Preface

The coasts are dynamic systems, undergoing adjustments of form and processes at different time and space scales in response to oceanographic and geomorphologic factors. It is continuously under threat from different hazards like storm surges, flooding, erosion, sea level rise, etc. Coasts will be exposed to increasing hazards over coming decades due to climate change and sea level rise. The increasing human induced pressures exacerbate the impact of climate change on coasts. Few of the world's coastlines are now beyond the influence of human pressures, although not all coasts are inhabited. It has been estimated that 23% of the world's population lives both within 100 km distance of the coast and less than 100 m above sea level. The population densities in coastal regions are about three times higher than the global average. Migration to coastal areas is rampant. Sixty percent of the world's 39 metropolis with a population of over 5 million are located within 100 km of the coast. This rapid urbanization has serious consequences on the coastal areas.

With renewed interest in the coastal areas, there is a dire need for a platform for sharing of knowledge, information and experience among the various groups/agencies directly or indirectly involved in working towards a common goal of achieving sustainability in coastal use. In the Indian scenario, such a platform in the lines of the International Coastal Symposium, which is being regularly organized, is lacking. The National Conference on Coastal Processes, Resources and Management conceived and organised by the Centre for Earth Science Studies (CESS) during February 5-7, 2010 was a beginning in that direction.

The Conference was inaugurated by Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences, Government of India. In his Key Note address he dwelt upon the problems faced by the vast coastline of the country. He emphasized that detailed studies are essential to remove the uncertainties in understanding coastal processes. This was followed by 21 Technical Sessions that covered eight themes: Coastal Hydrodynamics, Coastal Resources, Coastal Geology and Geomorphology, Coastal Resources, Coastal Hazards and Pollution, Modeling and Monitoring, Coastal Zone Management and Coastal Engineering. The conference had an overwhelming response from across the length and breadth of the country with active participation of nearly 200 delegates. Under the Technical Programme, there were 29 invited talks by leading scientists from premier institutions of the country such as IITs, NIO, NPOL, CWPRS, NIOT. In addition, there were 71 contributed papers covering all the conference themes. A volume consisting of the Abstracts/Extended Abstracts of the papers was released during the inaugural function of the conference. Two days of conference culminated with a field visit on the third day to Kovalam beach near Trivandrum, the site of the first Artificial Surf Reef in the country.

The Invited Papers of the Conference are brought out here as a Special Issue of the Indian Journal of Marine Sciences (IJMS), dedicated to Dr. M. Baba on the occasion of his superannuation from service. Dr. Baba had an illustrious career spanning over more than three decades. He will be remembered for his pioneering efforts in ocean wave research in India and for the significant contributions to coastal science in general. He made remarkable contributions in steering R & D programmes in CESS in earth system studies and natural resources management during his tenure as Director. The dedication of this Special Issue to Dr. Baba is also in recognition of his long time association and services to this Journal as a member of the Editorial Board. Prof. Kerry Black, formerly Professor at University of Waikato is kind enough to give an introductory write-up on Dr. Baba in this Issue.

This volume consists of 21 full papers spread over four themes viz. Coastal Processes, Coastal Hazards, Coastal Resources and Coastal Management. In the first section on Coastal Processes, 6 papers are included. Menon and Sangekar have presented a method/algorithm to retrieve salinity through optical remote sensing. *Prasad et al.* deals with the wave distribution along Gangavaram, east coast of India using a wave refraction model. *Rao,* from a study of variability of coastal ocean processes along the west coast of India, concludes that local stratification of the vertical temperature plays an important role for the cooling of the surface waters and warming in the sub-surface depths. *Shenoi* brings out the importance of considering the intra- and inter-annual variability of

coastal currents around India. *Unnikrishnan* studies the tidal propagation off the central west coast of India and concludes that the amplification of semi-diurnal constituents is caused by large width of the continental shelf. A brief review of various physical processes in the Gulf of Kachchh (GoK) is presented by *Vethamony and Babu*.

The Section on Coastal Hazards has 5 papers. *Hegde* discusses the global state of art methods available for erosion mitigation. *Kurian and Praveen* have studied the tsunami wave propagation in the Arabian Sea and its implications for the Kerala coast. The spatial distribution of marine pollutants at selected locations along the coastline of the country has been dealt by *Rajakumari et al. Ramesh and Sankar,* from a study of impact of global warming on cyclonic storms, have concluded that the frequency of storms is related to the changes in a couple of atmospheric parameters over the region. *Shukla et al.* by their studies along the Kachchh coast, western India has highlighted the vital role played by geomorphology and coastal configuration during tsunami.

In the Section on Coastal Resources, three papers are presented. The first paper by *Nag* deals with the coastal geomorphic features around Indian Ocean. *Ravindra Kumar and Sreejith* have attempted to track the origin of beach garnets by integrating the available chemistry of minerals from the source rocks with those from the beach sediments. *Sukumaran et al.* reports the identification of certain locations off the Kerala coast having natural resources of construction grade marine sand.

In the last Section on Coastal Zone Management**,** there are 7 papers. *Deo* deals with the application of ANN models to solve problems related to the coastal and ocean areas in recent past. *Kudale* throws light on the impact due to port development on the coastline and suggests that there is a need to make mitigation measures at the planning stage itself. *Prasad Kumar* has presented the importance of reliability based approach and concluded that the study can give vital information for assessment studies in integrated coastal zone management. *Prasada Rao* discusses the significance of ocean environment for underwater surveillance. *Srikumar Chattopadhyay* has stressed the need to adopt the concept of ICZM for tackling the problems of the coast. *Sundar and Anand* have presented the performance of three different types of curved front seawall models in comparison with that of a vertical seawall. *Swain et al*. highlights the advantages of implementing an integrated Naval Operational Ocean Prediction System consisting of wave, tide, circulation and internal wave models.

We consider that this Special Issue would contribute significantly to our understanding of some of the current problems in coastal science. It is our earnest hope that this will serve as a useful reference manual for students, practicing engineers, managers and administrators dealing with coastal problems. We would like to place on record our sincere gratitude to each and every author for their valuable contribution, lively presentation in the conference and submission of full papers and subsequent revisions addressing the comments of the reviewers. We express our gratitude to the Reviewers of the papers for their time and effort.

We are indebted to Dr. Gangan Pratap, Director, NISCAIR and Dr. J. Sundaresan, Editor, IJMS for their support and cooperation in publication of this Special Issue. Finally we extend our special thanks to the Ministry of Earth Sciences and the Department of Science & Technology, Government of India for generous financial support for successful conduct of conference and publication of this Special Issue.

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Guest Editors