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To cite this article: Emma J. Stewart, Daniela Liggett & Jackie Dawson (2017): The evolution of polar tourism scholarship: research themes, networks and agendas, Polar Geography, DOI: [10.1080/1088937X.2016.1274789](https://doi.org/10.1080/1088937X.2016.1274789)

To link to this article: <http://dx.doi.org/10.1080/1088937X.2016.1274789>



Published online: 20 Jan 2017.



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The evolution of polar tourism scholarship: research themes, networks and agendas

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ABSTRACT

The growth in polar travel has been matched in recent decades by an intensification of scholarly activity related to many aspects of polar tourism. This paper systematically reviews 262 journal articles published on polar tourism (1980–2016) and identifies key research phases and themes. The development of the polar tourism scholarly network is documented through a social network analysis (SNA) and reveals a highly fragmented scholarly community with the exception of a dense principal core group of researchers. A research agenda outlining future research themes and priorities is proposed. The paper indicates that polar tourism research has now emerged from its infancy and now is more likely to be underpinned by empirical, multi-disciplinary and theoretically situated research than in the past.

ARTICLE HISTORY

Received 18 November 2016
Accepted 16 December 2016

KEYWORDS

Polar tourism; scholarship; collaboration; social network analysis; Arctic; Antarctic

Introduction

The last few decades have seen an explosion in the number of new research areas defining themselves as disciplines. This new scholarly environment can be largely attributed to technological advancements enabling researchers to organize their communities through online networks or journals and the need to promote one's disciplinary contributions in an increasingly competitive and complex academic landscape (Matusall, Kaufmann, & Christen, 2011; Stichweh, 2003). While exactly how we define what constitutes an academic discipline remains largely static, the dynamics between individual disciplinary attributes have changed (Matusall et al., 2011) and our scholarly inquiries have become increasingly multi- and trans-paradigmatic. We have come a long way since Kuhn (1970) challenged us to rethink how a research community defines its goals and exerts a certain control over its members requiring them to conform to collective norms. Yet, at the same time, we are still battling with the same questions, still striving to define and, to a certain extent, control our research communities, and are still struggling to elevate new fields of study to the level of a discipline. The latter holds true for the field of tourism research, which has a well-established scholarly community, but which has experienced an intense debate the about the 'indiscipline of tourism' (Tribe, 1997). Leiper (1979, 1981) was the first to advocate tourism as a discipline. Other tourism

researchers struggled with the lack of unifying ontologies, epistemologies, methodologies or theories (Echtner & Jamal, 1997; Riley & Love, 2000; Tribe, 1997), with some scholars ultimately rejecting tourism as its own discipline (Tribe, 1997, 2000), culminating in a persuasive call to move into a post-disciplinary environment which is 'more problem-focused, based on more flexible modes of knowledge production, plurality, synthesis and synergy' (Coles, Hall, & Duval, 2006, p. 293).

Over the last decade, tourism research has diversified geographically and phenomenologically, and in doing so, it has given rise to a number of subfields, some of which are beginning to mature in their own right. Polar tourism research is such a subfield, which saw first tentative scholarly engagement in the late 1970s but which has since blossomed into a post-disciplinary discourse that borrows from the theories in the natural sciences as much as from a wide range of social science inquiry. In this paper we detail the development of polar tourism research over the past few decades and analyze the scholarly community that has become increasingly connected and organized overtime. These developments warrant a review article on this emergent field of study, not only to document the current state of knowledge and provide a platform for shaping future research, but also to understand the factors that have shaped its evolution.

The polar regions and tourism (research)

Attributes that define the polar regions – geographic isolation, unique wildlife, snow and ice landscapes, a legacy of human exploration and habitation (in the north) – have long fascinated travelers seeking out 'those activities that are organized [in the polar regions] with the purpose of enjoying (e.g. pleasure, adventure, education) specific polar values (e.g. wilderness, wildlife, remoteness, extremeness) in any form' (adapted from Lamers, 2009, p. 13). While travel for tourism purposes can be traced back to the late 1800s for both the Arctic and Antarctic regions (Barthelmess, 2007; Headland, 1994), the modern era of polar tourism is commonly regarded to have commenced in the 1960s when commercial expedition cruising to the Antarctic began (Crosbie & Spletstoesser, 2011) and, when communities in the Arctic were slowly starting to embrace the development opportunities and potential of nature-based, cultural and business tourism (Johnston, 2011). It was not until the late 1970s when 'the first tentative forays into studying tourism in these regions' were witnessed (Liggett & Stewart, in press). Since this time, there has been a proliferation of research investigating the polar tourism phenomena, alongside the rapid development of a community of scholars.

The early study of polar tourism was characterized by opportunistic and sporadic research that was geographically piecemeal. Research ideas tended to gravitate around individual scholars who had themselves visited the polar regions and could see merit in understanding more fully the impact of tourism's growth in the regions. For example, ecologist Bernard Stonehouse, who was based at the Scott Polar Research Institute (SPRI) at the University of Cambridge, initiated a series of research projects that incorporated an assessment of the development and characteristics of Antarctic tourism. He also supervised a number of Ph.D. projects on Antarctic tourism. Also from SPRI was Robert Headland, a polar historian, who developed a particular interest in tourism matters. He co-authored a paper reviewing tourism activities in the South Shetland Islands, Antarctica (1985). In the polar north, tourism anthropologist Valene Smith

published her seminal piece on ‘Eskimo’ tourism (Smith, 1977). These ‘founding scholars’ spanning the disciplines of ecology, anthropology and history established polar tourism as a legitimate and important domain of research and importantly, between them, they mentored a new generation of researchers (including Enzenbacher, Reich and others) who were able to build upon these early research endeavors, and who heralded polar tourism research into a new phase of inquiry around the early 1990s.

In 1993, Margaret Johnston and Wolfgang Haider published a series of papers from a conference held in September 1991 in Thunder Bay, Ontario, which examined the impact of tourism on northern (Arctic) communities and its role in land use management decisions (Johnston & Haider, 1993). One year later, under the guest editorship of Valene Smith and John Spletstoesser, the foundational work in the study of Antarctic tourism was captured – for the first time – in a special issue of the *Annals of Tourism Research* (Volume 21: 2). As the editorial reveals the articles were written by social scientists, biologists and government planners who were not necessarily tourism specialists ‘but who contributed their expertise toward meeting the many multi-faceted challenges of sustaining physical habitats while also providing an appropriate visitor experience’ (Smith, 1994, p. 222). Articles clustered around the relationship between science and tourism (Smith; Enzenbacher; Donachie); monitoring growth (Acero & Aguirre, 1994); establishing environmental guidelines (Spletstoesser & Folks); examining implications for heritage sites (Hughes, 1994); charting the historical development (Headland) as well as a regional analysis of managing tourism to the New Zealand and Australian sub-Antarctic Islands (Cessford & Dingwall, 1994; Sanson, 1994; Hall & Wouters, 1994).

As momentum built, Hall and Johnston brought together the first edited book on the subject, titled: ‘Polar Tourism: Tourism in the Arctic and Antarctic Regions’ (1995). The text synthesized the issues common to both polar regions (including the sub-polar zones) such as patterns of growth, monitoring impacts (including those on indigenous peoples in the north), tourism regulations and tools for sustainable management. This edited book has become the touchstone for many polar tourism scholars, whereby ‘the “knowledge base” was carefully brought together within one text clearly establishing polar tourism as an area of legitimate research activity with at least some definitions, boundaries and a corpus of key issues to investigate’ (Stewart, Draper, & Johnston, 2005, p. 384).

