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PATRON OF THE NEW ZEALAND ANTARCTIC SOCIETY

Professor Peter Barrett, 2008

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The Society recognises with life membership those people who excel in furthering the aims and objectives of the Society or who have given outstanding service in Antarctica. They are elected by vote at the Annual General Meeting. The number of life members can be no more than 15 at any one time.

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6. Ray Dibble (Wellington), 2008
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From the Editor

Welcome to a joint issue with The Antarctic Office. Articles for this issue were supplied by The Antarctic Office (see www.antarctic-office.org.nz). Please direct any follow-up enquiries to info@antarctic-office.org.nz. Christchurch locals, and visitors, are encouraged to take part in the Antarctic Season Opening events.

Readers are invited to view and explore the Society's new website www.antarcticsociety.org.nz. In conjunction with the new web address, all Society e-mails have changed, and have been updated in this issue. As well as refreshed and updated content, the website has a new on-line shop, with a discount for members – selling books, recent back issues of *Antarctic*, and Society items. Memberships may also be paid through the new website. Financial members will have free access to our electronic archive of back issues of the *Antarctic News Bulletin* (1950–1955) and *Antarctic* magazine (1956–2015.)

Lester Chaplow

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The Importance of Christchurch to Antarctica

By Hon Lianne Dalziel, Mayor of Christchurch City

As one of only five Antarctic gateway cities globally, Christchurch is in a unique position to connect Antarctica with the world. We have an authentic history where the heroic-era explorers that left our port of Lyttelton demonstrated leadership in seeking answers to the unknown questions of the time. Since 1955, when Christchurch and Antarctica were linked via air to Scott Base and McMurdo Station, we have been privileged to have many great scientists passing through our city continuing to explore answers to many more unknown questions.

In recent years these questions have become increasingly more relevant and pressing to us as global citizens. The impact of climate change on coastal communities, on our agricultural and horticultural industries and on our environment will make for significant disruptions to the way that we as a community live, work and play.

Our immediate proximity to the Antarctic means that we can rightfully use this connection to encourage local, national and global discussion around critical issues that affect us all, including climate change and sea level rise. As a city and a nation, we also have a proud history and willingness to stand up on matters of principle. Close to home, right here in Christchurch, Kate Sheppard led the movement for women's rights, while as a nation we were proud to stand up to bigger countries on nuclear testing.

Christchurch's Antarctic City Strategy is our next step in sparking changes in the way that we as a city and as a country can address these global challenges and show leadership on how we can collectively make a difference. The strategy completely flips our previous view of the city's links to Antarctica by focussing instead on **the importance of Christchurch to the Antarctic**. This all goes to our ambition to make Christchurch the world's Antarctic City where we can provide a focus to lead and influence the national and global agenda on Antarctic and Southern Ocean matters.

In Christchurch the opportunities for leadership and change on these matters are very real and immediate as we continue to rebuild and reimagine our city. As a Council, we have made a great start on a range of

initiatives to demonstrate our willingness to lead change. The implementation of the Antarctic City strategy across many stakeholder groups as well as our community engagement programme will be a significant step forward in making the vision a reality.

As I have said previously in other fora, the boundaries between countries are merely political lines on maps – they don't in themselves prevent the spread of disease, terrorism, global financial crisis, or the impacts of climate change – it is at the city level that the capacity to prepare for and counter all of these issues is much more real. Councils can't do this for their communities any more than governments can do it for cities. What cities can do however, is enable communities to be part of these discussions and solutions.

Our connection to Antarctica enables Christchurch to lead the way. 



A bronze statue by Mark Whyte that celebrates Lyttelton's contribution to Antarctic exploration was unveiled by the Mayor 1 October 2016. Photo credit: Pam Carmichael.



The Role of The Antarctic Office

By Eric Assendelft, Director, The Antarctic Office



The sum of the parts is greater than the whole. This is a key concept of the Antarctic City Strategy. The role of The Antarctic Office is to join the dots.

It's a New Zealand-wide effort, with Christchurch, the Antarctic City, as the host.

The Antarctic Office will provide a strategic direction that stretches across service, infrastructure, public engagement and global influence. Our aim is to add value to each of our partners and to the city as a whole.

Our role is all about relationships and connections – from linking up museums to creating an improved Antarctic experience for visitors, to looking for ways to combine equipment storage facilities and create a better service for all the international programmes which pass through our city.

We have built links with local and central government, businesses, researchers, the airport, education and tourism providers. We look for ways to improve operational efficiencies and to unlock new funding opportunities. By opening the doors of collaboration, we move closer to our common goals.

Our public events will build tangible and emotional relationships with the Antarctic, creating new levels of support and advocacy. By co-ordinating more consistent messages, we'll add strength and clarity to disparate voices.

Our vision is that no organisation will need to work in isolation, but will be supported by our strategy and connections to untap hidden potential and reach new audiences. 

The Antarctic Office team (from left to right): Andrea Herbert, Sue McFarlane, Eric Assendelft, Chloë Dear, Esther Last, Lydia McLean.
Photo credit: Lydia McLean.

The Antarctic City Strategy

By Eric Assendelft, Director, The Antarctic Office

When The Antarctic Office first considered the role of Christchurch as a gateway city, the emphasis was on maximising the commercial benefits that the city gets from the 5,000 or more scientists and support personnel that flow through the city each year on their way to and from the ice. However, as we started to talk to more and more stakeholders, as well as members of the community, what became increasingly apparent was the potential to use this relationship not just as an end in itself but as a means to an end. The enduring concept of guardianship/Kaitiakitanga, the “moral responsibility” for the Antarctic given that it is in our backyard, the unique proposition that the Antarctic has for the visitor economy and the potential for our emerging technology and innovation businesses to support Antarctic science meant that seeing the opportunity through just an economic development lens was short-sighted as well as naive. The conversation quickly flipped from “the importance of Antarctica to Christchurch” to the importance of “Christchurch to the Antarctic.”

This change also reflected a more contemporary view of a gateway city where its role is not just for the entry or exit of goods, trade and people but where Christchurch takes on a role as an “Antarctic custodian city.” This term describes the unique opportunities that gateway cities, such as Christchurch, and gateway nations, such as New Zealand, have with their unique geographic connection to the Southern Ocean and Antarctica. This custodian

concept completely reorients the role of an Antarctic gateway city not just as a thoroughfare but as an urban centre and nation that embodies the values associated with Antarctic custodianship: international cooperation, scientific innovation and ecological protection. Acknowledging this role, Christchurch and New Zealand become guardians, global custodians of the Antarctic.

The more The Antarctic Office spoke to the wider community the greater an opportunity started to emerge in which the city and the nation could use this Antarctic connection to drive conversations on critical global issues in the Antarctic including climate change, fishing management, environmental management and Antarctic tourism.

In the Antarctic City Strategy we are leaning heavily towards this concept of Christchurch as a “custodian city” and we believe that this is the right interpretation for our future role with the Antarctic. The real value and opportunity for Christchurch and New Zealand in the custodian role is where there

is active engagement with all our communities and where we use the international Antarctic relationships and enabling infrastructure to create a point of “competitive difference” for the city. Only then can we be a thought leader and influencer on Antarctic and Southern Ocean issues.

The saying that “change is constant” is absolutely relevant and critical to the Antarctic City Strategy. Internationally it is recognised that there will be some key challenges that New Zealand, and the world, will need to face over the coming decades. Antarctic tourism, whether we like it or not, will become more accessible, increasing the pressure for tourists to access more of Antarctica. Challenges to environmental protection rules and protocols, fishing management, etc. will require more sophisticated and multidisciplinary research as well as more effective international outreach if New Zealand is to maintain its influence in these matters. Potentially competing agendas between “old” and “new” Antarctic Treaty System (ATS) members, the slow decision-making for Antarctic Treaty matters, the increasing



Lyttelton has extensive historic and contemporary connections to Antarctica.
Photo credit: Pam Carmichael.

call to reduce the human footprint and the future nature of field-based science, and the application of emerging technology all mean that the current “model” of our Antarctic-related activities will have to change.

