



Paper 9  
SCAR SRP  
SG

Agenda 2.2  
AnT-ERA  
PS/LS/GS

Person  
Responsible:

Julian Gutt

## SCAR Executive Committee Meeting 2017

Brno, Czech Republic, July 2017

# Antarctic Thresholds – Ecosystem Resilience and Adaptation (AnT-ERA) 2016-2017 Report

**Report Author(s):** Julian Gutt with SC members

### **Summary of activities from 2016-17 and any other important issues or factors (<150 words):**

1. Scientific output. Two papers published/submitted as a **unique product of AnT-ERA**. More than 2000 additional papers fell into the scope of AnT-ERA.
2. Capacity building. (a) Mini-workshop during OSC, 2016; (b) multiple support of the OSC by many AnT-ERA SC members; (c) approx. 12 additional events co-chaired, e.g. ANTOS meetings.
3. Dissemination/products. Key "tool" is AnT-ERA **webpage** with ~100,000 hits since 2013. Approx. 520 **mailing list** members. AnT-ERA contributed to SCAR products, e.g. **ACCE** and **SCAR strategy plan**, and other international initiatives/stakeholders requests such as **IPBES** and **UNFCCC**.
4. Support of early-career scientists. 16 **mini-grants** awarded to applicants from approx. 10 countries. A **summer school** to be held 2018 in Argentina is in preparation.
5. Research. Expeditions and projects under the leadership of AnT-ERA scientists: J. Xavier (JR16003), A. Takahashi (JARE-AP0922). I. Hogg *Circum-Antarctic Expedition*, AFBA-project, G. di Prisco, *TEAM-fish* (planned).

### **Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any):**

AnT-ERA applies both, a community based approach depending on contributions from the scientific communities and a top-down approach, where an active SC significantly supports the coordination of science-related assignments. The efficiency of AnT-ERA benefits significantly from (1) low administrative efforts, e.g. efficient reporting, (2) support of the national committees of both, well established and emerging national programs, and (3) a clear focus of expected output, e.g. use of resources primarily for support of early career scientists or for unique high-end scientific products

## Progress and Plans:

### Major Activities and Significant Progress from the past year:

**1. Scientific output** is the most important challenge since AnT-ERA is fundamentally a science program. Due to limited funds and its official mission AnT-ERA can not carry out its own research but it contributes to advances in the knowledge on climate-change impacted biological processes. 17 members of the SC published in 2016/2017 >50 peer-reviewed papers. A number of recent papers shows that the response of organisms, such as mosses, demersal fish, various invertebrates, sea-birds and top predators are species specific, thus, overarching conclusions are difficult. This finding has implications for further studies in the direction that more ecological key species must be studied and generalization demands representative and not only exemplary studies. An example for a study on bioprospection is that by Coelho et al. (2017), which focused on collagen from Antarctic squid with applications for tissue substitution and regeneration.

### 2. Capacity building

- The results of the Cross-Program Workshop *Interactions between Biological and Environmental Processes*, 2015, in Barcelona, was used as the basis for a paper submitted in May 2017; funding for the writing was provided by the national programs. This workshop integrated ideas from different disciplines on the development of Antarctic ecosystem research. The paper will be a key output, which had not been written without the above mentioned AnT-ERA workshop
- Another paper based on an opinion survey on future Antarctic research showed a high priority to continue with climate-change related research and (other) applied aspects. New developments in climate-change policy underline the necessity expressed by the respondents of the survey, to support e.g. the *Paris Agreement* with more scientific results.
- Mini-workshop *Time for changes after COP21?*, 2016 during SCAR OSC, Kuala Lumpur.

### 3. Dissemination

- 12 web-articles in 2016/17 and approx. 20 permanently available and permanently updated news (meetings and job as well as other research opportunities) on the web-site, >100,000 clicks since 2013. Web-page closely linked to AnT-ERA projects: [www.pelagicbenthic.net](http://www.pelagicbenthic.net).
- 2016/17 ACCE update to ATCM
- chairing approx. 15 sessions and 3 mini-symposia during SCAR open science conference, biology symposium and other meetings e.g. ANTOS
- membership of SCAR conference organizing committees (I. Schloss: OSC Kuala Lumpur, Malaysia, V. Cummings, ANTOS workshops and J. Gutt: Biology Symposium, Leuven, Belgium),
- mailing list, >520 members

- I. Schloss: SCAR representative at COP XXII side meeting “ICSU/IAI/SCAR: Urgencies in Fundamental Climate Research following the Paris Agreement” in Marrakech, November 2016.

#### 4. Support of early-career scientists

16 mini-grants awarded to early career scientists from approx. 10 countries, with emphasis on attending meetings, SCAR (and other) conferences, symposia and workshops.

#### 5. Research projects (examples)

- Expedition JR16003 - To Antarctic Peninsula and South Georgia Region onboard of the RRS James Clark Ross (British Antarctic Survey) investigating a wide range of organisms through the Antarctic marine food web and bioaccumulation of heavy metals. It comprised scientists from UK, Portugal, Italy, Poland and Germany (**J. Xavier** et al.).
- Japanese Antarctic Research Expedition Project AP0922 – Studies on the foraging behaviour of Adelie penguins were conducted at Japanese Syowa Station and French DDU Stations (PI: **A. Takahashi**).
- “Antarctic Circumpolar Expedition” (ACE) funded through the Swiss Polar Institute. SC member I. Hogg participated in the “A Functional Biogeography of the Antarctic” (AFBA) project (voyage Dec 2016-Feb 2017; research ongoing).
- Co-PIs (**B. Adams, D. Wall**) part of the US McMurdo Long Term Ecological Research program (US NSF funded). 2016/17 austral summer field season in the McMurdo Dry Valleys.
- New Zealand Antarctic Research Institute (NZARI): “*Testing predicted tolerances of Antarctic non-marine biota in a whole-ecosystem framework*” (B. Adams, Co-PI with P. Novis, I. Hawes, A. Monks, F. Morgan, J. H. Kim) Funding Amount: \$115,000 2016-2017.
- National Science Foundation, DEB and OPP: “*Increased Connectivity in a Polar Desert Resulting from Climate Warming: McMurdo Dry Valley LTER Program*” (**B. Adams** Co-PI with D. McKnight, M. Gooseff, P. Doran, T. Vesbach, D. Wall, et al.). 2011-2017. ANT 1115245. \$5,880,000
- **I. Schloss**: 2016-2017 and 2017-2018: Expedition to Carlini Station (King George/25 de Mayo Island, South Shetlands, Antarctica) to study the effects of glacier melting on plankton.

#### Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years:

- A major event, that will not happen without AnT-ERA is a planned **Summer School** in 2018 in Argentina for graduate and PhD students. The largest part of our human and financial resources will be used for this event to attract a high number of students from various countries preferably from countries with a non-well developed national programme. Lecturers are to be recruited mainly from the AnT-ERA SC.

- Major contributions to the **SCAR Biology Symposium** in 2017 in Belgium (a) chairing sessions and (b) organizing a side event on future challenges of AnT-ERA.
- Preparation of the **Polar2018** SCAR/IASC OSC in Davos, Switzerland by structuring an amphi-polar session
- Strengthening an **Arctic-Antarctic scientific dialogue** by organizing a joint AnT-ERA / IASC mini-workshop during the *Polar2018* conference.
- Major contributions to the 1<sup>st</sup> order draft of the *Global Assessment of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES)* to be externally evaluated in the 2<sup>nd</sup> half of 2017 (J. Gutt).
- Major **research activities** by SC members are planned (examples): **V. Cummings**: Co-PI of New Zealand Antarctic Research Institute research project *Resilience in Antarctic biota and ecosystems* (2016-2019). Field season planned for October/November 2017. **B. Adams**: National Science Foundation, ANT: "The role of glacial history on the structure and functioning of ecological communities in the Shackleton Glacier region of the Transantarctic Mountains" (PI, with **D. Wall**, Berry Lyons, **I. Hogg** and N. Fierer). 2017-2019. PLR-1341736 (\$843,974). **G. di Prisco**: TEAM-fish (programme) expedition TUNU-VII on board R/V Helmer Hanssen, August 2017.

**Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):**

**Primary publications in peer-reviewed journals:** Approx. 100 AnT-ERA relevant publications on biological processes were published by SC members, supported by national programs (for examples see annex). A systematic literature review based on Google Scholar provided 2828 publications 2016-2017 using the search stings "Southern Ocean", Antarctica, "biological processes", "ecosystem functioning", "ecosystem services", and omics. The 18 top GS-ranked papers, which fell into the scope of AnT-ERA provide an exemplary overview and are listed in the annex. They include papers by SC members and include various components of the Antarctic ecosystems, terrestrial and marine, plankton and benthos, communities and molecular processes.

**Significant Deviations from the Implementation Plan:**

As planned for 2017 in the implementation plan: *Meeting to structure and draft reviews for each scientific AnT-ERA level* will be carried out during SCAR Biology Symposium, Leuven. Capacity building carried out throughout the life period of AnT-ERA will be strengthened by the planned summer school in 2018.

**Steps taken to address individual points from your External Review:**

Since the beginning of AnT-ERA we focused on unique output, which had not been produced without the support of AnT-ERA/SCAR. However, we must emphasize that this doesn't release us from resource-consuming obligations

to fulfill commitments to manage SCAR meetings, contribute to other SCAR products and support early career scientists.

**If your SRP produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.**

Products of AnT-ERA are mainly brainstorming output, opinions, dissemination and support of knowledge transfer. All data produced and published by national programmes in the context of AnT-ERA are handled according to the national rules of the institutions of the authors. E.g. Work by SC members Hogg, Adams and Wall deposit all sequence data to the Barcode of Life Datasystems (BOLD) and GenBank databases. For example, from Bennett et al. (2016) “all sequences were uploaded to the BOLD dataset DS-SPMACK (Springtails of Mackay Glacier Region; dx.doi.org/10.5883/DS-SPMACK) and cross-referenced to GenBank (accession numbers KU876787 - KU876880).”

**Use of the 2015/16 budget clustered into four large categories (please notice that capacity building also includes support of early career scientists):**



## Budget

### Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (USD)	Contact Name	Contact Email
TBD	Summer school	35000	J. Gutt & I. Schloss	Julian.gutt@awi.de, ireschloss@gmail.com
	Individual mini-grants for early career scientists from developing programs	4000	J. Gutt	Julian.gutt@awi.de
	Individual mini-grants for SC members	3000	J. Gutt	Julian.gutt@awi.de

#### Briefly describe what the funds will be used for and what the desired results are:

The summer school is planned especially for graduate and PhD students. Due to limited funds the geographical focus will be South America but applications from any other countries, especially from developing national programs are welcome. In addition to AnT-ERA funded participants (students and lecturers) an additional number of students and lecturers from the host country/institution is expected. The expected outcome is a knowledge transfer from seniors to students, from experienced lecturers to ambitious early career students with the special emphasis on the key objectives of AnT-ERA, climate-change related biological processes in the Antarctic. Another expected effect should be a strengthened integration of early career scientists in the Antarctic research community and in Antarctic research projects.

#### Provide an estimate on the % of the budget to be used for support of early career researchers:

2017 and 2018: direct support by individual travel grants: 60%, additional indirect support (for lecturers of summer school): 35%.

**Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):**

2017 and 2018: The proportion of support of scientists from countries with developing programmes depends on the applications for travel funds. It was decided to hold the summer school in Argentina to (1) make use of an existing infrastructure and not to spend much SCAR funds for that, (b) to accept participants from any country (especially from South America), which have - independently of their SCAR contribution category- an obvious need and desire to increase the education of their young generation of scientists.

## Linkages

**Please describe any direct support you receive for your activities beyond SCAR (examples):**

- D. Wall: AnT-ERA Scientific Committee on Antarctic Research Conference, Kuala Lumpur, Malaysia, August 2016 (Financial support from Ant-ERA and from the US National Committee on SCAR)
- C. Verde: Leading Investigator "*Enzymes of a cold-active metabolic pathway for the biosynthesis of long-chain omega-3 fatty acids: biotechnological applications*" National Programme for Antarctic Research (PNRA, 2017-2019); total Funding € 94,500.00
- C. Verde: Co-Investigator "*Journey to the cold and back: comparative genomics and transcriptomics in Antarctic and sub-Antarctic notothenioids*" National Programme for Antarctic Research (PNRA, 2017-2019); total Funding € 138,500.00.
- C. Verde: Participant "*Cosmeceuticals And Nutraceuticals From Antarctic Biological REsources (CAN FARE)*" National Programme for Antarctic Research (PNRA; 2017-2019) Total Funding € 84,000.00.
- C. Verde: Associated Partner of WP 3: *Polar microorganisms: responses to warming of model organisms and release of pathogens into the environment*; EU Project MicroArctic Innovative Training Networks (ITN). Total funding € 3.8 M
- J. Xavier: Applied science in Antarctic Marine Food webs. Session Polar Science on the Frontiers of the Earth. Encontro Ciência 2016. (Invited talk); Networking skills: an important soft skill for a scientist? APECS workshop. XXXIV SCAR OSC Kuala Lumpur, Malaysia (keynote talk); Identifying research priorities and emerging issues in Antarctic science related to policy. VIII Portuguese Polar Conference, Lisboa (invited talk); Challenges in bringing science into policy. APECS workshop POLAR QUESTS, 26 Oct. (invited talk), supported by national funding agencies and employers
- J. Gutt: all SCAR relevant traveling including SCAR representation at IPBES funded by German Science Foundation or employer