Until 2005, the subject of polar tourism research was clustered around four main areas: tourism patterns; tourism impacts; tourism policy and management; and tourism development, and collectively tended to be descriptive to a greater extent than it was empirical, and contextual to a greater extent than it was conceptual (Stewart et al., 2005). Research momentum has continued to build since 2005 and further evolved into a more empirically based, theoretically informed literature that was fashioned in a more coordinated and focused manner, at least to some extent. A more concerted research effort became apparent where outputs proliferated including at least 10 dedicated books (or edited books); at least 2 more special issues of journals (Liggett & Stewart, 2015; Maher & Stewart, 2007); over 30 postgraduate theses and approximately 150 peer-reviewed journal articles published in a wide variety of tourism, polar-specific as well as traditional discipline-based journals (Liggett & Stewart, in press).

However, the question remains: how can this proliferation of academic interest in polar tourism be harnessed and directed for the best possible outcomes, not only for academic advancement but for the management and wider governance of, arguably, our planet’s

most remote and fragile tourist destinations? In this paper, we undertake a systematic review of polar tourism research manifested in peer-reviewed journal articles, beginning in 1980, when the first paper was published by Reich, representing 35 years of scholarship.

Inextricably linked to understanding knowledge creation are 'social networks' (Hu & Racherla, 2008) which in the context of this paper refers to a rapidly growing community of polar tourism scholars: how they are connected, who they collaborate with and how their network is organized. Following Becken (2013), we report findings from a 'social network analysis' (SNA) as a way to understand more fully the development of polar tourism scholarship across different networks and communities. We also identify the factors that might 'enable', and conversely, 'hinder' research endeavors in this small, but rapidly evolving research community. The paper concludes with a critique of research efforts to date, as well as an outline of new research priorities to help frame the next stage of polar tourism scholarship and inquiry.

Methods

The study utilizes a systematic review of literature and a SNA of authors within the literature in order to evaluate the development of polar tourism field and the extent to which the scholarly community has become connected and organized over time. Systematic reviews involve critically evaluating a body of research according to a set of clearly formulated questions and through use of explicit and reproducible methods (Ford et al., 2012; Ford, Berrang-Ford, & Paterson, 2011). The approach is considered a 'rigorous tool for evaluating current knowledge' (Ford et al., 2012, p.809) because of the use of consistent and transparent search criteria, the clear inclusion and exclusion of certain criteria, and the standardized analysis approach (Ford et al., 2012; Petticrew & Roberts, 2006). The systematic review of literature provided a foundation for an SNA of author contributions within the literature. SNA is a powerful tool to assess networks of social relationships among various actors (i.e. the nodes of a network) by visualizing and investigating their interactions (i.e. the ties of a network) over time (Borgatti, Everett, & Johnson, 2013).

Database compilation

Following Stewart et al. (2005), we generated the data that form the basis of the systematic review through a keyword search of two online scholarly databases (Scopus and Google Scholar) for any journal articles that had a focus on polar tourism. While important research outputs are to be found in edited books, reports and conference proceedings, we chose to only include journal articles as they represent the main 'currency' in the field. Focusing on journal articles also limited any subjectivity that may be necessary in selecting other key outputs, which reflects a similar approach and line of reasoning offered by Becken (2013) in her review of sustainable tourism research. A list of journal articles resulting from the keyword search was compiled in a spreadsheet for analysis. Bibliographical information collected included authors (making careful note of those authors whose names may have changed); year of publication, title, name of journal, issue, volume and page numbers. In addition, the geographic focus of the article was noted (e.g. Antarctic, Arctic or Polar). The final database contained 262 entries of papers published in 84 different journals.

We note that an exercise of this nature cannot capture every journal article on polar tourism, and we caution that the clusters described here tend to reflect a bias toward North American and European literature and that which is available in the English language through the traditional means of research communications. This is clearly a limitation of the survey of literature and identifies the research culture within which the authors work. While a number of papers ($n = 12$) published in non-English language journals (e.g. *Norsk Geografisk Tidsskrift*; *Polarforschung* and *Téoros: Revue de Recherche en Tourisme*) were found in the databases through the keyword search, others published in languages other than English are likely to have been missed. Future work should aim to include all articles published in other languages, or those articles published in non-English language journals.

Analysis

In an iterative process, we jointly coded the journal entries and thematically attributed a 'key theme' and 'sub-theme' for each entry, with some entries also requiring a second sub-theme. The emerging clusters were reviewed for consistency of thematic and sub-thematic coding and were, if necessary, adjusted to ensure that they were meaningful. The final analysis included 8 key themes and 24 primary sub-themes. This approach provides a narrative that is consistent and, most importantly, it provides the basis for discussion about the nature of scholarship in this field. In addition, Excel was used to generate basic counts of frequency (e.g. publications per theme; per geographic area; per year), time-series highlighting thematic developments within the field and the analysis of relationships between the 'key' and 'sub-themes' of the journal articles.

Following Becken (2013), the systematic review was used as a basis for SNA using UCINET and Netdraw (Borgatti, Everett, & Freeman, 2002). The database was organized in an author-by-author matrix indicating the number of times each author appeared in the dataset (corresponding with the amount of articles they have worked on and with whom they collaborated). The matrix was undirected, meaning that the order of authors within a publication was not considered. UCINET and Netdraw (Borgatti et al., 2002) were then used to calculate network metrics and visualize collaboration amongst authors, respectively. As in Becken (2013), a maximum of four authors were recorded for reasons of database and social network management. The assumption is made that authors listed in fifth place or later are likely to have made a minor contribution to the publication. In the database, out of 262 entries only 17 papers had 5 or more authors.

The SNA is able to give some insight into an individual author's 'degree centrality' in the network, that is, the number of links (ties) to other researchers in the network allowing some assessment of collaboration. What is known as the 'Bonacich power' is a modification of degree centrality that includes not only the number of authors to whom one is connected, but also how many authors are connected to those direct connections (Hanneman & Riddle, 2005). The centrality of an author in a network is thus not only dependent on how many authors are connected to this author, but also with whom he or she is connected. Furthermore, the analysis can illuminate the 'betweenness centrality', which is an indication of how often a given author is present in the shortest path between two other authors (Borgatti et al., 2013). The more authors are connected only to a given author, the more he or she holds power within a network since he or she can act as a bridge

or broker between other authors. Finally, the analysis can determine the ‘network density’, which represents the portion of potential connections in a network that are actual connections. A potential connection is a connection that could potentially exist between two nodes (i.e. two authors). The higher the network density, the more well connected or dense a network is.

These measures of the polar tourism network are visualized through a series of co-authorship maps, which have been generated for certain timeframes, to illustrate changes in the network over time. The date of 2005 was chosen as pivotal date, being the start of what we label later as the ‘development phase’ and not coincidentally, the date of publication of the first review of the polar tourism literature (Stewart et al., 2005) which provides important insights into early polar tourism scholarship.

