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***A look at National Antarctic Programs practical  
implementation of the Protocol on Environmental  
Protection to the Antarctic Treaty***

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The Protocol for Environmental Protection is a key agreement for the state of environmental management in Antarctica. It came into force in 1998 and since then National Antarctic Programs have been required to fulfil in requirements in regards to environmental protection. They have employed a diverse range of techniques and strategies to implement these requirements ranging from education programmes and working groups to providing physical resources and upgrading stations. Occasionally disparity between the creation of policies and the implantation policies on the ground creates problems. Parties to the Protocol and public alike may benefit from a more integrated information sharing system.

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## Introduction

*“Antarctica’s greatest defence was isolation but that isolation has evaporated rapidly”  
(Ministerial Conference in Antarctica in January 1999)*

At a glance Antarctica seems an unlikely place in which to be concerned about human impacts. Its brief history of human habitation, vast tracks of land and harsh climate all seem point to an environment that would easily withstand the impacts of human activities; however the reality is that Antarctica is far more fragile than it would seem. Only 0.34% of the continent itself is not covered by ice, leaving existing ice free landscapes and habitats rare and vulnerable to modification (BAS 2004). Additionally the cold climate and long dark winters inhibits biological and chemical breakdown so any waste or contamination left behind by human’s remains there for a time period far greater than that of more temperate regions; leaving waste to accumulate over decades in which other environs would have recycled it (Riffenburgh 2007; Tin et al 2008).

Antarctica has no native population and is managed primarily through a joint agreement between 50 different nations as part of the Antarctic Treaty system (Hanessian 1960). As there is no single sovereign, some unique challenges are presented in regards to decision making and implementation of policy in Antarctica. This is due to the main decision making parties originating from diverse cultures and thus forming divergent opinions on how Antarctica should or should not be utilised. Fortunately despite sometimes coming from very different backgrounds there are many cases in which consensus has been made on key issues; such as when the Protocol on Environmental Protection was formed, giving Antarctica its first integrated environmental management regime (Parties 1991).

Alas when it comes to international agreements, simply implementing a legal document does not mean all contributing parties will comply with the same level as one another or that they will implement the requirements in the same way. The aim of this project is to compare and contrast the different management strategies each individual National Antarctic Program (NAP) party to the Protocol has implemented to adhere to the Protocol on Environmental Protection to the Antarctic Treaty. It will look at the diversity (or possible lack thereof) between various programs in methods used and the availability of information provided to the general public.

## The Environmental Protocol

### Background

In 1959 as a response to the political concerns of the day, the Antarctic Treaty was signed providing some vestige of a governing body for Antarctica (Hanessian 1960). Although the Treaty itself makes mention in its goals towards protecting and preserving the Antarctic environment little practical attention was given to these statements; the Treaty’s primary focus was dedicated towards scientific and political activities. Regulations around environmental management were left unspecified between parties and as a result, there were no universally agreed upon environmental values between the various nations present

in Antarctica for a long period of time. There were various acts added to the Treaty over time, most of which were geared towards protecting disparate areas within the Antarctic Environment such as flora and fauna, marine environments and mineral resources (ATCM 1964, 1972, 1975 & 1989; CCAMLR 1980). By the 1990s managing the environment solely through these various acts was proving increasingly inefficient; additionally debates around the use of mineral resources in the Antarctic that had surfaced in the 1980s were coming to a head and needed some form of resolution (Bastmeijer 2003). In 1991 the Protocol on Environmental Protection to the Antarctic Treaty was created to resolve these issues, formally coming into force in 1998 (Bastmeijer 2003; Parties 1991). The Protocol functions by designating Antarctica as a natural reserve; attempting to preserve it as a (reasonably) undisturbed wilderness and dealing with the issue of mining for mineral resources by banning those activities outright. It works via incorporating many elements of previous acts and policies that were established into its text, laying down a clear framework for a broad range of environmental issues and providing a more unified approach to environmental management (Parties 1991). Its principles are routed in avoiding adverse impacts to the Antarctic environment as much as possible and preserving the value of the area as a place for relatively undisturbed scientific research. The Protocol functions practically via implementing the use of regular Environmental Impact Assessments (EIAs) and establishing a Committee for Environmental Protection (CEP) to aid in formulating recommendations and providing advice to the Parties to the Protocol to be considered at Antarctic Treaty Consultative Meetings (Parties 1991). Additionally over time 6 Annexes were agreed upon pertaining to the more specific subjects of; Environmental Impact Assessment, Conservation of Antarctic fauna and flora, Waste disposal and waste management, Prevention of marine pollution, Management of protected areas and Liability for environmental emergencies (Parties 1991). Although over all the Protocol cannot be considered a complete solution to full environmental protection within the Antarctic it has been well received overall by various NGOs, government officials and lawyers, and is considered a big step forward in environmental protection (Bastmeijer 2003)

