Supplement of

GPS displacement dataset for study of elastic surface mass variations

Peidou et al.

Correspondence to: Athina Peidou (athina.peidou@jpl.nasa.gov)

S1. Offset detection in sites located in Michigan

The correlation screening metric showed a significant disagreement between GPS and GRACE(-FO) for sites located in the St. Lawrence basin. The fit between GPS annual signal and GPS/GRACE(-FO) correlation demonstrated a large negative trend $a = -1.26$. The average correlation across the basin was 0.55, which did not reflect the strong negative slope between amplitude and correlation. On top of this observation, another screening metric, trend maps, picked up a flipped trend in sites located in Michigan (part of the St. Lawrence basin) between the period 2015-2018. GPS reflected an uplift while GRACE(-FO) showed a subsidence (Fig. S1a and Fig. S1b). The pronounced disagreement triggered an investigation of the sites timeseries. Sites in Michigan exhibit an abrupt rise of about 7.6 mm and an abrupt east displacement of about 5 mm for about 24 months, starting in April 2016 (Fig. S1d). After investigation, we discovered that the issue was in the input NGL data (a mistake in the antenna heights in the header of the rinex files). Once the rinex headers were corrected and the sites were reprocessed, the overall correlation at the St. Lawrence basin improved to 0.61, the extreme negative slope stabilized to $a = -0.2$ (Fig. 2c) and GPS trends over the region aligned with trends picked up by GRACE (Fig. S1c).

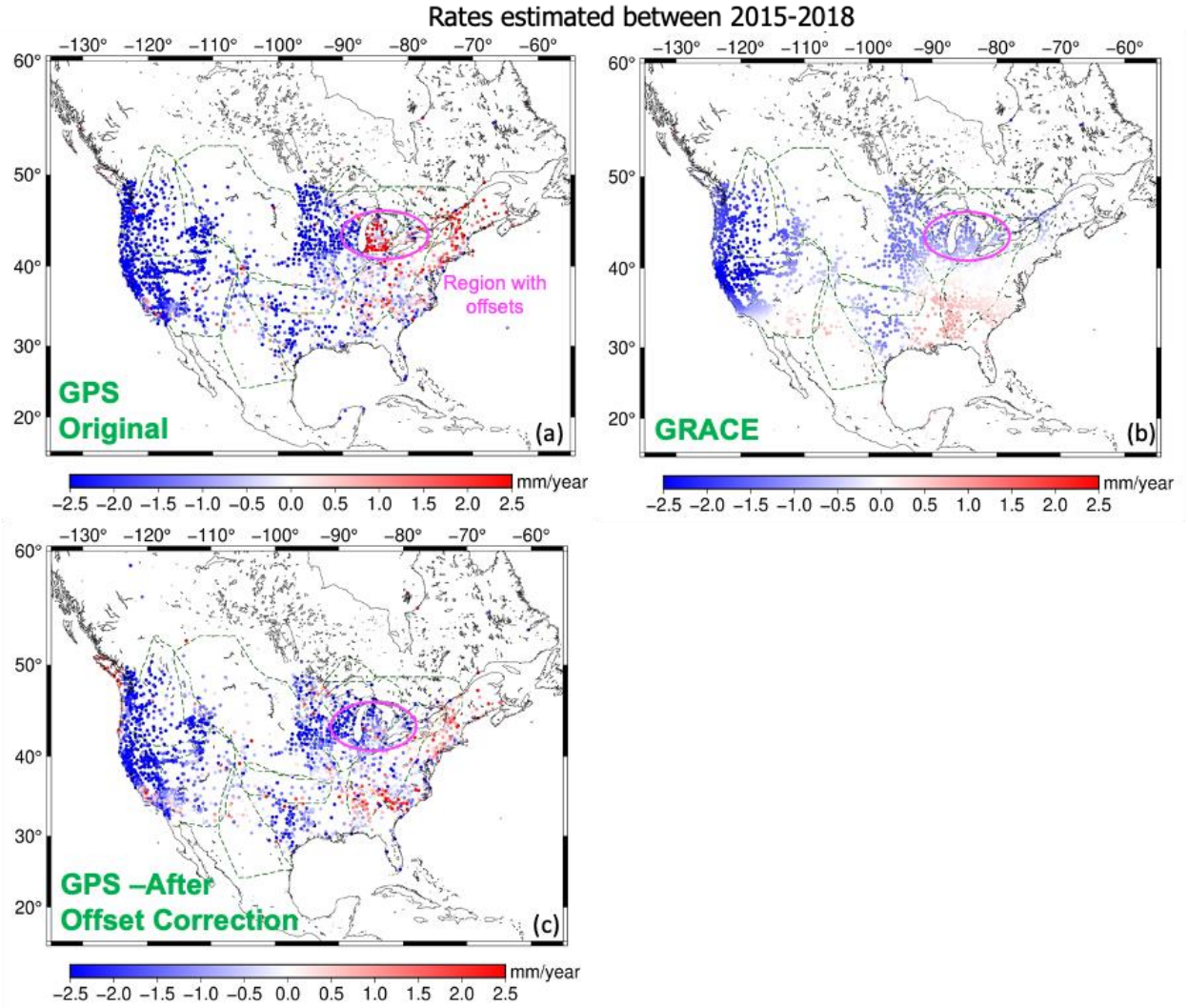

Figure S1: Rates estimated between 2015-2018 for a) GPS original data (with the unlogged offset); b) GRACE(-FO); and c) GPS after the fixing antenna heights in rinex headers.