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SCAR SG

LS

Person Responsible:

Yan Ropert-Coudert

XXXVII SCAR Delegates Meeting  
India, September 2022

SCAR Life Sciences Group

2020-22 Report

Summary

Report Author(s)

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Summary of activities from 2020-22

Over the last 2 years the Life Sciences group has done work to help support the action and expert groups during this period of significant COVID disruption, including the reallocation of funding to help support BEPSII to fund and run a summer school, during the recent Arctic summer in Canada, as well as to help ImpACT develop an interactive map for chemical pollution in Antarctica.

During this period the leadership of the group have all come to the ends of their terms of office and as such a new leadership team was elected during the recent business meeting: Ian McDonald (CO – NZ), Natalie Pattyn (Deputy CO – Belgium/JEGHBM) and Byron Adams (Secretary – USA).

A number of groups have requested extensions: Extension of expert group EG-ABI for 6 years; Extension of action group PLASTICS for 2 years; Extension of action group ImpACT for 1 year, with unanimous approval from all members present given for all extensions. SKAG requested to become an expert group (SKEG) and this also received unanimous approval from all members present.

The group also has a proposal to formalize as a rule in the “Rules of Procedure for SCAR Subsidiary Bodies” that the LS Deputy CO is a member of JEGHBM. This would require a recommendation to the Delegates for rewording the language in section 3.4.1. as follows: “The three officers should be from different scientific disciplines within the overall discipline of the SG, and from different regions. **The Deputy Chief Officer of Life Sciences will be a member of JEGHBM, if nominee available.** Appointments must be approved by the Meeting of Delegates”. This proposal received unanimous approval from all members present.

Summary Budget 2021 to 2024

	2021	2022	2023	2024
	Spent	Allocated	Request	Request
(US\$)		\$24,500	\$24,500	\$24,500

## Progress to date

### Sub-group Outcomes to date

Sub-group	Activity/Outcome
ImPACT-AG	As with climate change, the Earth's Polar regions play a pivotal role as sentinels of global chemical pollution and the work of ImPACT continues to work to fill an important gap in the Antarctic context for the generation, collation, and communication of policy-ready advice. This task, however, is beyond the scope of a SCAR Action Group and as such development of a larger Antarctic Monitoring and Assessment Programme (AnMAP) is underway.
PLASTICS-AG	2021_Special issue of Environment International (Elsevier, IF 7.943) entitled "Plastics in Polar Regions". Guest editors (Ilaria Corsi & Elisa Bergami). This special issue includes 10 key research papers from the Plastic-AG community on plastic pollution in the Arctic and Antarctica. Contribution to the delivering of the Southern Ocean Decade Action Plan. The Southern Ocean Action Plan will, as part of the UN Ocean Decade, deliver in achieving the UN Agenda 2030 and its Sustainable Development Goals in a polar context.
SKAG	Since 2020 SKAG has developed to an established body to transfer krill science which is important for management into CCAMLR and beyond such as the new established Science Industry Forum (SIF) and NGOs like WWF and PEW. In addition, SKAG has a close interaction with, and provides input to, the existing SCAR group Integrating Climate and Ecosystem Dynamics in the Southern Ocean - ICED, by performing joint workshops and papers, which greatly enhanced the opportunities for the ECRs to connect with peers and experts internationally and nurture collaboration. The role of SKAG as prime source for providing information on krill biology and ecology and as a conduit to facilitate collaboration becomes even more important in understanding and managing the SO ecosystem and its fishery in the changing environment.
BEPSII-EG	As an outcome of a 3-day side meeting of the POLAR2018 conference, the BEPSII community published a paper describing a policy-oriented position analysis on the future of Arctic sea-ice biogeochemistry and ice-associated ecosystems (Lannuzel et al. 2020, <i>Nature Climate Change</i> ). Publication of a synthesis paper on the role of sea ice in supporting ecosystems and ecosystem services (N. Steiner et al. 2021, <i>Elementa Science of the Anthropocene</i> ). Initiation of a joint BEPSII-CATCH (Cryosphere and Atmospheric Chemistry) SCOR working group aiming to improve our understanding and model parameterizations of biogeochemical processes in ocean - sea-ice - atmosphere systems. Nov. 2021.

