

Draft Strategic Plan for the SCAR Standing Scientific Group Life Sciences April 2009

Introduction

The Antarctic as a cold, isolated, pristine environment is undergoing significant change through regional climate warming, ozone depletion, alien introductions, long range transport of contaminants and increased global attention as a scientific and tourist destination and a fisheries provider. Over the 21st century, the Antarctic is projected to warm by $3.4 \pm 1^\circ\text{C}$ and lose about 30% of its sea ice extent. Biologically, the Antarctic is a centre of evolutionary divergence and adaptation to polar extremes. Its diversity is now threatened by environmental changes occurring on short time scales that do not accommodate natural selection.

Scientific Content

It will be the task of the SSSG-LS to coordinate research programmes focused on understanding the impact of past, current and predicted environmental change on biodiversity and the consequences for adaptation and function. Human contact with the Antarctic is increasing and the SSSG-LS will also seek to determine the effects of cold, darkness, isolation and pathogens on the health and welfare of scientists and support staff in the Antarctic. Through multidisciplinary collaborations, the SSSG-LS will seek to understand the complexities of the Antarctic environment and to predict the consequences of change. It will manage and provide access to data through websites and symposia. It will engage the general public through popular lectures, the media and the internet. It will recommend conservation measures and provide advice to SCAR, CCAMLR, COMNAP, the ATS, government agencies and other policy makers.

Geographic Focus

The SSSG-LS will focus on the biology of the Southern Ocean and terrestrial habitats, including freshwaters and glaciers, of the 'continental Antarctic' (comprising most of the continent), the 'maritime Antarctic' (comprising the Antarctic Peninsula and associated islands and archipelagos as well as the South Shetland, South Orkney, and South Sandwich Islands, and Bouvetøya), and the 'sub-Antarctic' (those islands that lie on or about the Antarctic Polar Frontal Zone (PFZ)).

Proposed Scientific Foci

SCAR Scientific Research Programme EBA

Through 2006-2013, the SCAR Scientific Research Programme EBA (Evolution and Biodiversity in the Antarctic: The Response of Life to Change) will seek to:

1. Understand the evolution and diversity of life in the Antarctic;
2. Determine how these have influenced the properties and dynamics of present Antarctic ecosystems and the Southern Ocean system;
3. Make predictions on how organisms and communities are responding and will respond to current and future environmental change; and

4. Identify EBA science outcomes that are relevant to conservation policy and communicate this science via the SCAR Antarctic Treaty System Committee.

EBA will aim to facilitate collaboration between key researchers from other disciplines through workshops and conferences and maximize international and multidisciplinary involvement. By integrating research in marine, terrestrial and freshwater ecosystems in a manner never before attempted, EBA hopes to advance evolutionary and ecological science globally using model systems and organisms from the Antarctic.

Expert Group on Human Biology and Medicine

The health of scientific investigators in the Antarctic is of key concern, especially in connection with future long duration isolation in extreme environments, both on Earth and in space. The EG-HB&M will coordinate and encourage psychological and physiological research in the Antarctic and collaborate with COMNAP to report on disease and injury. Human-animal interactions are also of concern, such as southern hemisphere seabirds as a potential vector for Lyme disease.

Cross-cutting Issues

The focus will be on marine, terrestrial, freshwater and ice-covered habitats. Interactions between the biosphere, cryosphere and atmosphere are of clear importance. Human-human and human-ecosystem interactions will also be of issue.

Potential Collaborators

SSSG-PS and SSSG-GS and their SRPs (e.g. AGCS, SALE and ACE), COMNAP, CCAMLR, CEP, AGCS, IUCN, IASC, IPY legacy (e.g. PAntOS and SOOS), ICED, SCAR MarBin, OBIS/GBIF, WoRMS.