

Updates to North Atlantic meridional overturning circulation variations from GRACE ocean bottom pressure anomalies

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Concerns about North Atlantic Meridional Overturning Circulation (NAMOC) changes imply the need for a continuous, large-scale observation capability to detect changes on interannual to decadal time scales. Here, we present updated analysis to our 2015 study (Landerer et al., 2015, GRL) of measurements of Lower North Atlantic Deep Water (LNADW) transport changes using only time-variable gravity observations from Gravity Recovery and Climate Experiment (GRACE) satellites from 2003 until now. Previously, we showed that improved monthly gravity field retrievals allow the detection of North Atlantic interannual bottom pressure anomalies and LNADW transport estimates that are in good agreement with those from the Rapid Climate Change-Meridional Overturning Circulation and Heatflux Array (RAPID/ MOCHA). Here, we update the GRACE-based LNADW time-series, introduce & discuss further refined gravity field retrievals, investigate long-term bottom pressure changes related to AMOC, discuss uncertainties and biases, and discuss how GRACE OBP fields can support the evaluation of spatial and temporal AMOC coherence.