of the international awareness and concern regarding the implications of climate change for tourism. The vast majority (81%) of respondents felt climate and weather were major determinants of tourism and recreation in their nation. An almost equal proportion (75%) believed climate change would have significant future implications for tourism in their country. Notably, 70% of the respondents from tourism organizations did not answer this question, suggesting that at the time, most were not in a position to form a scientific opinion about the possible implications of climate change for tourism. Importantly, less than 20% of the respondents were aware of any ongoing research on climate change and tourism. Based on the findings of this survey and review of the extant literature, Wall (1992: 215) argued that:

Although the implications (of climate change) are likely to be profound, very few researchers have begun to formulate relevant questions, let alone develop methodologies which will further understanding of the nature and magnitude of the challenges that lie ahead.

After the publication of the IPCC FAR, a number of what Wall and Badke (1994) call 'somewhat speculative overviews' of the possible implications of climate change and related environmental change for tourism were published (for example, Smith, 1990; Ewert, 1991; Wall, 1992; Guoyu, 1996). These 'speculative overviews' were useful for raising awareness of the possible implications of climate change for tourism, but too rarely have been followed by more rigorous studies to substantiate the impacts on the tourism and recreation sector that were projected. Perhaps an unfortunate reflection on this field is that such 'speculative overviews' continue to be published and presented at conferences more than a decade after the first such publications appeared. The 'speculative overviews' and other more empirical assessments of potential climate change impacts to specific tourism and recreation activities in specific locations were the basis for a broader consideration of tourism and recreation in the IPCC Second Assessment Report (SAR) (IPCC, 1996). Wall's (1998) review of the SAR found that it gave much greater attention to tourism and recreation than the FAR. The implications of climate change for tourism and recreation in four types of environments (mountains, oceans and coasts, small islands and aquatic ecosystems) were discussed. The anticipated adverse impact of climate change on skiing received considerable discussion, however there was no scientific basis for the

projected loss of US\$1.7 billion annually in the US ski industry. Even today there is little research to even speculate on the potential magnitude of economic losses in the US ski industry. Tourism in coastal areas and small island nations was identified as particularly vulnerable to sea level rises associated with climate change. The impact of the potential loss of economically important beaches was seen as a key threat to economic development in some developing nations where tourism is a vital component of the economy. Aquatic ecosystems and the recreation and tourism they support were recognized as vulnerable to changes in hydrological regimes. Once again, estimates of economic impacts related to changes in fish populations and the associated loss of recreational benefits were highly speculative. The contribution of national and international tourism travel to global greenhouse gas emissions and the implications of mitigation policies for travel patterns were not raised in the SAR.

Abegg *et al.*'s (1998) critique of the climate change and tourism research provided another important contribution to the growing body of literature in the 1990s. Abegg *et al.* (1998) argued that in very few cases did climate change and tourism research adopt a holistic climate impact assessment approach advocated in the IPCC's 'Technical Guidelines for Assessing Climate Change Impacts and Adaptations' (Carter *et al.*, 1994). It was noted that much of the climate change and tourism research focused largely on first-order impacts (i.e. biophysical effects of climate change, such as changes in water levels, ecosystems and snow cover) and, apart from identifying these biophysical changes as detrimental to tourism, rarely investigated the implications for tourism in a meaningful manner. The concentration on first-order impacts can be largely attributed to the fundamental lack of knowledge related to the relationship between climate and tourism-recreation and the observation by Wall and Badke (1994) and Abegg *et al.* (1998), supported by this bibliographical analysis, that the preponderance of climate change and tourism-recreation research was being conducted by climate scientists and others whose primary expertise was not tourism and recreation.

Abegg *et al.* (1998) also identified three core methodological limitations of climate change assessments of tourism and recreation. These criticisms are still largely applicable to more recent climate change and tourism-recreation research and are therefore worth reiterating. The first methodological limitation was related to the uncertainties and limited spatial and temporal resolution of climate change models. The inability to project how climate variability and extremes may be altered in the future was seen as a critical limitation. However, as Wall (1993: 27) pointed out, even if better climate change scenarios were available, '... it is doubtful if the (tourism) industry has, at present, sufficient understanding of its sensitivity to climate variability to plan rationally for future conditions'.