## **Domestic Policies**

The Protocol itself is legally enacted within contracting parties through a variety of domestic policies. As each individual country has its own individual environmental policies, values, legal system and political process the method of implementation varies between states. Some states (such as South Africa or Chile) enact the protocol directly into their laws via decrees or pre-existing documents specifying specific international agreements to be part of law (Bastmeijer 2003). In other countries the relevant parts of the Environmental Protocol are translated into wording and documentation more consistent with domestic legal frameworks. In countries such as Australia's case this means simply re-writing an already present Antarctic act to something more relevant to the Protocol. Other places (such as the Netherlands) had no current legislation on Antarctica present when the Protocol was written and had to write new acts in which to incorporate it (Bastmeijer 2003). Due to the

wide ranging methods used in incorporating the Protocol into domestic legislation there may be disparities between the exact specifics of how different Parties officially implement their official Protocol documentation (Bastmeijer 2003).

### National Antarctic Programs

Once policy has been implemented by domestic governments it is the job of their National Antarctic Programs to practically implement the framework into their on the ground activities. Antarctic programs face a range of challenges in implementing this policy as they are dealing with a range of different environments and operations; therefore the implementation of the protocol is often specific to each party, although reoccurring themes and general trends might be seen.

To keep as closely as possible to the underlying intentions of the Environmental Protocol individual NAPs have to implement a variety a techniques, regulations and practises to ensure they adequately comply. The Protocol requires them to enforce the prohibition of certain materials, develop waste management strategies that fulfil regulations, construct contingency plans for any incidents, promote international cooperation and report sufficiently on activities as required (Parties 1991). Ensuring adequate training and education of staff is also important in insuring the Protocol is properly implemented.

One of the management strategies in aiding in the implementation of the Protocol (originally put forward in the Treaty) is the element of regular inspections on stations by different Parties (Hanessian 1960; Parties 1991). Results of inspections are made public and are therefore a way in which strategies and compliance can be inferred. Unfortunately there is no structured regime behind inspections and therefore inspections are not necessarily regular or evenly distributed. The majority of inspections to date have been concentrated around the Antarctic Peninsula; however this is unsurprising considering the high proportion of human activity that happens in this region (ASOC 2011).

Considering the diverse circumstances between and within different NAPS, it is unsurprising that implementation standards were found to have varied between different stations or even differed within areas of the stations themselves (ASOC 2011). The main aspects of concern for implementing the Protocol were found to be waste management (waste storage in particular), management of abandoned stations or old work sites, fuel handling and storage, sewage treatment and a lack of awareness of EIAs and how to adequately follow them up on the ground (ASOC 2011). Many of these problem aspects are likely related to the cost, logistics and time it takes to implement or change some of the facilities to comply with Protocol standards with budget being an issue stated by many programs (UNEP and ASOC 2011). Overall progress has been reported on the implantation of the Protocol however barriers still remain (ASOC 2011).

## The Relationship between National Antarctic Programs and Policy Makers

As National Antarctic Programs are charged with the practical implementation of policy in a diverse and challenging environment, sometimes conflicts can arise between policy makers and the NAPs themselves. These tend to happen when there is confusion around what the official policy is or when laws written prove impractical for on the ground situations. An example of this is seen within Italy's Antarctic Program. During an inspection of the shared Italian/French station "Concordia" and the Italian station "Mario Zucchelli" the Italian members of staff complained of Italy's lack of official legal implementation of the Protocol (U.S-Russia Joint Inspection Team 2012). This gave Italian agencies little power in enforcement of the Protocol and created grey areas between Italian and French members of the station. In response to questioning over this, Italian officials pointed out that although they didn't have any domestic laws translating the Protocol into Italian legislation, they did have the Environmental Protocol directly incorporated into Italian law. However the Environmental Protocol by itself does not give national agencies direction or power over how their citizens operate and since then the Italian policy makers have stated they will make moves to clarify the situation (U.S-Russia Joint Inspection Team 2012).

