



Paper 10
SCAR SRP
SG

Agenda 2.2
AntClim21
PS/LS/GS

Person
Responsible:

Tom
Bracegirdle

SCAR Executive Committee Meeting 2017
Brno, Czech Republic, July 2017

AntarcticClimate²¹

Antarctic Climate Change in the 21st
Century (AntClim²¹)
2016-2017 Report

Report Author(s):

Tom Bracegirdle, Nancy Bertler, Alia Khan, Gerhard Krinner, Paul Mayewski, Marilyn Raphael, Joellen Russell

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

The main activities and changes this year have been:

- The third AntClim21 workshop was held as a side meeting to SCAR2016 in Kuala Lumpur. The focus was on climate model evaluation for improved climate projections of 21st century Antarctic and Southern Ocean climate change.
- The Steering Committee has been expanded to improve links with two key activities of World Climate Research Programme (WCRP), CliC and CORDEX, and to bring in expertise on sea ice. The former brings world leading sea ice expertise and the latter key links to the polar high-resolution climate modelling community (Polar CORDEX).
- Tom Bracegirdle has taken over from Nancy Bertler as Chair of the Steering Committee.
- A number of high impact papers have been published in the peer review literature.
- Planning for the upcoming #GreatAntarcticClimateHack (#GACH) workshop.
- Collaboration across different disciplines in the SCAR community.
- Initial plans for “Antarctic climate indicators” for climate monitoring.
- A session proposal for POLAR2018 has been accepted.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

- Kuala Lumpur workshop on Theme 3 (Antarctic climate projection to 2100)

This workshop was well attended and brought together a range of disciplines to provide broad perspectives on priorities for the evaluation of climate models. Key variables for model evaluation were documented along with sources of observational data. This is a key resource in the planning of the upcoming #GACH workshop and the ultimate output of providing the Antarctic component of ESMValTool – a major global community effort to develop standardised metrics for IPCC-class (CMIP) climate models (<https://www.esmvaltool.org/>).

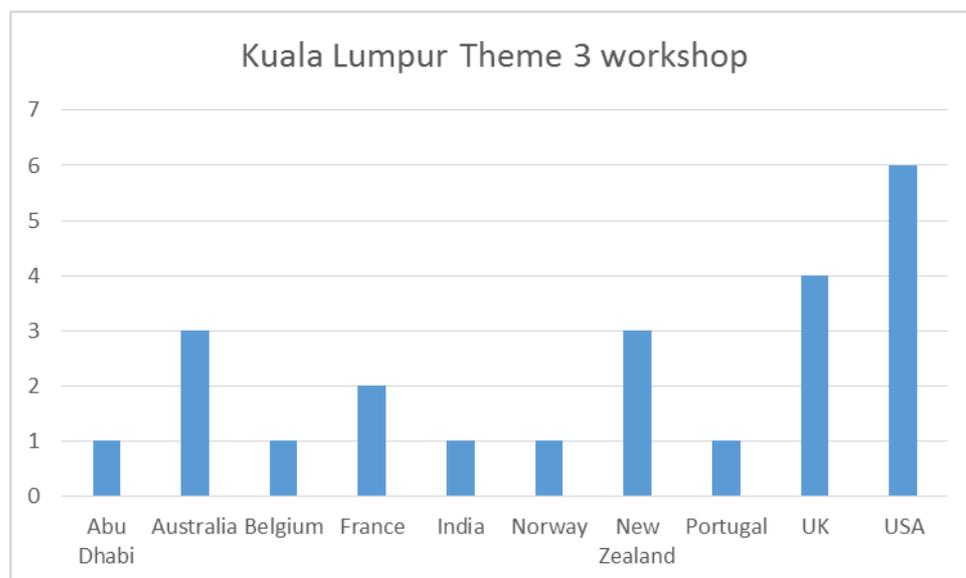


Fig. 1. Bar chart of country of employment of participants at the Theme 3 workshop in Kuala Lumpur.

