



SCAR Sub-Group

SG

Person
Responsible:

**Remote
sensing**
PS / LS

H.-U.Peter &
O. Mustafa

SCAR Delegates Report 2020

“SCAR Action Group on the Development of a satellite-based, Antarctic-wide, remote sensing approach to monitor bird and animal populations” 2018-2020 Report

Summary

Report Author(s)

Osama Mustafa & Hans-Ulrich Peter; Germany

Summary of activities from 2018-20

- Organizing an Action Group Meeting during the Polar2018 Conference in Davos with presentations from Colin Harris, Fritz Hertel, Roger Colominas, Christian Pfeifer, Heather Lynch & Fabian Reise
- Providing input for the Information Paper 10 of XLII ATCM (Prague 2019) “An update to the state of knowledge of wildlife responses to unmanned aerial vehicles” .
- Since 2016 Communication with the European Space Agency (ESA) resulted in a regular coverage of Antarctic coastline by Sentinel-2 every 10 days from September 2018 to April 2019.
- Organizing an Action Group Meeting during the SCAR OSC in Hobart , Joint meeting with SOOS working group CAPS (cancelled)
- Future plans: Integration of our remote sensing AG into the Earth Observation Action Group.

Summary Budget 2019 to 2022

	2019	2020	2021	2022
	Spent	Allocated	Request	Request
(US\$)	0	3000	3000	3000
		(1000 LS, 2000 PS)	Transferred from 2020*	

*Please transfer the money for 2019 and 2020 to 2021 to have the possibility to invite young scientists and scientists from developing countries for the next SCAR conference.

Progress to date

Sub-group Outcomes Summary

(Summarize the above and in each case provide your sub-group name in left hand column to assist Science Group COs in compiling their reports)

Sub-group	Activity/Outcome/Benefit/Achievement
Remote sensing	Organizing an Action Group Meeting during the Polar2018 Conference in Davos
	Providing input for the Information Paper 10 of XLII ATCM (Prague 2019)
	Communication with the European Space Agency (ESA) resulted in a regular coverage of Antarctic coastline by Sentinel-2
	Organizing an Action Group Meeting during the SCAR OSC in Hobart , Joint meeting with SOOS working group CAPS (cancelled)

Sub-group Cash Flow

(From previous Delegates meeting to date)

Sub-group	Allocation	
	2019	2020
Remote sensing (LS & PS)	0	0

Future plans

Planned activities in 2020 to 2022

Sub-group	Planned activity
Remote sensing	Organising a Meeting of the Action Group R in Hobart 2020, was cancelled, hopefully will take place in 2021
	Integration of our remote sensing AG into the Earth Observation Action Group. We are in contact/communication with Anna Hogg about the integration of the work of our AG into that newly founded group. Responsible from our side: Osama Mustafa

Planned use of funds for 2020 to 2022

Year (YYYY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
2021	Participation on the next SCAR conference	3000	H.-U.Peter	bpe@uni-jena.de
Total				

Any additional detail on funds usage and desired results/outcomes

It is necessary to transfer the money for 2019 and 2020 to 2021

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

2020:
2021: 80%
2022:

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

2020:
2021:20%
2022:

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	Hans-Ulrich	Peter	University of Jena	Germany	bpe@uni-jena.de	2013	2021
Co-Chair	Osama	Mustafa	Think	Germany	Osama.Mustafa@think-jena.de	2016	

*Please identify early-career researchers with * in first column*

Other members

First Name	Last Name	Affiliation	Countr y	Email
Andres	Barbosa	Natura/History Museum	Spain	barbosa@mncn.csic.es
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Remote Sensing: 2018-2020 Report, cont.

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Additional information (optional)

Please add any more detail here that you wish, on your subgroup activities, papers published, etc.

Integration of our remote sensing AG into the Earth Observation Action Group.

We are in contact/communication with Anna Hogg) about the integration of the work of our AG into that newly founded group. Responsible from our side: Osama Mustafa