We have also picked up on the mood for change that is evident in our discussions across the community with Antarctica often seen as the “last bastion of hope in a crumbling and confusing world”. Greater inequality and the growing wave of “anti-consumerism,” the breakdown of what constitutes communities, the desecration of the environment and the corruption of the mainstream media in a world of “fake news and alternative facts” have all collided to create a growing momentum for change. Fed by social and visual media, the degradation of the environment is seen as the single biggest threat to the continuation of mankind. This is especially so for the younger generation who have expressed concern about the impact of climate change in their own and their children’s lifetimes. Rightly or wrongly, government strategies are being perceived as ineffectual. In response, there is now an emerging movement internationally that recognises real change on these sorts of global issues needs to come from cities and communities not governments.

So how does all of this fit within the Christchurch and New Zealand Antarctic gateway story? We know that Christchurch has a long and authentic history and connection with the Antarctic. Our research and community engagement has shown an acknowledgement that the Antarctic connection brings with it a sense of responsibility and moral duty to protect. We have also moved towards this “custodian city” concept. The clear message we received was “protect Antarctica and

you protect the world”. The strategy therefore reorients all of the earlier preconceptions of the “gateway role” so that the opportunity is defined through the **importance of Christchurch to the Antarctic**. This all goes to our strategy ambition to make Christchurch the world’s Antarctic city where we, as a city can provide a national focus for New Zealand to lead and influence the national and global agenda on Antarctic and Southern Ocean matters.

The Antarctic City Strategy is our next step in sparking changes in the way that we as a city and as a country can address these global challenges and show leadership on how we can collectively make a difference. We want Christchurch and New Zealand to build the Antarctic connection through the combined strength of four themes, so that we are seen as a global thought leader and influencer on Antarctic issues. This means being able to build on our values, our knowledge and both the soft and hard infrastructure, and engage with communities around New Zealand and the world to understand and promote the “*why*”, “*so what*” and the “*what are we going to do about it*” stories of Antarctica and its relevance for the generations to follow.

In the Antarctic City Strategy, the four strategic themes that will achieve this vision are:

1. Service Excellence;
2. Enabling Infrastructure;
3. Deeper Community Engagement;
4. Thought Leadership.

The success of the Antarctic City Strategy will be in Christchurch and New Zealand doing many things well – and with all Antarctic-related agencies being involved and committed. Initiatives must be prioritised and implemented through a phased approach. However, **if there**

is no alignment across agencies and activities, there is no distinctive strategy and little sustainability. The harsh reality is that just tinkering with a few things will not achieve success. As a city and a nation, we don’t achieve much by only picking or choosing what could be “easy” options with success requiring a major shift away from the “business as usual” approach.

Success will also require the application of different ways of working across sectors as well as challenging the status quo, which will require the integration and alignment of decisions and actions across many independent agencies. The unique challenge in the Antarctic City Strategy is to identify how we shift the paradigm from individual silo operations to one that ensures that all of the individual components are working consistently and collaboratively so that **the “NZ-Inc.” effort is maximised**. This is where commitment to the strategy outcome, values and principles by all stakeholders becomes important.

The Antarctic City Strategy takes a leadership role in defining the combination of service excellence, enabling infrastructure and community engagement to ensure that there is a fit and sustainability that will give us this competitive differentiation. Only when we as a city and nation pull this together in a consistent manner do we end up with the capabilities and capacity to take a strong, enduring leadership and influencing role in future Antarctic and Southern Ocean issues.

See page 30 for more information on the Antarctic City Strategy’s four strategic themes. 



Christchurch's Antarctic Visitor Strategy



By Eric Assendelft, Director, The Antarctic Office

The question of Antarctic tourism is a vexed one. New Zealand's official policy position is to limit tourism and other non-governmental activities in Antarctica consistent with Antarctica's status as a natural reserve. Currently only 200 passengers visit the Ross Sea region from New Zealand per annum via Christchurch-based Heritage Expeditions. However, the question of whether to increase the number of visitors to Christchurch seeking an Antarctic experience is an opportunity.

For Christchurch, the impact of visitors on their way to Antarctica, or seeking an Antarctic experience, is economic. The latest (2015) economic impact assessment of the Antarctic to the Canterbury economy estimated that Antarctic-related tourism and events contributed about \$60 million per annum directly into the local economy. This helped support approximately 2,355 full time jobs in the region. This economic benefit comes from the 5,000+ international Antarctic science and support personnel spending time in Christchurch on their way to and from the ice, tourists visiting Antarctic-related attractions in the city, and people coming to Christchurch to attend Antarctic-related conferences and events.

Christchurch as an Antarctic gateway city has developed a number of Antarctic-related visitor attractions that serve to either reinforce the city's Antarctic connections or serve to engage with the public on Antarctic matters.

The biggest visitor drawcard in the city is the International Antarctic Centre near the airport. Officially opened in 1992, the attraction has an emphasis on interactive educational displays relating to science and the environment. Its role in promoting the importance of the Antarctic and its science to visitors is one that is internationally recognised and serves to reinforce Christchurch's role as an Antarctic gateway city. The attraction has plans to enhance the exhibits and activities to create even more of an Antarctic experience for visitors.

Other significant Antarctic visitor elements in the city include Canterbury Museum, which is internationally renowned for its extensive Antarctic collection, Akaroa Museum and Airforce Museum of New Zealand.

The portside town of Lyttelton has a number of Antarctic related sites of significance that describe the Antarctic history of the port as far back as Scott's voyages. The statue of Scott, broken during the February 2011 earthquake, will also be back in its rightful place in the central city in time for the 2017 Antarctic season opening which signals the beginning of the summer scientific season and an influx of Antarctica-bound visitors to the city.

Currently there is nothing that links the Antarctic connection through the whole city and beyond. The Antarctic Office is currently exploring the development of a digital-based Antarctic Trail that would link the city's heritage sites so that visitors are drawn through the city in a considered and informed manner. This would also be expanded to include other Antarctic related opportunities in the region including Mt John Observatory in Tekapo, and Oamaru. The Antarctic Office is also working with local operators to support the development of bespoke Antarctic city tours.

The Christchurch Visitor Strategy, produced by CIAL, confirmed that Christchurch needs to build on the unique proposition that the Antarctic gateway status offers. The Antarctic Office has been working with local partners to better define this unique differentiation with a focus on the potential development of an Antarctic precinct. This campus would encompass operational, research, programme administration, logistics, events and tourism functions using a bold architectural design to create an iconic representation of the city's connection to the Antarctic. The successful use of iconic buildings to define a city is best illustrated in the case of the Spanish city of Bilbao and the Guggenheim Museum. Having something that shouts out the city's Antarctic story that we, as a city, quite rightfully own would allow Christchurch and New Zealand to continue to build significantly on Antarctic visitor interest. 

Photo above: A Hägglunds, the Swedish-made over-snow vehicle used in Antarctica, outside the International Antarctic Centre in Christchurch. Photo courtesy of the International Antarctic Centre.



The Antarctic City Strategy – Four Strategic Themes

By Eric Assendelft,
Director, The Antarctic Office

There are four strategic themes within the Antarctic City Strategy that aligns the vision of Christchurch and New Zealand as Antarctic custodians.

1 Service Excellence

We must protect the value that we as a city and nation derive from the Antarctic relationship by excelling at our Antarctic-related service. Achieving this **service excellence** means ensuring that what we do in our gateway capacity and country leads to excellence in individual activities and that we are performing similar activities at least as good as, or better than, other gateway cities.

