SCAR Sub-Group	**ANGWIN**
SG	PS
Person Responsible:	Tracy Moffat-Griffin

SCAR Delegates Report 2020

Antarctic Gravity Wave Instrument Network (ANGWIN)

2018-2020 Report

Summary

Report Author(s)

Mike Taylor (Utah State University, USA)
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Tracy Moffat-Griffin (BAS, UK)
Damian Murphy (AAD, Australia)
Jose Valentin Bageston (INPE, Brazil)
Geonhwa Jee (KOPRI, South Korea)

Summary of activities from 2018-20

Our membership have presented ANGWIN related work at a range of conferences, including IUGG 2019, AGU 2019. We had contributed to convening a session at the 2020 SCAR OSC (and submitted several abstracts), submitted abstracts to COSPAR 2020 and had planned to hold our ANGWIN workshop in early 2020. However the pandemic has resulted in these 2020 events not taking place.

Key challenge – changing how we interact and continue ANGWIN work in 2020 due to the pandemic.

Major achievements – Dr Kogure, one of our ANGWIN members successfully gained a SCAR fellowship to pursue his ANGWIN work.

Upcoming activities – ANGWIN workshop 2021, session on polar field work (that can cover ANGWIN work) at BOCA-21 (IAMAS)

Summary Budget 2019 to 2022

	2019	2020	**2021**	**2022**
	Spent	Allocated	Request	Request
(US$)	$1500	$1500	$1500	$1500

Progress to date

Sub-group Outcomes Summary

Sub-group	Activity/Outcome/Benefit/Achievement
ANGWIN	Improved collaboration between Antarctic nations with data and analysis code sharing.
ANGWIN	Supporting early career scientists in our field.

Sub-group Cash Flow

We had budgets of $1500 for each 2019 and 2020. We've spent nothing so far in 2020.

Sub-group	Allocation	Amount spent		
		2018	2019	2020
ANGWIN	$1500	0	$1500	$0

Future plans

Planned activities in 2020 to 2022

Sub-group	Planned activity
ANGWIN	ANGWIN workshop 2021 at KOPRI (postponed from 2020 due to pandemic
ANGWIN	Participation at IAMAS 2021 (BOCA-21), AGU 20(?), 21, COSPAR 2022
ANGWIN	Developing an outreach package, including videos explaining what we research and its importance.

Planned use of funds for 2020 to 2022

Year (YYYY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
2020	Outreach package	$ not yet known	Dr Tracy Moffat-Griffin	tmof@bas.ac.uk
2021	Travel and subsistence for early career scientists to ANGWIN workshop	$1500	Dr Tracy Moffat-Griffin	tmof@bas.ac.uk
2022	Travel and subsistence for early career scientists to present ANGWIN work at an international/national conference	$1500	Dr Tracy Moffat-Griffin	tmof@bas.ac.uk
Total		**Min $3000**		

Any additional detail on funds usage and desired results/outcomes

We plan to use our funds to help support early career scientists to present ANGWIN related work at relevant conferences. We want to encourage as wide a participation from scientists from as many countries as possible.

For the “outreach package”, this is something we are currently discussing as our participation in conferences this year has been curtailed by the pandemic. We plan to do several videos explaining what we do, why it is important and how we gather our results. This will be a good use of our SCAR budget and will provide a means for all scientists to access SCAR ANGWIN science.

Percentage of the budget to be used for support of early-career researchers

2020:
2021: 80%
2022: 80%

Percentage of the budget to be used for support of scientists from countries with developing Antarctic programmes

We will try to overlap this by prioritising early career scientists from developing Antarctic Programmes but this may not always be possible.

Membership

Leadership

The science committee is run jointly by the following people:

Mike Taylor (Utah State University, USA)
Takuji Nakamura (NIPR, Japan)
Tracy Moffat-Griffin (BAS, UK)
Damian Murphy (AAD, Australia)
Jose Valentin Bageston (INPE, Brazil)
Geonhwa Jee (KOPRI, South Korea)

Other members

We have 98 members on our mailing list, around 1/3 of which are early career researchers. Further details can be provided on request (contact tmof@bas.ac.uk)

Additional information (optional)

Notable Papers

1. ANGWIN Journal of Geophysical Research joint special issue (Atmospheres and Space Physics) fully launched in January 2019: https://agupubs.onlinelibrary.wiley.com/doi/toc/10.1002/(ISSN)2169-8996.ANGWIN1

10 papers on ANGWIN science, an output from an earlier ANGWIN workshop.

