



EXCOM/COs Meeting 2011
Edinburgh, 16,18,19th July 2011

Agenda Item: 2.4.3
Person Responsible: P Convey

SCAR SRP 'Evolution and Biodiversity in the Antarctic'

Executive Summary (1 page)

Title: SCAR SRP 'Evolution and Biodiversity in the Antarctic'

Authors: P. Convey, G. di Prisco (EBA Co-Chairs), M. Rajanahally, J. Xavier (EBA co-Secretaries)

Relevant URLs or references to other reports: www.eba.aq

Introduction/ Background: EBA is one of five current approved Science Research Programmes of SCAR, and the only one representing the interests of the very large and diverse biological sciences research community with interests in Antarctica. The Programme has a planned lifetime of 2005-2013. Work under the auspices of EBA is divided into five 'workpackages', each working in both the marine and terrestrial environments of Antarctica.

Important Issues or Factors: Since the Programme's last Report to Delegates in 2010, and building on the very positive review of EBA science and outputs carried out by SCAR in 2008/9, the programme has continued to be very active in its primary coordination role, catalyzing interactions amongst the SCAR biological community.

EBA is now in its final 2-3 year period. Major delivery aims in this period are (1) for each component workpackage to organize a themed conference session/workshop with planned/defined synthesis output, documenting the 'state of the art' and major future challenges in their respective fields; (2) to propose an EBA 'mini-symposium' at the 2012 SCAR OSC, where single overview presentations of progress under each workpackage, and for the programme overall, will be presented by package and programme leaders, ideally to be accompanied by an appropriate publication output; (3) to play an active and central role in the development of proposals to SCAR for successor SCAR biological and cross-disciplinary research programmes.

Recommendations/Actions and Justification: (1) to note and approve of EBA actions and progress to date; (2) to confirm support for EBA's outline plans for the remaining life of the programme [1 provides an indication that Delegates recognise that EBA is delivering to SCAR as planned, 2 provides programme approval and security for its remaining life, and maximizes the opportunity of achieving the higher level syntheses and outputs that are the intended product of the programme, and provide the 'added value']

Expected Benefits/Outcomes: Significant continued publication output (both content and numbers), outreach delivery, advice to stakeholders, enhancement of SCAR profile.

Partners: Various outputs involve interactions with CEP, COMNAP, SCAR Expert and Action Groups

Budget Implications: Request for confirmation of SCAR science programme funding at current level for planned remainder of the Programme's operation to 2013

Evolution and Biodiversity in the Antarctic: The Response of Life to Change (EBA). Report for EXCOM, May 2011

(Working Papers should be no longer than 10 pages and Information Papers no longer than 5)

1. Rationale

Evolution and Biodiversity in the Antarctic: the Response of Life to Change (EBA) was endorsed by SCAR and became operational from January 2006.

The overall aim of the EBA programme is to understand the evolution and diversity of life in the Antarctic, to determine how these have influenced the properties and dynamics of present Antarctic and Southern Ocean ecosystems, and to make predictions on how organisms and communities will respond to current and future environmental change.

This programme involves an explicit integration of work on marine, terrestrial and limnetic ecosystems. The science in this programme thus extends over an entire biome on Earth. By comparing the outcome of parallel evolutionary processes over the range of Antarctic environments, fundamental insights can be obtained into evolution and the ways in which life responds to change, from the molecular to the whole organism level and ultimately to biome level. Most national programmes individually cannot attempt a study on such a bold scale, whereas the collaborative spirit of the Antarctic science community provides a mechanism for achieving outstanding scientific success.

EBA has established five Work Packages to cover the intended areas of research:

- Work Package 1: Evolutionary history of Antarctic organisms
- Work Package 2: Evolutionary adaptation to the Antarctic environment
- Work Package 3: Patterns of gene flow and consequences for population dynamics: Isolation as a driving force
- Work Package 4: Patterns and diversity of organisms, ecosystems and habitats in the Antarctic, and controlling processes
- Work Package 5: Impact of past, current and predicted future environmental change on biodiversity and ecosystem function

2. Overview of Progress

Information regarding the outputs and inputs specifically concerning the EBA programme and its undertakings are provided in the summary format requested by SCAR below. These highlights not only the high level, diversity and connectivity of research that contributes to EBA, and also the challenge that EBA has in keeping a track of these widely distributed groups.