G. di Prisco, 2017-2019: Co-Investigator of the project “*Enzymes of a cold-active metabolic pathway for the biosynthesis of long-chain omega-3 fatty acids: biotechnological applications*”. Italian National Programme for Antarctic Research (PNRA). € 94,500.00 and “*Journey to the cold and back: comparative genomics and transcriptomics in Antarctic and sub-Antarctic notothenioids*”, €138,500.00

**Please list any major collaborations your SRP has with other SCAR groups and with organisations/groups beyond SCAR:**

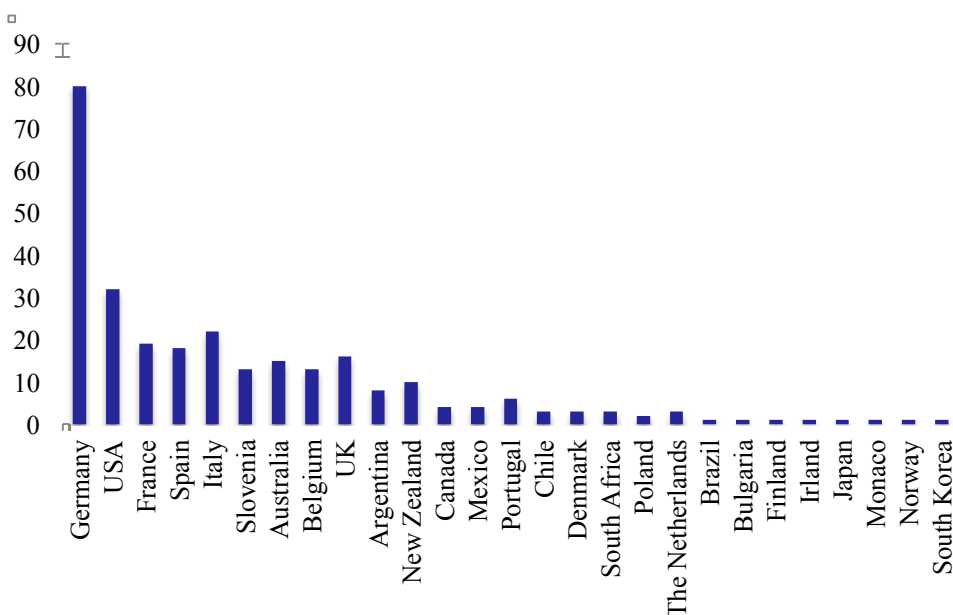
SCAR: AntEco, ACCE, EGBAMM, CBET, Development Council, SCAR-ATS; others: ICED, SOOS, IPCC, UNFCCC, IPBES, CCAMLR, IUCN, Global Soil Biodiversity Initiative, Antarctic Environments Portal

## Outreach and Capacity Building

**Please describe your outreach, communication and capacity building activities. Also provide information on activities that demonstrate effectiveness as a network.** (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved):

- 15 web-articles in 2016/17 and approx. 20 permanently available and permanently updated news (meetings and job as well as other research opportunities) on the web-site, >100,000 clicks since 2013.
- The mailing list includes approx. 520 persons, mainly scientists from the Antarctic/AnT-ERA community.
- AnT-ERA SC members contributed to an (almost) uncountable number of outreach events, in the public, schools, universities and for other stakeholders. For capacity building see above.

Contributions to AnT-ERA events, products and minigrants clustered according to (SCAR-) countries.





**As part of SCAR’s Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups including SRPs to form a ‘review panel’ so if applications in your field are submitted we have people to contact to help assess relevant applications. Please list one or more people (name and email address) from your SRP who would be willing to serve as reviewers for the next few years.**

Yuuki Watanabe (watanabe.yuuki@nipr.ac.jp)

## Membership

AnT-ERA has, on purpose, no official membership, it is **open to all scientists and other people interested in the mission of AnT-ERA** described in the mission statement and implementation plan.

## Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Start	Date Term is to End
CO	Julian	Gutt	AWI	GER	Julian.gutt@awi.de	2012	2021
SC	Lloyd	Peck	BAS	UK	lspe@bas.ac.uk	2013	2021
SC	Cinzia	Verde	IBBR	Italy	cinzia.verde@ibbr.cnr.it	2013	2021
SC	Byron	Adams	Brigham Univ.	USA	byron_adams@byu.edu	2013	2021
SC	Ian	Hogg	Univ. Waikato	NZ	hogg@waikato.ac.nz	2014	2021
SC	Diana	Wall	Colorado State Univ.	USA	Diana.Wall@colostate.edu	2013	2021
SC	Akinori	Takahashi	NIPR	Japan	atak@nipr.ac.jp	2013	2021
SC	Vonda	Cummings	NIWA	NZ	v.cummings@niwa.co.nz	2013	2021
SC	In-Young	Ahn	KOPRI	South Korea	iahn@kopri.re.kr	2014	2021
SC	Craig R.	Smith	Univ. of Hawaii	USA	craigsmi@hawaii.edu	2013	2021

## AnT-ERA: 2016-2017 Annual Report, cont.

SC	Enrique	Isla	ICM-CSIC	ESP	isla@icm.csic.es	2013	2021
SC	Irene	Schloss	Direccion Nacional	ARG	ireschloss@gmail.com	2013	2021
SC	Jose	Xavier	Univ. of Coimbra/ BAS	Portugal/ UK	xavier@zoo.uc.pt	2013	2021
SC	Sieglinde	Ott	Univ Düsseldorf	GER	otts@uni-duesseldorf.de	2014	2021

### Other members (liaison officers, APECS representatives etc.)

First Name	Last Name	Affiliation	County	Email
Thomas	Bracegirdle	BAS	UK	tjbra@bas.ac.uk
Monika	Kedra	Inst. of Oceanology	Poland	kedra@iopan.gda.pl
Don	Cowan	Univ. Pretoria	South Africa	Don.cowan@up.ac.za
Eugene	Murphy	BAS	UK	ejmu@bas.ac.uk
Guido	di Prisco	IBB	Italy	guido.diprisco@ibbr.cnr.it
Coleen	Suckling	Bangor Univ. APECS	UK	coleenclaire@yahoo.co.uk
Trevor	McIntyre	Univ. of Pretoria APECS	South Africa	tmcintyre@zoology.up.ac.za

Requests to the Secretariat: If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:

## Appendix:

### Peer-reviewed papers by SC members (examples):

Barr, N.G., Lohrer, A.M., Cummings, V.J. (2017). An in-situ method for measuring responses of under-ice algae to ocean warming and acidification in ice-covered habitats. *Limnology and Oceanography: Methods* 15(3): 264–275. <https://doi.org/10.1002/lom3.10154>

Beet, C. R., I. D. Hogg, G. E. Collins, D. A. Cowan, D. H. Wall, and B. J. Adams. 2016. Genetic diversity among populations of Antarctic springtails (Collembola) within the Mackay Glacier ecotone. *Genome* 59:762-770

Beet, C.R., I.D. Hogg, G.E. Collins, D.A. Cowan, D.H. Wall, B.J. Adams. 2016. Genetic diversity among populations of Antarctic springtails (Collembola) along the Mackay Glacier ecotone. *Genome* 59: 762-770

Bennett, K. R., I. D. Hogg, B. J. Adams, and P. D. N. Hebert. 2016. High levels of intraspecific genetic divergences revealed for Antarctic springtails: evidence for small-scale isolation during Pleistocene glaciation. *Biological Journal of the Linnean Society* 119:166-178.

Cherel, Y., Xavier, J. C., Colette Trouvé, C. & Weimerskirch, H. (2017). Food, feeding ecology and isotopic niche of the wandering albatross (*Diomedea exulans*) at Kerguelen and Crozet Islands. *Marine Ecology Progress Series* doi: 10.3354/meps11994

Coelho, R. C. G., Marques, A.L. P., Oliveira, S.M., Diogo, G. S., Pirraco, R. P., Moreira-Silva, J., Xavier, J. C., Reis, R. L., Tiago H. Silva, Mano, J. F. (2017). Extraction and characterization of collagen from Antarctic and Sub-Antarctic squid and its potential application in hybrid scaffolds for tissue engineering. *Materials Science & Engineering C* 78: 787-795

Collins, G.E., I.D. Hogg. 2016. Temperature-related activity of *Gomphiocephalus hodgsoni* (Collembola) mitochondrial DNA (COI) haplotypes in Taylor Valley, Antarctica. *Polar Biology* 39: 379–389.

Bylenga, C.H., Cummings, V.J., Ryan, K.G. (2017). High resolution microscopy reveals significant impacts of ocean acidification and warming on larval shell development in *Laternula elliptica*. *PLoS ONE* 12(4): e0175706. <https://doi.org/10.1371/journal.pone.0175706>

Cuypers B, Vermeylen S, Hammerschmid D, Trashin S, Rahemi V, Konijnenberg A, De Schutter A, Cheng C-H C, Giordano D, Verde C, De Wael K, Sobott F, Dewilde S, Van Doorslaer S 2017 Antarctic fish versus human cytoglobins - the same but yet so different. *Journal of Inorganic Biochemistry* 173:66-78

de Scally, S. Z., Makhalanyane, T. P., Frossard, A., Hogg, I. D., & Cowan, D. A. (2016). Antarctic microbial communities are functionally redundant, adapted and resistant to short term temperature perturbations. *Soil Biology and Biochemistry* 103: 160-170.

di Prisco G, Verde C 2017 The unique haemoglobin system of migratory *Pleuragramma antarctica*: correlation of haematological and biochemical adaptations with mode of life. In: *Advances in Polar Ecology: The Antarctic*

Silverfish: A Keystone Species in a Changing Ecosystem (Vacchi M, Pisano E, Ghigliotti L, eds), pp 47-65. Springer  
Driemel, A. et al. (2017) From pole to pole: 33 years of physical

oceanography onboard R/V Polarstern. *Earth System Science Data* 9, 211–220.

Fuentes, V., Alurralde, G., Meyer, B. Aguirre, G., Canepa, A., Wöfl, A.C., Hass, H.C., Williams, G.N. and Schloss, I.R. 2016. Glacial melting: an overlooked threat to Antarctic krill. *Scientific Reports* 6, 27234; doi: 10.1038/srep27234.

Fountain, A. G., G. Saba, B. Adams, P. Doran, W. Fraser, M. Gooseff, M. Obryk, J. C. Priscu, S. Stammerjohn, and R. A. Virginia. 2016. The Impact of a Large-Scale Climate Event on Antarctic Ecosystem Processes. *Bioscience* 66:848-863.

Gutt, J., Constable, A., Cummings, V., Hosie, G., McIntyre, T., Mintenbeck, K., Murray, A., Peck, L.S., Ropert-Coudert, Y., Saba, G., Schofield, O., Schloss, I., Stefels, J., Takahashi, K. 2016. Vulnerability of Southern Ocean biota to climate change. *Antarctic Environments Portal*. <https://www.environments.aq/information-summaries/vulnerability-of-southern-ocean-biota-to-climate-change/>

Gutt, J., Cummings, V., Dayton, P., Isla, E., Jentsch, A., Schiaparelli, S. 2016. Antarctic Marine Animal Forests: Three-Dimensional Communities in Southern Ocean Ecosystems. In: *Marine Animal Forests: The Ecology of Benthic Biodiversity Hotspots*. S. Rossi, L. Bramanti, A. Gori, C. Orejas, Saco del Valle (Editors). Springer International Publishing, Switzerland. 30 p. DOI 10.1007/978-3-319-17001-5\_8-1.

Gutt, J., David, B., Isla, E., (2016) High environmental variability and steep biological gradients in the waters off the northern Antarctic Peninsula: Polarstern expedition PS81 (ANT-XXIX/3). *Polar Biology* 39, 761–764, 10.1007/s00300-016-1937-7.

Gili, J-M., Zapata-Guardiola, R., Isla, E., Vaqué, D., Barbosa A., García-Sancho, L., Quesada, A., (2016) Introduction to the special issue on the Life in Antarctica: Boundaries and Gradients in a Changing Environment (XIth SCAR Biology Symposium). *Polar Biology* 39, 1–10, 10.1007/s00300-015-1852-3.

Hughes, K. A., Liggett, D., Roldan, G., Wilmotte, A, and Xavier, J. C. (2016). Narrowing the science/policy gap for environmental management. *Antarctic Science* 28: 325 DOI: <http://dx.doi.org/10.1017/S0954102016000407>

Hunt Jr., G.L., Drinkwater, K.F., Arrigo, K., Berge, J., Daly, K.L., Danielson, S., Daase, M., Hop, H., Isla, E., Karnovsky, N., Laidre, K., Mueter, F.J., Murphy, E.J., Renaud, P.E., Smith Jr., W.O., Trathan, P., Turner, J., Wolf-Gladrow, D. (2016) Advection in polar and sub-polar environments: Impacts on high latitude marine ecosystems. *Progress in Oceanography* 149, 40–81.

