

WATER QUALITY MONITORING IN CHILKA, A TROPICAL COASTAL LAGOON

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The Chilka Lagoon (N 19° 28' -19° 54'; E 85° 06' -85° 35') on the east coast of India in the Orissa state is the largest lagoonal system in the subcontinent and is one of the largest tropical lagoons of the world. Over the years the lagoon environment is under severe stress due to reduction in salinity, siltation, weed infestation, decline in fish yield, loss of biodiversity etc. In order to save the lagoon from its foreseeable danger a new mouth was cut open on 23 September 2000 and the lagoon was connected to the Bay of Bengal besides its pre-existing mouth. Long term monitoring of important water quality parameters such as salinity, temperature, depth, dissolved oxygen, turbidity, secchi depth, water nutrients, pH, oxidation reduction potential, total suspended solid, chlorophyll concentration etc in the time-space continuum were carried out during the period 1993 to 2002. Time series Indian Remote Sensing Satellite data were also used to portray water quality conditions in Chilka lagoon. Both the ground truth and satellite observations were synchronous on many occasion but a few representing different seasons are presented to depict the seasonal and interannual variations in water quality conditions. The study also depicts a comparative view of the water quality conditions in Chilka lagoon in its pre and post mouth opening conditions. Further, concurrent satellite and field observations have been used to develop water quality predictive regression equations. Besides classifying the lagoon other algorithms have also been applied to extract meaningful information on different lagoonal indices (Yellow Substance Index, Normalised Difference Vegetation Index, Soil Brightness Index, Benthic Biomass Index etc.) representing different water quality conditions of the lagoon.