

## **Action Group - Code of Conduct for the Exploration and Research of Subglacial Aquatic Environments (AG-CCER-SAE)**

### **Introduction**

Antarctic Subglacial Aquatic Environments (SAE) will be a major focus for international exploration and study for years to come. SAE are proving to be continental-wide features beneath thick ice sheets that play a fundamental role in the evolution of Antarctica now and over geologic time. Recent evidence of massive sub-ice hydrologic systems; analogous to sub-aerial lake, river, and wetland complexes; is attracting great scientific and public interest. These environments are unexplored unique environments that will require agreed environmental stewardship protocols to preserve their scientific and innate value. It is expected that SAE entry, sampling, and deployment of observatories will occur in the next few years as scientific investigations enter the main phase of exploration and study. Since a number of SAE projects are at the early stages of development, it is timely to consider the development of agreed principles on environmental stewardship for these unique environments.

### **Background**

SCAR has a long history of leadership in SAE research and development including the Subglacial Antarctic Lake Group of Specialists (SALEGoS 2000-2004) and the Scientific Research Program Subglacial Antarctic Lake Environments (SALE 2004 – present). Over the past few years SCAR has issued a series of code of conduct guidance documents to promote environmentally sound scientific activities and compliance with best practices to minimize environmental impact. Based on leadership in SAE exploration research and the promotion of best environmental practices, SCAR is well positioned to advise the international scientific community on how best to optimize scientific return while not unduly compromising unique SAE.

The following recommendation was approved by the Delegates at XX SCAR:

*Concerning a Code of Conduct for the Exploration and Research of Subglacial Aquatic Environments (endorsed by SSG-GS and SSG-LS)*

*Noting that*

- subglacial aquatic environments are becoming an increasingly important focus for Antarctic science.
- a primary focus of research will involve questions about microbial life in these unusual biomes that are now known to be quite prevalent across the Antarctic landscape beneath thick ice sheets.
- the scientific goals of this research will require entry, sampling, and emplacement of sensors in SAE at multiple sites.
- these environments are potentially sensitive to disturbance during efforts to enter and sample these environments in the conduct of important ground-breaking research.

*Recognizing* the value of these environments and the need to exercise wise environmental stewardship,

An Action Group comprised of suitable representatives from the three SSGs be formed, since a wide range of disciplines are involved in research in these environments, and since they bring differing but important perspectives on protecting these environments, to devise a “Code of Conduct for the Exploration and Research of Subglacial Aquatic Environments”.

### **Terms of Reference**

The AG-CCER-SAE will draw on the best available scientific expertise from a range of disciplines to develop a “Code of Conduct for the Exploration and Research of Subglacial Aquatic Environments”. The terms of reference for the group are:

- Review previous SCAR codes of conduct, the process utilized to arrive at consensus, and develop a Code of Conduct format and content consistent with previous documents (ideally a Code of Conduct would not exceed 2 pages for ease of distribution and utilization in the field).
- Define the range of activities required for SAE exploration and research in light of the scientific interest of the life sciences, geosciences and physical sciences including:
  - remote surveying techniques;
  - entry/drilling technologies;
  - sampling devices of all types;
  - emplacement of instruments, sensors and observatories of all types;
  - in situ experiments;
  - recovery of artefact-free samples;
  - disturbance-free recovery of samples;
  - logistical access to remote locations;
  - on-site drilling and laboratory facilities;
  - equipment sterilization/cleaning technologies; and
  - others as identified by the AG.
- Develop guiding principles for SAE exploration and research based on best practices and the most likely sources and types of contamination, the efficacy of methods to reduce or eliminate contamination, definitions of acceptable standards of “cleanliness”, demonstration of compliance with “cleanliness” standards, variable desired levels of “cleanliness” among activities, and the ability of current technologies to meet “cleanliness” standards by considering:
  - all relevant literature (i.e., planetary protection measures), applicable ATS environmental policies and procedures, expert advice, and any other sources of information and
  - paying special attention to SALE reports and the US National Academies report on environmental stewardship of SAE.
- Complete a work plan, budget and schedule to:
  - provide a draft of the Code of Conduct to be presented to the SCAR Executive Committee meeting in 2009,
  - ensure wide community comment and input including consultation and review by appropriate ATS entities such as COMNAP, and
  - based on community input, reviews by the relevant ATS entities and the SCAR Executive Committee, revise the draft Code of Conduct and

communicate its deliberations and recommendations to SCAR SCATS in time to prepare an Information Paper for the ATCM/CEP in 2010.

The AG is encouraged to conduct their work as much as possible by electronic means and early in the process determine how many committee meetings may be necessary to address the ToR. If physical meetings of the group are determined to be essential to the conduct of the group's work, the SCAR Executive Committee should be presented with a financial request. If physical meetings are deemed necessary, the AG should strive to conduct them in conjunction with other scheduled meetings to minimize costs.

### **AG Membership**

The AG membership should include experts that are essential to the addressing the ToR, co-opting additional experience as necessary during their deliberations. In addition to scientific expertise, the AG should include members familiar with environmental protocols, requisite technologies, codes of conduct, and the environmental policies and procedures of the ATS. Participation should also be international and diverse in regard to geographic origin, gender, and stage of career. In addition, AG membership should not exceed a total of 8 and include representatives from the following:

1. Jemma Wadham (SALE) - Geochemistry & hydrology of Arctic & Alpine regions. Hydrochemistry of polythermal glaciers and chemical weathering mechanisms in subglacial runoff; J.L.Wadham@bristol.ac.uk
2. Peter Doran (SALE) – geochemist, technologist US (US NAS Committee member); pdoran@uic.edu
3. Guido di Prisco (SSG-LS) – microbiologist; g.dipriso@ibp.cnr.it
4. Takeshi Naganuma (SSG-LS), microbial geneticist, takn@hiroshima-u.ac.jp
5. Bryan Storey (SSG-GS) – geologist; bryan.storey@canterbury.ac.nz
6. Warwick Vincent – polar ecology and microbiology (US NAS Committee) Warwick.Vincent@fsg.ulaval.ca
7. David Walton SCAR/ATS – biologist; (US NAS Committee); [dwhw@bas.ac.uk](mailto:dwhw@bas.ac.uk)
8. V Lipenkov –AARI; "lipenkov" <lipenkov@aari.nw.ru>