Earth and Space Science

Supporting Information for

Drought-induced vertical displacements and water loss in the Po river basin (Northern Italy) from GNSS measurements

F. Pintori[1] and E. Serpelloni[1]

[1]Istituto Nazionale di Geofisica e Vulcanologia (INGV), Bologna, 40128, Italy.

Contents of this file

Figures S1 to S8

Introduction

We provide additional figures to better explain how the time series are analyzed. These figures also support the inversion strategy employed to estimate the terrestrial water storage variations and what is presented in the discussion.

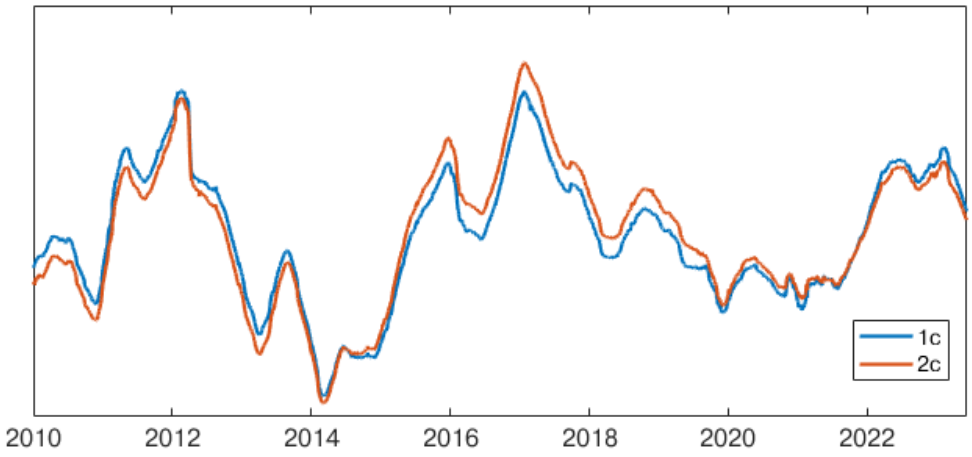

Figure S1. Comparison of the temporal evolution of the PC1 obtained considering 1 (blue), 2 (red) and 3 (yellow) total principal components.

