EXCOM 2013

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SSG-Life Sciences

Executive Summary (1 page)

Title: SSG Life Sciences

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Introduction/ Background: (Summary of SSG)

EG-ABI is seeking to improve the management, discovery, exploration, analysis and presentation of biodiversity data. It is still at the early stages but has been making significant progress for the SCAR community. EG-BAMM has been strengthening links with ABI, APECS and the new Action Group on Remote Sensing. The BAMM and Remote Sensing groups will increase our capacity to monitor bird and mammal populations and species by using satellites to count animals. BAMM is working on improving its databases, especially for bird and mammal tracking data in collaboration with ABI. The SO-CPR database is also being redeveloped through the support of the Australian Antarctic Data Centre to provide easier access and distribution of plankton data. SO-CPR Survey is now an endorsed programme of SOOS. It is taking a leadership role in the new Global Alliance of CPR Surveys (GACS) plankton monitoring programme. It continues to expand into new regions with South Africa and France joining the Survey. Korea plans to join soon. EG-CPR has supported capacity building training workshops for new personnel from Brazil, France and Korea. ICED is developing its core activities on food web modelling, data synthesis, fieldwork, policy information and E&O. Links are being strengthened with SOOS, APECS, IPCC and CCAMLR. Additional workshops are planned to address important issue relating to Antarctic and the EU, as well as improving E&O. EG-HB&M has merged with its COMPNAP counterpart and is continuing to work with IASC and APECS. The new JEGHBM is seeking to enhance tele-medicine, tele-health, research and associated databases.

Important Issues or Factors: (what do the SCAR Delegates need to be aware of)

SCAR EG-HB&M and the COMNAP Medical Network have merged to form the Joint Expert Group Human Biology and Medicine (JEGHBM).

A new observing system is being proposed "Antarctic Near-Shore and Terrestrial Observing System (ANTOS)", which is expected to be supported by an expert group within the SSG-LS. A full proposal which will be presented at the SCAR Business Meeting, Auckland 2014.

Recommendations/Actions and Justification:

AG-Acoustics should be abolished as its work is deemed complete and future requests should be handled by SCATS, as occurred in 2011-2012.

Expected Benefits/Outcomes: (if the actions are taken what outcomes are expected)

The RAATD will lead to the production of habitat usage maps for bird and mammals and identify multi-species areas of ecological significance. EG-CPR participation in GACS will allow us to place our observed changes in Antarctic plankton in a global context. Continued engagement with other partners, workshops and training enhances our knowledge exchange, capacity building and E&O.

Partners: (will this involve others both within and outside of SCAR?)

In addition to supporting SRPs (e.g. AnT-ERA and AntEco), and national programmes, LS groups work with and contribute to SOOS, CCAMLR, GACS, IPCC, GBIF, OBIS, APECS, CEP. ANTOS aims tot provide a platform for current and future SCAR Life Sciences programmes (e.g. AnT-ERA, AntEco)., as well as national Antarctic programmes

Budget Implications:

An Export Group for ANTOS will have funding implications but not until the 2015-16 budget period.

SSG Life Sciences

(Should be no longer than 8 pages, excluding appendices)

1. Chief Officers

CO: Graham Hosie (AUS); Deputy CO: March Shepanek (USA); Secretary: Yan Ropert-Coudert (FRA)

2. Major Future Initiatives and Actions

Report on proposed new groups, future meetings and activities

A new observing system is being proposed "Antarctic Near-Shore and Terrestrial Observing System (ANTOS)" to establish a network of observations across the Antarctic, which will be supported by an expert group within the SSG-LS. ANTOS will complement SOOS. Workshops will be conducted during 2013, notably at the SCAR Biology Symposium, to develop the proposal which will be presented at the SCAR Business Meeting, Auckland 2014. Further details are in the appendix.

Other meetings are scheduled at Barcelona for EG-ABI, EG-BAMM, and AG-Remote Sensing. There is a common focus of enhancing integration between these groups.