Isla, E., (2016) Organic carbon and biogenic silica in marine sediments in the vicinities of the Antarctic Peninsula: spatial patterns across a climatic gradient. *Polar Biology* 39, 819–828, 10.1007/s00300-015-1833-6.

Isla, E., (2016) Environmental Controls on Sediment Composition and Particle Fluxes over the Antarctic Continental Shelf. In: Source-to-Sink Fluxes in Undisturbed Cold Environments (Beylich, A.A Dixon, J.C. and Zwolinski, Z., eds.). Cambridge University Press, pp. 199-212.

Jiménez, S., Domingo, A., Brazeiro, A., Defeo, O., Wood, A. G., Froy, H., Xavier, J. C. and Phillips, R. A. (2016). Sex-related variation in the vulnerability of wandering albatrosses to pelagic longline fisheries. *Animal Conservation* 19: 281-295 DOI: 10.1111/acv.12245

Knox, M. A., D. H. Wall, R. A. Virginia, M. L. Vandegehuchte, I. S. Gil, and B. J. Adams. 2016. Impact of diurnal freeze-thaw cycles on the soil nematode *Scottinema lindsayae* in Taylor Valley, Antarctica. *Polar Biology* 39:583-592.

Krüger, L., Ramos, J.A., Xavier, J.C., Grémillet, D., González-Solís, J., Kolbeinsson, Y., Militão, T., Navarro, J., Petry, M.V., Phillips, R.A., Ramírez, I., Reyes-González, J.M., Ryan, P.G., Sigurdsson, A., Wales, R.M., Van Sebille, E., Paiva, V.H. (2017) Identification of candidate marine protected areas through a seabird seasonal-, multispecific- and extinction risk-based approach. *Animal Conservation*. DOI: 10.1111/acv.12339

Krüger, L., Ramos, J.A., Xavier, J.C., Grémillet, D., González-Solís, J., Petry, M.V., Phillips, R.A., Wanless, R.M. & Paiva, V.H. (2017). Projected distributions of Southern Ocean albatrosses, petrels and fisheries as a consequence of climatic change. *Ecography* DOI: 10.1111/ecog.02590

Lourenço, S., Saunders, R. A., Collins, M., Shreeve, R., Assis, C. A., Belchier, M., Watkins, J. L. & Xavier, J. C. (2016). Life cycle, distribution and trophodynamics of *Krefflichthys anderssoni* (Lönnberg, 1905) in the Scotia Sea. *Polar Biol.* doi:10.1007/s00300-016-2046-3

Negri, A., Daneri, G., Ceia, F., Vieira, R., Cherel, Y., Coria, N., Corbalán, A., Xavier, J. C. (2016). The cephalopod prey of the Weddell seal, *Leptonychotes weddellii*, a biological sampler of the Antarctic marine ecosystem. *Polar Biology* 39:561-564 DOI 10.1007/s00300-015-1794-9

Paparazzo, F.E., Alder, V.A., Schloss, I.R., Bianchi, A., Estéves, J.L. 2016. Spatial and temporal trends in the distribution of macronutrients in surface waters of the Drake Passage. *Ecología Austral* 26:027-039.

Pearce, D. A., I. A. Alekhina, A. Terauds, A. Willemotte, A. Quesada, A. Edwards, A. Dommergue, B. Sattler, B. J. Adams, C. Magalhães, W.-L. Chu, M. C. Y. Lau, C. Cary, D. J. Smith, D. H. Wall, G. Eguren, G. Matcher, J. A. Bradley, J.-P. de Vera, J. Elster, K. A. Hughes, L. Cuthbertson, L. G. Benning, N. Gunde-Cimerman, P. Convey, S. G. Hong, S. B. Pointing, V. H. Pellizari, and W. F. Vincent. 2016. Aerobiology Over Antarctica – A New Initiative for Atmospheric Ecology. *Frontiers in Microbiology* 7:4159-4157.

Pereira, J. M., Vítor H. Paiva, V. H. & Xavier, J. C. (2017). Seabirds mapping the distribution of elusive cephalopod species. *Marine Ecology Progress Series* <https://doi.org/10.3354/meps12020>

Rosa, R., Lopes, V. M., Guerreiro, M., Bolstad, K., Xavier, J. C. (2017). Biology and ecology of the world's largest invertebrate, the colossal squid (*Mesonychoteuthis hamiltoni*): a review. *Polar Biol.* doi:10.1007/s00300-017-2104-5

Seco, J., Daneri, G., Ceia, F. R., Vieira, R. P., Hill, S. L. & Xavier, J. C. (2016). Distribution of short-finned squid *Illex argentinus* (Cephalopoda: Ommastrephidae) inferred from the diets of Southern Ocean albatrosses using stable isotope analyses. *JMBA* 96:121–1215 DOI: 10.1017/S0025315415000752

Seco, J., Roberts, J., Ceia, F., Baeta, A., Ramos, J. A., Paiva, V. & Xavier, J. C. (2016). Distribution, habitat and trophic ecology of Antarctic squid *Kondakovia longimana* and *Moroteuthis knipovitchi*: inferences from predators and stable isotopes. *Polar Biology* 39: 167-175 DOI 10.1007/s00300-015-1675-2

Southwell, C., Emmerson, L., Takahashi, A., Barbraud, C., Delord, K., Lyons, W. B., K. Deuerling, K. A. Welch, S. A. Welch, G. Michalski, W. W. Walters, U. Nielsen, D. H. Wall, I. Hogg, and B. J. Adams. 2016. The Soil Geochemistry in the Beardmore Glacier Region, Antarctica: Implications for Terrestrial Ecosystem History. *Scientific Reports* 6:26189.

Southwell, C., Emmerson, L., Takahashi, A., Kato, A., Barbraud, C., Delord, K., Weimerskirch, H. (2017) Recent studies over-estimate colonization and extinction events for breeding Adélie penguins. *Auk* 134: 39-50.

Thiebot, J.B., Ito, K., Raclot, T., Poupart, T., Kato, A., Ropert-Coudert, Y., Takahashi, A. (2016) On the significance of Antarctic jellyfish as food for Adélie penguins, as revealed by video-loggers. *Marine Biology* 163: 108.

Thiebot, J.B., Arnould, J.P.Y., Gomez-Laich, A., Ito, K., Kato, A., Mattern, T., Mitamura, H., Noda, T., Poupart, T., Quintana, F., Raclot, T., Ropert-Coudert, Y., Sala, J.E., Seddon, P.J., Sutton, G.J., Yoda, K., Takahashi, A. (2017). Jellyfish and other gelata as food to four penguin species – insights from predator-borne videos. *Frontiers in Ecology and the Environment*, in press.

