



WP

11a

Agenda Item:

4.2.3

Person Responsible:

H Griffiths

**XXXIV SCAR Delegates Meeting
Kuala Lumpur, Malaysia, 29-30 August 2016**

State of the Antarctic Ecosystem 2015-16

Executive Summary

Title: State of the Antarctic Ecosystem 2015-16

Authors: Huw Griffiths, Jan Strugnell & the Steering Committee

Important Issues or Factors:

- Cross-Program SCAR workshop on 'Interactions between biological and climate processes in the Antarctic' was held in September 2015 in Barcelona, Spain.
- SO-AntEco Expedition to the South Orkney Islands.
- Multiple Ant-Eco sessions and workshops and the OSC 2016.
- AntEco supported early career scientists at the 'VIII Southern Connection Congress 2016', the SO-AntEco expedition and the SCAR OSC.

Recommendations/Actions and Justification:

We recommend that AntEco is extended for another four years and funding is approved for a further two years.

Budget Implications:

The continued funding of AntEco at current or increased levels for a further two years.

Introduction

Introduction/ Background: The Scientific Research Programme - AntEco (State of the Antarctic Ecosystem) has a focus on understanding and clarifying the processes driving patterns of biodiversity in all environments across the Antarctic, sub-Antarctic and Southern Ocean regions. The programme prioritises applied research and aims to provide scientific knowledge on biodiversity that can also be used for conservation and management. The full list of Steering Committee members and affiliations can be found in the '*AntEco External Performance Review Report*' (see Appendix 1.).

2015-2016 Progress

Since its formal inception in 2013, AntEco has focused on building and extending research networks, facilitating research that is aligned with the research priorities of the programme, and publishing research findings.

2015-16 has been a busy and productive year for AntEco, a recent publication list and other previously reported highlights can be found in the '*AntEco External Performance Review Report*' (see Appendix 1.) and responses to the comments arising.

A Cross-Program SCAR workshop on 'Interactions between biological and climate processes in the Antarctic' was held in September 2015 in Barcelona, Spain. AntEco was one of 4 SCAR programmes/groups hosting the event (along with AnT-ERA, AntarcticClimate 21 and Antarctic Climate Change and the Environment). AntEco supported 10 invited delegates to attend. (Approx. \$9.6k allocation)

The British Antarctic Survey funded a research cruise to the South Orkney Islands (February 2016) with a team of self-funded AntEco scientists (SO-AntEco) (see Appendix 2.). As part of the research and monitoring required by CCAMLR to inform and support the management of Marine Protected Areas (CM 91-04) an expert team of invited AntEco scientists conducted a benthic study of the South Orkney Islands Southern Shelf MPA and adjacent shelf and shelf-slope areas. The team included 22 participants from nine different countries and 16 institutes. The expedition took place on board the RRS James Clark Ross in February-March 2016.

The expedition serves as an excellent example of how national Polar Institutes can play a leadership role in developing international cooperation in policy-relevant polar science, under the umbrella of a SCAR research programme. Eight dedicated places were made available to AntEco early career scientists and an international call for participation was made through the CCAMLR scientific committee. The expedition provided hands-on experience and mentoring opportunities to early career scientists and met gender balance aspirations with over half of the scientists being female.

SO-AntEco used a variety of online communication tools including blogs and social media. The most immediate of these were the regular Twitter updates, with the #SOAntEco hashtag reaching an audience of **over one million twitter users**. This expedition will provide data and policy advice from the AntEco community and fits to the broader objective of "science that is policy relevant and assists in guiding management and conservation in the region." A more detailed summary of the expedition can be found in *Appendix 2*. This expedition required no direct funding from AntEco or SCAR, as is typical of the vast majority of research that our science community is happy to record as falling under the 'AntEco' banner.

AntEco supported a session and invited speaker participation at the 'VIII Southern Connection Congress 2016' Punta Arenas, Chile. 18-23 January. (approx. \$5k allocation), at which our Deputy Co-Chair Prof. Peter Convey was also, separately, an invited plenary speaker talking on Antarctic Biodiversity.