3. Major Tasks and Timeframe

Year	Task outlined in 2005 Implementation Timeline	Comments
2008	SCAR Open Science Meeting, St. Petersburg. Evolutionary Biology-Biodiversity Joint Session.	PC on SOC for this meeting, various EBA-linked contributions
2009	SCAR Biology Symposium, Sapporo.	PC, GdP on SOC for this meeting, many EBA-linked contributions; special issue of <i>Polar Science</i>
2010	SCAR Open Science Meeting (Buenos Aires) First major IPY meeting (Oslo)	PC on SOC for this meeting, various EBA-linked contributions Several sessions organized by EBA-linked IPY programmes
2010	Workshop 'Polar Marine and Latchstring Organisms: Gene and	Special issue of <i>Marine Genomics</i> in

	Protein Evolution in a Changing Environment' (Naples, Italy)	preparation
2010	Workshop on 'New SCAR Biology Programmes (Castiglione, Italy)	Meeting sponsored by SCAR and PNRA, major EBA member input; two new proposals led to approval of two PPGs by Delegates in BA
2011	Workshop 'Polar Genetic Monitoring' (Cambridge, UK)	Co-sponsored by EBA and IASC; ~20 international participants
2011	Workshop 'Antarctic Biodiversity' (Belgium)	~10 international speakers, including remote web-based presentations
2011	Workshop 'Antarctic Conservation' (Skukuza, South Africa)	EBA contribution to SC-ATS meeting
2011	Workshop, 'EBA', World Conference on Marine Biology (Aberdeen, UK)	EBA-sponsored session and workshop; also ANTABIF workshop
2012	SCAR Open Science Meeting (Portland)	PC co-chair of ISOC
2013	SCAR Biology Symposium, Spain – wrap-up of results and last year of program	End of EBA, and launch of new Biology programmes

4. Deliverables

The EBA Implementation plan (2005) outlined that the main output from the EBA programme would be a significant step forward in our understanding of the Antarctic biota and its evolution. There would also be important contributions to fundamental understanding in a number of disciplines. Specific outputs do and will include the following (as demonstrated in the following sections):

- Primary literature publications and books
- Conference proceedings and publications from workshops
- Programme reports
- Website
- Input to databases
- Advisory reports to ATCM and others (e.g., CEP, CCAMLR, COMNAP)
- Input to, and feedback from, international programmes
- Synergies with other SCAR programmes (e.g., ACE, AGCS, SALE)
- Trained PhD graduates and post-doctoral research fellows
- Capacity development of students and members from developing Antarctic nations
- Outreach via National Programmes and in coordination with proposed SCAR Outreach Committee

5. EBA Committee

Name	Role	Gender	Country	Term From
Prof Peter Convey	<i>Co-Chair</i>	Male	United Kingdom	2005
Prof Guido di Prisco	<i>Co-Chair</i>	Male	Italy	2005
Dr Jose Xavier	<i>Co-Secretary</i>	Male	Portugal/UK	2010
Ms Meghana Rajanahally	<i>Co-Secretary</i>	Female	NZ/India	2010
Dr Dana Bergstrom	Secretary (past 05-07)/Member	Female	Australia	2005
Prof Angelika Brandt	Member	Female	Germany	2005
Dr Marc Lebouvier	<i>Member (conservation matters)</i>	Male	France	2005
Dr Ad H.L. Huiskes	<i>CO LSSSG (ex officio)</i>	Male	The Netherlands	2005
Dr Michael Stoddart	<i>Census of Antarctic Marine Life</i>	Male	Australia	2005
Dr Brigitte Hilbig	Work Package 1 leader	Female	Germany	2005
Dr Dominic A. Hodgson	Work Package 1 leader	Male	United Kingdom	2005
Dr Katrin Linse	Work Package 1 leader	Female	United Kingdom/Germany	2009
Prof Takeshi Naganuma	Work Package 2 leader	Male	Japan	2005
Dr Elie Poulin	Work Package 3 leader	Male	Chile	2008
Dr Ian D. Hogg	Work Package 3 leader	Male	New Zealand	2005
Dr Julian Gutt	Work Package 4 leader	Male	Germany	2005

Dr Satoshi Imura	Work Package 4 leader	Male	Japan	2005
Dr Lucia Campos	Work Package 5 leader	Female	Brazil	2009
Dr David Renault	Work Package 5 leader	Male	France	2008
Dr Louise Newman	APECS Representative	Female	Switzerland/Australia	2010-2011

