

INTERNATIONAL WORKSHOP ON FORECASTING AND DATA ASSIMILATION IN THE BENGUELA AND COMPARABLE SYSTEMS

GSB Breakwater Lodge, Cape Town, 8 – 11 November 2004

International interest in regional ocean observing and forecasting is evident from the strategies of the Global Ocean Observing System (GOOS) of the Intergovernmental Oceanographic Commission, the International Association for the Physical Sciences of the Oceans (IAPSO) and other organisations. Permanent, continuously operating real-time regional ocean prediction systems are increasingly required to support a variety of critical activities in the ocean and coastal environments, including fisheries management, navigation and marine operations, response to oil and hazardous material spills, search and rescue, and prediction of harmful algal blooms and other ecosystem or water quality phenomena. Implementation of such systems requires advanced technologies in sensors and observing systems, and numerical models and data assimilation, as well as the infrastructures necessary to use them. Hydrodynamic and ecological models for regional systems are beginning to show considerable skills. The crucial step allowing for real-time regional forecasting is the development of oceanographic data assimilation, which is now becoming a reality. This international thinking is reflected in the strategy of the GEF/UNDP sponsored Benguela Current Large Marine Ecosystem (BCLME) Programme, where a key policy action is the assessment of environmental variability, ecosystem impacts and improvement of predictability. Two cornerstones of this policy action are the development of an early warning system and the improvement of predictability of extreme events and their impacts in the BCLME.

The 2004 Benguela Forecasting Workshop, which is being sponsored by the BCLME Programme, IAPSO, IUGG, IOC/GOOS and ICSU's Scientific Committee for Oceanic Research (SCOR) *inter alia*, will be a crucial step in the development of a viable observing and forecasting system in support of integrated and sustainable management of the Benguela Current Large Marine Ecosystem, for fast-tracking GOOS-Africa, and for implementing a key strategy of IAPSO.

Objectives

- Assess variability in the BCLME and ascertain which aspects are amenable to forecasting of value
- Review present status and recent advances in forecasting and data assimilation in the BCLME
- Review advances in forecasting in comparable ecosystems (e.g. Humboldt, Canary, California)
- Specify minimum data, modelling and human capacity requirements for an early warning system (EWS), and a blueprint for implementation
- Transfer expertise and technology from leading overseas individuals and institutions to the BCLME region
- Promote collaboration between scientists engaged in research and operational oceanography in eastern boundary current systems

- Contribute to improving numerical literacy skills of marine scientists and decision makers
- Build human capacity in ocean observing and forecasting through creating awareness of needs and opportunities
- Improve and further develop linkages and networking amongst scientists and managers in the BCLME countries, internationally, and between the BCLME Programme and international and intergovernmental agencies
- Contribute to BCLME management by improving assessment of variability and developing a forecasting capability

Scope

The Workshop will address a broad range of subjects (ocean and atmosphere physics, chemistry, biology and resource-related) of importance for the development of a predictive capability for the greater Benguela Current region and comparable systems. Topics of relevance to forecasting on time scales ranging from hours to months, and possibly even years and decades, will be addressed *inter alia*:

- Wind forcing: the South-East Atlantic as a coupled ocean-atmosphere system
- Modes of ocean-atmosphere variability in the South Atlantic which impact on the shelf system
- Variability of the Angola (Cabinda) Front, Angola Current and Angola Dome
- Variability of the Angola-Benguela Front and implications thereof
- Benguela Niños and other events of tropical origin
- Frontal variability and generation of upwelling filaments
- Variability and alongshore and cross-shelf process associated with the principal upwelling cell (Lüderitz cell): impacts and predictability
- Intrusions (filaments, rings etc) of the Agulhas Current
- Intrusions of Sub-Antarctic water into the Benguela
- Wind and waves and impacts on marine structures and maritime operations
- Generation and advection of hypoxia/anoxia
- Development and advection of harmful algal blooms, and their predictability
- Advection and dispersal of pollutants
- Sulphur “eruptions”: predictability and impacts
- Modelling food chain dynamics, including regime shifts
- Environmental impacts on fish resources
- Environmental constraints on the distribution of fish *vis-a-vis* modelling and forecasting
- Impacts of environmental variability on the ecosystem on inter-annual and decadal time scales
- Developments in observing and forecasting in comparable systems (Humboldt, Canary and California Current etc)
- Models and the data requirements
- Ocean observing system appropriate for the BCLME region
- Key elements of an early warning system for the BCLME: Development of a sub-regional component of GOOS-Africa

Workshop Outputs

- Comprehensive assessment of environmental and resource variability in the Benguela and comparable systems and of latest developments and applications of modelling and data assimilation
- Evaluation of those aspects of variability which are amenable to forecasting of value
- Specification of minimum data, modelling and human capacity requirements for a viable early warning system, and its implementation
- Technology transfer and capacity building
- Establishment of closer links (and possible future partnerships) between the BCLME Programme and international and intergovernmental organisations
- Definitive peer-reviewed book and CD/DVD on observing systems and forecasting in the BCLME. (The provisional title of the book is “Development of a predictive capability for environmental and resource variability in the Benguela and comparable systems”)

Participation

The Workshop is aimed at quantitative scientists, engineers, economists and resource experts and managers. It will be a focussed high level meeting limited to a maximum of 80 persons with the requisite skills. Of these 60 will be by specific invitation, while 20 places will be reserved for non-invited experts

Scientific Programme Committee (SPC)

The overall planning and organisation of the scientific programme for the Workshop is being undertaken by the SPC, which has the following membership:

Vere Shannon (South Africa – SPC Chair)

Geoff Brundrit (South Africa)

Erlich Desa (India)

Wolfgang Fennel (Germany)

Pierre Freon (France)

Johannes Guddal (Norway)

Dale Haidvogel (USA)

Hashali Hamukuaya (Namibia)

Kwame Koranteng (Ghana)

Mark Majodina (South Africa)

Coleen Moloney (South Africa)

Paola Rizzoli (USA)

Claude Roy (France)

Frank Shillington (South Africa)

John Woods (United Kingdom)

Local Organising Committee (LOC)

The LOC is responsible for all local and regional arrangements for the Workshop and will interact closely with the SPC. It is chaired by Lesley Staegemann (Director of the

BCLME Programme's Environmental Variability Activity Centre) and has a membership drawn from the main participating institutes in Angola, Namibia and South Africa.

Language

The official language of the Workshop will be English

Contact Details

The BCLME Programme's Environmental Variability Activity Centre (EVAC) will facilitate all arrangements for the Workshop. For more information contact Director: EVAC, bclmeevg@deat.gov.za (Tel +27 21 4023418/9)