



Paper No: 15 Agenda item: 8.3

SCAR SG PSG

Person Responsible: David Bromwich

SCAR Delegates Report 2020

Physical Sciences Group (PSG) 2018-20 Report

Summary

Report Author(s)

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Summary of activities from 2018-20

Near-term Variability and Prediction of the Antarctic Climate System

(AntClimNow) Proposal Planning Group sponsored by PSG. Submitted its proposal to SCAR to be a Scientific Research Program on May 31, 2020.

Radio Sciences Research on AntarCtic AtmosphEre (RESOURCE). Proposal Planning Group proposal submitted March 2020.

Year of Polar Prediction in the Southern Hemisphere (YOPP-SH), partially supported by and certainly facilitated by SCAR, successfully completed its Special Observing Period, November 2018-February 2019.

Recommending termination of PACT AG (long past its wind-up date) and SnowANT AG (no activity). Remote Sensing AG requests a merge with Earth Observation AG who agrees. These are good developments as PSG has too many subgroups and reduces the budding overlap between subgroups.

Summary Budget 2019 to 2022

	2019	2020	2021	2022
	Allocated/Spent	Allocated/Spent	Request	Request
(US\$)	32,500/11,187	28,500/5,580	32,500	28,500

Progress to date

Sub-group Outcomes to date

(List all sub-groups [Expert, Action and other Groups] with one to three sentence summary of major activity or outcome)

Sub-group	Activity/Outcome
ACCE EG	Awaiting report by Peter Convey of BAS. Former lead John Turner has stepped down from SCAR responsibilities.
ANTOS EG Joint with Life Sciences and Geosciences	Very active with proposed activities. Sites established and lots of coordination meetings.
ASPeCT EG	Continuing with their underway sea-ice description database. Online workshop July-August 2020.
EO EG	Very active with meetings. Antarctic place names proposed.
FRISP EG	Annual in-person research meetings in 2018 and 2019. Online meeting in June 2020.
GRAPE EG, Joint with Geosciences	Preparation and submission of RESOURCE Proposal Planning Group, submitted March 2020. Online workshop July 2020.
IPICS EG	Working on Oldest Ice drilling initiative. Open Science Conference delayed from October 2020 to October 2021.
ISMASS EG	Online session at European Geophysical Union in May 2020 on ice sheets and sea level.
OpMet EG	Actively monitoring weather and climate observations from the Antarctic. Participating in discussions on establishing an Antarctic Regional Climate Center.
SORP EG	Very active with meetings and publications.
ACA AG	Annual in-person research meetings held in 2018 and 2019. Online session planned for 2020.
ANGWIN AG	Active with meetings.
AntArchitecture AG Joint with Geosciences	Busy with meetings, papers and research.
PACT AG	Working on papers. Needs to be wound up as long past its expiration date.
Remote Sensing AG, Joint with Life Sciences	Requests a merger with Earth Observation EG who agrees. Great development to reduce the number of groups under PSG.
SnowANT AG	Inactive.
TATE AG	Active with meetings.

Sub-group Cash Flow*(From previous Delegates meeting to date)*

Sub-group	Allocation	Amount spent		
		2018	2019	2020
ACA	2000		0	0
ACCE	4000		0	0
ANGWIN	3000		1561	0
AntArchitecture	2000		0	0
ANTOS	3600		0	0
ASPeCt	5400		0	5400
FRISP	3600		1693	180
GRAPE	4500		0	0
IPICS	6300		6300	0
ISMASS	4500		0	0
Earth Obs.	3000		0	0
OpMet	3600		756	0
Remote Sensing	2000		0	0
PACT	1000		0	0
SnowAnt	2000		0	0
SORP	3600		0	0
TATE	2000		877	0
Miscellaneous	4900		0	0

Future plans**Sub-group future plans***(List all sub-groups [Expert, Action and other Groups] with one to three sentence summary of future plans)*

Sub-group	Planned activity
ACA	Develop a database of cloud, aerosol and precipitation observations, initially as metadata.
ACCE	ACCE update paper for a refereed journal
ANGWIN	Workshop planned for 2021
AntArchitecture	Building database of englacial layers/slopes across West and East Antarctica – papers and open access repository
ANTOS	ANTOS prospectus developed describing the purpose and value of ANTOS to potential funders. Database meeting – final design and implementation.
ASPeCt	Continuing development of the ASPeCt ship-based observation system and database for sea ice measurements taken by remote vessels (airborne and under ice), ship-based instruments and surface-based instruments and sampling.
FRISP	Annual in-person research meetings will be resumed when feasible.
GRAPE	Sessions at meetings, review paper submitted, web management and updating.

