



## Sea ice, Shackleton and Science: a century of changes in Antarctica

### British Antarctic Territory Project 2014-15: Final report

UK Polar Network and International Polar Foundation UK

#### Introduction

The Sea ice, Shackleton and Science project is a series of three public engagement events at venues around the UK, focused on polar science and Britain's current and historic role in Antarctica and linked to the centenary of Shackleton's Endurance expedition.

The events included the following:

- Use of the IPF interactive Polar maps to learn about the Arctic and Antarctica and show Shackleton's journey and what would happen if he made his journey in 2014 (relating to the centenary of the Imperial Trans-Antarctic expedition)
- Then and now – polar clothing and equipment from 1914-16 and today
- IPF Class Zero Emission climate change workshop experiments
- UKPN early career Polar scientists give real accounts of Polar research with short "meet the scientist" talks on their own science throughout each day
- Displays on Shackleton and the Endurance expedition, Britain in Antarctica and climate change over the past 100 years

#### Preparation

For each event, close collaboration took place between the International Polar Foundation UK (IPF), UK Polar Network (UKPN) and the contact from each Science Centre.

Two display posters were prepared with information on: (1) British Antarctic Territory, the UK's role within the Antarctic Treaty System, BAS and UK Antarctic Heritage and (2) Shackleton's Imperial Transantarctic Expedition and climate change over the past 100 years.

Loan of old expedition clothing from the Scott Polar Research Institute was arranged and an old stove was purchased. IPF puzzles and workshop equipment was couriered to each venue. UK Polar Network members were invited to participate in the events and the volunteers were coordinated by UKPN.

A publicity poster was produced by IPF and disseminated via the Science Centres, IPF, UK Polar Network, Shackleton 100 website and via social media. Science Centres organised the workshop schedules, provided venue information for volunteers and coordinated deliveries.

An A4 poster was made for each member of the team at each event with a photo (preferably in a polar location) and short description of their research/role. These were displayed at the venue.





## Event reports

### Dundee Science Centre (27-29<sup>th</sup> September)

IPF/UKPN coordination: Liz Pasteur

DSC contact: Rebecca Erskine, Exhibition and Community Engagement Manager

Public days on Saturday and Sunday; schools day on Monday

This event was run while Dundee Science Centre had the Ice Station Antarctica Exhibition (formerly at the Natural History Museum). The workshop was set up in the main exhibition space near the entrance to the Science Centre. Puzzles, banners and posters and experiments were set up, as well as a stream of photos on the projector showing the fieldwork areas of the UKPN scientists.

Visitors had the opportunity to learn about the Polar Regions using the IPF's large interactive polar puzzles, guided by the UKPN scientists. The route of Shackleton's ship *Endurance* through the ice could be seen on the Antarctic puzzle as well as where the ship was crushed during the 1914-16 Imperial Trans-Antarctic Expedition. Visitors could try on the type of clothes worn by the 1914-16 expedition and also modern polar clothing. Scientists from the UK Polar Network gave short summaries of their research and answered questions about living and working in the Polar Regions.

**TJ Young** from the Scott Polar Research Institute in Cambridge told visitors that he used to study whales and seals, but as he suffered very badly from sea-sickness he decided to work on land, using radar to investigate melt and flow at the base of the Greenland Ice Sheet.

**Laura Hobbs**, from the Scottish Association of Marine Science in Oban, Scotland investigates tiny animals called zooplankton and how they behave during the dark Arctic winter.

**Katie Wurtzell** worked on a research ship investigating krill and gelatinous zooplankton using acoustic technologies. She told visitors about her two research voyages along the western Antarctic Peninsula, where she also had the opportunity to visit research bases and penguin colonies.

**Ruth Hindshaw** from the University of St Andrews described her work collecting glacial stream water and analysing the minerals in the water to see how they relate to the weathering of rocks by glaciers and how this relates to the Earth's climate and the carbon cycle.

After meeting and talking to the scientists, visitors had the opportunity to become scientists themselves and conduct their own experiments relating to climate change in the Polar Regions. Experiments from the International Polar Foundation Class Zero Emission workshop coordinated by **Liz Pasteur** were used to demonstrate sea level rise, ocean acidification, albedo, ocean circulation and palaeoclimatology. Participants were assisted by UKPN scientists and had the opportunity to ask lots of questions!

On the Monday, four school groups took part in a series of workshops, learning about the Polar Regions, meeting the scientists and becoming scientists themselves and carrying out climate change experiments.