6. Outputs

a. Key achievements

- I. *Publications:* At least 225 peer reviewed publications were generated by groups contributing to EBA in the last year. This number is incomplete, and represents returns to a recent request for information sent to EBA participants and responded to by about 20 contributing groups and individuals. This indicates that the 'rate' of publication output from EBA-associated programmes and individuals is accelerating over time, as might be expected of a well established programme, and is also indicative of broad community support for the aims of the programme. EBA members were key within the editorial panel of the ACCE, as well as amongst the ~100 named chapter authors.
- II. *Workshop Sponsorship:* Throughout the life of EBA the programme has sponsored targeted workshops to encourage communication among scientists particularly to foster new ideas and cross-discipline discussions. The 2010 Report to Delegates listed workshops and other meetings then sponsored to date, and these are updated in (3) above.
- III. The jointly funded EBA/SC-ATS terrestrial biodiversity analyses resulted in working papers to the Uruguay ATCM, and further scientific publications are being developed, emphasising the increasing synergy between science and policy input in some areas of EBA-supported research. This is further illustrated in particular by a publication analysing the efficacy of protection measures provided by the current system for Antarctic Specially Protected Areas (Hughes & Convey 2010, *Global Environmental Change* **20**, 96-112), which forms part of an expanding body of literature and activity relating to quantifying, assessing and advising human impacts and interactions of various types with the Antarctic environment.
- IV. *EBA Website:* The EBA website was launched in July 2007 to help promote the cause of EBA and bring to the fore the various groups that contribute to EBA. See www.eba.aq
- V. *EBA Newsletter:* The EBA Newsletter gives recent news of the various parts of EBA. The latest newsletter issue is available on the EBA website.
- VI. *Links with the Antarctic Master Directory:* EBA's previous JCADM representative (Shulamit Gordon) created an EBA portal in the Antarctic Master Directory where information about Antarctic data is stored. This enables us to easily search for all types of data that contribute to EBA outcomes. PC is on the steering committee of the ANTABIF initiative, and many EBA members contribute actively to these biodiversity databases, either directly through SCAR-MarBIN, the terrestrial database held at AAD, or through component projects such as CAML.

b. Contributions to IPY Programmes:

Besides being a SCAR programme, EBA was also endorsed by the IPY Committee (Project # 137, coordinated by Guido di Prisco). With the completion of the IPY period, we are now in a period of data analysis, presentation and publication, exemplified by the strength of EBA and component IPY programme contributions to the June 2010 IPY meeting in Oslo.

VII. Inputs

a. Meetings and workshops

Several meetings and workshops have been, and are planned to be, sponsored by EBA, and many have been linked to EBA, as mentioned above and in previous reports.

b. Links to other SCAR SRPs or SCAR Action or Expert Groups

The Southern Ocean Continuous Plankton Recorder Survey (SO-CPR Survey) has identified itself as a project that contributes to EBA and this is currently an LS-SSG Action Group.

Links have been made with ACE and AGCS through the SCAR inter-programme leaders group, the editorial committee and authorship of the ACCE report, and the Action Group on the Prediction of Change.

c. New Programme Planning Groups

EBA members have been central in several fora in which discussions developing the structure and content of two proposed new SCAR biology programmes have taken place. Notable amongst these have been workshops held as part of the Sappora Biology Symposium, and sponsored by SCAR and PNRA in Italy, with further discussions within the SSG-LS in Buenos Aires, and all leading to the approval by Delegates of the SSG's proposal to develop two Programme Planning Groups. These are now working towards drafting and finalizing two proposals, for intermediate examination by EXCOM this year, and final submission to Delegates for approval in Portland in 2012. These two programmes are known as AntEco ('State of the Antarctic Ecosystem') and ANTETR ('Antarctic Ecosystems – Thresholds and Resistance'). Both programmes explicitly involve interaction with the physical and geological sciences communities, and discussions are ongoing as to how to best achieve the required integration in terms of programme structure. The case for developing two distinct programmes has been presented strongly. First, in the context of providing two future well defined and bounded programmes that are more manageable than has been possible with EBA, and that will provide clear central foci and catalysts across much of the SCAR biological research community, and second, in recognition that the size and activity/impact of that biological research community within SCAR cannot be adequately represented within that organization by a single 'umbrella' programme.