The universal application of the simplifying assumption of a static tourism sector (i.e. 'all else will remain equal') in climate change assessments of tourism and recreation was the second methodological limitation identified. As Scott (2003) noted, this assumption is common to the vast majority of climate change impact assessments and is not a shortcoming specific to tourism and recreation research. Knowing that 'all will not remain equal' over the next 20 to 80 years in any economic sector, let alone the rapidly evolving tourism sector, researchers must also consider how climate change may interact with other major influencing variables in the tourism sector (globalization and economic fluctuations, fuel prices, ageing populations in industrialized countries, increasing travel safety and health concerns, increased environmental and cultural awareness, advances in information and transportation technology, environmental limitations – water supply and pollution). Abegg *et al.* (1998) acknowledge that there is no easy way to overcome this important uncertainty. A number of authors have argued that the climate change impacts and adaptation research community need to develop methodologies to better integrate socio-economic changes into future assessments (Berkhout & Hertin, 2000; Lorenzoni *et al.*, 2000; US National Assessment Team, 2000).

The final methodological limitation identified by Abegg *et al.* (1998) was the inadequate consideration of adaptation. Assessing the potential of climate change adaptations to reduce the risks posed by climate change and to maximize the benefit of new opportunities is critical to understanding the vulnerability of tourism industry to climate change. Because the tourism industry is so dynamic, the opportunities for supply- (by recreation-tourism operators) and demand-side (by recreationists-tourists) adaptation to climate change will be numerous (Scott, 2003). Although some progress has been made, adaptation still remains an underdeveloped theme in climate change assessments of tourism and recreation.

The volume of journal articles related to climate change and tourism-recreation increased threefold between 1990–4 and 1995–9. These publications were available for consideration in the IPCC Third Assessment Report (TAR), which was eventually published in 2001. A review of the TAR showed that progress had been made since the SAR. Each of the regional chapters of volume two (Impacts, Adaptations and Vulnerabilities) mentioned implications for tourism in several contexts and three of the regional chapters dedicated a section to tourism (Chapter 13 – Europe, Chapter 15 – North America, and Chapter 17 – Small Island States). As in the SAR, a range of potential implications of climate change and related biophysical impacts for tourism were identified (e.g. water supply and water levels for recreational boating, wildlife habitat and ecotourism, snow cover and winter tourism, and sea level rise risks to infrastructure and recreational beaches).

Several other notable advances in the discussion of the tourism sector occurred in the TAR. For the first time, the European chapter (IPCC, 2001: 643) placed a confidence level on the impact of climate change on tourism:

Recreational preferences are likely to change with higher temperatures. Outdoor activities will be stimulated in northern Europe, but heat waves are likely to reduce the traditional peak summer demand at Mediterranean holiday destinations, and less reliable snow conditions could impact adversely on winter tourism [*medium confidence*].

Climate analogues were used for the first time in the Asia chapter (IPCC, 2001: 573) to illustrate potential impacts of climate change on tourism: 'The increased frequency of forest fires because of drier conditions in Indonesia during the 1997 El Niño resulted in haze that affected the tourism industries of Indonesia, Singapore, and Malaysia.' The first discussion of adaptation strategies for the tourism sector in the IPCC reports occurred in the Small Island States chapter (IPCC, 2001: 862):

To ensure the sustainability of the tourist industry in Cyprus, it has been recommended that a strategy of protection of infrastructure combined with planned retreat would be effective and appropriate to local circumstances. The overall goal would be to maintain the limited beach area to sustain the vital tourist industry, specifically by erecting hard structures, enforcing building set-backs, and use of artificial nourishment, although the latter measure may require external sources of sand. Although not all these strategies may be applicable to the atoll states, many other island nations – such as Barbados, Jamaica, Grenada, St. Lucia, and Singapore – already have begun to implement similar approaches as part of the Integrated Coastal Management process.

The North American chapter raised the possibility that climate change will bring new opportunities to the tourism and recreation sector and addressed the difficult question of the net impact of climate change on tourism (IPCC, 2001: 770), stating that:

The net economic impact of altered competitive relationships within the tourism and recreation sector is highly uncertain. Studies by Mendelsohn and Markowski (1999) and Loomis and Crespi (1999) attempt to put an economic value on climate change impacts in the United States. Although these were pioneering efforts, the assumptions and methods employed limit the confidence that can be placed in the findings. Until systematic national-level analyses of economically important recreation industries and integrated sectoral

assessments for major tourism regions have been completed, there will be insufficient confidence in the magnitude of potential economic impacts to report a range (based on disparate climate, social, technical, and economic assumptions) of possible implications for this sector.