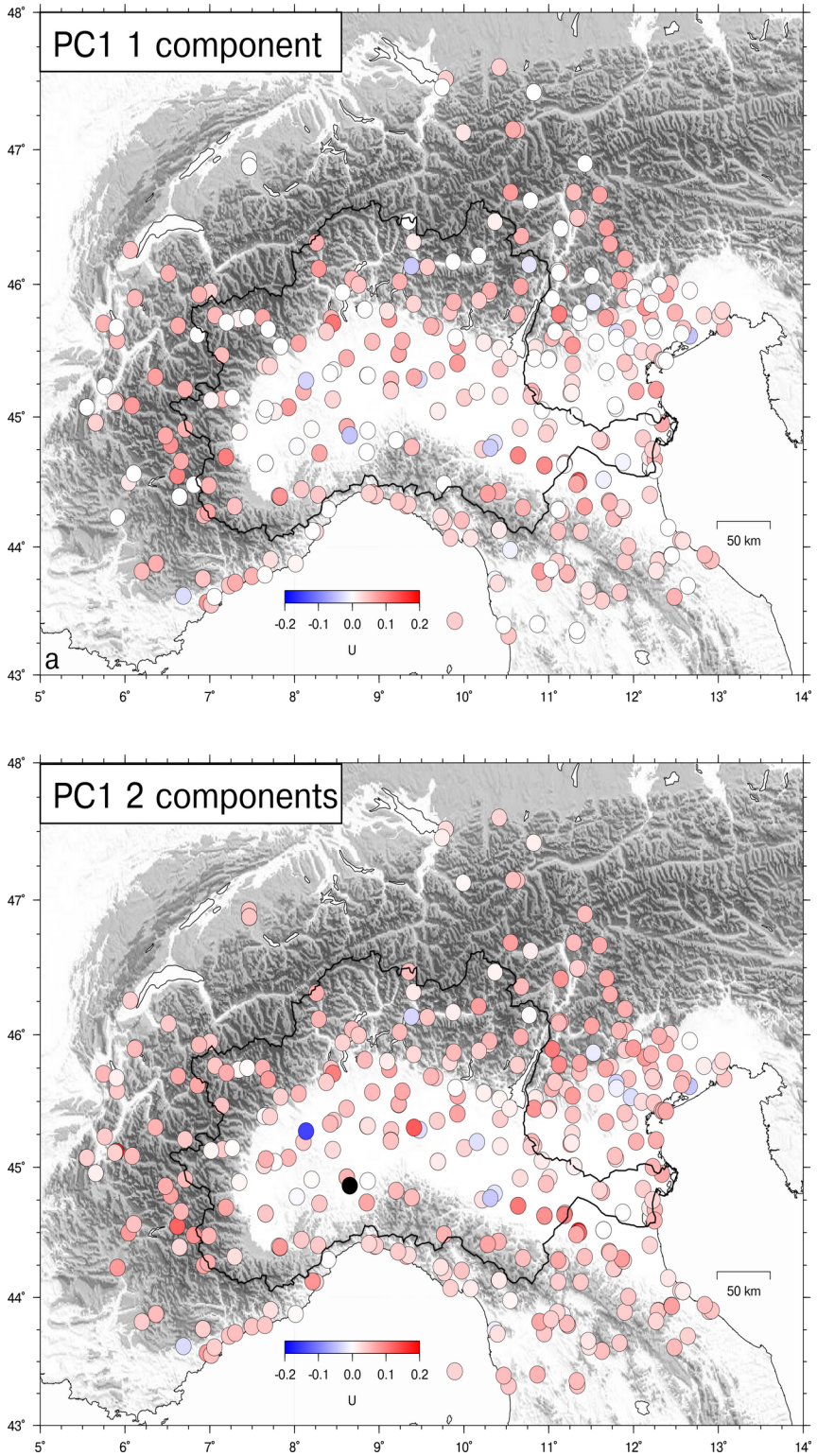

Figure S2. Comparison of the spatial responses of the PC1 obtained considering 1 (a), 2 (b) total principal components.

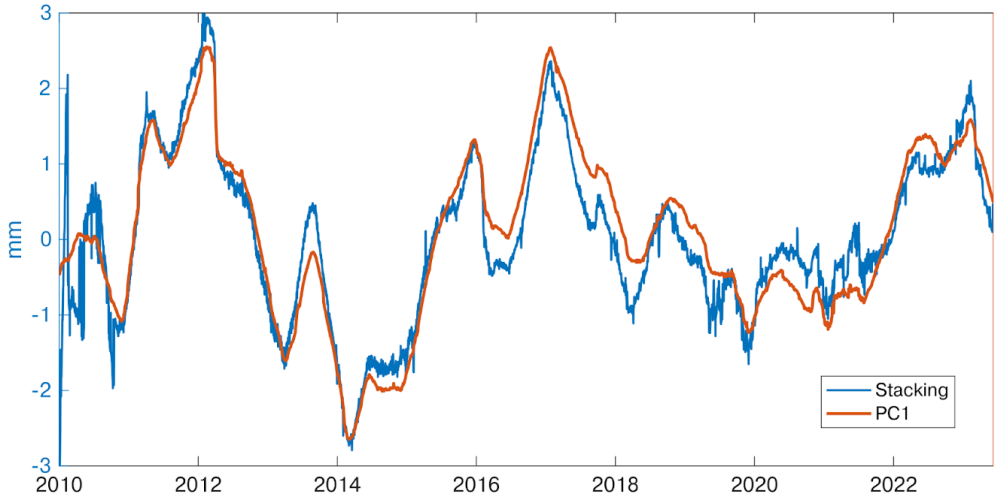

Figure S3. Comparison of the temporal evolution of the PC1 (red) with the common mode signal of the network obtained by performing a weighted stacking (blue).