Verde C, Giordano D, Bellas CM, di Prisco G, Anesio AM 2016 Polar marine microorganisms and climate change. *Adv Microb Physiol* 69: 187-215

Verde C, Giordano D, Gutt J, di Prisco G 2016 Editor's Corner: Molecular-genetic studies of polar biodiversity. In: *Biodiversity - Journal of Life on Earth*, Special Issue "Evolution and Biodiversity in Polar Regions - Molecular and Genetic Advances" (di Prisco G, Giordano D, Gutt J, Verde C, eds), 17: 1-3

Weimerskirch, H. (2017) Large-scale population assessment informs conservation management for seabirds in Antarctica and the Southern Ocean: A case study of Adélie penguins. *Global Ecology and Conservation* 9: 104-115.

Xavier, J.C., Peck, L., Fretwell, P. & Turner (2016). Climate change and polar range expansions: could cuttlefish cross the Arctic? *Mar. Biol.* 163:78 DOI 10.1007/s00227-016-2850-x

Xavier, J. C., Fugmann, G., Beck, I., Huffman, L. & Jensen, E. (2016). Education on biodiversity of the Polar Regions. In Castro, P., Azeiteiro, U.M., Bacelar Nicolau, P., Leal Filho, W., Azul, A.M. *Biodiversity's and Education for Sustainable Development (ESD) in the series Umweltbildung, Umweltkommunikation und Nachhaltigkeit - Environmental Education, Communication and Sustainability*, Peter Lang. Peter Lang GmbH International Academic Publishers Frankfurt am Main.: 43-56 ISBN: 978-3-319-32317-6 (Book chapter)

Xavier, J.C., Brandt, A., Ropert-Coudert, Y., Badhe, R., Gutt, J., Havermans, C., Jones, C., Schneider Costa, E., Lochte, K., Schloss, I.R., Kennicutt, M.C. II, Sutherland, W.J. 2016. Future challenges in Southern Ocean life and ecology research. doi: 10.3389/fmars.2016.00094

Xavier, J. C., Brandt, A., Ropert-Coudert, Y., Badhe, R., Gutt, J., Havermans, C., Jones, C., Costa, E. S., Lochte, K., Schloss, I. R., Kennicutt, C., & Sutherland, W. J. (2016). Future challenges in Southern Ocean life and ecology research. *Frontiers in Marine Science* 3:94 DOI: 10.3389/fmars.2016.00094

Xavier, J. C., Ferreira, S., Tavares, S., Santos, N., Mieiro, C. L., Trathan, P. N., Lourenço, S., Martinho, F., Steinke, D., Seco, J., Pereira, E., Pardal, M. & Cherel, Y. (2016). The significance of cephalopod beaks in marine ecology studies: Can we use beaks for DNA analyses and mercury contamination assessment? *Marine Pollution Bulletin* 103: 220-226 DOI: 10.1016/j.marpolbul.2015.12.016

Xavier, J. C., Raymond, B., Jones, D. C. & Griffiths, H. (2016). Biogeography of cephalopods in the Southern Ocean using habitat suitability prediction models. *Ecosystems* 19: 220-247 DOI: 10.1007/s10021-015-9926-1

Xavier, J.C., Trathan, P.N., Ceia, F.R., Tarling, G.A., Adlard, S., Fox, D., Edwards, E.W., Vieira, R.P., Medeiros, R., De Broyer, C. (2017) Sexual and individual foraging segregation in Gentoo penguins *Pygoscelis papua* from the Southern Ocean during an abnormal winter. *PloS one* 12:e0174850

### **Other important dissemination and capacity building activities by SC members**

Adams B: "Evolution and Environmental Change in the Transantarctic Mountains". S24. Physiological Adaptations in Antarctic Organisms. Scientific Council on Antarctic Research, Open Science Meeting, Kuala Lumpur, Malaysia. August 2016.

Adams B: "Adaptation and Exaptation: Coupled evolutionary and physiological responses to freezing and desiccation in *Plectus murrayi*". Mini Symposium; Connecting the biological and the physical: Environmental drivers of biodiversity in Antarctica. Scientific Council on Antarctic Research, Open Science Meeting, Kuala Lumpur, Malaysia. August 2016.

Adams B: "Metazoan Cryptobiosis and Medical Bioengineering". Stanford University, Palo Alto, CA. March 2016.

Adams B: "Antarctic Ecology and Evolution: Skepticism, Denialism and Science Education". Utah Science Teachers association, Annual Meeting, Provo, UT. February 2016.

Adams B: Polar Teachers and Researchers Exploring and Collaborating (PolarTREC): Hosted K-12 teacher embedded in expedition team. See: <https://www.polar trec.com/expeditions/tough-tardigrades>

Andriuzzi WS, Matthew A. Knox, Byron J. Adams, Diana H. Wall. Consequences of altered freeze-thaw cycle frequency on the dominant soil invertebrate in the McMurdo Dry Valleys. Scientific Committee for Antarctic Research Open Science Conference, Kuala Lumpur, Malaysia.

Cary SC, Cummings VJ, 2016. Antarctic Nearshore and Terrestrial Observation systems. Presentation to international ANTOS workshop, Kuala Lumpur, 21 August.

Cary C, Cummings V, 2016. SCAR Group Report on ANTOS, prepared for the XXXIV SCAR Delegates Meeting, Kuala Lumpur, Malaysia. 8 p. June.

Cummings VJ, 2016. Antarctic Nearshore and Terrestrial Observation systems. Presentation to SCAR Geosciences Scientific Standing Group, Kuala Lumpur, 24 August.

Cummings VJ, 2016. Antarctic Nearshore and Terrestrial Observation systems. Presentation to SCAR Life Science Scientific Standing Group, Kuala Lumpur, 24 August.

Cummings VJ, 2017. Update on the progress of the Antarctic Near-shore and Terrestrial Observation System for the SCAR website, <http://www.scar.org/2017/1045-antos-updat> March 7th.

Cummings V: 1. Co-supervised two students who received their degrees in Antarctic science: Bylenga C. H., 2016. The impacts of ocean acidification and warming on the Antarctic bivalve, *Laternula elliptica*. PhD thesis, Victoria University of Wellington, 165 p. Hempel, S. 2016. Response of the Antarctic bivalve *Laternula elliptica* to ocean warming and acidification. MSc thesis, Victoria University of Wellington.

Cummings V: Presentation to school children: Cummings, V.J., Marriott, P.M. 2016. Antarctic marine science: what, how and why we do it. Interactive presentation to Year 8 classes at Havelock North Intermediate School, Havelock North. 29 November.