During the majority of 2016, AntEco has focused its efforts on the 'XXXIV SCAR Open Science Conference 2016' Kuala Lumpur, Malaysia. Multiple Ant-Eco sessions were proposed and heavily subscribed, and also several workshops will be held by AntEco scientists (Approx \$10k allocation). AntEco intends to contribute funding to a number of early career scientists to attend the OSC and associated workshops and meetings. AntEco will also be presenting a poster to raise awareness of the programme and its activities.

Expenditure on project activities and plans for unspent funds

Table 1. AntEco Budget for 2016

Event	Location	Attendee	Nationality of Attendees	Amount (USD)
Spatial analyses workshop (organised by Stefano Schiaparelli)	OSC Malaysia	An ECR	Not yet known	\$2500
Microbiome workshop (organised by Charles Lee & Chun Wie Chong)	OSC Malaysia	An ECR	Not yet known	\$2500
Microbiome workshop (organised by Alison Murray ^{SC})	NCEAS Santa Barbara, USA	Not yet known	Not yet known	\$5000
Open Science Conference	Malaysia	Jan Strugnell ^{SC} (Chief Officer)	Australian	\$2200
Open Science Conference	Malaysia	Mary-Anne Lea ^{SC} Claudio Gonzales Wevar ^{SC}	Australian	\$2850
Open Science Conference – ECR fund	Malaysia	7 ECRs	USA, Germany, Australia, Italy & UK	\$6550
Open Science Conference – Mid-Career/established researcher fund	Malaysia	?	?	?
TOTAL				\$25000

^{SC} = AntEco Steering Committee

The budget for 2017 is not yet been finalized as we do not yet know if the programme has been extended following review and if so, what level of funding it is likely to receive. \$2000 USD has already been committed to the Gordon Research Conference. It is anticipated that a significant proportion of our 2017 budget will be spent on supporting workshops associated with the SCAR Biology Conference in Belgium and also in supporting attendance of ECRs at this conference.

Table 2. AntEco Budget for 2017

Event	Attendee	Nationality of Attendees	Amount
Polar Gordon Research Conference and Gordon Research Seminar	Not yet determined	Not yet determined	\$2000
SCAR Biology Conference	Funding to support invited speakers on AntEco themes		Not yet determined
Workshops (TBD)	Not yet determined	Not yet determined	Not yet determined
SCAR Biology Conference – ECR fund	Not yet determined	Not yet determined	Not yet determined
SCAR Biology Conference – Mid-Career/established researcher fund	Not yet determined	Not yet determined	Not yet determined

Future Plans

Under the assumption that the extension of AntEco is approved and funded we will endeavour to continue to foster new scientific research collaborations and ideas through organising and funding workshops, meetings and travel.

Future funds will be directed towards value adding to existing conferences (e.g. SCAR OSC, SCAR Biology, Polar Gordon Research Conference and Gordon Research Seminar) by supporting meetings and workshops that seek to build new collaborations and aim to address AntEco's objectives. We will continue to encourage and support early career scientists.

We also envisage planning a workshop or symposium towards the end of AntEco's intended lifespan dedicated to synthesis and bringing together the new information amassed by AntEco and marking the fruition of the programme. We believe that this could be achieved in conjunction with the OSC in 2018 to reduce costs although these plans are a work in progress.

The AntEco steering committee will be refreshed and we will encourage new members to join the mailing list. We will work closely with other SCAR Scientific Research Programmes to ensure that cross linkages are maintained and developed. We will also communicate regularly with the SCAR Secretariat to ensure that AntEco plays a leading role within the organisation.

Recommendations/Expected Outcomes

We recommend that AntEco is extended as an SCAR Scientific Research Programme for another four years and funding is approved for a further two years.

Appendix 1.



SCAR Scientific Research Programme



External Performance Review

State of the Antarctic Ecosystem



www.scar.org/srp/anteco

Authors and Main Contacts

Jan Strugnell, Huw Griffiths and the AntEco Steering Group.
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British Antarctic Survey UK (hjk@bas.ac.uk)

Introduction

The SCAR Scientific Research Programme - State of the Antarctic Ecosystem (AntEco) is designed to focus on past and present patterns of biodiversity across all environments within the Antarctic, sub-Antarctic and Southern Ocean regions. The broad objectives of the programme are to increase the scientific knowledge of biodiversity, from genes to ecosystems that, coupled with increased knowledge of species biology, can be used for the conservation and management of Antarctic ecosystems.