SCAR Life Sciences Group: 2020-22 Report, cont.

<p>EG-ABI</p>	<p>The SCAR/rOpenSci collaboration. rOpenSci is a non-profit initiative that promotes open and reproducible research, by developing and promoting R software tools that lower the barriers to working with scientific data sources, creating social infrastructure through a welcoming and diverse community, and building the capacity of software users and developers. EG-ABI started collaborating with rOpenSci in 2017. During 2021 and 2022, EGABI has been working with the SCAR ImPACT (persistent organic pollutants) group (CI Susan Bengtson-Nash) to collate data on POPs in the Southern Ocean, and build an interactive web application for researchers to visualise this data. This app is in an early but operational form. On the basis of this work, we reached out to the Plastic action group (Ilaria Corsi) to extend this work to a similar app for microplastics. This work is anticipated to be completed in late 2022 or early 2023.</p> <p>Spatial modelling. A number of groups in the SCAR community are developing and applying methods for spatial biodiversity modelling, including species distribution and habitat selectivity models. Given the wide applicability and interest in these techniques, EGABI is working to improve collaboration within the community by helping with communication, access to software and data, and sharing of expertise. EGABI will engage researchers within the community with an interest in spatial modelling to establish project need, scope and format.</p>
<p>ANTOS-EG</p>	<p>Invited Talks. During the pandemic and series of global lockdowns meetings continued to be held on-line. Over this period of time ANTOS continued to get the word out that a biology centric monitoring initiative was developing that would provide the guidance and hopefully support the establishment of cross continent integrated climate monitoring network. Members of the committee presented invited talks at four conferences including one seeking to develop a similar system across the sub-Antarctic – Sub-ANTOS.</p> <p>Technical Manual Development – the central spine of ANTOS is to design and install 25 dedicated monitoring nodes in or near per-selected biological sentinel sites. The key quality of these nodes is that the monitoring hardware is identical – every parameter being measured is measured in the same way at every sentinel site in both the terrestrial and marine systems. To achieve this, we needed to find a vendor that could develop the off-shelf capability and supply the equipment with a detailed manual of operation. After almost three years of exploring options, we found a vendor in Canada (Hoskins Scientific), who, with continued input from ANTOS, has developed three scalable monitoring systems (Tier 1-3)</p>

SCAR Life Sciences Group: 2020-22 Report, cont.

	<p>for both near-shore and terrestrial deployment and their respective manuals.</p>
<p>SO-CPR EG</p>	<p>We have completed over 20 CPR tows during the 2020/21 and 2021/22 Antarctic field season. Due to the influence of COVID-19, each country reduced the Southern Ocean research, so the number of towing was about half of the normal level.</p> <p>As a task of the EG-CPR of ten years, we published a special report on the “Status and Trends of Southern Ocean Zooplankton” to SCAR Britten in June 2021. This report brings together all information from 25 years of the SO-CPR Survey into one report. This report also identifies any trends (seasonal or long-term) in relation to changes in abundance, shifts in distribution, timing of events, or changes in composition and community composition.</p>
<p>EGBAMM</p>	<p>The RAATD program core team presented information papers on the outcomes of the study for ATCM and CCAMLR to facilitate their spatial management planning decisions. One additional paper was published (Reisinger, R. R., et al. (2022). "Predator-derived bioregions in the Southern Ocean: Characteristics, drivers and representation in marine protected areas." Biological Conservation 272: 109630. The RAATD dataset has also been used by other members of the SCAR community and forms the basis of several presentations at this year's OSC. There is on-going demand for EG-BAMM to coordinate tag and band re-sights. This year we continued to circulate photos to the broad EG-BAMM membership we were able to successfully identify the individual animals. This is an important scientific and also outreach activity, as often the re-sights are made by members of the public. Due to increasing demand for this capacity and the time constraints it imposed on the group, it has been proposed to develop an on-line tag re-sight portal as part of the EG-BAMM website. Following the COVID-19 pandemic, the WG quickly began to work on a risk assessment about the probability of infection of SARS-COV-2 to Antarctic wildlife. This activity was included in the SCAR COVID-19 project with the Working Package 6 “Antarctic Wildlife”. The work concluded in a paper published in the journal Science of Total Environment 755: 143352. In addition, the conclusions of this work were spread to several organizations as SCAR, COMNAP, IAATO and an Informative Paper was presented to the Antarctic Treaty Meeting in 2021. Finally, a video about the risk assessment was upload in the SCAR Youtube channel. The guidelines outlined in the paper for preventing the spread of SARS_CoV_2 to wildlife was incorporated into the IAATOs regulations and will again be employed this season.</p>