3. Major Activities and Significant Progress

i) Selected publications; databases; workshops and meetings; Education and Outreach; Data and Information activities

ii) Subsidiary Bodies (Action, Expert groups etc.) Outcomes

EG-ABI

Chief Officer: B. Danis

Biodiversity Informatics is the application of informatics techniques to biodiversity information for improved management, presentation, discovery, exploration and analysis. The application of modern computer techniques, can yield new ways to view and analyse existing information, as well as predictive models for information that does not yet exist.

The SCAR Expert Group on Antarctic Biodiversity Informatics (EG-ABI) was created during the SSG-LS meeting at the SCAR Open Science Conference in Portland Oregon, July 2012. Its terms of reference include to:

- Coordinate biodiversity informatics activities across SCAR for research, management, conservation and monitoring purposes;
- Promote free and open access to primary Antarctic biodiversity data, source code, and relevant resources;
- Promote community-driven biodiversity data projects;
- Provide advice to SCAR groups which require access to biodiversity data and advise on strategies to embrace future data streams;
- Advise SCAR groups on best practices in biodiversity data management, standardization, interoperability and biodiversity information networks designs;
- Advise on the involvement of SCAR with bodies such as the Global Biodiversity Information Facility (GBIF) or the Ocean Biogeographic Information System (IODE-OBIS) on matters relevant to Antarctica and the Southern Ocean;
- Contribute to the establishment of a dynamic, data-driven benchmark of the state of Antarctic ecosystems.

More specifically, EG-ABI plans to optimize ongoing developments in biodiversity informatics for the SCAR community. A series of relevant initiatives are ongoing, all aiming at offering free and open access to

biodiversity information, but also at carrying out open source technical developments, and promoting international standards. Ongoing initiatives include biodiversity.aq (all biodiversity information), the mARS project (microbial biodiversity), the Biogeographic Atlas of the Southern Ocean project, the Expert Group on Birds and Marine Mammals database, and connected initiatives such as the Southern Ocean Observing System (SOOS) or the new Antarctic Environments initiative.
At the upcoming SCAR Biology Symposium (Barcelona, Spain), EG-ABI will meet to discuss actions to be taken in the short and medium term. Examples of such actions include the setup of a dedicated information website, a survey of ongoing initiatives, and prioritization of coordination/promotion activities.

Members of EG-ABi include :
Bruno Danis (CO) – ULB, Belgium
Ben Raymond (Secretary) – AAD, Australia
Anton Van de Putte – Biodiversity.aq, Belgium
Yan Ropert-Coudert – CNRS, France
Alison Murray – DRI, USA
Claude De Broyer – RBINS, Belgium
Jose Xavier – U. Coimbra, Portugal
Huw Griffiths – BAS, UK
Horst Bornemann - AWI, Germany
Anne-Sophie Archambeau – MNHN, France

EG-BAMM

Chief Officer: Mark Hindell and Secretary: Yan Ropert-Coudert

The Expert Group on Birds and Marine Mammals (EG-BAMM) has had an active year in 2012-13. We have four new members: Jose Xavier, Hans-Ulrich Peter, Ben Raymond and Reny Tyson. Two members have also left the group: Martin Biuw and Donna Patterson.

The group met in Portland in July, and settled on a new operational structure, consisting of 8 sub-committees that cover the scope of our activities:

1. Outreach: MA Lea + R Tyson
2. Aliens In Antarctica: M Muelbert
3. Article database: Y Ropert-Coudert
4. RAATD database and analysis: MA Hindell + B Raymond
5. CAML: Y Ropert-Coudert + B Raymond
6. Satellite Monitoring: HU Peter
7. Antarctic Field Guide: Y Ropert-Coudert
8. Trophic Interactions and ANT-ECO : J Xavier + MA Hindell

EG-BAMM activities in 2012-13

The Antarctic field guide is being completely re-designed, but there are now contributions for many of the bird and mammal species which have been coordinated by Y Ropert-Coudert . The Southern Ocean bird and marine mammal reference database is being converted from the excel file into a Mendeley database. There are issues regarding the sharing of PDFs which will be discussed in the Barcelona meeting.

