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Tourism in Antarctica: Exploring the future challenges of regulating the Deep South

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TOURISM IN ANTARCTICA:

EXPLORING THE FUTURE CHALLENGES OF REGULATING THE DEEP SOUTH

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ABSTRACT

Tourism in the Antarctic is mainly managed through the self-regulatory system undertaken by IAATO, which appears to be operating effectively for the moment. Antarctic tourism is defined

in this report as being mainly recreational and/or educational activities in the Antarctic Treaty area. Issues around the management of tourism have been identified and explored with relevant examples from the literature and recent news sources. In doing so, we have come up with several key recommendations for the future of management and regulation for Antarctic tourism. These are ranked in priority order as follows: 1. The development of a strategic approach to tourism regulation which codifies IAATO's bylaws; 2. IAATO levying fees in order to fund standardised environmental monitoring for the impact of all operations, with data to be made publicly available; 3. Improving port state controls; 4. Better management of cumulative impacts on intensively landed areas through ASPA an ASMA regulations; and 5. The establishment of a rapid response disaster fund, alongside the eventual implementation of Annex VI.

INTRODUCTION

Tourism in latitudes below 60°S, the Antarctic Treaty area, is an industry that falls within the scope of the Antarctic Treaty. The recognition of the need to manage human impacts on the area, outlined in the Madrid Protocol of 1991 gave rise to key guiding principles for managing human activity in this unique environment. A coalition of existing Antarctic tour operators was formed called the International Association of Antarctica Tour Operators ("IAATO") which developed guidelines that set out safe operating practises and mitigated impact on the environment, paying heed to the Madrid protocol. In this report, the effectiveness of the management of tourism in the Antarctic Treaty area is examined against the regulatory framework and future challenges are identified with the aim of outlining the challenges to regulating and managing Antarctic tourism, and suggesting key recommendations for improvements to the current regulatory framework.

TOURISM IN ANTARCTICA

Travel may be a necessity of a nomadic lifestyle, a requirement of work or by choice. So what is it that makes a tourist different to any other sort of traveller?

THE 'TOURIST' CLASSIFICATION

Traditionally, a tourist was a person who travelled away from their country of residence for longer than 24 hours, for reasons other than to work or reside in their destination (Bauer, 2001). Tourism was defined by the British Tourist Authority (1978) as 'the temporary, short-term overnight movement of people to destinations outside the places where they normally live and work, and their activities at these destinations' (Reich, 1980). As Antarctica has no indigenous human population, and logistics typically require a stay to be longer than 24 hours, it could be deduced that all people who travel to Antarctica and are not paid directly for that purpose are tourists.

Identifying travellers to Antarctica as tourist or not, on the basis of whether they are paid is problematic. In Antarctica, there are scientists carrying out their research, with base and field

support staff ensuring that this work can be done safely. Amongst the scientists working in Antarctica, some are likely to be students carrying out fieldwork for their studies. In the 2016/2017 field season, thirteen of the eighteen programmes under Antarctica New Zealand are University research groups, many of which include post graduate students as part of the team of researchers (Antarctica New Zealand, 2017). The United States Antarctic Program, USAP, annually hosts around 700 scientists chosen by the National Science Foundation, NSF. The NSF gives these scientists jurisdiction for appointing scientist's assistants but stipulates that preference must be given to graduate and undergraduate students studying in the relevant discipline (National Science Foundation, 2017). Although they may not be earning a wage, they are definitely working while in Antarctica, so must be excluded from the category of tourist. A more useful definition of Antarctic tourism is given by C Michael Hall, 'as all existing human activities other than those directly involved in scientific research and the normal operations of government bases' (Hall, 1992).

There are other visitors to Antarctica who are unpaid, but are working there nonetheless. These volunteer Antarctic workers include people involved in historic conservation schemes, penguin and other wildlife conservation schemes. There are also volunteer working visitors to Antarctica; artists, musicians, photographers, film makers, educators, providers of outreach and community engagement. Visits to Antarctica are made by people such as politicians and their entourage, media, artists, youth groups, students, adventurers, tourist operators and also the people who pay their own way to journey to the 'last continent', Antarctica. Noting that work may be either paid or voluntary, an Antarctic tourist could be defined as a person who travels to Antarctica for a purpose other than to work there. A tightened definition of Antarctic tourism is "all human activities either mainly pursuing recreational and/or educational purposes or unequivocally catering for those who engage in recreational and/or educational activities in the Antarctic Treaty area south to 60° S Lat" (Haase, 2008).

Within the category of tourist, some people choose to travel to extreme parts of the world, to visit unique wildlife in their habitat, to experience pristine landscapes, to survive in an extreme climate, or to go where most people might never set foot. For the 2016/17 season, IAATO has estimated a 14% increase in tourist numbers, to a total of 44 000 including all ship, ship to shore and land based tourism south of 60° South (International Association Antarctica Tour Operators; IAATO, 2017). This is just a minute fraction of the one billion international tourists each year (World Tourism Organisation, UNWTO, 2016). Antarctica and the oceans that surround it make up a unique part of our planet. Antarctica is the coldest, driest and most isolated part of the planet. Its isolation is geographic, oceanographic and climatic. The environmental features are beautiful and harsh. The wildlife that have Antarctica as their habitat live in this delicate balance.

BY THE NUMBERS

Of the estimated 44 000 Antarctic tourists in the 2016/2017 season, 12 400 are expected to be involved in site landings. Each person landing on Antarctica has some form of impact on the

environment such as the inadvertent seed dispersal of non-native, or alien, species, disruption to wildlife in their habitat and the footprint. All forms of transport into the Antarctic Treaty area also impact the environment, and have the potential for catastrophe. The majority of travel for tourism is by ship, which has a significantly lower carbon footprint than air travel.

The estimated number of tourists in the 2016/2017 season can be compared to number of personnel involved in science research in the Antarctic Treaty area. The entire United States Antarctic Programme (USAP) has just over 3000 people involved in science programmes, base support and logistics who have travelled to, or are travelling to, Antarctica this summer season (United States Antarctic Program, 2017). Antarctica New Zealand has around 300 people southbound this season (Kent, 2017). The total annual USAP is approximately twice the USAP base capacity, whereas the Antarctica New Zealand personnel count of 300+, exceeds their base capacity fourfold. Taking an average of these two ratios, an estimate for the total number of non-tourists (as defined by Haase) in Antarctica this year is around three times the total base capacity of all the bases on the continent. There is a total of capacity of 4829 personnel across all the National Antarctic Program (NAP) bases on Antarctica (Council of Managers of National Antarctic Programs; COMNAP, 25). The total number of personnel involved in non-tourist activities, being mainly NAP activities, is estimated to be around 14500. The number of tourists in the Antarctic Treaty area is estimated at three times the numbers of NAP personnel over this, 2016/2017, summer season.