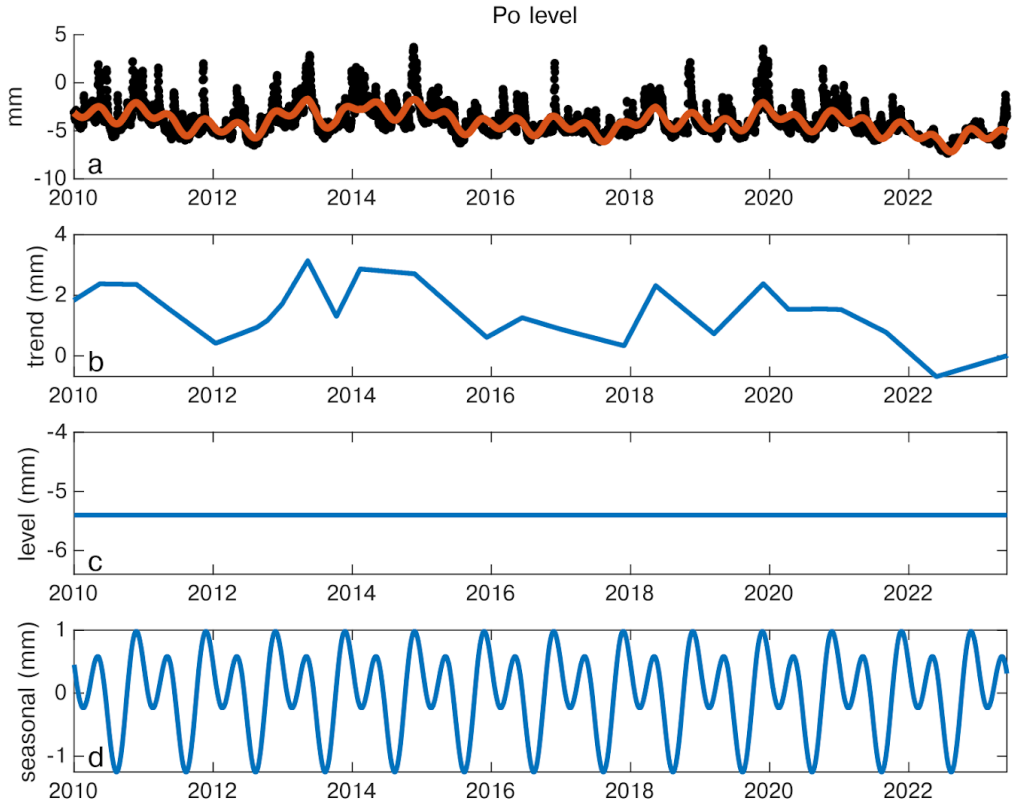

Figure S4. Decomposition of the Po river level measurements, performed using the L1 tool software. In a) the black dots represent the original time series, the red line the L1 tool model, which is the sum of the trend (b), level (c) and seasonal component (d).