An exciting new development is the use of satellites to count birds and mammals, which has the potential to greatly increase our capacity to monitor population and species. There is a new Action Group that deals with this, which includes EG-BAMM.

The CAML atlas is nearing completion, and the overall design of the atlas and the section on birds and marine mammals has consumed a lot of time for the EG-BAMM members (particularly Y Ropert-Coudert who was the lead editor of that section and B Raymond who produced all the maps).

The Retrospective Analysis of Antarctic Tracking Data (RAATD) has also progressed significantly. This study will develop global and regional habitat usage maps for key species based on physical and biological attributes of their "hot-spots" and then overlay all the species specific maps to identify multi-species areas of ecological significance. This is a new approach that, by virtue of identifying regions that are important to multiple species, will provide a much better understanding of the regions and processes that require monitoring and management in the future. We held a workshop in Strasbourg in December. The meeting developed a white paper outlining the steps that will be taken to achieve this broad objective, starting from the identification of likely animal tracking data sets, their collation and archiving, the processing and quality control of the data and the subsequent modelling of areas of ecological significance based on habitat usage maps. We also investigated publishing data sets through the Integrated Publishing Tool (IPT), the accepted route for including data into Antarctic Biodiversity Information Facility (AntaBIF). We decided to submit a test case with a king penguin tracking data set through the system, but this highlighted issues pertaining to the specific nature of the data set that will need to be addressed before the procedure is generalized to all the tracking data sets. This item will also be discussed in Barcelona.

The next meeting of the group will be Barcelona in July in conjunction with the SCAR Biology Symposium.

EG-CPR

Former CO: Graham Hosie and current CO: Kunio Takahashi

Field Work

The 2012/13 season has been one of the most successful field seasons to date. More than 90 tows were completed from seven vessels from Australia, Japan, New Zealand, and new Southern Ocean CPR members South Africa and France. South Africa commenced the season with tows in July 2012 from their new ice breaker south of Africa, providing rare winter samples down to the sea ice zone, and then continued with more tows through to May 2013. France started a new survey in the Kerguelen and Crozet region filling a gap in the Indian Ocean Sector. Australia, Japan and New Zealand focused on the eastern sector from the Prydz Bay region to the Ross Sea. Approximately 5,400 samples have been collected over ~27,000 nautical miles.

Data and usage

The 2012/13 data will bring the database to ~42,000 samples for 230+ taxa when all samples are processed. A new Southern Ocean CPR database and data portal is being developed, funded and hosted by the AADC. This will make data entry, access and distribution quicker and easier for all users. The data have been contributed to the new global CPR database created by the Global Alliance of CPR Surveys (www.globalcpr.org). This allows us to view Antarctic plankton events in a global context. The SO-CPR has strong leadership in GACS with Dr Hosie chairing the Board of Governance and a number of Southern Ocean members are also on the board. SO-CPR is now an endorsed programme within SOOS and in turn SOOS is an official stakeholder of GACS along with SCAR, SCOR, PICES, POGO and IOC-GOOS. Southern Ocean CPR data have been used in the first GACS annual Global Marine Ecological Status Report 2012, in several plankton chapters for the new SCAR Biogeographic Synthesis Atlas and for the CCAMLR endorsed MPA workshop for the Marion and Prince Edward Islands/Del Cano-Crozet region 2012. The workshop report was submitted to CCAMLR WG-EMM July 2012.

Training

Training workshops in use of the CPR and processing of samples were conducted at the AAD in October 2012 for participants from Brazil (Drake Passage samples), France (Kerguelen region) and Korea (potential new Pacific sector survey). Travel was supported by EG-CPR funds. A taxonomic workshop on Southern Ocean plankton was also held at SAHFOS, Plymouth in April 2013. Another is being planned for October 2013 at SAHFOS.