The popularity of Antarctica as a tourist destination has benefits to some science programmes. The air transport from Cape Town provided by Antarctic Logistic Centre International, ALCI, charter to both tourist operators and government science programmes, giving as Gabriela Roldan suggests “an example of tourism subsidising science” (Roldan, 2017). In return, the infrastructure provided by science programmes can be of use to tourist operators, as was the case recently when the evacuation of Buzz Aldrin, a client of White Desert Tours, from the South Pole was managed by the National Science Foundation (National Science Foundation, 2016). There is some degree of overlap between tourist activity and personnel involved in NAPs, such as a scientists partaking in recreational activities while on the continent. In turn, some NAPs support the tourist industry by accommodation of tourists and the establishment of tourist facilities, visitor centres and souvenir shops on the Antarctic continent (Bastmeijer *et al.,* 2008).

POTENTIAL IMPACTS OF TOURISM

The presence of human activity in the Antarctic Treaty area carries with it unavoidable impacts on the environment. An impact on the environment can be defined as “the difference between the future state of the environment if the action took place and the state if no action took place” (Cloesen, 2007) whereas cumulative impacts can be defined as “impacts on the natural and social environments from single or multiple sources which occur so frequently in time or so densely in space that they cannot be assimilated, or that combine with effects of other activities in a synergistic manner” (Verbitsky, 2011). Changes in attitude towards identifying

and mitigating negative environment impacts will improve tourism industry practice (Cloesen, 2003).

Passengers typically spend only a few hours on Antarctic landings. Although this is relatively small amount of time, it the part of their tour which is likely to have the most significant impact. In the 2013-2014 Antarctic season fifteen landing locations on the Peninsula made up 68% of all passenger landings on the continent, as shown in Figure 1 (Bender *et al.,* 2016). If this pattern continues these locations may be disproportionately vulnerable to disturbance given the concentration of landings.

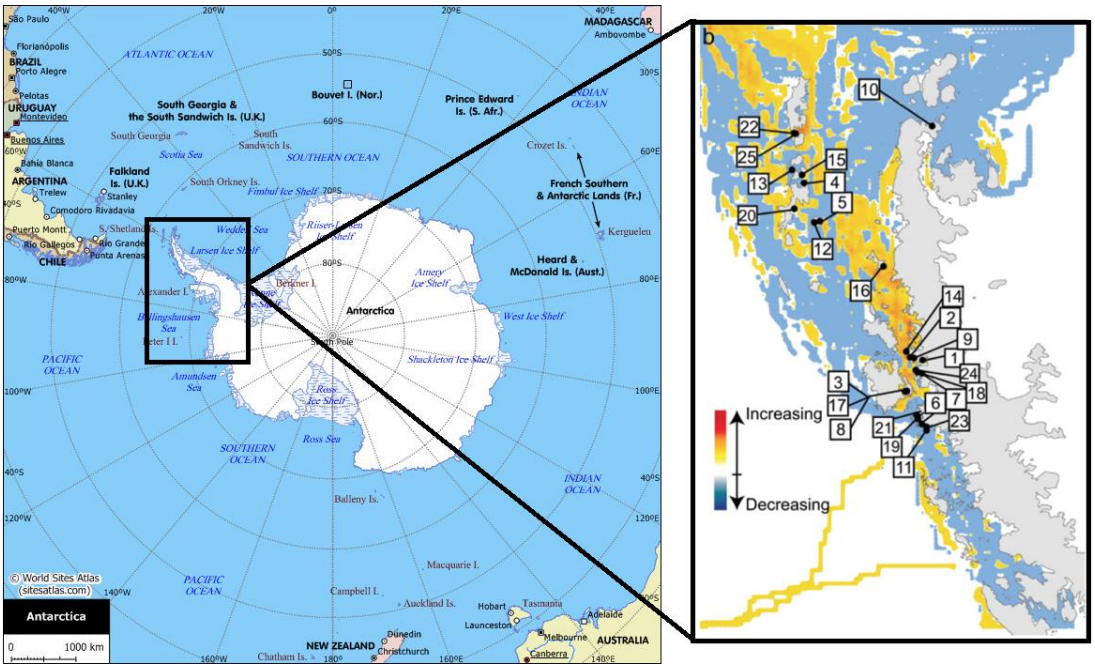

Figure 1: Map referencing the 25 most popular landing sites during the 2014-2015 season on the Antarctic Peninsula. Adapted from Bender *et al.,* 2016.

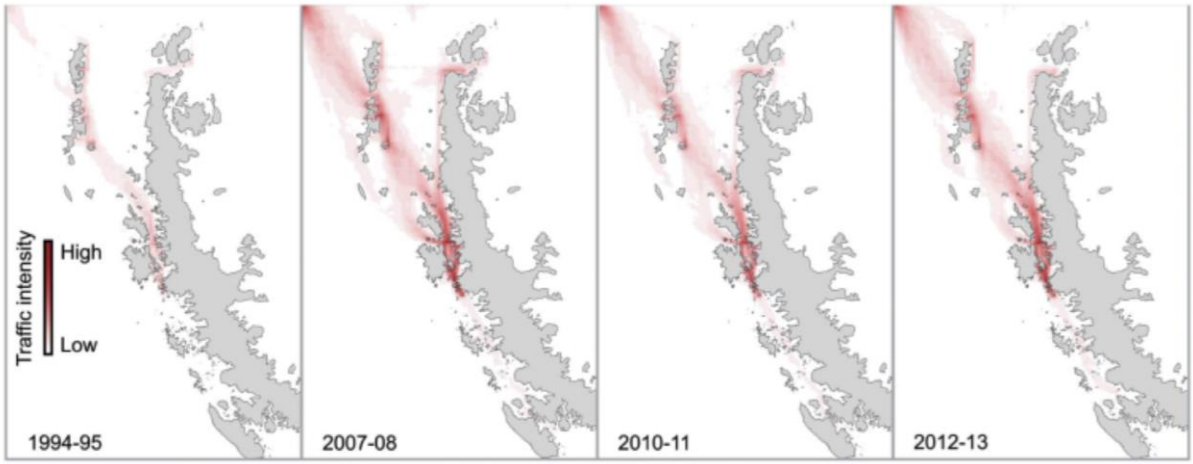

Figure 2: Map showing the vessel traffic intensity through the Lemaire and Neumayer channels from the 1994-1995 season until the 2012-2013 season. Source: Bender *et al.,* 2016.

The Antarctic environment is vulnerable to invasion by non-indigenous species which has the potential to irreversibly alter the terrestrial ecosystem. The continent's isolation and severe climatic conditions do not support complex community development amongst the flora and fauna (Hughes & Convey, 2010). This means that populations of Antarctic species that are spatially segregated are quite vulnerable to human impact from disturbance activities and introduced species. As human visitation increases, so too does the chance of non-indigenous species invasion, with the risks of introduction and colonisation. In terms of both species number and biomass, microorganisms dominate the Antarctic environment, however there are still vast areas of Antarctic life that remain well studied (Hughes & Convey, 2010).