- The planning of the #GreatAntarcticClimateHack has been a key activity of the Steering Committee during the first half of 2017 (more details on this are provided in the next section).
- Collaboration across different disciplines continues to be a core part of AntClim21 activities, in particular:
 - Continued position for Tom Bracegirdle as Physical Sciences Liaison Officer to the Ant-ERA SRP.
 - A large number of climate 'non-specialists' have registered for the #GACH.
 - A Nature Article on the impact of the expansion of ice free areas on biodiversity of terrestrial Antarctica involved collaboration between physical climate modelling (input from Tom Bracegirdle), ice modellers and ecologists.
- Papers in the peer review literature (see below list under New Deliverables and Outputs).
- Initial list of "Antarctic climate variables" for climate monitoring and model evaluation.
- Expanded Steering Committee
 - Improve links with WCRP CliC and high-resolution climate modelling community (CORDEX) – new SC member Gerhard Krinner.
 - Introduce sea ice expertise (new SC member Marilyn Raphael).
- AntClim21 will be co-convening a joint session at the POLAR2018 Open Science Conference.

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

- Begin planning and collating a writing team for the final AntClim21 synthesis report. At least part of the side-meetings booked at POLAR2018 will be set aside for this. A key aim will be to include contributors from diverse parts of the Antarctic science community (both in terms of nation and age). The planned timeline is to produce the report during the year that follows and submit a manuscript for peer review during 2019.
- Hold the fourth workshop for AntClim21 - #GreatAntarcticClimateHack. This will be held October 9-12, 2017 at the Scripps Institution of Oceanography Forum, La Jolla, California. Our first-ever Climate Hack will focus on bringing Antarctic and Southern Ocean observations to bear on evaluating the latest generation of climate and earth system models, producing new climate model metrics for the 21st century. In addition to the main scientific goal of producing the Antarctic / Southern Ocean contribution to ESMValTool (and the CMIP6 climate model data

that will feed into the next IPCC report), other key goals will be capacity building of the broader Antarctic science community in accessing and evaluation climate model data, developing links to emerging Antarctic nations and involving early career researchers. As can be seen from the bar chart below (Fig. 2), eight (11%) of the applicants are from Associate Member countries or countries with Initial Stage programmes (Belgium, Canada, Chile, Denmark, and Portugal). Decisions on travel support (currently being undertaken) will prioritise applicants from these nations and also early career researchers. Remote participation will be available for up to 50 participants, therefore opening the possibility of involvement for a large number of researchers globally who have limited travel budgets.

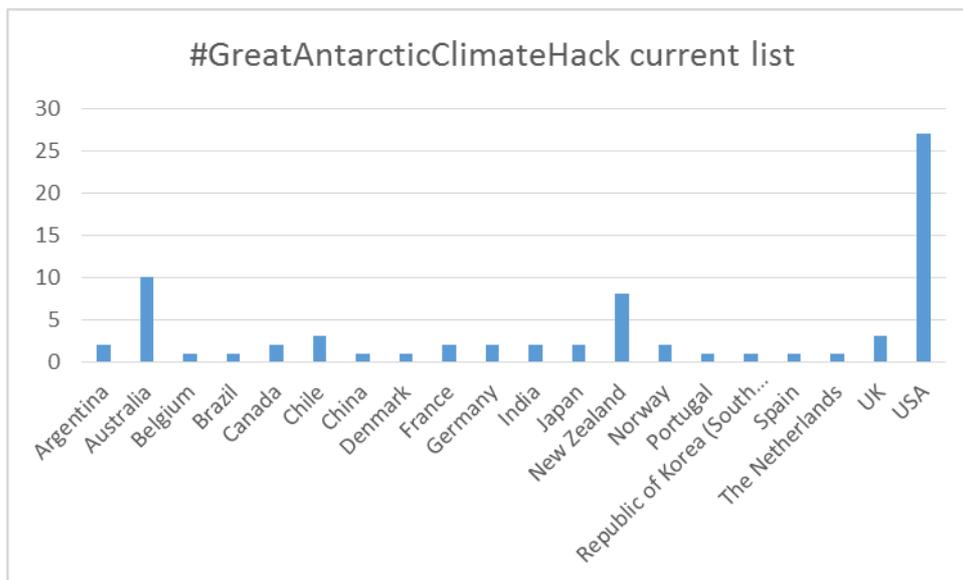


Figure 2. Distribution of nation of employment of current list of applicants to #GACH. Note that this is not the final attendance list.

