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Critical Literature Review

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Tourism in Antarctica: Finding a Balance for the Future

Nicky McArthur

55859062

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Abstract

Antarctic Tourism has increased significantly over the past fifty years, as has global tourism. This review sets out to consider how this increase in tourist numbers, which appears to be inevitable, is impacting on Antarctica. Is the current legislation sufficient for management of the negative impacts of tourism? If not, what is being suggested as a possible way to mitigate these impacts? Tourism has positive impacts as well, and the future for Antarctica appears to be finding a way forward by recognizing the value tourists bring and balancing this alongside manageable regulations to mitigate the negative impacts.

Introduction

Tourism around the world has increased significantly as a reflection of overall population growth, wealth, access to transportation and exposure to the globe via the media. These have all been factors in building the international tourist industry, and in 2012, travel for tourism will have reached one billion people. (1billiontourists.unwto.org, 2012) Inevitably, some of these travellers seek more than a package holiday in a developed country, and have the desire to see more remote and difficult to reach places as a means to satisfy their adventurous spirits.

This review sets out to look at the pressures placed on Antarctica by the increasing numbers of tourists wanting to visit, and the impacts that arise from tourists actually visiting the continent. In turn, this has given rise to much discussion about the need for further regulation of the industry. Are there any positive outcomes from allowing tourists to visit the continent, and if so what are they? How do we accurately assess impacts, costs and benefits and how do we monitor and manage those impacts going forward? Over the past twenty years as numbers have increased, so has the amount of literature investigating some of the implications for this increased growth.

The impact of popular media, in particular films such as *March of the Penguins* and television documentaries as well as the use of imagery in advertising, has markedly increased pressure on the industry and on the places it services (Starmer-Smith 2011). Tourism has been suggested to be “an expression of a global civil right “(ASOC 2001,1), whereby those individuals with the means can have access anywhere any time. The issue, of course, is where the right to have access threatens the very environment that is appealing in the first place. The great irony therefore is that we are in danger of

fostering access that will in turn diminish the very thing the users have come to value. “The ultimate tragedy – the paradox of tourism – occurs when tourism destroys the very thing it came to see.” (ASOC 2001, 1)

Current Status of Tourism in Antarctica

“The white majesty of the Antarctic continent and its association with heroic deeds or early explorers holds a deep fascination for many tourists.” (Lovering and Prescott 1979, 99) Antarctica is a land of extremes. Its remoteness, its climate, its wilderness and its aesthetic appeal are just some of the aspects that have attracted humans to Antarctica, be they explorers, scientists, artists or tourists. Other appeals include its not being owned by any one nation, having virtually no population to speak of and no infrastructure. Antarctica is considered to be the last great wilderness area left on earth, and up until 1820 probably nobody had even sighted the continent. The history of Antarctic tourism was investigated in detail by Reich in 1979. Many scientists have since made Antarctic tourism their study area. A look at worldwide tourism would indicate that numbers wishing to visit Antarctica will increase. Tourism is the fastest growing global industry; its economic power is enormous and generates ever-greater political influence at national and international levels. (ASOC 2001)

“Tourism” is travel for recreational, leisure or business purposes. The World Tourism Organization defines tourists as people "travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes" (WTO). “In the Antarctic context, tourism is defined as all existing human activities other than those directly involved in scientific research and the normal

operations of government bases” (Hall et al 1992, 156). Under the Antarctic Treaty System (ATS), tourists are not required to have a passport to enter into Antarctica and so cannot be considered international visitors. “By definition, and in the absence of an indigenous population all Antarctic humans are both foreign and domestic visitors at the same time.” (Bauer 2001, 70)

“What makes Antarctica a particular concern is that there is **no regulation of tourism at present.**” (ASOC 2012, 2) Due mainly to its remoteness and to technological difficulties in relation to access, Antarctica has been a relative latecomer in having to consider the impacts of tourism on the continent. However as tourist numbers have increased over the years so have the concerns about impacts on the continent and the management of these.

Interestingly, the numbers of tourists visiting Antarctica itself have fallen over the last few years. Numbers steadily grew from 4,698 in 1991 to 25,000 in 2011 – but this is still far fewer than the peak of 46,069 tourists that visited the shores of Antarctica in 2007/08. (IAATO 2010a) This is undoubtedly a reflection of the current state of the global economy, but it is against the general trend where tourism numbers have increased steadily over the past twenty years. Visitor numbers are expected to increase as the economic situation improves and the global population itself continues to grow.

