Tourism Management Perspectives xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Tourism Management Perspectives

journal homepage: www.elsevier.com/locate/tmp

Current issue in tourism

Thirty years of assessing the impacts of climate change on outdoor recreation and tourism in Canada

Micah J. Hewer *, William A. Gough

[a] Department of Physical and Environmental Sciences, University of Toronto Scarborough, 1265 Military Trail, Toronto, ON. Canada, M1C 1A4

ARTICLE INFO

Article history:
Received 9 December 2016
Received in revised form 26 June 2017
Accepted 5 July 2017
Available online xxxx

Keywords:
Climate change impacts
Outdoor recreation and tourism
Canada

ABSTRACT

This paper reviews 30 peer-reviewed academic journals articles (1986–2016) that assess the impacts of climate change on outdoor recreation and tourism in Canada. The review follows a sector-based approach, covering the various activities that have been assessed within a Canadian context. In general, climate change is expected to present increased risks for cold-weather activities in Canada, while there may be increased opportunities for warm-weather activities. A series of knowledge gaps are identified and recommendations for future research in the field are made. Emphasis is placed on overcoming limitations associated with reliance on out-dated climate science, climate models and climate change scenarios; addressing the uneven geographic distribution of existing assessments and filling the gap regarding regions that are currently underrepresented; as well as exploring the weather sensitivity and potential climate change impacts for outdoor recreation and tourism activities that have not yet been assessed.

Contents

* Corresponding author.
E-mail addresses: micah.hewer@mail.utoronto.ca (M.J. Hewer), gough@utsc.utoronto.ca (W.A. Gough).

http://dx.doi.org/10.1016/j.tmp.2017.07.003
2211-9736/

1. Introduction

The important relationship between weather and climate with recreation and tourism has been well-documented within the academic literature across the international scientific community. Furthermore, this acknowledgment has sparked numerous climate change impact assessments for outdoor recreation and tourism across the globe. Given the rapidly growing body of literature on climate change impacts for tourism, there have been several recent literature reviews in the field. Scott, Gössling, and Hall (2012) reviewed the projected impact of climate change on international tourism, outlining the complex interrelationships between climate change and the multiple components of the international tourism system, while taking a sector-based approach and discussing studies in numerous tourism contexts across the globe. Gössling, Scott, Hall, Ceron, and Dubois (2012) reviewed the current state of understanding and remaining uncertainty among the academic community concerning the perceptions and responses of tourists to global climate change and the implications for projected declines or increases in specific tourism markets. Becken (2013) reviewed 459 English-language academic publications from 1986 to 2012 and concluded that the multi-dimensional literature on tourism and climate change is an evolving knowledge domain, identifying key contributors in the field as well as academic debates that have materialised over time. Kaján and Saarinen (2013) methodically analysed 35 peer-reviewed academic journal articles from 2006 to 2011, looked specifically at more recent studies in the field that have begun to incorporate climate change adaptation for tourism into the assessment and discussion. Rosselló-Nadal (2014) reviewed the most common approaches to quantitative climate change impact assessment for tourism, but from a Euro-centric perspective that almost excludes entirely the vast body of literature from North America, that was been written on the subject. More recently, Njoroge (2015) re-conducted another review of studies considering climate change adaptation for tourism, identifying a newly emerging theme within the literature, namely sustainable adaptation. Earlier, Dawson and Scott (2010) reviewed the existing literature (including university papers, unpublished graduate theses, government reports, industry reports and book chapters) regarding the impacts of climate change on tourism in the Great Lakes region of North America (encompassing southern regions of Canada as well as northern regions of the United States).