Research trends

Our database reveals a surprisingly large total number of articles ($n = 262$) published over a 35 year period examining tourism in what are arguably regarded as niche destinations. Over this time frame there were slightly more papers published on tourism matters in the Arctic (50%) than in the Antarctic (45%). However, Antarctic-related research dominated the early phases of inquiry, perhaps reflecting the geographic interests of the early scholars and their students, while Arctic research is more prevalent in later years. Only 5% of all papers can be described as having a geographically bi-polar focus, and these tend to emerge post-1990.

Overall, as Table 1 illustrates, papers are published in a wide variety of journals (84 identified) and include a range of polar, tourism and discipline-focused journals. The general proliferation of academic journals in existing and new fields (Goel & Faria, 2007; Moosa, 2016) that could be observed over the last couple of decades has clearly also left its mark on the field of polar tourism research. The increase in the number of publications related to polar tourism in the last two decades paralleled a growth in the number of journals polar tourism researchers sought to publish. Of the dominant journals (i.e. those publishing five or more polar tourism-related articles), ‘Polar Record’, a long-standing and well-respected journal established in 1934 publishing papers on a broad range of polar matters, both from the physical and human perspectives, claims the greatest

Table 1. Dominant Journals publishing for polar tourism research (1980–2015).

Journals	Total
Dominant journals ($N = 12$ [33% polar focus & 67% non-polar])	156
<i>Polar Record</i>	44
<i>Annals of Tourism Research</i>	23
<i>Tourism in Marine Environments</i>	16
<i>The Polar Journal</i>	12
<i>Journal of Sustainable Tourism</i>	11
<i>Polar Geography</i>	9
<i>Scandinavian Journal of Hospitality and Tourism</i>	9
<i>Tourism Management</i>	8
<i>Arctic</i>	7
<i>Current Issues in Tourism</i>	7
<i>Journal of Ecotourism</i>	5
<i>Tourism Recreation Research</i>	5

number of papers (44%). *Annals of Tourism Research* follows and is the most frequently used tourism-specific journal (23%), followed more recently by *Tourism in Marine Environments* (16%).

Only 33% of the dominant publications outlets had a polar focus; the other dominant journals did not have a specific regional focus. These figures were even lower for the non-dominant journals, with five or fewer polar tourism publications each. Seventy-nine percent of these journals did not focus on the polar regions. Unsurprisingly, the majority of polar tourism publications featured in tourism-focused journals (67% of the dominant journals and 27% of the non-dominant journals specialize in publishing tourism research). However, tourism researchers have increasingly published their work in a range of journals that focus on other fields from governance and management, to culture and arts to the natural sciences. At the same time, scholars not primarily working in the field of tourism research (e.g. Bastmeijer or Molenaar) have begun devoting some attention to polar matters, especially with regard to their relationship with wider polar governance issues.

Phases of polar tourism research

Based on our assessment of the polar tourism publication database, viewed in conjunction with our knowledge of other key scholarly activities (such as key conferences, books and events), we suggest that polar tourism research has moved through three key phases of evolution (see [Figure 1](#)). The early days of research (up until 1991) represent an ‘exploratory’ phase, followed by an ‘establishment’ phase (1992–2006) and culminating in the current ‘development’ phase (since 2007).

Exploration phase

The first polar tourism article by Rosamunde Reich on the subject of tourism development in the Antarctic was published in the journal *Polar Record* in 1980. Over the next 10 years

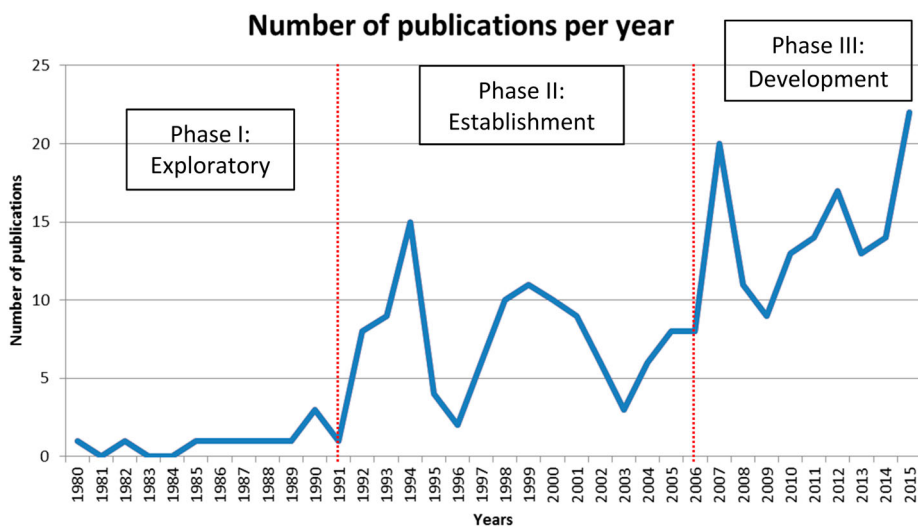


Figure 1. Number of publications on polar tourism (1980–2015).

only 9 more articles were published, all but one focusing on the Antarctic and the majority documenting, in largely descriptive ways, tourism's new reach to the polar regions. The journal *Polar Record* housed at the SPRI in Cambridge was the favored publishing outlet, with half of all the papers published in this multi-disciplinary polar journal. We refer to this first phase of polar tourism research as 'exploration' (1980–1991). Seven out of the ten publications in this phase focused on the development of polar tourism.

Establishment phase

The exploratory phase was replaced by a period of intensification of research activity over a 15-year period starting in the early 1990s, a phase we call 'establishment' (1992–2006). As shown in [Figure 3](#), there was a sharp spike in the number of published papers at this time, no doubt aligned with the actual growth in visitor numbers to the polar regions. Expedition cruising in the Antarctic was on a steep trajectory of growth at this time, as a fleet of former Soviet Union ice-strengthened vessels of the academic fleet had become available for use, an opportunity embraced by the tourism sector. In the Arctic, the socio-economic development opportunities associated with tourism were being explored with more vigor than ever before.

During this phase of research 'establishment', 116 journal articles were published and 6 out of the 8 key themes of polar tourism research we identify across the entire database (development, experience, governance, impact, management and reviews) were represented in this important phase of establishment. Unsurprisingly, papers on matters relating to 'development' (43%) and 'management' (34%) featured strongly. The only key themes not to emerge in this phase were papers related to 'global change' and 'community'.

Continuing the trend of Antarctic dominance, 57% of papers published in this phase were focused on the Antarctic and 38% on the Arctic. For the first time a small minority of papers (5%) explored issues spanning across both polar regions. The journal *Polar Record* remained prominent with one quarter of all papers published in this journal, closely followed by the *Annals of Tourism Research* (16%), which by far was the most favored tourism-specific journal of the polar tourism scholarly community during this phase of establishment.

Development phase

[Figure 1](#) depicts another spike in publishing around the mid-2000s, with 2006 seen as another watershed moment in polar tourism research. Not coincidentally, Becken (2013) also identified a similar shift in research momentum at this time in the broader area of sustainable tourism research. During this phase, which we label as one of research 'development' (since 2007), a further 136 journal articles were published in 49 different journals. Further analysis reveals that just over one half were published in tourism-specific journals, with the new journal *Tourism in Marine Environments* publishing the largest number of polar tourism papers ($n=14$), followed by the *Journal of Sustainable Tourism* ($n=9$) and the *Scandinavian Journal of Hospitality and Tourism* ($n=7$). Journal articles published in multi-disciplinary polar journals (i.e. non-tourism specific) accounted for 35% of all polar tourism papers with *Polar Record* ($n=13$), *Polar Geography* ($n=8$) and *Arctic* ($n=5$) being the most popular publishing outlets. Interestingly, the remainder of articles (14%) were published in non-tourism and non-polar-specific journals (16 of them in total) giving an indication that understanding polar tourism is a

crosscutting issue and one that is emerging as a multi-disciplinary area of research. The disciplinary bases of these journals vary widely and include fields as far apart as law, marine policy, arts, ornithology and biology.

In the research ‘development’ phase, we see a proliferation of Arctic-focused papers, and for the first time, the number of Arctic papers (63%) outweighs the number of Antarctic-related papers (31%) perhaps reflecting the reach of Arctic tourism into indigenous communities and its potential for economic development, as well as the concerns emerging at this time, about the implications of climate change for tourism and communities across the Arctic regions. Not surprisingly, this phase witnessed the arrival of papers focused on the key theme of ‘global change’ (15%) although papers relating to ‘development’ (24%) and ‘management’ (24%) remain as long-standing areas of inquiry. The thematic area of tourist experience (19%) also emerges strongly in this era.

Thematic review

Through our database we identify 8 key themes and 24 primary sub-themes, which assists us in characterizing the areas of focus for polar tourism researchers, as well as help understand how those areas of focus might have changed and evolved overtime. The eight key themes are development, management, experience, global change, governance, impact, community and reviews. As [Figure 2](#) indicates, research relating to tourism development (34%) and management of tourism (28%) in the polar regions dominate the literature, and have remained of interest over time. This finding concurs with the clusters identified in Stewart et al.’s (2005) earlier review.

Interestingly, the two key areas of research need identified by Stewart et al. (2005) – tourist experience and the implications of global and large-scale change on tourism – have, over the last ten years, become critical areas of scholarship, amassing significant and welcome research attention (see [Figure 3](#)). Indeed, these two areas appear to have

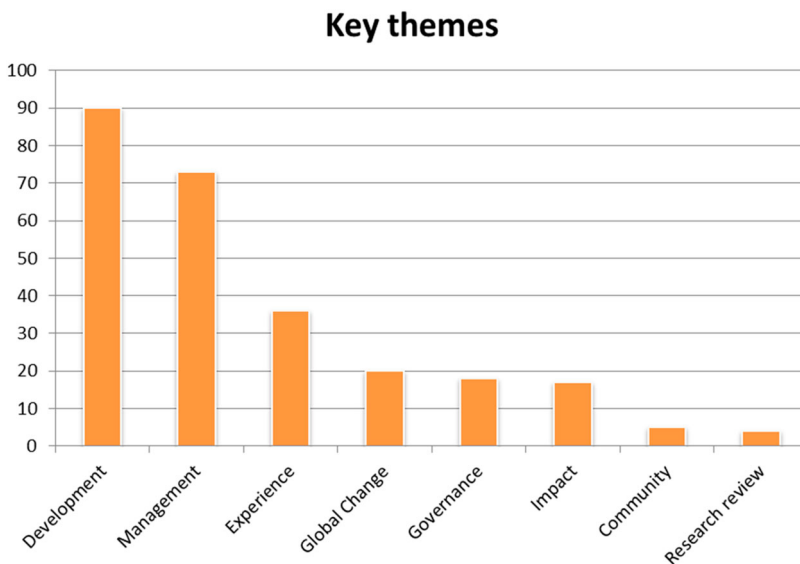


Figure 2. Key themes characterizing polar tourism research (1980–2015) ($n = 262$).

taken over the study of ‘impacts’ that were so prevalent in the early days of polar tourism scholarship and are on a trajectory of growth. As Figure 3 reveals research related to governance also has emerged strongly over the past decade, and there appears to be a growing momentum around community.

The sub-themes are noted in Table 2 and range from niche areas such as cruise, wildlife and cultural tourism, to phenomena such as heritage, economy and weather, through to concepts such as resilience and place attachment. The sub-themes are regarded as cross-cutting and may align with a number of different key themes.

Further analysis of our database reveals that the sub-themes (Table 2) are heavily skewed towards cruise tourism which is not entirely surprising given that this is the most usual mode of transport for tourists to both polar regions. Perhaps as a reflection of the growing empirical strength of the research in this field many of the articles were classified as contributing methodologically. The prevalence of research focused on wildlife is also not surprising, given the largely nature-based approach to tourism in the polar regions. However, this analysis of sub-themes does illustrate the wide variety of themes addressed by researchers.

In addition to calculating frequencies of the themes and sub-themes, selected radar charts were created to illustrate the key relationship between key themes and the associated sub-themes of the articles. The points on the radar charts refer to the number of articles published on the sub-theme within the key theme.

Development

Most publications (approximately one-third) on polar tourism (1980–2015) focused on issues relating to tourism development. In this context ‘development’ refers to the

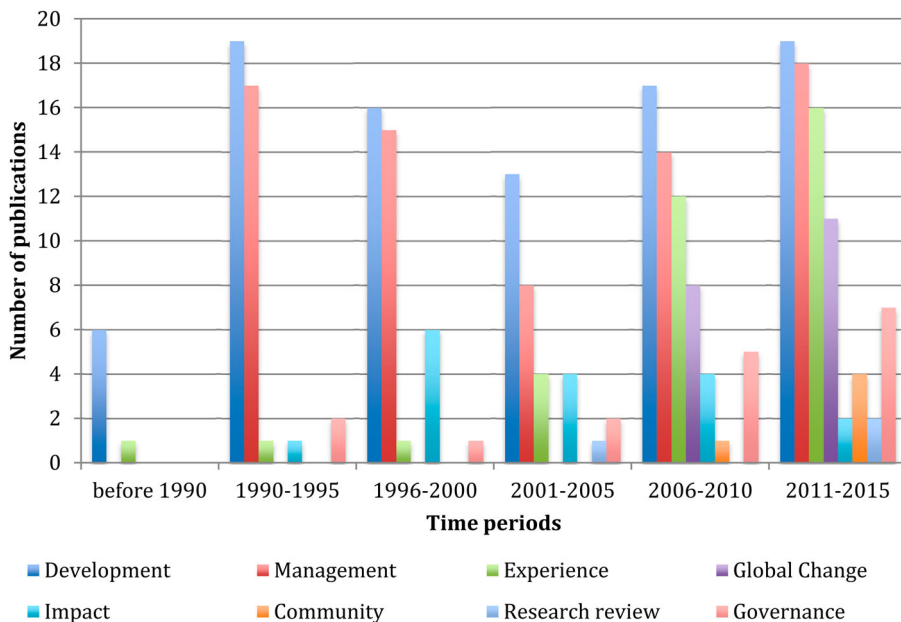


Figure 3. Number of publications by theme and year (1980–2015) (n = 262).

Table 2. Polar tourism sub-themes (1980–2015).

Sub-theme 1	
Cruise tourism	54
Methods	25
Wildlife tourism	22
Futures	18
Tourism geographies	18
Environment	16
Behaviour	12
Wilderness/protected areas	11
Nature-based tourism	10
Economy	9
Heritage	9
Cultural tourism	8
Strategy	7
Adventure tourism	6
Impact	6
Stations	6
Place attachment	5
History	4
Air-borne tourism	3
Resilience	3
Services, products & marketing	3
Sustainable development	3
Last-chance tourism	2
Weather	2
	262

evolution of tourism in the polar regions. In the early ‘exploratory’ phase descriptions and short chronologies of visitor numbers and activities dominated the literature and aimed to show how Antarctica, in particular, was developing as a destination (Boswall, 1986; Codling, 1982; Hart, 1988; Headland & Keage, 1985; Levich & Fal’kovich, 1987; Reich, 1980; Wace, 1990). Later work became more geographically diverse, with the Arctic featuring more prominently, such as Greenland (Christensen, 1992; Johnston & Viken, 1997); Sweden (Heberlein, Fredman, & Vuorio, 2002); Svalbard (Viken & Jorgensen, 1998) and Canada (Hinch & Swinnerton, 1993; Milne, Ward, & Wenzel, 1995; Nickels, Milne, & Wenzel, 1991). This mainly Arctic-focused work aligned with the sustainability discourse of the 1990s, where research sought to examine sustainable tourism in its broadest sense (environmental, cultural and economic) and to implement appropriate strategies to ensure that sustainability was a central component of polar tourism development. Later work under this theme, which was also heavily skewed toward the Arctic regions, focused on economic development (Fugmann, 2012), notions of place (Kaján, 2014a; Tuulentie & Heimtun, 2014) including protected areas (Maher & Lemelin, 2011; Tommasini, 2013), wilderness (Sæþórsdóttir, Hall, & Saarinen, 2011), rural locations (Brouder, 2012a, 2012b) and nature-based activities (Amundsen, 2012), and future tourism development including scenario development (Amelung & Lamers, 2006) and emerging phenomena such as ‘last-chance tourism’ (Lemelin, Dawson, Stewart, Maher, & Luck, 2010).

Management

Research relating to managing tourism in the polar regions also has been a dominant, and enduring theme, amassing 28% of the literature. The first paper on management was published by Storehouse (1990) who proposed the first ‘traveler’s code’ for Antarctic tourists.

Later work throughout the 1990s and early 2000s was concerned with managing the relationship between science and tourism (Ciaputa & Salwicka, 1997; Donachie, 1994; Enzenbacher, 1994; Smith, 1994); developing guidelines and codes of conduct (Davis, 1998, 1999; Mason, 1994, 1997; Mason & Mowforth, 1996; Spletstoesser & Folks, 1994) and assessing the utility of management models (Johnston, 1998; Kaltenborn, 1998, 2000; Kaltenborn & Emmelin, 1993; Scott, 2001). In more recent times, unsurprisingly, researchers have turned their attention to the pressing issues of managing an increasing number of cruise ships and cruise passengers visiting the polar regions as is clearly depicted in Figure 4 below (Bertram, Gunn, & Stonehouse, 2008; Hall, James, & Wilson, 2010; Huijbens, 2015; Lamers & Pashkevich, 2015; Lasserre & Têtu, 2015; Lynch, Crosbie, Fagan, & Naveen, 2010; Stewart & Draper, 2006; Wright, 2008).

Experience

Stewart et al.'s (2005) review highlighted the area of visitor experience as one of the areas that required more research attention (with only 7 papers being published up until that point), a call that has largely been attended to over the last 10 years with researchers examining multiple facets of visitor experience. These facets included place-related experiences (de la Barre, 2013; Grimwood & Doubleday, 2013; Orams, 2015; Powell, Brownlee, Kellert, & Ham, 2012) methodological opportunities (Roura, 2012); connections between experience and ambassadorship (Maher, McIntosh, & Steel, 2006; Powell, Kellert, & Ham, 2008) and wildlife viewing (Granquist & Nilsson, 2016; Lemelin & Smale, 2006, 2007; Lemelin & Wiersma, 2007; Lemelin et al., 2010; Lemelin, Fennell, & Smale, 2008; Tomaselli, 2012; Yudina & Grimwood, 2016). As Figure 3 shows, this area of research appears to be on a trajectory of growth.



Figure 4. The relationship between the management key theme and sub-themes.

Global change

As [Figure 3](#) reveals, papers related to ‘global change’ make an entry into the literature post-2006, and ever since this area of research has become a fertile one, including the calculation of emissions related to travel to remote polar locations (Amelung & Lamers, 2007; Dawson, Stewart, Lemelin, & Scott, 2010; Eijgelaar, Thaper, & Peeters, 2010; Farreny et al., 2011), perceptions of climate change and weather conditions (Denstadli & Jacobsen, 2014; Førland, et al., 2013; Hall, 2014; Tervo-Kankare, 2011) and effects of climate change on key resources such as heritage sites (Barr, 2015; Powell, Ramshaw, Ogle-tree, & Krafte, 2016). The relationship between the ‘global change’ theme and the cruise sector sub-theme reflects the strong links between climate change in particular (Dawson, Johnston, & Stewart, 2014; Dawson, Maher, & Slocombe, 2007) and important issues for the cruise sector, related to accessibility and safety. Especially changes in sea-ice extent and thickness, (Stewart, Howell, Draper, Yackel, & Tivy, 2007; Stewart et al., 2013; Stewart, Tivy, Howell, Dawson, & Draper, 2010), which are greatly influenced by atmospheric and hydrologic conditions, have important implications with regard to access to landing sites or navigational safety, as has been highlighted by a number of incidents and accidents of cruise vessels in polar waters over the past ten years (Stewart & Draper, 2008; Stewart & Dawson, 2011).

Governance

Not dissimilar to the themes of ‘experience’ and ‘global change’, the consideration of governance has been an increasing area of research interest to the polar tourism community of scholars ([Figure 5](#)). The considerable increase in cruise tourism activity raised questions and concerns with regard to the sufficiency of existing governance structures for polar

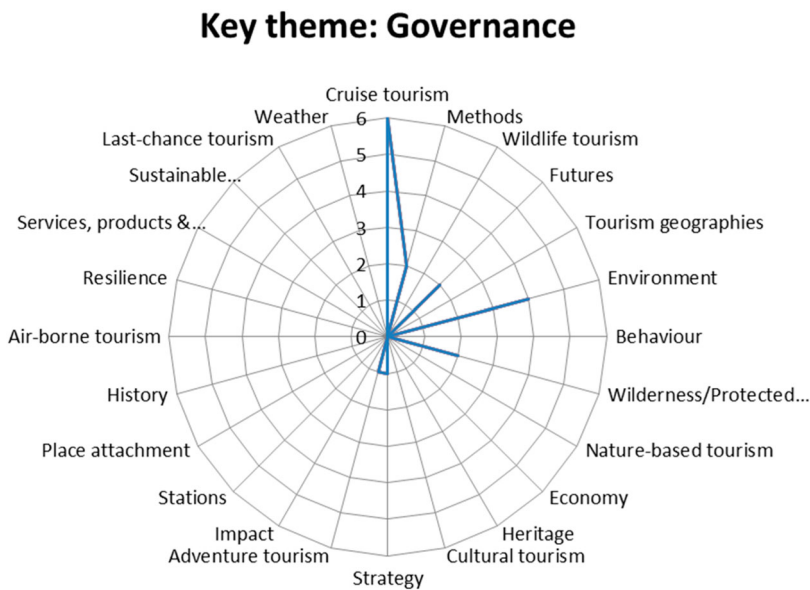


Figure 5. The relationship between the governance key theme and sub-themes.

cruise tourism (Marquez & Eagles, 2007; Molenaar, 2005; Pashkevich, Dawson, & Stewart, 2015). In addition, tourism researchers chose to devote some of their energies to helping understand governance regimes which could effectively meet the needs of local communities in the Arctic (Horejsova & Paris, 2013) or of the Antarctic Treaty System (Bastmeijer, 2013) as well as examining regulatory frameworks that would ensure safe and responsible visits to remote polar locations (Haase, 2006; Haase, Lamers, & Amelung, 2009; Haase, Storey, McIntosh, Carr, & Gilbert, 2007; Lamers, Liggett, & Amelung, 2012; Viken, 2011).