2. EOS article: Atmospheric Gravity Wave Science in the Polar Regions, April 2019: https://eos.org/editors-vox/atmospheric-gravity-wave-science-in-the-polar-regions

A public interest piece on the research that ANGWIN does.

3. Moffat-Griffin, T. (2019) An introduction to atmospheric gravity wave science in the polar regions and first results from ANGWIN. Journal of Geophysical Research: Atmospheres, 124. 1198-1199. https://doi.org/10.1029/2019JD030247

This paper introduces the JGR ANGWIN special issue (that came about as a result of the 3rd ANGWIN workshop), it also provides an overview of ANGWIN.

4. Giongo, G. A., et al. (2018), Mesospheric front observations by the OH airglow imager carried out at Ferraz Station on King George Island, Antarctic Peninsula, in 2011, Ann. Geophys., 36(1), 253-264. https://doi.org/10.5194/angeo-36-253-2018

This work utilises instrument data from ANGWIN to study gravity wave fronts in the middle atmosphere and associates them with their likely source. Identifying gravity wave sources in different parts of Antarctica is one of the main objectives of ANGWIN.

5. Yucheng Zhao, M. J. Taylor, P. ‐ D. Pautet, T. Moffat ‐ Griffin, M. E. Hervig, D. J. Murphy, W. J. R. French, H. L. Liu, W. R. Pendleton and J. M. Russell, Investigating an Unusually Large 28 ‐ Day Oscillation in Mesospheric Temperature Over Antarctica Using Ground ‐ Based and Satellite Measurements, Journal of Geophysical Research: Atmospheres, 124, 15, (8576-8593), (2019)

This work combines data from several Antarctic sites which measure mesospheric temperature and examines an unusually large planetary wave oscillation. Understanding wave-wave interaction is an important issue if we wish to understand variations in gravity waves.

6. Emilia Correia, Luis Tiago Medeiros Raunheitte, José Valentin Bageston and Dino Enrico D'Amico, Characterization of gravity waves in the lower ionosphere using very low frequency observations at Comandante Ferraz Brazilian Antarctic Station, Annales Geophysicae, 10.5194/angeo-38-385-2020, 38, 2, (385-394), (2020)

This paper demonstrates a new technique using VLF measurements to detect gravity waves in the lower ionosphere. This technique opens up possibilities for other studies of its kind in Antarctica.

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*)

N/a

Major collaborations your Science Group has with other SCAR groups and with organisations/groups beyond SCAR

(*Numbered list of substantive collaborations*)

N/a

Outreach, communication and capacity-building activities

Upcoming ANGWIN workshop: Hosted by KOPRI, now postponed to Summer 2021 (was meant to be Spring 2020)

In 2019 ANGWIN partially sponsored two scientists to give ANGWIN related talks at International meetings:

- Dr F Mulligan to the Network for the Detection of Mesospheric Change (NDMC) meeting. The aim of this was to advertise ANGWIN to this community with whom we have some overlap scientifically.
- Dr Kogure to IUGG general assembly in Montreal. An early career scientist doing key ANGWIN research.

We are developing a set of outreach videos on our research.

Summary of research:

The importance of gravity wave activity over Antarctica and its contribution to global circulation is well known, although there is a lack of comprehensive observations in this region. Gravity wave activity over Antarctica needs to be studied in a joined up fashion, continent wide and through all levels of the atmosphere in order to fully understand their impact and to constrain modelling work. By combining our resources through broad collaboration, and standardizing our analysis techniques we can achieve this.

SCAR fellowship reviewers

Please list one or more people (name and email address) from your group 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
Tracy	Moffat-Griffin	tmof@bas.ac.uk	Expert in atmospheric gravity waves.