- The concept of Antarctic Climate Indicators is that there is at present no central place that jointly displays or documents iconic climate variables relevant to Antarctica and the Southern Ocean, such as the Southern Annular Mode, Southern Hemisphere sea ice extent and Antarctic Peninsula temperatures. Over the coming year the implementation of collating such Antarctic Climate Indicators (ACIs) on the AntClim21 website will be planned.

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

- At the 2016 Kuala Lumpur workshop on AntClim21 Theme 3 (Antarctic climate projections to 2100) key diagnostics were identified for the evaluation of earth-system / climate models (Theme 2) for producing more reliable projections (Theme 3).

- Papers in the peer review literature - indicating (i) whether they were dependent on AntClim21 or would have happened anyway and (ii) how they map onto AntClim21 Themes.
 - Mayewski et al. (Quaternary Science Reviews, 2017, doi: 10.1016/j.quascirev.2016.11.017)
 - AntClim21 dependent
 - Helps to understand past Antarctic climate variability (Theme 1), which is an important part of improving the quantification of possible future climate trajectories and aligns with the AntClim21 goal of improving projections to 2100 (Theme 3).
 - Lee et al. (Nature, 2017, doi: 10.1038/nature22996)
 - AntClim21 dependent
 - Contributes to AntClim21 goal of improved projections (Theme 3).
 - Turner et al. (Nature, 2016, doi: 10.1038/nature18645)
 - Not directly AntClim21 dependent
 - The relevance to AntClim21 is broadly similar to that of Mayewski et al. (2017) above.
 - Sime et al. (Clim. Past, 2016, 10.5194/cp-12-2241-2016)
 - Not directly AntClim21 dependent
 - Fits both with model evaluation (theme 2) and improved future projections (theme 3).
 - Turner et al. (GRL, 2017, doi: 10.1002/2017GL073656)
 - Aligns with the topic of Antarctic climate variability (Theme 1)
 - Khan et al., (GRL, 2016, doi: 10.1002/2016GL068609)
 - Not directly AntClim21 dependent
 - The relevance of black carbon/impurities in snow/ice has implications for albedo and the surface energy budget.
 - Emile-Geay, J, McKay, N., Kaufman, D., von Gunten, L., Wang, J., Anchukaitis, K., Abram, N., Addison, J., Curran, M., Evans, M., Henley, B., Zhixin, H., Martrat, B., McGregor, H., Neukom, R., Pederson, G., Stenni, S., Thirumalai, K., Werner, J., Xu, C., Divine, D., Dixon, B., Gergis, J., Mundo, I., Nakatsuka, T., Phipps, S., Routson, C., Steig, E., Tierney, J., Tyler, J., Allen, A., Bertler, N., Björklund, J., Chase, B., Chen, M., Cook, E., de Jong, R., DeLong, K., Dixon, D., Ekaykin, A., Ersek, V., Filipsson, H., Francus, P., Freund, M., Frezzotti, M., Gaire, N., Gajewski, K., Ge, Q., Goosse, H., Gornostaeva, A., Grosjean, M., Horiuchi, K., Hormes, A., Husum, K., Isaksson, E., Kandasamy, S., Kawamura, K., Kilbourne, H., Nalan, K., Leduc, G., Linderholm, H., Lorrey, A., Mikhalenko, V., Mortyn, P., Motoyama, H., Moy, A., Mulvaney, R., Munz, P., Nash, D., Oerter, H., Opel, T., Orsi, A., Ovchinnikov, D., Porter, T., Roop, H., Saenger, C., Sano, M., Sauchyn, D., Saunders, K., Seidenkrantz, M., Severi, M., Shao, X., Sicre, A.-M., Sigl, M., Sinclair, K., St George, S., St. Jacques, J., Thamban, M., Thapa, U., Thomas, E., Turney, C., Uemura, R., Viau, A., Vladimirova, D., Wahl, E., White, J., Yu, Z., Zinke,

Jens (in press), A global multiproxy database for temperature reconstructions of the Common Era, Nature – Scientific Data; SDATA-16-00169