Finally, the Small Island States chapter (IPCC, 2001: 862) also discussed the potential for integrated effects of climate change and greenhouse gas emission mitigation policies to impact tourism:

A high proportion of tourism in small island states is motivated by the desire of visitors from developed countries of the north (their largest market) to escape cold winters. Small island states are becoming increasingly concerned that projected milder winters in these markets could reduce the appeal of these islands as tourist destinations. It is projected that tourism could be further harmed by increased airline fares if GHG mitigation measures (e.g., levies and emission charges) were to result in higher costs to airlines servicing routes between the main markets and small island states.

Maturation (2000–present)

Several trends were observed in the bibliographical analysis in the late 1990s and early 2000s that portend a positive future for the field of climate change and tourism and recreation research. Although the volume of journal publications appears of have declined slightly from 1995–9 to 2000–3 (Figure 3.1), the latter period only covers three and a half years. With the strong growth in the number of other types of publications (Figure 3.2), especially conference papers, it is anticipated that the number of journal papers published in 2000–4 will eventually exceed that of the 1995–9 period and continue the growth trend that began in the early 1990s. Two other observable trends support this supposition. At the same time that the volume of publications has increased, so too has the number of researchers involved in this field. Examining the authorship of journal papers in each decade, the number of different authors publishing in the field has increased from 11 in the 1980s, to 47 in the 1990s and 42 in only the first three and a half years of the 2000s. A similar analysis of the other types of publications included in Figure 3.2 would show a much greater increase in the number of researchers involved in climate change and tourism-recreation research. While the number of researchers involved in this field has increased substantially over the past five years, so too has the diversity of research approaches and academic disciplines involved. This infusion of new ideas and research techniques offers exciting prospects for multidisciplinary research in the future.

One notable concern remains – the low level of involvement from tourism and recreation experts. Of all the journal publications included in this analysis (Figure 3.1), 40% have appeared in climate-meteorological journals, 42% in a range of geography-environmental management-planning focused journals, and only 18% in tourism-recreation journals. While tourism-related articles have appeared in the top climate change journals, some of tourism journals have yet to publish a paper related to climate change (e.g. *Annals of Tourism Research*). Scott (2003) suggested that one possible explanation can be found in the contention by Carter *et al.* (2001: 266) that a resource management perspective is almost absent from tourism discourse and that:

While the importance of ecological sustainability and resource management is recognized in the tourism literature, it appears to remain poorly integrated or, at least, it appears to fit uncomfortably within tourism thought that is driven by disciplines associated with sociology and business.

Advances in understanding of the vulnerability of tourism sectors and destinations to climate change require that these disciplinary barriers be overcome and the level of collaboration between tourism and climate change experts increases.

Another important trend in the field of climate-weather and tourism-recreation research has been the increasing organization of its contributors. Since 2000 two research organizations have been established and three conferences have taken place to advance the state of knowledge in this field and foster collaboration among its researchers. The first of these organizations was the International Society of Biometeorology's (ISB) Commission on Climate, Tourism and Recreation (CCTR), which was founded during the 14th Congress of the ISB (Ljubljana, Slovenia) in September 1996. The ISB CCTR organized the first international conference dedicated to climate and tourism-recreation in October 2001 (Porto Carras, Greece). This meeting brought together researchers and tourism officials from 12 nations and a wide range of disciplines (meteorology-climatology, tourism, geography, architecture, planning, economics, landscape architecture) to review the current state of knowledge of tourism climatology, identify research needs, and establish a network of scientists and tourism stakeholders with climate interests. The 270-page proceedings produced from this conference make up the largest collection of research papers in this field to date.