## Table: Implementation of the Protocol

**Table 1:** A list of NAPs party to the Protocol, the rough size of the program (according to the COMNAP Antarctic facilities 2014 data sheet) and relevant available resources, primarily sourced from individual NAPs personal websites. Blue boxes indicate where language translation may have been an issue in data collection.

National Antarctic Program	No. of Year Round Stations/ Camps	No. of Seasonal Stations/ Camps	Max Pop	Relevant Data Made Available online
Argentina: Direccion Nacional Del Antartico (DNA)	6	7	660	<ul style="list-style-type: none"> <li>Links to comprehensive booklets pertaining to waste management, flora and fauna, protected areas and environmental management strategies.</li> <li>Relevant domestic legislation is also included.</li> <li>Data only available in Spanish</li> </ul> ( site: Direccion Nacional Del Antartico (n. d))
Australia: Australian Antarctic Division (AAD)	3	3	200	<ul style="list-style-type: none"> <li>Easily accessible descriptions on waste management, flora and fauna, human impacts, EIAs and the activities AAD is involved in</li> <li>Lists of relevant policy, SOE reports and management plans.</li> <li>Downloadable handbook with Environmental Protection Chapter</li> </ul>

				<ul style="list-style-type: none"> <li>Environmental Code of Conduct Provided</li> </ul> <p>(site: Australian Antarctic Division (2013))</p>
Belgium: Belgium Polar Secretariat	0	1	20	<ul style="list-style-type: none"> <li>Belgium Polar Secretariat only established in 2009</li> <li>No direct mentions of Environmental Protocol found</li> <li>Scientific publications on Belgium's NAP practices and Environmental Impacts are made available</li> <li>Site available in three languages</li> </ul> <p>( site: Belgium Polar Secretariat (2013))</p>
Brazil: Programa Antartico Brasileiro (PROANTAR)	1	0	40	<ul style="list-style-type: none"> <li>Details on an Environmental Assessment group (GAAM) are given on the front page of the website</li> <li>Tasks this group are given to comply with the Protocol include; creating EIAs, co-operating internationally, assessing scientific programs.</li> <li>All information is in portugese</li> </ul> <p>(site: Programa Antartico Brasileiro (n. d.))</p>
Bulgaria: Bulgarian Antarctic Institute (BAI)	0	1	18	<ul style="list-style-type: none"> <li>Pdf of Madrid protocol is given on official website but little mention is made of management strategies anywhere</li> </ul>
Chile: Instituto Antartico Chileno (INACH)	5	7	298	<ul style="list-style-type: none"> <li>Some basic information on Protocol given but little mention is made of management strategies anywhere</li> </ul> <p>(site: Instituto Antartico Chileno (n. d.))</p>
China: Chinese Arctic and Antarctic Administration (CAA) & Polar Research Institute of China (PRIC)	2	2	95	<ul style="list-style-type: none"> <li>Publications given including CEP and CEE reports</li> <li>Specifies that no current domestic legislation exists on Protocol</li> </ul> <p>(site: Chinese Arctic and Antarctic Administration (n. d.))</p>
Czech Republic: Masaryk University	0	1	20	<ul style="list-style-type: none"> <li>No direct mention of the Protocol</li> <li>Scientific publications regarding the environment and a 2003-2013 activity report given</li> </ul> <p>(site: Masaryk University (2014) )</p>
Ecuador: Instituto Antartico Ecuatoriano (INEA)	0	2	26	<ul style="list-style-type: none"> <li>Link to Environmental Protocol information broken on official site</li> <li>National documents (logistics, expedition reports) are available</li> </ul> <p>(site: Instituto Antartico Ecuatoriano (2014 ))</p>
Finland: Finnish Antarctic Research Program at the Finnish Meteorological Institute (FINNARP)	0	1	20	<ul style="list-style-type: none"> <li>Nordic Antarctic Environmental Handbook</li> <li>Ministry of Environment environmental guide for the guidance to visitors aiming to travel to Antarctica publication available on request</li> </ul> <p>(site: Finnish Antarctic Research Program at the Finnish Meteorological Institute (2010))</p>
France: Institut Polaire Francais Paul Emile Victor (IPEV)	2	1	180*	<ul style="list-style-type: none"> <li>No Data</li> </ul>