There is evidence that we already have a fair degree of service excellence. There are a number of Antarctic-related agencies and activities across the city and country that are well managed and respected – but each operates within their own narrow terms of reference. Anecdotally our national Antarctic partners have expressed satisfaction with what we as a city have to offer in support of their operations, although there is room for improvement in the availability and cost of some suppliers, material and warehousing. We have also heard in our stakeholder engagement that while each organisation is well managed, there is no coordination between the Antarctic-related agencies nor is there an aligned future focus.

Some of the specific actions that will be delivered under this theme include:

- The Antarctic City Strategy – this will create the common picture and alignment for all agencies involved in Antarctic gateway matters;
- An appropriately structured and resourced Antarctic Office to provide the strategic leadership across the Antarctic sector;
- An Antarctic precinct that addresses a number of infrastructure issues.

2 Enabling Infrastructure

Our stakeholder engagement has revealed that the absence of critical enabling infrastructure is a major city and national weakness in being able to create collaborative opportunities or partnerships. The Antarctic City Strategy aims to address this issue through the promotion of a National Polar Research Centre (NPRC). Rather than following the existing model of Antarctic science and Antarctic science funding, and in order to future proof our approach, we need to build on the excellent base that we have and allow opportunities to add value through both national and international collaboration. We can only do this through building specialised infrastructure (which we currently do not have) that **has very clear linkages to government policy, industry and the community.**

In particular, the strategy is proposing that we use the research currently being undertaken (the “what’s happening?”) and shift it along the “value chain”, and in doing so, focus on telling the “so what?” and “what are we going to do about it?” stories. The strategy takes a multi-disciplinary approach and is looking to create partnerships with Māori and integrate mātauranga (wisdom) to add the unique New Zealand perspective to environmental stewardship and management.

Only in this way can we move away from the current narrow perspectives into adding value on matters that relate to New Zealand and the world. This shift creates significant added value for policy advisors and decision makers in informing Antarctic related matters (which has been identified as a major gap for New Zealand). It also creates greater opportunities for engagement with the public on why and how matters such as the Antarctic and Southern Ocean should matter to us as citizens.



3 Deeper Community Engagement

Previous local public engagement on Antarctic matters has been quite limited. The biennial NZ IceFest run by the Christchurch City Council provided a focus, but the length between events failed to create a lasting impression on the city or community. The city has also held regular small scale events on Antarctica. While these have been successful, they “*preach to the converted*” and have failed to draw in the wider community. In addition, Antarctic-related public events have largely operated independently with no evident connection between them. To be really effective we need to leverage the combined knowledge and skills of all Antarctic agencies.

In line with the move towards being an Antarctic custodian city, a **much deeper level of engagement with all communities across both Christchurch and New Zealand** will be required. This means moving away from the delivery of ad-hoc temporary or transitory connections towards creating much deeper “emotional connections” with the Antarctic. In addition to a coordinated and more strategically-focussed calendar of events, this engagement will also be reflected through highlighting our local and national Antarctic cultural identity.

To achieve this strategic theme the Antarctic City Strategy will be implementing:

- An annual two-week Antarctic Season Opening Festival that celebrates Christchurch’s role as an Antarctic city;
- An annual national two-week festival held mid-winter that challenges the community on why the Antarctic should matter to us as citizens;
- A calendar of events through the year that engages with all sectors of the community across New Zealand;
- An Antarctic education strategy that aligns Antarctic education from primary through to tertiary;
- An industry forum to coordinate and provide a focus for Antarctic-industry opportunities.

4 Thought Leadership

New Zealand has maintained a consistent position on its strategic interests in Antarctica since the Antarctic Treaty was signed in 1959. While New Zealand has done a good job at maintaining these interests, a Strategic Assessment prepared for The Antarctic Office shows some significant challenges ahead over the next 10–20 years, including changes in the dynamics of the Antarctic Treaty System (ATS), pressures from tourism, environmental changes and pressures on fisheries management. Any disintegration of the ATS would create significant security and resourcing implications for New Zealand.

To protect and maintain our interests it will be important that New Zealand is able to continue to exert its views on the international stage. The Antarctic City Strategy uses the strategic themes of service excellence, enabling infrastructure and community engagement to deliver on the fourth theme: thought leadership. This creates opportunities for New Zealand to be a “future-maker” in its Antarctic engagement.

Successful delivery of this theme will only be achieved when all three of the first three themes are being consistently and collaboratively delivered in a “NZ-Inc.” manner. [Ⓐ]

Photo above: Inland Ice sculptural installation by Gabby O’Connor. Developed with oceanographer Craig Stevens. Photo credit: Triebels Photography.

Creating an Engaged Community of Antarctic Advocates

By Chloë Dear, Deputy Director – Public Engagement, The Antarctic Office

Central to the Antarctic City Strategy is the ambition for Christchurch to become an “Antarctic custodian city”, that is, a city that has a strong, credible and emotional connection to the Antarctic and exhibits behaviours at both city and community level that demonstrate this connection. One of the four strategic themes of the Antarctic City Strategy is public engagement.

Climate change is undoubtedly one of the world’s major challenges and although many people know that there is the risk of ice melt, few understand its significance. Well thought through, long-term public engagement will play a large part in enabling communities to understand the relevance of the Antarctic to everyday life. This will encourage a change in today’s behaviours to ensure a sustainable future for tomorrow’s generations.

Further, an engaged community is vital if Christchurch is to credibly claim an Antarctic custodian city positioning of global significance. It needs to understand the “why” and the “how” of the Antarctic; “how” our city and nation relates to Antarctica, and the “why”, the impacts on daily life and what can be done as a community of individuals to turn the tide.

The Antarctic Office is currently developing both short and long-term community engagement plans to connect our community with the “how” and the “why” of Antarctica. Plans include launching a nationally focussed “Antarctic Festival” in mid-winter, building a programme of public events around the opening of the Antarctic season which occurs each October when the majority of flights to Antarctica commence, and extending its successful Antarctic Talks Series, creating a year-round programme of Antarctic-related events.

The first steps to creating a year-round programme have already been taken. In early September 2017, a new Antarctic events calendar was launched on The Antarctic Office website, www.antarctic-office.org.nz. This calendar promotes any public Antarctic-related event or activity, including films, talks, open days, seminars and exhibitions across New Zealand.

Antarctic Festivals

Although NZ IceFest was successful and much enjoyed by attendees, as a biennial festival its impact was greatly dissipated by the length of time between festivals. To achieve the goals of the Antarctic City Strategy, we need to generate year-round programming, with two distinctive festivals connected by a calendar of supporting engagement activities.

We are planning to have an Antarctic Season Opening Festival in October celebrating Christchurch’s gateway role past, present and future; with the other mid-winter national Antarctic festival highlighting why the Antarctic is important and exploring themes such as climate change, sea level rise, stewardship, marine protection and sustainability.

Antarctic Season Opening Festival

To date, the Antarctic Season Opening has been marked within the Antarctic community by the Council’s Civic Reception event held each year. There was very little to no connection to the general public.

We are proposing that the Antarctic Season Opening festival now become a much more public event acknowledging the city’s historic and current connections to the Antarctic. It will be tied quite literally to the arrival of the USAP and the US Air Force’s C-17 into Christchurch, as well as acknowledging the start of Italian and Korean flights south some weeks later. This festival will focus on the “how” of the Antarctic: how to get there, how to survive there, Antarctic heritage, innovation and logistics. It will be delivered through talks, walks, activities for young people, book readings, exhibitions and an Antarctic Air Day. The start of the festival will continue to be built on the strong interest by, and support from, the diplomatic sector. This year we have programmed exhibitions and talks sponsored by the Italian Cultural Institute, the Canadian High Commission and the Norwegian Embassy (Canberra).