The World Tourism Organization (WTO), together with several other United Nations agencies, hosted the first international conference on climate change and tourism in April 2003 (Djerba, Tunisia). One of the central aims of this meeting was to develop awareness among tourism administrations, companies and other tourism stakeholders about the

climate change issue. This initiative to involve the tourism community was particularly valuable because Butler and Jones (2001: 300), in their concluding summary of the *International Tourism and Hospitality in the 21st Century* conference, forthrightly stated that climate change

could have greater effect on tomorrow's world and tourism and hospitality in particular than anything else we've discussed . . . The most worrying aspect is that . . . to all intents and purposes the tourism and hospitality industries . . . seem intent on ignoring what could be *the* major problem of the century. [original emphasis]

Delegates from 45 nations signified the salience of climate change for the sustainability of the global tourism industry in the *Djerba Declaration on Climate Change and Tourism* (see Appendix).⁸ The Djerba declaration recognized that climate change impacts are already occurring in some tourism destinations and that the impacts of climate change are anticipated to be more pronounced over the course of the 21st century. The two-way relationship between tourism and climate change was also recognized and the obligation of the tourism industry to reduce its greenhouse gas emissions highlighted. Finally, like other authors who have emphasized the need for greater collaboration among climate and tourism researchers (Smith, 1993; Scott, 2003), the conference stressed the need for further studies in which the tourism sector itself would take a more proactive position to ensure its interests (e.g. investment decisions, marketing programmes, physical infrastructure) are adequately addressed.

The European Science Foundation (ESF) convened an interdisciplinary workshop of climate change and tourism experts in June 2003 (Milan, Italy), with the key aims of formulating a future research agenda on the vulnerability of tourism to climate change and developing an international network of scientists and stakeholders to address collectively the identified research needs. A virtual international network for the study of the interactions between climate and tourism (e-CLAT) was founded at this meeting and is now based in the Climate Research Unit at the University of East Anglia (www.e-clat.org). A detailed science plan was developed collaboratively to represent the research themes and priorities identified by the delegates attending the workshop. The delegates reiterated the sentiments of previous authors (Wall, 1998; Viner & Agnew, 2001; Scott, 2003) that limited research on climate change and tourism by the climate change research community is not justified considering the current and growing significance of the tourism industry to the global economy. As was the case at the WTO conference in Djerba, there was agreement among the delegates of the need to raise the profile of tourism within the IPCC Fourth Assessment Report (AR4). The

interactions of climate change, the environment and tourism provide a cross-cutting research area that is highly relevant to the economies of many nations (Viner & Amelung, 2003) and the delegates called for the IPCC to commission a special report on tourism. Other important recommendations of the ESF workshop included, the adoption and implementation of the Djerba declaration (see Appendix), the need for greater international collaboration in the field, the importance for the tourism community to get involved in assessing the vulnerability of their own industry and new opportunities that might emerge from climatic change, and the need to prioritize research to focus on the components of the tourism sector and destinations that are anticipated to be the most vulnerable (i.e. developing nations where tourism is a vital aspect of the economy, coastal areas, areas with low water supplies, nature-based tourism industries).

Conclusion

This chapter has, in a broad manner, traced the chronological development of the climate change and tourism-recreation field, from the formative climate-weather and tourism-recreation assessments in the 1970s, to its place in the first three IPCC assessments and the recent initiatives that have led to notable growth in the field over the past five years. It is hoped that this overview provides a valuable context for the remainder of the chapters in this volume.

Appendix: *The Djerba Declaration on Climate Change and Tourism*

The participants gathered at the First International Conference on Climate Change and Tourism, held in Djerba, Tunisia, from 9 to 11 April 2003, convened by the World Tourism Organization, upon an invitation of the Government of Tunisia,

Having listened to the presentations by the representatives of the:

- Tunisian Government
- Intergovernmental Oceanographic Commission (IOC) – UNESCO
- Intergovernmental Panel on Climate Change (IPCC)
- United Nations Convention to Combat Desertification (UNCCD)
- United Nations Environment Programme (UNEP)
- United Nations Framework Convention on Climate Change (UNFCCC)
- World Meteorological Organization (WMO)
- World Tourism Organization (WTO)

and by representatives from the private and public sectors, as well as the points of view of a number of national governments, tourism companies, academic institutions, NGOs and experts;

Acknowledging that the objectives of this Conference are fully in line with the concerns, pursuits and activities of the United Nations system in the field of climate change, and more generally, in that of sustainable development;

Recognizing the key role of the Kyoto Protocol as a first step in the control of greenhouse gas emissions;

Taking into consideration that in convening this Conference WTO did not intend a purely science-based debate, neither to cover all the well-known social and environmental implications that climate change can have on societies, but rather to put emphasis on the relationships between climate change and tourism, given the economic importance that this sector of activity is having on many countries, especially small island and developing states, and with a view to raising awareness of these relationships and strengthening cooperation between the different actors involved;