\*(60 from

			<i>shared Italian station)</i>	
<b>Germany: Alfred Wegener Institute (AWI)</b>	1	4	78	<ul style="list-style-type: none"> <li>Information on station energy supply regarding Protocol standards</li> <li>Law requires everyone visiting Antarctica under AWI to participate in environmental protection training.</li> <li>All Antarctic activities must be approved by the German Federal Environment Agency (UBA)</li> </ul> <p>(site: Alfred Wegener Institute (n. d.))</p>
<b>India: National Centre for Antarctic &amp; Ocean Research (NCAOR)</b>	2	1	65	<ul style="list-style-type: none"> <li>No data found on official site</li> <li>A scientific report located elsewhere discusses the establishment of a permanent Environmental Monitoring Laboratory and an Environmental Management Plan within Antarctica (Tiwari 2006).</li> </ul>
<b>Italy: Programma Nazionale Di Ricerche in Antartide (PNRA)</b>	1	5	150*  <i>*(60 from shared French station)</i>	<ul style="list-style-type: none"> <li>Unable to find English translation.</li> </ul>
<b>Japan: National Institute of Polar Research (NIPR)</b>	1	4	125	<ul style="list-style-type: none"> <li>Mention made of a Syowa Station program for monitoring changes in global and regional environments</li> <li>No other references to Protocol found</li> </ul> <p>(site: National Institute of Polar Research (n.d.))</p>
<b>Republic of Korea: Korean Polar Research Institute (KOPRI)</b>	2	0	150	<ul style="list-style-type: none"> <li>Unable to find English translation.</li> </ul>
<b>The Netherlands: Netherlands Organization for Scientific Research (NWO)</b>	0	1	Shared with UK	<ul style="list-style-type: none"> <li>No Data</li> </ul>
<b>New Zealand: Antarctica New Zealand</b>	0	1	85	<ul style="list-style-type: none"> <li>Easily accessible descriptions on waste management, EIAs and Environmental monitoring</li> <li>Lists of relevant legislation and policy provided</li> <li>Downloadable environmental field manual available</li> <li>Environmental Code of Conduct Provided and Environmental Pre-departure requirements specified</li> <li>Staff made to take pre-departure tests on Bio security and Environmental Protection before allowed into Antarctica</li> <li>Committee for Environmental Protection Cleanup Manual</li> </ul> <p>(site: <a href="http://antarcticanz.govt.nz">http://antarcticanz.govt.nz</a>)</p>