National Antarctic Festival

It is too early to give a taste of the programming for the national Antarctic festival other than to say it will focus on addressing the “why is Antarctica important to me” question. This festival will typically be built around significant arts programming with an associated international symposium. A number of co-productions are currently under consideration for the proposed first Antarctic Festival in 2019 including an Antarctic musical, an outdoor dance piece involving an inflatable ice floe, an interactive digital installation and a film with live orchestral score. The festival is planned to bring light and illumination to dark winter months.

Much thought will be given to ensuring that both festivals are accessible to a broad range of people with respect to programming, subject matter, location and timing of activities with many lessons learnt from previous IceFests. Although always glad to welcome “Antarcticans” to events, The Antarctic Office is keen to appeal to those people who may not be so passionate or knowledgeable about the Antarctic. We know, for example, that successful events such as Antarctic Air Day and Sled Dog Racing have wide appeal, although the real attractions are the planes and dogs, not necessarily their relationship to Antarctica. The challenge will be to encourage audiences to relate these activities to the city’s Antarctic connections, past and present and in so doing, learn a little more about why the city’s Antarctic connection is so important.

Antarctic Talk Series

In late 2016, with the support of the wider Antarctic community, the Christchurch Antarctic talk series was launched as a joint initiative between Gateway Antarctica and The Antarctic Office. The intent is to hold around five seminars each year as a forum to explore Antarctic science using national and international speakers. The remaining four seminars will be opportunities for other speakers to lead discussions on topics connected to the Antarctic. Last year we started the series with an address by the Ambassadors of Chile and Argentina talking about the experiences of their respective countries Antarctic gateway cities. This year we had an address by the French Ambassador speaking about the Paris climate change agreement as a prelude to the French film *Ice and the Sky*. The intention is to programme some of these talks, especially those presented by international guests, in other locations around New Zealand.

Further Engagement Plans

The public engagement programme will also encompass a range of other activities such as icebreaker open days, Climathon, trade fairs, Antarctic-related symposiums and conferences, an Antarctic film festival, scenario games and more. Co-presentations and co-productions between the Office and other agencies such as Word, Canterbury Museum, SCAPE and Christchurch Arts Festival are in early discussions.

Creating an engaged community of Antarctic advocates is vital if Christchurch, and New Zealand, is to create a custodian city role. Making Antarctica relevant and accessible via a robust year-round community engagement plan is the fulcrum to creating change. [^]



Visitors enjoy Antarctic Air Day.
Photo credit: Triebels Photography.

Custodians of Antarctica: Rethinking the Role of the Antarctic Gateway Cities

By Gabriela Roldan, PhD candidate,
Gateway Antarctica, University of Canterbury

Antarctica's uniqueness is indisputable. Its remote and extreme environment are both a deterrent and an attraction to people who wish to travel there. The absence of a native culture has allowed people throughout the centuries to create cultural representations of this unique place that reflects its purity, wilderness, exceptionality and survival. In the past, the

Antarctic region has motivated nations to conceive of nationalistic expansion and exploration. Today, Antarctica represents international collaboration, peaceful purpose and scientific research under the management of the Antarctic Treaty.

Yet, the status quo seems to be threatened by rapid global change, with Antarctica again under pressure. Concerns are mounting over the resurgence of interest from

new countries eager to participate in scientific and logistic endeavours in the region, the continuous growth and diversification of Antarctic tourism and its activities, and the stability of the fragile Antarctic environment which is largely compromised because of anthropogenic climate change. Antarctica is a Global Commons and as such, we have an ethical responsibility to protect it.

Ushuaia port and city view. *Photo credit: Gabriela Roldan.*





Aurora Australis at Princes Wharf, Hobart.
Photo credit: Gabriela Roldan.



Welcome signs at Cruise Passenger Terminal, Punta Arenas. Photo credit: Gabriela Roldan.



S. A. Agulhas II Heading for Antarctica from Cape Town. Photo credit: Gabriela Roldan.

Moreover, Antarctica is of strategic importance to New Zealand. As one of its closest neighbours, the pressures and changes in the region will affect us directly. We have a longstanding relationship with the Ice, strong ties that transcend political agendas. Christchurch, for example, is one of five Antarctic gateway cities and shares this status with Cape Town (South Africa), Hobart (Australia), Punta Arenas (Chile) and Ushuaia (Argentina). The Antarctic gateway cities concentrate most of the travel to Antarctica, and have developed policies to provide infrastructure and logistical capabilities to support access to the polar region. The Antarctic gateway cities are hosts to the international Antarctic community that travel through on their way south. Every year, thousands of scientists, national Antarctic programme staff, Antarctic managers, politicians, tourists, fisheries operators, etc. witness how the Antarctic gateway cities interact with Antarctica.

The Antarctic connection shapes the cultural, economic and political aspects of these cities, and concurrently promotes the reputation of their polar specialists, which in turn creates and attracts other business opportunities. Although competition between the Antarctic gateway cities may seem inevitable, each of these have different

advantages to offer international Antarctic stakeholders, including access to specific areas of Antarctica due to their geographic location, specific transport infrastructure, scientific research facilities and experienced workforce.

The association with Antarctica fosters an interconnectivity within the Antarctic gateway cities that other cities are missing, and this requires further attention. The first attempt to understand the potential benefits of collaboration between Antarctic cities occurred in Christchurch in 2009 when each gateway nation's government signed a Statement of Interest proposing to explore the sharing of ideas and best practice. Although collaboration between competing political and economic interests appear to be unlikely in other fora, the values associated with Antarctica might be the catalyst to rethink the role the Antarctic gateway cities have in nurturing community engagement with the Ice. The Antarctic gateway cities should no longer be seen as thoroughfares to the southern region since they have a stronger role to play as custodians for Antarctica.

Recently a new strategic partnership between Christchurch, Hobart and Punta Arenas has been established with one clear idea in mind: how to create global custodians for Antarctica. A multi-disciplinary,

international research team from Australia, New Zealand and Chile is working together with The Antarctic Office and other international partners to address this concept. The research project "*Antarctic Cities and the Global Commons: Rethinking the Gateways*" is a substantial comparative programme of study that sets out to investigate how the Antarctic gateway cities imagine their relationship with Antarctica and with each other. It also explores how to best engage their citizens, in particular their youth, in future programmes towards Antarctic custodianship. This project employs an innovative set of tools to assess urban sustainability, governance and connectedness with Antarctica for each participant city. Additionally, the project will design an online game to encourage young urban citizens to engage with Antarctica; to consider future scenarios and effective decision-making in order to find solutions to the future challenges faced by Antarctica and the Southern Ocean.

A question to ask ourselves is, how do we fare as an Antarctic City (and country)?

For those with a personal connection with Antarctica, caring for it is a duty of global citizenship. The challenge is now set to guide the communities of the Antarctic Cities into becoming *Antarctic Custodians*. 



National Antarctic Programmes Based in Christchurch

By Sue McFarlane, Deputy Director – Relationships, The Antarctic Office

Christchurch, as New Zealand's Antarctic gateway city, hosts a number of international partners in addition to New Zealand's own Antarctic government agency, Antarctica New Zealand.

Antarctica New Zealand

Antarctica New Zealand is the government agency responsible for supporting New Zealand's scientific and environmental protection activities in Antarctica. Scott Base, established in 1957, is New Zealand's only permanent base in Antarctica, accommodating 85 people.