## SCAR Life Sciences Group: 2020-22 Report, cont.

JEGHBM	JEGHBM developed, distributed and is in the process of updating a paper on COVID including options for NAPs to address prevention, isolation, evacuation, and treatment. JEGHBM membership are in discussion with respect to the WHO announced Monkeypox public health emergency. JEGHBM membership were consulted and supported a range of medical challenges including evacuations from the ice. A session on extreme medicine off the grid, Antarctica to Outerspace was well received at the annual meeting.
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### Sub-group Cash Flow

(Since previous report to Delegates in 2020)

Sub-group	Allocation	Amount spent		
		2020	2021	2022
ImPACT-AG			\$14,305	
PLASTICS-AG			\$1,000	
SKAG			\$2,000	
BEPSII-EG	\$4,000		\$ 2000	\$10771
EG-ABI			\$820	
ANTOS-EG		0	0	0
SO-CPR EG		0	0	0
EGBAMM				
JEGHBM				

## Future plans

### Sub-group future plans

Sub-group	Planned activity
ImPACT-AG	Antarctic Monitoring and Assessment Programme (AnMAP) implementation was an explicit foundation goal of ImPACT, hence there is unresolved uncertainty surrounding the ideal path forward for the ImPACT Action Group. In light of this, the group is seeking an interim extension of 1 year to resolve AnMAP and ImPACT transition and placement within the SCAR framework.
PLASTICS-AG	Preparation of a perspective paper focusing on SO plastic research priorities, gaps and challenges in the context of SO decade Action plan. Contribute to an up-to-date and open access online interactive map resource on contaminants (POPs and microplastics) in the Antarctic environment, in collaboration with ImPACT AG. Organization of the 2nd SCAR PLASTIC AG Workshop (scheduled to take place in Siena (Italy) in 2023 hosted by the University of Siena, Department of Physical, Earth and Environmental Sciences). Expected in Spring 2023. Requested to extend the AG for a further 2 years in order to achieve all scheduled activities (which have been

SCAR Life Sciences Group: 2020-22 Report, cont.

	delayed by COVID), particularly as there are a number of projects and ideas in progress.
SKAG	Proposal to continue the work of SKAG as SCAR Krill Expert Group in 2023. An application is submitted to the heads of the Life Science Group.
BEPSII-EG	An updated synthesis on the sea-ice carbon pump (BEPSII carbon cycle experts, led by Sebastien Moreau (Norway), in preparation). A policy-oriented position analysis “Antarctic sea-ice change: Biogeochemical and Ecological Consequences” (Klaus Meiners et al. Australia). Preparing for a joint BEPSII-CATCH field campaign in the Antarctic to assess biogeochemical exchange processes between ocean, sea ice and the atmosphere. Collaborative effort within the new Clce2Clouds working group.
EG-ABI	EGABI has reached the end of its current term. However, it is clear that the need for data-focused science tools and capabilities continues to grow at a rapid pace. The various EGABI projects that are underway and the potential for continued, valuable community outputs means that EGABI is extremely well placed to continue to lead and assist the Antarctic science community in this area. We therefore request a renewal of the group for an additional 6 year term.
ANTOS-EG	ANTOS prospectus developed describing the purpose and value of ANTOS to potential funders. Database meeting – final design and implementation – bring online all current ANTOS installations. Multiple workshops to finalise drafts of ANTOS terrestrial and marine protocol, guideline, and technical manuals (2020-2023). These will be reviewed by the community before final versions are released (by Feb 2024).
SO-CPR EG	Our important future task for maintaining high quality data is developing and enhancing the skills of current and new technicians. We have held standards workshop by technicians from each country every two years, but due to the influence of COVID-19, we have not been holding them for the past three years. It is difficult to hold online because we need to actually observe the sample. We are planning to hold a workshop in 2023. The purpose of the workshop is to ensure that high standards of data quality are being maintained, in terms of species identification and methodology, among the main analysts of the SO-CPR survey, and to discuss future training methods and a future roadmap for the SO-CPR programme. We also aim to publish SO-CPR processing manuals and zooplankton counting rulebooks for the purpose of training for new technicians.
EGBAMM	A new leadership team has been nominated and after approval from the SCAR Delegates will commence at the OSC in 2022. The new leadership team is: Michelle La Rue (CO – NZ), Ryan Reisinger (Deputy CO – UK) and Manuela Basso (Secretary – Brazil).
JEGHBM	

