Geophysical Research Abstracts
Vol. 16, EGU2014-1433-1, 2014
EGU General Assembly 2014

Utilization of Aquarius and SMOS Salinity to study Indian Ocean Climate Dynamics

SUBRAHMANYAM BULUSU

United States (sbulusu@geol.sc.edu), Department of Earth and Ocean Sciences, University of South Carolina, Columbia, SC 29208

Salinity is often neglected in climate-related studies, yet it plays a critical role. The scientific value of salinity data collected by the recently launched Aquarius and SMOS missions will revolutionize both oceanographic and climate-related studies. In this study, Aquarius and SMOS salinity data along with the Simple Ocean Data Assimilation (SODA) Re-analysis (1950-present), and Hybrid Coordinate Ocean Model (HYCOM) outputs are analyzed to investigate the Indian Ocean climate dynamics related with the Indian Ocean Zonal Dipole Mode (IOZDM) and El Niño–Southern Oscillation (ENSO), and Arabian Sea Mini Warm Pool (ASMWP) Dynamics. Our preliminary analyses on the Indian Ocean Dynamics covering the period from 1950 to 2008 using SODA re-analysis showed that during a positive IOZDM event, positive Sea Surface Salinity (SSS) anomalies are found along the Sumatra coast due to the combination of wind-driven upwelling of subsurface high salinity waters, enhanced evaporation and anomalous surface circulation. The opposite is true, to a lesser extent, during negative IOZDM events. A Dipole Mode Index for Salinity (DMIS) based on the average of salinity in a region off the coast of Sumatra is introduced to monitor SSS variability during IOZDM and ENSO events. Warmer (>28°C) Sea Surface Temperature (SST) occurs in the South Eastern Arabian Sea (SEAS, 5°-13°N, 65°-76°E) during March-April, and is known as the Arabian Sea Mini Warm Pool (ASMWP). In this study we addressed the role of salinity and the upper layer heat and salt budgets in the formation and collapse of this ASMWP. In this study we would like to show the teleconnections between the IOZDM, ENSO, ASMWP Dynamics, and the role of Barrier Layer (BL). The study will also additionally examine the variability of salinity with regards to ENSO in the Indian Ocean and the importance of satellite derived salinity for the estimation of BL thickness.