

PREFACE

It gives me great pleasure to present the Annual Report for 1999-2000.

Recognising the need for good quality predictive models of the spatio-temporal patterns of precipitation in India, where agriculture is dependent on monsoon, C-MMACS has been developing improved forecasting models for rainfall, combining dynamical methods, neural networks and data analysis. Successful forecasts developed well ahead of the particular season have been the welcome outcome of this effort over the past four years; it has also attracted attention in Indian and International media.

Recent experiments with Ocean simulation, with improved heat and salt fluxes, have resulted in improvement of the thermal structure of the Indian Ocean. High frequency variability has been simulated, using six-hourly satellite winds, for forecasting purposes. The primary productivity model for the Ocean has been suitably modified to realistically simulate the growth of phytoplankton in a two-nutrient environment.

Further measurements at the previously established GPS sites have confirmed the near rigidity of the Indian plate. The convergence rates in the Himalaya, which have been obtained, indicate that most of the convergence takes place in the northern part of the Himalayan belt whereas the southern Himalaya is locked to the Indian plate. Work is also under way to study the deformation kinematics in the Himalaya in the light of critical wedge theory.

An algorithm has been developed for the characterisation of the interface between coding and noncoding regions in DNA sequences; a collaboration with Centre for Bio-chemical Technology, Delhi has been initiated. The push forward continues in the areas of nonlinear dynamics, earthquake studies, finite element analysis of discontinuous media, design of microstrip antenna, non-Newtonian flows, and bioremediation.

Collaborative activity has been initiated with Fishery Survey of India to carry out fish population dynamics in a detailed manner for fixing optimum exploitation levels in a reliable manner. New projects are being undertaken in the areas of glacier flow modelling and epidemiological modelling. Discussions with French scientists are underway to

establish an Indo-French Centre at C-MMACS on topics of mutual interest. Bangalore University Syndicate has approved recognition of C-MMACS as a research centre for carrying out work leading to a Doctoral degree in Computer Simulation.

Y2K rollover was trouble-free; thanks goes to the systems administration team. The coming of Y2K also saw the retirement of Convex C3820 supercomputer which had served indefatigably for the last six years. Process has been initiated towards procurement of a high performance compute server to meet the growing demands of large scale computing.

The 1999 C-MMACS Foundation Day lecture was delivered by Professor Jagdish C. Shukla, George Mason University and Director, Centre for Ocean-Land-Atmosphere Studies, Calverton, Maryland, USA, on *Predictability of short-term climate variations*. Dr. R. N. Singh, former Scientist-in-Charge (SIC), C-MMACS took over as Director, NEERI, Nagpur from 16th Aug 1999. He has been associated with C-MMACS since its very beginning and, as SIC, had shaped its activities over the past three years.

C-MMACS has been privileged to have its Advisory Committee chaired by Dr. R. A. Mashelkar, FRS, Director-General, CSIR; various distinguished scientists and technologists are its members. I would like to express my grateful thanks to them. I would also like to thank Dr. T. S. Prahlaad, Director, N. A. L. for providing generous support to C-MMACS activities and Dr. A. E. Muthunayagam, Secretary, Department of Ocean Development for supporting the Ocean modelling activities.

I thank all the members of Team C-MMACS for putting up an excellent performance. Dr. T. R. Krishna Mohan has carried out the task of bringing out the Annual Report with the secretarial assistance of Ms. S. Sita and, the assistance of Mr. A. S. Rajasekar, Mr. Santha Prakash Mathias and Dr. Srinivas Bhogle of IMD, NAL in the designing and composing of the report. I thank all of them.

A. Kumar
(Acting Scientist-in-Charge)