

Dr. Abhisek Chatterjee



Dr. Abhisek Chatterjee played an instrumental role in setting up the High-resolution Operational Ocean Forecast and reanalysis System (HOOFS). His expertise in numerical ocean modeling and deep understanding on the ocean processes were critical in configuring the basin-scale and coastal configurations of the Regional Ocean Modeling System (ROMS), which is the main work-horse of HOOFS. HOOFS is being used in INCOIS to issue operational forecasts of ocean general circulation parameters in the Indian Ocean and the coastal waters around the country. Dr. Abhisek and his team also prepare regular global ocean analysis based on INCOIS-GODAS, which is used by IITM and IMD to initialize CFSv2.0 model for issuing seasonal and extended range monsoon forecasts. With focused R&D efforts, Dr. Abhisek and his team could make significant improvements in INCOIS-GODAS system by fine-tuning the model parameters, streamlining the model simulations and addition of an advanced quality control checks for the observations used for model assimilation. Dr. Abhisek is also involved in the Deep Ocean Mission project of MoES and co-ordinate the “Ocean Climate Services” component of the mission. Currently, he is leading a team of scientists in INCOIS to develop a high-resolution global ocean model and a very high-resolution Indian Ocean model nested within the global model based on Modular Ocean Model (MOM) to downscale the sea level projections along the coast of India. As more than 30% of the Indian population lives along our coastline, better coastal zone management with the help of this modelling system will benefit a large fraction of the Indian economy.

Dr. Abhisek has also made significant contributions in enriching the understanding of the Indian Ocean circulation. He has developed a new atlas of temperature and salinity for the north Indian Ocean by assembling all the observations collected by the various Indian Institutes over the last few decades and applying state-of-the-art quality checks to add to the existing inventory of the World Ocean Database. The new atlas is found to be superior to the other available climatologies and hence is a popular product among the Indian Ocean researchers. Apart from this, Dr. Abhisek has extensively used ocean models to decipher various dynamical process of the Indian Ocean. In his one of the recent research, he showed that the Somali upwelling system is limited only along the front of the eddies (Great Whirl and Southern Gyre) and a major part (~60%) of the coast exhibits downwelling signature driven by remotely forced Rossby waves. Further, in addition to upwelling, entrainment and surface heat flux also play a key role in SST cooling over this region. Since cold SST along the Somali coast creates much needed thermal gradient for moisture transport for the Indian summer monsoon, this finding open-ups a new dimension to the understanding of the possible monsoon evolution in the changing climate. Dr. Abhisek and his co-authors documented the features of coastal circulation of the Andaman Sea and its importance in the variability of Bay of Bengal circulation. He also contributed to the research which demonstrated that the A&N Islands are responsible for ~50% eddies generated along the east coast of India by modulating baroclinic/barotropic instabilities.

Dr. Abhisek is awarded the Certificate of Merit for this outstanding contribution in the field of Ocean Science and Technology.