Through the development and maintenance of an international research network, AntEco aims to inform our understanding of current biodiversity and patterns therein, to distinguish the impact of present processes from historical signals, and to use this knowledge to develop scenarios of its future state through interdisciplinary approaches. While the scope of research activities supported are broad, research priorities are directed towards science that is policy relevant and assists in guiding management and conservation in the region.

AntEco is structured into five research sectors, each with a sector leader:

1. Spatial Ecology (Huw Griffiths, British Antarctic Survey, UK)
2. Molecular Ecology and Evolution (Jan Strugnell, La Trobe University, Australia)
3. Ecoinformatics and Systems Biology (Alison Murray, DRI, USA)
4. Paleoecology (Dominic Hodgson, British Antarctic Survey, UK)
5. Impacts, Trends and Conservation (Annick Wilmotte, University Liège, Belgium).

The AntEco Executive is comprised of the joint Chief Officers (Jan Strugnell and Huw Griffiths), joint Deputy Chief Officers (Don Cowan and Pete Convey), Secretary (Anton Van de Putte) and the research sector leaders (Alison Murray, Dominic Hodgson and Annick Wilmotte). The remainder of the Steering Group is comprised of leading researchers that, together, represent a broad range of countries and disciplines (Appendix 1).

Deliverables and Milestones

I. Up to five key achievements

1) Scientific Outputs:

Ant-Eco members contributed to hundreds of peer reviewed publications over the last 3 years. Many of these are listed in Appendix II. Notable highlights include:

- Chown S.L., Clarke A., Fraser Cl., Cary S.C., Moon K.L., & McGeoch M.A. (2015) The changing form of Antarctic biodiversity. *Nature* 522(7557), 431-438. doi:10.1038/nature14505
- Royles, J., Amesbury, M.J., Convey, P., Griffiths, H., Hodgson, D.A., Leng, M.J., Charman, D.J. (2013) Plants and soil microbes respond to recent warming on the Antarctic Peninsula. *Current Biology*, 23. 1702-1706. doi:10.1016/j.cub.2013.07.011
- Barnes D.K.A. (2015) Antarctic sea ice losses drive gains in benthic carbon drawdown. *Current Biology*, 25. R789-R790. 10.1016/j.cub.2015.07.042
- Constable, A.J., Melbourne-Thomas, J., Corney, S.P., Arrigo, K.R., Barbraud, C., et al. (2014): Climate change and Southern Ocean ecosystems I: How changes in physical habitats directly affect marine biota. *Global Change Biology*, 1-22, doi: 10.1111/gcb.12623.
- Convey P., Chown S.L., Clarke A., Barnes D.K.A., Cummings V., Ducklow H., Frati F., Green T.G.A., Gordon S., Griffiths H., Howard-Williams C., Huiskes A.H.L., Laybourn-Parry J., Lyons B., McMinn A., Peck L.S., Quesada A., Schiaparelli S. & Wall D. (2014) The spatial structure of Antarctic biodiversity. *Ecological Monographs* 84, 203-244.

2) The Biogeographic Atlas of the Southern Ocean:

The Biogeographic Atlas of the Southern Ocean (De Broyer C., et al [eds.] 2014. Biogeographic Atlas of the Southern Ocean. Scientific Committee on Antarctic Research, Cambridge, XII 498 pp) is a key resource for all scientists studying life in the Southern Ocean. It represents an unprecedented effort by AntEco and SCAR scientists to collate and interpret the largest database of Antarctic marine life ever compiled. It is a collection of 66 syntheses describing the distribution patterns and processes

of a significant and representative proportion of Southern Ocean organisms, illustrated by more than 800 distribution maps and 200 pictures and graphs. The Atlas is an important legacy of the International Polar Year 2007-2008 and a key output of the Census of Marine Life and SCAR-Marine Biodiversity Information Network. The Atlas was launched at the SCAR Meeting and Open Science Conference (Auckland, New Zealand August 25-28th 2014).