Organisms that are transported to Antarctica through human activities can come on boots, in cargo, on food or in clothing. Often seeds and other small organisms become entangled in the Velcro of jackets and use it as a vehicle to be transported. The Antarctic Peninsula is geographically close to South America making it a vulnerable channel for potential non-native organisms to Antarctica (McLeonard, 2014). Antarctica is considered the most biologically isolated area in the world, however with increased traffic to the continent an estimated 75 000 organisms are transported to Antarctica each season. Steven Chown surveyed the bags and clothing of 850 passengers to Antarctica in the 2007/08 season, using a vacuum cleaner, and found one passenger unknowingly carried 86 individual seed species and a total of 472 specimens in their belongings (McLeonard, 2014).

Tourism beings the potential for an environmental disaster. For example, in 1989 the Bahia Paraiso sunk in Arthur Harbor discharging diesel fuel, jet fuel, gasoline, compressed gas cylinders and hydraulic fluids into the harbor (Sweet *et al.,* 2015). The surrounding environment had an immediate reaction to the spill, especially the intertidal zone where limpets, birds, sediments, rocks and macroalgae were contaminated by the oil. Within one week thousands of dead limpets were witnessed in the intertidal zone and washed up on the shore (Sweet *et al.,* 2015).

The tourism industry also has the potential to cause harmful interference to wildlife and their habitats. An example of this is at Cape Royds, between 1956 and 1962, where the population of Adélie Penguins halved coincident with repeated multiple daily landings of tourists via helicopter (Hall, 2016).

Cumulative effects involve impacts, which may not be important on an individual visit, but can be significant when examined in a larger geographic perspective, due to the magnitude of the problem. Unless processes are put into place in the near future, the biodiversity of the Antarctic Treaty area will be permanently damaged, compromising its use for ongoing science (Cloesen, 2007).

IMPORTANCE OF IAATO

The issue of who is visiting Antarctica, why and how they need to respect the Antarctic Treaty area, adhering to the Antarctic Treaty of 1959, was addressed in Madrid in 1991. The Protocol on Environmental Protection to the Antarctic Treaty ("Madrid Protocol") provides guidelines for responsible visits to Antarctica. Article 3 of the Madrid Protocol recognises the broad range of activities in Antarctica being scientific research programmes, tourism and all other governmental and non-governmental activities. The protocol addresses the responsibilities of the tourists to Antarctica, the people coming for reasons other than work, and the tourist operators who host them. The International Association of Antarctica Tour Operators (IAATO), a self-regulatory body, acknowledges that the Madrid Protocol requires that "anyone planning activities in the Antarctic - including tour operators - must submit environmental impact assessments of the potential impacts of their intended activities. For IAATO operators, this includes the prevention of waste disposal and discharge; deference to scientific research and protected areas; adequate response plans to potential environmental emergencies; and other protection, self-sufficiency and safety requirements" (International Association Antarctica Tour Operators, 2017). The IAATO guidelines are particularly appropriate with this year, 2017, having been named by the world Tourism Organization, UNWTO, as the International Year for Sustainable Tourism for Development (World Tourism Organization, UNWTO, 2016). To appreciate the possible impact of tourism, we need to consider the numbers involved and how the industry is managed.

If environmental impact was due to volume of traffic numbers alone, then the size of the Antarctic tourism industry could be seen as a major issue. However, the responsible actions of IAATO ensure that most of the tourist operators comply with the intentions of the Madrid Protocol, through adherence to the IAATO guidelines and acting as unofficial role models and watchdogs to those operators outside of IAATO. During a lecture on Landcare NZ's project of Tracking Human Impact, Dr Fraser Morgan, commented that data collected to date shows it is not generally the tourists who were shown to be spreading alien species, most commonly as seeds stuck in their pocket fluff and on Velcro, but the scientists (Morgan, 2016). The current approach to regulating and managing Antarctic tourism appears, on paper, to be working.

The tourist operators who subscribe to IAATO are making every effort to minimise the environmental impact of their presence in the Antarctic region. "Tourism is now carefully regulated, and Guidelines set by IAATO for non-governmental expeditions advocate safe and environmentally responsible private-sector travel in Antarctica. Visitors are well controlled and are aware of the need to abide by the requirements of the companies with which they travel" (Harrowfield, 2007). The challenges that relate to the current, IAATO self-regulatory approach are focussed around managing unregulated tourist operators and the few adventurous travellers who fall outside of this system. Such adventurers as Mike Horn, who is kite-skiing and blogging across Antarctica, operate outside of the parameters of the IAATO guidelines. The ultimate regulatory factors in their actions may be their own conscience, the feedback from

public following their journey and the potential wrath of sponsors if they stray too far from the guiding principles of the Madrid Protocol.

THE REGULATORY FRAMEWORK

The regulatory system of Antarctic tourism management is complex, with many binding and non-binding measures to consider nested in a variety of authorities. The Antarctic Treaty, Madrid Protocol, and additional measures adopted by Antarctic Treaty Consultative Parties (ATCPs) at Antarctic Treaty Consultative Meetings (ATCMs) held annually, have formed a solid framework for the protection of the environment from human activities. IAATO has built on this framework and developed its own guidelines for visitors and tour operators. Many of the guidelines imposed by IAATO foster good practice and co-ordination of major tourism activities in Antarctica, through self-regulation. In addition, measures such as the Polar Code outlined by the International Maritime Organisation have increased safety standards for ships operating in polar conditions, which is something that the ATS fails to address.

THE ANTARCTIC TREATY SYSTEM

No dedicated regulatory agreement exists for tourism in Antarctica. However, the Antarctic Treaty System (ATS) applies to every activity carried out in the designated Antarctic Treaty, south of 90°. While the Antarctic Treaty (1959) makes no mention of tourism, it does establish that Antarctica is to be set aside for peaceful purposes, and that any activities carried out there shall not be seen as furthering a claim for territorial sovereignty. All treaty parties have a right under Article IX to establish observers and complete inspections on “all ships and aircraft at points of discharging or embarking cargoes or personnel”, as well as aerial observations over Antarctica, to ensure that the treaty obligations are met at all times. In addition to this, under Article VII each signatory to the treaty must give advance notice of all expeditions to Antarctica organised in or proceeding from its territory, which also applies to tourist ventures.

The Madrid Protocol (1991) was created as a supplement to the Antarctic Treaty (“The Treaty”), and has established a baseline for environmental protection in the Antarctic Treaty area. It provides a good guideline for responsible visits to Antarctica, although it has been criticised as being too broad and open to interpretation (Hemmings and Roura, 2003). Article 3 of the Madrid Protocol sets of environmental principles, and requires that any activities carried out there are “planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems”, including avoiding adverse effects or significant changes to nearly all aspects of the natural and physical environment.