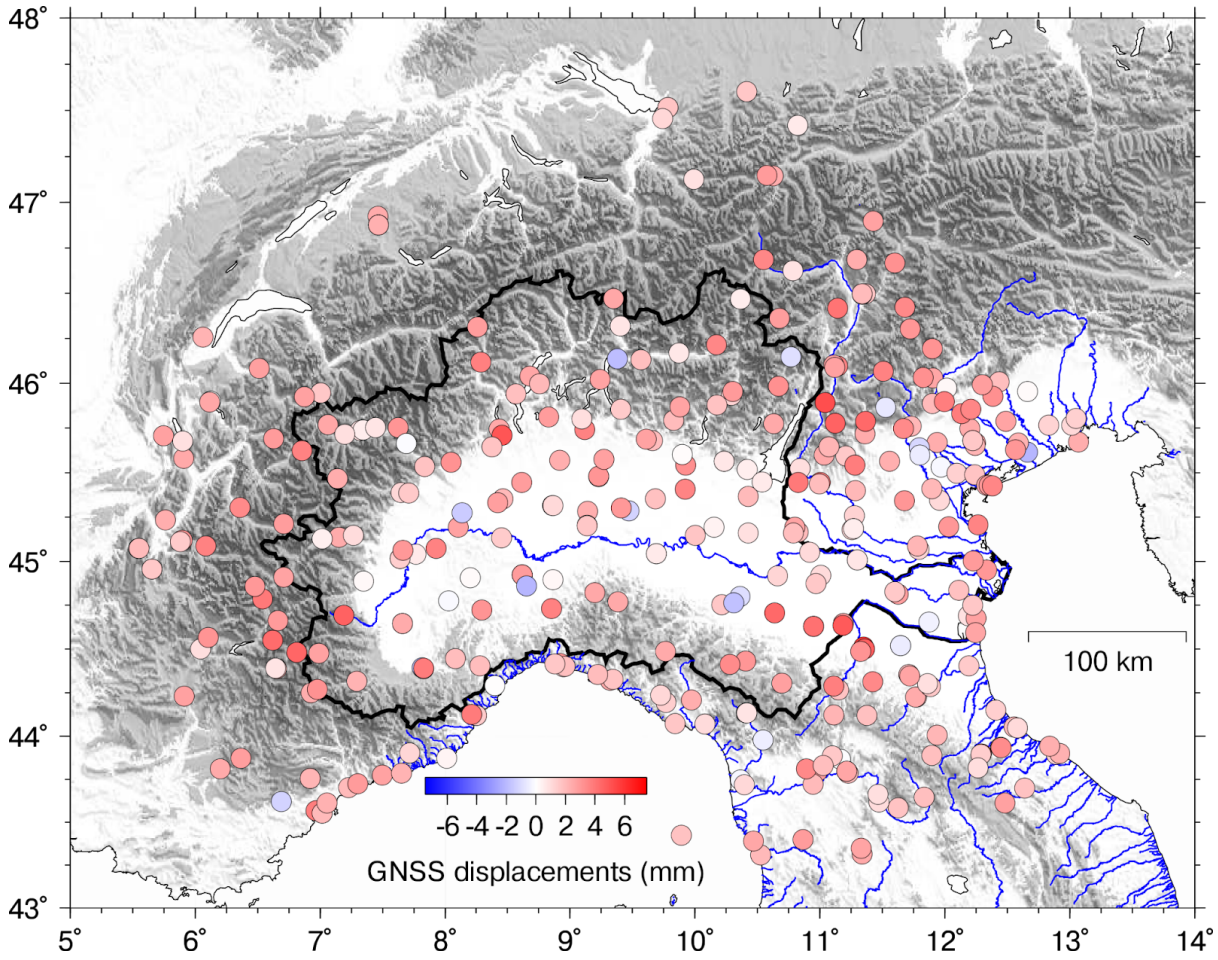

Figure S5. Vertical displacements associated with PC1 during the 2021.00 (January, 2021) - 2022.58 (August, 2022) time interval.