3) Support for the AntEco community:

AntEco has nurtured new collaborations through facilitating and funding workshops and meetings (see section V for details). It also seeks to encourage early career scientists (see section VI) through actions such as providing letters of support, travel funding and the provision of berths on an AntEco-led expedition to the Southern Ocean. AntEco regularly communicates with the community via the email list, website and the SCAR Biology Facebook page, providing information about funding opportunities, new scientific discoveries, upcoming meetings and deadlines (see section VII).

4) The Monaco Assessment:

A meeting of global biodiversity and specifically Antarctic experts, entitled 'Antarctica and the Strategic Plan for Biodiversity 2011-2020: The Monaco Assessment', was convened for three days in Monaco in May 2015, with the support of the Monaco government, the Centre Scientifique de Monaco, SCAR, and Monash University. Aleks Terauds and Pete Convey from the AntEco Steering Group attended this meeting. The purpose of the meeting was to examine the extent to which conservation of the biodiversity of Antarctica and the Southern Ocean is realizing the set of ambitions agreed for the world as part of the Strategic Plan for Biodiversity 2011-2020. The meeting aimed to develop guidance for action that can effectively help deliver further conservation successes for Antarctica and the Southern Ocean. One outcome was a statement on Antarctic and Southern Ocean conservation in the context of the Strategic Plan for Biodiversity 2011-2020 entitled 'The Monaco Assessment' (www.scar.org/monaco-assessment). Findings were that the biodiversity outlook for Antarctica and the Southern Ocean appears to be no better than that for the rest of the globe, and while some areas are tracking well (e.g. non-native species management), other direct pressures on Antarctic biodiversity remain significant and require urgent attention. The assessment noted that prospects for effective action over the next five years to improve the outlook are exceptional.

II. Primary publications in peer-reviewed journals

See Highlight 1 and Appendix II.

III. Major reports, including linkages to major SCAR activities (e.g. advice to the Treaty or IPCC)

AntEco Steering Committee members are authors on chapters of the latest Intergovernmental Panel on Climate Change reports and also the United Nations World Ocean Assessment – a landmark publication resulting in, on the 23rd of December 2015, the General Assembly adopting resolution 70/235 on "Oceans and the law of the sea".

AntEco members have contributed to a range of content on the Antarctic Environments Portal (AEP) including non-native species, conservation and biodiversity. They also were invited to the Climate Change Content Development Workshop that drafted topic scoping summaries for the AEP (Cambridge 17-18 March 2015).

IV. Other reports and grey literature

AntEco members contributed to the scientific background document in support of the development of a CCAMLR MPA in the Weddell Sea (Antarctica) – Version 2014. This report has been compiled by members of the German Weddell Sea MPA project team and by experts from other CCAMLR member states and acceding states. AntEco members contributed to the 1st SCAR Antarctic and Southern Ocean Horizon Scan published in *Antarctic Science* and highlighted in *Nature*.

V. Workshops and other key meetings

AntEco convened five sessions at the SCAR–OSC in Auckland: i) Diversity and Distribution of life in Antarctica; ii) Impact of Past Glaciation and Climate; iii) Scientific Advice for Policymakers and Evidence-based Conservation; iv) Microbes Diversity and Ecological Roles; v) Diversity and Connectivity in Antarctica & Spatial Analysis of Antarctic Biodiversity. These sessions represent each of the research sectors in the AntEco implementation plan and were extremely well subscribed and attended. The sessions included over 70 oral presentations covering all aspects of AntEco work from the marine, lacustrine and terrestrial realms. The link between scientific research and design of management and conservation strategies by environmental managers and policymakers was also emphasized. In addition, AntEco also convened three well-attended and successful workshops during the OSC:

Workshop 1: Physical drivers of biodiversity at multiple spatial scales. Significant progress in the collation of biodiversity has been made since the meeting, with both marine and terrestrial datasets being consolidated. Analyses have begun on some specific marine taxa and terrestrial models are currently under development.