United States (United States Antarctic Program – USAP)

The National Science Foundation (NSF), an independent US government agency, manages the US Antarctic Program (USAP). NSF's Office of Polar Programs (OPP) coordinates all US scientific research on the continent and aboard ships in the Southern Ocean as well as related logistics support. Through an Antarctic Support Contract, PAE (New Zealand) operates the USAP in Christchurch. The New York Air National Guard operates LC-130 (ski-equipped) airplanes in the Antarctic programme. The C17 Globemaster, which flies regularly during the summer season from Christchurch International Airport to Antarctica, is operated by the US Air Force while the US Coast Guard operates icebreakers, including the USCGC Polar Star, in Antarctica to escort supply ships and to support science.

McMurdo Station, the logistics hub of the US Antarctic Program in the Ross Sea, accommodates up to 1,200 people. It is just 3km from New Zealand's Scott Base.

United States (National Aeronautics and Space Administration – NASA)

NASA operates two major programmes through Christchurch. The largest programme, SOFIA (Stratospheric Observatory for Infrared Astronomy), operates out of Christchurch from June to August conducting a range of missions to observe celestial objects. The second and smaller programme, ATom (Atmospheric Tomography Mission), visits Christchurch for a week each February and October as part of a global data-collection mission. Using a modified DC-8 passenger aircraft, ATom studies the impact of human-produced air pollution on greenhouse gases and on chemically reactive gases in the atmosphere.

Italy (Programma Nazionale di Ricerche in Antartide – PNRA)

Since establishing the Mario Zucchelli Research Station in Terra Nova Bay in 1986, the Italian Antarctic programme has used Christchurch as their base to service the station. The base supports around 70 people and operates during the summer months, hosting a variety of scientific projects. Approximately 230 personnel pass through Christchurch each summer.

The Italian programme is currently completing a permanent runway at its Mario Zucchelli base, which will allow flights throughout all the summer months; previously air movements were restricted to the beginning of the season.

Republic of Korea (Korea Polar Research Institute – KOPRI)

The Korean Antarctic programme has maintained a presence in the city since it opened its Korea-New Zealand Antarctic Co-operation Office in 2014. The programme services the Jang Bogo Station in Terra Nova Bay. Approximately 200 Korean scientists and support personnel pass through Christchurch each summer. KOPRI's icebreaker and research vessel, *Araon*, usually visits Lyttelton on its way to and from the Antarctic.

Germany (Bundesanstalt für Geowissenschaften und Rohstoffe – BGR)

With the reopening of the Gondwana Research Station in Terra Nova Bay, the Federal Institute for Geosciences and Natural Resources (BGR) is increasing its operational relationship with Christchurch. Currently 10–20 scientists work in the base over summer, mainly in collaboration with the Italian Antarctic programme. However, the expectations are that the BGR programme will increase over the next few years with increases in personnel and collaborative partnerships.

COMNAP (Council of Managers of National Antarctic Programs)

Formed in 1988, COMNAP consists of 30 National Antarctic Program members. COMNAP's purpose is to develop and promote best practice in managing the support of scientific research in Antarctica. The secretariat is based in Christchurch. 



Araon

By The Antarctic Office

Araon, Korea Polar Research Institute's (KOPRI), icebreaking research vessel, is a regular visitor to Lyttelton, docking in port 3–4 times a year to allow change-over of research teams and re-supply.

The ship operates in both polar regions supporting both KOPRI projects and international collaborations. One scientific research operation this summer hosted researchers from 10 nations.

Until this year, only invited guests had been given the opportunity to go aboard and learn more about its

scientific research activities. On 4 March, KOPRI and The Antarctic Office, with the support of Lyttelton Port Company, organised its first New Zealand open day. Over 500 members of the public toured the ship in small groups, visiting labs, cabins, the hospital bay, helideck and bridge where they were welcomed by the Captain. The tours were conducted by Korean students who were able to provide translation services as well as commentary.

Due to the success of the first open day, and the demand for the free tickets (snapped up within 24 hours), future open days have been proposed. 



The Korean Polar Research Institute (KOPRI) icebreaker IBRV Araon moored at Lyttelton Port. *Photo credit: Peter McCarthy.*



Members of the public inspect the Korean Polar Research Institute (KOPRI) icebreaker IBRV Araon moored at Lyttelton Port. *Photo credit: Peter McCarthy.*

SOFIA

By The Antarctic Office

For the past four winters, the NASA programme SOFIA (Stratospheric Observatory for Infrared Astronomy) has visited Christchurch to study celestial objects that are best observed from southern latitudes.

Using a modified Boeing 747SP aircraft, SOFIA is the largest airborne observatory in the world, carrying a reflecting telescope with an effective diameter of 2.3

metres (100 inches). SOFIA typically flies at about 45,000 feet in the stratosphere above 99% of the Earth's infrared-blocking water vapour in order to make its observations.

During its planned 20-year programme, SOFIA aims to inspire the development of new scientific instrumentation as well as foster the education of children and young scientists. SOFIA is an 80:20 partnership between NASA and the German Aerospace Center (DLR).

During their two-month stay in Christchurch, over 120 crew and scientists conduct around 25 missions to observe celestial objects such as star formations within the Magellanic Clouds (two neighbouring galaxies to our Milky Way galaxy).

Christchurch provides the ideal base for SOFIA given the access to the clear skies of the Southern Ocean and the Antarctic region along with the relatively low levels of humidity (water vapour) in the air. 



SOFIA at Christchurch Airport *Photo credit: NASA.*



Fostering Antarctic Innovation

By Eric Assendelft, Director, The Antarctic Office

In 2016 the international Antarctic science community through COMNAP (Council of Managers of National Antarctic Programs) identified the most critical scientific questions facing the global Antarctic science community. To solve these questions however, requires a call to action to improve the accessibility and development of critical technologies that support Antarctic science, as well as the creation of new partnerships and models for international cooperation. This “call for action” followed an earlier call by SCAR (The Scientific Committee on Antarctic Research) on the need to change the way Antarctic science is being undertaken in order to facilitate greater international collaboration and reduce the human footprint on the ice.

COMNAP’s Antarctic Roadmap Challenges (ARC) identified that the critical requirements needed to enable and deliver key science would be through “cross-cutting technologies”. This would include increasing satellite and remote sensing capabilities to capture diverse types of data and providing integrated and region-wide data to multiple parties.

The COMNAP Challenge concluded that only a third of the technologies required to answer the critical priority questions were currently available, and even then available only to a select group of scientists. Other technologies were available in one form or another but could potentially benefit from improvement. Of significance was the realisation that new technologies will be required to address the priority questions, and that these new advances in technology will come from outside the Antarctic community.

Technology will fundamentally change what questions are addressable, and even what specific questions can be asked. In addition, no single country will have the money to pursue all Antarctic science priorities. Continuing cooperation and collaboration will

remain a high priority and an ever increasing financial reality for many national programmes. As technological advancements occur outside the Antarctic system, new models of collaboration and cooperation will be needed.

The Antarctic Office is rising to the challenge issued by SCAR and COMNAP, and has recognised the significant opportunity that technology offers both the New Zealand and international Antarctic science communities. In collaboration with central government and industry, we have been preparing some proof of concept projects to test the viability of commercially available technology to support Antarctic science and address the critical science questions posed by COMNAP. It is expected that these proof of concept projects will help identify future R & D opportunities that will benefit New Zealand industry, the Antarctic science community and add to the growing innovation sector emerging in Christchurch and New Zealand. (See page 39 for The Antarctic Office’s involvement in Climathon NZ.)

The Antarctic Office is also working with a number of industry partners to look at future options to promote a “NZ-Inc.” data link from the Antarctic back to Christchurch and beyond. The 24/7 availability of remote sensing and satellite data captured throughout the continent and the Southern Oceans and made financially and technologically accessible to the science community would represent a huge step-change in the way that Antarctic science could be undertaken as well as the types of questions that could be addressed. With the reality that Antarctic science funding is not likely to increase significantly, efficiencies in Antarctic science delivery can only mean that even more science can be undertaken. This step-change in the way data is collected and distributed would also support the production of “big data” and Earth System Models that integrate a wide variety of smaller models and observations.