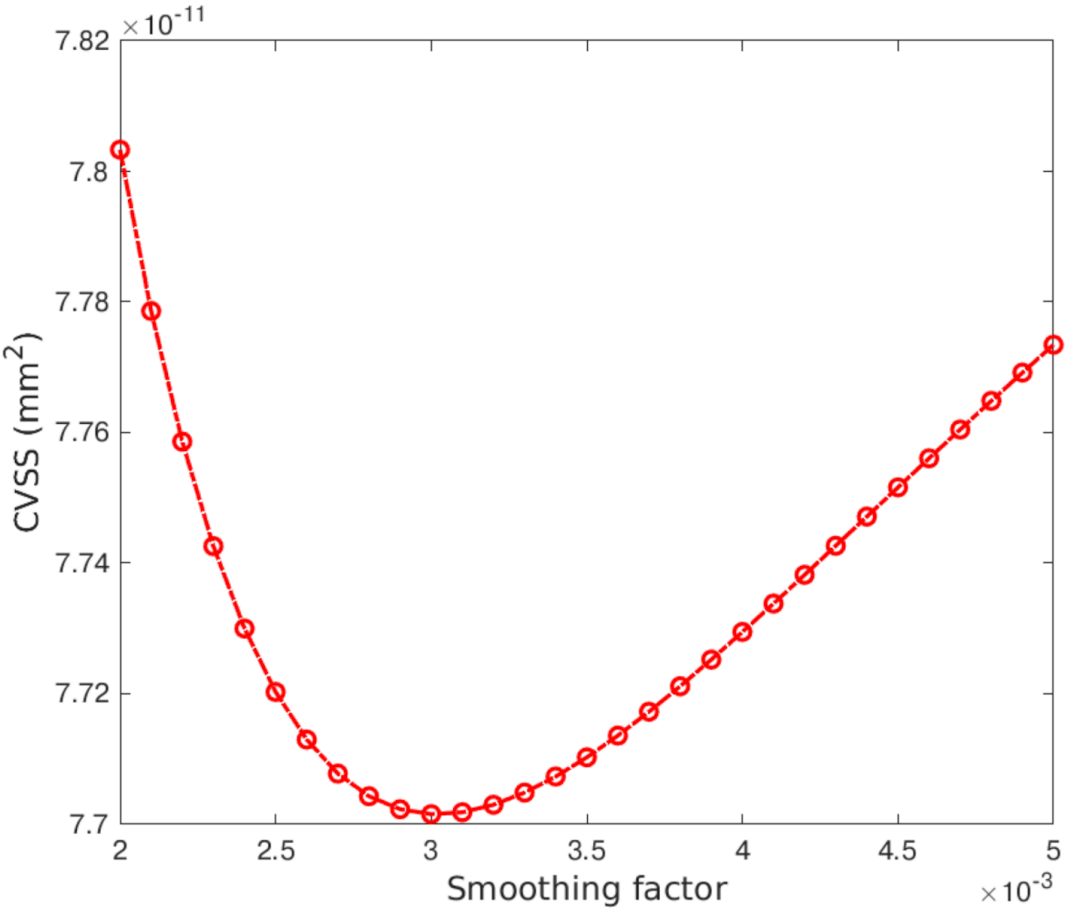

Figure S6. Relation between the sum of squared residuals from cross-validation (CVSS) and the smoothing factor.

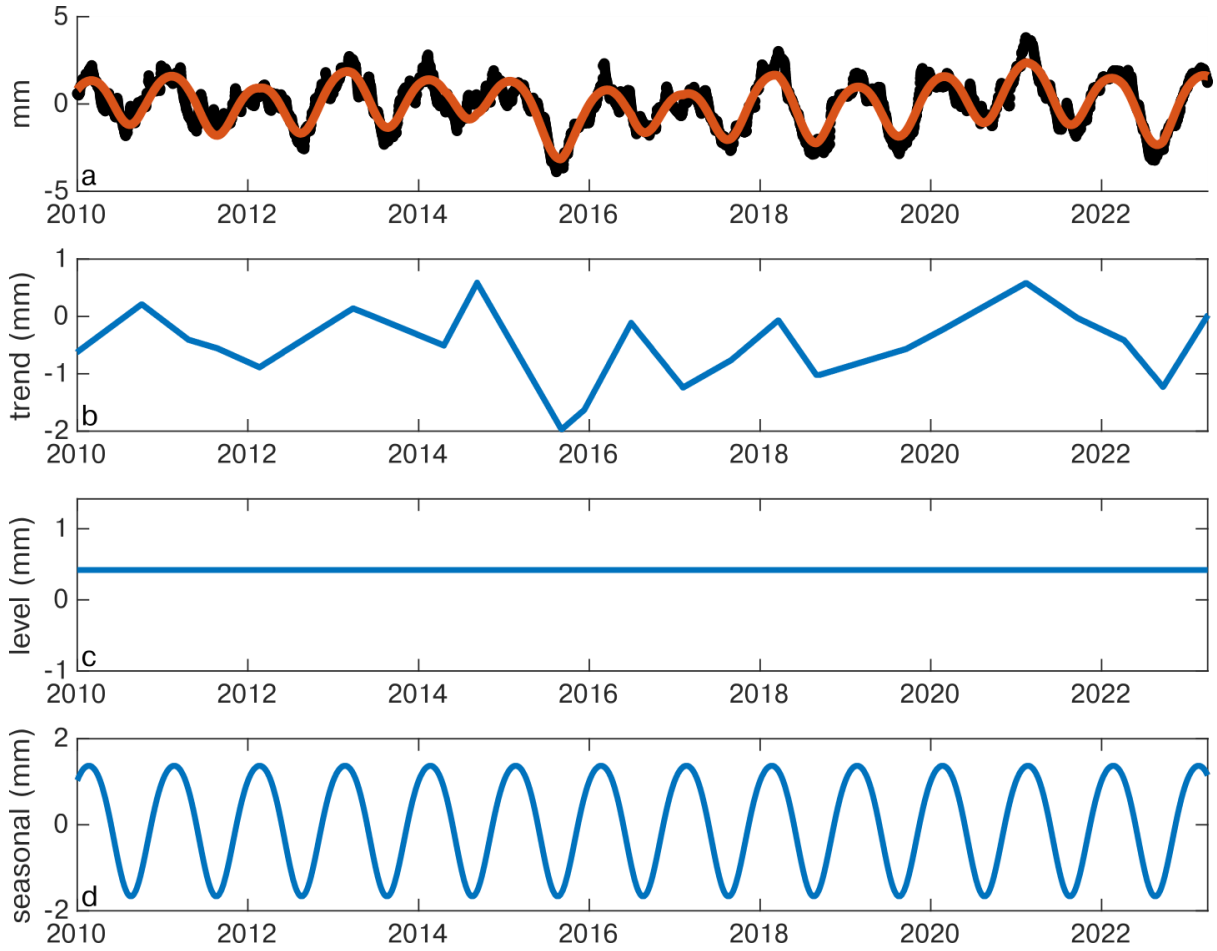

Figure S7. Decomposition of the GLDAS surface water content time series, associated with the cell with coordinates lon=10.88°, lat= 45.88°, performed using the L1 tool software. In a) the black dots represent the original time series, the red line the L1 tool model, which is the sum of the trend (b), level (c) and seasonal component (d).