Since the inception of the International Association of Antarctica Tour Operators (IAATO) in 1991, records of tour itineraries and site visits have been maintained. In recent years these expeditions have largely been conducted using vessels which carry from six to five hundred passengers. The ships sail primarily to the Antarctic Peninsula region. Some itineraries also include South Georgia and the Falkland Islands. These

voyages generally depart from Ushuaia (Argentina), Port Stanley (Falkland Islands), and to a lesser extent from Punta Arenas (Chile), Buenos Aires (Argentina) or Puerto Madryn (Argentina).

By far the most visited area of Antarctica is the Antarctic Peninsula. Molenaar (2005) puts the figure at 95%. According to IAATO records (IAATO website), approximately two hundred sites including twenty research stations have been visited in the Antarctic Peninsula region since 1989. About fifty of these sites have received more than one hundred visitors in any one season and about the same number have been visited just once. A cursory examination of the tour data indicates that visits are concentrated at less than thirty-five sites. Less than ten sites receive around 10,000 visitors each season.

Tourists, like scientists, choose to visit Antarctica mostly during the summer months between October and March. The benefits of visiting in the summer months are obvious; there is significantly more wildlife during breeding seasons, longer daylight, higher temperatures and easier access due to reduced ice coverage (Molenaar 2005).

The sources of Antarctic tourists are similar to global patterns of tourism: the United States (32.4%), Germany (14.1%), the United Kingdom (10.3%), Australia (7.0%), Canada (5.6%), the Netherlands (3.9%), Japan (3.2%), Switzerland (2.8%), other countries (20.6%) (IAATO 2010a). According to current information, Antarctica is likely to remain a specialized and relatively expensive niche destination offered by a limited number of experienced operators focusing on educational voyages to areas of natural and wilderness value. IAATO vessels also transport dozens of scientists per year to the Antarctic and Sub-Antarctic islands.

Impacts of Antarctic Tourism

The effects of tourism are multifaceted and can be direct, indirect and cumulative. They can relate to individuals, groups of tourists or the whole of the tourism industry; be short term, e.g. one landing, or long term, e.g. whole season; and may be local, regional and, indirectly, worldwide. Liggett (2011) considers the impacts of tourism in Antarctica fall into five key areas: environmental, social, cultural, economic and political. Whilst all of these are significant, the key factor in terms of public perception is of course the environmental impacts of these visits. Hofman & Jatko (2000) were among the first to look at this in detail with their study of the possible cumulative environmental impacts of commercial ship-based tourism in the Antarctic Peninsula.

An investigation of the possible impacts by Bauer (2001) using a Delphi method to explore perceptions and potential impacts of future tourism in Antarctica gave a wide range of areas for consideration. With regard to impacts on the natural and created Antarctic environment they included general tourism/visitor impacts, scale of impacts on sites visited, regulation and management of impacts, exclusion/limits of development, impacts of shipborne tourism, airborne tourism, land-based tourism, adventure tourism, impacts on the land, wilderness and scenic values, impacts on the sea, on the natural environment (flora and fauna), and on historic sites, scientific work and stations.

It is the fragility of the Antarctic environment that is now being recognized, whereby even the smallest changes induced by human impact could have long term implications for the environment. These are difficult to assess because of the complexities associated with the Antarctic ecosystem, but the fact remains that “the Antarctic contains unique

marine and terrestrial ecosystems with at least 60% of all terrestrial and 70% of all marine species endemic to the region” (Hall et al 1993, 118).

There is minimal conclusive empirical evidence that can identify that the overall effect of tourism on the ecology of Antarctica is negative (Stewart et al 2005, 386). Whilst it doesn't reduce any problems that tourists bring, there is also some discussion that scientists and their logistical staff may equally have substantial negative environmental impacts on the areas surrounding their bases.