Physical Sciences Group: 2018-2020 Report, cont.

IPICS	Third Open Science Conference, Switzerland, October 2021
ISMASS	Workshop on recent ice-sheet changes planned in summer/autumn 2021 in Lincoln, UK / review paper. Organizing ISMIP6 that is designed to deliver projections of the ice sheet contribution to sea level rise.
Earth Obs.	ESA Earth Obs. for Polar Science Workshop, October 2020 – Write a scientific roadmap for major science challenges in the Polar regions that can be tackled using EO data. Coordinate with an Arctic focussed team to propose a complimentary IASC EO Working Group.
OpMet	Maintain website, update READER, continue implementing an Antarctic Regional Climate Centre.
Remote Sensing	Integration of remote sensing AG into the Earth Observation Action Group.
SORP	Holding regular telecons, planning next EG meeting (SORP-14) in 2021 along with workshop on sea ice fluxes.
TATE	Workshop in Malaysia and a session in Asian Forum for Polar Science in 2021.

Sub-groups recommended for closure

(Provide full name, current leads, and brief explanation for closure)

Sub-group	Leaders	Reasons for closure
PACT AG	Andrew Klekociuk and Gennadi Milinevsky	Way past its termination date.
SnowANT AG	Ghislain Picard	Inactive
Remote Sensing AG	Osama Mustafa and Hans-Ulrich Peter	Requests merge into EO AG who agrees.

New sub-groups being proposed

(Provide full name, proposed leads, and cross-reference to establishment document)

Sub-group	Leaders	Cross-reference SCAR Delegates WP
Antarctic Subglacial Environment Exploration (ASEE) joint SCAR Expert Group (Geosciences, Physical Sciences, and Life Sciences)	Pavel Talalay	

Scientific Research Programme Planning Groups

Radio Sciences Research on AntarCtic AtmosphEre

Lead Proponents: Lucilla Alfonsi (Italy), Nicolas Bergeot (Belgium)

Contributors: Adriana Gulisano (Argentina), Fabien Darrouzet (Belgium), Eric Pottiaux (Belgium), Roeland Van Malderen (Belgium), Emilia Correia (Canada), P. T. Jayachandran (Canada), Guozhu Li (China), PR Shreedevi (ECR, China), Kirsti Kauristie (Finland), Edith Macotela (ECR, Finland), Jean Lilensten (France), Georg Heygster (Germany), Tanja Fromm (Germany), Janos Lichtenberger (Hungary), Giorgiana De Franceschi (Italy), Federica Marcucci (Italy), Federica Marcucci (Italy), Monia Negusini (Italy), Changsup Lee (ECR, Korea), Wojciech Jacek Miloch (Norway), Irina Zakharenkova (Russia), Pierre Cilliers (South Africa), Michael Kosch (South Africa), Stefan Lotz (South Africa), Mark Clilverd (UK), Iurii Cherniak (USA), Jade Morton (USA), Shasha Zou (ECR, USA).

Description:

The RESOURCE SRP aims to improve the current knowledge of the Antarctic atmosphere, also in relation to the Arctic environment in a bi-polar framework, achieved through the use of radio sensors and supported by complementary instrumentation. These measurements are obtained both through instruments principally designed for atmospheric observation and through ancillary observations extracted from other instrumentation such as magnetometers. Currently, several instruments working on radio and optical frequencies are extensively used to probe the atmosphere. These instruments include VLF, VHF, UHF, and HF active and passive devices, GNSS receivers, radio beacons, radiometers and microwave humidity sounders on satellites. Used independently and in combination, these devices have contributed significantly to the advancement of the understanding the physics of the neutral and ionized atmosphere. However, several questions remain open and need to be addressed with a synergistic approach requiring the involvement of various research groups in the field. The GRAPE Expert Group is one example of how synergy among the Antarctic sciences can be applied to gathering important scientific data for a number of applications from GNSS measurements.

While the users of radio devices often consider the atmospheric contribution to their radio measurements as a source of error that needs to be corrected, deleted, or mitigated, **atmospheric scientists who rely on radio techniques have a common interest: to isolate the atmospheric contribution and use it in the study of the near-earth space environment.**

RESOURCE aspires to such common goal to pursue three main scientific objectives:

1. To monitor the polar atmosphere
2. To investigate and better understand the polar atmosphere physics;
3. To support the sciences interested in removing the atmospheric contribution from their observations or mitigating the negative impact of atmospheric contributions to their observations.

