

Indian Ocean Sea Level Rise Revealed from ARGO, GRACE and Altimeter

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The cause of sea level change is due to change in volume and shape of the ocean basins comparatively long time scales. The change in volume is caused by the changes in sea water density (steric) and mass (eustatic). The change in temperature (thermosteric) and salinity (halosteric) of the water column can change sea water density, whereas melting of glaciers in land and Arctic and Greenland ice will change the mass of the water in the Ocean. The shape of the ocean basin changes due to vertical land movement, which is associated with local tectonic activity and post glacial rebound of land.

In this paper, we present the status of total sea level rise during 2004-2009 over Indian Ocean region (30°E to 120°E, 30°S to 30°N) using total sea level change observed from merged altimeter data. The global sea level trend computed by us is comparable to that of Cazenave et al. (2009). It is observed that the average sea level rise during 2004-2009 in Indian Ocean is about three times higher than global average. The contribution of steric and eustatic components of total sea level rise were quantified using Argo profiling floats and GRACE. The steric and ocean mass trend values contribute ~ 50 % to the total mean sea level change for the Indian Ocean, whereas the steric component is negligible over global ocean. Spatial trend of total sea level, steric component and water mass contribution in Indian Ocean are presented.

Reference:

Cazenave A., et. al., *Global and Planetary Change*, 65 83–88 (2009)