The face of a glacier in Antarctica.
Photo credit: Anthony Powell.

Climathon NZ

By Lydia McLean, Public Engagement Co-ordinator, The Antarctic Office

What do New Zealand cities need to thrive in a changing climate? 24 hours could make all the difference.

The Antarctic Office is joining forces with youth-led climate action group Generation Zero to organise Christchurch's Climathon, a "hackathon" style event that will simultaneously take place in over 200 cities around the world.

Bringing together the challenges of the world's cities with the people who have the passion and ability to solve them, Climathon attracts innovators, entrepreneurs, students and professionals to create innovative solutions to cities' climate challenges. Participants will tackle a set challenge for a full 24 hours before pitching their ideas in front of relevant local stakeholders. These ideas can develop into tangible sustainable solutions and businesses that address city climate challenges across the globe.

Wellington has hosted Climathon events for the past two years, and in 2017 Auckland and Christchurch have come on board in a national effort for New Zealand's cities to become leaders in implementing climate change solutions. The 2015 winners of Wellington Climathon were invited to present their idea at the United Nations Climate Change Conference in Paris, and received ongoing mentoring to see their idea become a reality. The start-up business that emerged from this process, Po0ol, supports a wide variety of time-poor small and medium businesses, providing competitive and sustainable goods and services solutions for them via their e-commerce platform.

The inaugural Christchurch event will challenge participants to come up with practical ideas to incorporate into the rebuild – taking this as the perfect opportunity to

create a sustainable city that takes the lead on combating climate change. Solutions could involve anything from rethinking building regulations to urban planning to creating an app or gadget or incentivising a sustainable behaviour. Christchurch-based representatives from the entrepreneurship sector, local government, scientists and tech experts will be present during the event to offer their expertise and to help shape ideas. Climathon aims to capture the local knowledge of the participants and mentors to find locally applicable solutions to local problems.

The three New Zealand events are sponsored and supported by the Deep South National Science Challenge, which is one of the 11 challenges set out by the government in 2011 to tackle some of the biggest science-based issues and opportunities facing New Zealand. The objective of the Deep South National Science Challenge is to understand the role of the Antarctic and Southern Ocean in determining our climate and our future environment in order to enable New Zealanders to adapt, manage risk, and thrive in a changing climate. Being the southernmost Climathon in the world, it is particularly appropriate that the Christchurch event is supported by both the Deep South Science Challenge and The Antarctic Office, as this cements public understanding of Antarctica as the driving force behind our climate. With the aim of becoming recognised as "the World's Antarctic City," Christchurch will need to show leadership on climate and sustainability issues nationally as well as globally. Climathon NZ stands as an opportunity for Christchurch to step forward and demonstrate this leadership.

Christchurch Climathon is supported by The Antarctic Office, Generation Zero and Ara Institute of Canterbury. 

What: Climathon NZ

When: 27–28 October 2017

Time: 6pm Friday 27 October – 6pm Saturday 28 October. (Doors open at 5.30pm on Friday. Presentations and prize giving will follow the event on Saturday.)

Where: Christchurch, Wellington, Auckland and 200+ cities around the world

Who: Anyone with ideas, skills and energy that can be put into finding solutions for New Zealand cities to address climate related challenges.

How Climathon works: Each city sets its own local climate challenge that reflects what affects their urban life the most. Participants then tackle the set challenge for a full 24 hours before pitching their ideas in front of relevant local stakeholders. These ideas may develop into tangible, sustainable solutions and businesses that address city climate challenges across the globe.

Cost: Free

Website: www.climathon.nz



Education Mission: Antarctica

By Miranda Satterthwaite, STEM Coordinator, Ara Institute of Canterbury

Two new education projects that enhance co-operation in the areas of science, space, energy, technology and innovation are being rolled out in early October as part of The Antarctic Office's Antarctic Season Opening festival.

Ara Institute of Canterbury in partnership with The Antarctic Office, International Antarctic Centre and Fab Lab Christchurch are delivering two STEM¹ school holiday programmes with the aim of introducing 12–15 year old students to the skill pathways they would need to survive, thrive and work in harmony with the Antarctic environment and in the Antarctic sciences.

STEM at Ara is based on the idea of educating students in four specific disciplines; science, technology, engineering and mathematics, in an interdisciplinary and applied

approach. Learning is collaborative and project-based; students work closely together in a hands-on way to solve real-world problems.

In the two-day programme Mission to Antarctica, students experience Antarctica's inhospitable conditions in virtual reality and gain an understanding of the challenges of exploring and living on this fascinating continent. Students use engineering and architectural design thinking principles and 3D printing to build geodesic habitats and energy systems for survival.

For Antarctic EcoBots, also a two-day programme, students build a robot that can tackle dangerous environmental tasks using their maths, physics and computing skills. This course focuses on Antarctic science including microbiology, glaciation and the damage global warming does to the environment. The importance of sensor technology

to collect, transmit and analyse data in Antarctica is also illustrated.

Both courses provide students with opportunities to collaborate with others and to present their ideas to VIP guests attending the Antarctic Season Opening festival. Students will be involved in presentations throughout the festival, culminating in a showcase event on 25 October 2017 where students will display their work.

The two STEM courses that ARA is offering are the beginning of a wider conversation being held via The Antarctic Office around defining a vision for Antarctic education in New Zealand. A long-term education strategy paves the way for international collaboration while furthering international cooperation and science and technology capabilities. 

¹ STEM: Science, Technology, Engineering, and Mathematics.

Details and registration:

Mission to Antarctica

2–3 October 2017

Ara Institute of Canterbury,
Madras Street Campus

Mission to Antarctica is a free engineering holiday workshop for Years 9–11. Experience Antarctica's inhospitable conditions in virtual reality, and gain an understanding of the challenges of exploring and living on this fascinating continent.

<http://www.ara.ac.nz/explore-ara/ara-experience/holiday-workshops/Mission-to-Antarctica>

Antarctic EcoBots

4–5 October 2017

Ara Institute of Canterbury,
Madras Street Campus

Build a robot that can tackle dangerous environmental tasks using your maths, physics and computing skills. EcoBots is a free interactive workshop for Year 9 and 10 students.

<http://www.ara.ac.nz/explore-ara/ara-experience/holiday-workshops/Antarctic-Ecobots>

The unveiling of the Scott memorial statue in February 1917.
 Photo courtesy of Bishop Collection,
 Canterbury Museum, 1923.53.762.

Repairing our History: The Memorial to Robert Falcon Scott and the Polar Party

By Sarah Murray, Curatorial Manager, Canterbury Museum, and Emily Fryer, Conservator, Emily Fryer Conservation Ltd

On 9 February 1917, the people of Canterbury unveiled a memorial to Antarctic explorer Robert Falcon Scott and his Polar Party, Edward Wilson, Edgar Evans, Lawrence Oates and Henry (Birdie) Bowers, who died on the return journey from a failed attempt to be the first to the South Pole in 1911. Carved by his widow, Kathleen Scott, the memorial was installed on the corner of Worcester Boulevard and Oxford Terrace in central Christchurch. Over the decades that followed, the memorial became an important part of the city's heritage fabric. Unfortunately, the 22 February 2011 earthquake dislodged the statue from its plinth. It fell to the ground below and broke through the legs. Since that time, a team of experts have worked on the project to determine a method to conserve and repair the memorial.