Under Article 8 and Annex I all parties conducting an activity likely to cause an environmental impact (even those less than minor or transitory in nature) need to have an Environmental Impact Assessment (EIA), which is initially assessed under domestic legislation. The EIA permitting process is shown in Figure 3 below. As part of the EIA, activities need to account for cumulative impacts of the activity, for example the impact of other visitors landing at a particular site over time, in combination with other activities in the Antarctic Treaty area. The

Madrid Protocol stipulates that regular, effective monitoring must be carried out in order to assess the impact of any ongoing activities and detect any unforeseen effects. If the initial assessment indicates a more than minor or transitory impact, then a comprehensive environmental evaluation (CEE) of the activity is required, which is made publicly available and is circulated to all Treaty parties, with a final decision made by committee.

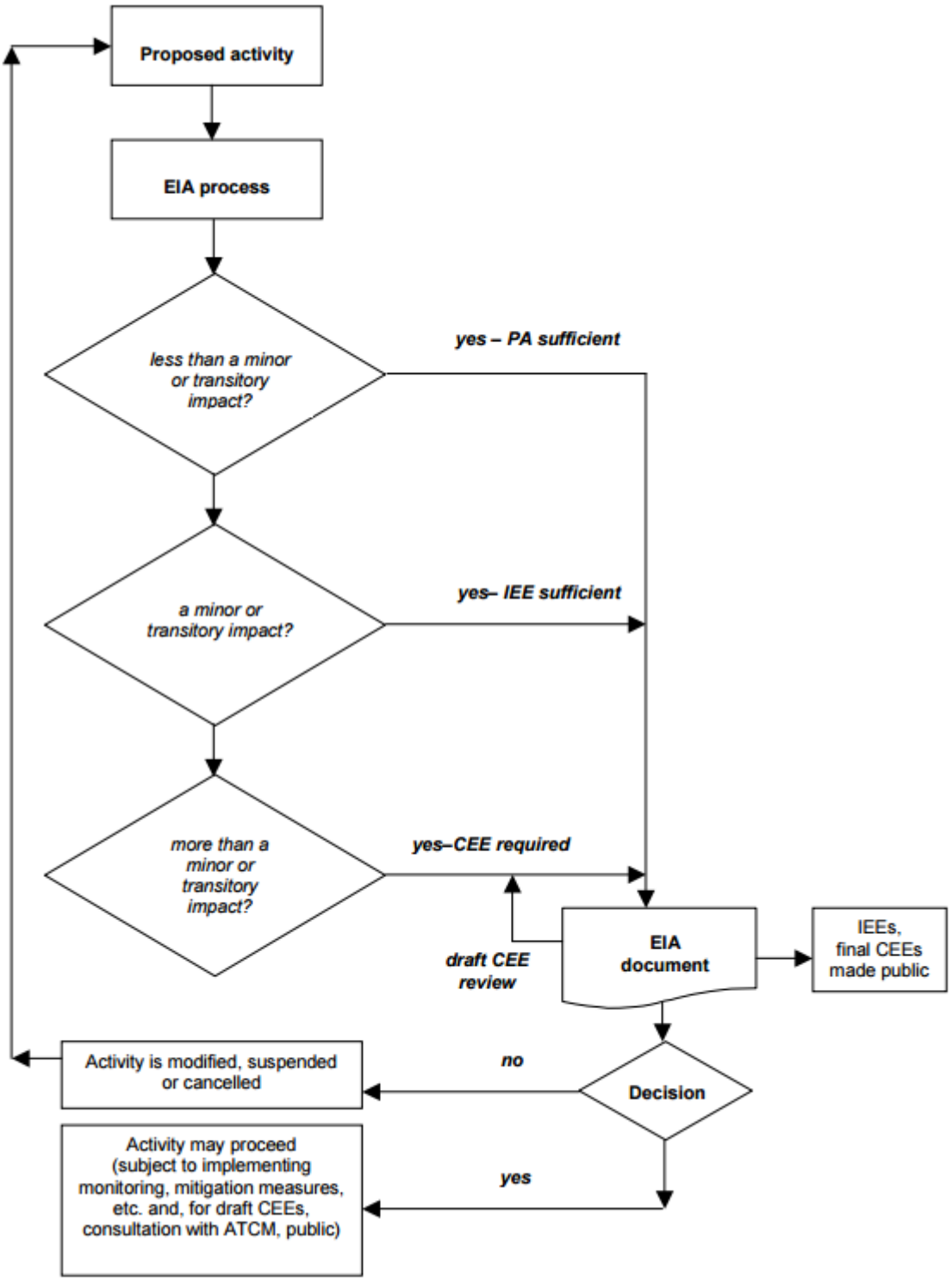

Figure 3: A summary of the EIA process under the Madrid Protocol, from Hemmings and Roura (2003). Key PA = preliminary assessment; IEE = initial environmental evaluation; CEE = comprehensive environmental evaluation.

Annex IV regulates rubbish and sewage disposal and requires waste to (as far as practical) be removed from Antarctica by the visitor. Sewage has several different regulatory pathways depending on whether it is derived from a venture carried out on land, at sea or in a freshwater environment. In general, for vessels carrying more than 10 people (the most common type of operation), raw sewage cannot be discharged within 12 nautical miles of a land or ice shelf. Measures to conserve Antarctic flora and fauna are set out in Annex II. In a general sense, these prohibit the taking (such as handling, killing or damaging) or harmful interference (such as wilful disturbance) of wildlife, and the introduction of non-native species without a permit.

Spatial protection of specific areas can also be designated under Annex V. Antarctic Specially Protected Areas (ASPAS) are generally sites with historic, aesthetic or wilderness values (such as many breeding sites for penguins and historic huts) and require visitors to obtain entry permits. Sites designated as Antarctic Specially Managed Areas (ASMAS) do not require permits, but a set code of conduct usually applies. Guidelines for frequented sites have also been adopted at Antarctic Treaty annual meetings. These guidelines are particularly important for tourist enterprises as they include a useful summary of the important information about the site, any permits required, and any special considerations to adhere to (such as numbers ashore at any given time)

Annual Treaty meetings can often feature a host of legally binding and non-banding recommendations for discussion to improve on the measures outlined in the Madrid Protocol. Consensus is often not reached on proposals, but when it is the measure is added to the Antarctic Treaty System via the Antarctic Secretariat website. Site specific guidelines, such as those discussed above, are the most common measure agreed upon, however other measures have included the standardisation of reporting of tourist activities to the ATS (Resolution 3 (1995) - ATCM XIX, Seoul), improving search and rescue effectiveness through cooperation and vessel tracking (Resolution 6 (2008) - ATCM XXXI - CEP XI, Kyiv) and guidelines for yachts (Resolution 10 (2012) - ATCM XXXV - CEP XV, Hobart). As discussed further on, ATCPs reaching consensus at annual meetings is challenging.