Workshop 2: Antarctic Aerobiology. A subsequent perspective article, led by David Pearce and entitled 'Aerobiology over Antarctica – a new initiative for a pan-continental sampling approach', has recently been published in *Frontiers in Microbiology*

Workshop 3: Eradication in Antarctica: Management and ecological considerations to inform conservation decision-making. A manuscript detailing the workshop findings is nearing completion.

AntEco convened an Antarctic Symposium at the joint Ecological Society of Australia and New Zealand Conference in Auckland (August 2013). Antarctic ecology was presented to a broad cross-section of the ecological research community.

AntEco supported a workshop in Dartington, England (2014): 'Moss-Dominated Ecosystems in Antarctica and surrounding regions: Past, Present and Future.' A manuscript detailing findings is in preparation.

AntEco supported and convened a session at the 2015 ISAES meeting in Goa, India, 'Key drivers of Antarctic biodiversity through the Cenozoic: the influence of climate, oceanography and tectonics'.

AntEco supported the 'Antarctic Near-Shore and Terrestrial Observation System' (ANTOS) workshop held in Hamilton, NZ, 18-19 August, 2015. A videoconference was organised each evening to inform and discuss with participants who could not travel to NZ.

AntEco also supported and co-convened the Interdisciplinary SCAR Cross-Program Workshop on Interactions between Biological and Environmental Processes in the Antarctic", Barcelona, Spain September 2015, along with AnT-ERA, ACCE and AntClim21 (see IX below)

AntEco supported a session at the VIII Southern Connection Congress 2016 in Chile.

AntEco members (Convey, Cowan) contributed to the SCAR Sub-Antarctic region Action Group meeting in Punta Arenas, 15-17 January 2016

VI. Capacity building and education outreach activities; detail any difficulties encountered

The SO-AntEco expedition is providing spaces for 8 early career scientists to gain vital experience of Antarctic fieldwork. They will be included as authors of the official reports and summary publications of the cruise. The expedition will also use social media and the SCAR website to engage with the public and the wider scientific community. This cruise has a website (<https://www.bas.ac.uk/project/so-anteco/>), blog and Twitter feed (#SOAntEco). This expedition will also conduct live telephone conversations with schools and museums as well as answering questions sent in over Twitter.

The Biogeographic Atlas had a significant media impact, with over 60 media articles published online following the press release including ABC News (Australia) and the BBC news website. Radio interviews included voice of Russia, RTE (Ireland) and the BBC World Service. Printed media included The Irish Times, El Mundo and the Independent (UK).

Several AntEco activities have had active outreach components including the ANDEEP SYSTCO expedition and its blog and the Scotia Arc Expeditions through the Australian Museum (www.australianmuseum.net.au/scotia-arc-expedition). The data from the Scotia Arc expeditions was subsequently used to create lesson plans for increasing participation in STEM disciplines for high school students (<https://ucsdcreate.wordpress.com/2013/12/20/doing-a-deep-dive-biology-teachers-explore-antarctic-invertebrates-at-sio/>).

VII. New data and/or meta-data (including plans for archiving)

New data and/or meta-data associated with AntEco includes:

- The complete expert-validated database that was used to create the Atlas, including records from the continent to latitude 40°S, represents 1.07 million occurrence records for 9,064 validated species from about 434,000 distinct sampling locations. The database is publicly available on the SCAR-MarBIN/ANTABIF portal (www.biodiversity.aq).
- New geomorphic interpretation of the Ross Sea region, based on the IBCSO bathymetry compilation. Analysis of benthic communities from seafloor communities on the Sabrina Shelf (120E).
- Metagenomic DNA from 20 soil samples has been sequenced (HiSeq). Metagenome sequence datasets (to be submitted to Biodiversity.aq) will provide information on total soil biodiversity (viruses/phage, prokaryotes, lower eukaryotes, invertebrates).
- datasets continue to be made available on mARS (Microbial Antarctic Resource System) http://mars.biodiversity.aq/site_pages/datasets

VIII. Communication activities (eg website contents, social media, brochures, speaking engagements) and how these contribute to the promotion of SCAR and its mission.

AntEco news is highlighted on our website (<http://www.scar.org/anteco/anteco-news>). We have documented activities that AntEco has supported over the last few years including conferences, workshops and future events such as the South Orkneys – AntEco cruise.