Change in leadership

With Dr Hosie taking on the duties as CO of SSG-LS, Dr Kunio has taken over the duties as CO of EG-CPR. Eventually, he will take over the international leadership and coordination of the SCAR SO-CPR Survey.

EG-ICED

Chair: Eugene Murphy, Executive Officer: Rachel Cavanagh, Programme Manager: Nadine Johnston
Scientific Steering Committee: Richard Bellerby, Andrew Constable, Dan Costa, Eileen Hofmann, Walker Smith, Zhaomin Wang, Dieter Wolf-Gladrow, Jose Xavier.

Key Events 2012

- ICED Session at the IPY Conference, Montreal, Canada, April 2012

Under the theme "Polar marine ecosystems: status and change", this successful session was the second most participated session of the conference (164 abstracts; 54 oral presentations in 5 different days). ICED scientists were also prominent at the Polar Educators workshop, APECS workshop and at discussion panels.

- ICED Sentinel workshop, Hobart, Australia, May 2012

The Southern Ocean Sentinel/ICED workshop discussed the current research into and status of Southern Ocean and Antarctic ecosystems and how to measure any changes and impacts of climate change and ocean acidification. Cooperative research approaches were considered. A review paper on the effects of climate change on Southern Ocean ecosystems, focused on the requirements of the Intergovernmental Panel on Climate Change, is in the process of being submitted.

- ICED Session at the XXXII SCAR Open Science Conference, Oregon, USA, July 2012

Under the theme 'Response of Southern Ocean ecosystems to change' we held a multidisciplinary ICED session focused on the response of individual species, food webs and whole ecosystems to change.

- EUR-OCEANS Consortium Flagship on Polar Ecosystem Change and Synthesis (PECS) Workshop, Bremerhaven, Germany, November 2012.

This group (the European branch of ICED) held its first workshop: "Identifying key links between biogeochemical processes and food web structure". Two manuscripts are in preparation and a Strategy for polar marine ecosystem research has been prepared and distributed within the European Commission. The Strategy was received extremely positively by members of the Directorate General (DG) Research and Innovation of the European Commission in Brussels, resulting in a Thematic Workshop scheduled to take place in May (see below).

Planned events 2013

- Thematic workshop: Polar Marine Ecosystems Research: Strategic directions for the EU Research Area, Brussels, Belgium, May 2013

This workshop will present the above-mentioned Strategy and highlight why research on both Arctic and Antarctic Ocean ecosystems should form an essential component of the EU Research Area through the Horizon 2020 Work Programmes. This will promote collaborate research within Europe and internationally.

- ICED workshop: Circumpolar food webs and scenarios of change, Cambridge, UK, November 2013

An international group of experts (climate scientists, ecologists and modellers) will gather for this workshop at the British Antarctic Survey to provide the scientific basis for projecting the likely response of Southern Ocean ecosystems to environmental change scenarios.

Core activities

Food web Modelling

- Food web quantification and comparison – ongoing
- Circumpolar food web review and analyses underway
- Research on the links between foodwebs and biogeochemistry and scenario analysis

Data syntheses and mining – building circumpolar maps of distribution

- Currently seeking funds to develop an ICED data portal and to mine *Discovery Investigations* data further
- Plans to link with SOOS data portal

Fieldwork coordination

- Redevelopment of online fieldwork map tool (see www.iced.ac.uk) /links with SOOS
- Sentinel Southern Ocean Wiki being developed. This is described in CCAMLR's WG-EMM-12/59.