Norway: Norwegian Polar Institute	1	1	44	<ul style="list-style-type: none"> <li>• Specific guidelines are provided for each individual specially protected area the Norwegian Polar Institute manages. This includes assessment of visitor impacts, a code of conduct and descriptions of restricted areas</li> <li>• Details on inspections, including downloadable reports and inspection checklist provided</li> <li>• Details and downloadable report forms given for IEAs and conservation guidelines</li> <li>• Nordic Antarctic Environmental Handbook</li> </ul> <p>(site: Norwegian Polar Institute n.d.)</p>
Peru: Division of Antarctic Affairs	0	1	28	<ul style="list-style-type: none"> <li>• No Data</li> </ul>
Poland: Polish Academy of Sciences Department of Biology	1	0	40	<ul style="list-style-type: none"> <li>• Links to CEP handbook provided</li> <li>• Brief description of Protocol and mentions of environmental monitoring programs</li> </ul> <p>(site Polish Academy of Sciences Department of Biology 2012 )</p>
Russian Federation: The Arctic and Antarctic Research Institute (AARI/RAE)	5	7	404	<ul style="list-style-type: none"> <li>• Annual reports on the Russian Federations implementation of the provisions of the Protocol from 2004-2010</li> <li>• Reports discuss waste management and disposal, EIAs, flora and fauna and environmental monitoring.</li> </ul> <p>( Russian Federation: The Arctic and Antarctic Research Institute n.d.)</p>
South Africa: South African National Antarctic Programme (SANAP)	1	0	80	<ul style="list-style-type: none"> <li>• List of prohibited items provided</li> </ul> <p>(site: South African National Antarctic n.d.)</p>
Spain: Comite Polar Espanol	0	2	50	<ul style="list-style-type: none"> <li>• A detailed description on Annex's I, II &amp; III are provided with relevant download links to guidelines, management plans and policy provided.</li> </ul> <p>(site: Comite Polar Espanol 2013)</p>
Sweden: Swedish Polar Research Secretariat	0	2	20	<ul style="list-style-type: none"> <li>• Comprehensive list of EIAs given</li> <li>• Nordic Antarctic Environmental Handbook</li> <li>• Environmental Monitoring Program documentation provided</li> </ul> <p>(site: Swedish Polar Research Secretariat n.d.)</p>
Ukraine: National Antarctic Scientific Centre of Ukraine (NASC)	1	0	24	<ul style="list-style-type: none"> <li>• Unable to find English translation.</li> </ul>
United Kingdom: British Antarctic Survey (BAS)	2	4	217	<ul style="list-style-type: none"> <li>• Environment Office: coordinates/monitors environmental activities on BAS stations and ships</li> <li>• Information on Protocol related legislation</li> </ul> <p>(site: British Antarctic Survey 2012)</p>

United States: National Science Foundation Division of Polar Programs	3	3	293	<ul style="list-style-type: none"> <li>Links to ATS site (Non-Native species manuals, Guidelines for the operation of aircraft, ATCM reports database)</li> </ul> <p>(National Science Foundation n.d.),</p>
Uruguay: Antartico Uruguayo (IAU)	1	1	60	<ul style="list-style-type: none"> <li>EIA forms available and guidelines available</li> <li>Environmental reviews on bases</li> <li>Wildlife code of conduct and non-native species handbook</li> <li>Aircraft operation guidelines near birds</li> <li>Operating procedures for waste treatment available</li> <li>Ballast water guidelines</li> <li>SCAR Code of Conduct for field work</li> </ul> <p>(site: Antartico Uruguayo n.d.)</p>

## National Antarctic Program Strategies

There is a wide range in techniques in which various NAPs have employed to implement the Protocol and ensure that systems continue to function. Table 1 demonstrates the wide range of strategies available from a public source that various NAPs are using. Many programs appear individual in nature with variations between each program. Universal resources such as the SCAR fuel guidelines and COMNAP environmental handbook are sometimes employed however many programs appear to have adapted to their own individual preferences (Cameron et al 2012; Handbook 2000). The program size and population appear to have little effects on what preferences are shown.

## Education, training and regulation

Ensuring members of NAPs or visitors to Antarctica are properly educated are key elements to fulfilling the requirements of the Protocol and NAPs achieve this through a variety of different methods.

### The use of handbooks

Field manuals or guidebooks are a common solution produced by a number of programs for a variety of different subjects. Some guidebooks are formulated by individual Antarctic programs specifically for the purposes of compliance (such as Antarctica New Zealand's Field Manual) while some are produced as a joint effort between multiple programs (the Nordic Environmental Handbook covers a variety of Protocol related topics and is shared between Finland, Sweden and Norway). There are also resources provided by COMNAP and SCAR to encourage NAPs to utilise similar guidelines. Handbooks are a useful way in which to ensure staff on the ground has access to information on a wide range of procedures and regulations without instantly having to commit a large quantity of information to memory.

They also often contain information on procedures to perform during incidents that may not happen on a regular basis as well as being particularly portable within the field.

Unfortunately they seldom go into great depth on individual situations. An exception to this would be the Norwegian Polar Institutes individual guidelines it produces for each individual specially protected area within its region of management. These guidelines are designed with visitors to the area (primarily tourists) in mind and are incredibly specific to each area. They provide descriptions of the potential environmental impacts that could be inflicted upon the region, prohibited areas and each individual pamphlet has its own code of conduct specific to the activities undertaken in the region.