Landborne impacts are potentially the most severe, with the infrastructure necessary to service bases including airstrips, roads, routes and trails, waste disposal, housing for scientists and utility buildings (Kriwoken and Rootes 2000). The impact of ship-based tourism on the Antarctic environment is not without controversy however. Whilst keeping the tourists essentially in “floating hotels,” the pressure placed on the few landing sites available means considerable numbers of people visiting a small number of sites. The cumulative impact in these sites is perhaps easier to monitor as IAATO operators are required to log their visits and record observations for each visit, but in reality long term wider impacts are hard to measure. An additional problem in assessing impacts is the difficulty of separating current impacts from historical impacts.

It is the dynamic nature of tourism that is of concern in regard to future impacts, as each new tourism direction or venture brings with it a new set of risks and potential impacts. As discussed earlier, the numbers would indicate that the pressure from tourism in the Antarctic looks most likely to increase unless regulations come into force. Impacts from emerging and diversifying tourism could include extension of existing activities into new areas both from the sea (e.g. new Zodiac landing sites, increased pressure at

existing sites such as from camping) and from the air as tourism activities push further inland to until-now relatively undisturbed wilderness areas.

One of the aspects of Antarctic tourism which has held visitor numbers in check over the decades, apart from the technical difficulties of actually getting to the continent, is the short season available to tourists for visiting. This however has its own set of impacts as it tends to coincide with the breeding season for much of the Antarctic wildlife and creates competition for ice-free land. Whilst presenting good opportunities for viewing of wildlife, it also brings problems including disturbance, noise, possible introduction of disease, littering, fuel pollution and trampling. These impacts could be described as transient (Kriwoken and Rootes 2000).

The risks of all human activities in the Antarctic are greater than anywhere else. Whilst there is a human presence in Antarctica there will be negative impacts, and as human interest in the continent grows, be it for science or tourism, a robust set of regulations will be required to ensure that these negative impacts are minimized as much as possible. Good vision with long term strategic planning will be essential to ensure the continent retains its intrinsic wilderness values. The human footprint has never been comprehensively and systematically assessed in Antarctica (ASOC 2012, 52). Good science with measures and monitoring in place will be essential for keeping apace with the projected growth in tourism. If this comes about it will facilitate information sharing and good long term planning.

Current Regulations

No nation has legal sovereignty over any part of Antarctica and so the legal status of the land and the resources of the continent are subject to the conditions of the Antarctic Treaty, signed in 1959 and coming into effect on 23rd June 1961. The Treaty established Antarctica for peace and science. The original Treaty document does not make any specific mention of tourism, but as tourist numbers have increased over time various protocols have been added to the document in a rather ad hoc manner to ensure some environmental protection for the Antarctic Continent and also the Southern Ocean. Since the Antarctic Treaty Consultative Parties' (ATCP) 1966 meeting in Santiago, at almost every biennial Antarctic Treaty Consultative Meeting recommendations have been added (Hall 1992).

The Madrid Protocol, introduced into the ATS system in 1991, put in place an environmental code of conduct. The Environmental Protocol, adopted, ratified, and implemented domestically by all the Antarctic Treaty Parties in the 1990s, set out the environmental protection of Antarctica from all human activities, including tourism (Lamers 2005, 6). As Wood explained in his Introduction (2010, 139):

The Madrid Protocol on Environmental Protection to the Antarctic Treaty entered into force in 1998. Its purpose is to provide a comprehensive regime for the protection of the Antarctic environment, including its special value as an area for the conduct of scientific research. Protection of the coastal and marine environment would seem to be a fundamental part of this objective considering the primary importance of the marine ecosystem in Antarctica and the potential impact of steadily increasing shipping activity in the region. However, while some

States have taken steps to implement the Madrid Protocol comprehensively within the entire Antarctic Treaty area, others have interpreted its reach to be strictly limited with respect to the marine environment. As a result of this narrow approach, the ability of the Madrid Protocol to preserve the scientific value of Antarctica has been markedly reduced.

IAATO, the International Association of Antarctica Tour Operators, was formed in 1991 by tour operators active in Antarctica as an organization aimed at the advocacy, promotion and practice of environmentally responsible private-sector travel to Antarctica (IAATO 2012, 1). IAATO has developed a robust set of rules, regulations and guidelines by which all their members operate, and is recognized to have contributed significantly to lessening some of the negative impacts of tourists in the Antarctic. Indeed many of the scientific bases will now only receive tourists to view their operations if they are from an IAATO member operator.