AntEco Steering Committee members set up and manage the “SCAR Biology” Facebook account on behalf of the Life Sciences SSG, <https://www.facebook.com/SCARBiology/>, this is a vital communication tool for reaching a wider audience, especially for early career researchers. It is currently followed by 280 people and this number continues to grow.

IX. Linkages to other SCAR groups, international programmes and other activities

A SCAR cross-program workshop was held in Barcelona, Spain, 16-18th of September 2015. This workshop brought together participants from several SCAR and other related programs including ANTECO, ANT-ERA, AntCLim21, ICED, BEPSII, PAIS, EGBAMM, ICED, and IPCC and aimed to provide a forum for biologists and physicists to discuss the development of cross-disciplinary research to answer pressing questions in Antarctic science.

Jan Strugnell, the Co-Chair of Ant-Eco, was invited to present a keynote lecture, titled ‘Evolutionary Patterns and Processes in Antarctica (and the Arctic) at the Gordon Research Conference (GRC) on Polar Marine Science held in Tuscany, Italy from 15-20 March, 2015. The theme of the conference was ‘Polar Shelves and Shelf Break Exchange in Times of Rapid Climate Warming’. The conference included 172 delegates from 23 countries.

Don Cowan was an invited participant to the SCAR/COMNAP Antarctic Roadmap Challenge meeting, Tromsø, Norway, August 2015. Pete Convey gave invited plenary lectures to the Southern

Connections meeting in Chile in January 2016 and also to the 12th workshop on Systems Biology 2015 'From Big Data to Bioeconomy' in Melbourne 18 May- 5 June, 2015.

X. Expenditure on project activities and plans for unspent funds

Activity	Expenditure (USD)
Cross Program Workshop, Accommodation, Spain	\$3,371.88
Cross Program Workshop, Long Haul Travel, Spain	\$6,375.90
ANTOS Workshop, New Zealand	\$2,000
XVI COLACMAR-XVI Senalmar Meeting D. Deregiibus	\$1,490.19
XII International Symposium on Antarctic Earth Science C. Gonzalez-Wevar	\$1,100
VIII Southern Connection Congress	\$5,000

All 2015 funds have been spent.

Future funds will be directed towards value adding to existing conferences (e.g. SCAR OSC, SCAR Biology) by supporting meetings and workshops that seek to build new collaborations and aim to address AntEco's objectives. We will continue to encourage and support early career scientists.

Future Plans

AntEco will continue to build upon its achievements and support scientific collaboration and capacity building. The three overarching inter-disciplinary questions (outlined in our terms of reference) remain as important as when they were first written and align well with the themes of the 1st SCAR Antarctic and Southern Ocean Horizon Scan. We plan on continuing to use AntEco funding to facilitate scientific meetings and workshops and to encourage participation by early career scientists and those from regions with less well-developed Antarctic programmes.

SO-AntEco is a British Antarctic Survey (BAS) led expedition undertaken in conjunction with an international team of scientists from the Scientific Committee for Antarctic Research (SCAR) AntEco research programme. The team includes participants from 9 different countries and 16 institutes. The expedition will take place on board the BAS research ship the RRS James Clark Ross in early 2016. The SO-AntEco expedition will investigate the diversity of life both inside and outside of the SOISS MPA region in order to better understand the distribution and composition of the seafloor communities around islands. This work will lead to a series of scientific publications, public outreach and scientific advice to policy makers through written reports and presentations.

AntEco will play a very active role in activities associated with the Open Science Conference in Malaysia. AntEco members are playing a lead role in organising the following Mini Symposia:
MS2. Connecting the biological and the physical: Environmental divers of biodiversity in Antarctica.
MS3. Linking Antarctic science with environmental protection: Celebrating the 25th anniversary of the Madrid Protocol. In addition, several symposia at the OSC will be chaired by AntEco members including S22, S25, S28, S29, & S30.

In addition two side meetings supported by AntEco will take place at the OSC, "Spatial analyses of Antarctic biodiversity: sampling bias, environmental variables and statistical issues" (organized by Stefano Schiaparelli) and Harmonising Molecular and Functional Analyses of Antarctic Microbiomes: Toward A Methodological Framework for Understanding Ecosystem Functional Resilience (organised by Charles Lee).