Cummings V: Session Chair: Organism responses to Ocean Acidification, 4th International Symposium on the Ocean in a High-CO<sub>2</sub> World, Hobart, 3-6 May. Session Chair SCAR Open Science conference, Kuala Lumpur, 22-26 August. Session coordinator: Multidisciplinary studies in terrestrial and marine transition zones, SCAR Biology Symposium, Leuven, July 2017.

Cummings V: Interview with freelance journalist about NZ Antarctic marine science, 26 August 2016, Kuala Lumpur.

Cummings VJ: 2017: Invited Plenary speaker, New Zealand Marine Sciences Society conference. Christchurch, July 4<sup>th</sup> (presentation topic = Antarctic marine science).

Cummings VJ: 2017: Invited participant, Ministry for Primary Industries Ross Sea Marine Protected Area research and monitoring planning workshop (co-lead benthic theme). Wellington, 2-3 March.

Cummings VJ., Lohrer, A.M., Barr, N., Thrush, S. 2016. Antarctic sea ice algae: in situ response to simulated ocean acidification. Presented at the 4th international symposium on the ocean in a high-CO<sub>2</sub> world, Hobart, 3-6 May.



di Prisco: 2017: Moderator of the International Debate, "Life at sea ice/water contact: what we may lose" *Festival della Scienza*, Genova (Italy) 26 October-5 November 2017. Funded by the organisation of the *Festival della Scienza*. Organiser: C Verde; Keynote Speaker: Julian Gutt

di Prisco: 2017: Co-Chair of Session S10: Understanding Physiology (including '-omics' approaches), *XII SCAR BIOLOGY Symposium*, Leuven (Belgium) 10-14 July 2017 (planned)

Gutt J, OSC, KL, Malaysia, co-convener of sessions and mini-symposia (also IOC),

Knox MA, Walter S. Andriuzzi, Byron J. Adams, Diana H. Wall. Response of an Antarctic soil invertebrate to warming and freeze-thaw cycles. Ecological Society of America Annual Meeting, Fort Lauderdale, FL, USA.

Schloss I: 2017: Invited Speaker at the Gordon Research Conference on Polar Marine Science in Ventura, California, 26-31 March 2017. Conference: "Potter Cove, a System on the Move: Main Results from 25 Years of Research"

Schloss I, Gordon Research Conference on Polar Marine Science, invited speaker

Schloss I; SCAR OSC Kuala Lumpur, 2016. Co-convener of conference

Schloss I: 2017: Invited Speaker at the XII SCAR BIOLOGY Symposium, "Scale Matters", Leuven (Belgium) 10-14 July 2017. Conference: "What does phytoplankton tell us about global change?"

Shaw EA, Byron J. Adams, Ross A. Virginia, Diana H. Wall. Identifying the carbon sources of soil foodwebs in the McMurdo Dry Valleys, Antarctica. Ecological Society of America Annual Meeting, Fort Lauderdale, FL, USA.

Shaw EA, Byron J. Adams, Ross A. Virginia, Diana H. Wall. Identifying soil foodwebs' carbon sources in the McMurdo Dry Valleys, Antarctica. Scientific Committee for Antarctic Research Open Science Conference, Kuala Lumpur, Malaysia.

Smith CR, OSC, KL, Malaysia, co-convener of sessions and mini-symposia

Takahishi A, OSC, KL, Malaysia, co-convener of sessions and mini-symposia

Verde C: 2018: Verde-Co-Organiser of the Session (1 full day) Cardio-respiratory adaptations to environmental change Society for Experimental Biology, Florence, Italy 3-6 July 2018

Verde C: 2018: Chair of Session 33, XXXV SCAR Biennial Meetings-Arctic Science Summit Week 2018 & IASC Business Meetings. SCAR/IASC Open Science Conference 2018-Arctic Observing Summit 15-26 June 2018 (<http://www.polar2018.org/>)

Verde C, 2017: Organiser of the International Debate, "Life at sea ice/water contact: what we may lose" *Festival della Scienza*, Genova (Italy) 26 October-5 November 2017. Funded by the organisation of the *Festival della Scienza*. Keynote Speaker: Julian Gutt; Moderator: Guido di Prisco

Verde C, 2017: Co-Chair of three Sessions XII SCAR BIOLOGY Symposium, Leuven (Belgium): S08: Response to climate change: understanding bio

resilience; S09: Adaptation and processes in top predators; S10: Understanding Physiology (including '-omics' approaches). 10-14 July 2017

Verde C, 2016: Guest Editor of the Special issue, Marine Genomics "Navigating the Future: Cross Sector Marine Genomics" (Labes A, Reich M, Giuliano L, Verde C, eds) (<http://www.journals.elsevier.com/marine-genomics/news/call-for-papers-navigating-the-future-cross-sector-marine-ge/>)

Verde C, 2016: Guest Editor of the Special issue, Marine Genomics "Genome-powered perspectives in integrative physiology and evolutionary biology" (Berenbrink M, Cossins A, Verde C, eds)

Verde C, 2016: Guest Editor of the Special issue, Biodiversity - Journal of Life on Earth "Evolution and Biodiversity in Polar Regions - Molecular and Genetic Advances" (di Prisco G, Giordano D, Gutt J, Verde C, eds), 17: 1-75

Verde C, 2018: Verde-Co-Organiser of the Session (1 full day) Cardio-respiratory adaptations to environmental change Society for Experimental Biology, Florence, Italy 3-6 July 2018

Verde C, 2018: Verde: Chair of Session 33, XXXV SCAR Biennial Meetings-Arctic Science Summit Week 2018 & IASC Business Meetings. SCAR/IASC Open Science Conference 2018-Arctic Observing Summit 15-26 June 2018 (<http://www.polar2018.org/>)

Verde C, 2017: Verde: Organiser of the International Debate, "Life at sea ice/water contact: what we may lose" Festival della Scienza, Genova (Italy) 26 October-5 November 2017. Funded by the organisation of the Festival della Scienza. Keynote Speaker: Julian Gutt; Moderator: Guido di Prisco

Verde C, 2017: Verde: Co-Chair of three Sessions XII SCAR BIOLOGY Symposium, Leuven (Belgium): S08: Response to climate change: understanding bio resilience; S09: Adaptation and processes in top predators; S10: Understanding Physiology (including '-omics' approaches). 10-14 July 2017

Verde C, 2017: Invited Lecture MicroArctic meeting, Akureyri (Iceland) 03-09 April 2017,

Verde C, 2016: Invited Lecture 41 CIESM Conference, Kiel (Germany) 12-14 September 2016,

Verde C, 2016: Keynote Lecture XXXIV SCAR Open Science Conference, Kuala Lumpur (Malaysia) 20-30 August 2016,

Wall D, invited speaker, Soil biodiversity: necessary for life. UNCBD, Cancun, Mexico, 2016

Wall D, Common Ground: Soil biodiversity and sustainability. California Academy of Sciences, keynote lecture at the Annual Fellows Gathering, San Francisco, November 2016

Wall D, Meeting global challenges through soil ecology. EU COST Action First Training School, 'Soil Fauna – key to soil organic matter dynamics and modeling', Coimbra, Portugal, October 2016

Wall D: Co-organizer, with W. Andriuzzi (CSU), Public Antarctic Lecture Series, Fort Collins Library

Wall D: Member, Local organizing committee for the NSF workshop Environmental Assessment of the McMurdo Dry Valleys: Witness to the Past and Guide to the Future, May 2016

Wall D: These early career scientists had SCAR US National Committee funds to travel to present at Scientific Committee for Antarctic Research Open Science Conference, Kuala Lumpur, Malaysia.