From a national perspective, Canada can be viewed as an example of best practice within the international field of climate change impact assessment for tourism. It has been acknowledged by Dawson and Scott (2010) as well as Kaján and Saarinen (2013) that the first climate change impact assessment for tourism ever conducted was completed in Canada (Wall, Harrison, Kinnaird, McBoyle, & Quinlan, 1986). Furthermore, based on several quantitative measurements (number of publications, degree of connectedness with other authors and power or influence over the field of study) it was recognised by Becken (2013) that the leader in the field of climate change and tourism research operates out of Canada (Professor Daniel J. Scott). Additionally, many of Professor Scott's former graduate students have continued to publish in the field within a Canadian context as they embark on their own academic and professional careers (Dr. Brenda Scott, Dr. Jackie Dawson, Dr. Christopher Lemieux, Dr. Michelle Rutty, Dr. Micah Hewer, Dr. Mark Groulx). Including, but not limited to Professor Scott's legacy of promising graduate students that have now become young academics, within Becken's (2013) list of the most influential authors in the field of climate change and tourism research, 6 out of 19 academics listed (32%) are based in Canadian research institutions (Dr. Daniel Scott, Dr. Jackie Dawson, Dr. Geoffrey Wall, Dr. Geoff McBoyle, Dr. Brenda Jones, Dr. Rachel Dodds). Nonetheless, no study to date has produced a formal synthesis of the academic community's current understanding regarding the impacts of projected climate change on ORT in Canada.

The purpose of this article is to review all the available peer-reviewed academic journal articles that assess the impacts of climate change on ORT in Canada. There have been numerous working papers published by Canadian universities as well as several industry and government reports concerning the impact of climate change on ORT in Canada. However, these collections were not subject to the rigorous peer-review process that academic journal articles go through and are also seldom referenced by the international scientific community. For these reasons, reports published by university departments, industry organizations and government agencies were not included in this review. However, the value of this review has utility for university researchers, industry stakeholders as well as government agencies. Not only will this review illustrate the evolution of our current understanding on the issue, it will also create a clearer picture for national tourism policy-makers as well as destination managers and planners about the potential impacts of climate change on tourism in the country. Furthermore, this review of Canadian scholarship will provide the international academic community with a national example of best practice in the field of climate change and tourism impact assessment. Finally, this review will also provide national academics in the field with a current appreciation of the prevailing research inadequacies, existing knowledge gaps, the geographic imbalance of current assessments, as well as generate additional ideas for potential areas of future research.

The materials for this review were collected in a series of different ways to ensure the ability of this paper to present a collection of all the peer-reviewed academic journal articles that assess the impact of climate change on ORT in Canada. Initially, the collection of papers was compiled through various searches for numerous research projects in the field, using scholarly databases at university libraries, over the course of the lead author's academic career. Additionally, papers discovered this way then acted as useful cross reference tools and directed the authors to other papers that had been published since they were being referenced by related publications. Finally, to ensure the comprehensive nature of this review, the lead author personally contacted several notable scholars in the field (see Acknowledgements) to confirm the list of relevant publications that had already been compiled and request copies of any papers that may have been overlooked. The final stage did not yield many new papers but was helpful in gaining access to papers that had been discovered through the cross-referencing process but were not indexed in the host universities' scholarly databases.

2. Climate change impacts on outdoor recreation and tourism in Canada: a sector-based review

2.1. Alpine ski industry

2.1.1. Season length

Due to the dependence of skiing as a recreational activity on snow as a climatic resource, considering the implications of temperature fluctuations for snow fall, snow depth and snow-making, the ski industry is highly sensitive to weather and climate variability. The impact of climate change on the ski industry has received significant and warranted attention within the academic community worldwide and within a Canadian context as well. However, early studies attempting to assess the impact of climate change of the ski industry in Canada most likely overestimated the impact of climate change on ski season length. Table 1 displays the first studies conducted in an effort to assess the impact of climate change on ski season length in Canada. These studies were limited to the available climate change models which involved only a doubled carbon dioxide concentration emissions scenario (approximately equal to future climatic conditions in the 2050s). However, the greatest limitation associated with these early assessments was their failure to take into consideration snow-making as a supply side adaptation to climate change.

The first study looking at the impact of climate change on the ski industry in Canada that effectively accounted for snow-making as a

Please cite this article as: Hewer, M.J., & Gough, W.A., Thirty years of assessing the impacts of climate change on outdoor recreation and tourism in Canada, *Tourism Management Perspectives* (2017), http://dx.doi.org/10.1016/j.tmp.2017.07.003