Safety of operations is not a primary concern of the Madrid Protocol, however Annex VI covers disaster liability cost of response and clean up, and is intended to act as a deterrent for acting irresponsibly. Annex VI was agreed to at the ATCM in Stockholm in 2005, but it has not yet been fully ratified. In a recent decision at the ATCM in Sofia (Decision 5 (2015) - ATCM XXXVIII - CEP XVIII, Sofia), parties agreed to make progress towards the ratification of Annex VI, and that regular information needed to be shared with other ATCPs on developments. This superseded two previous decisions in 2005 and 2010 regarding implementation timeframes, which demonstrates that the process has been drawn out and that some consultative parties

may be hesitant to ratify the agreement as it would confer liabilities to them from tourist operations registered in their country.

COMPLIANCE AND ENFORCEMENT

Consultative parties are responsible for checking compliance under the ATS, and in particular, responsibility for specific tour operators lies with the country of registration. The main mechanism for this is by conducting inspections of ships, and checking that information requirements such as EIAs and other permits have been made appropriately. Inspections are made at port facilities, or observers can be placed on vessels on their way to Antarctica to observe on-board and in-field operations.

Given that Antarctica is such a remote destination, with no military presence, self-regulation of the industry is the main mechanism for achieving compliance. Voluntary supervision of the Antarctic tourism industry occurs through IAATO, who hire observers to conduct inspections, and ensure that all members adhere to the ATS regulatory system and IAATO bylaws. If there are repeated non-compliances with a member then there is a potential for sanctions against them, such as reporting them to the responsible authority, and removal from the IAATO website. IAATO members also help to regulate by reporting on non-complying operations (although it is difficult to find information on how often this occurs and the effectiveness of this system).

One issue that occurs in international agreements such as the Antarctic Treaty, is that they usually do not include every country in the world. In the case of Antarctica, ships often register to a non-ATS party state, which eliminates any liability of non-compliance with regulations. For example, Swanson *et al.* (2015) surveyed ships in the Antarctic registry between 2011 and 2014, nothing that overall 51% were registered to non-ATS party states. Of those states, the biggest proportions were ~31% came from the Bahamas and 12% from Malta. Ensuring compliance with these vessels (especially with regards to safety standards) can be challenging, and increasing port state controls is a key mechanism in cracking down on convenience flagged vessels (Swanson *et al.,* (2015).

Travellers, adventurers and operator-managed tourists, are more often than not managed personnel who follow the guidelines set by IAATO and regulations under the ATS. These IAATO operators are paying heed to the Madrid Protocol, providing the dual role of mentor and watchdog identifying the 'underground' operators, such as convenience flagged vessels, or adventurers such as the Norwegian, Jarle Andøy, who sailed a yacht to Antarctica without a permit, ending in a catastrophe, and a rescue mission by ATCP countries. The authorities of Andøy's native country, Norway, managed to press charges against him. Although they had wanted to prosecute via an Annex VI of the Madrid Protocol, it is unratified, however he was prosecuted under their domestic legislation "When you're to travel in waters south of the 60th parallel, you have a duty to report to the Norwegian Polar Institute. Andøy is accused of not

having given notice in advance. He has therefore not arranged insurance as the rules require..." (Oesterud, 2017).

ADDITIONAL REGULATORY MEASURES

THE POLAR CODE

The International Code for Ships Operating in Polar Waters ("Polar Code") entered into force on 1 January 2017, implementing a range of safety and environmental protection measures for all ships that operate in the Arctic and below 60 °S in the Antarctic. Southern faring ships will now need to apply for a Polar Ship Certificate, through which they are classified based on the sort of polar conditions the ship is able to operate in, such as being able to navigate first year ice. Standard safety measures that are now required include ship design and construction, operations, staff training and safety equipment. This has set a higher bar for ship safety, something which the ATS does not focus on.

While the new safety aspects of the Polar Code have been commended, regulations involving environmental protection not been furthered beyond what has been required by the Madrid Protocol. A SOC have expressed their disappointment in this, given the Polar Code was a unique opportunity to impose new restrictions (ASOC, 2015). Discharges of raw sewage beyond 12 nautical miles of land or an ice shelf are still permitted, and measures to minimise invasive species introduction via biofouling and ballast water are only recommended guidelines as opposed to being mandatory to comply fully with the code. ASOC supports a full ban on raw sewage discharges, mandatory practices to prevent invasive hull fouling, along with better training for staff on mitigating minor oil spills (ASOC, 2015).

CRITICISMS OF THE REGULATORY SYSTEM

DIFFICULTIES AGREEING IN A CONSENSUS BASED SYSTEM

Although the Antarctic Treaty and Madrid Protocol have good intentions, the most challenging barrier to adding to and updating the legislation over the years has been the consensus based process required under the Treaty. There are now 29 consultative parties to the Treaty, each with their own values and ideas about how activities should be carried out in Antarctica. Numerous proposals relating to tourism have been put forward at ATCMs, however very few additional measures have been adopted. In particular, consensus around strategic policy directives specific to tourism has been virtually impossible (Verbitsky, 2013). This inability to move recommendations forward swiftly has resulted in a low flexibility to adapt to changes in the industry or to new information on environmental effects. As such, new tourism developments have been developed in an ad-hoc fashion, the result being a fragmented regulatory framework for tourism (Lamers *et al.,* 2013).

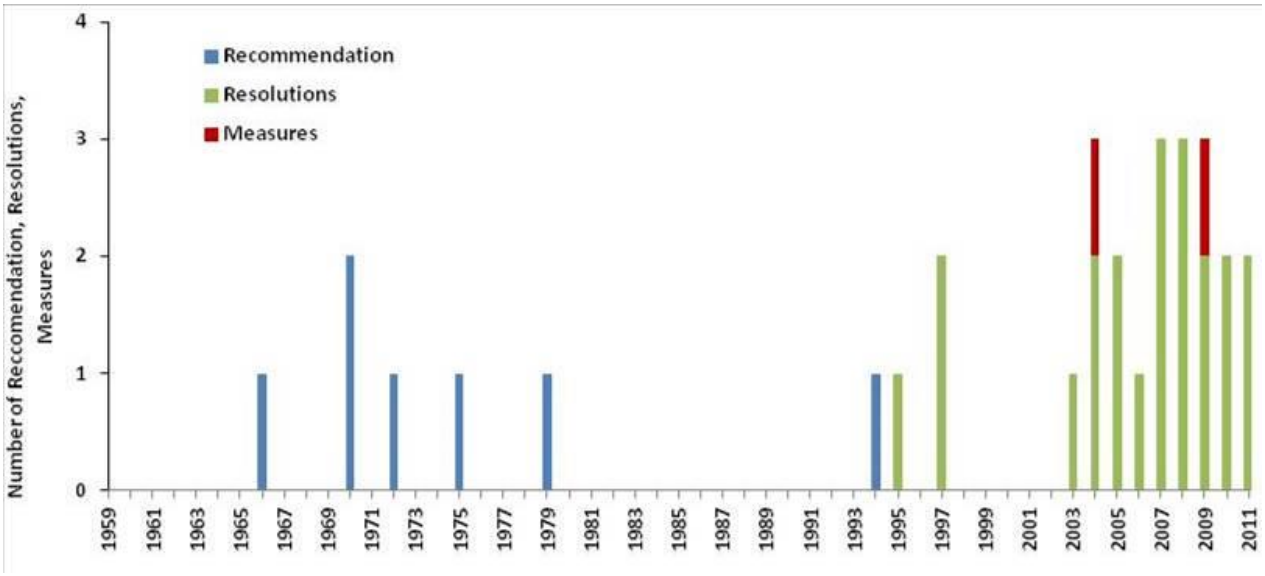

Figure 4: The number of recommendations, resolutions and measures, adopted by ATCMs that relate to the management of tourism, to 2011 (The Committee for Environmental Protection, 2012).