When news broke in Christchurch on 11 February 1913 that Scott and his companions had died almost a year earlier, Christchurch went into mourning. Within days, the call for a New Zealand memorial to Scott and the expedition echoed throughout the country. In Christchurch, Mayor Henry Holland called for a meeting and, with unanimous support, a special committee was formed to solicit funds. Over £1,000 was raised and several options, including a home for "chronic cases or incurables", scientific scholarships and a monument were considered. By mid-1915, following a series of delicately worded letters and approval from a public meeting of

subscribers, Kathleen was commissioned to create a statue of her husband in bronze. The statue was to be a copy of Kathleen's statue of Scott commissioned by the officers of the Royal Navy for Waterloo Place, London.

Within months, however, it became clear that the impact of the First World War made a bronze statue beyond financial reach. The committee therefore agreed with Kathleen's suggestion that the statue be carved from marble and she travelled to Carrara, Italy, for this purpose in mid-1916. By the end of that year, the memorial and stone for the plinth had arrived via ship to Lyttelton. Mayor Holland was delighted with the "sculptural masterpiece in... exquisite marble" and a special unveiling was held by the city. Shortly thereafter, the committee gifted the memorial to Christchurch City Council in response to the Council clearing a £145 debt for its installation. Over the following decades, the Council facilitated care of the memorial along with the gardens, a fountain, lighting and brickwork added to the memorial reserve and surrounding area.

For almost one hundred years, the memorial was a source of pride for locals, particularly those with an enthusiasm for Antarctica. Prior to the 22 February 2011 earthquake, there were no major structural concerns with the memorial. As with many other statues of that period, it was not fixed by any means to the top of the plinth. It was, however, the only marble memorial cared for by Council to suffer complex damage in the earthquake.

The break sustained because of its fall was across the thinnest, and therefore the weakest, point of the legs. The very steep and compound angles of the break posed a challenge with conventional repair methods unsuitable for the angle and area of the break. Thankfully, the remainder of the statue was in excellent condition as the soft ground had cushioned its fall. The plinth was mostly unaffected; however, the specific nature of the internal construction method was unknown. This required investigation to ensure that the plinth would hold the repaired statue and not be the point of weakness in a structural design.

In mid-2016, after the completed repairs of the John Robert Godley and William Rolleston statues, Council identified that resources were now available to commence the repair of the memorial to Scott and the Polar Party. A project group was established with a project manager, stone mason, structural engineer, conservator and heritage specialist considering options for the memorial's future. From the outset, no option was excluded from discussion. As a result, the group appraised the relative merits and risks of numerous options in detail. These ranged from no treatment of the damaged statue and the installation of a new memorial through to external structures or supports to ensure the safe reinstatement of the original statue. With these options clearly identified, Council was then able to consider how community values and stakeholder perspectives would inform the project.

In October 2016, Christchurch City Council commissioned a significance assessment of the memorial. Providing a detailed history of the memorial, the significance assessment process assessed feedback from a wide range of stakeholders and offered detailed information on the significance of the memorial to the community and how possible options for the management of the memorial might affect this significance. The report allowed Council to make informed decisions about the memorial's care that addressed community expectations



The statue of Robert Falcon Scott after the 22 February 2011 earthquake. Photo courtesy of Emily Fryer, Emily Fryer Conservation Ltd.

and concerns. This community consultation process delivered a unanimous mandate for Council to repair and return the statue to the original plinth. Given the memorial's high historic and artistic significance, this directive qualified that any external changes must be minimal and sympathetic to the work.

The significance assessment outlined that the memorial to Scott and the Polar Party is one of a limited number of monuments that recognise the significance of Antarctic exploration in the early twentieth century. It is probably the finest example in the world due to its significance across a range of artistic, historic and symbolic factors as well as its provenance and rarity. Created by Scott's widow, the marble statue is the single largest work Kathleen ever carved and a magnificent testament to the concepts of patriotism and inspiration that surrounded the story of the Antarctic explorers in that period. Furthermore, the memorial has considerable importance in symbolising a wide range of connections. It marks the association between the city and Antarctic exploration over the years and underscores the relationship between New Zealand and the British Empire. As an emblem of relationships with a range of international Antarctic stakeholders, the memorial is an important place of remembrance and commemoration. The memorial is highly significant for the local, national and international community.



As the conservation and repair project progresses, the marble legs and granite block are reattached to the body of the statue. Photo courtesy of Becky Helliwell, Emily Fryer Conservation Ltd.

With such clear guidance in the significance assessment, a visually low impact solution for the support of the statue was essential. Due to the memorial's height and location, the repair strategy had to meet building code compliance and be able to withstand significant future seismic events. In a location by the river where people gather underneath the memorial, ensuring the memorial was compliant was vitally important. For this reason, the project team focused on strengthening the plinth as well as identifying a method to more appropriately affix the statue. In keeping with international standards for conservation, it was also important that the repair strategy removed as little of the original material as possible; this discounted several strategies from consideration. With the significance assessment indicating the integrity of the carved stone surface was paramount for stakeholders, the project team focused on methods of interior drilling which would allow for internal supports.

With these factors in mind, one option for the repair strategy stood out. Although not previously used on historic marble, this strategy involved drilling into the marble legs of the statue and placing carbon fibre rods in the holes. Together with an adhesive along the broken joints, this method holds the two pieces together. In addition, this approach employed internal confinement bands using carbon fibre tow to confine the marble above and below the break. This mitigates any spalling

damage to the marble in another large earthquake. The repair strategy also required strengthening of the plinth which was best achieved by drilling then epoxy grouting in vertical stainless-steel rods. Following its repair, this approach would then reconnect the statue to the plinth using a heavy steel spring that provides additional seismic protection, by allowing the statue to rock backward and forward, in the event of another large earthquake. In June 2017, testing of this method was carried out on a carved replica of the leg, made from the same type of Carrara marble, to determine if this option was viable and what problems could be encountered in the process. The testing, carried out under the supervision of the structural engineer and specialist testing team, clearly demonstrated that this method would meet the required seismic strength. This confirmed that the proposed method, which involved a visually acceptable approach, also met required earthquake standards.

The results of this testing and the proposed treatment were relayed to the project stakeholders and were well received. The project's success rests on the interdisciplinary approach taken as well as the many parties involved contributing their knowledge and expertise. The statue has importance to many people and complex treatment needs. It is essential that these needs are met now and in the future so this magnificent example of public art is preserved for future generations to enjoy. [^]



Robert Falcon Scott statue, pre-February 2011.
Photo credit: Peter McCarthy.



www.antarcticsociety.org.nz

New Zealand Antarctic Society Membership

The New Zealand Antarctic Society Inc was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have been to the Antarctic and all of whom are interested in some aspect of Antarctic exploration, history, science, wildlife, or adventure.

A membership to the New Zealand Antarctic Society entitles members to:

- *Antarctic*, the quarterly publication of the Society. *Antarctic* is unique in Antarctic literature as it is the only periodical which provides regular and up to date news of the activities of all nations at work in the Antarctic, Southern Ocean, and Subantarctic Islands. It has worldwide circulation.
- Attend meetings, and educational and fun events that are held by the Auckland, Wellington and Canterbury branches of the Society.

The Editor of *Antarctic* welcomes articles from any person on any subject related to the Antarctic, the Southern Ocean, or Subantarctic regions. In particular, articles recounting personal experiences of your time in the Antarctic are welcomed. Articles may be submitted at any time to the Editor at editor@antarcticsociety.org.nz. The Editor reserves the right to decline to publish an article for any reason whatsoever. Note that all articles will be subject to editorial review before publishing. Please see our advice to contributors and guidelines for authors at www.antarcticsociety.org.nz/our-magazine/, or contact the Editor.

Advertising, including inserts, is also welcome. Please contact the Editor for rates and bookings.

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Antarctic magazine correspondence, advertising enquiries, and article submissions should be sent to editor@antarcticsociety.org.nz, or to:

The Editor
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Christchurch 8140
New Zealand

Enquiries regarding back issues of *Antarctic* should be sent to backissues@antarcticsociety.org.nz, or to the National Treasurer at the above address.

