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Annual and Seasonal Variability of Net Heat Budget in the Northern Indian Ocean

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In this study we investigate the spatial and temporal features of the net heat budget over the Northern Indian Ocean (focusing on the Arabian Sea and the Bay of Bengal), using satellite and numerical model estimates. The main objective is to characterize the annual, seasonal, and inter-annual patterns over this basin of climatic significance. To assess the temporal variability, several turbulent and radiative fluxes are used The turbulent fluxes are based on information from the Institut Français pout la Recherche et l'Exploitation de la MER (IFREMER V3), the Hamburg Ocean-Atmosphere Parameters from Satellite (HOAPS V3), the SEAFLUX V1, the Japanese Ocean Flux Data sets with Use of Remote Sensing Observations (J-OFURO V2), the Objective Analysis Fluxes (OAFlux V2), the European Center for Medium Weather Forecasts (ECMWF), the ERA Interim, the National centers for Environmental Prediction (NCEP) Climate Forecast System Reanalysis, CFSR, and the National Aeronautics Space Administration (NASA) Modern Era Retrospective Analysis for Research and Application (MERRA). The radiative fluxes, both shortwave and longwave, include those produced at the University of Maryland (UMD) as well as those derived from several of the above mentioned numerical models. An attempt will be made to evaluate the various fluxes against buoy observations such as those from the RAMA array. The National Institute of Ocean Technology, Chennai, India under its Ocean Observation Program has deployed a series of OMNI Buoys both in the Arabian Sea and the Bay of Bengal. These buoys are equipped with sensors to measure the radiation as well as other parameters. Comparison has been done with the OMNI observations and good agreement has been found with the current set-up of the instrument at a 3 m level. We found significant differences between the various products at specific locations. The ultimate objective is to investigates the sources of the differences in terms of atmospheric variables (surface winds, air temperature and humidity), oceanic variables (sea surface temperature, sea state), and on bulk parametrizations.