Although recommendations with regard to tourism in the Antarctic Treaty area have been tabled by ATCPs at ATCMs since 1996, it was not until 1995 that the first resolution was adopted. As shown in Table 1, working papers presented at ATCMs have increased overall during the past five decades, with the most recent decade showing rapid growth.

Table 1: Showing the number of Tourism papers presented at ATCMs, split by decade. Data has been sourced from the Antarctic Treaty Database.

Decade	Working papers on tourism
1966-1976 (inclusive)	5
1976-1986	3
1986-1996	4
1996-2006	8
2006-2016	23

In the early 90's, there was a push to create an Annex in the Madrid Protocol specifically for tourism, which would have allocated specifically managed tourist interest areas, and attempt to limit tourism to maritime travel in order to reduce land-based effects (Working Group II of the Chile session of the XIth SATCM (1990, at 108). However this did not translate into an agreed document, in part due to the limited negotiation time for such a complex issue, so it was tabled for the next ATCM. During the next ATCM a designated tourism working group was established, however there were again differing opinions on the draft Annex and agreement could not be reached. This resulted in a paper being drawn up by the parties, recommending to their respective governments, that an informal meeting was needed by the order to discuss the complex issue of tourism. This resulted in recommendations to address the "number of

tourist/carrying capacity, permanent infrastructure for tourists, concentration/dispersal of tourist activities, and access to unexplored areas." (Bastmeijer, 2009). In subsequent meetings, no formal consensus could be obtained on these issues or whether a draft tourism Annex to the Madrid Protocol was suitable (Richardson, 2000; Bastmeijer, 2009). Over twenty years on, these issues have not been resolved in any strategic way, which is a strong reflection on the functionality of the consensus system.

LACK OF GATEKEEPER MECHANISMS

The only codified ATS gatekeeper mechanism preventing tourists from going to the Antarctic is the EIA permitting process. Often seen as a 'rubber stamping' exercise, permit applications are rarely rejected, even if a comprehensive environmental evaluation is required (Hemmings and Roura, 2003). The domestic assessment process may not be consistently applied across countries, given that the terminology such as 'minor' and 'transitory' are open to interpretation, which could result in countries having differing thresholds for the level of environmental impact. In addition, the content of EIAs can vary significantly, with some being rigorous in their analysis of effects, while other being very light in detail (Hemmings and Roura, 2003), thus actual or potential effects on the environment can be underplayed or underanalysed.

For example, in 2007 the Golden Princess, a huge cruise ship with a capacity of 3600 people sailed to Antarctica from Rio de Janeiro, visiting Argentina and Chile along the way. The ship was not ice strengthened, and was registered in Bermuda (considered a 'flag of convenience'), although the operators had ties to the USA. The cruise operators were permitted to go under domestic USA legislation despite significant safety concerns from ASOC (ASOC, 2008), who called for a comprehensive assessment to be submitted for consideration by ATCPs. At that time, the ship was the largest ever to sail to Antarctica, and if it had sunk, would have caused an environmental disaster, not to mention loss of life. This demonstrates that a precautionary approach can be lacking with regard to issuing EIAs, and that the process may not be robust enough to adequately assess unprecedented tourist ventures.

As there is no centralised process for monitoring and reporting on cumulative environmental impacts, these are often difficult to report on in EIAs. Some impacts of human interaction with wildlife only become apparent over the long term, therefore monitoring of these cumulative interactions and comparing them against a baseline dataset is important (Tin *et al.,* 2014). Long term data on the effects of tourism over time is seriously lacking (Lamers *et al.,* 2013), and is therefore difficult be accounted for in EIAs. For example, climate change is a significant environmental concern in the future, especially in Polar Regions. Antarctic tourism can have a high carbon footprint due to the large distance travelled to arrive at the continent, compared with other tourist destinations in the world (Amelung and Lamers, 2007). Despite this, estimates of carbon emissions are not a required component of EIAs.

THE FUTURE OF TOURISM IN ANTARCTICA

With the rapid growth of Antarctic tourism in towards the end of the twentieth century, the need for regulating the tour operators to mitigate the impact on the environment and to reduce the likelihood of accidents. While the 1991 "Madrid Protocol" provides the main regulatory framework applicable to tourism it is the coalition of tour operators, IAATO which has played a major role in regulating tourism in the Antarctic Treaty area. This self-regulating body has paved the way for the ATS to provide governance over this sector.

GROWING NUMBERS

The impacts of tourism on the Antarctic Treaty area relate to the number of tourists, the number of passenger landings and the adherence of the operators to the IAATO regulations.