However there are concerns about the tourism industry self regulating through IAATO, and as the numbers of treaty members increase there is a call for ATS as the theoretical governor of Antarctica to review its approach to tourism policy. One of the difficulties may be lack of knowledge about tourism among the members of ATS. IAATO has filled some of the roles for them until now but a combined approach could be developed for the future (Liggett et al 2010).

Enzenbacher argues the case for urgent review of tourism as it enters a new era of unprecedented growth. Policy making in Antarctic tourism presents a range of challenges for the Antarctic Treaty Parties (ATPs) and there appears to be uncertainty over how it should best be managed. One of these challenges is the keeping up with

developments and the potential increase in numbers.

Benefits of Antarctic Tourism

"It is expected that tourism will become ever more centered upon a quest for something larger, something more personally fulfilling....It is argued that the quest for knowledge and understanding, enacted through travel, will continue to be a dominant theme of the new century" (*ScienceDaily* Jan 30 2012, 2).

The benefits of tourism can be many and varied. The difficulties in accessing Antarctica do create two points of advantage. The first is that because of the cost involved Antarctic tourism tends to attract more affluent and therefore probably more educated travellers who are likely to be more receptive to the conservation message. The second is that the majority of Antarctic tourism is ship-based, where education is part and parcel of what is offered.

"The benefits derived from responsible tourism, such as better knowledge and appreciation of the region, are substantial. The wildlife-rich coastline, snow-covered mountains, glaciated landscapes, and extreme weather of this physically remote and magical part of the world lend this region remarkable wilderness and aesthetic value for the adventurous traveller." (IAATO 2012) As Steve Wellmeir, executive director of IAATO, is quoted as stating (Starmer-Smith 2011, 3), "Our experience is that the visitors return home as 'ambassadors' for conservation in this environment and strong advocates for any preservation efforts."

"This is a place that is not owned by any sovereign nation and it has virtually no

infrastructure, population or politics to speak of. No-one there has anything in common other than a shared attraction to this immense, unspoilt and untouched area of the earth.” (Herzog, quoted in Starmer-Smith 2011, 2) It is pristine wilderness, while so many parts of the rest of the globe, for example Africa, are being overrun with tourists. What is it about Antarctica that inspires people to adventure there; that makes them become great ambassadors for not only Antarctica but also the wider conservation picture in the world? It is this intrinsic wilderness value that captures the imagination, that is what tourists take away, and that is at the core of their becoming ambassadors for Antarctica.

Antarctic tourism is necessary also because it creates a public interest and a much greater awareness of the continent worldwide. Without this interest people are less likely to support global political regimes that promote Antarctic conservation interests. If a limited number of tourists is allowed to visit, by definition they are likely to be educated and wealthy and are likely to keep the public debate alive and of interest. It is about the balance between the direct impacts of the tourists and the positive impact of the social and political voice.

Conclusion: Finding a Balance

It is relatively easy to ascertain visitor numbers to Antarctica and overall worldwide statistics and trends through readily available data sources (IAATO, UNWTO, ASOC), though some non-IAATO visitor numbers may not be available. However it is much more difficult to gain accurate measures of the impacts of tourism in Antarctica due to the influencing factors being so varied. Information in regard to the measuring and monitoring of tourism impacts has greatly increased over the past decade (Kriwoken

2000, Lamer et al 2012, Liggett et al 2011), but due to the dynamic nature of tourism, and in particular the difficulty in measuring cumulative impacts, it is extremely difficult to truly understand actual impacts related solely to tourism since often impacts relate to other human activity around sites, regions or indeed worldwide.

Antarctica is likely to remain a specialized and relatively expensive niche destination offered by a limited number of experienced operators focusing on educational voyages to areas of natural and wilderness value. IAATO provides excellent tourism, but not all visitors to Antarctica are members of IAATO or are bound by their regulations.

What is apparent is that all human presence in the fragile Antarctic continent has negative impacts along with the possibility of beneficial ones. New research would suggest that negative impacts could be exponential in relation to the actual numbers visiting the continent each year. The impacts need to be addressed as a whole and taken into account when reviewing protocols for future management. Undoubtedly a limit needs to be placed on overall tourist numbers if current projections are accurate, particularly in the Antarctic Peninsula area where pressure on the continent is highest. Future research could focus on cumulative negative impacts and collaborative science between Treaty parties. A balance needs to be kept between recognition of Antarctica's unique position as a place for peace and science, and the human right to visit together with the necessary management and monitoring of our environment not only in Antarctica but throughout the ecosystem of the whole world.

WORKS CONSULTED

Amelung, B., & Lamers, M. (2005). Scenario development for antarctic tourism:

Exploring the uncertainties. *Polarforschung*, 75(2-3), 133-139.

ASOC. (2001). *Antarctic Tourism*. Paper presented at the ASOC.

ASOC. (2012). *Antarctic Tourism*

. *Antarctic Tourism*, from

file:///Users/nicholamcarthur/Documents/Nicky's/Antartica/PCAS%20601
%20Tourism%20in%20Antartica/IAATO/Tourism%20Overview%20-
%20IAATO.webarchive

Australian Antarctic Division. Tourism Retrieved 2nd Dec 2012, from

<http://www.antarctica.gov.au/about-antarctica/tourism>

Bauer, T. G. (1999). *Polar Tourism*. New Zealand: Puffin

Bauer, T. G. (2001). *Tourism in the Antarctic*: The Haworth Press.

Braun, C., Mustafa, O., Nordt, A., Pfeiffer, S., & Peter, H. U. (2012).

Environmental monitoring and management proposals for the Fildes

Region, King George Island, Antarctica. *Polar Research*, 31(SUPPL.).

Chown, S. L., Lee, J. E., Hughes, K. A., & Barnes, J. (2012). Conservation.

Challenges to the future conservation of the Antarctic. *Science (New*

York, N. Y.), 337(6091), 158-159. doi: 10.1126/science.1222821

Chown, S. L., Lee, J. E., Hughes, K. A., & Barnes, J. (2012). Conservation.

Challenges to the future conservation of the Antarctic. *Science (New*

York, N. Y.), 337(6091), 158-159. doi: 10.1126/science.1222821

Daily, S. (2012). The Challenges Facing a Vulnerable Antarctica

, from <http://www.sciencedaily.com/releases/2012/07/120712144741.htm>

Division, A. A. (2002). Antarctic Tourism

Dove, J. (1997). Antarctica: tourism's last frontier. *Geography Review*, 10(4), 14-18.

Drewry, D. (1980). Assessing Antarctica's Future Last of lands ... Antarctica, by J. F. Lovering and J. R. V. Prescott, Melbourne, Melbourne University Press, 1979, 212 p, illus. A\$9.80. *Polar Record*, 20(124), 79-80. doi: 10.1017/s0032247400003028

Enzenbacher, D. (2007). Antarctic Tourism Policy-making: Current Challenges and Future Prospects. *British Institute of International and Comparative Law*. .

Farreny, R., Oliver-Solà, J., Lamers, M., Amelung, B., Gabarrell, X., Rieradevall, J., . . . Benayas, J. (2011). Carbon dioxide emissions of Antarctic tourism. *Antarctic Science*, 23(6), 556-566. doi: 10.1017/s0954102011000435

Haase, D. (2005). Too much pressure on thin ice? Antarctic tourism and regulatory considerations. *Polarforschung*, 75(1), 21-27.

Haase, D. (2008). *Tourism in the Antarctic: modi operandi and regulatory effectiveness : a thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Antarctic Studies, Gateway Antarctica, University of Canterbury*. (Dissertation/Thesis). Retrieved from

<http://canterbury.summon.serialssolutions.com/link/0/eLvHCXMwY2BQS DJNTDJKMjNMMzcHHToJrKRBh4KbmXqmJqYBqx8jIB2uSKW5myiDopt>

riLOHLsLUeOgoBrCICjotyBQjIEF2C9OBQCtlhjf

Haase, D., Storey, B., McIntosh, A., Carr, A., & Gilbert, N. (2007). Stakeholder perspectives on regulatory aspects of antarctic tourism. *Tourism in Marine Environments*, 4(2-3), 167-183.

Hall, C. M. (1992). Tourism in Antarctica: Activities, Impacts, and Management. *Journal of Travel Research*, 30(4), 2-9. doi: 10.1177/004728759203000401

Hall, C. M., & McArthur, S. (1993). Ecotourism in Antarctica and adjacent sub-Antarctic islands: development, impacts, management and prospects for the future. *Tourism Management*, 14(2), 117-122. doi: 10.1016/0261-5177(93)90044-I

Hall, C. M., McArthur, S., & Spoelder, P. (1992). Ecotourism in Antarctica and adjacent sub-Antarctic islands: development, impacts, management and prospects for the future. *Canberra, Bureau of Tourism Research*.

Headland, R. K. (1994). Historical Development of Antarctic Tourism *Scott Polar Research Institute, Uk, Annals of Tourism Research*, 21(2).

Headland, R. K. (1994). Historical development of Antarctic tourism. *Annals of Tourism Research*, 21(2), 269-280. doi: 10.1016/0160-7383(94)90044-2

Hofman, R. J., J. . (2000). Assessment of the Possible Cumulative Environmental Impacts of Commercial Ship Based Tourism in the Antarctic Peninsula Area.

<http://www.sciencedaily.com/releases/2012/07/120712144741.htm>. (2012)

IAATO. (2011/12). Tourism Statistics from <http://iaato.org/tourism-statistics>

IAATO. (2012). Scope of Antarctic Tourism - A background Presentation

from iaato.org/tourism-overview

IAATO. (2012). Tourism Overview, from

file:///Users/nicholamcarthur/Documents/Nicky's/Antartica/PCAS%20601
%20Tourism%20in%20Antartica/IAATO/Tourism%20Overview%20-
%20IAATO.webarchive

IPY_APECS. (2007-8). Polar Resource Book

IPY_APECS_PolarResourceBook_feb09geneva.doc.

Judy Vulker, G. M., Royal Institute of Architects, ACT, 1989. (1989). The

Antarctic Experience: Tourism's Final Frontier. *Architecture in the Wild: the issues of tourist developments in remote and sensitive environments*, 796.51.7,

.Kriwoken, L. K., & Rootes, D. (2000). Tourism on ice: environmental impact

assessment of Antarctic tourism. *Impact Assessment and Project Appraisal*, 18(2), 138-150. doi: 10.3152/147154600781767538

Lamers, M., Liggett, D., & Amelung, B. (2012). Strategic challenges of tourism

development and governance in Antarctica: Taking stock and moving forward. *Polar Research*, 31(SUPPL.).

Liggett, D., McIntosh, A., Thompson, A., Gilbert, N., & Storey, B. (2011). From

frozen continent to tourism hotspot? Five decades of Antarctic tourism development and management, and a glimpse into the future. *Tourism Management*, 32(2), 357-366.

Lovering, J. F. a. J. R. P. (1979). *Last of Lands: Antarctica*. Melbourne,

Australia: Melbourne University Press, Australia.

Machiel, L., Daniela, H., & Bas, A. (2008). Facing the elements: analysing

trends in Antarctic tourism. *Tourism Review of AIEST - International Association of Scientific Experts in Tourism*, 63(1), 15. doi: 10.1108/16605370810861017

Maher, P. T. (2005). A Ulysses Connection: Examining Experiences in the Ross Sea Region, Antarctica. *The Journal of Experiential Education*, 27(3), 311-313.

Maher, P. T., Johnston, M. E., Dawson, J. P., & Noakes, J. (2011). Risk and a changing environment for Antarctic tourism. *Current Issues in Tourism*, 14(4), 387-399.

Maher, P. T., Steel, G., & McIntosh, A. (2003). Examining the experiences of tourists in Antarctica. *The International Journal of Tourism Research*, 5(1), 59-59.

Maher, P. T., & Stewart, E. J. (2007). *Polar tourism*. Elmsford, N.Y.: Cognizant Communication Corp.

Maher, P. T., Stewart, E. J., & Lück, M. (2010). *Polar tourism : human, environmental, and governance dimensions*. Putnam Valley, NY: Cognizant Communication Corporation.

Molenaar, E. J. (2005). Sea-Borne Tourism in Antarctica: Avenues for Further Intergovernmental Regulation. *The International Journal of Marine and Coastal Law*, 20(2), 247-247. doi: 10.1163/157180805775094454

Naveen, R. (1995). Polar Tourism: Tourism in the Arctic and Antarctic Regions. Colin Michael Hall and Margaret E. Johnston (Editors). 1995. New York and Chichester: John Wiley and Sons, xvi 329 p, illustrated, hard cover. ISBN 0-471-94921-3. £37.50. *Polar Record*, 31(179), 433-435. doi:

10.1017/s0032247400027467

Powell, R. B., Brownlee, M. T. J., Kellert, S. R., & Ham, S. H. (2011). From awe to satisfaction: immediate affective responses to the Antarctic tourism experience. *Polar Record*, 48(2), 1-12. doi: 10.1017/s0032247410000720

Powell, R. B., Brownlee, M. T. J., Kellert, S. R., & Ham, S. H. (2012). From awe to satisfaction: Immediate affective responses to the Antarctic tourism experience. *Polar Record*, 48(2), 145-156.

Powell, R. B., Kellert, S. R., & Ham, S. H. (2008). Antarctic tourists: ambassadors or consumers? *Polar Record*, 44(3), 233-241. doi: 10.1017/s0032247408007456

Reich, R. J. (1980). The development of Antarctic tourism. *Polar Record*, 20(126), 203-214. doi: 10.1017/s0032247400003363

Reich, R. J. (1980). The development of Antarctic tourism. *Polar Record*, 20(126), 203-214. doi: 10.1017/s0032247400003363

Roura, R., & Rijksuniversiteit te Groningen. Archaeological Centre. (2011). *The footprint of polar tourism : tourist behaviour at cultural heritage sites in Antarctica and Svalbard*. Eelde, the Netherlands: Barkuis Pub.

Roura, R. M., & Hemmings, A. D. (2011). Realising strategic environmental assessment in antarctica. *Journal of Environmental Assessment Policy and Management*, 13(3), 483-514.

Ryan, C. (1991). *Recreational Tourism: A social science perspective* New York, USA: Routledge, Chapman and Hall Inc.

Senegačnik, J. (2011). Tourism in Antarctica. *Turizem na Antarktiki*, 58(2), 4-14.

Smith, V. R. (2008). Energy flow and nutrient cycling in the Marion Island

- terrestrial ecosystem: 30 years on. *The Polar Record*, 44(3), 211-226.
- Snyder, J. M., & Stonehouse, B. (2007). Prospects for polar tourism (pp. 1 online resource (xiv, 318 p.)). Retrieved from <http://ezproxy.canterbury.ac.nz/login?url=http://www.cabi.org/CABeBooks/default.aspx?site=107&page=45&LoadModule=PDFHier&BookID=356>
- Splettstoesser, J. (1998). IAATO's Stewardship of the Antarctic Environment: a History of Tour Operator's Concern for a Vulnerable Part of the World. *International Journal of Tourism Research*(Jan/Feb 200).
- Splettstoesser, J., & Folks, M. C. (1994). Environmental guidelines for tourism in Antarctica. *Annals of Tourism Research*, 21(2), 231-244. doi: 10.1016/0160-7383(94)90042-6
- Starmers-Smith, C. (10 December 2011). Frozen Planet: The lure of the Antarctic, *The Telegraph*.
- Stewart, E. J., Draper, D., & Johnston, M. E. (2005). A Review of Tourism Research in the Polar Regions. *Arctic*, 58(4), 383-394.
- Stonehouse, B. (1996). Arctic and Antarctic Tourism, can the one learn from the other?
- Stonehouse, B., & Snyder, J. (2010). *Polar tourism : an environmental perspective*. Bristol ; Buffalo: Channel View Publications.
- Tourism development in critical environments (Chapter 10)*. (1999). New York: Cognizant Communication Corp.
- Tourism development in critical environments*. (1999). New York: Cognizant Communication Corp.
- US Fed News Service, i. U. S. N. (2009). Antarctic Tourism. Retrieved from

USEP and ASOC, L. C., Goldsworthy Lyn, Roura Ricardo. (2012). *Review of the Implementation of the Madrid Protocol: inspections by Parties (Article 14)*. Paper presented at the Antarctic Treaty Consultative Meeting XXXV, Hobart 2012.

Wood, K. R. (2003). The Uncertain Fate of the Madrid Protocol to the Antarctic Treaty in the Maritime Area. *Ocean Development & International Law*, 34(2), 139-159. doi: 10.1080/00908320390209618