Impacts

The study of impacts has been an enduring theme in tourism scholarship. So, it is surprising that, while the first papers go back to the early 1990s (e.g. Hall, 1992), this theme does not feature more prominently. The work tended to gravitate toward assessing impact across key areas such as the economy (Dressler, Berkes, & Mathias, 2001), and environment, and in particular wildlife (Ciaputa & Sierakowski, 1999; Dyck & Baydack, 2004; Fowler, 1999; Patterson, Holm, Carney, & Fraser, 1996; Riffenburgh, 1998; Tyrrell, 2006; Walker, Boersma, & Wingfield, 2005).

Community

Post 2009, we see the emergence of a small number of papers specifically examining the relationship between polar tourism (and exclusively Arctic tourism) and various notions of community such as resident perspectives (Kaján, 2013, 2014a, 2014b; Lemelin, Dawson, Johnston, Stewart, & Mattina, 2012; Stewart, Dawson, & Draper, 2011; Stewart, Dawson, & Johnston, 2015) and specifically the importance of involving community members in polar tourism research (Stewart & Draper, 2009).

Research reviews

We also identify a small number of papers ($n = 4$) taking stock of polar tourism research (Liggett & Stewart, 2015; Stewart et al., 2005) and reflecting on literature in key areas such as 'gateways' (Hall, 2015) and 'biodiversity' (Tolvanen & Kangas, 2016).

This overarching thematic review indicates that research has built on its early foundations developing long-standing traditional research clusters (such as on matters relating to tourism development and management) but that it has also extended its reach into new realms, exploring the implications of global change for tourism and the need to build robust governance structures. There is evidence to indicate that researchers are working with colleagues from other disciplines to help address the multi-faceted nature of polar tourism. Similarly, there is an emerging literature that examines issues comparatively, mainly within regions (through case studies) but also with pan-regional studies that extend their focus across national boundaries in the Arctic, and occasional trans-polar comparative studies. Taken together, we suggest that polar tourism research has now emerged from its infancy and is maturing to a point where scholarship is more likely to be underpinned by empirical research, to be theoretically situated and to connect to a wider disciplinary base than in the past. This maturing phase aligns with the growing

momentum in the polar social sciences in general, but importantly, it has been nurtured and supported by the emergence of a growing community of scholars.

Authors and networks

As Kuhn (1970) suggests if we wish to more fully understand the development of scholarly communities, it is critical to know the special characteristics of the groups that create and use it. In this section we identify authors, collaborations and relationships across the polar tourism network. Table 3 reveals that E. Stewart was the author with the most publications overall (24) and the second most prolific in terms of first or sole author publications (12). J. Dawson is second most prolific author (18) followed by R. Lemelin and M. Johnston (both 16). R. Lemelin had the most first or sole author publications (13), and was tied with J. Dawson as the most well connected researcher (degree of 15). The author with highest Bonacich power was E. Stewart (2941.915), followed by J. Dawson (2873.045) and M. Johnston (2576.581). The author with the highest 'betweenness centrality' was R. Lemelin (486.367), followed by E. Stewart (473.582) and D. Liggett (348.567). There is a relatively high interconnectivity between authors, as listed in the last column of Table 1. Top authors wrote publications with reoccurring collaborators. This is similar to Becken (2013) but dissimilar to findings in Lemieux et al. (unpublished study, on climate change and biodiversity). As Becken (2013) cautions, this finding poses a risk of inflating the quantum of research articles in the field without necessarily adding new thinking. Table 3 also reveals that a number of the 'founding' scholars of the community noted earlier (e.g. M. Johnston and M. Hall) are still active in this network, a finding that confirms their enduring impact on the study of polar tourism.

Co-authorship visualization was first generated for 1980–2004 (Figure 6), illustrating a small, highly fragmented network (122 authors, 44 connections) over the first 20 years, or so, of research activity. The largest author groupings were six groups of four authors, and five groups of three authors. The network size more than doubled over time (279 authors, 194 connections), yet remained highly fragmented with the exception of a dense principal component (Figure 7). The principal component centered on R. Lemelin, E. Stewart, J. Dawson, M. Johnston and D. Liggett (Figure 8). The network has maintained an almost consistent density, slightly decreasing from 0.006 to 0.005. This indicates that while the network has grown in size and number of authors collaborating, groups of authors are not collaborating either more or less with one another.

The expanded polar tourism scholarly network witnessed over the past decade has in part been facilitated by the International Polar Year (IPY) 2007–2009 which brought polar matters to the global stage. For the first time polar social scientists were actively encouraged to seek out collaborative projects with physical scientists and, while there were very few tourism-specific projects supported directly through IPY, the momentum generated brought together diverse groups with interests in polar research giving polar tourism scholars the opportunity to connect, present results and develop new collaborations. One such collaboration has had a lasting impact on the development of the polar tourism scholarly community. At a Canadian Geographers conference held at Lakehead University in 2007, Alain Grenier gathered together a group of scholars interested in polar tourism and suggested that it would be timely to initiate a research network, later to become known as the 'International Polar Tourism Research Network' (IPTRN). Initial

Table 3. Number of publications and measures of centrality and power for key authors.