Informing policy

- Scenario testing to inform IPCC and CCAMLR (workshop November 2013)
- ICED/WWF Stakeholder Event (mid 2014)
- Strategy for European polar marine ecosystem research (thematic workshop to be held in Brussels May 2013, see above)

Education and outreach

- ICED SSC links with Association of Polar Early Career Scientists (APECS)
- E&O area of the ICED website under development
- International Workshop: "Education meets science: bringing polar research into the classrooms" Coimbra, Portugal, March 2013

JEGHBM

Chair: Jeff Ayton, Deputy-Chair: Eberhard Kohlberg, Secretary: Prof. Sergio Pillon

The EG-HB&M of SCAR and the COMNAP Medical Network have merged to create the Joint SCAR-COMNAP Expert Group on Human Biology and Medicine (JEGHBM). The group is serving as a forum to develop best practices for safe, healthy, efficient and effective management in healthcare and in the support of scientific research in Antarctica (terms of reference being finalized). Telemedicine and tele-health are a priority for JEGHBM, as well as international collaboration and resource management. Subgroups addressing specific topics of interest are under development.

A SCAR related website addressing human biology and medicine in the Antarctic has been developed and is on line.

The EG-HB&M research strategy is aligned to SCAR research strategy to help coordinate and facilitate medical research in the Antarctic. While maintaining doctor patient confidentiality and individual privacy as primary, support for best medical practices, nutrition, exercise, and behavioural health have been or are being supported. Affiliation with other groups dealing with medicine of extreme environments is a priority including the Arctic, space and other agencies.

The new JEGHBM is:

- concentrating on increased visibility to and engagement with the general scientific community including the early career researchers.
- focusing on coordination of research to help overcome the fragmented nature of current projects, and small numbers of participants in any given project.
- exploring areas of cooperation with IASC, the International Union of Circumpolar Health and other organizations involved in HB&M research in the Arctic.
- telemedicine
- group dynamics and multicultural effects
- circadian rhythm and the effects of 24 hour night
- genetic and physiological variation in reactions to cold, altitude and hypoxia, climate change and other variables
- pharmacological issues such as drug viability
- disease and injury surveillance
- mechanisms for reporting of novel medical problems, particularly infectious disease.
- collaborative work across disciplines with respect to genetics, comparative physiology, zoonotic disease, vector transmission and changes in these over time, particularly with changes in climate.

- Initiating collaboration between SCAR, COMNAP and individual National Antarctic Programs to undertake health data collection, including a longitudinal epidemiological study of healthcare problems in the Antarctic in a secure, anonymous format.
- Initiating collaboration between SCAR, COMNAP and individual National Programs to develop a database of medical resources and best practices to improve clinical practice and support properly reviewed and selected research proposals.
- developing an Antarctic medical facilities database on the members only area of the COMNAP members only website including a secure discussion forum, linkages with the evolving SCR website both linking from the JEGHBM public website www.medicalantarctica.com.

EG-ATHENA – See SSG-GS Report WP7
EG-OCEANS – See SOOS Report IP4

AG-Acoustics

Chief Officer: Philip O'Brien

In 2011, the CEP requested that SCAR prepare an update of the state of scientific knowledge on the impacts of marine acoustic technology. Rather than holding another workshop, a literature review was prepared by SCATS and submitted to the CEP in Hobart in June 2012. This approach was preferred because of the great expansion of available literature and the holding of regular symposia dedicated to the subject. The review was mostly well received however a member of one delegation did criticise some of the studies we left out. This boiled down to a disagreement over relevance. The CEP meeting requested further updates. Initially the request was for a review every 2 years. SCATS suggested updates should be provided when there were substantial new results to report as the field shows slow progress in spite of the large effort being expended. Given the change to periodic literature reviews as opposed to workshops, the Acoustics Action Group chair suggest that the separate Acoustics Action Group be abolished and that future request be handled by SCATS, as occurred in 2011-2012.

AG-Remote Sensing

Chief Officer: Hans-Ulrich Peters

AG-Remote Sensing has been established with the full name "*Development of a satellite-based, Antarctic-wide, remote sensing approach to monitor bird and animal populations"* at the SCAR XXXII Meeting in Portland 2012. After discussing the topics of this group the Terms of Reference were finally established in February 2013 (see http://www.scar.org/researchgroups/remotesensing).

A working meeting of the Action group will be held during the XIth SCAR Biology Symposium on 19 July 2013 in Barcelona.