Two AntEco members (Annick Willmotte, Anton Van de Putte) will directly participate in the organisation of the next SCAR Biology meeting to be held in Belgium in 2017.

Appendix I - Membership

Steering Committee

Last Name, First Name	Affiliation	Country	Email	Gender	Term	Position
Griffiths, Huw	British Antarctic Survey	UK	hjh@bas.ac.uk	M	2012 -	Chief Officer & Research Sector leader
Strugnell, Jan	La Trobe University	Australia	J.Strugnell@latrobe.edu.au	F	2012 -	Chief Officer & Research Sector leader
Convey, Pete	British Antarctic Survey	UK	pcon@bas.ac.uk	M	2012 -	Deputy Chief Officer
Cowan, Don	U. Pretoria	South Africa	don.cowan@up.ac.za	M	2012 -	Deputy Chief Officer
Terauds, Aleks	Australian Antarctic Division	Australia	aleks.terauds@gmail.com	M	2012 -	Chief Officer (2012-14)
Murray, Alison	Desert Research Institute	US	Alison.Murray@dri.edu	F	2012 -	Research Sector leader
Hodgson, Dominic	British Antarctic Survey	UK	daho@bas.ac.uk	M	2012 -	Research Sector leader
Van de Putte, Anton	University of Leuven	Belgium	antonarctica@gmail.com	M	2012 -	Secretary
Wilmotte, Annick	University Liège	Belgium	awilmotte@ulg.ac.be	F	2012 -	Research Sector leader
Lea, Mary-Ann	IMAS, U Tas	Australia	MaryAnne.Lea@utas.edu.au	F	2012 -	Steering Group member
Brandt, Angelika	U. Hamburg	Germany	Abrandt@zoologie.uni-hamburg.de	F	2012 -	Steering Group member
Cary, Craig	U. Waikato	New Zealand	caryc@waikato.ac.nz	M	2012 -	Steering Group member
di Prisco, Guido	U. Naples	Italy	g.diprisco@ibp.cnr.it	M	2012 -	Steering Group member
Gonzales-Wevar, Claudio	U. Chile	Chile	omeuno01@hotmail.com	M	2012 -	Steering Group member
Gutt, Julian	AWI	Germany	julian.gutt@awi.de	M	2012 -	Linkage with Ant-ERA
Avila, Conxita	U. Barcelona	Spain	conxita.avila@ub.edu	F	2012 -	Steering Group member
Schiaparelli, Stefano	U. Genoa	Italy	stefano.schiaparelli@unige.it	M	2012 -	Steering Group member

Members

AntEco is open to any interested scientists. It has no official membership. The AntEco mailing list comprising a 'community' of 278 members.

Appendix II - References

2013

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Appendix III.

SO-AntEco (South Orkneys – State of the Antarctic Ecosystem) JR15005

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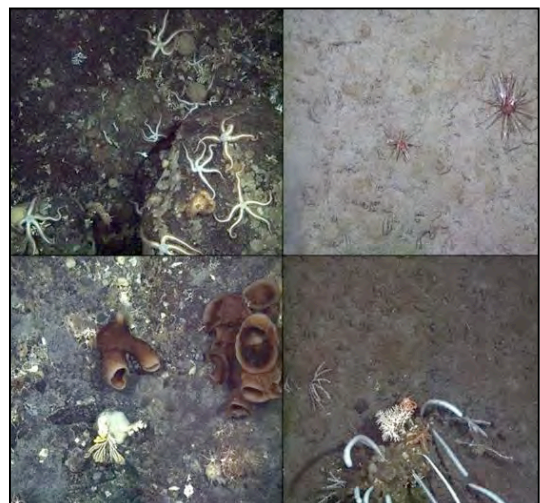
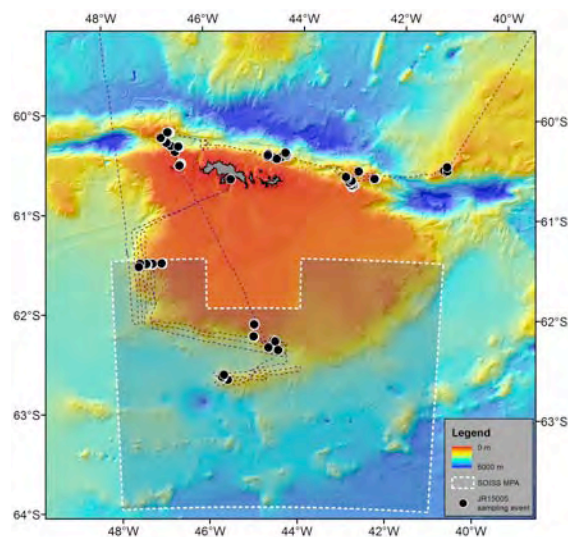


