



Leakage Effects of Land Hydrology on the GRACE Derived Water Mass Estimates for the Black Sea

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GRACE derived water mass variations in the Black Sea are heavily influenced by nearby terrestrial water mass changes. Spatial filtering of GRACE data not only reduce the contribution of short-wavelength noise from the higher degree spherical harmonics of the gravity field solutions but also contaminate the sea water mass variations by signals outside the region. The leakage from the land hydrology can be removed by using continental models depending on how well they represent the region. We will demonstrate that widely used GLDAS continental land hydrology model underestimates the terrestrial water mass variations surrounding the Black Sea yielding a significant bias in the annual amplitudes of the sea water mass variations estimated from spatially filtered GRACE solutions. We discuss whether using GRACE solutions obtained through different processing strategies which are less affected from the leakage improve sea water mass estimates for the Black Sea.