## Birmingham Thinktank Science Centre (24-26<sup>th</sup> April)

IPF/UKPN coordination: TJ Young

Thinktank contact: Amy Burrill, Learning Officer

Schools day on Friday; Brownies and Guides (and public) on Saturday; public on Sunday

This series of workshops was run from a double classroom in the science centre. On Saturday, the busiest day, a display area with the puzzles, banners and some experiments was also set up in the area outside the classrooms. This meant that general visitors could take part and also groups doing the workshop could have more time engaging with the resources and scientists. The team was as follows:

**Jenny Turton** from the British Antarctic Survey in Cambridge and the University of Leeds studies meteorology in Antarctica

Marine biologist **Maddie Brasier** from the University of Liverpool studies marine invertebrates that live on the sea floor around Antarctica

Ecologist **Catherine Docherty** from the University of Birmingham studies how climate change may affect freshwater biodiversity in Greenland streams

**TJ Young** from the Scott Polar Research Institute in Cambridge investigates melt and flow at the base of the Greenland Ice Sheet using radar

**Nathalie Van Isacker**, Scientific Officer and **Liz Pasteur**, Exec Secretary UK, from the International Polar Foundation (who previously worked in Antarctica analysing ice cores to look at past climate).

Participants got the chance to become scientists, putting on lab coats and conducting the IPF Class Zero Emission workshop experiments on sea level rise, snow and ice albedo, and ocean acidification.

The team were kept extremely busy over the three days by a well scheduled programme produced by Birmingham Thinktank learning officer, Amy Burrill. A total of 16 workshops were run for school groups, Girl Guides and Brownies and the general public in the double learning classroom. A “drop in” stand with the puzzles and some experiments was also set up in the main concourse outside the classrooms on the busiest day, which worked really well as it allowed interested visitors to spend more time with the scientists. A total of 425 people took part directly in the organised workshops with an estimated further 150 people visiting the stand.

Feedback from teachers and Brownie/Guide leaders:

“Practical activities and demos – fab! Great range of activities”

“Seeing happy faces and the girls learning”

“Fabulous hands-on activities that the Brownies thought were ‘epic’ and ‘awesome’”

“Very entertaining and kept their interest.”

“The girls enjoyed looking at the polar models outside the workshop and talking to the demonstrators”

“It was rather rushed - we needed more time to do everything”

“CO2 experiment was interesting”

“Polar clothing - dressing up their guide teacher was most enjoyable”





## At-Bristol Science Centre (30<sup>th</sup> May – 1<sup>st</sup> June)

IPF/UKPN coordination: Laura Hobbs

@Bristol contact: Katy Nehammer, Informal learning manager

Public days on Saturday and Sunday (during half term); schools and public on Monday

The workshop was run in a similar format to those at Dundee and Birmingham. @Bristol allowed us the use of their “Meet the Expert Live Lab” – a defined area within the main hall of the centre, but fully open and accessible to the visiting public. This worked extremely well and meant that many families could drop in without the workshop looking too intimidating. We had the posters and banners, including the information on the BAT and Shackleton’s expedition on the exterior of the workshop. This seemed to work well, with many visitors (particularly elderly visitors with grandchildren) stopping to read the information whilst the children took part in the activities.

All three days were open to the public. Saturday and Sunday featured mostly families, whilst Monday had predominantly school groups. @Bristol allows school groups an hour of their visit to roam the main displays and centre, and this was the time in which they were able to interact with our workshop.

Below are details of the team running the workshop, their research, and some information on what people found most interesting about their work:

- **Laura Hobbs**, Scottish Association for Marine Science. Working on the behaviours of Arctic zooplankton during the Polar Night. Lots of people were interested in the light environment of the Polar Regions that leads to 24 hour day and night.
- **Sammie Buzzard**, Centre for Polar Observation and Modelling, Department of Meteorology, University of Reading. Works on modelling the formation of lakes of surface melt on Antarctic Ice Shelves looking at their role in ice shelf disintegration. Lots of people were interested in the differences between the Arctic and Antarctic, many were surprised to find that Antarctica was land based whereas the North Pole is not.
- **Stephen Chuter**, University of Bristol. Researching the Antarctic grounding zone with the ESA Cryosat-2 satellite. Many people were interested in the roles of the oceans and how they interact with the ice sheets affecting its stability.
- **Anna Belcher**, National Oceanography Centre. Investigating the role of ocean biology on the transfer of carbon from the atmosphere to the seabed. Great to talk to people about working in the Southern Ocean, they seemed really interested in life at the research stations in South Georgia.
- **Michael Cooper**, Bristol Glaciology Centre. Investigating what lies beneath the Greenland Ice Sheet. Lots of people were interesting in the natural reflectivity of ice, and its role in regulating our climate.
- **Isabel Nias**, University of Bristol, uses a computer model to help understand the causes of ice loss from the West Antarctic Ice Sheet.
- **Moya MacDonald**, University of Bristol. Looking at trace gases produced by microbes in snow, on ice surfaces and beneath ice sheets. People are often surprised by how much life exists even in the coldest of places.

