

Sea Level Changes Caused by Global Ocean Mass

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KEY WORDS: Applications in Geosciences on Local and Regional Scales

ABSTRACT:

Ocean mass variation is a main component for global sea level changes. It caused by glaciers melt, runoff, evaporation, precipitation, ocean circulation and so on. Most research on ocean mass variations is derived from monthly GRACE solutions recently. However, there is not good precision for the low-degree spherical harmonic coefficients of time-dependent gravity data from GRACE. And the coefficients suffer from a correlated error that causes “stripes” in the maps that are not fully removed by a simple Gaussian smoothing, uncertainty of correction for glacial isostatic adjustment (GIA) based on the PGR model, and “leakage” from hydrology signal. So, a new method keeping away from these problems is necessary to estimate the ocean mass variations. We calculate the change of ocean bottom pressure to reckon the ocean mass variations because the change of ocean mass can bring the change of ocean bottom pressure. Firstly, the ocean mass variations are calculated using data of ECCO (Estimation of the Circulation and Climate of the Ocean) model. Secondly, we obtain the ocean mass variations from the cabled ocean bottom pressure data. And the result is compared with both GRACE and ECCO results.