17. Significance of Met-Ocean-Subsurface Indian OMNI Buoy Measurements in the Bay of Bengal

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Abstract: The important role of Sea surface temperature (SST) and near surface heat content on the evolution of monsoons and cyclones has been reported in many recent publications. There was a scientific need to augment met – ocean buoys with underwater sensors to record vertical profiles of temperature, salinity and current in the Bay of Bengal. Six moored buoys were deployed having equipped with subsurface sensors to measure the vertical structure of temperature and salinity at discrete depths (5, 10, 15, 20, 30, 50, 75, 100, 200, 500 m) and current sensors to measure vertical profiles of currents at discrete depths (1.2, 10, 20, 30, 50 , and 100 m). Now these buoys have been providing valuable data for operational agencies and serve sea truth validations of satellite data. The OMNI data buoys serve as observatory, which provide all this surface marine, meteorological parameters that go into weather prediction models for improved forecasts. These OMNI buoy data would be very useful to predict the evolution of summer and winter monsoons, the life cycle of monsoon lows, depressions, deep depressions, cyclone and severe cyclones, which mostly originate over the Bay of Bengal. The subsurface measurements can be used to study the Kelvin and Rossby waves in the Indian Ocean. The availability of time series data on surface met-ocean parameters and near surface thermohaline structure provides unlimited opportunities for research scientists to describe and explain the variability on different time scale across the basin. Studies related to warm and cool pools and fresh water pool are being carried out to explain their genesis, evolution and decay in certain regions of the Arabian sea and the Bay of Bengal. The Bay of Bengal is a region of intense haline stratification in near-surface layer primarily due to heavy discharge of fresh water from major rivers. In the northern Bay of Bengal large number of monsoon lows and depressions originates and then propagate along the monsoon trough to provide copious amount of rainfall over Indo-Gangetic plains. These buoy net-work provide very valuable sea truth data to validate the satellite measurements and model prediction. It is proposed to include pCO2 sensor to few of these buoy systems to evaluate the potential for direct covariance gas flux measurements. This will also augment RAMA moorings in Bay of Bengal. Tropical oceans are the main source of CO2 from the ocean to the atmosphere because of tropical upwelling. These upwelling systems are also an important factor in regulating strong biological activity in the tropical oceans. These long time series measurements can reveal significant correlation between CO2 outgassing and tropical circulation change on decadal or longer time scales. Engineering is important not only for development of vandal-resistant moorings but also to ensure that mooring designs keep pace with advances in technology. This paper describes significance of this moored buoy system in Bay of Bengal relevance to climate change.