- Not directly dependent on AntClim21, contributes to Theme 1
 - Stenni, B., Curran, M., Abram, N., Orsi, A., Goursaud, S., Masson-Delmotte, V., Goosse, H., Neukom, R., Divine, D., van Ommen, T., Steig, S., Dixon, D., Thomas, E., Bertler, N., Isaksson, E., Ekaykin, A., Frezzotti, M., and Werner, M.: (2017) Antarctic climate variability at regional and continental scales over the last 2,000 years., Climate of the Past Discussions, cp-2017-40, Special Issue: Climate of the past 2000 years: global and regional syntheses
 - Not directly dependent on AntClim21, contributes to Theme 1
 - Thomas, E., van Wessem, M., Roberts, J., Isaksson, E., Schlosser, E., Fudge, T.J., Vallelonga, P., Medley, B., Bertler, N., and Dixon, D. (2017): Review of regional Antarctic snow accumulation over the past 1000 years. Climate of the Past Discussions, cp-2017-18, Special Issue: Climate of the past 2000 years: global and regional syntheses
 - Not directly dependent on AntClim21, contributes to Theme 1
- Tom Bracegirdle contributed to the 2017 update of the Antarctic Climate Change and the Environment (ACCE) Report, which is an important outreach activity.

Significant Deviations from the Implementation Plan, if any:

None identified.

Steps taken to address individual points from your External Review, if any:

We have made steps to address the following recommendations, as outlined below:

- Indicate which achievements are specifically AntClim21 and what would have happened anyway.
 - This has been indicated on the above list of outputs and deliverables
- Support for early career scientists should involve some kind of 'feed-back' to their home countries
 - This will be implemented for #GACH

- Acknowledge SCAR in publications and highlight how they advance the objectives of the programme
 - We have been encouraging acknowledgement of SCAR AntClim21, which has for example been included in the above listed papers by Mayewski et al. (2017) and Lee et al. (2017). Their relevance to the AntClim21 themes has also been indicated above.
- The aim to create user friendly access to model outputs should be well coordinated with other efforts in this sense, notably those undertaken by CMIP.
 - The #GreatAntarcticClimateHack is aiming to address exactly this point by helping to bridge the gap between climate experts and the broader Antarctic science community
- AntClim21 SC should make concrete efforts to coordinate their efforts with those of WCRP, CliC, CORDEX, and the Polar Climate Prediction Initiative (PCPI).
 - New steering committee members have been added to develop these links. Gerhard Krinner is just completing a term as Co-chair, CliC/WCRP Scientific Steering Group and Marilyn Raphael is Co-Chair of PCPI.
 - Tom Bracegirdle registered to attend a POLAR CORDEX workshop in October.
- The group should consider taking extra effort to engage scientists from nations with smaller/emerging Antarctic research programmes in their activities.
 - The #GreatAntarcticClimateHack has been made open to the community and support for participants from emerging Antarctic nations and early career scientists will be provided.
 - Specific targeted invites were sent to known contacts in emerging Antarctic nations.

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

None

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
10-17	#GACH	\$30,000	Joellen Russell	jrussell@email.arizona.edu
06-18	POLAR2018 workshop	\$15,000	Tom B	tjbra@bas.ac.uk

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

For #GACH approximately half of the funds will be dedicated to venue hire and hospitality and the other half will support travel and accommodation for participants.

For POLAR2018 the majority of the funds will be dedicated to support for travel and accommodation of participants.

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

2017: 15-20% for support of attendance at #GACH

2018: Approximately one third for support of attendance at POLAR2018

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: ~15% for support of attendance at #GACH

2018: ~20% for support of attendance at POLAR2018

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

None

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

- Tom Bracegirdle Physical Sciences Liaison Officer to Ant-ERA
- Alia Khan – SnowAnt Member
- Nancy Bertler – Member PAGES 2ka Antarctic Arrays for temperature and snow accumulation

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) (<250 words):

- Continued early-career representation on Steering Committee (Alia Khan).
 - Support attendance at workshops and conferences.
- Antclim21 Facebook Page with 1359 followers.

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.**

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	Tom	Bracegirdle	BAS	UK	tjbra@bas.ac.uk	From Oct-2016 (SC Theme Leader 2012-2016)	2020
Theme 1 leader	Paul	Mayewski	University of Maine	USA	Paul.Mayewski@maine.edu	2012	2020
Theme	Nancy	Bertler	Victoria	New	Nancy.Bertler	From Oct-	2020

[SCAR SRP Name]: 2016-2017 Annual Report, cont.