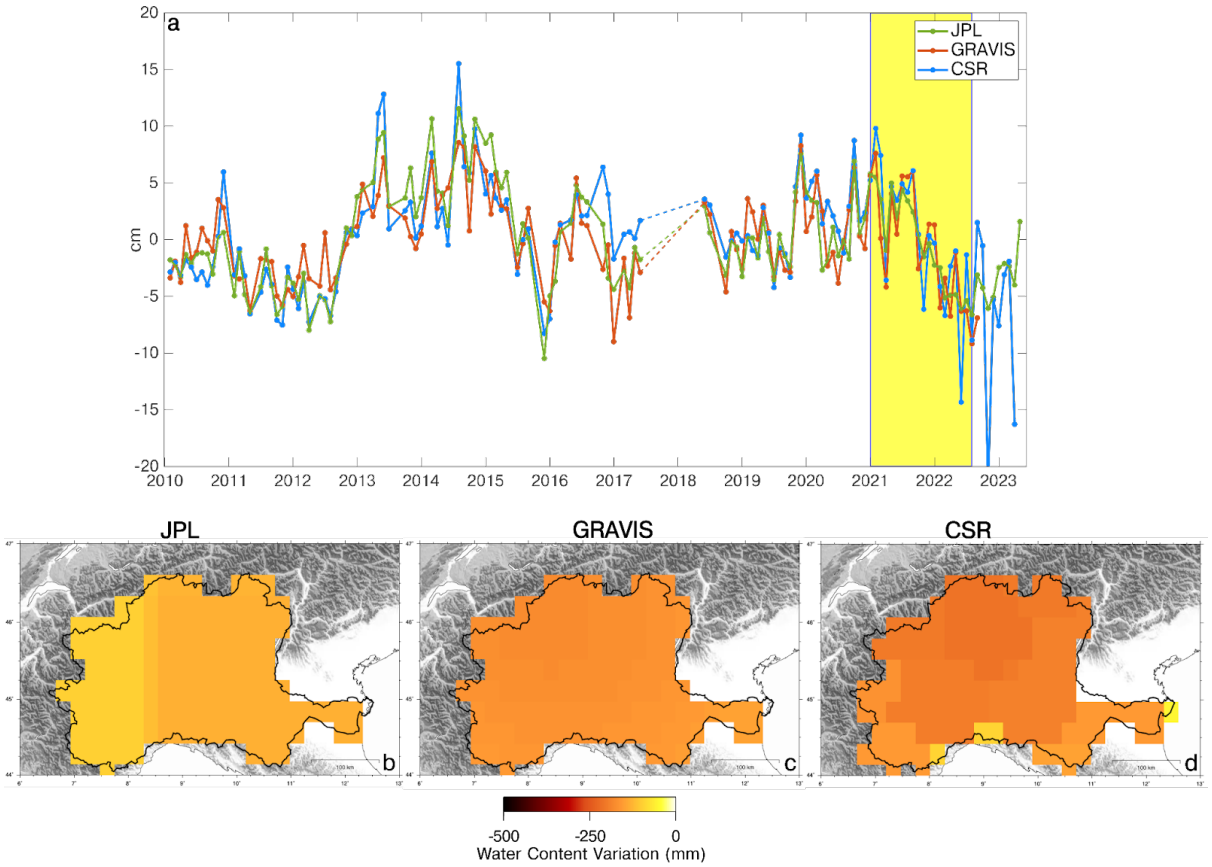

Figure S8. (a) Comparison among the regional-averaged water content from GRACE estimated by JPL (green), GRAVIS (red) and CSR (blue). Bottom panels represent water loss occurred in the 2021.00 - 2022.58 time interval in terms of Liquid Water Equivalent Thickness from GRACE, estimated by JPL (b), GRAVIS (c) and CSR (d).