NERC update for UKNCAR – June 2024

Strategic Science

Highlight Topics:

- Highlight topics is in its tenth year and therefore considered an appropriate time to review the scheme. As such there will be no call for highlight topic ideas this year.
- Funding opportunity for the tenth Highlight Topic funding round is live, with a closing date of 9 October 2024. Topic B is marine-based ice sheet contributions to past, present and future sea-level rise.

Big Ideas pipeline

The NERC Big Ideas pipeline remains available as a means of identifying larger scale challenges that require substantial environmental research to be addressed. A Big Idea should be compelling, ambitious and targeting a solution that requires research bigger than the scale and scope possible within a single research grant (more than £4 million) and collaborative working across disciplines and sectors is encouraged. Big Ideas can be submitted via an online form and further information can be found on the NERC website.

Other active NERC polar research programmes: (more information available if interested)

- International Thwaites Glacier Collaboration (ITGC)
- Sensitivity of the West Antarctic Ice Sheet to 2 Degrees Celsius of Warming (SWAIS2C)

Other areas of interest and investment

Digital environment:

- The NERC Digital Strategy was published in 2021 and is being publicised at both internal and external events where appropriate.
- The second NERC Digital Gathering event will be held 11 and 12 September 2024. Its being held in Manchester and is being co-ordinated with the Digital Solutions team. The event will bring together our research community to highlight the increasing role of digital technologies in environmental research. This includes spotlighting the outcomes from NERC-funded research, the ongoing work of the Environmental Data Service, and industry experts including IBM and Microsoft.
- JASMINx: Funded through the UKRI Digital Research Infrastructure Fund, this programme is providing a major upgrade to the existing JASMIN HPC infrastructure and a consultancy to understand cross-UKRI needs and requirements for JASMIN going forward. This funding has now been awarded for spend in FY 2022-23 and 2023-24 and is on track. A new JASMIN Programme Board has been set up to provide advice and steer in strategic matters. The JASMINx project finished at the end of March 2024 and a final report has now been submitted to the NERC. An additional UKDRI Phase 2 proposal has been funded across the 23/24 and 25/25 F/Years. This programme of work will build upon the outcomes of JASMINx by continuing capital investment to secure the current capability of JASMIN to maintain services to the current user community and as a foundation for future expansion. The project will also explore future evolution of the capabilities of JASMIN to meet requirements arising in the community and it will also build on previous studies to develop collaboration with additional user communities. The Programme Board has met 3 times so far, the next meeting will be held in August.
- The Environmental Data Service (EDS), which includes the NERC Polar Data Centre, was awarded £1M (with a potential for a further £500K in 25/26) from the UKRI Digital Research Infrastructure Fund to enhance data service provision for data flows from sensor networks. The programme aims to develop functional sensor data pipelines for active use cases thus demonstrating the capability.
- UKRI AI CDT call closed on 13 July 2023. The aim of the CDT is to deliver high quality, cohort-based doctoral training in the applications and implications of novel and existing AI technologies. Funding decision was made in autumn 2023 (https://www.ukri.org/what-we-do/how-we-work-in-ai/ukri-artificial-intelligence-centres-for-doctoral-training/ and https://www.ukri.org/news/ukri-invests-in-the-next-generation-of-ai-innovators/) to award £117m for 12 new CDTs based at 16 universities. NERC is leading on the relationship with the 'Intelligent Earth' (Oxford) and 'AI for Sustainability' (Southampton) CDTs on behalf of UKRI.

- Natural Environment Digital Twins: NERC, in partnership with the Met Office, has recently awarded a total of £2.8m in funding to 5 projects to develop digital twins of the ocean, ocean glider observations, operational flight of a research aircraft, water-related hazard forecasting and wave overtopping (https://www.ukri.org/news/digital-twin-projects-to-transform-environmental-science/?utm_medium=email&utm_source=govdelivery). All projects within this Programme have commenced successfully and are due to end in Spring 2025.
- Innovation in Environmental Monitoring: 13 projects (£7m) have been funded under the funding opportunity in partnership with Defra, and as part of a wider programme of activity also with IUK (£13m in total). Successful projects have been announced for the NERC-led calls, IUK-led projects are due to be announced soon.
- Tools for Automated Image Analysis for biodiversity monitoring is a £3.6m programme which kicked off on 28 February 2024. 5 projects were awarded in supporting AI for biodiversity monitoring, Adding depth to camera trap analyses, Federated Learning Optimised for Remote Assessment of Species in Agricultural Grassland Ecosystems, Decentralised Learning for automated image analysis and biodiversity monitoring, and Using artificial intelligence for automated habitat assessment.
- A NERC Earth Observation workshop will take place at BAS in Cambridge on 1st July 2024. The event bring together experts from a range of domains and disciplines to explore the future opportunities posed by contemporary and future EO technologies to transform environmental science within the next ten years.
- UKRI Digital Research Technical Professional Skills NetworkPlus – A £9.5m programme which NERC is administering on behalf of UKRI which directly contributes to the wider UKRI Digital Research Infrastructure programme. The NetworkPlus awards will bring together disciplines, sectors, and domains to address cross-cutting challenges related to digital RTP skills and careers. Closing date for applications is 2nd October 2024.

Research Facilities in the NERC portfolio:

- Following a scoping process to look across its Scientific Support and Facilities (S&F) portfolio, NERC has recommissioned seven facilities from 1 April 2024 to 31 March 2031 managed by the British Geological Survey (BGS), National Centre for Earth Observation (NCEO) and National Centre for Atmospheric Science (NCAS). Researchers interested in using NERC S&F should continue to contact the relevant facility to discuss their research proposal. £70m for environmental research facilities and equipment – UKRI

- NERC funds a range of research facilities and large research infrastructures, many of which are directly relevant to this community, all of these can found here.

Other relevant news:

- Pushing the Frontiers: The latest round of Pushing the Frontiers is open and closes 17 July 2024.

- Renewal scheme for current Future Leaders Fellows: Successful applicants to the Future Leaders Fellowships scheme have the opportunity to extend their four-year fellowship by up to a further three years. Current submission window opened on 24 April and closes 11 July 2024.

- Delivering training courses for environmental scientists 2024 : opportunity to apply for funding to deliver short training courses within the NERC remit, focussing on identifiable training needs. Closing date 15 October 2024.

- The Funding Service (TFS): An initial goal of the programme is to have Research Council opportunities managed end-to-end using only the new UKRI Funding Service from January 2024. To achieve this goal in a managed and controlled fashion, the programme plans for Councils to launch future opportunities using TFS, rather than the existing system, Je-S.

- New Executive Chair of NERC Louise Heathwaite now in post

- Director of Research and Skill has left NERC and Tracy Shimmield has been appointed interim Chair, starting in July.

Number of proposals classifed as over 50% polar south under each scheme and high level classification

	2013		2013 Total	2014		2014 Total	2015		2015 Total	2016		2016 Total	2017		2017 Total	2018		2018 Total	2019		2019 Total	2020		2020 Total	2021		2021 Total	2022		2022 Total	2023		2023 Total	2024		2024 Total	Grand Total
	N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		
Fellowship	**1**	**2**	**3**	**5**		**5**	**7**		**7**	**2**	**2**	**4**	**3**		**3**	**4**	**1**	**5**	**7**	**1**	**8**	**6**	**1**	**7**	**7**		**7**	**4**		**4**							**53**
Atmospheric				1		1	2		2				2		2				1		1	1		1	1		1	1		1							9
Earth																			1		1	3		3	2		2	2		2							8
Marine	1	2	3	4		4	4		4	1	2	3	1		1	3	1	4	5		5	1	1	2	3		3	1		1							30
Terrestrial							1		1	1		1				1		1				1		1	1		1										6
Large		**3**	**3**				**9**		**9**	**5**		**5**								**7**	**7**		**1**	**1**										**1**	**1**	**2**	**27**
Atmospheric							3		3																												3
Marine		3	3				1		1	5		5								7	7		1	1										1	1	2	19
Terrestrial							5		5																												5
Research Programmes	**2**	**4**	**6**	**1**	**3**	**4**	**1**	**1**	**2**	**8**	**17**	**25**	**2**	**5**	**7**	**5**	**13**	**18**	**8**	**17**	**25**	**18**	**5**	**23**	**3**	**9**	**12**	**25**	**4**	**29**	**6**	**8**	**14**		**1**	**1**	**166**
Atmospheric	2		2	1		1					3	3				1		1		5	5				1		1	4		4							17
Earth		2	2		2	2					2	2		1	1	1	9	10	1	3	4	3		3	1	1	2	2	2	4	2		2				32
Freshwater											1	1										12		12				1		1		1	1				15
Marine		2	2				1	1	2	8	10	18	1	4	5		2	2	7	8	15	2	5	7	1	8	9	18	2	20	8	1	9		1	1	91
Terrestrial					1	1					1	1	1		1	3	2	5		1	1	1		1								1	1				11
Standard RM	**27**	**9**	**36**	**68**	**5**	**73**	**35**	**5**	**40**	**22**	**1**	**23**	**11**	**4**	**15**	**15**	**2**	**17**	**19**	**4**	**23**	**25**	**4**	**29**	**9**	**2**	**11**	**2**	**4**	**6**							**273**
Atmospheric	8		8	10		10	6	2	8	3		3	4	1	5	5		5	2		2	1	2	3		1	1										45
Earth	9	3	12	17	5	22	3	1	4	3		3	1	1	2	4	1	5	3	1	4	5		5	1		1										58
Freshwater				3		3	2		2	1		1		2	2							1		1													9
Marine	10	6	16	30		30	21	2	23	7	1	8	6		6	6	1	7	13	1	14	16		16	8	1	9	2	4	6							135
Terrestrial				8		8	3		3	8		8							1	2	3	2	2	4													26
Grand Total	**30**	**18**	**48**	**74**	**8**	**82**	**52**	**6**	**58**	**37**	**20**	**57**	**16**	**9**	**25**	**24**	**16**	**40**	**34**	**29**	**63**	**49**	**11**	**60**	**19**	**11**	**30**	**31**	**8**	**39**	**10**	**1**	**11**				**519**

Number of proposals classifed as less than 50% polar south under each scheme and high level classification

	2013		2013 Total	2014		2014 Total	2015		2015 Total	2016		2016 Total	2017		2017 Total	2018		2018 Total	2019		2019 Total	2020		2020 Total	2021		2021 Total	2022		2022 Total	2023		2023 Total	2024		2024 Total	Grand Total
	N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		N	Y		
Fellowship	**6**		**6**	**6**	**2**	**8**	**2**	**1**	**3**	**5**	**1**	**6**	**3**	**2**	**5**	**4**	**1**	**5**	**3**		**3**	**1**		**1**	**5**	**3**	**8**	**4**		**4**							**49**
Atmospheric	3		3	2	1	3				1	1	2	1		1	2	1	3	2		2				3	2	5	1		1							20
Freshwater													1		1							1		1	1		1										3
Marine	3		3	2	1	3	2	1	3	3		3	1	2	3	2		2	1		1				1	1	2	3		3							23
Terrestrial				2		2				1		1																									3
Large				**10**	**5**	**15**					**10**	**10**	**4**		**4**					**2**	**2**																**31**
Atmospheric				9		9																															9
Marine				1	5	6					10	10	4		4					2	2																22
Research Programmes	**4**	**5**	**9**	**1**	**2**	**3**	**5**	**31**	**36**	**10**	**11**	**21**	**1**	**4**	**5**	**5**	**4**	**9**	**7**	**7**	**14**	**6**	**9**	**15**	**1**	**1**	**2**	**19**	**5**	**24**	**8**	**5**	**13**				**151**
Atmospheric	1	4	5	1	1	2	2	29	31	1	7	8		1	1	1	1	2		3	3	2	9	11	1		1	5	1	6	1	3	4				74
Earth	2		2				1		1	1	2	3		1	1	1	1	2		2	2	1		1				4		4	1		1				17
Freshwater										1		1							1		1							3		3		1	1				6
Marine	1	1	2		1	1	2	2	4	5	2	7	1	2	3	2	2	4	4	2	6	2		2		1	1	7	4	11	6	1	7				48
Terrestrial										2		2				1		1	2		2	1		1													6
Standard RM	**7**	**4**	**11**	**18**	**1**	**19**	**13**	**1**	**14**	**10**	**3**	**13**	**7**	**11**	**18**	**6**	**3**	**9**	**9**	**2**	**11**	**6**	**1**	**7**	**4**	**1**	**5**	**2**	**4**	**6**							**113**
Atmospheric	2		2	6		6	5		5	7	1	8	2	3	5	4	1	5	6	1	7	2		2	3	1	4	1	1	2							46
Earth	3		3	6		6	2	1	3	1		1	3	1	4	1	1	2				1		1													20
Freshwater				2		2											1	1											1	1							4
Marine	2	4	6	4	1	5	5		5	2	2	4	2	7	9	1		1	3	1	4	3	1	4	1		1	1	2	3							42
Terrestrial							1		1																												1
Grand Total	**17**	**9**	**26**	**35**	**10**	**45**	**20**	**33**	**53**	**25**	**25**	**50**	**15**	**17**	**32**	**15**	**8**	**23**	**19**	**11**	**30**	**13**	**10**	**23**	**10**	**5**	**15**	**25**	**9**	**34**							**344**

Total funding awarded to proposals classified as over 50% polar south

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
Fellowship	**833,133**			**1,143,808**		**476,986**	**653,781**	**529,044**					**3,636,752**
Marine	833,133			1,143,808		476,986		529,044					2,982,972
Terrestrial							653,781						653,781
Large	**2,845,071**						**2,340,362**	**615,444**				**2,765,463**	**8,566,340**
Marine	2,845,071						2,340,362	615,444				2,765,463	8,566,340
Research Programmes	**620,987**	**77,536**	**99,111**	**5,460,687**	**1,295,861**	**6,355,439**	**5,241,823**	**1,563,221**	**4,334,384**	**2,956,820**	**2,944,115**	**552,119**	**31,850,433**
Atmospheric				662,087			3,184,386						3,846,473
Earth	527,869	64,114		278,338	52,251	3,947,515	171,762		47,073	1,138,138			6,231,478
Freshwater				514,391							105,524		619,915
Marine	93,118		99,111	3,616,409	1,243,610	1,279,780	2,204,088	1,563,221	4,287,311	1,818,682	2,638,230	552,119	19,395,678
Terrestrial		13,421		389,463		1,128,143	25,501				200,361		1,756,889
Standard RM	**3,077,584**	**1,005,351**	**1,824,799**	**298,337**	**1,866,732**	**1,368,997**	**2,113,167**	**1,371,045**	**1,067,918**	**1,573,511**			**15,567,440**
Atmospheric			953,227		628,391			701,633	417,727				2,700,978
Earth	1,191,225	1,005,351	291,024		610,108	585,987	625,099						4,308,794
Freshwater					628,233								628,233
Marine	1,886,359		580,548	298,337		783,009	458,884		650,191	1,573,511			6,230,839
Terrestrial							1,029,184	669,412					1,698,596
Grand Total	**7,376,775**	**1,082,887**	**1,923,910**	**6,902,833**	**3,162,593**	**8,201,421**	**10,349,132**	**4,078,755**	**5,402,302**	**3,598,290**	**363,815**	**363,815**	**59,620,966**

Total funding awarded to proposals classified as less than 50% polar south

Row Labels	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Grand Total
Fellowship		**509,161**	**153,697**	**206,807**	**655,288**	**567,509**			**1,920,352**	**617,394**			**4,012,813**
Atmospheric		14,864		206,807		567,509			1,129,044				1,918,223
Marine		494,297	153,697		655,288				791,308				2,094,591
Large		**2,651,887**		**5,094,736**			**1,093,291**						**8,839,914**
Marine		2,651,887		5,094,736			1,093,291						8,839,914
Research Programmes	**715,714**	**216,454**	**20,778,620**	**3,800,024**	**329,058**	**923,954**	**1,213,663**	**2,058,398**	**103,762**	**1,195,578**	**24,267,721**		**31,335,225**
Atmospheric	599,136	125,347	13,560,867	2,381,555	101,894	403,415	419,809	2,058,398		79,400	24,004,428		43,734,250
Earth				561,363	50,382	196,146	616,835						1,424,726
Freshwater											82,344		82,344
Marine	116,578	91,106	7,217,753	857,107	176,782	324,392	177,018		103,762	1,116,179	180,949		10,180,678
Standard RM	**1,294,021**	**318,754**	**411,139**	**1,319,818**	**3,379,077**	**1,896,218**	**211,249**	**501,119**	**850,216**	**1,888,345**			**12,069,956**
Atmospheric				403,379	1,157,310	632,736	146,307		850,216	638,526			3,828,475
Earth			411,139		404,137	650,360							1,465,636
Freshwater						613,122				605,888			1,219,010
Marine	1,294,021	318,754		916,439	1,817,630		64,942	501,119		643,930			5,556,836
Grand Total	**2,009,735**	**3,696,255**	**21,343,457**	**10,421,385**	**4,363,424**	**3,387,680**	**2,518,202**	**2,559,518**	**2,874,330**	**3,083,923**	**24,267,721**		**81,143,024**

UKNCAR Reporting 2024 (July 2023-Jun 2024)

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED). ICED is a regional programme of IMBeR (Integrated Marine Biosphere Research) and the Scientific Committee on Oceanic Research (SCOR) and is a SCAR Co-Sponsored programme.
2. Principal UK Researchers	Dr Nadine Johnston (Co-chair, Theme 1 Co-Lead), Dr Jen Freer (Theme 2 Co-Lead), Dr Rachel Cavanagh (Theme 3 Co-Lead). All activities below have been led/co-led or involved UK representatives of the ICED Programme, as well as SOOS, and SCAR
3. Major activities and progress since previous year involving UK personnel/infrastructure	**ICED Marine Ecosystem Assessment of the Southern Ocean (ICED-MEASO):** First Marine Ecosystem Assessment for the Southern Ocean completed. This has included a high number of UK researchers: Dr Sian Henley (U. Edinburgh); Dr Nadine Johnston, Prof. Eugene Murphy, Dr Susie Grant, Dr Simon Morley, Dr Rachel Cavanagh, Dr Huw Griffiths, Dr David Barnes, Prof Geraint Tarling, Dr Richard Philips, Dr Sally Thorpe, Dr Clara Manno, Dr Cecilia Liszka, Dr Simeon Hill, Dr Claire Waluda, Dr Gabriele Stowasser, Dr Kevin Hughes, Dr Jen Jackson, Dr Ryan Saunders, Dr Chester Sands, Dr Mike Meredith, Dr Phil Trathan, Dr Peter Ward and others (British Antarctic Survey). Outputs this reporting year include: • Marine Ecosystem Assessment for the Southern Ocean: Summary for Policymakers • Launch of the MEASO Summary for Policy Makers in Hobart, Oct 2023 ahead of SC-CCAMLR 2023 and international press releases (including a BAS press release) • Representation at the 2024 UN Oceans Conference (see below) **CCALMR Climate Change Workshop 2023** (Co-convened by R. Cavanagh) • Contributed 2 background papers SC-CAMLR-42/BG/11 and SC-CAMLR-42/BG/28 **SOOS Symposium 2023:** • Co-convened a workshop and a session– 1) Taking the pulse of the Southern Ocean: an internationally coordinated, circumpolar, and year-round mission (with A Haumann, Corney, Johnston, Heil, Sikes, Hattermann, McMahon, Meredith, Arndt, Murphy, Martin) and 2)

	'Observations to improve predictions of Southern Ocean ecosystems in the global context' (Corney, Hofmann, Green, Murphy, Johnston, Sylvester) • Delivered an ICED presentation for the closing plenary on 'Gaps and next steps for the Southern Ocean Observing System' **SCAR:** • Participated in Ant-ICON and AntClimNow meetings • SCAR Biology Symposium 2023: Delivered an ICED Presentation at EGBAMM meeting • SCAR Delegates 2023: Delivered ICED presentation and completed reporting on ICED • 5th International Polar Year (2032-2033) Interim Planning Group. Key activities include: - Attending 6 monthly online meetings - Completion of an Initial Concept Note **United Nations Decade of Ocean Science for Sustainable Development (2021-2030):** • UN Decade Collaborative Centre for the Southern Ocean Region (DCC-SOR). Key activities included; - Participation in Southern Ocean Task Force meetings to organise DCC-SOR representation at the 2024 UN Decade of the Ocean Conference, Barcelona Spain - Co-convened a satellite event at the 2024 UN Decade of the Ocean Conference: Long-term engagement in the Polar oceans: A decade of international action (Badhe, Johnston, Arndt, Henley, Xavier, Van de Putte, Elshout, Herbert, Sparrow, Mormentyn, Giron, Corney, Cavan) - Presented a poster on the DCC-SOR at the 2024 UN Decade of the Ocean Conference **ICED-SKEG Krill Modelling work:** ICED and SKEG co-convened a session (led by ERCs Bahl & Bahlberg, & with Johnston, Corney and Kawaguchi) 'Session 14: The role of zooplankton (including Antarctic krill) in Southern Ocean ecosystems in a changing world: Integrating across scales, disciplines, and methods' at the 7th International ICES-PICES Zooplankton Production Symposium 2024, Hobart, Australia.
4. Major future initiatives and actions involving UK personnel/infrastructure	**Publish outputs from the ICED Krill Modelling Workshop**, May 2022: ECR led Papers (and involving UK scientists) on; ○ 1 - Overwintering and recruitment in sea ice environments (led by Alexis Bahl, Canada and Dominic Bahlburg, Germany)

	○ 2- Modelling sea ice –krill recruitment (led by Zephyr Sylvester, USA and Devi Veytia, AUS) **Co-convene a session at the 2024 EU Polar Science Week** 3-6 Sep in Copenhagen, Denmark: on ' Taking the Pulse of the Southern Ocean: an Internationally Coordinated, Circumpolar, and Year-Round Mission – Antarctica InSync (Arndt, Haumann, Meijers, Du Plessis, Pithanm, Gupta, Darelius, Hattermannm, Janout, Silvano, Goldberg, Johnston, Flores, Tarling, van Opzeeland) **SCAR OSC 2024, Chile:** Participate in a SCAR-CONMAP mini-symposium 'A Promising Future for Antarctic Research: Facilitation of circumpolar initiatives through science/science support partnerships". ICED will present and participate in a panel discussion providing a perspective on the challenges of conducting circumpolar research.
5. Policy outcomes	n/a
6. Selected publications	Constable, A.J., Melbourne-Thomas, J., Muelbert, M.M.C., McCormack, S., Brasier, M., Caccavo, J.A, Cavanagh, R.D. , Grant, S.M. , Griffiths, H.J. , Gutt, J., Henley, S.F., Höfer, J., Hollowed, A.B., Johnston, N.M., Morley, S.A. , Murphy, E.J. , Pinkerton, M.H., Schloss, I.R., Swadling, K.M., van de Putte, A.P. (2023) Marine Ecosystem Assessment for the Southern Ocean: Summary for Policymakers. Online, SCAR, SCOR and IMBeR, 74 pp. 10.5281/zenodo.8359585 (= Output from ICED-MEASO) Murphy, Eugene J., Johnston, Nadine M., Hofmann, Eileen E., Phillips, Richard A., Jackson, Jennifer A. , Constable, Andrew J.. (2023) The Southern Ocean Ecosystem Affects The Entire World. *Frontiers for Young Minds*, 11. 10 pp. 10.3389/frym.2023.1089779 (Output from ICED-MEASO) SCAR. (2023). Antarctic climate change and the environment: update on recent research relevant to CCAMLR. SC-CAMLR-42/BG/11 (Background paper submission to 2023 CCAMLR Climate Change Workshop/SC-CCAMLR-42) SCAR and SCOR. (2023). Summary for Policy Makers from the first Marine Ecosystem Assessment for the Southern Ocean (MEASO) and recommendations for CCAMLR. SC-CAMLR-42/BG/28 (Background paper submission to 2023 CCAMLR Climate Change Workshop/SC-CCAMLR-42)
7. Funding awards	n/a

8. Points for discussion at UKNCAR meeting	• ICED-MEASO activities in Section 1 • UN Ocean Decade activities in Section 1 • 5th IPY activities in Section 1 • Input to CCAMLR Climate Change Workshop & SC CCAMLR 2023 in Section 1

UKNCAR Reporting 2024

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	Expert Group on Operational Meteorology in the Antarctic (OpMet)
2. Principal UK Researchers	Steve Colwell
3. Major activities and progress since previous year involving UK personnel/infrastructure	Working on an implementation plan for the World Meteorological Organisation (WMO) Antarctic Reginal Climate Centre. Having a refresh of the membership with the view to holding an online meeting to discuss future activities.
4. Major future initiatives and actions involving UK personnel/infrastructure	Continue planning for the implementation of the Antarctic Regional Climate Centre.
5. Policy outcomes	
6. Selected publications	
7. Funding awards	
8. Points for discussion at UKNCAR meeting	

1. Name of SCAR Group or Programme	AntArchitecture
2. Principal UK Researchers	Robert Bingham (University of Edinburgh; steering committee chair); Tom Jordan, Carlos Martín (British Antarctic Survey); Felipe Napoleoni (University of Edinburgh); Neil Ross (Newcastle University); Kate Winter (Northumbria University); Felix Ng (University of Sheffield); Rebecca Sanderson (PhD student, Newcastle University); Harry Davis, Clara Nyqvist (PhD students, University of Edinburgh)
3. Major activities and progress since previous year involving UK personnel/infrastructure	• The primary activity of the year has been writing a white paper outlining the need for an Antarctic radar-layers database, the potential applications, and methods for achieving it: so that our community presents a peer-reviewed mission statement to the international community. Regular readers of these annual reports may recall that this paper has been in development since 2020, but the last year, finally free from the pandemic and its impacts on competing insitutional commitments, has seen real progress: o A lead writing team of Bingham + 5 ECRs including J. Bodart (Edinburgh) and R. Sanderson (Newcastle) took ownership of the writing process. o We held two online workshops in autumn 2023 with the international community to discuss the paper's main narrative and invite multiple writing contributions. o The paper has been invited to *The Cryosphere* by that journal's editorial team. o We are on course to submit the paper (with an authorship of 54 members of the international AntArchitecture community who actively contributed) in July 2024. • Further progress has been made in tracing englacial layers across both West and East Antarctica, primarily by PhD students based at Edinburgh and Newcastle: o Julien Bodart (Edinburgh) successfully defended his PhD thesis in 2023 that had produced 3 peer-reviewed papers, and has moved to the University of Bern (Switzerland) to continue *AntArchitecture*-motivated research as part of Dr. Johannes Sutter's SNF grant CHARIBDIS: Charting Antarctic Ice Sheet evolution via the ice sheet's internal stratigraphy. o Rebecca Sanderson (Newcastle) has led further research papers on East Antarctic layer tracing as part of her PhD. o Two new PhD students, Clara Nyqvist and Harry Davis, joined Edinburgh in autumn 2023 and are respectively beginning projects to trace layers in East Antarctica's Wilkes Land and West Antarctica's Ellsworth Land. • AntArchitecture is hosting its first in-person (also hybrid) workshop since 2019 in August 2024, in connection with the SCAR OSC. The workshop is being hosted by the Centro de Estudios Cientificas, Valdivia, with organisation facilitated by their alumnus Felipe Napoleoni, who is presently based at the University of Edinburgh.

4. Major future initiatives and actions involving UK personnel/infrastructure	Our workshop in August 2024 will be used as the primary forum for planning AntArchitecture's pathway for the next 3 years – the remaining period of current Action Group status.
5. Policy outcomes	The group is not advanced enough to influence policy outcomes at this stage.
6. Selected publications **UK authors in bold**	Chung, A. and 15 others inc. **C. Martín** (2023) Stagnant ice and age modelling in the Dome C region, Antarctica. *The Cryosphere*, 17 (8), 3461-3483. https://doi.org/10.5194/tc-17-3461-2023 Goel, V.; **C. Martín** and K. Matsuoka (2024) Evolution of ice rises in the Fimbul Ice Shelf, Dronning Maud Land, over the last millennium. *Antarctic Science*, 36 (2), 110-124. https://doi.org/10.1017/S0954102023000330 **Sanderson, R.J.**; **K. Winter**, S. L. Callard, **F. Napoleoni**, **N. Ross**, **T.A. Jordan** and **R.G. Bingham** (2023) Englacial architecture of Lambert Glacier, East Antarctica. *The Cryosphere*, 17 (11) https://doi.org/10.5194/tc-17-4853-2023 To be submitted very soon … **Bingham, R.G.**, **Bodart, J.A.,** Cavitte, M.G.P., Chung, A., **Sanderson R.J.**, Sutter, J.C.R and 48 others (the AntArchitecture Consortium) Antarctica's internal architecture: Towards a radiostratigraphically-informed age–depth model of the ice sheet. *The Cryosphere*.
7. Funding awards	None over the reporting period.
8. Points for discussion at UKNCAR meeting	We have nothing to raise for discussion this year especially, but welcome any input on how UKNCAR can support our activities.

UKNCAR Reporting - IPICS

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report.

1. Principal UK Researchers	Liz Thomas, Eric Wolff, Dieter Tetzner, Jack Humby, Thomas Bauska, Rachael Rhodes, Amy King
2. Major activities and progress since previous year involving UK personnel/infrastructure	**Successful UK-ICON (Ice Core Network) workshop** 2-day workshop hosted at BAS attended by over 40 UK researchers. Included talks, posters and discussions sessions focused on community needs (drilling and analytical) and supporting early career researchers. Initiative co-funded by Quaternary Research Association (QRA) to support ECR attendance. https://www.bas.ac.uk/our-events/uk-icon/ **Brunt Ice Shelf drilling** – First successful drilling of the RIFT-TIP (Rates of Ice Fracture and Timing of Tabular Iceberg Production) project. Two cores drilled on the Brunt Ice Shelf (110 m and 37 m) to explore physical properties of the ice, including fracture and toughness. The RIFT-TIP team (Emma Pearce, Liz Thomas, Oliver Marsh (BAS), and Tom Mitchell (UCL)), are using seismic, radar, ApRES and GPS data to investigate the evolution of cracks. Four new cores will be collected in the 2024/25 season. https://www.bas.ac.uk/project/rift-tip/ **Beyond EPICA oldest ice (BE-OI)** –Drilling reached 1863.18 m, which spans the past ~ 195,000 years. UK driller (James Veale) participated in the drilling season. The ice was returned to Italy in April, and processing of the core has started at the Alfred Wagner Institute, Germany (supported by UK scientists, Jack Humby and Dieter Tetzner). BE-OI ExCom meeting in Venice, March 2024. Consortium and ExCom meeting attended by UK participants in person and virtually. The project is on track to reach bedrock next season, and plans are currently underway to decide which European labs will lead the analysis. **Successful sea ice sampling** – Several sea ice cores collected from the Weddell Sea (SDA as part of the BIPOLE cruise), and the Amundsen Sea (RV Aaron). Sea ice samples for organic analysis to support ice core sea ice reconstructions (collaboration between University of Cambridge and BAS). Project team, Siobhan Johnson, Roseanne Smith, Liz Thomas, and Chiara Giorio.

3. Major future initiatives and actions involving UK personnel/infrastructure	**Next UK led deep ice core** – A new deep ice core will be drilled on the Antarctic Peninsula starting in 2024. The NERC funded project "Sea Ice and Westerly wind in the Holocene in coastal Antarctica to better constrain CO2", aims to drill a 500 m+ ice core to cover the full Holocene (~11,000 years). UK research team – Liz Thomas (PI), Dieter Tetzner, James Veale, Jack Humby, Thomas Bauska, Rachael Rhodes. https://www.bas.ac.uk/project/siwha/ Next IPICS conference – Banff, Canada 2026 RIFT-TIPP ice core drilling 2024/25. BE-OI – ice core drilling campaigns 2024-2027.
4. Policy outcomes	
5. Selected publications	• King, Amy C.F., Bauska, Thomas K. , Brook, Edward J., Kalk, Mike, Nehrbass-Ahles, Christoph, Wolff, Eric W., Strawson, Ivo, Rhodes, Rachael H., Osman, Matthew B.. (2024) Reconciling ice core CO2 and land use change following New World-Old World contact. *Nature Communications*, 15. 9 pp. 10.1038/s41467-024-45894-9 • Grieman, Mackenzie M., Nehrbass-Ahles, Christoph, Hoffmann, Helene M., Bauska, Thomas K., King, Amy C.F. , Mulvaney, Robert , Rhodes, Rachael H., Rowell, Isobel F., Thomas, Elizabeth R. , Wolff, Eric W.. (2024) Abrupt Holocene ice loss due to thinning and ungrounding in the Weddell Sea Embayment. *Nature Geoscience*. 9 pp. 10.1038/s41561-024-01375-8 • Dalaiden, Quentin, Rezsohazy, Jeanne, Goosse, Hugues, Thomas, Elizabeth R. , Vladimirova, Diana O. , Tetzner, Dieter . (2023) An unprecedented sea ice retreat in the Weddell Sea driving an overall decrease of the Antarctic sea-ice extent over the 20th century. *Geophysical Research Letters*, 50. 12 pp. 10.1029/2023GL104666 • Moser, Dorothea Elisabeth, Thomas, Elizabeth R. , Nehrbass-Ahles, Christoph, Eichler, Anja, Wolff, Eric. (2024) Melt-Affected Ice Cores for Polar Research in a Warming World. *The Cryosphere*, 18. 28 pp. 10.5194/tc-18-2691-2024 • Thomas, E.R. , Tetzner, D.R. , Roberts, S.L., Turner, S.D., Rose, N.L.. (2023) First evidence of industrial fly-ash in an Antarctic ice core. Scientific Reports, 13. 5 pp. 10.1038/s41598-023-33849-x
6. Funding awards	(PI: A Burke) -UKRI-Norway: Figuring Out how to Reconstruct Common Era forcing of climate by VOLcanoes with novel data and modelling approaches (FORCE-VOL) [NE/Y001028/1/and NE/Y001044/1]
7. Points for discussion at UKNCAR meeting	

UKNCAR Reporting 2024

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	Southern Ocean Observing System (SOOS) Joint initiative of SCAR and SCOR
2. Principal UK Researchers	Sian Henley, Andrew Meijers, Pierre Dutrieux, Peter Fretwell, Petra ten Hoopen, Alessandro Silvano
3. Major activities and progress since previous year involving UK personnel/infrastructure	Several cruises led by UK and other national programs. SOOS Symposium in Hobart, Tasmania, August 2023. Gathered >300 scientists from across the international community to discuss state-of-the-art, progress underway and future plans. SOOS Symposium Statement here: https://soossymposium2023.au/ 4th International Ross Sea Conference, Naples, Italy, July 2023. Supported by SOOS and its Ross Sea Regional Working Group. Session co-convened by SOOS in partnership with EU Polar Board, ICED, FPA2 and Antarctica In Sync at UN Ocean Decade Conference, Barcelona, Spain, April 2024. SOOS contribution to SO-CHIC / OCEAN: ICE Southern Ocean Summer School, Corsica, France, May 2024.
4. Major future initiatives and actions involving UK personnel/infrastructure	UN Ocean Decade Coordination Centre for the Southern Ocean Region (DCC-SOR), led by SCAR with involvement from SOOS and many other organisations. Activity planned for duration of UN Ocean Decade (2021-2030). Planning is well underway for the 5th International Polar Year – SOOS represented in discussions and planning meetings by Sian Henley and Alyce Hancock. Antarctica In Sync: international coordinated field research program, 2028-29(?). SOOS involved in coordination, networking, community building and needs identification.
5. Policy outcomes	Major contribution to COP28 UN Climate Change Conference in collaboration with ICCI.

	SOOS participation in annual ATCM and CCAMLR meetings, as well as CCAMLR MPA workshop.
6. Selected publications	Henley, S. F., Cozzi, S., Fripiat, F., Lannuzel, D., Nomura, D., Thomas, D. N., Meiners, K. M., Vancoppenolle, M. et al. (2023). Macronutrient biogeochemistry in Antarctic land-fast sea ice: Insights from a circumpolar data compilation. Marine Chemistry, doi: 10.1016/j.marchem.2023.104324
7. Funding awards	Core funding for SOOS IPO is currently provided by a Hobart-based funding partnership consisting of the University of Tasmania's Institute for Marine and Antarctic Studies, Tasmanian State Government, CSIRO, Australian Antarctic Division and Australian Antarctic Program Partnership. International funding is provided by Antarctica New Zealand, Swedish Polar Research Secretariat, University of Cape Town, Turkish Polar Research Institute TUBITAK.
8. Points for discussion at UKNCAR meeting	UKNCAR vision and plans for IPY 2032-33. UKNCAR plans and involvement with Antarctica In Sync. UKNCAR involvement in plans for a potential Polar Decade 2025-35. Co-ordination of EDI initiatives across UKNCAR and exchanges with wider SCAR community.

UKNCAR Reporting 2024

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1. Name of Standing Committee, SCAR Group or Programme	SCAR EDI Action Group
2. Principal UK Researchers	Pilvi Saarikoski (BAS), Huw Griffiths (BAS)
3. Major activities and progress since previous year involving UK personnel/infrastructure	- Development of SCAR Code of Conduct - Development of activity-based Code of Conduct for SCAR community activities such as the OSC - Development of SCAR Demographic Survey for SCAR OSC 2024 (data collection for future publications) - Write-up of SCAR Demographic Survey report from past data (including 2022 OSC), paving the way for future work - Development of engagement and workshops for SCAR OSC 2024 in Pucon
4. Major future initiatives and actions involving UK personnel/infrastructure	- Delivery of engagement and workshops for SCAR OSC 2024 - Development and writing of SCAR EDI information paper for the 2025 Antarctic Treaty meeting held in Italy – outlining academic EDI literature relevant for the Antarctic research community. The aim is to support EDI conversations within the ATCM. - Collaboration with the newly established
5. Policy outcomes	- Establishing EDI as a business as usual item on SCAR ATCM update papers
6. Selected publications	- White paper outlining the work and ambitions of the SCAR EDI AG – submitted to Antarctic Affairs
7. Funding awards	n/a
8. Points for discussion at UKNCAR meeting	- UK vision for IPY: How to bring community together to co-create the vision? ***Suggested discussion in conjunction with DiPSI*** - How can the UK contribute to the SCAR information paper for the 2025 ATCM bringing together EDI literature focusing on UK Antarctic research communities – linking in with the social science / humanities communities

UKNCAR Reporting 2024

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	Scientific Research Programme on Near-term Variability and Prediction of the Antarctic Climate System (AntClimNow)
2. Principal UK Researchers	Tom Bracegirdle, co-chair Rachel Cavanagh (BAS), Steering Committee member Liz Thomas (BAS), Steering Committee member Caroline Holmes (BAS), Committee member (monthly talk organiser) Siobhan Johnson (BAS), Committee member (communications)
3. Major activities and progress since previous year involving UK personnel/infrastructure	AntClimNow (https://www.scar.org/science/antclimnow/home/) looks at current trends and prediction of near-term conditions in the Antarctic climate system on timescales of years to decades. These time scales are highly relevant across multiple disciplines and to a range of key stakeholders, whilst aligning strongly with scientific priorities identified as part of the SCAR Horizon Scan. Key aspects of progress since 2022 are: 1. Continuation of monthly science talks, which are are a successful activity for engaging membership and the wider community. 2. Over the last year AntClimNow sponsored two international workshops and co-sponsored a third workshop. Over the coming year funding one wr a. A international workshop on b. Co-sponsored a polar session ($5k USD) at the atmospheric rivers conference in Chile in October 2022, see https://cw3e.ucsd.edu/iarc2022_ars_and_polar_meteorology_and_climate/ c. Co-sponsorship of the NERC NC-International SURFEIT project kick-off meeting July 2023. d. Sponsorship of a workshop on working towards an Antarctic radiation observation network [July 2023]. e. Contributed to a CCAMLR Climate Change workshop in September 2023. 3. The membership is continuing to grow. There are now approximately 100 members with a strong international contingent and UK representation.

	4. A data stewardship and development scheme is successfully helping researchers to develop and maintain observational records of the Antarctic climate system.
4. Major future initiatives and actions involving UK personnel/infrastructure	AntClimNow will be running a science session and a workshop on extreme weather at SCAR 2024 in Pucon, Chile, in August 2024.
5. Policy outcomes	• Involvement in the September 2023 CCALMR workshop, in particular providing expertise on climate science to help inform the workshop conclusions/actions. • A working paper on Antarctic Climate Indicators was presented at the 2024 ATCM (May 2024).
6. Selected publications	1. Amory, C., Buizert, C., Buzzard, S., Case, E., Clerx, N., Culberg, R., et al. (2024). Publisher Correction: Firn on ice sheets. Nature Reviews Earth & Environment. doi:10.1038/s43017-024-00524-2 This paper draws from an online workshop funded by AntClimNow, the International Firn Workshop / Symposium held in May 2022. 2. Bracegirdle, T. J., T. Caton Harrison, C. R. Holmes, H. Lu, P. Martineaux, T. Phillips. (2023). Antarctic extreme seasons under 20th and 21st century climate change. In preparation. This paper, in preparation, is motivated by AntClimNow science aims and draws from discussions during the launch meeting in early 2021. 3. Cook, S., Nicholls, K. W., Vaňková, I., Thompson, S. S., & Galton-Fenzi, B. K. (2023). Data initiatives for ocean-driven melt of Antarctic ice shelves. Annals of Glaciology, 63(87-89), 27-32. Doi:10.1017/aog.2023.6 The AntClimNow Dataset Development and Stewardship scheme funded part of the work of the work that contributed to the NECKLACE project reported in this paper. 4. Evangelista H, Prado LF, Gorodetskaya IV, et al. The June 2022 extreme warm event in central West Antarctica. Antarctic Science. 2023;35(5):319-327. doi:10.1017/S0954102023000238 This work is highly relevant to AntClimNow. Although not directly linked to specific AntClimNow activities, it involves two authors from AntClimNow. 5. Gorodetskaya, I.V., Durán-Alarcón, C., González-Herrero, S. et al. Record-high Antarctic Peninsula temperatures and

	surface melt in February 2022: a compound event with an intense atmospheric river. npj Clim Atmos Sci 6, 202 (2023). https://doi.org/10.1038/s41612-023-00529-6 This work is highly relevant to AntClimNow. Although not directly linked to specific AntClimNow activities, it involves two authors from AntClimNow. 6. Heil P, Stevens C, Lee WS, Eayrs C, Shin HC, Alexander SP and Rack W (2023) Bridging the gap for ice–ocean–ecosystem processes: integrated observing system for the Ross Sea-far East Antarctic Region. Front. Mar. Sci. 10:1206119. doi: 10.3389/fmars.2023.1206119 The ideas in this minireview were informed by a number of project teams including AntClimNow and SOOS. 7. Hughes, K., Cavanagh, R., & Convey, P. (2022). Advancing Antarctic climate change policy: Upcoming opportunities for scientists and policymakers to work together. Antarctic Science, 34(6), 403-407. doi:10.1017/S095410202200044X This is an opinion piece in Antarctic Science about the importance of conveying the latest climate change scientific information to ATCM, CEP and CCAMLR, highlighting recent progress and upcoming plans, and encouraging the scientific community and policymakers to work together to facilitate necessary policy responses. It is relevant to, but independent of AntClimNow. 8. Libera, S., Hobbs, W., Klocker, A., Meyer, A., & Matear, R. (2022). Ocean-sea ice processes and their role in multi-month predictability of Antarctic sea ice. Geophysical Research Letters, 49, e2021GL097047. https://doi.org/10.1029/2021GL097047 This work is highly relevant to AntClimNow. Although not directly linked to specific AntClimNow activities, it involves two authors from AntClimNow. 9. Siegert, M. J., Bentley, M. J., Atkinson, A., Bracegirdle, T. J., Convey, P., Davies, B., et al. (2023). Antarctic extreme events. Frontiers in Environmental Science, 11. doi:10.3389/fenvs.2023.1229283 This work is highly relevant to AntClimNow. Although not directly linked to specific AntClimNow activities, it involves two authors from AntClimNow.
7. Funding awards	BAS EDI Internship (10-week project) was funded and a student, Tanya Glazkova, worked on the Antarctic Climate Indicators project.

8. Points for discussion at UKNCAR meeting	

UKNCAR Report: SCAR Ant-ICON - Integrated science to inform Antarctic and Southern Ocean Conservation

June 2024

1. Principal UK Researchers	Kevin Hughes (BAS), Jasmine Lee (BAS), Adrian Howkins (University of Bristol), Steve Chignell (University of Bristol)
2. Major activities and progress since previous year involving UK personnel/infrastructure	• Experts from Ant-ICON provided information on non-native species in Antarctica to the global assessment by IPBES, with the output listed in Appendix III (Seebens et al., 2023). • Ant-ICON (R3) ran a panel discussion on Antarctic conservation and related challenges at the Biennial Conference of the SCAR Standing Committee on the Humanities and Social Sciences in June 2023 in Lisbon, Portugal. • In an effort to help early-careers researchers understand the necessity and opportunity to make their science relevant to policymakers, including those within the Antarctic Treaty system, the R2 co-chairs and other Ant-ICON members produced the following paper: Hughes, K. A., Lowther, A., Gilbert, N., Waluda, C. M., & Lee, J. R. (2023). Communicating the best available science to inform Antarctic policy and management: a practical introduction for researchers. *Antarctic Science*, *35*(6), 438-472. • Ant-ICON has funded early-career participation in a range of conferences (e.g., the SCAR Biology Symposium and the SCAR SC-HASS Conferences) and prioritises funding for early-career and underrepresented researcher participation in the upcoming SCAR Open Science Conference in Chile in August 2024. • Jasmine Lee (R2) was on the International Scientific Organising Committee for the 2023 SCAR Biology Symposium and also co-convened a session entitled 'Toward better understanding and management of terrestrial Antarctica'.
3. Major future initiatives and actions involving UK personnel/infrastructure	Ant-ICON's aims for 2024 and beyond are to: • publish a paper on the assessment of the research needs of the CEP in 2024 by mapping the research of Ant-ICON onto the CEP's research needs, and identify further Ant-ICON inputs to the CEP's work (S1); • draft a peer-reviewed publication synthesising and contextualising CCAMLR's scientific needs as a precursor to a "living document" summarizing those needs at regular (2-3 year) intervals (R2); • hold a further mini-symposium at the SCAR OSC in 2024 on Co-producing knowledge at the Antarctic science-policy interface in a complex world (S1, broader Ant-ICON membership and SC-ATS); • run a series of interactive workshops online and at the SCAR OSC to explore open questions related to identifying research needs for the implementation and development

	of monitoring programs for Marine Protected Areas in the Southern Ocean (R1); • explore the significance and practical implications of the designation of inviolate areas from conservation and environmental governance perspectives and prepare a paper on this topic (R3); and • Ensure the continued success of the SCAR science-policy fellowship
4. Policy outcomes	• A Working Paper was presented by SCAR to the Committee for Environmental Protection at the Antarctic Treaty Consultative Meeting entitled: An example SCAR online application to inform State of the Antarctic Environment Reporting (SAER). The online application showed the distribution of non-native species in Antarctica: https://saer-non-nativespecies.data.bas.ac.uk. In response, the CEP thanked SCAR for developing the tool and encouraged SCAR to present further information syntheses to the Committee to inform its advice to the ATCM and subsequent decision-making. • An Information Paper was submitted to the CEP based on an Ant-ICON publication: terrANTALife: Increasing the availability of terrestrial and freshwater biodiversity data checklists to inform CEP decision-making. • The second SCAR Ant-ICON/SC-ATS science policy fellowship was launched with the recipient (Yousra Makanse, Brazil) participating in the CEP/ATCM (Kochi, India, May 2024). She produced the following paper for CEP/ATCM: Antarctic tourism diversification: current state and issues previously discussed by the ATCM.
5. Selected publications	Brooks, S. T., Jabour, J., Hughes, K. A., Morgan, F., Convey, P., Polymeropoulos, E. T., & Bergstrom, D. M. (2024). Systematic conservation planning for Antarctic research stations. *Journal of Environmental Management*, *351*, 119711. This paper provides a management tool to limit the expansion of research station footprints on unimpacted areas. Burrows, J. L., Lee, J. R., Wilson, K. A. (2023). Evaluating the conservation impact of Antarctica's protected areas. *Conservation Biology*, e14059. This paper lays out a framework for evaluating the effectiveness of the Antarctic Specially Protected Area network. Convey, P., & Hughes, K. A. (2023) Untangling unexpected terrestrial conservation challenges arising from the historical human exploitation of marine mammals in the Atlantic sector of the Southern Ocean. *Ambio* **52**. 357-375. 10.1007/s13280-022-01782-4 This paper explores the unintended consequences of marine mammal harvesting on Antarctic terrestrial ecosystems.

	Howkins, A., Liggett, D., Chignell, S. et al. (Submitted). Human Dimensions of Antarctic Conservation: Developing a Research Agenda. *Antarctic Science*. This paper reports the findings of a series of interactive and transdisciplinary workshops on the topic of Antarctic conservation and environmental management organised by R3. Hughes, K. A., Boyle, C. P., Morley-Hurst, K., Gerrish, L., Colwell, S. R., & Convey, P. (2023). Loss of research and operational equipment in Antarctica: Balancing scientific advances with environmental impact. *Journal of Environmental Management*, *348*, 119200. This paper explores the challenges around undertaking science in the Antarctic while at the same time minimizing environmental impact. Hughes, K. A, Chwedorzewska, K. J., Molina Montenegro, M. A., Pertierra, L. R. (2023). Terrestrial non-native species in Antarctica: introduction, impact and management response. *Antarctic Environments Portal [Terrestrial]*. 10.48361/qbtd-qt57 This output was produced in response to a request from the editor of the Antarctic Environments Portal and will introduce the topic to policymakers. Hughes, K. A., Convey, P. (2023). Non-native species in Antarctic terrestrial environments: how climate change and increasing human activity are compounding the threat of invasion. In: Ziska, Lewis (eds.). *Invasive species and global climate change*, CABI, 23 pp. 10.1079/9781800621459.0006 This chapter provides a review of the impact of non-native species and climate change on the Antarctic environment. Hughes, K. A., Lowther, A., Gilbert, N., Waluda, C. M., & Lee, J. R. (2023). Communicating the best available science to inform Antarctic policy and management: a practical introduction for researchers. *Antarctic Science*, *35*(6), 438-472. The Theme 2 co-chairs and others have provided a 'beginner's guide' to the Antarctic Treaty System in order to help ECRs engage at the science/policy interface. Karatekin, Feride, F. Rumeysa Uzun, Beverley J. Ager, Peter Convey, and Kevin A. Hughes. "The emerging contribution of Türkiye to Antarctic science and policy." *Antarctic Science* 35, no. 4 (2023): 299-315. This paper resulted from a two-month placement of two female Turkish ECRs at the British Antarctic Survey. The paper explores the progress of Türkiye on its journey towards consultative status within the Antarctic Treaty Consultative Meeting

	Lee, J. R., Shaw, J. D., Ropert-Courdert, Y., Terauds, A., Chown, S. L. (2024). Conservation features of the terrestrial Antarctic Peninsula. *Ambio* **53**. 1037-1049. This paper identifies important features for biodiversity, science, and tourism in the Antarctic Peninsula – which is useful for future conservation planning exercises in the region. Pertierra, L. R., Varliero, G., Barbosa, A., Biersma, E. M., Convey, P., Chown, S. L., ... & Greve, M. (2024). TerrANTALife 1.0 Biodiversity data checklist of known Antarctic terrestrial and freshwater life forms. *Biodiversity Data Journal*, *12*. This paper provides a comprehensive database of life in the Antarctic terrestrial and freshwater environments. Seebens, H., Meyerson, L.A., Rahlao, S.J., Lenzner, B., Tricarico, E., Aleksanyan, A., Courchamp, F., Keskin, E., Saeedi, H., Tawake, A., Pyšek, P., Hughes, K. , et al. (2023) Chapter 2. Trends and status of alien and invasive alien species. In: Hui, C., Werenkraut, V. (eds.). *IPBES Invasive Alien Species Assessment*, Bonn, Germany, IPBES secretariat, 269 pp. 10.5281/zenodo.7430725 Experts from Ant-ICON provided information on non-native species in Antarctica to the global assessment by IPBES.
6. Funding awards	
7. Points for discussion at UKNCAR meeting	None

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Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	**INSTANT** **INS**tabilities and **T**hresholds in **ANT**arctica
2. Principal UK Researchers	Bentley, Jamieson, McClymont, Paxman, Nield (Durham) Hillenbrand, Thomas, Larter, Sime, Hogan, Smith, Hodgson, Johnson, Allen, Roberts (BAS) van de Flierdt, Nichols, Marschalek (Imperial) Bingham, Hein (Edinburgh) Gasson, Siegert (Exeter) Silvano (NOC)
3. Major activities and progress since previous year involving UK personnel/infrastructure	INSTANT conference, Trieste, Italy. September 2023 (reports: PAGES Magazine 2024, 32 (1), 52-53). Keynotes involved UK ECR (Grace Nield) and UK session chairs. Several UK speakers in main sessions INSTANT is still developing action plans and writing review/white papers across a broad range of research areas. There are three themes (1) Atmosphere-Ocean-Ice interactions, (2) Earth-ice interactions and (3) Stakeholder-Science interactions, and collectively 11 sub-committees. UK has representation on the steering committee – Thomas (committee member) and Bracegirdle (representing AntClimNow). Theme 1 is Co-led by UK researchers (Thomas and Silvano). Several of the sub-committees have UK leadership involvement (e.g. Jamieson leads Antarctic Geological Boundary Conditions (ABC)) and there is UK involvement in every sub-committee, either as a member or steering committee member. INSTANT has a high proportion of ECRs, including in lead roles. Website - https://www.scar-instant.org/ Theme 1 seminar series running – bi-monthly talks relating the Atmosphere-Ocean-Ice interactions. Talks online (https://www.youtube.com/channel/UCY-Jo9slQ2Lxqc-pt09IWuw?app=desktop). White papers being produced by sub-committees, e.g. SOACEP Marine cruises: various international cruises (e.g., EASI-2 & EASI-3 with RV *Polarstern* to East Antarctic margin).

	GIA summer school at Gavle, Swede, in July 2023 with some UK teachers (Bentley, Le Brocq) and UK students. Mid-term report to SCAR
4. Major future initiatives and actions involving UK personnel/infrastructure	Special Issue (*Cryosphere*) to collate papers from INSTANT sub-committees Paper on geophysical approaches to understanding solid earth-ice interactions led by Scheinert and Weisen with UK authors (Clarke, Bentley). BEDMAP3 – due this summer (Pritchard and Fretwell) – data already available RINGS – survey planning (esp. Jordan) Working groups and committees to meet at OSC, Chile
5. Policy outcomes	Trieste conference had strong non-academic stakeholder involvement (e.g., managers of Venice lagoon barrier; ICCI members who help advise climate negotiators)
6. Selected publications	Lau, S.C.Y. *et al.* (incl. Linse), 2023: Genomic evidence for West Antarctic Ice Sheet collapse during the Last Interglacial. *Science*, 1384-1389. Nichols, K.A. *et al.* (incl. Johnson), 2023: Offshore-onshore record of Last Glacial Maximum–to–present grounding line retreat at Pine Island Glacier, Antarctica. *Geology* 51 (11), 1033-1037. Carter, C.M. *et al.* (incl. Bentley, Jamieson), 2024: Extensive palaeo-surfaces beneath the Evans-Rutford region of the West Antarctic Ice Sheet control modern and past ice flow. *Cryosphere* 18, 2277–2296. Clark, R.W. *et al*. (incl. Hillenbrand, Smith, Larter), 2024: Synchronous retreat of Thwaites and Pine Island glaciers in response to external forcings in the presatellite era. *PNAS* 121 (11), e2211711120. Evangelinos, D. *et al*. (incl. van de Flierdt), 2024: Late Miocene onset of the modern Antarctic Circumpolar Current. *Nature Geosci.* 17, 165-170. Zundel, M. *et al.* (incl. Hillenbrand, Larter, Smith), 2024: A large-scale transcontinental river system crossed West Antarctica during the Eocene. *Sci. Adv.* 10, eadn6056.
7. Funding awards	SWAIS2C international consortium for drilling in Ross Sea includes NERC funding with multi-institution grant (£2M+) (Imperial, UCL, BAS, Leeds, Exeter, Durham) led by van de Flierdt
8. Points for discussion at UKNCAR meeting	*None*

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Name of Standing Committee, Scientific Research Programme or Action/Expert Group: (Bio)Geosciences

Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report.

1. Principal UK Researchers	Claire Allen, Amber Annett, Alex Burton-Johnson, Mike Bentley, Robert Bingham, Katharine Hendry, Sian Henley, Claus-Dieter Hillenbrand, Dominic Hodgson, Kelly Hogan, Joanne Johnson, Tom Jordan, Philip Leat, Victoria Peck, Teal Riley, Stephen Roberts, John Smellie, James Smith, Geraint Tarling,
2. Major activities and progress since previous year involving UK personnel/infrastructure	There were two major oceanographic cruises, including biogeochemistry (BGC) components, to the Antarctic Peninsula and Weddell Sea on the RRS Sir David Attenborough in the 23/24 season as part of the NERC-funded BIOPOLE and PICCOLO projects.
3. Major future initiatives and actions involving UK personnel/infrastructure	Dr Joanne Johnson (BAS) has set up a new international community focus group on 'Holocene Antarctic ice sheet readvance', involving several UK researchers The group have met twice for talks and discussion, and will continue meeting 2-3 times a year in hybrid format, as well as in person at conferences where there is an opportunity. The group has a large ECR membership from the UK. **BIOPOLE** fieldwork continues, with the BIOPOLE II cruise to the Weddell Sea scheduled in early 2025 (Chief Scientist Geraint Tarling), and coastal sampling in Ryder Bay planned from Rothera Research Station in late 2024/early 2025 in collaboration with NERC funding SiCLING project (PI Katharine Hendry).
4. Policy outcomes	
5. Selected publications	The Geological History Constraints (GHC) project of the NERC-NSF International Thwaites Glacier Collaboration, led by Dr Joanne Johnson (BAS), has produced the following publications: Nichols, K. A., Rood, D. H., Venturelli, R. A., Balco, G., Adams, J., Guillaume, L., Campbell, S., Goehring, B. M., Hall, B. M., Wilcken, K., Woodward, J. W., Johnson, J. S.: Offshore-onshore record of Last Glacial Maximum-to-present grounding line retreat at Pine Island Glacier, Geology 51(11), 1033–1037, https://doi.org/10.1130/G51326.1, 2023. Braddock, S., Venturelli, R. A., Nichols, K. A., Moravec, E., Boeckmann, G. V., Campbell, S., Balco, G., Ackert, R., Small, D., Johnson, J. S., Dunbar, N., Woodward, J., Mukhopadhyay, S., Goehring, B.: Lessons learned from shallow subglacial bedrock drilling campaigns in Antarctica. Annals of Glaciology, https://doi:10.1017/aog.2024.12, 2024. Other publications: Agostini, S., Leone, N., Smellie, J.L. and Rocchi, S., 2024. Magma differentiation, contamination/mixing and eruption modulated by glacial load – The volcanic complex of The Pleiades, Antarctica. Geochemistry, Geophysics, Geosystems. Deng, 2023. A late Holocene palaeoecological reconstruction of Southern Hemisphere Westerlies variability and lacustrine ecosystem shifts on subantarctic Macquarie Island. MSc dissertation, UCL. Heredia Barión, P., Roberts, S. J., Spiegel, C., Binnie, S. A., Wacker, L., Davies, J., Gabriel, I., Jones, V. J., Blockley, S., Pearson, E. J., Foster, L., Davies, S. J.,

Roland, T. P., Hocking, E. P., Bentley, M. J., Hodgson, D. A., Hayward, C. L., McCulloch, R. D., Strelin, J. A., & Kuhn, G., 2023. Holocene deglaciation and glacier readvances on the Fildes Peninsula and King George Island (Isla 25 de Mayo), South Shetland Islands, NW Antarctic Peninsula. The Holocene, 33(6), 636-658. https://doi.org/10.1177/09596836231157059

Hodgson, D.A., Roberts, S.J., Izagirre, E., Perren, B.B., De Vleeschouwer, F., Davies, S.J., Bishop, T., McCulloch, R.D., Aravena, J.-C., 2023. Southern limit of the Patagonian Ice Sheet. Quaternary Science Reviews 321, 108346. https://doi.org/10.1016/j.quascirev.2023.108346

McCulloch, R.D., Mansilla, C.A., Roberts, S.J., Tisdall, E.W., 2023. Late Quaternary climatic inferences from southern Patagonia (~53°S): A holistic palaeoecological approach to tracking the behaviour of the southern westerly winds. Palaeogeography, Palaeoclimatology, Palaeoecology 631, 111822. https://doi.org/10.1016/j.palaeo.2023.111822

RILEY, T.R., CURTIS, M.L., CRAME, J.A., CANTRILL, D.J. & MACDONALD, D.I.M. (2024). Geological Map of Alexander Land, Antarctic Peninsula. BAS GEOMAP2 series, number 8, edition 1. 1: 500 000 scale.

RILEY, T.R., FLOWERDEW, M.J., CARTER, A., CURTIS, M.L., MILLAR, I.L., CRAME, J.A. & WHITEHOUSE, M.J. (2024). Tracking the tempo of a continental margin arc: insights from a forearc succession in West Antarctica. Geological Society of America Bulletin. https://doi.org/10.1130/B37558.1

BASTIAS, J., BURTON-JOHNSON, A., CHEW, D., RILEY, T.R., JARA, W. & CHIARADIA, M. (2024). A temporal control on the isotopic compositions of the Antarctic Peninsula arc. Nature Communications Earth and Environment. https://doi.org/10.1038/s43247-024-01301-1

RILEY, T.R., BURTON-JOHNSON, A., HOGAN, K.A., CARTER, A. & LEAT, P.T. (2023). Cretaceous – Paleogene magmatism of the South Scotia Ridge and implications for the initiation of subduction in the Scotia Sea. Journal of the Geological Society, London, 180, 10.1144/jgs2023-013

RILEY, T.R., MILLAR, I.L., CARTER, A., FLOWERDEW, M.J., BURTON-JOHNSON, A., BASTIAS, J., STOREY, C.D., CASTILLO, P., CHEW, D. & WHITEHOUSE, M.J. (2023). Evolution of an accretionary complex (LeMay Group) and terrane translation in the Antarctic Peninsula. Tectonics. 10.1029/2022TC007578

RILEY, T.R., BURTON-JOHNSON, A., FLOWERDEW, M.J., POBLETE, F., CASTILLO, P., HERVÉ, F., LEAT, P.T., MILLAR, I.L., BASTIAS, J. & WHITEHOUSE, M.J. (2023). Pre-Jurassic geological and tectonic history of the Antarctic Peninsula and correlations with Patagonia. Earth-Science Reviews. 236, 28 pp, 10.1016/j.earscirev.2022.104265

Smellie, J.L., Panter, K.S., McIntosh, W.C. and Licht, K.J., 2024. Landscape evolution in the southern Transantarctic Mountains during the early Miocene (c. 20-17 Ma) and evidence for a highly dynamic East Antarctic Ice Sheet margin from the southernmost volcanoes in the world (87°S). Global and Planetary Change.

Smellie, J.L., Martin, A.P., Townsend, D.B. and Di Vincenzo, G., 2024. Linking the terrestrial environmental record at Mason Spur volcanic complex with the Middle Miocene—Pleistocene Ross Sea marine record, Antarctica: a history of subaerial (ice-free) eruptions and glaciovolcanism under variable ice thicknesses. Geological Society of America Bulletin.

Monteiro, T., Henley, S. F., Pollery, R. C. G., Mendes, C. R. B., Mata, M., Tavano, V. M., Garcia, C. A. E., & Kerr, R. Spatiotemporal variability of dissolved inorganic macronutrients along the northern Antarctic Peninsula (1996–2019). Limnology and Oceanography. doi: https://doi.org/10.1002/lno.12424, 2023.

6. Funding awards	
7. Points for discussion at UKNCAR meeting	**Antarctica InSync** Antarctica InSync is an international effort (secretariat based in Germany) aimed at coordinated synchronous observations around Antarctica to allow for "a circumpolar assessment of the connections between ice, ocean, climate, environment and life, including human pressures, and their solutions such as marine protection". The program is currently in the planning stages, with the aim to carry out fieldwork in 2027-2028. BGC is likely to be a major component of the efforts (carbon and nutrient cycling, biological impacts etc.). **Future of AntVolc** John Smellie stepped back from running AntVolc, but remains in an *ad hoc* advisory capacity. Despite the original vision to end AntVolc once all of its stated objectives had been met, the group was asked by SCAR to continue as they were impressed by how much it had achieved. AntVolc requires new leadership to define a new role for the group, together with clear objectives and a timescale. One possible direction proposed is to assess the volcanic risk across all of Antarctica, given how many volcanoes are active or potentially so and their potential impact regionally and globally.

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1. Name of Standing Committee, SCAR Group or Programme	Standing Committee on the Antarctic Treaty System (SC-ATS)
2. Principal UK Researchers	Susie Grant (BAS) – SC-ATS Chief Officer (until Aug 2024), Kevin Hughes (BAS), Jasmine Lee (BAS), Tom Bracegirdle (BAS) and many other UK researchers from across SCAR groups have contributed to the development of papers.
3. Major activities and progress since previous year involving UK personnel/infrastructure	SC-ATS coordinates the provision of SCAR's scientific advice to the Antarctic Treaty System (Antarctic Treaty Consultative Meeting (ATCM), Committee on Environmental Protection (CEP), Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)) – drawing upon expertise from across all SCAR programmes and affiliated groups. **CCAMLR activities** SCAR participated in the CCAMLR Scientific Committee and Commission meetings (Hobart, Oct 2023) as an invited Observer, and presented the following papers: • Antarctic climate change and the environment: update on recent research relevant to CCAMLR. SC-CAMLR-42/BG/11 • Contribution of information to inform State of the Antarctic Environment Reporting (SAER): a potential new SCAR initiative. SC-CAMLR-42/BG/16 • Early maturation and reproductive success in Antarctic krill in the Antarctic Peninsula region in response to environmental and climate conditions. SC-CAMLR-42/BG/18 • Essential Variables for Tracking Change in the Southern Ocean - The SCAR Antarctic Biodiversity Portal, update 2023. SC-CAMLR-42/BG/20 • Summary for Policy Makers from the first Marine Ecosystem Assessment for the Southern Ocean (MEASO) and recommendations for CCAMLR. SC-CAMLR-42/BG/28 • The SCAR Annual Report to CCAMLR. SC-CAMLR-42/BG/30 • Update on the Southern Ocean contribution to the UN Decade on Ocean Science for Sustainable Development. SC-CAMLR-42/BG/32 SCAR also participated in the CCAMLR Workshop on Climate Change (Cambridge, September 2023) and presented the following papers: • SCAR affiliated research activities relevant to the integration of climate change information into CCAMLR's work program. WS-CC-2023/11

	• Outcomes of the first Marine Ecosystem Assessment for the Southern Ocean (MEASO) useful to CCAMLR in developing science to support managing the effects of climate change. WS-CC-2023/12 **ATCM/CEP activities** SCAR participated in the Antarctic Treaty Consultative Meeting (ATCM) and the Committee on Environmental Protection (CEP) (Kochi, India, May 2024) as an invited Observer, and presented the following papers: • An example SCAR online application to inform State of the Antarctic Environment Reporting (SAER) WP046 (SCAR) • Update on High Pathogenicity Avian Influenza in Antarctica. WP047 (SCAR, COMNAP, IAATO & CCAMLR) • Update on the status of emperor penguins in a variable and changing environment WP048 (SCAR) • SCAR AntClimNow Antarctic Climate Indicators project WP049 (SCAR & WMO) • The Scientific Committee on Antarctic Research Annual Report 2024 to the 46th Antarctic Treaty Consultative Meeting IP010 (SCAR) • Antarctic Environments Portal IP119 (SCAR) • Update on the Southern Ocean contribution to the United Nations Decade of Ocean Science for Sustainable Development IP121 (SCAR) • Plans for a fifth International Polar Year 2032/33 IP122 (SCAR & WMO) • The SCAR Equality, Diversity and Inclusion Action Group IP124 (SCAR) • terrANTALife: Increasing the availability of terrestrial and freshwater biodiversity data checklists to inform CEP decision-making IP131 (Spain, SCAR & Australia) • SCAR Lecture: "Decoding the Intricate Link Between the Tropics and Antarctica" IP162 (SCAR) • Observing systems in Antarctica IP163 (SCAR) • SCAR response to risk of High Pathogenicity Avian Influenza in Antarctica IP165 (SCAR) • Antarctic Climate Change and the Environment update IP166 (SCAR) • Status of Observational Coverage and Gaps in the Southern Ocean IP168 (SCAR) • Southern Ocean Observing System (SOOS) Symposium 2023 IP169 (SCAR) • Incorporation of Antarctica into the Global Monitoring Plan for Persistent Organic Pollutants through co-development of harmonized monitoring frameworks between National Antarctic Programmes and relevant national environmental agencies IP171 (SCAR)

	• Antarctic tourism diversification: current state and issues previously discussed by the ATCM IP172 (SCAR) • Scientific research supporting the development of a comprehensive and consistent framework for Antarctic tourism management IP173 (SCAR & IUCN) • Understanding Future Sea-level Change Around Antarctica IP184 (SCAR, COMNAP & WMO) In 2024, the second SC-ATS/Ant-ICON science-policy fellowships were awarded to: - Yousra Makanse (Brazil/Netherlands) for participation at the ATCM/CEP – working on tourism diversification. - Noémie Friscourt (France/Australia) for participation at the CCAMLR Scientific Committee – working on trophic ecology of Antarctic fur seals. These fellowships have been very successful in facilitating the participation of early/mid-career researchers in the CEP and SC-CAMLR, and helping them to gain an understanding of these policy forums.
4. Major future initiatives and actions involving UK personnel/infrastructure	Participation in CCAMLR Scientific Committee and Commission meetings (Oct 2024) and CEP/ATCM (June 2025) – ongoing development of advice and provision of information as requested by these bodies.
5. Policy outcomes	
6. Selected publications	
7. Funding awards	
8. Points for discussion at UKNCAR meeting	

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Provide up to two pages of information following the structure below, only filling out those sections where there is new information to report. We are particularly interested in hearing of key activities (e.g. expeditions/cruises/projects) publications, policy outcomes, future initiatives that you would like publicised, or where UKNCAR could help a group/programme liaise with other parts of SCAR.

1. Name of Standing Committee, SCAR Group or Programme	SCAGI – Standing committee on Antarctic Geographic Information
2. Principal UK Researchers	Louise Ireland (UK rep and Co-Chair)
3. Major activities and progress since previous year involving UK personnel/infrastructure	Antarctic Digital Database (ADD) 1. UK has coordinated and delivered new versions of the Antarctic coastline this past year, v7.8 in November 23, and v7.9 in May 2024. New versions included updates to the South Orkney Islands, sections of the Filchner, West, Wilkins and George VI ice shelves, and ice fronts in eastern Dronning Maud Land and west of Law Dome. As well as Brunt, Wilkins and Stange Ice Shelves, Pine Island and Thwaites Glaciers and James Ross Island ice fronts. 2. A new web map viewer was released in May 2024 providing a much more reliable service to view and interact with ADD topographic datasets. The viewer is managed by UK (https://add.scar.org/). Composite Gazetteer of Antarctica (CGA) 1. UK Antarctic Place Names Committee (APC) has fed all new gazetteer additions for British Antarctic Territory to the SCAR Composite Gazetteer of Antarctica. This consists of 16 new names. Air Operations Planning maps 1. UK hosted a workshop with attendees from USA, Australia, Norway and Belgium to discuss next steps and requirements for continuation of Air Operations Planning Maps Series. This included discussion and agreement on consistent use of REMA v2.0 elevation data to derive spot heights and contours, a review of the current map specification and proposed amendments, use of ISBNs and DOIs for the maps, and inclusion of wildlife data.
4. Major future initiatives and actions involving UK personnel/infrastructure	• SCAGI will hold it's next annual meeting at the SCAR Open Science conference in Pucon. • UK is working on making all previous versions of the Antarctic Digital Database coastline available. Initially, this will include v1 (1993) to v5 (2010).

5. Policy outcomes	None
6. Selected publications	None
7. Funding awards	None
8. Points for discussion at UKNCAR meeting	None

Report from UK Polar Data Centre (PDC) for UKNCAR June 2024

The UK Polar Data Centre (PDC) is the UK's National Antarctic Data Centre. It provides a secure long-term repository for polar and cryospheric data. Data are made available, normally using the UK Open Government Licence (http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/), and can be provided with a DOI to allow proper citation of the data. This enables scientists to comply with the UKRI Open Access Policy. It forms part of NERC's Environmental Data Service (https://eds.ukri.org) which is commissioned on a five- year basis. This service is one year into its current commissioning cycle with funding running from 2023-2028. The PDC is certified by the CoreTrustSeal. This is an internationally recognised certification scheme for data repositories that signifies a repository is sustainable and trustworthy, following best practices to manage the data it holds. Our current certification to this scheme ended in March 2024 and we submitted a new application demonstrating improvements we had made over the last three years in December 2023 but are still waiting for the outcome of the peer review.

SCADM

The UK member on the Standing Committee for Antarctic Data Management is Helen Peat who attends monthly video calls and presents an annual report on UK polar data management activities. The terms of reference for SCADM can be found in Appendix A. SCADM produced a new data policy for SCAR (https://www.scar.org/library/products/scadm/5767-scar-data-policy-2022/file/) which has been endorsed by the SCAR executive and published in 2022.

One of its primary aims is to support National Antarctic Data Centres in making Antarctic data FAIR (Findable, Accessible, Interoperable and Reusable). Finding data is facilitated by the Antarctic Metadata Directory (https://search.earthdata.nasa.gov/search?portal=amd) which is a metadata catalogue provided by NASA's EarthData Directory. In addition, SCADM has worked with other polar data communities to produce a new Polar Data Search facility (https://search.polder.info/). This is a federated catalogue that collates results from many underly data catalogues.

SCADM is keen to work more with SCAR's research programmes and can provide data management advice, particularly when the research programme includes development of a data product. You can get in touch with Helen Peat (hjpe@bas.ac.uk) or the SCADM Chief Officer, currently Johnathan Kool at the Australian Antarctic Data Centre, if you would like to find out more.

The PDC works closely with the BAS mapping group (MAGIC) and provides DOIs for all layers within the SCAR Antarctic Digital Database of topographic information.

In October 2023 we hosted Polar Data Forum V at the British Antarctic Survey. This is a biennial meeting where polar data managers get together to share knowledge, experiences and challenges. It was the first time for four years that we had met in person. Over 50 delegates from 16 countries visited BAS between 30th October and 3rd November with others contributing online. We began with a two-day workshop focused on data from polar vessels, followed by two days of talks on a broad range of data topics and a final day discussing the creation of an Arctic Data Policy and having the formal SCADM annual meeting. Further details of the programme and recordings of the sessions can be found at: https://polar-data-forum.org/.

SOOS

The Southern Ocean Observing System (SOOS), an international initiative of the Scientific Committee on Antarctic Research (SCAR) and the Scientific Committee on Oceanic Research (SCOR), focuses on sustained and coordinated observations of the Southern Ocean and it's increasing value has been clearly demonstrated in 2023 during the Inaugural SOOS Symposium in Hobart. The Symposium was attended by 300 scientists from 25 nations for a week of plenary presentations, parallel sessions and

workshops covering a wide spectrum of Southern Ocean research. Several UK researchers and data professionals contributed with plenary presentations, chaired parallel sessions and led organisation of several Symposium workshops. They also took part in the co-located Southern Ocean Essential Variable Workshop, organised by the SOOS and the SCAR Expert Group on Antarctic Biodiversity Informatics (EG-ABI). Sian Henley (University of Edinburgh, UK) is currently a member of the SOOS Executive Committee and represents UK together with Andrew Meijers (British Antarctic Survey, UK) and Petra ten Hoopen (British Antarctic Survey, UK) on the SOOS Scientific Steering Committee. Petra ten Hoopen (British Antarctic Survey, UK) is currently a Co-Chair of the SOOS Data Management Sub-Committee (DMSC), a SOOS initiative that connects data repositories with interest in multidisciplinary observations in the Southern Ocean and supports delivery of FAIR data to the Southern Ocean research community. Povl Abrahamsen (British Antarctic Survey, UK) became recently a member and as a researcher provides a valuable perspective on the DMSC data activities.

SOOS collaborates with the SCAR Standing Committee on Antarctic Data Management (SCADM) and is represented at SCADM by Petra ten Hoopen (British Antarctic Survey, UK). An example of a fruitful collaboration was the Polar Data Forum V and Research Vessel Workshop that took place at the British Antarctic Survey in 2023 and consisted of a week of discussions and presentations on polar data management, as detailed above.

Helen Peat 30/05/2024

Appendix A: The Terms of Reference[1] for SCADM are to:

1. Promote long-term preservation and accessibility of data relating to Antarctica and the Southern Ocean in sustainable repositories.

2. Assist in establishing and implementing Antarctic data management policies, priorities and best practices, taking into account and contributing to global best practices.

3. Promote a distributed, interoperable network of accredited National Antarctic Data Centres (NADCs), in accordance with ATCM XXII Resolution 4.1 (1998)[2].

4. Encourage and enable the community to make data Findable, Accessible, Interoperable, and Re-usable according to the FAIR Principles[3] by submission of metadata and data to the Antarctic Data Management System (ADMS).

5. Further develop, design, implement, and improve the ADMS - a system that encompasses the Antarctic Master Directory (AMD), NADCs, other interoperable, networked data repositories, and key data discovery tools.

6. Provide linkages and improve interoperability with other relevant data management systems, initiatives, and repositories; and thereby enhance the accessibility of data relating to Antarctica and the Southern Ocean.

7. Provide guidance to the AMD host.

8. Work with other SCAR groups, Council of Managers of National Antarctic Programs, Committee for Environmental Protection, Commission for the Conservation of Antarctic Marine Living Resources, the Antarctic Treaty Secretariat, and other relevant groups to identify, develop, and publish fundamental datasets of value to the Antarctic Community.

[1] The procedural parts of SCADM's mandate are covered in SCAR's "Rules of Procedure for Subsidiary Bodies", see https://scar.org/scar-library/search/governance/780-rules-of-proc-subsidbodies-aug10/

[2] http://www.ats.aq/devAS/info_measures_listitem.aspx?lang=e&id=258

[3] https://www.force11.org/group/fairgroup/fairprinciples

Report from UK Polar Data Centre (PDC) for UKNCAR June 2024

The UK Polar Data Centre (PDC) is the UK's National Antarctic Data Centre. It provides a secure long-term repository for polar and cryospheric data. Data are made available, normally using the UK Open Government Licence (http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/), and can be provided with a DOI to allow proper citation of the data. This enables scientists to comply with the UKRI Open Access Policy. It forms part of NERC's Environmental Data Service (https://eds.ukri.org) which is commissioned on a five- year basis. This service is one year into its current commissioning cycle with funding running from 2023-2028. The PDC is certified by the CoreTrustSeal. This is an internationally recognised certification scheme for data repositories that signifies a repository is sustainable and trustworthy, following best practices to manage the data it holds. Our current certification to this scheme ended in March 2024 and we submitted a new application demonstrating improvements we had made over the last three years in December 2023 but are still waiting for the outcome of the peer review.

SCADM

The UK member on the Standing Committee for Antarctic Data Management is Helen Peat who attends monthly video calls and presents an annual report on UK polar data management activities. The terms of reference for SCADM can be found in Appendix A. SCADM produced a new data policy for SCAR (https://www.scar.org/library/products/scadm/5767-scar-data-policy-2022/file/) which has been endorsed by the SCAR executive and published in 2022.

One of its primary aims is to support National Antarctic Data Centres in making Antarctic data FAIR (Findable, Accessible, Interoperable and Reusable). Finding data is facilitated by the Antarctic Metadata Directory (https://search.earthdata.nasa.gov/search?portal=amd) which is a metadata catalogue provided by NASA's EarthData Directory. In addition, SCADM has worked with other polar data communities to produce a new Polar Data Search facility (https://search.polder.info/). This is a federated catalogue that collates results from many underly data catalogues.

SCADM is keen to work more with SCAR's research programmes and can provide data management advice, particularly when the research programme includes development of a data product. You can get in touch with Helen Peat (hjpe@bas.ac.uk) or the SCADM Chief Officer, currently Johnathan Kool at the Australian Antarctic Data Centre, if you would like to find out more.

The PDC works closely with the BAS mapping group (MAGIC) and provides DOIs for all layers within the SCAR Antarctic Digital Database of topographic information.

In October 2023 we hosted Polar Data Forum V at the British Antarctic Survey. This is a biennial meeting where polar data managers get together to share knowledge, experiences and challenges. It was the first time for four years that we had met in person. Over 50 delegates from 16 countries visited BAS between 30th October and 3rd November with others contributing online. We began with a two-day workshop focused on data from polar vessels, followed by two days of talks on a broad range of data topics and a final day discussing the creation of an Arctic Data Policy and having the formal SCADM annual meeting. Further details of the programme and recordings of the sessions can be found at: https://polar-data-forum.org/.

SOOS

The Southern Ocean Observing System (SOOS), an international initiative of the Scientific Committee on Antarctic Research (SCAR) and the Scientific Committee on Oceanic Research (SCOR), focuses on sustained and coordinated observations of the Southern Ocean and it's increasing value has been clearly demonstrated in 2023 during the Inaugural SOOS Symposium in Hobart. The Symposium was attended by 300 scientists from 25 nations for a week of plenary presentations, parallel sessions and

workshops covering a wide spectrum of Southern Ocean research. Several UK researchers and data professionals contributed with plenary presentations, chaired parallel sessions and led organisation of several Symposium workshops. They also took part in the co-located Southern Ocean Essential Variable Workshop, organised by the SOOS and the SCAR Expert Group on Antarctic Biodiversity Informatics (EG-ABI). Sian Henley (University of Edinburgh, UK) is currently a member of the SOOS Executive Committee and represents UK together with Andrew Meijers (British Antarctic Survey, UK) and Petra ten Hoopen (British Antarctic Survey, UK) on the SOOS Scientific Steering Committee. Petra ten Hoopen (British Antarctic Survey, UK) is currently a Co-Chair of the SOOS Data Management Sub-Committee (DMSC), a SOOS initiative that connects data repositories with interest in multidisciplinary observations in the Southern Ocean and supports delivery of FAIR data to the Southern Ocean research community. Povl Abrahamsen (British Antarctic Survey, UK) became recently a member and as a researcher provides a valuable perspective on the DMSC data activities.

SOOS collaborates with the SCAR Standing Committee on Antarctic Data Management (SCADM) and is represented at SCADM by Petra ten Hoopen (British Antarctic Survey, UK). An example of a fruitful collaboration was the Polar Data Forum V and Research Vessel Workshop that took place at the British Antarctic Survey in 2023 and consisted of a week of discussions and presentations on polar data management, as detailed above.

Helen Peat 30/05/2024

Appendix A: The Terms of Reference[1] for SCADM are to:

1. Promote long-term preservation and accessibility of data relating to Antarctica and the Southern Ocean in sustainable repositories.

2. Assist in establishing and implementing Antarctic data management policies, priorities and best practices, taking into account and contributing to global best practices.

3. Promote a distributed, interoperable network of accredited National Antarctic Data Centres (NADCs), in accordance with ATCM XXII Resolution 4.1 (1998)[2].

4. Encourage and enable the community to make data Findable, Accessible, Interoperable, and Re-usable according to the FAIR Principles[3] by submission of metadata and data to the Antarctic Data Management System (ADMS).

5. Further develop, design, implement, and improve the ADMS - a system that encompasses the Antarctic Master Directory (AMD), NADCs, other interoperable, networked data repositories, and key data discovery tools.

6. Provide linkages and improve interoperability with other relevant data management systems, initiatives, and repositories; and thereby enhance the accessibility of data relating to Antarctica and the Southern Ocean.

7. Provide guidance to the AMD host.

8. Work with other SCAR groups, Council of Managers of National Antarctic Programs, Committee for Environmental Protection, Commission for the Conservation of Antarctic Marine Living Resources, the Antarctic Treaty Secretariat, and other relevant groups to identify, develop, and publish fundamental datasets of value to the Antarctic Community.

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