### **Codes of Conduct**

The use of Codes of Conduct to lay to clear expectations of behaviour for those going to the Antarctic is a common technique used amongst Antarctic programs. Once again organisations such as SCAR provide codes of conduct for various activities which are utilised by some Antarctic programs (an example would be Uruguay that provides links to SCARs code of conduct for field work on its website; Table 1). Other countries provide their own specialised Environmental Code of Conducts that are required readings for those visiting Antarctica under their program. Overall environmental codes of conduct can be a short, efficient and easy to follow way to lay down expectations and promote good environmental practises within those going to the Antarctic.

### **Training Programs**

Arguably the most effective way in which to ensure compliance with the Protocol is to give program personnel sufficient training on good environmental practises, correct management techniques, reasons and ability on how to do EIAs, appropriate responses to crisis and system implemented by NAPs in regards to ensuring the Protocol is followed. Many NAPs do employ some form of training system for their staff and scientists in regards to various aspects of living in the Antarctic. A recent survey on energy management done by COMNAP found that 21 out of 24 NAPs surveyed had some sort of education programme on energy conservation and other such measures (COMNAP 2013). Programmes were primarily run prior to departure although regular reminder training sessions within Antarctica were common. Outside of the energy survey, evidence for more general Environmental Protection training is also present Germanys Alfred Wegener Institute (AWI) states on its website that anyone visiting Antarctic through it must undergo environmental protection training and Antarctica New Zealand requires its personnel to complete an online course on bio security and environmental protocol before they are allowed to enter the Antarctic (Table 1)( Alfred Wegener Institute n.d.). Training staff members and ensuring information is passed down correctly through to new team members is very important in ensuring each countries laws regarding the Protocol are actively implemented. An inspection on the Indian station “Maitri” ran into issues when staff members had trouble identifying what a certain part of their waste management system (a man made sewage pond) was even for which

could create difficulties in the future should problems with the treatment plant emerge (Japan 2010)

### **Environmental assessment groups**

To avoid unintended and unnecessary environmental consequences some NAPs have set up various committees or offices to deal with the environmental issues and assess potential problems. The Brazilian Antarctic program set up an environmental assessment group (GAAM) in 1995 to coincide with its government's ratification of the Protocol. It is charged ensuring Brazil's Antarctic program abides by the principles of the Protocol, primarily via assessing the impacts Brazil's scientific research, tourism and logistical support activities impacts on the Antarctic environment and associated ecosystems (Programa Antartico Brasileiro n. d.). They are tasked with formulating reports on impacts and how potential impacts can be minimised or completely avoided. Additionally they are tasked with suggesting how to modify activities to a more environmentally friendly state or whether to cancel them if they are deemed too hazardous. Other activities include establishing environmental monitoring, suggesting urgent response procedures, interacting with those responsible for EIAs in other Antarctic programs and identifying areas that are lacking in sufficient research (Programa Antartico Brasileiro n. d.). The British Antarctic Program also provides an example of environmental specific programs in its Environmental Office; In charge of coordinating and monitoring environmental activities on BAS stations and ships.

### **Infrastructure**

Possibly one of the most difficult and expensive aspects of fulfilling the requirements of the Protocol is the updating or removal of old infrastructure that no longer complies with the Protocol. Despite this NAPs appear to be fairly active in regards to station modification and improvement in regards to environmental standards. In a survey prepared by COMNAP it was found that out of 24 National Antarctic Programs interviewed, most of them reported high levels of insulation and fuel efficiency (COMNAP 2013). Of the ones that did not report this, five of them were either currently undergoing or had just completed refurbishing their stations to become more energy efficient and three stations had either entirely replaced old stations or built new ones that were designed to be considerably more environmentally friendly.

Another area in which some National Antarctic Programs are putting considerable effort into is the cleanup of old abandoned stations. These stations have the potential to cause considerable harm to the environment with large fuel slicks being observed emerging from some abandoned stations left to the elements (Fryirs et al 2013). Due to this, many programs (such as the Australian Antarctic Division) have begun to invest in the clean up and complete removal of obsolete or un-usable stations and equipment (Fryirs et al 2013).

## **The Accessibility of Information to the General Public**

New information is of no use if it is not being shared and utilised, therefore it is very important to be able to effectively share data between Parties and even the general public so new techniques can be picked up, adapted and improved upon by various individuals. Comparing and contrasting relevant information on the ways different NAPs manage their Environmental Protocol requirements is currently a difficult task as there is no universal portal in which to compile data. The official ATS website does store EIA reports and other such relevant documentation however there are some issues around this. First and foremost, reports do not necessarily specify activities and programs implemented by individual NAPs (such as the use of guidebooks or the requirements of staff training), instead focusing on environmental impact reporting. In addition to this, there is no guarantee that reporting is necessarily complete or up to date the level of compliance for Consultative Parties providing adequate reports only found to be at 65% (UNEP and ASOC 2011). Furthermore many programs were found to store their reports on their own website instead of submitting the to the official ATS website (UNEP and ASOC 2011).

Due to the lack of concise data on many NAPs Protocol activities, information had to be obtained via other outlets such as through their own personal websites (Table 1). This created a problem in regards to language barriers as there are a multitude of different languages spoken by the Parties. Although some websites did provide several language options many of these were incompletely translated. Most NAPS provided information solely in their native tongue and therefore translation software had to be utilised to access it. This created issues both because translations could not be fully relied upon and the software could not translate all documents. It can be assumed that due to this some available information was missed simply owing to translation error.

Information on Environmental Protocol compliance varied greatly between NAPs with some programs providing comprehensive lists of activities, field guides or reports while with others no mention of the Protocol could be found in regards to activities. The Australian Antarctic Division (AAD) provides a comprehensive website that clearly presents details on the Protocol, its requirements and the actions AAD has taken to implement it in a simple and easy to understand manner that is very accessible to the general public. Download links to a variety of relevant information (such as handbooks, consent forms and reports) were given on relevant pages making it easy to identify many of the techniques used by the AAD. Argentina's Antarctic program; Direccion Nacional Del Antartico, also provided access to a comprehensive and easily downloadable list of resources on its website, however the information appeared to be more directed at staff members as less explanation were given on activities. There were many NAPs that did not mention their practises through official public vectors; although this does not mean they do not comply with the Protocol itself. An

example of this situation would be India as though it gave little indication of activities on its official site, information located elsewhere contained discussions around environmental protection were found and inspection reports gave it a reasonably good assessment in compliance. France also provided little in the way of information in its more public channels however has the highest number of EIA reports submitted to the ATS website and is well represented in inspection reports (Japan 2010; Tiwari 2006).

Although information is available, it may be more beneficial in the long run to create some sort of portal or sharing mechanism to adequately compare data on the environmental protocol. COMNAP provides some information in the way of suggested guidelines and member lists however nowhere is comprehensive lists or collections of data present. New Zealand is currently working on a website designed for the gathering and sharing of scientific data from Antarctica. Perhaps this template could be used in the future to be applied to more policy and management strategies related information (ATCM 2012).

## **Conclusion**

Overall National Antarctic programs employ a diverse range of techniques and strategies to implement the requirements of the Environmental Protocol ranging from education programmes and working groups to providing physical resources and upgrading stations. Sometimes there is disparity occurring between the creation of policies and the implantation of them on the ground, and difficulties can arise from lack of communication, as demonstrated by the Italian Antarctic Program. Data gathering can also be difficult as there is no one resource in which to access integrated and complete information on the implementation of the Protocol. Even a list of the nations Party to the Environmental Protocol itself is difficult to come by. It may be potentially beneficial for some form of online portal to be developed that specialises in the sharing of legislative and practical information in regards to Antarctic Treaties.

## **Appendix: Acronyms and Shorthand**

**ATCM: Antarctic Treaty Consultative Meeting**

**ATS: Antarctic Treaty Secretariat**

**CCAMLR: Convention for the Conservation of Marine Living Resources**

**CEE: Comprehensive Environmental Examination**

**CEP: Committee for Environmental Protection**

**COMNAP: Council of Managers of National Antarctic Program**

**EIA: Environmental Impact Assessment**

**IEE: Initial Environmental Examination**

**NAP: National Antarctic Program**

**Parties: Signatory Parties to the Environmental Protocol**

**The Protocol: Protocol on environmental protection to the Antarctic treaty**

**The Treaty: The Antarctic Treaty**

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