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Regional patterns of ocean mass sea-level change over the satellite altimetry era (1993-2017)

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Ocean mass variation is one of the main drivers of present-day sea-level change (SLC). Also known as barystatic SLC, those fluctuations are due to the melting of continental ice from glaciers and ice sheets, and variations in landwater storage. While a large number of studies have quantified the contribution of barystatic SLC to global mean SLC, fewer works have looked into how much ocean mass has contributed to regional SLC. Besides, most of the regional studies have focused only on the effect of one of the components (e.g., melt from Antarctica), or on the period and results of the GRACE satellite mission (since 2002). This work aims at providing a comprehensive analysis of global and regional barystatic SLC since 1993. For that, we collect a suite of estimates of the individual freshwater sources, namely the Antarctic and Greenland ice sheets, glaciers and terrestrial water storage. We then use them as input on the sea-level equation to obtain regional patterns (fingerprints) of barystatic SLC, and validate our results by comparing the individual estimates with the values obtained from GRACE products. We finalize our analysis by looking into trend uncertainty patterns related to each contribution.