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Antarctic Season Opening Programme

1 October – 15 October 2017

The Antarctic Office's Antarctic Season Opening Festival celebrates the best of Antarctica with exhibitions, talks and activities throughout Christchurch during October.

Until 5 Sunday November
Postcards to Antarctica

*Canterbury Museum,
Rolleston Avenue*

Scott Base staff and scientists share what Antarctica means to them. A multimedia exhibition by photo-journalist Guy Frederick.

Saturday 30 September –
Sunday 15 October
Antarctic Holiday Fun

Christchurch City Libraries

The Christchurch City Libraries will have a range of Antarctic-themed activities during the school holidays including Antarctic Storytimes, Penguin craft, 3D print your favourite Antarctic animal, Ozobots and make a cardboard Scott Base!

Sunday 1 – Sunday 27 October

**Gateway to Antarctica –
the Antarctic Collection**

Mon – Thu, 8.00am – 9.00pm;
Fri, 8.00am – 6.00pm; Sat – Sun,
10.00am – 5.00pm

*EPS Library, adjacent to Creyke
Road and the Engineering Core,
University of Canterbury*

The Antarctic Collection is a valuable resource for the Antarctic community, and since the 1990s has been accessible at the University of Canterbury Library. This is an opportunity to see the collection, plus an exhibition, to celebrate the 60 year association of Aotearoa and the Antarctic.

Monday 2 – Friday 13 October
**International Antarctic Centre
Holiday Programme**

Mon – Fri, 9.00am – 5.00pm

International Antarctic Centre

The International Antarctic Centre will be running a school holiday programme suitable for 6 – 12 year olds.

Monday 2 – Tuesday 3 October
Mission to Antarctica

*Ara Institute of Canterbury,
Madras Street Campus*

Mission to Antarctica is a free engineering holiday workshop for Years 9–11. Experience Antarctica's inhospitable conditions in virtual reality, and gain an understanding of the challenges of exploring and living on this fascinating continent.

Tuesday 3 October
**Re-imagining Antarctic
Gateway Cities**
6.00pm

*Bentley's, University of Canterbury,
Ilam Campus*

An introduction to the Antarctic Cities Project, developing the concept of Antarctic custodian cities. A collaboration between agencies in Christchurch, Hobart, Sydney and Punta Arenas.

Tuesday 3 – Thursday 5 October
**Into the White – Joanna
Grochowicz**

Christchurch City Libraries

Author Joanna Grochowicz will take children on an interactive journey using play and props to learn about the value of teamwork, curiosity and resilience in the context of Antarctic exploration. Suitable for ages 7 – 12.

Wednesday 4 October
**Climate Change –
A Public Lecture**

6.00pm – 8.00pm

Transitional Cathedral

Join Julianne Hickey and Kofe Havea as they discuss the impacts of climate change in the Pacific.

Wednesday 4 – Monday 23 October
**Lessons From The Arctic – How
Roald Amundsen Won The Race
To The South Pole**

Mon – Fri, 10.00am – 7.00pm;

Sat – Sun, 10.00am – 4.00pm

*Kahukura (Engineering &
Architectural Studies building)*

Ara Institute of Canterbury

In December 1911 Roald Amundsen planted the Norwegian flag at the South Pole, just weeks ahead of fellow polar explorer, Britain's Robert Falcon Scott. This panel exhibition of images and personal accounts reveals how Amundsen succeeded, exploring some of the lessons he learnt from earlier experience in both Polar Regions.

Wednesday 4 – Monday 23 October
**Fortitudo – Shackleton's
Antarctic Expedition in the
Endurance 1914–1917
through the paintings of
Paola Folicaldi Suh**

Mon – Fri, 10.00am – 7.00pm;

Sat – Sun, 10.00am – 4.00pm

*Kahukura (Engineering &
Architectural Studies building)*

Ara Institute of Canterbury

Paola Folicaldi Suh brings new life to the dramatic history of Sir Ernest Shackleton's Endurance expedition to the Antarctic during 1914–1917.

Antarctic Season Opening Programme 1 October – 15 October 2017 (cont.)

Thursday 5 October

The Ghost Ships of the Arctic: the Discoveries and Exploration of Sir John Franklin's missing ships

6.00pm – 7.30pm

The Piano, 156 Armagh Street

Marc-André Bernier, Head of Parks Canada's Underwater Archaeology team, led the search for the missing ships from Sir John Franklin's 1845 Expedition. He was one of the first to dive on both ships after their discovery.

Thursday 5 – Friday 6 October

Antarctic EcoBots

Ara Institute of Canterbury, Madras Street Campus

Build a robot that can tackle dangerous environmental tasks using your maths, physics and computing skills. EcoBots is a free interactive workshop for Year 9 and 10 students.

Friday 6 October

Scott Statue Reinstatement

2.30pm

Corner of Worcester Boulevard and Oxford Terrace

Come and join the official ceremony for the reinstatement of Christchurch's iconic Robert Falcon Scott statue.

Friday 6 October

Postcards to Antarctica – Free Public Talk

12.30pm – 1.30pm

Bird Hall, Level 3, Canterbury Museum

Guy Frederick talks about his exhibition at Canterbury Museum and the relationship between people and place.

Friday 6 – Sunday 9 October

Sean Garwood's ANTARCTICA

Classics Area, The Arts Centre, Worcester Boulevard

A compelling portrayal of 16 paintings depicting the environs of the heroic-era polar explorers from an artist with a real affinity for the frozen continent.

Saturday 7 October

Antarctic Air Day

10am – 4pm

Christchurch Airport

Step on-board Antarctic aircraft before they head to the ice for the summer season. Meet the crews and learn about what it is like to live on the coldest and windiest continent. A fun, free and not-too-freezing day out for the whole family.

Saturday 7 October

Double Bill: Antarctic Heritage Talks

6.00pm – 8.30pm

Great Scott: The Story of a Christchurch Memorial

The Piano, 156 Armagh Street

Sarah Murray, Curatorial Manager, Canterbury Museum, presents the story of this important Christchurch memorial.

Rediscovering the Magnetic Observatory of Christchurch

John Clemens, Curator, Christchurch Botanic Gardens, rediscovers the observatory used by Scott and other explorers heading to Antarctica.

Sunday 8 October

South to Antarctica Church Service

10.00am

Transitional Cathedral

Join together with family and friends to bid those travelling south to Antarctica during the 2017/18 season a safe and successful journey. All welcome.

Sunday 8 October

Wreath Laying Ceremony

11:30am

Scott's Statue, corner of Worcester Boulevard and Oxford Terrace

The wreath laying ceremony is a tradition that started in the 1930s when Admiral Richard Byrd laid a wreath at the Scott Statue in Christchurch. Join the New Zealand Antarctic Society Canterbury Branch and Antarctica New Zealand to share in paying tribute to Antarcticans who currently serve, and those who have gone before.

Sunday 8 October

Lyttelton's Antarctic Connections

12.30pm – 3.00pm

Lyttelton – meet at the sled dog statue on the corner of London and Canterbury Streets

Lyttelton was the last port of call for many Antarctic expeditions before they headed south. This walk will visit heritage sites around the port and town that are connected to the expeditions of Scott and Shackleton.

Sunday 15 October

Antarctic Heritage Trail

1.30pm – 3.00pm

Christchurch CBD – meet outside entrance to Canterbury Museum, Rolleston Avenue

Christchurch has long been a gateway for explorers and scientists heading to Antarctica. Visit some of the city's Antarctic landmarks and learn about our connections to the Ice. 3.6km guided walk. Ⓐ

Please check The Antarctic Office website for further details and more information on dates, times and locations.

www.antarctic-office.org.nz