Figure 1. A range of animals collected during JR15005. Images by C. Waller, H. Wiklund, B. Danis and C. Moreau.

Background

The South Orkney Islands is a small archipelago located in the Southern Ocean, 375 miles north-east of the tip of the Antarctic Peninsula. The seafloor around the South Orkney Islands has been shown to be an area with exceptionally high biodiversity. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) closed all finfish fisheries around the South Orkney Islands in 1989, and in 2009 they established the South Orkney Islands Southern Shelf Marine Protected Area (SOISS MPA), the first MPA located entirely within the High Seas anywhere on the planet.

SO-AntEco (JR15005) was a British Antarctic Survey (BAS) led expedition undertaken in conjunction with an international team of scientists from the Scientific Committee for Antarctic Research (SCAR) AntEco research programme. The team included 22 participants from 9 different countries and 16 institutes. The expedition took place on board the *RRS James Clark Ross* in February-March 2016.



Objectives

- To find and identify seafloor animals from around the South Orkney Islands and to name and describe any species new to science.
- To detect any significant differences between the types of species and numbers of animals in different habitats and to identify species that are indicative of specific habitat types to help with future habitat mapping.
- To map all vulnerable species found and to report their presence and distribution to relevant stakeholders and
- To contribute information and scientific advice to the CCAMLR South Orkney Islands MPA review in 2019.

Results

A total of 124 trawled gear and 34 video/camera deployments (Figure 2) were conducted during ~17 days of science. In total, over 700 seafloor habitat photographs (Figure 3) and 3,900 live specimen photos were taken with over 38,000 individual invertebrates and fish (158 kg) collected and preserved for future analyses. Eighteen phyla of animals were found from depths between ~500 m and ~2000 m.

Highlights

- New species were found in most groups of animals examined on the cruise including corals, anemones, echinoderms and polychaete worms, with many other probable new species awaiting further identification.
- There was an evident correlation between abundance of animals from Vulnerable Marine Ecosystem groups and the overall diversity of seafloor life, both inside and outside of the SOISS MPA.
- A range of unusual animals including rare pelagic bryozoans, the highly publicised “Dendrogramma” (found for the first time since their discovery in Australia) and a seafloor covered with the plates of long-dead giant acorn barnacles all came as a surprise to an experienced group of Antarctic marine biologists.
- The importance of Vulnerable Marine Ecosystem indicator groups such as corals, sponges and pencil urchins as habitats for other species was highly evident and previously unknown associations and interactions were revealed (Figure 4).
- Specimens were collected for future research into the biogeography of Vulnerable Marine Ecosystem groups, molecular biology (all specimens were preserved in 96% ethanol or RNA Later), ocean acidification, palaeo-oceanography and climate, food webs, habitat mapping and biochemistry.



Figure 4. Examples of VME animals providing habitat for other species, recorded during JR15005. Images by C. Waller.

Impact

The expedition serves as an excellent example of how national Polar Institutes can play a leadership role in developing international cooperation in policy-relevant polar science, under the umbrella of a SCAR research programme. The expedition provided hands on experience and mentoring opportunities to early career scientists and met gender balance aspirations with over half of the scientists being female.

SO-AntEco used a variety of online communication tools including blogs and social media. The most immediate of these were the regular Twitter updates, with the #SOAntEco hashtag reaching an audience of over one million twitter users.