AG-ECA

Co-Chief Officers: Paolo Cescon and Gabriele Capodaglio

During the ECA meeting held at the XXXII SCAR conference in Portland and in consideration of results, further priorities emerged:

- The dataset of organic and inorganic pollutants, collected and integrated on the Antarctic Master Directory, must be continuously updated with available literature information. It also emphasized the necessity to extend the dataset to emerging contaminants as well; PBDE, PCN, antifouling compounds.
- Analysis of available data, also from recent studies, provide evidence for the necessity to coordinate programs to obtain a coherent panorama of the environmental contamination in Antarctica and the

extension over all the Antarctic continent. For this activity, the national agencies responsible for the application of the Madrid Protocol should be involved.

- There is evidence that warming may remobilize contaminants buried or immobilized in soils by the permafrost producing a potential effect on the biota. Therefore the group recommended that studies should be carried out to clarify this potential environmental problem and to consider this input on models.

Activities in progress

- Merging the ECA group and the AGAFS on the group: "Chemical contamination in the Antarctic environment: monitoring and mitigation"
- Extension of interest from environmental chemical contamination studies to the assessment of their effects on the Antarctic ecosystem.
- The 9th International Conference on: Contaminants in Freezing Ground, to be held in Melbourne 18-22 May 2014, will include topics of particular interest for the ECA and AGAFS groups: studies carried out on Arctic and Antarctic areas, permafrost and climate change impact on decontamination.

The group plans to:

- develop an AnMAP synthesis (Antarctic Monitoring and Assessment Program, similar to AMAP and State of the Environment Reports).
- promote a Contaminants portal-registry and management tool (State of the Environment Report)
- produce a Risk assessment guideline.

AG-SAVAnt – See SSG-GS Report WP 7
AG-Acidification – See SSG-PS Report WP5

4. Budgetary Implications

The establishment of a new Export Group for the "Antarctic Near-Shore and Terrestrial Observing System" will have funding requirements from 2015 from Life Sciences.

EG-BAMM and EG-ABI have jointly received US$5000 from the contingency fund to develop a database of tracking data for Southern Ocean birds and mammals. Data will be uploaded into AntaBIF's Integrated Publishing Tool (IPT). This will enhance the objectives and output of both Expert Groups.

AG-Remote Sensing has been allocated US$4000 from the contingency funds for 2013 and 2014 to support young scientists to participate on meetings to help develop that action group.

Appendices

e.g. further details of particular proposals or reports

Proposed new Expert Group - Antarctic Near-Shore and Terrestrial Observing System (ANTOS)

Workshops will be held this year to develop the concept of ANTOS. The goal is that a network will be established across the Antarctic supported by an expert group within the SSG-LS. Proposal for the expert group will be presented in 2014.

Background
Some areas such as the moss beds at Casey, the Palmer and Dry Valleys LTER sites and the Rothera near-shore environment have long term observing systems in place to predict, identify, track and attribute change in Antarctic ecosystems. ANTOS aims to link and harmonise such activities, provide impetus for new observing sites and develop a co-ordinated Observing System across Antarctica. ANTOS will aim to

maximise effort and national program investment outcomes and provide a platform for current and future SCAR Life Sciences programs (ANTERA and ANTECO).

The goal is to have workshops in Hobart in June, SCAR Biology Barcelona and the Latin American Antarctic Science conference in September in Chile.

Workshop Aim: to develop a framework for ANTOS
Objectives

- Coordinate and expand strategic observations of Antarctic and subantarctic near-shore and terrestrial ecosystems to identify, track and attribute environmental change.
- Stimulate the development of new observation technologies.
- Provide opportunity for alignment of national and international programs and projects.
- Unify and harmonise current and future observation efforts.
- Facilitate data sharing and improved communication.
- Workshop targets:
- Initiate ANTOS planning
- Identify goals of ANTOS
- Identify current & potential locations for long term observations and predictions of change