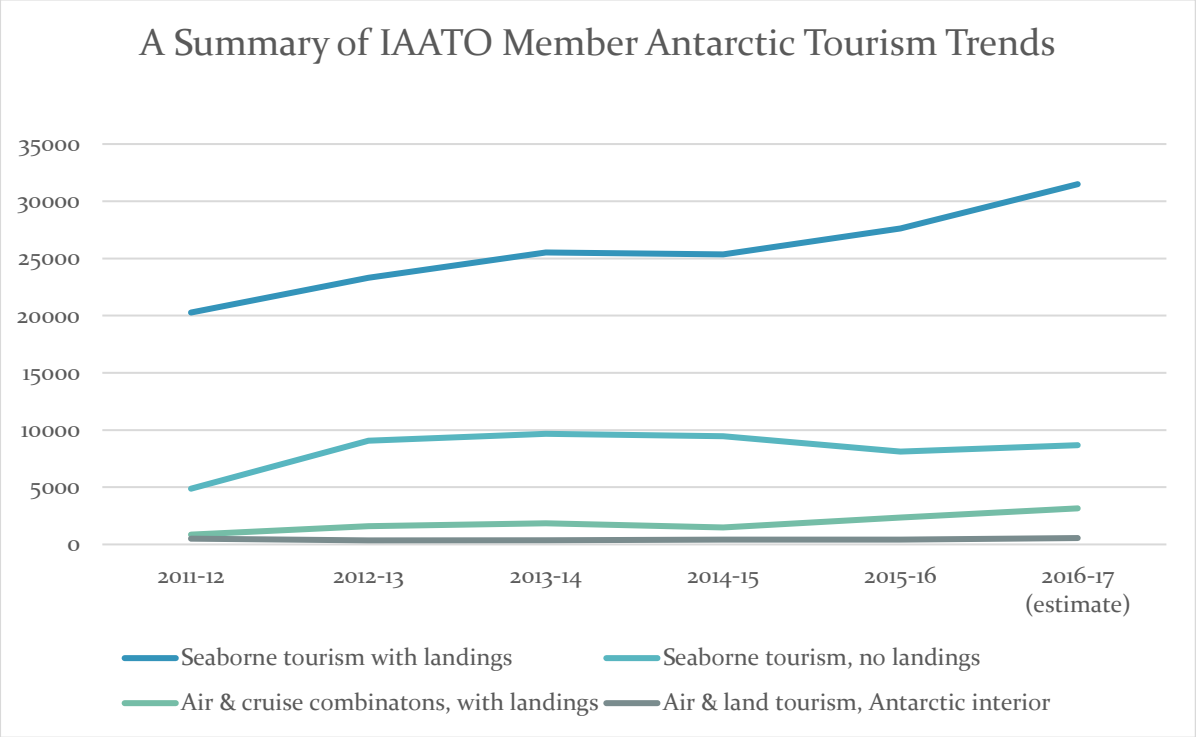

Figure 5: The total number of passengers carried by IAATO members for the previous five years and estimated for the current season (International Association Antarctica Tour Operators, 2017).

The total number of tourists in the Antarctic Treaty area has followed an overall increasing trend driven mainly by a recent, sharp increase in ship to shore landings (see Figure 5). With more people present in the area, the sense of remoteness could be compromised. Due to a lack of studies carried out on the impacts of landings, the effects of cumulative impacts such as the introduction of invasive species via mechanisms such as ship fouling and wastewater discharge, and the continued disturbance to penguin nesting sites are not fully quantified. The need for data on these impacts will become more important as we face the possibility of increased numbers, especially in high traffic areas such as the Antarctic Peninsula (Haase *et al.,*

2009). It would be appropriate for tour operators to be levied to provide funding for research to be carried out, providing data and the analysis of that data, in the impact of their industry on the Antarctic Treaty area.

Looking over a longer term at the number of passenger landings as shown in Figure 6; an overall increase in the past twenty years is visible, showing a decline between 1999-2003, and 2007-2010, the latter being a the result of the economic recession and a ban on heavy fuel use by the IMO. The potential for further increase is limited by IAATO regulations in terms of the number of landings per sites, the sites used and the protocol needed to be followed when visiting sites designated as ASPAs and/or ASMAs.

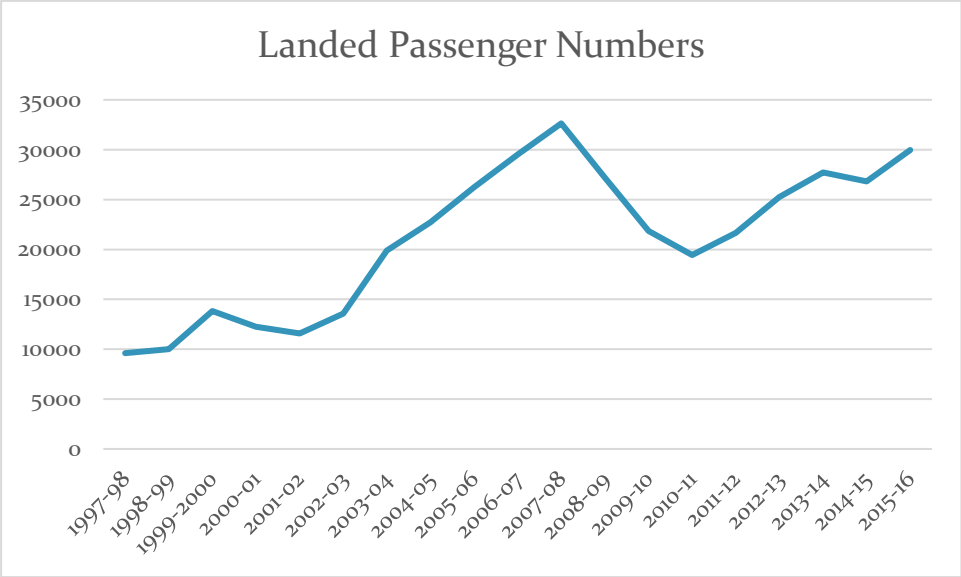

Figure 6: The total number of landed passengers on Antarctica by season (International Association Antarctica Tour Operators, 2016). Note that most ship to shore cruises offer a multiple number of landings.

Over the past 15 years 98.8% of Antarctic tourists have travelled area via ship (IAATO, 2017). The trend of increasing numbers of operators in the market has the potential to create tension in the current IAATO member system. Haase *et al.* (2009) discussed a recent case when a group of operators with ships of carrying capacity greater than 500 wanted to become members of IAATO. Initially, IAATO declined but then reversed their decision after the operators threatened to create their own self organised group. IAATO felt it was more important to maintain a united membership than to become fractured over less important issues. There is always the potential for operators to work outside of any regulating body, but it is hoped that the market demands for safety and sustainability would not support such ventures. Many of the tourists visiting the Antarctic Treaty area are doing so because they care for the environment (Vereda, 2016), so would likely choose operators with the endorsement of safe, low impact and environmental sustainability measures that IAATO promote.

MARKET DIVERSIFICATION

As discussed above, the increase in scale has brought a greater number of operators and vessels into the Antarctic tourism space. What this increase in numbers brings is inter-operator competitiveness in an attempt to provide the customer with a point of difference for their Antarctic experience.

To extend on this, lately there has been an apparent expansion of new activities undertaken in the Antarctic but of particular importance is the increase of non-regulated activities tourism activities (Schillat, Jensen, Vereda, Sánchez, & Roura, 2016). These new unregulated activities have implications both in the safety aspect and in the environmental management considerations that IAATO keeps at the forefront of their work. There is a need to regulate these new types of activity occurring in the Antarctic Treaty area which becomes problematic with issues around the ATS as a consensus based system reducing the flexibility of the regulatory system to minimise impact (Haase et al., 2009).

Table 2: Programs and Participant Numbers (clients) for 2015-16 season (note some participants may take part in several programs). Source: IAATO, 2016.

Program	**No. Participating**
Emperor Penguin Colony Visits	45
Deep Field Experiences (Camping, skiing, climbing, etc.)	60
Deep Field Flights (e.g. to Pole of Inaccessibility)	21
South Pole Fly-in	107
South Pole Ski Expedition	7

South Pole Motorised Expedition	0
Last Degree Expedition	30
Antarctic Crossing	2
Vinson Massif	143
Marathon	80

Operators are diversifying from a traditional market of passive travellers to those with a taste for more interaction with the environment, such as adventure activities. At present legally binding regulations on tourism are lacking especially in terms of safety and risk management, especially with non IAATO members operating in this space (Schillat *et al.,* 2016).