Many visitors commented that they were pleased to hear about research being done by local scientists from the University of Bristol.





## Feedback from Science Centres

Dundee Science Centre education team: “The workshop content was very engaging, the pupils seemed to be fascinated. The staff did a brilliant job of sharing their research and engaging the pupils with climate threats and polar research.”

Birmingham Thinktank Learning Officer: “I feel that this weekend was extremely successful. It is really important to us that we provide our visitors with opportunities to meet practicing scientists, academics and experts, and you were very much part of that aim. Your event was really well thought out with lovely activities for visitors of all ages to engage with.” And “We have loved having you here, and you really inspired our learning and enabler teams.”

@Bristol Informal Learning Manager “Over 3,000 people visited At-Bristol during the 3 days of our meet the expert event. The Polar-science activities and scientists were in the heart of At-Bristol’s ground floor in an area called Livelab. Visitors flocked to take part and were met by a team of enthusiastic, knowledgeable and very approachable scientists. The activities were well thought through and organised and visitors of all ages got involved. The average dwell time of visiting families and school groups was high with most people taking part in multiple experiments. Visitors clearly enjoyed the activities and anecdotally fed back that ‘it was great to see some climate science activities’ and that they felt the scientists were ‘great role models’.”

## Publicity and media coverage

There was coverage on Twitter and Facebook before, during and after all events. Dundee Science Centre produced a video with interviews of the scientists, which was uploaded onto Facebook.

The International Polar Foundation published reports at

[http://www.educapoles.org/news/news\\_detail/sea\\_ice\\_shackleton\\_and\\_science](http://www.educapoles.org/news/news_detail/sea_ice_shackleton_and_science)

and

[http://www.educapoles.org/news/news\\_detail/phd\\_polar\\_scientists\\_inspire\\_the\\_next\\_generation\\_at\\_centenary\\_event](http://www.educapoles.org/news/news_detail/phd_polar_scientists_inspire_the_next_generation_at_centenary_event)

Other online coverage:

<http://dundeesciencecentre.org.uk/event/show/193.html>

<https://www.at-bristol.org.uk/2573.html>

<http://visitbristol.co.uk/whats-on/meet-the-expert-sea-ice-shackleton-and-science-p1884493>

<https://www.list.co.uk/event/20763920-meet-the-expert-sea-ice-shackleton-and-science/>

## Summary

The Sea ice, Shackleton and Science: a century of changes in Antarctica project has been a success on a number of different levels. It has provided a lively forum for the public and school and community groups to learn about polar science, the Polar Regions and the present day and historical relevance of the Antarctic to the UK. It has also offered polar scientists the opportunity to take time out from their research and tell people about it.

A great aspect of running this series of workshops was that many of the scientists had attended a UKPN workshop on Science Communication (also funded by the British Antarctic Territory strategic project funding) which took place in April 2014, and saw this as a good opportunity to practise the skills and ideas that they had learnt at the workshop. Jenny, Maddie, Samantha, Anna, Stephen, and Isabel had all attended this workshop, organised by Laura, which also included a session on the IPF Class Zero Emission workshop.



The UKPN scientists are excellent role models, providing inspiration for the many young people who attended the Sea Ice, Shackleton and Science workshops. The scientists themselves benefitted from experience in science communication and interacting with people of different ages and abilities, while working in a supportive team environment with UKPN, IPF and Science Centre staff. They were also offered the chance to look around the Science Centres to see the displays, presentations and other outreach activities.

The UKPN and IPF are planning to continue to collaborate on education and outreach projects in the UK and are hoping to provide some workshops for teachers in the coming year.

## **Acknowledgements**

This project would not have been successful without the generosity and support of several organisations and institutions:

- Naomi Chapman from the Scott Polar Research Institute and Mike Dinn from the British Antarctic Survey for the loan of both historical and modern polar expedition clothing;
- Nicola Munro at the NERC Arctic Office for the managing of cash flow.
- Jean François Delhez from the International Polar Foundation for the preparation of the publicity posters.
- We would particularly like to thank Rebecca Erskine (Dundee Science Centre), Amy Burrill (Birmingham Thinktank) and Katy Nehammer (@Bristol Science Centre) for welcoming us to their excellent venues, organising groups for the workshops and helping to make the sessions fun and successful.
- The UK Foreign Office, Polar Regions Unit for providing funding for the three workshop events.