Preface

The year 2003-2004, sixteenth for C-MMACS, stands out for a number of significant events, scientific achievements and general enhancement in its coverage of scientific and meta-scientific activities.

The year has seen the formal launching of the CSIR Network Project on Mathematical Modelling with two sub-tasks. A number of discussion meetings have been held to initiate integrated work on various components. For more information about the network project, please visit the website at www.cmmacs.ernet.in.

The C-MMACS experimental dynamical long-range forecasts of monsoon have received wide acclaim. The model successfully predicted the severe deficit for Karnataka in 2003, in spite of an overall good monsoon. These forecasts, as well as the experimental forecasts for 2004, were provided to the Govt. of Karnataka on request; these forecasts provided critical inputs in policy meetings in which C-MMACS participated by invitation. A programme to generate experimental forecasts at district level or smaller scale has now been launched with a grant from CSIR.

C-MMACS is also a major partner in the NMITLI project on Monsoon Related Meso-scale Forecasting; C-MMACS' primary responsibility is to provide a modeling option for simulation of meso-scale events in a global environment. Notable progress in this direction was made through extensive simulation of cyclones over the north Indian Ocean.

Other important developments in atmospheric modelling and forecasting involve development and validation of a soil moisture model as a part of C-MMACS-ISRO collaborative project on biosphere modeling and development of a prognostic model for cloud cover.

The ocean modelling studies at C-MMACS now encompass several directions, from development of Indian Ocean community model to simulation of primary productivity to estimation of CO_2 flux. Notable progress in this direction was made through comparison of model simulations with observed data on primary productivity and upper ocean thermal structure.

C-MMACS' position of leadership in the areas of geological hazards, tectonics and computational seismology has been further strengthened through a series of developments; these activities are now covered under the broad heading of Solid Earth Modelling Programme (SEMP). New significant results include estimation of the convergence rate and crustal structure across the northeastern Indo-Himalayan collision zone and discovery and mapping of a previously unrecognized active regional transverse fault (Gish Transverse Fault) in the Darjeeling-Sikkim Himalayas.

The Computational Mechanics Group has implemented a state-of-the-art four-noded shell element for the FINEART package, which is the main deliverable of the sub-task I of the Network Project. It has also continued its work on error-analysis for non-linear elastostatics and some new results have emerged.

The long-standing collaboration between C-MMACS and Tezpur University (TU), as well as C-MMACS and Cochin University of Science and Technology (CUSAT) resulted in signing of MoUs between CSIR and each of these two Universities. Both MoUs were signed by the respective Vice-Chancellors and the Scientist-in-Charge, C-MMACS representing CSIR in the presence of DG, CSIR. In addition to providing a platform for sustained collaborative research, these MoUs enable eligible CSIR scientists to be recognized as M Tech/ Ph D guides in these universities, and young CSIR scientists to attain higher education. On-line registration as guide as well as other details on the collaboration are available at C-MMACS web-site.

The International Conference on Scale Interaction and Variability of Monsoon, which was co-organized by C-MMACS and CUSAT under the Indo-French Centre for Environment and Climate, was successfully held at Munnar, Kerala during 6-10, October 2003. It was an example of collaborative team effort with the two co-organizers, C-MMACS and CUSAT, working together. It is a pleasure to acknowledge the support of many organizations, including the Embassy of France in India.

The recent years have seen an increased use of cloud modification by different states. Recognizing the urgent need for a reliable indigenous cloud modification technology, the Advisory Committee of C-MMACS entrusted it with the task of developing a multi-institutional integrated project on development of a cloud modification technology. A project proposal involving participation of a number of organizations has resulted following two Discussion Meetings. The proposal has been sent to CSIR for consideration.

It is, of course, very difficult to provide details of the broad spectrum of work at C-MMACS in a document like an Annual Report. We have therefore made available details at a C-MMACS web-site (http://www.cmmacs.ernet.in/publication).

C-MMACS has the rare privilege of having the DG, CSIR as Chairman of its Advisory Committee (AC). C-MMACS would like to take this opportunity to express its most grateful thanks to the Chairman, Dr R A Mashelkar, FRS and all the members of the Advisory Committee.

I thank all the members of Team-C-MMACS for putting up an excellent performance in scientific and meta-scientific activities. I would also like to acknowledge the efforts of Dr P Goswami, S Himesh, Suchanda Ray and other members of C-MMACS in preparing the Annual Report.

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