

Changing trend of pH-temperature-NaCl-salinity relationship in coastal water and sediment of Bay of Bengal and Arabian Sea during 2005-2010

Anupam Ghosh, I. Nageswararao, Vineeta Ghosh, Shila Ghosh and Shanta Ghosh
Asian Marine Conservation Association, India

In the present era of climatic change research, the role of various physico-chemical parameter of coastal ecosystem has become the focal point of major scientific investigation because of the fact that the CO₂ plays a leading role in directing global climate patterns on one hand, and on the other, during the air-sea gas exchange, surface seawater uptake of the CO₂ is reported to be causing ocean acidification. Since in the determination of climatic change through ocean system in respect of carbon dioxide, it is important to study the thermodynamics equilibrium of the gaseous carbon dioxide [CO₂ (g)] and CO₂ and that are related by Henry's law where the temperature and salinity dependent solubility coefficient of CO₂ in seawater, the present piece of investigation was carried out under two different seawater systems of India to assist Indian climate science research.

DIU (Union Territory of India) situated at 20° 42' N, 71° 01' E facing Arabian Sea and Visakhapatnam (State of Andhra Pradesh) situated at 17° 41' N, 83° 17' E facing Bay of Bengal were selected for having two different geographical and socio-economic situations. In both the project regions 5 different locations were chosen to carry out the investigation on the spot, specially for air temperature measurement and sampling of water and sediment and their subsequent analyses in the laboratory with all due precautionary measures.

It is evident that pH of the surface seawater was found to be in increase in trend in DIU during November-February (8.91 ± 0.5 to 8.47 ± 0.5 mean of 6 years) and decrease in trend during April-June (8.01 ± 0.5 to 7.95 ± 0.4). In Visakhapatnam, the pH value of the surface seawater was found (7.91 ± 0.5 to 7.16 ± 0.5 mean of 6 years) to be significantly lesser than that of found in DIU during the same period both in surface sea water and sediment (taken 5 ft overlying seawater condition in all the locations). pH-NaCl salinity-temperature (surface seawater or sediment) relationship as established for long by various earlier workers in most of the cases both in DIU and Visakhapatnam were found to be not maintainable.

Biography

Anupam Ghosh earned two Bachelor Degrees in Biological Sciences (B.Sc.-Bio) and Law (LL.B.), a Master Degree in Agriculture (M. Sc.-Ag), a Doctorate Degree (Ph.D.) in Plant Physiology related to Agro-Environmental Studies on Pesticides from the University of Calcutta, and also earned three Graduate (Master level) Certificates from Bermuda Biological Station for Research (Lexington Avenue, New York, U.S.A.) in Marine Science & related resource management that include : (1) Analysis of Marine Pollution; (2) Oil Spill Contingency Planning ;and (3) Biogeochemical Cycling Processes in Coastal Carbonate System - all in and with the North Atlantic Ocean Systems. Dr. Ghosh had proceeded his academic and research interests in Oceanography primarily under the renowned Scientist and Philosopher, Dr. James Newton Butler, Ex-Gordon McKay Professor of Applied Chemistry, Harvard University, U.S.A. Dr. Ghosh was awarded "Young Scientist" in Agricultural Science in 1981 from West Bengal for his outstanding work with Insecticide, fungicide and weedicide in Rice & Wheat in West Bengal, jointly by the Indian Science Congress Association and Department of Science & Technology, Govt. of India. Dr. Ghosh also has advised Prime Minister of India, Mr. Chandrasekhar Singh, for formation of the "Task Force" combating Oil Spill pollution problem during Gulf War in the year 1991.

anupamghoshworldwide@yahoo.com