**Sub-groups recommended for closure**

Sub-group	Leaders	Reasons for closure
None		

**New sub-groups being proposed**

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

Sub-group	Leaders	Cross-reference SCAR Delegates Paper
SKEG	Bettina Meyer and So Kawaguchi	2022_New_Group_Proposal_SCAR_Krill_Expert_Group_300622

**Budget**

**Planned use of funds for 2022 to 2024**

	2023 (requested)	2023 (allocated)	2024 (requested)	2024 (allocated)	End Date*
IMPACT	\$2,500	\$2,000	0	0	2022 (2023)*
PLASTICS	\$2,800	\$2,000	\$2,800	\$2,500	2022 (2024)*
SKAG (SKEG)	\$5,000	\$2,000	\$5,000	\$3,000	2022 (2028)*
BEPSII	\$4,000	\$2,000	\$4,000	\$3,000	2026
ABI	\$2,000	\$2,000	\$2,000	\$2,000	2022 (2028)*
ANTOS	\$8,000	\$2,000	\$8,000	\$4,000	2024
SO-CPR	\$3,000	\$2,000	0	0	2024
EGBAMM	\$3,000	\$2,000	\$3,000	\$2,000	2026
JEGHBM	\$2,000	\$2,000	\$2,000	\$2,000	Open
Life Sciences	\$8,000	\$6,500	\$8,000	\$6,000	
<b>Total requested</b>	<b>\$40,300</b>	<b>\$24,500</b>	<b>\$34,800</b>	<b>\$24,500</b>	

\*End dates in bracket reflect requested extensions or moves to EG.

Life Sciences has requested more funds in 2023 to facilitate satellite meetings of Action and Expert Groups at SCAR Biology 2023, and funding for 2024 is associated with the costs of attending the SCAR OSC.

## Membership

### Leadership

Role	First Name	Last Name	Affiliation	Country	Primary Language	Email	Date Started
CO	Yan	Ropert-Coudert	French Polar Institute & La Rochelle University	France	French	docyaounde@gmail.com	2012
Deputy CO	Marc	Shepanek	NASA	USA	English	marc.a.shepanek@nasa.gov	2010
Secretary/New CO	Ian	McDonald	University of Waikato	New Zealand	English	i.mcdonald@waikato.ac.nz	2016/2022
New Deputy CO	Nathalie	Pattyn	Vrije University Brussel	Belgium		npattyn@vub.ac.be	2022
New Secretary	Byron	Adams	Brigham Young University	USA	English	Byron_adams@byu.edu	2022

*(Please identify early-career researchers with \* in first column)*

### Other members

See the list of members at <https://www.scar.org/science/lsg/contact/>

## Additional information (optional)

### Notable Papers

Caruso G., Bergami E., Singh, Corsi I. 2022. Plastic occurrence, sources and impacts in Antarctic environment and biota. *Water Biology and Security*, 1, 100034. <https://doi.org/10.1016/j.watbs.2022.100034>.

This review paper provides a state of the art on plastic occurrence, sources and impact on the Antarctic environment. It was the outcome of the 2021 activities of the AG.

Buckingham, J. W., Manno, C., Waluda, C. M., & Waller, C. L. (2022). A record of microplastic in the marine nearshore waters of South Georgia. *Environmental Pollution*, 306, 119379. <https://doi.org/10.1016/j.envpol.2022.119379>

This work provides first information on Microplastic contamination on the waters around South Georgia.

Bergami E., Rota E., Birarda G., Vaccari L., Corsi I. 2020. Plastics everywhere: first evidence of polystyrene fragments inside the common Antarctic collembolan *Cryptopygus antarcticus*. *Biology Letters*, 16, 20200093.

This work provides the first field-based evidence of microplastics entering Antarctic terrestrial food webs. It is related to the outcomes of the Impacts Working Group of the PLASTIC-AG Workshop in Hull, October 2019.

D. Lannuzel, et al. (2020) The future of Arctic sea-ice biogeochemistry and ice-associated ecosystems. *Nature Climate change* <https://doi.org/10.1038/s41558-020-00940-4>

This paper is the outcome of a 3-day side meeting of the POLAR2018 conference and describes BEPSII's community view on the future of Arctic sea-ice biogeochemistry and ice-associated ecosystems.

L. Miller, F. Fripiat, S. Moreau, D. Nomura, J. Stefels, N. Steiner, L. Tedesco, M. Vancoppenolle (2020) Implications of sea ice management on Arctic sea ice biogeochemistry. *EOS*, 101, <https://doi.org/10.1029/2020EO149927>.

This work provides a commentary from the BEPSII community on Implications of Sea-Ice Management and geo-engineering for Arctic biogeochemistry.

Steiner, N., Stefels, J., Bowman, J. S., Castellani, G., Crabeck, O., Delille, B., Else, B., Flores, H., Fripiat, F., Lannuzel, D., Meiners, K., Miller, L., Moreau, S., Nomura, D., Tedesco, L., & Vancoppenolle, M. (2021). **BEPSII Arctic Policy Brief**. <https://doi.org/10.5281/zenodo.5595254>

This Policy Brief was drafted by the BEPSII SSC to summarise the main outcome of the above mentioned papers and was used as input for COP26.

SCAR Life Sciences Group: 2020-22 Report, cont.

Reisinger R, et al. (2021) Habitat model forecasts suggest potential redistribution of marine predators in the southern Indian Ocean. *Diversity and Distributions* <https://doi.org/10.1111/ddi.13447>

A followup paper from the RAATD project that looks at the potential shift of important southern Indian Ocean habitat under climate change scenarios.

Brooks CM, et al. (2020) Progress towards a representative network of Southern Ocean protected areas. *PLoS ONE* <https://doi.org/10.1371/journal.pone.0231361>

An analysis of the coverage of current and proposed MPAs in the Southern Ocean, considering (amongst other things) the pelagic and benthic bioregionalisation analyses that EGABI members have previously contributed to.

Van de Putte AP, et al. (2021) From data to marine ecosystem assessments of the Southern Ocean: achievements, challenges and lessons for the future. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2021.637063>

A contribution from EGABI members to the MEASO special issue, touching on informatics considerations in the context of marine ecosystem monitoring and assessment.

Meyer, B., Atkinson A., & Bernard, K., et al. 2020 Successful ecosystem-based management of Antarctic krill should address uncertainties in krill recruitment, behaviour and ecological adaptation, *Commun Earth Environ* **1**, 28. <https://doi.org/10.1038/s43247-020-00026-1>

Advances have been made in methods for analysis of seafloor community data obtained using remotely deployed cameras (see papers below). This sampling and analysis is crucial for gathering underpinning biological information that the environmental data collected using the ANTOS Tier systems supports.

Montes-Herrera, J.C., Cimoli, E., **Cummings, V.**, Hill, N., Lucieer, A., Lucieer, V. (2021). Underwater Hyperspectral Imaging (UHI): A review of systems and applications for proximal seafloor ecosystem studies. *Remote Sensing* **13**, 3451. <https://doi.org/10.3390/rs13173451>

Marini S., Federico B., Lorenzo C., Bordone A., **Schiaparelli S.**, Peirano A. (2022) Long-term Automated Visual Monitoring of Antarctic Benthic Fauna. *Methods in Ecology and Evolution*. <https://doi.org/10.1111/2041-210X.13898>

The papers listed below all are considering the impact of warming on terrestrial Antarctic ecosystems. Each of these studies either describes new approaches to understanding biological responses to predicted warming or provides foundational biological data in key locations that are likely to be considered as ANTOS sentinel sites.

Monteiro, M.R., Marshall, A.J., Hawes, I., **Lee, C.K., McDonald, I.R., and Cary, S.C.** (2022). Geochemically Defined Space-for-Time Transects Successfully Capture Microbial Dynamics Along Lacustrine Chronosequences in a Polar Desert. *Frontiers in Microbiology*. doi:/10.3389/fmicb.2021.783767

Bottos, E.M., Laughlin, D.C., Herbold, C.W., **Lee, C.K., McDonald, I.R., and Cary, S.C.** (2020.) Abiotic factors influence patterns of bacterial diversity and community composition in the Dry Valleys of Antarctica. *FEMS Microbiology Ecology*. doi:/10.1093/femsec/fiaa042

Ryan F. Heneghan, Jason D. Everett, Patrick Sykes, Sonia D. Batten, Martin Edwards, Kunio Takahashi, Iain M. Suthers, Julia L. Blanchard, Anthony J. Richardson (2020) A functional size-spectrum model of the global marine ecosystem that resolves zooplankton composition. *Ecological Modelling*. DOI: 10.1016/j.ecolmodel.2020.109265

This is the scientific paper that used our dataset for a functional size-spectrum model of the global marine ecosystem. They suggested that including zooplankton complexity in ecosystem models could be key to better understanding the distribution of fish biomass and trophic efficiency across the global ocean.

Leonie Suter, Andrea Maree Polanowski, Laurence John Clarke, John Andrew Kitchener, Brue Emerson Deagle (2020) Capturing open ocean biodiversity: Comparing environmental DNA metabarcoding to the continuous plankton recorder. *Molecular Ecology*. DOI: 10.1111/mec.15587

This work assessed whether eDNA metabarcoding could capture similar Southern Ocean zooplankton biodiversity as conventional CPR bulk sampling. They suggested that eDNA metabarcoding could become an efficient tool for monitoring open ocean biodiversity with refinement and standardization of methodology.

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

### **Within SCAR**

1. SOOS
2. ImPACT
3. AnTEco
4. ASPeCT
5. SCAR Antarctic biodiversity Portal - biodiversity.aq
6. ICED
7. The SO-CPR database is hosted by the Australian Antarctic Division Data Centre. The data are transmitted to SCAR's biodiversity.aq.

### **Outside SCAR**

1. European Polar Board (EPB)
2. International Association of Antarctica Tour Operators (IAATO)
3. Association of Arctic Expedition Cruise Operators (AECO)
4. Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
5. Energy and Environment Institute (EEI), University of Hull
6. Association of Polar Early Career Scientists (APECS)
7. SCOR working group, Floating Litter and its Oceanic Transport Analysis and Modelling (FLOTSAM)
8. Polar Educators International (PEI)

9. Sila.lu (Zero Waste Luxembourg)
10. Polar.lu (Luxembourg's Polar program)
11. Service de Coordination de la Recherche et de l'Innovation pédagogiques et technologiques (SCRIPT) from the Ministry of Education => Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse.
12. Antarctic Logistics and Expeditions (ALE)
13. Antarctic Monitoring and Assessment Programme (AnMAP)
14. SOLAS
15. CLiC
16. IASC
17. SCOR
18. CATCH
19. SOOS
20. rOpenSci, for R software development and community resources
21. CoastCarb. Kerstin Jerosch is co-leader of the CoastCarb Data Information System work package. Elements of this (particularly the online visualisation and analysis tool development) share commonalities with EGABI activities.
22. Marine Ecosystem Assessment of the Southern Ocean (MEASO)
23. Science Industry Forum (SIF)
24. Global Alliance of CPR Surveys (GACS)  
The SO-CPR Survey is a founding member of the Global Alliance of CPR Surveys (GACS). The general goal of GACS is to understand changes in plankton biodiversity at ocean basin scales through a global alliance of CPR surveys
25. Our data are transmitted to other data portals such as Ocean Biogeographic Information System (OBIS), Southern Ocean Observing System (SOOS), Global Ocean Observing System (GOOS), Atlas of Living Australia, and the data are offered to Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).
26. Arctic Monitoring and assessment Programme (AMAP) – ImPACT continues to work closely with the AMAP Secretariat and contributors for the co-design and development of AnMAP.

### **Outreach, communication and capacity-building activities**

1. June 2022: Projects funded by the Italian National Program of Antarctic Research on plastics (SCAR LS Italian delegates meeting).
2. June 2022: Show case and talk “The fate of microplastic in the Southern Ocean” for CHANEL delegates.
3. May 2022: Show case and talk “Source of plastic pollution in Antarctica” for BERRY GLOBAL delegates.
4. May 2022: Microplastics in Antarctica (Dialogos Antarticos, Conferencia Italian Embassy in Uruguay, Las investigacion cientifica en las bases de Italia y Uruguay).
5. May 2022: Pint of Science, synergistic impact of microplastic and other pollutant in the Southern Ocean
6. March 2022: Ocean Decade laboratory Activity, talk-PLastic Pollution in Southern Ocean: a global outlook in the context of the UN Ocean Decade

## SCAR Life Sciences Group: 2020-22 Report, cont.

7. October 2021: participation to the Ice Worlds Festival of Polar Science. National Maritime Museum Greenwich, London (public outreach)
8. September 2021: The plastic human footprint in Antarctica. (European Researchers' Night at the Italian Antarctic Museum, Siena)
9. May 2021: The Emerging Issue of Plastic Pollution in Antarctica. Contribution to the project "Antarctic Resolution", edited by Giulia Foscari/UNLESS, Lars Müller Publishers, pp. 992.
10. May 2021: Plastics in polar environments: main findings and ongoing studies of the 4 years PLANET project in Antarctica. SETAC Europe 2021.
11. March 2021: The SCAR Plastic in Polar Environments Action Group: International cooperation on plastic pollution at the poles (International Symposium on Plastic in the Arctic and the sub-Arctic region).
12. September 2020: Environment and microplastics: news from Antarctica. ESOF EuroScience Open Forum 2020 (CERIC-ERIC invited talk).
13. September 2020: Together for the environment. Public awareness project promoted by the Italian Income Revenue Authority (Emilia-Romagna region: invited talk).
14. ANTOS presented at the APECS Workshop SCAR 2020 - Logistical Collaborations. Aug 13<sup>th</sup>, 2020. Invited talk
15. In March 2021 we held an online EGABI information session
16. In October 2021 a workshop took place in collaboration with CESAB, to look at follow up projects to RAATD.
17. Communication and outreach in SKAG are organised by ECRs\* who are represented in our board (Kim Bernard, Ryan Driscoll\*, Zephyr Sylvester\*). They created the SKAG Newsletter "The KRILL Reader" which is published biannually and the SKAG logo. In addition, ECRs from SKAG and ICED organised the joint ICED-SKAG modelling workshop in May 2021 and the ECR sessions at our annual SKAG workshop.
18. Over the last decade, EG-CPR has conducted numerous training workshops in Australia, Japan, New Zealand, UK, Brazil, and South Africa. A standardisation workshop for the current team of SO-CPR analysts was held on December 2018 to confirm that consistent and high standards of species identification, methodology, and data quality were being maintained amongst the main analysts in the SO-CPR Survey. Small training sessions have been conducted for those participating in Australia's and Japan's Antarctic programme.
19. Act Now – Legacy and Emerging Contaminants in Polar Regions (attendance by Rainer Lohmann, Susan Bengtson Nash, Pernilla Bohlin Nizzetto)
20. AMAP workshop on remote vs. distant sources (attendance by Rainer Lohmann, Susan Bengtson Nash, Pernilla Bohlin Nizzetto, Simonetta Corsolini, Nicoletta Ademollo and Zaneta Polkowska)

### **Contributions to equality, diversity, and inclusion (EDI)**

All groups within Life Sciences specifically target the inclusion of ECRs in their group activities and support them to attend meetings and workshops.

## SCAR Fellowship Reviewers

First Name	Last Name	Email	Principal Expertise
Ian	McDonald	i.mcdonald@waikato.ac.nz	Microbial ecology, bioinformatics, geothermal
Yan	Ropert-Coudert	Yan.ropert-coudert@cebc.cnrs.fr	Seabirds and marine mammals ecology