Having carefully considered the complex relationships between tourism and climate change, and particularly the impacts that the latter are producing upon different types of tourism destinations, while not ignoring that some transport used for tourist movements and other components of the tourism industry, contribute in return to climate change;

Aware of the importance of water resources in the tourism industry and of its links with climate change;

Recognizing the existing and potentially worsening impact of climate change, combined with other anthropogenic factors on tourism development in sensitive ecosystems, such as the drylands, coastal and mountain areas as well as islands; and

Taking into consideration that the right to travel and the right to leisure are recognized by the international community, that tourism is now fully integrated in the consumption patterns of many countries, and that WTO forecasts indicate that it will continue to grow in the foreseeable future,

Agree the following:

1. *To urge* all governments concerned with the contribution of tourism to sustainable development, to subscribe to all relevant intergovernmental

and multilateral agreements, especially the Kyoto Protocol, and other conventions and similar declarations concerning climate change and related resolutions that prevent the impacts of this phenomenon from spreading further or accelerating;

2. *To encourage* international organizations to further the study and research of the reciprocal implications between tourism and climate change, including in the case of cultural and archaeological sites, in cooperation with public authorities, academic institutions, NGOs, and local people; in particular, *to encourage* the Intergovernmental Panel on Climate Change to pay special attention to tourism in cooperation with WTO and to include tourism specifically in its Fourth Assessment Report;
3. *To call upon* UN, international, financial and bilateral agencies to support the governments of developing, and in particular of least developed countries, for which tourism represents a key economic sector, in their efforts to address and to adapt to the adverse effects of climate change and to formulate appropriate action plans;
4. *To request* international organizations, governments, NGOs and academic institutions to support local governments and destination management organizations in implementing adaptation and mitigation measures that respond to the specific climate change impacts at local destinations;
5. *To encourage* the tourism industry, including transport companies, hoteliers, tour operators, travel agents and tourist guides, to adjust their activities, using more energy efficient and cleaner technologies and logistics, in order to minimize as much as possible their contribution to climate change;
6. *To call upon* governments, bilateral and multilateral institutions to conceive and implement sustainable management policies for water resources, and for the conservation of wetlands and other freshwater ecosystems;
7. *To call upon* governments to encourage the use of renewable energy sources in tourism and transport companies and activities, by facilitating technical assistance and using fiscal and other incentives;
8. *To encourage* consumer associations, tourism companies and the media to raise consumers' awareness at destinations and in generating markets, in order to change consumption behaviour and make more climate friendly tourism choices;

9. To invite public, private and non-governmental stakeholders and other institutions to inform WTO about the results of any research study relevant to climate change and tourism, in order for WTO to act as a clearing house and to create a database on the subject and disseminate know-how internationally; and

10. To consider this Declaration as a framework for international, regional and governmental agencies for the monitoring of their activities and of the above mentioned action plans in this field.

Source: World Tourism Organization (2003)

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Part 2: The Effects of Climate Change on Tourist Flows and Recreation Patterns

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Chapter 4

Climate and Policy Changes: Their Implications for International Tourism Flows

SUE MATHER, DAVID VINER AND GRAHAM TODD

Introduction

The global climate is already changing. A key element in leisure travel demand is the degree of comfort (or discomfort) to be experienced at the traveller's destination. Subject to issues such as humidity and precipitation, human comfort becomes harder to maintain once air temperatures exceed around 31°C. This 'comfort factor' is also affected by other elements such as disease risk, extended rainfall and changes in extremes. These factors all affect the choice of destination by leisure travellers. Climatic factors, especially those of reliable summer weather, are the prime motivation for mass leisure travel. Their impact on other forms of leisure travel varies in importance.

This chapter focuses at a 'macro' level on the likely influences on the tourism industry of climate change. A broad approach is adopted that can hide important local or regional variations. The limitations of this approach are discussed as well as some broad lines of action to be taken by tourism authorities in assessing the likely impact on their own tourism sector.

Climate Change

It is accepted that climate change induced by human activity is underway. Of all the effects on the world's climate, greenhouse gas (GHG) emissions are having the greatest impact. While human-induced climate change is manifesting itself in a warming of the planet, more rapid changes may arise as a result of unquantifiable surprises and shocks.

Even if it were possible to stop all human GHG emissions and stabilise GHG concentrations in the atmosphere at today's level, the effects on climate change of earlier emissions would continue to be felt for at least