Report on the ICED Session

SCAR Open Science Conference, Hobart, July 2006

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Introduction

Integrated analyses of circumpolar Climate interactions and Ecosystem Dynamics in the Southern Ocean (ICED)[i] is an international initiative aimed at coordinating integrated, multidisciplinary, circumpolar analyses of Southern Ocean ecosystems. ICED is being developed in conjunction with the Scientific Committee on Oceanic Research (SCOR) and the International Geosphere-Biosphere Programme (IGBP), through joint support from the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) and Global Ocean Ecosystem Dynamics (GLOBEC) programmes.

Following the launch of ICED at its first workshop in May 2005 involving 33 participants from 14 countries, ICED held its first scientific session during the second Scientific Committee on Antarctic Research (SCAR) Open Science Conference (OSC) in July 2006 in Hobart. This session was planned in order to further the international development of the programme and to stimulate increased coordination, communication and momentum in taking ICED forward. The theme of the OSC was "Antarctica in the Earth System" making this an ideal setting for the first ICED scientific session.

The ICED Session at SCAR

The scene for the session was set with an introduction and overview of the ICED programme presented by Eileen Hofmann. This presentation outlined how ICED will bring together climatologists, oceanographers, biogeochemists, ecologists and fisheries scientists in a single circumpolar research effort in response to the increasing need to develop circumpolar coverage and improved integration of research, to better understand how climate and anthropogenic forcings may affect the ecosystems of the Southern Ocean. This was followed by Eugene Murphy's presentation on the spatial and temporal operation of the Scotia Sea. This review of the operation of the Scotia Sea ecosystem provided a detailed example to illustrate how developing integrated analyses of a regional ecosystem also requires understanding of the circumpolar operation of Southern Ocean ecosystems as a whole.

Following a presentation by HC Shin on the influences of sea-ice retreat and eddies on differing marine ecological regimes over a meso-scale distance in the southwest Atlantic sector of the Southern Ocean, pointing to the need to further investigate the importance of the different processes, the session moved into sea ice ecosystems (Igor Melnikov), sea ice gap layers (SF Ackley) and circulation (JM Klinck). Melnikov made an important point regarding the influence of sea ice on biological production (coastal and pelagic), particularly in the austral winter, and the need to consider this in Southern Ocean biological models for a fuller picture. These presentations generally illustrated the need to consider physical processes in biological models in order to build up a more accurate picture of the complex interactions influencing ecosystem structure. Further, the preliminary results presented by Guy Williams from the parallel biological and biogeochemical surveys carried out during the 'BROKE-West' cruise in East Antarctica, and the influence of oceanographic structure on the foraging strategies of penguins and seals (S Sokolov) clearly demonstrate the importance of the physical environment to the structure and functioning of the marine ecosystem.

Moving towards more direct consideration of climate change processes, Mike Meredith presented the evidence for rapid climate change in the ocean west of the Antarctic Peninsula, likely influenced by, and contributing to, the observed atmospheric climate change at the peninsula. This led into Angus Atkinson's analysis of the potential sensitivity of Antarctic

krill to climate change, both these presentations raising the implications of the effects of regional warming on key species in the Southern Ocean foodweb through their dependence on the physical environment and the consequential potential impact on ecosystem operation. The final presentation of the ICED session by Valerie Loeb focussed on the importance of ENSO-driven climate variability on the krill-based food web and its implications for krill fishery management.

Stimulating discussion sessions were held after each presentation, and it was clear that new ideas were developed and potential multidisciplinary collaborations envisaged and discussed. The abstracts and presentations from the ICED session at SCAR will be posted on the website in due course: http://www.antarctica.ac.uk/Resources/BSD/ICED/

Future plans

In addition to the scientific session, an evening meeting was also held in Hobart between those members of the ICED interim steering committee who were present at the SCAR meeting (Eileen Hofmann, Eugene Murphy and Walker Smith), together with Julie Hall (Chair of IMBER's Scientific Steering Committee). The main focus was to discuss the structure of ICED and how to take the programme forward. Further news and updates on ICED will be posted on the website in due course. This will include meeting reports and the developing Science and Implementation Plan which is currently in preparation, and following review will be published jointly by IMBER and GLOBEC later this year.

ICED now has strong support in the international community having been successfully presented to IMBER and GLOBEC steering committees, to EUR-OCEANS and IPY, and is gathering momentum. We welcome suggestions for collaboration and other feedback on the programme.

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[i] ***For more information:***
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Website (under development): www.antarctica.ac.uk/Resources/BSD/ICED/