Author	Publications	First/ sole author	Degree	Bonancich power	Betweenness	Collaborating authors
E. Stewart	24	12	15	2941.915	473.582	A. Johnston (2x), A. Pashkevich, A. Tivy, C. Lemieux (2x), D. Draper (7x), D. Liggett (nee Haase), D. Scott, G. Steel (2x), J. Dawson (15x), J. Yackel, M. Johnston (10x), P. Maher, R. Lemelin (4x), S. Howell (3x), V. Kirby (2x)
J. Dawson	18	5	14	2873.045	181.699	A. Johnston (2), A. Pashkevich, A. Tivy, C. Lemieux (2x), D. Draper, D. Scott, E. Stewart (15x), J. Childs, J. Noakes, M. Johnston (11x), P. Maher (4x), R. Lemelin (4x), S. Howell (2x), S. Slocombe
R. Lemelin	16	13	15	2108.544	486.367	B. Smale (2x), B. Walmark (2x), D. Fennell, D. Peerla, D. Scott, E. Stewart (4x), E. Wiersma (3x), F. Siebel, I. Budke, J. Dawson (4x), M. Dowsley, M. Johnston (2x), N. Bennett, N. Youroukos, P. Maher (3x), R. Koster (2x)
M. Johnston (ME)	16	4	13	2576.581	313.69	A. Johnston (2x), A. Viken, C. Lemieux (2x), D. Draper, D. Twynam, E. Stewart (10x), J. Childs, J. Dawson (11x), J. Noakes, P. Maher (2x), P. Mason, R. Lemelin (2x), S. Howell
M. Hall	12	10	7	10.722	17.5	A. Sæþórsdóttir, J. Saarinen (4x), K. Tervo-Kankare, M. James, M. Wouters (2x), S. McArthur, S. Wilson
M. Lamers	10	4	9	339.432	252.525	A. Pashkevich, B. Amelung (7x), D. Liggett (3x), J. Harcha, J. Oliver-Solà, J. Student, H. Gelter, K. Bastmeijer, R. Farreny
D. Liggett (nee Haase)	9	5	11	909.736	348.567	A. McIntosh (2x), A. Thompson (2x), B. Amelung (3x), B. Storey, E. Stewart, G. Roldan, J. Swanson, M. Lamers (3x), N. Gilbert, S. Engelbertz
P. Maher	9	5	9	2058.232	119.286	A. McIntosh, E. Stewart, G. Steel, J. Childs, J. Dawson (4x), J. Noakes, M. Johnston (2x), R. Lemelin (3x), S. Slocombe
P. Mason	8	8	4	431.099	99	D. Twynam, J. Cheyne, M. Johnston, S. Legg (2x)
B. Stonehouse	7	6	3	4.025	2	C. Gunn, E. Bertram, L. Brigham
B. Amelung	7	2	5	212.163	37.575	D. Liggett (3x), J. Oliver-Solà, J. Student, M. Lamers (7x), R. Farreny
D. Draper	7	0	5	1493.234	3.488	E. Stewart (7x), J. Dawson, J. Yackel, M. Johnston, S. Howell
R. Roura	6	4	2	2.959	0	A. Hemmings (3x), T. Tin
J. Saarinen	6	2	3	5.637	0.5	A. Sæþórsdóttir, K. Tervo-Kankare, M. Hall (4x)
J. Spletstoesser	5	4	4	5.557	7	D. Landau, F. Todd, M. Folks, R. Headland
B. Grimwood	4	3	4	6.465	3	J. Qiu, M. Muldoon, N. Doubleday, O. Yudina (2x)
R. Headland	4	3	3	4.447	4	F. Todd, J. Spletstoesser, P. Keage (2x)
J. Jabour	4	1	4	5.346	5	C. Murray, J. Aase, J. Carlsen, S. Muir
G. Steel	4	0	6	1019.886	40.05	A. McIntosh, D. Liggett, E. Stewart (2x), P. Maher, S. Engelbertz, V. Kirby (2x)

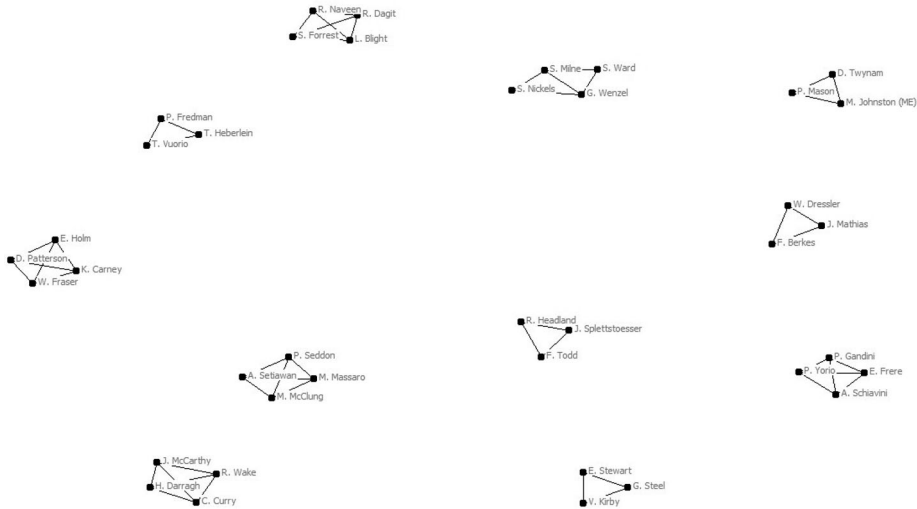


Figure 6. Visualized co-authorship network for publications dated prior to 2005 (layout spring embedded with a geodesic distance of 10; pendants and isolates removed).

funding support came from the Université du Québec à Montréal, and in 2008 Grenier hosted the first of the IPTRN's biennial conferences in Nunavik, Arctic Quebec. While the gathering was small with only 16 researchers present (in addition to consultants and government delegates), critical tourism issues facing Arctic communities were discussed and later published (see Grenier & Müller, 2011). From these early tentative beginnings, the IPTRN has grown in membership, formalized an executive committee and hosted four further conferences: Abisko, Sweden in 2010; Nain, Canada in 2012; Christchurch, New Zealand in 2014 and northern Iceland in 2016. The sixth and seventh

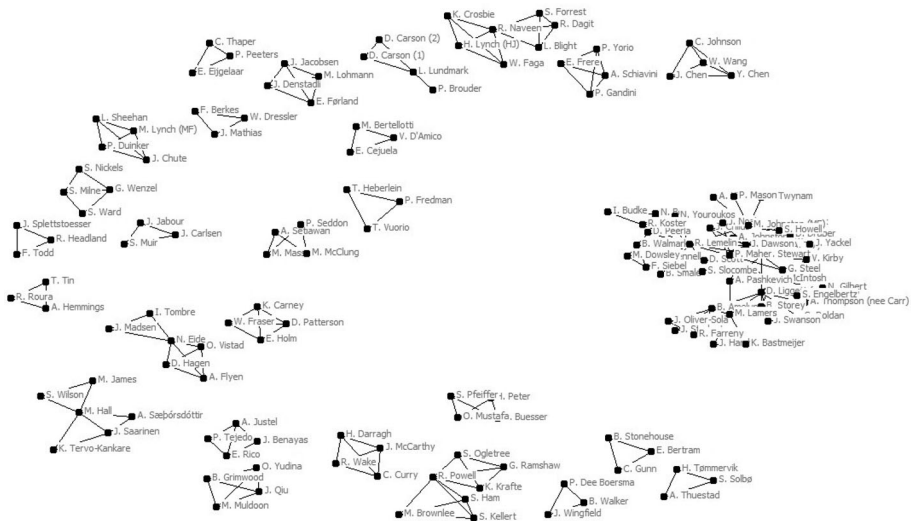


Figure 7. Visualized co-authorship network for all publications between 1980 and 2015 (layout spring embedded with a geodesic distance of 10; pendants and isolates removed).