Verde C, 2017: Invited Lecture MicroArctic meeting, Akureyri (Iceland) 03-09 April 2017,

Verde C, 2016: Invited Lecture 41 CIESM Conference, Kiel (Germany) 12-14 September 2016

Verde C, 2016: Keynote Lecture XXXIV SCAR Open Science Conference, Kuala Lumpur (Malaysia) 20-30 August 2016,

Xavier JC 2016. Applied science in Antarctic Marine Food webs. Session Polar Science on the Frontiers of the Earth. Encontro Ciência 2016. (Invited talk)

Xavier JC 2016. Networking skills: an important soft skill for a scientist? APECS workshop. XXXIV SCAR OSC Kuala Lumpur, Malaysia (keynote talk)

Xavier JC 2016. Identifying research priorities and emerging issues in Antarctic science related to policy. VIII Portuguese Polar Conference, Lisboa (invited talk)

Xavier JC 2016. Challenges in bringing science into policy. APECS workshop POLAR QUESTS, 26 Oct. (invited talk)

Xavier J, co-convenor of sessions and mini-symposia

Xavier JC (2016). Applied science in Antarctic Marine Food webs. Session Polar Science on the Frontiers of the Earth. Encontro Ciência 2016. (Invited talk)

Xavier JC (2016). Networking skills: an important soft skill for a scientist? APECS workshop. XXXIV SCAR OSC Kuala Lumpur, Malaysia (keynote talk)

Xavier JC (2016). Identifying research priorities and emerging issues in Antarctic science related to policy. VIII Portuguese Polar Conference, Lisboa (invited talk)

Xavier JC (2016). Challenges in bringing science into policy. APECS workshop POLAR QUESTS, 26 Oct. (invited talk)

**18 top GS-ranked papers, which fell into the scope of AnT-ERA as a result of a systematic literature review using Google Scholar and Publish or Perish 5**

Gottschalk J, Skinner LC, Lippold J et al. 2016. Biological and physical controls in the Southern Ocean on past millennial-scale atmospheric CO<sub>2</sub> changes. *Nature Communications* 7: art. no. 11539

Siegel V, Watkins JL 2016. Distribution, biomass and demography of Antarctic krill, *Euphausia superba*. In: *Biology and Ecology of Antarctic krill*, Siegel V (ed), *Advances in Polar Ecology*, 21-100

Tarling GA, Fielding S 2016. Swarming and behavior in Antarctic krill. In: *Biology and Ecology of Antarctic krill*. Siegel V (ed), *Advances in Polar Ecology*, 279-319

[Le Moigne FAC, Henson SA, Cavan E et al. 2016. What causes the inverse relationship between primary production and export efficiency in the Southern Ocean? \*Geophysical Research Letters\* 34: 4457-4466](#)

Belcher A, Iversen M, Manno C et al. 2016. The role of particle associated microbes in remineralization of fecal pellets in the upper mesopelagic of the Scotia Sea, Antarctica. *Limnology and Oceanography* 61: 1049-1064

[Smidt K, Atkinson A 2016. Feeding and Food Processing in Antarctic Krill \(\*Euphausia superba\* Dana\). In: \*Biology and Ecology of Antarctic krill\*. Siegel V \(ed\), \*Advances in Polar Ecology\*, 175-224](#)

Constable A, Costa DP, Schofield O et al. 2016. Developing priority variables ("ecosystem Essential Ocean Variables"-eEOVs) for observing dynamics and change in Southern Ocean ecosystems. *Journal of Marine Systems* 161: 26-41

Rigual-Hernandez AS, Trull TW 2016. The fate of diatom valves in the Subantarctic and Polar Frontal Zones of the Southern Ocean: Sediment trap versus surface sediment assemblages. *Palaeogeography, Palaeoclimatology, Palaeoecology* 457: 129-143

Gutt J, Cummings V, Dayton PK, Isla E, Jentsch A, Schiaparelli S 2016. Antarctic Marine Animal Forests: Three-Dimensional Communities in Southern Ocean Ecosystems. In: *Marine Animal Forests: The Ecology of Benthic Biodiversity Hotspots*. Rossi S, Bramanti L, Gori A, Orejas Saco del Valle C (eds), Springer International Publishing Switzerland

[Kersken D, Feldmayer B, Janussen D 2016. Sponge communities of the Antarctic Peninsula: influence of environmental variables on species composition and richness. \*Polar Biology\* 39, 851-862](#)

Le Quere C, Buitenhuis ET, Moriarty R et al. 2016. Role of zooplankton dynamics for Southern Ocean phytoplankton biomass and global biogeochemical cycles. *Biogeosciences* 13: 4111–4133

Petrou K, Kranz SA, Trimborn S et al. 2016. Southern Ocean phytoplankton physiology in a changing climate. *Journal of Plant Physiology* 203: 135-150

Segelken-Voigt A, Bracher A, Dorschel B, et al. 2016. Spatial distribution patterns of ascidians (Ascidiacea: Tunicata) on the continental shelves off the northern Antarctic Peninsula. *Polar Biology* 39: 863-879

Bowman JS, Vick-Majors TJ, Morgan-Kiss R 2016. Microbial community dynamics in two polar extremes: The lakes of the McMurdo Dry Valleys and the West Antarctic Peninsula marine ecosystem. *BioScience* 66 (10): 829-847

Ugalde SC, Westwood KJ, van den Enden R et al. 2016. Characteristics and primary productivity of East Antarctic pack ice during the winter-spring transition. *Deep-Sea Research II* 131: 123-139

Ryan-Keogh TJ, DeLizo LM, Smith WO et al. 2017. Temporal progression of photosynthetic-strategy in phytoplankton in the Ross Sea, Antarctica. *Journal of Marine Systems* 166, 87-96

Huth TJ, Place SP 2016. Transcriptome wide analyses reveal a sustained cellular stress response in the gill tissue of *Trematomus bernacchii* after acclimation to multiple stressors. *BMC Genomics* 17:127