Delegates meeting WP: *(not yet available)*

Budget

Planned use of funds for 2020 to 2022

(one row per sub-group or other activity)

Note these requests have been confused by the Covid-19 pandemic and the cancellation of the SCAR OSC in Hobart during 2020 and represent the best estimates during a time of high uncertainty. How the issue of unspent funds from 2019-2020 plays into these requests is not taken into account.

Year (YYYY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
2021-2022	ACA/Database development	3000	Tom Lachlan-Cope	tlc@bas.ac.uk
2021-2022	ACCE/Update paper	4000	Peter Convey	pcon@bas.ac.uk
2021-2022	ANGWIN/Meetings	3000	Tracy Moffat-Griffin	tmof@bas.ac.uk
2021-2022	AntArchitecture/Meetings	4000	Robert Bingham	r.bingham@ed.ac.uk
2021-2022	ANTOS/Meetings	3000	Craig Cary	caryc@waikato.ac.nz
2021-2022	ASPeCt/Meetings	5000	Marilyn Raphael	raphael@geog.ucla.edu
2021-2022	FRISP/Annual Workshop	3000	Adrian Jenkins	ajen@bas.ac.uk
2021-2022	GRAPE/Meetings	5000	Giorgiana de Franceschi	Giorgiana.defranceschi@ingv.it
2021-2022	IPICS	0	Tas van Ommen	Tas.Van.Ommen@awe.gov.au
2021-2022	ISMASS/two workshops	5000	Frank Pattyn	fpattyn@ulb.ac.be
2021-2022	Earth Obs/Meetings	4000	Anna Hogg	A.E.Hogg@leeds.ac.uk
2021-2022	OpMet/Meetings	4000	Steve Colwell	src@bas.ac.uk
2021-2022	Remote Sensing/SCAR OSC	2000	H.-U.Peter	bpe@uni-jena.de
2021-2022	SORP/Meetings	6000	Torge Martin	torge.martin@gmail.com
2021-2022	TATE/Meetings	4000	Sheeba Nettukandy Chenoli	sheeba@um.edu.my
2021-2022	Miscellaneous/ECR Activities	6000	David Bromwich	bromwich.1@osu.edu
TOTAL		61,000		

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
CO	David	Bromwich	Ohio State Univ.	USA	bromwich.1@osu.edu	2012	2020
Deputy-CO	Adriana	Gulisano	Dirección Nacional del Antártico	Argentina	adrianagulisano@gmail.com	2016	2020
Secretary	Steven	Colwell	British Antarctic Survey	UK	src@bas.ac.uk	2012	2020

Please identify early-career researchers with * in first column

Other members

See <https://www.scar.org/science/psg/contact/>

First Name	Last Name	Affiliation	Country	Email

Please identify early-career researchers with * in first column

Additional information (optional)

Please add any more detail here that you wish, on subgroup activities, papers published, etc, since the SCAR Delegates meeting in 2018.

Notable Papers

(Five to ten most notable papers – see the example below, which includes a brief statement (shaded) indicating the link to the group)

See EG and AG annual reports for notable papers.

Direct support from outside organisations received for your activities
(Numbered list with values indicated if direct cash support. Please restrict in-kind support to substantive in-kind support only)

The groups EGs and AGs under PSG receive support from a wide variety of international organizations that greatly leverage the modest funding allocated by SCAR.

Major collaborations your Science Group has with other SCAR groups and with organisations/groups beyond SCAR
(Numbered list of substantive collaborations)

Within SCAR

1. All groups within SCAR interact with PSG entities.

Outside SCAR

1. PSG EGs and AGs vigorously interact with the global scientific community.

Outreach, communication and capacity-building activities

See EG and AG annual reports for details.

SCAR Fellowship Reviewers

Please list one or more people (name and email address) from your SG who would be willing to serve as reviewers for the next few years, along with 1-3 keywords on their principal expertise.

First Name	Last Name	Email	Principal Expertise
David	Bromwich	Bromwich.1@osu.edu	Climate and weather
Adriana	Gulisano	adrianagulisano@gmail.com	Upper atmosphere
Steven	Colwell	src@bas.ac.uk	Operational Meteorology