Solutions to this issue are scarce in that there is a limited amount of information available on tourist activity in the Antarctic. Although there are significant quantities of legislation under the ATS and further guidelines under IAATO, more specific and flexible regulations on new forms of tourism is needed. This may become problematic in a consensus based system but IAATO could potentially take on this task.

KEY REGULATORY CHALLENGES FOR THE FUTURE

"There is a lack of institutional infrastructure for monitoring tourism, absence of comprehensive tourism statistics to help inform decision-making, and inexperience in tourism management among ATCPs" (Verbitsky, 2013). Drawing upon the range of issues discussed in this report, the key regulatory challenges for the future appear to be:

- The development of a strategic approach to tourism regulation which codifies IAATO's bylaws;
- IAATO levying fees in order to fund standardised environmental monitoring for the impact of all operations, with data to be made publicly available (as discussed below);
- Improving port state controls (as discussed below);
- Better management of cumulative impacts on intensively landed areas through ASPA an ASMA regulations (as discussed below); and
- The establishment of a rapid response disaster fund, alongside the implementation of Annex VI

SO 'WHY NOT' JUST BAN TOURISM?

Given that Antarctica is widely recognised for having outstanding wilderness that should be preserved and studied, banning tourism outright seems a logical, effective method of protecting the environment from unnecessary human impact. However, the current regulatory framework, working alongside interests of consultative parties with different values and

incentives, makes the possibility of implementing a ban doubtful. Tourism does not feature in the Antarctic Treaty, instead the Treaty is explicit that military activity is banned and that science is favoured, leaving a third category of neutral 'peaceful' activities, which are permitted by virtue of omission (Bastmeijer *et al.,* 2008). Under the current framework, Antarctica is effectively considered a 'global commons' for all people (UNEP, 2016), which strengthens the argument that everyone should be able to access the continent by some means. Arguably before any ban on tourism in an area of 'global commons', resource extracting activities, such as fishing, would need to be banned before general access to the continent.

It is best to conclude that tourism will always exist in some shape or form in Antarctica, so what is important is ensuring regulations are fit for purpose and that the regulatory system is proactive with sufficient flexibility to adapt to a changing industry.

STANDARDISED ENVIRONMENTAL MONITORING

Given that there is no standardised mechanism for conducting long term environmental monitoring of tourism operations, this is sorely needed as the measuring of cumulative impacts is required by way of the Madrid Protocol. It is also needed to make informed decisions about future management of tourism. One method of funding this approach is for IAATO to create a levy for monitoring from their membership base.

DISASTER FUND LEVY

In a recent presentation of the management of Antarctic Tourism, to an expert audience, the authors of this paper ran a pop-quiz which included the task of highlighting the potential environmental impact that was of most concern to them. The list they chose from was invasive species, land-based effects, wildlife disruption, wastewater dumping, the potential for accidents and the carbon footprint. The most common response from this survey (sample size 38) was the potential for accidents. The potential of environmental catastrophe resulting from an accident involving tourist vessels, or the tourists themselves, is mitigated through the self-regulation of the tourism industry. However, no amount of mitigation can rule out all the possibilities of future accidents. It would be prudent of the industry to impose a levy with the intention to create a disaster fund. Annex VI of the Madrid Protocol requires that the country of the responsible party carries the cost of response action and clean up. A disaster fund would mean immediate response could be taken and the Madrid Protocol would require reimbursement to that fund by the responsible country.

IMPROVING PORT STATE CONTROL

The majority of tourist vessels depart from gateway cities, with ~85% departing from Ushuaia, Argentina (Swanson *et al.,* 2015). Greater ability for port states to enforce regulations would strengthen compliance with existing regulations, and reduce the issue of flags of convenience.
Furthering Site Protection

FURTHERING SITE PROTECTION

Furthering site protection is one method of strengthening the current environmental protection in the event of market diversification and increased landings at new sites. Currently ASPA protection allocation has been criticised as not being representative of all bioregions in Antarctica, and not being precautionary enough in its application (Convey *et al.,* 2012). In addition, development of protected areas is not clearly connected with future tourism activities (ASOC, 2015). ATCPs could begin to use ASPA and ASMAs to proactively manage tourism, and through their use tourism could be "concentrated, diverted or dispersed as required, whenever possible in anticipation of tourism developments" (ASOC, 2015).

SUMMARY AND RECOMMENDATIONS

Although we are unable to predict the future with certainty, it is evident that the growth and diversification of tourism in the Antarctic will continue. This will pose further environmental risk to the Antarctic environment if the regulatory framework does not keep in touch with the industry. While the self-regulatory system undertaken by IAATO appears to be operating effectively, it still faces challenges due to potential opportunism in the industry of non-compliant members and of non-members.

Based on our findings presented in this report we are highlighting the five most pressing issues of managing tourism in the Antarctic Treaty area. These have been ranked according to priority for incorporation into the regulatory framework:

1. The development of a strategic approach to tourism regulation which codifies IAATO's bylaws;
2. IAATO levying fees in order to fund standardised environmental monitoring for the impact of all operations, with data to be made publicly available;
3. Improving port state controls;
4. Better management of cumulative impacts on intensively landed areas through ASPA an ASMA regulations; and
5. The establishment of a rapid response disaster fund, alongside the eventual implementation of Annex VI

Prioritisation has taken into account our view on how achievable the measure will be to agree to and implement in the short term, how wide-ranging the effects will be once implementation has occurred, and the risk profile of the activity/impact it seeks to regulate. For example, the risk of disaster from inadequate vessels was deemed relatively low, while IAATO's bylaws affect all tourism operations and so we viewed that these should be codified into the ATS. Adequate environmental monitoring and reporting is seen as a necessity for all operations, hence the high ranking.

Looking to the future, ATCPs need to work towards replicating IAATO's success in managing tourism in the Antarctic Treaty area; as a standards setter, a repository of data and as a

watchdog for rogue tour operators. Codifying IAATOs bylaws would assist with this and has been viewed as an achievable goal in the short term. IAATO could also lead the way in promoting a standardised environmental monitoring system for tourism operations, by levying their membership fees.

With regard to enforcing ATS obligations, implementing port state controls were identified as a good way of eliminating rogue operators and states who fly flags of convenience. Although this idea has already been suggested by ASOC, better protection of vulnerable sites from the cumulative impacts of tourism and future industry diversification could be achieved through ASPA and ASMAs.

And finally, recognising that Annex VI will eventually be ratified, we have recommended that a disaster relief fund be set up to assist with the initial cost of response and clean up (with the intention of reimbursement into the fund from the liable party).

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