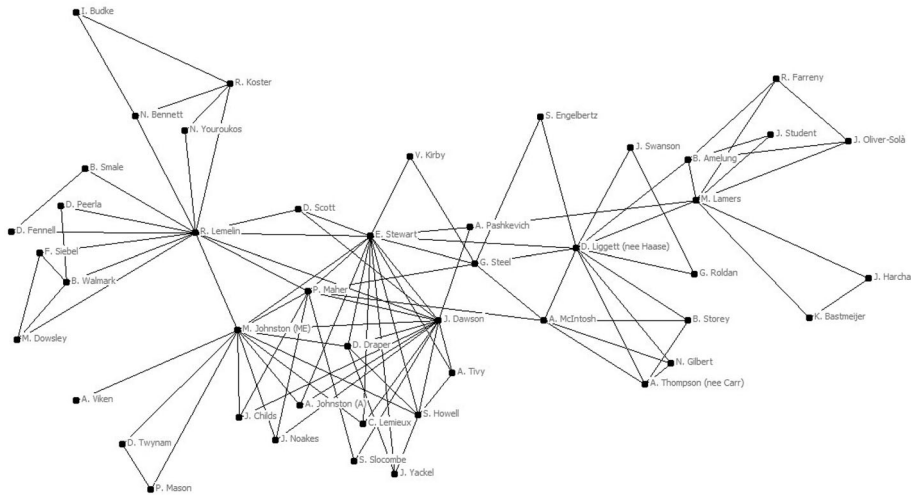


Figure 8. Visualized principal component of the co-authorship network for all publications between 1980 and 2015 (layout spring embedded with a geodesic distance of 10; pendants and isolates removed). This is a zoom into the ‘core’ network seen in Figure 7.

conferences are to be hosted in the Canadian Yukon in 2018 and in Ushuaia in 2020. Each conference brings in new members and is evidence of the strong and growing momentum in polar tourism research community. An indication of the collaborative potential of IPTRN was recognized recently with the joint publication by members on the contribution polar tourism can make to observing systems (de la Barre et al., 2016).

Advancing the research agenda

As tourism in the polar regions positions itself as a major human activity, the time has come to build on the existing bank of research and advance a research agenda that balances the needs of the environment, indigenous peoples (in the north), tourists themselves and other interested parties. Mason and Legg (1999) began this process for the Antarctic (only), and this was augmented by Stewart et al. (2005). As we illustrate, the proliferation of research over the last decade has, more or less, addressed the research needs outlined by Stewart et al. (2005) through the building of scholarship around established themes such as management and development as well as tackling new research particularly in the global change and governance space. Following a trans-polar approach, we suggest five new overarching research themes, each with a series of starting research questions (see Table 4).

Advancing these new thematic research areas will require in-depth regional case studies, trans-regional and trans-polar knowledge and a commitment to trans-disciplinary and integrative approaches to what Coles et al. (2006) define as post-disciplinary science. That polar tourism networks have tentacles that stretch into other disciplines, that there is desire to develop meaningful management and policy recommendations, and that there is a genuine aspiration to work more closely with stakeholders actively involved in tourism operations, management and regulation is all evidence that the increasingly connected and organized polar tourism research community is well prepared to tackle these research priorities (Liggett & Stewart, in press). While we cannot be certain of future watershed

Table 4. Advancing new thematic areas for polar tourism research.

Theme	Key Questions
1. Changing tourism demand	<ul style="list-style-type: none"> • How have polar tourism visitors changed? • How have tourism products changed and evolved (such as new activities such as citizen science, modes of transport)?
2. Understanding new polar actors	<ul style="list-style-type: none"> • How does nationalism influence polar tourism development? • What are the values of new polar actors and how might these influence future tourism development?
3. Governance and regulation	<ul style="list-style-type: none"> • What is effective and efficient governance for tourism in the polar regions? • How will regulatory mechanisms evolve to keep pace with rapid developments in polar tourism?
4. Global change	<ul style="list-style-type: none"> • What is the relationship between polar tourism and climate change? • What is the role tourism could play in observing environmental changes in the polar regions? • What is the need, provision and use of environmental information necessary for safe travel within the polar regions?
5. Influence of new technology	<ul style="list-style-type: none"> • What is the influence of new technology on tourist experience and behaviour in the polar regions? • How might the management of polar tourism be enhanced through novel, remote monitoring and observing solutions?

moments in the development of this field of study we can perhaps suggest that the community is on the brink of entering a new phase, moving beyond its current phase of ‘development’ to one of ‘consolidation’.

Conclusion

Since the publication of Smith’s and Spletstoesser’s (1994) special issue on Antarctic Tourism, more than two decades ago, tourism has positioned itself as a significant human activity in the polar regions, and not surprisingly, aligned to this growth we have witnessed a proliferation of tourism research. While being largely descriptive and exploratory at first, this research now shows clear signs of maturing. The conceptual engagement with the tourism phenomena and contributions to the wider body of scholarly work on tourism reflects a deeper engagement with polar tourism phenomena from experiential, participatory, ethnographic, co-productive and existential angles, amongst others. We attempted to explore the transforming relationship between tourism researchers and polar tourism phenomena in this paper, drawing on the understanding that, in Kuhn’s words:

[s]cientific knowledge, like language, is intrinsically the common property of a group or else nothing at all. To understand it we shall need to know the special characteristics of the groups that create and use it. (Kuhn, 1970, p. 210)

As we have shown in this paper, the groups creating and expanding our understanding of polar tourism phenomena are still relatively small and are brought together by a handful of key tourism researchers. However, the scholars driving polar tourism research have

begun to institutionalize their interactions and capacity building through IPTRN. Such an institutionalization has the potential to focus collaborative attempts of assessing gaps in polar tourism research and targeting them in a strategic and cooperative fashion. We have already seen some of the fruits of these efforts, in form of building research capacity and forming new collaborations (e.g. de la Barre et al., 2016) but we have yet to see a consolidated attempt at identifying tourism research needs and strategies across the polar regions and across the groups contributing to polar tourism research.

In terms of understanding the special characteristics of the groups using the scientific knowledge created by polar tourism researchers, we may still have a long way to go. We have witnessed an increasing interest in polar tourism research by policy makers, for example, by the Committee on Environmental Protection to the Antarctic Treaty that commissioned a comprehensive state-of-the-art review on Antarctic tourism (CEP, 2012) or the Arctic Council's Arctic Marine Tourism Project (see Arctic Council, 2015). To a certain extent, policy makers consult polar tourism researchers on matters of mutual interest semi-regularly in informal stakeholder meetings, but the potential of this direct link between science and policy is far from being exhausted.

Nonetheless, we have shown that, drawing on Kuhn's words cited above, (a) a network of polar tourism research has been built, with (b) an increasing level of collaboration, and thus joint ownership of ideas and knowledge, between researchers and institutions, (c) a common language around polar tourism phenomena and (d) increasing interactions between users and creators of knowledge, which necessitates understanding the needs and characteristics of the users and creators of this knowledge. Not the least, through the SNA our paper offered a glimpse at the identities and networks of the knowledge creators and has highlighted the development of these networks over time. Although a lot more work has to be done to further develop the field of polar tourism research and build additional research capacity, our analysis in this paper suggests that this burgeoning scholarly community is well placed to tackle new research priorities.

Acknowledgement

The authors would like to thank Jessica Jaja (University of Ottawa) for her assistance with the social network analysis.

Disclosure statement

No potential conflict of interest was reported by the authors

Funding

This work was supported by the Environment, Society and Policy Group (ESPG), Department of Geography, Environment and Geomatics at the University of Ottawa, Canada.

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