2 leader			University of Wellington	Zealand	r@vuw.ac.nz	2016 (Chair 2012-2016)	
Theme 3 Leader	Joellen	Russell	University of Arizona	USA	jrussell@email.arizona.edu	2012	2020
SC member	Marylin	Raphael	University of California	USA	Raphael@geog.ucla.edu	2017	2020
SC member	Gerhard	Krinner	CNRS	France	Gerhard.krinner@cnrs.fr	2017	2020
Early-career/APECS Rep.	Alia	Khan	University of Colorado - Boulder	USA	Alia.khan@colorado.edu	2012	2020

* Please include any APECS representative / Junior Officers

Other members

Name	Affiliation	County	Email
Goodwin, Ian	Macquarie University	Australia	ian.goodwin@mq.edu.au
Turner, John	British Antarctic Survey	UK	jtu@bas.ac.uk
Schneider, David	National Center for Atmospheric Research	USA	dschneid@ucar.edu
Birkel, Sean	University of Maine	USA	sbirke61@maine.edu
Carleton, Andrew	Pennsylvania State University	USA	amc7@psu.edu
England, Matthew	University of New South Wales	Australia	M.England@unsw.edu.au
Kang, Jung-Ho	Korea Polar Research Institute	Korea	jhkang@kopri.re.kr
Velicogna, Isabella	University of California Irvine and California Institute of Technology	USA	isabella@uci.edu
Ding, Qinghua	University of Washington	USA	qinghua@u.washington.edu
Fogwill, Christopher	University of New South Wales	Australia	c.fogwill@unsw.edu.au
Fyfe, John	University of Victoria	Canada	John.Fyfe@ec.gc.ca
Karpechko, Alexey	Finnish	Finland	alexey.karpechko@fmi.fi

[SCAR SRP Name]: 2016-2017 Annual Report, cont.

Alexey	Meteorological Institute		
Kusahara, Kazuya	Hokkaido University	Japan	kazuya.kusahara@lowtem.hokudai.ac.jp
Hellmer, Hartmut	Alfred Wegener Institute	Germany	Hartmut.Hellmer@awi.de
Larour, Eric	NASA Jet Propulsion Laboratory	USA	eric.larour@jpl.nasa.gov
Meier, Walter	NASA	USA	walter.n.meier@nasa.gov
Polvani, Lorenzo	Columbia University	USA	lmp@columbia.edu
Stevenson, Samantha	University of Hawaii	USA	slgs@hawaii.edu
Van Wessem, Melchior	Utrecht University	Netherlands	J.M.vanWessem@uu.nl
Van der Berg, Wilhelm	Utrecht University	Netherlands	w.j.vandenberg@uu.nl
Wainer, Ilana	University of Sao Paulo	Brazil	wainer@usp.br
Scherer, Reed	Northern Illinois University	USA	Reed@niu.edu
Stevens, Craig	NIWA	New Zealand	C.Stevens@niwa.co.nz
DeConto, Rob	University of Massachusetts	USA	deconto@geo.umass.edu
Bodeker, Greg	Bodeker Scientific	New Zealand	greg.@bodekerscientific.com
Comiso, Joey	NASA	USA	Josefino.c.comiso@nasa.gov
Naish, Timothy	Victoria University	New Zealand	Timothy.Naish@vuw.ac.nz
Escutia, Carlota	University of Granada	Spain	escutia@ugr.es
Catherine Ritz	LGGE	France	Catherine.ritz@lgge.obs.ujf-grenoble.fr
Pattyn, Frank	Universite Libre de Bruxelles	Belgium	fpattyn@ulb.ac.be
De Santis, Laura	University of Trieste	Italy	ldesantis@ogs.trieste.it
Pollard, David	PennState University	USA	pollard@essc.psu.edu

[SCAR SRP Name]: 2016-2017 Annual Report, cont.

Gutt, Julian	AWI	Germany	Julian.Gutt@awi.de
Chown, Steven	Monash University	Australia	Steven.Chown@monash.edu
Ferreira, David	University of Reading	UK	d.g.ferreira@reading.ac.nz
Strugnell, Jan	Latrobe University	Australia	J.Strugnell@labrobe.edu.au

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: