



SCAR Research Day

held on
Wednesday 24 August 2016
as part of the XXXIV SCAR
Open Science Conference and Business Meetings

Abstracts

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SCAR Research Day

SCAR's mission is to advance Antarctic research, and to promote scientific knowledge, understanding and education on any aspect of the Antarctic region. To this end, SCAR is charged with the initiation and international co-ordination of Antarctic and Southern Ocean research that is relevant to science and beneficial to global society.

One major SCAR activity of particular relevance in defining the most important research questions that need to be addressed in the coming years, was the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan, carried out in 2014, providing a long-term vision for high-impact cross-cutting Antarctic research and will assist in guiding the scientific work of SCAR.

The SCAR Science Day is designed to help encourage participation of the entire Antarctic research community in shaping the future direction of SCAR research. The presentations outline the most important topics covered by the Scientific Research Programmes (SRPs) and related activities in relation to the Horizon Scan questions, and look forward to what is needed to address emerging priorities. The current SRPs only run for another 2-4 years, so its time for the SCAR community to start scoping out ideas for new research programmes and activities.

In addition to the plenary presentations and open discussion, there will be a special Poster Session where activities of the SCAR groups, national committees, and union members will be featured.

The afternoon session involves more detailed discussions from the Scientific Standing Groups where new activities will be proposed, ideas and priorities discussed and much more. The main parts of these meetings are open for conference participants and your participation is encouraged.

This is your opportunity to learn more about SCAR, the research achievements and plans, and to help shape new projects.

Time	Agenda Item	Chair / Presenter
8:30	Welcome and Introduction	Jeronimo Lopez-Martinez
8:35	SCAR Horizon Scan Research and Future Directions	Azizan Abu Samah
8:40	Astronomy and Astrophysics from Antarctica (AAA)	John Storey
8:55	Antarctic Climate Change in the 21st Century (AntClim21)	Nancy Bertler / Thomas Bracegirdle
9:10	State of the Antarctic Ecosystem (AntEco)	Pete Convey
9:25	Antarctic Thresholds- Ecosystem Resilience and Adaptation (AnT-ERA)	Julian Gutt
9:40	Past Antarctic Ice Sheet Dynamics (PAIS)	Laura De Santis/ Tim Naish
9:55	Solid Earth Response and influence on Cryospheric Evolution (SERCE)	Terry Wilson
10:10	Southern Ocean Observing System (SOOS)	Louise Newman
10:20	Integrating Climate and Ecosystem Dynamics (ICED)	Andrew Constable
10:30	Coffee Break	
11:00	Humanities and Social Sciences	Daniela Liggett/ Elizabeth Leane
11:10	SCAR Development Council - initiatives to enhance support	Pete Convey
11:15	Future Perspectives from the Disciplinary Scientific Standing Groups (SSGs)	Terry Wilson
11:20	Geosciences	Berry Lyons
11:25	Life Sciences	Marc Shepanek/ Yan Ropert-Coudert
11:30	Physical Sciences	David Bromwich
11:35	Moderated Open Discussion on "Status & where next?"	Berry/Marc/David

12:50	Wrap up and next steps	Terry Wilson
13:00	Lunch	
14:00	Poster Session & Exhibits	
15:30- 18:00	Scientific Standing Group Meetings – Open to All!	

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Astronomy and Astrophysics from Antarctica (AAA)

John Storey

AAA has responded to the Horizon Scan by holding a special session at the AAA2015 workshop in Volcano, Hawaii, to develop a white paper. This paper defines the technical and logistical requirements needed to enable the scientific studies that address the key questions of the Horizon Scan. The white paper was submitted to COMNAP for their consideration as part of the 20-year Roadmap process. Meanwhile, considerable research effort is being applied by AAA members to the development of improved application of existing technologies, in order to continue to make progress in all the key areas previously identified.

AntClim21 and SCAR Horizon Scan Science

Tom Bracegirdle and Nancy Bertler

The major focus of AntarcticClimate21 (AntClim21) is on Antarctic and Southern Ocean climate projections to 2100 AD. This involves both characterising the slowly-varying mean climate responses to projected future anthropogenic forcing scenarios and the variability about these mean responses. A key aspect is the use of in-situ observations and longer-term proxy records of current and past conditions to help improve estimates of future climate from climate model projections. A number of aspects of the SCAR Horizon Scan (HS) are being addressed, relating in particular to stratospheric ozone recovery, Southern Ocean change, impacts of sea ice, and extremes.

New areas of science and scientific capability that are emerging at present include: (i) an improved understanding of dynamic linkages between Antarctica and lower latitudes, (ii) new insights into the dynamics of the Southern Ocean response to external forcing alongside rapidly expanding ocean observation networks, (iii) seasonal prediction of the Antarctic environment (e.g. sea ice), (iv) advances in merging paleoclimate modelling and proxy climate records, and (v) Antarctic-wide (and even global) high-resolution climate model simulations of past and projected climate (e.g. Antarctic CORDEX and HiRESMIP). In this talk these emerging areas will be set into the context of the Horizon Scan exercise and options for merging into broader follow-on research programmes will be discussed.

AntEco and the Horizon Scan – progress and future priorities

Peter Convey¹, Huw Griffiths¹, Jan Strugnell², Don Cowan³

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The SRP, State of the Antarctic Ecosystem (AntEco), was established in 2013 and seeks to increase scientific knowledge, from genes to ecosystems that, coupled with increased knowledge of species biology, can be used to advance the conservation and management of Antarctic ecosystems. The AntEco community actively contributed to the initial Horizon Scan questions generated and was well-represented at the Horizon Scan event. As a result, the final Horizon Scan questions adopted appropriately reflect the overall priorities previously identified by AntEco. The Horizon Scan is predicated on a 20 year future timescale, but we highlight that the AntEco community is already addressing Horizon Scan questions, for instance, relating to biodiversity knowledge, human and climate change impacts and conservation of the Antarctic Environment, through events such as The Monaco Assessment that took place in 2015. Similarly the AntEco community continues to address the history and drivers of Antarctic biology using biogeographic and molecular biology tools. AntEco is contributing strongly to several developing SCAR initiatives with a strong Horizon Scan focus, including Antarctic Aerobiology, Eradication in Antarctica and the Antarctic Near-Shore and Terrestrial Observing System (ANTOS), although we must emphasise that participation in all of these is a function of national science funding decisions and strategies not in our or SCAR's control.

Priorities for the future include:

- Influence national funding strategies to leverage support for our science priorities
- Ensure accurate and appropriate representation of the size and activity of the SCAR biological research community in the next generation of SCAR scientific programmes to be developed

- Stimulate and facilitate trans-national collaborations for improved regional access and enhanced research efficiency
- Continue trans-disciplinary research initiatives such as with AntClim21, PACE and AnT-ERA
- Engage with external sponsorship/award initiatives to increase profile of SCAR science.

Antarctic Thresholds – Ecosystem Resilience and Adaptation (AnT-ERA)

Julian Gutt

The structure of AnT- ERA comprising three main levels of biological organisation, essential organisational principles, major achievements and future plans are briefly explained. Scientific highlights are clustered into coarse themes, e.g. ecosystem dynamics, vulnerability and complexity, and attributed to most Horizon Scan questions of the cluster "Antarctic life on the precipice". The condensed output of another brainstorming event and an opinion survey on future research directions referring to the Paris UNFCCC climate conference are presented.

Past Antarctic Ice Sheet (PAIS) Programme: Achievements and plans for the future

Laura DeSantis, ldesantis@inogs.it, National Institute of Oceanography & Geophysics, Trieste, Italy

Tim Naish, tim.naish@vuw.ac.nz, Victoria University of Wellington, Wellington, New Zealand

The overarching goal of PAIS is to improve confidence in predictions of Antarctic ice sheet and sea-level response to future climate change and ocean warming. PAIS is, therefore, strongly aligned with one of the six priorities of the SCAR Horizon Scan (Kennicutt, Chown et al., 2014); "Antarctic ice sheets and sea-level - Understand how, where and why ice sheets lose mass". To achieve its goals, PAIS facilitates research aimed at understanding the sensitivity of East, West, and Antarctic Peninsula Ice Sheets to a broad range of climatic and oceanic conditions. Study intervals span a range of timescales, including past "greenhouse" climates warmer than today, and times of more recent warming and ice sheet retreat during glacial terminations. The PAIS research philosophy is based on data-data and data-model integration and intercomparison, and the development of data transects, extending from the ice sheet interior to the deep sea. The data-transect concept links ice core, continental, ice sheet-proximal, offshore, and far-field records of past ice sheet behaviour and sea level, and is yielding an unprecedented view of past changes in ice sheet geometry, volume, and ice sheet-ocean interactions. These integrated data sets are enabling robust testing of a new generation of coupled Glacial Isostatic Adjustment-Ice Sheet-Atmosphere-Ocean models that include new reconstructions of past and present ice bed topography and bathymetry, and processes that influence marine ice sheet instability. PAIS is accomplishing its objectives by: 1) supporting the planning of new data-acquisition missions using emerging technologies; 2) encouraging data sharing and integration of spatially targeted transect data with modelling studies; and 3) initiating/expanding cross linkages among Antarctic research communities.

Highlights to date include:

- (1) New knowledge of thresholds in the stability and behavior of the Antarctic ice sheet include: (a) relatively ice free Antarctic environment in a world >650ppm atmospheric CO₂, (b) a dynamic terrestrial ice sheet between 650-400ppm, and (c) dynamic marine based ice between 400-300ppm.
- (2) Improved knowledge of the rate and contribution of the Antarctic ice mass to sea-level rise during the last deglaciation.
- (3) Dissemination of policy-relevant PAIS research and contributions to the IPCC 5th Assessment Report and new, ongoing IPCC activities.
- (4) New predictions of Antarctic ice-sheet contribution to future sea-level rise under IPCC representative concentration pathways using ice sheet models tested and validated on past climates with boundary conditions that are relevant to future projections.
- (5) Co-ordination of the Antarctic paleoclimate community through PAIS PRAMSO to secure scheduling of a US\$50 million transect of Antarctic IODP drilling expeditions (Wilkes Land, Ross Sea, Amundsen Sea) in 2017/2018 and 2018/2019.

Future plans include:

- (1) PAIS is hosting its first international research symposium on **September 10-16th 2017 in Trieste (Italy)**. <http://www.scar.org/pais/>. The aim of the conference is to present and discuss recent results that address still open questions in understanding the sensitivity of the Antarctic Ice Sheet and its contribution to past and future sea level and climate change (e.g. SCAR Horizon Scan).
- (2) The conference will identify key targets to be achieved by a future Geoscience program after PAIS and to develop a strategic research focus towards key policy relevant knowledge gaps for IPCC AR6 report (e.g. improve understanding of ice-ocean and ocean-sea bed interactions, research cruises, future drilling employing also ANDRILL, subglacial and shallow drilling facilities).
- (3) PAIS aims to improve cross disciplinary linkages with other SCAR expert groups and SRPs and non-SCAR communities such as geodynamical, climatological, glaciological, oceanographic, ecosystem and ice cores

communities, and also with those communities studying Arctic environmental change, since their work is crucial for understanding the processes and dynamics of the integrated system.

- (4) Within the framework of the SCAR ARC Roadmap, PAIS is looking forward 10 years to the logistical and operational requirements of future data acquisition projects such as IODP and other offshore and nearshore geological drilling programs, subglacial drilling and investigations, ice coring, research cruises for cross-disciplinary sea bed mapping and for collecting geophysical data for paleobathymetric reconstructions of the Antarctic margin.

Solid Earth Response and influence on Cryospheric Evolution (SERCE)

Terry J. Wilson - Ohio State University, School of Earth Sciences and Byrd Polar and Climate Research Center, Columbus, OH, USA

The *Solid Earth Response and influence on Cryospheric Evolution* (SERCE) scientific research programme aims to *advance understanding of the interactions between the solid earth and the cryosphere to better constrain ice mass balance, ice dynamics and sea level change in a warming world*. This overarching objective is being addressed through integrated analysis and incorporation of geological, geodetic and geophysical measurements into models of glacial isostatic adjustment (GIA) and ice sheet dynamics. Topics under investigation during the first 4 years of SERCE activities include crust and mantle structure beneath the ice sheets, measurements of solid earth deformation, feedbacks between solid earth deformation and ice sheet dynamics, modeling of glacial isostatic adjustment (GIA) driven by ice mass change in Antarctica incorporating new ice histories and geological, geodetic and geophysical measurements, and application of new GIA model results to improve ice mass balance estimates derived from data from current space missions.

Contemporary changes in bedrock elevation provide a critical proxy record of both past and modern ice mass change (HorScan Q.40), modulated by tectonics and the strength of the crust and mantle (HorScan Q.37). New measurement campaigns have yielded extensive new information on crustal motions across Antarctica, providing critical constraints on ancient and modern ice mass change and global sea level since the Last Glacial Maximum, yet large differences in estimates remain between current models, mandating new, integrated data-modeling studies. Better data sets and methods to isolate crustal motion signals due to modern ice mass change from the isostatic response to more ancient ice loss are clearly critical for Antarctica. It is important at this stage to synthesize and integrate the extensive new geological and geophysical data sets with modeling efforts in a timeframe to contribute to IPCC AR6.

Seismological studies have significantly improved our knowledge of crust and mantle properties beneath large sectors of Antarctica (HorScan Q.37), documenting significant variations in the deep earth beneath the continent, particularly within West Antarctica. Glacial isostatic modeling studies, constrained by a wealth of new geodetic crustal motion data, have shown regional variations in earth response to changing ice mass loads and have signaled the importance of ice mass change on centennial scales in regions underlain by weak, low viscosity upper mantle. Together these emerging results point to the need for focusing research in directions that include enhanced efforts to develop model skills to simulate GIA on an earth with laterally varying deep earth structure, methods to invert the varying deep earth structure constrained by seismological and other geophysical techniques into rheological earth models, and interdisciplinary studies to improve ice history constraints, particularly for the late Holocene and Little Ice Age time periods.

The link between dynamic earth processes and ice sheets is especially important in Antarctica. Recent work has demonstrated that vertical displacements of Earth's surface due to ice load fluctuations can influence ice sheet stability (HorScan Q.28 and Q.32). Subglacial morphology and geological structure (HorScan Q.26) are primary influences on ice dynamics and subglacial hydrological regimes. Geothermal heat flux is a key control on ice behaviour and subglacial hydrology (HorScan Q.27). Better understanding of Antarctic geothermal heat is emerging from crustal bedrock studies, direct point measurements and seismic studies, but these analyses are yielding contrasting results. New focus on obtaining constraints on geothermal heat flux and integration of new data with ice sheet modeling is needed. Remarkable ancient landscapes beneath ice cover reveal the history of interactions between ice and the solid earth and dating these landscapes using emerging techniques hold promise in developing new paradigms on landscape history and surface processes (HorScan Q.39). Understanding erosion processes and rates of geomorphological change across the subglacial terrain will enable scientists to decipher feedbacks between tectonic surface displacement, global climate and the growth and demise of ice sheets. Improved spatial coverage is needed for relative sea level records that provide historical data on ice mass change indicating when and where ice has been lost (HorScan Q.40).

Solid earth processes intersect with the evolution of climate, ice sheets and life, and these intersections are particularly suitable for new interdisciplinary investigations by SCAR science groups. Climate change and solid earth properties linked with crustal uplift and volcanism, including geothermal flux, influence biotic distributions, and the location and extent of ice-free refugia during more recent glacial periods would have been crucial for the survival of life in Antarctica. Volcanism may affect ice sheet dynamics and continued documentation of the extent and timing of past and current volcanism in Antarctica is needed to better understand its effects on the lithosphere, ice sheets, climate and biogeography (HorScan Q.38). Recent instrument deployments have documented ongoing magmatism beneath the West Antarctic ice sheet rapid

uplift is already underway where recent ice loss has occurred and the underlying deep mantle is mechanically weak. Development of models for Earth deformation and volcanic activity as the ice sheet changes in the future (HorScan Q.41) are required to better constrain future trends.

The vision for a Southern Ocean Observing System (SOOS): Delivering the data you need to address Horizon Scan priorities

Louise Newman*, Anna Wählin, Oscar Schofield, Sebastiaan Swart, Andrew Constable, Phillippa Bricher, the Scientific Steering Committee and Data Management Sub-Committee

The Southern Ocean Observing System (SOOS) developed out of the need for an internationally coordinated and integrated approach to the collection and delivery of observational data from the Southern Ocean. Current observation efforts are significant, but are predominantly organised through uncoordinated, short-term, single nation/disciplinary programs that leave large spatial and temporal gaps in key observations. Further, discovery of and access to the collected data is difficult and time consuming, if possible at all.

The vision for SOOS is ambitious. Sustained observations of dynamics and change of the physics, chemistry, geology and biology of the Southern Ocean system should be readily accessible. In turn, this will provide a foundation for the international scientific community to advance understanding of the Southern Ocean and for managers to address critical societal challenges, such as those clarified through the Horizon Scan initiative.

Achieving this ambitious plan will require shifts in the way that Southern Ocean observations are planned, funded, collected, and shared. What is the best way for us, the international community, to collect observations in a sustained way, to the benefit of all stakeholders? How can we ensure that fundamental observational data is available for you all to base your research projects on, and address the priority science questions?

SOOS is taking a structured, step-wise approach to develop this system. This presentation will outline the vision for SOOS, prompt discussion around the cultural and structural changes that are needed to achieve the vision, and describe the steps that SOOS is taking towards this vision.

Integrating Climate and Ecosystem Dynamics (ICED)

Andrew Constable

ICED is a regional programme of Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) and is also closely linked with SCAR. ICED is undertaking integrated circumpolar analyses to improve our understanding of change and the implications for Southern Ocean ecosystems and their management. A range of multidisciplinary research is underway and considerable progress has been made in three main areas: assessments of change; identifying and addressing major gaps in knowledge (focusing on links between biogeochemistry and food webs); and quantifying and modelling food webs. A series of ICED community papers are planned for 2016-17 on scenarios of change, historical data rescue and synthesis, stakeholder engagement, polar food web diversity and functioning, and an ICED mid-term programme review.

Through IMBER, SCAR and associated programmes, ICED will ensure that its scientific activities reflect international as well as regional priorities. A current major focus is to more comprehensively assess (and where possible quantify) key impacts of change on Southern Ocean ecosystems. This will be achieved through the analysis and integration of available data together with development of models, scenarios and projections.

ICED is keen to continue to forge links with SCAR in order to enhance our joint scientific understanding and progress, and to strengthen the impact of our input to CCAMLR, CEP and other relevant bodies concerned with conservation and management of the Southern Ocean. We recommend SCAR endorses and encourages activities including: following up on the recommendations and capitalising on the opportunities generated from the recent Joint CCAMLR-CEP workshop; encouraging and facilitating the sharing of scientific expertise in understanding Southern Ocean ecosystems and change (including attending the ICED workshop on projections in 2017 and conference in 2018, and vice versa with ICED involvement in relevant SCAR activities); and ICED's ongoing work with SOOS.

Humanities & Social Sciences and the SCAR Horizon Scan

Daniela Liggett and Elizabeth Leane

The scope and scale of human activities in the Antarctic are increasing and are challenging established governance mechanisms. The Horizon Scan questions in the "Human Presence" cluster acknowledge the trend of growing human engagement with the Antarctic, but it is still unclear exactly how human engagement might change and what the defining characteristics of human engagement with the Antarctic will be. Broadly speaking, humanities scholars and social

scientists are currently working on understanding the modalities of the changing engagement with the Antarctic, which underpin half of the questions in the "Human Presence" cluster. In our presentation, we will briefly outline the progress that has been made with this work. In addition, we will detail some of the research that has been undertaken, with a focus on addressing questions 76 ("How will external pressures and changes in the geopolitical configurations of power affect Antarctic governance and science?") and 78 ("How will regulatory mechanisms evolve to keep pace with Antarctic tourism?"). Finally, we will discuss plans aimed at addressing other Horizon Scan questions, the challenges this brings along, and what other areas of work are currently being targeted by humanities scholars and social scientists.

SCAR Development Council – initiatives to enhance support for SCAR activities

Peter Convey (British Antarctic Survey, Cambridge, United Kingdom)

SCAR's Development Council (DC; <http://www.scar.org/donate/development-council>) was created several years ago in order to encourage awareness and development of alternative or previously unrecognised routes of enhancing SCAR's international recognition and standing. In particular, the DC aims to identify new routes or opportunities to generate funding or other forms of support for SCAR's scientific activities. SCAR has had a number of significant successes in recent years, most notably in the role of the Tinker Foundation in the creation and support of the Martha Muse Prize, the awarding of the Monaco Biodiversity Prize, sponsorship of important meetings such as the recent Monaco Antarctic Biodiversity Assessment, and in the wider recognition of the importance of and subsequently funding commitment to major international initiatives such as SOOS (Southern Ocean Observing System) and, it is to be hoped, ANTOS (Antarctic Near-shore and Terrestrial Observing System). The DC exists to assist SCAR and its component groups continue building on these successes. We see particular opportunities to develop new interactions for instance with industrial and tourism sponsors which, along with original thinking from national research communities, could considerably enhance highly positive activities such as the SCAR Fellowship and Visiting Professorship schemes, and create exciting 'citizen science' opportunities.

While the DC's activities are not directly associated with the Horizon Scan outcomes, many initiatives to enhance SCAR's science activities will build our component Groups' capacities to do so. This year we have actively appealed to SCAR Delegates, SRP Chairs and other Group leaders to take up the challenge of assisting SCAR and the DC in identifying and pursuing new opportunities for such sources of national funding and support, by bringing these to our attention, and then mutually assisting in developing appropriate proposals. As with all SCAR bodies, DC members give their service entirely voluntarily, and we must all make the most efficient use of the limited time that we can give. With this background we emphasise that the DC itself cannot be a 'proposal writing' body, rather serving three particularly useful functions for SCAR:

- (a) To encourage and facilitate an 'opportunity seeking' mindset in the leadership groups of SCAR (Delegates, SRPs, specialist and other Groups), developing greater engagement with these opportunities from the communities involved.
- (b) To develop and provide over time a central resource of such opportunities that exist and/or have been attempted within the SCAR community; a spreadsheet is being constructed on the SCAR website of many available funding sources and other opportunities; realistically, it is unlikely that the different SCAR groups as a whole would become involved in more than probably 1-3 such bids in an annual cycle.
- (c) To play an active role in ensuring that bids being developed by different SCAR groups do not mutually compromise each other; to do so we want to ensure that the DC and SCAR Executive are informed and involved at an early stage in the process of bid development, again to make the best use of SCAR's limited resources and the most effective use of the voluntary efforts of all involved.

APPENDIX 1



SCAR Activities Poster Session

Wednesday 24 August 2016
13:00 – 14:30
KLCC, Kuala Lumpur, Malaysia

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Astronomy and Astrophysics from Antarctica (AAA)

Astronomy & Astrophysics from Antarctica (AAA) is a SCAR Scientific Research Program. The objectives of AAA are to coordinate astronomical activities in Antarctica to ensure the best possible outcomes from international investment in Antarctic astronomy, and to maximise the opportunities for productive interaction with other disciplines. To achieve this, Astronomy & Astrophysics from Antarctica is helping to:

- ❧ Coordinate site-testing experiments to ensure that results obtained from different sites are directly comparable and well understood,
- ❧ Build a database of site-testing data that is accessible to all researchers,
- ❧ Increase the level of coordination and cooperation between astronomers, atmospheric physicists, space physicists and meteorologists,
- ❧ Extend existing Antarctic site-testing and feasibility studies to potential Arctic sites; for example, in Greenland and Canada,
- ❧ Define and prioritise current scientific goals,
- ❧ Maintain an ongoing roadmap for development of major astronomical facilities in Antarctica, and
- ❧ Stimulate international cooperation on major new astronomical facilities in Antarctica.

Website: <http://www.astronomy.scar.org>

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International Astronomical Union (IAU)

The International Astronomical Union (IAU) was founded in 1919. Its mission is to promote and safeguard the science of astronomy in all its aspects through international cooperation. Its individual members — structured into Divisions, Commissions, and Working Groups — are professional astronomers from all over the world, at the Ph.D. level and beyond, who are active in professional research and education in astronomy. The IAU has 12,412 individual members from 97 countries. In addition, the IAU collaborates with various scientific organisations all over the world, and is a Union Member of SCAR.

The long-term policy of the IAU is defined by the General Assembly and implemented by the Executive Committee, while day-to-day operations are directed by the IAU Officers. The focal point of its activities is the IAU Secretariat, hosted by the Institut d'Astrophysique de Paris, France. The scientific and educational activities of the IAU are organised by its 9 Scientific Divisions and, through them, its 35 specialised Commissions covering the full spectrum of astronomy, along with its 39 Working Groups.

The IAU also works to promote astronomical education, research and public outreach actions towards the public. These activities recently culminated with the organisation of the

UNESCO International Year of Astronomy in 2009, which reached out to over 800 million people from 148 countries.

Website: <http://www.iau.org>

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Snow in Antarctica Action Group (SnowAnt)

The SnowAnt Action Group was established in 2014. Its key goals are to:

- ❧ Investigate: Improve the knowledge on depositional and metamorphic processes in Antarctic snow and its feedbacks to the climate system; develop a snow classification for Antarctica.
- ❧ Protect: What is disturbed today will be in the ice core for the next ~1 My – preserve pristine snow areas; currently disturbed areas have to be mapped and coordinated with national logistic operators.
- ❧ Implement: SnowREADER (database) to document disturbed areas, historic snow profiles, accumulation data from AWS, stake farms, surface radar profiles, shallow firn – snow cores.
- ❧ Educate and Coordinate: Quantitative snow stratigraphy methods developed by the IACS working group MicroSnow should be implemented by snow schools; recognize the importance of snow for SCAR.

Website: <http://www.scar.org/ssg/physical-sciences/snowant>

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International Partnerships in Ice Core Sciences (IPICS)

IPICS represents scientists and technical experts in ice coring from laboratories in 24 nations. It is a SCAR Expert Group, and is also affiliated to Past Global Changes (PAGES) and International Association of Cryospheric Sciences (IACS). IPICS acts as a voice for ice core science, and also promotes a small set of priority projects. Continuing priorities are IPICS - Oldest Ice, IPICS - Last Interglacial, and IPICS 2k. New priorities on Terminations and seesaws, and on Ice dynamics are being developed, as is an activity on non-polar cores. IPICS runs an open science conference every 4 years, and also supports the organisation "Ice Core Young Scientists (ICYS)".

Website: <http://pastglobalchanges.org/ini/end-aff/ipics/intro>

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Past Antarctic Ice Sheets (PAIS)

The overarching goal of PAIS is to improve confidence in predictions of ice sheet and sea-level response to future climate change and ocean warming. For this, PAIS aims to improve understanding of the sensitivity of East, West, and Antarctic Peninsula Ice Sheets to a broad range of climatic and oceanic conditions. Study intervals span a range of timescales, including past “greenhouse” climates warmer than today, and times of more recent warming and ice sheet retreat during glacial terminations. The PAIS research philosophy is based on data-data and data-model integration and intercomparison, and the development of data transects, extending from the ice sheet interior to the deep sea. The data-transect concept will link ice core, continental, ice sheet-proximal, offshore, and far-field records of past ice sheet behaviour and sea level, yielding an unprecedented view of past changes in ice sheet geometry, volume, and ice sheet-ocean interactions. These integrated data sets will enable robust testing of a new generation of coupled Glacial Isostatic Adjustment-Ice Sheet-Atmosphere-Ocean models that include new reconstructions of past and present ice bed topography and bathymetry.

Website: <http://www.scar.org/srp/pais>

Contact Person: Tim Naish Email: tim.naish@vuw.ac.nz

AntarcticClimate21

AntClim21 is a SCAR Scientific Research Programme, which focuses on the Antarctic / Southern Ocean environment and ecosystem will change over the 21 Century and beyond.

Website: <http://www.scar.org/srp/antclim21>

Contact Person: Nancy Bertler Email: Nancy.Bertler@vuw.ac.nz

Year of Polar Prediction

The *Year of Polar Prediction* is a major international activity that has been initiated by the World Meteorological Organization’s World Weather Research Programme. As a key component of the Polar Prediction Project it will take place from mid-2017 to mid-2019. Supporting improved weather and climate services, the overarching goal of the *Year of Polar Prediction* is to significantly advance our environmental prediction capabilities for the polar regions and beyond, on time scales from hours to seasons.

The *Year of Polar Prediction* is an internationally coordinated period of intensive observing, modelling, prediction, verification, user-engagement, and education activities. Prediction of sea ice and other key variables such as visibility, wind, and precipitation will be central to the initiative. Various stakeholder groups will be involved in the *Year of Polar Prediction* in order to identify their specific decision-making needs with respect to weather, climate, ice and related environmental services.

Planning of the *Year of Polar Prediction* runs in three stages – the Preparation Phase has been initiated in 2013; the Core Phase, which is the actual *Year of Polar Prediction*,

happens from mid-2017 to mid-2019, and the Consolidation Phase takes place from mid-2019 to 2022. The *Year of Polar Prediction* will greatly contribute to the knowledge base needed to managing the opportunities and risks that come with climate change amplified in Polar Regions.

Website: <http://polarprediction.net/>

Contact Person: Kirstin Werner Email: office@polarprediction.net

International Union of Geodesy and Geophysics (IUGG)

International Association of Cryospheric Sciences (IASC)

The International Union of Geodesy and Geophysics, which has been a Union Member of SCAR since 1958, is comprised of eight semi-autonomous disciplinary Associations. Each of these has scientific topics or activities which link, or has potential to link, with those of SCAR. Some of the fields of similar interest between SCAR and IUGG Associations will be outlined, with a particular focus on activities of the newest IUGG Association, IACS, which deals with ice and snow.

Website: www.iugg.org and www.cryosphericciences.org

Contact Person: Ian Allison Email: ian.allison@utas.edu.au

Operational Meteorology in the Antarctic Expert Group

This group is working on items that are related to operational meteorology in the Antarctic and also fostering links with other stakeholders like the World Meteorological Organisation (WMO) and the annual Antarctic Meteorological Observation, Modeling & Forecasting Workshop (AMOMFW) which SCAR part funds.

Website: https://legacy.bas.ac.uk/met/jds/met/SCAR_oma.htm

Contact Person: Steve Colwell Email: src@bas.ac.uk

GNSS Research and Application for Polar Environment (GRAPE)

GRAPE is a joint SSG Physical Science and Geoscience Expert Group. It was born in 2012 at the SCAR OSC in Portland and includes the former Action Group "GPS for Weather and Space Weather Forecast". GRAPE is dealing with the monitoring of neutral and ionized atmosphere at bi-polar latitudes with the scope of investigating the atmospheric response to solar activity and its effects on GNSS based systems and applications.

The main goal is to continue to intensify the international efforts to build and coordinate a robust network of collaborations able to answer a variety of weather and space weather related needs through ad hoc data sharing and models development.

Website: www.grape.scar.org

Contact Person: Giorgia De Franceschi Email: giorgiana.defranceschi@ingv.it

Geospatial Information - Geodesy (Geodetic Infrastructure in Antarctica) Expert Group (GIANT)

As interest in earth sciences and the effects of change within Antarctica have grown over the years the need of earth monitoring observatories have increased. GIANT is an expert group established to oversee the development of geodetic infrastructure across the Antarctic Continent to facilitate the monitoring of its physical processes. The group has acted as an advisory committee to help coordinate various infrastructure associated with earth monitoring techniques such as GNSS, gravity meters as well as the installation of tide gauges to monitor sea level change.

Website: <http://www.scar.org/ssg/geosciences/giant>

Contact Person: Mirko Scheinert Email: mirko.scheinert@tu-dresden.de
Alessandro Capra Email: alessandro.capra@unimore.it

Quantarctica

The Norwegian Polar Institute has developed the standalone open GIS package “Quantarctica” for Antarctic science and mapping. This geospatial data package is built on the free, open-source, cross-platform QGIS software, and includes a wide range of cartographic basemap layers, geophysical and glaciological datasets, and satellite imagery. Here, we briefly revisit the structure and accomplishments of the first two version releases of Quantarctica since its creation in 2013 and its recognition as an official SCAR data product in 2014, before presenting the vision for version 3.0, to be released in 2016-2017.

Two primary goals exist for Quantarctica 3.0: 1) An increase in the breadth and depth of the included open data from an expanded array of international partners and investigators in Antarctic climatology, biology, oceanography, and atmospheric sciences, and 2) Expanded educational outreach, in the form of online and video tutorials, documentation, and user workshops.

Quantarctica exists as a dynamic compilation of freely-available geospatial data from and for the scientific community. As such, the project welcomes any and all new or updated data contributions, user feedback, and potential collaborations.

Website: <http://www.quantarctica.org/>

Contact Person: George Roth Email: george.roth@npolar.no

Geological Mapping Update of Antarctica Action Group (GeoMAP)

There are numerous, hard-copy, regional-scale geological maps of Antarctica that were developed last century. Many have been scanned, some have been georeferenced, but few are more than raster digital information. For the most part they are geologically reliable for defining bedrock geology ('deep time') but unfortunately they contain little representation of glacial geology. The GeoMAP action group is facilitating an integrated programme to promote the capture of existing geological map data, update its spatial reliability, improve representation of glacial sequences and geomorphology, and enable data delivery via web-feature services. The group aims to build a modern geological dataset that classifies and describes the bedrock and surficial geology of Antarctica's rock exposures. It will meet a growing need for a comprehensive digital dataset to define the exposed geosphere, for pinpointing the locations of glacial deposits, indicate their mode of formation, age, and likely source. Such key underpinning information are also needed to constrain biological and ecological research, identify geoindicators of climate change, and help improve our understanding of Antarctica's influence on global climate.

Website: <http://www.scar.org/ssg/geosciences/geomap>

Contact Person: Simon Cox Email: s.cox@gns.cri.nz

International Bathymetric Chart of the Southern Ocean (IBCSO)

The International Bathymetric Chart of the Southern Ocean (IBCSO) project aims to create comprehensive and reliable digital bathymetric models (DBM) for the Circum-Antarctic waters. Due to the size, remoteness and inaccessibility of this region, the success of the project depends on international efforts and collaboration. For this reason, IBCSO is well connected to internationally operating scientific and hydrographic organizations. IBCSO is an expert group of SCAR since 2004. Furthermore, it is a regional mapping project of the General Bathymetric Chart of the Ocean (GEBCO) under the joint auspices of the Intergovernmental Oceanographic Commission (IOC) (of UNESCO) and the International Hydrographic Organization (IHO).

In 2013, the first version of IBCSO became available to the scientific community, accompanied by a publication in Geophysical Research Letters (Arndt et al., 2013). For this version, more than 30 institutions from 15 countries contributed data. The DBM covers the area south of 60° S with a cell resolution of 500 m. The gridded DBM can be downloaded in various formats from the project website, as well as a chart and cartographic background data for GIS use. Even though all available data had been compiled for IBCSO V1.0, approximately 83 % of the gridded cells remained not directly constrained by soundings. Since the release of IBCSO V1.0 the amount of available data has increased significantly and will do so in the future. Accordingly, a possible IBCSO version 2.0 is envisaged that will also include the waters up to 50° S. This requires additional acquisition of bathymetric data and their contribution to the project.

Website: www.ibcso.org

Contact Person: Jan Erik Arndt Email: Jan.Erik.Arndt@awi.de

Antarctic Digital Magnetic Anomaly Map Project (ADMAP-2)

ADMAP is an international effort officially launched in August 2013 that aims to compile all existing magnetic data holdings for the Antarctic continent.

The first magnetic anomaly map for Antarctica was published in 2001 by the British Antarctic Survey in collaboration with an international consortium including over 13 countries and 20 institutions. Since the first compilation, the international geomagnetic community has been very active collecting over 2 ML line km of new aeromagnetic and ship-borne magnetic data over the continent, particularly over largely un-explored Antarctic frontiers.

The group aims to produce a new state of the art map and digital magnetic database for Antarctica, including wherever possible point observations. The new compilation will significantly enhance Antarctic geological research by providing, for example, new geophysical perspectives into the role of Antarctica in the supercontinental cycle and the influence of geological boundary conditions on ice sheet dynamics.

Website: To be re-launched/re-vamped at SCAR meeting (proposal is for new ADMAP-2 site to be hosted at BAS initially).

Contact Person: Fausto Ferraccioli Email: ffe@bas.ac.uk

Geological Heritage and Geoconservation Action Group

With improving accessibility to Antarctica, the need for recognition, protection and management of geo-heritage sites is becoming increasingly important. Environmental protection and conservation practise in the Antarctic is managed by provisions contained within the Protocol on Environmental Protection to the Antarctic Treaty. Whilst these provisions have been used primarily to protect sites of biological or cultural significance, sites of geological or geomorphological significance may also be considered. However, to date, sites of geological and geomorphological significance have not received the same attention as sites protecting other values, leaving much scope to improve protection of Antarctica's geological heritage.

SCAR has created the Geological Heritage and Geoconservation Action Group to consider emerging concerns on the recognition, protection and ongoing management of geological and geomorphological sites of significance within the Antarctic, including fossils. Their goal is to develop a policy paper detailing their findings for submission to the Antarctic Treaty Consultative Meeting's Committee for Environmental Protection.

Website: <http://www.scar.org/ssg/geosciences/geoconservation>

Contact Person: Kevin A. Hughes Email: kehu@bas.ac.uk

International Union of Geological Sciences

The International Union of Geological Sciences (IUGS) is one of the largest and most active non-governmental scientific organizations in the world. Founded in 1961, IUGS is a member of the International Council of Science. IUGS promotes and encourages the study of geological problems, especially those of world-wide significance, and supports and facilitates international and interdisciplinary cooperation in the Earth sciences.

With 121 national members, the Union aims to promote development of the Earth sciences through the support of broad-based scientific studies relevant to the entire Earth system; to apply the results of these and other studies to preserving Earth's natural environment, using all natural resources wisely and improving the prosperity of nations and the quality of human life; and to strengthen public awareness of geology and advance geological education in the widest sense.

The IUGS gives particular value and attention to the research conducted by the international community on the Antarctic continent - still largely unknown- and on the Antarctic region for the unique opportunity to understand the interactions between the various components of the system (including the cryosphere) and the functioning of the Earth system.

Website: <http://www.iugs.org/>

Roland Oberhansli IUGS President

Jose Paolo Calvo IUGS General Secretary

Carlo Alberto Ricci IUGS representative to SCAR

Email: carloalberto.ricci@unisi.it

Antarctic Volcanism (AntVolc)

The Expert Group on Antarctic Volcanism (ANTVOLC) was formed in 2014 and includes about 70 members from more than dozen countries.

The group aims to:

- ☞ Promote the study of Antarctic volcanism and disperse information;
- ☞ Discuss protocols, methods, best practices;
- ☞ Integrate and share geological information;
- ☞ Facilitate regional correlations (e.g. tephrochronology);
- ☞ Compile, integrate and publish databases (e.g. outcrop maps, geochemistry);
- ☞ Identify priorities, critical issues, future scientific directions;
- ☞ Develop collaborations and international joint research projects;
- ☞ Exchange data and ideas with other SCAR Scientific Programmes or Expert Groups;

- ☞ Provide a clear route map for obtaining expert advice in case of volcanic crises, e.g. Deception Island, Mount Erebus, Mount Melbourne; and
- ☞ Develop productive links with related science disciplines (e.g. glaciology, biology, modelling).

Website: <http://www.scar.org/ssg/geosciences/antvolc>

Contact Person: Massimo Pompilio Email: massimo.pompilio@gmail.com

History of Antarctic Research Expert Group

The SCAR History Expert Group started as an Action Group in 2004 and held its first workshop in 2005. Since then the Group has flourished and membership of the Expert Group has steadily increased, as has the geographical and disciplinary diversity of the participants. Yearly group's meetings continue to serve as a valuable discussion space for students, junior and senior scholars alike. These meetings have been held in four continents (Africa, Europe, North America, South America), permitting the core group of academic historians to be joined by local researchers who would likely not otherwise have joined the Group.

The core disciplinary identity of the Expert Group has steadily expanded from historians to include archeologists, anthropologists, cultural heritage specialists, and others, in addition to polar veterans from various disciplines.

The SCAR History Expert Group provides a unique and irreplaceable site for scholars to exchange ideas and develop historical research related to the Antarctic. Collaborative research projects undertaken by some of the group members demonstrate the group's dynamism.

The Group now has significant expertise in cultural heritage issues, particularly as many members of the International Polar Heritage Committee, and is well placed to make a stronger and more formal contribution to SCAR within this domain.

Website: <http://www.scar.org/othergroups/humanities/historygroup>

Contact Person: Cornelia Lüdecke Email: C.Luedecke@lrz.uni-muenchen.de

Humanities and Social Sciences Expert Group (HASSEG)

The Humanities and Social Sciences Expert Group [HASSEG] brings together researchers in the humanities and social sciences with an interest in the Antarctic region. The group facilitates the exchange of news, publications and research ideas, and organizes regular conferences and workshops. HASSEG also organises research projects on different topics, which are generally revolving around the wide range of human engagement with Antarctica. Our first joint project was an exploration of the values associated with Antarctica, and while we explore opportunities for future joint projects on topics of interest

to a wide range of humanities scholars and social scientists (e.g., Antarctic wilderness; science communication), we encourage all researchers to share any of their Antarctic scholarly work (that broadly falls into the social sciences or humanities) at our conferences or SCAR OSC sessions.

Website: <http://antarctica-ssag.org>

Contact Persons: Daniela Liggett Email: daniela.liggett@canterbury.ac.nz
Elizabeth Leane Email: Elizabeth.leane@utas.edu.au

SCAR/COMNAP Joint Expert Group Human Biology and Medicine (JEGHBM)

The SCAR COMNAP JEGHBM is a joint group of medical doctors and researchers with membership from those responsible for medical programs and research in National Antarctic Programs and Human Biology and Medicine researchers from universities, Arctic, space agencies, and other extreme environments.

The group originated and was first formed in 1974 as the SCAR Working Group on Human Biology and Medicine. In its early years a significant achievement was the collaboration of numerous nations to conduct the International Biomedical Expedition to Antarctica which resulted in significant scientific and outreach achievements. The group undergone name changes in particular with the more recent advent of COMNAP and is now a joint group of both SCAR and COMNAP as part of SCAR SSG-Life Sciences.

The group has continued its important work of being the only group and network of Antarctic medical practitioners providing peer support, unique expertise and advice to ACTM, COMNAP, SCAR and the Scientific community on Antarctic medical and human responses in the extreme environment. Importantly with the unique collaboration between operational matters and research, critical evidence and applied research can be undertaken and drawn upon.

Website: www.scar.org/ssg/life-sciences/jeghbm. www.medicalantarctica.com

Contact Person: Dr Jeff Ayton Email: jeff.ayton@aad.gov.au

Expert Group on Birds and Marine Mammals (EGBAMM)

The title of the group is self-explanatory but in case it is not enough we are tasked with providing expert knowledge and research leadership in all matters related to birds and mammals in the Antarctic, in order to support research that will quantify the role of birds and marine mammals in the Antarctic marine and terrestrial ecosystems.

Website: <http://www.scar.org/ssg/life-sciences/bamm>

Contact Persons: Mark Hindell Email: Mark.Hindell@utas.edu.au
Yan Ropert-Coudert Email: yan.ropert-coudert@cebc.cnrs.fr

Working Group of Health Monitoring of Birds and Marine Mammals/ Expert Group of Birds and Marine Mammals

Health Monitoring of Birds and Marine Mammals is part of the SCAR Expert Group of Birds and Marine Mammals. The aim of this group is to coordinate the research and the assessment about health of birds and marine mammals in Antarctica. Specifically the group will work:

- ☞ To monitor the health status of Antarctic birds and marine mammals;
- ☞ To provide advice and assessment to the SCAR through EG-BMM about matters related to health and disease status of Antarctic wildlife;
- ☞ To coordinate research about health of Antarctic wildlife identifying scientific gaps and compiling the existent information;
- ☞ To promote the generation of knowledge and information about the presence and effects of pathogens and parasites on Antarctic birds and marine mammals; and
- ☞ To work with other components and scientific programs of the SCAR (EB-ABI Expert Group of Antarctic Biodiversity Informatics; ANTABIF Antarctic Biodiversity Information Facility, ANTERA, ANTECO) to achieve multidisciplinary approaches to animal health issues.

Website: <http://www.scar.org/ssg/life-sciences/bamm>

Contact Person: Andres Barbosa Email: barbosa@mncn.csic.es

State of the Antarctic Ecosystem (AntEco)

Biological diversity is the sum of all organisms in a system. These organisms collectively determine how ecosystems function and underpin the life-support system of our planet. The SCAR-Biology Programme - State of the Antarctic Ecosystem (AntEco) has been designed to focus on past and present patterns of biodiversity across all environments within the Antarctic, sub-Antarctic and Southern Ocean regions. The broad objectives of the programme are to increase the scientific knowledge of biodiversity, from genes to ecosystems that, coupled with increased knowledge of species biology, can be used for the conservation and management of Antarctic ecosystems.

Website: <http://www.scar.org/srp/anteco>

Contact Persons: Jan Strugnell Email: J.Strugnell@latrobe.edu.au
Huw Griffiths Email: HJG@bas.ac.uk

International Union of Biological Sciences (IUBS)

IUBS is a non-governmental, non-profit organization created in 1919. IUBS is currently composed of 28 national members (Academies, Science Council, Royal Societies...) and 84 scientific members (international biological societies). Thus IUBS represents a wide network of disciplines dealing with the biology of microorganisms, plants and animals, ranging from cell biology, genetics, taxonomy to ecology and concerned with such different domains as seed testing, horticultural sciences, marine biology and biological education. IUBS objectives are to promote biological sciences, coordinate international and interdisciplinary cooperation, support scientific programmes and conferences. Our goal is to counteract the fragmentation within biology by developing a unified biology approach. For the next triennium, IUBS has decided to implement programmes on climate change, education, bioinformatics, bionomenclature and agroecosystems, developing collaborations with Future Earth.

Website: <http://www.iubs.org/>

Contact Person: Andres Barbosa (SCAR representative) Email: barbosa@mncn.csic.es

Antarctic Thresholds - Ecosystem Resilience and Adaptation (AnT-ERA)

The main goal of AnT-ERA is to facilitate the science required to examine changes in biological processes, mainly related to climate change, from the molecular to the ecosystem level, in Antarctic and Sub-Antarctic marine, freshwater and terrestrial ecosystems.

Website: <http://www.scar.org/srp/ant-era>

Contact Person: Julian Gutt Email: julian.gutt@awi.de

Antarctic Nearshore and Terrestrial Observation System Action Group (ANTOS)

Antarctic Near-Shore and Terrestrial Observation System (ANTOS) is a SCAR Action Group (2 years in duration), established in August 2014. ANTOS was formed in response to the widespread recognition of the need for information on variability in environmental parameters that influence Antarctic ecosystems. The central tenet of ANTOS is to identify and interpret change over the long-term, how this impacts Antarctic's unique ecosystems around the continent, its offshore islands, and the sub-Antarctic. Consequently, ANTOS aims to establish an integrated, coordinated transcontinental and trans-regional observation system to track environmental variability and change at biologically relevant scales. In essence, ANTOS will provide robust data to contextualise change across an entire global biogeographic zone in both near-shore and terrestrial realms. Furthermore, ANTOS will provide a platform for current and future science programmes to operate within, which will allow locally collected data to be leveraged into a much larger continental scale reference network. The first major activity to further the implementation of ANTOS was a two-day international workshop, held in Hamilton, New Zealand, in August 2015. The activities and outcomes of the workshop are the subject of this poster.

Website: <http://www.scar.org/antos>

Contact Persons: Craig Cary Email: caryc@waikato.ac.nz

Vonda Cummings Email: Vonda.Cummings@niwa.co.nz

Southern Ocean Observing System (SOOS)

SOOS is an international initiative with the mission to facilitate the collection and delivery of essential observations on dynamics and change of Southern Ocean systems to all international stakeholders (researchers, governments, industries), through design, advocacy and implementation of cost-effective observing and data delivery systems.

SOOS Objectives are structured to follow a logical sequence of implementation: Design of the System, Capabilities, Observations, Regional Implementation, Data Deliver, Support Activities

- ☞ Facilitate the design and implementation of a comprehensive and multi-disciplinary observing system for the Southern Ocean;
- ☞ Advocate and guide the development of new observation technologies;
- ☞ Compile and encourage use of existing international standards and methodologies, and facilitate the development of new standards where required;
- ☞ Unify and enhance current observation efforts and leverage further resources across disciplines, and between nations and programs;
- ☞ Facilitate linking of sustained long-term observations to provide a system of enhanced data discovery and delivery, utilising existing data centres and programmatic efforts combined with, as needed, purpose-built data management and storage systems; and
- ☞ Provide services to communicate, coordinate, advocate and facilitate SOOS objectives and activities.

Website: www.soos.aq

Contact Person: Louise Newman Email: louise.newman@utas.edu.au

Anna Wåhlin Email: anna.wahlin@marine.gu.se

Oscar Schofield Email: oscar.schofield@rutgers.edu

Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED)

Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED) is an international multidisciplinary programme established in 2008. ICED is undertaking an integrated circumpolar approach to improve our understanding of Southern Ocean change, the implications for ecosystems, and implications for management. The programme was developed in conjunction with the Scientific Committee on Oceanic Research (SCOR) and the International Geosphere-Biosphere Programme (IGBP). ICED is currently a regional programme of the IGBP's Integrated Marine Biogeochemistry and Ecosystem Research

(IMBER) and is closely linked with the Scientific Committee on Antarctic Research (SCAR). ICED will also transition with IMBER into the new Future Earth initiative.

Website: www.iced.ac.uk

Contact Person: Rachel Cavanagh Email: rcav@bas.ac.uk

Antarctic Biodiversity Portal

Antarctic Biodiversity portal, data portal, biogeographic Atlas of the Southern Ocean

Website: www.biodiversity.aq

Contact Person: Anton Van de Putte Email: antonarctica@gmail.com

SCAR Biology Symposium 2017

Organisers of the upcoming SCAR biology Symposium in 2017 in Belgium

Website: not available yet

Contact Person: Anton Van de Putte Email: antonarctica@gmail.com

Standing Committee on Antarctic Data Management (SCADM)

Standing Committee on Antarctic Data management

Website: <http://www.scar.org/data-products/scadm>

Contact Person: Anton Van de Putte Email: antonarctica@gmail.com

Standing Committee on the Antarctic Treaty System (SCATS)

SCAR is an official Observer to the Antarctic Treaty and has provided independent, objective scientific advice in a variety of fields, particularly on environmental and conservation matters. The Standing Committee on the Antarctic Treaty System (SCATS) is the body tasked with developing SCAR's scientific advice to the Antarctic Treaty Consultative Meeting (ATCM) and its Committee on Environmental Protection (CEP), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Convention for the Conservation of Antarctic Seals (CCAS), and the Advisory Committee to the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

SCAR's role in the ATCM and CEP includes provision of Working Papers and Information Papers on:

- ☞ Emerging policy-relevant issues;
- ☞ Reviews of the state of knowledge; and
- ☞ Scientific and technical advice.

Website: <http://www.scar.org/antarctic-treaty-system/scats>

Contact Person: Aleks Terauds Email: aleks.terauds@gmail.com

Polar Knowledge Canada (POLAR)

Polar Knowledge Canada (POLAR) is Canada's lead federal agency to strengthen Canadian leadership in science and technology in the Arctic and Antarctic, and is Canada's adhering body to the Scientific Committee on Antarctic Research (SCAR). POLAR is currently working to develop a Canadian Antarctic Research Program to increase knowledge of the Antarctic, global systems, and polar linkages. The Canadian Committee on Antarctic Research (CCAR) provides advice and guidance to POLAR on Antarctic matters, including opportunities to strengthen Canadian Antarctic research activities, and serves as Canada's National Committee under SCAR.

Website: <https://www.canada.ca/en/polar-knowledge/advancingpolarknowledge/ccar.html>

Contact Person: Susan File Email: susan.file@polar.gc.ca

German National Committee for SCAR/IASC

The German National Committee (GNC) SCAR/IASC acts as a national corresponding body to SCAR and IASC. The GNC is planning and coordinating activities of German University research in the field of Polar Research together with the Alfred-Wegener-Institute, Helmholtz-Centre for Polar and Marine Research and associated national institutions that also provide required logistics. The GNC coordinates its work on the national level with the German Research Foundation (DFG) commissions, that are responsible for the specific branches within geosciences, and also cooperates with further potentially affected DFG panels.

Website: <http://www.scar-iasc.de/>

Contact Person: Sascha Willmes Email: willmes@uni-trier.de

Indian Antarctic Program

National Centre for Antarctic and Ocean Research-Goa, India - Ministry of Earth Sciences

(Indian Antarctic Program – coup d'oeil)

The journey of three and a half decades of Indian Antarctic Program began in the year 1981 from its first foray in the Schirmacher Hills of Dronning Maud Land, East Antarctica. The first scientific research was initiated in geosciences, atmospheric and biological sciences. Over the years, the Indian Antarctic Program has evolved significantly both in terms of breadth of scientific activities as well as in terms of logistic achievements by establishing two permanent stations which is on par with many of the global Antarctic research stations. Since the last decade and a half, the Indian Antarctic Program has embarked on various multi-disciplinary research fields. The Program has evolved significantly due to major collaborations with international polar research institutes. Through this step, India is making great strides in Antarctic Research and a strong effort is being made to align it to the SCAR Science Research Programs (SCAR Horizon Scan). In an effort to bring international community together for the benefit of Indian Antarctic Program, the twelfth edition of the International Symposium on Antarctic Earth Sciences (XII-ISAES) was held at Goa during 13-17 July 2015, which saw the participation of scientists from 27 countries, thereby creating a platform for enhanced interaction of the geosciences community from all around the globe. In this poster, we will provide you coup d'oeil - a glance that takes in a comprehensive view, of the Indian Antarctic Program and the scientific ventures in which we are active since the inception of the Indian Antarctic Program.

Website: www.ncaor.gov.in

Contact Person: Dr. Rahul Mohan, Project Director - Antarctic Science Email: rahulmohangupta@gmail.com

Sultan Mizan Antarctic Research Foundation (SMARF)

The establishment of the Sultan Mizan Antarctic Research Foundation (SMARF) or the Yayasan Penyelidikan Antartika Sultan Mizan (YPASM) was approved by the Cabinet on 6 June 2012. Subsequently, on 18 July 2012, YPASM was registered as a Company Limited by Guarantee and not having share capital, under the Companies Act 1965. SMARF is under the purview of the Ministry of Science, Technology and Innovation and was officially launched by Ke Bawah Duli Yang Maha Mulia Al-Wathiqu Billah Tuanku Mizan Zainal Abidin Ibni Al-Marhum Sultan Mahmud Al-Muktafi Billah Shah, Sultan of Terengganu on 19 July 2012 in Kuala Terengganu, Malaysia. The idea to establish a foundation dedicated to Polar research was mooted by the XIII Yang Di-Pertuan Agong during His Majesty's special visit to the Antarctic continent from 20-23 November 2011. His visit to the South Pole is the first by a Muslim Head of State. The objectives establishment of SMARF are as follows:

- ☞ To initiate and promote scientific research programmes in the Arctic and Antarctic regions and on the role of the Polar regions in the Earth system;
- ☞ To provide and manage funding through research grants, post-graduates studies and fellowship for R&D in the Polar regions for Malaysian scientists; and

- ☞ To develop Malaysian scientific capacity, specifically young scientists; to promote Antarctic science in the education system; and to disseminate Polar scientific information.

Website: <http://www.ypasm.my/>

Contact Person: Hafiz Ambar Email: hafiz@ypasm.my

Netherlands Polar Programme

This is the national granting programme for Netherlands polar research, coordinated and operated by the Dutch funding agency (Netherlands organisation for Scientific Research)

Website: <http://www.nwo.nl/en/research-and-results/programmes/Netherlands+Polar+Programme>

Contact Person: Liesbeth Noor Email: l.noor@nwo.nl

Polish National Committee on SCAR

The poster presents major research activities conducted in Antarctica by Polish scientists in Life and Geosciences. Most of these activities are centered on King George Island, where the Polish Arctowski Station is located. Research in other areas is done thanks to international cooperation.

Website: www.kbp.pan.pl

Contact Person: Wojciech Majewski Email: wmaj@twarda.pan.pl

Propolar

Propolar is the Portuguese programme for polar research. The main objective of Propolar (www.propolar.org) is to provide logistics for Portuguese scientific missions in the Arctic and Antarctic, in close cooperation with international partners, and to promote polar science among young scientists. Propolar is funded by the Foundation for Science and Technology (FCT) and run by a committee originating from several universities involved in polar research. It also hosts a programme of fellowships sponsored by public and private funds aims at promoting polar research among young scientists.

Website: www.propolar.org

Contact Person: Adelino Canário Email: acanario@ualg.pt

Royal Society of New Zealand Committee of Antarctic Science

The Royal Society Committee on Antarctic Science (formerly referred to as an Expert Panel on Antarctic Sciences RSEPAS) was formed to provide advice to the Royal Society on Antarctic Science matters.

The committee also acts as the National Committee on Antarctic Science when co-ordinating matters for the Scientific Committee on Antarctic Research (SCAR), a subcommittee of the International Council of Scientific Unions (ICSU), such as for protected area management plans or guidelines on environmental impact assessments. It is a discipline-based committee that has 12 members drawn from New Zealand universities and Crown Research Institutes.

Website: <http://www.royalsociety.org.nz/organisation/panels/antarctic/>

Contact Person: Bryan Storey Email: bryan.storey@canterbury.ac.nz

Spain National SCAR Committee

Spain became a SCAR associate member in 1987 and a SCAR full member in 1990. The Spanish SCAR National Committee functions include promotion of Antarctic scientific research in Spain, development of links between the national and international Antarctic scientific communities, and representation of the Spanish scientific community in the Scientific Committee on Antarctic Research. The National Committee has organised in Spain different international and national Antarctic meetings, lectures, publications and other activities. Information about the Committee and its activities can be seen in its website: <http://www.uam.es/cn-scar>

Website: <http://www.uam.es/cn-scar>

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United Kingdom National Committee for Antarctic Research

The UK National Committee for Antarctic Research is responsible for promoting and co-ordinating the UK's interests in the activities of SCAR and other areas of international Antarctic scientific activity, and to discuss and disseminate information about this and future developments in Antarctic research within the UK Antarctic community.

Website: <https://legacy.bas.ac.uk/UKNCAR/>

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United States National Committee to SCAR

The Polar Research Board (PRB) of the U.S. National Academies of Sciences, Engineering, and Medicine serves as the U.S. National Committee to SCAR.

The PRB also serves as the U.S. National Committee to the International Arctic Science Committee (IASC)—thereby providing a valuable common ground for discussion among Antarctic and Arctic research communities. The PRB appoints the members of the U.S. SCAR delegation—which includes a lead and alternate delegate, and representatives for each of the SCAR Scientific Groups. This delegation leads U.S. participation in the biennial SCAR meetings, and (together with the PRB) works to expand the pool of Antarctic and Southern Ocean researchers across the U.S. who are actively involved in SCAR activities. Our website and “ANSWER” newsletter provide key means for sharing information.

Website: <http://usscar.org/>

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