Notable Papers

- Gonçalves, B.C., B. Spitzbart, and H.J. Lynch. “SealNet: A Fully-Automated Pack-Ice Seal Detection Pipeline for Sub-Meter Satellite Imagery.” *Remote Sensing of Environment* 239 (March 2020): 111617.
<https://doi.org/10.1016/j.rse.2019.111617>.
- Harris, Colin M., Heike Herata, and Fritz Hertel. 2019. “Environmental Guidelines for Operation of Remotely Piloted Aircraft Systems (RPAS): Experience from Antarctica.” *Biological Conservation* 236 (August): 521–531.
[doi:10.1016/j.biocon.2019.05.019](https://doi.org/10.1016/j.biocon.2019.05.019).
- Iles, David T., Heather Lynch, Rubao Ji, Christophe Barbraud, Karine Delord, and Stephanie Jenouvrier. “Sea Ice Predicts Long-Term Trends in Adélie Penguin Population Growth, but Not Annual Fluctuations: Results from a Range-Wide Multi-Scale Analysis.” *Global Change Biology*, March 19, 2020.
<https://doi.org/10.1111/gcb.15085>.
- Miranda, Vasco, Pedro Pina, Sandra Heleno, Gonçalo Vieira, Carla Mora, and Carlos E.G.R. Schaefer. “Monitoring Recent Changes of Vegetation in Fildes Peninsula (King George Island, Antarctica) through Satellite Imagery Guided by UAV Surveys.” *Science of The Total Environment*, November 2019, 135295. <https://doi.org/10.1016/j.scitotenv.2019.135295>.
- Reiser, Fabian, Willmes, Sascha, Hausmann, Ute, & Heinemann, Günther (2019). Predominant sea ice fracture zones around Antarctica and their relation to bathymetric features. *Geophysical Research Letters*, 46, 12117–12124.
<https://doi.org/10.1029/2019GL084624>
- Borwicz, A., McDowall, P., Youngflesh, C., Sayre-McCord, T., Clucas, G., Herman, R., Forrest, S., Rider, M., Schwaller, M., Hart, T., Jenouvrier, S., Polito, M.J., Singh, H., Lynch, H.J., 2018. Multi-modal survey of Adélie penguin mega-colonies reveals the Danger Islands as a seabird hotspot. *Sci Rep* 8, 3926.
<https://doi.org/10.1038/s41598-018-22313-w>
- Firla, M., Mustafa, O., Pfeifer, C., Senf, M., Hese, S., 2019. Intraseasonal variability of guano stains in a remotely sensed penguin colony using UAV and satellite. *ISPRS Ann. Photogramm. Remote Sens. Spatial Inf. Sci.* IV-2/W5, 111–118.
<https://doi.org/10.5194/isprs-annals-IV-2-W5-111-2019>
- Mustafa, O., Barbosa, A., Krause, D.J., Peter, H.-U., Vieira, G., Rümmler, M.-C., 2018. State of knowledge: Antarctic wildlife response to unmanned aerial systems. *Polar Biology* 41, 2387–2398. <https://doi.org/10.1007/s00300-018-2363-9>
- Mustafa, O., Braun, C., Esefeld, J., Knetsch, S., Maercker, J., Pfeifer, C., Rümmler, M.-C., 2019. Detecting Antarctic seals and flying seabirds by UAV. *ISPRS Ann. Photogramm. Remote Sens. Spatial Inf. Sci.* IV-2/W5, 141–148.
<https://doi.org/10.5194/isprs-annals-IV-2-W5-141-2019>
- Pfeifer, C., Barbosa, A., Mustafa, O., Peter, H.-U., Rümmler, M.-C., Brenning, A., 2019. Using Fixed-Wing UAV for Detecting and Mapping the Distribution and Abundance of Penguins on the South Shetlands Islands, Antarctica. *Drones* 3, 39. <https://doi.org/10.3390/drones3020039>
- Rümmler, M.-C., Mustafa, O., Maercker, J., Peter, H.-U., Esefeld, J., 2018. Sensitivity of Adélie and Gentoo penguins to various flight activities of a micro UAV. *Polar Biology* 41, 2481–2493. <https://doi.org/10.1007/s00300-018-2385-3>

Schwaller, M.R., Lynch, H.J., Tarroux, A., Prehn, B., 2018. A continent-wide search for Antarctic petrel breeding sites with satellite remote sensing. *Remote Sensing of Environment* 210, 444–451. <https://doi.org/10.1016/j.rse.2018.02.071>

Weimerskirch, H., Prudor, A., Schull, Q., 2018. Flights of drones over sub-Antarctic seabirds show species- and status-specific behavioural and physiological responses. *Polar Biol* 41, 259–266. <https://doi.org/10.1007/s00300-017-2187-z>

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)

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

(Numbered list of substantive collaborations)

Within SCAR

1. SOOS/ CAPS,
2. EGBAMM
3. EOAG

Outside SCAR

1. ATCM

Outreach, communication and capacity-building activities

Brief highlights of any activities undertaken since the SCAR Delegates meeting in 2018.

- Consultancy for National Scientific Antarctic Center of the Ukraine on the establishment of a drone based monitoring program of Penguin colonies and vegetation at Argentine Islands. This includes a workshop during IX International Antarctic Conference in Kiev, 12 – 16 May 2019.
- Summer school in Jena (Germany) with Russian and German students in 2019

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
Osama	Mustafa	Osama.mustafa@think-jena.de	Drones
Hans-Ulrich	Peter	bpe@uni-jena.de	Bird ecology